Appendix A
LAX SPECIFIC PLAN AMENDMENT STUDY

Notice of Preparation/Scoping

July 2012

Prepared for:

Los Angeles World Airports
One World Way
Los Angeles, California 90045

Prepared by:

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111 Academy Way, Suite 150
Irvine, CA 92617

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2008 NOP Document

California Environmental Quality Act

NOTICE OF PREPARATION

To: Responsible or Trustee Agency
Interested Parties

From: City of Los Angeles
Los Angeles World Airports
1 World Way, Room 218
Los Angeles, CA 90045

Subject: **Notice of Preparation of a Draft Environmental Impact Report (SCH No. 1997061047)**

Project Title: Los Angeles International Airport Specific Plan Amendment Study

Project Location: Los Angeles International Airport in the City of Los Angeles, County of Los Angeles

The City of Los Angeles - Los Angeles World Airports (LAWA) will be the lead agency and will prepare an Environmental Impact Report (EIR) for the project identified above. The subject EIR will be tiered from the Los Angeles International Airport (LAX) Master Plan EIR (State Clearinghouse Number 1997061047).

LAWA, as the Lead Agency, must prepare and distribute a Notice of Preparation (NOP) after it decides to prepare an EIR. LAWA, through the NOP, solicits participation in determining the scope of the EIR from responsible public agencies (those which may have discretionary approval power over the proposed Project or an aspect of it), trustee agencies (agencies with jurisdiction over a natural resource held in public trust that the Project may affect), and from local governments, regional agencies, private individuals and organizations which may have concerns about the Project. This NOP is intended to inform all those parties of LAWA's intent to prepare a draft EIR on the proposed Los Angeles International Airport Specific Plan Amendment Study. The NOP solicits comments regarding the proposed scope and content of the environmental studies and other information that will be included in the EIR. LAWA has prepared this NOP in accordance with the State CEQA Guidelines and the City of Los Angeles CEQA Guidelines.

On receipt of comments on the NOP, LAWA will consider those comments and prepare the draft EIR. The EIR will analyze the potential adverse impacts that are anticipated to result from the Project, identify potential mitigation measures where reasonable and feasible, and analyze reasonable and feasible alternatives to the proposed Project that could reduce or avoid identified impacts while still feasibly achieving most of the basic Project objectives.

LAWA is requesting input from interested government and quasi-government agencies, other organizations and private citizens regarding the scope and content of environmental information to be included in the EIR. In the future, public agencies receiving this notice may need to use the EIR prepared by LAWA when considering their permits or other approvals for the proposed Project.

Notice of Preparation

Any public agencies that respond to this Notice are requested, at a minimum, to:

1. Describe significant environmental issues, reasonable alternatives and mitigation measures which they would like to have addressed in the EIR.
2. State whether they are a responsible or trustee agency for the Project, explain why and note the specific Project elements that are subject to their regulatory authority.
3. Provide the name, address and phone number of the person who will serve as their point of contact throughout the environmental review process for this Project.

As part of the scoping process, two (2) public scoping meetings will be held as follows:

Location: The Proud Bird Restaurant
11022 Aviation Boulevard
Los Angeles, CA 90045

Dates & Times: Wednesday, May 7, 2008, 6:00 to 9:00 PM
Saturday, May 10, 2008, 9:00 AM to Noon

Your response to this NOP should be sent at the earliest possible date and must be received by LAWA no later than Wednesday, June 18, 2008.

Please send your response to Mr. Herb Glasgow, Senior City Planner, at the address shown above.

Signature: Herbert Glasgow
Herb Glasgow

Title: Senior City Planner

Date: 3/12/08

Telephone: (310) 646-7690

1. PROJECT LOCATION

The Project is located at Los Angeles International Airport (LAX), situated within the City of Los Angeles and Los Angeles County. As depicted on Figure 1, LAX is bordered by the community of Westchester (part of the City of Los Angeles), the City of El Segundo, the City of Inglewood, the unincorporated community of Lennox, and the Pacific Ocean. The airport is located approximately 12 miles southwest of downtown Los Angeles. Figure 2 provides an aerial view of the existing airport.

2. PROJECT BACKGROUND

The LAX Master Plan, approved by the Los Angeles City Council in December 2004, is the strategic framework for future development of LAX. The LAX Master Plan provides for modernization of the runway and taxiway system, redevelopment of the terminal area, improvement of access to the airport, and enhancement of passenger safety, security, and convenience. Key improvements under the LAX Master Plan are identified and depicted on Figure 3.

The LAX Specific Plan, approved in December 2004 as part of the LAX Master Plan Program, establishes procedures for approval of all projects defined in the LAX Master Plan Program. The approval procedures are different for a subset of the LAX Master Plan projects. These projects are commonly referred to as the "Yellow Light Projects." Such projects, as delineated in Section 7.H of the LAX Specific Plan, include the following:[1]

- Ground Transportation Center (GTC);
- Automated People Mover (APM) 2 from the GTC to the Central Terminal Area (CTA);
- Demolition of CTA Terminals 1, 2, and 3;
- North Runway re-configuration, including center taxiways; and
- On-site road improvements associated with the GTC and APM 2.

In January 2005, a number of lawsuits challenging the approval of the LAX Master Plan Program were filed. In early 2006, the City of Los Angeles and plaintiffs gave final approval to a settlement of the subject lawsuits. As part of the Stipulated Settlement, LAWA is proceeding with the LAX Specific Plan Amendment Study (SPAS) process to identify potential alternative designs, technologies, and configurations for the LAX Master Plan Program that would provide solutions to the problems that the Yellow Light Projects were designed to address, consistent with a practical capacity of LAX at 78.9 million annual passengers, the same practical capacity as included in the approved LAX

[1] Section 7.H of the LAX Specific Plan as approved in December 2004 also included the West Satellite Concourse and associated APM segments; however, those improvements were later removed from that section of the Specific Plan through a Specific Plan Amendment. As such, they are not considered to be Yellow Light Projects, which is consistent with Section V.D.1 of the Stipulated Settlement described herein.

Master Plan. The Stipulated Settlement and the Specific Plan Amendment approved by the Board of Airport Commissioners and the Los Angeles City Council remove the West Satellite Concourse and associated APM segments from this list of projects identified in the LAX Specific Plan that are to be addressed as part of the SPAS process.

The LAX Master Plan, LAX Specific Plan, and the Stipulated Settlement are available for review at http://www.laxmasterplan.org.

3. PROJECT DESCRIPTION

The proposed Project consists of the Specific Plan Amendment Study including related amendments to the adopted LAX Plan and LAX Specific Plan as identified through the evaluation of potential alternative designs, technologies, and configurations for the LAX Master Plan Program that would provide solutions to the problems that the Yellow Light Projects were designed to address, consistent with a practical capacity of LAX at 78.9 million annual passengers, the same practical capacity as included in the approved LAX Master Plan. Figure 4 identifies the location of the Yellow Light Project areas. The following briefly describes, for each Yellow Light Project, existing conditions, the problem that was intended to be addressed, and the various options that have been formulated based on input received from the community and from the LAX SPAS Advisory Committee established through the Stipulated Settlement. Based on the nature and characteristics of the various options, several alternatives have been formulated for possible consideration in the SPAS EIR. The alternatives represent a reasonable range of how the various options might be combined to form complete potential scenarios for consideration in the EIR. The EIR will also evaluate whether there are other alternatives, to the extent such alternative could avoid or substantially reduce significant impacts identified in the EIR analysis.

The SPAS EIR will be a Supplemental EIR that is tiered from the LAX Master Plan EIR, providing new or revised analyses of the environmental impacts specific to the alternatives associated with the Yellow Light Project options. The discretionary actions to be addressed by the SPAS EIR are anticipated to include, but not be limited to, a general plan amendment and a specific plan amendment.

3.1 Yellow Light Projects Options

The following sections provide a brief description of the options that have been formulated based on input received from the community and from the LAX SPAS Advisory Committee

3.1.1 North Airfield Reconfiguration, including Center Taxiways

Existing Conditions: There are currently two runways in the north airfield of LAX; Runways 6L/24R and 6R/24L. Runway 6L/24R is primarily used for arrivals and Runway 6R/24L is primarily used for departures. Runway 6R/24L, the inboard runway, is 10,285 feet long and 150 feet wide. Aircraft access to and from Runway 6R/24L is provided by a parallel taxiway located 400 feet south of Runway 6R/24L, and a series of connecting taxiways between the runway and the parallel taxiway. Outboard Runway 6L/24R, located approximately 700 feet to the north of Runway 6R/24L's centerline is

8,925 feet long and 150 feet wide. Aircraft access to and from Runway 6L/24R is provided by a series of connecting taxiways. At this time, there is no parallel taxiway associated with Runway 6L/24R.

The current north airfield was designed in the 1960s to accommodate the fleet of aircraft in use at that time. The largest of these older aircraft are known as Design Group IV aircraft, which are smaller than the fleet of aircraft currently using the north airfield (known as Design Group V aircraft) and smaller than the fleet of large aircraft that are currently in production and testing (known as Design Group VI). Group V aircraft are defined by certain characteristics, such as wingspan, tail height and weight, and include aircraft such as the Boeing B747 and the Airbus A340. Group VI aircraft are larger than Group V aircraft and include aircraft such as the Airbus A380 and the Boeing B747-8.

Problems the North Airfield Reconfiguration was Designed to Address: Under the LAX Master Plan, a primary function of the reconfiguration of the North Airfield is to provide a physical solution that would reduce the risk of runway incursions, enhance the safety of aircraft operations at LAX, and provide a better balance in operations between the North Airfield and the South Airfield. The approved Master Plan would achieve these goals by relocating Runway 6R/24L 340 feet to the south of the existing runway centerline in order to accommodate a 75-foot-wide centerfield taxiway between Runway 6L/24R and Runway 6R/24L with 520 feet separation between each of the runway centerlines and the new taxiway centerline.

This North Airfield design would provide for a Modified Group VI airfield. Group VI standards are designed to accommodate the new generation of wide-bodied airplanes set to be introduced to LAX and other airports in the near future. These aircraft, referred to as new large aircraft or NLA, have significantly wider wingspans, taller tail sections, and longer fuselages. In the absence of an airfield that meets Group VI aircraft, operational restrictions would have to be imposed to accommodate NLA at LAX.

SPAS Options: As part of the LAX SPAS process, LAWA, in consultation with members of the surrounding communities and the LAX SPAS Advisory Committee, has identified five options for the reconfiguration of the North Airfield that are under consideration for inclusion in the LAX SPAS and its EIR. The options for reconfiguration of the North Airfield are depicted on Figure 5 and described below.

Move Runway 6R/24L 340' South (Approved Master Plan)

- Move Runway 6R/24L340 feet south of the existing runway centerline.
- Extend Runway 6R/24L approximately 135 feet west and approximately 1,280 feet to the east and widen by 50 feet (i.e., The easterly runway extension would provide additional runway length from which departing aircraft, heading west, would start their takeoff; however, aircraft arriving from the east would continue to touch down in a similar location on the relocated runway).

- Extend Runway 6L/24R approximately 1,495 feet to the west. Construct a new Modified Group VI parallel center taxiway 520 feet north of relocated Runway 6R/24L and 520 feet south of Runway 6L/24R.
- Relocate, extend and/or widen other existing taxiways on the North Airfield.

Move Runway 6R/24L 100' South

- Move Runway 6R/24L 100 feet south of the existing runway centerline.
- Extend Runway 6R/24L approximately 135 feet west and approximately 1,280 feet to the east and widen by 50 feet (i.e., The easterly runway extension would provide new pavement for aircraft takeoffs to the west and landings and takeoffs to the east, but would not be used for landing to the west).
- Construct a new Group V parallel center taxiway 400 feet north of relocated Runway 6R/24L and 400 feet south of Runway 6L/24R.
- Relocate, extend and/or widen other existing taxiways on the North Airfield.

Keep Existing Runway Locations - Implement Operational Improvements Only

- Implement operational improvements, including upgrading the existing Airport Surface Detection Equipment (ASDE), surface radar equipment, Runway Status Lights (RWSL), and additional air traffic control tower staffing. While the other runway options described herein would also include operational improvements within the control of LAWA, this option relies solely on operational improvements with no changes to the current runway and taxiway configuration for the North Airfield.

Move Runway 6L/24R 100' North

- Move Runway 6L/24R 100 feet north of the existing runway centerline.
- Extend Runway 6L/24R approximately 1,495 feet west and widen by 50 feet.
- Displace threshold of Runway 24R approximately 1,440 feet west of existing Runway 24R threshold location. The runway pavement east of the displaced threshold would be useable for departures to the west and landings and takeoffs to the east but this section of runway pavement would not be useable for landings to the west.
- Extend Runway 6R/24L approximately 1,280 feet to the east and approximately 135 feet to the west and widen by 50 feet (i.e., the easterly runway extension would provide new pavement for aircraft takeoffs to the west and landings and takeoffs to the east, but would not be used for landing to the west).

3.1.3 Ground Transportation Center

Existing Conditions: Under existing conditions, vehicular access to the passenger terminals, including curb front facilities that allow for the drop-off and pick-up of passengers, is provided within the CTA. Commercial vehicles (i.e. taxis, shuttle vans and limos) provide direct service to passengers within the terminal area. Vehicle access to the CTA is provided via World Way, which operates as a one-way, multi-lane, two-level rectangular loop road within the CTA with direct connections to all the terminals. Ramps from the main access routes (i.e. Century Boulevard, Sepulveda Boulevard, and Sky Way) direct traffic onto World Way just east of Terminal 1. Parking structures located within the CTA provide close-in public parking. Security within the CTA is provided by police checkpoints, random vehicle checks, active curbfront traffic enforcement, police patrols, passenger and baggage screening, employee badging and other layered and coordinated policing techniques.

The site proposed for the GTC under the LAX Master Plan, known as Manchester Square, is located northeast of the intersection of Aviation and Century Boulevards. Manchester Square is part of the ongoing LAX Voluntary Residential Acquisition and Relocation Program, through which much of the area has been vacated.

Problem the Ground Transportation Center was Designed to Address: Under the LAX Master Plan, the function of the GTC is to replace CTA curb front for drop-off and pick-up of passengers and to replace a portion of private vehicle parking area and all of the commercial vehicle (e.g., taxis, shuttle vans and limousines) staging area. The GTC was designed to allow closure of the CTA to private vehicle access and provide the curb front function at a location well-removed from the main terminal area, which could help enhance security within the CTA. The GTC, in conjunction with the Intermodal Transit Center and other parking facilities proposed as part of the LAX Master Plan, also provided replacement parking for the existing parking that would be eliminated under the Master Plan, such as in the CTA and Lots C and D.

SPAS Options: As part of the LAX SPAS process, LAWA, in consultation with members of the surrounding communities, has identified three options to the GTC that are under consideration for inclusion in the LAX SPAS. The options to the GTC are depicted on Figure 6 and described below. Inasmuch as the GTC was an integral part of the LAX Master Plan's design to address potential security concerns arising from the events of September 11, 2001, the SPAS evaluation of the options described below will include security considerations.

Close Access to CTA – Build GTC at Manchester Square (Approved Master Plan)

- Eliminate private vehicle access to the CTA.
- Construct GTC at Manchester Square.

- Construct a new Group V parallel center taxiway 400 feet south of relocated Runway 6L/24R and 400 feet north of Runway 6R/24L.
- Relocate, extend and/or widen other existing taxiways on the North Airfield.

Move Runway 6L/24R 340' North

- Move Runway 6L/24R 340 feet north of the existing runway centerline.
- Extend Runway 6L/24R approximately 1,495 feet west and widened by 50 feet.
- Extend Runway 6R/24L approximately 1,280 feet to the east and approximately 135 feet to the west and widen by 50 feet (i.e. the easterly runway extension would provide new pavement for aircraft takeoffs to the west and landings and takeoffs to the east, but would not be used for landing to the west).
- Construct anew Modified Group VI parallel center taxiway 520 feet south of relocated Runway 6L/24R and 520 feet north of Runway 6R/24L.
- Relocate, extend and/or widen other existing taxiways on the North Airfield.

3.1.2 Demolition of CTA Terminals 1-3

Existing Conditions: Terminals 1, 2, and 3 are located on the north side of the Central Terminal Area (CTA). The three terminals are configured in a pier formation and consist of aircraft gates, over one million square feet of terminal and concourse space, including passenger processing, passenger holdroom, concessions, airline operations, and administrative space.

Problem the Demolition of Terminals 1-3 was Designed to Address: Under the LAX Master Plan, Terminals 1-3 would be demolished in order to provide room for the relocation of Runway 6R/24L 340 feet to the south of the existing runway centerline. The existing terminals would be replaced by a linear concourse that would provide aircraft gates and passenger holdrooms but no passenger processing capacity. Under the approved Master Plan, the passenger processing capacity provided by the existing Terminals 1-3 would be replaced by new passenger processing facilities in the interior of the CTA (where the existing parking garages are currently located). Under the LAX Specific Plan and Stipulated Settlement, only the Demolition of Terminals 1-3 is a Yellow Light Project.

SPAS Options: There are two options for Terminals 1-3 that are under consideration for inclusion in the environmental evaluation for the LAX SPAS. These Terminals 1-3 options consist of the following:

- Demolish Terminal 1-3 (Approved Master Plan)
- Do Not Demolish Terminals 1-3 – Keep Existing Configuration

3.1.4 Automated People Mover 2

Existing Conditions: LAX is not served by an Automated People Mover (APM) system under existing conditions.

Problem the APM2 was Designed to Address: Under the LAX Master Plan, the function of APM2 is to provide connection between the planned GTC and the CTA.

SPAS Options: As part of the LAX SPAS process, LAWA, in consultation with members of the surrounding communities, has identified three options for APM2 that are under consideration for inclusion in the LAX SPAS. The options for APM2 are depicted on Figure 6 and described below.

Build APM2 (Approved Master Plan)

- Construct APM2 to connect the GTC and the CTA via a route along the south side of Century Boulevard.

Do Not Build APM2 - Build Only APM1 With An Additional Stop

- Do not build APM2. To provide an APM connection between the optional Transportation Centers (identified above) and the CTA, modify the APM1 route, which is an approved Master Plan improvement planned to provide access between the CTA, the Consolidated Rental Car (RAC) facility, and the Intermodal Transit Center, by adding a stop at Manchester Square (i.e., at the Transportation Center proposed at Manchester Square described above for the GTC options).

Do Not Build APM2 - Build Only APM1 With Two Additional Stops

- Do not build APM2. To provide an APM connection between the optional Transportation Centers and Ground Access Facility (identified above) and the CTA, modify the APM1 route, which is an approved Master Plan improvement planned to provide access between the CTA, the Consolidated Rental Car (RAC) facility, and the Intermodal Transit Center, by adding a stop at Manchester Square (i.e., at the Transportation Center proposed at Manchester Square described above for the GTC options) and a stop east of the CTA (i.e., at the New Drop-Off/Pick-Up Area East of Terminal 1 described above for the GTC options).

3.1.5 On-Site Road Improvements Associated with the GTC and APM2

The on-site road improvements that are associated with Yellow Light Project status consist of roadways that would provide access to the GTC and APM2. Without these facilities, it is not necessary to develop alternative designs, technologies or configurations that would provide the access to the GTC and APM2 that these improvements were designed to address.

Keep Access to CTA - Build Transportation Centers at Manchester Square and at Aviation/Imperial

- Maintain private vehicle access to the CTA.
- Construct a Transportation Center in the Manchester Square area and a second Transportation Center on Aviation Boulevard near Imperial Highway. The Transportation Center in Manchester Square would provide an airport transit connection for passengers using public transportation (bus services, future Metro Green Line), remote public employee parking, remote passenger pick-up and drop-off, and remote transportation services (taxis, shuttles, etc). The Transportation Center on Aviation Boulevard would serve as a second connection point between the airport and ground transportation services, including parking, the existing Green Line Aviation Station, and regional bus service.

Keep Access to CTA - Build Transportation Centers at Manchester Square and at Aviation/Imperial and Provide New Drop-Off/Pick-Up Area East of Terminal 1

- Maintain private vehicle access to the CTA.
- Construct a Transportation Center in the Manchester Square area and a second Transportation Center on Aviation Boulevard near Imperial Highway. The Transportation Center in Manchester Square would provide an airport transit connection for passengers using public transportation (bus services, future Metro Green Line), remote public parking, remote passenger pick-up and drop-off, and remote transportation services (taxis, shuttles, etc). The Transportation Center on Aviation Boulevard would serve as a second connection point between the airport and ground transportation services, including parking, the existing Green Line Aviation Station, and regional bus service.
- Provide additional curb-front area for vehicles to drop off and pick up passengers on the east side of Terminal 1. This would occur by replacing all or part of the existing Park One parking facility, located east of Terminal 1, and realigning Sky Way eastward to provide area adjacent to Terminal 1 for passengers to be dropped off or picked up. Other roads and ramp connections may be needed between this new ground access facility and the existing CTA roads and ramps to ensure efficient movement of airport ground traffic. Additionally, this option may include, within the area currently occupied by Park One, construction of a new parking structure and adjacent landside building that provides a limited level of passenger processing.

3.2 EIR Alternatives Based on Yellow Light Project Options

The discussion above focuses on alternative designs, technologies and configurations to the specific Yellow Light Projects identified in the LAX Specific Plan (as modified by the Stipulated Settlement). However, for purposes of the environmental impact report (EIR), individual options to each Yellow Light Project were grouped together to create comprehensive project alternatives for study in the EIR. The resulting potential project alternatives are the product of the community-based planning process LAWA engaged in during the initial phase of the SPAS process.

CEQA requires that an EIR include among the range of alternatives a "no project" scenario, which, in accordance with Section 15126.6 of the CEQA Guidelines, can be considered in two ways. Relative to the SPAS EIR, the No Project/No Development Alternative assumes that none of the Yellow Light Projects, or options thereto, are implemented. Under this No Project scenario the existing conditions for each Yellow Light Project, as described above, generally remain and the only changes would be those that could be reasonably be assumed to occur in the absence of the Project (i.e., airfield-related operational improvements currently being advanced at LAX). Under the No Project/No SPAS Alternative, it is assumed that all of the Yellow Light Projects are implemented as originally planned, i.e., none of the new options developed as part of the SPAS process are implemented.

In addition to the two variations of the No Project Alternative required by CEQA, this NOP identifies four possible alternatives that represent a reasonable range of combinations for the various Yellow Light Project options. The four alternatives are identified at this point as being "potential," pending completion of the scoping process. The two variations of the No Project Alternative required by CEQA and the four potential alternatives that have been formulated for possible consideration in the SPAS EIR are:

- Required Alternative - No Project/No Development (Existing Conditions)
- Required Alternative - No Project/No Specific Plan Amendment (Implement Approved Master Plan)
- Potential Alternative - Runway 6R/24L 100' South
- Potential Alternative - Existing Runways with Operational Improvements Only
- Potential Alternative - Runway 6L/24R 100' North
- Potential Alternative - Runway 6L/24R 340' North

The basic characteristics of these six alternatives are summarized in Table 1, and depicted in Figures 7 through 12.

Table 1
Potential Alternatives that may be Analyzed in the EIR

	No Project/No Development Alternative	No Project/No SPAS Alternative (Approved Master Plan)	Runway 6R/24L 100' South Alternative	Existing Runways	Runway 6L/24R 100' North Alternative	Runway 6L/24R 340' North Alternative
Yellow Light Project Options						
North Airfield Reconfiguration						
Keep Existing Runway Layout	√			√		
Move Runway 6R/24L 340' South		√				
Move Runway 6R/24L 100' South			√			
Move Runway 6L/24R 100' North					√	
Move Runway 6L/24R 340' North						√
Demolition of Terminals 1, 2, and 3						
Keep Existing Terminals 1-3	√			√	√	√
Demolish Terminals 1-3		√	√			
Ground Transportation Center						
Keep Existing CTA Ground Access System (CTA Open to Public Access - No GTC)	√		√	√	√	√
Close CTA to Public Access - Build GTC		√				
Keep CTA Open to Public Access - Build Transportation Centers at Manchester Square and Aviation/Imperia			√		√	√
Keep CTA Open to Public Access - Build Transportation Centers at Manchester Square and at Aviation/Imperial and Provide New Drop-Off/Pick-Up Area East of Terminal 1				√		
Automated People Mover 2						
Existing Conditions (No APM)	√					
Build APM2 (Connecting GTC to CTA)		√				
Build Modified APM1 instead of APM2 to connect Transportation Centers to CTA			√		√	√
Build Modified APM1 instead of APM2 to connect Transportation Centers and New Drop-Off/Pick-Up Area East of Terminal 1 to CTA				√		
On-Site Road Improvements Associated with the GTC and APM2						
Existing System (No GTC and APM2; therefore No GTC/APM-Related Road Improvements)	√		√	√	√	√
Build On-Site Road Improvements Associated with the GTC and APM2		√				

3.3 Probable Environmental Effects of the Project

An Initial Study Checklist has been prepared for the proposed Project and is attached at the end of this NOP. Based on a preliminary review of the Project site and in consideration of the proposed Project activities, LAWA has determined that potentially adverse effects may occur in the following areas:

- Air Quality/Human Health Risk
- Traffic and Circulation
- Noise
- Land Use
- Cultural Resources
- Biological Resources
- Hydrology/Water Quality
- Hazardous Materials/Risk of Upset
- Aviation Safety
- Aesthetics
- Public Services
- Public Utilities (Water, Wastewater and Solid Waste)
- Cumulative Impacts

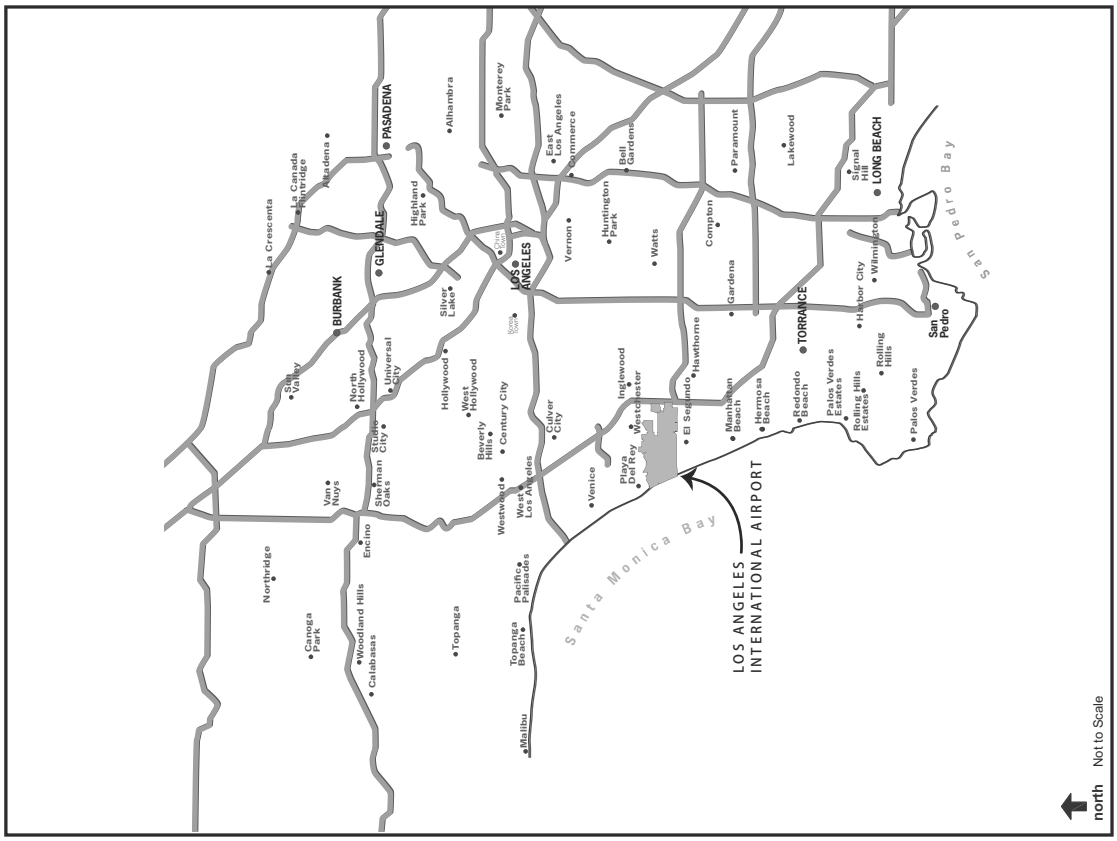
These topics will be addressed in the Draft EIR.

3.4 Comments and Next Steps

Comments regarding the scope and content of the Draft EIR will be accepted for 90 days following issuance of this notice (i.e., comments are due to LAWA no later than June 18, 2008 - see page 2 of NOP). They will assist LAWA in the preparation of the Draft EIR. The Draft ER is scheduled to be completed in August 2009. At that time, a Draft EIR Notice of Completion will be filed with the Los Angeles County Clerk and the document will be circulated for a 45-day public review period.

LAWA will prepare responses to comments received during the public review period regarding the adequacy of the Draft EIR. The comments and responses, together with the Draft EIR and its appendices, will comprise the Final EIR. In arriving at a decision on whether to proceed with the proposed Project, the Los Angeles City Council will consider, among other things, the information in the Final EIR and will determine the adequacy of the environmental documentation under CEQA.

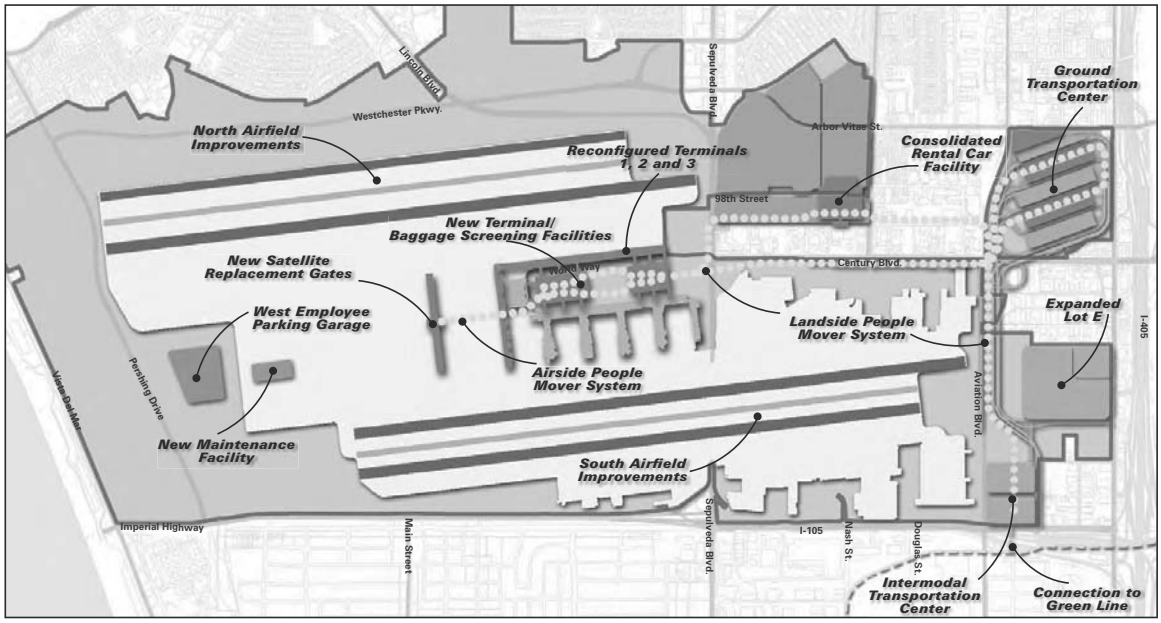
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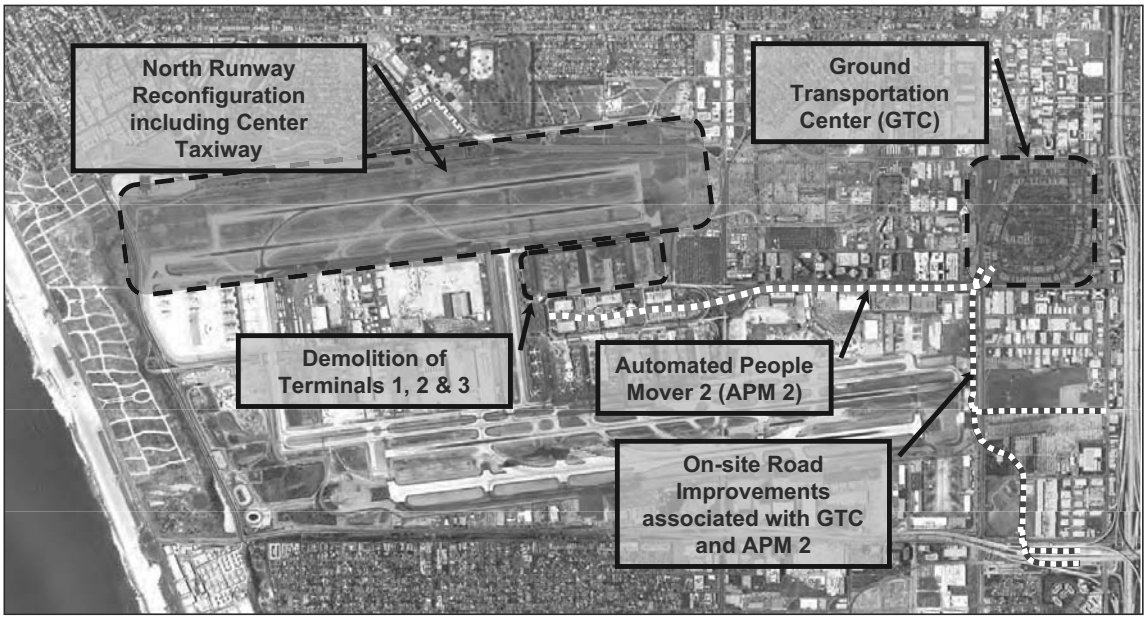
LAX Specific Plan Amendment Study	Project Location Map	Figure 1



LAX Specific Plan Amendment Study	Existing Airport	Figure 2



LAX Specific Plan Amendment Study	Approved LAX Master Plan	Figure 3



Source: LAX Specific Plan, 2004 and LAX Stipulated Settlement, 2006

LAX Specific Plan Amendment Study	SPAS Project Site Areas	Figure 4



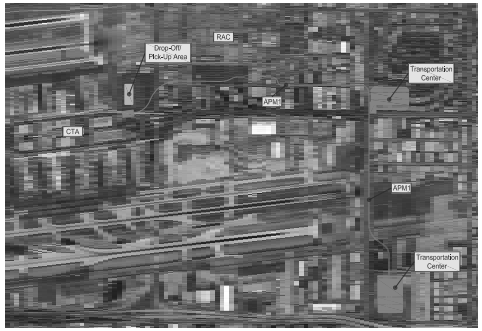
Approved Master Plan

- Close Access to CTA
- Build GTC at Manchester Square
- Built APM2

Note: APM1 is not a Yellow Light project



- Keep Access to CTA
- Build Transportation Centers at Manchester Square and Aviation/Imperial
- Build Modified APM1



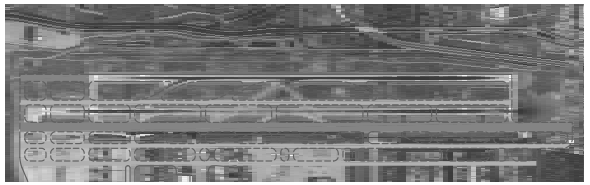
- Keep Access to CTA
- Build Transportation Centers at Manchester Square and Aviation/Imperial
- Provide New Drop-Off/Pick-Up Area East of Terminal 1
- Build Modified APM1

North

0 3,000'

Scale

LAX Specific Plan Amendment Study	Options for Ground Transportation Center and Automated People Mover 2	Figure 6



Move Runway 6R/24L 340' South (Approved Master Plan)



Move Runway 6R/24L 100' South



Existing Runway Locations - Implement Operational Improvements Only



Move Runway 6L/24R 100' North



Move Runway 6L/24R 340' North

Legend

Runway

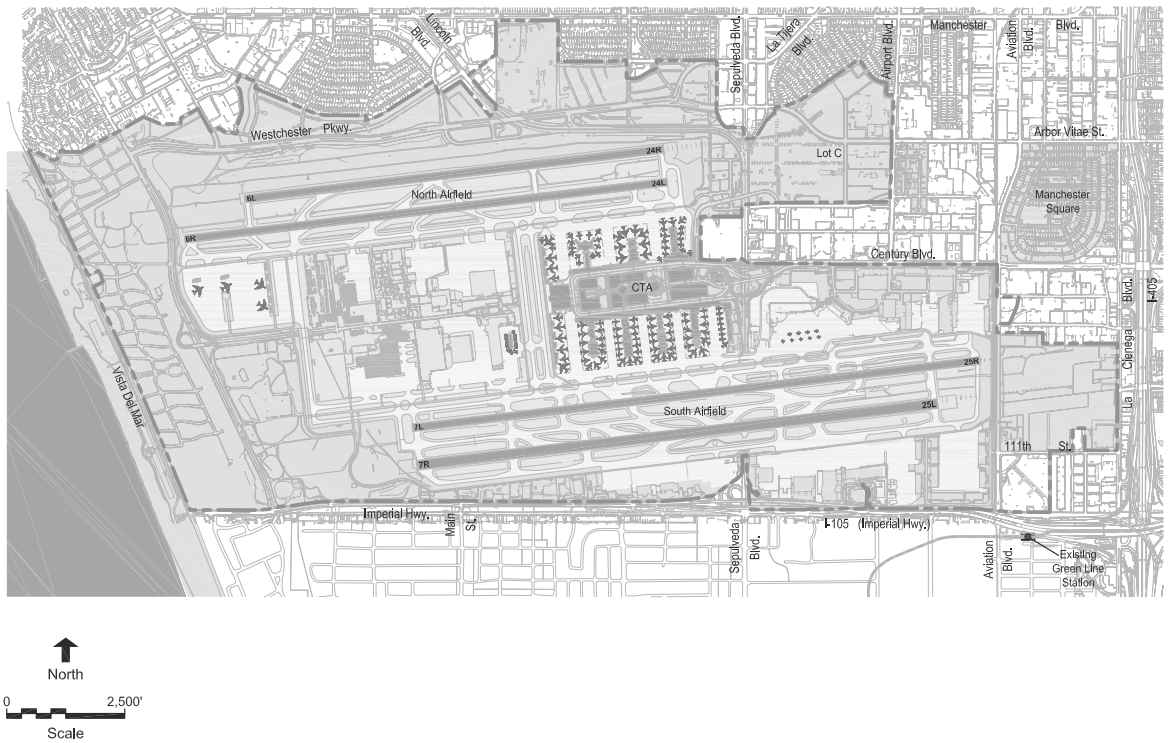
Parallel Taxiway

North

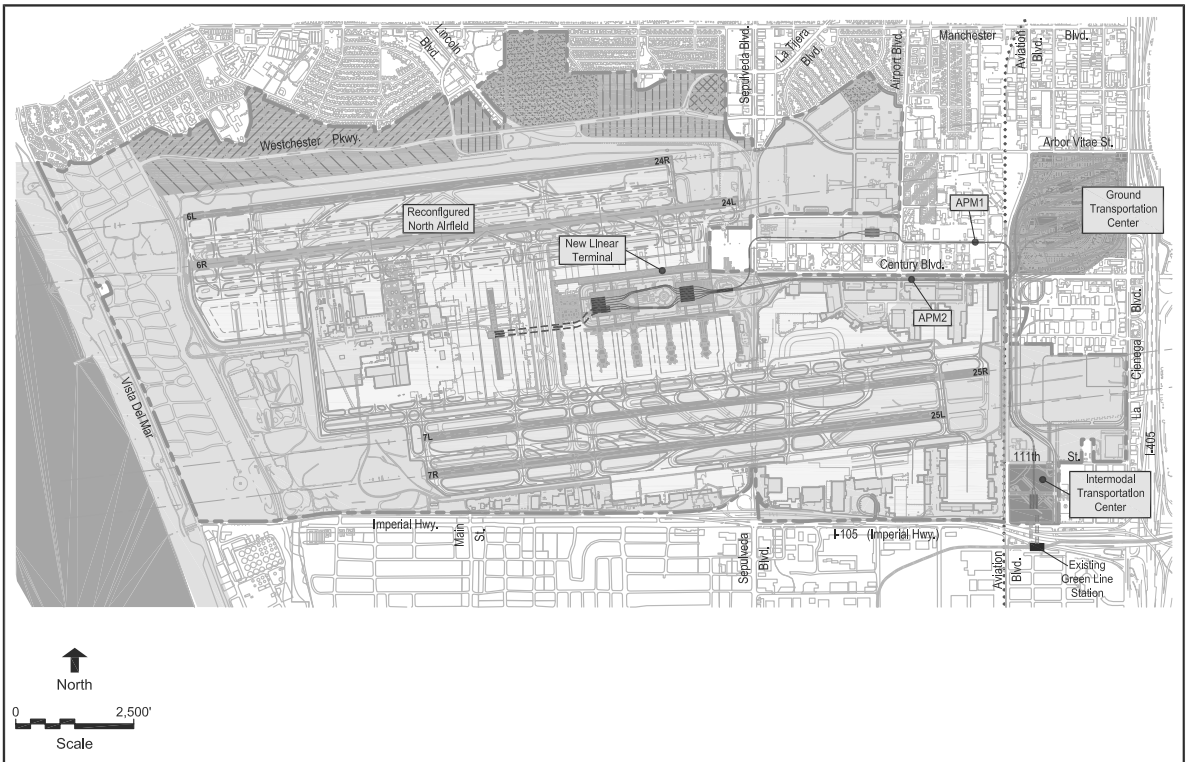
0 2,500'

Scale

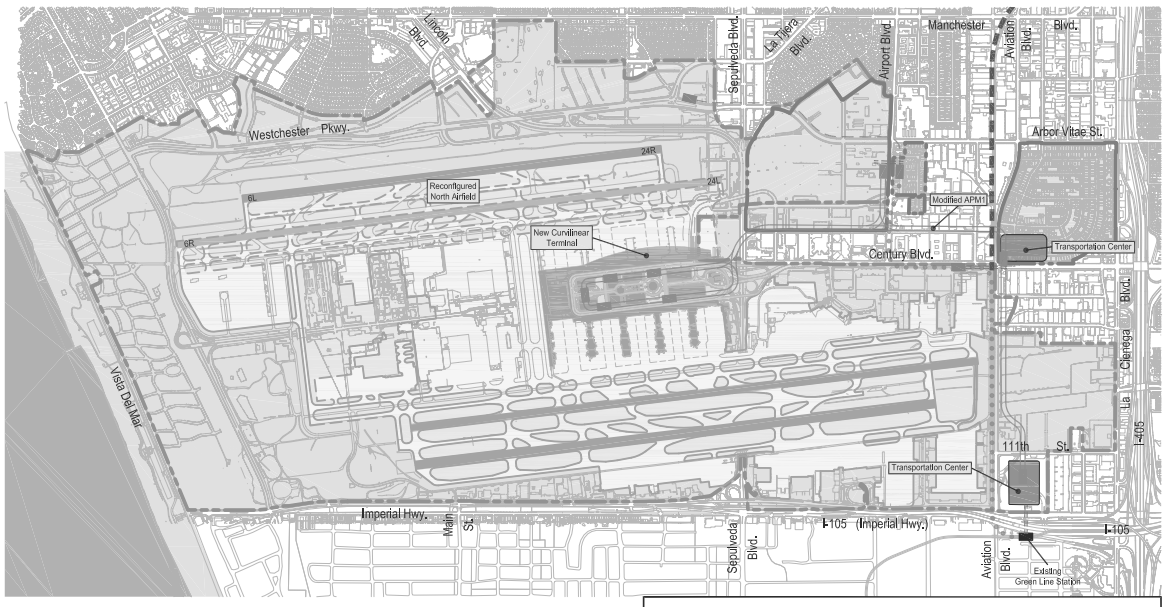
LAX Specific Plan Amendment Study	Options for North Airfield	Figure 5



LAX Specific Plan Amendment Study	Required Alternative No Project/No Development (Existing Conditions)	Figure 7



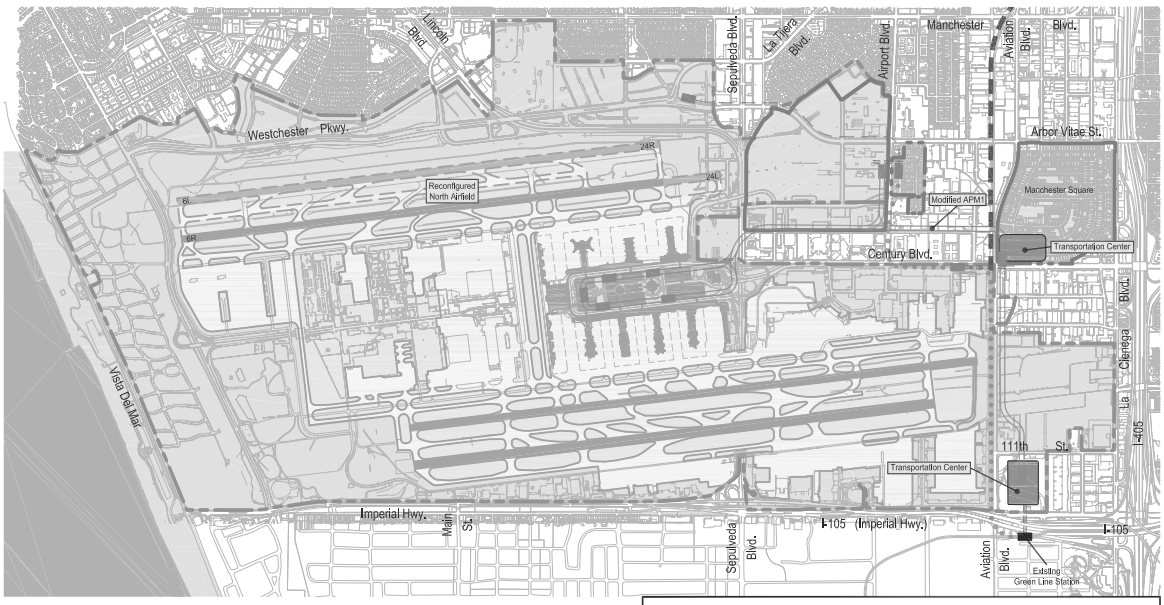
LAX Specific Plan Amendment Study	Required Alternative - No Project/No Specific Plan Amendment (Implement Approved Master Plan)	Figure 8



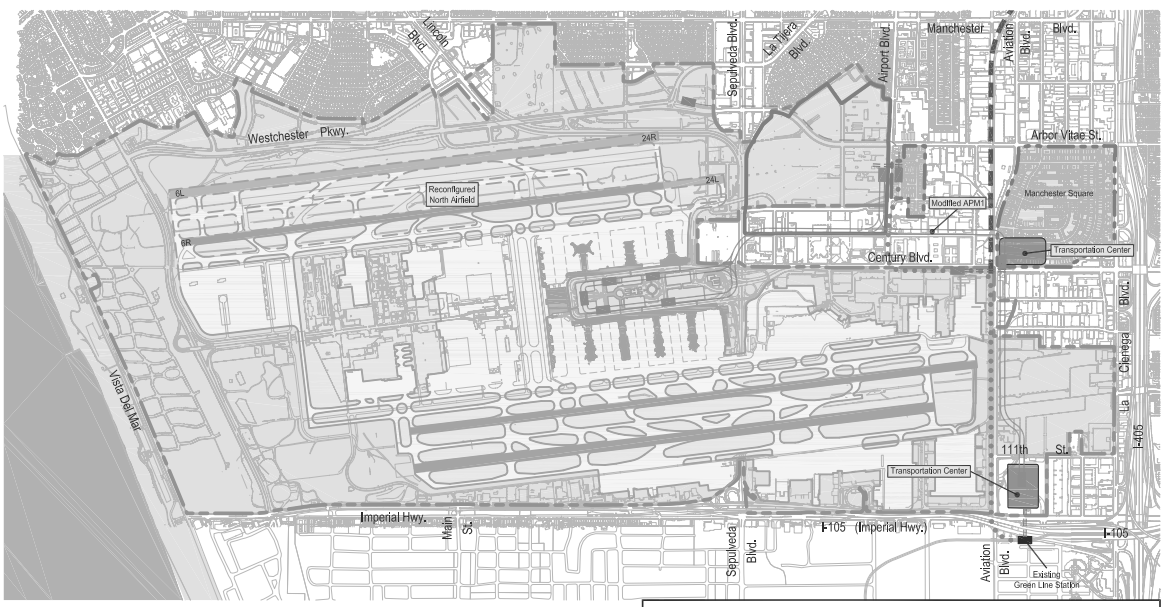
LAX Specific Plan Amendment Study	Potential Alternative Runway 6R/24L 100' South	Figure 9



LAX Specific Plan Amendment Study	Potential Alternative Existing Runways with Operational Improvements Only	Figure 10



LAX Specific Plan Amendment Study	Potential Alternative Runway 6L/24R 100' North	Figure 11



LAX Specific Plan Amendment Study	Potential Alternative Runway 6L/24R 340' North	Figure 12

DETERMINATION (To be completed by Lead Agency)

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions on the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☒ I find the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Herbert Glasgow — SIGNATURE

Snr. City Planner — TITLE

EVALUATION OF ENVIRONMENTAL IMPACTS:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants based on a project-specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less that significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of a mitigation measure has reduced an effect from "Potentially Significant Impact" to "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from Section XVII, "Earlier Analysis," cross referenced).

CITY OF LOS ANGELES

OFFICE OF THE CITY CLERK
ROOM 615, CITY HALL
LOS ANGELES, CALIFORNIA 90012

CALIFORNIA ENVIRONMENTAL QUALITY ACT

INITIAL STUDY AND CHECKLIST

(Article IV City CEQA Guidelines)

LEAD CITY AGENCY	COUNCIL DISTRICT	DATE
Los Angeles World Airports	Council District 11	March 13, 2008

RESPONSIBLE AGENCIES

PROJECT TITLE/NO.
Los Angeles International Airport Specific Plan Amendment Study

CASE NO.
AD-007-08

PREVIOUS ACTIONS CASE NO.
Los Angeles International Airport Master Plan
Case No. CF-00-1774-S4 and CPC 2003-4647 GPA/ZC/CA/PBA
LAX Master Plan EIR (SCH#1997061047)

☒ **DOES have significant changes from previous actions.**

☐ **DOES NOT have significant changes from previous actions.**

PROJECT DESCRIPTION:
The proposed Project consists of potential alternative designs, technologies, and configurations for the LAX Master Plan Program that would provide solutions to the problems that the Yellow Light Projects were designed to address, consistent with a practical capacity of LAX at 78.9 million annual passengers, the same practical capacity as included in the approved LAX Master Plan. The Yellow Light Projects are: the Ground Transportation Center (GTC); Automated People Mover (APM) 2 from the GTC to the Central Terminal Area (CTA); Demolition of CTA Terminals 1, 2, and 3; North Runway re-configuration, including center taxiways; and, on-site road improvements associated with the GTC and APM 2. *Please see the accompanying Notice of Preparation for additional information regarding the Project Description.*

ENVIRONMENTAL SETTING:
The Project site is located within a highly-developed, urbanized area consisting of airport, commercial, transportation (i.e., interstate highways) and residential uses. West of the Project site are the Los Angeles/El Segundo Dunes, a designated Ecologically Sensitive Habitat Area, and beyond the Dunes is the Pacific Ocean.

PROJECT LOCATION
The project site is located within LAX, generally south of Westchester Parkway, west of Interstate 405, north of Imperial Highway and east of Pershing Drive.

PLANNING DISTRICT
Los Angeles International Airport Specific Plan

STATUS:
☐ **PRELIMINARY**
☐ **PROPOSED**
☒ **ADOPTED** December 14, 2004

EXISTING ZONING	MAX. DENSITY ZONING	
LAX - A Zone: Airport Airside Subarea LAX - L Zone: Airport Landside Subarea LAX - N Zone: LAX Northside Subarea		☒ **DOES CONFORM TO PLAN**
PLANNED LAND USE & ZONE Airport-related airfield, access and ground transportation facilities.	**MAX. DENSITY PLAN**	☐ **DOES NOT CONFORM TO PLAN**
SURROUNDING LAND USES North - Open Space, Recreation, and Residential East - Airport, Commercial, Industrial, and Residential South - Airport West – Open Space	**PROJECT DENSITY**	☐ **NO DISTRICT PLAN**

INITIAL STUDY CHECKLIST (To be completed by the Lead City Agency)

BACKGROUND

PROPONENT NAME	PHONE NUMBER*
Los Angeles World Airports	(310) 646-7690
PROPONENT ADDRESS	
1 World Way, Room 218, Los Angeles, CA 90045	
AGENCY REQUIRING CHECKLIST	**DATE SUBMITTED**
Los Angeles World Airports	March 13, 2008
PROPOSAL NAME (If Applicable)*	
Los Angeles International Airport Specific Plan Amendment Study	

5) Earlier analysis must be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR, or negative declaration. Section 15063 (c)(3)(D). In this case, a brief discussion should identify the following:

    1) Earlier Analysis Used. Identify and state where they are available for review.
    2) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
    3) Mitigation Measures. For effects that are "Less Than Significant With Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A sources list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whichever format is selected.

9) The explanation of each issue should identify:
    1) The significance criteria or threshold, if any, used to evaluate each question; and
    2) The mitigation measure identified, if any, to reduce the impact to less than significance.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☒ Aesthetics	☒ Hazards & Hazardous Materials	☒ Public Services
☐ Agricultural Resources	☒ Hydrology/Water Quality	☐ Recreation
☒ Air Quality	☒ Land Use/Planning	☒ Transportation/Traffic
☒ Biological Resources	☐ Mineral Resources	☒ Utilities/Service Systems
☒ Cultural Resources	☒ Noise	☒ Mandatory Findings of Significance
☐ Geology/Soils	☐ Population/Housing	

ENVIRONMENTAL IMPACTS

(Explanations of all potentially and less than significant impacts are required to be attached on separate sheets)

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
I. AESTHETICS. Would the project:				
a. Have a substantial adverse effect on a scenic vista?	☒	☐	☐	☐
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings, or other locally recognized desirable aesthetic natural feature within a city-designated scenic highway?	☒	☐	☐	☐
c. Substantially degrade the existing visual character or quality of the site and its surroundings?	☒	☐	☐	☐
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☒	☐	☐	☐
II. AGRICULTURAL RESOURCES. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b. Conflict the existing zoning for agricultural use, or a Williamson Act Contract?	☐	☐	☐	☒
c. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	☐	☐	☐	☒
III. AIR QUALITY. The significance criteria established by the South Coast Air Quality Management District (SCAQMD) may be relied upon to make the following determinations. Would the project result in:				
a. Conflict with or obstruct implementation of the South Coast Air Quality Management Plan?	☒	☐	☐	☐
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☒	☐	☐	☐
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the air basin is non-attainment (ozone, carbon monoxide, PM_{10}, & $PM_{2.5}$) under an applicable federal or state ambient air quality standard?	☒	☐	☐	☐
d. Expose sensitive receptors to substantial pollutant concentrations?	☒	☐	☐	☐
e. Create objectionable odors affecting a substantial number of people?	☒	☐	☐	☐
f. Result in a substantial increase in greenhouse gas emissions?	☒	☐	☐	☐

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES. Would the project:				
a. Have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations by the California Department of Fish and Game or U.S. Fish and Wildlife Service ?	☒	☐	☐	☐
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in the City or regional plans, policies, regulations by the California Department of Fish and Game or U.S. Fish and Wildlife Service ?	☒	☐	☐	☐
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh vernal pool, coastal, etc.) Through direct removal, filling, hydrological interruption, or other means?	☒	☐	☐	☐
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☒	☐	☐	☐
e. Conflict with any local policies or ordinances protecting biological resources, such as tree preservation policy or ordinance (e.g., oak trees or California walnut woodlands)?	☒	☐	☐	☐
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☒	☐	☐	☐
V. CULTURAL RESOURCES: Would the project:				
a. Cause a substantial adverse change in significance of a historical resource as defined in State CEQA §15064.5?	☒	☐	☐	☐
b. Cause a substantial adverse change in significance of an archaeological resource pursuant to State CEQA §15064.5?	☒	☐	☐	☐
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
d. Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐
VI. GEOLOGY AND SOILS. Would the project:				
a. Exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving :				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii. Strong seismic ground shaking?	☐	☐	☒	☐

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
iii. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv. Landslides?	☐	☐	☐	☒
b. Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potential result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☒	☐
d. Be located on expansive soil, as defined in Table 18-1-B of the Los Angeles Building Code (2002), creating substantial risks to life or property?	☐	☐	☒	☐
e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
VII. HAZARDS AND HAZARDOUS MATERIALS. Would the project:				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials	☐	☐	☒	☐
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☒	☐	☐	☐
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☒	☐	☐	☐
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☒	☐	☐	☐
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☒	☐	☐	☐
f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for the people residing or working in the area?	☐	☐	☐	☒
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☒	☐	☐	☐
h. Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒
VIII. HYDROLOGY AND WATER QUALITY. Would the project result in:				
a. Violate any water quality standards or waste discharge	☒	☐	☐	☐

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
requirements?				
b. Substantially deplete groundwater supplies or interfere with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned land uses for which permits have been granted)?	☐	☐	☒	☐
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☒	☐	☐	☐
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in an manner which would result in flooding on- or off site?	☒	☐	☐	☐
e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☒	☐	☐	☐
f. Otherwise substantially degrade water quality?	☒	☐	☐	☐
g. Place housing within a 100-year flood plain as mapped on federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h. Place within a 100-year flood plain structures which would impede or redirect flood flows?	☐	☐	☐	☒
i. Expose people or structures to a significant risk of loss, inquiry or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j. Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒
IX. LAND USE AND PLANNING. Would the project:				
a. Physically divide an established community?	☐	☐	☐	☒
b. Conflict with applicable land use plan, policy or regulation of an agency with jurisdiction over the project (including but not limited to the general plan, specific plan, coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☒	☐	☐	☐
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?	☒	☐	☐	☐
X. MINERAL RESOURCES. Would the project result in:				
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☒

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
be accelerated?				
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒
XV. TRANSPORTATION/CIRCULATION. Would the project:				
a. Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to ratio capacity on roads, or congestion at intersections)?	☒	☐	☐	☐
b. Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☒	☐	☐	☐
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☒	☐	☐	☐
d. Substantially increase hazards to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☒	☐	☐	☐
e. Result in inadequate emergency access?	☒	☐	☐	☐
f. Result in inadequate parking capacity?	☒	☐	☐	☐
g. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☒	☐	☐	☐
XVI. UTILITIES. Would the project:				
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☒	☐	☐	☐
b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☒	☐	☐	☐
c. Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☒	☐	☐	☐
d. Have sufficient water supplies available to serve the project from existing entitlements and resource, or are new or expanded entitlements needed?	☒	☐	☐	☐
e. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☒	☐	☐	☐
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☒	☐	☐	☐
g. Comply with federal, state, and local statutes and regulations	☒	☐	☐	☐

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. NOISE. Would the project result in:				
a. Exposure of persons to or generation of noise in level in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☒	☐	☐	☐
b. Exposure of people to or generation of excessive groundborne vibration or groundborne noise levels?	☒	☐	☐	☐
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☒	☐	☐	☐
d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☒	☐	☐	☐
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☒	☐	☐	☐
f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
XII. POPULATION AND HOUSING. Would the project:				
a. Induce substantial population growth in an area either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b. Displace substantial numbers of existing housing necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐
c. Displace substantial numbers of people necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐
XIII. PUBLIC SERVICES. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
a. Fire protection?	☒	☐	☐	☐
b. Police protection?	☒	☐	☐	☐
c. Schools?	☐	☐	☒	☐
d. Parks?	☐	☐	☐	☒
e. Other governmental services (including roads)?	☐	☐	☒	☐
XIV. RECREATION.				
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or	☐	☐	☐	☒

This page intentionally left blank.

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
related to solid waste?				
XVII. MANDATORY FINDINGS OF SIGNIFICANCE.				
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☒	☐	☐	☐
b. Does the project have impacts which are individually limited, but cumulatively considerable?("Cumulatively considerable" means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects).	☒	☐	☐	☐
c. Does the project have environmental effects which cause substantial adverse effects on human beings, either directly or indirectly?	☒	☐	☐	☐

DISCUSSION OF THE ENVIRONMENTAL EVALUATION **(Attach additional sheets if necessary)**

(See Attachment A)

ATTACHMENT A
EXPLANATION OF CHECKLIST DETERMINATIONS

I. AESTHETICS. *Would the project:*

a. Have a substantial adverse effect on a scenic vista?

b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings, or other locally recognized desirable aesthetic natural feature within a city-designated scenic highway?

c. Substantially degrade the existing visual character or quality of the site and its surroundings?

d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

a-d. Potentially Significant Impact. The LAX Master Plan EIR evaluated the aesthetic impacts of the Master Plan alternatives, including potential impacts to aesthetic resources and views, as well as impacts related to light emissions and glare. However, the SPAS Alternatives propose a different configuration of certain LAX Master Plan facilities and, therefore, the proposed project has the potential to create new or substantially different/increased aesthetic impacts than addressed in the LAX Master Plan EIR. The LAX SPAS EIR will evaluate the potential for the SPAS Alternatives to have significant aesthetic impacts that were not addressed in the LAX Master Plan EIR.

II. AGRICULTURAL RESOURCES. *In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California agricultural land evaluation and site assessment model (1997) prepared by the California department of conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the Project:*

a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

b. Conflict the existing zoning for agricultural use, or a Williamson Act Contract?

c. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?

a-c. No Impact. The project is located within a developed airport and is surrounded by airport uses, urbanized areas, and the Los Angeles/El Segundo Dunes. As indicated in the LAX Master Plan EIR, no agricultural resources or operations currently exist, or have existed in the recent past, at the project site or surrounding areas. Further, there are no Williamson Act contracts in effect for the project site or surrounding areas.[1] The proposed project would represent a continuation of the current airport-related and urban uses and would not convert farmland to non-agricultural use nor would it result in any conflicts with existing zoning for agricultural use or a Williamson Act contract. Therefore, no impacts to agricultural resources would occur with implementation of the proposed project, and no mitigation measures are required. As such, this issue does not require any further analysis in the LAX SPAS EIR.

III. AIR QUALITY. *The significance criteria established by the South Coast Air Quality Management District (SCAQMD) may be relied upon to make the following determinations. Would the project result in:*

a. Conflict with or obstruct implementation of the South Coast Air Quality Management Plan?

b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

c. Result in a cumulatively considerable net increase of any criteria pollutant for which the air basin is non-attainment (ozone, carbon monoxide, PM_{10}, and $PM_{2.5}$) under an applicable federal or state ambient air quality standard?

d. Expose sensitive receptors to substantial pollutant concentrations?

e. Create objectionable odors affecting a substantial number of people?

f. Result in a substantial increase in greenhouse gas emissions?

a-f. Potentially Significant Impact. The LAX Master Plan EIR evaluated the air quality impacts of the Master Plan alternatives, including the potential for the Master Plan alternatives to: conflict with or obstruct implementation of the South Coast Air Quality Management Plan; violate air quality standards or contribute to an existing or project air quality violation; result in a cumulatively considerable adverse net increase in air pollutants; and, expose sensitive receptors to substantial pollutant concentrations/odors. However, the SPAS Alternatives propose a different configuration of certain LAX Master Plan facilities and, therefore, the proposed project has the potential to create new or substantially different/increased air quality impacts than addressed in the LAX Master Plan EIR. Additionally, changes and updates to the regulatory setting for air quality have occurred since completion of the Master Plan EIR. The LAX SPAS EIR will evaluate if the SPAS Alternatives have potentially significant air quality impacts that were not

[1] City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.16, April 2004.

addressed in the LAX Master Plan EIR. Included in the LAX SPAS EIR will be an assessment of energy consumption and green house gas emissions associated with construction and operation of the LAX SPAS alternatives.

IV. BIOLOGICAL RESOURCES. *Would the project:*

a. Have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in the City or regional plans, policies, regulations by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

a-b. Potentially Significant Impact. The LAX Master Plan EIR evaluated the biological resources impacts of the Master Plan alternatives, including potential impacts to biotic communities, endangered and threatened species of flora and fauna, and wetlands. However, the SPAS Alternatives propose a different configuration of certain LAX Master Plan facilities and, therefore, the proposed project has the potential to create new or substantially different/increased biological resources impacts than addressed in the LAX Master Plan EIR. The LAX SPAS EIR will evaluate the potential for the SPAS Alternatives to have significant impacts to biological resources that were not addressed in the LAX Master Plan EIR.

c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Potentially Significant Impact. The LAX Master Plan EIR identified a number of small ephemerally wetted areas within the LAX Master Plan boundaries, totaling 1.3 acres, subject to U.S. Army Corps of Engineers jurisdiction. The 1.3 acres of jurisdictional wetlands were identified in the western portion of the north and south airfields.[2] The LAX Master Plan EIR determined that the 1.3 acres of jurisdictional wetlands would be impacted under any and all of the alternatives considered, including even under the No Action/No Project Alternative due to the fact that the subject ephemerally wetted areas were within the Airfield Operations Area (AOA) and would be subject to impacts from ongoing airfield operations and maintenance activities. A key consideration related to the impacts to the 1.3 acres was the fact that the subject area contained embedded cysts of the Riverside Fairy Shrimp, a federally-listed endangered species. Those embedded cysts were, however, subsequently removed from the airport in July and August 2005, pursuant to an April 20, 2004 Biological Opinion from the United States Fish and Wildlife Service (USFWS), as well as an April 8, 2005 Biological Opinion for Operation and Maintenance

[2] City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.12, April 2004.

Activities at LAX.[3] The LAX SPAS EIR will provide an updated description of current conditions relevant to the SPAS Alternatives study area and address the potential for impacts to wetlands.

d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Potentially Significant Impact. Please see Response No. IV.a-b above.

e. Conflict with any local policies or ordinances protecting biological resources, such as tree preservation policy or ordinance (e.g., oak trees or California walnut woodlands)?

Potentially Significant Impact. Please see Response No. IV.a-b above.

f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

Potentially Significant Impact. Please see Response No. IV.a-b above.

V. CULTURAL RESOURCES. *Would the project:*

a. Cause a substantial adverse change in significance of a historical resource as defined in State CEQA §15064.5?

Potentially Significant Impact. The LAX Master Plan EIR evaluated the impacts of the Master Plan alternatives to historical resources. The findings of the historic resources surveys of LAWA-owned property and adjacent areas conducted as part of the LAX Master Plan EIR indicated that four buildings within the overall boundary of LAX are considered potentially significant historic/architectural resources. These buildings are as follows:[4]

- Hangar One (listed on National Register) on the southeastern portion of LAX near the northwest corner of Aviation Boulevard and Imperial Highway;
- Theme Building (eligible for National Register) in the center of the LAX terminals;
- WWII Munitions Storage Bunker (eligible for National Register) near the western boundary of LAX; and

[3] Biological Opinion from United States Fish and Wildlife Service (USFWS) of the LAX Master Plan Final EIR, April 2004. Biological Opinion from USFWS of the LAX Operation and Maintenance, April, 2005.

[4] City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.9.1, April 2004.

- Intermediate Terminal Complex (eligible for the California Register) on the south side of Century Boulevard between Sepulveda Boulevard and Airport Boulevard.

None of the proposed SPAS Alternatives would physically impact any of the potentially significant historic resources identified above; however, the LAX SPAS EIR will provide an updated review of potentially historic resources in or near the study area and an evaluation of potential impacts associated with each of the SPAS alternatives.

b. Cause a substantial adverse change in significance of an archaeological resource pursuant to State CEQA §15064.5?

Potentially Significant Impact. The LAX Master Plan EIR evaluated the impacts of the Master Plan alternatives to archaeological resources. However, the SPAS Alternatives propose a different configuration of certain LAX Master Plan facilities and, therefore, the proposed project has the potential to create new or substantially different/increased impacts to archaeological resources than addressed in the LAX Master Plan EIR. The LAX SPAS EIR will evaluate the potential for the SPAS Alternatives to have significant impacts to archaeological resources that were not addressed in the LAX Master Plan EIR. The analysis will include an updated records search and consultation with the state Native American Heritage Commission.

c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Potentially Significant Unless Mitigation Incorporated. As indicated in the LAX Master Plan EIR, the LAX property lies in the northwestern portion of the Los Angeles Basin, a broad structural syncline with a basement of older igneous and metamorphic rocks overlain by thick younger marine and terrestrial deposits. The older deposits that underlie the LAX area are assigned to the Palos Verdes Sand formation. The Palos Verdes Sand formation is one of the better known Pleistocene age deposits in southern California. This unit was deposited in a shallow sea that covered the region some 124,000 years ago. The results of the records search conducted as part of the LAX Master Plan EIR indicate that the Palos Verdes Sand formation is a formation with a high potential for yielding unique paleontological deposits. The Palos Verdes Sand formation covers half of the LAX area, beginning at Sepulveda Boulevard and extending easterly beyond the airport.

The records search conducted for the LAX Master Plan EIR identified the presence of two vertebrate fossil occurrences within the study area, three more in the immediate vicinity of the study area, and one beyond the study area within two miles from the center of LAX proper. These fossils were found at depths ranging from 13 to 70 feet. The deposits within which these resources occur were found to underlie the

entire LAX area and surrounding vicinity.[5] The abundance of fossils within the LAX study area at depths generally greater than six feet strongly suggests that grading and excavations for a variety of construction activities, including those associated with the LAX SPAS alternatives, have the potential to expose and damage potentially important fossils. This would be a significant impact on the region's paleontological resources. Furthermore, the exposure of the fossil sites, and the accompanying potential for making the site accessible for unauthorized fossil collection, could result in the loss of additional fossil remains, associated scientific data, and fossil sites.

Because the proposed project is located within an area identified as having a high potential for yielding unique paleontological deposits, in accordance with the LAX Master Plan Mitigation Monitoring & Reporting Program Paleontological Management Treatment Plan (PMTP),[6] it is subject to oversight by a professional paleontologist. In addition, as noted above, the potential exists for grading and excavation to uncover vertebrate fossil remains. The potential destruction of fossils during construction would result in a significant impact to a paleontological resource; however, the following mitigation measures, set forth in the PMTP, are applicable to all LAX Master Plan projects, including any improvements occurring under the SPAS.

Mitigation Measure CR1: Prior to the initiation of grading and construction activities, LAWA will retain a professional paleontologist, as defined in the Paleontologist Management Treatment Plan (PMTP), who will determine if the project site exhibits a high or low potential for subsurface resources. If the project site is determined to exhibit a high potential for subsurface resources, paleontological monitoring will be conducted in accordance with the procedures stipulated in the PMTP. If the project site is determined to exhibit a low potential for subsurface deposits, excavation need not be monitored as per the PMTP. In the event that paleontological resources are discovered, the procedures outlined in the PMTP for the identification of resources will be followed.

Mitigation Measure CR2: In accordance with the PMTP, construction personnel will be briefed by the consulting paleontologist in the identification of fossils or fossilferous deposits and in the correct procedures for notifying the relevant individuals should such a discovery occur.

Implementation of these mitigation measures would reduce potential impacts associated with paleontological resources to a level that is less than significant. As such, no further analysis of potential impacts to paleontological resources is required for the LAX SPAS EIR.

[5] City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.9.2, April 2004.

[6] City of Los Angeles, Los Angeles World Airports, Environmental Management Division, Final LAX Master Plan Mitigation Monitoring & Reporting Program, Paleontological Management Treatment Plan, June 2005.

d. Disturb any human remains, including those interred outside of formal cemeteries?

Potentially Significant Unless Mitigation Incorporated. The project site is developed with aviation-related uses, and the airport is located within a highly urbanized area. Within the project area, traditional burial resources would likely be associated with the Native American group known as the Gabrielino. Based on previous surveys conducted at LAX and the results of the record searches completed in 1995, 1997, and 2000 for the LAX Master Plan EIR, no traditional burial sites have been identified within the LAX boundaries or in the vicinity. However, if human remains are encountered, the following mitigation measure is required.

Mitigation Measure CR3: If human remains are found, all grading and excavation activities in the vicinity shall cease immediately and the appropriate LAWA authority shall be notified. Compliance with those procedures outlined in Section 7050.5(b) and (c) of the State Health and Safety Code, Section 5097.94(k) and (i) and Section 5097.98(a) and (b) of the Public Resources Code shall be required. In addition, those steps outlined in Section 15064.5(e) of the CEQA Guidelines shall also be implemented.

Implementation of this mitigation measure would ensure that potential impacts associated with human remains would be less than significant. As such, this issue does not require any further analysis in the LAX SPAS EIR.

VI. GEOLOGY AND SOILS. *Would the project:*

a. Exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

Less Than Significant Impact. Fault rupture is the surface displacement that occurs along the surface of a fault during an earthquake. As indicated in the LAX Master Plan EIR, while the site is located within the seismically active southern California region, it is not located within an Alquist-Priolo Special Study Zone.[7] Geotechnical literature indicates that the Charnock Fault, a potentially active fault, may be located near or through eastern portions of LAX property. However, as stated in the LAX Master Plan EIR, recent evaluation indicates that the Charnock Fault is considered to have low potential for surface rupture independently or in conjunction with movement on the Newport-Inglewood Fault Zone, which is

[7] City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.22, April 2004.

located approximately three miles east of LAX.[8] Therefore, impacts to people or structures resulting from rupture of a known earthquake fault are considered less than significant, and no mitigation measures are required.

ii. Strong seismic ground shaking?

Less Than Significant Impact. As indicated in the LAX Master Plan EIR, the project site is located in the seismically active southern California region; however, there is no evidence of faulting on the site, and it is not located within an Alquist-Priolo Special Study Zone.[9] Nevertheless, under the proposed project, structures and people (relative to existing conditions) would be exposed to seismically-induced ground shaking throughout the design life of the improvements. As noted in the LAX Master Plan EIR, this is a condition that exists throughout the Los Angeles region.

As part of the proposed project, all construction would be designed in accordance with the provisions of the Uniform Building Code (UBC) and the City of Los Angeles Building Code (LABC). Since the proposed project would comply with UBC and LABC requirements, potential impacts associated with strong seismic ground shaking would be less than significant, and no mitigation measures are required.

iii. Seismic-related ground failure, including liquefaction?

Less Than Significant Impact. Liquefaction is a seismic hazard that occurs when strong ground shaking causes saturated granular soil (such as sand) to liquefy and lose strength. The susceptibility of soil to liquefy tends to decrease as the density of the soil increases and the intensity of ground shaking decreases. As indicated in the LAX Master Plan EIR, the depth to groundwater at LAX is generally greater than 90 feet, which would indicate that the site has a very low susceptibility to liquefaction. However, perched groundwater[10] conditions have been noted in the upper 20 to 60 feet at some locations at LAX, and the density of sand deposits in the upper 30 feet is generally considered to be low to medium dense. Liquefaction could, therefore, potentially occur in very localized areas; however, the overall potential for liquefaction at LAX is considered low.[11]

Strong ground shaking will also tend to densify loose to medium dense deposits of partially saturated granular soils and could result in seismic settlement of foundations and the ground surface at LAX. Due to

[8] City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.22, April 2004.

[9] City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.22, April 2004.

[10] Groundwater, generally shallow, that is isolated and not connected to an aquifer.

[11] City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.22, April 2004.

variations in material type, seismic settlements would tend to vary considerably across LAX, but are generally estimated to be between negligible and 0.5 inch; the overall potential for damaging seismically-induced settlement is considered to be low.[12]

Seismically-induced ground shaking can also cause slope-related hazards through various processes including slope failure, lateral spreading,[13] flow liquefaction, and ground lurching.[14] Because existing slopes in the LAX vicinity are relatively small in area and of low angle and height (less than 15 feet) the overall potential for such failures is considered to be low.[15]

The California Department of Conservation (CDC) is mandated by the Seismic Hazards Act of 1990[16] to identify and map the state's most prominent earthquake hazards in order to help avoid damage resulting from earthquakes. The CDC's Seismic Hazard Zone Mapping Program charts areas prone to liquefaction and earthquake-induced landslides throughout California's principal urban and major growth areas. According to the Seismic Hazard Map for the Inglewood Quadrangle, no potential liquefaction zones are located within the LAX area. Isolated zones of potential seismic slope instability are identified near the western edge of the airport, within the dune area.[17]

In summary, the potential for seismic-related ground failure at the project site is considered low. As part of the proposed project, all construction would be designed in accordance with the provisions of the UBC and the LABC. Since the proposed project would comply with UBC and LABC requirements, potential impacts associated with seismic-related ground failure would be less than significant, and no mitigation measures are required.

iv. Landslides?

No Impact. The project site and vicinity are relatively flat and are primarily surrounded by existing airport and urban development. Furthermore, the City of Los Angeles Landslide Inventory and Hillside

[12] City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.22, April 2004.
[13] Lateral Spreading: Deformation of very gently sloping ground (or virtually flat ground adjacent to an open body of water) that occurs when cyclic shear stresses caused by an earthquake induce liquefaction, reducing the shear strength of the soil and causing failure and "spreading" of the slope.
[14] Ground Lurching: Ground-lurching (and related lateral extension) is the horizontal movement of soil, sediments, or fill located on relatively steep embankments or scarps as a result of earthquake-induced ground shaking. Damage includes lateral movement of the slope in the direction of the slope face, ground cracks, slope bulging, and other deformations.
[15] City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.22, April 2004.
[16] Public Resources Code 2690-2699.6.
[17] City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.22, April 2004.

Areas map does not identify any areas in the vicinity of the project site that contain unstable slopes which may be prone to seismically-produced landslides.[18] Implementation of the proposed project would not result in the exposure of people or structures to the risk of landslides during a seismic event. Therefore, no impacts resulting from landslides would occur, and no mitigation measures are required.

b. Result in substantial soil erosion or the loss of topsoil?

Less Than Significant Impact. As indicated in the LAX Master Plan EIR, the potential for soil erosion on the project site is low due to the generally level topography of the project site. In addition, the majority of the project site is developed with buildings and covered with impervious surfaces. The proposed project would result in substantial grading, excavation and use of fill during construction of the airport facilities. Conformance with LABC Sections 91.7000 through 91.7016, which include construction requirements for grading, excavation, and use of fill, would reduce the potential for wind or waterborne erosion. In addition, the LABC requires an erosion control plan that is reviewed by the Department of Building and Safety prior to construction if grading exceeds 200 cubic yards and occurs during the rainy season (between November 1 and April 15). The project applicant, LAWA, would be required to prepare an erosion control plan to reduce soil erosion. Therefore, proposed project impacts related to soil erosion are anticipated to be less than significant, and no mitigation measures are required.

c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

Less Than Significant Impact. Settlement of foundation soils beneath engineered structures or fills typically results from the consolidation and/or compaction of the foundation soils in response to the increased load induced by the structure or fill. As indicated in the LAX Master Plan EIR, the presence of undocumented and typically weak artificial fill at LAX creates the potential for settlement. The Lakewood Formation also includes some silt and clay layers prone to settlement. However, foundation design features and construction methods can reduce the potential for excessive settlement at LAX, and the overall potential for damaging settlement is considered low.[19] See also Responses VI.a.iii and VI.a.iv above.

d. Be located on expansive soil, as defined in Table 18-1-B of the Los Angeles Building Code (2002), creating substantial risks to life or property?

[18] City of Los Angeles Planning Department, Safety Element of the City of Los Angeles General Plan, Exhibit C, Landslide Inventory & Hillside Areas In the City of Los Angeles, June 1994.
[19] City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.22, April 2004.

Less Than Significant Impact. Expansive soils are typically composed of certain types of silts and clays that have the capacity to shrink or swell in response to changes in soil moisture content. Shrinking or swelling of foundation soils can lead to damage to foundations and engineered structures including tilting and cracking. As indicated in the LAX Master Plan EIR, fill materials located in some portions of the LAX area could be prone to expansion, and some portions of the Lakewood Formation found beneath the eastern portion of LAX may also be susceptible, due to their higher content of clay and silt.[20]

New structures under the SPAS Alternatives could be subject to the effects of expansive soils. As project construction would occur in accordance with the LABC Sections 91.7000 through 91.7016, which include construction requirements for grading, excavation, and foundation work, the potential for hazards to occur as a result of expansive soils would be minimized. Therefore, proposed project implementation would not result in significant impacts associated with expansive soils, and no substantial risks to life or property would occur. No mitigation measures are required.

e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

No Impact. The project site is located in an urbanized area where wastewater infrastructure is currently in place. The proposed project would not use septic tanks or alternative wastewater disposal systems. Therefore, the ability of on-site soils to support septic tanks or alternative wastewater systems would not be relevant to the proposed project, and no mitigation measures are required.

Conclusion: Based on the above discussion of Items VI.a. through VI.e., the analysis provided in Section 4.22 of the LAX Master Plan EIR, relative to potential impacts associated with geology and soils, is considered to be adequate, current, and complete. No significant impacts are anticipated to occur under any of the SPAS Alternatives and no further evaluation is required for the LAX SPAS EIR.

VII. HAZARDS AND HAZARDOUS MATERIALS. *Would the project:*

a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less Than Significant Impact. Construction and operation of the proposed project would involve the use of potentially hazardous materials, including vehicle fuels, oils, transmission fluids, and cleaning solvents. As indicated in the LAX Master Plan EIR, compliance with existing federal, state and local regulations and routine precautions would reduce the potential for accidental releases of a hazardous

[20] City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.22, April 2004.

material to occur and would minimize the impact of an accident should one occur.[21] As such, construction of the proposed project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, and no mitigation measures are required.

b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Potentially Significant Impact. The LAX Master Plan EIR evaluated the potential impacts related to the risk of upset at facilities that store acutely hazardous materials (i.e., the Central Utility Plan) or large quantities of flammable or explosive fuels or other materials (i.e., the fuel farm, liquefied natural gas (LNG)/compressed natural gas (CNG) facilities) from implementation of the Master Plan alternatives. However, the SPAS Alternatives propose a different configuration of certain LAX Master Plan facilities and, therefore, the proposed project has the potential to create new or substantially different/increased impacts associated with risk of upset than addressed in the LAX Master Plan EIR. The LAX SPAS EIR will evaluate the potential for the SPAS Alternatives to have significant risk of upset impacts that were not addressed in the LAX Master Plan EIR.

c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Potentially Significant Impact. The proposed project does not include the use or storage of acutely hazardous materials, substances, or waste. However, schools within one-quarter mile of LAX may be adversely impacted by hazardous air emissions from aircraft and airport-related vehicles/traffic. The LAX Master Plan EIR evaluated the human health risks of increased emissions of toxic air pollutants on sensitive receptors, including children at schools, associated with implementation of the Master Plan alternatives. However, the SPAS Alternatives propose a different configuration of certain LAX Master Plan facilities and, therefore, the proposed project has the potential to create new or substantially different/increased human health impacts than addressed in the LAX Master Plan EIR. The LAX SPAS EIR will evaluate the potential for the SPAS Alternatives to have significant human health impacts that were not addressed in the LAX Master Plan EIR.

d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

[21] City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.23, April 2004.

Potentially Significant Impact. As part of the LAX Master Plan EIR, pursuant to Government Code Section 65962.5, a hazardous waste site database search for the LAX Master Plan alternatives was conducted. The results of the database search identified a number of existing known contamination/remediation sites within the LAX boundaries. As part of the LAX SPAS EIR, a new hazardous waste site database search will be conducted to identify any potential additional hazardous waste contamination/remediation sites within or adjacent to LAX that may be impacted by construction of the LAX SPAS alternatives. In addition, the SPAS Alternatives propose a different configuration of certain LAX Master Plan facilities and, therefore, the proposed project has the potential to create new or substantially different/increased hazardous material impacts with respect to existing contamination and remediation activities than addressed in the LAX Master Plan EIR. The LAX SPAS EIR will evaluate the potential for the SPAS Alternatives to have significant hazardous material impacts related to existing contamination and remediation activities that were not addressed in the LAX Master Plan EIR.

e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

Potentially Significant Impact. The LAX Master Plan EIR evaluated the aviation safety impacts of the Master Plan alternatives. However, the North Airfield reconfiguration alternatives for the LAX SPAS have the potential to create new or substantially different/increased aviation safety impacts than addressed in the LAX Master Plan EIR. The LAX SPAS EIR will evaluate the potential for the LAX SPAS alternatives to have significant aviation safety impacts that were not addressed in the LAX Master Plan EIR.

The airport plan adopted as part of the LAX Master Plan was designed in light of safety and security considerations resulting from the terrorism events of September 11, 2001. As required by the LAX Master Plan Stipulated Settlement, the LAX SPAS will include evaluation of security considerations, which will be reflected in the LAX SPAS EIR.

f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for the people residing or working in the area?

No Impact. The project site is not located within the vicinity of a private airstrip but rather within a public airport.

g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Potentially Significant Impact. As indicated in Response No. XIII.a and Response No. XIII.b below, the LAX Master Plan EIR evaluated the impacts on emergency services from implementation of the Master Plan alternatives. However, the SPAS Alternatives propose a different configuration of certain LAX Master Plan facilities and, therefore, the proposed project has the potential to create new or substantially different/increased impacts on emergency access than addressed in the LAX Master Plan EIR. The LAX SPAS EIR will evaluate the potential for the SPAS Alternatives to have significant impacts on emergency access that were not addressed in the LAX Master Plan EIR.

h. Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

No Impact. The project site and vicinity are predominantly paved and/or developed. There are no fire hazard areas containing flammable brush, grass, or trees on the project site. Furthermore, the project site is not within a City of Los Angeles Wildfire Hazard Area, as delineated in the Safety Element of the General Plan.[22] Therefore, implementation of the proposed project would not result in the exposure of people or structures to hazards associated with wildland fires, and no mitigation measures are required. As such, this issue does not require any further analysis in the LAX SPAS EIR.

VIII. HYDROLOGY AND WATER QUALITY. *Would the project:*

a. Violate any water quality standards or waste discharge requirements?

Potentially Significant Impact. As indicated in the LAX Master Plan EIR, surface water at the project site drains into storm drain facilities within the jurisdiction of the County of Los Angeles and the City of Los Angeles, which discharge to either San Pedro Bay, via the Dominguez Channel, or to Santa Monica Bay. Construction and operation of the improvements proposed under the LAX Master Plan would alter existing surface drainage patterns at LAX, mainly due to changes in the location and amounts of impervious surfaces within the airport area, and would generate surface water pollutants posing the potential to exceed state water quality standards. Such potential impacts would, however, be reduced to a level that is less than significant based on development and implementation of Master Plan Commitment HWQ-1, which provides for a Conceptual Drainage Plan. That Plan is designed to address the potential changes in surface drainage patterns at LAX and includes numerous Best Management Practices (BMPs) that address water quality pollutants associated with construction and operations. The Conceptual Drainage Plan for LAX was formalized in conjunction with the LAX South Airfield Improvement Project (SAIP) EIR and applies to all Master Plan improvements at LAX. The SPAS Alternatives propose a different configuration of certain LAX Master Plan facilities contemplated in the LAX Master Plan EIR and associated Conceptual Drainage Plan and, therefore, the proposed project has the potential to create

[22] City of Los Angeles Planning Department, Safety Element of the City of Los Angeles General Plan, Exhibit D, Selected Wildfire Hazard Areas In the City of Los Angeles, April 1996.

new or substantially different/increased hydrology and water quality impacts than addressed in the LAX Master Plan EIR and Conceptual Drainage Plan. The LAX SPAS EIR will evaluate the potential for the SPAS Alternatives to have significant impacts on hydrology and surface water quality that were not addressed in the LAX Master Plan EIR.

b. Substantially deplete groundwater supplies or interfere with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned land uses for which permits have been granted)?

Less Than Significant Impact. As indicated in the LAX Master Plan EIR, the project site is located within the West Coast Groundwater Basin. Groundwater beneath LAX is not used for municipal or agricultural purposes.[23] Construction and operation of the proposed project would not require the use of groundwater and, thus, would not deplete groundwater supplies. The majority of the project site is developed and paved, although there are areas of disturbed, undeveloped pervious areas adjacent to the runways in the North Airfield. Similar to the conclusion made in the LAX Master Plan EIR, although the SPAS Alternatives may result in a net increase in impervious area and an associated decrease in the volume of surface recharge within the LAX area when compared to existing conditions, the reduction in surface recharge would not substantially change the groundwater storage or groundwater elevation beneath LAX. Moreover, groundwater production would not be affected. In summary, impacts to groundwater supplies and recharge would be less than significant, and no mitigation measures are required. As such, this issue does not require any further analysis in the LAX SPAS EIR.

c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

Potentially Significant Impact. Please see Response No. VIII.a. above.

d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off site?

Potentially Significant Impact. Please see Response No. VIII.a. above.

e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

[23] City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.7, April 2004.

Potentially Significant Impact. Please see Response No. VIII.a. above.

f. Otherwise substantially degrade water quality?

Potentially Significant Impact. Please see Response No. VIII.a. above.

g. Place housing within a 100-year flood plain as mapped on federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

h. Place within a 100-year flood plain structures which would impede or redirect flood flows?

g-h. No Impact. As indicated in the LAX Master Plan EIR, no 100-year floodplain areas are located within the LAX Master Plan boundaries.[24] Further, the LAX SPAS alternatives do not involve the construction of housing. Therefore, no impacts resulting from the placement of housing or other structures within a 100-year floodplain would occur, and no mitigation measures are required. As a result, this issue does not require any further analysis in the LAX SPAS EIR.

i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

No Impact. Please see Response No. VIII.g-h above. In addition, as delineated on the City of Los Angeles Inundation and Tsunami Hazard Areas map,[25] the project site is not within a boundary of an inundation area from a flood control basin. Further, the project site is not located within the downstream influence of any levee or dam. Therefore, no impacts due to the exposure of people or structures to a risk of loss, injury, or death involving flooding as a result of the failure of a levee or dam would occur, and no mitigation measures are required. As such, this issue does not require any further analysis in the LAX SPAS EIR.

j. Inundation by seiche, tsunami, or mudflow?

No Impact. The project site is located approximately .5 mile east of the Pacific Ocean and is not delineated as a potential inundation or tsunami impacted area in the City of Los Angeles Inundation and Tsunami Hazard Areas map.[26] Mudflows are not a risk as the project site is located on, and is surrounded by, relatively level terrain and urban development. Therefore, no impacts resulting from inundation by

[24] City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.13, April 2004.

[25] City of Los Angeles Planning Department, Safety Element of the City of Los Angeles General Plan, Exhibit G, Inundation & Tsunami Hazard Areas In the City of Los Angeles, March 1994.

[26] City of Los Angeles Planning Department, Safety Element of the City of Los Angeles General Plan, Exhibit G, Inundation & Tsunami Hazard Areas In the City of Los Angeles, March 1994.

seiche, tsunami, or mudflow are anticipated to occur, and no mitigation measures are required. As such, this issue does not require any further analysis in the LAX SPAS EIR.

IX. LAND USE AND PLANNING. *Would the project:*

a. Physically divide an established community?

No Impact. The improvements contemplated in the proposed SPAS Alternatives would occur largely on airport property, with the possible exception of potential APM routes and other transportation-related improvements. No land use acquisition or new facilities are proposed that would physically divide an established community. While it is not anticipated that the project would physically divide an established community, the LAX SPAS EIR will include an analysis of potential land use impact associated with each alternative.

b. Conflict with applicable land use plan, policy or regulation of an agency with jurisdiction over the project (including but not limited to the general plan, specific plan, coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Potentially Significant Impact. The LAX Master Plan EIR evaluated the land use impacts of the Master Plan alternatives, including the potential for construction and operation activities to result in land use incompatibilities and/or inconsistencies with applicable federal, state, and local regulations, plans, and policies. However, the SPAS Alternatives propose a different configuration of certain LAX Master Plan facilities and, therefore, the proposed project has the potential to create new or substantially different/increased land use impacts than addressed in the LAX Master Plan EIR. The LAX SPAS EIR will evaluate the potential for the SPAS Alternatives to have significant land use impacts that were not addressed in the LAX Master Plan EIR.

c. Conflict with any applicable habitat conservation plan or natural community conservation plan?

Potentially Significant Impact. Changes in the placement of navigational aids associated with alternative configurations of the North Airfield runways have the potential to result in impacts to biological resources in the Los Angeles/El Segundo Dunes. The Los Angeles/El Segundo Dunes, a designated Ecologically Sensitive Habitat Area, contains the El Segundo Blue Butterfly Habitat Restoration Area. The LAX SPAS EIR will evaluate if the SPAS Alternatives would result in potential conflicts with the Los Angeles/El Segundo Dunes Specific Plan that were not addressed in the LAX Master Plan EIR.

X. MINERAL RESOURCES. *Would the project:*

a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

No Impact. The State Mining and Geology Board classifies mineral resource zones throughout the State. As indicated in the LAX Master Plan EIR, the project site is contained within a MRZ-3 zone, which represents areas with mineral deposits whose significance cannot be evaluated from available data.[27] The project site is developed with airport-related or other urban uses that are mostly paved with some disturbed open space and limited landscaping. There are no actively-mined mineral or timber resources on the project site. Therefore, the proposed SPAS Alternatives would not affect access to or the availability of valued mineral resources, and no mitigation measures are required. As such, this issue does not require any further analysis in the LAX SPAS EIR.

b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

No Impact. The project site is not within an area delineated on the City of Los Angeles Oil Field & Oil Drilling Areas map in the City of Los Angeles General Plan Safety Element.[28] Furthermore, the project site is developed or disturbed, and the proposed project would not affect the availability of a locally-important mineral resource recovery site. As such, no mitigation measures are required and this issue will not be evaluated any further in the LAX SPAS EIR.

XI. NOISE. *Would the project result in:*

a. Exposure of persons to or generation of noise in level in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

b. Exposure of people to or generation of excessive groundborne vibration or groundborne noise levels?

c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

[27] City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.17, April 2004.

[28] City of Los Angeles Planning Department, Safety Element of the City of Los Angeles General Plan, Exhibit E, Oil Field & Oil Drilling Areas in the City of Los Angeles, May 1994.

e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

a-e. Potentially Significant Impact. The LAX Master Plan EIR evaluated the noise impacts of the Master Plan alternatives, including potential increases in noise levels from aircraft, surface roadways, and construction traffic and equipment in the communities surrounding LAX. However, the SPAS Alternatives propose a different configuration of certain LAX Master Plan facilities and, therefore, the proposed project has the potential to create new or substantially different/increased noise impacts than addressed in the LAX Master Plan EIR. The LAX SPAS EIR will evaluate the potential for the SPAS Alternatives to have significant noise impacts that were not addressed in the LAX Master Plan EIR.

f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. The project site is not located within the vicinity of a private airstrip, but rather within a public airport. However, those residing or working in the project area may be exposed to excessive noise levels as indicated in Response No. XI.a-e above.

XII. POPULATION AND HOUSING. *Would the project:*

a. Induce substantial population growth in an area either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

No Impact. The proposed project evaluates alternative configurations of certain LAX Master Plan facilities. The project does not include residential or business development. Therefore, the proposed project would not directly induce population growth.

In accordance with the LAX Master Plan Stipulated Settlement, the planning framework for the LAX SPAS alternatives is such that they would not exceed a practical capacity of 78.9 million annual passengers (MAP), the same passenger capacity as projected under the approved LAX Master Plan. In addition, the projected cargo activity for the LAX SPAS alternatives would remain the same as that under the approved LAX Master Plan (3.1 million annual tons). The LAX Master Plan EIR addresses the growth implications associated with the cargo and passenger activity levels and concludes that the Master Plan would not induce substantial growth. Based on the comparable levels of passenger and cargo activity, it is not expected that the growth implications associated with operation of the LAX SPAS alternatives would be materially different than those previously addressed in the LAX Master Plan EIR. Similarly, the LAX Master Plan does not involve the expansion or extension of infrastructure into under-developed or undeveloped areas. Thus, the proposed project is not anticipated to result in substantial direct or indirect

growth in population and housing, and no mitigation measures are required. As such, this issue does not require any further analysis in the LAX SPAS EIR.

b. Displace substantial numbers of existing housing necessitating the construction of replacement housing elsewhere?

c. Displace substantial numbers of people necessitating the construction of replacement housing elsewhere?

b-c. Less Than Significant Impact. As discussed in the LAX Master Plan EIR, independent of the LAX Master Plan, LAWA has an existing relocation program underway to mitigate aircraft noise impacts on area residences, as part of LAWA's Aircraft Noise Mitigation Program (ANMP).[29] A total of over 2,500 houses and apartments in Manchester Square, the location of the GTC project under the approved Master Plan, and the Belford residential area (which is not included in the proposed project site boundaries), have been or are planned to be acquired and the residents relocated under the program existing plan. Voluntary property acquisition commenced in the spring of 1998.

Similar to the approved LAX Master Plan, no residential acquisition is proposed for the LAX SPAS alternatives. However, depending on the LAX SPAS alternative ultimately selected, should the ANMP land acquisition under LAWA's Existing ANMP Relocation Plan for Manchester Square not be completed by the time selected LAX SPAS alternative is approved and advanced into implementation, the City of Los Angeles and LAWA will begin to explore the most appropriate and practical measures (e.g., voluntary acquisition, leasing, and/or public condemnation) to ensure that the designated areas are vacated consistent with the project construction sequencing plan. As indicated in Section 4.4.2 of the Master Plan EIR, these measures would be available to pursue any needed acquisition that cannot be obtained through negotiations. Compliance with the Uniform Act would adequately address residential relocation, and impacts to existing housing would therefore be less than significant. No mitigation measures are required. Notwithstanding, the LAX SPAS EIR will include a discussion of the current status of the property acquisitions in Manchester Square and Belford and the proposed use of the subject area with respect to the SPAS alternatives.

[29] Under the ANMP, LAWA will acquire the Belford and Manchester Square areas east of and adjacent to the airport. These properties are heavily impacted by noise, traffic, and incompatible adjacent land uses. Residents in those areas approached the airport and requested that their properties be acquired rather than soundproofed. The existing acquisition activities were previously approved as part of LAWA's *Final Relocation Plan -- Voluntary Residential Acquisition/Relocation Program for the Areas Manchester Square and Airport/Belford,* June 2000 (referred to within the relocation analysis as the Existing ANMP Relocation Plan).

XIII. PUBLIC SERVICES. *Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services?*

a. Fire protection?

Potentially Significant Impact. The LAX Master Plan EIR evaluated the impacts on fire protection from implementation of the Master Plan alternatives, including whether the proposed alternatives would directly increase demand on fire protection and emergency services resulting in facility capacity constraints, inadequate fire flows, or unacceptable emergency response times. However, the SPAS Alternatives propose a different configuration of certain LAX Master Plan facilities and, therefore, the proposed project has the potential to create new or substantially different/increased impacts on fire protection than addressed in the LAX Master Plan EIR. The LAX SPAS EIR will evaluate the potential for the SPAS Alternatives to have significant impacts on fire protection that were not addressed in the LAX Master Plan EIR.

b. Police protection?

Potentially Significant Impact. The LAX Master Plan EIR evaluated the impacts on law enforcement services from implementation of the Master Plan alternatives, including whether the proposed alternatives would directly increase demand for law enforcement services to an extent that would result in understaffed law enforcement services, inadequate facilities, or increased and unacceptable response times. However, the SPAS Alternatives propose a different configuration of certain LAX Master Plan facilities and, therefore, the proposed project has the potential to create new or substantially different/increased impacts on law enforcement services than addressed in the LAX Master Plan EIR. The LAX SPAS EIR will evaluate the potential for the SPAS Alternatives to have significant impacts on law enforcement services that were not addressed in the LAX Master Plan EIR.

c. Schools?

Less than Significant. The proposed project evaluates alternative configurations of certain LAX Master Plan facilities and does not include residential development, which could contribute to increases in school enrollment. Further, the proposed project would not directly physically impact/alter any public schools. Similar to the approved LAX Master Plan, under the proposed project there would be a reduction in airport-related employment due to productivity increases (i.e., the production of more economic output per worker).[30] This decrease in employment is anticipated to result in a decrease of students associated with LAX employment in the Los Angeles Unified School District and other school districts in the region

[30] City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.5, April 2004.

over the planning period. The estimated decrease in employment and its effect on enrollment is not expected to cause a school closure or the need for new or modified school facilities in any of these districts. The project-related decreases in enrollment would occur over time and be more than offset by enrollment increases associated with other projects. Although enrollment impacts are considered to be less than significant, any indirect enrollment impacts on schools associated with the proposed project would be mitigated through payment of school impact fees by LAWA or its non-governmental tenants for commercial and industrial development, thereby avoiding any significant impacts.[31] As such, the issue of direct impacts to schools does not require any further analysis in the LAX SPAS EIR. Non-enrollment impacts on schools relative to noise, air quality, health risk, and traffic/access will be addressed in the LAX SPAS EIR.

d. Parks?

No Impact. The proposed project evaluates alternative configurations of certain LAX Master Plan facilities and does not include residential development, which could contribute to increases in park demand. Further, the proposed project would not directly physically impact/alter any public park or recreation areas. As discussed in Section XIII.c above, similar to the approved LAX Master Plan, under the proposed project there would be a reduction in airport-related employment due to productivity increases. Thus, employment-related demand for parkland would decrease due to the reduction in direct employment generated by LAX. As indicated in the LAX Master Plan EIR, although no residential development is proposed, increases in passenger activity, compared with existing conditions, may increase demand for parks and recreation. However, demand from passengers is not considered substantial as most visitors to the airport are focused on arriving or departing directly from the immediate area. In addition, this increase is expected to be offset by the projected decrease of airport-related employees that would occur under the approved LAX Master Plan, as well as the proposed project.[32] Therefore, the proposed project would not result in the need for new/altered parks and no mitigation measures are required. As such, this issue does not require any further analysis in the LAX SPAS EIR.

e. Other governmental services (including roads)?

Potentially Significant Impact. The SPAS alternatives may include some modifications to local roads at, or near, LAX that were not addressed in the LAX Master Plan EIR. These modifications, as well as any resulting potential impacts associated with area roads, will be discussed in the LAX SPAS EIR.

With respect to libraries, the proposed project does not include residential development, which could contribute to increases in library services demand. Further, the proposed project would not directly

[31] City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.27, April 2004.

[32] City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.26.3, April 2004.

physically impact/alter any public libraries. As discussed in Section XIII.c above, similar to the approved LAX Master Plan, under the proposed project there would be a reduction in airport-related employment due to productivity increases. Thus, employment-related demand for library services would decrease due to the reduction in direct employment generated by LAX. As indicated in the LAX Master Plan EIR, although no new residential development is proposed, it is possible that increases in passenger activity, compared with existing conditions, could result in an increase in demand for library services. However, demand from passengers is not anticipated to be substantial and this potential increase is expected to be offset by the projected decrease of airport-related employees that would occur under the approved LAX Master Plan, as well as the proposed project.[33] Therefore, the proposed project would not result in the need for new/altered libraries, and no mitigation measures are required. As such, no further analysis of potential impacts to libraries is required for the LAX SPAS EIR

XIV. RECREATION.

a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

a-b. No Impact. The proposed project does not include development of recreational facilities. As indicated in Response No. XIII.d above, although no residential development is proposed as part of the project, increases in passenger activity, compared with existing conditions, may increase demand for parks and recreation. However, demand from passengers is not considered substantial as most visitors to the airport are focused on arriving or departing directly from the immediate area. In addition, this increase is expected to be offset by the projected decrease of airport-related employees that would occur under the approved LAX Master Plan, as well as the proposed project. Therefore, the proposed project would not result in substantial physical deterioration of existing area recreational facilities or require the construction or expansion of recreational facilities. As such, this issue does not require any further analysis in the LAX SPAS EIR.

XV. TRANSPORTATION/CIRCULATION. *Would the project:*

a. Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to ratio capacity on roads, or congestion at intersections)?

b. Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?

[33] City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.26.4, April 2004.

a-b. Potentially Significant Impact. The LAX Master Plan EIR evaluated the transportation impacts of the Master Plan alternatives, including potential impacts to on-airport transportation (airport roadway, curbfront, and parking systems; remote parking facilities; commercial vehicle staging areas; remote parking facilities; rental car facilities; transit systems; Automated People Mover; and, pedestrian activities) and off-airport transportation (arterial roads and highway segments and ramps that serve traffic approaching and departing the airport). However, the SPAS Alternatives propose a different configuration of certain LAX Master Plan facilities and, therefore, the proposed project has the potential to create new or substantially different/increased transportation impacts than addressed in the LAX Master Plan EIR. The LAX SPAS EIR will evaluate the potential for the SPAS Alternatives to have significant transportation impacts that were not addressed in the LAX Master Plan EIR.

c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

Potentially Significant Impact. The LAX Master Plan EIR evaluated the aviation safety impacts of the Master Plan alternatives. However, the North Airfield reconfiguration alternatives for the LAX SPAS have the potential to create new or substantially different/increased aviation safety impacts than addressed in the LAX Master Plan EIR. The LAX SPAS EIR will evaluate the potential for the LAX SPAS alternatives to have significant aviation safety impacts that were not addressed in the LAX Master Plan EIR.

d. Substantially increase hazards to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Potentially Significant Impact. Please see Response No. XV.a-b and Response No. XV.c above.

e. Result in inadequate emergency access?

Potentially Significant Impact. As indicated in Response No. XIII.a and Response No. XIII.b, the LAX Master Plan EIR evaluated the impacts on emergency services from implementation of the Master Plan alternatives. However, the SPAS Alternatives propose a different configuration of certain LAX Master Plan facilities and, therefore, the proposed project has the potential to create new or substantially different/increased impacts on emergency access than addressed in the LAX Master Plan EIR. The LAX SPAS EIR will evaluate the potential for the SPAS Alternatives to have significant impacts on emergency access that were not addressed in the LAX Master Plan EIR.

f. Result in inadequate parking capacity?

Potentially Significant Impact. Please see Response No. XV.a-b above.

g. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?

Potentially Significant Impact. Please see Response No. XV.a-b above.

XVI. UTILITIES. *Would the project:*

a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

a-b. Potentially Significant Impact. The LAX Master Plan EIR evaluated the impacts on water and wastewater conveyance and treatment facilities from implementation of the Master Plan alternatives. However, the SPAS Alternatives propose different land acquisition than the Master Plan alternatives, with the potential to create new or substantially different/increased impacts on water and wastewater conveyance and treatment facilities than addressed in the LAX Master Plan EIR. In addition, the LAX SPAS EIR will provide an updated description of current conditions relative to wastewater treatment and will evaluate the potential for changes in conditions to result in new impacts. The LAX SPAS EIR will evaluate the potential for the SPAS Alternatives to have significant impacts on water and wastewater conveyance and treatment facilities that were not addressed in the LAX Master Plan EIR.

c. Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Potentially Significant Impact. Please see Response No. VIII.a. above.

d. Have sufficient water supplies available to serve the project from existing entitlements and resource, or are new or expanded entitlements needed?

Potentially Significant Impact. The LAX Master Plan EIR evaluated the impacts on water supply from implementation of the Master Plan alternatives. However, the SPAS Alternatives propose different land acquisition than the Master Plan alternatives, with the potential to create new or substantially different/increased impacts on water supply than addressed in the LAX Master Plan EIR. In addition, the LAX SPAS EIR will provide an updated description of current conditions relative to water supply and will evaluate the potential for changes in conditions to result in new impacts. The LAX SPAS EIR will evaluate the potential for the SPAS Alternatives to have significant impacts on potable water supply that were not addressed in the LAX Master Plan EIR. With respect to impacts of the SPAS alternatives on reclaimed water supply, as indicated in the LAX Master Plan EIR, LAWA would maximize the use of

reclaimed water in new facilities and within irrigated areas, such as landscaping. With the planned expansion of existing reclaimed water production and existing distribution capacity, ample supply and facilities would be available to accommodate the demand for reclaimed water use.[34] Therefore, no significant impacts with respect to reclaimed water supply would occur. As such, the issue of impacts on reclaimed water supply does not require any further analysis in the LAX SPAS EIR.

e. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Potentially Significant Impact. Please see Response No. XVI.a-b above.

f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

g. Comply with federal, state, and local statutes and regulations related to solid waste?

f-g. Potentially Significant Impact. The LAX Master Plan EIR evaluated the impacts on solid waste generation and disposal from implementation of the Master Plan alternatives. However, the SPAS Alternatives propose different land acquisition than the Master Plan alternatives, with the potential to create new or substantially different/increased impacts on solid waste generation and disposal than addressed in the LAX Master Plan EIR. In addition, the LAX SPAS EIR will provide an updated description of current conditions relative to solid waste disposal and will evaluate the potential for changes in conditions to result in new impacts. The LAX SPAS EIR will evaluate the potential for the SPAS Alternatives to have significant impacts on municipal solid waste generation and disposal that were not addressed in the LAX Master Plan EIR. With respect to impacts of the SPAS alternatives on inert solid waste (e.g., concrete and asphalt from construction and demolition activities) disposal capacity, as indicated in the LAX Master Plan EIR, as of December 2000, the total remaining permitted inert waste capacity in Los Angeles County was estimated to be approximately 57.7 million tons. Based on the average 2000 disposal rate, this capacity would be exhausted in approximately 44 years. Therefore, there is anticipated to be no shortfall in disposal capacity for inert waste within the county.[35] As such, the issue of impacts to inert solid waste disposal capacity does not require any further analysis in the LAX SPAS EIR.

34 City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.25.1, April 2004.

35 City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, Section 4.19, April 2004.

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XVII. MANDATORY FINDINGS OF SIGNIFICANCE.

a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Potentially Significant Impact. The proposed project has the potential to degrade the quality of the environment and has the potential to affect biological and cultural resources. The potential for significant impacts to these resources will be evaluated in the LAX SPAS EIR.

b. Does the project have impacts which are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects).

Potentially Significant Impact. Implementation of the proposed project may result in cumulative impacts when considered with other past, present and probable future projects on the airport and in the surrounding area. The potential for the proposed project to contribute to cumulative adverse environmental impacts will be evaluated in the LAX SPAS EIR.

c. Does the project have environmental effects which cause substantial adverse effects on human beings, either directly or indirectly?

Potentially Significant Impact. Implementation of the proposed project may result in adverse environmental effects which could potentially result in substantial adverse effects on humans. The potential for the proposed project to result in significant adverse impacts on humans will be evaluated in the LAX SPAS EIR.

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REFERENCES

Biological Opinion from United States Fish and Wildlife Service (USFWS) of the LAX Master Plan Final EIR, April 2004.

Biological Opinion from United States Fish and Wildlife Service (USFWS) of the LAX Operation and Maintenance, April, 2005.

City of Los Angeles, Los Angeles World Airports (LAWA), Final Environmental Impact Report, Los Angeles International Airport Proposed Master Plan Improvements, April 2004.

City of Los Angeles, Los Angeles World Airports (LAWA), Environmental Management Division, Final LAX Master Plan Mitigation Monitoring & Reporting Program, Paleontological Management Treatment Plan, June 2005.

City of Los Angeles Planning Department, Safety Element of the City of Los Angeles General Plan, adopted November 1996.

2008 NOP PowerPoint Presentation

LAX Specific Plan Amendment Study EIR
Notice of Preparation

Advisory Committee Meeting

March 6, 2008

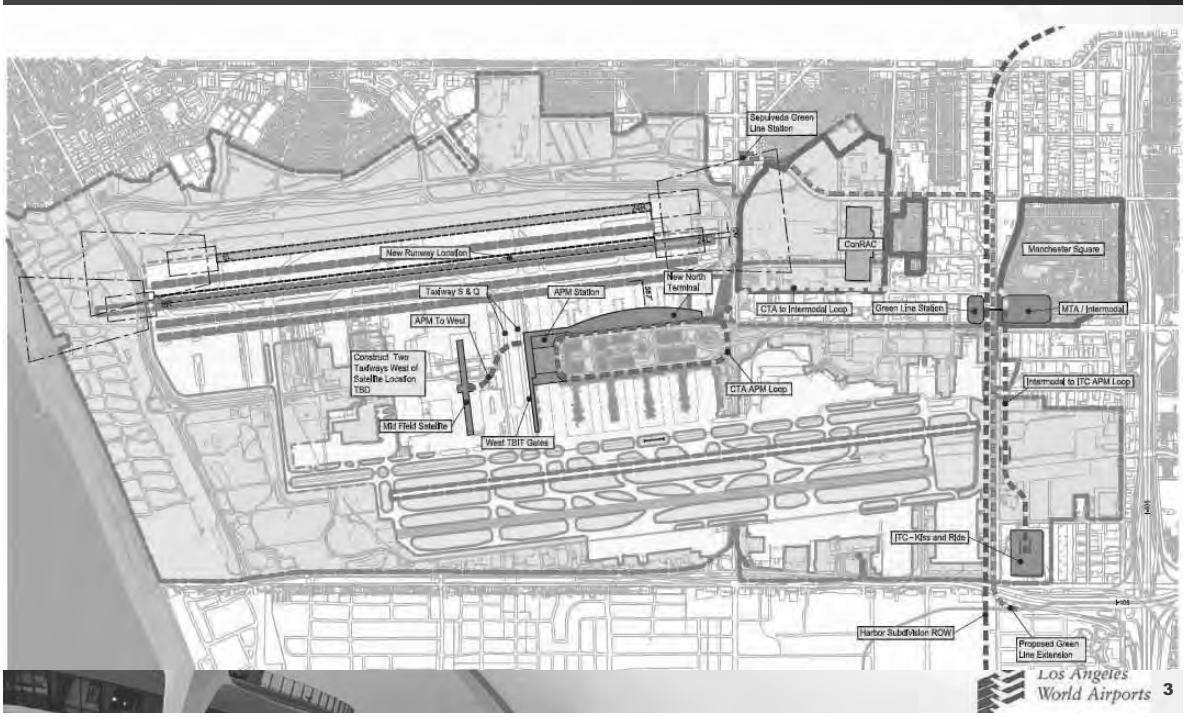


Agenda

- Review SPAS Alternatives
- Review Approach to NOP
- Security Consultant Selection

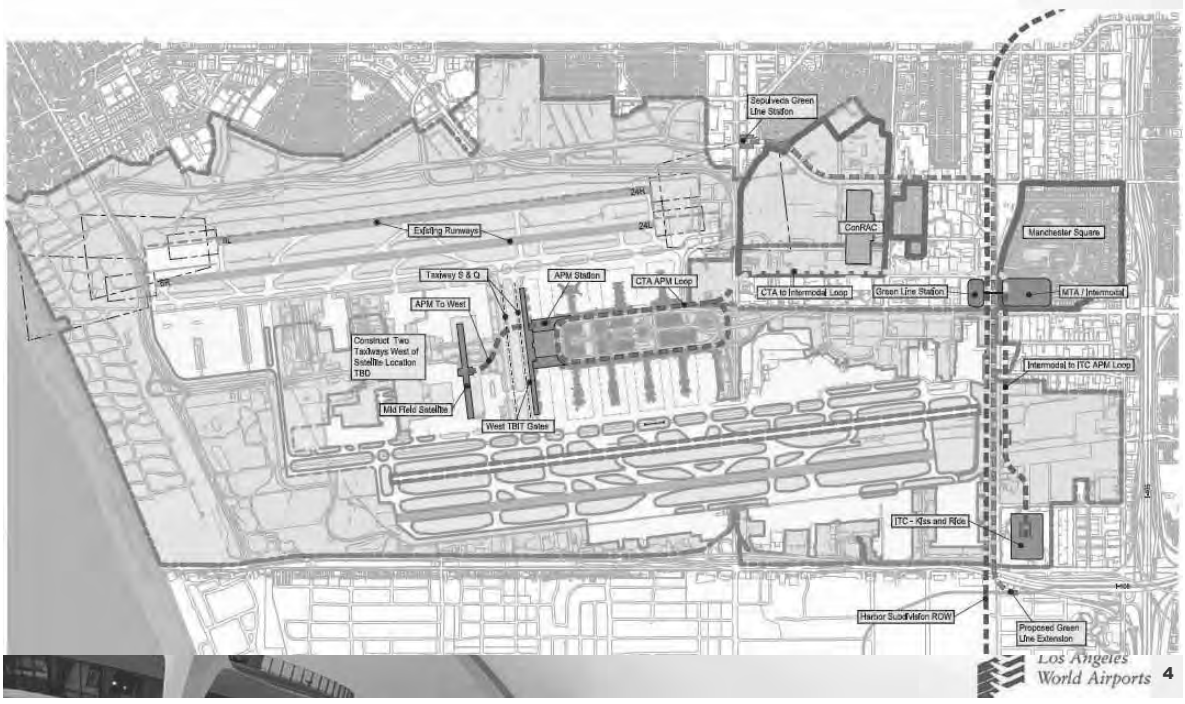


Draft Unified Concept



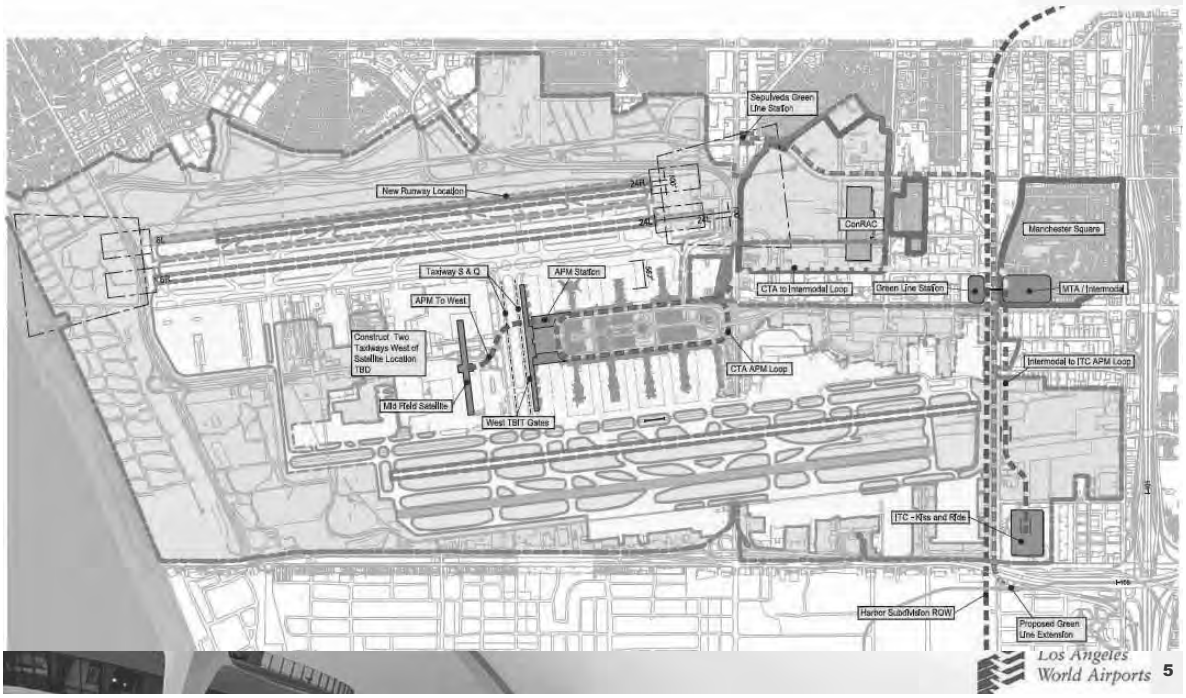
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Draft ARSAC Concept

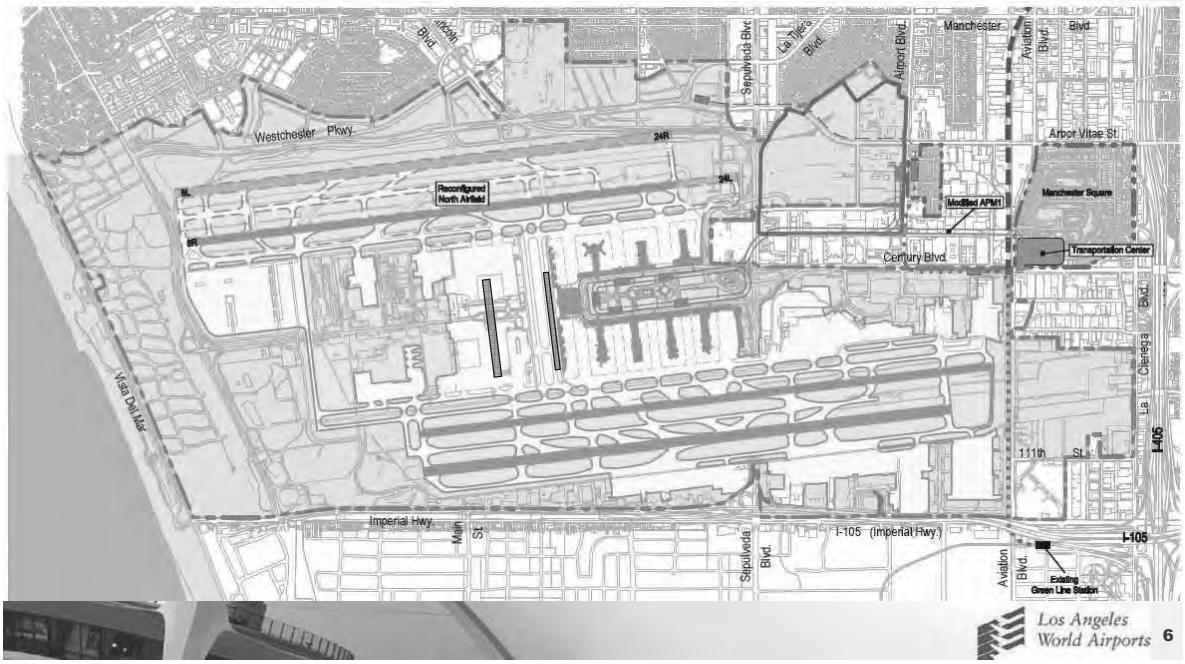


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Draft El Segundo/Inglewood Concept



Draft LAWA Concept

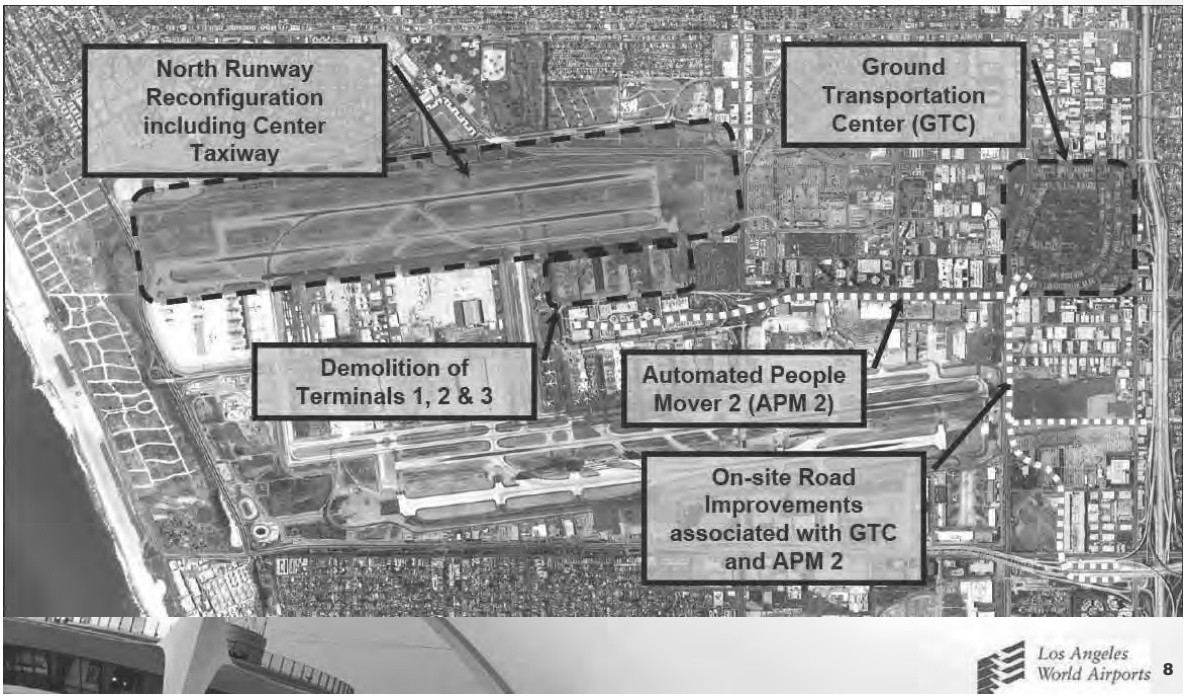


Yellow Light Projects

- Ground Transportation Center (GTC)
- Automated People Mover (APM) 2 from the GTC to the Central Terminal Area (CTA)
- Demolition of CTA Terminals 1, 2, and 3
- North Runway re-configuration, including center taxiways
- On-site road improvements associated with the GTC and APM 2

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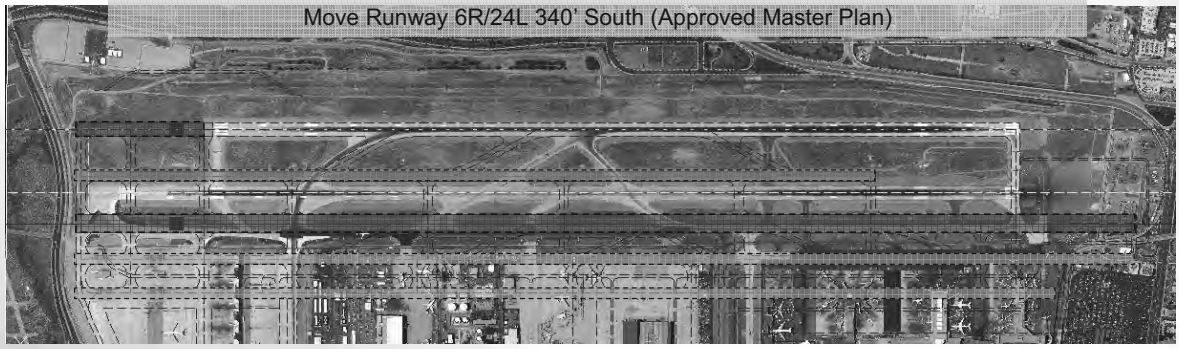
Yellow-Light Project Areas



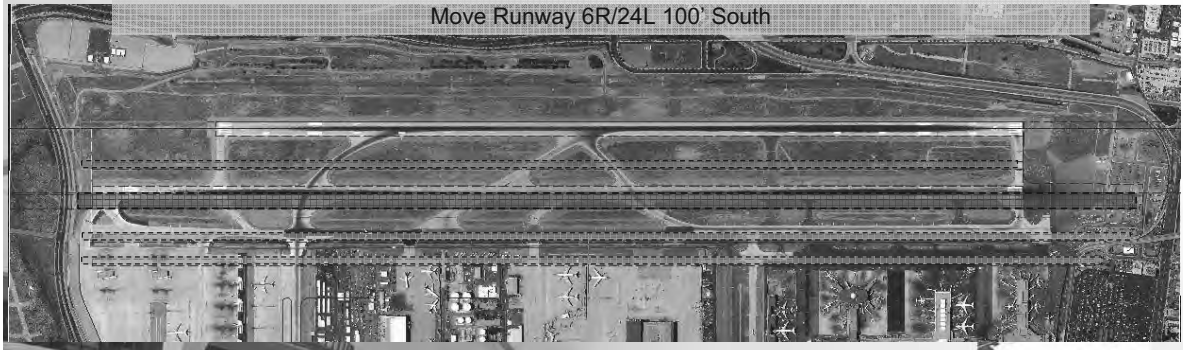
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Options for North Airfield

Move Runway 6R/24L 340' South (Approved Master Plan)



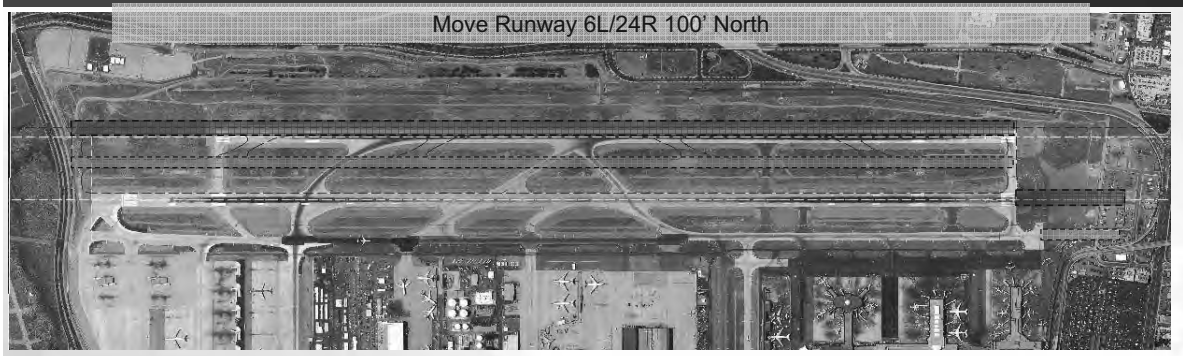
Move Runway 6R/24L 100' South



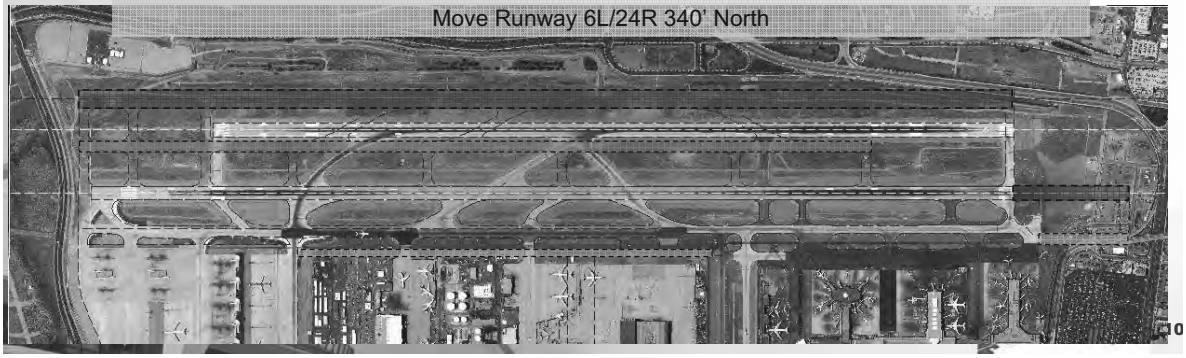
Draft

Options for North Airfield

Move Runway 6L/24R 100' North



Move Runway 6L/24R 340' North



Draft

Options for North Airfield

Existing Runway Locations – Add Runway Status Lights



Draft

Options for Ground Transportation Center and APM2

Approved Master Plan



- **Close Access to CTA**
- **Build GTC at Manchester Square**
- **Build APM 2**

Draft Options for Ground Transportation Center and APM2



- Keep Access to CTA
- Build Transportation Center at Manchester Square
- Build Modified APM 1

Draft Options for Ground Transportation Center and APM2

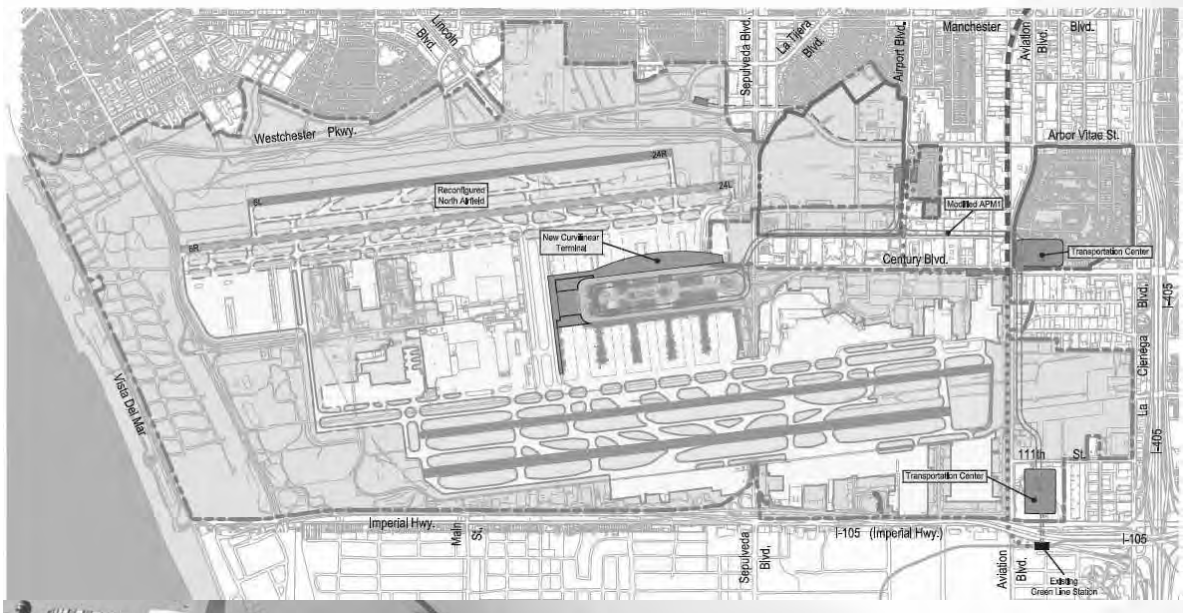


- Keep Access to CTA
- Build Transportation Centers at Manchester Square and Aviation/Imperial
- Build Modified APM 1

Potential Alternatives Identified in NOP

- Potential Alternative - Runway 6R/24L 100' South (Unified Concept)
- Potential Alternative - Existing Runways with Runway Status Lights (ARSAC Concept)
- Potential Alternative - Runway 6L/24R 100' North (El Segundo/Inglewood Concept)
- Potential Alternative - Runway 6L/24R 340' North (LAWA Concept)
- Required Alternative - No Project/No Development (Existing Conditions)
- Required Alternative - No Project/No Specific Plan Amendment (Implement Approved Master Plan)

Draft Potential Alternative Runway 6R/24L 100' South (Unified Concept)

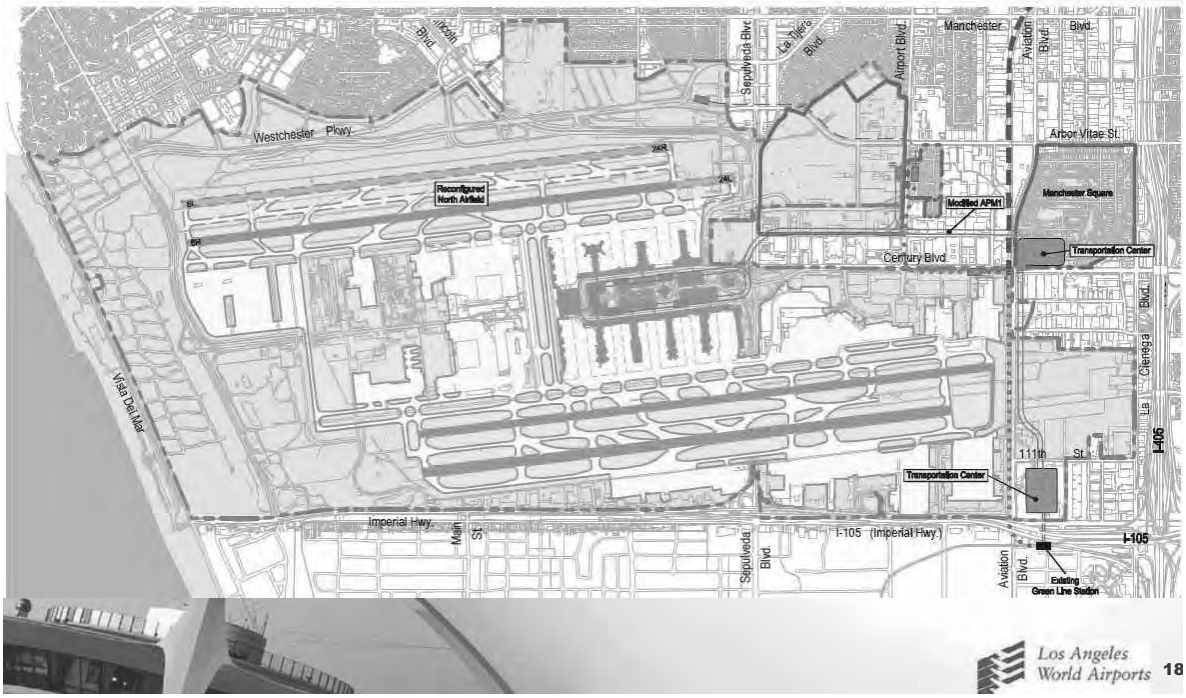


Draft Potential Alternative Existing Runways with Runway Status Lights (ARSAC Concept)



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Draft Potential Alternative Runway 6L/24R 100' North (El Segundo/ Inglewood Concept)



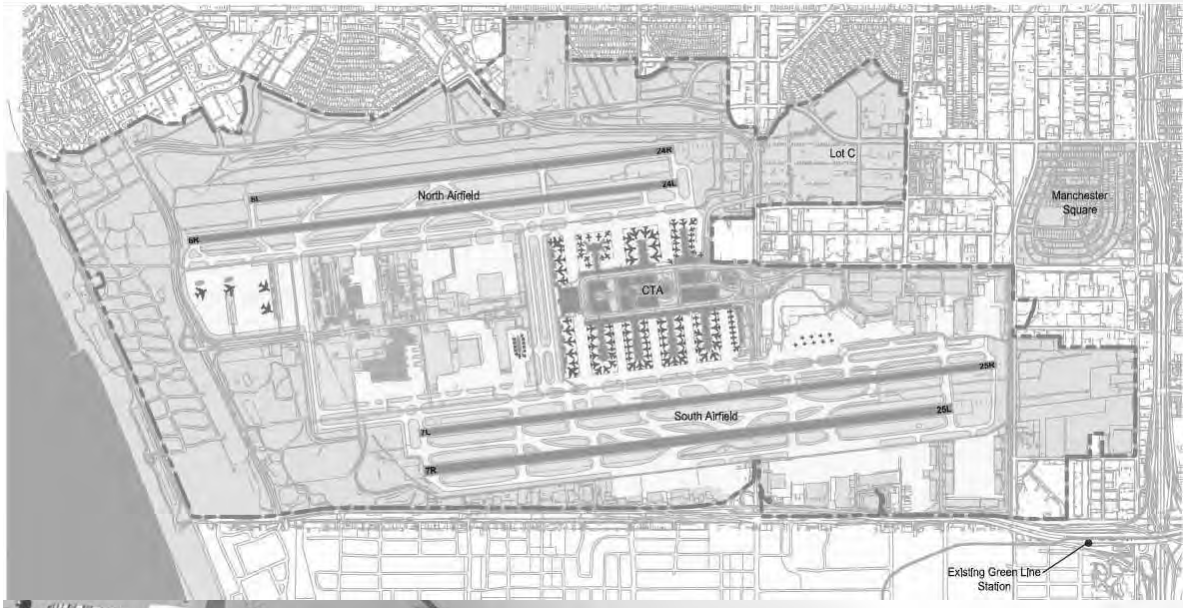
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Draft Potential Alternative Runway 6L/24R 340' North (LAWA Concept)



Los Angeles World Airports 19

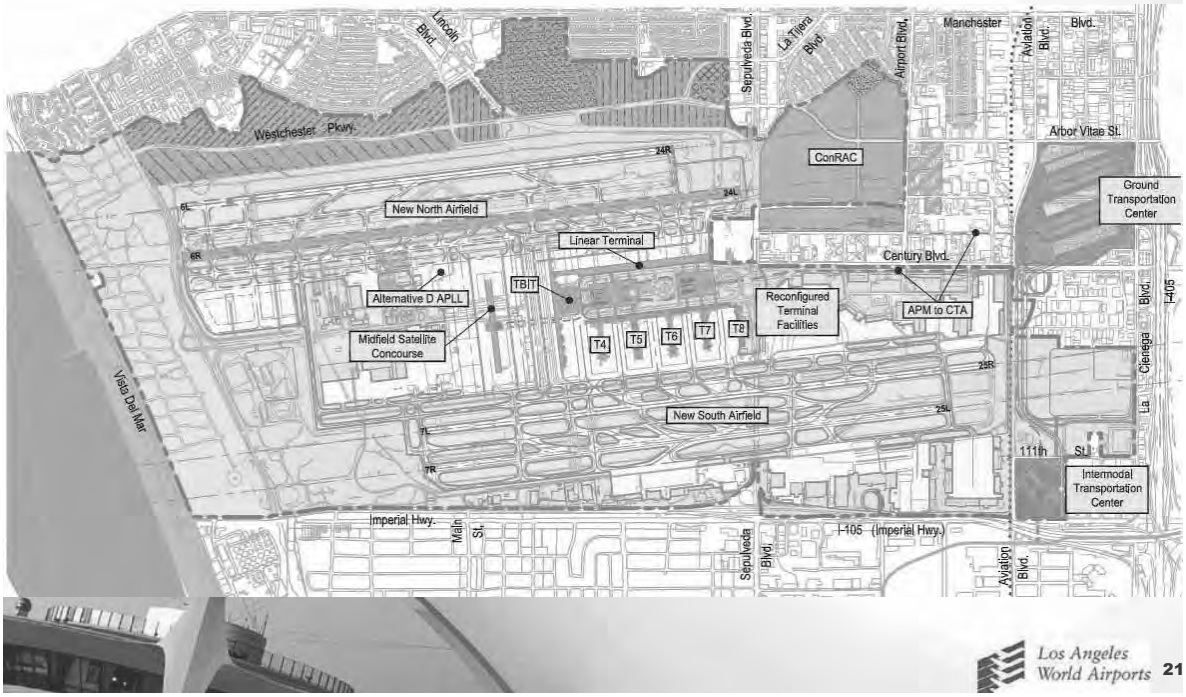
Draft Required Alternative No Project/No Development (Existing Conditions)



Los Angeles World Airports 20

Draft

Required Alternative
No Project/No Specific Plan Amendment
(Implement Approved Master Plan)



Los Angeles World Airports

Security Consultant Selection

- Options for Security Consultant
- LAX Stipulated Settlement Requirements

Los Angeles World Airports

Next Steps



2008 NOP Sign In Sheets

Los Angeles World Airports

LAX Specific Plan Amendment Study
Wednesday, March 15, 2006

Welcome . . .

Los Angeles World Airports (LAWA) is committed to implementing an inclusive community-based planning process for the LAX Specific Plan Amendment Study.

The purpose of tonight's meeting is to:

- provide an update on the Settlement Agreement finalized in February 2006 regarding the Los Angeles International Airport (LAX) Master Plan
- explain the "green light" projects
- obtain ideas to potentially replace "yellow light" projects with alternative projects that increase airport efficiency and mitigate traffic, noise and pollution.

There will be a presentation followed by smaller group breakout sessions. In the smaller groups, you will have the opportunity to ask questions and discuss specific ideas.

Tonight's Agenda

- **6:00 p.m. – Sign-In/Welcome**
- **6:15 p.m. – Presentation**
- **7:00 p.m. – Working Group Sessions**
- **8:00 p.m. – Working Group Summaries**
- **8:45 p.m. – Next Steps in the Process**
- **9:00 p.m. – Adjournment**

Thank you for coming.

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

LAX Specific Plan Amendment Outreach

Los Angeles World Airports invites the public to participate in the first LAX Specific Plan Amendment Study (LAXSPAS) outreach meetings.

When: Wednesday, March 15, 2006 from 6:00 p.m. to 9:00 p.m.
Saturday, March 18, 2006 from 9:00 a.m. to 12:00 p.m.

For public convenience, two meetings have been scheduled. Attendance is not necessary at both meetings as the same material will be presented.

Where: Flight Path Learning Center located at 6661 West Imperial Highway, Los Angeles, CA 90045. Parking is available on site.

The focus of the meetings will be to brief the public on:

Results of the LAX Master Plan Stipulated Settlement
Scope and schedule for the LAX Specific Plan Amendment Study

For more information, please contact Los Angeles World Airports at (800) 919-3766.

Los Angeles World Airports

LAX Specific Plan Amendment Study
Saturday, March 18, 2006

Welcome . . .

Los Angeles World Airports (LAWA) is committed to implementing an inclusive community-based planning process for the LAX Specific Plan Amendment Study.

The purpose of tonight's meeting is to:

- provide an update on the Settlement Agreement finalized in February 2006 regarding the Los Angeles International Airport (LAX) Master Plan
- explain the "green light" projects
- obtain ideas to potentially replace "yellow light" projects with alternative projects that increase airport efficiency and mitigate traffic, noise and pollution.

There will be a presentation followed by smaller group breakout sessions. In the smaller groups, you will have the opportunity to ask questions and discuss specific ideas.

Today's Agenda

- **9:00 a.m. – Sign-In/Welcome**
- **9:15 a.m. – Presentation**
- **10:00 a.m. – Working Group Sessions**
- **11:00 a.m. – Working Group Summaries**
- **11:45 a.m. – Next Steps in the Process**
- **12:00 p.m. – Adjournment**

Thank you for coming.

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

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LAX Specific Plan Amendment Study
Community Meeting
March 15, 2006
General Public

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William & Green Beahm	Apt Owner	90 Dapplegray Ln Rolling Hills Est. CA	90274	(310) 326 6829		
HARRY ROSE	WNA	8160 REDLANDS ST 102 PLAYA DEL REY 90293	90293	213 341-1652		
Linda Peterson	LAXAAC	7053 Vista del Mar Lane Playa del Rey	90293	310 822-0435		gene.white@comcast.net

LAX Specific Plan Amendment Study
Community Meeting
March 15, 2006
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Ines Doyle		624 CORITA ST. El SEGundo CA	90245	310 322 4600		
Ken Alpern	President, the Transit Coalition	3222 Military Ave. Los Angeles, CA	90034	(310) 231-7822		
WILLEM EPONE	PVT CITIZEN	8307 BANDERA LA 90045	90045	310.417 5209		
MARIA PECHS	McDonald's	21300 Victory Blvd suite 900 WOODLAND HILLS, CA 91364	91364	818.594. 7530		
VERN NORTON		1012 6th Ave. Inglewood, Calif 90303	90303			

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TOMMY ROYS	NONE	7577 McConnell 90045	90045	3101 6458748	—	—
DOUG EHLERS	Public	5527 W 77ST LA CA 90045		310 649 6034	Same	77dgeh@ Earthlink.net
Cleveland Brown	L.V. 250 Inglewood Resident	9333 So. Van Ness Ave Inglewood 90305	90305	323/ 779-4402		BRO Clev shirt@ AOL.com
HEZEKIAH HARRIS	CATTS IIIC	5995 S. SEPULVEDA #206 CULVER CITY	90230	310 390 9558	310 390 9847	hharris@ cattsinc.com
David Herbst	MWWD staff	660 S Figueroa #1400 LA 900	90017	213 4466560	213 4466501	Dherbst@ mwdh2o.com

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March 15, 2006

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John Brady	Mayor's Office			310-410-1349		John.S.Brady@lacity.org
Commissioner Walter Zipkin	LAWA-BOAC					
SASA Bahadori	Mayor			213) 473-6040		sasa.bahadori@lacity.org
Kathryn Frengs	Councilman Rosendahl	7166 Manchester	90045	310 568 8772		kathryn.frengs@lacity.org
Phillip Tate	"	200 N Spring St Rm 415	90012	213 473 7011		phillip.tate@lacity.org
Val Velasco	BOAC			310 321-7890		

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Ruth Dawson		8117 Chase Ave. Westchester 90045	90045	310 641-6773		
Gordon Mego	None	4535 W. 141st St. Hawthorne, Calif. 90250-6927	90250-6927	(310)675-8674	—	—
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ALEX MACINTOSH		1418 E. WALNUT AV. EL SEG 90245	90245	310 640-9568		
Jason Alt	SELF	914 ST PAUL AVE ST PAUL, MN 55116	55116	612.327.4448		jalt@wjsco.com
Cecil Carpio						
John Bowman	Self	407 Exton ~~90302~~	90302			

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Dennis Zane	Urban Planning	2943 Delaware Ave Santa Monica	90404	310-582-0037		dennyzane@aol.com
E FAHLER		~~6151 W CENTURY~~ 17552 LA MAIDA SHERMAN OAKS CA ~~91403~~	91403	310 709 9878		mfahler@yahoo.com
MARTHA GUTIEZ		3675 W 108TH ST INGLEWOOD, CA 90303		(310) 6712357		MGUTIEZ1203@YAHOO.COM

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Carly ICIMURA	Enterprise Rent a car	8734 Bellanca LA 90045	90045	310-649-5400		
Kelly Marzo	Enterprise Rent-A-Car	8734 Bellanca LA 90045				
Mike Rockwood		5820 Arbor Vitae	90045	310-833-0070		
Lisa Wellik	LAWA	8939 S. Sepulveda #100	90045	310-646-1836		lwellike lawa.org
ROBERT DROLLINGER	Property owner	Box 48034 L.A. 90048	48	323 874-2077	0	e
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Pedro Ayala	LADOT	7100 W. Manchester	90045	213/485-1062	—	PAyala@DOT.lacity.org.

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Daniel Walker	-	7416 W. 82nd St L.A.	90045			milowalker@comcast.net
Kim Thompson		17345 Tampa Place	91344	818 360 4346		kimthompson@socal.rr.com

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MR & Mrs. Eugene Rubido	SELF	10918 Truro, Lennox	90304	310 671-8505	—	—
Mary Beal	10th & 11th Ave Blocks Club	9301-10th Ave Ingl	90305	310 671-6850		MARYCAKE @SBCGLOBAL. NET
Dennis Chan	LAX-AAC	8939 S. Sepulveda Suite 102	90045	206 409 5607		dchan1 de @aol.com
JERRY GOMEZ	Travelers Aid Society LAX	P.O. Box 1531 FULLERTON	92836	714 2370382		jlax45a @y400.com
ROBERT L. ROBLES	~~THE~~ POLARIS GROUP V. CA	14647 TUSTIN ~~ST~~ SHERMAN OAKS CA	91403	818-789-7318	818 789-1218	POLARISLAW @AOL.COM, NET

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Marc Carrel	Office of Rep. Jane Harman	2321 E. Rosecrans Ave Suite 3270 El Segundo, CA ~~90245~~	90245	310-643-3636	310-643-6445	Marc.carrel@mail.house.gov
Kelly McDowell	Mayor of El Segundo					
Jose Gutierrez	Environmental Affairs	200 N. Spring St, Rm 2005 Los Angeles ~~90012~~	90012	213 978-0851	213 978-0893	Jose.Gutierrez@ Lacity.org
Mike Bonin	CD11					
~~[illegible]~~						

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Bill Crouk	City of El Segundo					

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Karen Kanta	resident	7929 W. 81st Pl LA	90293	310-822-9045		
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ARNIE CORLION	RESIDENT AND DIRECTOR- APARTMENT ASSOCIATION of GREATER LA	8726 S. SEPULVEDA Blvd. #211 LOS ANGELES CA	90045	310-398-4511	310-216-1199	ACORLION@AOL.com

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LAX Specific Plan Amendment Study
Community Meeting
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BEN ALKERSON	PANIC	27129 SPRING CREEK RD RANCHO PALOS VERDES [illegible]	90275	3105413026		
ROY HEFNER	LAXAAC	6548 W 80 Pl	90045	3106708955		
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JOHN DRAGONE	LAXAAC	922 SHELDONS ELSEGUND	90245	(310) 266-0338		
Lois Nichols		3101 W. 84th St Inglewood	90305	(323-754-3243		

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STYLES LOGAN	80 ST B C	1243 W 80th St	90044	3237511693		
DENNY SCHNEIDER	ARSAC	7929 GREEN AV WESTCHESTER	90045	310 641-7999		
Audrey Lee		1728 W 108th St	90047	323 754 3343	—	—
Shannon Hicks		Eucalyptus St El Segundo CA	90245	310.339.0147		

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March 18, 2006

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Cecil Carpio						
Barbara Musella	President Westchester Streetscape Improvement Assoc.	6383 W 80th St LA Ca 90045	90045	310 - 649-0374		Rbmusella @ earthlink Net
TOM HASTINGS	Self	804 N Dianthus St Manhattan Beach	90266	310 372 6724		
JOHN RUHLEN		7839 HEATHERFER AVE L.A. CA	90045	310 645-9820		
KAREN WEST		1085 W. Arbor Vitae Inglewood CA 90301		310-678 7897	310- 645-4595	—

LAX Specific Plan Amendment Study
Community Meeting
March 18, 2006

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
SUSAN GEE-WILSON Richard Musella	PUBLIC GEN. INTEREST	4322 VIA MARINA M.D.R.	90292	310-822-3793	—	EMW99 @ESKETHLINK. NET
Richard Musella		6383 W 80TH ST Westchester	90045	310 649 0374	—	Rbmusella@ earthlink.net
WENDELL & MARILYN HARTER	CITIZEN	821 5th St. Manhattan Beach	90626	310-374-6003	310-372-9445	wwharter @aol.com
Donna Cope	LAX Area Advisory Com	8219 Reading Ave Westchester, 90045	90045	3103966556 X314 310 641-2503		dcope@stinson.k&h.org
Michael DiVirgilio	MWW Group	660 S. Figueroa St., Suite 1400 Los Angeles, CA	90017	213 486 6560 X328		mdivirgilio@mww.com
Lora Ary	Self	13418 Traub Ave Los Angeles CA 90059	90059	310- 352-7885	Same	lora_ary @yahoo
Suzette Frio	resident | business owner	5815 W 76TH ST LA 90045	90045	310- 641-8019		msn595 @aol.com

LAX Specific Plan Amendment Study
Community Meeting
March 18, 2006

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
EMMA SCHAFER		4201 Summertime Lane Culver City	90230			SchaferCom@aol.com
ESTER HARAMPOLY		7455 W. 91st LA	90045	310 645-8155		
WILLIAM D. SMART JR		464 LUCAS AVE	90014	213-977-9400		WSMART@LAANB.ORG
DAVID COLLINS	NEIGHBORHOOD COUNCIL NCUPDR	8430 TRUXTON AVE WESTCHESTER	90045	310 649-3038		DAVID@WESTCHESTERKIDS.ORG
Jessie Marshall ANNA Marshall		8953 Ruthelen St	90047	3237599267		-
W Bates		4A SALLE 4107 SALLE AL	90047	3233236049		
P. Aliaga		270 W. Hardy St. Inglewood, CA	90301	310.674.8223		paola_aliaga@yahoo.com

LAX Specific Plan Amendment Study
Community Meeting
March 18, 2006

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Sam Kaiser		825 Wilshire Blvd	Santa Monica	3106674061		framepicture@earthlink.net
M Parker Griffin	79th St. Block Club	1116 W. 79th St. CA	90044	323 7556747		
GRACIELA HUTH	El Manor Emerson Com	8932 El Manor Av LA CA 90045	90045	(310) 649-4273		
JOE LEGAS	DPS	1580 FRANCISCO ST TORRANCE CA 90501	90501	(310) 783-6271	(310) 783-6601	
W. Beden	Apt owner	5520 Arbor Vitae, LA 90045	90045	(310) 326-6829		-
E.R. Schauss	Self	6426 W. 84th Place LA 90045		310 670 5152		
A. TENA	SELF	7728 HENDRY AV L.A. 90045		—		

LAX Specific Plan Amendment Study
Community Meeting
March 18, 2006

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Bobby H. Luhst		3926 W 102 NO. 2ST. APT. B	90303	310 674-0644		
Tom Zimnoski		1535 Monterey #3 HB CA	90254	310 567 4580		

LAX Specific Plan Amendment Study
Community Meeting
March 18, 2006

Los Angeles World Airports

ELECTED OFFICIALS & STAFF

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Carl Jacobsen	City of El Segundo	350 Main St. El Segundo	90245	310 524 2302		cjacobsen@elsegundo.org
Edgar Saenz	Rep. Maxine Waters	6033 W. Century Blvd	90045			
Vaffelaars	BOAC					
Jim Bickhart	Mayor's Office	200 N Spring St.	90012	2139780641		jim.bickhart@lacity.org

LAX Specific Plan Amendment Study
Community Meeting
March 18, 2006

Los Angeles World Airports

ELECTED OFFICIALS & STAFF

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Gary Parsons	Council Member City of Hawthorne	5128 W. 120th St Hawthorne	90250	310 643-7096	—	Gary@GaryParsons.org
April LAWRENCE	Congresswoman MAXINE WATERS	10124 S. Broadway Ste 1 LA 90003	90003	323 757-8900	323 757-9506	April.LAWrence@mail.house.gov
JOHN FRIEDOW	COMMISSIONER DOT	8635 FALLBROOK	91352	310 503 0207		
Maxine Waters	Congresswoman					

Los Angeles World Airports

LAX Specific Plan Amendment Study
Wednesday, April 19, 2006

Welcome . . .

Los Angeles World Airports is pleased to welcome you to the community-based planning process for the LAX Specific Plan Amendment Study. The purpose of tonight's meeting is to solicit the public's input on a series of traffic, access, and transit issues developed in conjunction with the Advisory Committee.

To assist with tonight's discussion, LAWA staff will:

- Provide a brief summary of the Stipulated Settlement for new attendees
- Present a project schedule update including topics for future meetings
- Share an overview of the first public meetings
- Provide some background, traffic data to promote an understanding of passenger travel mode patterns

There will be a presentation followed by smaller group breakout sessions. In the smaller groups, you will have the opportunity to ask questions and discuss specific ideas.

Tonight's Agenda

- **6:00 p.m. – Sign-In/Welcome**
- **6:15 p.m. – Presentation**
- **6:45 p.m. – Working Group Sessions**
- **7:45 p.m. – Working Group Summaries**
- **8:45 p.m. – Next Steps in the Process**
- **9:00 p.m. – Adjournment**

Thank you for attending.

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

LAX MASTER PLAN SPECIFIC PLAN AMENDMENT STUDY

COMMUNITY MEETINGS

ROUND 2

Los Angeles World Airports is continuing to solicit public input for developing the LAX Master Plan Specific Plan Amendment Study. LAWA was gratified to see the turnout and input given to us at our initial meetings held in March, 2006. As we continue together through the LAX Master Plan Specific Plan Amendment Study, we look forward to hearing from you once again. This coming week, LAWA will host a second set of public meetings to hear your views on how to modernize LAX while reestablishing a good relationship with our neighbors. The next set of meetings will be held on the following dates:

Wednesday, April 19, 2006 from 6:00 p.m. to 9:00 p.m.

Saturday, April 22, 2006 from 9:00 a.m. to 12:00 noon

Flight Path Learning Center
Imperial Terminal
6661 West Imperial Highway, Los Angeles
Free parking on site

At these meetings members of the public will be asked to focus on ways to address traffic and access issues. Attendance is not necessary at both meetings, as the same topics will be covered.

For more information you may call 1-800-919-3766. Information on the LAX Master Plan Amendment Study and the presentation from the Round 1 meetings are available at www.laxmasterplan.org under the LAX Master Plan Stipulated Settlement.

Los Angeles World Airports

LAX Specific Plan Amendment Study
Saturday, April 22, 2006

Welcome . . .

Los Angeles World Airports is pleased to welcome you to the community-based planning process for the LAX Specific Plan Amendment Study. The purpose of today's meeting is to solicit the public's input on a series of traffic, access, and transit issues developed in conjunction with the Advisory Committee.

To assist with today's discussion, LAWA staff will:

- Provide a brief summary of the Stipulated Settlement for new attendees
- Present a project schedule update including topics for future meetings
- Share an overview of the first public meetings
- Provide some background, traffic data to promote an understanding of passenger travel mode patterns

There will be a presentation followed by smaller group breakout sessions. In the smaller groups, you will have the opportunity to ask questions and discuss specific ideas.

Tonight's Agenda

- **9:00 a.m. – Sign-In/Welcome**
- **9:15 a.m. – Presentation**
- **9:45 a.m. – Working Group Sessions**
- **10:45 a.m. – Working Group Summaries**
- **11:45 a.m. – Next Steps in the Process**
- **12:00 p.m. – Adjournment**

Thank you for attending.

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

Los Angeles World Airports

LAX Specific Plan Amendment Study
Community Meeting
April 19, 2006

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
DAN R. WISE	INGLEWOOD CHAMBER COMM	9924 S. LaBrea Inglewood CA	90301	310 677-1515	310 677-1505	
Wagih S. Andraos	STV	1055 W 7th ST L.A CA		(213) 236-2544	andraow@stvinc.com	
Charles Adams	Carter & Burgess	600 Wilshire Blvd	90017	213-239-1347	Charles.Adams@c-b.com	
Alan J. Allum		3313 W. 109th St. Inglewood	90303	310/673-3445	AJAllum@LADWP.org	
CECIL CARPIO						
WARREN BOWMAN	FRIENDS OF THE GREENLINE	753 Rum VENICE	90291	310 306-4862	WARREN BOWMAN@MAC.com	

LAX Specific Plan Amendment Study
Community Meeting
April 19, 2006

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Eric Glyn-Davies	H.B.Drollinger Co.	8929 S. Sepulveda Blvd. #130	90045	310-417-8048	417-8029	Eric@HBDrollin
Sally F. Boyle	LAX Area Dem Club	2700 Aviation #22	90278	310-376-5717		sbdasaro c @yahoo.com
Rina Johnson	self	952 Superba Avenue Venice, CA 9	90291	310-822-4201		rmj0428@ comcast.net

LAX Specific Plan Amendment Study
Community Meeting
April 19, 2006

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Howard Drollinger	HBD Co.	8929 Sepulveda	90045	310/417-8048		
Alice Wiggins	Parsons Brinckerhoff	4445 Flower LA	90071	213 362 9477		
Sam Pared	SV	1055 7th		917 902 4986		
Steven Powers		8117 W. Manchester Ave	90293	310 305 4249		
ANDREW SHADDOCK	TRANSIT COALITION	425 29th St Manhattan Bch	90266	310 546 7102		

LAX Specific Plan Amendment Study
Community Meeting
April 19, 2006

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Diana Orozco	Elazar Interpreter					
Linda Orozco	E. Lazar Interpreter					
Tom Carranza	LADOT	7166 W. Manchester Av L.A., CA	90045	310-642-1624		tcarranz@dot.lacity.org
Dita Lott	Property owner	5551 W. Century	90045	818-886-7075		
Ricky Hall	P. owner	9609 Gatt Ave Dix CA	90305	323 7577882		
Dennis Olson	LAX.AAAE	8939 S. Sepulveda #102	90045	206 409-5807		olsonide@aol.com
ANTON ACHERMAN	WHA	6055 W 5TH PLACE LOS ANGELES 90048	90045	310 645-8528		
John Bowman	LAXEN	407 Exter	90502			
MADELYN HARTER	property owner	821 - 8th St	90266	310-374-6003		
WENDELL HARTER	"	"	"	"		

LAX Specific Plan Amendment Study
Community Meeting
April 19, 2006

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Jenny Daigre	Kimley-Horn					
Barry Haberman	Redstone College student					
Dan Schneider	Arrae WNA	7929 Bryson Ave	90045	(310)641-4199		
Flor Barajas-Tena	LAANE	464 Lucas Ave Los Angeles	90017	(213)977-9460		fbtena@laane.org
Bill ARTHUR	ARINC Radio	2001 World Way West LA	90045	310 646 6633		WKATE@ARINC.com
Scott Tate	LAWA	7301 W	"	310 646-9410		state@lawa.org
KENT STRUMPELL	WESTCHESTER STREETSCAPE ASSOC.	6483 NANCY ST	90045	310 215 8114	KENTSTRUM@AOL.COM	
Paola Aliaga	—	270 W. Hardy St. Inglewood, CA	90301	310. 567. 2988		paola_aliaga@yahoo.com
Jose Gutierrez	EAD LA City	200 N. Spring St., Rm 2005 L.A.	90012	213 978 0851		Jose.Gutierrez@lacity.org
Wendell Harter		"				

LAX Specific Plan Amendment Study
Community Meeting
April 19, 2006

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Tommy Rojas	—	WESTCHESTER 7577 Mc Connell Ave.	90045	—	—	—
JOHN S. EHRET	RETIRED AERO ENGR	8219 CALABAR AVE PLAYA DEL REY CA	90293	(310) 8239417		
ECK CHAIBOONMA	MTA	1 Gateway Plaza LA	90012	2139222014		CHAIB @MTA.NET
Roy HEFNER	LAXAAC	6548 W 80 Pl	9044	310-670-8456		
HARRY ROSE	WNA	8160 REDLANDS #102	90293	213 341-1652		
JOHN CORTINA	DEL AIRE NEIGHBORHOOD ASSOC.	5248 WIGHTMS	90304	310-536-9163		
Jason Ac		5957 W CENTURY BLVD	90045	3104176100		
~~David~~						
Donna Coyle	LAXAAC	8219 Realty Ave	90045	310 641-2503		
JERRY GOMEZ	LAX Travelers Aid	P.O. BOX 1531 Fullerton, CA	92836	714-2370382		jlaxusae yahoo.com

LAX Specific Plan Amendment Study
Community Meeting
April 19, 2006

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
TERRY MARCELLUS		7345 W. 90th St LA	90045	645 0561	670872	TMarcellus @aol.com
DAVE SPENCER	APS	316 W. Florence Ave Inglewood CA	90013	645-3370	645-3350	
Renee Berlin	Metro	One Gateway Plaza LA, CA 9	90012	213) 922-3035		Berlinr@metro.net
JOHN KOPPELMAN	DEL AIRE NEIGHBORHOOD ASSOC	5508 W. 118TH PL DEL AIRE CA	90304	310-643-6800		JOHNKOPPELMAN @ AOL.COM
Joanne/Richard Puleo	None	419 Concord St El Segundo	90245	310-322-5150		
MATTHEW HETZ	Friends for the Green Line	6211 W. 78TH ST LA-CA	90045	310-645-8518		Hermes333 @aol.com
RICHARD MATHIAS	—	5936 W. 78TH ST LA, CA 90045	90045	310 645-1070		rmchmatthias @yahoo.com
MARY CUSACK	—	8107 READING AVE L.A.	90045	310 641 7386	—	—
Marianne & Herman GUTIERREZ		6158 W. 74th LA 90045		641-8854		
Tom Hastings	—	809 N DIANTHUS MANHATTAN BEACH CA	90266	310 372 6734		tom.hastings @xeroxlabs.com

LAX Specific Plan Amendment Study
Community Meeting
April 19, 2006

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
J. Bauman	KFWB	LA				

LAX Specific Plan Amendment Study
Community Meeting
April 19, 2006

Los Angeles World Airports

ELECTED OFFICIALS & STAFF

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Val Velasco	BOAC					
JOHN BRADY	LA MAYOR'S					
DIANA SANCHEZ	LAWA					
James Chon	LACODPW					
Jim Bickhart	Mayor's Off.					

LAX Specific Plan Amendment Study
Community Meeting
April 19, 2006

Los Angeles World Airports

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	NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
(3)	Emily Linnemeier	offc of Sen. Bowen	2512 Artesia Blvd #200 Redondo Beach 90278		310-318-6994		emily.linnemeier@sen.ca.gov ✓
(2)	Edgar Saenz	Rep Maxine Waters					✓
(5)	Phil Tate	CD 11	City Hall		213-473-7011		✓
(1)	Lara Jacobs	El Segundo	350 Main St	90245	310 524 2802		✓
	David Haber	"	"	"	213 9666526		
	Suzanne Tracy	City Attorney	1 World Way				
	BILL WATERHOUSE	"	"				
	DENNY SCHNEIDER	ALSAC	7929 BARTON AV	90045	310 641-4199		
(4)	John Brady	V					
	Marc Carrel	Rep. Harman					

LAX Specific Plan Amendment Study
Community Meeting
April 22, 2006

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Ben Seaman		5739 W 74th St	90045	310 645 4063		
Stan Rosen		8004 Kentwood LA	90045	3102161677		SRosen6@aol.com
Ruth Ison		1135 W 95th St	90044	323-779-4637		
DIANA PROVOST		609 Kew	90302	3106797294		CITYLIGHTS@
Michael DiVirgilio		660 2nd St. A Hermosa Beach	90254	310 940-1163		mdivirg.lis@mwdh.com
SUSAN GEE-WILSON		4322 Via Marina No. D M.D.R.	90292	310. 822-3793		EMWGP@EARTHLINK.NET
Tony Czuleger		1730 Ruston Ln. F Redondo Beach CA.	90278	310-213-8669		Tonyespoke@MSN.com
GRACE HUTTI		8732 EL MANOR AV LA CA 90045		(310) 649-4273		
Mustapha Jannah		STAR Alliance PO 91094 LA 90009	90009	310 486-1981		Mustapha.jannah@staralliance.com
Himelda Reynoso		848 W Hardy St CA Inglewood 90301				

LAX Specific Plan Amendment Study
Community Meeting
April 22, 2006

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
MICHAEL SWANSON	CENTINELA FREEMAN HEALTH SYSTEM	555 E. HARDY ST INGLEWOOD	90301	310-330-8437	310-419-8397	MICHAEL.SWANSON@CENTINELA FREEMAN.EDU
EMMA SCHAFER		4201 Summertime Lane Culver	90232			
Jeannette Martini		945 Pepper #7314 El Segundo 90245		310/322-2935	—	—
Diana Orozco	Interpreter	Elaine Lazar Assoc				
Linda Orozco	Interpreter	Elaine Lazar & Assoc.				
Barbara Muscella	Pres. Westchester Streetscape	6283 W 80th St	90045	310-649-0374		
Natalie Stern	PATH Ventures	340 N. Madison Ave.	90004	323 644-2225	323 644-2223	natalie@pathventures.org
Sonia Ramirez		4111/2 Arbor Vitae	90301	310 904-9855		
Armando Lara		346 W Hardy st	90301	910 5821		
Antonio Parra		11406 Cedar Ave	90250	341 51 15		

LAX Specific Plan Amendment Study
Community Meeting
April 22, 2006

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
N.S. RUBENSTEIN	LAX ADVISORY COMMITTEE					
Pat Nordlund		660 W. Imperial Ave #3 El Segundo 90245		310/322-6798		NORDLUCA@AOL.COM
Jack Kenton	LAXAAC/ES	535 Dune St E. Seg		322-8098		
Cindy Sugimoto		2111 Marshall Field LN B Redondo Beach CA 90278		846-1764		Sugimoto@LeeEllis.com
Kulsum FAROOQUI		9627 Hasgow Pl				
GRANT FRANCIS		6716 W 87 ST LA 90045		310 216-9365		
Jerry Ramirez	LA County	500 W. Temple LA 90012		213 974-4282		
JOE LYONS	DES	501 Francisco St Torrance		310 782 6217		

LAX Specific Plan Amendment Study
Community Meeting
April 22, 2006

Los Angeles World Airports

ELECTED OFFICIALS & STAFF

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Edgar Saenz,	Rep. Waters,	6033 W. 85th St LA	90045	310-642-4610		
Val Velasco	BOAC					
Susa Bahadori	Mayor	200 N Spring St.	90012	(213) 473-8020		

Los Angeles World Airports

LAX Specific Plan Amendment Study
Wednesday, May 17, 2006

Welcome . . .

Los Angeles World Airports (LAWA) is pleased to welcome you to the community-based planning process for the LAX Specific Plan Amendment Study. The purpose of today s meeting is to provide LAWA an opportunity to respond to some of the questions raised during the public meetings held in March and April.

To assist with today s discussion, LAWA staff will present information on:

- Aircraft operations and flight patterns
- Noise contours
- Noise mitigation efforts
- Part 161 Study
- Residential Soundproofing Program

Following each presentation, the public will have an opportunity to ask questions and provide comments.

Agenda

- **6:00 p.m. Sign-In/Welcome**
- **6:15 p.m. Presentations with Questions and Answer Sessions**
- **8:45 p.m. Next Steps in the Process**
- **9:00 p.m. Adjournment**

Thank you for attending.

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LAX Specific Plan Amendment Study
Public Outreach Meetings
May 17 and 20, 2006

Attention Airport Neighbors

Los Angeles World Airports (LAWA) is pleased to host a third set of public outreach meetings as part of the LAX Specific Plan Amendment Study. LAWA received a great deal of constructive ideas from the public meetings held in March and April. The May meetings will provide LAWA an opportunity to respond to some of the questions raised during the previous outreach meetings and present information on:

Aircraft operations and flight patterns
Noise contour
Noise mitigation efforts
Residential Soundproofing Program

When: ***Wednesday, May 17, 2006 from 6:00 p.m. to 9:00 p.m.***
Saturday, May 20, 2006 from 9:00 a.m. to 12:00 p.m.
For public convenience, two meetings have been scheduled. Attendance is not necessary at both meetings as the same material will be presented.

Where: Flight Path Learning Center, Imperial Terminal, 6661 West Imperial Highway, Los Angeles, CA 90045
Free parking is available on site.

For more information on the outreach meetings and the LAX Specific Plan Amendment Study, please contact Los Angeles World Airports at (800) 919-3766 or visit our website at www.laxmasterplan.org.

LAX Specific Pla.. Amendment Study
Community Meeting
May 17, 2006
GENERAL PUBLIC

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Hakim Mendez		9127 S. 3rd Ave.	90305	(323)418-7791		hamendezh@yah
Susana Franco Rogan	L.A. County Dept. Regional Planning	320 W. Temple St L.A. 90012	90012	213 -974-6425		sfranco-rogan@planning.co.la.ca.us
Nova Lee Owens	The Real Estate Consulte	8956 Vicksburg Ave.	90045	810 2167861		novaleeowens@hotmail.com
Sonia Ramirez		411 1/2 Arbutus Ingle	90301	310 901-475		
Gordon Mego	None	4535 W. 114 1st St Hawthorne, Calif.	90250 -6927	(310) 675 -8674		

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LAX Specific Pla.. Amendment Study
Community Meeting
May 17, 2006
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Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
JONATHAN MALRIGHT		P.O. BOX 5521	90310			
MARSHA Wilkes		8712 Gramercy Pl	90047	323-758-1710		MAWilkes@AOL.com
JAMES HARRIS		8755 Vermont	90047	7509087		SOUTHWESTNOC@AOL.COM
Diane Sambrano		3640 W. 111th Pl	90303	310 671-4410		
Donna Cone		8219 Reading Ave	90043	310 641-2503		dcone@stjosephctr.org

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LAX Specific Pla_ Amendment Study
Community Meeting
May 17, 2006
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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
GENE SMITH		700 W. ARBOR VITAE	90301	310 673-0776	310 673-0777	BANAPEST@AOL.COM
Judy Bowles		1117 S. Truro Ave Inglewood	90301	3106226544		
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Greg Gerard		355 Kelso/Market Inglewood	90302	310-674-1872		—
Oscar Brito	—	3634 W. 107th Street 90303 INGLEWOOD CA.	90303	(310) 672-1322	—	—
Himelda Reyposo		886 W Hardy St Inglewood CA 90301	90301	(310) 674-5087		

9

LAX Specific Pla_ Amendment Study
Community Meeting
May 17, 2006
GENERAL PUBLIC

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Holden Fred + Jeannette		10524 S. St. Andrews P.A. CA.	90047	323 755-0757		
William Hernon		8816 S. Wilton Pl LA 90047	90047	323 751-7219		
DON BARSUMIAN		5811 W. 77th Pl.	90045	(310) 641-5418		
ALVIN PARMER		641 W. 103 ST LA CA. 90044	90044	323 7558971		
John Bowman		407 Exton #4 Inglewood CA	90302	—	—	—
Brian Gibson		424 Oregon St.	90245	(310) 322-8958		
Joanne Puleo Richard Puleo		419 Concord St	90245	310 322-5150		
Ramon Uriarte	City of Inglewood			310 412-5289		
Christie Dixon	CD-8	8475 S. Vermont Ave	90044	213 485-7614		

9

LAX Specific Pla. Amendment Study
Community Meeting
May 17, 2006
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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
c/o Leslie Hollis	Hollis Properties	11139 Hesketh Ave Inglewood.	90303	3237724833		
Linda Orozco	E. Lazar e Associates					
Thelma Sam E. Clifton	1535 W. 96th St. LA. CA.		90047			
Ricky Hill	64th Ave Black Wall	9609 64th AVE ING	90305	323 757882		MASTERRICKY@COMCAST.NET
O.V. Matisse	UCLA-Senate Staff	648 W 103rd St	90044	310-825-7842		omatisse@ucla.edu x ucla.edu
Lynda Schram		7540 W 91st St	90045			
ARR AVAIL		731 W. PINE AVE	90245	322-0988		
Pam Ford	resident	7534 W 91st St	90045	337-7191		pameladford@comcast.net
Catherine Reyrama	resident	8515 Falmouth Ave #320, PDR, CA 90293	90293	821-9575		kayreyrama@aol.com

Remove Kenneth J from this contact.

email/ new website to SLO Reg page AC

LAX Specific Pla. Amendment Study
Community Meeting
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Jane Sullivan		7848 STEWART	90045			
BENWIE THOMAS		8812 S. HAAS L.A. 90047	90047	323 971 5098	(323) 750 6801	
NORA McKenzie		2717 Thoreau St Inglewood, CA	90303	309 755-4761		
Gretchen Hardison	City of LA	200 N. Spring #2005 LA, CA	90012	213 978-0852		gretchen.hardison@lacity.org
Armando Lara			90301	(310) 674-5097		
Steven Brandon	City of LA					

7

LAX Specific Pla. Amendment Study
Community Meeting
May 17, 2006
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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
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Evelyn Hallman		1133 W 77TH ST	90044	323 759-0204		
Berny Motta	CD8	8475 S. Vermont Ave	90044	213 485-7616		
MaryAnn Graham		8203 Kittyhawk Ave	90045	(310) 780-2496		
Roger Jones		11906 Cedar Ave.	90250	(310) 686-6247		

5

LAX Specific Pla. Amendment Study
Community Meeting
May 20, 2006
GENERAL PUBLIC

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Ruby Smith		8706 S. Wilton Pl LA CA	90047	323 7525702		
Pat Norlund		600 W. Imperial Hwy #3 El Segundo	90245	310 322-6798		
Victoria Hernandez		20000 99TH ST LA. CA.	90003	323 820-9534		
Joyce H. Jacquet		9431 So. Tobert Blvd	90047	323 418-7996		
Jonathan Wolfrey		P.O. Box 552				
Andy & Nan Lazzaretto	County of Los Angeles	INGLEWOOD, CA 90310				
Alan Hoffenauer	LMU	1 LMU Drive LA.	90045	310-338-3798		
		8065 Nardian Way LA 90045		Request for map of proposed land use.		

8

LAX Specific Pla. Amendment Study
Community Meeting
May 20, 2006
GENERAL PUBLIC

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
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EILEEN CROWLEY		8943 KITTYHAWK	90045	641-1173		
OLA DOWD		1518 W. 96th St	90047	323 777 9338		
JERRY COBOLA		409 N. PCH #440 REDONDO BEACH CA	90277	702-0391		
Rowena Cole		8409 Lincoln Westchester	90045	502-9991		
ELEANOR ANDERSON		8706 S. WILTON PL LA CA	90047	(323) 752-5702		
Reginald Rodney		200 W. 99TH ST.	90003	(323) 820-9534		

7

LAX Specific Pla. Amendment Study
Community Meeting
May 20, 2006
GENERAL PUBLIC
Los Angeles World Airports
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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
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F WHEELER		11110 ARTATH AVE	90303	323 779-5480		
HERMAN Thompson		11 PEPPER CT, INGLEWOOD	90302	310 673-9640		HPTCTT@Aol.com
ORTIS DOWD		1518 W 96th ST.	90047	323 820-9495		
Pamela McClain		1529 W. 96TH ST	90047	323 755-3310		
Diana Ortega		Interpreter				
Linda Ortega		Interpreter				
Wanda Johnson						
RICHARD MATTHEWS		5936 W. 78TH ST	90045	310 645-1070		Yahoo.com richmatthews2@
SHIRLEY GEE-WILSON		4322 VIA MARINA, #D M.D.R.	90292	310-822-3793		EMH/99@ EARTHLINK. NET

10

Los Angeles World Airports

LAX Specific Plan Amendment Study
South Airfield Improvement Project (SAIP)
Tuesday, July 25, 2006

Welcome . . .

Los Angeles World Airports (LAWA) is pleased to welcome you to the first of three meetings regarding the reconstruction of Runway 25L in the south airfield complex at Los Angeles International Airport.

To assist with today's discussion; LAWA staff will present information on:

- SAIP Construction Schedule
- Aircraft Operations
- Noise Monitoring
- Mitigation Measures

Following each presentation, the public will have an opportunity to ask questions and provide comments.

Agenda

- **6:00 p.m. – Sign-In/Welcome**
- **6:15 p.m. – Presentation, Questions and Public Comments**
- **9:00 p.m. – Adjournment**

Contact telephone numbers:

- Aircraft Noise (310) 646-9410 or (310) 646-6473
- SAIP Construction Noise (866) 758-5292
- SAIP Construction Traffic (310) 417-2311
- SAIP Dust Control (310) 491-3100

Thank you for attending.

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

Los Angeles World Airports

LAX MASTER PLAN SPECIFIC PLAN AMENDMENT STUDY

COMMUNITY MEETINGS

Los Angeles World Airports (LAWA) – LAX was gratified to see the turnout and input given at the meetings held in March, April and May 2006. LAWA is continuing to solicit public input for developing the LAX Master Plan Specific Plan Amendment Study. As we continue together, we look forward to hearing from you once again. LAWA will host a fourth set of public meetings to hear your views on how to modernize LAX while reestablishing a good relationship with our neighbors. The next set of meetings will be held on the following dates:

These meetings are a follow up to the April meetings. Members of the public will be presented with some improvement concepts based upon the public's input regarding vehicular and public transit access to the airport.

When: **Wednesday, July 19, 2006 from 6:00 p.m. to 9:00 p.m. or**
Saturday, July 22, 2006 from 9:00 a.m. to 12:00 noon
For public convenience, two meetings have been scheduled. Attendance is not necessary at both meetings as the same material will be presented.

Where: **Flight Path Learning Center, Imperial Terminal, 6661 West Imperial Highway, LA 90045**
Free parking is available on site.

For more information on the outreach meetings and the LAX Specific Plan Amendment Study, please contact Los Angeles World Airports at (800) 919-3766 or visit our website at http://www.laxmasterplan.org/publicMeetings.cfm? under the LAX Master Plan Stipulated Settlement.

LAX Specific Plan Amendment – South Airfield Improvement Project (SAIP)
Community Meeting
July 25, 2006
Public

Los Angeles World Airports

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Name	Organization	Street/City	ZIP Code	Phone	Fax	E-Mail
HARRY ROSE	WNA	8160 REDLANDS #102	90293	213 341-1652		HLROSE@MINDSPRING.COM
Sparky Carpio		407 Exton Ave #4	90302	(310)671-2315		
LEON TARR		406 E. SYCAMORE	90245	310-640-8181		latarr@FLASH.NET
Cecil Carpio						
Sam Emmersen	The Better World Group	150 East Olive Ave., #211 Burbank	91502	(818) 563-9111	(818) 563-4943	sam@betterworldgroup.com
Dalila Perez-Arevedo		626 Wilshire Blvd Suite 1000	90017			
MARY JONES	HERTZ CORP	9000 AIRPORT BLVD LA ~~CA~~	90045	~~310~~ 568 3450		myejones@HERTZ.COM
Michael D. Virgilio	MWW Group	660 S. Figueroa, Suite 1400 LA	90017	213-486-6580		mdivirgilio@mww.com
Jeff Stewart	City of El Seg.	350 Main Street	90245	524-2301		
Roy Embry		512 W. Walnut	90245	64-8839		

LAX Specific Plan Amendment – South Airfield Improvement Project (SAIP)
Community Meeting
July 25, 2006
Public

Los Angeles World Airports

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Name	Organization	Street/City	ZIP Code	Phone	Fax	E-Mail
B Campbell + N. Campbell		41 Bartlett St	90245			
Kevin GROBER		STEVER ST. / CULVER CITY	90230	562.925.3366 (WK)		KevinGrober@AOL.com
Bill Fisher						Bill@FisherEngineering.com
Bennic Liedtke		501 Richmond St. El Seg.	90245	310414.1115		BLiedtke@talentworksLA.com
Sharon Talley		808 Eucalyptus El Seg	90245	310 336-1727		Sharon.J.Talley@aero.org
JOHN KOPPELMAN	DEL AIRE NEIGHBORHOOD ASSOC	5508 W. 118TH PL DEL AIRE CA	90304	310 643-6800		JOHNKOPPELMAN@AOL.COM
Vince Hourigan						
HENRY J. DE BARD ERNA T. DE BARD		MARINA DEL REY	90292			
AL Gold						
MARY BUENO		315 W. MANCHESTER BLVD INGLEWOOD	90301	310 677-4363		

LAX Specific Plan Amendment – South Airfield Improvement Project (SAIP)
Community Meeting
July 25, 2006
Public

Los Angeles World Airports

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Name	Organization	Street/City	ZIP Code	Phone	Fax	E-Mail
Robinson, D		340 Hillcrest ST ES	90245	3227979	3	
Jose Gutierrez						City
Teresa/Matt Boor		220 W Acacia Ave	90245	640 7011		
Kathryn Frengs	Councilman Rosendahl	7166 W Manchester 90045		508 8772		
Jim Aldinger	councilman City of MB	1400 Highland Ave	90266	8025053		jaldinger@ci.mb.ca.us
Mary Elizabeth Booth	S.M. Airport Association	1019 Ozone Ave. S.M.	90405	(310)399-0700	none	none
JOHN CORMICK	BEL-AIR NEIGHBORHOOD	5248 W 113TH ST	90304	3105526243		
Denny Zane	Urban Democrats	2943 Dilloway, SM	90404	310-570-5810		dennyzane@aol.com
Eddie and Virginia Tompson		2038 W. 104 ST Los Angeles	90047	3237773621		
LITA RAXSTRESSER		9711 ISIS AVE #211	90045	310/676-7755	310/676-7795	littlestinker@juno.com

LAX Specific Plan Amendment – South Airfield Improvement Project (SAIP)
Community Meeting
July 25, 2006
Public

Los Angeles World Airports

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Emma Schafer	Shafer Communications					
Roger Sowell	SAIP & Lea Andrews Group					
Mustapha Jarmeh	Star Alliance - LAX					
Harry & Bernice Whitcomb		732 Hillcrest St, El Segundo	90245			

LAX Specific Plan Amendment – South Airfield Improvement Project (SAIP)
Community Meeting
July 25, 2006
Public

Los Angeles World Airports

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Name	Organization	Street/City	ZIP Code	Phone	Fax	E-Mail
Tom & Susan Callanan		201 E. Walnut ES	90245	322-8238		
JERRY GOMEZ	Traveler's Aid LAX	P.O. Box 1531 Fullerton, CA	92836			jlaxusa @ yahoo.com

Los Angeles World Airports

Meeting Title: LAX Specific Plan Amendment Study - South Airfield Improvement Project Public Meeting **Meeting Date:** July 25, 2006

	Initials	Name		Agency	Title	Address		City	Zip	Phone	E-mail Address
1		Asher	Grieg	City of Los Angeles, Council District 11	Planning Deputy	200 N. Spring Street	Room 415	Los Angeles	90012		Grieg.asher@lacity.org
2		Bahadori	Sasa	City of Los Angeles		200 N. Spring Street		Los Angeles	90012	(213) 978-0641	sasa.bahadori@lacity.org
3		Bauer	Sandra	Bauer Planning & Environmental Services, Inc.	Principal	220 Commerce	Suite 200	Irvine	92602	(714) 508-2522	sandra@BPESINC.com
4	✓	Bickhart	Jim	City of Los Angeles	Associate Director, Transportation	200 N. Spring Street	Room 303	Los Angeles	90012	(213) 978-0641	jim.bickhart@lacity.org
5		Bonin	Mike	City of Los Angeles, Council District 11	Chief of Staff	200 N. Spring Street	Room 415	Los Angeles	90012	(213) 473-7011	mike.bonin@lacity.org
6		Brady	John	City of Los Angeles, Office of the Mayor	Area Representative, Neighborhood & Community Services	7166 W. Manchester Avenue		Westchester	90045	(310) 410-1749	john.s.brady@lacity.org
7		Brown	Darryl	City of Inglewood	Chief of Staff to the Mayor	One Manchester Boulevard	P.O. Box 6500	Inglewood	90301	(310) 412-5300	dbrown@cityofinglewood.org
8		Carrel	Marc	Office of Representative Jane Harman, CA-36	Deputy Chief of Staff					(310) 643-5445 or DC Ph: (202) 225-8220	marc.carrel@mail.house.gov
9	✓	Cortez	Annette	LAX Stakeholder Liaison Office	Outreach Coordinator	One World Way		Los Angeles	90045	(213) 321-8573	acortez@lawa.org
10		De la Vega	Jaime	City of Los Angeles	Deputy Mayor, Transportation	200 N. Spring Street	Room 303	Los Angeles	90012	(213) 978-2360	jaime.delavega@lacity.org
11		Dorn	Roosevelt F.	City of Inglewood	Mayor	One Manchester Boulevard	P.O. Box 6500	Inglewood	90301	(310) 412-5300	MayorDorn@cityofinglewood.org
12	✓	Doucette	Michael	Los Angeles World Airports	Chief of Airport Planning II	One World Way		Los Angeles	90045	(310) 417-2344	mdoucette2@lawa.org
13		Faughnan	Thomas	County of Los Angeles	Principal Deputy County Counsel	500 West Temple Street		Los Angeles	90012	(213) 974-1810	tfaughnan@counsel.co.la.ca.us
14		Gertler	Julie	Consensus Planning Group	President	626 Wilshire Boulevard	Suite 1000	Los Angeles	90017	(213) 438-1755	jgertler@consensusp.com
15		Gertler	Joshua	Consensus Planning Group	Senior Vice President	626 Wilshire Boulevard	Suite 1000	Los Angeles	90017	(213) 438-1755	joshgertler@consensusp.com
16		Glasgow	Herb	Los Angeles World Airports	Senior City Planner	One World Way		Los Angeles	90045	(310) 646-7690	hglasgow@lawa.org
17		Hackney	Janet	Los Angeles World Airports	Sr. Management Analyst II	One World Way				(310) 417-2343	jhackney@lawa.org
18		Hall, Jr.	Carlyle	Akin Gump Strauss Hauer & Feld LLP		2029 Century Park East	Suite 2400	Los Angeles	90067	(310) 728-3242	cwhall@akingump.com
19		Herbst	David	MWW Group	Senior Vice President/General Manager	660 South Figueroa Street	Suite 1400	Los Angeles	90017	(213) 486-6560 x314	dherbst@mww.com
20		Hoffman	Ellen	Los Angeles World Airports	Management Assistant	One World Way		Los Angeles	90045	(310) 646-7690	ehoffman@lawa.org
21		Ijams	Robin	Camp Dresser & McKee Inc.	Principal	18581 Teller Avenue	Suite 200	Irvine	92612	(949) 752-5452	rijamsre@cdm.com
22	✓	Jacobson	Carl	City of El Segundo		350 Main Street		El Segundo	90245	(310) 524-2302	cjacobson @elsegundo.org
23		Johnson	Nick	Johnson Aviation		6524 Deerbrook Road		Oak Park	91377	(818) 606-3560	njohnson@lawa.org
24		Kennard	Lydia	Los Angeles World Airports	Executive Director	One World Way		Los Angeles	90045	(310) 646-6250	lkennard@lawa.org
25		Kurtz	Barry	City of Culver City	Consulting Traffic Engineer	16903 Avenue de Santa		Pacific Pallicades	90272	(310) 293-5625	bkurtztraffic@verizon.net
26		Lazzaretto	Andrew	A.C. Lazzaretto & Associates	Consulting	P.O. Box 3073		Burbank	91504	(818) 569-4526	andy@aclazz.com
27		Lichman	Barbara	Chevalier, Allen & Lichman LLP	Attorney at Law	695 Town Center	Suite 700	Costa Mesa	92626	(714) 384-6520	blichman@calairlaw.com
28		Martinoff	Barbara	Los Angeles World Airports	Chief Management Analyst	One World Way		Los Angeles	90045	(310) 646-7312	bmartinoff@lawa.org
29		McCarthy	David	City of Culver City	Deputy City Attorney	9770 Culver Boulevard	P.O. Box 507	Culver City	90232	(310) 253-5660	david.mccarthy@culvercity.org
30	✓	McDowell	Kelly	City of El Segundo	Mayor	350 Main Street		El Segundo	90245	(310) 640-8966	kmcdowell@elsegundo.org

Revised:June 22, 2006

Meeting Title: LAX Specific Plan Amendment Study - South Airfield Improvement Project Public Meeting

Meeting Date: July 25, 2006

	Initials	Name		Agency	Title	Address		City	Zip	Phone	E-mail Address
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32		Mengistu	Samson	Los Angeles World Airports	Deputy Executive Director, Chief of Staff	One World Way		Los Angeles	90045	(310) 215-7662	smengistu@lawa.org
33		Molnar	Chad	Office of Representative Jane Harman, CA-36	District Director	2321 E. Rosecrans Ave		El Segundo	90245	(310) 643-3636	chad.molnar@mail.house.gov
34		Moses	Eric	Consensus Planning Group	Director	626 Wilshire Boulevard	Suite 1000	Los Angeles	90017	(213) 438-1755	emoses@consensusp.com
35		Napolitano	Steven	County of Los Angeles, Torrance Field Office	Deputy	825 Maple Avenue	Room 150	Torrance	90503	(310) 222-3015	Snapolitano@lacbos.org
36		Olson	Dennis	LAX Airlines Airport Affairs Committee	Managing Director	8939 S. Sepulveda	Room 102	Los Angeles	90045	(866) 393-6717	olson1de@aol.com
37		Oelz	andrew	Akin Gump Strauss Hauer & Feld LLP	Attorney at Law	2029 Century Park East	24th Floor	Los Angeles	90067	(310) 728-3362	aoelz@akingump.com
38		Perez-Acevado	Dalila	Consensus Planning Group	Project Manager	626 Whilshire Boulevard		Los Angeles	90017	(213) 438-1755	dperezacevedo@consensusp.com
39		Quintanilla	Evelyn	Los Angeles World Airports	City Planner	One World Way		Los Angeles	90045	(310) 646-7690	equintanilla@lawa.org
40		Ramirez	Jerry	Los Angeles County CAO	Senior Analyst	500 W. Temple	Suite 750	Los Angeles	90012	(213) 974-4282	jramirez@cao.co.la.ca.us
41		Remington	Victoria	Los Angeles World Airports	Sr. Clerk Typist	One World Way		Los Angeles	90045	(310) 646-7690	vremington@lawa.org
42		Ritchie	Jim	Los Angeles World Airports	Deputy Executive Director	One World Way		Los Angeles	90045	(310) 417-2342	jritchie@lawa.org
43	✓	Saenz	Edgar	Office of Congresswoman Maxine Waters		6033 W. Century Blvd	Suite 807	Los Angeles	90045	(310) 753-1668 or 642-4610	edgar.saenz@mail.house.gov
44		Schneider	Denny	Alliance for a Regional Solution to Airport Congestion		7929 Breen Avenue		Los Angeles	90045	(310) 641-4199	DennySchneider@WeLiveFree.com
45		Schneider	Nan	Alliance for a Regional Solution to Airport Congestion		7929 Breen Avenue		Los Angeles	90045	(310) 641-4199	nanschneider@welivefree.com
46		Shute	E. Clement	Shute, Mihaly & Weinberger LLP	Counsel	396 Hayes Street		San Francisco	94102	(415) 552-7272 or (415) 225-1018	shute@smwlaw.com
47	✓	Skidmore	Tony	Camp Dresser & McKee Inc.		18581 Teller Avenue	Suite 200	Irvine	92612	(949) 752-5452	skidmoreaj@cdm.com
48		Tate	Phillip	City of Los Angeles, Council District 11	Legislative Deputy	200 N. Spring Street	Room 415	Los Angeles	90012	(213) 473-7011	phillip.tate@lacity.org
49		Tomcheck	Patrick	Los Angeles World Airports	Sr. Transportation Engineer	One World Way		Los Angeles	90045	(310) 646-3298	ptomcheck@lawa.org
50		Tracy	Suzanne	City of Los Angeles, Office of the City Attorney	Deputy City Attorney	One World Way		Los Angeles	90045	(310) 646-8497	stracy@lawa.org
51		Tubert	Patricia	Los Angeles World Airports	Deputy Executive Director	One World Way		Los Angeles	90045	(310) 646-7142 x 6726	ptubert@lawa.org
52	✓	Velasco	Valeria	Los Angeles World Airports	Vice President, Board of Airport Commissioners	One World Way		Los Angeles	90045	(310) 821-7890	vvelasco@aol.com
53		Villaraigosa	Antonio	City of Los Angeles	Mayor	200 N. Spring Street	3rd Floor	Los Angeles	90012	(213) 978-0600	villaraigosa@mayor.lacity.org
54		Vitale	Ross	Los Angeles World Airports	Management Analyst II	One World Way		Los Angeles	90045	(310) 646-9107	rvitale@lawa.org
55		Waterhouse	William	City of Los Angeles	City Attorney	One World Way		Los Angeles	90045	(310) 646-3260	Wwaterhouse@lawa.org
56		Wells	Richard	Los Angeles World Airports	Chief of Airport Planning II	One World Way	Room 208	Los Angeles	90045	(310) 646-7116	rwells@lawa.org
57		Willis	Anita	City of Inglewood	City Attorney	One Manchester Boulevard	P.O. Box 6500	Inglewood	90301	(310) 412-5372	awillis@cityofinglewood.org
58		Wolff	Osa	Shute, Mihaly & Weinberger LLP		396 Hayes Street		San Francisco	94102	(415) 552-7272	wolff@smwlaw.com
59		Wong	Joyce	Akin Gump Strauss Hauer & Feld LLP		2029 Century Park East	Suite 2400	Los Angeles	90067	(310) 728-3241	jwong@akingump.com
60		Zimmerman	Martin	Los Angeles County CAO	Chief Administrative Officer	500 West Temple Street		Los Angeles	90012	(213) 974-1326	mzimmerman@cao.co.la.ca.us
61											
62											
63											
64											

Revised June 22, 2006

Los Angeles World Airports

LAX Specific Plan Amendment Study
August 23, 2006

Welcome . . .

Los Angeles World Airports is pleased to welcome you to the community-based planning process for the LAX Specific Plan Amendment Study. The purpose of tonight's meeting is to solicit feedback on preliminary concepts developed in response to public and LAX Specific Plan Advisory Committee input from previous outreach meetings.

To assist with tonight's discussion, LAWA staff will:

- Provide background information on the public planning process
- Report on regional planning efforts
- Review LAWA's progress on Stipulated Settlement commitments
- Present preliminary access concepts

Immediately following staff's presentation, small groups will be formed to provide participants an opportunity to ask questions and discuss the preliminary concepts. The small groups will then report back to the general assembly.

Tonight's Agenda

- **6:00 p.m. – Sign-In/Welcome**
- **6:15 p.m. – Presentation**
- **7:00 p.m. – Working Group Sessions**
- **8:00 p.m. – Working Group Summaries & General Discussion**
- **8:45 p.m. – Next Steps in the Process**
- **9:00 p.m. – Adjournment**

Thank you for attending.

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

Los Angeles World Airports

LAX Specific Plan Amendment Study
Public Outreach Meetings
August 23 and 26, 2006

Los Angeles World Airports (LAWA) is pleased to announce a fifth set of meetings in the community-based planning process for the modernization of LAX. The focus will be to discuss preliminary concepts developed based upon public input received at the outreach meetings held in March, April, May and July.

LAWA welcomes the public to attend the next set of meetings to be held as follows:

When: **Wednesday, August 23, 2006 from 6:00 p.m. to 9:00 p.m. OR**
Saturday, August 26, 2006 from 9:00 a.m. to 12:00 noon

For public convenience, two meetings have been scheduled. Attendance is not necessary at both meetings as the same material will be presented.

Where: **Flight Path Learning Center, Imperial Terminal**
6661 West Imperial Highway, Los Angeles, CA 90045
Free parking is available on site.

For more information on the outreach meetings and the LAX Specific Plan Amendment Study, please contact Los Angeles World Airports at (800) 919-3766 or visit our website at http//www.laxmasterplan.org/publicMeetings.cfm?

Los Angeles World Airports

LAX Specific Plan Amendment Study
August 23 & 26, 2006

Concept Development Goals - Access

1. Create direct freeway access to the LAX terminal curbs.
2. Reduce congestion on airport access roads.
3. Increase points of access to and from the CTA.
4. Establish a direct transit connection to the LAX terminals.
5. Increase security on LAX terminal access roads.
6. Reduce air quality impacts caused by traffic congestion in and around LAX.
7. Increase capacity on airport access roads.
8. Reduce congestion on CTA curb fronts.

Los Angeles World Airports

LAX Specific Plan Amendment Study
August 26, 2006

Welcome . . .

Los Angeles World Airports is pleased to welcome you to the community-based planning process for the LAX Specific Plan Amendment Study. The purpose of this meeting is to solicit feedback on preliminary concepts developed in response to public and LAX Specific Plan Advisory Committee input from previous outreach meetings.

To assist with today's discussion, LAWA staff will:

- Provide background information on the public planning process
- Report on regional planning efforts
- Review LAWA's progress on Stipulated Settlement commitments
- Present preliminary access concepts

Immediately following staff's presentation, small groups will be formed to provide participants an opportunity to ask questions and discuss the preliminary concepts. The small groups will then report back to the general assembly.

Today's Agenda

- **9:00 a.m. – Sign-In/Welcome**
- **9:15 a.m. – Presentation**
- **10:00 a.m. – Working Group Sessions**
- **11:00 a.m. – Working Group Summaries & General Discussion**
- **11:45 a.m. – Next Steps in the Process**
- **12:00 p.m. – Adjournment**

Thank you for attending.

www.lawa.org

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LAX Specific Plan Amendment Study
Community Meeting
Wednesday, August 23, 2006
ELECTED OFFICIALS & STAFF

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Edgar Saenz	Rep Waters	-	-	310-642-4610		
Jim Bickhart	Mayor			2139780644		

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LAX Specific Plan Amendment Study
Community Meeting
Wednesday, August 23, 2006
MEDIA

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Ric Dyson +	KNBC			818 540 8444		
Sal Garcia	KMEX 34	5555 center pl L.A.		310 348-3495		
Jane Yamane	Fox 11			310 584 2053		
Susan Valot	KPCC Radio	Pasadena, CA		(714) 836-7559		svalot@kpcc.org
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Roger Templeton	Venice Paper.net	723 Ocean Front Walk	90291	310 581 5575		rogers@venicepaper.net
Steve Lowe	KFWB Radio					

LAX Specific Plan Amendment Study
Community Meeting
Wednesday, August 23, 2006
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Mark Marchetti	Resident "Home Owner"	7545 Whitlock Ave PDR	90293	(310) 745-2369		Markmarchetti at SBCglobal.Net

LAX Specific Plan Amendment Study
Community Meeting
Wednesday, August 23, 2006
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JOAN RUBIN	Concerned Residents	"	90064	(424)-2529		—
Andrew Stefanakis		7296 W 85th St LA 90045	90045	310 641-3372	Same as Phone	
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Roy B. RAY		10925 CHANERA AVE Inglwd 90303				

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Wednesday, August 23, 2006
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Wednesday, August 23, 2006
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Pat + Gaelan Middleton		7550 W. 87st. PDR	90293	310-215-1095		
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Elvin Lowe		7844 W. 80th St	90293	310-823-1101		
Diana Orozco		Interpreter.				

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Wednesday, August 23, 2006
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LANE, Carolyn		8909 Rayford Dr LA	90045	310-645-9046		

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WENDELL KLIEVER						
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[illegible]	[illegible]	7836 W. 80 ST	90293	—		[illegible]
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LAX Specific Plan Amendment Study
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LAX Specific Plan Amendment Study
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LAX Specific Plan Amendment Study
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MARSHA WILKES		8712 GRAMERCY PL	90047	323-758-1710		
Michael Simpson		POB 20854, Inglewood, CA	90308-0854	(310) 646-1525		
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Dan Cohen		530 Washington St.	90245	310 322-8007		
Theresa Torrance	resident	7909 W. 81st St.	90293	n/a		
Pam Rector		6470 W. 85th St.	90045	310-215-3192		
Joel Kirschenbaum	SII ~~LSD~~	IUSD	71361	909 3723999		

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Community Meeting
Wednesday, August 23, 2006
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LAX Specific Plan Amendment Study
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Wednesday, August 23, 2006
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Tim Barrett		257 REDLANDS ST PLAYA DEL REY	90293	310-821-1575		jtb@isi.edu

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Wednesday, August 23, 2006
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~~JEFF~~ RICHARDS		114 FOWLING ST PDR CA 90293	90293	310 396 7890		cerberus@aol.com
A.C. Lazzaretto	Co of Los Angeles	P.O. Box 3073	91504 ~~406~~	818/569-4526		

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Brian Weis	LAXEN	8836 Croydon Ave LA CA	90045	(310) 216-0973		bweis@dslextreme.com
Arlene Fisher		7030 Vista del Mar PDR	90293	310 578 5783		Shellie@q6.net

LAX Specific Plan Amendment Study
Community Meeting
Wednesday, August 23, 2006
GENERAL PUBLIC

Los Angeles World Airports

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SIGN – IN

NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
William Locher	Homeowner	7333 Trask Ave PDR	90293	310-822-4119	310-822-3790	Locher4fun@AOL.com
Dorraine Gilbert	"	241 Rees St. PDR	90293	315-821-9990		dorraine@954alumni.org
M Castagnasso	Homeowner	322 Culver Blvd #127 PDR CA	90293	31712-2594	—	—

Los Angeles World Airports

LAX Specific Plan Amendment Study
October 25, 2006

Welcome . . .

Los Angeles World Airports (LAWA) is pleased to welcome you to the sixth series of meetings in the community-based planning process for the LAX Specific Plan Amendment Study.

At the request of the office of Los Angeles Mayor Antonio Villaraigosa, Los Angeles Councilmember Bill Rosendahl, City of Inglewood Mayor Roosevelt Dorn, and City of El Segundo Mayor Kelly McDowell, the focus of the meeting will be airfield safety, an important and complicated issue. No planning concepts will be discussed.

Representatives from the Federal Aviation Administration will be available to provide information on runway incursions, tower operations, and airport safety concerns.

Agenda

- **6:00 p.m. – Sign-In/Welcome**
- **6:15 p.m. – Presentation**
- **7:15 p.m. – Public Questions**
- **8:45 p.m. – Next Steps**
- **9:00 p.m. – Adjournment**

Thank you for attending.

www.laxmasterplan.org

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

Los Angeles World Airports

LAX Specific Plan Amendment Study
Public Outreach Meetings
October 25 and 28, 2006

Los Angeles World Airport (LAWA) welcomes the public to attend the next meetings in the community-based planning process for the modernization of LAX. The focus of these meetings will be to discuss the North Airfield Preliminary Concepts. The concepts will be accessible on the LAX Master Plan website on October 17, 2006.

The next set of meetings to be held as follows:

When: **Wednesday, October 25, 2006 from 6:00 p.m. to 9:00 p.m. OR**
Saturday, October 28, 2006 from 9:00 a.m. to 12:00 noon

For public convenience, two meetings have been scheduled. Attendance is not necessary at both meetings as the same material will be presented.

Where: **Proud Bird Restaurant**
11022 Aviation Boulevard
Los Angeles, CA 90045
Free parking is available on site.

To view the North Airfield Preliminary Concepts, please visit our website at
http://www.laxmasterplan.org/publicMeetings.cfm?
For more information on the outreach meetings, please contact Los Angeles World Airports at (800) 919-3766.

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LAX Specific Plan Amendment Study
Community Meeting
Wednesday, October 25, 2006
ELECTED OFFICIALS & STAFF

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Edgar Saenz	Rep Waters	-	-	-		edgar.saenz@house.gov
Stephanie Molen	Rep. Ted Lieu	1700 East Walnut Ave # 601		El Segundo CA	90245	310) 615-3515 // 615-3520 Fax
Carl Jacobson	El Segundo					
John Brady	LA MAYOR'S OFF					
Phil Tate	Rosendahl					
Bill Rosendahl	CD11					
Gary Parsons	Hawthorne					Gary@GaryParsons.org
Gabriel Sermeno	Mayor Villaraigosa's Off	Housing and Econ Dep.		Mayoral Aide	200 N. Spring LA CA 90012 #303	gabriel.sermeno@lacity.org
(9) Jim Bickhart	"					jim.bickhart@lacbs.org

(2)

LAX Specific Plan Amendment Study
Community Meeting
Wednesday, October 25, 2006
MEDIA

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
James L Thompson	Citizens Radio Network	3475 Maplewood Ave	90066	(310) 397-3224	—	—
Helga Gendell	The Argonaut	5355 McConnell Ave L.A. 90	90066	310 822-1629 x105		helgagendell@argonaut.com
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LAX Specific Plan Amendment Study
Community Meeting
Wednesday, October 25, 2006
GENERAL PUBLIC

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Eric Glyn Davies	H.B. Drollinger Co	8929 S. Sepulveda Blvd #130 LA CA 90045	90045	(310) 417-8047	417-8029	Eric@HBDrollinger.com
*EUGENE ELLING	SELF	200 WATERVIEW ST PLAYA DEL REY, CA	90293	310-306-1237		
JOSH WUSSICK	SELF	2110 CLARK LN #1 REDONDO BEACH, 90278		(714)319-4602		captainwussick@hotmail.com
Edward FRANCE	Self	3509 West 78th Inglewood, CA	90305	323 759-4131		
David Maury	Self	5624 W. 78th St	90045	310 8221629	310 8224950	davidmaury@aol.com
Melvin + Ernestine Shaw	Self	3210 W. 83rd St	90305	(323) 758-6501		
*Lawrence Ramsey	Self	7517 Trask Ave	90293	310 380-6518		
DIANA HO	SELF	2422 WALNUT AVE VENICE, CA 90291	90291	310-344-1552	213-947-1039	DIANA.HO2@VERIZON.NET
Scott CARNI	"	7443 W. 81st ST LA 45				SCARNI50@HOTMAIL.COM
GEORGE FESTA	SELF	7323 Kentwood Ave 90045	90045	310-649-5959		GGFESTA@Hotmail.com

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LAX Specific Plan Amendment Study
Community Meeting
Wednesday, October 25, 2006
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Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
W. J. SKLIRA	WNA	7927 GLIDDEN AVE	90045	310 6454179	—	WM51952@AOL.com
HERMAN PASS		8117 TUSCANY PL	90293	310-8237440	310-8235455	HWPASS@AOL.COM
G.H. REYNOLDS		7001 W. 83rd ST.	90045	310-670-2885		
RITA REYNOLDS		7001 W. 83 ST	90045	310/670-2885		
Julie Hertz		8110 Manitoba St PDR CA #215	90293	310 574-4044		
walter Moore		10713 S. 8th Place Inglewood ca.	90303	323-755-0660	323 774-1305	hertie@ca.rr.com
Nora MacLellan		8324 Delgany Ave Playa del Rey	90293	310-301-7728		daynora@aol.com
Herb Child		7320 Ringside Ave Playa Del Ry, CA	90293	310-395-2111		HChild@accessHousing.org
Dori Child		7320 Ringside Ave Playa Del Ry	90293	"		"
Mark Johnston		4185 Van Buren St. Chino, CA.	91710	909-591-6691		Markrjo@adelphia.net

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LAX Specific Plan Amendment Study
Community Meeting
Wednesday, October 25, 2006
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Los Angeles World Airports

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SIGN – IN

NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Antje Frei		7335 W. 87th Pl. Westchester CA	90045	310-567-8451		Antje_frei@yahoo.com
Tania Winter		259 Manchester #202	90293	310 8270701		wwhizzie@aol.com
Robert Kailes	CPA CFP	6201 Ocean Front Walk #2 Playa del Rey	90293	(310)827-7470		bkailes@pacbell.net
Joe Callinan	self	8021 Alverstone Av L.A. CA	90045	(310) 670-4653		
ART GARCIA	APG COMMERCIAL	5875 Doubleday Culver City	90230	310-641-7335		APGCOMM.SBC.GLOBAL
KEN CARBON	SELF	4031 Will Rogers St LA	90045	310.641-4804		
JESUS LOPEZ	SELF	6151 W. CENTURY BLVD L.A.	90045	310-462-5756		
Renate Hild	Westchester Revitalization	7429 McConnell LA 90045		310-216-2707		renatohild@yahoo.com
John Hicks	LAX	M. Beach	90266	5452430		John.n.Hicks@verizon.net
TIMA HAKAMIAN		8039 CHASE	90045			

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LAX Specific Plan Amendment Study
Community Meeting
Wednesday, October 25, 2006
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Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Douglas Maclellan	The Maclellan Group, LLC	8324 Delgany Ave. P.D.R. 90293		310-301-7728		maclellangroup@cs.com
Harold Buchman		5777 W. Century Blvd LA, CA 90045	90045			harold@spiceinet.net
Edith Ramirez		6941 W 85th Pl.	90045			
Frank Sweeney		245 World Way N Los Angeles CA	90045			
[illegible]		(206 So. FIR Inglewood	90301			
Janice Bartmess		1206 So FIR Inglewood	90301			
TATIANA ORTIZ	METROMEDIA GRAPHICS	6151 W. CENTURY/EL CA 90045	90045	310 846 1755		tatiana@gomng.net
BRIAN COCHRAN	PEGASUS	36 NORTH CIVIC DRIVE #206 PALOS VERDES	90274	310 375-7600		bcochran@pegasus.perc
JOHN COSGROVE		7411 EARLDOM PLAYA DEL REY	90293	310 823-9448		JCOSGROVE@COMPUTER.ORG
[illegible]		5622 W. Manchester LA 90045				

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LAX Specific Plan Amendment Study
Community Meeting
Wednesday, October 25, 2006
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Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
William Buchanan	Self	7433 Kentwood Pl	90045	310-6456509		
Candy Aguirre	Self	8017 Campion Dr Westchester CA	90045	—		
DTG						
Bill West	SELF	8853 Dethridge Ave	90045	310 645-9623		
Bob Regran	Gibson 4 Congress	504 Center St. El Segundo	90245	312-322-8958		gibson@sbcglobal.net
Cynthia Lochhead	Self	7333 Trask Ave PDR CA 90293	90293	310/206-0428		Lochhead4fun@AOL.com
Philip Osgood		Playa del Rey, CA	90293	(310)823-9448		
Christina Davis	Westchester/LAX Chamber of Commerce	6151 W. Century LA 90045	90045	310 645-515)		

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LAX Specific Plan Amendment Study
Community Meeting
Wednesday, October 25, 2006
GENERAL PUBLIC

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
RICHARD HAURY	URS	Los Angeles CA				
28415 SMITH		1D102, 8 AVE	90293	310 8247850		2SMITH313@YAHOO.COM
KELLY S WILLIS	VENICE NEIGHBORHOOD COUNCIL	1631 SHELL AVE VENICE	90291	310-704-8061	—	willismgm@earthlink.net
Mike Arias	NCWPDR	6701 Center Drive West 14th Fl.	90045	310/670-600	310/670-1231	MARIAS@AOGLLP.com
~~David Voss~~	~~VCA~~					
(5) David Lyon	Westchester Watch Charles	5602 W. Manchester Ave Westchester, CA 90045	90045	(310) 641-0477		david_lyon@netzero.com

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LAX Specific Plan Amendment Study
Community Meeting
Wednesday, October 25, 2006
GENERAL PUBLIC

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
ONDRA Lewis	TAXPAYER	2509 West 85TH St Inglewood Calif	90305-1817	(323)9714420		

(1)

LAX Specific Plan Amendment Study
Community Meeting
Wednesday, October 25, 2006
~~MEDIA~~ staff sign-in

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Ellen Haffner	LAWA					
Evelyn Quintanilla	LAWA					
Antoinette Ferrara	CPG					
Andrea Campbell	CPG					
Josh Gertler	CPG					
Julie Gertler	CPG					
Eric Moses	CPG					
Eileen Schoteau	LAWA			2482573		
Robert Bell	CD 35					
[illegible] Boms	CD 35					

LAX Specific Plan Amendment Study
Community Meeting
Wednesday, October 25, 2006
~~MEDIA~~ Staff Sign-in

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
[illegible]	[illegible]					
CASEY CHUNG	LA 35					
[illegible]	LAWA					
JUAN LOPEZ	LAWA					
Vickie Remington	LAWA					
[illegible]	LAWA					
Nancy Castles	LAWA					
Pat tomcheck	LA WA					
Janet Hackney	LAWA					
Annette Cotter	URS					
Mike Doucette	LAWA					

LAX Specific Plan Amendment Study
Community Meeting
Wednesday, October 25, 2006
~~MEDIA~~ Staff. Sign-in.

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Barbara Martinez	LAWA					
Nick Johnson	johnsonaviation					
Jacqueline Graves	LAWA					

Advisory Committee Sign-in 10/25-3 ✓

Los Angeles World Airports

Public Meetings

Meeting Title: LAX Specific Plan Amendment Study Public Meetings - October 25th and 28th

Meeting Dates: October 25th or 28th, 2006

	Initials	Name		Agency	Title	Address		City	State	Zip	Phone	E-mail Address
1		Akef	Reza	Office of Representative Jane Harman, CA-36	Field Representative	2321 E. Rosecrans Ave	Suite 3270	El Segundo		90245	(310) 643-3636	Reza.Akef@mail.house.gov
2		Asher	Grieg	City of Los Angeles, Council District 11	Planning Deputy	200 N. Spring Street	Room 415	Los Angeles	CA	90012		Grieg.asher@lacity.org
3		Bahadori	Sasa	City of Los Angeles		200 N. Spring Street		Los Angeles	CA	90012	(213) 978-0641	sasa.bahadori@lacity.org
4		Bauer	Sandra	Bauer Planning & Environmental Services, Inc.	Principal	220 Commerce	Suite 200	Irvine	CA	92602	(714) 508-2522	sandra@BPESINC.com
5		Bickhart	Jim	City of Los Angeles	Associate Director, Transportation	200 N. Spring Street	Room 303	Los Angeles	CA	90012	(213) 978-0641	jim.bickhart@lacity.org
6		Bonin	Mike	City of Los Angeles, Council District 11	Chief of Staff	200 N. Spring Street	Room 415	Los Angeles	CA	90012	(213) 473-7011	mike.bonin@lacity.org
7		Brady	John	City of Los Angeles, Office of the Mayor	Area Representative, Neighborhood & Community Services	7166 W. Manchester Avenue		Westchester	CA	90045	(310) 410-1749	john.s.brady@lacity.org
8		Brown	Darryl	City of Inglewood	Chief of Staff to the Mayor	One Manchester Boulevard	P.O. Box 6500	Inglewood	CA	90301	(310) 412-5300	dbrown@cityofinglewood.org
9		Carrel	Marc	Office of Representative Jane Harman, CA-36	Deputy Chief of Staff						(310) 643-6445 or DC Ph: (202) 225-8220	marc.carrel@mail.house.gov
10		Chatten-Brown	Jan	Alliance for a Regional Solution to Airport Congestion	Attorney at Law	3250 Ocean Park Boulevard	Suite 300	Santa Monica		90405	(310) 314-8040	jcb@cbcearthlaw.com
11		Cortez	Annette	LAX Stakeholder Liaison Office	Outreach Coordinator	One World Way		Los Angeles	CA	90045	(213) 321-8573	acortez@lawa.org
12		De la Vega	Jaime	City of Los Angeles	Deputy Mayor, Transportation	200 N. Spring Street	Room 303	Los Angeles	CA	90012	(213) 978-2360	jaime.delavega@lacity.org
13		Dorn	Roosevelt F.	City of Inglewood	Mayor	One Manchester Boulevard	P.O. Box 6500	Inglewood	CA	90301	(310) 412-5300	MayorDorn@cityofinglewood.org
14		Doucette	Michael	Los Angeles World Airports	Chief of Airport Planning II	One World Way		Los Angeles	CA	90045	(310) 417-2344	mdoucette2@lawa.org
15		Faughnan	Thomas	County of Los Angeles	Principal Deputy County Counsel	500 West Temple Street		Los Angeles	CA	90012	(213) 974-1810	tfaughnan@counsel.co.la.ca.us
16		Gertler	Julie	Consensus Planning Group	President	626 Wilshire Boulevard	Suite 1000	Los Angeles	CA	90017	(213) 438-1755	jgertler@consensusp.com
17		Gertler	Joshua	Consensus Planning Group	Senior Vice President	626 Wilshire Boulevard	Suite 1000	Los Angeles	CA	90017	(213) 438-1755	joshgertler@consensusp.com
18		Glasgow	Herb	Los Angeles World Airports	Senior City Planner	One World Way		Los Angeles	CA	90045	(310) 646-7690	hglasgow@lawa.org
19		Hackney	Janet	Los Angeles World Airports	Sr. Management Analyst II	One World Way					(310) 417-2343	jhackney@lawa.org
20		Hall, Jr.	Carlyle	Akin Gump Strauss Hauer & Feld LLP		2029 Century Park East	Suite 2400	Los Angeles	CA	90067	(310) 728-3242	cwhall@akingump.com
21		Herbst	David	MWW Group	Senior Vice President/General Manager	660 South Figueroa Street	Suite 1400	Los Angeles	CA	90017	(213) 486-6560 x314	dherbst@mww.com
22		Hoffman	Ellen	Los Angeles World Airports	Management Assistant	One World Way		Los Angeles	CA	90045	(310) 646-7690	ehoffman@lawa.org

Revised:September 8, 2006

Meeting Title: LAX Specific Plan Amendment Study Public Meetings - October 25th and 28th

Meeting Dates: October 25th or 28th, 2006

	Initials	Name		Agency	Title	Address		City	State	Zip	Phone	E-mail Address
23		Ijams	Robin	Camp Dresser & McKee Inc.	Principal	18581 Teller Avenue	Suite 200	Irvine	CA	92612	(949) 752-5452	ijamsre@cdm.com
24		Jacobson	Carl	City of El Segundo	Council Member	350 Main Street		El Segundo	CA	90245	(310) 524-2302	cjacobson @elsegundo.org
25		Johnson	Nick	Johnson Aviation		6524 Deerbrook Road		Oak Park	CA	91377	(818) 606-3560	njohnson@lawa.org
26		Johnson	Roger	Los Angeles World Airports	Deputy Executive Director	On World Way		Los Angeles		90045		
27		Jonesco	AJ	LAX Stakeholder Liaison Office	Outreach Coordinator	One World Way		Los Angeles	CA	90045	(213) 321-8573	ajonesco@lawa.org
28		Kamman	Tom	Williams Aviation Consultants	Vice President, Operations	3140 Avenue Magora		Escondido		92029	(760) 738-9960	tskamman@aol.com
29		Kennard	Lydia	Los Angeles World Airports	Executive Director	One World Way		Los Angeles	CA	90045	(310) 646-6250	lkennard@lawa.org
30		Kurtz	Barry	City of Culver City	Consulting Traffic Engineer	16903 Avenue de Santa		Pacific Palicades	CA	90272	(310) 293-5625	bkurtztraffic@verizon.net
31		Lazzaretto	Andrew	A.C. Lazzaretto & Associates	Consulting	P.O. Box 3073		Burbank	CA	91504	(818) 569-4526	andy@aclazz.com
32		Lichman	Barbara	Chevalier, Allen & Lichman LLP	Attorney at Law	695 Town Center	Suite 700	Costa Mesa	CA	92626	(714) 384-6520	blichman@calairlaw.com
33		Martinoff	Barbara	Los Angeles World Airports	Chief Management Analyst	One World Way		Los Angeles	CA	90045	(310) 646-7312	bmartinoff@lawa.org
34		McCarthy	David	City of Culver City	Deputy City Attorney	9770 Culver Boulevard	P.O. Box 507	Culver City	CA	90232	(310) 253-5660	david.mccarthy@culvercity.org
35		McDowell	Kelly	City of El Segundo	Mayor	350 Main Street		El Segundo	CA	90245	(310) 640-8966	kmcdowell@elsegundo.org
36		McHargue	Paula	Los Angeles World Airports	Supervising Transportation Planner II	One World Way		Los Angeles	CA	90045	(310) 646-9181	pmchargue@lawa.org
37		Mengistu	Samson	Los Angeles World Airports	Deputy Executive Director, Chief of Staff	One World Way		Los Angeles	CA	90045	(310) 215-7662	smengistu@lawa.org
38		Molnar	Chad	Office of Representative Jane Harman, CA-36	District Director	2321 E. Rosecrans Ave		El Segundo	CA	90245	(310) 643-3636	chad.molnar@mail.house.gov
39		Moses	Eric	Consensus Planning Group	Director	626 Wilshire Boulevard	Suite 1000	Los Angeles	CA	90017	(213) 438-1755	emoses@consensusp.com
40		Napolitano	Steven	County of Los Angeles, Torrance Field Office	Deputy	825 Maple Avenue	Room 150	Torrance	CA	90503	(310) 222-3015	Snapolitano@lacbos.org
41		Olson	Dennis	LAX Airlines Airport Affairs Committee	Managing Director	8939 S. Sepulveda	Room 102	Los Angeles	CA	90045	(866) 393-6717	olson1de@aol.com
42		Oelz	Andrew	Akin Gump Strauss Hauer & Feld LLP	Attorney at Law	2029 Century Park East	24th Floor	Los Angeles		90067	(310) 728-3362	aoelz@akingump.com
43		Perez-Acevado	Dalila	Consensus Planning Group	Project Manager	626 Whilshire Boulevard		Los Angeles	CA	90017	(213) 438-1755	dperezacevedo@consensusp.com
44		Quintanilla	Evelyn	Los Angeles World Airports	City Planner	One World Way		Los Angeles	CA	90045	(310) 646-7690	equintanilla@lawa.org
45		Ramirez	Jerry	Los Angeles County CAO	Senior Analyst	500 W. Temple	Suite 750	Los Angeles	CA	90012	(213) 974-4282	jramirez@cao.co.la.ca.us
46		Remington	Victoria	Los Angeles World Airports	Sr. Clerk Typist	One World Way		Los Angeles	CA	90045	(310) 646-7690	vremington@lawa.org
47		Ritchie	Jim	Los Angeles World Airports	Deputy Executive Director	One World Way		Los Angeles	CA	90045	(310) 417-2342	jritchie@lawa.org

Revised:September 8, 2006

Meeting Title: LAX Specific Plan Amendment Study Public Meetings - October 25th and 28th

Meeting Dates: October 25th or 28th, 2006

	Initials	Name		Agency	Title	Address		City	State	Zip	Phone	E-mail Address
48		Saenz	Edgar	Office of Congresswoman Maxine Waters		6033 W. Century Blvd	Suite 807	Los Angeles	CA	90045	(310) 753-1668 or 642-4610	edgar.saenz@mail.house.gov
49		Saunders	Carl	City of Inglewood -	City Attorney	One Manchester Boulevard	POBox 6500	Inglewood		90312	(310) 412-5372	
50		Schneider	Denny	Alliance for a Regional Solution to Airport Congestion		7929 Breen Avenue		Los Angeles	CA	90045	(310) 641-4199	DennySchneider@WeLiveFree.com
51		Schneider	Nan	Alliance for a Regional Solution to Airport Congestion		7929 Breen Avenue		Los Angeles	CA	90045	(310) 641-4199	nanschneider@welivefree.com
52		Shute	E. Clement	Shute, Mihaly & Weinberger LLP	Counsel	396 Hayes Street		San Francisco	CA	94102	(415) 552-7272 or (415) 225-1018	shute@smwlaw.com
53		Skidmore	Tony	Camp Dresser & McKee Inc.		18581 Teller Avenue	Suite 200	Irvine	CA	92612	(949) 752-5452	skidmoreaj@cdm.com
54		Sohagi	Margaret	Fox & Sohagi, LLP	Attorney at Law	10960 Wilshire Boulevard	Suite 1270	Los Angeles	CA	90024	(310) 444-7805	mmsohagi@fox-sohagi.com
55		Stickland	Michelle	City of Inglewood	Assistant City Attorney	One Manchester Boulevard		Inglewood	CA	90312	(310) 412-5372	m.stickland@cityofinglewood.org
56		Tate	Phillip	City of Los Angeles, Council District 11	Legislative Deputy	200 N. Spring Street	Room 415	Los Angeles	CA	90012	(213) 473-7011	phillip.tate@lacity.org
57		Tomcheck	Patrick	Los Angeles World Airports	Sr. Transportation Engineer	One World Way		Los Angeles	CA	90045	(310) 646-3298	ptomcheck@lawa.org
58		Tracy	Suzanne	City of Los Angeles, Office of the City Attorney	Deputy City Attorney	One World Way		Los Angeles	CA	90045	(310) 646-8497	stracy@lawa.org
59		Tubert	Patricia	Los Angeles World Airports	Deputy Executive Director	One World Way		Los Angeles	CA	90045	(310) 646-7142 x 6726	ptubert@lawa.org
60		Velasco	Valeria	Los Angeles World Airports	Vice President, Board of Airport Commissioners	One World Way		Los Angeles	CA	90045	(310) 821-7890	vvelasco@aol.com
61		Villaraigosa	Antonio	City of Los Angeles	Mayor	200 N. Spring Street	3rd Floor	Los Angeles	CA	90012	(213) 978-0600	villaraigosa@mayor.lacity.org
62		Vitale	Ross	Los Angeles World Airports	Management Analyst II	One World Way		Los Angeles	CA	90045	(310) 646-9107	rvitale@lawa.org
63		Waterhouse	William	City of Los Angeles	City Attorney	One World Way		Los Angeles	CA	90045	(310) 646-3260	Wwaterhouse@lawa.org
64		Wells	Richard	Los Angeles World Airports	Chief of Airport Planning II	One World Way	Room 208	Los Angeles	CA	90045	(310) 646-7116	rwells@lawa.org
65		Willis	Anita	City of Inglewood	City Attorney	One Manchester Boulevard	P.O. Box 6500	Inglewood	CA	90301	(310) 412-5372	anita.willis@sbcglobal.net
66		Wolff	Osa	Shute, Mihaly & Weinberger LLP		396 Hayes Street		San Francisco	CA	94102	(415) 552-7272	wolff@smwlaw.com
67		Wong	Joyce	Akin Gump Strauss Hauer & Feld LLP		2029 Century Park East	Suite 2400	Los Angeles	CA	90067	(310) 728-3241	jwong@akingump.com
68		Yurtis	Barry	Williams Aviation Consultants	Consultant	14216 W. Civele Ridge		Sun City West	AZ	85375	(661) 341-0414	byurtis@earthlink.net
69		Zimmerman	Martin	Los Angeles County CAO	Chief Administrative Officer	500 West Temple Street		Los Angeles	CA	90012	(213) 974-1326	mzimmerman@cao.co.la.ca.us
70												
71												
72												

Revised:September 8, 2006

Meeting Title: LAX Specific Plan Amendment Study Public Meetings - October 25th and 28th

Meeting Dates: October 25th or 28th, 2006

	Initials	Name		Agency	Title	Address		City	State	Zip	Phone	E-mail Address
73												
74												

Revised:September 8, 2006

Meeting Title: LAX Specific Plan Amendment Study Public Meetings - October 25th and 28th

Meeting Dates: October 25th or 28th, 2006

	Initials	Name		Agency	Title	Address		City	State	Zip	Phone	E-mail Address
1		Agaibi	Mike	Federal Aviation Administration	Airports							
2		Aiken	G	Federal Aviation Administration	Manager Safety and Stds							
3		Armstrong	Brian	Federal Aviation Administration	Manager, Los Angeles ADO							
4		Diggons	C	Federal Aviation Administration	Air Traffic System Analyst							
5		Kurner	Col. Dave	Federal Aviation Administration	Program Manager							
6												
7												
8												
9												
10												
11												

Revised:September 8, 2006

(3)

LAX Specific Plan Amendment Study
Community Meeting
Saturday, October 28, 2006

ELECTED OFFICIALS & STAFF

Los Angeles World Airports

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SIGN – IN

NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
~~DENNY SCHNEIDER~~	~~ARSAC~~	signed in twice.				DENNYX@WESTNET.COM
✓ Edgar Saenz	Rep. Waters					
✓ ALAN ROTHENBERG	BOAC					
✓ Jim Bickhart	Mayor's ofc.					jim.bickhart@lacity.org

LAX Specific Plan Amendment Study
Community Meeting
Saturday, October 28, 2006
GENERAL PUBLIC

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
NEIL RUBENSTEIN	LAX ADVISORY COMMITTEE	4733 MAYTIME LANE CULVER CITY	90230			
[illegible]	[illegible]	5739 2074 [illegible]	90045			
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JOHN KALINOWSKI	RESIDENT	8357 KENYON AVE, LA, CA	90045	310-922-0266		johnkaline@yahoo.com
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Stan Sharpe		7345 Rindge Ave P.D.R.	90293	310 822 7808		
Eugene Chow	Student	460 Crestwood Ln. Walnut,	91789			eugene-chow@hotmail.com
[illegible]	[illegible]		90274			
Janet Bryant	Student	7538 Hesperia Ave Reseda	91335			[illegible]

37

(10)

LAX Specific Plan Amendment Study
Community Meeting
Saturday, October 28, 2006
GENERAL PUBLIC

Los Angeles World Airports

(15)

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
BRIAN NADREAU	JACOBS CONSULTANCY	10960 WELLWORTH AVE #410 LOS ANGELES, CA 90024	90024	(310)562-4353	(650) 343-5220	brian.nadreau@jacobs-consultancy.com
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~~Provost DIANA~~						
MRS. LOIS E. THOMPSON		1864 E. KRAMER DRIVE DOMINGO HILLS, CALIF.	90746	N/A	N/A	N/A
Georgetois Fisher		8005 Zayanta Dr. Playa Del Rey	90293	310-874-6553	—	—
Ed Jurkiewicz		7734 El Manor Ave LA CA. 90045	90045	310-642-4660	Same	edpaulinejd@sbcglobal.net
CHRISSY H		211 WATERVIEW PLAYA DEL REY	90293	3038072704	—	CHSMITH@BDO.com
Benita O'Meara		34172 Capo. by the Sea Dana Point, CA 92629	92629	949.489-5060		
VAL SCHNABL		7356 RINDGE AVE PDR	90293			
Phineas Oliver		7349 Rindge Ave. PDR	90293	310 827 9601		phineas@qetsold.com

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LAX Specific Plan Amendment Study
Community Meeting
Saturday, October 28, 2006
GENERAL PUBLIC

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Sheila Mi						
Adam Kliszewski		7817 Belaire Ave	90045	(310)694-3855		
JC Fishbeck		7511 Trask Ave.	90293	(310) 821-3720		jcfishbeck@comcast.net
Michael Festa		7323 Kentwood Ave	90045	(310) 649-5959		mfesta@ucla.edu
D. Wendling		7431 W 85th St	90045			
Margaret Wilson		8130 Flight Ave	90045	(310)645-5035	NA	NA
Shalott Hazzard	3rd Ave United Neighbors	9011 S. 3rd Ave	90305	(310)722-1328		duhue2@aol.com
Paula Baeumler		7413 W 89TH	90045			paula baeumler s @sbcglobal

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LAX Specific Plan Amendment Study
Community Meeting
Saturday, October 28, 2006
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George Festa		7323 Kentwood Ave	90045	310 649 5919		GOFESTA@Hotmail.com
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Pam Witz		8000 Naylor Ave	90045			
Kathy Gonnad		6433 Nancy	90045	3106708322		

LAX Specific Plan Amendment Study
Community Meeting
Saturday, October 28, 2006
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Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Vivian Chu	Boy Scout			310-337-2873		
Alexander Chu	Boy Scouts			310-337-2873		
LEON	Society Hispanic Engineers	3605 Long Beach Blvd 235	90807	5629894500	562 989 4509	d Leon, engineers @ Verizon. Net
VISITOR	LAWA	7127 GLIDEN AV	90045	3106451799		

STAFF

LAX Specific Plan Amendment Study
Community Meeting
Saturday, October 28, 2006
[redacted]

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Ellen Hoffman	LAWA	Annette Cortez URS				
Vicki Remington	LAWA	Juan Lopez IT LAWA				
Barbara Martinoff	"	Eli Degozman IT LAWA				
Janet Hackney	"	Samson LAWA				
Pat Touchcale	"	Consensus planning				
Nikki Doucette	"	Julie				
Nicole Johnson	Johnson Aviation	Josh [redacted]				
		Julia Dehoza				
Don Dennis	LAWA	Antoinette				
Jim Ritchie	"	Eric				
Paul Turk	"					

Los Angeles World Airports

LAX Specific Plan Amendment Study
December 6 & 9, 2006

Welcome . . .

Los Angeles World Airports (LAWA) is pleased to welcome you to the seventh series of meetings in the community-based planning process for the LAX Specific Plan Amendment Study.

The focus of these meetings will be to obtain community input on the North Airfield Preliminary Concepts and reuse opportunities for the Manchester Square area and LAX Northside properties.

For public convenience, two meetings have been scheduled. Attendance is not necessary at both meetings as the same material will be presented.

Agenda

I. **Sign-In/Welcome**
II. **Opening and Introductions**
III. **Presentation**
IV. **Public Questions**
V. **Next Steps**
VI. **Adjournment**

Thank you for attending.

www.laxmasterplan.org

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

Los Angeles World Airports

LAX Specific Plan Amendment Study
Public Outreach Meetings
December 6 and 9, 2006

Los Angeles World Airports (LAWA) welcomes the public to attend the next meetings in the community-based planning process for the modernization of LAX. The focus of these meetings will be to review and obtain community input on the North Airfield Preliminary Concepts, and reuse opportunities for the Manchester Square area, and LAX Northside properties. The concepts will be accessible on the LAX Master Plan website on November 28, 2006.

The next set of meetings to be held as follows:

When: **Wednesday, December 6, 2006 from 6:00 p.m. to 9:00 p.m. OR**
Saturday, December 9, 2006 from 9:00 a.m. to 12:00 noon

For public convenience, two meetings have been scheduled. Attendance is not necessary at both meetings as the same material will be presented.

Where: **Flight Path Learning Center**
Imperial Terminal
6661 W. Imperial Highway
Los Angeles, CA 90045
Free parking is available on site.

To view the North Airfield Preliminary Concepts, please visit our website at http://www.laxmasterplan.org/publicMeetings.cfm?. For more information on the outreach meetings, please contact Los Angeles World Airports at (800) 919-3766.

DEC-12-2006 13:38 LAX MP STAKHOLDER OFFICE 310 646 9501 P.10/28

LAX Specific Plan Amendment Study
Community Meeting
Date: Wednesday, Dec. 6th, 2006

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Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
JR Lewis	Westchester Elks	13022 Isonasmy	90066	2213 3103918777		RecRog@AOL.com
Andrew Wilder		8707 Falmouth #326	90293	310-578-8132		
Mary Jane Ludwig	Wchr. resident	6373 Riggs Pl.	90045	(310) 649-5171		mjludwig@earthlink.net
Norma Hanni	resident ?	8110 Fordham Pl	90045			
Susan Siegmund	"	7900 Emerson Ave	90045	310 649-3788		
Sandra Bauer	Comm. of LA					ASW. Contact List
TOM CHESNEY	WNA, ARSAC	5945 W. 76th ST LA 90045	90045	310-946-5151		productionwrg@usa.net
E. de Bar		7287 W 90TH	90045	310-645-7565		EDB@KHYTHM.COM
LANCE PEKARA	RESIDENT	7533 W. 89th ST	90045	310 215 8405		SECRET_CHIN@YAHOO.COM
Mo BONNIE SADRPOUR	91 street Homeowner Assoc. + Self	7100 W. 91 ST.	90045	310-645-2342		bonniesadrpour@yahoo.com

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LAX Specific Plan Amendment Study
Community Meeting
Date: Wednesday, December 6th, 2006

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
EDGAR AND KATHERINE FICKENSCHER		7416 STEWART AV. L.A	90045	310-645-0484		
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PAUL HIRSCHER	BARELY	6450 W 87 PLACE	90045	310 216 0617		
Jonathan Fukumoto		6471 W. 85th Pl LA, CA 90045	4	3107048741		
LUCY TAYLOR		7287 W. 90TH ST	90045	310-266-1743		LUCY@LUCY.NET
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Ron Zeliner		8349 Westlawn Ave	90045	310-410-9614		zeliner@sbcglobal.net
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DEC-12-2006 13:40 LAX MP STAKHOLDER OFFICE 310 646 9501 P.17/28

LAX Specific Plan Amendment Study
Community Meeting
Date: Wednesday, Dec. 6th, 2006
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DEC-12-2006 13:40 LAX MP STAKHOLDER OFFICE 310 646 9501 P.18/28

LAX Specific Plan Amendment Study
Community Meeting
Date: Wednesday, Dec. 6th, 2006
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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
KATHLEEN MCDONALD	HOME OWNER	6600 W. 80th PL. WEST.	90045	(310) 568-0920	N/A	

DEC-12-2006 13:40 LAX MP STAKHOLDER OFFICE 310 646 9501 P.19/28

LAX Specific Plan Amendment Study
Community Meeting
Date: Wednesday, Dec. 16th, 2006

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
BARBARA TAYLOR	HARBOR DEPT.	8707 FALMOUTH AVE. PDR #106	90293	310 306 9501		btaylor@portla.org
Piper Smith		7008 El Manor	90045	310-649-4919		
Vernette Sparks		929 E Bieff St	90302	3108126199		
Maria Zepeda		700 W. Hillcrest Bl	90301	310 674 7610		teresa_zep@MSN.com

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LAX Specific Plan Amendment Study
Community Meeting
Date: Wednesday, December 16th

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
BERNIE C. HART	Chevalier Allen & Lockman; City of Inglewood & Culver City	695 Town Center Drive Suite 700 Costa Mesa, CA	92626	714.384.6520	714.384.6521	cal@calpolitics.com
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James M Ferguson	Represent Pacific Sands Inc	770 W Imperial Av. Unit #31 ElSeg 90241	90241	310-322-6713		
Gregory R. Espinosa	HOA	6151 W Century Blvd 100th LA CA	90045	(310) 417-6490		GREPINO@LAWA.ORG
J.D. Webster	NC Walker PDR	6645 W 86th PL Westchester	90045	310 645 4344		PASTORJD@SBCGLOBAL.NET
Patricia Araujo		8707 Falmouth Ave #301	90293	(310)560-7186		luv_re@yahoo.com

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LAX Specific Plan Amendment Study
Community Meeting

Date: Wednesday, Dec. 6th, 2006

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LYSBETH BURNS		7546 W 91st ST	90045	310-6104459		
LAWRENCE SCHMID		7546 WESTLAWN AVE	90045	310-649-5345		
Barbara Lotts		6123 W. 75th St	90045	(310) 645-9728		
Joey Grotts		6123 w 75th st	90045	(310) 645-9728		
DON ARMSTRONG		27915 RIDGEBROOK CT RANCHO PV	90275	3103778965		
Robert Enriquez		219 WATERVIEW ST	90293	3103746379		
JEAN NELSON		8707 FALMOUTH #322	90293	310 821-8977		
Elizabeth Hall		8141 Chase Ave	90045	310-665-0972		ehall@ucla.edu
Cora Smith		7808 El Manor	90045			

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LAX Specific Plan Amendment Study
Community Meeting

Date: 12-06-06

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
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LAX Specific Plan Amendment Study
Community Meeting
Date: Wednesday, December 6, 2006

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Russell Ivy	"	"	"	"		"

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LAX Specific Plan Amendment Study
Community Meeting
Date: Wednesday, Dec. 6th, 2006

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
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Allen Watson		8148 Redlands St #206	90293	(310)827-1383		Nail-aw@excite.com

310 646 9501 P.07/28
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LAX Specific Plan Amendment Study
Community Meeting
Date: Wednesday, December 6th, 2006

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
JACK LOCKETT		6596 W. 84TH PLACE	90045			
David Haschauer Haschauer		6301 Regis PL	90045			
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RAND CRESPO	LOCAL RESIDENT	7300 W. 91ST.	90045	310-670-1191		
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ROBT C BRINKMEYER	11	7425 ALVERSTONE AVE	90045	310 645 3715		
DANIEL K TOBIAS	LADWSE	3536 W 75th Inglewood	90305	323 219-2138		ktobiasdk@comcast.net
Kevin Lillestol	Resident	8507 Ramsgate Ave	93550	310 670-9207		K. Lillestol
Esther Elfman	Resident	8394 Dunbarton Ave	90045	310 410-2902		

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310 646 9501 P.08/28
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LAX Specific Plan Amendment Study
Community Meeting
Date: Wednesday, Dec. 6th, 2006

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
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Ryan Dameron Dameron	HNTB	8814 Highland Ave Apt 4 Manhattan Beach CA	90266	310-841-1803		rdameron@hntb.com
DAVID AMMON	—	8045 DUNDARTON AVE	90045	310 649-3504		dammon@parbellnet
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Di Di Guerrero		12512 Felton Ave Del Aire 90250	90250	310 6447914		LAXDiD@AOL.com
David Lewis	Boy Scout 427	11	11	11		11
Nick Boyiozis		7542 W. 89 St Los Angeles	90045	(310)645-7367		LAXNIKBOY@NEYZERO.NET
MARY & BOB LONGO	Homeowner	6601 Esplanade PDR	90293	310-306-1951		marylongo@verizon.net

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LAX Specific Plan Amendment Study
Community Meeting
Date: Wednesday, December 13th, 2006

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Morris Rusch		7412 3/4 Arizona Ave	90045	(424) 620-5145		
Lorraine Fesq		6738 Esplanade Pdr	90293	310-822-1701		
Neil Orysdale		7313 Trask Ave Playa Del Rey	90293	310 822-1701		
Sidney Thompson		PO Box 90273	90009	(323) 779-4512		

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LAX Specific Plan Amendment Study
Community Meeting
Date: Wednesday, December 6th, 2006

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Bill Rennick		8912 Oriole Dr	90045	645-6269		sourcy@aol.com
Douglas Walker	—	6288 Thornburn St	90045	310-645-2112		doug@spidellspecialties.com
Mordy Kay		7761 Airport Bl	90045	310-645-8609		mordy-mary@sbcglobal.net
Mary V. Hollifield		7761 Airport Blvd	90045	310-645-4168		mhollifield@mac.com
Bruce Scheldeh		8128 Manitoba St #101	90293	3103067115		bgscheldeh@verizon.net
Chuck Willig		9100 Falmouth Ave	90293	310 823 4651		cwillig@stbernardhs.com
Rich Koerner		13603 Marina Pointe Dr	90292	720-272-4228		rkoerner@leedlevick.com
Michael Faught		7328 Vista del Mar Lane	90293	310-306-1244		~~MFF47CC@AOL.com~~ MFF47CC@aol.com
Natalina Chew		8118 W 83rd St #1	90293	310 8230574		natalinac@verizon.net
Hugh Burns		7546 W. 91st	90045	3106704459		aguyandagal@comcast.com

Hugh

10

P.15/28
310 646 9501
DEC-12-2006 13:39
LAX MP STAKHOLDER OFFICE

LAX Specific Plan Amendment Study
Community Meeting

Date: Wednesday, Dec. 6th, 2006

GENERAL PUBLIC

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Peggy Lucas	Resident	8830 Reading LA	90045	310 670 6623		
Marni Blackwood	Resident	6547 Firebrands	90045	310 645-0577		

P.16/28
310 646 9501
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LAX Specific Plan Amendment Study
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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Kelley Shomaut Shomautz	West Bluffs Conservancy	8330 Campion Dr LA CA 90045				Yhoskumikians@sbcglobal.net
Jamie Gutierrez	LAWA	6151 Century Blvd 10th Floor Los Angeles CA 90045	90045	(310)417-6490		jamiegutierrez@lawa.org
MIKE FIELD		8180 Manitoba #203 PDR CA 90293	90293	310-823-1492		
Judy May.	Westchester	7406 El Manor	90045	310-641-2849		judyandroger@sbcglobal.net
Roger May	"	" "	"	"		" "
Madeleine Lawdon	Westchester resident	7819 Alverstone Ave LA	90045	310 216 2516		maddylewis@ca.rr.com
Sabine Klinger	P.D.R. resident	8148 Redlands St #101 P.D.R. CA 90293	90293			Sabinekli@yahoo.com
Michael & Connie Parrish	Westchester Residents	9628 Airdrie Blvd	90045	310-649 0776		
Jean Cassetta	westchester Resident	8001 Loyola Blvd	90045			jean_bulpitt@sbcglobal.net

DEC-12-2006 13:37 LAX MP STAKHOLDER OFFICE 310 646 9501 P.03/28

LAX Specific Plan Amendment Study
Community Meeting
Date: Wednesday, December 6th, 2006

ELECTED OFFICIALS & STAFF

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Jeff Pool	L.A. City Planning	200 N. Spring St. #621 Los Angeles, CA	90012	213/978-1165	213/978-1226	jeff.pool@lacity.org
WALTER ZIFKIN	BOAC					
JOHN BRADY	LA MAYOR'S					
Isaac Lieberman	Bill Rosendahl					
CARL JACOBS	ES City Council					
[illegible]	Neighborhood Council Vallejo	8828 Reseda				KaCurtiss@ca.rr.com

DEC-12-2006 13:40 LAX MP STAKHOLDER OFFICE 310 646 9501 P.21/28

LAX Specific Plan Amendment Study
Community Meeting
Date: Saturday, December 9th, 2006

ELECTED OFFICIALS & STAFF

Los Angeles World Airports

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SIGN – IN

NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
DENNY SCHNEIDER	NCWPDR	7929 BREENAN LA	90045	310 641-4199		DENNY@WELIVEFREE.COM
CARL JACOBSEN	CITY EL SEGUNDO					
Cmy Vellaco						
PJ GAGAJENA	LA CITY PLANNING	200 N. SPRING	90012	213-978-1177		
David Herbst	City of El Segundo					
Isaac Lieberman	Bill Rosendahl					

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LAX Specific Plan Amendment Study
Community Meeting

Date: Wednesday, December 6th

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Helga Gendell X	The Argonaut	220 Waterview St. PDR	90293	310 302-8988		helgagendell@argonews.com
Doug Irving X	Daily Breeze	~~5200~~ 5215 Torrance Blvd Torrance	90503	310-543-6643		

2

DEC-12-2006 13:40 LAX MP STAKHOLDER OFFICE 310 646 9501 P.22/28

LAX Specific Plan Amendment Study
Community Meeting

Date: Saturday, December 9th, 2006

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Vicki Paneitz		8635 Falmouth #311 PDRay 90293	90293			
H. Hugh Choate		8635 Falmouth PDRay 90293	90293			
RICHARD RICCINDI		8707 FALMOUTH AVE #210	90293			INCOGNITOTWO @ VERIZON. NET
Doyle Fredrickson		8707 Falmouth Ave #210	90293			
Janet Knapp		7815 W. 83rd St LA, Ca 90293	90293			
David Weiss		" "	" "			
Sue Clerkz		123 E. OAK El Segundo	90245			
Deborah Cavalho		7446 W. 89th St L.A	90045			
Bruce Campbell		1158 26th St. #803 SANTA MONICA	90403			madroncweb@aol.com
DAMIEN GOODMAN		3062 STOCKER PLACE LA, CA ~~90008~~	90008			damienwg@gmail.com

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310 646 9501 P.23/28
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LAX Specific Plan Amendment Study
Community Meeting
Date: Saturday, December 9, 2006
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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Naomi Khan		8412 Loyola Bl	90045			Traveldocs4u@yahoo.com
Gary Schuler		8400 Belford Ave	90045			
Ruth Caudell	USC	Campus	90007			
LINDA Williams		3806 S. VAN NESS AVE	90062	323-547-3942	N/A	Hwoodown3400@Aol.com

310 646 9501 P.24/28
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Community Meeting
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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
JOHN CLARK		7808 ULSTA DEL MAR LANE PLAYA DEL REY CA 90293	90293	310 322 6330	310 322 3086	JCLARK@LOOKINGLAX.COM.
LIONEL Notto						
D.A. "Curt" Curtis	SELF	7880 Vicksburg C.A. 90045	90045	310 645-5989	—	curt7880@aol.com
RICHARD B. COOK	SELF	6722 W. 89TH ST LA. 90045	90045	310 670-9234		
JAY EDIE	"	7517 EARLDOM AVE PDR 90293	90293	310-822-8549		j.d.edie@alum.mit.edu
JUNE DURR	self	7819 Mcconnell Ave Westchester, CA 90045	90045	(310) 641-8567		junedurr@yahoo.com
THEA GELLER	SELF	6220 Pacific PDR 90293		310 994-1568		geller4t@yahoo.com.
ERNA EVANS	"	801 WATERVIEW PDR 90293	90293	310 306-2234	Same	erc98@aol.com
TOM EVANS	"	201 WATERVIEW PLAYA DEL REY CA	90293	"	Same	
BOB DUNAGAN	Self	7966 W. 83rd St PDR, CA 90293	90293	310 577 4514	310 574 3330	BOBDUNAGAN@VERIZON.NET

P.25/28 310 646 9501 LAX MP STAKHOLDER OFFICE DEC-12-2006 13:41

LAX Specific Plan Amendment Study
Community Meeting
Date: Sat. December 9th, 2006

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Frederick P. Berry		7443 Arizona	90045	310 337 9619		Fberry1806@earthlink.net
BERNIE HART	Aero Implement Chandler Allen & Lichter & Culver City	695 Town Center Drive Costa Mesa, CA	92626	714 384-6520		cal@calairlaw.com
Chad Molnar		957 E. 2nd St. LB, CA 90802	90802			cmolnar01@yahoo.com
Ylden Roecketal		6565 Firebrand Ave	90045	310-670-1403		
Patricia Edie	homeowner	7517 Earldom Ave PdR	90293	310/822-8549		jpedie@ca.rr.com
DAN QUARNSTROM	HOMEOWNER	8332 LOYOLA BLVD LOS ANGELES	90045	310-670-0668		
LORI ERENBOSSON	HOMEOWNER	8371 STEWART AVE WESTCHESTER CA	90045	310/641-3136		OCEANLOR@BIGPLANET.COM
R.J Wensley	Homeowner	8217 Dalgarno Av PDR CA 90293	90293			JGWensley@earthlink.net
Katy Loftus	homeowner	7016 Earldom PdR	90293	310 822 0799		KSloftus@att.net

P.27/28 310 646 9501 LAX MP STAKHOLDER OFFICE DEC-12-2006 13:41

LAX Specific Plan Amendment Study
Community Meeting
Date: Saturday, 12/9/2006

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Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
SUSAN Finkelstein		8675 FALMOUTH #205 PLAYA del Rey, CA	90293	310 305 1221		miracle2@ca.rr.com
WILLIAM ZHAO		107 LOS HIGOS ST ALHAMBRA CA 91801	91801	(626) 457-7320		WE111982@HOTMAIL.COM
Karina Abe						
GILLIAN RODRIGUEZ		8900 L'HAMIK AVE. LA. 90045	90045			
Leonard Breijo		7705 W. 80th St PLAYA DEL REY	90293			lbreijo@globalmedia-television.com
JACK TOPAL		8200 CALABAR AVE PLAYA DEL REY	90293			PLAYA8200@AOL.com
Thomas Richter		6220 Pacific Ave Playa del Rey	90297			RRJR@Comcast.net
Lore Pekarek		7822 W. Manchester #4 PDR 90293	90293			elpe2@earthlink.net
Jan Bryant	student	-				sneakerpaw@aol.com
Rusty Rosen	I.B.E.W. L.U. #11	8333 AIRPORT BLVD	90045	(310) 645-7637	(310) 645-0308	

DEC-12-2006 13:41 LAX MP STAKHOLDER OFFICE 310 646 9501 P.28/28

LAX Specific Plan Amendment Study
Community Meeting
Date: Saturday, December 9th, 2006

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
P.A CONINE R.D. CONINE		7907 WEST 80TH ST	90293	(310) 822-3947		
DAN COVIELLO		9606 Ives Ave	90045	3106699446		
[illegible]						
JOYCE CURRAN		8180 MANITOBA PLAYA DEL REY #242	90293	310822-8466		
Jeff Shein		7278 W. 90th Street LA, CA 90045	90045	310 713 5222		
JAMES PATRICK SMITH	SELF	947 VIRGINIA EL SEGUNDO, CA	90245	(310) 322-9552		
TERRY LEE	ELAC	29 N. CURTIS AVE, ALHAMBRA	91801	(626) 916-2267		
John Ramey		6546 W. 82nd 90045		(310) 559.2460		jfr436@yahoo.com
DAN DESFORGES		7260 W. 91ST STREET 90045	90045	310-417-8396		ddesforges@ca.rr.com
Floyd Parrish		7911 Yorktown Ave L.A. CA 90045	90045	310-645-5696		

DEC-12-2006 13:41 LAX MP STAKHOLDER OFFICE 310 646 9501 P.26/28

LAX Specific Plan Amendment Study
Community Meeting
Date: 12/9/06 Saturday

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
GUILLERMO JORDON		8701 FOLSOM DR #105 PDR, CA	90293	310 8277632		PJORDON@UIA.NET
DAVID CAGLE		7723 Hosford Ave LA	90045	310 337-0717		dbcagle@hotmail.com
Herbert Goss		7307 W. 87th Street LA	90045	310 378-9977		HerbertGoss@AOL.com
Brian Larson Debbie Larson		6551 W 85 Place LA	90045	310-641-4284		dcompellarson@yahoo.com
michael Koshak		6327 Riggs Pl.	90045	310 337 9639		Mouthfish@aol.com
Hilary Hanafin		6335 Riggs Pl.	90045	310 670 0340		hhanafin@comcast.net
Lorrie Stewart		7278 W 90th	90045	310 670-3661		Lorrie52@hotmail.
ADA LA-GRECA		8711 Falmouth #115 Cir	90293 CA 92	310 9628565		

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LAX Specific Plan Amendment Study
Community Meeting
Date: Saturday, December 9th, 2006

Los Angeles World Airports

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NAME	ORGANIZATION	ADDRESS/CITY/STATE	ZIP CODE	PHONE	FAX	E-MAIL
Jane Engle	Los Angeles Times	130 S. Broadway	90012	213-237-7000		

2008 NOP List of Commentors

LAX Specific Plan Amendment Study 2008 NOP Response Letters					
New	**Commentor**	**Affiliation/Agency**	**Department**	**Date**	**Received Via**
1	Blackburn, Gregor	FEMA	Floodplain Management and Insurance Branch	April 9, 2008	Hand delivered from Evelyn Quintanilla
2	Frost, Paul	State of California, Resources Agency	Dept. of Conservation	April 18, 2008	Hand delivered from Evelyn Quintanilla
3	Oborne, Juli	State of California	Dept. of Toxic Substances Control	April 29, 2008	Hand delivered from Evelyn Quintanilla
4	Smith, Steve	South Coast Air Quality Management District		March 25, 2008	Hand delivered from Evelyn Quintanilla
5	Wolff, Osa	City of El Segundo (Shute, Mihaly, & Weinberger LLP)		June 17, 2008	Email from Evelyn Quintanilla 6/17/2008 4:00 p.m.
6	Lichman, Barbara E.	City of Inglewood and Culver City (Chevalier, Allen, & Lichman LLP)		June 17, 2008	Hand delivered from Evelyn Quintanilla
7	Chapman, Susan	Metropolitan Transportation Authority		June 5, 2008	Hand delivered from Evelyn Quintanilla
8	Holloway, Charles C.	City of Los Angeles	Dept. of Water and Power	June 13, 2008	Email from Evelyn Quintanilla 6/19/2008 1:06 p.m.
9	Williams, Wanda J.	City of Inglewood		June 19, 2008	Email from Evelyn Quintanilla 6/24/2008 10:11 a.m.
10	Fujioka, William T.	County of Los Angeles	Chief Executive Office	June 30, 2008	Email from Evelyn Quintanilla 7/7/2008
11	Alvarez, Elmer	State of California	Department of Transportation	July 7, 2008	Email from Evelyn Quintanilla 7/10/2008
12	Placeholder				
13	Placeholder				
14	O'Donnell, Janet	None Provided		May 7, 2008	Email from Evelyn Quintanilla 5/21/2008 5:35 p.m.
15	Molleson, Karen	None Provided		May 7, 2008	Email from Evelyn Quintanilla 5/21/2008 5:35 p.m.
16	Mahony, Tania	None Provided		May 7, 2008	Email from Evelyn Quintanilla 5/21/2008 5:35 p.m.
17	Morrison, Nancy - Gene W.	None Provided		May 7, 2008	Email from Evelyn Quintanilla 5/21/2008 5:35 p.m.
18	Hamilton, Jacqueline	None Provided		May 7, 2008	Email from Evelyn Quintanilla 5/21/2008 5:35 p.m.
19	Young, Robert A.	None Provided		May 7, 2008	Email from Evelyn Quintanilla 5/21/2008 5:35 p.m.
20	Boughey, Tom	None Provided		May 7, 2008	Email from Evelyn Quintanilla 5/21/2008 5:35 p.m.
21	Torrance, Theresa	None Provided		May 7, 2008	Email from Evelyn Quintanilla 5/21/2008 5:35 p.m.
22	Acherman, Robert	None Provided		May 7, 2008	Email from Evelyn Quintanilla 5/21/2008 5:35 p.m.
23	Cunningham, Joe	None Provided		May 7, 2008	Email from Evelyn Quintanilla 5/21/2008 5:35 p.m.
24	Chambers, Greg	None Provided		May 7, 2008	Email from Evelyn Quintanilla 5/21/2008 5:35 p.m.
25	Alley, Rochelle	None Provided			Email from Evelyn Quintanilla 5/21/2008 5:35 p.m.
26	Lofthouse, Paul	None Provided			Email from Evelyn Quintanilla 5/21/2008 5:35 p.m.
27	Dunagan, Bob	None Provided		May 7, 2008	Email from Evelyn Quintanilla 5/21/2008 5:35 p.m.
28	Burns, Georgina	None Provided		May 10, 2008	Email from Evelyn Quintanilla 5/21/2008 5:35 p.m.
29	Ehret, John S.	None Provided		May 10, 2008	Email from Evelyn Quintanilla 5/21/2008 5:35 p.m.
30	Dawson, Ruth	None Provided		May 10, 2008	Email from Evelyn Quintanilla 5/21/2008 5:35 p.m.
31	Bray, Sandra	None Provided		May 10, 2008	Email from Evelyn Quintanilla 5/21/2008 5:35 p.m.
32	Kliever, Wendell	None Provided		May 10, 2008	Email from Evelyn Quintanilla 5/21/2008 5:35 p.m.
33	Roys, Tommy	None Provided		May 10, 2008	Email from Evelyn Quintanilla 5/21/2008 5:35 p.m.
34	David, Mary T.	None Provided		May 10, 2008	Email from Evelyn Quintanilla 5/21/2008 5:35 p.m.
35	Rose, Harry	None Provided			Email from Evelyn Quintanilla 5/21/2008 5:35 p.m.
36	Poyourow, Joanne & Rood, Peter H.	Environmental Change-Makers		April 15, 2008	Hand delivered from Evelyn Quintanilla
37	Cognein, Antonia D.	None Provided		April 28, 2008	Hand delivered from Evelyn Quintanilla

LAX Specific Plan Amendment Study 2008 NOP Response Letters					
New	**Commentor**	**Affiliation/Agency**	**Department**	**Date**	**Received Via**
38	Ehret, John S.	None Provided			Hand delivered from Evelyn Quintanilla
39	Hefner, Roy	None Provided			Hand delivered from Evelyn Quintanilla
40	Crowley, Eileen	None Provided		May 18, 2008	Email from Evelyn Quintanilla 6/5/2008 3:00 p.m.
41	Johnston, Mark	None Provided		May 18, 2008	Email from Evelyn Quintanilla 5/22/2008 3:50 p.m.
42	Notto, Lionel	None Provided		May 29, 2008	Email from Evelyn Quintanilla 6/5/2008 3:00 p.m.
43	Waian, Steven N.	None Provided		June 2, 2008	Email from Evelyn Quintanilla 6/5/2008 3:00 p.m.
44	Dial, Karen	H.B. Drollinger Co.		June 10, 2008	Email from Evelyn Quintanilla 6/11/2008 5:52 p.m.
45	Notto, Cynthia	None Provided		June 13, 2008	Hand delivered from Evelyn Quintanilla
46	Moore, John	None Provided		June 13, 2008	Hand delivered from Evelyn Quintanilla
47	Moss, Percy Crosby	None Provided		June 12, 2008	Hand delivered from Evelyn Quintanilla
48	Kapp, Carol	None Provided		June 16, 2008	Hand delivered from Evelyn Quintanilla
49	Cope, Danna	Los Angeles International Airport Advisory Committee		June 16, 2008	Email from Evelyn Quintanilla 6/19/2008 1:06 p.m.
50	Williams, Linda	None Provided		June 16, 2008	Email from Evelyn Quintanilla 6/19/2008 1:06 p.m.
51	Duckworth, Donald R.	Westchester Business Improvement District		June 17, 2008	Email from Evelyn Quintanilla 6/19/2008 9:14 a.m.
52	Schneider, Denny	Alliance for a Regional Solution to Airport Congestion		June 17, 2008	Email from Evelyn Quintanilla 6/19/2008 1:06 p.m.

2008 NOP Comment Letters

- All buildings constructed within a coastal high hazard area, (any of the "V" Flood Zones as delineated on the FIRM), must be elevated on pilings and columns, so that the lowest horizontal structural member, (excluding the pilings and columns), is elevated to or above the base flood elevation level. In addition, the posts and pilings foundation and the structure attached thereto, is anchored to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all building components.

- Upon completion of any development that changes existing Special Flood Hazard Areas, the NFIP directs all participating communities to submit the appropriate hydrologic and hydraulic data to FEMA for a FIRM revision. In accordance with 44 CFR, Section 65.3, as soon as practicable, but not later than six months after such data becomes available, a community shall notify FEMA of the changes by submitting technical data for a flood map revision. To obtain copies of FEMA's Flood Map Revision Application Packages, please refer to the FEMA website at http://www.fema.gov/business/nfip/forms.shtm.

Please Note:

Many NFIP participating communities have adopted floodplain management building requirements which are more restrictive than the minimum federal standards described in 44 CFR. Please contact the local community's floodplain manager for more information on local floodplain management building requirements. The City of Los Angeles floodplain manager can be reached by calling Rod Tashima at (213) 485-4559. The Los Angeles County floodplain manager can be reached by calling Rick Sun, Los Angeles Public Works, at (626) 458-5911.

If you have any questions or concerns, please do not hesitate to call Cynthia McKenzie of the Mitigation staff at (510) 627-7190.

Sincerely,

Gregor Blackburn, CFM, Branch Chief
Floodplain Management and Insurance Branch

cc:
Rod Tashima, Floodplain Administrator, City of Los Angeles
Rick Sun, P. E., Los Angeles County Public Works, Watershed Management Division
Garret Tam Sing/Salomon Miranda, State of California, Department of Water Resources, Southern District
Cynthia McKenzie, Floodplanner, CFM, DHS/FEMA Region IX
Alessandro Amaglio, Environmental Officer, DHS/FEMA Region IX

U.S. Department of Homeland Security
FEMA Region IX
1111 Broadway, Suite 1200
Oakland, CA. 94607-4052

FEMA

April 9, 2008

Herb Glasgow, Senior City Planner
City of Los Angeles, Los Angeles World Airports
1 World Way, Room 218
Los Angeles, California 90045

Dear Mr. Glasgow:

This is in response to your request for comments on the CEQA Availability of Notice of Preparation of a Draft Environmental Impact Report for the Los Angeles International Airport Specific Plan Amendment Study.

Please review the current effective Flood Insurance Rate Maps (FIRMs) for the City of Los Angeles (Community Number 060137), Map revised May 4, 1999 and Los Angeles County (Community Number 065043), Map revised July 6, 1998. Please note that the City of Los Angeles, Los Angeles County, California is a participant in the National Flood Insurance Program (NFIP). The minimum, basic NFIP floodplain management building requirements are described in Vol. 44 Code of Federal Regulations (44 CFR), Sections 59 through 65.

A summary of these NFIP floodplain management building requirements are as follows:

- All buildings constructed within a riverine floodplain, (i.e., Flood Zones A, AO, AH, AE, and A1 through A30 as delineated on the FIRM), must be elevated so that the lowest floor is at or above the Base Flood Elevation level in accordance with the effective Flood Insurance Rate Map.

- If the area of construction is located within a Regulatory Floodway as delineated on the FIRM, any ***development*** must not increase base flood elevation levels. **The term *development* means any man-made change to improved or unimproved real estate, including but not limited to buildings, other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, and storage of equipment or materials.** A hydrologic and hydraulic analysis must be performed *prior* to the start of development, and must demonstrate that the development would not cause any rise in base flood levels. No rise is permitted within regulatory floodways.

To ensure proper review of building projects, the Division has published an informational packet entitled, "Construction Project Site Review and Well Abandonment Procedure" that outlines the information a project developer must submit to the Division for review. The Department of Transportation should contact the Division Cypress district office for a copy of the site-review packet. The local planning department should verify that final building plans have undergone Division review prior to the start of construction.

Thank you for the opportunity to comment on the Notice of Preparation. If you have questions on our comments, or require technical assistance or information, please call me at the Cypress district office: 5816 Corporate Avenue, Suite 200, Cypress, CA 90630-4731; phone (714) 816-6847.

Sincerely,

Paul Frost

Paul Frost
Associate Oil & Gas Engineer
Division of Oil, Gas and Geothermal Resources
District 1

cc: State Clearing House
P.O. Box 3044
Sacramento, California 95812-3044

Mrs. Linda Campion - Headquarters

STATE OF CALIFORNIA, RESOURCES AGENCY ARNOLD SCHWARZENEGGER, GOVERNOR

DEPARTMENT OF CONSERVATION

DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

5816 Corporate Avenue, Suite 200, Cypress, CA 90630-4731

PHONE 714/816-6847 • FAX 714/816-6853 • WEB SITE conservation.ca.gov

April 18, 2008

Mr. Herb Glasgow
City of Los Angeles Department of Airports
1 World Way
Los Angeles, California 90045

Subject: Notice of Preparation for Los Angeles International Airport Specific Plan Amendment Study - SCH# 1997061047

Dear Mr. Glasgow:

The Department of Conservation's (Department) Division of Oil, Gas, and Geothermal Resources (Division) has reviewed the above referenced project. The Division supervises the drilling, maintenance, and plugging and abandonment of oil, gas, and geothermal wells in California.

The proposed project is located within the administrative boundaries of the Hyperion and El Segundo oil fields. There are eight plugged and abandoned wells within the project boundaries. The wells are identified on Division map W1-5 and in Division records. The Division recommends that all wells within or in close proximity to project boundaries be accurately plotted on future project maps.

Building over or in the proximity of idle or plugged and abandoned wells should be avoided if at all possible. If this is not possible, it may be necessary to plug or re-plug wells to current Division specifications. Also, the State Oil and Gas Supervisor is authorized to order the reabandonment of previously plugged and abandoned wells when construction over or in the proximity of wells could result in a hazard (Section 3208.1 of the Public Resources Code). If abandonment or reabandonment is necessary, the cost of operations is the responsibility of the owner of the property upon which the structure will be located. Finally, if construction over an abandoned well is unavoidable an adequate gas venting system should be placed over the well.

Furthermore, if any plugged and abandoned or unrecorded wells are damaged or uncovered during excavation or grading, remedial plugging operations may be required. If such damage or discovery occurs, the Division's district office must be contacted to obtain information on the requirements for and approval to perform remedial operations.

DTSC provides guidance for Preliminary Endangerment Assessment preparation and cleanup oversight through the Voluntary Cleanup Program (VCP). For additional information on the VCP please visit DTSC's web site at www.dtsc.ca.gov. If you would like to meet and discuss this matter further, please contact Mr. Alberto Valmidiano, Project Manager, at (818) 717-6550 or me, at (818) 717-6539.

Sincerely,

Juli Oborne
Unit Chief
Southern California Cleanup Operations Branch – Chatsworth Office

cc: Governor's Office of Planning and Research
State Clearinghouse
P. O. Box 3044
Sacramento, California 95812-3044

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Planning and Environmental Analysis Section
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Arnold Schwarzenegger
Governor

April 29, 2008

Mr. Herb Glasgow
City of Los Angeles Department of Airports
1 World Way
Los Angeles, California 90045

NOTICE OF PREPARATION FOR THE LOS ANGELES INTERNATIONAL AIRPORT SPECIFIC PLAN AMENDMENT STUDY DRAFT ENVIRONMENTAL IMPACT REPORT, SCH NO. 1997061047

Dear Mr. Glasgow:

The Department of Toxic Substances Control (DTSC) has received your Notice of Preparation of draft Environmental Impact Report (EIR) for the project mentioned above.

Based on the review of the document, DTSC comments are as follows:

1. The draft EIR needs to identify and determine whether current or historic uses at the Project site (Site) have resulted in any release of hazardous wastes/substances.

2. The draft EIR needs to identify any known or potentially contaminated area within the Site. For all identified areas, the draft EIR needs to evaluate whether conditions at the Site pose a threat to human health or the environment.

3. The draft EIR should identify the mechanism to initiate any required investigation and/or remediation for any area that may require remediation, and which government agency will provide appropriate regulatory oversight.

4. If during construction of the project, soil contamination is suspected, construction in the area should stop, and appropriate health and safety procedures should be implemented. If it is determined that contaminated soils exist, the draft EIR should identify how any required investigation and/or remediation will be conducted, and which government agency will provide regulatory oversight.

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In addition to analyzing regional air quality impacts the SCAQMD recommends calculating localized air quality impacts and comparing the results to localized significance thresholds (LSTs). LST's can be used in addition to the recommended regional significance thresholds as a second indication of air quality impacts when preparing a CEQA document. Therefore, when preparing the air quality analysis for the proposed project, it is recommended that the lead agency perform a localized significance analysis by either using the LSTs developed by the SCAQMD or performing dispersion modeling as necessary. Guidance for performing a localized air quality analysis can be found at http://www.aqmd.gov/ceqa/handbook/LST/LST.html.

It is recommended that lead agencies for projects generating or attracting vehicular trips, especially heavy-duty diesel-fueled vehicles, perform a mobile source health risk assessment. Guidance for performing a mobile source health risk assessment ("Health Risk Assessment Guidance for Analyzing Cancer Risk from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis") can be found on the SCAQMD's CEQA web pages at the following internet address: http://www.aqmd.gov/ceqa/handbook/mobile_toxic/mobile_toxic.html. An analysis of all toxic air contaminant impacts due to the decommissioning or use of equipment potentially generating such air pollutants should also be included.

Mitigation Measures

In the event that the project generates significant adverse air quality impacts, CEQA requires that all feasible mitigation measures that go beyond what is required by law be utilized during project construction and operation to minimize or eliminate significant adverse air quality impacts. To assist the Lead Agency with identifying possible mitigation measures for the project, please refer to Chapter 11 of the SCAQMD CEQA Air Quality Handbook for sample air quality mitigation measures. Additional mitigation measures can be found on the SCAQMD's CEQA web pages at the following internet address: www.aqmd.gov/ceqa/handbook/mitigation/MM_intro.html Additionally, SCAQMD's Rule 403 – Fugitive Dust, and the Implementation Handbook contain numerous measures for controlling construction-related emissions that should be considered for use as CEQA mitigation if not otherwise required. Other measures to reduce air quality impacts from land use projects can be found in the SCAQMD's Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning. This document can be found at the following internet address: http://www.aqmd.gov/prdas/aqguide/aqguide.html. In addition, guidance on sitting incompatible land uses can be found in the California Air Resources Board's Air Quality and Land Use Handbook: A Community Perspective, which can be found at the following internet address: http://www.arb.ca.gov/ch/handbook.pdf. Pursuant to state CEQA Guidelines §15126.4 (a)(1)(D), any impacts resulting from mitigation measures must also be discussed.

Data Sources

SCAQMD rules and relevant air quality reports and data are available by calling the SCAQMD's Public Information Center at (909) 396-2039. Much of the information available through the Public Information Center is also available via the SCAQMD's World Wide Web Homepage (http://www.aqmd.gov).

The SCAQMD is willing to work with the Lead Agency to ensure that project-related emissions are accurately identified, categorized, and evaluated. Please call Charles Blankson, Ph.D., Air Quality Specialist, CEQA Section, at (909) 396-3304 if you have any questions regarding this letter.

Sincerely,

Steve Smith, Ph.D.
Program Supervisor, CEQA Section
Planning, Rule Development and Area Sources

SS:CB:AK
LAC080320-05AK
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Air Quality Management District
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March 25, 2008

Mr. Herb Glasgow, Senior Planner
City of Los Angeles
Los Angeles World Airports
1 World Way, Room 218
Los Angeles, CA 90045

Dear Mr. Glasgow:

Notice of Preparation of a Draft Environmental Impact Report (Draft EIR) for the Los Angeles International Airport Specific Plan Amendment Study

The South Coast Air Quality Management District (SCAQMD) appreciates the opportunity to comment on the above-mentioned document. The SCAQMD's comments are recommendations regarding the analysis of potential air quality impacts from the proposed project that should be included in the draft environmental impact report (EIR). Please send the SCAQMD a copy of the Draft EIR upon its completion. **In addition, please send with the draft EIR all appendices or technical documents related to the air quality analysis and electronic versions of all air quality modeling and health risk assessment files. Without all files and supporting air quality documentation, the SCAQMD will be unable to complete its review of the air quality analysis in a timely manner. Any delays in providing all supporting air quality documentation will require additional time for review beyond the end of the comment period.**

Air Quality Analysis

The SCAQMD adopted its California Environmental Quality Act (CEQA) Air Quality Handbook in 1993 to assist other public agencies with the preparation of air quality analyses. The SCAQMD recommends that the Lead Agency use this Handbook as guidance when preparing its air quality analysis. Copies of the Handbook are available from the SCAQMD's Subscription Services Department by calling (909) 396-3720. Alternatively, the lead agency may wish to consider using the California Air Resources Board (CARB) approved URBEMIS 2007 Model. This model is available on the SCAQMD Website at: www.urbemis.com.

The Lead Agency should identify any potential adverse air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project. Air quality impacts from both construction (including demolition, if any) and operations should be calculated. Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips). Operation-related air quality impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Air quality impacts from indirect sources, that is, sources that generate or attract vehicular trips should be included in the analysis.

The SCAQMD has developed a methodology for calculating PM2.5 emissions from construction and operational activities and processes. In connection with developing PM2.5 calculation methodologies, the SCAQMD has also developed both regional and localized significance thresholds. The SCAQMD requests that the lead agency quantify PM2.5 emissions and compare the results to the recommended PM2.5 significance thresholds. Guidance for calculating PM2.5 emissions and PM2.5 significance thresholds can be found at the following internet address: http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html.

In addition to the joint comments submitted as Exhibit A to this letter, the City of El Segundo offers the following individual comments:

"Runway 6R/24L 100' North" Alternative. Based on currently available information, the City of El Segundo has identified the "Runway 6R/24L 100' North" Alternative as its preferred option among the SPAS alternatives. This option would modify the north airfield in a manner similar to the South Airfield Improvement Program ("SAIP") recently undertaken by LAWA. El Segundo recognizes that LAWA would like to separate the north airfield runways in order to allow for a new centerline taxiway, like the one recently installed on the south airfield, to address runway incursion concerns. This goal can and should be accomplished by shifting Runway 6L/24R just 100 feet to the north, not 340 feet as proposed in the "Runway 6R/24L 340' North" Alternative. Not only would a limited 100 foot shift address LAWA's stated safety goals without substantially increasing LAX's airfield capacity, it would do so with limited community impacts comparable to those associated with the SAIP.

Tiering of Environmental Analysis. The SPAS NOP states that LAWA intends to "tier" its EIR for the SPAS process from its EIS/EIR for the LAX Master Plan adopted in 2004 ("2004 LAX Master Plan"). Tiering is appropriate when general environmental analysis is conducted at an early stage and more specific analysis is undertaken at a later stage. CEQA Guidelines § 15152, *Vineyard Area Citizens for Responsible Growth v. City of Rancho Cordova*, 53 Cal.Rptr.3d 821, 834 (Cal. SCt. 2007) ("proper tiering of environmental review allows an agency to defer analysis of certain details of later phases of long-term linked or complex projects until those phases are up for approval..."). This general guidance for tiering is not directly applicable in the case of the SPAS process. With the SPAS process, LAWA appears to be conducting a general environmental analysis of proposed changes to the 2004 LAX Master Plan, not a detailed analysis for the implementation of elements of the previously-approved plan.

The SPAS process is mandated by the 2006 Stipulated Settlement entered into by Petitioners and the City of Los Angles/LAWA. As articulated in the 2006 Stipulated Settlement, the SPAS process is aimed at identifying and evaluating alternatives to certain "yellow light" elements of the 2004 LAX Master Plan. If one of these alternatives is ultimately adopted, the result will be significant changes to the 2004 LAX Master Plan. As such, those proposed changes will require major revisions to the EIR previously prepared by LAWA for the 2004 LAX Master Plan "due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects." Public Resources Code § 21166; CEQA Guidelines §

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June 17, 2008

Via Email to hglasgow@lawa.org and Fed Ex

Herb Glasgow
City of Los Angeles
Los Angeles World Airports
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Los Angeles, CA 90045

Re: Notice of Preparation for LAX Specific Plan Amendment Study EIR

This firm represents the City of El Segundo in connection with the Specific Plan Amendment Study ("SPAS") for the Los Angeles International Airport ("LAX") Master Plan. We respectfully submit this comment letter on the Notice of Preparation ("NOP") recently released for the Environmental Impact Report ("EIR") that is being prepared by Los Angeles World Airports ("LAWA") for the SPAS process.

Petitioners' Joint Comments. We have attached as Exhibit A to this letter a document titled "Petitioners' Overview of Guiding Principles for Environmental Analysis: LAX Specific Plan Amendment Study EIR." That document consists of comments prepared and submitted jointly by the Petitioners that filed legal challenges to the LAX Master Plan approved in 2004 [City of El Segundo, City of Inglewood, City of Culver City, County of Los Angeles, and Alliance for a Regional Solution to Airport Congestion ("ARSAC")]. Petitioners' joint comments address a range of important issues, including: (1) LAWA's obligation to reduce impacts to neighboring communities, (2) gate constraint extension, (3) airfield balance, (4) the regional approach to meeting aviation demand and (5) the public review period for the SPAS Draft EIR. In the interest of brevity, we will not repeat any of those comments here, but rather incorporate them by this reference. The Petitioners urge LAWA to consider carefully their joint comments.

15162(a)(1), *see also* potentially applicable standards at CEQA Guidelines §§ 15162(a)(2)&(3). The environmental review prepared for the SPAS process should therefore be conducted in a subsequent EIR. *See Sierra Club v. County of Sonoma*, 6 Cal.App.4th 1307, 1316-18 (1992).

LAX Capacity Analysis. The NOP properly acknowledges that alternatives evaluated in the SPAS process, like the LAX Master Plan elements approved in 2004, should be designed to limit LAX's physical capacity to 78.9 million annual passengers ("MAP"). *See* Stipulated Settlement § V(D)(1). An accurate calculation of an airport proposal's physical capacity is exceedingly important to the evaluation of its environmental impacts. An understatement of physical capacity leads directly to understatement of environmental impacts, because the most problematic airport impacts (i.e., noise, air emissions and traffic) are determined by an airport's physical capacity and associated level of operations. The Draft EIR must disclose the full physical capacity of each alternative and carefully calculate the associated reasonably foreseeable passenger and cargo activity levels in order to evaluate the resulting future environmental impacts.

At one point, the NOP addresses the capacity issue indirectly by stating that "Based on comparable levels of passenger and cargo activities [under the 2004 Master Plan and the SPAS alternatives], it is not expected that the growth implications associated with operation of the LAX SPAS alternatives would be materially different than those previously addressed in the LAX Master Plan EIR." NOP at A-19. Based on this statement, it appears that LAWA may be inclined to simply assume that the SPAS alternatives will result in the same physical airport capacity as the 2004 Master Plan. Such an assumption would be improper. LAWA cannot simply rely on the capacity calculations conducted for the previously-approved Master Plan. Not only were those calculations seriously flawed (*see* El Segundo's earlier comment letters and briefing), but they are inapplicable to the alternatives currently under consideration in the SPAS process. LAWA must instead conduct an analysis of the passenger and cargo capacity of each SPAS alternative. In conducting that analysis, LAWA should make clear what assumptions it is making regarding the number of gates, types of aircraft flying at LAX, the seating arrangement on those aircraft, number of seats filled (load factors), and seasonal patterns of aviation activity.

"True Up" of Master Plan Modeling. LAWA will have fully implemented the SAIP by the time the SPAS DEIR is released. LAWA will therefore have the opportunity to validate the assumptions made in the environmental documents for the 2004 LAX Master Plan and SAIP by comparing them to real-world operations at LAX during and following

implementation of the SAIP. This is particularly important with respect to noise impacts. El Segundo encourages LAWA to undertake this "true up" analysis of its Master Plan modeling.

Airfield Balance. As LAWA acknowledges in the NOP, existing LAX operations are not balanced between the north and south airfields. Rather, the south airfield, which borders El Segundo, is used more for large ("heavy") aircraft operations. This lack of airfield balance results in substantial undesirable impacts to airfield efficiency, safety and noise. The 2004 LAX Master Plan addressed this lack of balance by proposing improvements to the north airfield. As the SPAS process evaluates various alternatives to the north airfield reconfiguration approved in the 2004 LAX Master Plan, LAWA must carefully consider whether and to what extent each of those alternatives would address the need for balance between the north and south airfields. Based on the limited information now available, El Segundo is concerned that the "No Project/No Development (Existing Conditions)" and "Existing Runways with Operational Improvements Only" Alternatives would do little, if anything, to promote airfield balance because they involve no significant airfield improvements. Similarly, although the "No Project/No Specific Plan Amendment (Implement Approved Master Plan)" and "Runway 6R/24L 100' South" Alternatives would result in airfield modifications, El Segundo is concerned that due to their complexity, including the need to demolish terminals 1-3, those alternatives would take too long to implement, significantly delaying the benefits of improved airfield balance. The SPAS EIR should take this timing issue into consideration in its environmental analysis of the various alternatives.

Drop-Off/Pick-Up Area East of Terminal 1. The NOP does not include the possible addition of a proposed passenger drop-off/pick-up area east of Terminal 1 as part of the "Runway 6R/24L 100' North Alternative". Please note that in the event that LAWA determines that the addition of a passenger drop-off/pick-up area east of Terminal 1 would be advantageous under the "Runway 6R/24L 100' North Alternative", that passenger drop-off/pick-up area should be added.

Impacts Associated with Demolition of Terminals 1-3. As noted in the NOP, some of the proposed alternatives would retain terminals 1-3 and some would require their removal and replacement. The City of El Segundo is concerned that the removal and replacement of terminals 1-3 would be a major undertaking involving substantial, unnecessary expense and delay. For example, under some of the alternatives being evaluated, improvements on the north airfield would have to wait until after the removal and replacement of terminals 1-3. Additionally, the removal and replacement of terminals

1-3 would involve substantial construction impacts (e.g., construction and demolition vehicle traffic, air emissions, noise) that would be avoided by retaining those terminals. The SPAS EIR prepared by LAWA should carefully identify and evaluation these differences between alternatives.

Global Climate Change Analysis. LAX operations, including surface and air transportation of cargo and passengers, produce enormous quantities of green house gas emissions. The LAX SPAS EIR prepared by LAWA must contain a full analysis of the global climate change issue, including a discussion of appropriate alternatives and mitigation. For example, the EIR should evaluate the extent to which implementing a regional approach to serving aviation demand would help reduce vehicle miles traveled and the associated green house gas emissions. Similarly, the EIR should evaluate the climate change benefits associated with implementing, as part of the project or as mitigation, improved public transportation to and from LAX.

Air Apportionment Study. As required by the 2006 Stipulated Settlement, LAWA has been proceeding with an air pollution apportionment study for LAX with technical input from El Segundo and others. The air quality analysis conducted for the SPAS EIR should carefully consider any available findings from this air apportionment study.

NEPA Analysis. The NOP outlines LAWA's plans for CEQA analysis, but does not address compliance with the National Environmental Policy Act ("NEPA"). Because the proposed SPAS program would necessarily require federal approvals, LAWA should provide information regarding NEPA compliance. We note that the 2006 Stipulated Settlement provides, in relevant part that, "Should the Los Angeles City Council approve at a future time an LAX Specific Plan Amendment, LAWA will be required to seek FAA review and approval of, at a minimum, changes to the LAX Airport Layout Plan. LAWA will seek such review and approval from FAA. FAA has made clear in its Record of Decision for the LAX Master Plan Program that any such future decision by the Los Angeles City Council to amend any aspect of the project approved in FAA's Record of Decision will require further review by FAA of the proposed changes and compliance with all applicable federal laws, including NEPA and the conformity requirements under the Clean Air Act."

Timing of Environmental Analysis. El Segundo is concerned that, to date, the SPAS process has taken much longer than envisioned in the 2006 Stipulated Settlement. *See* 2006 Stipulated Settlement § V(A) (commence study process within 60 days), § V(B) (good faith effort to select a contractor & prepare budget/scope of work for study within 6

months), Settlement Agreement § V(C) (good faith effort to complete study within 24 months). In order to comply with the Settlement Agreement, LAWA must proceed expeditiously with the EIR process.

Very truly yours,

SHUTE, MIHALY & WEINBERGER LLP

OSA L. WOLFF

Exhibit A: Petitioners' Overview of Guiding Principles for Environmental Analysis: LAX Specific Plan Amendment Study EIR

[P:\ELSEGUN\SPAS EIR\SPAS NOP\SPAS NOP Comment Letter (final).wpd]

Petitioners' Overview of Guiding Principles for Environmental Analysis: LAX Specific Plan Amendment Study EIR

Submitted by Petitioners: City of El Segundo, City of Inglewood, City of Culver City, County of Los Angeles, and Alliance for a Regional Solution to Airport Congestion (ARSAC).

Background: In January of 2005, Petitioners filed lawsuits challenging the approval of the LAX Master Plan Program and the associated Environmental Impact Report (EIR) prepared by Los Angeles World Airports (LAWA) under the California Environmental Quality Act (CEQA). These suits were resolved by a 2006 Stipulated Settlement between LAWA and Petitioners. In response to the Notice of Preparation (NOP) recently released by LAWA for the Specific Plan Amendment Study (SPAS) Draft EIR, Petitioners now jointly submit this overview of principles that should guide LAWA in that environmental review process. Petitioners will also submit detailed individual comments.

LAWA's Obligation to Avoid and Reduce Impacts to Surrounding Communities. As LAWA proceeds with refinement and analysis of options as part of the SPAS process, it must continually recognize its obligation to avoid and mitigate impacts to the communities that surround LAX. Options under consideration must be evaluated and ranked based on how they would impact the environment, public health and safety in surrounding communities (e.g., noise, air quality, traffic). All alternatives should be subject to a full and fair evaluation in the SPAS DEIR and LAWA should remain open to options that would avoid or mitigate impacts to its neighbors, taking care not to prematurely select a preferred alternative.

Continued Consultation with Surrounding Communities. The alternatives described in the SPAS NOP were developed and selected by LAWA during a lengthy consultation process with Petitioners. That consultation process grew out of the 2006 Stipulated Settlement, which states, in relevant part, that "An LAX Specific Plan Amendment Process Advisory Committee shall be created consisting of representatives of the City of Los Angeles, County of Los Angeles, El Segundo, Inglewood, Culver City, and ARSAC. LAWA shall consult with the Committee during each significant step of the LAX Specific Plan Amendment Process." Petitioners wish to recognize LAWA's compliance to date with this provision of the Stipulated Settlement. LAWA must now ensure that it continues to consult with Petitioners as the EIR process proceeds and the SPAS alternatives are developed in more detail. In particular, LAWA should take care to consult with Petitioners regarding the details and analysis of the alternatives supported by any Petitioner.

Extension of Gate Constraint. LAWA, FAA and the Petitioners all agree that limiting the number of gates at LAX will promote efficient passenger operations and encourage other airports in the Los Angeles basin to increase capacity to serve aviation demand. Accordingly, the long term success of the regional approach to serving aviation demand depends on maintaining appropriate gate constraints at LAX. The 2006 Stipulated Settlement between LAWA and the Petitioners limits the number of permissible gates at LAX to 163 and, commencing in 2010, requires LAWA to begin reducing the number of operating gates at LAX to 153. This settlement provision is operative through December 31, 2020. As part of the SPAS process, LAWA must analyze the continuation of the LAX gate constraints beyond 2020, as well as the possible

Exhibit A

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THE FOLLOWING IS FOR: Herb Glasgow, Senior Planner

FIRM/COMPANY NAME: City of Los Angeles, Los Angeles World Airports

DOCUMENT SENT: Letter dated June 17, 2008

COMMENTS:

FROM: Barbara E. Lichman, Ph.D.

NUMBER OF PAGES INCLUDING THIS COVER SHEET: 11

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DATE: June 17, 2008
ATTORNEY NAME: Barbara E. Lichman, Ph.D.
CLIENT/MATTER:
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enhancement of those constraints at a level that will efficiently serve up to 78.9 million annual passengers at LAX, while encouraging growth elsewhere in the region, including at the other airports owned and operated by LAWA.

Airfield Balance. In the NOP, LAWA indicates that under the LAX Master Plan, one of its goals is to "provide a better balance in operations between the North Airfield and the South Airfield." Petitioners support this goal and urge LAWA to conduct a full analysis of whether and to what extent each of the proposed SPAS alternatives would help achieve better airfield balance. Petitioners agree that total flight operation balance can lead to less operational crowding, which is good for all.

Regional Approach. Petitioners strongly support a regional approach to accommodating passenger and cargo aviation demand throughout Southern California. Because the area around LAX is fully developed, and because we must reduce vehicle miles traveled to improve air quality, decrease greenhouse gases, and increase productivity, a regional solution to serving aviation demand is essential. The regional approach, which is fully supported by the Southern California Association of Governments, must be a key component of everything LAWA does, including in the SPAS process. LAWA should vigorously pursue accommodating aviation demand at Palmdale and Ontario, and work aggressively with other airport operators and local governments to advance the regional approach.

DEIR Public Review Period. The NOP indicates that LAWA intends to provide just 45 days for public review and comment on the Draft SPAS EIR. In light of the complexity of this project and LAWA's tendency to produce lengthy CEQA documents, Petitioners anticipate that 45 days will not be sufficient.

character of the NOP. Cities therefore reserve their right to supplement these comments in response to future environmental documents.

Finally, Cities attach to these comments as Exhibit A "Petitioners' Overview of Guiding Principles for Environmental Analysis: LAX Specific Plan Amendment Study EIR" ("Guiding Principles"). Exhibit A represents the general approach to evaluation of the proposed development offered jointly by Petitioners in the case of *City of El Segundo, et al. v. City of Los Angeles, et al.*, Riverside County Superior Court Case No. RIC 426822, the settlement of which gave rise to the Project.

I. THE "TIERING" OF THE NOP ON THE "APPROVED MASTER PLAN" RESULTS IN IMPROPERLY ATTENUATED ENVIRONMENTAL REVIEW.

The NOP states that the SPAS EIR will be a Supplemental EIR tiered from the LAX Master Plan EIR (NOP, p.4), "providing new or revised analyses of the environmental impacts specific to the alternatives associated with the SPAS EIR..." LAWA, in its NOP for the Crossfield Taxiway Project (which was almost contemporaneous with the publication of this NOP), justified expedited environmental review on the premise that adequate environmental review was already completed during the prior Master Plan environmental review.

While the Legislature has directed local agencies to "tier" EIR's whenever feasible..., the utility of tiering is limited to those situations where the individual projects are consistent with the larger project such as the approved Master Plan project which has already been environmentally reviewed. "Tiering is a process by which agencies can adopt programs, plans, policies, or ordinances with EIRs focusing on the 'big picture' and can then use streamlined CEQA review for individual projects that are consistent with such...[first tier decisions]...." Koster v. County of San Joaquin, 47 Cal.App.4th 29, 36 (1996). [Emphasis added.]

Despite the fact that the "approved Master Plan" remains in place, many of its most salient features, such as off-site ticketing facility; closure of the CTA to surface traffic; and movement of Runway 6R/24L 340 feet to the south, thus necessitating the restructuring of Terminals 1 through 3, have been replaced by the Project currently being evaluating under this NOP. These radical changes significantly differ from the projects and environmental impacts originally evaluated in conjunction with the approved Master Plan. As an example, the proposed movement of Runway 6R/24L 340 feet north is a radical departure from the movement contemplated in the Master Plan, possibly impacting, among other things, the size and location of the noise contours and the Runway Protection Zone ("RPZ"). This change in preference, including the City of Los Angeles' decision to effectively eliminate the options of moving

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June 17, 2008

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Re: Notice of Preparation of Draft Environmental Impact Report (SCH No. 1997061047) - Los Angeles International Airport Specific Plan Study

Dear Mr. Glasgow:

The following are the comments of the Cities of Inglewood and Culver City ("Cities") concerning the Notice of Preparation ("NOP") for the Los Angeles International Airport ("LAX") Specific Plan Amendment Study ("SPAS"). The NOP commences the environmental review of the implementation of five development activities at LAX, including construction of the Ground Transportation Center ("GTC"), Automated People Mover ("APM") from the GTC to the Central Terminal Area ("CTA"), and associated on-site road improvements; demolition of Terminals 1, 2 and 3; and reconfiguration and separation of Runways 6L/24R and 6R/24L on the North Runway Complex (these activities, taken together will be referred to as "Project"). Cities regard the Project as a component of a more comprehensive expansion plan, including, but not limited to, construction of Midfield Satellite Terminal, a Crossfield Taxiway, and additional gates at the Tom Bradley International Terminal ("TBIT").

As a threshold issue, please be advised that Cities respond to Question No. 2, NOP, p. 2, as follows: neither City falls within the category of "responsible agency" or "trustee agency," as those terms are defined in 14 Cal.Code Regs. §§ 15096, 15381, and 15386.[1] Please be further advised that the following comments concerning significant environmental issues raised by the Project, alternatives and mitigation measures are necessarily preliminary, due to the attenuated

[1] CEQA's implementing regulations will be referred to throughout these comments as "CEQA Guidelines".

Runway 6R/24L 340 feet south, demolition of Terminals 1 through 3, and movement of passenger check-in off site, severely attenuates the previous attributes of Alternative D. Thus, it is questionable that the original Master Plan project, characterized as Alternative D, actually exists as an alternative for purposes of the environmental and development process.

In short, the significant differences between Alternative D, the "No Project/No SPAS Alternative (Approved Master Plan)," and the actual "No Project Alternative" raises the question of what is left of the original Master Plan, in terms of viable project alternatives, to make tiering an appropriate option. Given these circumstances, the Cities question the appropriateness of the "tiering" of the NOP projects upon the Master Plan EIR.

II. THE NOP'S PROJECT DEFINITION IS INCOMPLETE.

The five components of the Project being environmentally reviewed are apparently derived from the Stipulated Settlement between Petitioners in *El Segundo, et al. v. City of Los Angeles* ("Settlement"), § V which provides for "potential alternative designs, technologies, and configurations for the LAX Master Plan program that would provide solutions to the problems that the yellow light projects were designed to address consistent with a practical capacity of LAX at 78.9 million annual passengers (the 'Alternative Projects')." Stipulated Settlement, § V.D.2.

First, it should be noted that the Project's five components actually boil down to only two: (1) the North Airfield Reconfiguration; and (2) the proposed GTC. This is because the APM and onsite road improvements are necessitated by, and part and parcel of, the proposed GTC. It also appears, according to the description of the various components and their alternatives in the NOP, that the APM and onsite road improvements would only occur for the purpose of linking the GTC and CTA. Thus, if the GTC were not built (the existing condition), the ancillary transportation improvements would not occur either.

In addition, the options relating to the demolition of Terminals 1 through 3 are constrained to "yes" or "no". As there is no off-site ticketing facility proposed, as there was in Alternative D, there is, in reality, no "yes" option, because such an option would effectively obliterate 30% of the airport's terminal capacity, without any potential replacement.

Moreover, at least one of the two remaining components, the North Airfield Runway Reconfiguration, is inextricably linked to other projects either in planning or ongoing at LAX, but excluded from the NOP's current project definition. For example, it has long been conceded by LAWA that one of the principal purposes of the North Airfield Reconfiguration is to provide

sufficient runway separation to allow unencumbered access by New Large Aircraft ("NLA"), expected to begin service at LAX in 2010, and thereby to equalize operations between the two runway complexes. The Crossfield Taxiway Project, being evaluated concurrently but separately with this NOP, has substantially the same purpose, *i.e.*, to allow free access for NLAs and effective passage between the South and North Airfields (Crossfield Taxiway NOP, p. 4).

For purposes of CEQA review, a "project" is "the whole of an action which has potential for resulting in either a direct physical change to the environment or a reasonably foreseeable indirect change." CEQA Guidelines § 15378(a). "A public agency may not divide a single project into smaller individual projects in order to avoid its responsibility to consider the environmental impacts of the project as a whole." *Sierra Club v. Westside Irrigation District*, 128 Cal.App.4th 690, 698 (2005).[2]

Here, the synergistic impacts of the various projects is beyond question. The Crossfield Taxiway is a necessary component of access to and from the North Airfield with impacts that are not addressed in this NOP. Similarly, the new midfield satellite terminal, and the gate additions at the TBIT are intimately related to the changes in the North Airfield Complex, as the new, associated taxiway system appears to encourage expedited access from the North Airfield Complex, without which the North Airfield Complex would become a victim of the same airfield gridlock that LAWA now purports to foresee for the whole airport, if the Project is not implemented.

Although "where the second activity is independent of, and not a contemplated future part of, the first activity, the two activities may be reviewed separately, even though they may be similar in nature," *Sierra Club*, 128 Cal.App.4th at 699, *i.e.*, have independent utility, that circumstance does not exist here. Even now, the above specified projects are moving forward at the same time, toward a single, connected goal, the enhancement of the LAX airfield capacity, with particular emphasis on NLA serving the international market. It is therefore Cities' position that the various planned projects should be included in the Project Definition for the NOP and evaluated in the same EIR.

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[2] The National Environmental Policy Act, 42 U.S.C. § 4321, *et seq.*, ("NEPA"), under which this Project must also be reviewed in order for LAWA to obtain Federal funding for its implementation, further requires that the environmental analysis of multiple actions must be included in a single document "when the record raises 'substantial questions' about whether there will be 'significant environmental impacts' from the collection of anticipated projects." *Klamath-Siskiyou Wildlands Center v. BLM*, 387 F.3d 989, 999 (9th Cir. 2004).

III. THE EIR'S CUMULATIVE IMPACT ANALYSIS SHOULD AT MINIMUM INCLUDE ALL PROJECTS NOT INCLUDED IN THE SPAS.

Even if, for argument's sake, the myriad of projects currently planned or being implemented at LAX were not part of a larger project "the agency may prepare one EIR for all projects, or one for each project, but shall in either case comment upon the cumulative effect," CEQA Guidelines § 15165. "The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project, when added to other closely related past, present and reasonably foreseeable probable future projects." CEQA Guidelines § 15355.

It is beyond dispute that the complex of projects at issue in this NOP are "closely related" both to each other, as well as to other "present", or, at minimum, "reasonably foreseeable future" projects such as the Midfield Satellite Terminal and the Crossfield Taxiway. Their collective scope, however, requires more than a simple "comment". If the projects are not evaluated as part of the same project, substantially the same attention should be paid to their impacts in the cumulative impacts analysis. Absent the requisite attention to the collective effects of the myriad of projects that are or will shortly be implemented to enhance "throughput rate", *i.e.*, capacity, FAA Advisory Circular 150/5060-5, page 1, on the LAX airfield, the EIR will be inadequate.

IV. THE NOP FAILS TO ADDRESS SURFACE TRAFFIC IMPACTS RESULTING FROM THE PROJECT.

Cities are concerned about the Project's potentially significant impacts on surface traffic, not merely in areas immediately contiguous to LAX, but also on routes frequently traveled to get there. Cities are already suffering from the surface traffic generated by current operations, most, if not all, of which remains unmitigated. As passenger traffic and capacity at LAX increases, so does traffic on the surface streets and interstates (I-405, I-105) used to access it. As the traffic on the freeways becomes more congested, travelers exit these freeways seeking alternative routes which usually end up being the surface streets of Inglewood, Culver City and Westchester, in particular Sepulveda Blvd.(N/S) as far north as Slauson Ave. & Centinela Ave.; La Cienega (N/S) from Centinela to Imperial Highway; as well as Manchester and Century Blvds. (E/W) and Imperial Hwy. (E/W).

The proposed Project has the potential to cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system. It may easily exceed the level of service standard established by the county Congestion Management Agency for designated roads and highways; cause a substantial increase in hazards; and increase demand for

off-street parking. This increased surface traffic also has strong potential to adversely affect the infrastructure of the streets, as well as air quality, in neighborhoods in the proximity of the airport as well as throughout the region. Those impacts must be addressed in the EIR, not only because they are a direct result of the Project individually, but also because there will be additional contributions from other projects, "past, present and reasonably foreseeable" cumulatively.

In addressing such impacts, it is important that consideration is given to appropriate avoidance and mitigation measures that take into consideration the "actual" traffic patterns and impacts on the surface traffic in Cities and neighboring communities. Cities strongly urge LAWA to develop effective surface traffic mitigation such as that previously proposed in detail during the SPAS process, including, but not limited to, an additional off ramp on the northbound 405 freeway south of LAX ("Lennox off ramp") to offload traffic directly into the airport before it enters Culver City, and another off ramp on the south bound 405 freeway directly into the Manchester Square development. It appears the "Keep Access to CTA - Building Transportation Centers at Manchester Square and at Aviation/Imperial and Provide Drop Off/Pick Up Area East of Terminal 1" option, as part of the 100 feet to the North alternative takes traffic off the 405 freeway northbound, but not southbound. The Cities (and their consultants) are looking forward to working closely with LAWA on developing and implementing reasonable mitigation measures and alternatives to address surface traffic..

V. THE PROPOSED MOVEMENT OF RUNWAY 6L/24R 340 FEET NORTH HAS SIGNIFICANT CAPACITY AND NOISE ENHANCING POTENTIAL.

The NOP proposes an alternative that moves Runway 6L/24R 340 feet to the North, as well as an extension of approximately 1495 feet west, with the width increased by 50 feet, and a new Modified Group VI parallel center taxiway 520 feet south of relocated Runway 6L/24R and 520 feet north of Runway 6R/24L. The NOP suggests that the planned reconfiguration is designed to address safety issues, e.g., "reduce the risk of runway incursions, enhance the safety of aircraft operations at LAX, and provide a better balance in operations between the North Airfield and the South Airfield."

Leaving aside the obvious, that a firm conclusion on the runway reconfiguration's safety effects cannot be definitively determined until the North Airfield Safety Study, currently being conducted by LAWA, is completed and evaluated by the public, analyses performed by consultants on behalf of Cities already indicates that: (1) there exist numerous measures that are more efficient in effecting safety goals, such as improved runway lighting and marking, especially since only a small proportion of the total incursions and incidents at LAX occurred on the North Airfield; and (2) the proposed separation has significant capacity enhancing potential,

particularly that of allowing triple simultaneous arrivals to both the North and South Runway Complexes.

Moreover, the reconfiguration will likely affect the size and location of the noise contours, moving them north and east, beyond the scope of the relatively extensive 1992 noise contour used by LAWA for the determination of sound-mitigation construction funding for Inglewood. The reconfiguration may also displace overflights on approach to relocated Runway 6L/24R to the north, thereby bringing increased noise impacts, as well as air quality and other impacts not only to Inglewood, but to Culver City as well. Finally, the NOP gives little attention to the environmental impacts of the original impetus for the runway separation, *i.e.*, to accommodate the NLA which have a wing span of 262 feet and carry up to 800 passengers.

It should be noted that neither NOP Figure 5, nor Figure 11, fully depicts the configuration of the North Airfield, as both omit: (1) the displaced threshold intended for use on Runway 6L/24R, to ensure arrivals at the same runway point as on the current runway length; and (2) the Runway Protection Zones ("RPZ") for both runways. The latter are important because of the constraints on the use of the land that falls within them. Specifically, FAA regulations require that RPZ property belonging to the airport be kept largely clear of structures in order to "enhance the protection of people and property on the ground." FAA Advisory Circular 150/5300-13, § 212. Moreover, to the extent that property within other jurisdictions such as Westchester fall within the RPZ, the ALUCP for LAX may constrain the reuse of such property by its owners, California *Public Utilities Code* § 21675(a).

In summary, the proposed runway reconfiguration is potentially damaging to Cities. Cities have, instead, offered, in partnership with co-Petitioners El Segundo and ARSAC, and continue to support, the alternative which allows movement of Runway 6L/24R 100 feet to the north. (*See*, NOP, Figure 11). Petitioners offer this alternative in recognition of LAWA's need to facilitate operations on the airfield, but with the equivalent understanding that such improvement need not come at Petitioners' environmental expense. Movement of Runway 6L/24R 100 feet to the north will allow the same runway separation as now exists on the South Runway Complex, the current targeted recipient complex for all NLA traffic, which LAWA has deemed "safe" for that purpose. The 100 feet north alternative would, thus, allow precisely the same balance between the runway complexes as that articulated as a primary goal in the LAX Master Plan § 1.1, Goal 7, while, at the same time, providing environmental mitigation to surrounding communities.

In short, the alternative that allows movement of Runway 6L/24R 100 feet to the north offers LAWA the same benefits it sought for the South Complex, without either the adverse

impacts, or potential controversy that will unavoidably accompany the increased capacity, air and surface traffic, and environmental impacts attendant upon movement of Runway 6L/24R 340 feet to the north. Petitioners strongly urge that the alternative of moving Runway 6L/24R 100 feet to the north be adopted as the EIR's preferred alternative.

Cities appreciate this opportunity to comment and look forward to partnering with LAWA to implement a mutually acceptable and environmentally sensitive airport development.

Sincerely,

CHEVALIER, ALLEN & LICHMAN, LLP

Barbara Lichman

Barbara E. Lichman, Ph.D.

cc: Mayor Roosevelt Dorn, City of Inglewood
Timothy Wanamaker, City Manager, City of Inglewood
Cal Saunders, City Attorney, City of Inglewood
D. Scott Malsin, Mayor, City of Culver City
Jerry Fulwood, City Manager, City of Culver City
Carol Schwab, City Attorney, City of Culver City
Dave McCarthy, Deputy City Attorney, City of Culver City

Petitioners' Overview of Guiding Principles for Environmental Analysis: LAX Specific Plan Amendment Study EIR

Submitted by Petitioners: City of El Segundo, City of Inglewood, City of Culver City, County of Los Angeles, and Alliance for a Regional Solution to Airport Congestion (ARSAC).

Background: In January of 2005, Petitioners filed lawsuits challenging the approval of the LAX Master Plan Program and the associated Environmental Impact Report (EIR) prepared by Los Angeles World Airports (LAWA) under the California Environmental Quality Act (CEQA). These suits were resolved by a 2006 Stipulated Settlement between LAWA and Petitioners. In response to the Notice of Preparation (NOP) recently released by LAWA for the Specific Plan Amendment Study (SPAS) Draft EIR, Petitioners now jointly submit this overview of principles that should guide LAWA in that environmental review process. Petitioners will also submit detailed individual comments.

LAWA's Obligation to Avoid and Reduce Impacts to Surrounding Communities. As LAWA proceeds with refinement and analysis of options as part of the SPAS process, it must continually recognize its obligation to avoid and mitigate impacts to the communities that surround LAX. Options under consideration must be evaluated and ranked based on how they would impact the environment, public health and safety in surrounding communities (e.g., noise, air quality, traffic). All alternatives should be subject to a full and fair evaluation in the SPAS DEIR and LAWA should remain open to options that would avoid or mitigate impacts to its neighbors, taking care not to prematurely select a preferred alternative.

Continued Consultation with Surrounding Communities. The alternatives described in the SPAS NOP were developed and selected by LAWA during a lengthy consultation process with Petitioners. That consultation process grew out of the 2006 Stipulated Settlement, which states, in relevant part, that "An LAX Specific Plan Amendment Process Advisory Committee shall be created consisting of representatives of the City of Los Angeles, County of Los Angeles, El Segundo, Inglewood, Culver City, and ARSAC. LAWA shall consult with the Committee during each significant step of the LAX Specific Plan Amendment Process." Petitioners wish to recognize LAWA's compliance to date with this provision of the Stipulated Settlement. LAWA must now ensure that it continues to consult with Petitioners as the EIR process proceeds and the SPAS alternatives are developed in more detail. In particular, LAWA should take care to consult with Petitioners regarding the details and analysis of the alternatives supported by any Petitioner.

Extension of Gate Constraint. LAWA, FAA and the Petitioners all agree that limiting the number of gates at LAX will promote efficient passenger operations and encourage other airports in the Los Angeles basin to increase capacity to serve aviation demand. Accordingly, the long term success of the regional approach to serving aviation demand depends on maintaining appropriate gate constraints at LAX. The 2006 Stipulated Settlement between LAWA and the Petitioners limits the number of permissible gates at LAX to 163 and, commencing in 2010, requires LAWA to begin reducing the number of operating gates at LAX to 153. This settlement provision is operative through December 31, 2020. As part of the SPAS process, LAWA must analyze the continuation of the LAX gate constraints beyond 2020, as well as the possible

EXHIBIT A

enhancement of those constraints at a level that will efficiently serve up to 78.9 million annual passengers at LAX, while encouraging growth elsewhere in the region, including at the other airports owned and operated by LAWA.

Airfield Balance. In the NOP, LAWA indicates that under the LAX Master Plan, one of its goals is to "provide a better balance in operations between the North Airfield and the South Airfield." Petitioners support this goal and urge LAWA to conduct a full analysis of whether and to what extent each of the proposed SPAS alternatives would help achieve better airfield balance. Petitioners agree that total flight operation balance can lead to less operational crowding, which is good for all.

Regional Approach. Petitioners strongly support a regional approach to accommodating passenger and cargo aviation demand throughout Southern California. Because the area around LAX is fully developed, and because we must reduce vehicle miles traveled to improve air quality, decrease greenhouse gases, and increase productivity, a regional solution to serving aviation demand is essential. The regional approach, which is fully supported by the Southern California Association of Governments, must be a key component of everything LAWA does, including in the SPAS process. LAWA should vigorously pursue accommodating aviation demand at Palmdale and Ontario, and work aggressively with other airport operators and local governments to advance the regional approach.

DEIR Public Review Period. The NOP indicates that LAWA intends to provide just 45 days for public review and comment on the Draft SPAS EIR. In light of the complexity of this project and LAWA's tendency to produce lengthy CEQA documents, Petitioners anticipate that 45 days will not be sufficient.

Transportation Center. There should be sufficient capacity for bus layovers and bus stops to host the number and frequency of routes that are planned to serve the LAX area (including routes planned and operated by multiple service providers). Furthermore, any bus facilities should also include support facilities (such as passenger information and operator restrooms) and passenger waiting areas at least the equivalent size of the LAX City Bus Center.

A Traffic Impact Analysis (TIA), with highway, freeway, and transit components, is required under the State of California Congestion Management Program (CMP) statute. The CMP TIA Guidelines are published in the "2004 Congestion Management Program for Los Angeles County", Appendix D. The geographic area examined in the TIA must include the following, at a minimum:

5. All CMP arterial monitoring intersections, including monitored freeway on/off-ramp intersections, where the proposed project will add 50 or more trips during either the a.m. or p.m. weekday peak hour (of adjacent street traffic); and
6. Mainline freeway-monitoring locations where the project will add 150 or more trips, in either direction, during either the a.m. or p.m. weekday peak hour.

Among the required steps for the analysis of development-related impacts to transit are:

7. Evidence that in addition to Metro, all affected Municipal transit operators received the NOP for the Draft EIR;
8. A summary of the existing transit services in the area;
9. Estimated project trip generation and mode assignment for both morning and evening peak periods;
10. Documentation on the assumptions/analyses used to determine the number and percentage of trips assigned to transit;
11. Information on facilities and/or programs that will be incorporated into the development plan that will encourage public transit usage and transportation demand management (TDM) policies and programs; and
12. An analysis of the expected project impacts on current and future transit services along with proposed project mitigation.

Metro looks forward to reviewing the Draft EIR. If you have any questions regarding this response, please call me at 213-922-6908 or by email at chapmans@metro.net. Please send the Draft EIR to the following address:

Metro CEQA Review Coordination
One Gateway Plaza MS 99-23-2
Los Angeles, CA 90012-2952
Attn: Susan Chapman

Sincerely,

Susan Chapman
Program Manager, Long Range Planning

Metropolitan Transportation Authority
One Gateway Plaza
Los Angeles, CA 90012-2952
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Metro

June 5, 2008

Mr. Herb Glasgow, Senior City Planner
City of Los Angeles, Los Angeles World Airports
1 World Way, Room 218
Los Angeles, CA 90045

Dear Mr. Glasgow:

Thank you for the opportunity to comment on the Notice of Preparation (NOP) for the Los Angeles International Airport Specific Plan Amendment Study. This letter conveys recommendations from the Los Angeles County Metropolitan Transportation Authority (Metro) concerning issues that are germane to our agency's statutory responsibilities in relation to the proposed project.

Regarding the depiction of the Metro Green Line North Extension:

1. The alignment of the Metro Green Line Northern Extension shown within the SPAS documents differs from the alignment that Metro had environmentally cleared in a Final Supplemental Environmental Impact Report in 1994. To the extent that LAWA presents or proposes other alignments that are different from the previously cleared alignment for the SPAS, LAWA should acknowledge the difference and should establish that additional environmental review and clearance will be needed.

2. Metro supports the development of Transportation Centers that promote links between existing and future fixed guideway transit facilities and an Automated People Mover that connects with LAX's CTA. Metro especially supports the development of an intermodal transit hub as proposed within the Manchester Square Transportation Center (near the northeast corner of Aviation and Century Boulevards). This facility could serve multiple regional transportation facilities, including a future extension of the Metro Green Line as well as transit connections defined by the Crenshaw Corridor Transit Project (identified in the funded element of Metro's Draft 2008 Long Range Transportation Plan) that is currently being environmentally cleared and the Harbor Subdivision Alternatives Analysis studies, currently being advanced by Metro.

Regarding the Transportation Centers and Automated People Mover Connections to the Central Terminal Area (CTA):

3. Metro appreciates that all alternatives in the SPAS include a connection between the Transportation Centers and the CTA through either of the two APM alternatives – APM 1 with additional stations or APM 2. As long as there is a people mover connection, any combination of these alternatives would be acceptable.

Regarding the provisions for Bus Transit Centers within Transportation Center:

4. Metro recommends that connections to bus services be incorporated into the planning and design of Transportation Centers, especially the proposed Manchester Square Transportation Center (Aviation and Century Boulevards). As LAWA contemplates a relocation of the LAX City Bus Center, Metro recommends incorporating a bus transit center and transfer facility at the Manchester Square

The 2005 UWMP calls for increased water conservation continually through 2030, which is as far as the plan forecasts. Conservation goals are broken down in 5-year increments. By 2010, the plan calls for 5,000 acre-feet per year of additional water conservation savings.

In order to achieve the anticipated water conservation savings identified in the UWMP, all new construction associated with the Ground Transportation Center element included in your Notice of Preparation needs to include where applicable the standard water conserving measures and devices that are identified in this letter. Your assistance is necessary and appreciated to meet the required water conservation goals to ensure adequate water supplies for the future.

WATER CONSERVATION DEVICES AND MEASURES

- High efficiency toilets (1.28 gallons per flush or less, includes dual flush)
- High efficiency urinals (0.5 gallons per flush or less, includes waterless)
- Restroom faucet flow rate of 1.5 gallons per minute or less
- Public restroom self-closing faucets
- Showerhead flow rate of 2.0 gallons per minute or less
- Limit of one showerhead per shower stall
- High efficiency clothes washers (water factor of 6.0 or less)
- High efficiency dishwashers (Energy Star rated)
- Domestic water heating system located in close proximity to point(s) of use, as feasible; use of tankless and on-demand water heaters as feasible
- Cooling towers must be operated at a minimum of 5.5 cycles of concentration
- Require onsite water recycling systems for wastewater discharge for commercial laundries, dye houses, food processing, certain manufacturing operations, etc. (subject to a payback threshold of five years or less). Mandate water recycling system for all new car wash facilities.
- Strict prohibition of single-pass cooling
- Irrigation system requirements
  - Weather-based irrigation controller with rain shutoff
  - Flow sensor and master valve shutoff (large landscapes)
  - Matched precipitation (flow) rates for sprinkler heads
  - Drip/microspray/subsurface irrigation where appropriate
  - Minimum irrigation system distribution uniformity of 75 percent
  - Proper hydro-zoning, turf minimization and use of native/drought tolerant plant materials
  - Use of landscape contouring to minimize precipitation runoff
- Metering
  - All dwelling units/commercial spaces require individual metering and billing for water use
  - All irrigated landscapes of 5,000 square feet or more require separate metering or submetering
- Mandated use of recycled water (where available) for appropriate end uses (irrigation, cooling towers, sanitary)

Department of Water and Power the City of Los Angeles

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H. DAVID NAHAI,
Chief Executive Officer and General Manager

June 13, 2008

Mr. Herb Glasgow
Senior City Planner
Los Angeles World Airports
1 World Way, Room 218
Los Angeles, CA 90045

Dear Mr. Glasgow:

Subject: Notice of Preparation (NOP) of a Draft Environmental Impact Report for the Los Angeles International Airport Specific Plan Amendment Study (LAX SPAS) (State Clearinghouse Number 1997061047)

The Los Angeles Department of Water and Power (LADWP) is in receipt of your NOP dated March 12, 2008. LADWP appreciates the opportunity to provide input on the scope and content of the Environmental Impact Report as you begin the planning and environmental review process for the LAX SPAS project pursuant to the California Environmental Quality Act (CEQA).

One component of the CEQA Guidelines includes a public agency's duty to minimize environmental damage and balance competing public objectives. Water supply and availability is one public objective for which LADWP is accountable and as you are aware, water supply issues are of particular concern to LADWP. Last year, the City of Los Angeles (City) received the lowest rainfall on record, our own Los Angeles Aqueduct supply from the Eastern Sierra was at near record lows, and snowpack for the rest of California was also well below normal. In addition, a Federal Court ruling last year has resulted in reduced exports from the Delta to the State Water Project, the major source of supply to the Metropolitan Water District of Southern California, who we have increasingly relied upon to meet our water supply needs.

Continued development in the City of Los Angeles has generated concern of having sufficient water supplies to meet the increased needs. The LADWP Urban Water Management Plan (UWMP), last adopted in 2005, recognizes and accounts for periods of dry conditions and also anticipates both population growth and increased water demands. In light of the recent events, the LADWP has been undergoing a closer examination of what steps the City must take to ensure the water supply goals of the UWMP are achieved in order to have a sustainable water supply for the City.

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Water Saving Equipment or Programs for New Construction

Equipment Type	Water Efficient Standard	Program and Contact Information
High Efficiency (H.E.) Toilets – includes dual-flush	1.28 gallons/flush (gpf)	Commercial/Multifamily Water Conservation Rebate program ($50/each), call 1-877-728-2282 or www.ladwp.com/cwr
High Efficiency Urinals	0.5 gpf or less	Commercial/Multifamily Water Conservation Rebate program (from $200/each to $250 each), call 1-877-728-2282 or www.ladwp.com/cwr
Bathroom faucet aerators	1.5 gallons/minute (gpm), 1.0 gpm, or 0.5 gpm	Free water Conservation Equipment program, 10800-544-4498, press "0"
Public restroom self-closing faucets	self-closing	No rebate from LADWP
Limit of one showerhead per stall		N/A
Showerheads	2.0 gpm	Free water Conservation Equipment program, 10800-544-4498, press "0"
H.E. Residential Clothes Washers – inside of individual dwelling units	6.0 Water Factor (WF) or less	Consumer Rebate Program ($250/each) – call 1-800-374-2224 or www.ladwp.com/crp
H.E. Commercial Clothes Washers – in common areas or Laundromats	7.5 WF or less	Commercial/Multifamily Water Conservation Rebate program (from $200/each to $250 each), call 1-877-728-2282 or www.ladwp.com/cwr
H.E. Dishwashers	Energy Star	No rebate from LADWP
Domestic Hot Water Systems	Close Proximity to point(s) of use, as feasible; use of tankless and on-demand water heaters as feasible	No rebate currently given by LADWP
Cooling Tower Water Treatment – 5.5 Cycles of Concentration (COC) w/metering	pH treatment or equivalent	Commercial/Multifamily Water Conservation Rebate program ($3,000/ each pH Conductivity controller), 10877-728-2282 or www.ladwp.com/cwr. Additional monies may be available through the Technical Assistance Program. 1-800-544-4498 press "3" or http://www.ladwp.com
Strict prohibition of single-pass cooling		N/A
Weather-based irrigation controller (landscape 2,500 s.f. or more)	Weather-Based Irrigation controller using weather date wirelessly or from a weather sensor or sensors	Commercial/Multifamily Water Conservation Rebate program ($1,000 per acre controlled), call 1-877-728-2282 or www.ladwp.com/cwr
Flow Sensor and master valve shutoff (large landscapes)		No rebate currently given by LADWP

Matched precipitation (flow) rates for sprinkler heads		Potential rebates for rotator nozzles through the Commercial/Multifamily Water Conservation Rebate Program ($5/nozzle – 25 minimum purchase) call 1-877-728-2282 or www.ladwp.com/cwr
Drip/microspray/subsurface irrigation where appropriate		Potential rebates offered through the Technical Assistance Program of $1.50/1,000 gallons of water served/1st 2 years a project is in. Call 1-800-544-4498, press "3" or http://www.ladwp.com/ladwo/cms/ladwp001799.jsp

Water Saving Equipment or Programs for New Construction

Equipment Type	Water Efficient Standard	Program and Contact Information
Minimum irrigation system distribution uniformity	75%	Potential rebates offered through the Technical Assistance Program of $1.50/1,000 gallons of water served/1st 2 years a project is in. Call 1-800-544-4498, press "3" or http://www.ladwp.com/ladwo/cms/ladwp001799.jsp
Proper hydro-zoning, turf minimization and use of native/drought tolerant plant materials		Potential rebates offered through the Technical Assistance Program of $1.50/1,000 gallons of water served/1st 2 years a project is in. Call 1-800-544-4498, press "3" or http://www.ladwp.com/ladwo/cms/ladwp001799.jsp
Use of landscape contouring to minimize precipitation runoff		No rebate currently given by LADWP
All dwelling units/commercial spaces require individual metering and billing for water use		No rebate currently given by LADWP
All irrigated landscapes of 5,000 square feet or more require separate metering or submetering		No rebate currently given by LADWP
Mandated use of recycled water (where available)		No rebate currently given by LADWP
Standard Urban Storm Water Mitigation Plan		No rebate currently given by LADWP

For more information about any of the water conservation measures, please contact Lucia Alvelais, Water Conservation Manager, at (213) 367-2885 or lucia.alvelais@ladwp.com.

Please include LADWP in your mailing list and address it to the undersigned in Room 1044. We look forward to reviewing your environmental document for the proposed project. If there are any additional questions, please contact Ms. Nadia Dale of my staff at (213) 367-1745.

Sincerely,

Charles C. Holloway
Manager of Environmental Assessment

c: Nadia Dale
Lucia Alvelais

The document must clearly indicate why the relocation of runways would outweigh the need to preserve wetlands for the preservation of flora and fauna that were listed in the LAX Master Plan. The further reduction of rare or endangered species should be considered as part of this analysis. The analysis should also include additional Phase I and Phase II investigations of potential rare or endangered species that are located within a one mile area of the proposed GTC and APM routes. The introduction of nighttime lighting, noise, vehicle emissions, vibration, and stationary/mobile air quality impacts of the proposed APM and GTC could cause a marked reduction among rare or endangered species that reside in a one mile radius of the project area.

The document must contain a description of potential roadway surface damage that is likely to require repair in surrounding communities as a result of the use of the GTC and discuss the direct and indirect cost sustained by those communities to repair roadway surface damage and to make other roadway improvements to address the increased use of roadways.

The EIR must contain a description of potential public service impacts that may occur from location of the GTC near surrounding communities. The frequency of GTC staff and visitors to travel into adjacent communities should be examined to determine if added police and fire personnel are required to project and serve this additional "visitor" population. Are there inter-jurisdictional police and fire issues that would occur as a result of police pursuits or apprehensions or fire truck responses to bomb and fire events that take place as a result of GTC visitor use of surrounding community facilities?

The EIR cannot confine its analysis to the airport properties and the checklist must be broadened to consider the fiscal impact (beneficial or negative) that would occur to communities that border LAX that would support roadway traffic in and out of the GTC.

As noted above, there may be impacts pertaining to the automated people movers. The area of construction occurring along Century Boulevard may present specific impacts to traffic entering into the City of Inglewood. Traffic circulation issues in the Manchester Square area may also occur. The project would likely cause a traffic distribution pattern that differs significantly from current conditions and could result in land use, vehicle noise and traffic impacts for residential properties located near Century Boulevard.

The document fails to specifically indicate if the runway relocation(s) is/are likely to produce a shift to the noise contour.

From: Wanda J. Williams [mailto:wwilliams@cityofinglewood.org]
Sent: Thursday, June 19, 2008 3:29 PM
To: LAX Master Plan Stakeholder Liaison
Cc: Sheldon Curry
Subject: LAX Specific Plan Amendment Study

The City of Inglewood is forwarding the following comments regarding publication of the NOP/Initial Study for the LAX Specific Plan Amendment Study. In general, the City of Inglewood agrees with many of the categories that the checklist identifies as "potentially significant impact," however believes that additional categories will require a similar level of evaluation during preparation of the draft EIR. Please contact Wanda Williams, Planning Manager at (310) 412-5230 if you have questions regarding the below comments. Thank you for this opportunity to comment on the NOP/Initial Study and we look forward to reviewing and commenting further on the draft EIR.

Comments:

The EIR must consider that the design of one or more automated people movers (APM) and a defined ground transportation center (GTC) located outside of the central terminal area (CTA) requires an evaluation of homeland security issues related to deterring or detection of an attack before it occurs, the potential number of casualties that a terrorist attach would result in and the cost and level of delays to airport services caused by an attack. There have been more than 75 recorded attacks on airports since the 1980s, including detection and explosion of explosive devices. The reconfiguration of the airport to include the APM and GTC would likely increase the potential impact caused by a terrorist attack, since the passenger services would be centralized and the area of potential terrorist attack (two mile APM) would be increased by extending the area served by the airport terminals. Conversely, an attack at one terminal only would limit the potential number of casualties or impacted operations. While reconfiguration would reduce the potential for small vehicle bombs to enter into the CTA, a larger population would become at risk to small vehicle bombs in the GTC. The larger airport area served by the terminals would also require greater security patrolling and therefore require greater dedication of police and fire personnel. The two mile APM link would potentially increase the likelihood for terrorists or others to damage rail line(s) for the APM or to penetrate the APM cars with explosive devices such as Molotov cocktails, bullets, etc. The detonation of a car bomb or similar device packed with explosives and radioactive materials at the GTC would potentially cause destruction in a much larger area (extending five or more miles beyond the airport into the adjacent neighboring residential communities). The draft document must consider the potential to increase the number of persons subjected to a terrorist threat by creating a GTC, the potential for residents residing within a five mile or more radius to be affected by radioactive explosives and the potential for terrorists, gangs or others to cause damage to APM tracks or penetrate cars and cause damage to riders.

The EIR must also consider global warming and the impacts of emissions caused by the construction and operation of the alternative measures.

The Checklist should reflect the likelihood that destruction of buildings, APM cars and other death or injury to people caused by seismic ground shaking is a strong possibility due to the location of the GTC, CTA and APM to the Charnock Fault and the nearby Newport-Inglewood fault line. The document must clearly identify the potential number of people and structures that would be affected by a major event on either fault.

- Limitations on Avigation Easement requirement;
- Further environmental review of West Employee Parking Structure; and
- Study options for an LAX connection to the Green Line.

The NOP also makes clear that the 'Yellow Light' projects, to be given further study as part of the SPAS process, include:

- *Reconfiguration of the North Airfield;*
- *Demolition of Central Terminal Area (CTA) Terminals 1, 2 and 3;*
- *Provision for a Ground Transportation Center (GTC);*
- *Construction of an Automated People Mover (APM) linking the GTC and the CTA;* and
- *Construction of onsite roadways to provide access to the GTC and the CTA.*

Through numerous comment letters provided at each stage of the LAX Master Plan EIR/EIS review process, the County's primary areas of concern are well known to Los Angeles World Airports (LAWA).

With respect to the LAX Master Plan project, the County's concerns are as follows:

- *The need to **establish a long-term cap on operations at LAX;***
- *Affirmative steps to **expand the regional airport system** in tandem with expansion of LAX, so that long-term airport capacity limitations remain feasible as demand is met elsewhere;*
- *Project alternatives that would eliminate the **Ground Transportation Center,** coupled with the use of **Manchester Square** to address **Environmental Justice** concerns and neighborhood compatibility;*
- *Incorporation of **essential safety and security design features;***
- ***Fast-track transportation improvements** to remove airport traffic from local roadways; and*
- ***Compliance** with the terms of the Stipulated Settlement.*

Our comments in this letter focus only on issues of concern to the County, and do not attempt to address the suggested scope and focus outlined in other sections of the NOP. In addition, the County concurs with the other Petitioners in the Overview of Guiding Principles for Environmental Analysis, which the County submits with its comments (attached).

Within this context, the County offers the following comments and suggestions:

GENERAL COMMENT: The NOP states that: *"The SPAS EIR will be a Supplemental EIR that is tiered from the LAX Master Plan EIR . . ."* NOP, p. 4. The County notes that, based upon the Project Description, tiering from the LAX Master Plan EIR would not be appropriate pursuant to California Public Resources Code section 21094 because the proposed project: (1) is not consistent with the LAX Master Plan as it proposes major changes to the approved LAX Master Plan (e.g., markedly different runway configurations, no elimination of terminals 1-3, no Ground Transportation Center (GTC), etc.); (2) is not consistent with applicable local land use plans as the approved LAX Master Plan was found to be inconsistent with the County's Comprehensive Airport Land

County of Los Angeles
CHIEF EXECUTIVE OFFICE
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WILLIAM T FUJIOKA
Chief Executive Officer

Board of Supervisors
GLORIA MOLINA
First District
YVONNE B. BURKE
Second District
ZEV YAROSLAVSKY
Third District
DON KNABE
Fourth District
MICHAEL D. ANTONOVICH
Fifth District

June 30, 2008

Herb Glasgow
Senior City Planner
Los Angeles World Airports
1 World Way, Room 218
Los Angeles, CA 90045

Dear Mr. Glasgow:

**COMMENTS ON BEHALF OF COUNTY OF LOS ANGELES:
NOTICE OF PREPARATION OF DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE LOS ANGELES INTERNATIONAL AIRPORT SPECIFIC PLAN AMENDMENT STUDY
(SCH NO. 1997061047)**

The County of Los Angeles (County) has reviewed the Notice of Preparation (NOP) of a Draft Environmental Impact Report (DEIR) for the Los Angeles International Airport (LAX) Specific Plan Amendment Study (SPAS) dated March 12, 2008. Our comments on the NOP are presented herein. In keeping with requirements of the California Environmental Quality Act (CEQA) and the NOP, our comments focus on the significant environmental issues, reasonable alternatives, and mitigation measures that should be addressed in the forthcoming DEIR.

In response to Question No. 2 of the NOP on page 2, the County's Airport Land Use Commission may be a responsible agency for the proposed project, and the County may be a responsible agency to the extent the project, as approved, requires modifications to storm drain facilities within the jurisdiction of the County or proposes traffic mitigation to roadways or intersections within the jurisdiction of the County.

As a signatory to the Stipulated Settlement Agreement (Stipulated Settlement), the County appreciates the NOP acknowledgement that relevant provisions contained in that Stipulated Settlement are intended to be addressed as part of the SPAS process. Very briefly, the Stipulated Settlement contains the following provisions:

- Passenger Gate Provisions generally limiting LAX gate capacity;
- Specific Plan (SP) Amendment Study Process including preparation of the SP Amendment Study;
- Funding of Mitigation Measures including funding of Aircraft Noise and Air Quality Mitigation measures;
- Creation of a Regional Airport Working Group;
- Regional Strategic Planning initiative to encourage expanded passenger and cargo use of Ontario and Palmdale airports;
- Outreach to Airport Neighbors;

Use Plan (CLUP) and consistency of the proposed project has not been determined; and (3) substantial changes are proposed in the project which will require major revisions of the environmental impact report, making Public Resources Code section 21166 applicable. Further, the County calls into question the appropriateness of even a supplemental EIR since, in contravention of CEQA Guideline 15163, much more than *minor additions or changes* appear to be necessary, based upon the NOP, to make the previous EIR adequately apply to the proposed project.

In addition, the adopted LAX Master Plan is based on a fundamentally flawed Final EIS/EIR and environmental review process, subject to numerous legal challenges, including the County's lawsuit. The earlier document should not be used as the basis for concluding that issues have previously been examined, and therefore, do not need to be examined in the forthcoming EIR. The County specifically requests that the forthcoming DEIR *not rely on any portion of the Draft and Final EIS/EIR that was challenged by the County in comment letters leading to the Stipulated Settlement,* including letters dated June 2001, October 2003, May 2004, and August 2004. The County hereby incorporates these earlier comment letters by reference.

SAFETY AND SECURITY: The NOP recognizes the need to evaluate essential safety and design requirements in its discussion under Initial Study §VII (Hazards and Hazardous Materials): *"The airport plan adopted as part of the LAX Master Plan was designed in light of safety and security considerations resulting from the terrorism events of September 11, 2001. As required by the LAX Master Plan Stipulated Settlement, the LAX SPAS will include evaluation of security considerations, which will be reflected in the LAX SPAS EIR."* As part of this forthcoming analysis, the County submits the following requests:

→ The EIR analysis should describe the way in which the security program will be designed to protect the safety and welfare of neighborhoods surrounding LAX.

TRANSPORTATION: With respect to transportation, the NOP recognizes that the LAX SPAS alternatives may result in *"new or substantially different/increased transportation impacts than addressed in the LAX Master Plan EIR"* and so proposes to evaluate significant transportation impacts that were not addressed in the LAX Master Plan EIR. As part of that analysis, the County requests that the scope and focus include the following information:

→ The analysis of new airport peak hour trips should include all vehicle trips on all traffic lanes at key intersections utilized to access the airport. Truck trips should be converted to Passenger Car Equivalents (PCE) when calculating the net new airport peak hour vehicle trips at key intersections. The DEIR should clearly identify how the increase in annual passengers at LAX has been measured, and delineate the criteria used for predicting these increases.

→ If the Lennox interchange is retained as a mitigation measure, the County requests that the DEIR review its relationship to the circulation system east and west of the I-405 and evaluate reconfiguration of the road system in this area after the interchange is completed.

→ The forthcoming DEIR should include a complete inventory of available parking spaces (airport owned and off-airport) and specify the location of future vehicle parking areas to accommodate all additional air passenger demands through build-out.

→ Section V.G. of the Stipulated Settlement, requiring consultation with all affected local jurisdictions regarding potential traffic impacts, consideration of additional intersections/roadways identified by the Petitioners, and proposal of feasible mitigation measures to mitigate potentially significant impacts, must be fully complied with.

LAND USE PLANNING: In response to the Initial Study discussion of Land Use Planning (§IX.b. on page A-17), the County notes that on August 25, 2004, the County's Airport Land Use Commission (ALUC) determined that the LAX Master Plan was inconsistent with the CLUP on several grounds, including that it results in negative noise and safety impacts on a significantly different population than was assumed by the 1991 CLUP (which was overruled by the City Council on December 7, 2004) and that the proposed project will also need to be reviewed by ALUC for a determination of consistency.

CAPACITY LIMITATIONS: The NOP makes frequent reference to the requirement that the Yellow Light projects were developed within the framework of a practical capacity of LAX at 78.9 million air passengers (MAP). However, the Initial Study discussion of Population and Housing (§XII on page A-19) concludes that although the proposed project evaluates alternative configurations of certain facilities, the project does not include residential or business development and, therefore, would not directly induce population growth. This analysis goes on to state that the planning framework is such that the alternatives would not exceed a practical capacity of 78.9 MAP, and the projected cargo activity would:

"*...remain the same as that under the approved LAX Master Plan (3.1 million air tons). The LAX Master Plan EIR addresses the growth implications associated with the cargo and passenger activity levels and concludes that the Master Plan would not induce substantial growth. Based on the comparable levels of passenger and cargo activity, it is not expected that the growth implications associated with operation of the LAX SPAS alternatives would be materially different than those previously addressed in the LAX Master Plan EIR. Similarly, the LAX Master Plan does not involve the expansion or extension of infrastructure into the under-developed or undeveloped areas. Thus, the proposed project is not anticipated to result in substantial direct or indirect growth in population or housing, and no mitigation measures are required. As such, this issue does not require any further analysis in the LAX SPAS EIR.*"

→ The County has consistently noted the absence of data to support stated passenger service levels at LAX, suggesting that the Master Plan may not in fact constrain growth at LAX. Moreover, the external constraints represented by the Stipulated Settlement will not constrain growth past 2020. It is, therefore, incumbent upon LAWA to create and analyze the MAP growth projections that will result as part of the SPAS EIR process. The County regards this obligation as an essential element of the forthcoming DEIR process.

→ To provide a level of confidence that the Master Plan and SPAS will develop reasonable estimates for passenger service, the County requests that projections be updated as part of a transparent analysis of the capacity of the existing facilities.

→ To establish more effective limitations on incremental growth at LAX, the County requests that the forthcoming DEIR provide a clear statement of the levels of passenger service that would be accommodated by the Master Plan and all alternatives to be studied, including from any physical improvements or operational use of the open concrete areas (remote gates).

→ The County requests that the forthcoming DEIR provide a procedure for monitoring total cargo activity at LAX, including nighttime flights and 24-hour cargo delivery trip counts to monitor cargo-related ground transportation.

STRATEGIC REGIONALIZATION: The NOP makes *no* mention of LAWA's obligation, under the Stipulated Settlement, to spearhead efforts to achieve a regional distribution of air traffic demand.

→ Since regionalization is essential to the successful accomplishment of a long-term cap on operations at LAX, the County requests that this topic be thoroughly examined as part of the forthcoming DEIR.

MANCHESTER SQUARE: The County notes that LAWA currently proposes to examine three alternatives for Manchester Square, including: (a) construction of the GTC at Manchester Square with closed access to the CTA, (b) construction of transportation centers at Manchester Square and Aviation/Imperial with continued private vehicle access to the CTA, and (c) construction of transportation centers at Manchester Square and Aviation/Imperial with a new drop-off and pick-up area east of Terminal 1 and continued private vehicle access to the CTA.

The impacts associated with GTC construction at Manchester Square have been a consistent concern to the County, as expressed in most of the County's comment letters thus far submitted. This neighborhood already experiences numerous Environmental Justice concerns as a result of the disproportionate noise impacts resulting from aircraft overflights and increased vehicle traffic, as well as increased traffic congestion, associated impacts on air quality, and increased cancer health risk associated with Toxic Air Contaminants (TACs). All of these serious environmental impacts would have the potential to disproportionately impact the minority populations in Census Tracts 6014.02

and 2772.00 located immediately east and west of Manchester Square. The primary source of TACs is vehicle traffic, construction equipment, and airport ground services support equipment.

Although the Initial Study claims in §IX (Land Use and Planning) that *"no land use acquisition or new facilities are proposed that would physically divide an established community,"* the impacts of GTC construction in Manchester Square would in fact cause increased fragmentation of the community in neighborhoods east of the airport and the I-405 freeway as a result of the inevitable migration of airport ground services east into the Manchester Square area. The associated traffic congestion would create further barriers to pedestrian and local traffic movement.

→ The County requests that the forthcoming DEIR examine, as part of this alternative or another scenario, the use of Manchester Square as a mitigation site to address Environmental Justice concerns and neighborhood compatibility. Consideration should be given for a project that promotes commercial, industrial and public service land uses needed to pull together the fractured and alienated community surrounding the airport.

In closing, the County affirms the importance of LAX to this region and again recognizes the pressing need for improvements to ensure the safety, security and comfort of future air travelers. However, the County strongly cautions LAWA against use of the Master Plan EIR as a framework for the forthcoming SPAS EIR. We ask that LAWA consider not only the specific comments contained herein, but also the underlying concerns reflected in County comment letters submitted over the past seven years (all incorporated by reference herein) and, more broadly, in the language of the Stipulated Settlement. Your consideration of these comments is greatly appreciated.

Questions can be directed to Jerry Ramirez in this Office at 213.974.4282 or Tom Faughnan in County Counsel at 213.974.1887.

Sincerely,

WILLIAM T FUJIOKA
Chief Executive Officer

WTF:ES
MKZ:pg

Attachment

c: Each Supervisor
County Counsel
Acting Director of Public Works

Extension of Gate Constraint. LAWA, FAA and the Petitioners all agree that limiting the number of gates at LAX will promote efficient passenger operations and encourage other airports in the Los Angeles basin to increase capacity to serve aviation demand. Accordingly, the long term success of the regional approach to serving aviation demand depends on maintaining appropriate gate constraints at LAX. The 2006 Stipulated Settlement between LAWA and the Petitioners limits the number of permissible gates at LAX to 163 and, commencing in 2010, requires LAWA to begin reducing the number of operating gates at LAX to 153. This settlement provision is operative through December 31, 2020. As part of the SPAS process, LAWA must analyze the continuation of the LAX gate constraints beyond 2020, as well as the possible enhancement of those constraints at a level that will efficiently serve up to 78.9 million annual passengers at LAX, while encouraging growth elsewhere in the region, including at the other airports owned and operated by LAWA.

Airfield Balance. In the NOP, LAWA indicates that under the LAX Master Plan, one of its goals is to "provide a better balance in operations between the North Airfield and the South Airfield." Petitioners support this goal and urge LAWA to conduct a full analysis of whether and to what extent each of the proposed SPAS alternatives would help achieve better airfield balance. Petitioners agree that total flight operation balance can lead to less operational crowding, which is good for all.

Regional Approach. Petitioners strongly support a regional approach to accommodating passenger and cargo aviation demand throughout Southern California. Because the area around LAX is fully developed, and because we must reduce vehicle miles traveled to improve air quality, decrease greenhouse gases, and increase productivity, a regional solution to serving aviation demand is essential. The regional approach, which is fully supported by the Southern California Association of Governments, must be a key component of everything LAWA does, including in the SPAS process. LAWA should vigorously pursue accommodating aviation demand at Palmdale and Ontario, and work aggressively with other airport operators and local governments to advance the regional approach.

DEIR Public Review Period. The NOP indicates that LAWA intends to provide just 45 days for public review and comment on the Draft SPAS EIR. In light of the complexity of this project and LAWA's tendency to produce lengthy CEQA documents, Petitioners anticipate that 45 days will not be sufficient.

ATTACHMENT

Petitioners' Overview of Guiding Principles for Environmental Analysis: LAX Specific Plan Amendment Study EIR

Submitted by Petitioners: City of El Segundo, City of Inglewood, City of Culver City, County of Los Angeles, and Alliance for a Regional Solution to Airport Congestion (ARSAC)

Background: In January of 2005, Petitioners filed lawsuits challenging the approval of the LAX Master Plan Program and the associated Environmental Impact Report (EIR) prepared by Los Angeles World Airports (LAWA) under the California Environmental Quality Act (CEQA). These suits were resolved by a 2006 Stipulated Settlement between LAWA and Petitioners. In response to the Notice of Preparation (NOP) recently released by LAWA for the Specific Plan Amendment Study (SPAS) Draft EIR, Petitioners now jointly submit this overview of principles that should guide LAWA in that environmental review process. Petitioners will also submit detailed individual comments.

LAWA's Obligation to Avoid and Reduce Impacts to Surrounding Communities. As LAWA proceeds with refinement and analysis of options as part of the SPAS process, it must continually recognize its obligation to avoid and mitigate impacts to the communities that surround LAX. Options under consideration must be evaluated and ranked based on how they would impact the environment, public health and safety in surrounding communities (e.g., noise, air quality, traffic). All alternatives should be subject to a full and fair evaluation in the SPAS DEIR and LAWA should remain open to options that would avoid or mitigate impacts to its neighbors, taking care not to prematurely select a preferred alternative.

Continued Consultation with Surrounding Communities. The alternatives described in the SPAS NOP were developed and selected by LAWA during a lengthy consultation process with Petitioners. That consultation process grew out of the 2006 Stipulated Settlement, which states, in relevant part, that "An LAX Specific Plan Amendment Process Advisory Committee shall be created consisting of representatives of the City of Los Angeles, County of Los Angeles, El Segundo, Inglewood, Culver City, and ARSAC. LAWA shall consult with the Committee during each significant step of the LAX Specific Plan Amendment Process." Petitioners wish to recognize LAWA's compliance to date with this provision of the Stipulated Settlement. LAWA must now ensure that it continues to consult with Petitioners as the EIR process proceeds and the SPAS alternatives are developed in more detail. In particular, LAWA should take care to consult with Petitioners regarding the details and analysis of the alternatives supported by any Petitioner.

connections to the ITC. Please advise Caltrans regarding the status of these new proposed freeway connections, which were previously submitted to Caltrans for review and approval.

Since LAX is considered to be a significant trip generator and a major activity center for the Southern California region, Caltrans' involvement in the preparation and development of the traffic study will be critical in identifying project related transportation impacts. Mainline freeway, freeway-to-freeway interchanges and freeway ramp analyses will be needed for the I-405 and I-105 Freeways regarding traffic impacts caused by buildout of the GTC and ITC facilities. A "Select Link" analysis for SR-1, I-105 and I-405 State facilities will be needed for the Specific Plan. The Select Link analysis will need to analyze project traffic upstream and downstream of LAX extending to the north, east and south of LAX. The analysis may include additional highway facilities such as Interstate 10 (I-10) Santa Monica Freeway, US-101 Ventura Freeway, Interstate 110 (I-110) Harbor Freeway and affected local streets.

All inbound and outbound traffic bottlenecks will need to be identified including mitigation measures. Caltrans is especially concerned about the operations of off-ramps and potential queues that may occur with queues backing up onto the mainline freeway lanes. Mitigation measures will be needed if queue lengths are anticipated to backup onto the mainline freeway lanes.

The alignment of the Automated People Mover (APM) will need to be fully discussed including crossings at State Route 1 (SR-1) Sepulveda Boulevard.

A traffic study will be needed to evaluate the overall impact of the buildout of the Specific Plan on the State Transportation System. We recommend the use of the Highway Capacity Manual (HCM) methodology in analyzing mainline freeways, freeway interchanges, freeway ramps and intersections. The traffic study should include, but not be limited to:

Trip generation, trip distribution, mode split, and traffic assignment.

Traffic volumes and level-of-service (LOS) calculations will be needed for major intersections and for affected freeway on/off-ramps. Seasonal and weekend variations in traffic should also be considered. We recommend the use of HCM 2000 for level-of-service calculations. The traffic analysis will need to include:

- Existing year traffic volumes for AM, PM and for any other peak periods; level-of-service (LOS) calculations for the mainline freeways and ramp intersections; and average daily trips (ADT)
- Project traffic volumes for AM, PM and for any other peak periods; level-of-service (LOS) calculations for the mainline freeways and ramp intersections; and average daily trips (ADT)
- Cumulative traffic volumes for all approved developments in the area including AM, PM and any other peak periods; level-of-service (LOS) calculations for the mainline freeways and ramp intersections; and average daily trips (ADT)
- Project plus cumulative traffic volumes including AM, PM and any other peak periods; level-of-service (LOS) calculations for the mainline freeways and ramp intersections; average daily trips (ADT)

We recommend that the lead agency refer to the Caltrans Guide for the Preparation of Traffic Impact Studies on the internet at:

www.dot.ca.gov/hq/traffops/developserv/operationalsystems/reports/tisguide.pdf

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY ARNOLD SCHWARZENEGGER, Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 7, OFFICE OF PUBLIC
TRANSPORTATION AND REGIONAL PLANNING
IGR/CEQA BRANCH
100 SOUTH MAIN STREET
LOS ANGELES, CA 90012
PHONE (213) 897-6696
FAX (213) 897-1337

Flex your power!
Be energy efficient!

July 7, 2008

IGR/CEQA NOP CS/080358
Los Angeles International Airport Specific Plan Amendment Study
Vic. LA-1-(26.00-28.71), SCH# 1997061047

Mr. Herb Glasgow
City of Los Angeles
Department of Airports
1 World Way, Room 218
Los Angeles, CA 90045

Dear Mr. Glasgow:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the Notice of Preparation (NOP) for the Los Angeles International Airport (LAX) Specific Plan Amendment Study. LAX is located along State Route 1 (SR-1) Sepulveda Boulevard/Lincoln Boulevard and just north of Interstate 105 (I-105) Glenn Anderson/Century Freeway and west of Interstate 405 (I-405) San Diego Freeway. Based on the information received, we have the following comments:

Caltrans is the responsible agency in respect to the overall operation of State Highway facilities and is a commenting agency under CEQA. In consultation with local agencies, Caltrans provides guidance regarding the parameters and methodologies for the preparation of traffic impact studies. Establishing requirements for the traffic study early in the planning process can eliminate potential delays.

Caltrans is the responsible agency in respect to any modifications to the State transportation system. Any work to be performed within the State Right-of-way that is expected to cost over $1 million will need a Caltrans Project Initiation Document (PID)/Project Study Report (PSR). Caltrans Encroachment Permits will be needed for any work to be performed within the State Right-of-way.

Reconfiguration of the north airfield that may extend runways to the east and may cross over State Route 1 (SR-1) Sepulveda Boulevard/State Route 1 (SR-1) Lincoln Boulevard will need to be reviewed and approved by Caltrans. We recommend that the City initiate relinquishment proceedings to turn over control of State Route 1 (SR-1) Sepulveda Boulevard/Lincoln Boulevard from the State to the City. The relinquishment at a minimum should include the portion from I-105 Freeway/Sepulveda Boulevard to Lincoln Boulevard/La Tijiera Boulevard.

It appears that the NOP did not mention access to the Ground Transportation Center (GTC) and Intermodal Transportation Center (ITC) via new access points from adjacent freeway facilities. The Master Plan included new freeway interchanges from the I-405 Freeway at Lennox Boulevard with connections to the GTC and from the I-105 Freeway at Imperial Highway to Aviation Boulevard with

Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: 6/7/08

Name: Janet O'Donnell

Organization:

Address: 8034 Alverstone Ave Westchester

Comment:

Appreciate the meeting, but I find it difficult to believe or trust the LAX improv. Group. As was pointed out in our meeting - your beautiful brochure conveniently completely omits the impact on Westchester. You never address Destruction. I feel like I am in a Con game - You see improvements to Downtown Westchester & hold "land use" mtg for us & really don't care as you already have an agenda - I do not want the airport to expand North I wish this was ORANGE County & we could vote to turn it into a park. Why can't we start with the least intrusive and least costly - i.e. more air traffic controllers & better lighting and warning system, than

Please drop the completed form into the box marked "COMMENTS" or mail to:
Mr. Herb Glasgow
Senior City Planner
Los Angeles Worlds Airports
1 World Way, Room 218
Los Angeles, CA 90045
All comments must be received no later than Wednesday, June 18, 2008.

Traffic projections will need to include forecasted trips based on buildout of the Master Plan and SpecificPlan and future year 2030 traffic projections. Transportation models utilized for the Traffic Impact Analysis will need to be consistent with SCAG's Travel Demand Model.

Any traffic mitigation measures to relieve traffic impacts will need to include:

- Financing
- Scheduling considerations
- Implementation responsibilities
- Monitoring Plan

The equitable share responsibility for traffic mitigation measures will need to be calculated as determined by the percentage increase in projected peak period trips resulting in operational impacts to State Highways. LAWA should refer to Appendix "B" Methodologies for Calculating Equitable Mitigation Measures found in our Caltrans Guide for the Preparation of Traffic Impact Studies.

Consultation between the lead agency, Caltrans, and those involved in the preparation of the traffic impact study will be needed to establish what data and assumptions will be necessary for the study. We also invite LAX officials as well as LAX traffic consultants to discuss with Caltrans any highway impacts resulting in the buildout of LAX Specific Plan facilities and the need for appropriate traffic mitigation measures involving the State Transportation System.

We recommend that construction related truck trips on State Highways be limited to off-peak commute periods. Transport of over-size or over-weight vehicles on State highways will need a Caltrans Transportation Permit.

A Stormwater Management Plan will be needed for the project to control pollution and manage stormwater runoff. Best Management Practices will need to be implemented to reduce the discharge of pollutants to storm drainage systems.

If you have any questions regarding our comments, you may reach me at (213) 897-6696 or contact IGR/CEQA Coordinator: Carl Shiigi at (213) 897-1726 and please refer to our record number 080358/CS.

Sincerely,

Elmer Alvarez

ELMER ALVAREZ
IGR/CEQA Program Manager
Office of Regional Planning

cc: Scott Morgan, State Clearinghouse

Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: May 7 2008

Name: Karen Mollesm

Organization: self

Address: 237 Rees St. Playa del Rey

Comment:

I support a regional solution to LA's airport situation. I would ask that money be spent on improving other airports that are not close to population centers. Moving the north runway will not solve the problem of incursions. There are other appropriate solutions that do not involve moving the runways. Incursions are due to human error, not to airport configuration.

Traffic congestion + pollution is → (over)

Please drop the completed form into the box marked "COMMENTS" or mail to:
Mr. Herb Glasgow
Senior City Planner
Los Angeles Worlds Airports
1 World Way, Room 218
Los Angeles, CA 90045
All comments must be received no later than Wednesday, June 18, 2008.

Los Angeles World Airports

COMENTARIO ESCRITO

REPORTE DE IMPACTO AMBIENTAL DEL ESTUDIO DE ENMIENDA AL PLAN ESPECÍFICO DE LAX
REUNIÓN PÚBLICA DE ÁMBITO

Por favor use letra de molde.

Fecha: _____

Nombre: _____

Organización: _____

Domicilio: _____

Comentario:

We can meet again if this is not effective. N.Y. & Chicago have more than one airport. — I don't think you take terrorism seriously enough. Instead of using millions of dollars of taxes to fund studies - why not look for a new site & build the state of the art airport you seem to want but can't find the right shoe horn to fit it in here? If people want to come to LA they will buy a ticket on a plane come to LA. Even if it isn't an Airbus - which by the way was able to land at the unimproved LAX - and managed to leave! If the first plan stays in the current boundries & the new terminal takes the load off of Sepulveda, that is acceptable if you won't move & hide to do something

Por favor complete y deje el formulario en la caja marcada "COMENTARIOS" o envíelo por correo a:
Mr. Herb Glasgow
Senior City Planner
Los Angeles Worlds Airports
1 World Way, Room 218
Los Angeles, CA 90045

Todos los comentarios tienen que ser recibidos a más tardar el miércoles, 18 de junio del 2008.

Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: May 7, 2008

Name: Tonia Mahoney

Organization: _____

Address: Playa Del Rey

Comment:
Having conducted over 100 public hearings over 30 years the lesson is very clear: The public will forever be slowly + methodically crushed - time + time again by politicians (who campaign on a "no change at LAX" platform) + Business interests come to speak + "solicit" public input.
The better to ignore it. Or change the process, or the agenda to build with a new plan + replacing it with another. Slowly the public will, wilts + the battle is won by vested interests - be they political, professional or monetary.
Other countries have a more direct method: they

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Los Angeles World Airports

COMENTARIO ESCRITO

REPORTE DE IMPACTO AMBIENTAL DEL ESTUDIO DE ENMIENDA AL PLAN ESPECÍFICO DE LAX
REUNIÓN PÚBLICA DE ÁMBITO

Por favor use letra de molde.

Fecha: _____

Nombre: _____

Organización: _____

Domicilio: _____

Comentario:

→ a major problem + I don't see that this will be made better by any of the proposed solutions. People in other parts of the city can go to other airports more easily than having everyone funneled to the west side to fly.
Noise pollution from the airport is also a nuisance + a health hazard.
It is my understanding that the FAA sets the # of flights in + out of LAX so the number of 78+ million as a cap is meaningless in my view. Thank you.
Karen Hillis

Por favor complete y deje el formulario en la caja marcada "COMENTARIOS" o envíelo por correo a:
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Senior City Planner
Los Angeles Worlds Airports
1 World Way, Room 218
Los Angeles, CA 90045

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Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: May 7, 2008

Name: Nancy-Gene W. MORRISON

Organization:

Address: 6350 W. 81st Street, LA 90045

Comment: No mention of Sepulveda Blvd. in the presentation and in looking at the material handed out, it appears that it just stops in all illustrations. What are the plans for Sepulveda Blvd?

thank you.

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Los Angeles World Airports

COMENTARIO ESCRITO

REPORTE DE IMPACTO AMBIENTAL DEL ESTUDIO DE ENMIENDA AL PLAN ESPECÍFICO DE LAX
REUNIÓN PÚBLICA DE ÁMBITO

Por favor use letra de molde.

Fecha:

Nombre:

Organización:

Domicilio:

Comentario: Skip the pretenses + just take the land.

Por favor complete y deje el formulario en la caja marcada "COMENTARIOS" o envíelo por correo a:

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Senior City Planner
Los Angeles Worlds Airports
1 World Way, Room 218
Los Angeles, CA 90045

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Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: 7 May 2008

Name: Robert A Young

Organization: SoLA

Address: 6410 W. 80th Place, Los Angeles, CA 90045

Comment: In the interest of both air and ground traffic relief, LAWA should consider relocation of all major air freight to alternate airports. The location of air freight should be concentrated where other freight options are convenient, to include rail and truck, such as in the Ontario or Palmdale locations

Please drop the completed form into the box marked "COMMENTS" or mail to:
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Senior City Planner
Los Angeles Worlds Airports
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Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: 5/7/2008

Name: JACQUELINE HAMILTON

Organization: HAMILTON CONSULTING & SERVICES

Address:

Comment: SAFETY CONCERNS - ONGOING CONGRESSIONAL ISSUES
PLEASE CONSIDER THE RESIDENTS WHO LIVED IN THE MANCHESTER SQUARE AREA WHOSE RELOCATION AWARDS WERE FORFEITED DUE TO BEING EXTREME VICTIMS OF CRIME. I FOR ONE KNOW THAT MY VICTIMIZATION IS NOT BEING HANDLED PROPERLY BY SOME LAW ENFORCEMENT AGENCIES BECAUSE I DID NOT RECEIVE STATUS ON MY CASES AFTER REPORTING THEM. YOU MUST ALSO CONSIDER CITING MANAGERS AND OWNERS OF APARTMENT COMPLEXES IN THE MANCHESTER SQUARE AREA WHO ALLOWED RESIDENTS PERSONAL, BANKING, AND BUSINESS INFORMATION TO BE USED IN THEFT, SUCH AS THE COMPLEX OWNER - JESUS LOZANO AND MANAGERS LILLIAN FOGELBACH AND MARIA ESTRADA I AND SEVERAL OTHERS WERE FORCED INTO DESTITUTE SITUATIONS DUE TO THEIR TRAPPINGS OF PROMISING A RELOCATION AWARD AND NOT HANDLING CRIME ISSUES AND NOT RETROFITTING THE COMPLEX FOR THE ENVIRONMENT. THEIR ACTIONS HAVE CAUSED CLOSURE OF THE HOUSING AND EMPLOYMENT MARKETS FOR MANY PEOPLE ILLEGALLY.

LAX

Please drop the completed form into the box marked "COMMENTS" or mail to:
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Senior City Planner
Los Angeles Worlds Airports
1 World Way, Room 218
Los Angeles, CA 90045
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Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: May 7th 2007

Name: Theresa Torrance

Organization:

Address: Playa del Rey, CA

Comment:

I am 6 months pregnant with my 1st child & am very concerned about the air & noise pollution from the various proposals to move the Northern runways MUCH closer to many residents. I would like to see an unbiased (non LAWA) study on long term residents, as well as on ~~children~~ those people who grew up in Westchester/Playa del Rey to see what current health hazards are. This information is crucial before any consideration given to more air & car traffic, & movement of any runways closer to resident communities.

Please drop the completed form into the box marked "COMMENTS" or mail to:
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Senior City Planner
Los Angeles Worlds Airports
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Los Angeles, CA 90045
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Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: 5/7/08

Name: Tom Boughey

Organization: Westchester Resident

Address: 6528 W 80th Place, Los Angeles, Ca. 90045

Comment:

Living in Westchester and riding my bike along Westchester Pkwy 3 times a week I am well aware of the impacts of LAX on the neighborhood

1) On mornings with a line of planes waiting in line to take off there is a strong smell of airplane fuel emanating well into Westchester

2) Noise from the North runway has increased several fold and runs later into the night; ~~e.g. there~~ There now seems to be a midnight rush of planes leaving the airport at night.

3) All the run way problems on the South Airfield were solved by moving the runways 800 feet apart (an extra 50 feet). Presently ~~those runways~~ the north runways are 700 feet apart. Any plan separating those runways ~~by~~ to more than 800 feet is ~~one~~ unnecessary.

Please drop the completed form into the box marked "COMMENTS" or mail to:
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Senior City Planner
Los Angeles Worlds Airports
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Los Angeles, CA 90045
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Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: 5/7/08

Name: JOE CUNNINGHAM

Organization:

Address: 6043 W 76th ST. 90045

Comment:

WHEN I BOUGHT MY HOME ~~THE EAR WAS~~ ~~PROMISING ANY FROM PASSENGER GROWTH~~ LAX CAPACITY WAS NOT TO EXCEED ~~40 M~~ PASSENGER MILES. BECAUSE WE WERE GOING TO BUILD A NEW AIRPORT IN PALMDALE WHAT HAPPENED! GREED. YOU KNOW ~~THAT~~ THE POLLUTION IS KILLING PEOPLE. YET YOU HIDE BEHIND THE GOOD OF THE WHOLE! YOU HAVE ~~WHEN IS~~ PASSED THE POINT OF DIMINISHING RETURNS. ~~IT IS~~ IT IS TIME ~~TO HAVE~~ FOR LA TO ~~MAKE THE~~ BITE THE BULLET AND BUILD A REAL WORLD CLASS ~~AIRPORT~~ IN PALMDALE.

Please drop the completed form into the box marked "COMMENTS" or mail to:
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Senior City Planner
Los Angeles Worlds Airports
1 World Way, Room 218
Los Angeles, CA 90045
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Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: MAY 7, 2008

Name: ROBERT ACHARMAN

Organization:

Address: 6025 W 75TH PLACE, WESTCHESTER, CA 90045-1631

Comment:

EIR NEEDS TO STUDY FUMES AND SMELLS CAUSED/CREATED BY AIRPORT AND AIRCRAFT OPERATIONS. JET FUEL SMELL IS VERY STRONG ALONG WESTCHESTER PARKWAY. HAVE THERE BEEN STUDIES DONE ON AIRPORT AND AIRCRAFT FUMES AND WHAT THE HEALTH EFFECTS IF ANY?

PLEASE INCLUDE STUDIES OF PARTICULATE MATTER (PM 1) ONE. THIS IS ANOTHER HEALTH ISSUE TO STUDY AND REPORT ON IN THE EIR.

Please drop the completed form into the box marked "COMMENTS" or mail to:
Mr. Herb Glasgow
Senior City Planner
Los Angeles Worlds Airports
1 World Way, Room 218
Los Angeles, CA 90045
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Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: _____

Name: Rochelle Alley

Organization: _____

Address: _____

Comment:

- Moving terminals + runways is not a good idea
- For operating + modernizing the airport — this will exchanges similar to Dulles and other airports and decrease efficiency. In other airports using people movers decreased efficiency.

Please drop the completed form into the box marked "COMMENTS" or mail to:
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Senior City Planner
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WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: 5/7/08

Name: GREG CHAMBERS

Organization: _____

Address: 7912 COWAN AVE CA 90045

Comment:

(1) When analyzing moving runway north vs. moving it south & eliminating terminals, it will probably cost more to move it south. However, be sure to include the impact on Westchester property values and more importantly, the impact on the health and quality of life of Westchester residents. These factors are much more important than the cost analysis.

(2) The GTC is supposed to enhance security. Be sure to assess the security of the passengers, rather than the planes and terminals. A passenger blown up at the entrance to the GTC is just as dead as one blown up in an airplane or a terminal.

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Senior City Planner
Los Angeles Worlds Airports
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Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: 5/7/08

Name: Bob DUNIGAN

Organization: RESIDENT

Address: 7446 W 85th St Playa del Rey, CA 90293

Comment: LAX & The Surrounding Communities simply cannot sustain and/or support the proposed changes.

A regional solution is acceptable — anything else is foolish & wasteful

Please drop the completed form into the box marked "COMMENTS" or mail to:
Mr. Herb Glasgow
Senior City Planner
Los Angeles Worlds Airports
1 World Way, Room 218
Los Angeles, CA 90045
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Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date:

Name: Paul LaFthouse

Organization: Self

Address: 333 Manford Way, Pasadena

Comment: We need a revamped airport NOW. The small communities adjacent to the airport are selfish — and are not looking at the overall good a revamped airport would be to all the citizens of Los Angeles City, County and Southern California.

Whoever is in charge should get OFF ~~there's~~ your Asso's and get things going! FINISHED NOW

Get the runway moved to the North and extended — to prevent airline disater — killing Hundreds of people.

Please drop the completed form into the box marked "COMMENTS" or mail to:
Mr. Herb Glasgow
Senior City Planner
Los Angeles Worlds Airports
1 World Way, Room 218
Los Angeles, CA 90045
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May 10, 2008

Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: May 10, 2008

Name: John Ehret

Organization:

Address: see attached

Comment: see attached

Please drop the completed form into the box marked "COMMENTS" or mail to:
Mr. Herb Glasgow
Senior City Planner
Los Angeles Worlds Airports
1 World Way, Room 218
Los Angeles, CA 90045
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Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: 5/10/08

Name: Georgina Burns

Organization:

Address: 7742 Redlands, D1047, Playa del Rey

Comment:

Do Not Expand the LAX in any regard - specifically at this point the Northern Runway! There will be no end to LAX expansion if you do Not stop now!

Please drop the completed form into the box marked "COMMENTS" or mail to:
Mr. Herb Glasgow
Senior City Planner
Los Angeles Worlds Airports
1 World Way, Room 218
Los Angeles, CA 90045
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Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: May 18, 2008

Name: Ruth Dawson (Resident)

Organization: Retired — 1961 - Playa del Rey ↗ Westchester →

Address: 8117 Chase Ave. Westchester, CA 90045

Comment: We want a safe, secure and convenient airport.
Do not move NORTH Runways ! Not safe for us !
Please — go to regional Airports !
Best for us and lots of other folks —
Traffic ! Traffic ! Traffic !
Noise, Noise Noise
Health, Health, Health

Please drop the completed form into the box marked "COMMENTS" or mail to:
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Senior City Planner
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COMMENTS FROM AN OLD TIMER, SENIOR AERONAUTICAL ENGINEER

To Whom It May Concern:

In reviewing LAX (D) and LAX (E), I find them full of holes and VERY EXPENSIVE.

1. Leave the terminals and existing access as is. This allows people to drop off and pick up the elderly and handicapped right at their terminals. This scatter of terminals is safer than the proposed concentration.

2. Moving runways and putting a taxiway between them has not improved wing tip clearance versus 45 degree holding between existing runways. Nobody shows which way the airplanes would be going in those center taxiways. This is very unsafe.

3. The time and cost of moving a runway will affect a shortage of operational runways for a long time and with the existing air traffic will cause a real delay problem.

4. The location of the new tower solved the visibility problem that occurred on the north runway and taxiway that one time. NO VISIBILITY PROBLEMS SINCE.

5. With the financial shortage in Federal, State and City, leave as is except to improve the security in the existing terminals.

6. I went to the library to review the airport Plan D and was shocked by the extent of the environmental study. About 6 feet of books full of VERBAGE which was hard to understand. There wasn't an acceptable plan to evaluate. What a waste of taxpayer's funds.

7. Cargo truck traffic mixed with passenger traffic could be solved by utilizing Ontario Airport where the truck traffic can come and go in all directions and not be restricted to approach only in one direction.

8. To accommodate the new double deck Aerobus at the terminal, a two level ramp system must be available. THIS IS AVAILABLE.

9. To solve the problem of the landing aircraft having to cross the takeoff runway to get to the terminals, switch them to land on the inboard runway and take off on the outboard runway.

John S. Ehret
8219 Calabar Avenue
Playa del Rey, CA 90293
Retired from McDonnell Douglas (1979) after 31 years. Retired from FAA (1989) and continued as a consultant with McDonnell Douglas Technical Service Co. until Boeing took over.
Private Pilot, Land and Sea for 53 years.

Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: MAY 10 2008

Name: WENDELL KLIEVER

Organization:

Address: 8331 217TH TERR. EDR.

Comment: Long Beach, heavy light aircraft are a minority of commercial aircraft. The south runways have already been rebuilt for the large aircraft. There is no need to change the north runways, the south runways should suffice.

Please drop the completed form into the box marked "COMMENTS" or mail to:
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Senior City Planner
Los Angeles Worlds Airports
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Los Angeles, CA 90045
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Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: 5-10-08

Name: SANDRA BRAY

Organization: HOMEOWNER

Address: 8712 YORKTOWN AVE LA 90045

Comment: HOW DARE YOU PUT MY HOME, NEIGHBORHOOD, COMMUNITY + BUSINESS DISTRICT IN JEOPARDY AGAIN! WHAT HAPPENED TO THE SETTLEMENT AGREEMENT WHERE YOU WERE TO WORK WITH US? YOUR PLANS FAIL TO MAKE LAX SAFE OR SECURE + WILL DEMOLISH HOMES + BUSINESSES + REDUCE QUALITY OF LIFE CONTRARY TO YOUR "FUZZY" MAPS WHICH DELIBERATELY DO NOT SHOW THE REAL DAMAGE THAT WILL BE DONE

WE VOTED FOR A MAYOR AND A CITY COUNCILMAN WHO ARE OPPOSED TO ANY "EXPANSION"! DID YOU FORGET THAT LITTLE DETAIL?

IT'S PAST TIME FOR YOU TO BUILD A STATE OF THE ART AIRPORT IN PALMDALE. OTHERS SUCH AS DENVER HAVE MOVED OUT + SUCCEEDED.

THE BURDEN FOR THIS AIRPORT MUST NOT CONTINUE TO BE ON THE WESTCHESTER - PLAYA DEL REY COMMUNITY

Please drop the completed form into the box marked "COMMENTS" or mail to:
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Senior City Planner
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Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: MAY 10, 2008

Name: TOMMY ROYS

Organization:

Address: 7577 McCONNELL, L.A. 90045-1037

Comment:

SAFETY:

1.) STAFF THE AIR TRAFFIC CONTROL TOWER TO THE FULL COMPLIMENT. THAT SHOULD TAKE CARE OF THE SAFETY ISSUES. DO NOT HAVE ON-THE-JOB TRAINING W/NEW HIRE CONTROLLERS. IF THEY NEED OTHER CITY TRAINING PERIODS FROM WHERE THEIR JOB WILL BE, THEY NEED FULL-PAY, PAID HOUSING, & PER DIEM TO HELP OFFSET THEIR EXPENSES BEING AWAY FROM HOME.

2.) EXTRA SPACING TIME BETWEEN AIRCRAFT – BOTH IN FLIGHT & BETWEEN TAKEOFFS & LANDINGS.

3.) RUNWAY LIGHTS FOR AIRCRAFT GROUND CONTROL.

Please drop the completed form into the box marked "COMMENTS" or mail to:
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Senior City Planner
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Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print. MAY 10, 2008

Date: TOMMY ROYS

Name: ↓ ↓

Organization:

Address: 7577 McCONNELL, L.A. 90045-1037

Comment:

1.) SCHEDULE THESE MEETINGS WHEN PEOPLE CAN ATTEND. YOU LIKE TO HAVE THEM IN THE MIDDLE OF THE CHRISTMAS HOLIDAY SEASON; MIDDLE OF SUMMER WHEN FOLKS ARE GONE; & THIS ONE THE DAY PRIOR MOTHER'S DAY!!

2.) DEVELOP THE NORTH SIDE VACANT LAND THAT YOU TOOK AWAY FROM PEOPLE 30 YRS AGO. USE THE SUGGESTIONS THAT WE, THE NEIGHBORS, GAVE TO YOU ON WHAT WE WANT DONE W/THAT LAND.

3.) LEAVE THE REST OF OUR BUSINESSES & HOMES ALONE IN WESTCHESTER, PLAYA DEL REY & INGLEWOOD!!

Please drop the completed form into the box marked "COMMENTS" or mail to:
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PUBLIC SCOPING MEETING

Please print.

Date: MAY 10, 2008

Name: TOMMY ROYS

Organization:

Address: 7577 McCONNELL, L.A. 90045-1037.

Comment:

1) MODERNIZE THE BUILDINGS IF NECESSARY, BUT DO NOT INCREASE PASSENGER CAPACITY; 2) DO NOT MOVE OR LENGTHEN THE NORTH RUNWAYS.

REGIONALIZE - DO WHAT IS TRULY NEEDED. HAVE FLIGHTS IN & OUT OF OTHER AIRPORTS - WHERE THE PEOPLE LIVE. DON'T KEEP HAVING ALL OF SO CAL COME TO LAX TO ~~TRAVEL~~ BOTH DOMESTIC & INTERNATIONAL & W/CARGO FLIGHTS. GIVE THE AIRLINES INCENTIVES TO OPEN COUNTERS & HAVE FLIGHTS IN/OUT OF THE OTHER AIRPORTS.

Please drop the completed form into the box marked "COMMENTS" or mail to:
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Los Angeles Worlds Airports
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Los Angeles, CA 90045
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Los Angeles World Airports

WRITTEN COMMENT

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PUBLIC SCOPING MEETING

Please print.

Date: MAY 10, 2008

Name: TOMMY ROYS

Organization:

Address: 7577 McCONNELL, L.A. 90045-1037

Comment:

1) IF THE NORTH RUNWAY MUST BE MOVED (AFTER AN UNBIASED FULL STUDY ON SAFETY ISSUES SHOWS THIS WOULD BE ABSOLOTELY NECESSARY), THEN MOVE RUNWAY 24L 340FT SOUTH TOWARDS THE TERMINALS 1,2+3 - & DEMOLISH THOSE TERMINALS IF NECESSARY. NO LENGTHENING OF THE RUNWAY.

NO INCREASE IN LAX'S PASSENGER CAPACITY.

2) LEAVE MANCHESTER SQUARE ALONE. DO NOT BUILD ANYTHING ON IT.

3) HAVE LAWA PAY FOR THE ~~X~~EXTENSION OF THE GREEN LINE INTO THE AIRPORT.

4) EXPAND & ADVERTISE THE FLYAWAY BUS TO MORE AREAS. GET THESE CARS OFF OUR ROADS!!

Please drop the completed form into the box marked "COMMENTS" or mail to:
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Senior City Planner
Los Angeles Worlds Airports
1 World Way, Room 218
Los Angeles, CA 90045
All comments must be received no later than Wednesday, June 18, 2008.

Harry Rose
8160 Redlands Street #102
Playa del Rey CA 90293

hlrose@toadaway.net

Here we are again, looking at another set of big expensive projects for LAX, this time designed to address an alleged safety-geometry-voodoo problem concocted by LAWA, the Downtown Chamber of Commerce, and the criminal liars currently running the FAA.

I'm not sure what parts of the statement "civilized societies build real airports in the middle of nowhere" is so difficult for this city to understand. There is obviously some kind of disconnect somewhere.

I think I will give it a name and call it greed.

What would be the ECONOMIC IMPACT of, say, a one month shutdown of LAX due to some catastrophe? Are there any Contingency Plans regarding, for example, emergency supplies flown in should the above occur? Who is responsible for such plans and how often are they updated?

As a resident of Playa del Rey, I'm concerned about the VOC's I smell in our atmosphere, the black stuff I find on my windowsills, and the constant din of folks playing with their noisy airplanes in the dead of night. I have noticed that songbirds have shifted their springtime calls to the wee hours of the morning before daylight in the hope that a potential mate might hear them.

I would like to see a thorough study of the level of aircraft related air pollution in Playa del Rey, Westchester. Lennox and Inglewood including VOC and Particulates all the way down to PM-1.5. Why does the Sea Port of Los Angeles get so much attention about pollution and not LAX. Why was LAX not included in the MATES III Study?

I would also like to see an evaluation of published scientific data linking aircraft pollution to cancer, asthma in children, the early onset of pulmonary ailments in adults, and the detrimental effects on unborn children during pregnancy and how this relates to the communities surrounding LAX.

I would also like to see an evaluation of published scientific data linking aircraft noise pollution to hypertension and related heart disease and how this applies to the communities surrounding LAX.

I have provided hyperlinks to five studies covering the pollution issues in a written copy of my comments and I can assure you that I am not the only one wishing to see these studies performed accurately and honestly.

We have been lied to for decades. We've had enough and we're not going to take it anymore.

Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: May 10, 2008

Name: Mary T. David

Organization: Westchester home owner

Address: 6517 W 87th PL LA, CA 90045

Comment: Would appreciate honest answer to the following questions

(1) Is there a Plan to put runway status lights on the runways of the airport?

(2) If your plan means moving the North runway 340 ft North what happens to those homeowners who will be directly + immediately impacted? I mean those homeowners immediately north to the runway (south of manchester west of sepulveda, north of Westchester parkway)

(3) I would like to have these questions answered so I can decide if I need to make

Please drop the completed form into the box marked "COMMENTS" or mail to:
Mr. Herb Glasgow
Senior City Planner
Los Angeles Worlds Airports
1 World Way, Room 218
Los Angeles, CA 90045
All comments must be received no later than Wednesday, June 18, 2008.

Environmental Change-Makers
Westchester / Los Angeles Founded 2005

April 15, 2008

Mr. Herb Glasgow, Senior City Planner
City of Los Angeles
Los Angeles World Airports
1 World Way, Room 218
Los Angeles, CA 90045

Re: Los Angeles International Airport Specific Plan Amendment Study
Comments from Private Individuals and Organizations

Mr. Glasgow:

A "Master Plan" is, by definition, based on forward thinking. Any Amendment to such Plan should similarly be based on forward thinking. At this point in human history, we are on the cusp of dramatic societal transformation. Any realistic, forward thinking Plan must take into consideration both global warming and peak oil.

We acknowledge that the issue put before us is certain Proposed Amendments to the Specific Plan, which facilitates implementation of the Master Plan. However, significant changes to environmental science, legislation, and policy recommendations have occurred since the completion of the Master Plan EIR.

Changes to global warming science, updated policy recommendations for mitigation, legislation, and city Agreements have occurred since completion of the Master Plan EIR, including:

- IPCC Fourth Assessment Report (AR4), 2007.
- Hansen, et al, "Target Atmospheric CO_2: Where Should Humanity Aim?" 2008.
- Union of Concerned Scientists, "Our Changing Climate: Assessing the Risks to California," July 2006.
- California Global Warming Solutions Act of 2006 (Division 25.5, commencing with Section 38500, of the Health and Safety Code).
- U.S. Mayor's Climate Protection Agreement, signed by Los Angeles circa 2006.

Global warming is changing the climate of our planet. In 2007, a series of reports by the international body of scientists, the IPCC, established that, with 90% certainty, global warming is human-caused. Global warming is caused by our burning fossil fuels, including aircraft fuels, truck diesel, automobile gasoline, and fossil-based "alternative"

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Boyle, Karleen A., "Evaluating Particulate Emissions from Jet Engines: Analysis of Chemical and Physical Characteristics and Potential Impacts on Coastal Environments and Human Health," TRANSPORTATION RESEARCH RECORD 1517, 1996. The results of this study suggest that the range of size of particulate emissions from some jet engines clusters below 1.5 mm and that the emissions contain heavy metals. Therefore, jet exhaust articulates (JEPs) have the potential to adversely affect both the environment and human health.
http://www.areco.org/pdf/ParticulateEmissionsJetEngines1996.pdf

Knox, E.G. "Childhood cancers and atmospheric carcinogens," Journal of Epidemiology and Community Health, doi:10.1136/jech.2004.0216752005;59;101-105, Feb. 12, 2005. Reported associations of cancer birth places with sites of industrial combustion,VOCs uses, and associated engine exhausts, are confirmed. Newly identified specific hazards include the known carcinogens 1,3-butadiene,dioxins,and benz(a)pyrene. The mother probably inhales these or related materials and passes them to the fetus across the placenta. Airport and aircraft operations emit massive amounts of the mentioned toxins in comparison to other sources.
http://www.areco.org/Childhood%20cancers%20and%20atmosheric%20carcinogens.pdf

Pope III, C. Arden, et al. "Cardiovascular Mortality and Long-Term Exposure to Particulate Air Pollution Epidemiological Evidence of General Pathophysiological Pathways of Disease," American Heart Association, Circulation, DOI: 10.1161/01.CIR.0000108927.80044.7F, 2004.
The study builds upon the previous general agreements that a 10 µg/m3 increase in PM2.5 average concentration can substantially increase cardiovascular disease risks, especially ischemic heart disease (meaning blocked coronary arteries), general atherosclerosis (scarring/blocked arteries) and aortic aneurysms (aortic artery ruptures). Also shows that PM2.5 environmental concentrations also increases disease risks further for smokers.
http://www.areco.org/PM2.5_CardiovascCorrellations.pdf

Haralabidis, Alexandros S., et al., "Acute effects of night-time noise exposure on blood pressure in populations living near airport," CLINICAL RESEARCH, European Heart Journal, doi:10.1093/eurheartj/ehn013, 2008. Effects of noise exposure on elevated subsequent BP measurements were clearly shown. The effect size of the noise level appears to be independent of the noise source.
http://www.areco.org/pdf/ehn013.pdf

Lars Jarup, et al., "Hypertension and Exposure to Noise near Airports - the HYENA study," Study significant effects on blood pressure of night-time aircraft noise and average 24 hour road traffic noise exposure. Hypertension is an important independent risk factor for myocardial infarction and stroke. Aircraft and road traffic noise near airports may therefore contribute to the burden of cardiovascular disease. Results indicate that preventive measures should be considered to reduce road traffic noise and night-time noise from aircraft. National Institute of Environmental Sciences, US Department of Health & Human Services, 11 December 2007.
http://www.areco.org/pdf/10775.pdf

fuels like CNG. Any forward thinking master plan for a transportation hub like an airport must take its global warming impact into serious account.

The Union of Concerned Scientists has created reports which detail the climate change impacts coming to the state of California. Specific forecasts include an increase in heat wave days and heat-related deaths in major urban centers; an increase in days conducive to ozone formation for the Los Angeles area; increased risk of large wildfires; more critically dry years; and a substantial decrease in Sierra Nevada snowpack, the source of much of our water supply.

Union of Concerned Scientists studies also indicate that **WE HAVE A CHOICE**. If we switch to lower carbon activities as soon as possible, we stand a chance of minimizing the climate change impacts on our state, and on the planet as a whole. If, on the other hand, we choose to continue with "business as usual," we will create catastrophic change to this planet, to California agriculture, and to the potential for long term human survival.

Any responsible master plan amendment drafted at this time must make significant positive strides toward mitigating global warming.

The NOP "Initial Study and Checklist," Attachment A, Item III, promises "an assessment of energy consumption and greenhouse gas emissions (ghg) associated with construction and operation of the LAX SPAS alternatives."

This assessment should reveal:

- the energy consumption and ghg emissions associated with the construction process itself, as an isolated figure;
- the energy consumption and ghg emissions associated with LAWA's operational activities under the alternative scenarios;
- the increased total ghg emissions to the world by total LAX airport activities* under the alternative scenarios;
- the ghg emissions associated with total LAX airport activities*; its percentage of ghg emissions with respect to Los Angeles City's total emissions; and its percentage of ghg emissions with respect to California total ghg emissions. In other words, how much of this state's total ghg pollution problem is attributable to the presence of LAX and its combined activities?

Ghg measurements in the Draft EIR should be ghg emissions that are "real, permanent, quantifiable, and verifiable" as defined by California Health and Safety Code Section

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38562(d)(1). These ghg measurements should be stated in gross, prior to any offsets by "market-based compliance mechanisms" (Section 38505(k)).

* Total LAX airport activities in the Draft EIR should include all emissions from the airport campus and aircraft using the airport: all parties including LAWA operations, participating airlines, contractors; airport leased facilities, airline facilities; aircraft emissions associated with approach, landing, taxiing, takeoff, climb out operations; gate and fueling operations; ground support vehicles (aircraft tugs, baggage tractors, cargo moving equipment, etc.); ground access vehicles (passenger cars, busses, vans, other service vehicles, etc.); cargo transport (light, medium and heavy duty trucks used for mail and cargo transport); military operations.

Scientists tell us that the greenhouse effect is cumulative. Carbon reductions created today have far more positive impact than carbon reductions created in the distant future. Our choice of action over the next decade will make the determination. We must begin dramatic changes in our societal habits *within the next ten years* in order to make a difference in climate change. That means we must start today.

Scientists tell us that in order to make a difference in global warming, we must achieve 70 to 80 percent reduction in carbon emissions by 2050. Any master plan that covers the years between now and 2050 must include a phase-in of carbon reduction to achieve this goal. And that phase-in must place heavy reductions on the near end (prior to 2020).

"Potential mitigation measures" identified in the Draft EIR must be real greenhouse gas reductions, not just purchased "market-based compliance mechanisms." While market-based compliance mechanisms like carbon credits are an interesting idea toward raising awareness, they do nothing to reduce the very real physical molecules being released into our upper atmosphere.

Aircraft emissions that take place at high altitude have even greater effect (radiative forcing) on greenhouse warming than molecules emitted at ground level. Air flight, particularly any "short hop" flight under 500 miles, tops the list of the most polluting, least fuel-efficient forms of travel.[1]

LAX is one of the 5 biggest airports in the world. The environmental effects of LAX's extended activities far transcend the short little list in the March 2008 notice of availability letter, which included air quality, biological resources, hazards and hazardous materials, and more. LAX's combined activities (air, ground, access, passenger, cargo, etc.) mean enormous additions to the entire planet's global warming problem.

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The greenhouse gas emissions of LAX's combined activities impact not just Los Angeles voters, but *every person on the earth*, today and in future generations.

Any LAX Master Plan that covers the years between now and 2020 must include SUBSTANTIAL and SIGNIFICANT real greenhouse emission reductions across all operations.

The Draft EIR should reveal, with respect to ghg emissions that are "real, permanent, quantifiable, and verifiable" (as defined by California Health and Safety Code Section 38562(d)(1)):

- LAX targets and specific action steps to reduce global warming pollution at least 7% below 1990 levels by 2012;[2]
- LAX targets and specific action steps to reduce global warming pollution at least 25% below 1990 levels by 2020;[3]
- LAX targets and specific action steps to reduce global warming pollution at least 80% below 1990 levels by 2050;[4]
- How does the LAX Master Plan participate in reducing CO_2 concentrations below 350ppm by late this century?[5]
- How does the LAX Master Plan reflect the IPCC's "Underlying policy framework" for Transport Sector?[6]
- How does the LAX Master Plan comply with the California Global Warming Solutions Act? How does the LAX combined airport enterprise measure up to Health and Safety Code Section 38530(b)(1) (irrespective of any and all waivers LAX might have sought under Section 38562(b) or other sections)?
- How does the LAX Master Plan adhere to the U.S. Mayor's Climate Protection Agreement, Item C 1?[7]
- How do the Yellow Light Projects help the overall LAX enterprise to meet the above goals?

Each of the above should be stated with respect to

(a) LAWA's operational activities

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and also

(b) total LAX airport activities (as defined at page 3 of this letter). In other words, how is the combined airport enterprise and airline industry working to mitigate its total share of California's ghg pollution problem?

Fossil fuels are a non-renewable resource. The planet cannot make more very quickly, and at present we are using fossil fuel supplies at a mind-boggling rate. "Peak oil" is the term for the fact that we have exhausted the first half of our planet's supply of fossil fuels. Oil reserves are a closely held industry and political secret, but studies have shown that new discoveries of major oil reserves reached a maximum in the 1970s. New discoveries can not keep pace with our rate of using this nonrenewable resource. In short, we are currently delving into the second half of our oil supply. Demand for oil and its derivatives is only increasing. We will soon run out.

Yes, Richard Branson and Virgin recently tried to fly a plane "on biofuels." But the fuel mix in that plane included a very low percentage of biomass-derived fuel, and a very high percentage of fossil-derived fuel. In other words, that plane was still flying on fossil fuels. Biofuels are not a sustainable solution to our overuse of oil, because we haven't enough acreage on the planet to produce both food and fuel.[8] Other alternatives, such as hydrogen, are extremely experimental and will not be available in time to ease the shortage. We must accept the reality that the road ahead is inevitably one of decrease and "power down": decrease in passenger transportation, decrease in cargo hauling, decrease in ground transportation, decrease in air transport overall.

The term "Peak oil" is also used for the end of cheap oil. With $4.00 a gallon gasoline and $112 a barrel oil, it is obvious: we are already there. The second half of our oil supply is going to cost a lot more.

As a society, we have had a cavalier attitude about fossil fuels. Fossil fuels have been cheap, widely available, and they've allowed us to do wonderful things like travel and import lots of goods from very far away. But we are currently poised at the very end of this short-term fantastic blip in the course of human history. The twin crises of global warming and peak oil spell the end of the high-powered fossil fuel era.

The end of cheap oil is already curbing our appetite for excess. The revaluation of the dollar is adding its impact. Foreign imports and shipping cost more. Air cargo will soon decrease. People are now more cautious in their spending. The carefree days of world travel are ending.

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Any amendment to a master plan for an airport must take into consideration the inevitable decrease of demand brought on by Peak Oil.

Changes to peak oil science have occurred since completion of the Master Plan EIR, including the Association for the Study of Peak Oil and Gas scenarios (2006).[9]

Changes and updates to the price of fuel, and thus to the long-term viability of energy-intensive airport services, have occurred since the completion of the Master Plan EIR.

The Potential Amendments to the LAX Master Plan maintain an assumed capacity of 78.9 million annual passengers. The Draft EIR should reveal, with respect to airport demand:

- changes in demand for air transportation since Fall 2007 (when gasoline threatened $3.00 per gallon);
- changes in demand for air transportation since Spring 2008 (when gasoline threatened $4.00 per gallon);
- changes in demand for air transportation as fuel prices further increase (say, as gasoline threatens the $5.00 and $6.00 thresholds);
- a justification of using "practical capacity of 78.9 million annual passengers" for long-term decision making when the end of cheap oil and the revaluation of the dollar are considered in the projection.

Construction, in and of itself, is an activity which requires enormous earth resources. From the quantities of concrete and rock for runways, to the steel and glass for terminals, to the diesel and gasoline for trucks, tractors, cranes, and workmens' commutes, building any modifications at LAX will produce significant greenhouse gas emissions, and use precious earth materials. It is up to us to assure that these resources are being *invested wisely*.

It is up to us to decide whether these resources are being spent for a fantasy future of paper projections, or to prepare us for the power-down future we will really experience.

"Power down," means lifestyles using less power. That means less fossil fuels, less oil, less coal, less batteries, less fossil-derived electricity, less energy overall. Successfully powering down our citizenry will require reeducation. It will require reconfiguring our city layout to allow for more human-powered transportation. We will need our local undeveloped areas--such as the acres of LAX Northside and vacated areas of Manchester Square--to remain open for future uses like community gardens for small scale agriculture. Powering down will require bringing necessary services, such as localized power

generation, closer to the places where people live. Basic services like fire, police, and pumping water/sewage will all have to evolve.[10] This transformation will require *money, resources, and time to build the revised infrastructure*.

As with global warming, we have somewhat of a choice. If we start now we stand a chance of being prepared for the coming power-down lifestyle. If we continue with high-powered activities and "business as usual," peak oil experts forecast severe hardship from shortages, infrastructure collapse, social upheaval, and civil unrest.

Forward thinking cities such as Portland, Oregon, are creating Peak Oil task forces. In March 2007, Portland's task force issued a report which details the projected impacts on the city, its infrastructure, and its citizens.

Portland discovered they need to "prevent infrastructure investments that would not be prudent given fuel shortages and higher prices." They need to "support land use patterns that reduce transportation needs." They need to "reduce total oil and natural gas consumption by 50 percent over the next 25 years." They need to "redesign the safety net and protect vulnerable and marginalized populations."

What about Los Angeles? Without radical changes to city infrastructure and support systems, we are ill prepared to provide for the needs of our citizenry.

Any major city expenditure at this point in time must prepare the city to better weather the effects of Peak Oil.

The "Initial Study and Checklist," Attachment A, Item XVIIc, promises that the "potential for the proposed project to result in significant adverse impacts on humans will be evaluated in the LAX SPAS EIR." Changes and updates to our environmental agreements and our environmental setting have occurred since completion of the Master Plan EIR.

- The City of Portland Peak Oil Task Force found that they needed to "Engage business, government and community leaders to initiate planning and policy change." The Draft EIR should examine whether the LAX Master Plan as a whole represents planning and policy change for energy and climate uncertainty.
- The Post Carbon Institute recommends that cities plan for fundamental changes and "make land use and transportation infrastructure decisions with 100-year timeframes." The Draft EIR should examine how the LAX Master Plan as a whole fits into a 100-year viewpoint, and should include Peak Oil in this discussion.
- The City of Portland Peak Oil Task Force found that they needed to "prevent infrastructure investments that would not be prudent given fuel shortages and higher

In this day and age, it is unconscionable to craft a master plan for the next 10 years--or any amendments thereto--with plans for increased use of fossil fuels and increased greenhouse gas emissions.

It is unconscionable to apply city funds and resources toward building fancy terminals, bigger airport runways, and tower building developments, when we need those funds and resources for power-down infrastructure for our citizens' very real future.

The Portland Peak Oil Task Force called for engaging "business, government and community leaders to initiate planning and policy change." Here is our opportunity in Los Angeles. We can orient Los Angeles as a world leader in carbon cleanup, or stay the course as a world polluter.

Sincerely,

Joanne Poyourow

The Reverend Peter H. Rood, Jr.

Founders of The Environmental Change-Makers of Westchester

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prices." The Draft EIR should explore whether infrastructure investment in the Yellow Light Projects is "prudent given fuel shortages and higher prices."

- The Draft EIR should reveal how the LAX Master Plan of 2004 adheres to the U.S. Mayor's Climate Protection Agreement, with respect to each bullet point under Item C of that Agreement.

In summary, any Amendments made to LAX's Master Plan must help orient the overall Plan toward the realities of our future. The proposed Amendments will be blatantly deficient if they do not address the following:

- fundamentally rethink our region's transportation practices for an era of energy and climate uncertainty.
- provide radical targets and concrete action steps toward greenhouse gas neutrality of airport operations.
- require participating airlines and ground contractors to create and implement phase-in plans for carbon neutrality.
- provide for a substantial reduction of total oil and natural gas consumption (including electricity generation and water/sewage pumping).
- take into account the substantial decrease in airport demand and operations as the era of cheap oil comes to a close.
- preserve open land for future power-down uses, rather than seek to develop it for short-term fossil-intensive purposes.
- reallocate city resources away from "infrastructure that is not prudent given fuel shortages and higher prices," toward infrastructure that will prepare our citizenry for energy and climate uncertainty.

"Present policies … suggest that decision-makers do not appreciate the gravity of the situation," writes NASA's James Hansen. "We must begin to move now toward the era beyond fossil fuels. Continued growth of greenhouse gas emissions, for just another decade, practically eliminates the possibility of near-term return of atmospheric composition beneath the tipping level for catastrophic effects."[11]

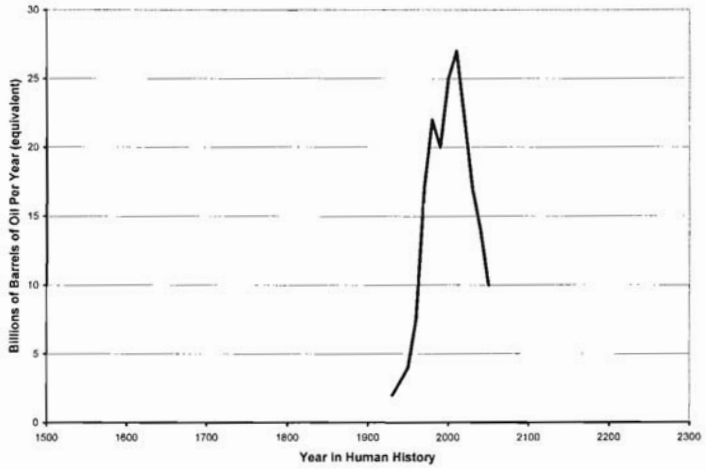
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The NOP page 1 states that the EIR will "identify potential mitigation measures." Potential energy consumption and greenhouse gas emissions mitigation measures may be found in the full text of the following documents:

- City of Portland Peak Oil Task Force, "Descending the Oil Peak: Navigating the Transition from Oil and Natural Gas"
  - Executive Summary (enclosed)
  - Full report at www.portlandonline.com/osd/index.cfm?c=ecije
- Union of Concerned Scientists, "Our Changing Climate: Assessing the Risks to California" (enclosed).
- "Peak Oil Primer," Energy Bulletin www.energybulletin.net/primer.php
- "Oil Depletion Protocol," which has been adopted by the cities of San Francisco and Portland. http://www.oildepletionprotocol.org/theprotocol
- "Post Carbon Cities: Planning for Energy and Climate Uncertainty," from the Post Carbon Institute
  - Executive Summary (enclosed)
  - full report at http://postcarboncities.net//guidebook

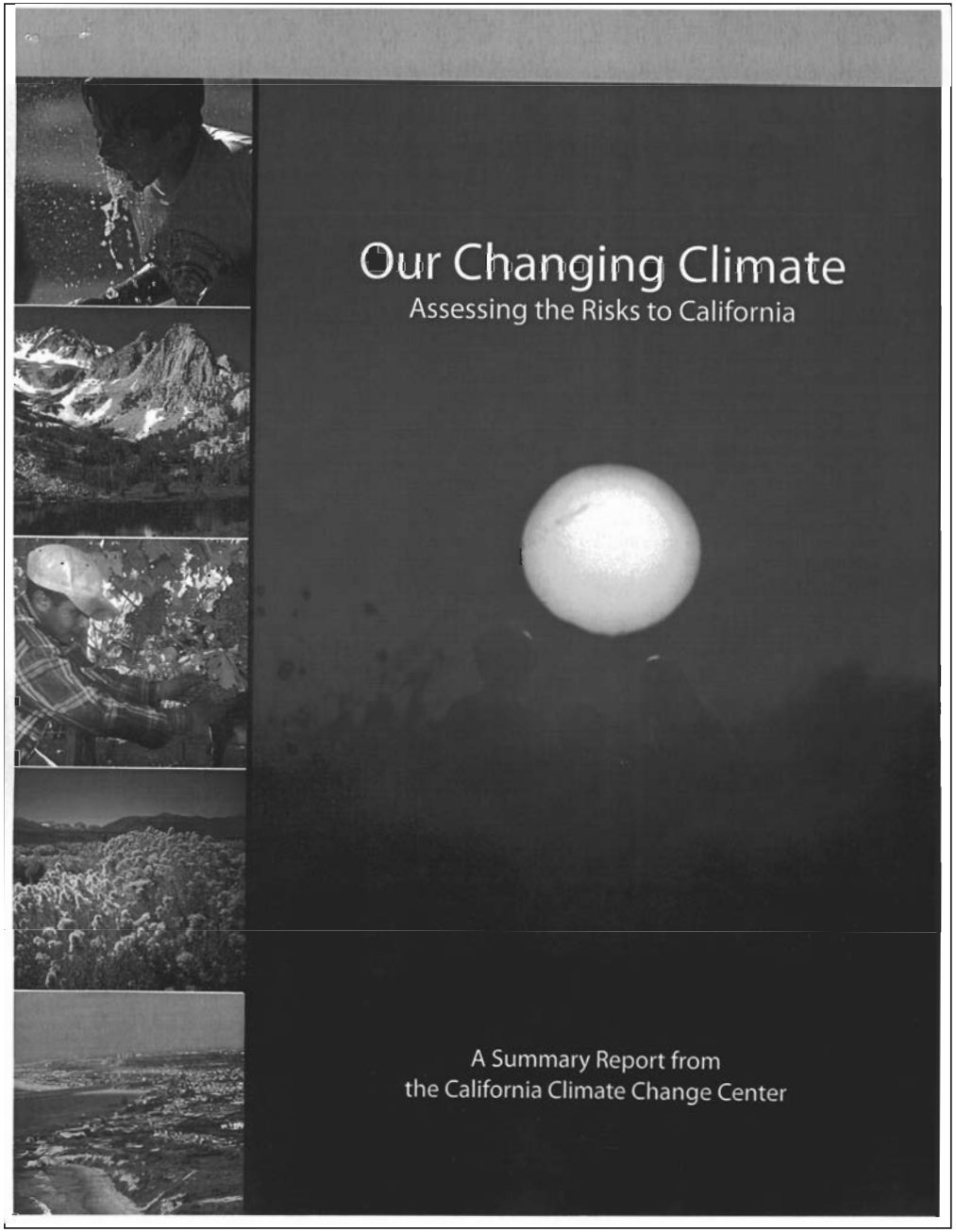
Cc: Mayor Antonio Villaraigosa
Councilmember Bill Rosendahl
Assemblymember Curren Price
Assemblymember Ted Lieu
Representative Maxine Waters
Congresswoman Jane Harman
Governor Arnold Schwarzenegger
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Union of Concerned Scientists West Coast Office

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The Brief Era of Oil[12]

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[1] Per AirportWatch.org.uk http://www.aef.org.uk/downloads//Howdoesairtravelcompare.doc
[2] U.S. Mayor's Climate Protection Agreement, Item A. http://www.seattle.gov/mayor/climate/
[3] 25% statistic is explained at http://www.1sky.org/about/1sky-solutions
[4] 80% statistic is explained at http://stepitup2007.org/article.php?id=466
[5] Hansen, J., Sato, M., Kharecha, P., Beerling, D., Masson-Delmotte, V., Pagani, M., Royer, D., Zachos, J., "Target Atmospheric CO_2: Where Should Humanity Aim?" www.columbia.edu/~jeh1/2008/TargetCO2_20080407.pdf
[6] IPCC Fourth Assessment Report (AR4), Working Group III Report, "Mitigation of Climate Change," November 2007, Table SPM-4. http://www.ipcc.ch/
[7] U.S. Mayor's Climate Protection Agreement, 2005. http://www.seattle.gov/mayor/climate/
[8] "UN Expert Calls Biofuel 'A Crime Against Humanity'", Associated Press, 27 October 2007, http://www.livescience.com/environment/071027-ap-biofuel-crime.html
[9] summarized at "Peak Oil Primer," from Energy Bulletin http://www.energybulletin.net/primer.php
[10] Source: the Transition movement, documented in works such as Rob Hopkins' *The Transition Handbook: From oil dependency to local resilience*, Green Books, Ltd, 2008.
[11] Hansen, J., Sato, M., Kharecha, P., Beerling, D., Masson-Delmotte, V., Pagani, M., Royer, D., Zachos, J., "Target Atmospheric CO_2: Where Should Humanity Aim?" www.columbia.edu/~jeh1/2008/TargetCO2_20080407.pdf
[12] Source data for 1930 to 2050 is from Association for the Study of Peak Oil and Gas, "Oil and Gas Production Profiles, ASPO 2006 Scenario," http://www.energybulletin.net/primer.php

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California's Future Climate

California's climate is expected to become considerably warmer during this century. How much warmer depends on the rate at which human activities, such as the burning of fossil fuels, continue. The projections presented here illustrate the climatic changes that are likely from three different heat-trapping emissions scenarios (see figure below).

Projected Warming

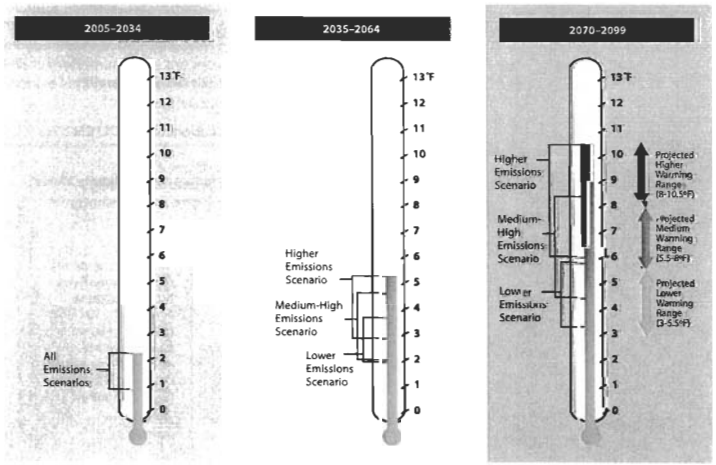
Temperatures are expected to rise substantially in all three emissions scenarios. During the next few decades, the three scenarios project average temperatures to rise between 1 and 2.3°F; however, the projected temperature increases begin to diverge at mid-century so that, by the end of the century, the temperature increases projected in the higher emissions scenario are approximately twice as high as those projected in the lower emissions scenario. Some climate models indicate that warming would be greater in summer than in winter, which would have widespread effects on ecosystem health, agricultural production, water use and availability, and energy demand.

Toward the end of the century, depending on future heat-trapping emissions, statewide average temperatures are expected to rise between 3 and 10.5°F. The analysis presented here examines the future climate under three projected warming ranges:[1]

- **Lower warming range:** projected temperature rises between 3 and 5.5°F
- **Medium warming range:** projected temperature rises between 5.5 and 8°F
- **Higher warming range:** projected temperature rises between 8 and 10.5°F

Precipitation

On average, the projections show little change in total annual precipitation in California. Furthermore, among several models, precipitation projections do not show a consistent trend during the next century. The Mediterranean seasonal precipitation pattern is expected to continue, with most precipitation falling during winter from North Pacific storms. One of the three climate models projects slightly wetter winters, and another projects slightly drier winters with a 10 to 20 percent decrease in total annual precipitation. However, even modest changes would have a significant impact because California ecosystems are conditioned to historical precipitation levels and water resources are nearly fully utilized.



California is expected to experience dramatically warmer temperatures during the 21st century. This figure shows projected increases in statewide annual temperatures for three 30-year periods. Ranges for each emissions scenario represent results from state-of-the-art climate models.

1 These warming ranges are for illustrative purposes only. These ranges were defined in the original Climate Scenarios analysis to capture the full range of projected temperature rise. The exact values for the warming ranges as presented in the original summary report are: lower warming range (3 to 5.4°F); medium warming range (5.5 to 7.9°F); and higher warming range (8 to 10.4°F).

Because most global warming emissions remain in the atmosphere for decades or centuries, the choices we make today greatly influence the climate our children and grandchildren inherit. The quality of life they experience will depend on if and how rapidly California and the rest of the world reduce these emissions.

In California and throughout western North America, signs of a changing climate are evident. During the last 50 years, winter and spring temperatures have been warmer, spring snow levels in lower- and mid-elevation mountains have dropped, snowpack has been melting one to four weeks earlier, and flowers are blooming one to two weeks earlier.



These regional changes are consistent with global trends. During the past 100 years, average temperatures have risen more than one degree Fahrenheit worldwide. Research indicates that much of this warming is due to human activities, primarily burning fossil fuels and clearing forests, that release carbon dioxide (CO_2) and other gases into the atmosphere, trapping in heat that would otherwise escape into space. Once in the atmosphere, these heat-trapping emissions remain there for many years—CO_2, for example, lasts about 100 years. As a result, atmospheric concentration of CO_2 has increased more than 30 percent above pre-industrial levels. If left unchecked, by the end of the century CO_2 concentrations could reach levels three times higher than pre-industrial times, leading to dangerous global warming that threatens our public health, economy, and environment.

The latest projections, based on state-of-the art climate models, indicate that if global heat-trapping emissions proceed at a medium to high rate, temperatures in California are expected to rise 4.7 to 10.5°F by the end of the century. In contrast, a lower emissions rate would keep the projected warming to 3 to 5.6°F. These temperature increases would have widespread consequences including substantial loss of snowpack, increased risk of large wildfires, and reductions in the quality and quantity of certain agricultural products. The state's vital resources and natural landscapes are already under increasing stress due to California's rapidly growing population, which is expected to grow from 35 million today to 55 million by 2050.

This document summarizes the recent findings of the California Climate Change Center's "Climate Scenarios" project, which analyzed a range of impacts that projected rising temperatures would likely have on California. The growing severity of the consequences as temperature rises underscores the importance of reducing emissions to minimize further warming. At the same time, it is essential to identify those consequences that may be unavoidable, for which we will need to develop coping and adaptation strategies.

In 2003, the California Energy Commission's Public Interest Energy Research (PIER) program established the California Climate Change Center to conduct climate change research relevant to the state. This Center is a virtual organization with core research activities at Scripps Institution of Oceanography and the University of California, Berkeley, complemented by efforts at other research institutions. Priority research areas defined in PIER's five-year Climate Change Research Plan are: monitoring, analysis, and modeling of climate; analysis of options to reduce greenhouse gas emissions; assessment of physical impacts and of adaptation strategies; and analysis of the economic consequences of both climate change impacts as well as the efforts designed to reduce emissions.

Executive Order #S-3-05, signed by Governor Arnold Schwarzenegger on June 1, 2005, called for the California Environmental Protection Agency (CalEPA) to prepare biennial science reports on the potential impact of continued global warming on certain sectors of the California economy. CalEPA entrusted PIER and its California Climate Change Center to lead this effort. The "Climate Scenarios" analysis summarized here is the first of these biennial science reports, and is the product of a multi-institution collaboration among the California Air Resources Board, California Department of Water Resources, California Energy Commission, CalEPA, and the Union of Concerned Scientists.

Cover photos: (sunset) Photos.com; (from top to bottom) AP Photo/Paul Sakuma, iStockphoto, IndexStock, Picturequest, iStockphoto. Above: Bureau of Land Management. Background: IndexStock



Public Health

Continued global warming will affect Californians' health by exacerbating air pollution, intensifying heat waves, and expanding the range of infectious diseases. The primary concern is not so much the change in *average* climate but the projected increase in *extreme* conditions, which pose the most serious health risks.

Poor Air Quality Made Worse

Californians currently experience the worst air quality in the nation, with more than 90 percent of the population living in areas that violate the state's air quality standard for either ground-level ozone or airborne particulate matter. These pollutants can cause or aggravate a wide range of health problems including asthma and other acute respiratory and cardiovascular diseases, and can decrease lung function in children. Combined, ozone and particulate matter contribute to 8,800 deaths and $71 billion in healthcare costs every year. If global background ozone levels increase as projected in some scenarios, it may become impossible to meet local air quality standards.

Higher temperatures are expected to increase the frequency, duration, and intensity of conditions conducive to air pollution formation. For example, if temperatures rise to the medium warming range, there will be 75 to 85 percent more days with weather conducive to ozone formation in Los Angeles and the San Joaquin Valley, relative to today's conditions. This is more than twice the increase expected if temperature rises are kept in the lower warming range.

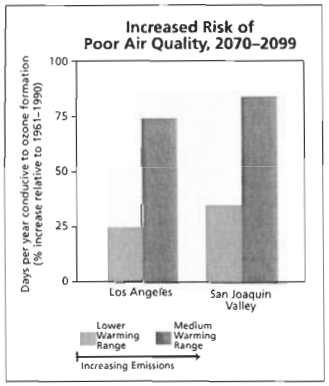
Air quality could be further compromised by increases in wildfires, which emit fine particulate matter that can travel long distances depending on wind conditions. The most recent analysis suggests that if heat-trapping gas emissions are not significantly reduced, large wildfires could become up to 55 percent more frequent toward the end of the century.

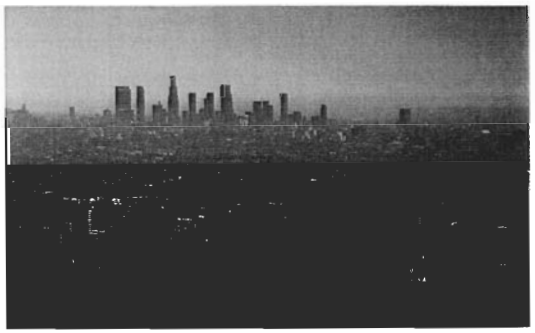
More Severe Heat

By 2100, if temperatures rise to the higher warming range, there could be up to 100 more days per year with temperatures above 90°F in Los Angeles and above 95°F in Sacramento. This is a striking increase over historical patterns (see chart on p. 6), and almost twice the increase projected if temperatures remain within or below the lower warming range.

As temperatures rise, Californians will face greater risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat. By mid century, extreme heat events in urban centers such as Sacramento, Los Angeles, and San Bernardino could cause two to three times more heat-related deaths than occur today. The members of the population most vulnerable to the effects of extreme heat include people who are already ill; children; the elderly;

As temperatures rise, Californians will face greater risk of death from dehydration, heat stroke, heart attack, and other heat-related illnesses.





Cars and power plants emit pollutants that contribute to global warming and poor air quality. As temperatures increase, it will be increasingly difficult to meet air quality standards throughout the state.

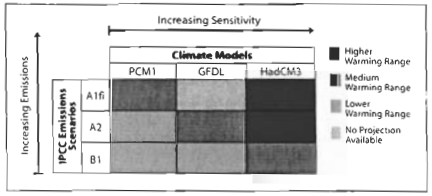
Projecting Future Climate

How much temperatures rise depends in large part on how much and how quickly heat-trapping emissions accumulate in the atmosphere and how the climate responds to these emissions. The projections presented in this report are based on three different heat-trapping emissions scenarios and three climate models.

Emissions Scenarios

The three global emissions scenarios used in this analysis were selected from a set of scenarios developed by the Intergovernmental Panel on Climate Change's (IPCC) *Special Report on Emissions Scenarios*, based on different assumptions about population growth and economic development (measured in gross domestic product).

- The **lower emissions scenario (B1)** characterizes a world with high economic growth and a global population that peaks by mid-century and then declines. There is a rapid shift toward less fossil fuel-intensive industries and introduction of clean and resource-efficient technologies. Heat-trapping emissions peak about mid-century and then decline; CO_2 concentration approximately doubles, relative to pre-industrial levels, by 2100.
- The **medium-high emissions scenario (A2)** projects continuous population growth and uneven economic and technological growth. The income gap between now-industrialized and developing parts of the world does not narrow. Heat-trapping emissions increase through the 21st century; atmospheric CO_2 concentration approximately triples, relative to pre-industrial levels, by 2100.
- The **higher emissions scenario (A1fi)** represents a world with high fossil fuel-intensive economic growth, and a global population that peaks mid-century then declines. New and more efficient technologies are introduced toward the end of the century. Heat-trapping emissions increase through the 21st century; CO_2 concentration more than triples, relative to pre-industrial levels, by 2100.



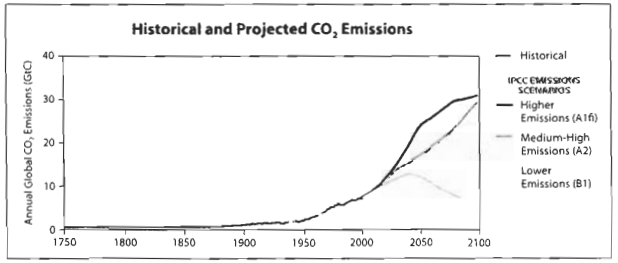
This matrix shows the temperature increases that result from the three climate models, assuming emission inputs indicated in the IPCC emissions scenarios. The resulting temperatures are grouped into three warming ranges defined in the "Climate Scenarios" analysis.

Climate Sensitivity

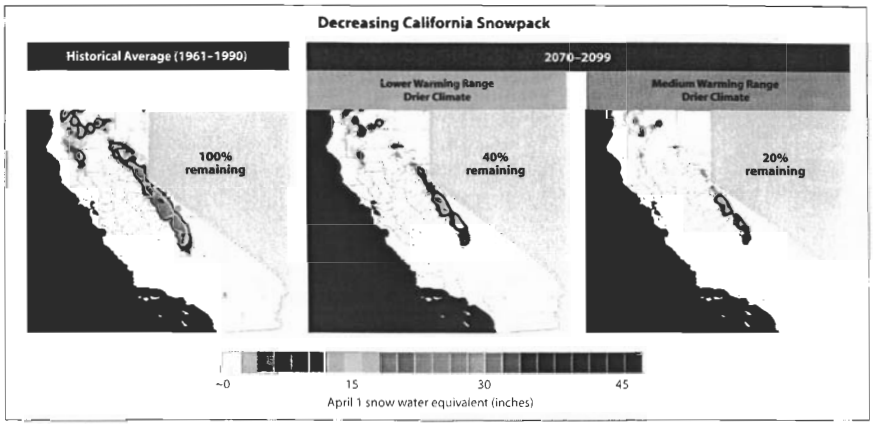
The three models used in this analysis represent different climate sensitivities, or the extent to which temperatures will rise as a result of increasing atmospheric concentrations of heat-trapping gases. Climate sensitivity depends on Earth's response to certain physical processes, including a number of "feedbacks" that might amplify or lessen warming. For example, as heat-trapping emissions cause temperatures to rise, the atmosphere can hold more water vapor, which traps heat and raises temperatures further—a positive feedback. Clouds created by this water vapor could absorb and re-radiate outgoing infrared radiation from Earth's surface (another positive feedback) or reflect more incoming shortwave radiation from the sun before it reaches Earth's surface (a negative feedback).

Because many of these processes and their feedbacks are not yet fully understood, they are represented somewhat differently in different global climate models. The three global climate models used in this analysis are:

- **National Center for Atmospheric Research Parallel Climate Model (PCM1):** low climate sensitivity
- **Geophysical Fluids Dynamic Laboratory (GFDL) CM2.1:** medium climate sensitivity
- **United Kingdom Met Office Hadley Centre Climate Model, version 3 (HadCM3):** medium-high climate sensitivity



As this figure shows, CO_2 emissions from human activities (such as the burning of fossil fuels) were negligible until around the so-called industrial age starting in the 1850s.



economy and population. Decreasing snowmelt and spring stream flows coupled with increasing demand for water resulting from both a growing population and hotter climate could lead to increasing water shortages. By the end of the century, if temperatures rise to the medium warming range and precipitation decreases, late spring stream flow could decline by up to 30 percent. Agricultural areas could be hard hit, with California farmers losing as much as 25 percent of the water supply they need.

Water supplies are also at risk from rising sea levels. An influx of saltwater would degrade California's estuaries, wetlands, and groundwater aquifers. In particular, saltwater intrusion would threaten the quality and reliability of the major state fresh water supply that is pumped from the southern edge of the Sacramento/San Joaquin River Delta.

Coping with the most severe consequences of global warming would require major changes in water management and allocation systems. As more winter precipitation falls as rain instead of snow, water managers will have to balance the need to fill constructed reservoirs for water supply and the need to maintain reservoir space for winter flood control. Some additional storage could be developed; however, the economic and environmental costs would be high.



Left: Photodisc. Right: Corbis

Rising temperatures, potentially exacerbated by decreasing precipitation, could increase the risk of water shortages in urban and agricultural sectors.

Potential Reduction in Hydropower

Higher temperatures will likely increase electricity demand due to higher air conditioning use. Even if the population remained unchanged, toward the end of the century annual electricity demand could increase by as much as 20 percent if temperatures rise into the higher warming range. (Implementing aggressive efficiency measures could lower this estimate.)

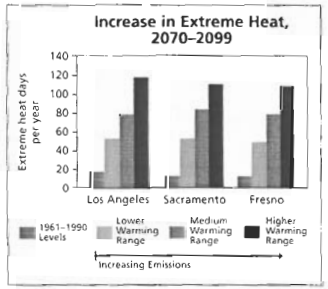
At the same time, diminished snow melt flowing through dams will decrease the potential for hydropower production, which now comprises about 15 percent of California's in-state electricity production. If temperatures rise to the medium warming range and precipitation decreases by 10 to 20 percent, hydropower production may be reduced by up to 30 percent. However, future precipitation projections are quite uncertain so it is possible that precipitation may increase and expand hydropower generation.

Loss of Winter Recreation

Continued global warming will have widespread implications for winter tourism. Declines in Sierra Nevada snowpack would lead to later starting and earlier closing dates of the ski season. Toward the end of the century, if temperatures rise to the lower warming range, the ski season at lower and middle elevations could shorten by as much as a month. If temperatures reach the higher warming range and precipitation declines, there might be many years with insufficient snow for skiing and snowboarding.

and the poor, who may lack access to air conditioning and medical assistance.

More research is needed to better understand the potential effects of higher temperatures and the role that adaptation can play in minimizing these effects. For example, expanding air conditioner use can help people cope with extreme heat; however, it also increases energy consumption, which, using today's fossil fuel-heavy energy sources, would contribute to further global warming and air pollution.





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Water Resources



If global warming emissions continue unabated, Sierra Nevada snowpack could decline 70 to 90 percent, with cascading effects on winter recreation, water supply, and natural ecosystems.

Most of California's precipitation falls in the northern part of the state during the winter while the greatest demand for water comes from users in the southern part of the state during the spring and summer. A vast network of man-made reservoirs and aqueducts capture and transport water throughout the state from northern California rivers and the Colorado River. The current distribution system relies on Sierra Nevada mountain snowpack to supply water during the dry spring and summer months. Rising temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snowpack, increasing the risk of summer water shortages.

Decreasing Sierra Nevada Snowpack

If heat-trapping emissions continue unabated, more precipitation will fall as rain instead of snow, and the snow that does fall will melt earlier, reducing the Sierra Nevada spring snowpack by as much as 70 to 90 percent. How much snowpack will be lost depends in part on future precipitation patterns, the projections for which remain uncertain. However, even under wetter climate projections, the loss of snowpack would pose challenges to water managers, hamper hydropower generation, and nearly eliminate skiing and other snow-related recreational activities. If global warming emissions are significantly curbed and temperature increases are kept in the lower warming range, snowpack losses are expected to be only half as large as those expected if temperatures were to rise to the higher warming range.

Challenges in Securing Adequate Water Supplies

Continued global warming will increase pressure on California's water resources, which are already over-stretched by the demands of a growing

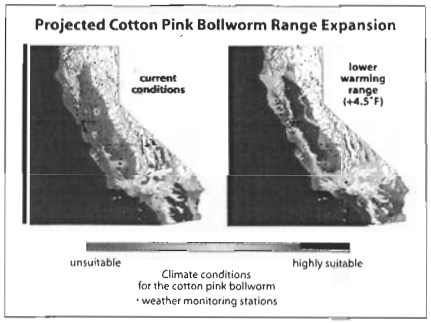


Increasing temperatures will likely decrease the quantity and quality of some agricultural commodities, such as certain varieties of fruit trees, wine grapes, and dairy products.

than twice the reduction expected if temperatures stay within or below the lower warming range.

Expanding Ranges of Agricultural Weeds

Noxious and invasive weeds currently infest more than 20 million acres of California farmland, costing hundreds of millions of dollars annually in control measures and lost productivity. Continued climate change will likely shift the ranges of existing invasive plants and weeds and alter competition patterns with native plants. Range expansion is expected in many species while range contractions are less likely in rapidly evolving species with significant populations already established. Should range contractions occur, it is likely that new or different weed species will fill the emerging gaps.





As temperatures rise, the climate is expected to become more favorable for the pink bollworm (above), a major cotton pest in southern California. The pink bollworm's geographic range is limited by winter frosts that kill over-wintering dormant larvae. As temperatures rise, winter frosts will decrease, greatly increasing the winter survival and subsequent spread of the pest throughout the state.

Increasing Threats from Pests and Pathogens

California farmers contend with a wide range of crop-damaging pests and pathogens. Continued climate change is likely to alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates. For example, the pink bollworm, a common pest of cotton crops, is currently a problem only in southern desert valleys because it cannot survive winter frosts elsewhere in the state. However, if winter temperatures rise 3 to 4.5°F, the pink bollworm's range would likely expand northward, which could lead to substantial economic and ecological consequences for the state.

Temperature is not the only climatic influence on pests. For example, some insects are unable to cope in extreme drought, while others cannot survive in extremely wet conditions. Furthermore, while warming speeds up the lifecycles of many insects, suggesting that pest problems could increase, some insects may grow more slowly as elevated CO_2 levels decrease the protein content of the leaves on which they feed.

Multiple and Interacting Stresses

Although the effects on specific crops of individual factors (e.g., temperatures, pests, water supply) are increasingly well understood, trying to quantify interactions among these and other environmental factors is challenging. For example, the quality of certain grape varieties is expected to decline as temperatures rise. But the wine-grape industry also faces increasing risks from pests such as the glassy-winged sharpshooter, which transmits Pierce's disease. In 2002, this bacterial disease caused damage worth $13 million in Riverside County alone. The optimum temperature for growth of Pierce's disease is 82°F, so this disease is currently uncommon in the cooler northern and coastal regions of the state. However, with continued warming, these regions may face increased risk of the glassy-winged sharpshooter feeding on leaves and transmitting Pierce's disease.



Agriculture

California is home to a $30 billion agriculture industry that employs more than one million workers. It is the largest and most diverse agriculture industry in the nation, producing more than 300 commodities including half the country's fruits and vegetables. Increased heat-trapping emissions are expected to cause widespread changes to this industry, reducing the quantity and quality of agricultural products statewide.

Although higher carbon dioxide levels can stimulate plant production and increase plant water-use efficiency, California farmers will face greater water demand for crops and a less reliable water supply as temperatures rise. Crop growth and development will change, as will the intensity and frequency of pest and disease outbreaks. Rising temperatures will likely aggravate ozone pollution, which makes plants more susceptible to disease and pests and interferes with plant growth.

To prepare for these changes, and to adapt to changes already under way, major efforts will be needed to move crops to new locations, respond to climate variability, and develop new cultivars and agricultural technologies. With adequate research and advance preparation, some of the consequences could be reduced.

Increasing Temperature

Plant growth tends to be slow at low temperatures, increasing with rising temperatures up to a threshold. However, faster growth can result in less-than-optimal development for many crops, so rising temperatures are likely to worsen the quantity and quality of yield for a number of California's agricultural products. Crops that are likely to be hard hit include:

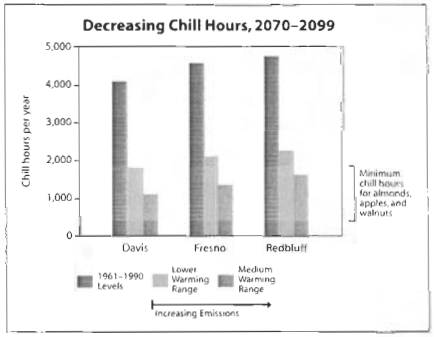
Wine Grapes

California is the nation's largest wine producer and the fourth-largest wine producer worldwide. High-quality wines produced throughout the Napa and Sonoma Valleys and along the northern and central coasts generate $3.2 billion in revenue each year. High temperatures during the growing season can cause premature ripening and reduce grape quality. Temperature increases are expected to have only modest effect on grape quality in most regions over the next few decades. However, toward the end of the century, wine grapes could ripen as much as one to two months earlier, which will affect grape quality in all but the coolest coastal locations (Mendocino and Monterey Counties).



Fruits and Nuts

Many fruit and nut trees are particularly sensitive to temperature changes because of heat-accumulation limits and chill-hour requirements. Heat accumulation, which refers to the total hours during which temperatures reach between 45 and 95°F, is critical for fruit development. Rising temperatures could increase fruit development rates and decrease fruit size.



For example, peaches and nectarines developed and were harvested early in 2004 because of warm spring temperatures. The fruits were smaller than normal, which placed them in a lower quality category.

A minimum number of chill hours (hours during which temperatures drop below 45°F) is required for proper bud setting; too few hours can cause late or irregular bloom, decreasing fruit quality and subsequent marketable yield. California is currently classified as a moderate to high chill-hour region, but chill hours are diminishing in many areas of the state. If temperatures rise to the medium warming range, the number of chill hours in the entire Central Valley is expected to approach a critical threshold for some fruit trees.

Milk

California's $3 billion dairy industry supplies nearly one-fifth of the nation's milk products. High temperatures can stress dairy cows, reducing milk production. Production begins to decline at temperatures as low as 77°F and can drop substantially as temperatures climb above 90°F. Toward the end of the century, if temperatures rise to the higher warming range, milk production is expected to decrease by up to 20 percent. This is more



Forests and Landscapes

California is one of the most climatically and biologically diverse areas in the world, supporting thousands of plant and animal species. The state's burgeoning population and consequent impact on local landscapes is threatening much of this biological wealth. Global warming is expected to intensify this threat by increasing the risk of wildfire and altering the distribution and character of natural vegetation.

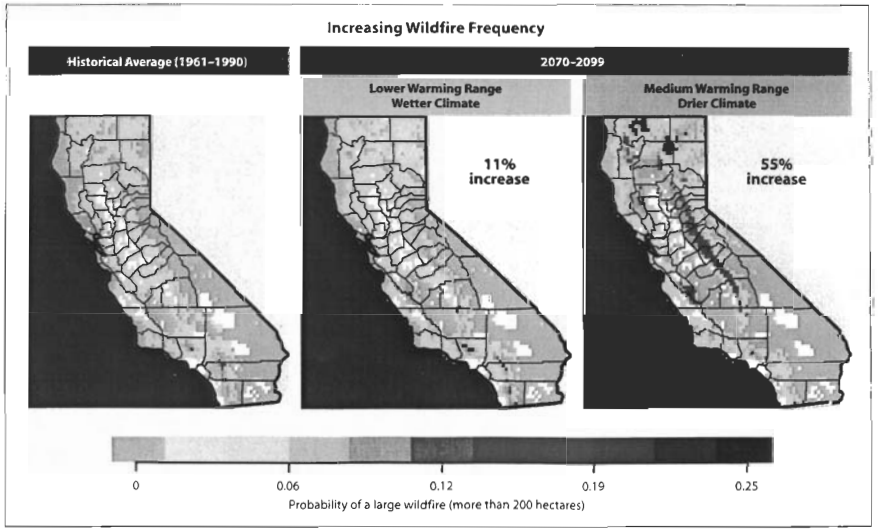


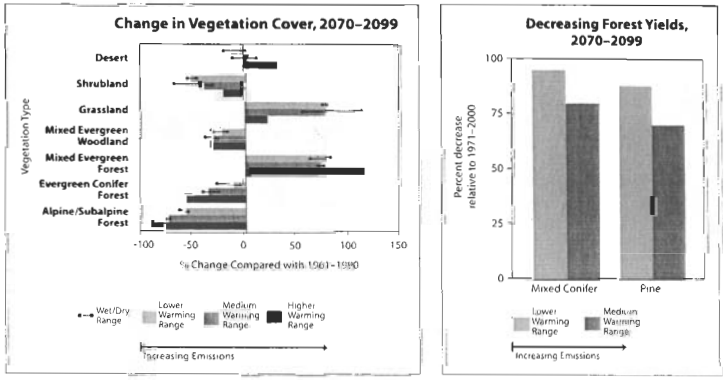
Global warming threatens alpine and subalpine ecosystems, which have no place to move as temperatures rise.

Increasing Wildfires

Fire is an important ecosystem disturbance. It promotes vegetation and wildlife diversity, releases nutrients into the soil, and eliminates heavy accumulation of underbrush that can fuel catastrophic fires. However, if temperatures rise into the medium warming range, the risk of large wildfires in California could increase by as much as 55 percent, which is almost twice the increase expected if temperatures stay in the lower warming range.

Because wildfire risk is determined by a combination of factors including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the state. In many regions, wildfire activity will depend critically on future precipitation patterns. For





Vegetation cover over the 21st century will depend on both temperature and precipitation. The lower and medium warming range bars reflect vegetation cover under a wetter climate (blue) and a drier climate (brown) projected in the different climate models. For the higher warming range, only a drier climate was considered.

example, if precipitation increases as temperatures rise, wildfires in the grasslands and chaparral ecosystems of southern California are expected to increase by approximately 30 percent toward the end of the century because more winter rain will stimulate the growth of more plant "fuel" available to burn in the fall. In contrast, a hotter, drier climate could promote up to 90 percent more northern California fires by the end of the century by drying out and increasing the flammability of forest vegetation.

Shifting Vegetation

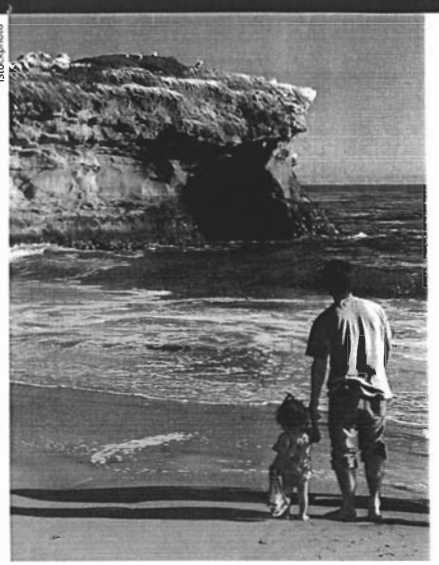
Land use and other changes resulting from economic development are altering natural habitats throughout the state. Continued global warming will intensify these pressures on the state's natural ecosystems and biological diversity. For example, in northern California, warmer temperatures are expected to shift dominant forest species from Douglas and White Fir to madrone and oaks. In inland regions, increases in fire frequency are expected to promote expansion of grasslands into current shrub and woodland areas. Alpine and subalpine ecosystems are among the most threatened in the state; plants suited to these regions have limited opportunity to migrate "up slope" and are expected to decline by as much as 60 to 80 percent by the end of the century as a result of increasing temperatures.

Declining Forest Productivity

Forestlands cover 45 percent of the state; 35 percent of this is commercial forests such as pine plantations. Recent projections suggest that continued global warming could adversely affect the health and productivity of California's forests. If average statewide temperatures rise to the medium warming range, the productivity of mixed conifer forests is expected to diminish by as much as 18 percent by the end of the century. Yield reductions from pine plantations are expected to be even more severe, with up to a 30 percent decrease by the end of the century.

The risk of large wildfires in California could increase by as much as 55 percent.



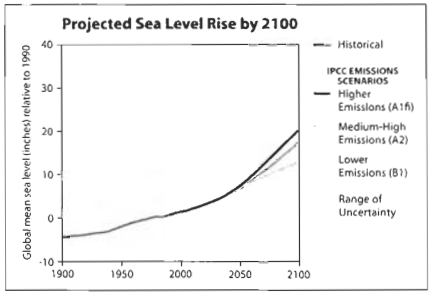


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Many California beaches are threatened from rising sea levels and increased erosion, an expected consequence of continued global warming.

state. Continued sea level rise will further increase vulnerability to levee failures. Some of the most extreme flooding during the past few decades has occurred during El Niño winters, when warmer waters fuel more intense storms. During the winters of 1982–1983 and 1997–1998, for example, abnormally high seas and storm surges caused millions of dollars' worth of damage in the San Francisco Bay area. Highways were flooded as six-foot waves crashed over waterfront bulkheads, and valuable coastal real estate was destroyed.

Continued global warming will require major changes in flood management. In many regions such as the Central Valley, where urbanization and limited river channel capacity already exacerbate rising flood risks, flood damage and flood control costs could amount to several billion dollars.



Shrinking Beaches

Many of California's beaches may shrink in the future because of rising seas and increased erosion from winter storms. Currently, many beaches are protected from erosion through manmade sand replenishment (or "nourishment") programs, which bring in sand from outside sources to replace the diminishing supply of natural sand. In fact, many of the wide sandy beaches in southern California around Santa Monica, Venice, and Newport Beach were created and are maintained entirely by sand nourishment programs. As sea levels rise, increasing volumes of replacement sand will be needed to maintain current beach width and quality. California beach nourishment programs currently cost millions of dollars each year. As global warming continues, the costs of beach nourishment programs will rise, and in some regions beach replenishment may no longer be viable.

Multiple Causes of Coastal Flooding

Several factors play a role in sea level and coastal flooding, including tides, waves temperature, and storm activity. Sea levels fluctuate daily, monthly, and seasonally; the highest tides occur in winter and in summer, during new and full moons. Sea levels often rise even higher during El Niño winters, when the Eastern Pacific Ocean is warmer than usual and westerly wind patterns are strengthened.

Coastal flooding usually occurs during winter storms, which bring strong winds and high waves. Storm winds tend to raise water levels along the coast and produce high waves at the same time, compounding the risk of damaging waves—a doubling of wave height is equivalent to a four-fold increase in wave energy. When these factors coincide with high tides, the chances for coastal damage are greatly heightened.

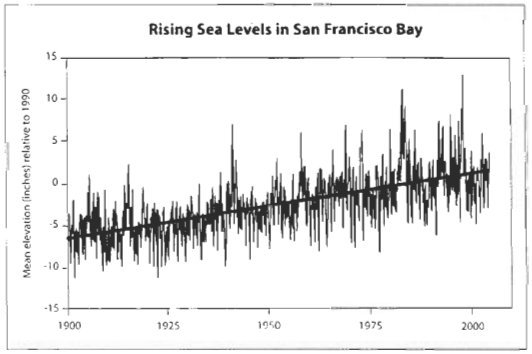
As sea levels rise, flood stages in the Sacramento/San Joaquin Delta of the San Francisco Bay estuary may also rise, putting increasing pressure on Delta levees. This threat may be particularly significant because recent estimates indicate the additional force exerted upon the levees is equivalent to the square of the water level rise. Estimates using historical observations and climate model projections suggest that extreme high water levels in the Bay and Delta will increase markedly if sea level rises above its historical rate. These extremes are most likely to occur during storm events, leading to more severe damage from waves and floods.



Rising Sea Levels

California's 1,100 miles of coastline are a major attraction for tourism, recreation, and other economic activity. The coast is also home to unique ecosystems that are among the world's most imperiled. As global warming continues, California's coastal regions will be increasingly threatened by rising sea levels, more intense coastal storms, and warmer water temperatures.

During the past century, sea levels along California's coast have risen about seven inches. If heat-trapping emissions continue unabated and temperatures rise into the higher warming range, sea level is expected to rise an additional 22 to 35 inches by the end of the century. Elevations of this magnitude would inundate coastal areas with salt water, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats.



Increasing Coastal Floods

The combination of increasingly severe winter storms, rising mean sea levels, and high tides is expected to cause more frequent and severe flooding, erosion, and damage to coastal structures. Many California coastal areas are at significant risk for flood damage. For example, the city of Santa Cruz is built on the 100-year floodplain and is only 20 feet above sea level. Although levees have been built to contain the 100-year flood, a 12-inch increase in sea levels (projected for the medium warming range of temperatures) would mean storm-surge-induced flood events at the 100-year level would likely occur once every 10 years.

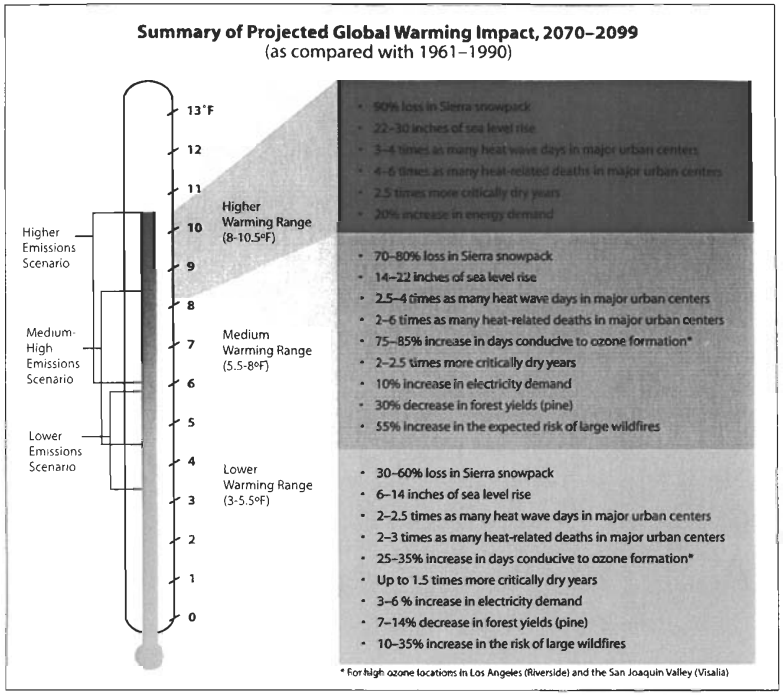
Flooding can create significant damage and enormous financial losses. Despite extensive engineering efforts, major floods have repeatedly breached levees that protect freshwater supplies and islands in the San Francisco Bay Delta as well as fragile marine estuaries and wetlands throughout the



Robert A. Eplett/CA Governor's Office of Emergency Services

Rising sea levels and more intense storm surges could increase the risk for coastal flooding.

Sea levels could rise up to three feet by the end of the century, accelerating coastal erosion, threating vital levees, and disrupting wetlands.



Preparing for these unavoidable changes will require minimizing further stresses on sensitive ecosystems and implementing management practices that integrate climate risks into long-term planning strategies.

By reducing heat-trapping emissions, severe consequences can be avoided.

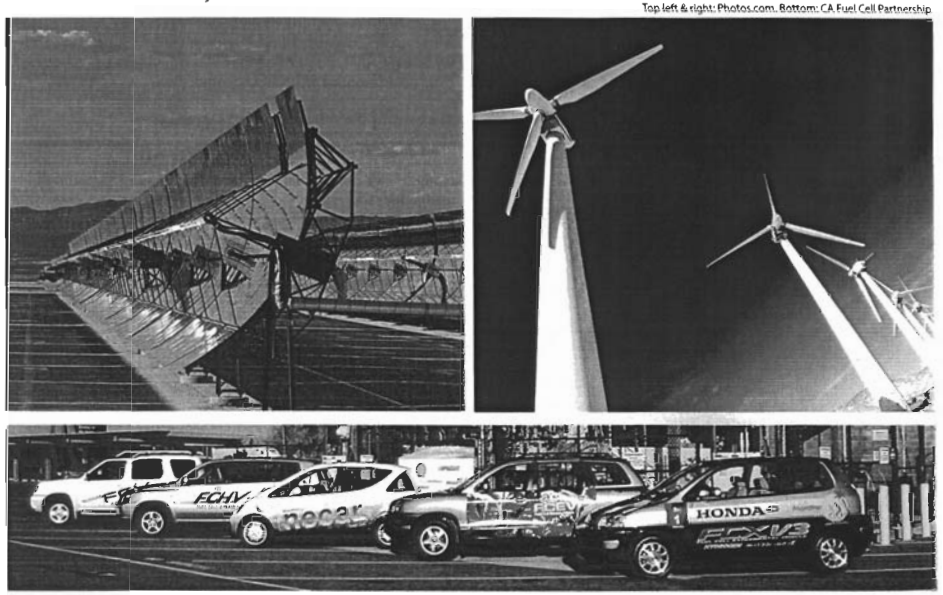
California's Leadership

California has been a leader in both the science of climate change and in identifying solutions. The California Climate Change Center is one of the first—and perhaps the only—state-sponsored research institution in the nation dedicated to climate change research, and other state agencies such as the Air Resources Board support similar research. Continuing this strong research agenda is critical for developing effective strategies for addressing global warming in California.

The state has also been at the forefront of efforts to reduce heat-trapping emissions, passing precedent-setting policies such as aggressive standards for tailpipe emissions, renewable energy, and energy efficiency. However, existing policies are not likely to be sufficient to meet the ambitious emission reduction goals set by the governor. To meet these ambitious goals California will need to build on its legacy of environmental leadership and develop new strategies and technologies to reduce emissions.

California alone cannot stabilize the climate. However, the state's actions can drive global progress. If the industrialized world were to follow the emission reduction targets established in California's executive order, and industrializing nations reduced emissions according to the lower emissions path (B1) presented in this analysis, we would be on track to keep temperatures from rising to the medium or higher (and possibly even the lower) warming ranges and thus avoid the most severe consequences of global warming.

Top left & right: Photos.com. Bottom: CA Fuel Cell Partnership



Cleaner energy and vehicle technologies can help California reduce global warming emissions, improve air quality, and protect public health.

Managing Global Warming

Continued global warming will have widespread and significant impacts on the Golden State. Solutions are available today to reduce emissions and minimize these impacts.

The projections presented in this analysis suggest that many of the most severe consequences that are expected from the medium and higher warming ranges could be avoided if heat-trapping emissions can be reduced to levels that will hold temperature increases at or below the lower warming range (i.e., an increase of no more than 5.5°F). However, even if emissions are substantially reduced, research indicates that some climatic changes are unavoidable. Although not the solution to global warming, plans to cope with these changes are essential.

California's actions can drive global progress to address global warming.

Reducing Heat-Trapping Emissions

Reducing heat-trapping emissions is the most important way to slow the rate of global warming. On June 1, 2005, Governor Arnold Schwarzenegger signed an executive order (#S-3-05) that sets goals for significantly lowering the state's share of global warming pollution. The executive order calls for a reduction in heat-trapping emissions to 1990 levels by 2020 and for an 80 percent emissions reduction below 1990 levels by 2050. These emission reduction targets will help stimulate technological innovation needed to help transition to more efficient and renewable transportation and energy systems.

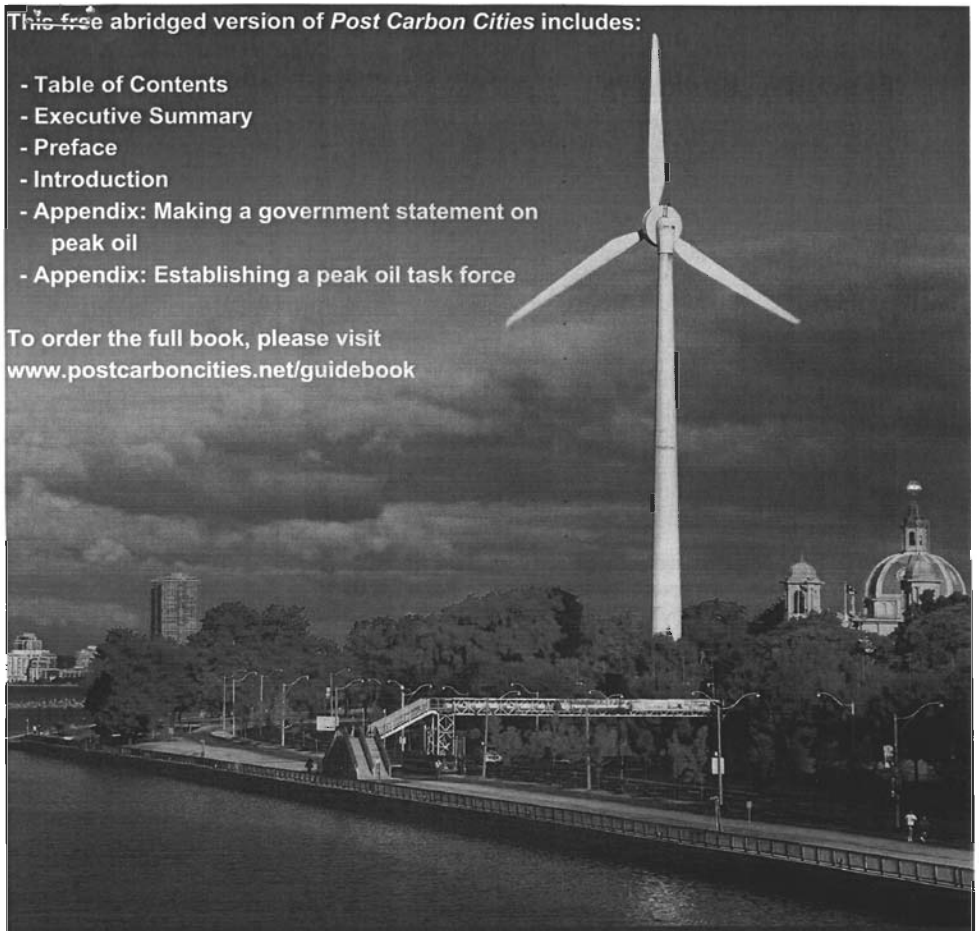
Coping with Unavoidable Climatic Changes

Because global warming is already upon us, and some amount of additional warming is inevitable, we must prepare for the changes that are already under way.

This free abridged version of *Post Carbon Cities* includes:

- Table of Contents
- Executive Summary
- Preface
- Introduction
- Appendix: Making a government statement on peak oil
- Appendix: Establishing a peak oil task force

To order the full book, please visit
www.postcarboncities.net/guidebook



Post Carbon Cities:
Planning for Energy and Climate Uncertainty

A Guidebook on Peak Oil and Global Warming for Local Governments

DANIEL LERCH

Post Carbon Institute
www.postcarbon.org

Published by Post Carbon Press
www.postcarbonpress.com

The full text of the Climate Scenarios analysis overview report, and the core scientific papers that comprise this analysis, are online at *www.climatechange.ca.gov*. The scientists that participated in this effort are:

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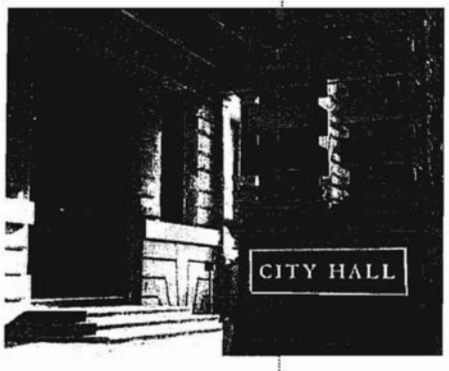
Incentives to act locally As many southeastern U.S. municipalities discovered after Hurricane Katrina knocked out regional fuel pipelines in 2005, state/provincial and federal government agencies do not have the ability to meet every jurisdiction's resource needs in times of crisis. Local governments, however, have the flexibility, capacity and motivation to address risk management and emergency response needs in ways that higher-level government agencies cannot.

Local governments have strong financial incentives to address peak oil and climate change. Reducing local oil dependence and carbon emissions means pursuing energy-efficient buildings, locally-controlled energy sources, compact transit-oriented land uses, alternative transportation modes and other aims that are energy prudent, and thus ultimately fiscally conservative. When the challenges created by peak oil and climate change are not future risks but present problems, those communities that have prepared will have distinct advantages over those that haven't.

Local governments are well-positioned to address peak oil and climate change because they have influence over three key areas of urban spatial and economic development:

- **Building construction and energy efficiency.** Through zoning codes, building codes and the permitting process, municipalities can encourage building designs that save energy and resources.
- **Local land use and transportation patterns.** Municipal land use and transportation planning decisions directly influence whether people and businesses will have mobility choices that allow them to save energy and money.
- **Local economic activity.** Municipal economic development initiatives are opportunities to encourage development in low-energy, zero-carbon directions, by both incentive and example.

Four Initial Steps Over the last fifteen years, hundreds of local governments in the U.S. and Canada have begun systematically reducing their greenhouse gas emissions in response to global warming. And since 2004, when oil prices climbed beyond 15-year highs, a growing number of local and regional government agencies in both countries have begun responding to the threats posed by peak oil.



Drawing from the experiences of these local governments, here are **four initial steps** that your own city can take to address peak oil and global warming:

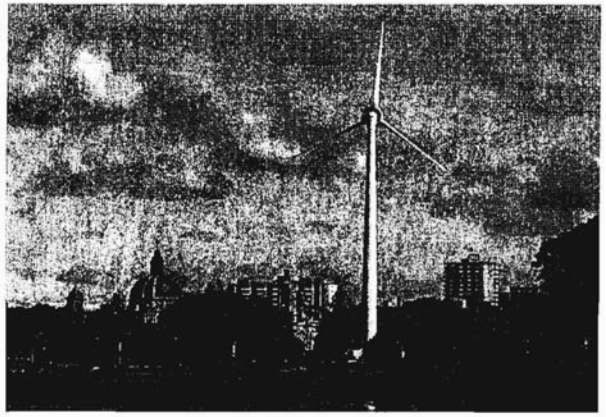
1: Sign the Mayors Climate Protection Agreement (U.S.) / Endorse the World Mayors and Municipal Leaders Declaration on Climate Change. For U.S. mayors, signing the Climate Protection Agreement commits your city to greenhouse gas reduction in the absence of federal leadership. Both U.S. and Canadian cities can also contribute to international carbon mitigation efforts by signing the Declaration on Climate Change. See www.coolmayors.com and www.iclei.org/montrealsummit.

2: Join ICLEI's Cities for Climate Protection Campaign' to get your city started on reducing energy use and greenhouse gas emissions, and to connect to the resources and expertise of the leading global movement of local governments working on climate change. See www.iclei.org.

3: Sign the Oil Depletion Protocol, which sets a target for reducing oil consumption across your community. Signing the Protocol sends a signal to citizens, business leaders and municipal staff that your city is serious about reducing its energy vulnerability. See www.oildepletionprotocol.org.

4: Establish a Peak Oil Task Force to quickly identify the challenges and vulnerabilities your community faces as a result of peak oil. A task force is also a valuable way to

Executive Summary



Post Carbon Cities: Planning for Energy and Climate Uncertainty **provides guidance and support to local government officials and staff for meeting three critical goals: breaking community dependence on oil, stopping community contributions to global warming, and preparing the community to thrive in a time of energy and climate uncertainty.**

The most direct strategy for achieving these goals is to ***reduce consumption*** and ***produce locally:*** reduce the community's overall resource consumption, and develop the capacity of local farmers and manufacturers to provide for the community's basic needs. The more your community can get its energy and basic goods from local sources, the less vulnerable it will be to rising and unstable oil prices, and the less it will contribute to climate change.

Energy and climate uncertainty Most credible observers now recognize that our global climate faces radical change in the coming decades if we do not take immediate and far-reaching action. Peak oil (the coming high point and subsequent decline of world oil production) is not as widely understood, but presents a similarly complex set of challenges.

Time is short to prepare for peak oil and global warming. At current rates of fossil fuel consumption we will most likely pass peak oil by 2010*, and we seriously risk widespread, catastrophic climate change if we do not begin dramatically reducing global carbon emissions.'

The key problem posed by both peak oil and global warming is ultimately one of ***uncertainty:*** these phenomena are creating changes in economies and ecosystems at the global, regional and even local levels that we cannot easily predict. For local governments—responsible for managing local public services, planning for future land use and transportation, and protecting the community's economic and social health— this uncertainty creates a wide variety of risks and vulnerabilities. How will local economies be affected if the price of oil exceeds $100 a barrel? How will regional climate shifts affect the local water supply? Local government decision makers need to understand and respond to these challenges.

ABRIDGED VERSION – TO ORDER FULL VERSION VISIT WWW.POSTCARBONCITIES.NET/GUIDEBOOK



Descending the Oil Peak: Navigating the Transition from Oil and Natural Gas

Report of the City of Portland Peak Oil Task Force

March 2007



introduce community stakeholders to the challenges of energy uncertainty, and engage them in developing a broad-based response. See *Appendix: Establishing a peak oil task force.*

Five principles for the long term Integrate these five principles into your local government's decision-making and planning processes to comprehensively address energy and climate uncertainty over the long term:

1. Deal with transportation and land use (or you may as well stop now). Fundamentally rethink your municipality's land use and transportation practices, from building and zoning codes to long-range planning. Make land use and transportation infrastructure decisions with 100-year timeframes. Organize with neighboring jurisdictions to address the land use and transportation challenges of energy and climate uncertainty at a regional level.

2. Tackle private energy consumption. Use the tools you already have to encourage serious energy conservation and efficiency in the private sector. Engage the business community aggressively, challenging your local business leaders to reinvent the local economy for the post-carbon world.

3. Attack the problems piece-by-piece and from many angles. Meet your energy and climate uncertainty response goals with multiple, proven solutions, pursuing many different kinds of solutions at different scales. Enlist the entire community, setting clear community goals and spurring action from all sides to meet them.

4. Plan for fundamental changes... and make fundamental changes happen. Educate and involve your fellow elected officials, staff and community stakeholders about energy and climate uncertainty, challenge them to come up with serious solutions. Lead your city's transition by integrating peak oil and climate change considerations in your own decisions.

5. Build a sense of community. In short, do anything you can to get people talking with each other, forming relationships, and investing themselves in the larger community.

Join the conversation online The Post Carbon Cities network is a resource for everyone who works with or for local governments. Our website at www.postcarboncities.net provides news feeds and special features, resources for policymakers and planners, and a forum where elected officials, municipal staff and others can share and discuss their common problems, challenges, best practices and lessons learned.

We welcome your participation in this dialog; we can all learn much more, much faster, by sharing our successes and our failures, building an ever-richer knowledge base. Please visit us online and join the growing movement of municipal leaders who are preparing their communities for the challenges of energy and climate uncertainty.

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* According to an increasing number of petroleum analysts, we seem to be facing an undulating plateau of world oil production from 2007 onward, with permanent decline likely underway by 2010. See page 12.

† In 2006 James Hansen, director of NASA's Goddard Institute for Space Studies, publicly called for immediate, broad-based action to reduce carbon emissions, saying "we have a very brief window of opportunity to deal with climate change...no longer than a decade, at the most."

‡ The ICLEI (International Council for Local Environmental Initiatives) Cities for Climate Protection program works with cities around the world to track and reduce local greenhouse gas emissions. In Canada, this program is implemented for ICLEI by the Federation of Canadian Municipalities as "Partners for Climate Change"; see http://www.iclei.org.

ABRIDGED VERSION – TO ORDER FULL VERSION VISIT WWW.POSTCARBONCITIES.NET/HANDBOOK

Executive Summary

Introduction: Preparing for Peak Oil
Every day, businesses, government agencies and households around the world plan and make decisions based on the assumption that oil and natural gas will remain plentiful and affordable. In the past few years, powerful evidence has emerged that casts doubt on that assumption and suggests that global production of both oil and natural gas is likely to reach its historic peak soon. This phenomenon is referred to as "peak oil." Given both the continuous rise in global demand for these products and the fundamental role they play in all levels of social, economic and geopolitical activities, the consequences of such an event are enormous. This report assesses Portland's vulnerabilities in the face of wide-ranging changes in global energy markets and provides an initial set of recommendations for addressing that challenge thoughtfully and prudently.

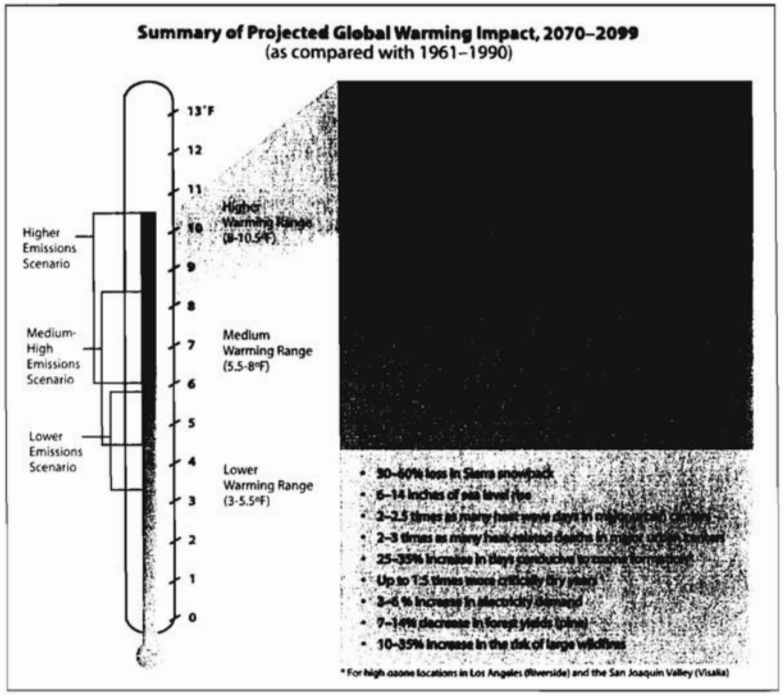
Task Force Created by City Council
In May 2006 Portland City Council adopted Resolution 36407 establishing the Peak Oil Task Force consisting of 12 citizens from a wide variety of backgrounds. The resolution charged the Task Force with examining the potential economic and social consequences of peak oil in Portland and developing recommendations to mitigate the impacts of rising energy costs and declining supplies. Over the past six months, the Task Force held more than 40 meetings and involved more than 80 stakeholders and interested citizens in gathering information.

Impacts and Vulnerabilities: High Fuel Prices Will Change Portland
Fifty years from now, the peak of global oil production will be a distant memory. Predictions for the year oil production will peak range from present day until 2040, with the most common estimates between 2010 and 2020. Despite the apparent breadth of current projections, even the most optimistic forecasts offer little time to adapt given the very long lead times required to change such things as transportation and building infrastructure.

Of all the impacts from rising oil prices, the clearest are those on transportation, which will experience profound pressure to shift toward more efficient modes of travel. For personal travel, this means transit, carpooling, walking, bicycling and highly efficient vehicles. Transportation of freight will become more costly and either decline or shift modes from air and truck to rail and boat. Population may shift to city centers, and density and mixed-use buildings will increase.

Food is a critical resource, and the American food system has become highly dependent on fossil fuels. Food production and distribution accounts for 17 percent of U.S. energy consumption. Because of this, higher oil and natural gas prices are expected to lead to a decline in the amount and variety of food produced and available locally, even with Portland's proximity to the agricultural production of the Willamette Valley. Food prices will rise, further straining the ability of low-income households to put food on the table.

Like agriculture, the economy as a whole is expected to experience significant disruption and volatility. Impacts will vary widely by industry and firm, and Portland has strengths in high technology and a relatively diversified transportation system. Portland also enjoys a strong and growing clean energy sector, which is likely to see increased demand. Nevertheless, many of Portland's industries are dependent on national and global markets, and business start-ups and failures are likely to increase.



Preparing for these unavoidable changes will require minimizing further stresses on sensitive ecosystems and implementing management practices that integrate climate risks into long-term planning strategies.

By reducing heat-trapping emissions, severe consequences can be avoided.

California's Leadership
California has been a leader in both the science of climate change and in identifying solutions. The California Climate Change Center is one of the first—and perhaps the only—state-sponsored research institution in the nation dedicated to climate change research, and other state agencies such as the Air Resources Board support similar research. Continuing this strong research agenda is critical for developing effective strategies for addressing global warming in California.

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California alone cannot stabilize the climate. However, the state's actions can drive global progress. If the industrialized world were to follow the emission reduction targets established in California's executive order, and industrializing nations reduced emissions according to the lower emissions path (B1) presented in this analysis, we would be on track to keep temperatures from rising to the medium or higher (and possibly even the lower) warming ranges and thus avoid the most severe consequences of global warming.

2. Inform citizens about peak oil and foster community and community-based solutions.
3. Engage business, government and community leaders to initiate planning and policy change.

Urban design addresses the challenge at a community scale.

4. Support land use patterns that reduce transportation needs, promote walkability and provide easy access to services and transportation options.
5. Design infrastructure to promote transportation options and facilitate efficient movement of freight, and prevent infrastructure investments that would not be prudent given fuel shortages and higher prices.

Expanded efficiency and conservation programs shape the many energy choices made by individual households and businesses.

6. Encourage energy-efficient and renewable transportation choices.
7. Expand building energy-efficiency programs and incentives for all new and existing structures.

Sustainable economic development fosters the growth of businesses that can supply energy-efficient solutions and provide employment and wealth creation in a new economic context.

8. Preserve farmland and expand local food production and processing.
9. Identify and promote sustainable business opportunities.

Social and economic support systems will be needed to help Portlanders dislocated by the effects of fuel price increases.

10. Redesign the safety net and protect vulnerable and marginalized populations.

Emergency plans should be in place to respond to sudden price increases or supply interruptions.

11. Prepare emergency plans for sudden and severe shortages.

Each of these 11 major recommendations is accompanied by a series of action items detailing how it can be implemented.

Next steps
A number of the recommendations imply the need for a central program to coordinate goal setting, tracking and communications. Other recommendations are policies, programs or projects to be implemented by specific bureaus or groups of bureaus. The Task Force proposes that a team of city staff be appointed to translate these recommendations into a funded, operational course of action.

Acting on this report, however, does not need to await further study or analysis. City bureaus can immediately look for ways to incorporate these energy concerns and impacts into ongoing planning activities and educational programs around sustainable development. City Council can challenge bureaus to align their investments and activities with the recommendations outlined in this report.

Finally, the Task Force members would like to express their willingness to continue assisting the City of Portland as it engages City staff and the public about peak oil and Portland's energy future.

Unemployment could be a major economic and social issue. This is of particular concern, since social services are already stretched to their limits. Vulnerable and marginalized populations are likely to grow and will be the first and hardest hit by rising oil prices. Increasing costs and decreasing incomes will reduce health coverage and further stress the health care system, which is already in crisis. Heating, maintenance, and monthly housing costs will consume a larger share of household budgets and push people toward lower-quality housing choices at the same time that auto transportation costs increase dramatically. First responders, especially police, are likely to be further taxed as social service agencies struggle to meet demand.

Recommendations: Act Big, Act Now
The Task Force findings illustrate the profound economic and social vulnerabilities that could result as fuel supplies cease to be abundant and inexpensive. The magnitude of this issue led the Task Force to explore bold and far-reaching solutions. The Task Force is unified in urging strong and immediate action.

The Task Force recommends preparedness on two different levels. Most of the recommendations seek to reduce Portland's exposure to rising fuel prices, anticipating the economic and lifestyle adjustments that will be needed in the future. Other recommendations prepare Portland to maintain community stability as volatile energy markets trigger conditions ranging from emergency shortages to longer-term economic and social disruption.

Reduce Portland's exposure: The Task Force proposes cutting oil and natural gas consumption in half, transforming how energy is used in transportation, food supply, buildings and manufacturing. It proposes strategies to maintain business viability and employment in an energy-constrained marketplace.

***Strengthen community cohesion*:** However well Portland succeeds in its energy transition, it will not be able to isolate itself from global energy crises or the resulting economic implications. The Task Force sees the potential for profound economic hardship and high levels of unemployment, and it recommends having plans in place to adapt social and economic support systems accordingly. Similarly, contingency plans are needed for fuel shortages that may last for months or years, well beyond the time considered in existing emergency plans.

The Task Force recommends a comprehensive package of actions, proposing strategies to initiate institutional change and to motivate action by households and businesses. The recommendations propose major changes for Portland, but the Task Force believes their implementation can have a positive social and economic impact as local residents and businesses spend less on imported fuels and redirect dollars into the local economy. This presents a significant economic development opportunity for Portland.

While all the recommendations are important, ***achieving a significant reduction in oil and natural gas use*** is a necessity for easing the transition to an energy-constrained future.

1. Reduce total oil and natural gas consumption by 50 percent over the next 25 years.

Leadership builds the public will, community spirit and institutional capacity needed to implement the ambitious changes. Leadership is needed to build partnerships to address these issues at a regional and statewide level.

Herb Glasgow, Senior city planner
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Room 218
Los Angeles, Ca. 90045

April 28, 2008

Seaside Village 8114 Manitoba St.
Unit # 201
Playa del Rey, Ca.
90293

To Herb Glasgow;

I am a United States citizen, a resident owner living in Playa del Rey Westchester borderline. Any expansion - movement of LAX's North runway would cause TERRIBLE air and noise pollution and an invasion of the "quality of life" already diminished by LAX's other expansion plans already in action.

I am, please note this for the record, ABSOLUTEY against ANY way, shape, form, type of LAX EXPANSION now or in the future.

Antonia D. Cogneia

Antonia D. Cogneia

 LA TIMES

Airport panel awards contracts to upgrade LAX

Architectural and engineering firms get $80.9 million to help improve runways, taxiways and terminals.

By DAN WEIKEL
Times Staff Writer

Plans to expand and modernize Los Angeles International Airport advanced Friday when airport commissioners approved $80.9 million in contracts for engineering and architectural services.

The board awarded three-year contracts of $41.5 million to Fentress Architects and $39.4 million to Hatch Mott MacDonald for engineering, planning and design work, bringing the total spent on consultants for the modernization program to $260 million during the last decade.

"This is crucial," said Alan Rothenberg, president of the Los Angeles Board of Airport Commissioners. "It is the first step to get us into the 21st century."

Fentress and Hatch Mott MacDonald have each worked on large infrastructure projects worth billions of dollars, including airports in the United States and overseas.

They will team up with DMJM Aviation Inc., a company based in Tampa, Fla., that received a $25-million contract in March to manage airport modernization projects.

LAX is planning an estimated $5 billion to $8 billion in improvements to runways, taxiways and terminals to handle increases in passengers and larger commercial aircraft, such as the Airbus A380, the Boeing 787 Dreamliner and new versions of the Boeing 747.

The projects include a midfield concourse with new gates and a taxiway from the north side of the airport to the south side.

Renovation of the Tom Bradley International Terminal is also on the list, including the addition of gates by January 2012. Airport officials caution that the actual number of projects and amount spent could change depending on the financial health of the airline industry, which is undergoing a period of bankruptcies and mergers.

Before awarding the current architecture and engineering contracts, the airport had spent about $148.5 million for consultants with expertise in engineering, planning, environmental analysis, public relations and management.

The contracts reflect work undertaken during three administrations going back to Mayor Richard Riordan, each with its own views and ambitions for the development of LAX.

Riordan's plan, for example, called for 89 million passengers a year, while Mayor James K. Hahn's plan was designed for 78.5 million passengers, a figure still mentioned by Antonio Villaraigosa's administration. LAX now handles about 61 million passengers a year.

dan.weikel@latimes.com

Lottery results

Tonight's Super Lotto Plus
Jackpot: $15 million
Sales close at 7:45 p.m.

For Friday, April 25, 2008

Mega Millions
Mega number is bold

19-32-37-45-52—**Mega 41**
Jackpot: $71 million

Fantasy Five: 2-6-13-17-19

Daily Three (midday): 7-6-6

Daily Three (evening): 3-6-0

Daily Derby:
(9) Winning Spirit
(2) Lucky Star
(12) Lucky Charms
Race time: 1:40.85

Results on the Internet:
latimes.com/lottery
General Information:
(800) 568-8379
(Results not available at this number)

COMMENTS FROM AN OLD TIMER, SENIOR AERONAUTICAL ENGINEER

To Whom It May Concern:

In reviewing LAX (D) and LAX (E), I find them full of holes and VERY EXPENSIVE.

1. Leave the terminals and existing access as is. This allows people to drop off and pick up the elderly and handicapped right at their terminals. This scatter of terminals is safer than the proposed concentration.

2. Moving runways and putting a taxiway between them has not improved wing tip clearance versus 45 degree holding between existing runways. Nobody shows which way the airplanes would be going in those center taxiways. This is very unsafe.

3. The time and cost of moving a runway will affect a shortage of operational runways for a long time and with the existing air traffic will cause a real delay problem.

4. The location of the new tower solved the visibility problem that occurred on the north runway and taxiway that one time. NO VISIBILITY PROBLEMS SINCE.

5. With the financial shortage in Federal, State and City, leave as is except to improve the security in the existing terminals.

6. I went to the library to review the airport Plan D and was shocked by the extent of the environmental study. About 6 feet of books full of VERBAGE which was hard to understand. There wasn't an acceptable plan to evaluate. What a waste of taxpayer's funds.

7. Cargo truck traffic mixed with passenger traffic could be solved by utilizing Ontario Airport where the truck traffic can come and go in all directions and not be restricted to approach only in one direction.

8. To accommodate the new double deck Aerobus at the terminal, a two level ramp system must be available. THIS IS AVAILABLE.

9. To solve the problem of the landing aircraft having to cross the takeoff runway to get to the terminals, switch them to land on the inboard runway and take off on the outboard runway.

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8219 Calabar Avenue
Playa del Rey, CA 90293
Retired from McDonnell Douglas (1979) after 31 years. Retired from FAA (1989) and continued as a consultant with McDonnell Douglas Technical Service Co. until Boeing took over.
Private Pilot, Land and Sea for 53 years.

Roy Hefner
6548 W 80 Place
Westchester, CA
90045-1404
310 670 8958
SWEETROY1@AOL.COM

Herb Glasgow
Senior City Planner
LAWA
1 World Way Rm. 218
Los Angeles 90045

Dear Mr. Glasgow,

I apologize for the helter skelter composition of this letter. My computer broke down three times during its composition. Thus, there are some repetitions of statements and questions. I attended the May 7, 2008 meeting at the Proud Bird and made a presentation which I'm certain you have read or will read.

When may I expect a response? I know you group similar question together.The BOAC appears to be in a hurry to get things moving.

I was very disappointed when after more than 35 years of working with the airport the powers that are did not consider me worthy of being a responsible citizen to continue. They won. I have reduced my activities markedly

Sincerely,

Roy Hefner
6548 W. 80th Place
Westchester, CA 90045
1-310-670-8958

THE ARGONAUT 4/24/08

Public scoping meetings on LAX draft EIR

Los Angeles World Airports, the city agency that operates Los Angeles International Airport (LAX) and three other regional airports, has scheduled two public scoping meetings next month to discuss the Notice of Preparation of a Draft Environmental Impact Report (EIR) for the LAX Specific Plan Amendment Study.

The first meeting is scheduled from 6 to 9 p.m. Wednesday, May 7th, with presentations at 6:15 and 7:30 p.m. The second meeting is scheduled from 9 a.m. to noon Saturday, May 10th, with presentations at 9:15 and 10:30 a.m.

The meetings will be held in the Proud Bird Restaurant, 11022 Aviation Blvd., Westchester.

The proposed project consists of a Specific Plan Amendment Study, including related amendments to the adopted LAX Plan and LAX Specific Plan.

Potential amendments will be identified through evaluation of potential alternative designs, technologies and configurations for the LAX Master Plan Program that will provide solutions to the problems that certain LAX Master Plan projects, referred to as the "Yellow Light" projects, were designed to address, airport officials said.

The designs are consistent with a practical capacity of LAX at 78.9 million annual passengers, the same practical capacity as included in the approved LAX Master Plan, officials said.

Yellow Light projects are subject to particular approval procedures in the LAX Specific Plan and include the following:

portation Center;

— Construct an Automated People Mover 2 from the Ground Transportation Center to the Central Terminal Area;

— Demolish Central Terminal Area terminals 1, 2 and 3;

— Reconfigure the runway, including center taxiways; and

— Make on-site road improvements associated with the Ground Transportation Center and Automated People Mover.

Potential environmental effects that may result from the proposed alternatives include aesthetics, air quality, biological resources, hazards and hazardous materials, hydrology/water quality, land use/planning, noise, public services, transportation/traffic and public utilities, airport officials said.

The Notice of Preparation is available online at *www.OurLAX.org/*, "Specific Plan Amendment Study," and is posted in the office of the Los Angeles City Clerk and on the desk of the Los Angeles County Clerk. For more information or to request a copy, (310) 646-7690.

Responses to the Notice of Preparation should be received no later than Wednesday, June 18th. Responses should be sent to Herb Glasgow, senior city planner, City of Los Angeles World Airports, 1 World Way, Room 218, Los Angeles 90045.

Air space Gridlock - airspace gridlock is a real and present danger. To enable the public to review the different plans proposed for the LAX Master Plan, the following items need to be fully delineated and cover all runways on all plans for both east-to-west and west-to-east operations.

Noise contours. The increase in air traffic will, inevitably, lead to more noise. LAX led the nation in the fight to convert to stage 3 engine aircraft, and this change did reduce the noise temporarily. With the proposed new runways and increase in air traffic, the noise contours will again expand. The noise impact from realigned and/or new runways in areas such as Lennox must be fully investigated. Individual noise footprints for each aircraft (as has been done at SFO) would serve to impact areas.

Specific flight paths with elevations and rate/angles or accent/decent Of special concern are the approach and take off flight paths for the proposed new runways. For instance, approach/take off paths for the commuter runway proposed in Concept 1(now alt A) adjacent to Playa del Rey residential area would be fairly low over Westchester/ Playa del Rey.

Escape corridors. Escape paths for aborted landings or take offs may have to go over residential areas. These paths must be clearly defined for all conceivable conditions.

Early turns. There continues to be numerous early turns, primarily by commuter aircraft, especially on the south side of the airport. The commuter airline runway being proposed for the north side of the airport in three of the four concepts would be located very close to the Playa del Rey residential area. Therefore, early turns must be addressed as part of the discussion on the plans.

Advisory Working Group

Rep. Maxine Waters – Edgar Saenz	310-642-2610
Rep. Jane Harman – Marc Carrel	310-643-3636
Sup. Yvonne Burke –	213-974-2222
Sup. Don Knabe – Steve Napolitano	310-222-3015
Mayor Villaraigosa – Jim Bickhart	213-978-0600
Mayor Dorn – Darryl Brown	310-412-5300
Mayor McDowell – David Herbst	310-524-2302
Mayor Albert Vera – David McCarthy	310-253-5660
County of Los Angeles – Tom Faughnan	213-974-1823
CD 8 Councilor Bernard Parks – Steve Ongele	213-473-7008
CD 10 Councilor Herb Wesson -	213-473-7010
CD 11 Councilor Bill Rosendahl - Mike Bonin	213-485-3811
ARSAC – Denny Schneider	310-641-4199
LAWA – Val Velasco	310-821-7890
Lydia Kennard	310-646-6250
Mike Doucette	310-417-2344

Regards,

A SHORT CHRONOLOGICAL REVIEW OF THE 'MASTER PLAN' FOR LAX

1. After rthree years of public meetings and discussions the BOAC adopted, in 1978, the EIR placing a limit of 40 MAP for LAX along with the development on Palmdale Airport.

2. Approximately 14 national, state, and local policies, programs, and plans included 40 MAP as a basis for their plans and operations.

3. In December of 1986 40 MAP was exceeded by LAX.

4. In January of 1988 the BOAC published their EIR 2000 to allow an increase of MAP to 65 MAP by the year 2000.

5. Shortly thereafter the City Council of L.A. requested that any LAX plan be included as part of the master plan of the City of Los Angeles.

6. In March of 1989 the L.A. City Council approved that proposal.

7. In June of 1990 the L.A. Council approved the Planning Depts. LAX Master Plan work program.

8. In January of 1992 three public forums were held in 1. Westchester, 2. L.A. Chamber of Commerce, 3. The San Fernando Valley.
   A. 60 to 70 local residents plus a few aviation related individuals and government agencies attended the Westchester meeting.
   B. Many prospective consultants and business people attended the chamber meeting.
   C. About 5 citizens attended the valley meeting

9. After a few years of almost no action on the part of the L.A. Planning Department the Department of Airports took over the financing and operation of the LAX Master Plan in 93-94,94-95.(?)
   A. Several consultants were hired to gather information about traffic, noise, air pollution, urban design, parking, new terminals, satellite terminals, runway expansion, people mover, etc., etc., etc.....
   B. Four concepts were suggested for the expansion of LAX.
   C. A public meeting was held in Westchester, Inglewood, Lennox, and I believe El Segundo. In 1995 these concepts were presented to the public.

10. Two of those concepts were deleted and eventually two more concepts (oops sorry, alternatives 1,2,3, plus No action/no project) were added.

11. Today we know these as No Action/No Project, Alternatives A, B, C.

12. WE HAVE TRAVELED FOR 22 YEARS PAST THE 40 MAP LIMITATION AND LAX IN THE YEAR 2000 HANDLED 67,600,000 PASSENGERS plus a marked increase in cargo without an EIR/EIS

IF AIRLINES DON'T HAVE ENOUGH FACILITIES TO LAND AND TAKE-OFF AT ONE AIRPORT THEY WILL OR CREATE OTHER FACILITIES AT ANOTHER AIRPORT.

1. AIRLINES DETERMINE WHERE THEY WANT TO L;AND
A. FAA SUPPORTS THE AIRLINES.
B STATE OF CALIOFORNIA SUPPORTS THE AIRLINES(Noise variances have done little if anyting to reduce noise)
C . AIRPORTS ARE NOT REQUIRED TO PROVIDE ADEQUATE FACILITIES
D. NO ROOM FOR AIRCRAFT = NO MORE AIRCRAFT

Some additional or repetitive concerns of the LAX Area Advisory Committee about the LAX Master Plan

mitigate noise?

The old Master Plan Brochure states , "The purpose of the LAX Master Plan process is to allow the Los Angeles Department of Airports the best means possible to determine: How best to **ensure** (my highlight) that the impact of LAX improvements will also **improve** (my highlight) the environment and quality of life." It appears that this is a commitment by the LAX Department of Airports to the local communities. Is it??

Please give all the potential new runways an identifying number such as 26, etc.

Provide the exact boundaries by street name and number of dwelling units, businesses, hotels, etc. in each concept that may be included in any land acquisition progra.m.

Prepare noise contour maps to project the noise contours for five year periods for all Lax Master Plan Project concepts.

All **direct and indirect** impacts of the proposed actions and their alternatives must be considered. Amongst these are:

1. Air space.
2. Water quality
3. Social impacts
4. Land use
5. Air quality
6. Hazardous waste
7. Flight safety
8. Noise

The EIR must address the noise impacts resulting from the combination of the Airside expansion proposed, such as constructing new runways and extending and moving existing runways.

The EIR must address the increased noise impacts resulting from the increase of operations, as well as the dispersion of the noise over a larger area to the east, north, and south

The EIR should address single event noise analysis. (The FAA specifically has agreed to include single event analysis at Minneapolis-St. Paul International Airport, Memphis International Airport, Detroit City Airport, Philadelphia International Airport, and Baltimore International Airport.)

TheEIR must not only examine the combined effects of the actions proposed in the Master Plan, but also consider the combined effects of the proposed actions with other projects both on and off airport property.

. Consider another Master Plan option of expanding the airport without adding any new runways.

Consider the mitigation measure of expanding the existing airports or building a new airport in the distant future.

Consider mitigation measures pertaining to the health of children and adults as a result of air and noise pollution.

Considered mitigation measures which will lessen the harmful effects of noise and air pollution in the learning process of young people.

There are many other area to be considered in the EIR process. Time does not permit me to delve further into this important subject. I hope that others will fill in the voids.

Project the number of potential job losses or gains if an expansion project is not adopted.

FAA regulations require that the 'total proposal' be considered. The regulations state the "total proposal includes the proposed action and all other actions reasonably related to it in time and probability." On this basis I have the following questions and comments. The EIR/EIS should address any mitigation activity they might incorporate as a result of the LAX Master Plan evolution. (Maybe I should say revolution.)

What will be the impacts and mitigation measures for any change in landing and takeoff flight paths?

What affect will the increase capacity of LAX have on over ocean takeoff and landing procedures from 12:00 a.m. to 6:30 a.m.? Will this over ocean window be decreased as a result of increased operations?

What affect will increased aircraft traffic have on preferential runway utilization of 24R and 25L?

Will a potential new Primarily Commuter Runway be used for west to east takeoffs in inclement weather? If so what will be the landing and takeoff flight path patterns?

What will be the mitigation procedures?

A. How about flyovers and wave offs of possible west to east landings?

What will be the mitigation procedures?

B. How about flyovers and wave offs of east to west landings? What will be the mitigation procedures?

C. Where will the air traffic controller direct those aircraft to fly? Where will the flight paths be located?

What effect will the changing of the landing and takeoff thresholds have in changing the noise contours and the distribution of polluted air if any of the existing runways are extended to the east and/or north and/or south?

(The thresholds will no doubt change if any runway is extended especially toward the east has been presented on some of the alternatives.)

How will the FAA improve on the methods to enforce its own rules and regulations pertaining to:

A. no turns until the aircraft crosses the shoreline,

1. Under what conditions may this rule be changed?

B. utilization of the inboard runways at all possible times instead of outboard runways,

1. Under what conditions may this rule be changed?

What changes in your 'Rules and Regulations' could be anticipated with the expansion of LAX?

What effect will 'single' event noise have on the adjacent neighbors as a result of LAX expansion? Please include in your studies this very important item of single event noise.

The FAA should consider 60 DNL (CNEL) as a new measuring standard since single event operations will increase at LAX as well as most every major airport in the U.S.A., over time, and we know people complain about single event noise not DNL (CNEL) noise. This concept should be included in the EIR.

Will one of the mitigation measures be to have the ATC hold an aircraft in a landing pattern longer in order to avoid a wave-off when there may be congestion on the runways? This should be considered.

What impact will reducing the separation of independent parallel instrument approaches below 4500' or even going as low as 2500'?

Consideration should be given for the FAA to help LAX enforce their Rules and Regulations to

For how long will these happen? What will the operating hours of the construction route?

Why didn't you use World Health Organization (WHO) documentation to support your Federal

Interrogatory Committee on Aircraft Noise (FICAN) information? Also, why was FICAN not used for Sound Exposure Level (SEL)?

What mitigation measure did you include for SEL? If there were none, then why were they not included? What abatement measures have been done elsewhere for any kind of single event noise, not limited to airports? How successful were those abatement measures?

Where else in the world, and in the United States in particular, has habitat relocation been attempted? Has this effort been successfully implemented? If it is not successful, then what penalty will LAWA suffer for non-compliance with the EIS/EIR?

In cases of Single Event Noise/Sound Noise Level, what would be the AdBA for serious annoyance and speech intelligibility and moderate annoyance?

How does LAWA propose to evaluate and mitigate noise impact on the learning process of students in schools?

Why is there no specific noise study in the community on schools impacted by LAX?

Why is there not a report of the origin and destination of passengers at LAX?27. How were the projected 2015 levels of air pollution arrived at for the area north and east of Manchester Square for the No Action No Plan Alternative in the EIS? Were mitigation measures implemented by LAWA between the 1996 baseline and the present accounted for in the projections?

Why was there an assumption that the current Part 161 study would develop mitigation actions. '

Nothing can be assumed until the study is complete.
Where is a firm commitment by LAWA and the city of Los Angeles to the CNEL and over-ocean procedures included in the EIR?

Where are the studies of increased traffic on 6L and 6R during easterly operations.

Where is the study on single-event noise generated by easterly take-offs?

Over 20,000 would be newly exposed to 94dBA SEL noise under the EIR. What time of day would these impacts occur? What mitigation measures were included for SEL impacts?

What is the cost difference for Alternative D if non-union labor is used instead of union labor?

Where is the cost analysis showing the impact on neighboring communities in terms of businesses during construction? Health issues such as loss of hearing, increased respiratory diseases, cancers, and stress? Loss to employers and employees for sick time due to these health issues?

How will LAWA retain low cost airlines (e.g. Southwest, at LAX who may be displaced from their existing passenger terminal facilities .

What other costs to be borne by the City of Los Angeles, County of Los Angeles, State of California and the United States of America for impacts related to LAX? What costs will incurred by these levels of government for health issues created by LAX?

If 78.9 million annual passengers (MAP) is the proposed maximum number of passengers to be handled at LAX in a calendar year, then what do you anticipate will be the number of passengers per gate when you reach that level?(I know they will VARY)

Does the budget for the LAX Master Plan include potential litigation costs? What is the udget amount? Are litigation expenses included in costs analyses? Are settlement costs budgeted and for what amount?

What amount of property is to be acquired via eminent domain?

How many Airbus A380 aircraft are expected to fly into LAX? How many flights per day? To what extent must passenger terminals be redesigned to accommodate these aircraft? How many gates will be established for these aircraft and at which terminal buildings?

Why are some numbers explained as percentages in the draft EIR document? Can you explain the numbers instead of a percentage?

Why are there no studies being conducted to study the health effects of LAX on surrounding residents?

Is LAWA recording and tracking low frequency noise generated at LAX? What mitigation measures are being employed to reduce low frequency noise? Low frequency noise must be studied, mitigated and abated.

At what location do you anticipate placing the run-up enclosure? Will the enclosure prevent high and low frequency noise from going out into the surrounding community? What will the hours of operation be for the run-up enclosure? How will aircraft be moved to and from the enclosure-aircraft under power, electric tugs, etc.?

How will biological incursions by non-native plants, animals and insects be handled?

What is the amount of time each runway will be out of service when a runway is moved and/or extended?

What is the construction route? Will existing streets be blocked and/or detours put into place?

landing pattern longer in order to avoid a wave-off when there may be congestion on the runways? This should be considered.

What impact will reducing the separation of independent parallel instrument approaches below 4500' or even going as low as 2500'?

Consideration should be given for the FAA to help LAX enforce their Rules and Regulations to mitigate noise?

Provide the exact boundaries by street name and number of dwelling units, businesses, hotels, etc. in each concept that may be included in any land acquisition program.

. The EIR must address the increased noise impacts resulting from the increase of operations, as well as the dispersion of the noise over a larger area to the east, north, and south

The EIR should address single event noise analysis. (The FAA specifically has agreed to include single event analysis at Minneapolis-St. Paul International Airport, Memphis International Airport, Detroit City Airport, Philadelphia International Airport, and Baltimore International Airport.)

TheEIR must not only examine the combined effects of the actions proposed in the Master Plan, but also consider the combined effects of the proposed actions with other projects both on and off airport property.

Consider another Master Plan option of expanding the airport without adding any new runways.

What conditions are being put into any new alternative to insure a continuation of over ocean operations?

A noise footprint for each aircraft under all weather conditions on each flight path during take-off and landing must be included in noise studies showing single event impacts on each neighborhood.

What will be the landing and takeoff patterns for all future modernization programs ?

What will be the impacts and mitigation measures for any change in landing and takeoff flight paths?

What affect will the increase capacity of LAX have on over ocean takeoff and landing procedures from 12:00 a.m. to 6:30 a.m.? Will this over ocean window be decreased as a result of increased operations?

What affect will increased aircraft traffic have on preferential runway utilization of 24R and 25L?

What effect will the changing of the landing and takeoff thresholds have in changing the noise contours and the distribution of polluted air if any of the existing runways are extended to the east and/or north and/or south?
(The thresholds will no doubt change if any runway is extended especially toward the east.)

How will the FAA improve on the methods to enforce its own rules and regulations pertaining to:

A. no turns until the aircraft crosses the shoreline,
   1. Under what conditions may this rule be changed?

B. utilization of the inboard runways at all possible times instead of outboard runways,
   1. Under what conditions may this rule be changed?

What changes in the 'Rules and Regulations' could be anticipated

What effect will 'single' event noise have on the adjacent neighbors as a result of LAX expansion? Please include in your studies this very important item of single event noise.

The FAA should include in the EIS information pertaining to increase minimum flying elevations to 2000' of all helicopters in the LAX area. Will you study this as a mitigating factor.

. The FAA should consider 60 DNL (CNEL) as a new measuring standard since single event operations will increase at LAX as well as most every major airport in the U.S.A., over time, and we know people complain about single event noise not DNL (CNEL) noise. This concept should be included in the EIS/EIR.

If the FAA is no longer involved in the 'promoting of air commerce, then we suggest you allow LAX to use the ARTS III system of reporting procedures of aircraft operations to be used for enforcement purposes of FAA and LAX Rules and Regulations. This should be included as a mitigation measure to lessen negative environmental impacts as a result of increased aircraft operations.

Will one of the mitigation measures be to have the ATC hold an aircraft in a

Roy Hefner - 6548 W. 80th Place - Westchester Ca 90045

These statements indicate that the project is going to go forward regardless of any potential negative impacts created by the project. I surmise that your job is to identify the potential negative impacts and suggest what can be done to reduce those impacts but in the final analysis the project will be approved.

The EIR of 1978 which allowed for the expansion of LAX to forty MAP was reached and surpassed in 1986. The 'Draft EIR 2000' indicated a growth to 65 MAP by the year 2000. That draft was subsequently taken off the table to be replaced by the LAX Master Plan Process. LAX served 60 MAP in 1997 and this is without any significant expansion programs done at LAX without an EIR.

Project the number of passengers, number of aircraft operations, amount of cargo tonnage, etc. that would exist in the year 2015 or **2020** if no LAX expansion takes place.

Project the number of potential job losses or gains if one of the four expansion project is not adopted.

FAA regulations require that the 'total proposal' be considered. The regulations state the "total proposal includes the proposed action and all other actions reasonably related to it in time and probability." On this basis I have the following questions and comments. The EIR/EIS should address any mitigation activity they might incorporate as a result of the LAX Master Plan evolution. (Maybe I should say revolution.)

What will be the landing and takeoff patterns for all concepts?
f(including alternative 'E)

What will be the impacts and mitigation measures for any change in landing and takeoff flight paths?

What affect will the increase capacity of LAX have on over ocean takeoff and landing procedures from 12:00 a.m. to 6:30 a.m.? Will this over ocean window be decreased as a result of increased operations?

What affect will increased aircraft traffic have on preferential runway utilization of 24R and 25L?

Will a new Primarily Commuter Runway be used for west to east takeoffs in inclement weather? If so what will be the landing and takeoff flight path patterns? What will be the mitigation procedures?

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B. How about flyovers and wave offs of east to west landings? What will be the mitigation procedures?

C. Where will the air traffic controller direct those aircraft to fly? Where will the flight paths be located?

D. What size planes would be able to use the so-called commuter runways? (727, A320, 757, etc.)

What effect will the changing of the landing and takeoff thresholds have in changing the noise contours and the distribution of polluted air if any of the existing runways are extended to the east and/or south?

(The thresholds will no doubt change if any runway is extended especially toward the east has been presented on some of the concepts.)

. How will the FAA improve on the methods to enforce its own rules and regulations pertaining to:

A. no turns until the aircraft crosses the shoreline,

1. Under what conditions may this rule be changed?

B. utilization of the inboard runways at all possible times instead of outboard runways,

1. Under what conditions may this rule be changed?

What changes in your 'Rules and Regulations' could be anticipated with the expansion of LAX?

What potential flight paths, for take offs and landings, will be used for all existing runways and all potential new runways in each concept?

What effect will 'single' event noise have on the adjacent neighbors as a result of LAX expansion? Please include in your studies this very important item of single event noise.

The FAA should include in the EIS information pertaining to increase minimum flying elevations to 2000' of all helicopters in the LAX area. This should be studied as a mitigation factor.

. The FAA should consider 60 DNL (CNEL) as a new measuring standard since single event operations will increase at LAX as well as most every major airport in the U.S.A. and we know people complain about singles event noise not DNL (CNEL) noise. This concept should be included in the EIS/EIR.

If the FAA is no longer involved in the 'promoting of air commerce, then I suggest you allow LAX to use the ARTS III system of reporting procedures of aircraft operations to be used for enforcement purposes of FAA and LAX Rules and Regulations. This should be included as a mitigation measure to lessen negative environmental impacts as a result of increased aircraft operations.

. The EIS must address the noise impacts resulting from the combination of the airside expansion proposed, such as constructing new runways and extending and moving existing runways.

The EIS must address the increased noise impacts resulting from the increase of operations, as well as the dispersion of the noise over a larger area to the east, north, and south

The EIS should address single event noise analysis. (The FAA specifically has agreed to include single event analysis at Minneapolis-St. Paul International Airport, Memphis International Airport, Detroit City Airport, Philadelphia International Airport, and Baltimore International Airport.)

The EIS must not only examine the combined effects of the actions proposed in the Master Plan, but also consider the combined effects of the proposed actions with other projects both on and off airport property.

Consider another Master Plan option of expanding the airport without adding any new runways.

. Consider the availability of other airports when their existing restriction expires such as Long Beach and John Wayne Airports.

. Consider the mitigation measure of expanding the existing airports or building a new airport in the distant future.

Consider mitigation measures pertaining to the health of children and adults as a result of air and noise pollution.

Considered mitigation measures which will lessen the harmful effects of noise and air pollution in the learning process of young people.

There are many other area to be considered in the EIR process. Time does not permit me to delve further into this important subject. I hope that others will fill in the voids.

Sincerely,

Roy Hefner
6548 W. 80th Place
Westchester, CA 90045
1-310-670-8958

Will one of the mitigation measures be to have the ATC hold an aircraft in a landing pattern longer in order to avoid a wave-off when there may be congestion on the runways? This should be considered.

. What impact will reducing the separation of independent parallel instrument approaches below 4500' or even going as low as 2500'?

Consideration should be given for the FAA to help LAX enforce their Rules and Regulations to mitigate noise?

The Master Plan Brochure states on the first inside page, first paragraph, "The purpose of the LAX Master Plan process is to allow the Los Angeles Department of Airports the best means possible to determine: How best to **ensure** (my highlight) that the impact of LAX improvements will also **improve** (my highlight) the environment and quality of life." It appears that this is a commitment by the LAX Department of Airports to the local communities.

Include in the EIR/EIS materials the methods you plan to use to ensure and improve the environment and quality of life.

Explain how you plan to ensure and improve the environment and quality of life if of the approximate 91 'Initial Study Checklist' items 20 say no impact and the other 71 say yes there is an impact or maybe there will be an impact.

Please give all the potential new runways an identifying number such as 26, etc.

Provide the exact boundaries by street name and number of dwelling units, businesses, hotels, etc. in each concept that may be included in any land acquisition program.

Describe commuter aircrafts that may be using a new 'commuter' runway.

Prepare noise contour maps to project the noise contours for five year periods for all Lax Master Plan Project concepts.

All direct and indirect impacts of the proposed actions and their alternatives must be considered. Amongst these are:

1. Air space.
2. Water quality
3. Social impacts
4. Land use
5. Air quality
6. Hazardous waste
7. Flight safety
8. Noise

Dear Mr Glasgow: Page (1) 5/18/08

Best Plans are (IN order top 3)

(1) Move Runway 340 ft North
(2) Move Runway 100 ft North
(3) Adding People mover (with proper green Line Looks) no change to Runways

---

(A) Do not let local "nimbys" tie up a Metro Area of millions who depend on Airport, not do mentla tourists and Business Travelers who get a Bad view of our city Because of the Airport Condistion + traffic - Lack of Transit

(B) The Airport is fast Becoming "3rd world" (As is the city) Due to Lack of First class facilities and Transit Connections.

(C) Don't Spend Big $$ tearing Down terminals, Move the Runway Instead

(D) If Anything, tear down the Inside Parking garages and expand the terminals and for ease of transit Connections. (over)

Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: 5/18/08

Name: EILEEN CROWLEY

Organization: RESIDENT

Address: 8943 KITTYHAWK AVE

Comment: WHY IS LAWA DESTROYING WESTCHESTER. WE HAVE TRYING TO BUILD IT UP. MOVING THE NORTH RUNWAY 340 FEET WILL DESTROY BUSINESSES, HOMES, A COMMUNITY'S WAY OF LIFE. LAWA TOOK SO MUCH OF WESTCHESTER ALREADY. WHY? JUST SO LAWA CAN EXPAND. IT HAS NOTHING WHATSOEVER TO DO WITH SAFETY. LAWA KNOWS IT, THE MAYOR KNOWS IT AND THE FAA KNOWS IT. LIES. LAX IS A MAIN TARGET FOR TERRORIST. SO WHY WOULD LAWA & FAA GIVE THEM A BIGGER TARGET. PUTTING ALL THE COMMODITIES AROUND LAX IN GREATER DANGER. THE REAL PROBLEM IS THE FAA NOT HIRING ENOUGH CONTROLLERS FOR THE TOWER. ALSO NOT PUTTING IN THE STATUS LIGHTS. BOTH SHOULD HAVE BEEN DONE A LONG TIME AGO. WHY HAVEN'S THEY? LAWA & FAA CAUSE THE PROBLEMS. HUMAN ERROR CAUSED THE INCIDENTS NOT THE SIZE OF THE RUNWAY. IF THE FAA IS SO CONCERNED ABOUT SAFETY. WHY DID THEY ALLOW AIRLINES TO FLY THAT DIDN'T LINE UP TO SAFETY INSPECTIONS? SO, STOP THE LIES AND DON'T INSULT OUR INTELLIGENCE. ALL COMMODITIES WILL FIGHT TOOTH & NAIL TO STOP EXPANSION THAT IS UNNECESSARY.

Please drop the completed form into the box marked "COMMENTS" or mail to:
Mr. Herb Glasgow
Senior City Planner
Los Angeles Worlds Airports
1 World Way, Room 218
Los Angeles, CA 90045
All comments must be received no later than Wednesday, June 18, 2008.

(Page 3)

✓ Any future subway Along the 405 to the S.F. Valley would connect at north TC.

(G) More parking should be concentrated ~~at~~ north and south TC's and out of the Central Termine Area

(H) Tearing Down the Central Parking Garages, would open up Huge Areas for Expanded Terminals

(I) People mover should have stops at new Consolidated Rental Car center

(J) All Buses — Airport, Charter, Hotel shuttle Should have a drop off spot outside terminal City Buses also — or best the MTA / Santa Monica Blue Bus / Torrance / Gardena — be the ~~only~~ Buses in Central Terminal Area — Expands public transportation Advantage

— Summary →

(Page 2)

(D) See Attached Map — Pink is green line — orange is people mover.

Don't Duplicate green Line and people mover waste of money and you have a ~~flight~~ Right of way Along Aviation. Metrolink should connect at Both north + South TC's.

Chevrolet Line Can come into from north to north TC.

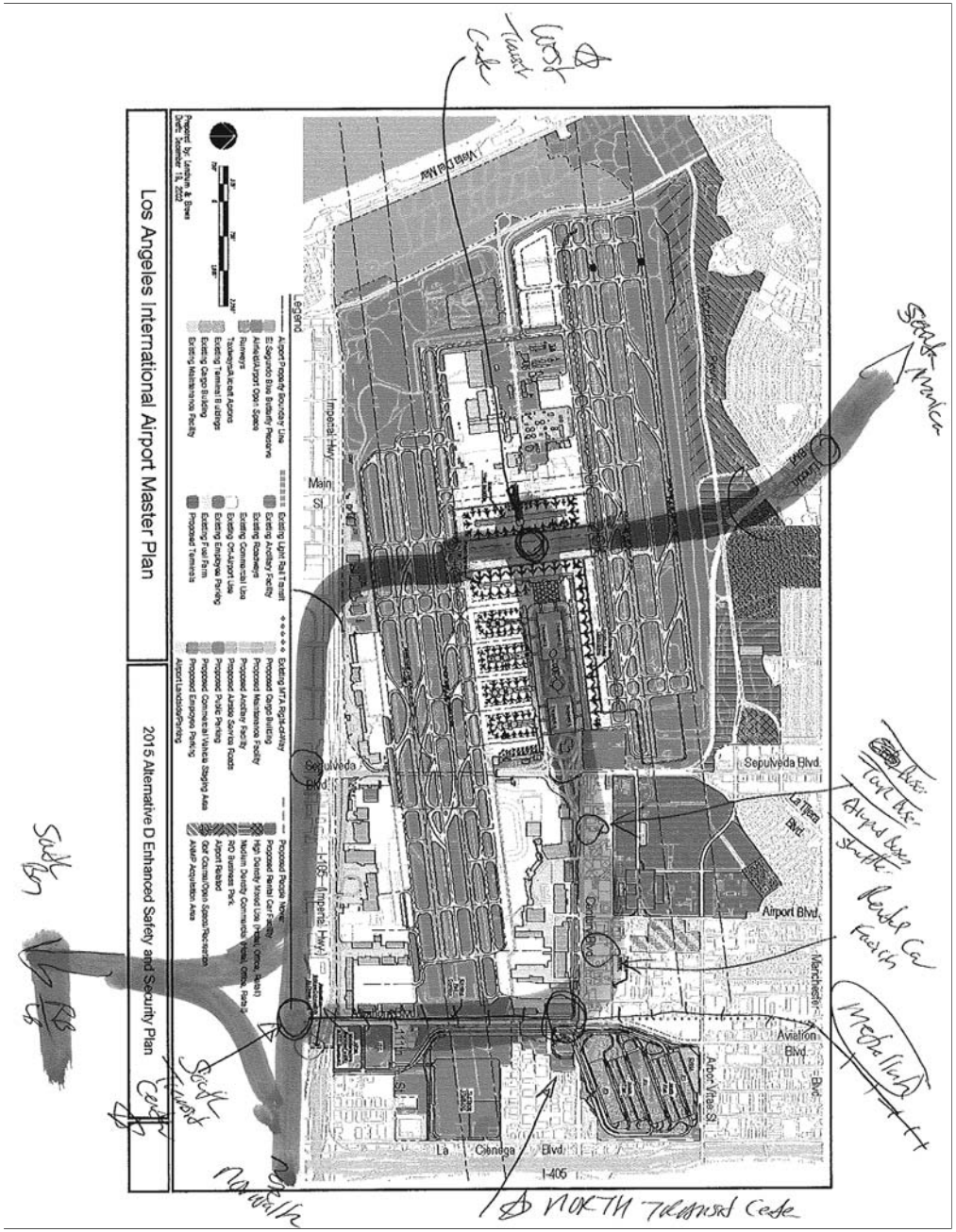
(E) green Line stays elevated Along Imperial, then tunnels under south Runway to the new "west" TC in the new International terminal. Then under the north Runway, Curving Above into westchester and on to Playa del Rey and eventually Santa Monica. Underground electricities Above ground wires — Catenary concerns near an airport

(F) ✓ green Line passengers from the East / green from the South Connect at south TC To People mover for Domestic or to west TC for International

✓ Coast / green Line from Santa Monica — Connect at west TC for Both International + Domestic

✓ Metrolink Connects at north TC for Domestic or foreign

3 TC's Spreads the Crowds / Loads out over the people mover



(4)

(1) Don't Tear down Existing Terminals to make Runway — Saves $, $, $

(2) Don't develop green & people move Creates a Bigger Transit Footprint

(3) My green line Existing Can be Built With Limited Adverse Effects to operation of Airport. Needs to be Build In conjunction with new Intermodal Hub

(4) → 3 TC's to spread connections, crowds out

(5) More parking outside Central Terminal Area.

Thank You. I have many other ideas on this project if Interested

Mark Johnston
4185 Van Buren St
Chino, CA 91710

Note – Lived In pasadena for 22 years.
Currently Live In Flight path of Ontario Airport – So I know the Issues

Sorry for the Hard writing – Leaving on Vacation – Wanted to Send Before I Leave

Member – TRAC. AAAE

Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: 5-29-08

Name: Lionel Notto

Organization:

Address: 9226 So. Harvard Blvd. LA 90047

Comment: I have a concern of the aircraft noise that impact in the area where I am located. I want to meet someone at the site with a decible level indicator where my Property is located, so I will Know what is the level of noise, the property address is above. Please call me at (323) 752.3501 Please Mail all Communications to: Lionel Notto 3032 W. 78th Place Inglewood, Ca. 90305

Thank you,
Lionel Notto

Please drop the completed form into the box marked "COMMENTS" or mail to:
Mr. Herb Glasgow
Senior City Planner
Los Angeles Worlds Airports
1 World Way, Room 218
Los Angeles, CA 90045
All comments must be received no later than Wednesday, June 18, 2008.

Google Maps Address **Los Angeles Int'l Airport**

Get Google Maps on your phone
Text the word "GMAPS" to 466453



Replace Plan

Member:
ICSC
BOMA

H.B. DROLLINGER CO.

Developers • Property Management • Commercial Brokers

June 10, 2008

Mr. Herb Glasgow, Senior City Planner
Los Angeles World Airports
.1 World Way, Room 218
Los Angeles, CA 90045

Comments re: Notice of Preparation of a Draft Environmental Impact Report (SCH No. 1997061047), LAX Master Plan Specific Plan Restudy

Dear Mr. Glasgow:

The H.B. Drollinger Company is a longtime owner and operator of commercial properties in the Westchester community just north of LAX. Our comments reflect the history of this company and its ongoing relationship with the airport which is our neighbor.

Our company has survived several previous expansions of LAX, and we know well the costs to the community and hence to the City of Los Angeles of airport expansion. As businesspeople, we also understand the need for a thriving municipal economy—which is the rationale usually cited for expanding LAX.

Rather than repeat statements you will hear from numerous others, let me start by endorsing the Overview of Guiding Principles for Environmental Analysis which you will receive from the petitioners in the 2005 litigation concerning the previous plan for expansion (Cities of El Segundo, Inglewood, and Culver City, County of Los Angeles, and Alliance for a Regional Solution to Airport Congestion).

In addition, I ask that the EIR pay particular attention to the issues of (1) Land Use and Planning, (2) Population and Housing, and (3) Environmental Justice. All these issues also relate to Transportation and Circulation and to Air Quality.

LAND USE AND PLANNING: All the communities surrounding LAX are jobs-rich and housing-poor. This imbalance increases traffic congestion and lowers air quality. Some of this is because previous noise control measures as well as airport expansion have resulted in the removal of previously existing housing. Los Angeles (Westchester/Playa del Rey) and Inglewood have lost housing. With the loss of housing comes a loss of customer-base, and thus a loss of sales tax and business tax revenues to the City of Los Angeles in addition to the direct losses to local businesses. In your DEIR,

8929 South Sepulveda Blvd., Suite #130 • Los Angeles, California 90045 • (310) 417-8048 • Fax (310) 417-8029
E-Mail: info@hbdrollinger.com • www.HBDrollinger.com

Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: 6/2/08

Name: STEVEN N. NAIAN

Organization: HOME OWNER, & COMMUNITY RESIDENT.

Address: 8932 KENTWOOD AVE. · L.A. CA. 90045-4129

Comment:

MOVING RUNWAYS 24L & 24R NORTH ARE NOT AN OPTION.
WE ALL KNOW THAT THE AIRPORT WANTS TO LAND NEW LARGER GENERATION AIRCRAFT.
BUT THIS WILL NOT HAPPEN AT THE EXPENSE OF THE COMMUNITY THAT WAS HERE FIRST.
EXPANDING THE AIRPORT IS NOT AN OPTION. START THINKING IN TERMS
OF A REGIONAL DISTRIBUTION OF AIRPORTS AROUND LOS ANGELES
(PALMDALE & ONTARIO need to be expanded, + Burbank, Long Beach,
& JOHN WAYNE, O.C.) for the sake of traffic in the AIR & on the ground.
IF YOU WANT LARGER AIRCRAFT TO LAND AT LAX — LET THEM LAND ON
THE SOUTH SIDE, OR MAKE ONE RUNWAY ON THE NORTH SIDE
IN LIEU OF THE TWO YOU ENJOY NOW. THE SAFETY ISSUE REQUIRING A
MIDDLE TAXI WAY IS AN EXCUSE TO MOVE THE RUNWAYS NORTH. IMPLEMENT
TRAFFIC LIGHTS & STRICT ENFORCEMENT OF PILOT COMPLIANCE (WITH FINES
FOR NONCOMPLIANCE TO PILOTS & AIRLINES FOR VIOLATIONS) TO ELIMINATE ANY CONFUSION
ON THE GROUND - ALSO HONOR THE CITY'S COMPROMISE AGREEMENT WITH THE COMMUNITY
& SURROUNDING CITIES NOT TO EXPAND AT THE COMMUNITIES EXPENSE

Please drop the completed form into the box marked "COMMENTS" or mail to:

Mr. Herb Glasgow
Senior City Planner
Los Angeles Worlds Airports
1 World Way, Room 218
Los Angeles, CA 90045

All comments must be received no later than Wednesday, June 18, 2008.

MAYOR VILLARAIGOSA DEFENDED IN HIS BID TO EXPAND
OTHER ELECTED OFFICIALS WILL FACE SIMILAR FATES.

Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: June 13, 2008

Name: Cynthia Notto

Organization:

Address: 1844 W. 82nd Street, Los Angeles, CA 90047

Comment:

I have a concern of the aircraft noise in the area where I am located and the impact that it has on my physical hearing. I want to meet with someone at the above address with a decible Level indicator where my property is located, so I will know the level of noise. Please contact me at the following phone number (323) 778-6760 or the above address. I look forward to hearing from you soon.

Thank you for your immediate concern in this matter.

Sincerely,

Cynthia Notto

Please drop the completed form into the box marked "COMMENTS" or mail to:
Mr. Herb Glasgow
Senior City Planner
Los Angeles Worlds Airports
1 World Way, Room 218
Los Angeles, CA 90045
All comments must be received no later than Wednesday, June 18, 2008.

I urge you to consider the impacts on jobs-housing balance from further expansion of the airport, including its required runway protection zones.

POPULATION AND HOUSING: See above. To the extent airport expansion or "modernization" reduces West Side housing and population, it increases travel distances for airport passengers and employees. Increased vehicle miles traveled (VMT) correlates with degraded air quality and must be addressed under both TRANSPORTATION and AIR QUALITY in your EIR.

ENVIRONMENTAL JUSTICE: Since the prevailing winds carry coastal air pollution inland, this increase leads directly to a plume of bad air trailing over communities inland of the airport. The population of the most seriously impacted communities is mostly minority.

And finally, I ask that you add to the EIR a long-overdue project alternative, the much talked about and little explored "regional solution."

PROJECT ALTERNATIVE: The above concerns coupled with recent and possibly permanent higher fuel costs raise questions which require LAWA's attention. If fuel prices remain high, does it make sense for such a high proportion of Southern California's air cargo and passenger traffic to drive the ever-increasing distances from home to LAX? Can LAWA and the airlines offer a less expensive alternative by locating more service capability closer to the cargo and passenger points of origin?

For both environmental and economic reasons, this is the time for LAWA to consider a Project Alternative that would transfer your "modernization" efforts from LAX to locations in and near the Inland Empire and the Antelope and Central Valleys? Just as expansion proponents have argued that "the demand is at LAX," American auto manufacturers have argued that "the demand is for trucks and SUVs." In both cases, the answer is "not any more."

Your EIR should compare the air quality impacts and the traffic and circulation impacts of investing in Ontario or Palmdale to the impacts from continued investment in LAX expansion.

Thank you for the opportunity to comment on the Notice of Preparation. The H.B. Drollinger Company looks forward to working with LAWA "for a better Westchester."

Yours truly,

Karen Dial

Karen Dial
President

accommodate the traffic stemming from the development of Playa Vista . With respect to these two arteries it is unlikely that they can be widened any further. Any modification of the traffic signals controlling access from cross streets to permit greater traffic flow while resulting in long waits would be unacceptable.

In addition to the potential traffic impact to local traffic arteries, additional traffic impact to the already congested San Diego Freeway must be addressed. This artery is already at capacity. Although further widening of the highway is possible, further widening would be costly, would be a time consuming process and would likely result in community opposition.

All traffic studies must address the traffic flow at key intersections at different times of day. Attention must be given to "rush hour" when local streets are currently severely impacted and airport traffic appears to increase. The impact from increased traffic flow at the holiday season needs also to be addressed. Traffic surveys need to address traffic flow on the San Diego Freeway as well as major arteries.

Although mass transit, namely buses and tie-ins to light rail are being proposed as means to manage traffic flow. Light rail projects are largely dependent on government funding and this funding availability and timing of such funding will dictate the timeframe. Any capacity at LAX increase must be in "lockstep" with any such passenger capacity increase resulting from the completion of mass transit projects. In the public meeting the Crenshaw-Prairie light rail line was discussed as one means of re-directing traffic destined to the airport. This project is in the early planning stages and its completion date can not be assured at this time.

Air Quality: A comprehensive air quality study is necessary to assess the air quality impacts resulting from additional surface vehicle and aircraft. In this study both fugitive particulate and non-particulate emissions from these sources needs to be addressed.

It is noted that one of the reasons to realign the north runways is to accommodate the larger aircraft. The emissions generated from these aircraft, especially upon takeoff, also the maximum number of takeoffs and landings in a defined time period through out the day and resulting emissions need to be need to be addressed. With respect to surface vehicles, undoubtedly with the increased passenger traffic flow, there will be increase surface vehicle traffic. The air qualiy study needs to address the impact from these additional vehicles.

If alternative fuel-powered vehicles, namely those powered by Liquefied Natural Gas (LNG), Compressed Natural Gas, or Biodiesel are offered as measures to mitigate diminished air quality, siting of vehicle fueling facilities and the long-term reliability of fuel supplies in the event of a supply disruption either human-caused or a natural disaster needs to be addressed . Please note that currently no LNG is produced in California and all LNG must be trucked from out-of-state.

Noise: A comprehensive noise survey is needed to assess the impacts from the individual alternatives and the deployment of larger aircraft on the North Runways. Movement of the runways to the North will move the source of noise generated by the aircraft closer to the community. The scheduling of takeoffs and landings of these larger aircraft and any increase in the total number of flights also need to be addressed.

8065 Nardian Way
Los Angeles, CA 90045
June 13, 2008

Mr. Herb Glasgow
Senior City Planner
City of Los Angeles
Los Angeles World Airports
1 World Way, Room 218
Los Angeles, CA 90045

LOS ANGELES INTERNATIONAL AIRPORT – SPECIFIC PLAN AMENDMENT STUDY – ENVIRONMENTAL IMPACT REPORT PROCESS - PUBLIC COMMENT

Dear Mr Glasgow:

The Specific Plan Amendment Study for the expansion of Los Angeles International Airport (LAX) is extremely ambitious. As indicated in the Notice of Preparation (NOP) for the Specific Plan Amendment Study Environmental Impact Report public outreach document.

The proposed capacity of LAX is to be increased to approximately 78 million passengers/day.

It is anticipated that significant from impacts from noise, air quality traffic will result from the projects proposed "yellow light" projects. In the preparation of the environmental document, attention must be given to address these impacts. These will require detailed technical analyses to assess the impacts to the community and develop appropriate mitigation measures addressed.

Pursuant to the California Environmental Quality Act the environmental document must consider the cumulative impacts of other projects in the immediate area directly north of LAX, namely the Playa Vista and Loyola Marymount University 20 year master plan as well as other projects in the planning stage will also have on the community directly north of the airport Each project and its incremental impacts must stand on its own.

Surface Vehicular Traffic: With respect to each alternative all graphic materials indicating the existing and proposed alignment of major surface traffic arteries in the vicinity of LAX need to be clearly defined. Note that the alignments of Sepulveda and Lincoln Boulevards as illustrated on the renderings exhibited in the 16 page document distributed at the May 7, 2008 public meeting, have been screened to the extent that the location of these major arteries are not clearly defined. The alignment of these arteries is extremely faint and the reader can not determine whether the existing alignment is maintained or whether the roadway is to be realigned. In the environmental document it must be specified whether realignment of any major traffic arteries will be necessary as part of an alternative and the impact from such realignment.

With respect to roadway capacity, it may be necessary to widen major arteries to accommodate additional traffic. This has already been done with Lincoln and Sepulveda Boulevards to

Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: JUNE 12TH 2008

Name: PERCY CROSBY MOSS

Organization: HOME OWNER

Address: 1850 WEST 82ND STREET LOS ANGELES, CA

Comment: REGUARDING THE AIRPLAIN NOISE ALONG THE AIRPLAIN CORRIDOR THEY FLY DIRECTLY OVER MY HOME AND BACK YARD AND THY DROWN OUT THE SOUND OF TV AND SOME TIME WHEN TALKING OVER THE TELEPHONE. I HAVE A TAPE OF SOME OF THE AIRPLAIN NOISE AS THEY FLEW OVER MY HOME IN THE AIR PLAIN CORRIDOR, PLEASE CONSIDER MY HOME FOR SOME SOUNDPROOFING

Percy C. Moss

Please drop the completed form into the box marked "COMMENTS" or mail to:

Mr. Herb Glasgow
Senior City Planner
Los Angeles Worlds Airports
1 World Way, Room 218
Los Angeles, CA 90045

Satellite Airports. The environmental document needs to address the efforts of the Regional Airport Working Group. Much of the recent and future growth is/will be occurring in more remote areas of Los Angeles, San Bernardino, Riverside, Orange and Ventura Counties. It is likely a large portion of the future surface traffic and need for air transit will come from these areas. It would be irresponsible to not address the coupling expansion at LAX with increased capacity at other regional airports. These regional airports have room to expand and would be beneficial in managing regional air traffic as well as cargo.

I look forward to the preparation of the Draft Environmental Impact Report and seeing how these comments are addressed in the environmental document.

Sincerely,

John A. Moore, P.E.

Los Angeles International Airport Advisory Committee

Committee: Residents of El Segundo, Inglewood, Lennox, Hawthorne, Culver City and Westchester/Playa del Rey

June 16, 2008

Herb Glasgow
Senior City Planner
Los Angeles World Airports
1 World Way, Room 218
Los Angeles, California 90045

Dear Mr. Glasgow:

The Los Angeles International Airport Area Advisory Committee (LAXAAC) is providing in this letter comments relating to the scoping process for the on-going planning process for LAX, and particularly the issue of the separation of the north runways. Although the scoping process is intended to develop numerous ideas for consideration, we are concerned that LAWA already has fixed on one proposal, namely that of moving Runway 24R north by 340 or more feet. Although we will include here our suggestions for the discussion of the impacts of that proposal which we assume will be considered in the EIR, we also are suggesting other alternatives that should be considered. At this point, we are not necessarily advocating any of these options; we just believe they must be considered.

At least one Airport Commissioner has suggested that the current situation of incursions occurring when airplanes move from one north runway to the other north runway is so unsafe that an emergency must be declared to deal with it expeditiously. If that truly reflects the beliefs of the members of the Board of Airport Commissioners, then the only way to proceed is for LAWA to take the necessary steps to close one of the two north runways until the situation can be remedied.

Although we certainly agree that safety should be LAWA's first priority, we are skeptical about the use of safety as the sole justification for the proposal to move Runway 24R north, given that there is no comprehensive study or other evidence that supports the claim that moving the runway would have prevented the incursions that have occurred on the North Airfield. Adding a center-line taxiway has, however, reduced the number of incursions at other airports. The GAO study mentioned several safety measures that could be taken at LAX that did not include moving Runway 24R. A comprehensive safety study should be completed and analyzed thoroughly before any decisions are made regarding the North Airfield runways, because the first issue to be determined should be what, if any, safety issue exists.

Nonetheless, given that safety is the current rationale for changing the north airfield, we make the following three suggestions that we believe should be studied in the process of determining what actions should be taken to improve overall safety at the airport.

1. SAFETY ENHANCEMENTS

127 Rees Street
Playa del Rey, Ca. 90293
June 16, 2008

Regarding May 7, 2008 Scoping meeting for LAX Specific Plan Amendment Study for EIR

Dear Mr. Johnson, Herb Glasgow and LAWA at Large,

Please include my comments in Responses to the Notice of Preparation.

How many times do we have to tell you that Westchester and Playa del Rey have paid our due$?? No LAX Expansion.

No to options 2,3,5,6. Absolutely No, No,No,No!!!!!!!!!!!!!!!!
I support option 1-- "No Action".
If option 4 is not a "Wolf in sheep's clothing" then I say yes only after you come back and tell us what is hidden.

This is not news but I want it included: Incursions are human issues --- either Pilots or Traffic Controllers. So you need to "in service" both groups again and again until there are no more incursions. Additionally, you should hire more Controllers. This is money well spent in the name of Safety. It is safety science and you can save all the expansion dollars by hiring the right people!!!! Do It now and stop insulting us with the same old rhetoric!!!
Carol Kapp CK
West Beach Playa del Rey Property Owners Association
Member

cc A. Villaraigosa, Mayor: B. Rosendahl, Councilman 11th

The scoping process should include an analysis of all safety measures that could be taken to reduce incursions. Our first proposal would be a determination of whether the following actions would resolve any perceived safety issues:

- Imposing a moratorium on landings on primary departure runways,
- Improving communications between tower and cockpit,
- Fully staffing tower and TRACON offices,
- Installing the most modern and efficient equipment in the tower,
- Installing GPS ground-tracking system,
- Reconfiguring existing taxiways (S-curves, etc.),
- Installing additional runway status lights,
- Maintaining more space between aircraft,
- Creating an end-around taxiway, and
- Adhering to the LAX preferential runway noise abatement plan, including creating an on-going training program with the FAA control tower so that air traffic controllers are frequently reminded of the LAX noise procedures handbook.

This should not be considered a "no-action" proposal, because it does involve significant actions that are not currently in place. We expect that these changes would have limited economic, environmental, health and noise impacts, but at the same time would increase safety.

2. Reduce North Airfield to One Runway.

If the incursions are due to aircraft traveling from one runway to the other, the problems should be eliminated if LAWA reduces the north airfield to one runway. This would require fewer overall operations at LAX, because without such a reduction, this change would unduly and unfairly impact the residents of El Segundo and other communities south of the airport. Although the environmental, noise and traffic impacts could be expected to be beneficial to the communities on at least the north side of the airport, the economic impacts also must be considered. Of course, the economic impacts---both positive and negative---of moving those operations to other airports, such as Palmdale and Ontario, must be considered as part of the EIR process, and considered in the aggregate, not just the impacts at LAX.

Moreover, as a matter of national security, the Southern California region should have more than one significant airport. Even if it is not within the scope of the EIR process to consider national security, we would consider it a flagrant breach of fiduciary duty for the BOAC not to consider the issue.

In addition, the EIR must address how any of the proposals would fit into the well-recognized need to adopt a regional approach to air transportation in Southern California. The proposal to limit the north airfield to one runway would do the most to accomplish this goal, while the proposals to move Runway 24R north can be expected eventually to result in increased operations at LAX, rather than doing anything to diminish the significance of LAX. The EIR honestly should address how the proposed separation of runways, whether by moving north or south, would allow operations at LAX to increase capacity, and the resulting impacts of such capacity increases on our communities.

Without considering the impacts of all proposals on a regional air transportation system, the EIR will fail to address adequately the impacts of the proposed change on the communities surrounding the airport. Only a truly regional approach to air transportation will mitigate the current impact of air traffic on the communities surrounding LAX. Only if the air traffic burden

can be spread throughout the Southern California region, will we continue to see the economic benefits of a vibrant transportation system without unduly impacting one portion of the Southern California community. We expect that the EIR will do more than give lip service to this concern.

3. Move 24R north by 100 feet and add a center taxiway.

A third option that the EIR should include is a discussion of the impacts of moving Runway 24N north by no more than 100 feet, and adding a center taxiway between the runways. This would make the geometry of the north side of the airport comparable to that of the south side, now that the runway move there is complete.

In no event, however, should LAWA endeavor to make LAX a Type 6 airport.

4. Move 24L South

Our fourth proposal for the EIR to discuss, would arise only if the need to increase the separation of the two north runways is seen as the only solution to resolve the safety concerns. That proposal would be to move Runway 24L 340 feet south and to add a center-line taxiway. This concept would require some alterations to Terminals 1, 2, and 3. This would be an opportune time to reassign terminal usage by making these terminals linear (with approximately 32 gates - almost the current number) and limit them to smaller aircraft and/or low-cost carriers. Airlines throughout LAX could also be realigned with their current alliance partner affiliations in the same or adjacent terminals, making connections easier for passenger and baggage transfers.

By moving Runway 24R 100 feet south, many of the portions of the Westchester business district that are now within the FAA buffer zone for the runway would be clear of the zone.

* * *

With respect to the proposal that LAWA at this time seems to favor, LAXAAC members are seriously concerned about the safety, economic, health and environmental impacts that moving Runway 24R as much as 340 feet north would have on their communities near LAX. Indeed, if the runway is moved that far north, it would exacerbate all of the current air pollution, noise and ground traffic impacts on Westchester, Inglewood, and Culver City, at a minimum, while newly exposing communities not as currently as heavily impacted by the airport (such as Venice and Marina del Rey) to noise, health and other environmental concerns.

The EIR must also discuss whether any of the proposed changes would allow for an expansion of operations or annual passengers at LAX. The coastal area's network of surface transportation is currently near gridlock. Given continuing deficits in the federal and state budgets, funding for any kind of rail access to LAX is, at best, far in the future. Enhancing capacity at LAX would increase the surface transportation to an intolerable level for communities from Malibu through the Palos Verdes Peninsula, and for many miles east.

In addition, the EIR with respect to each proposed option must include complete economic impacts, such as the loss to the city of the tax base and purchasing capability of dislocated businesses and residences in addition to the cost to the city of purchasing these properties to comply with the FAA-mandated runway buffer zone if the runway is moved closer to the communities north of LAX. In this regard, the costs of moving Runway 24R should be

Los Angeles International Airport Area Advisory Committee

Committee: Residents of El Segundo, Inglewood, Lennox, Hawthorne, Culver City, and Westchester/Playa del Rey

Los Angeles International Airport Area Advisory Committee (LAXAAC)

Background Statement

The Los Angeles International Airport Area Advisory Committee (LAXAAC) has been in existence for more than 30 years as an advisory board to the Board of Airport Commissioners (BOAC).

Members of the committee are appointed by the appropriate legal authority in communities immediately surrounding LAX:

El Segundo,
Lennox,
Hawthorne,
Inglewood,
Culver City,
Marina del Rey,
and the Westchester and Playa del Rey areas of Los Angeles.

The members of LAXAAC have one overriding concern about LAX: **safety.** This concern includes safety for those who work or live near LAX in addition to air passengers, crews, and aircraft.

Other concerns for committee members are air and noise pollution and surface traffic in and around their communities.

The members of LAXAAC will continue to participate in LAX issue discussions and proposals and look forward to on-going interaction with the members of the BOAC and LAWA staff.

04/07

compared to the costs of building instead at Ontario and Palmdale. The following items must be addressed:

- The businesses and homes that will be condemned and purchased if the runway must be moved and the timing and cost of that condemnation, including expected litigation;
- Additional schools, hospitals and entire communities that will require soundproofing, and the cost of that soundproofing;
- All health issues, including the impact of airport operations on incidents of asthma in the nearby communities, including the harmful effects of particulate matter at the $PM_{1.5}$ and lower levels that are created by airport activities;
- All educational issues, especially the inability of children in schools to concentrate with repeated overflights;
- All environmental damage, including new studies showing the impact on the upper atmosphere by pollution from aircraft;
- The impact on noise and air pollution from the loss of open space and greenery that currently exists near Westchester Parkway;
- The traffic impacts from the loss of Westchester Parkway and other changes to surfaces streets if the runway is moved;
- Noise impacts, including CNEL contours to the 60dB and 55dB levels.

Please let us know if you have any questions regarding our proposals for the scoping process. We look forward to working with LAWA in the planning process.

Very truly yours,

Danna Cope

Danna Cope, LAXAAC Chair
Los Angeles International Airport Area Advisory Committee
#1 World Way, P.O. Box 92216
Los Angeles, California 90009-2216

Enclosure

cc: LAWA Board of Airport Commissioners
Los Angeles Mayor Antonio Villaraigosa
Councilman Bill Rosendahl
Gina Marie Lindsay, LAWA Executive Director
Michael Doucette, Deputy Executive Director
Roger Johnson, Deputy Executive Director
Gaby Pacheco, LAX Community Relations

WESTCHESTER
BUSINESS IMPROVEMENT DISTRICT

Karen Dial
H.B. Drollinger Co.
President

John Ruhlen
Ruhlen & Associates
Honorary Mayor
Secretary

Miki Payne
H.B. Drollinger Co.
Treasurer

Tracy S. Thomas
Coreland Companies

William F. Allen
HFH Ltd.

Donald R. Duckworth
Executive Director

June 17, 2008

Mr. Herb Glasgow
Senior Planner
City of Los Angeles World Airports
1 World Way, Room 218
Los Angeles, CA 90045

Re: Comments of Notice of Preparation of a Draft Environmental Impact Report (SCH No. 1997061047), Los Angeles International Airport (LAX) Master Plan Specific Plan Amendment

Dear Mr. Glasgow:

The Westchester Business Improvement District (BID) appreciates this opportunity to comment on the Notice of Preparation for the LAX Specific Plan Amendment.

We are writing to formally register our concern that any proposed northward movement of LAX northern runways, and its resultant loss of business properties or function, will economically damage the entire Westchester business district by diminishing its viability as a district. In the past, LAX expansion has removed market area (residences) from Westchester BID area businesses and they have suffered as a result. The current proposal could result in similar market area reductions; and, in addition, would appear to eliminate nearly half of the business properties in the district thereby diminishing the economic viability of those that would remain. We are concerned that this could condemn the business district to a slow downward spiral of deterioration, deprive local residents of needed retail and service opportunities, and reduce the area's ability to fully participate in the region's economic future as the neighboring City of El Segundo has been able to.

The evaluation of the environmental impacts of the LAX Specific Plan Amendment should include the preparation of an economic analysis / model of the highest and best future use(s) of the Westchester business district as it is currently configured without additional LAX intrusion, as compared to the highest and best use(s) given the proposed intrusion. The impact of any "runway protection zone(s)" must be precisely identified and considered. Alternative economic models must be considered in order to accommodate real world vagaries. Possible future

8929 S. Sepulveda Blvd., #130
Westchester, CA 90045
310.417-9030 ph • 310.417-9031 fx
www.WestchesterBID.org

Los Angeles World Airports

WRITTEN COMMENT

LAX SPECIFIC PLAN AMENDMENT STUDY ENVIRONMENTAL IMPACT REPORT
PUBLIC SCOPING MEETING

Please print.

Date: June 16, 2008

Name: Linda Williams

Organization: _____

Address: 2720 W 95th St

Comment: my comments & concern are about the air-plane noise & the Abatement Program. I was told my house was not in the zone, What Zone? I have lived at 2720 W. 95th St for 32 yrs. They've repaired windows all around me but I'm not in the zone. The airplane noise does not stop at Hindry St and pick up again at 98th St. I have sat in my backyard and taken pictures of airplanes belly. When there's two planes going to LAX at the same time, there's more noise in the middle (because we're getting it from both planes) than there is behind. With the vapors of the plane, it fans out When it rains and the airplanes take off overhead my house shakes & rumble just like everyone else. I need a better understanding of the "ZONE" Thank You Linda Williams

Please drop the completed form into the box marked "COMMENTS" or mail to:
Mr. Herb Glasgow
Senior City Planner
Los Angeles Worlds Airports
1 World Way, Room 218
Los Angeles, CA 90045
All comments must be received no later than Wednesday, June 18, 2008.

ARSAC *Alliance for a Regional Solution to Airport Congestion*
322 Culver Blvd., #231 Playa del Rey, CA 90293
www.RegionalSolution.org

June 17, 2008

Mr. Herb Glasgow
Senior City Planner
City of Los Angeles Los Angeles World Airports
1 World Way, Room 218
Los Angeles, CA 90045

Comments re: Notice of Preparation of a Draft Environmental Impact Report (SCH No. 1997061047), Los Angeles International Airport (LAX) Master Plan Specific Plan Restudy

Dear Mr. Glasgow:

The Alliance for a Regional Solution to Airport Congestion (ARSAC) appreciates this opportunity to comment on the Notice of Preparation for the Specific Plan Amendment Study. In addition to these comments, ARSAC has adopted the attached "Petitioners' Overview of Guiding Principles for Environmental Analysis: LAX Specific Plan Amendment Study EIR."

A. The Proposed Reliance on Tiering is Problematic.

The NOP (p.4) indicates that "[t]he SPAS EIR will be a Supplemental EIR that is tiered from the LAX Master Plan EIR…" This statement requires clarification, and the tiering approach requires reconsideration by LAWA. While tiering may be appropriate when a Lead Agency has already certified an EIR for a project, in this case ARSAC strongly cautions against relying too heavily on the previous Master Plan EIR. Tiering is only appropriate when the later project is "consistent with the program, plan, policy, or ordinance for which an environmental impact report has been prepared and certified." Pub. Res. Code § 21094(b). Case law also stresses the need for consistency between the subsequent project and previously certified EIR. See *Koster v. County of San Joaquin* (1996) 47 Cal. App. 4th 29, 36. The very purpose of the project now proposed is to change some of the key underlying assumptions of the Master Plan EIR. Therefore, it is very difficult to argue that the SPAS EIR project could be consistent with the previously certified Master Plan EIR.

The NOP for the SPAS EIR proposes significant changes to the Master Plan,

development scenarios for the currently vacant Northside LAWA properties - such as the possible creation of an architecturally distinctive LAX corporate headquarters campus, the long discussed LAX area convention / meeting center, a life-style-type community center, or other economically viable alternatives - should be considered and incorporated into any Specific Plan amendment for its ability to mitigate historical and future economic damages to the Westchester business community.

Finally, given the complexity of the proposed Specific Plan amendment and the attendant Draft EIR, we request that its circulation time be increased from 45 to 120 days in order that full public review and participation can be effectively accomplished.

As we can assist further in any way, please contact me.

Sincerely,

Donald R. Duckworth
Executive Director

C: WBIA Board of Directors

cultural resources (i.e. the "Sea to Shining Sea" mosaic tile mural in Terminal 3), geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, noise, population and housing, public services, recreation, transportation/circulation, and utilities.

1. The list of impacts proposed for study is incomplete.

a. Geology/Soils.

Although LAWA has not checked off plans to study geology and soils, population and housing and recreation, LAWA should include these in the EIR. Geology and soils are critical concerns with any construction project. Several projects and/or ongoing geology/soils concerns should be considered In the EIR. Presently, there are proposals to build a ground water runoff retention basin on the northwest corner of the LAX airfield. An underground storage facility is also proposed. LAWA should examine the potential for leaks, and to the Impacts on the soil above. As this location is near the El Segundo Dunes, the soil tends to contain more sand than the eastern boundaries of the LAX property. Additionally, there are old sewer lines running underneath LAX dating back to the 1920's. Some of these lines in Playa del Rey (such as on Zitola Terrace) have collapsed, and the City of Los Angeles has had to buy out certain homeowners (e.g. James Marcinkus). Another proposed project could affect LAX is the Woodside Natural Gas pipeline that will use part of LAX property in the El Segundo Dunes and will traverse underneath Westchester Parkway to a facility near 98th Street and Bellanca. The EIR should address potential cumulative geology/soils impacts.

b. Population/Housing.

Population and housing are expected to increase in the Westchester/Playa del Rey/Playa Vista community plan area. Although this area presently has over 50,000 residents, Playa Vista will be adding more housing stock as will the new apartment complex on the corner of Manchester and Lincoln (former Furama Hotel site). Furthermore, the proposed revision to the Housing Element to the City of Los Angeles General Plan seeks to double housing in the Westchester/Playa del Rey/Playa Vista area. With increased housing and population come increased traffic and pollution impacts as well as additional stresses on infrastructure such as roads, water usage, power consumption and sanitation (trash pick-up and sewer). The EIR should address any cumulative impacts.

c. Recreation.

Recreation is another area that must be studied. For nearly two decades, LAWA has promised to restore the 3 holes removed from Westchester Golf Course when Westchester

including movement of Runway 6R/24L; changes to the proposed closure of the CTA to surface traffic; development of an off-site ticketing facility; and the future of Terminals 1, 2, and 3. Given the magnitude of the changes, ARSAC questions the viability of the Master Plan as a document off of which LAWA may appropriately tier the SPAS EIR. While some aspects of the Master Plan remain unchanged, the better approach would be to incorporate by reference the portions of the Master Plan unaffected by the proposed changes (see Guidelines Section 15150), but develop the SPAS EIR as a primarily stand alone document that address the significant, and previously unstudied, impacts of the project now proposed.

In addition, tiering is not appropriate under Section 21094(b) when a Lead Agency determines that the provisions of Public Resources Code Section 21166 apply. The existence of the NOP and proposal for the SPAS EIR make the applicability of Section 21166 self evident. Section 21166 requires a subsequent or supplemental EIR when "[s]ubstantial changes are proposed in the project which will require major revisions to the environmental impact report." Pub. Res. Code §21166(a). LAWA has rightly determined that this section applies. However, because this section applies, the tiering provisions of Section 21094 are inapplicable, and LAWA should prepare a primarily stand-alone document.

LAWA should also rethink the proposal to develop a Supplemental EIR. Preparation of a Supplemental EIR should occur when "[o]nly minor additions or changes would be necessary to make the previous EIR adequately apply to the project in the changed condition." Guidelines §15163(a)(2). By contrast, a Subsequent EIR is required when "[s]ubstantial changes are proposed in the project which will require major revisions of the previous EIR..." Guidelines §15162(a)(2). The proposed changes are clearly substantial and go well beyond "minor additions" to the Master Plan. Therefore, LAWA should not treat the SPAS EIR as a Supplement to the Master Plan, but rather as a stand-alone Subsequent EIR.

B. Analysis of Impacts.

The checklist of impacts in the subject NOP includes specific comments that raise numerous concerns for ARSAC. First, greenhouse gas emissions should be specifically addressed in the impacts analysis, as is acknowledged on the Initial Study, Attachment A, p. 3. However, the scope of that analysis appears too narrow. Since greenhouse gas emissions were not analyzed in the 2004 EIR, the analysis of emissions should not be limited to the construction and operation of the LAX SPAS alternatives, but should include all airport operations.

ARSAC expects LAWA and the City will have to find significant impacts in the areas of aesthetics, air quality, emission of greenhouse gases, biological resources,

resultant traffic and increased numbers of people who will be impacted by airport related pollution. The numbers projected by the Westchester-Playa del Rey Community Plan EIR should be used after modification for further increases enabled by other LA City ordinances such as transit corridor bonuses and affordable housing bonuses and the Housing Element of the LA City General Plan.

LAX physical layout changes and/or operations at LAX should be considered when determining ground traffic pollution contributions.

b. Air Quality Impacts and Public Health.

Recent studies of pollution sources have identified serious impacts by air pollution on human health. LAWA should consider the latest air quality information from AQMD and California Air Resources Board to assess the various project alternatives for pollution impacts. Average pollution over a long period of time should be determined, but also pollution concentrations in any four-hour period since air and ground traffic tend to have peak hours.

Please see and analyze in the EIR the attached reports from the following websites as examples of the air impacts that have been studied.

http://www.arb.ca.gov/newsrel/nr052208.htm
http://www.arb.ca.gov/research/health/pm-mort/pm-mort.htm
http://www.arb.ca.gov/research/health/pm-mort/pm-mortdraft.pdf

LAWA is conducting an air pollution contribution apportionment study to fulfill a Settlement promise. Along with an air pollution contributions analysis, LAWA will be following up a study contract ("Monitoring and Modeling of Ultrafine Particles and Black Carbon at Los Angeles International Airport," Froines, John, ARB Contract 04-325, 3-5-2007) in which ultra fine particle studies smaller than those normally measured were correlated with aircraft operations. Additionally a 2000 report by McDonnell (http://www.nature.com/jes/journal/v10/n5/pdf/7500095a.pdf) highlighted a method to investigate particle impacts on health that should be followed in the assessment of air quality impacts. "This study did not have direct measures of PM2.5 but relied on TSP and PM10 data. In a follow-up analysis (McDonnell et al. 2000), visibility data were used to estimate PM2.5 exposures of a subset of males who lived near an airport." We ask that air quality measurements be taken on LAX property and in surrounding communities that are in close proximity to LAX.

c. Operations Analysis.

In examining all alternatives, LAWA must examine the use of, and the impact of, operating the LAX in various configurations including Westerly operations, Easterly

Parkway was constructed. The Westchester Golf Course is one of the most heavily used golf courses in the City of Los Angeles. Earlier this year, LAWA also held a public meeting at Loyola Marymount University to gather ideas for uses of the LAX Northside property. Many of these uses that garnered positive responses were recreation uses. Furthermore, LAWA may be deficient in producing this EIR if LAX Northside land use issues were not discussed. The FAA's 2005 Record of Decision on the LAX Master Plan specifically excluded approval of the LAX Northside from the Airport Layout Plan on the basis of inconsistency due to, "markedly different assumptions underlying the analysis of environmental impacts that may be expected to result form the LAX Northside portion of the LAX Master Plan."

We request that each of these potential impact areas be thoroughly addressed, even when LAWA feels that impacts can be avoided or reduced by feasible mitigation measures or alternatives.

2. Specific Concerns Regarding Particular Impacts.

a. Traffic Impacts.

Sources of pollution outside of those from LAX operations are cumulatively significant and must be included in the study. In addition to pollution sources from vehicular traffic, aircraft flying in the skies surrounding LAX are also expected to have increased impacts. Additionally, pollution from local refineries, treatment plants, and other sources should be considered additive when determining impact significance.

The communities surrounding LAX are generally used as thoroughfares for north-south traffic and few alternative routes exist. The 405 freeway, Vista del Mar and Pershing on the west, Lincoln Blvd., Sepulveda Blvd., and La Cienega all bear heavy traffic, including that associated with LAX operatives. The environmental impact analysis must include those above and beyond the normal operations of LAX, but also the impacts on traffic by travelers and cargo operations forced to go long distances within Southern California to get to LAX. Traffic on the 405 freeway can become bumper-to-bumper at any time of the day or evening. The 405 traffic "spill off" can cause level E and F service on the few other major routes or other alternative routes through the communities. The economic impacts and health impacts of these delays should be identified and quantified.

Community growth is increasing the number of people within the communities surrounding LAX. We want to ensure that any related impacts to the community growth are included in the total impact. Population growth and traffic increases resulting from all further land utilization allowed by zoning within community plans must also be considered. LAWA should use maximum use zoning in their analysis, not just those projects that have been approved. City Community Plans call for substantial increases in housing density with

off without entering the major CTA traffic loop. The benefits from this potential project should be segregated so that they may be added to any of the alternatives.

Each of the new alternatives contains a Midfield Terminal and the addition of gates to the backside of Tom Bradley International Airport. LAWA should specify the locations of the taxiways and taxiway intersections. All ground and air impacts of this set of projects must be included in the analysis of each of the alternatives.

In examining all alternatives, LAWA must examine the use of, and the impact of, operating LAX in various configurations including Westerly operations, Easterly operations and Over-Ocean operations. Safety impacts of the varied scenarios must be assessed. Furthermore, other operational scenarios using outboard runways for take-offs and inboard runways for landings need to be considered, as well as parallel landings on the north or the south runway complexes.

D. Analysis of Alternatives.

1. The Proposed Alternatives.

The NOP identifies two no project alternatives and four alternatives. ARSAC is *unalterably opposed* to the alternative of moving the runway 24R 340 feet to the north, and strongly supports analysis of the alternative of keeping the existing runways at the present location and implementing operational improvements to enhance safety. Only if safety risks remain after such operational improvements have been implemented can the costs and disruption of runway movement be justified. LAWA has demonstrated the capability of landing Group VI aircraft on both the north and south complexes, albeit with some adjacent taxiway use restrictions. When the South Airfield Project was presented for approval, LAWA indicated that it would be capable of handling the Group VI aircraft and it is our understanding that a ground terminal access route using the south runway 25L has been formally approved for use by the FAA. In the ground air traffic analysis, LAWA should consider the benefits of moving the runways south, and how that would improve the deficient (but legal) taxiways near the terminal gates.

When analysis is performed on the north and south runway complexes, we want the assumptions for operational efficiency and safety impacts of the Runway Status Lights to include both the proposed Pilot Program, which is promised to be installed in 2009, and a complete system which includes the other runways and taxiway intersections which have not been included.

In addition to the alternatives already under consideration, ARSAC requests that an additional alternative, moving runway 24L 340 feet to the south with the revised terminal configuration described in the attachment to this letter, be analyzed as part of this EIR.

operations and Over-Ocean operations. Safety impacts of the varied scenarios must be assessed. Furthermore, other operational scenarios using outboard runways for take-offs and inboard runways for landings need to be considered, as well as parallel landings on the north or the south runway complexes. Further, any changes in facilities should trigger personnel safety reviews to identify and mitigate potential hazards on both the landside and airside of LAX.

C. Specific Questions that Should be Addressed.

ARSAC's comments in the attached "Table of NOP Comments" pose questions that should be addressed in the course of the EIR preparation. The comments have been made to correspond with the NOP document organization.

We understand project impacts deleted from Alternative D by the Stipulated Settlement, and designated as "yellow light projects," will not be analyzed, except for the no action alternative. However, the EIR should analyze the worst case for each of the individual projects' impacts. Further, if a derivative of a yellow light project is proposed in one of the alternatives (e.g., moving runway 24L 340'south), the impacts shall be segregated and not tied to a requirement to impose other yellow light elements, but any worst-case alternative use must be included.

In 2004, LAWA took credit for the reduction in development at the Northside Development area from the 4.5 million square feet assumed in the 1982 EIR to 1.5 feet 5 million square of light industrial and commercial space. However, the ROD excluded the Northside Development. The DEIR should clearly specify what is planned at this time, and the full impact of such development. Similarly, all proposed uses of the Belford Square area should be delineated in the assumptions used to assess the impacts.

The new alternatives all contain a new transportation center at Century and Imperial. Changes to traffic flows and pollution impacts should be highlighted along with those from any automated people movers (APM) that would go from that facility to the central terminal area. The stops of the APM can have a significant impact on ground traffic. The locations assumed for stops must be identified in detail.

Although the Consolidated Rental Car facility location was approved for project analysis by the Stipulated Settlement in the Lot C location, it is our understanding that alternative locations have been considered. The impacts on ground traffic should be assessed separately for each alternative location.

One alternative discussed modifications to the ingress/egress along the 98th Street bridge for the Central Terminal Area near the present Terminal 1. This proposed solution called for a structure in the area where Park One currently is located. This proposal allows people going to the north terminal, especially Terminal 1, an opportunity for drop

taxiway, in reducing incursions.

a. One Single Safe North Runway Alternative.

This proposal was presented at the Specific Plan Advisory Committee meeting where it was agreed by the Petitioners that all concepts submitted to the LAX Master Plan EIR would be studied, including new one such as the one runway concept. This concept would reduce the number of runways on the north runway complex from to two runways to one runway. Runway crossings are the leading cause of runway incursions. Airports that have runway layouts where aircraft do not have to cross one runway to access another runway have very low incidences of runway incursions. Munich Airport (MUC) in Germany has one runway on each side of the terminal complex. One runway is used for landings and the other runway for takeoffs. Since its opening in 1992, MUC had only one runway incursion. London Heathrow Airport (LHR), the world's third busiest passenger airport, has a similar runway layout and is able to handle 70 million annual passengers.

b. 340 feet south / Airline Alliance Plan.

This plan, presented to LAWA Executive Director Gina Marie Lindsey on May 7, 2008, is similar to Alternative D except that in place of replacing Terminals 1, 2 and 3 with a concourse for widebody aircraft, Low Cost Carrier terminals would be constructed. Airlines that have airline alliances would be relocated to terminals with their domestic airline partners, or to the Tom Bradley International Terminal for most foreign airlines. The Central Terminal Area (CTA) parking garages would not be torn down in this plan. The Consolidated Rent-A-Car (RAC) facility would be located in Manchester Square and connected to the CTA by an Automated People Mover. An elevated roadway would connect the 405 freeway to the RAC and CTA.

3. The Need for Development of a Regional Plan.

ARSAC continues to believe in a regional solution to airport congestion. The Stipulated Settlement provided that "The first regional strategic planning initiative *will be* prepared by December 31, 2006." Unfortunately, this commitment was not kept. Not only was the Plan only recently submitted to the County of Los Angeles, but it has now been withdrawn. ARSAC is disturbed by LAWA's failure to aggressively pursue development of a Regional Strategic Plan, and asks that members of the SPAC have an opportunity to comment upon the draft plan prior to the time it is finalized and adopted by the Board of Airport Commissioners, and that this effort be treated as a high priority by LAWA.

Regardless of what is done with the Regional Strategic Plan, LAWA should

This alternative reduces the impacts on Westchester and Playa del Rey, while improving airport efficiency.

Besides analyzing alternative runway configurations and diverting flights to other airports, the EIR must consider and provide a quantification of all airfield operational scenarios in evaluating the alternatives- westerly operations, easterly operations and over-ocean operations. The noise, pollution and safety impacts on the surrounding communities differ depending upon the operational state. For example, during easterly operations, aircraft taking off on the north runway complex have cut across parts of Westchester such as Westport Heights that are normally not over flown by aircraft at very low altitudes.

The February 2006 Stipulated Settlement specified in SECTION V. LAX SPECIFIC PLAN AMENDMENT STUDY PROCESS, Item C states a goal of "…minimizing environmental impacts on the surrounding communities, and creating conditions that encourage airlines to go to other airports in the region, particularly those owned and operated by LAWA." In particular we want detailed analysis of the north runway complex impacts to show that they are less than that of the current condition of no runway change or in the worst case, Alternative D that was previously approved.

When any of the alternatives are examined for impacts, a key element that must be assessed is the quality of life. Will a runway protection zone require the removal of homes and businesses? The analysis should include all cost factors of eminent domain and loss of values for the surrounding communities that might lose their community serving businesses.

In terms of ground traffic analysis, petitioners are allowed to add up to15 additional intersections for review, and these intersections may require additional mitigation in several communities. Regardless, the Settlement does not limit the intersections and highways that must be mitigated to accommodate LAX projects.

2. Consideration of Additional Alternatives.

The NOP provides the opportunity for the submittal of additional reasonable alternatives to be studied within the EIR. ARSAC submits two additional proposals to be included in the EIR and the North Runway Complex Safety Study. ARSAC has generated these proposals to increase the range of alternatives that may be considered. The narratives of both proposals are included as attachments. A short summary is below. ARSAC feels that it imperative that no alternative be selected as a preferred alternative until after the North Runway Safety Studies and analysis have been completed and examined. Furthermore, ARSAC requests data from the South Airfield Improvement Program to determine the effectiveness of those improvements, such as the centerline

examine in the DEIR the increased utilization of LAWA controlled airports at LA/Ontario International (ONT) and LA/Palmdale Regional Airport (PMD), as opposed to expanding LAX. There is precedent for this kind of study. During the late 1990's, in the LAX Terminal 4 EIR to modernize the American Airlines terminal, a cursory examination was made of shifting some flights to ONT and/or PMD. The failure of the Terminal 4 EIR was that it did not fully examine all of the environmental effects through increased utilization of ONT and PMD, versus LAX. ONT and PMD are large investments for LAWA and they both have the potential for greater economic, operational and environmental value if properly marketed. For example, the "Fly Ontario" marketing campaign did increase the public's awareness of ONT and several new flights were added to ONT, with the notable addition of ExpressJet's west coast hub.

The EIR should analyze all of the environmental benefits to the area surrounding LAX that would occur if some international flights were shifted to ONT. ONT currently has staffed Federal Inspection Facilities (FIS- Immigration, Customs, Agriculture). Additionally, LAWA should analyze the benefits of shifting some cargo flights from LAX to ONT.

LAWA should also consider the impacts of benefits of shifting some domestic flights to PMD, as was identified in the 2001 TriStar Marketing report on PMD and subsequent destination studies. LAWA should also discuss the LAWA/US Air Force Plant 42 Joint Use Agreement (JUA) for PMD, and how the JUA could be revised to accommodate more flights, allow for development of the LAWA owned property, and remove the domestic flight restriction to allow for international traffic at PMD.

LAWA should discuss how a "multi-airport discount rate" system could encourage the shift of flights or the addition of new flights to ONT and PMD. The "Multi-Airport Discount Rate" would give airlines that operate at LAX, ONT and PMD more favorable landing fees and terminal rents than operating solely at LAX. Airlines that operate solely at ONT and/or PMD would get even better rates for not operating to LAX. The "multi-airport discount rate" plan should be available to international carriers, as well as domestic carriers. For international flights, there would have to be parity between those international flights operated by domestic and foreign airlines.

LAWA should examine changing the financing model at LAX (residual vs. compensatory) to allow for cross-subsidization of ONT and PMD to support the "multi-airport discount rate" system.

European and Asian airlines have expressed interest in operating out of ONT. Please discuss how new, smaller, highly efficient widebody aircraft such as the Boeing 787 Dreamliner and the Airbus A350XWB can help make ONT more viable for international flights, while lessening the impact on the environment. Many foreign airlines have ordered these aircraft. Continental and Northwest are the only U.S. airline

customers for the Boeing 787, while US Airways and Hawaiian Airlines are the only U.S. airlines to order the Airbus A350 XWB. Domestic airlines are adding international routes to meet demand for more non-stop services between new cities, and to feed their domestic networks. Also, please discuss how new multi-lateral and bi-lateral agreements, such as the United States-European Union Open Skies Agreement and the new US-Australia Bilateral Air Services Agreement, can provide ONT with more opportunities for international air service development. Discuss LAWA's past, current and future efforts to attract more air service to ONT and PMD.

Finally, LAWA needs to address the issue of Orange County residents using LAX for their air travel needs. It has been estimated that one-third of the passenger traffic through LAX is destined for Orange County, and that LAX handles 90% of Orange County's air cargo. LAWA should discuss the possibility of working with the Walt Disney Company to rename LA/Ontario International Airport to Walt Disney International Airport and then re-package the airport as the gateway airport to the Disneyland Resort, and the primary international gateway airport for the Orange County and Inland Empire regions. In your analysis, please assume that the Right of Way can be obtained for a monorail or high-speed rail between ONT and the Disneyland Resort and/or the Anaheim Transportation Center. This way, ONT will be provided with the necessary critical mass for ground transportation. The rail line could be operated by LAWA, Disney, or in cooperation with the California-Nevada Super Speed Rail Commission.

E. Enhancing Airport Security.

Security is another matter that needs to be carefully examined in the EIR. RAND performed two security studies on the LAX Master Plan. The first was done at the request of Congresswoman Jane Harman. The second study was commissioned by the Board of Airport Commissioners (BOAC). To date, the public is unaware of how, if at all, LAWA is implementing the RAND recommendations. Please discuss what, if any, follow up with RAND has been occurred, and the status of implementation of its recommendations.

F. Processing of the EIR.

Although the NOP has been released, ARSAC believes the NASA study should be completed and evaluations conducted by the selected members of the academic community have been published before the Draft EIR is released so that the studies will inform the selection of a preferred alternative. This would also allow LAWA to first have experience with operations at the South Runways before selecting a preferred alternative.

When the Draft EIR is released, ARSAC requests that it, and all related documents,

Attachment to ARSAC Comments to SPAC
Environmental Review: Table of NOP Comments:

NOP paragraph	NOP pg ref	Comment
1.0 Project Location	2	Figure 2 does not distinguish the elements of the SAIP. The date of origin of this photo should be identified.
2.0 Project Background	2	In the City Council hearings 07-0541-S1 8-30-2007 a Specific Plan Amendment to remove the west satellite concourse from the projects requiring maximum scrutiny was approved. The "Midfield Terminal" discussed during these hearings was equated to the "west satellite concourse." Does the approval of this amendment authorize use of only project level EIRs for the Midfield Terminal including the concourse, additional gates on the back of TBIT, and associated taxiways and taxilanes?
3.0 Project Description	4	Clarification: The gate limitation is not 153, but no more than 153 per Section IV C of the Stipulated Settlement.
SPAS Options	5	What are the northside runway complex airfield restrictions that were resolved by Alternative D? If the north runway complex is not reconfigured, what will be the operational restrictions on NLAs? Which restrictions can be mitigated by changing the locations of taxiways and runway intersections or gate locations rather than moving runways?
340' option, Alt D	5	With the extension of runway 24L 1000' to the east, this 340' S option says takeoffs would be closer to the community all the way back to Sepulveda. What specific sections and paragraphs in the 2004 EIR provided impact analysis? How many flights would be taking off from this newly located east end of the runway? What noise and pollution studies were included in the 2004 EIR in the assessment? What will be the impacts in easterly operations or in over-ocean operations?
Move 24L 100' South	6	LAWA should identify what relocations and runway extensions they plan to study. Are these decisions being made on the basis of simulations underway with the NASA study? How will the alternatives for this be evaluated and compared for environmental impacts? Will location selections of taxiways be done to improve operational efficiency of NLA? What specific criteria are being used to evaluate the improvements? What will be the impacts in eastern operations or over ocean operations?

be provided electronically in searchable format, as well as in hard copies.

To the extent that the new EIR relies upon the 2004 LAX Master Plan Environmental Impact Report, that EIR contained many conflicting comments within its 17,000 pages, and numerous deficiencies that were identified by ARSAC and other petitioners in the lawsuit that resulted the Stipulated Settlement of 2006. To assure greater clarity, and avoid some of the problems that occurred in the past, whenever any of the prior documentation is referenced in the upcoming EIR, we request that specific paragraphs and page number references be included for documents referenced in the DEIR. We also strongly request that the EIR and all supporting documents be provided in a format that is searchable electronically.

Finally, so that the best possible public review and participation will occur, we also ask that the Draft EIR circulation time be increased from 45 to 120 days. Forty-five days for review of an extremely complex and technical document is simply inadequate.

Please feel free to follow up with any questions you may have about these comments or recommendations.

Sincerely,



Denny Schneider, President

Attachments:

1. Environmental Review: Table of NOP Comments
2. Petitioners' Overview of Guiding Principles for Environmental Analysis
3. One runway option overview
4. Low cost carrier option overview

3.1.3 Ground Transportation Center; Problem to be addressed	8	LAWA has stated that they want to improve CTA traffic flows and in the surrounding community, but has never provided a quantified measure of levels of traffic that are needed to be accommodated in various locations. For instance, how many cars (per hour and at peak periods) much be accommodated along the curbsides within the CTA? What were the levels of adverse impacts that were to be mitigated by the GTC that was eliminated by the Stipulated Settlement? The aggregate numbers are important so that replacement concepts can be measured and judged against a consistent yardstick. Is it 1000 cars per day and 50 cars during peak hours in the CTA or is it 100 times that? How will traffic be segregated and how will any proposed mitigations address the traffic impacts in the CTA as well as in the surrounding community? What alternatives been identified such as van and bus drop offs and pickups in the parking structures or another location? What plans exist for a people mover to accommodate passengers dropped off outside the CTA in an area local to LAX for people to get into the CTA? Please provide detail information about the way in which cars currently enter and leave the terminal areas. Ensure that the directional information is broken down by hours and volume from each of the directions entering the CTA (Sepulveda N, Sepulveda S, 98th street bridge, and Century Boulevard. What levels of vehicle types can be accommodated by the no project, existing conditions? LAWA has established programs to reduce the number of vans and busses in the CTA. What assumptions are made about the effectiveness of these programs and what baseline numbers are used in the assessments? What programmatic changes are "in the works" that apply as a baseline condition for the numbers of hotel and car rental courtesy rolling billboard busses that frequently block curbside access for cars?
Close Access to GTC	8	Identify how luggage would be handled. Would the approved tunnel be constructed? Although the Manchester Square GTC was yellow-lighted by the Settlement, the tunnel was not specifically mentioned. How would safety/security for the tunnel be handled? What would be the mitigations for ground traffic associated with the use of the tunnel? How will disabled and elderly travelers be handled? Adults with excessive baggage or with children? Since the methods for handling people and location/directions of car trips would dramatically change, how is this to be addressed for environmental impacts? Is there an assumption that better traffic flow is facilitated by improved signage over the lanes and along the CTA terminals? How much improvement is expected from signage improvements?

Keep existing locations	6	This option was supposed to include an as yet unidentified taxiway and intersection modifications to improve aircraft movement. When this alternative is evaluated for safety and operational effectiveness, what assumptions will be made about the gate locations? What about taxiway and intersection locations? What will be the impacts in eastern operations or over ocean operations?
Move 24R 100' North	6	This 100' N says takeoffs would be closer to the community all the way back to Sepulveda. How many flights would be taking off from this location? Where is the noise and pollution study to justify this? This appears to be one of the deficiencies of the original EIR. What would be the impacts on eastern operations or over ocean operations? This 100' N alternative should include two sub-options: extension of 24R west and no further extension that are both evaluated.
Move 24R 100' North	7	If terminal demolition of 1,2, 3 is "yellow-lighted," why doesn't LAWA consider the associated taxiways or other CTA activity related to this issue "yellow-lighted" instead of presuming only a project EIR is required? If changes are to be made, what are they to be and how would it affect the CTA traffic (and any environmental issues related thereto)?
Move 24R 340' North	7	Calls for extending 24L. To where will the vehicle holding area be relocated? Has this been included in the environmental reviews including traffic study?

Move 24R 340' North	7	This option calls for modifications to taxiways. LAWA should identify what relocations and extensions they plan to study. Will the selection of locations and extensions be made on the basis of simulations underway as part of the NASA study? How would the various alternative taxiway locations be evaluated and analyzed for relative environmental impacts? Will location selections of taxiways be based upon improving operational efficiency of NLA? What specific criteria will be used to evaluate the improvements?
3.1.2 CTA Demolition	7	The NOP states: "Under the LAX Specific Plan and Stipulated Settlement, only the Demolition of Terminals 1-3 is a Yellow-Light Project. If the terminal demolition is yellow-lighted, why aren't the taxiways or other CTA activity related to CTA demolition also treated as yellow-light per the Stipulated Settlement? If changes are to be made, what are they and how will it affect the CTA traffic (and any environmental issues related thereto)?

		Fairy Shrimp change from the former El Toro Marine Corp Air Station to an area in Redondo Beach? Can LAWA simply leave the Riverside Fairy Shrimp in tact at LAX and place some sort of netting or fishing lines over the shrimp habitat so that the shrimp will not have to be moved? Where are the earthquake prone areas? What are the amounts and types of pollutants from aircraft? How will these pollutants be mitigated? What will be done to reduce the greenhouse gases from LAX operations?
3.4 Comments and Next Steps	13	45 days circulation for review is inadequate. This should be as much as 120 days so that the maximum time will elapse to obtain South Airfield incursion experience. The NASA study should also be complete before this comment period begins. Figure 1- Project Location None The grayed area shows all of LAX, but also lands that were transferred from the Westchester-Playa del Rey Community Plan to the LAX Plan during Alt D approval. Not all of this is being considered for cumulative impacts during the EIR reviews of the SPAS airport projects. Please delineate which areas are specifically included in the impact studies.
Figure 2- Existing Airport		What is the date of this photo? On what date is the existing airport based? This photo does not show the completed the SAIP project, but we assume that it is part of the existing airport. Earlier in the document, Paragraph 3.2 identified two different no action alternatives. Please detail what airport elements are part of the two "no action" alternatives and their relationship to the baseline conditions against which new projects are being judged.
Figure 9- Potential Alternative -Runway 6R124L 100' South		Green Line stop is shown along Century instead of in Intermodal Transportation Center. How much traffic of each transport mode is expected? How would the traffic impact the type and quantity of mitigations required?
Figure 11- Runway 100' North		Green Line stop is shown along Century instead of in Intermodal Transportation Center. Although ARSAC supports the extension this is not part of the approved Master Plan or existing condition. Environmental improvements from this project are not part of the baseline and should be included in the assessment accordingly.

Transportation Center at Manchester Square and Aviation/Imperial and new Terminal 1 drop-off where Park One is located	9	A connection to the APM or a moving sidewalk can provide access to all of the north side terminals. How many and what percentage of people do you expect to be served by this new access? Would this increase total access capacity? By how much?
3.2 No Action Alternatives	11	Given that there are two different "no project" alternatives—one with all of the yellow-light projects of Alternative D and one based on the existing configuration with several non-Master Plan improvement projects that are underway. The second paragraph segregates the "no project" into two conditions; when all yellow light projects are assumed to have been built and when none are built. How will the EIR assess the overall impacts of these two "baselines" if some yellow-light projects are subsequently built? If the yellow-light projects overlap with other project elements that have been approved and are therefore part of the "other" base how will the other alternatives be assessed in comparison to the baseline? If, for instance, a newly designated intermodal transportation were built at Century/Aviation to accommodate a Green Line extension would all of the impacts of the totality of the baseline projects be used to assess other project impacts in addition to the yellow-project designated ones?
3.3 Probable Environmental Effects	13	Under aesthetics, the NOP acknowledges excessive lighting is a potential issue. Does this include runway lights if moved north? Are Northside development impacts included? If yes, what version (s) of the Northside development? What new Manchester Square development is assumed? Are there any other projects such as APMs and where would they stop and flow/to from? This could impact local communities with noise, pollution and traffic in various ways depending upon the paths used and the locations of the stops. This is another concern for neighbors and also for the flora and fauna. Introduction of new species from LAX arrival flights? Although good faith attempts to stop the arrival of foreign plants and animals is made, the locations of the aircraft and the handling of baggage and cargo can impact how an unwanted species can be spread to the surrounding areas outside of LAX. What about impacts on Riverside Fairy shrimp locations? LAWA was caught filling in Continental City with asphalt-laden dirt about 2003. LA Building & Safety halted the non-permitted filling. Where are all of the areas impacted by the 2003 action? What sensitive species are in surrounding areas? Why did the relocation area for the Riverside

Figure 12- Runway 340' North		See comment for Figure 11 above.
Initial Study and Check List –CEQA Lead Determination	IS-2	Please provide a matrix of which environmental impact studies are being reassessed and which are being rerun and correlate each impact study to the baseline 2004 FEIR paragraph numbers.
Evaluation 6)	IS-3	The document acknowledges the requirement to document source reference in detail. Anything less makes it difficult to identify what has been done and its validity.

Environmental factors potentially affected	IS-3	Three additional impact areas should have been checked. Geology/soils. Proposals to move the runways could be in areas where there are sand dunes and other soil with high liquefaction potential. Transportation/Traffic. To accomplish some of the projects in the LAWA 340' north alternative what housing would be impacted as well as the community serving businesses. Please identify all units that are subject to removal by any federal or state law regardless of whether it is believed that these laws would be enforced. Population/Housing. To accomplish some of the projects in the LAWA 340' north alternative housing would be impacted as well as the community serving businesses. Please identify all units that are subject to removal by any federal or state law regardless of whether it is believed that these laws would be enforced.
VI. Geology & Soils (a)	IS-6	There is some seismic potential. A plume of the Inglewood/San Andreas faults is near some of the areas where projects have been suggested along Century, for instance. We call on LAWA to review the most current USGS maps to assess earthquake susceptibility. The 340' N alternative, for instance, calls for moving Lincoln Boulevard and burying its connection to Sepulveda. Additionally we call upon LAWA to address the sandy soil conditions toward the Northside development along Westchester/Playa del Rey and western sections of LAX property for impacts from building any tunnels or from impacts from existing tunnels, underground utilities or sewer lines.
VII Hazards & Hazardous Matls. (a)	IS-7	Could run off with fuel and rubber off the runways create a hazard?
VII Hazards & Hazardous Matls. (f)	IS-7	The ability to get medical care can be impaired since the Medical Center on Sepulveda could be closed off within the boundaries of LAX if an emergency occurs. Insufficient trauma facilities are available within the local area if a medical emergency occurs. The closest is UCLA that would be impossible to get to during most of the day due to heavy traffic on the 405.

VII Hazards & Hazardous Matls. (g)	IS-7	See comments for element (f) above.
VIII Hydrology & Water Quality (i)	IS-8	There was some question about the 100-year flood plain structures in the last EIR due to the drainage canals being fed with much greater runoff due to all of the local developments surrounding LAX. A new urban run-off facility has been suggested for construction at the northwest corner of the LAX airfield. What effect will this facility have on LAX and water quality issues? The sewer lines near and underneath LAX date back to the 1920s. Are these sewers adequate and structurally sound? If not, what hazards do these sewer lines present?
XII Population & Housing (a)	IS-9	LAX traffic causes severe impacts on the local communities. Westchester-Playa del Rey and the other surrounding communities have become thoroughfares for people traveling from the South Bay and further south and the LA Westside. LAX traffic exacerbates this. Has the new LA City General Plan traffic increases due to changes in the housing element been taken into consideration?
XIV Recreation	IS-9	Holes were removed from the Westchester Golf Course to accommodate previous LAX expansion in the 1970s. Restoration of these holes has been a LAX promised mitigation ever since. When will this be accomplished and what other recreation opportunities will be created for the surrounding communities?
Attachment A V Cultural Resources (a)	A-4	Under historic elements, other buildings that are impacted such as the Paradise Building, Centinela Adobe, Randy's donuts should also be addressed due to off airport projects that facilitate these projects. Others items such as the LAX Theme Building and the "Sea to Shining Sea" mosaic tile air travel mural in Terminal 3 should also be addressed.
Attachment A V Cultural Resources (b)	A-5	Have any burial sites been identified? What about pottery or other Indian relics? What about prehistoric bones on the west and north areas in and around LAX due to the high incidence of oil reserves in the area? Prior LAX layouts have included N-S runways such as the one that existed in the area behind Tom Bradley International Terminal. Are any of these old structures historically significant? Are there any historic elements from the Bennett Ranch or previous ranch owners that used the land that is the present day LAX?

Attachment A V Cultural Resources (c) Mitigation CR2	A-6	The NOP says that mitigation reduces the impact to less than significant and therefore nothing else will be done. Please identify which areas are subject to higher potential impact mitigation per the

		existing paleontology mitigation program.
VI Geology and Soils:	A-7	What about the water filtration system that is being proposed for the Northside development area? How could this filtration project interface with the potential building set for the entire Northside development area? The prior EIR claimed that earthquake susceptibility was not significant, but at an SPAC meeting it was acknowledged that there earthquake fault areas that would impact the tunnel that was approved in Alternative D. Where else would earthquake faults impact building or construction? Soil conditions under the north runway may or may not be significant but more detail is required to ensure against construction or maintenance issues.
VI Geology & Soils (a) ii.	A-8	Seismic ground shaking. During the Northridge quake several back up power systems failed at LAX. Are alternative energy supplies available? What are the evacuation procedures to be followed for the airport in case of an earthquake, and how will this impact the local communities?
VI Geology & Soils (a) iii.	A-8	Seismic related ground failure. Several major water runoff and sanitation processing lines go under LAX. If any of these are seriously damaged what is the potential for sinkholes or other damage to structures at the surface? Since the LAX area was built on a Coastal plain, what impacts would liquefaction have? Is there potential for natural gas leakage pathways along fault lines from natural sources since the entire Playa del Rey area was once an oil field? Can gas leakage occur at LAX along a fault line from the Gas Company reservoir that is under the bluff in Playa del Rey and under the wetlands near Playa Vista? What effect, if any, would the proposed Woodside Energy Natural Gas project have on LAX? Please describe how each of the components may affect LAX – gas line connection in or through the coastal bluff, high pressure lines running underneath Westchester Parkway, distribution facility at 98th Street and Bellanca near the Neutrogena offices, and WallyPark parking garage.

VI Geology & Soils (a) iii.	A-9	Even if there are not major seismic hazard areas identified within LAX, what about nearby areas that can impact access to LAX? If normal access to LAX is blocked are there alternative routes that can handle the traffic loads? As there was seismic concern about the Manchester Square-CTA tunnel, what about people movers or elevated roadways? What UBC (Universal Building Code) and LABC (LA Building Code) requirements are applicable? The LAX Specific Plan Sec. 3 "Relationship to the Los Angeles Municipal Code and other Ordinances" negates Site Plan and "Major" Development Project Ordinances (item D).
VI Geology & Soils (c) soil stability	A-10	Is there any plan to add earthen berms on the north and south borders of LAX to reduce the transmittal of low frequency noise? Since we don't know precisely where major sewage and drainage pipes are precisely located, and the soil is very sandy, what is the likelihood of sewer or pipes being disrupted? Have there been any ground issues such as sinkholes at LAX in the past?
VI Geology & Soils general	A-11	Since the size and location of facilities is not delineated in the NOP, what special assessments will be made to determine how stable the ground is in areas of new construction? Given that there have been issues with sewer drains in the area and that the area has hundreds of formerly used oil wells that had water pumped into them, is there any likelihood that additional problems will arise slowing construction or requiring special measures?
VII Hazards & Hazardous Matl.	A-12	Since there are numerous carcinogenic items in use at an airport including aviation fuel, could the repeated spillage and evaporation cause a health hazard? What about fuel that is dumped during emergencies or fuel that is released in flight from major accelerations and landing? What about the potential for terrorism with hazardous materials since LAX is one of the most potent targets on the west coast?
VII Hazards & Hazardous Matl. (e)	A-13	There are many impacts to the community if the runways are moved north. There are many hazardous materials transported through the community. We expect transportation routes for hazardous materials to be carefully delineated and monitored. We expect LAWA to review and consider all of the suggestions from the 2004 Rand study as well.
VII Hazards & Hazardous Matl. (g)	A-13	A-13 Are there any hazard control plans for LAWA that need to be updated? We are certainly concerned that if any disaster occurs the medical care facility that is most convenient would likely be blocked from community use by closure of Sepulveda Blvd.

VII Hazards & Hazardous Matl. (h)	A-14	Although LAWA noted the lack of concern for wild fires etc. there is still concern that an air accident could cause a major fire due to the amount of fuel held by aircraft. We expect that a valid plan will be identified and any access issues will be resolved. At least one of the plans calls for relocation of Lincoln Blvd that includes a portion of the road inside of a tunnel. A fire in this area could be very disastrous, as would poisonous gas clouds. We are aware of several radioactive containers that have been damaged before or after arrival at LAX. There needs to be very specific plans on how to handle such incidents.
VII Hydrology and Water Quality (a)	A-14	A-14 A master plan for grey water usage should be created to work with Hyperion even though LAWA has a good record in this area. As aircraft and support equipment are produced with new exotic materials there can be a potential runoff issue when repairs are initiated or during maintenance.
VII Hydrology and Water Quality (c)	A-15	There are independent plans being established currently for projects to supplement drainage filtration by the LA Sanitation Dept. in the north quadrant of LAX and in the Northside Development area. Another potential issue is damaging of critical sewage and dry/wet water runoff control channels during construction and adversely impacting the gravity feed requirements of that system.
IX Land Use and Planning (a)	A-17	If eminent domain is exercised on a significant portion of the business district there could be separation of businesses into less than a critical mass to draw local community support. Also, if the runway protection zones are enforced and homes are taken on the northeast end of LAX, small pockets of remaining homes could be created. This potential must be fully disclosed.
IX Land Use and Planning (b)	A-17	There is some question as to how homes will be impacted if the runways move north. Several large apartment complexes and some schools will be much closer to runway activity with attendant noise and pollution as well as safety issues. A 1980 study on LAX area school children showed that airport noise affected learning abilities. Newer, more effective methods for mitigating noise have been developed since soundproofing was provided to impacted schools. Does LAWA plan to offer sound proofing upgrades and air conditioning to LAUSD, private, and public schools to those located within the 1992 Noise Impacted Contour or for any who will sustain a 1.5 dB increase in noise? When new noise contours are estimated using updated aircraft mix estimates LAWA should assess the impacts.

IX Land Use and Planning (c)	A-17	Habitat issues remain not only in the formal "Blue Butterfly dunes" area, but also the plains areas that were the site of homes on the Northside development property. There were also some habitats on the east end of LAX that may need to be examined including Continental City. Street traffic is another major issue. Although LAWA is rerunning the traffic studies with a maximum of 15 additional intersections, it must still address all of the central terminal traffic as well. Further, greater use of mass transit must be evaluated. Open space must be maintained and so must community serving commercial. Wherever the airport has displaced affordable housing it should generate at least that much replacement affordable housing.
XI Noise	A-18	Topography and single noise events should be taken into consideration when determining the areas impacted by noise. Placement of the terminal gates and taxiways, as well as any other relocated or new facilities should take into consideration so that the impacts from aircraft engines are minimized. When calculating noise, the proper aircraft mix should be used and an estimate of the runway uses should be confirmed as well. Although the preferred runway alternative for taking off is inboard, LAWA estimates that 10% are done on the outboard. The health impacts of noise exposure must also be addressed. The use of noise canceling equipment is required to the extent feasible, and the most sophisticated equipment available should be identified and analyzed. Which noise canceling speaker systems been considered? Please provide a contour map of areas subjected to at least 30 airport/aircraft noise events at 65 dB or above in a day, and/or were subjected to at least two 65 dB or greater events from midnight to 7 a.m.
XII Population and Housing (c)	A-20	This could be significant depending on the home and business displacements for alternatives that propose moving runways north. When LAWA does it's analysis it must assume that Manchester and Belford Square areas are empty and that everything that is constructed there adds to the area traffic.

XIII Public Services (a-c)	A-21	The EIR for the Westchester-Playa del Rey Plan states that a substantial increase in fire and police protection manpower is required to meet current zoning estimates. Much of the community to the north relies on Fire Station 5 for rapid community response. This station deploys both the Manchester Boulevard and Westchester Parkway. This dual access must be maintained. For emergency services at LAX there must be a good emergency health care plan in place with capacity to meeting both LAX and community needs. If an event occurs at LAX that causes airport closure this facility will be unavailable to the surrounding community. The nearest urgent care for local residents is located on Sepulveda north of Century. In view of the closure of several emergency rooms and Daniel Freeman Hospital does the needed capacity still exist? If not, what solution is proposed? Several schools will be subjected to increased noise and pollution. Air pollution especially must be assessed for not only 10 and 2.5 micron size but also smaller (i.e. 0.1 as done in the 2007 CARB study of LAX particle pollution). Although several schools have been previously sound proofed during earlier programs, determination should be made if another round of soundproofing is appropriate. Several churches and schools may be subjected to enough noise to cause learning impairment under EPA or other standards (i.e. NIH).
XIII Public Services (d)	A-22	Some airport land, such as Nielson Field and the Westchester Golf Course, is currently used for open space. If this use is diminished or if promised elements (i.e. Golf Course) is not restored the negative impacts of this should be analyzed and mitigated.
XIII Public Services (e)	A-22	Some other governmental uses should be investigated, as well as new housing opportunities for Manchester Square. Certainly the need for additional road access is evident due to the increases of traffic from current levels to the "nominal" 78.9 MAP. Also cargo and other related causes of traffic need to be assessed fully. Traffic should be diverted away from residential communities. Even if there are only moderate increases in traffic from LAX the overall impact may still be substantial due to major increases in present and authorized development zoning changes.

XV Transportation/Circulation	A-23	Potential traffic changes in the CTA must be assessed. Are there better ways to direct the traffic from the surrounding areas into LAX? LOS around LAX is marginal on many streets already. LAX modifications such as the location of the cargo support businesses, consolidated rental car facility, integrated transportation near Continental City and more must be included in the assessments. The total costs and fair share allocations of improvements must be addressed.
XV Transportation/Circulation	A-24	Locations and stops, methods for supporting baggage handling, etc., must be identified.
XV Transportation/Circulation	A-24	Movement of the runways will modify the flight tracks of approaching and departing aircraft. This change must be studied to assess impacts on the number and urgency of go-arounds and other noisy, polluting flight maneuvers. A July 2007 Airline Pilots Association White Paper on incursions notes modest air traffic increases have resulted in major increases in the number of incursions. Air capacity assessments must be identified and quantified for all key factors, not just the first order limiting factor of capacity growth. Although gate capacity is the current capacity limiting factor, if it is resolved several others can become significant. Several factors of concern are, but not limited to, the number of cars entering the CTA, taxiway routes for aircraft to get to gates, and the number of aircraft operations per unit time as the required separation distance in the sky that limits the number of takeoffs and landings. Otherwise, if the limiting factor for capacity is the only factor addressed, as soon as the Settlement limitation on embarkation gates expires, capacity may be dramatically increased without a former EIR review. Traffic from parking areas must be assessed after the parking locations are determined. This traffic is a source of noise and pollution, as well as frustrating easy access to the central terminal area. Better signage and other types of improvements must also be identified as mitigations for areas around LAX and inside the CTA.
XV Transportation/Circulation	A-25	Alternative transportation uses must be closely examined. LAWA should look into how and where the new flyaway programs can be used and how all of the bus movements inside the CTA can be reduced to eliminate or at least reduce traffic jams. There are many new potential airside issues. Taxiway locations (especially around the terminal gates) have been noted by LAWA and the FAA to restrict aircraft movement that reduces operational efficiency and adds pollution and noise. Studies must address the movement of taxiways, taxiway/runway intersections, and gate locations to

Petitioners' Overview of Guiding Principles for Environmental Analysis: LAX Specific Plan Amendment Study EIR

Submitted by Petitioners: City of El Segundo, City of Inglewood, City of Culver City, County of Los Angeles, and Alliance for a Regional Solution to Airport Congestion (ARSAC).

Background: In January of 2005, Petitioners filed lawsuits challenging the approval of the LAX Master Plan Program and the associated Environmental Impact Report (EIR) prepared by Los Angeles World Airports (LAWA) under the California Environmental Quality Act (CEQA). These suits were resolved by a 2006 Stipulated Settlement between LAWA and Petitioners. In response to the Notice of Preparation (NOP) recently released by LAWA for the Specific Plan Amendment Study (SPAS) Draft EIR, Petitioners now jointly submit this overview of principles that should guide LAWA in that environmental review process. Petitioners will also submit detailed individual comments.

LAWA's Obligation to Avoid and Reduce Impacts to Surrounding Communities. As LAWA proceeds with refinement and analysis of options as part of the SPAS process, it must continually recognize its obligation to avoid and mitigate impacts to the communities that surround LAX. Options under consideration must be evaluated and ranked based on how they would impact the environment, public health and safety in surrounding communities (e.g., noise, air quality, traffic). All alternatives should be subject to a full and fair evaluation in the SPAS DEIR and LAWA should remain open to options that would avoid or mitigate impacts to its neighbors, taking care not to prematurely select a preferred alternative.

Continued Consultation with Surrounding Communities. The alternatives described in the SPAS NOP were developed and selected by LAWA during a lengthy consultation process with Petitioners. That consultation process grew out of the 2006 Stipulated Settlement, which states, in relevant part, that "An LAX Specific Plan Amendment Process Advisory Committee shall be created consisting of representatives of the City of Los Angeles, County of Los Angeles, El Segundo, Inglewood, Culver City, and ARSAC. LAWA shall consult with the Committee during each significant step of the LAX Specific Plan Amendment Process." Petitioners wish to recognize LAWA's compliance to date with this provision of the Stipulated Settlement. LAWA must now ensure that it continues to consult with Petitioners as the EIR process proceeds and the SPAS alternatives are developed in more detail. In particular, LAWA should take care to consult with Petitioners regarding the details and analysis of the alternatives supported by any Petitioner.

Extension of Gate Constraint. LAWA, FAA and the Petitioners all agree that limiting the number of gates at LAX will promote efficient passenger operations and encourage other airports in the Los Angeles basin to increase capacity to serve aviation demand. Accordingly, the long term success of the regional approach to serving aviation demand depends on maintaining appropriate gate constraints at LAX. The 2006 Stipulated Settlement between LAWA and the Petitioners limits the number of permissible gates at LAX to 163 and, commencing in 2010, requires LAWA to begin reducing the number of operating gates at LAX to 153. This settlement provision is operative through December 31, 2020. As part of the SPAS process, LAWA must analyze the continuation of the LAX gate constraints beyond 2020, as well as the possible

		determine more efficient ways to handle ground aircraft movement to reduce noise and pollution promulgated into the surrounding communities.
XVI Utilities	A-25	Utility systems should be assessed to determine where additional capacity is required and where back-up systems are required.
XVI Utilities	A-26	Although sufficient solid waste capacity is presumed, there are many opportunities for reducing the generation of solid waste. If we continue the same methods of disposal to Sunshine Canyon and other remote landfills, and there is a substantial increase in waste, we will be adding much pollution and noise due to the long haul disposals.
XVII Mandatory findings of Significance	A-27	The cumulative effects of increased traffic will increase pollution and has serious adverse economic impacts in terms of reduced productivity along with adverse health impacts.

ATTACHMENT 3 to ARSAC LAX Master Plan NOP Comment Letter, 6-17-08

One Safe Single North Runway Proposal

Background: The Stipulated Settlement Agreement provided for a re-examination of Yellow Light projects such as the north runway complex by the Specific Plan Advisory Committee and to come up-with other efficient and community friendly alternatives. The One Safe Single North Runway proposal aims to address safety, efficiency and being community friendly.

Runway incursions continue to be cited as a reason for making improvement to the north airfield complex at LAX. Despite numerous requests, one idea that has not and should be included and fully studied in the NASA north airfield safety study and in the LAX Master Plan NOP and EIR/EIS is this "One Safe Single North Runway." This proposal can provide safety and keep LAX within the desired 78.9 Million Annual Passenger (MAP) limit.

The only runway designs in the world that have been most effective in preventing runway incursions are designs where aircraft do not have to cross one runway to get to another. Munich Franz Josef Strauss Airport (MUC) in Germany was designed with one runway on each side of the terminal complex as a way to prevent runway incursions. Since MUC opened in 1992, there has been only one runway incursion (2006). MUC handled 34 MAP in 2007.

London Heathrow Airport (LHR) in the United Kingdom, the world's busiest international airport, has a similar runway layout with one runway on each side of the terminal complex. LHR has traffic signals operated by two tower controllers, at each runway to permit aircraft to enter the runways. LHR has not had incursion problems. At LHR, one runway is used for take-offs and one runway is used for landings. This is known as Single Mode Operation. In 2007, LHR handled 68 MAP.

London Gatwick Airport (LGW) is a single runway airport that operates in Multi-Mode Operation. In 2007, LGW handled 35 MAP. According to its operator, BAA, "Gatwick is the busiest single-runway airport in the world, the second largest airport in the UK and the sixth busiest international airport in the world." Clearly, a single runway airfield can be successful!

Requirements for all concepts:

- Runway 24 Right closed and either covered with fill dirt or removed
- Enhanced runway/taxiway lighting, striping and signage on Runway 24 Left
- ASDE-X and Runway Status Lights on Runway 24 Left
- Noise contours cannot increase in Westchester/Playa del Rey
- No taking of land in Westchester/Playa del Rey
- No northward runway movement and no placement of taxiways north of runway

Concept 1:

- Use Runway 24 Left in its existing configuration.

Concept 2: "Super Runway"

- Rebuild Runway 24 Left in its current location to a new 200-foot wide runway and 10,000 feet in length. The runway would be extended up to 1,000 to the east. The associated taxiways near Terminals 1, 2 and 3 and the Tom Bradley International Terminal would be rebuilt as required. Movement toward the center of the two existing runways facilitates the least expensive upgrades to the present inadequate, congestion producing taxiways and taxilanes adjacent to the terminals.

Questions or comments? Contact Robert Acherman at (310) 927-2127, racherman@netvip.com

enhancement of those constraints at a level that will efficiently serve up to 78.9 million annual passengers at LAX, while encouraging growth elsewhere in the region, including at the other airports owned and operated by LAWA.

Airfield Balance. In the NOP, LAWA indicates that under the LAX Master Plan, one of its goals is to "provide a better balance in operations between the North Airfield and the South Airfield." Petitioners support this goal and urge LAWA to conduct a full analysis of whether and to what extent each of the proposed SPAS alternatives would help achieve better airfield balance. Petitioners agree that total flight operation balance can lead to less operational crowding, which is good for all.

Regional Approach. Petitioners strongly support a regional approach to accommodating passenger and cargo aviation demand throughout Southern California. Because the area around LAX is fully developed, and because we must reduce vehicle miles traveled to improve air quality, decrease greenhouse gases, and increase productivity, a regional solution to serving aviation demand is essential. The regional approach, which is fully supported by the Southern California Association of Governments, must be a key component of everything LAWA does, including in the SPAS process. LAWA should vigorously pursue accommodating aviation demand at Palmdale and Ontario, and work aggressively with other airport operators and local governments to advance the regional approach.

DEIR Public Review Period. The NOP indicates that LAWA intends to provide just 45 days for public review and comment on the Draft SPAS EIR. In light of the complexity of this project and LAWA's tendency to produce lengthy CEQA documents, Petitioners anticipate that 45 days will not be sufficient.

ATTACHMENT 4- ARSAC comment letter on the LAX Master Plan NOP

LAX Master Plan

340' south / airline alliance realignment proposal

June 17, 2008

Prepared by: Robert Acherman, Vice President, ARSAC
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Plan Features

- Moves Runway 24 Left 340 feet south
- Airlines regrouped in terminals by airline alliances (e.g. SkyTeam, Star, oneworld)
- Terminals 1, 2, 3 and part of north wing of Tom Bradley International Terminal are torn down
- Low Cost Carrier (LCC) Terminals built to replace Terminals 1, 2 and 3
- No changes to the parking garages in Central Terminal Area
- Consolidated Rent-a-car center (CONRAC) to be located in Manchester Square
- Elevated roadways to connect the CTA to the CONRAC and the freeways

Plan Benefits

- Moves airport and related operations away from residential communities
- Incorporates current airport terminal management practices
- Logically arranges airlines by alliances
- Provides opportunities for both Low Cost and alliance carriers
- Places CONRAC in safer location and better connected to the 405 freeway
- Addresses increased safety and security needs
- Improves customer satisfaction by keeping access to LAX as convenient as possible

24 Left moved 340 feet south

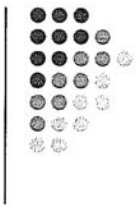
- Moves aircraft noise and safety issues AWAY from the Westchester/Playa del Rey community
  - Runway 24 Right has eastern displaced threshold to move RPZ out of Westchester Central Business District
  - Runway 24 Right extended no more than 1,000 feet west to offset the displaced threshold on the east end of the runway
- Creates a modified Group VI airfield to handle New Large Aircraft (NLA) such as the Airbus A380 and the Boeing 747-8 Intercontinental
- Allows for a centerline taxiway to be constructed between the two north runways
- ASDE-X to be installed at LAX
- FAROS and EMAS installed at end of runways
- Runway Status Lights (RWSL) to be added at all runway entrances
- Improved striping, signage and lighting for all runways and taxiways

Airlines grouped by alliances



- Newest trend in terminal management
  - Allows for easier connections and shared use of ticket counters, lounges and gate areas
  - First implemented at Tokyo Narita Airport on June 2, 2006
    - Terminal 1 South- Star Alliance (ANA, United, Lufthansa)
    - Terminal 1 North- SkyTeam (Northwest, KLM, Korean Air)
    - Terminal 2- oneworld (Japan Airlines, American, British)
  - Possible to implement at LAX with limited movements of airlines
    - Delta/Northwest merger helps to resolve Terminal 2 lease situation

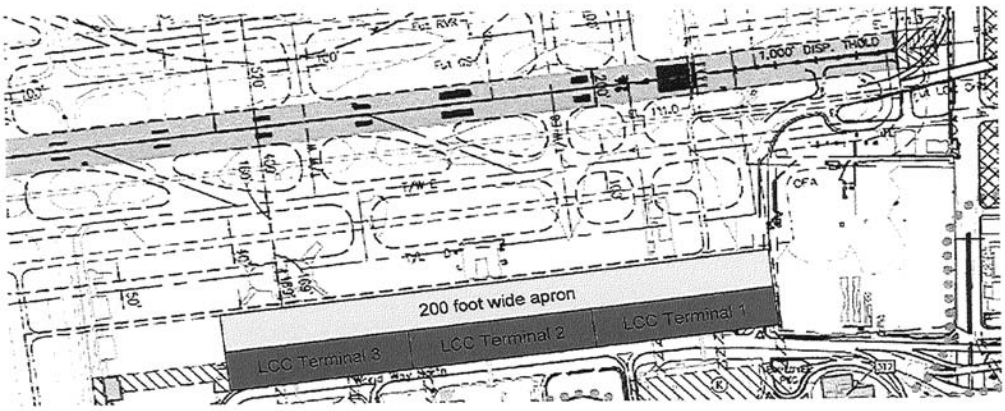
New LCC Terminals



- Incorporates current trends in airport operations
  - Decreasing the distance from the curb to the gate
  - Common Use Terminal Equipment (CUTE) to allow the airport operator flexibility in use of gates and meet federal airport competition plan requirements
  - Low cost is the hottest trend in terminal operations
    - Simplified facilities
      - LAX will continue to have elevators and escalators
    - Design allows for rapid turnaround of aircraft

LCC Terminal Design

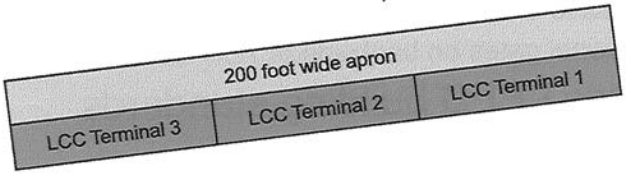
- Terminal designs similar to John Wayne and San Jose
- Terminals and apron are 200 feet wide each



LCC Terminal Design

- Terminal designs similar to John Wayne and San Jose
- Terminals and apron are 200 feet wide each

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.



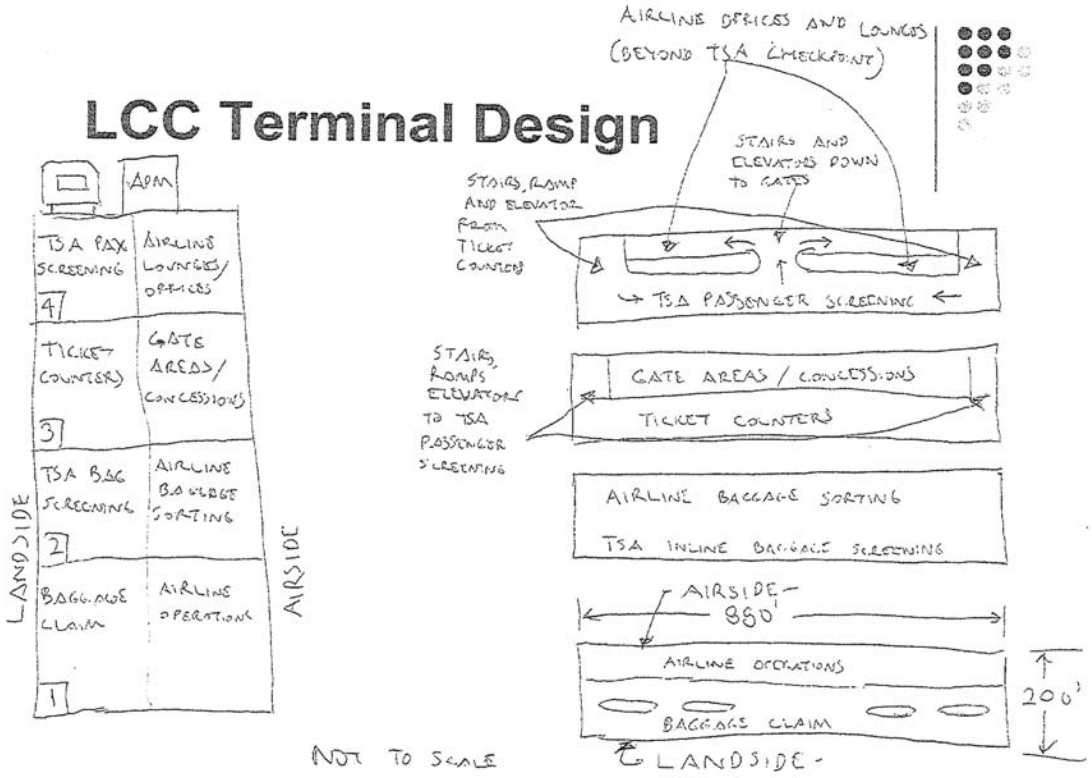
LCC Terminal Design

- All three terminals have same design to save on costs
  - 200 feet wide from front door on landside to windows on airside
  - 880 feet long
  - 4 story buildings
  - 6 to 8 gates per terminal for A320/B737 type aircraft
    - Gate reductions at LCC Terminals 1, 2 and 3 offset by Tom Bradley International Terminal
      - Access to Gates 119 to 121 remains open
      - Additional gates on backside of TBIT and at Midfield Terminal
- Incorporates LEED building standards

LCC Terminal Design

- Landside
  - Rooftop- APM station
  - 4th floor- TSA passenger screening
  - 3rd floor- ticket counters
  - 2nd floor- TSA inline baggage screening
  - 1st floor (ground level)- baggage claim
- Airside
  - Rooftop
  - 4th floor- airline lounges and offices
  - 3rd floor- gate areas and concessions
  - 2nd floor- baggage sorting area
  - 1st floor (ground level)- airline operations

LCC Terminal Design



No changes to the CTA

- Parking garages in the CTA will be unchanged
- Access to the CTA will remain open to private vehicles, busses and taxis
- Passenger convenience is maintained with curb front drop-off and pick-up

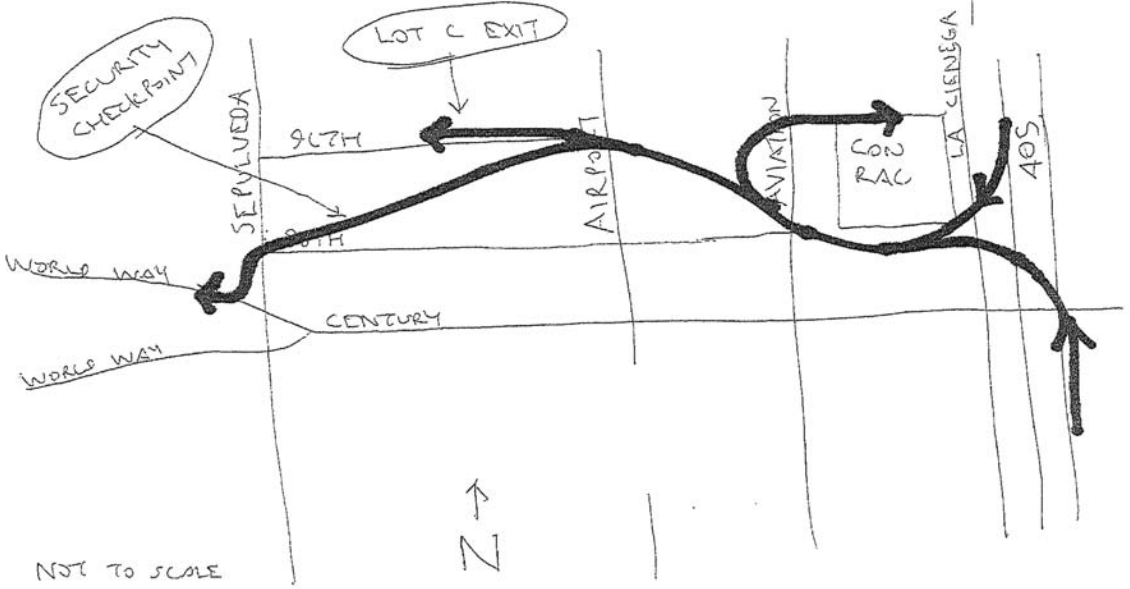
CONRAC

- Manchester Square location
  - Multi-story parking garage for all car rental operations
    - Successful model at Phoenix Sky Harbor Airport
  - Easy direct 405 freeway and LAX access via elevated roadway
  - Connection to Automated People Mover (APM)
  - CONRAC is outside of Runway Protection Zone
    - Alternative D has CONRAC located in RPZ
  - Large set-backs and landscaping will be used to prevent massing of the CONRAC along surrounding streets

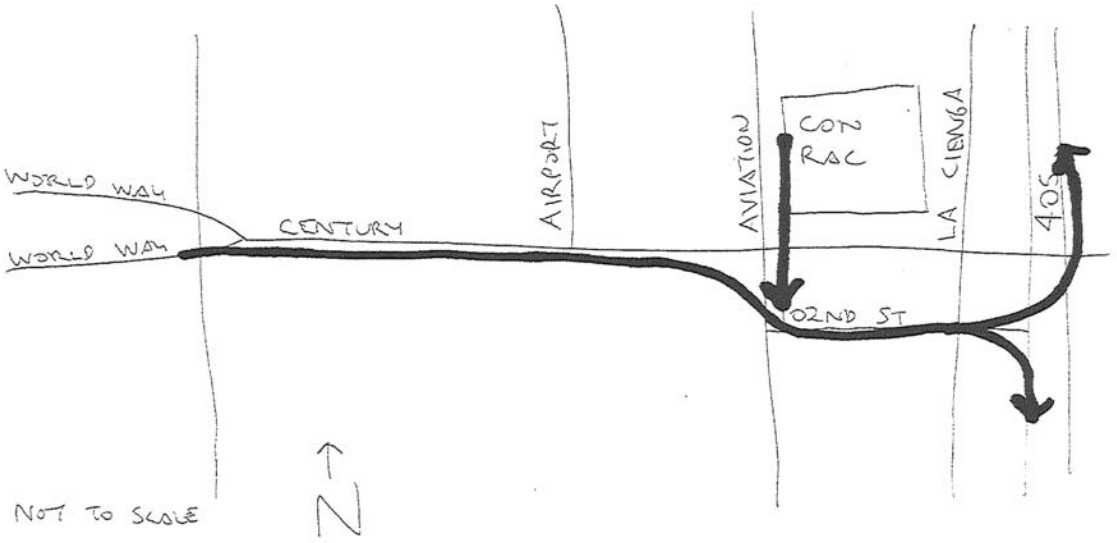
Elevated Roadways

- Connected to 405 north and south
- Into LAX: From 405 to CONRAC and then along 96th Street; at Airport to 98th Street and Sepulveda; south turn to World Way entrance bridge
  - Exits to CONRAC and Lot C
  - Built in vehicle security screening area along 98th Street portion of elevated roadway
- Out of LAX: From CTA along Century to current 405 south on-ramp at La Cienega
  - Elevated roadway will be built on piers installed on south side of Century Boulevard (grass median between south side of street and cargo building areas)
  - East of Aviation, elevated roadway will follow along 102nd Street to the 405 freeway

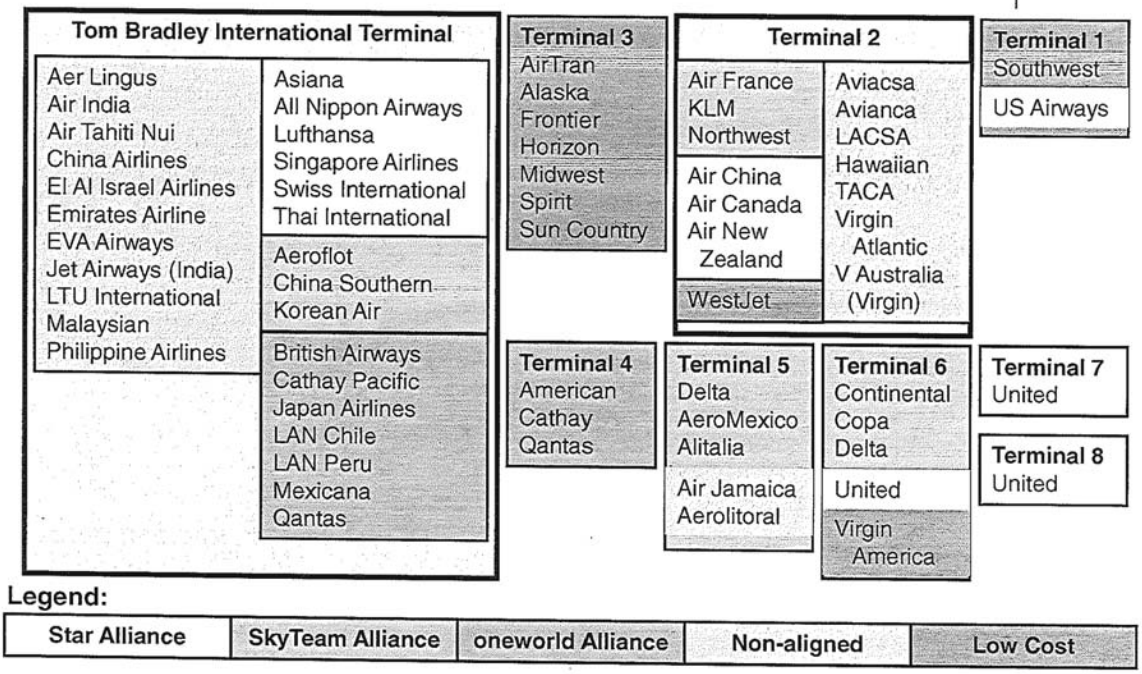
Elevated Roadways- inbound



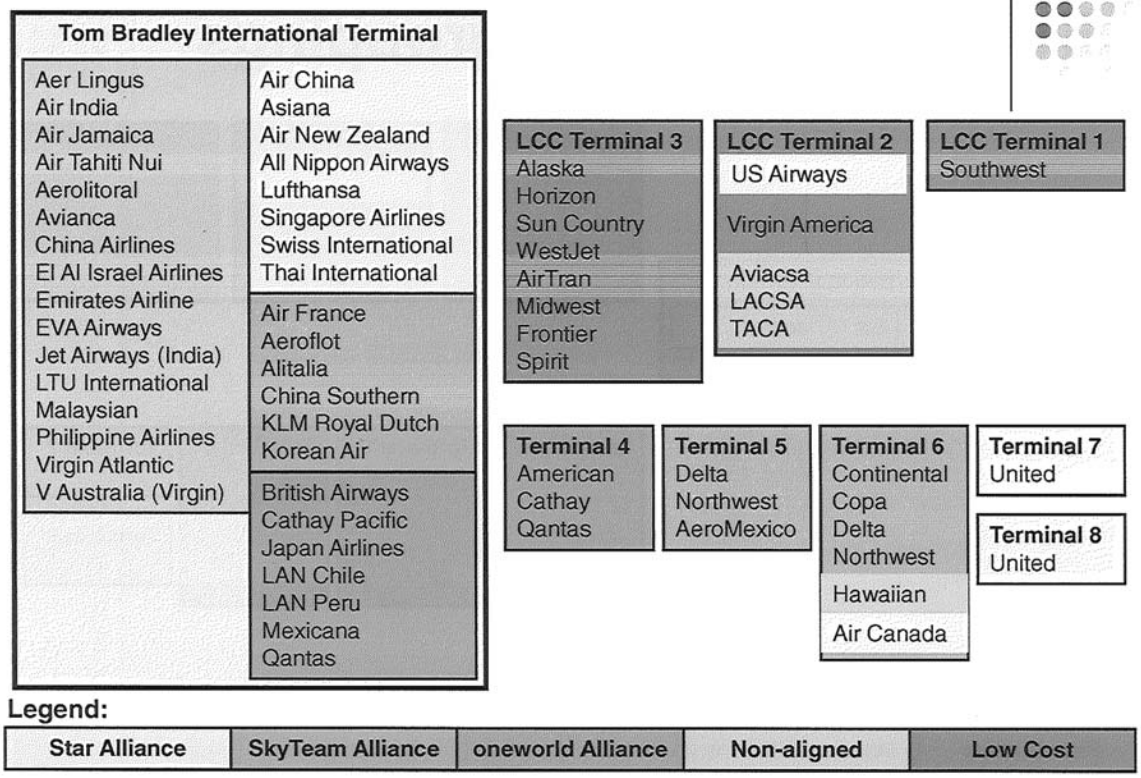
Elevated Roadways- outbound



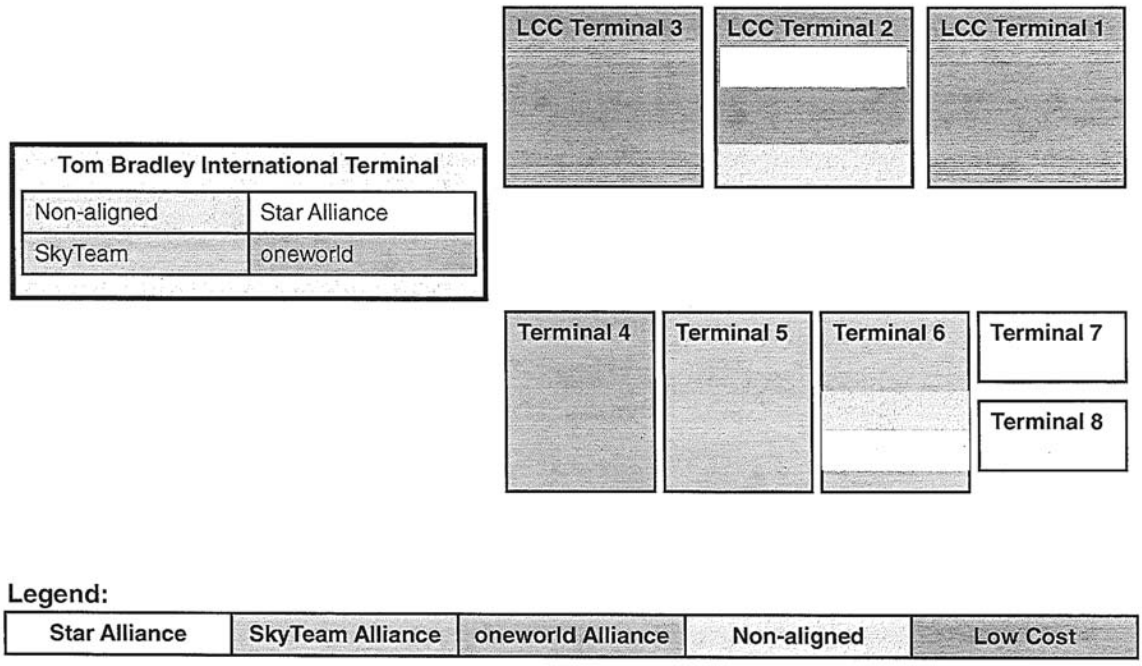
Current LAX configuration as of June 17, 2008



LAX co-location plan preview



Terminal layout by groupings



Legend:

Star Alliance	SkyTeam Alliance	oneworld Alliance	Non-aligned	Low Cost

Notes on re-location

- U.S. airlines are cutting back capacity as much as 20%
- Delta and Northwest announced a merger on April 15, 2008
- Continental may leave SkyTeam to join oneworld alliance
- United and US Airways merger talks failed
- Virgin America is 25% owned by Virgin Group due to U.S. Government restrictions on foreigners for owning U.S. airlines. This restriction may go away with the second phase of "Open Skies" between the U.S. and European Union
- Virgin Atlantic is 49% owned by Singapore Airlines. VS is not part of an airline alliance.
- V Australia is another Virgin branded airline
- LACSA is a part of Groupo TACA
- AirTran and Frontier are marketing partners
- Frontier is operating in Chapter 11 bankruptcy
- Spirit operates flights to Mexico from LAX
- Copa is partly owned by Continental

Construction sequence

- Complete the Tom Bradley International Terminal midfield terminal. Relocate international carriers from Terminal 2 to TBIT.
- Move Continental to Terminal 2 while Terminal 6 is being refurbished. Air Jamaica would move to TBIT. Virgin America would move to Terminal 3.
- When Terminal 6 is refurbished, Continental, Northwest, Hawaiian and Air Canada move to Terminal 6
- Reconstruct Terminal 2 into LCC Terminal 2
- When LCC Terminal 2 is completed, move US Airways to Terminal 8 (requires United's cooperation) and Southwest to LCC Terminal 2
- Reconstruct Terminal 1 into LCC Terminal 1
- When LCC Terminal 1 is complete, move Southwest back to LCC Terminal 1
- Move Terminal 3 airlines to LCC Terminal 2
- Reconstruct Terminal 3 into LCC Terminal 3
- Move Terminal 3 airlines back to LCC Terminal 3
- Move US Airways to LCC Terminal 2
- Move Runway 24 Left 340 feet south
- Build the centerline taxiway
- Build the Rent-a-car facility (this could occur sooner)
- Complete roadway connections from Rent-a-car facility to Central Terminal Area (could occur sooner)
- Complete roadway connections from CTA back out to freeways (could occur sooner)

Questions?

Please contact
Robert Acherman
Vice President
ARSAC
(310) 927-2127 racherman@netvip.com

experiencing adverse health effects from PM2.5 exposure. Even small increases in PM2.5 exposures may increase health risks.

Major contributors to PM2.5 include trucks, passenger cars, off-road equipment, electric power generation and industrial processes, residential wood burning, and forest and agricultural burning. All combustion processes generally produce PM2.5.

While the new data reveals a greater threat from PM2.5, the state's previous efforts to reduce emissions throughout the state have been successful. The ARB in coordination with the 35 air districts throughout the state continues to develop and implement strategies of aggressive air pollution control. These measures have been so effective for the last two decades that PM exposures have been reduced in California's major populated areas. Since the official year-round monitoring of ambient PM2.5 began in 1999, concentrations have decreased 30 percent across California, most notably in the South Coast and the San Joaquin Valley regions.

Additionally, in 2000 ARB adopted an aggressive risk reduction plan that targets all diesel PM sources in California. As part of the plan, cleaner diesel fuels and new diesel engines (both on-road and off-road) have been developed. In concert with regulations aimed at requiring cleaner new engines, other regulations have been adopted to address diesel engines already on the road, including those in waste collection vehicles, transit fleet, school buses, stationary engines, transport refrigeration units and portable engines. Later this year, ARB will consider rules to significantly cut diesel particulate emissions from private truck fleets.

For more information, see: http://www.arb.ca.gov/research/health/pm-mort/pm-mort.htm
.

The Air Resources Board is a department of the California Environmental Protection Agency. ARB's mission is to promote and protect public health, welfare, and ecological resources through effective reduction of air pollutants while recognizing and considering effects on the economy. The ARB oversees all air pollution control efforts in California to attain and maintain health based air quality standards.

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California Environmental Protection Agency

NEWS RELEASE

Air Resources Board

Release 08-47
FOR IMMEDIATE RELEASE
May 22, 2008

Dimitri Stanich
(916) 322-2825
www.arb.ca.gov

More premature deaths than previously thought from particles in vehicle exhaust
New research reveals significant new information

SACRAMENTO - The California Air Resources Board was presented with research today showing long-term exposures to fine particle pollution pose a greater health threat than previously estimated.

Annually, 14,000 to 24,000 premature deaths are estimated to be associated with exposures to PM2.5, a mix of microscopic particles less than 2.5 microns in size. A majority of these deaths occur in highly populated areas around the state, including the South Coast, San Joaquin Valley and San Francisco Bay air basins.

"Particle pollution is a silent killer," said ARB Chairman Mary D. Nichols. "We must work even harder to cut these life-shortening emissions by further addressing pollution sources head-on."

Particulate matter (PM) is a complex blend of substances ranging from dry solid fragments, solid-cores fragments with liquid coatings, and small droplets of liquid. These particles vary in shape, size and chemical composition, and may include metals, soot, soil and dust.

At the request of the board in 2006, ARB researchers carefully reviewed all scientific studies on the subject and consulted with health scientists. While exposures to particulate matter have long been known as a serious health threat, new information suggests that the pollutant is even more toxic than previously thought.

Hospitalizations, emergency room visits and doctor visits for respiratory illnesses or heart disease have been associated with PM2.5 exposure. Other studies suggest that PM2.5 exposure may influence asthma symptoms and acute and chronic bronchitis. Children, the elderly and people with pre-existing chronic disease are most at risk of

New! Public Workshop	June 25, 2008
Public Comments Due	July 11, 2008
Final Report	August 2008

For more information, please contact Dr. Hien Tran at htran@arb.ca.gov or (916) 445-1324.

Health and Air Pollution Research Activities

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The Board is one of six boards, departments, and offices under the umbrella of the California Environmental Protection Agency.
Cal/EPA | ARB | CIWMB | DPR | DTSC | OEHHA | SWRCB

From website: http://www.arb.ca.gov/research/health/pm-mort/pm-mort.htm

HEALTH IMPACTS ANALYSIS: PM PREMATURE DEATH RELATIONSHIP

Wednesday, June 18, 2008

This page reviewed June 10, 2008

Health Impacts Analysis:

Actions to Update the Methodology for Estimating Premature Death Associated with Fine Airborne Particulate (PM2.5) Exposure

As part of the Air Resources Board's development of the Emission Reduction Plan for Ports and Goods Movement, ARB staff performed a health impacts analysis for domestic and international goods movement activities. At the April 20, 2006 Board meeting, staff presented the results of this analysis, which can be found in Appendix A at http://www.arb.ca.gov/planning/gmerp/gmerp.htm. Following the presentation, staff was directed by the Board to update the health impacts methodology to reflect recent health information on PM2.5 exposures and premature death. On August 21, 2006 we held a public workshop to discuss our approach for revising the methodology and our timeline for completing the work. Staff reviewed all relevant literature and completed a draft report incorporating public comment received at the workshop. A formal review of the updated methodology and analysis was conducted by a peer review committee formed by the University of California. The committee is composed of experts in the fields of epidemiology, air quality measurement, risk management, health effects of air pollution, and biostatistics.

The draft staff report was discussed at the May 22, 2008 Air Resources Board meeting and made available for public comment. Also, a workshop to discuss the draft methodology is scheduled for June 25, 2008. Please submit comments on the draft staff report to Dr. Hien Tran by email at htran@arb.ca.gov or by FAX (916 323-1045 or 916 322-4357) by July 11, 2008. Comments may also be mailed to Dr. Tran at the Air Resources Board, Research Division, 1001 I Street, P.O. Box 2815, Sacramento CA 95812. Public comment will be considered in drafting the final report, which we anticipate will be released to the public in August 2008.

This fact sheet provides background on particulate matter and the health risks it poses.

SCHEDULE

First Public Workshop	August 21, 2006
Peer Review Completed	January 15, 2008
Board Update on Draft Report - Presentation	May 22, 2008

State of California

Air Resources Board

Mary D. Nichols, Chairman *Governor Arnold Schwarzenegger*

Methodology for Estimating Premature Deaths Associated with Long-term Exposures to Fine Airborne Particulate Matter in California

DRAFT
Staff Report

May 22, 2008

California Environmental Protection Agency

Air Resources Board

California Environmental Protection Agency

Linda S. Adams, Secretary

Printed on Recycled Paper

From website: http://www.arb.ca.gov/research/health/pm-mort/pm-mort.htm

Attached to my e-mail is the document that was presented at the website….

Also attached is the Froines study….

Methodology for Estimating Premature Deaths Associated with Long-term Exposures to Fine Airborne Particulate Matter in California

DRAFT
Staff Report

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Acknowledgments

The staff thanks Donald McCubbin of Abt Associates, Inc. for assisting with BenMAP. Staff also appreciates the thorough review by Dr. Deborah Drechsler, the data analysis provided by Dr. Susan Gilbreath and Jeff Austin, and the technical assistance provided by Sarah Barnett, Vanessa Fontana, and Rebecca Boyer.

Disclaimer

This report has been reviewed by the staff of the Air Resources Board. Mention of trade names or commercial products does not constitute endorsement or recommendation for their use. To obtain this document in an alternative format, please contact the Air Resources Board ADA Coordinator at (916) 322-4505, TDD (916) 324-9531, or (800) 700-8326 for TDD calls from outside the Sacramento area.

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Acronyms and Abbreviations

ACS	American Cancer Society
AHSMOG	The Adventist Health Study of Smog
ARB	California Air Resources Board
Board	California Air Resources Board
BS	Black Smoke or British Smoke
CARB	California Air Resources Board
CHS	Children's Health Study
C-R Function	Concentration-Response Function
CRPAQS	California Regional PM10/PM2.5 Air Quality Study
DPM	Diesel Particulate Matter
EI	Emission Inventory
EPA	United States Environmental Protection Agency
IMPROVE	Interagency Monitoring for Protected Visual Environments
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
OEHHA	Office of Environmental Health Hazard Assessment
PM	Particulate Matter
PM2.5	Fine Particulate Matter; Particulate Matter 2.5 Micrometers in Diameter and Smaller
PM10	Particulate Matter 10 Micrometers in Diameter and Smaller
SA	Source Apportionment
SO_x	Sulfur Oxides
UFP	Ultrafine Particle
U.S. EPA	United States Environmental Protection Agency
VA	Veterans Administration

Executive Summary

The California Air Resources Board (CARB) quantifies health impacts of exposure to particulate matter (PM) as part of the development of control measures for PM, including those for ports and goods movement. The methodology that CARB staff uses for quantifying premature death and other health impacts from PM exposure is based on a peer-reviewed methodology developed by the U.S. Environmental Protection Agency (EPA) for their risk assessments. This methodology is regularly updated by CARB staff as new epidemiological studies and other related studies are published that are relevant to California's health impacts analysis. This report discusses the results of staff's review of the recent scientific literature related to the mortality effects of exposure to fine PM (PM2.5) and presents recommendations for revisions to the current methodology.

In this report, the relative risk of premature death due to PM2.5 exposure was reevaluated based on all relevant scientific literature, and a new relative risk factor was developed. This new relative risk factor is a 10% increase in premature death per 10 $\mu g/m^3$ increase in PM2.5 exposures (uncertainty interval: 3% to 20%). Using this new factor, staff estimates diesel PM contributes to 3,900 (uncertainty interval 1,200 to 7,100) premature deaths, statewide on an annual basis. Staff also used a systematic approach for assessing the lowest level of PM2.5 that can be associated with premature death. Although the recent literature is consistent with a no-threshold model, no empirical evidence has been reported to date for an effect of exposure below 7 $\mu g/m^3$ in a general population. Staff therefore recommends that the cut-off be presented as a range of results. Using this approach, exposures to ambient PM2.5 can be associated with about 14,000 to 24,000 premature deaths statewide annually, with uncertainty ranging from 4,300 to 41,000 deaths.

The methodologies and results presented in this report have been endorsed by our scientific advisors, Dr. Jonathan Levy of Harvard University, Dr. Bart Ostro of the Office of Environmental Health Hazard Assessment, and Dr. Arden Pope of Brigham Young University. This report underwent an external peer review by experts selected through a process involving the University of California at Berkeley, Institute of the Environment. The results of the peer review process have been incorporated into this report.

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health impacts analysis (CARB 2006). Staff also informed the Board of plans to revise and improve the health impacts methodology by updating the health information that relates changes in PM2.5 exposures to premature death. This report is a product of this effort to update the methodology. In it, we summarize the health literature on the subject, interpret U.S. EPA's expert elicitation results, and explain how we apply these results to estimate the mortality impacts associated with Californians' exposures to ambient PM levels.

II. Methodology

The methodology presented in this report have been endorsed by our scientific advisors, Dr. Jonathan Levy of Harvard University, Dr. Bart Ostro of the Office of Environmental Health Hazard Assessment, and Dr. Arden Pope of Brigham Young University.

A. Summary of health studies on long-term PM exposures and premature death

The following is adapted with the authors' permission from the 2006 Critical Review in the Journal of Air and Waste Management Association by C. Arden Pope III and Douglas Dockery (Pope and Dockery 2006).

Daily time-series studies of acute exposures suggest short-term acute PM effects, but they provide little information about the degree of life shortening, pollution effects on longer-term premature death rates, or the role of pollution in inducing or accelerating the progress of chronic disease. As early as 1970, several analyses of pollution and premature death data reported that long-term average concentrations of PM2.5 or sulfate are associated with annual mortality rates across U.S. metropolitan areas. These population-based cross-sectional mortality rate studies were largely discounted by 1997 because of concern that they could not control for individual risk factors, such as cigarette smoking and body weight, which could potentially confound the air pollution effects. With regard to the premature death effects of long-term PM exposure, recent emphasis has been on prospective cohort studies that can control for individual differences in age, sex, smoking history, and other risk factors. However, since these studies require collecting information on large numbers of people and following them prospectively for long periods of time, conducting such studies can be costly, time consuming, and, therefore, much less common. A brief summary of results from these studies is presented in Table 1.

Below is a summary of the main long-term cohort studies published in the literature.

A.1 Original Harvard Six Cities and ACS Studies

In the mid-1990s, two cohort-based mortality studies had reported evidence of mortality effects of chronic exposure to fine particulate air pollution. The first study, often referred to as the Harvard Six Cities Study, reported on a 14- to 16-year prospective follow-up of

I. Introduction and Background

In 2002, when CARB established a new ambient air quality standard for PM2.5 in collaboration with the Office of Environmental Health Hazard Assessment, we estimated the human health impacts of public exposures to PM levels above various levels, including the new standard (CARB 2002). The quantification of premature death from PM exposure used by CARB staff in previous analyses is based on a peer-reviewed methodology developed by the U.S. Environmental Protection Agency for their risk assessments (U.S. EPA 2004, 2005). The quantified death estimates play an important role in CARB's cost-benefits analysis of plans and regulations as they make up for the majority of the health valuation. For example, as part of the development of emission reduction plans and control measures for PM, CARB quantifies the health impacts of reducing population exposure to ambient PM that would result through the implementation of the proposed measures (CARB 2003a, 2003b, 2003c, 2004a, 2004b, 2004c).

In all of the recent analyses, including that for goods movement (CARB 2006), CARB has relied on the results from the American Cancer Society (ACS) study (Pope et al. 1995, 2002) to estimate the premature deaths. In U.S. EPA's regulatory impact analyses of recent years, including those on the Clean Air Interstate Rule in 2005, U.S. EPA continued to base the concentration-response function relating PM exposure to premature death on the published results of Pope et al. (2002). A concentration-response function relates changes in exposures to ambient concentrations of a pollutant to changes in an adverse health effect. However, several new epidemiological studies and other related studies have been published which may be relevant to California's health impacts analysis. These recent studies prompted CARB to consider updating the PM2.5 mortality relationship. For example, Jerrett et al. (2005) analyzed the data in the Los Angeles region, and Laden et al. (2006) performed an extended follow-up to the Harvard Six Cities study. In addition, intervention studies (Clancy et al. 2002) examining the effect of significant decreases in air pollution exposures show that the PM-mortality relationship can be larger than predicted by daily time-series studies (Samet et al. 2000). Also, clinical and toxicological studies (Chen et al. 2005) have emerged that suggest mechanisms by which PM exposure may contribute to the cardiovascular disease process, thus adding to the plausibility of the positive association between PM exposure and disease found in the long-term cohort studies.

Additional information comes from the U.S. EPA, which has elicited the opinions of twelve experts on the PM2.5-mortality relationship. Their opinions have been included in the latest regulatory impact analysis for the new national PM ambient air quality standard to characterize the uncertainty and range in the relationship[1], although Pope et al. (2002) results are still used in the primary analysis along with Laden et al. (2006).

At the April 20, 2006 Board meeting, staff presented the results of the goods movement

[1] http://www.epa.gov/ttn/ecas/regdata/RIAs/Chapter%205--Benefits.pdf

8,000 adults living in six U.S. cities (Dockery et al. 1993), representing a wide range of pollution exposure. The second study, referred to as the ACS (American Cancer Society) study, linked individual risk factor data from the ACS, Cancer Prevention Study II with national ambient air pollution data (Pope et al. 1995). The analysis included data from more than 500,000 adults who lived in 151 metropolitan areas and were followed prospectively from 1982 through 1989. About 50 metropolitan areas had PM and sulfate monitoring data. Both the Harvard Six Cities and the ACS cohort studies used Cox proportional hazard regression modeling to analyze survival times and to control for individual differences in age, sex, cigarette smoking, education levels, body mass index, and other individual risk factors. In both studies, cardiopulmonary mortality was significantly and most strongly associated with sulfate and PM2.5 concentrations.

Table 1: Summary of key studies and relative risks on long-term exposures to PM and premature death (Pope and Dockery 2006)

			Percent Increases in Relative Risk of Mortality (95% CI)		
Study	**Primary Source**	**Exposure Increment**	**All Cause**	**Cardiopulmonary**	**Lung Cancer**
Harvard Six Cities, original	Dockery et al. 1993	10 µg/m^3 PM2.5	13 (4.2, 23)	18 (6.0, 32)	18 (-11, 57)
Harvard Six Cities, HEI reanalysis	Krewski et al. 2000	10 µg/m^3 PM2.5	14 (5.4, 23)	19 (6.5, 33)	21 (-8.4, 60)
Harvard Six Cities, extended analysis	Laden et al. 2006	10 µg/m^3 PM2.5	16 (7, 26)	28 (13, 44)[a]	27 (-4, 69)
Harvard Six Cities, extended analysis between periods	Laden et al. 2006	10 µg/m^3 PM2.5	27 (5, 43)	31 (-1, 54)	6 (-57, 162)
ACS, original	Pope et al. 1995	10 µg/m^3 PM2.5	6.6 (3.5, 9.8)	12 (6.7,17)	1.2 (-8.7, 12)
ACS, HEI reanalysis	Krewski et al. 2000	10 µg/m^3 PM2.5	7.0 (3.9, 10)	12 (7.4, 17)	0.8 (-8.7, 11)
ACS, extended analysis	Pope et al. 2002 Pope et al. 2004	10 µg/m^3 PM2.5	6.2 (1.6, 11)	9.3 (3.3, 16) 12 (8, 15)[a]	13.5 (4.4, 23)
ACS adjusted using various education weighting schemes	Dockery et al. 1993 Pope et al. 2002 Krewski et al. 2000	10 µg/m^3 PM2.5	8–11	12–14	3–24
ACS intrametro Los Angeles	Jerrett et al. 2005	10 µg/m^3 PM2.5	17 (5, 30)	12 (_3, 30)	44 (-2, 211)
Postneonatal infant mortality, U.S	Woodruff et al. 1997	20 µg/m^3 PM10	8.0 (4, 14)	–	–
Postneonatal infant mortality, CA	Woodruff et al. 2006	10 µg/m^3 PM2.5	7.0 (-7, 24)	113 (12, 305)[c]	–
AHSMOG[b]	Abbey et al. 1999	20 µg/m^3 PM10	2.1 (-4.5, 9.2)	0.6 (-7.8, 10)	81 (14, 186)
AHSMOG, males only	McDonnell et al. 2000	10 µg/m^3 PM2.5	8.5 (-2.3, 21)	23 (-3, 55)	39 (-21, 150)
AHSMOG, females only	Chen et al. 2005	10 µg/m^3 PM2.5	–	42 (6, 90)[a]	–
Women's Health Initiative	Miller et al. 2004	10 µg/m^3 PM2.5	–	32 (1, 73)[a]	
Women's Health Initiative	Miller et al. 2007	10 µg/m^3 PM2.5	–	76 (25, 147)[a]	
VA, preliminary	Lipfert et al. 2000, 2003	10 µg/m^3 PM2.5	0.3 (NS)[d]	–	–
VA, extended	Lipfert et al. 2006	10 µg/m^3 PM2.5	15 (5, 26)[e]	–	–
11 CA counties, elderly	Enstrom 2005	10 µg/m^3 PM2.5	1 (-0.6, 2.6)	–	–
Netherlands	Hoek et al. 2002	10 µg/m^3 BS	17 (-24, 78)	34 (-32, 164)	–
Netherlands	Hoek et al. 2002	Near major road	41 (-6, 112)	95 (9, 251)	–
Netherlands	Beelen et al. 2008	10 µg/m^3 BS		22 (-1, 50)[c]	3 (-12, 20)
Netherlands	Beelen et al. 2008	10 µg/m^3 PM2.5		4 (-10, 21)[c]	6 (-18, 38)
Hamilton, Ontario, Canada	Finkelstein et al. 2004	Near major road	18 (2, 38)	–	–
French PAARC	Filleul et al. 2005	10 µg/m^3 BS	7 (3, 10)[f]	5 (-2,12)[f]	3 (-8,15)[f]
Cystic fibrosis	Goss et al. 2004	10 µg/m^3 PM2.5	32 (-9, 93)	–	–

[a]Cardiovascular only; [b]Pooled estimates for males and females; pollution associations were observed primarily in males and not females; [c]Respiratory only; [d]Reported to be nonsignificant by author; overall, effect estimates to various measure of particulate air pollution were highly unstable and not robust to selection of model and time windows; [e]Estimates from the single pollutant model and for 1989 –1996 follow-up; effect estimates are much smaller and statistically insignificant in an analysis restricted to counties with nitrogen dioxide data and for the 1997–2001 follow-up; furthermore, county-level traffic density is a strong predictor of survival and stronger than PM2.5 when included with PM2.5 in joint regressions; [f]Estimates when six monitors that were heavily influenced by local traffic sources were excluded; when data from all 24 monitors in all areas were used, no statistically significant associations between mortality and pollution were observed.

Although both the Harvard Six Cities and ACS studies used similar study designs and methods, these two studies had different strengths and limitations. The strengths of the Harvard Six Cities Study were its elegant and relatively balanced study design, the prospective collection of study-specific air pollution data, and the ability to present the core results in a straightforward graphical format. On the other hand, the primary limitations of the Harvard Six Cities Study were the small number of subjects from a small number of study areas (that is, exposures) in the Eastern United States. In contrast, the major strength of the ACS study was the large number of participants and cities distributed across the entire United States. The primary limitation of the ACS was the lack of planned, prospective collection of study-specific air pollution and health data, and the reliance on limited, separately collected subject and pollution data. Nonetheless, the ACS study provided a test of the hypotheses generated from the Harvard Six Cities Study in an independently collected dataset. Therefore, these two studies were considered complementary.

A.2 Reanalyses and Extended Analyses of Harvard Six Cities and ACS Studies

In the mid-1990s, the Harvard Six Cities and the ACS prospective cohort studies provided compelling evidence of mortality effects from long-term fine particulate air pollution (Dockery et al. 1993, Pope et al. 1995). Nevertheless, these two studies were controversial. Subsequently, the data quality, accessibility, analytic methods, and validity of these studies came under intense scrutiny when the U.S. EPA considered them in the effort to revise the PM ambient air quality standards. There were serious constraints and concerns regarding the dissemination of confidential information and the intellectual property rights of the original investigators and their supporting institutions. In 1997, the investigators of the two studies agreed to provide the data for an intensive reanalysis by an independent research team under Health Effects Institute (HEI) oversight, management, sponsorship, and under conditions that assured the confidentiality of the information on individual study participants. The reanalysis included: (1) a quality assurance audit of the data, (2) a replication and validation of the originally reported results, and (3) sensitivity analyses to evaluate the robustness of the original findings. The reanalysis (Krewski et al. 2000, 2004) reported that the data were "generally of high quality" and that the results originally reported could be reproduced and validated. The data audit and validation efforts revealed some data and analytic issues that required some tuning. However, the adjusted results did not differ substantively from the original findings. The reanalysis demonstrated the robustness of the PM-mortality risk estimates to many alternative model specifications. Further, the reanalysis team also made a number of innovative methodological contributions that not only demonstrated the robustness of the PM-mortality results but substantially contributed to subsequent analyses. In the reanalysis, persons with higher educational attainment were found to have lower relative risks of premature death associated with PM2.5 in both studies.

Further extended analyses of the ACS cohort (Pope et al. 2002, 2004) included more than twice the follow-up time (more than 16 years) and approximately triple the number of deaths. The mortality associations with fine particulate and sulfur oxide pollution

The Adventist Health Study of Smog (AHSMOG) cohort study related air pollution to 1977–1992 mortality in more than 6000 non-smoking adults living in California, predominantly from San Diego, Los Angeles, and San Francisco (Abbey et al. 1999). All-cause mortality, nonmalignant respiratory mortality, and lung cancer mortality were significantly associated with ambient PM10 concentrations in males but not in females. Cardiopulmonary disease mortality was not significantly associated with PM10 in either males or females. This study did not have direct measures of PM2.5 but relied on TSP and PM10 data. In a follow-up analysis (McDonnell et al. 2000), visibility data were used to estimate PM2.5 exposures of a subset of males who lived near an airport. All-cause, lung cancer, and nonmalignant respiratory disease (either as the underlying or a contributing cause) were more strongly associated with PM2.5 than with PM10. In a recent analysis of the AHSMOG cohort, fatal coronary heart disease was significantly associated with PM among females but not among males (Chen et al. 2005).

Women's Health Initiative

The association between long-term PM2.5 exposure and first cardiovascular events (fatal and nonfatal) were explored in the Women's Health Initiative Observational Study (Miller et al. 2004, Miller et al. 2007). Based on measurements from the nearest monitor, air pollution exposures were estimated for about 66,000 post-menopausal women without prior cardiovascular disease in 36 metropolitan areas from 1994 to 1998. After adjusting for age, smoking, and various other risk factors, PM2.5 exposures were found to be significantly associated with increases in nonfatal cardiovascular and fatal cardiovascular events, including premature death from cardiovascular disease. The risk of death from exposure to PM2.5 was greater than nonfatal cardiovascular events. The hazard ratio estimated from this study was also larger than mortality estimates from other studies. The authors suggest that the larger hazard ratio may be due to efforts to reduce misclassification of outcomes and exposures. It may also be possible that the effects of PM2.5 may be greater in women than men. Because this study investigated the association between long-term PM2.5 exposure and first cardiovascular events, it is unlikely that the effects are limited only to women who are already ill.

Veterans Administration (VA)

Lipfert et al. (2000, 2003) assessed the association of total mortality and air pollution in a prospective cohort of about 50,000 middle-aged, hypertensive, male patients from 32 Veterans Administration (VA) clinics followed for about 21 years. The cohort had a disproportionately large number of current or former smokers (81%) and African-Americans (35%) relative to the U.S. population or to other cohorts that have been used to study air pollution. Air pollution exposures were estimated by averaging air pollution data for participants' county of residence at the time of entrance into the cohort. Only analyses of total mortality were reported. In addition to considering mortality and average exposures over the entire follow-up period, three sequential mortality periods and four exposure periods were defined and included in various analyses. Lipfert et al. (2006a) extended the follow-up of the VA cohort and focused on traffic density as the measure of environmental exposure. It was suggested that traffic density was a more "significant and robust predictor of survival in this cohort" than PM2.5. However, of the

persisted and were robust to control for individual risk factors including age, sex, race, smoking, education, marital status, body mass index, alcohol use, occupational exposures, and diet and the incorporation of both random effects and nonparametric spatial smoothing components. There was no evidence that the PM-mortality associations were due to regional or other spatial differences that were not controlled in the analysis. These analyses also evaluated associations with expanded pollution data, including gaseous co-pollutant data and new PM2.5 data. Elevated premature death risks were most strongly associated with measures of PM2.5 and sulfur oxide pollution. Coarse particles and gaseous pollutants, except for sulfur dioxide (SO_2), were generally not significantly associated with elevated premature death risk.

Jerrett et al. (2005a) assessed air pollution associations of the 23,000 subjects in the ACS cohort who lived in the metropolitan Los Angeles area. PM-mortality associations were estimated based on PM2.5 measures from 23 monitoring sites interpolated to 267 residential zip code centroids for 2000, and health data analyzed for the period between 1982 and 2000. Cox proportional hazards regression models controlled for age, sex, race, smoking, education, marital status, diet, alcohol use, occupational exposures, and body mass. In addition, because variations in exposure to air pollution within a city may correlate with socioeconomic gradients that influence health and susceptibility to environmental exposures, zip code-level ecological variables were used to control for potential "contextual neighborhood confounding" (Jerrett et al. 2003, 2005b). The premature death associations with the intra-metropolitan PM2.5 concentrations were generally larger than those observed previously in the ACS cohort across metropolitan areas. However, the associated confidence intervals were also wider than those previously reported in the ACS national cohort studies. Nonetheless, such results corroborate the Harvard Six Cities results (Dockery et al. 1993), making the possibility of a greater effect than observed in the full ACS cohort more plausible.

A recent analysis of the Harvard Six Cities cohort by Laden et al. (2006) extended the mortality follow-up for eight more years with approximately twice the number of deaths. PM2.5 concentrations for the extended follow-up years were estimated from PM10 and visibility measures. PM2.5-mortality associations, similar to those found in the original analysis, were observed for all-cause, cardiovascular, and lung cancer mortality. However, PM2.5 concentrations were substantially lower for the extended follow-up period than they were for the original analysis, especially for two of the most polluted cities. Reductions in PM2.5 concentrations were associated with reduced premature death risk and were largest in the cities with the largest declines in PM2.5 concentrations. The authors note that, "these findings suggest that mortality effects of long-term air pollution may be at least partially reversible over periods of a decade." Further, it is noteworthy that the authors observed a substantial decrease in premature death risk corresponding to the decrease in PM2.5 concentrations between the two periods.

A.3 Other Independent Studies

The Adventist Health Study of Smog (AHSMOG)

Hamilton, Ontario, Canada

In an exploration of the relationship between proximity to traffic air pollution and premature death observed in the Netherlands study, an analysis using a cohort of 5,228 persons greater than 40 years of age living in Hamilton, Ontario, Canada, was conducted (Finkelstein et al. 2004). Somewhat higher mortality risks were observed for individuals who lived within 100 meters of a highway or within 50 meters of a major road.

Air Pollution and Chronic Respiratory Diseases (PAARC) Survey in France

Filleul et al. (2005) reported an analysis of about 14,000 adults who resided in 24 areas from seven French cities as part of the Air Pollution and Chronic Respiratory Diseases (PAARC) survey. Participants were enrolled in 1974, and a 25-year mortality follow-up was conducted. Ambient air pollution monitoring for total suspended particulates, black smoke, nitrogen dioxide, and nitric oxide was conducted for three years in each of the 24 study areas. When survival analysis was conducted using data from all 24 monitors in all of the areas, no statistically significant associations between mortality and pollution were observed. However, when the six monitors that were heavily influenced by local traffic sources were excluded, non-accidental mortality was significantly associated with all four measures of pollution, including black smoke. In addition to PM, mortality was associated with nitric oxide. Nitric oxide concentrations were also significantly associated with mortality risk in a cohort of Norwegian men (Nafstad et al. 2004), but no measure of PM was available.

Cystic Fibrosis Foundation

A unique study of the effects of ambient air pollution was conducted utilizing a cohort of 20,000 patients more than 6 years old who were enrolled in the U.S.-based Cystic Fibrosis Foundation National Patient Registry in 1999 and 2000 (Goss et al. 2004). Annual average air pollution exposures were estimated by linking fixed-site ambient monitoring data with resident zip code. A positive, but not statistically significant, association between PM2.5 and premature death was observed. PM2.5 was associated with statistically significant declines in lung function (FEV1) and an increase in the odds of two or more pulmonary exacerbations.

Postneonatal Infants

Woodruff et al. (1997) reported the results of an analysis of postneonatal infant mortality (deaths after one month of age and before one year of age determined from the U.S. National Center for Health Statistics birth and death records) for about 4 million infants in 86 U.S. metropolitan areas between 1989 and 1991 linked with U.S. EPA-collected PM10 data. Postneonatal infant mortality was compared with levels of PM10 concentrations during the 2 months after birth, controlling for maternal race, maternal education, marital status, month of birth, maternal smoking during pregnancy, and ambient temperatures. Postneonatal infant mortality for all causes, respiratory causes

various measures of ambient air pollution, PM2.5 was most strongly correlated with traffic density (r = 0.50). In single pollutant models, PM2.5 was associated with mortality risk resulting in risk estimates comparable to other cohorts. These results were also confirmed in another analysis by Lipfert et al. (2006b) examining PM2.5 constituents and related air quality variables as predictors of survival. Overall, in the VA analyses, effect estimates to various measures of PM were unstable and not robust to model selection, time windows used, or various other analytic decisions. It was difficult, based on the preliminary results presented, to make conclusive statistical inferences regarding PM-mortality associations.

Eleven California Counties

Enstrom (2005) reported an analysis of about 36,000 elderly males and females in 11 California counties followed between 1973 and 2002. Countywide PM2.5 concentrations were estimated from outdoor ambient monitoring for the time period 1979–1983. For approximately the first half of the follow-up period (1973–1983) and for the time period approximately concurrent with PM2.5 monitoring, a small PM2.5-mortality association was observed. No PM2.5-mortality risk associations were observed for the later follow-up (1983–2002). For the entire follow-up period, only a small statistically insignificant association was observed. When 1979-93 pollution and mortality date were examined, a statistically significant association was observed.

Netherlands Pilot Study

In a pilot study, Hoek et al. (2002) evaluated the associations between premature death and PM based on a random sample of 5000 participants in the Netherlands Cohort Study on Diet and Cancer, originally 55 to 69 years of age and followed for more than 8 years. Although the effect estimates were not very precise, the adjusted risk of cardiopulmonary mortality was nearly double for individuals who lived within 100 meters of a freeway or within 50 meters of a major urban road. Based on residential location of participants and interpolation of pollution data from the Netherlands' national air pollution monitoring network, average background concentrations of black smoke ([BS] or British smoke measured by optical densities or light absorbance of filters used to gather PM from the air) for the first 4 years of follow-up were estimated. Background plus local traffic-related black smoke exposures were estimated by adding to the background concentration a quantitative estimate of living near a major road. Cardiopulmonary mortality was associated with estimates of exposure to black smoke, and the association was nearly doubled when local traffic-related sources of black smoke in addition to background concentrations were modeled.

A more recent study on the same Cohort, Beelen et al. (2008), reinforces the conclusions of the pilot study. The authors found a positive association between traffic intensity on the nearest roadway to the subject's residence and death rate. They also confirmed the link between interpolated BS concentrations and cardiopulmonary mortality. While the associations between pollutants and mortality in this study were not statistically significant, the authors' methodology was very careful, and their results lend convincing support to the link between premature death and PM.

and sudden infant death syndrome (SIDS) were associated with particulate air pollution. Woodruff et al. (2006) also linked monitored PM2.5 to infants who were born in California in 1999 and 2000 and who lived within 5 miles of a monitor, matching 788 postneonatal deaths to 3,089 survivors. Each 10 $\mu g/m^3$ increase in PM2.5 was associated with a near doubling of the risk of postneonatal death because of respiratory causes and a statistically insignificant increase for death from all causes.

A.4 Summary

Cohort studies generally apply proportional hazards models controlling for many individual-level risk factors (such as body mass index, smoking, alcohol use, occupational exposures, age/race, etc. and ecologic factors) before air pollution is considered. Many of the above studies also correct for spatial autocorrelation to avoid misinterpretation of results.

Nonetheless, evaluating which studies to consider in assessing the public health impacts of air pollution is a difficult task. As recommended by both the National Research Council (2002) and the Science Advisory Board (U.S EPA 2004), the U.S. EPA elicited experts for their assessment of the literature and opinion on the most appropriate concentration-response function relating premature death to long-term exposures to PM2.5. This process asked experts to review all available studies to derive the plausible range of values that describe the PM2.5-mortality relationship. These studies included not only the cohort studies described above but also intervention studies which show stronger effects compared to time-series or cohort studies. Also included were toxicological and clinical studies which suggest the mechanisms by which PM exposures can contribute to the cardiovascular disease process, thus adding to the plausibility of the positive association between exposures and disease found in the long-term cohort studies.

B. U.S. EPA elicitation process

In this section, we adapt a report by U.S. EPA's contractor, Industrial Economics (2006) to describe the U.S. EPA's expert elicitation. Similar information has been published in Environmental Science and Technology (Roman et al. 2008).

In its 2002 report to Congress titled *Estimating the Public Health Benefits of Proposed Air Pollution Regulations*, the National Research Council (2002) recommended that a better characterization of the uncertainty be performed for regulatory impact analyses, including estimating premature death associated with exposures to PM2.5 levels.[2] As a result, U.S. EPA convened a panel of twelve experts to assess the reduction in premature death in the adult U.S. population resulting from a long-term reduction in annual average PM2.5. Our proposed methodology makes use of results from the panel's report. In their assessment, the experts considered all published literature on

[2] http://www.nap.edu/catalog/10511.html

the subject.[3]

B.1 Selection of experts

The twelve experts participating in the study were selected through a two-part peer nomination process and included experts in epidemiology, toxicology, and medicine. The peer nomination process was designed to obtain a balanced set of views and serves to minimize the influence of Industrial Economics and U.S. EPA on expert selection.

The first phase of the expert selection process was designed to select nine experts. The initial decision to include nine experts was based on several factors, including: 1) a literature search that found most of the elicitation studies conducted to date (60 percent) use panels of six to eight experts, and 90 percent use panels of 11 or fewer experts (Walker, 2004); 2) it was deemed that nine experts would provide a balanced set of views on this topic; 3) the pilot study conducted in 2004 was criticized for the small panel size of five experts (IE 2004); 4) government agencies are required to undergo an Information Collection Request process for the Paperwork Reduction Act if information is collected from more than nine individuals; and 5) resource and time requirements increase with each additional expert.

While this process featured a good acceptance rate and yielded nine experts, the panel exhibited less diversity in expertise than originally anticipated in design, with most experts being epidemiologists. In an effort to increase representation of the biological, medical, and toxicological disciplines, a second phase of selections was conducted. U.S. EPA sought additional nominations of experts in these fields based on nominations provided by the Health Effects Institute (HEI). The general criteria for nominations were the same as for the first part of the selection process (Holmstead 2005).

The following twelve individuals made up the panel of experts:

- Doug Dockery, Ph.D., Professor of Environmental Epidemiology
  Department of Environmental Health, Harvard School of Public Health
- Kaz Ito, Ph.D., Assistant Professor of Environmental Medicine
  New York University of Medicine
- Daniel Krewski, Ph.D., Director
  R. Samuel McLaughlin Centre for Population Health Risk Assessment
  University of Ottawa
- Nino Kuenzli, M.D., Ph.D., Associate Professor
  Department of Preventive Medicine
  University of Southern California Keck School of Medicine
- Morton Lippmann, Ph.D., Professor and Director of Aerosol Research
  Laboratory, New York University School of Medicine
- Joe Mauderly, DVM, Vice President and Senior Scientist
  Lovelace Respiratory Research Institute

[3] http://www.epa.gov/ttn/ecas/benefits.html

- Bart Ostro, Ph.D., Chief
  Air Pollution Epidemiology Unit,
  California Environmental Protection Agency Office of Environmental Health Hazard Assessment
- C. Arden Pope, III, Ph.D., Professor of Economics
  Brigham Young University
- Richard Schlesinger, Ph.D., Biology and Health Sciences
  Pace University
- Joel Schwartz, Ph.D., Professor of Environmental Health
  Department of Environmental Health, Harvard School of Public Health
- George Thurston, Ph.D., New York University of Medicine,
- Mark Utell, M.D., Professor of Medicine and Environmental Medicine
  University of Rochester School of Medicine and Dentistry

B.2 Elicitation process

A "briefing book" binder was sent to all experts at least two weeks in advance of their interview (IE 2006). The purpose of the briefing book was to provide experts with a baseline set of materials to assist them in preparing for their elicitation interview; however, experts were free to consider other materials not included in the briefing book. The briefing book contained the following materials: the elicitation interview protocol; a CD containing over 150 relevant papers and compendia, searchable both alphabetically and by topic area; a set of background information pages with recent U.S. data on air quality, health status, population demographics, and other topics that may factor into the experts' probabilistic judgments; and background materials, including a document describing factors to consider when providing probability judgments in order to avoid potential sources of bias, and an excerpt from the National Research Council (2002) report on estimating public health benefits of proposed air rules.

The pre-elicitation workshop was designed to introduce the project, provide background information to the panel on expert judgment and the elicitation process, and to foster discussion about the key evidence available to answer the questions posed by the study. The key evidence includes not only the main studies on long-term exposures to PM and mortality but also short-term time-series studies, toxicological studies, intervention studies, and other studies.

Each elicitation interview lasted approximately eight hours and covered both qualitative and quantitative questions. The qualitative questions probed experts' beliefs concerning key evidence and critical sources of uncertainty and were intended to make the conceptual basis for their quantitative judgments explicit. These questions covered topics such as potential biological mechanisms linking PM2.5 exposures with premature death; key scientific evidence on the magnitude of the PM-mortality relationship; sources of potential error or bias in epidemiological results; the likelihood of a causal relationship between PM2.5 and premature death; and the shape of the concentration-response (C-R) function. The main quantitative question asked each expert to provide a probabilistic distribution for the average expected decrease in U.S. annual, adult, all-cause mortality associated with a 1 $\mu g/m^3$ decrease in annual average PM2.5 levels.

In addressing this question, the experts first specified a functional form for the PM2.5 mortality C-R function and then developed an uncertainty distribution for the slope of that function (the mortality impact per unit change in annual average PM2.5), taking into account the evidence and judgments discussed during the qualitative questions.

When answering the main quantitative question, each expert was instructed to consider that the total mortality effect of a 1 $\mu g/m^3$ decrease in ambient annual average PM2.5 may reflect reductions in both short-term peak and long-term average exposures to PM2.5. Each expert was asked to aggregate the effects of both types of changes in his answers. Each expert was given the option to integrate their judgments about the likelihood of a causal relationship and/or threshold in the C-R function into his distribution or to provide a distribution "conditional on" one or both of these factors. The interviewers asked each expert to characterize his distribution by assigning values to fixed percentiles (5th, 25th, 50th, 75th, 95th). To assist experts in the elicitation process, the interviewers provided real-time feedback during the interviews in the form of graphs and example calculations, using spreadsheet tools and Internet teleconferencing. During the interviews, experts were able to view their responses plotted onto a distribution using a software interface. They then adjusted their estimates until the distribution represented the views they expressed during the day-long interview.

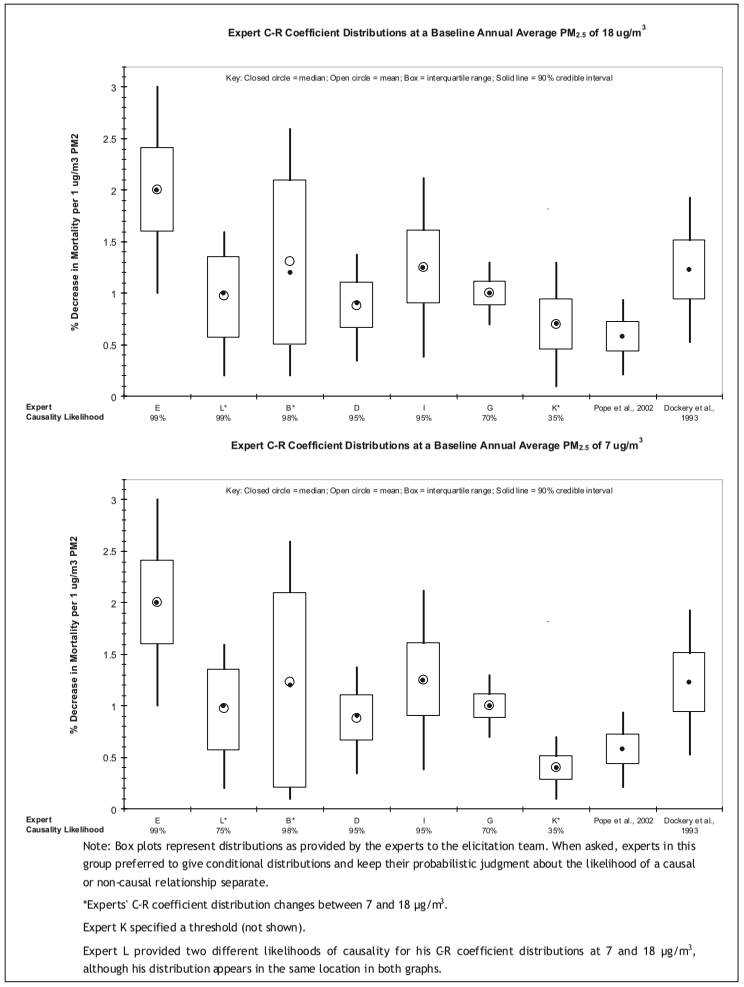
B.3 Results of U.S. EPA's elicitation

Figures 1 and 2 display the responses of the experts to the main quantitative elicitation question. The distributions provided by each expert, identified by the letters A through L, are depicted as box and whisker plots with the solid circle symbol showing the median (50th percentile); the open circle showing the mean; the box defining the interquartile range (bounded by the 25th and 75th percentiles); and the ends of the "whiskers" defining each expert's 5th and 95th percentiles.

Each expert's stated best estimate of the likelihood of a causal relationship between PM2.5 and premature death is shown on the x-axis and the experts are arrayed in order of decreasing certainty of causality. Figure 1 displays the distributions for the experts who chose to provide a distribution conditional on the existence of a causal relationship between PM2.5 and premature death. Figure 2 shows the distributions for the group who chose to integrate their judgments about the likelihood of causality directly into their distribution. Each figure displays the expert distributions for two different PM2.5 levels, 18 $\mu g/m^3$ and 7 $\mu g/m^3$, to observe the implications of four experts' (B, F, K, and L) assumptions about nonlinearities in the C-R function and about differing degrees of uncertainty in the slope of the function across specific ranges of PM. Also, as a point of reference for the results, we include box plots of two epidemiologic studies often used in U.S. EPA benefit analyses (Pope et al. 2002, Dockery et al. 1993).

Among the experts who provided distributions that were conditional on the existence of a causal relationship (Figure 1), median estimates ranged from a 0.4 to 2.0 percent decrease in annual, adult, all-cause mortality risk per 1 $\mu g/m^3$ decrease in annual average PM2.5 exposures. Similarly, among the experts who directly incorporated their

Figure 1: Expert uncertainty distributions for PM2.5-mortality coefficient, conditional on the existence of a causal relationship (IE 2006)



Note: Box plots represent distributions as provided by the experts to the elicitation team. When asked, experts in this group preferred to give conditional distributions and keep their probabilistic judgment about the likelihood of a causal or non-causal relationship separate.

*Experts' C-R coefficient distribution changes between 7 and 18 μg/m^3.

Expert K specified a threshold (not shown).

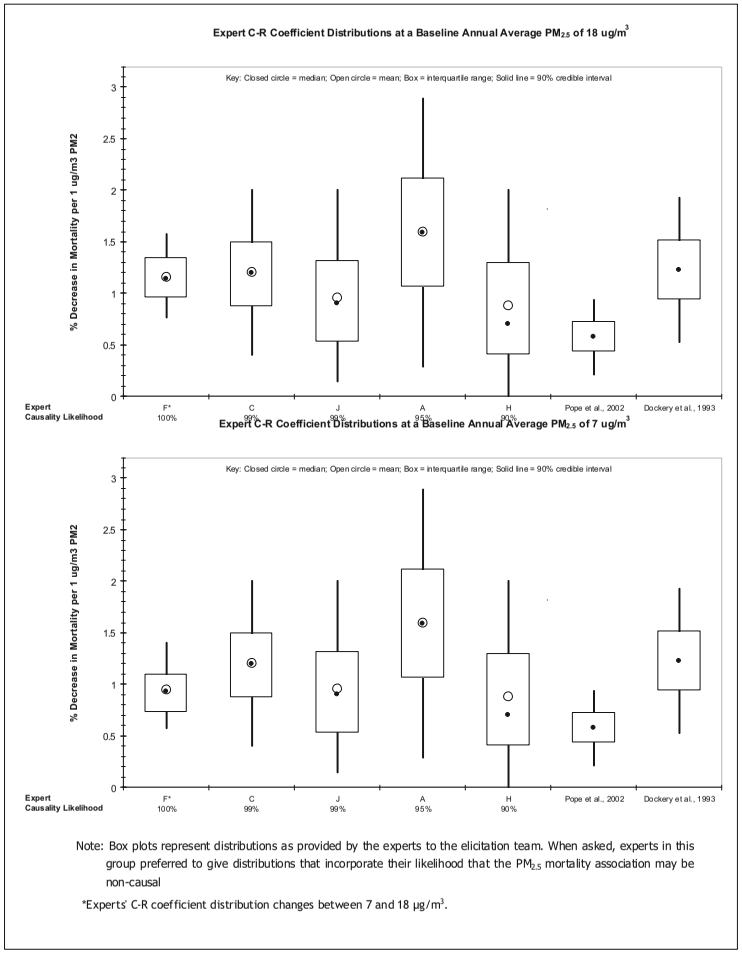
Expert L provided two different likelihoods of causality for his GR coefficient distributions at 7 and 18 μg/m^3, although his distribution appears in the same location in both graphs.

views on the likelihood of a causal relationship into their distributions (Figure 2), the median estimates also ranged from a 0.7 to 1.6 percent decrease in annual, adult, all-cause mortality risk per 1 μg/m^3 decrease in annual-average PM2.5 exposures.

Certain observations and conclusions can be drawn from these plots and from the experts' responses to the qualitative questions:

- Experts in this study tended to be confident that PM2.5 exposure can cause premature death. Ten of twelve experts believed that the likelihood of a causal relationship was 90 percent or higher. The remaining two experts gave causal probabilities of 35 and 70 percent. Recent research in both epidemiology (e.g., Jerrett et al. 2005, Laden et al. 2006) and toxicology (e.g., Sun et al. 2005) significantly contributed to experts' confidence.
- Only one of twelve experts explicitly incorporated a threshold into his C-R function. The rest believed there was a lack of empirical and/or theoretical support for a population threshold. However, three other experts gave differing effect estimate distributions above and below some cut-off concentration. The adjustments these experts made to median estimates and/or uncertainty at lower PM2.5 concentrations were modest.
- Experts relied upon a core set of cohort epidemiology studies to derive their quantitative estimates, mainly those associated with the ACS and Six Cities cohorts. The Six Cities results tended to be weighted more highly by experts in this study than in the pilot study. The greater emphasis on Six Cities appeared to result from corroborating evidence in the recent Six Cities follow-up (Laden et al., 2006) and from concerns about potential exposure misclassification issues and/or effect modification in the ACS cohort (see below). Expert K indicated that he was 50 percent sure that a threshold existed. If there were a threshold, he thought that there was an 80 percent chance that it would be less than or equal to 5 $\mu g/m^3$, and a 20 percent chance that it would fall between 5 and 10 $\mu g/m^3$. See Table 2a and 2b for a listing of core studies used by the experts.
- Although the quantitative question asked experts to consider mortality changes due both to short-term and long-term PM2.5 exposures, all experts based their median effect estimates on effects due to long-term exposures. Short-term exposure effects were sometimes used to derive lower-bound effect estimates.
- Confounding of epidemiological results tended to be a minor concern for most experts. Only one of twelve experts expressed substantial concern about confounding as a source of error in the key literature on PM2.5 and premature death.
- Experts' concerns regarding potential negative bias in the ACS main study results due to effect modification (see Pope and Dockery 2006) and/or exposure misclassification (Jerrett et al. 2005; Willis et al. 2003; and Mallick et al. 2002) led many experts to adjust the published results upwards when considering the percentiles of their distribution.
- A sensitivity analysis conducted using a simplified benefits analysis (IE 2006) demonstrated that no individual expert's distribution of effect estimates had more than a plus or minus 8 percent impact on an overall, pooled distribution of effects. The influence of individual experts appeared symmetrically distributed.

Figure 2: Expert uncertainty distributions for PM2.5-mortality coefficient incorporating the experts' likelihood of a causal relationship (IE 2006)



Note: Box plots represent distributions as provided by the experts to the elicitation team. When asked, experts in this group preferred to give distributions that incorporate their likelihood that the $PM_{2.5}$ mortality association may be non-causal

*Experts' C-R coefficient distribution changes between 7 and 18 $\mu g/m^3$.

Table 2a: Key studies discussed by experts while answering conditioning questions (IE 2006)

	Six Cities (Dockery et al., 1993; Krewski et al., 2000; Laden et al., 2006)	ACS (Pope et al., 1995, 2002 & 2004; Krewski et al., 2000)	ACS LA Reanalysis (Jerrett et al., 2003 & 2005	Utah Valley (Pope et al., 1989, 1991, 1996; Ghio et al., 2004)	Netherlands Cohort Study (Hoek et al., 2002)	AHSMOG (Abbey et al., 1991 & 1999; McDonnell et al., 2000; Chen et al., 2005)	Veteran's (Lipfert et al., 2000, 2003 & 2006)	Dublin Study (Clancy et al., 2002)	Elderly Californians Study (Enstrom et al., 2005)	Hong Kong Study (Hedley et al., 2002)	APHEA[1]	NMMAPS (Samet et. al., 2000)	Canadian Time-Series Studies (Burnett et al., 2000 & 2003)	Finkelstein et al., 2004	MESA Cohort[2]	Mallick et al., 2002	Willis et al., 2002	Filliuel et al., 2005	Woodruff et al., 1997	Women's Health Initiative[2]
Expert A	✓	✓	✓	✓	✓			✓			✓	✓			✓					
Expert B	✓	✓	✓			✓	✓				✓	✓	✓			✓				
Expert C	✓	✓	✓	✓				✓		✓										
Expert D	✓	✓	✓	✓			✓		✓											
Expert E	✓	✓	✓		✓												✓			
Expert F	✓	✓	✓																	
Expert G	✓	✓		✓						✓										
Expert H	✓	✓				✓	✓													
Expert I	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓							✓		
Expert J	✓	✓	✓		✓	✓	✓		✓					✓					✓	✓
Expert K	✓	✓	✓					✓												
Expert L	✓	✓	✓		✓	✓			✓											
Total:	12	12	10	5	5	5	5	4	4	3	3	2	1	1	1	1	1	1	1	1

[1] The Air Pollution and Health - A European Approach (APHEA) includes a large group of studies. For full list of papers, please consult http://airnet.iras.uu.nl/products/reports_and_annexes/APHEA/APHEA_publications.pdf.
[2] Study not yet published at the time of the interview.

Table 2b: Key studies relied upon by experts in creating their C-R uncertainty distributions (IE 2006).

	ACS (Pope et al., 2002)	ACS LA Reanalysis (Jerrett et al., 2005)	Six Cities (Dockery et al., 1993)	Six Cities (Laden et al., 2006 (Cross-Sectional))	ACS (Pope et al., 1995)	Netherlands Cohort Study (Hoek et al., 2002)	Six Cities (Laden et al., 2006 (Change estimate))	Mallick et al., 2002	Willis et al., 2002	NMMAPS (Samet et al., 2000)	Women's Health Initiative[2]	AHSMOG (Abbey et al., 1991 & 1999; McDonnell et al., 2000; Chen et al., 2005)
Expert A	○	⊙	○	⊙			○			○		
Expert B	⊙	⊙			⊙ ○			⊙				
Expert C	⊙	⊙	⊙									
Expert D	⊙		⊙									
Expert E	⊙	⊙		⊙		⊙	⊙		⊙			
Expert F	○	○	⊙	⊙								
Expert G	⊙ ○		⊙ ○									
Expert H	⊙	⊙ ○	○									
Expert I	⊙	⊙		⊙								
Expert J[1]	⊙	⊙ ○	⊙ ○			0				○	○	○
Expert K	⊙		⊙ ○									
Expert L	○	⊙ ○		○						○		
Total ⊙:	9	8	6	4	1	1	1	1	1	0	0	0
Total ○:	4	4	5	1	1	1	1	0	0	3	1	1

⊙ = Expert used the study to inform the median of his C-R coefficient distribution(s).
○ = Expert used the study to inform the uncertainty of his C-R coefficient distribution(s).
[1] Expert J also cited the following short-term studies as support for his uncertainty: Levy et al., 2000; Steib et al., 2002; Anderson et al., 2005; Ostro et al., 2005; Schwartz et al., 1996, Klemm et al., 2000; Burnett et al., 2003).
[2] Study not yet published at the time of the interview.

elicitation output.

One key factor in choosing an appropriate study is the generalizability of the study population. As our objective is to derive a relative risk applicable to the general population of California, it is important to use studies that have a similar at-risk population. This criterion would eliminate direct application of studies like the Washington University-EPRI Veterans Cohort (Lipfert et al. 2000, 2003, 2006), which focused on male military veterans under treatment for hypertension, with 81 percent current or former smokers. Similarly, the Adventist Health Study on Smog (AHSMOG) (Abbey et al. 1999, McDonnell et al. 2000, Chen et al. 2005) focused on non-Hispanic white Seventh-Day Adventists who were nonsmokers. In addition, studies on infant mortality (Woodruff 1997, 2006) do not directly address long-term exposures to PM2.5; hence, they do not apply to our assessment. It is important to recognize that the inability to utilize these studies directly to develop general population relative risks does not mean that they are invalid, nor does it mean that these studies did not influence the judgments of the experts within the expert elicitation. Findings regarding the effect of PM2.5 on populations either with a greater or lesser collection of risk factors than the general population are informative, but cannot directly provide a relative risk applicable to the general population of California.

Other criteria that can be applied involve utilizing only studies that measured the pollutant of interest (PM2.5) and the health outcome of interest (all-cause mortality). Thus, while studies like Miller et al. (2004) and Chen et al. (2005) may be more interpretable by focusing on cardiovascular risk (an outcome for which there is extensive evidence supporting biological plausibility), if the aim is to develop a relative risk factor for all-cause mortality, these studies cannot be used directly. Similarly, studies that use an alternative measure of particulate matter like black smoke (Filleul et al. 2005) or proximity to a major road (Beelen et al. 2008, Hoek et al. 2003, Finkelstein et al. 2004) provide insight about the effects of motor vehicle-related particulate matter on premature death but cannot directly inform PM2.5 relative risk. In addition, the AHSMOG study also cannot be used directly, for it did not have direct measurement of PM2.5 but relied on TSP and PM10 data.

Other important screening criteria include a desire for geographic appropriateness. This does not necessarily mean that only studies in California can be used for risk evaluations in California, but it means that significant factors that vary geographically should be addressed. This can occur at multiple levels. For example, a study in a developing country may not be directly applicable to the U.S., due to differences in age distributions, underlying disease patterns, pollutant composition, standard of health care, and many other factors. Within the U.S., regional differences could occur if the composition of PM2.5 differed significantly and more/less toxic agents could be identified, or if concentration-exposure relationships differed significantly (i.e., due to differences in air conditioning prevalence). While there are some noticeable differences between California and other states in terms of climate and concentrations of PM constituents, there is little evidence for California's relative risk to be differentiated from the U.S. average. More explicitly, there is not adequate evidence at present regarding the quantitative differential toxicity of different particle constituents, and national and

B.4 U.S. EPA's peer review process

Six reviewers were asked to participate in the peer review of U.S. EPA's elicitation. They include:

- Douglas Crawford-Brown, Ph.D.
  Director, Institute for the Enviroment
  Professor, Environmental Sciences and Engineering
  University of North Carolina at Chapel Hill
- John S. Evans, Sc.D.
  Senior Lecturer on Environmental Science
  Harvard School of Public Health
- Granger Morgan, Ph.D.
  Lord Chair Professor in Engineering
  Carnegie Mellon University
- D. Warner North, Ph.D.
  Department of Management Science and Engineering
  Stanford University
- David Stieb, Ph.D.
  Air Health Effects Division,
  Health Canada
- Thomas S. Wallsten, Ph.D.
  Department of Psychology
  University of Maryland at College Park

Overall, the reviewers unanimously agreed that U.S. EPA conducted a high quality expert elicitation. The elicitation follows best practices and can serve as a model of good practice for expert elicitations in a variety of agency-wide settings. The reviewers agree that the elicitation protocol provides a reliable basis for eliciting the probabilistic distributions of uncertainty in the PM2.5 C-R relationship[4].

C. Applicability of U.S. EPA's expert elicitation results to California

The experts' judgments on the PM2.5-mortality relationship apply to regulatory impact analyses at the national scale. To fully understand how such results are applicable to California, it is helpful to discuss the strengths and weaknesses of the studies cited by the experts and evaluate how applicable they are in California.

The studies described in Section II.A provide significant evidence regarding the influence of PM2.5 on premature death. However, only a subset of these studies may be suitable for developing a relative risk applicable to general populations for use in regulatory impact analyses. While the relative risk in premature death per unit change in PM2.5 long-term exposures is derived from a formal expert elicitation protocol, as described in Section II.B, by highlighting the strengths and weaknesses of the various studies from the perspective of relative risk derivation, we can better interpret the expert

[4] http://www.epa.gov/ttn/ecas/regdata/Uncertainty/pm_ee_peer_review_summary.pdf

addressed these concerns by considering a larger number of subjects and a more expansive geographic coverage, although some population representativeness issues remained due to the recruitment approach for the ACS Cancer Prevention Study II. There are also concerns that the retrospective exposure assessment (using existing monitors) may have contributed exposure misclassification, a point potentially supported by the greater C-R function in Jerrett et al. (2005) relative to earlier publications. Regardless, these studies fulfill all other criteria and can be used as a basis to develop a new relative risk for regulatory impact analyses in California. As can be seen in the discussion in Section II.B, the experts recruited by U.S. EPA relied heavily on these studies to develop their probability distributions of the PM2.5-mortality relationship.

In summary, it is appropriate to rely on the U.S. EPA's experts' judgments for California's specific risk assessments. Both the ACS national study by Pope et al. (1995, 2002), which includes California counties, and the ACS sub-cohort study in Los Angeles (Jerrett et al. 2005) heavily influenced the experts' evaluations. Although the Harvard Six Cities studies do not include California, the range in PM levels observed in the six cities reflect those measured in California, and the analysis by Jerrett et al. (2005) produced results similar to those found in the Harvard Six Cities studies. Thus, it is justifiable to use Harvard Six Cities studies for California. Furthermore, time-series studies like NMMAPS show the PM-mortality relationship holds for broad geographic regions, including California (Dominici et al. 2005). Hence, it is appropriate to rely on U.S. EPA's expert elicitation results in developing a new relationship between premature death and long-term PM exposures for use in California.

D. Methodology for developing a concentration-response relationship

While the expert elicitation protocol yields significant insight regarding the strength of current scientific evidence and the range of C-R functions supported by experts in the field, some caution is necessary in interpreting a pooled estimate or the collective opinion of the panel. Some researchers (Morgan and Henrion 1990) assert that, if the range of expert opinions is significant enough to have major consequences for the outcome of the analysis, the opinions should generally not be combined to produce an "average" result. The empirical evidence seems to indicate good agreement among most experts regarding the appropriate C-R function, in which case any pooling approach would yield similar estimates, but there are some important differences that may be masked or exaggerated by a combined estimate.

If a pooled estimate is needed for a given policy application, as is the case here, there are a few basic approaches that could be used. The simplest approach is to average the individual assessments, or similarly, to use inverse-variance weighted averages. While this has the benefit of simplicity, this approach presumes that all experts are equally well-calibrated in their abilities to construct confidence intervals, which is not likely the case. Many expert elicitation applications use a series of calibration exercises, utilizing questions for which the answer is known or knowable, to determine the ability of experts to characterize uncertainty. This ability is characterized by calibration (i.e., 5 percent of estimates are outside of a 95 percent confidence interval) and

regional information about exposure-concentration differentials, to make any formal adjustments.

National-scale epidemiological studies addressing short-term effects of PM exposures using time-series analyses do not demonstrate an appreciable difference between California and other states or regions in relative risks. For example, in a publication on 91 U.S. cities addressed by the National Mortality Morbidity Air Pollution Study, Dominici et al. (2005) showed that the southern California relative risk was slightly higher than the national average, while that of the Northwest (which included northern California as well as Oregon, Washington) was slightly lower than the national average. A simple average of the southern California and Northwest relative risks gives a value almost identical to the national average. A recent publication investigating PM2.5 mortality in 27 large communities around the U.S. (Franklin et al. 2007) found that the C-R function was above the national average for San Diego and Sacramento but below the national average and insignificant for Riverside and Los Angeles. It should be noted that the cohort study by Jerrett et al. (2005) did find a statistically significant effect for the Los Angeles metropolitan area, once exposure was estimated with more geographic precision. Thus, the available evidence does not provide any rationale for excluding relative risks derived from studies across the U.S. to California.

In addition, studies used in developing a relative risk for use in quantifying public health impacts should ideally have controlled for co-pollutants and other potentially significant confounders, should have undergone extensive sensitivity analyses, and been validated through multiple measures (i.e., detailed quality assurance/quality control, re-analyses by multiple investigators). These represent standard quality criteria for including studies in any meta-analyses; they also serve to guide us in choosing studies for California's risk assessments as well. In this regard, the Enstrom (2005) study of elderly Californians neither adequately controlled for smoking nor adjusted for exposure to environmental tobacco smoke, two factors that could significantly alter the effect of PM exposures on premature death. Further, exposure misclassification is another issue of concern. In Entrom's study, PM2.5 was assigned on the basis of data from just a few monitoring sites and at times on very few measurements (Brunekreef 2006). No discussion was provided as to the representativeness of sites; it is surprising, for instance, that Kern County ranked higher than Los Angeles in terms of PM exposures. Yet another issue is the long time passed since enrollment (1959) and follow-up (1973-2002), which must have been associated with many changes in diet, smoking, occupation, etc., factors for which the authors could not adequately control.

Based on the above criteria, the primary evidence for PM2.5 mortality C-R functions comes from multiple analyses from the Harvard Six Cities study (Dockery et al. 1993, Krewski et al. 2000, Laden et al. 2006) and the ACS cohort study (Pope et al. 1995, Krewski et al. 2000, Pope et al. 2002, Pope et al. 2004, Jerrett et al. 2005). Each of these studies addresses all-cause mortality associated with PM2.5 from a general population cohort, and each has undergone extensive peer review and re-analysis. In spite of the strengths, there are some limitations of each study. Namely, the Six Cities study focused on only white adults in six cities in the eastern half of the U.S., with resulting concerns for generalizability and for statistical power. The ACS study

informativeness (confidence intervals are not excessively large).

Within U.S. EPA's expert elicitation, no calibration exercise was done, so we do not have the ability to construct individual weights beyond the reported confidence intervals. Thus, it is potentially most interpretable to examine the range of estimates provided and determine a central estimate and low/high estimate, without conducting a formal statistical pooling of estimates. Among measures of central tendency, the median is the statistic least influenced by outlying observations. With that in mind, staff chose the median to represent the point of central tendency among each expert's distribution of point estimates. The median of the experts' medians is then considered to be the overall estimate of central tendency for the PM-mortality relationship. We also used the medians of the experts' 5th and 95th percentiles as the lower and the upper bound of the credible range, respectively. Consequently, the credible range can be treated as a 90% uncertainty interval around the estimate of the PM-mortality relationship.

D.1 Sensitivity Analysis

Simple averaging of experts' distributions can be used to corroborate the above assessments, with sensitivity analyses on the relative weights used to determine the robustness of the pooled estimate. In addition, results will be compared against pooling empirical study results. Later, we demonstrate that alternative approaches for deriving the central, low, and high estimates yield similar results to the approach CARB staff has chosen. Below is a detailed discussion of these alternative approaches.

Developing a credible range of the PM-mortality relationship based on a wide range of evidence on the subject is without doubt challenging. We demonstrate the robustness of our chosen range by considering several alternative ways to interpret the data and arrive at other plausible C-R functions. These include:

1. Pooling three studies, Pope et al. (2002), Laden et al. (2006), and Jerrett et al. (2005) using equal weight — to treat the results from three studies equally. Note that since Jerrett's analysis uses a subset of the ACS cohort analyzed by Pope et al., it is technically incorrect to pool the non-independent results. However, for the purpose of demonstrating the robustness of the approach CARB staff has chosen, results are presented in this report.
2. Pooling Pope et al. (2002), Laden et al. (2006) and Jerrett et al. (2005) using inverse-variance weighting — to give more weight to studies with tighter confidence bounds than those with wider confidence bounds.

The remaining four alternative analyses rely on random effects pooling, of which a detailed discussion follows.

3. Pooling Pope et al. (2002), Laden et al. (2006), and Jerrett et al. (2005) using random effects in BenMAP[5].
4. Pooling Pope et al. (2002) and Laden et al. (2006) using random effects in BenMAP.
5. Pooling all 12 expert distributions using random effects in BenMAP

[5] http://www.epa.gov/air/benmap/download.html

6. Pooling 10 expert distributions (without experts E & H, who provided the highest and lowest estimates among the twelve experts). This analysis will assess the impact of outlying opinions using random effects in BenMAP.

A common method for weighting estimates involves using their variances. The variance takes into account both the consistency of data and the sample size used to obtain the estimate, two key factors that influence the reliability of results. The exact way in which variances are used to weight the estimates from different studies in a pooled estimate depends on the underlying model.

The fixed effects model assumes that there is a single true concentration-response relationship and therefore a single true value for the parameter in question. For example, in our discussion, the parameter would be the relative risk. Differences among parameters reported by different studies are therefore simply the result of sampling error. That is, each reported relative risk is an estimate of the *same underlying parameter.* The certainty of an estimate is reflected in its variance (the larger the variance, the less certain the estimate). Pooling that assumes a fixed effects model therefore weights each estimate under consideration in proportion to the *inverse* of the variance. This means that estimates with small variances (i.e., estimates with relatively little uncertainty surrounding them) receive large weights, and those with large variances receive small weights.

The estimate produced by pooling based on a fixed effects model, then, is just a weighted average of the estimates from the studies being considered, with the weights as defined to be equal, as in scenario (1) above, or inverse-variance, as in scenario (2). An alternative to the fixed effects model is the random effects model, which allows the possibility that the estimated relative risks from the different studies may in fact be estimates of *different* parameters, rather than just different estimates of a single underlying parameter. In studies of the effects of PM on premature death, for example, if the level of wood burning varies among study locations the underlying relationship between mortality and PM may be different from one study location to another. If wood burning associated with cold weather causes individuals to stay inside more on days with high PM (likely to occur during the winter in California), then the mortality risk may be lower in areas with high prevalence of wood burning. As such, one would expect the true value of the relative risk in cities with low wood burning prevalence to be greater than the true value of the relative risk in cities with high wood burning prevalence. This would violate the assumption of the fixed effects model.

Embedded in BenMAP is a procedure for testing whether it is appropriate to base the pooling on the random effects model (vs. the fixed effects model). If the evidence does not support the fixed effects model, then the random effects model is assumed, allowing the possibility that each study is estimating a different relative risk. The weights used in a pooling based on the random effects model must take into account not only the within-study variances (used in a meta-analysis based on the fixed effects model) but the between-study variance as well. The weighting scheme used in a pooling based on the random effects model is basically the same as that used if a fixed effects model is

assumed, but the variances used in the calculations are different. This is because a fixed effects model assumes that the variability among the estimates from different studies is due only to sampling error (i.e., each study is thought of as representing just another sample from the same underlying population), while the random effects model assumes that there is not only sampling error associated with each study, but that there is also *between-study* variability — each study is estimating a different underlying beta coefficient. Therefore, the sum of the within-study variance and the between-study variance yields an overall variance estimate. U.S. EPA's report[6] provides a more detailed discussion of this weighting scheme.

Once a concentration-response function relating changes in PM exposures to premature death is derived, one can estimate the health impacts.

E. Methodology for estimating health impacts associated with PM exposures

In this section, we discuss the methodology developed to estimate the health impacts associated with PM exposures above a predetermined level. This methodology is consistent with that used in CARB's staff report on the PM ambient air quality standard (CARB, 2002). The major modification to that methodology is calculating impacts at an annual level for three years, then averaging the results, rather than averaging exposure estimates over three years and then calculating health impacts. This modification is an improvement over the previous methodology since the annual concentrations (not three-year average concentrations) are used to address the average-annual PM impact, and averaging over three years would yield results that are more representative of the current situation than just using one year of data. Detailed discussions of each step follow.

STEP 1: Obtain PM concentrations for all sites in California

The observed PM2.5 concentrations are obtained for years 2004, 2005, and 2006. In addition to the routine monitoring network, data from the IMPROVE (Interagency Monitoring for Protected Visual Environments) are included in the analysis. See Appendix 1 for a description of these special monitoring data. Annual averages of quarterly means are calculated for each site for consistency with the national and state definition of the PM standard attainment designations.

STEP 2: Estimate PM concentration per census tract

The concentration per census tract is estimated using the ambient annual average PM2.5 concentrations measured at monitoring sites. This step is done with BenMAP[7], a software program developed by the U.S. EPA for estimating and mapping health impacts associated with air pollution. BenMAP interpolates PM concentrations using nearby monitored values with the inverse distance weighted squared method.

[6] http://www.epa.gov/ttn/ecas/regdata/RIAs/Appendix%20H--Additional%20Details%20on%20Benefits%20Methodologies.pdf#search='epa%20benmap%20random%20effects%20pooling'

[7] http://www.epa.gov/air/benmap/download.html

The interpolation is confined to a 50-kilometer radius, with the weight assigned to each nearby monitored PM value as the inverse square of the distance from the monitor to the location of interpolation. In some areas of California, there may be no monitoring information within 50 kilometers. In these cases, the concentration that will be assigned will be from the closest monitor, regardless of the distance. The end result is a smooth contour surface of PM values throughout the entire state. The interpolated value is then assigned to each census tract center. This step is performed for each of the three years.

STEP 3: Estimate mortality impact

The concentration-response functions are applied to calculate mortality impacts due to long-term changes in PM exposure, using county-specific baseline incidence rates from the Center for Disease Control[8].

For log-linear functions, the health impact is

$\Delta Y = -Y_O [\exp (-\beta * \Delta PM - 1)] * pop$, where

Y_O = baseline mortality rates, which include all-case deaths for the population over age 30. We used the morality rate for the year 2005 to calculate health impacts for years 2004, 2005 and 2006.

β = beta coefficient derived from the relative risk of epidemiologic study results.

ΔPM = the difference between the estimated ambient PM concentration and a level below which we expect no PM-related mortality or cut-off level.

pop = population age 30 or above in each census block, from US Census for each year (2004-2006).

Note that the baseline mortality rate and population are available for various subgroups (age 30-34, 35-44, 45-54, 55-64, 65-74, 75-84, 85+). The health impact is actually calculated for each subgroup at the census track level. After each change in health impacts is calculated for each census track, we sum across the results for an air basin or for the entire state. Heath impacts are calculated for each year; they are then averaged over three years to reduce the influence of any year with unusual meteorology on the overall results.

E.1 Cut-off Level

This section describes ARB's consideration of a cut-off level or level below which we expect no PM-related mortality. Recent evidence suggests that exposures to low PM2.5 levels may lead to adverse health impacts (Schwartz et al. 2002, Kappos et al. 2004, de Kok et al. 2006, Miller et al. 2007). In addition, most of the long-term exposure studies

[8] http://wonder.cdc.gov/mortSQL.html

that examined the shape of the C-R function failed to demonstrate a flattening of the function at lower levels; linearity could not be rejected based on statistical tests (Krewski et al., 2000, Pope et al. 2002, Schwartz et al., 2008). Finally, many daily time-series mortality studies include concentrations very close to background levels (Ostro et al. 2006, Schwartz et al. 2002, Schwartz et al. 1996). For these reasons, we assessed the likelihood of a threshold by reviewing the scientific literature on this issue and by inferring from the conclusions of the U.S. EPA's expert elicitation.

As part of the protocol in the U.S. EPA's expert elicitation, the experts were asked for their individual judgment regarding whether a threshold exists in the PM2.5-mortality function. The purpose was to assess expert judgments regarding theory and evidential support for a population threshold (i.e., the concentration below which no member of the study population would experience an increased risk of death). From a theoretical and conceptual standpoint, all experts generally believed that while a threshold may exist at the individual level, there was no evidence of a population-based threshold. Specifically, eleven of the twelve experts discounted the idea of a population threshold in the C-R function on a theoretical and/or empirical basis. Seven of the experts favored epidemiological studies as ideally the best means of addressing the population threshold issue, suggesting this approach is best to evaluate the full range of susceptible individuals at environmentally relevant exposure levels. However, those who favored epidemiologic studies generally acknowledged that definitive studies addressing thresholds would be difficult or impossible to conduct since they would need to include a very large and diverse population with wide variation in exposure and a long follow-up period. The following is a discussion of three alternatives for a threshold level: 7, 2.5, and 5 $\mu g/m^3$.

Cut-Off Level of 7 $\mu g/m^3$. As discussed above, in the U.S. EPA's expert elicitation, only one of twelve experts thought the shape of concentration-response function may change at a level at or below 7 $\mu g/m^3$, suggesting that this level may serve as a possible threshold. The level of 7 $\mu g/m^3$ also happens to be the lowest concentration observed in the American Cancer Society study (Pope 2002). In this large cohort study, Pope et al. (2002) provided empirical evidence that exposures to PM2.5 levels as low as 7 $\mu g/m^3$ can be associated with premature death. Also, since the ACS study is the largest cohort study conducted to date, it would be reasonable to use 7 $\mu g/m^3$ as a presumed cut-off level for calculating PM2.5-related mortality. Thus, there is direct empirical evidence that some effects are likely to occur down to this level, although based on the limited data at these low concentrations, the uncertainty is greater than the uncertainty for PM levels in the middle range of the distribution (between 10 and 18 $\mu g/m^3$).

Cut-Off Level of 2.5 $\mu g/m^3$. A second alternative is to select the background level for PM2.5 as the cut-off level, which addresses all impacts due to anthropogenic PM exposures. In California, the background PM2.5 level is 2.5 $\mu g/m^3$ (Motallebi et al. 2003). As discussed above, there is no empirical evidence for long-term mortality effects at levels below 7 $\mu g/m^3$. Thus, quantifying human health impacts due to exposures at levels below 7 $\mu g/m^3$ would be the result of personal judgment and

inference from the available data on long-term studies. In the Women's Health Initiative Study (Miller et al. 2007), the investigators found significant relationships between long-term exposure to PM2.5 and the incidence of cardiovascular events at levels lower than 7 $\mu g/m^3$. However, due to the subpopulation of older women being addressed in this study, we could not justify using the results for a general population.

Cut-Off Level of 5 $\mu g/m^3$. During the review of the document, the peer reviewers were asked to consider the cut-off level in addressing premature death associated with PM2.5 exposures. The reviewers recognized that selecting a cut-off level involves professional judgment due to limited empirical evidence in the low PM2.5 range. The consensus of the peer review panel was that a cut-off level of 4 to 5 $\mu g/m^3$ was reasonable based on the lowest observed short-term levels associated with mortality (Ostro et al. 2006, Schwartz et al. 2002, Schwartz et al. 1996).

Staff Recommendation. While empirical evidence indicates that mortality can be associated with long-term exposure to PM2.5 levels as low as 7 $\mu g/m^3$, the consensus of the peer reviewers is that effects likely occur below this level. However, choosing a specific value for a threshold of effect is necessarily a matter of individual judgment, due to the lack of long-term data at low ambient concentrations of PM2.5. Assuming that the probability of effects between 7 $\mu g/m^3$ and 2.5 $\mu g/m^3$ (background) is uniform, staff recommends that the cut-off level be expressed as a range of values from 2.5 to 7 $\mu g/m^3$.

F. Methodology for estimating ambient concentrations of PM from diesel-fueled engine emissions

The following is a summary of an updated method for estimating ambient diesel PM (DPM) concentrations from ambient NO_x concentrations. A full discussion of the methodology can be found in the Appendix 3. It consists of a simple variation of a receptor model, which uses measurements of ambient chemical concentrations to infer source contributions, known as the tracer species method. A basic assumption in this method is that the ambient concentration of a tracer species, C, may be used alone to infer the ambient concentration of a pollutant from a specific source, S:

$$S = \alpha C,$$

where α is a scale factor that is independent of location. In the estimation of DPM, we take C to be the ambient concentration of NO_x and S to be the ambient concentration of DPM less than 2.5 µm (DPM2.5). The factor α relates the concentration of PM produced by diesel-fueled engine emissions to the concentration of NO_x produced by all sources.

The estimates of the ratio DPM/NO_x from the emission inventory (EI)-population weighted and source apportionment (SA) studies compare very well: EI 0.023 (0.003 or 0.006) and SA South Coast Air Basin 0.026 (0.006) and San Joaquin Valley 0.027 (0.008). This agreement between EI and SA estimates for α, coupled with the uncertainty intervals, motivates the use of a single scaling factor for the whole state of

instruments measuring NO_x and NO.

- Continuous hourly measurements of nitrogen oxides data from the California Regional PM10/PM2.5 Air Quality Study (CRPAQS); measurements were made at a time resolution of 5 or 10 minutes using a gas chromatograph and luminol chemiluminescence detector.

At rural sites, in the absence of nitrogen oxides measurements, the best estimates were obtained using ammonium nitrate data from the Interagency Monitoring of Protected Visual Environments (IMPROVE) program monitoring sites. IMPROVE sites are located in federally protected Class 1 areas and are outside of urban areas. The IMPROVE sampler is programmed to collect two 24-hour duration samples per week. In this data analysis, the mass associated with ammonium nitrate can be estimated by multiplying the nitrate values by the ratio of the molecular weight of ammonium nitrate (80) to the molecular weight of nitrate (62), a factor of 1.29.

From previous data analysis work (Motallebi 2006), a quantitative relationship between precursor emissions and secondary ammonium nitrate was developed. To estimate the conversion of NO_x to PM nitrate, it was suggested that the fraction of NO_x emissions converted to nitrate ranged from 30 to 50 percent. For example, this could indicate that each gram of emitted NO_x produces approximately 0.30 - 0.50 grams of secondary PM (i.e., PM-Nitrate). In this analysis, a mid-range of 40 percent was used to convert ammonium nitrate to NO_x at IMPROVE monitoring sites.

The additional NO_2 data, based on PM nitrate, further improve the spatial coverage of the NO_x monitoring network.

G. Methodology for evaluating risk to small populations exposed to PM emissions from specific sources

Health impacts from PM exposure are commonly estimated at the statewide or a similarly large geographic scale because these estimates are based on epidemiologic studies that relied on single ambient air monitoring stations to represent regional exposures to the pollutant, and incidence rates are calculated at the county level. Our interest is in refining and applying such estimation techniques to finer scales, for small populations being affected by small changes in pollutant concentrations that would result from a single or few sources of emissions.

Below is a summary of two methodologies that are proposed for estimating health impacts associated with exposures to PM resulting from specific sources in a limited geographical area. The discussion is divided into two sections based on available information on the pollutant concentration: a) modeled concentrations and b) emissions data. Examples using ports and goods movement are shown to clarify the discussion.

G.1. Methodology based on modeled concentrations

In the first scenario, an air dispersion model is used to estimate ambient concentrations of PM in a limited geographic area affected by emissions from a specific source or group of sources. Examples would be locomotive emissions at a rail yard or all sources

California to estimate annual average concentrations of DPM from annual average measurements of NO_x. We take the EI values for the average and standard deviations for high and low-NO_x emission counties as best estimates for a population weighted value of DPM/ NO_x: α = 0.023 (0.003 high NO_x counties or 0.006 low-NO_x counties). The value of α gives a population weighted estimate of DPM/ NO_x for all locations in California; the standard deviation values indicate the uncertainty in this choice of α for a given county (based on population).

Based on the agreement between source apportionment and emissions inventory estimates of the scaling factor α, the ratio DPM/total NO_x, we propose the use of a single value of α for estimating the population-weighted annual average ambient DPM concentration for California from NO_x concentrations.

The proposed method to estimate ambient DPM concentrations has distinct advantages over the previous PM10 method (CARB, 1998) as well as several important limitations. The primary strengths of the method include the strong relation of DPM to (total) NO_x, simple application, estimates of uncertainty intervals, and ability to capture sub-county variations in DPM concentrations. In addition to these strengths, the approach is tied directly to the ARB emission inventory, and links bottom-up EI estimates with top-down SA estimates. Several limitations and caveats also bear on applications of the method. The limitations include all assumptions sufficient for application of EI estimates to ambient air, such as well-mixed air parcels (county scale), proportional removal rates for NO_x and DPM, proportionally uniform emission rates for all NO_x and DPM sources, etc. Verification of these assumptions is in general not possible; instead, agreement between EI and SA estimates is taken as best available evidence. The uncertainty intervals produced by the estimation method are based on variations between similar (low- or high- NO_x) counties and reflect differences in relative emission sources (primarily diesel vs. non-diesel). As such, the uncertainty describes the confidence in α to accurately describe either low- or high- NO_x counties. Further work is needed in strengthening the understanding of the contribution of various emission sources to ambient concentrations of both gases and particles. In this respect, source apportionment work that utilizes organic marker species is the best available approach; ideally, highly time-resolved studies would allow better characterization and support for single species scaling estimates, such as the NO_x-scaling method. The following is a discussion of the NO_x data used in this methodology.

Nitrogen Oxides Air Quality Data

Nitrogen dioxide (NO_2) and nitric oxide (NO) are products of all types of combustion. NO reacts with hydrocarbons in the presence of sunlight to form NO_2. Routine ambient air nitrogen oxides are monitored continuously at more than 114 sites in California using federally approved chemiluminescence methods. The data for each monitoring site are reported as 1-hour average concentrations. Statewide estimates of annual average nitrogen oxides concentrations were calculated using data from routine and special monitoring programs, which are briefly described below.

- Continuous hourly measurements of nitrogen oxides data from the 12 Children's Health Study (CHS) air quality monitoring network located in the southern California. NO_2 was determined hourly from EPA-approved chemiluminescent

A.1 Results of Sensitivity Analyses

To demonstrate the robustness of the relative risk described above, we performed sensitivity analyses using alternative approaches described in Section II.E (Table 3). For each of the alternative scenarios considered, Table 3 presents results in terms of percent change in premature death per 10 μg/m^3 change in PM2.5 exposures, with low indicating 5th percentile and high indicating 95th percentile. For reference, our proposed credible range of the PM2.5-mortality C-R function is listed in the first row. These results showed that regardless of the method chosen, the mean factor relating PM2.5 exposure to premature death lies between 9.5 percent and 12 percent, which brackets our estimate of 10 percent.

Table 3: Percent change in mortality risk per 10 μg/m^3 increase in PM2.5 exposure

Scenario	*Low*	*Mean*	*High*
Proposed credible range	3%	10%	20%
1. 3 studies, equal weight	2%	12%	26%
2. 3 studies, inverse-variance weight	4%	11%	19%
3. 3 studies, random effects pooling	3%	11%	19%
4. 2 studies, random effects pooling	3%	10%	20%
5. twelve experts, random effects pooling	0%*	10%	21%
6. 10 experts, random effects pooling	0%*	9.5%	19%

*Whenever the lowest value in an expert's distribution includes zero, a pooled result (including this expert) can have zero as a lower bound.

B. Results on premature deaths associated with exposures to ambient PM

In this section, we present the results of estimating premature deaths associated with ambient PM exposures above certain cut-off levels. Tables 4a and 4b show the number of premature deaths using a 10 percent relative risk associated with PM2.5 exposures above 7 μg/m^3 and 2.5 μg/m^3, respectively. The level of 7 μg/m^3 represents a reasonable cut-off level based on empirical epidemiologic evidence; and 2.5 μg/m^3 represents the PM2.5 background, the concentration of PM2.5 in the absence of any PM from anthropogenic sources. For this analysis, PM2.5 monitoring data from years 2004 through 2006 were used to represent current ambient PM levels. The population data from the 2000 Census were grown to each corresponding year in BenMAP. As explained in Section II.E.1 above, the results are averages of annual impacts. All results greater than 100 have been rounded to two significant figures. As such, the totals may not add up. The significance of the variation in the results shown in Tables 4a-4d is discussed in Section IV.

of diesel (trucks, locomotives, ships) at a California port or harbor. In this scenario, the annual average ambient diesel PM concentration would be estimated by grid cells using a model such as U.S. EPA ISCST3. For each grid cell, the premature death could be estimated based on a C-R function, the population in that grid cell, and the baseline countywide incidence rates. The total impacts for the affected population in the modeling domain would then be obtained by summing the results from each grid cell. In the results section, an example on the Ports of Los Angeles and Long Beach is discussed.

G.2 Methodology based on emissions data only

When it is not feasible to model PM concentrations, emissions can be used to estimate health impacts as an alternative methodology. For example, to estimate health impacts associated with goods movement activities in California, an emissions inventory approach was used in all regions outside of the Ports of Los Angeles and Long Beach, as shown below. Details for this methodology can be found in the CARB 2006 report.

1. Use ARB's estimated county-specific PM2.5 concentrations attributed to diesel sources in year 2000 (CARB 1998).
2. Calculate the premature deaths for the base year 2000 by applying a C-R function to the exposed population for a county.
3. Associate the health impacts with the total diesel PM emission inventory for that county in the base year 2000 to determine the number of tons emitted per annual death. This is called the "tons-per-death" factor for the county.
4. Apply the tons-per-death factor to the diesel PM emission inventory for a single source to estimate the average annual deaths associated only with exposure to these emissions, adjusting for population growth between the year of interest and the base year 2000. Note that the diesel PM emissions from the single source may be small compared to the county's emission inventory used in step 3 above.

III. Results

A. General relationship (relative risk) for use in California

From the procedures described in Section II.D, the central estimate of the relative risk of premature death is 10 percent per 10 μg/m^3 increase in PM2.5 exposures, with 3 percent to 20 percent confidence interval. The central estimate is the median of the twelve experts' medians (adjusted for the causality likelihood in cases where the expert did not incorporate the likelihood directly into his distribution) from U.S. EPA's expert elicitation, while the lower and upper bounds are the medians of the experts' 5th percentiles and 95th percentiles, respectively. These three values represent our proposed credible range (or uncertainty interval) for the PM2.5-mortality C-R function.

After our credible range was developed, the results from the European Expert Elicitation on the likely relationship between long-term PM2.5 exposures and premature death in the United States were published (Cooke et al. 2007). The median of the six selected European experts' medians is also 10 percent per 10 μg/m^3 change in PM2.5 exposures, confirming the reasonableness of our central estimate of 10 percent.

C. Results on premature deaths avoided by strategies designed to attain ambient air quality standards

In addition to examining the mortality impacts associated with exposures above certain PM2.5 levels, we also assessed the health benefits of attaining the established ambient air quality standards. Tables 4c and 4d presents the annual premature deaths that would be avoided if PM2.5 levels from the years 2004 through 2006 were reduced to attain the national standard of 15 $\mu g/m^3$ and the State standard of 12 $\mu g/m^3$. For this calculation the cut off level was set at 2.5 $\mu g/m^3$. Interestingly, setting the cut off level to 7 $\mu g/m^3$ did not alter the results significantly. The number of premature deaths avoided by attaining the national standard decreased from 5,514 to 5,506 (unrounded); for the State standard, it decreased from 9,300 to 9,200. Details on the methodology used in calculating these estimates are provided in Appendix 2.

Table 4c: Annual premature deaths avoided by attainment of the national annual PM2.5 standard of 15 $\mu g/m^3$ *

Air Basin	*Low*	*Mean*	*High*
Great Basin Valleys	<1	<1	<1
Lake County	<1	<1	<1
Lake Tahoe	<1	<1	<1
Mojave Desert	8	27	49
Mountain Counties	2	5	10
North Central Coast	<1	<1	<1
North Coast	<1	<1	<1
Northeast Plateau	<1	<1	<1
Sacramento Valley	4	15	26
Salton Sea	<1	1	1
San Diego County	<1	2	3
San Francisco Bay	1	5	9
San Joaquin Valley	310	1,000	1,900
South Central Coast	1	4	8
South Coast	1,300	4,400	7,900
Statewide Total	**1,700**	**5,500**	**9,900**

*Totals do not add up due to rounding; air quality data from years 2004 to 2006.

Table 4a: Annual premature deaths associated with ambient PM2.5 levels above 7 $\mu g/m^3$ *

Air Basin	*Low*	*Mean*	*High*
Great Basin Valleys	<1	1	1
Lake County	<1	1	2
Lake Tahoe	<1	<1	<1
Mojave Desert	37	120	220
Mountain Counties	18	59	110
North Central Coast	5	15	28
North Coast	7	25	45
Northeast Plateau	1	4	8
Sacramento Valley	260	850	1,500
Salton Sea	30	100	180
San Diego County	260	870	1,600
San Francisco Bay	530	1,800	3,200
San Joaquin Valley	610	2,000	3,500
South Central Coast	76	250	460
South Coast	2,500	8,100	14,000
Statewide Total	**4,300**	**14,000**	**25,000**

*Totals do not add up due to rounding; air quality data from years 2004 to 2006.

Table 4b: Annual premature deaths associated with ambient PM2.5 levels above 2.5 $\mu g/m^3$ *

Air Basin	*Low*	*Mean*	*High*
Great Basin Valleys	3	8	15
Lake County	6	21	38
Lake Tahoe	1	3	6
Mojave Desert	100	330	580
Mountain Counties	62	210	370
North Central Coast	57	190	340
North Coast	40	130	230
Northeast Plateau	4	15	26
Sacramento Valley	510	1,700	2,900
Salton Sea	89	300	520
San Diego County	510	1,700	3,000
San Francisco Bay	1,100	3,700	6,600
San Joaquin Valley	900	2,900	5,000
South Central Coast	200	670	1,200
South Coast	3,600	12,000	20,000
Statewide Total	**7,200**	**24,000**	**41,000**

*Totals do not add up due to rounding; air quality data from years 2004 to 2006.

Table 5: Annual premature deaths associated with exposures to estimated primary diesel PM*

Air Basin	*Low*	*Mean*	*High*
Great Basin Valleys	<1	<1	1
Lake County	3	9	17
Lake Tahoe	<1	1	2
Mojave Desert	19	66	120
Mountain Counties	8	26	48
North Central Coast	7	22	40
North Coast	4	14	26
Northeast Plateau	<1	<1	<1
Sacramento Valley	55	190	340
Salton Sea	12	40	72
San Diego County	81	270	490
San Francisco Bay	190	640	1,200
San Joaquin Valley	84	280	510
South Central Coast	22	76	140
South Coast	690	2,300	4,100
Statewide Total	**1,200**	**3,900**	**7,100**

*Year 2000, based on the new PM2.5-mortality relative risk of 10 percent per 10 µg/m^3 increase in PM2.5 exposures. Totals do not add up due to rounding.

E. Results on premature deaths associated with exposures to specific sources

In this section, results are presented based on applications of two methodologies discussed in sections G.1 and G.2.

Ports of Los Angeles and Long Beach. We applied the methodology using modeled concentrations of diesel PM2.5 to assess the mortality effects (described in section G.1) to the area surrounding the Ports of Los Angeles and Long Beach. Using the new PM2.5-mortality function of 10 percent per 10 µg/m^3 change in PM2.5 exposures, staff estimated that based on modeled diesel PM concentrations for year 2002, the annual premature deaths associated with the ports' emissions are around 120, with uncertainty interval 36 to 310 deaths. The population data from the 2000 Census was grown to estimate the year 2002 populations affected. Details on the modeling methodology used can be found in the CARB 2006 report.

Goods Movement in California. We also used the emissions-based methodology (described in section G.2) to estimate the total mortality impacts associated with PM2.5 generated from all ports and goods movement activities in California. Details on the emissions related to goods movement are in the CARB 2006 report. Using this methodology, staff estimates that annually 3,700 premature deaths can be associated with PM2.5 exposure from goods movement activity statewide. Also noteworthy is that 2,000 premature deaths are associated with exposures to primary diesel PM from goods movement activities, which is slightly more than one-half the total estimated diesel PM impact (from all sources) shown in Table 5.

Table 4d: Annual premature deaths avoided by attainment of the State annual PM2.5 standard of 12 µg/m^3 *

Air Basin	*Low*	*Mean*	*High*
Great Basin Valleys	<1	<1	<1
Lake County	<1	<1	1
Lake Tahoe	<1	<1	<1
Mojave Desert	12	41	74
Mountain Counties	8	27	48
North Central Coast	1	4	7
North Coast	1	5	8
Northeast Plateau	<1	<1	<1
Sacramento Valley	130	420	760
Salton Sea	16	55	100
San Diego County	94	320	570
San Francisco Bay	210	710	1,300
San Joaquin Valley	460	1,500	2,700
South Central Coast	14	46	83
South Coast	1,900	6,200	11,000
Statewide Total	**2,800**	**9,300**	**17,000**

*Totals do not add up due to rounding; air quality data from years 2004 to 2006.

D. Results on premature deaths associated with exposures to diesel PM exposures

Table 5 lists the estimated premature deaths associated with exposure to diesel PM by air basin. The estimates reflect the central estimate of the relative risk of premature death of 10 percent per 10 µg/m^3 increase in PM2.5 exposures, with 3 percent to 20 percent confidence interval. The concentration of ambient diesel PM concentrations were calculated using the ambient NO_x concentrations. A full discussion of the methodology for estimating diesel PM from NO_x concentrations can be found in the Appendix 3.

statewide.

Treating diesel PM and ambient PM as equally toxic and using the new PM2.5-mortality function, staff estimate that statewide, public exposures to diesel PM can be associated with about 3,900 deaths, with uncertainty ranging from 1,200 to 7,100.

The PM2.5-mortality concentration-response function we developed can be applied in regional (i.e., by county) assessments of premature deaths associated with PM2.5 exposures, as most epidemiological studies relate death and health data with regional PM measurements that apply to large populations. However, recent advances in exposure classification techniques, as demonstrated by Jerrett et al. (2005) for example, suggest that it is also reasonable to apply the PM2.5-mortality relationship to analyses involving populations of small sizes, as long as uncertainties and limitations are explicitly stated. Staff demonstrated such applications in estimating the mortality impacts associated with PM2.5 emissions related to port activities for the Ports of Los Angeles and Long Beach. Using the new PM2.5-mortality relationship, it is estimated at about 110 premature deaths (uncertainty interval: 36 to 310) are associated with annual PM2.5 exposures to emissions resulting from such activities.

It should be noted that while this report focuses on premature death, additional quantified health impacts include hospital admissions, lost workdays, minor restricted activity days, and a number of other health endpoints (CARB 2006). Still, some other health effects (e.g. asthma exacerbation) cannot be quantified at this time (CARB 2006). Therefore, taken as a whole, the overall health benefits of PM reduction may be under-estimated.

V. Uncertainties and Limitations

There are a number of uncertainties involved in quantitatively estimating the health impacts associated with exposures to outdoor air pollution. Over time, some of these will be reduced as new research is conducted. However, some uncertainty will remain in any estimate. Below, some of the major uncertainties and limitations of the estimated health impacts presented in this report are briefly discussed.

Concentration-Response Function

A primary uncertainty is the choice of the specific studies and the associated concentration-response (C-R) functions used for quantification. Epidemiological studies used in this report have undergone extensive peer review and include sophisticated statistical models that account for the confounding effects of other pollutants, meteorology, and other factors. While there may be questions on whether C-R functions from the epidemiological studies are applicable to California, it should be noted that some of the cities in the ACS cohort are in California. Also, studies have shown that the mortality effects of PM in California are comparable to those found in other locations in the United States (Dominici et al. 2005, Franklin et al. 2007, Jerrett et al. 2005; Pope et al. 2002). The C-R function for PM2.5-related mortality developed in this report was based on a careful review of all relevant scientific literature and a thorough consideration of their strengths and limitations. In addition, it was approved by our advisors and independent peer reviewers.

Table 6: Annual premature deaths associated with PM2.5 from Goods Movement activities[1]

Pollutant	*Low*	*Mean*	*High*
Primary Diesel PM	600	2,000	3,500
Secondary Diesel PM (Nitrates)	480	1,600	2,800
Secondary Diesel PM (Organic Aerosols)	15	49	85
Other Primary PM2.5[2]	12	39	68
Statewide Total[3]	***1,100***	***3,700***	***6,500***

[1]For the year 2005, these estimates do not include the contributions from particle sulfate formed from SO_X emissions, which is being addressed with several ongoing emissions, measurement, and modeling studies. Results listed are based on the previous emission inventories used in the Goods Movement Emission Reduction Plan in April of 2006 but with the new PM2.5-mortality relationship of 10 percent per 10 µg/m^3 increase in PM2.5 exposures; these values may change if emissions inventories are updated.
[2]PM2.5 includes tire wear, brake wear, and particles from boilers, which are not covered under primary diesel PM.
[3]Totals do not add up due to rounding.

IV. Discussion

By evaluating the recent epidemiologic data and the results of the U.S. EPA's expert elicitation, we were able to systematically develop a new range for the relationship between long-term exposures to PM2.5 and the risk for premature death.

Up to now, CARB staff has calculated mortality impacts associated with PM2.5 exposures based on the C-R relationship from the American Cancer Society study (Krewski et al. 2003, Pope et al. 2002). Several recently published studies prompted CARB to consider updating the C-R function as well as other aspects of the methodology for quantifying mortality impacts. In this report, all relevant literature on PM2.5 mortality was reviewed and evaluated, and a new C-R function of 10 percent per 10 µg/m^3 change in PM2.5 exposure was developed (with uncertainty interval from 3 percent to 20 percent). Although the interpretation of the recent literature mostly favors a no-threshold model, staff discussed several possible cut-off levels and presented a range of results. Because of uncertainties in the cut-off concentration below which we expect no PM2.5-related adverse health impacts, staff recommends using a range of cut-off values from 2.5 to 7 µg/m^3. Depending on the cut-off level chosen, as shown in Tables 4a and 4b above, exposures to 2004-06 PM2.5 can be associated with about 14,000 to 24,000 premature deaths statewide annually, with uncertainty ranging from 4,300 to 41,000 deaths.

The methodology for estimating the premature deaths avoided by attaining the ambient PM2.5 annual standards has also been updated. With the new C-R function applied to the updated methodology, about 5,500 deaths (uncertainty: 1,700 to 9,900) are avoided annually if the current PM levels (years 2004 through 2006) are reduced statewide to attain the national standard of 15 µg/m^3. Similarly, about 9,300 deaths (uncertainty: 2,800 to 17,000) would be avoided if the State standard of 12 µg/m^3 is attained

Many of the studies were conducted in areas having fairly low concentrations of ambient PM, with ranges in PM levels that cover California values. Thus, the extrapolation is within the range of the studies. Finally, the uncertainty in the C-R functions selected is reflected in the lower and upper estimates given in all the health impacts tables, which represent 95 percent confidence intervals.

Baseline Mortality Rate

Mortality baseline rates are entered into the C-R functions in order to calculate the estimates presented in this report, and there is uncertainty in these baseline rates. Often, one must assume a baseline incidence level to be consistent throughout the city or county of interest. In addition, incidence can change over time as lifestyles, income and other factors evolve. For this analysis, we utilized baseline rates that are used by U.S. EPA. Additional information were obtained from Department of Health Services and the Centers for Disease Control and Prevention. It is expected that incidence rates may change over time.

Diesel PM Compared to Ambient PM Relative Toxicity

In this assessment, staff assumed diesel PM is equally toxic as PM2.5. Without definitive evidence to conclude otherwise, this approach may underestimate the true effects of diesel PM exposures on adverse health effects.

Diesel PM Concentrations

In the absence of a direct measurement method, ambient diesel PM concentrations were estimated from ambient NO_x concentrations. These diesel PM estimates depend upon the network of ambient NO_x measurements from ARB monitoring sites. A basic assumption in this method is that the ambient concentration of a tracer species may be used to infer the ambient concentration of diesel PM.

The limitations include all assumptions sufficient for application of emissions inventory estimates to ambient air, such as well-mixed air parcels (county scale), proportional removal rates for NO_x and diesel PM, proportionally uniform emission rates for all NO_x and diesel PM sources. Verification of these assumptions is in general not possible. Instead, agreement between emissions inventory and source apportionment estimates is taken as best available evidence. The uncertainty intervals produced by the estimation method are based on variations between low- NO_x counties and reflect differences in relative emission sources (primarily diesel vs. non-diesel). However, this uncertainty has not been incorporated into estimating the premature deaths associated with diesel PM exposure in this report.

Interpolation

Interpolation is the procedure of predicting the PM2.5 concentration at areas without ambient measurements. Interpolation is necessary when monitoring data do not cover the area of interest completely. The source of error for this analysis stems from measurement error and error associated with having enough monitors to get adequate spatial coverage. When data are abundant, most interpolation techniques give similar results. When data are sparse, however, the assumption made about the underlying variation that has been sampled and the choice of method and its parameters can be

critical if one is to avoid misleading results.

Exposure concentration

There are three methods for estimating the exposure concentration used to estimate PM2.5-related mortality: ambient measurement, modeled concentration and emissions inventory. There are advantages, uncertainties, and limitations with each method.

Concentration is estimated from ambient measurement by interpolating in areas with no measured concentration. The technique used in this report was inverse distance weighted squared. It has the advantage of having a high degree of certainty of the pollutant concentration near the monitoring station. As the distance increases away from the monitoring station, the uncertainty in the interpolated concentration also increases. In areas with high spatial coverage and low variability in concentration, this method gives the most reliable estimate of concentration.

When ambient measurements are not available, modeled concentration estimates of ambient air quality are done using emission inventories and air quality models. The models may be simple box models that track the movement of an air parcel through a region or detailed models that incorporate photochemical reactions and complex terrain. This technique has the advantage of estimating the relative source of PM2.5 compared to other sources. It can, for example, estimate the amount of PM2.5 from ships, trucks, or stationary sources at a particular location. Modeling can also estimate localized concentrations with sharp gradients that would not be feasible to measure with air quality monitors. The downside to modeling is that it is labor intensive and has an uncertainty of about a factor of two. Nonetheless, it is the next best tool when ambient monitoring is not feasible.

The least reliable estimation of health impacts occurs when emissions are used to infer about air quality. As outlined in section II.G.2, this method estimates the health benefits associated with reductions in PM2.5 emissions due to ARB regulatory action. To infer health impacts due to emission reductions, this method applies a “tons of PM2.5 per death” factor to estimate the number of deaths avoided due to reductions in PM2.5. The method may give an overestimate of mortality where sources are far from populated areas. For example, emissions from the Ports of Los Angeles and Long Beach are miles away from populated areas, and would result in an overestimate of mortality. It may also produce an underestimate where the source of PM2.5 is in close proximity to populated sources.

VI. Conclusions

This report was a product of an evaluation of the available published literature on PM mortality. A new relative risk factor of premature death associated with PM2.5 exposures was developed: 10 percent increase in premature death per 10 $\mu g/m^3$ increase in PM2.5 exposures (uncertainty interval: 3 percent to 20 percent). Also, staff proposed to use a range of cut-off levels between 2.5 to 7 $\mu g/m^3$ based on the health effects observed over the range of PM concentrations recorded in case-control studies.

Although the literature mostly favors a no-threshold model, without strong empirical evidence for long-term PM effects between 2.5 and 7 $\mu g/m^3$, we recommend this range for the purpose of assessing the premature deaths associated with long-term exposures to fine PM. The methodologies and results presented in this report have been endorsed by our scientific advisors and have undergone an external peer review process.

VII. References

Abbey, D.E.; Nishino, N.; McDonnell, W.F.; Burchette, R.J.; Knusten, S.F.; Beeson, W.L.; Yang, J.X. Long-Term Inhalable Particles and Other Air Pollutants Related to Mortality in Nonsmokers; *Am. J. Respir. Crit. Care Med.* (1999), *159,* 373-382.

APHEA2. In *Revised Analyses of Time-Series of Air Pollution and Health. Special Report*; Health Effects Institute: Boston, MA, (2003); pp 157–164.

Beelen, R.; Hoek, G.; van den Brandt, P.A.; Goldbohm, R.A.; Fischer, P.: Schouten, L.J.; Jerrett, M.; Hughes, E.; Armstrong, B.; Brunekreef, B. Long-Term Effects of Traffic-Related Air Pollution on Mortality in a Dutch Cohort (NLCS-AIR Study); Environmental Health Perspectives (2008), 116:196-202.

Brunekreef, B.; Hoek, G. A Critique of "Fine Particulate Air Pollution and Total Mortality Among Elderly Californians, 1973-2002" by James E. Enstrom, PhD; *Inhalation Toxicology* (2006), 18:507-508.

Burnett, R.T.; Brook, J.; Dann, T.; Delocla, C.; Philips, O.; Cakmak, S.; Vincent, R.; Goldberg, M.S.; Krewski, D. Association between Particulate- and Gas-Phase Components of Urban Air Pollution and Daily Mortality in Eight Canadian Cities; *Inhal. Toxicol.* (2000), *12,* 15-39.

Burnett, R.T.; Goldberg, M.S. Size-Fractionated Particulate Mass and Daily Mortality in Eight Canadian Cities. In *Revised Analyses of Time-Series of Air Pollution and Health. Special Report*; Health Effects Institute: Boston, MA, (2003); pp 85–90.

CARB 1998. California Air Resources Board, Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant. Appendix III. Part A: Exposure Assessment, available at http://www.arb.ca.gov/toxics/id/summary/diesel_a.pdf. (1998).

CARB 2002. California Air Resources Board and Office of Environmental Health Hazard Assessment. Staff Report: Public Hearing to Consider Amendments to the Ambient Air Quality Standards for Particulate Matter and Sulfates, available at http://www.CARB.ca.gov/research/aaqs/std-rs/pm-final/pm-final.htm. (2002).

CARB 2003a. California Air Resources Board. Staff Report: Proposed Diesel Particulate Matter Control Measure For On-Road Heavy-Duty Residential and Commercial Solid Waste Collection Vehicles, available at
http://www.CARB.ca.gov/regact/dieselswcv/isor3.pdf. (2003)

CARB 2003b. California Air Resources Board. Staff Report: Proposed Airborne Toxic Control Measure For In-Use Diesel-Fueled Transport Refrigeration Units (TRU) And TRU Generator Sets, And Facilities Where TRUs Operate, available at http://www.CARB.ca.gov/regact/trude03/isor.pdf. (2003)

Dominici F, McDermott A, Daniels M, Zeger SL, Samet JM. Revised analyses of the National Morbidity, Mortality, and Air Pollution Study: mortality among residents of 90 cities. J Toxicol Environ Health A. (2005);68(13-14):1071-92.

Enstrom, J.E. Fine Particulate Air Pollution and Total Mortality Among Elderly Californians, 1973–2002; *Inhal. Toxicol.* (2005), *17,* 803-816.

Filleul, L.; Rondeau, V.; Vandentorren, S.; Le Moual, N.; Cantagrel, A.; Annesi-Maesano, I.; Charpin, D.; Declercq, C.; Neukirch, F.; Paris, C.; Vervloet, D.; Brochard, P.; Tessier, J.F.; Kauffmann, F.; Baldi, I. Twenty-Five Year Mortality and Air Pollution: Results from the French PAARC Survey; *Occup. Environ. Med.* (2005), *62,* 453-460.

Finkelstein, M.M.; Jerrett, M.; Sears, M.R. Traffic Air Pollution and Mortality Rate Advancements Periods; *Am. J. Epidemiol.* (2004), *160,* 173-177.

Franklin M, Zeka A, Schwartz J. Association between PM(2.5) and all-cause and specific-cause mortality in 27 US communities. J Expo Sci Environ Epidemiol. (2007), 17, 279-287.

Ghio, A.J.; Biological effects of Utah Valley ambient air particles in humans: a review. *Journal of Aerosol Medicine* (2004), 17(2): 157-164.

Goss, C.H.; Newsom, S.A.; Schildcrout, J.S.; Sheppard, L.; Kaufman, J.D. Effect of Ambient Air Pollution on Pulmonary Exacerbations and Lung Function in Cystic Fibrosis; *Am. J. Repir. Crit. Care Med.* (2004), *169,* 816-821.

Hedley, A.J.; C.M. Wong, et al.; Cardiorespiratory and all-cause mortality after restrictions on sulphur content of fuel in Hong Kong: an intervention study. *Lancet* (2002), 360(9346): 1646-1652.

Holmstead, J.; U.S. EPA, Office of Air and Radiation. Letter to Robert O'Keefe, Health Effects Institute. July 11, (2005).

Hoek, G.; Brunekreef, B.; Goldhohm, S.; Fischer, P.; van den Brandt, P.A. Association between Mortality and Indicators of Traffic-Related Air Pollution in the Netherlands: A Cohort Study; *Lancet* (2002), *360,* 1203-1209.

IE, 2004. An expert judgment assessment of the concentration-response relationship between PM2.5 exposure and mortality. Industrial Economics, Incorporated, prepared for the Office of Air Quality Planning and Standards, Research Triangle Park, NC. (2004), available at http://www.epa.gov/ttn/ecas/regdata/Benefits/pmexpert.pdf.

IE, 2006. Expanded Expert Judgment Assessment of the Concentration-Response Relationship Between PM2.5 Exposure and Mortality, Industrial Economics, Incorporated, Final Report, September 21, (2006), available at http://www.epa.gov/ttn/ecas/regdata/Uncertainty/pm_ee_report.pdf.

Jerrett, M.; Burnett, R.T.; Willis, A.; Krewski, D.; Goldberg, M.S.; DeLuca, P.;

CARB 2003c. California Air Resources Board. Staff Report: Airborne Toxic Control Measure For Stationary Compression-Ignition Engines, available at http://www.CARB.ca.gov/regact/statde/isor.pdf. (2003)

CARB 2004a. California Air Resources Board. Staff Report: Proposed Modifications To The Fleet Rule For Transit Agencies And New Requirements For Transit Fleet Vehicles, available at http://www.CARB.ca.gov/regact/bus04/isor.pdf. (2004)

CARB 2004b. California Air Resources Board. Staff Report: Airborne Toxic Control Measure For Diesel-Fueled Portable Engines, available at http://www.CARB.ca.gov/regact/porteng/isor.pdf. (2004)

CARB 2004c. California Air Resources Board. Staff Report: Proposed Regulatory Amendments Extending the California Standards for Motor Vehicle Diesel Fuel to Diesel Fuel Used in Harborcraft and Intrastate Locomotives, available at http://www.CARB.ca.gov/regact/carblohc/isor.pdf. (2004)

CARB 2005. California Air Resources Board, "Diesel PM Exposure Assessment Study for the Ports of Los Angeles (POLA) and Long Beach (POLB)", Oct 2005, available at http://www.CARB.ca.gov/msprog/offroad/marinevess/documents/100305draftexposrep.pdf. (2005).

CARB 2006. California Air Resources Board, "Quantification of the Health Impacts and Economic Valuation of Air Pollution From Ports and Goods Movement in California." Appendix A in Emission Reduction Plan for Ports and Goods Movement. March 22, (2006), available at http://www.CARB.ca.gov/planning/gmerp/march21plan/appendix_a.pdf

Chen, L.H.; Knutsen, S.F.; Shavlik, D.; Beeson, W.L.; Petersen, Ghamsary, M.; Abbey, D. The Association between Fatal Coronary Heart Disease and Ambient Particulate Air Pollution: Are Females Greater Risk? *Environ. Health Perspect.* (2005), *113,* 1723-1729.

Clancy, L.; P. Goodman, et al.; Effect of air-pollution control on death rates in Dublin, Ireland: an intervention study. *Lancet* (2002), 360(9341): 1210-4.

Cooke, R.M; Wilson, A.M.; Toumisto, J.T.; Morales, O.; Tainio, M.; Evans, J.S. A Probabilistic Characterization of the Relationship between Fine Particulate Matter and Mortality: Elicitation of European Experts. Env. Sci. and Tech (2007) 41:6598-6605.

de Kok, T.; Driece, H.; Hogervorst, J.; Briede, J.. Toxicological assessment of ambient and traffic-related particulate matter: a review of recent studies. Mutation Research (2006), 613:103-122.

Dockery, D.W.; Pope, C.A., III; Xu, X.; Spengler, J.D.; Ware, J.H.; Fay, M.E.; Ferris, B.G.; Speizer, F.A. An Association between Air Pollution and Mortality in Six U.S. Cities; *N. Engl. J. Med.* (1993), *329,* 1753-1759.

Finkelstein, N. Spatial Analysis of the Air Pollution-Mortality Relationship in the Context of Ecologic Confounders; *J. Toxicol. Environ. Health* (2003), *66,* 1735-1777.

Jerrett, M.; Burnett, R.T.; Ma, R.; Pope, C.A., III; Krewski, D.; Newbold, K.B.; Thurston, G.; Shi, Y.; Finkelstein, N.; Calle, E.E.; Thun, M.J. Spatial Analysis of Air Pollution and Mortality in Los Angeles; *Epidemiol.* (2005a), *16,* 727-736.

Jerrett, M.; Finkelstein, M. Geographies of Risk in Studies Linking Chronic Air Pollution Exposure to Health Outcomes. *J. Toxicol. Environ. Health A* (2005b), *68,* 13-14, 1207-1242.

Kappos, A.; Bruckmann, P.; Eikmann, T.; Englert, N.; Heinrich, U.; Hoppe, P.; Koch, E.; Krause, G.; Kreyling, W.; Rauchfuss, K.; Rombout, P.; Schulz-Klemp, V.; Thiel, W.; Wichmann, H.E. Health effects of particles in ambient air. *Int. J. Hyg. Environ. Health* (2004), 207, 399 - 407

Krewski, D.; Burnett, R.T.; Goldberg, M.S.; Hoover, K.; Siemiatycki, J.; Jerrett, M.; Abrahamowicz, M.; White, W.H. *Reanalysis of the Harvard Six Cities Study and the American Cancer Society Study of Particulate Air Pollution and Mortality. Special Report*; Health Effects Institute: Cambridge MA, (2000).

Laden, F.; Schwartz, J.; Speizer, F.E.; Dockery, D.W. Reduction in Fine Particulate Air Pollution and Mortality: Extended Follow-Up of the Harvard Six Cities Study. *Am. J. Respir. Crit. Care Med.* (2006), *173,* 667-672.

Lipfert, F.W.; Perry, H.M., Jr.; Miller, J.P.; Baty, J.D.; Wyzga, R.E.; Carmody, S.E. The Washington University-EPRI Veterans' Cohort Mortality Study: Preliminary Results; *Inhal. Toxicol.* (2000), *12,* 41-73.

Lipfert, F.W.; Perry, H.M., Jr.; Miller, J.P.; Baty, J.D.; Wyzga, R.E.; Carmody, S.E. Air Pollution, Blood Pressure, and Their Long-Term Associations with Mortality; *Inhal. Toxicol.* (2003), *15,* 493-512.

Lipfert, F.W.; Wyzga, R.E.; Baty, J.D.; Miller, J.P. Traffic Density as a Surrogate Measure of Environmental Exposures in Studies of Air Pollution Health Effects: Long-Term Mortality in a Cohort of US Veterans; *Atmos. Environ.* (2006a), *40,* 154-169.

Lipfert, F.W.; Baty, J.D.; Miller, J.P.; Wyzga, R.E. PM2.5 Constituents and Related Air Quality Variables as Predictors of Survival in a Cohort of US Veterans; *Inhal. Toxicol.*. (2006b), 18, 645-657.

Mallick, R.; K. Fung, et al.; Adjusting for measurement error in the Cox Proportional Hazards Regression Model. *Journal of Cancer Epidemiology and Prevention* (2002), 7(4): 155-164.

McDonnell, W.F.; Nishino-Ishikawa, N.; Petersen, F.F.; Chen, L.H.; Abbey, D.E. Relationships of Mortality with the Fine and Coarse Fraction of Long-Term Ambient PM10 Concentrations in Nonsmokers; *J. Expo. Anal. Environ. Epidemiol.* (2000), *10,* 427-436.

Miller, K.A.; Siscovick, D.S.; Sheppard, L.; Shepherd, K.; Anderson, G.; Kaufman, J.D. Air Pollution and Cardiovascular Disease Events in the Women's Health Initiative Observational (WHI-OS) Study. *Circulation* (2004), 109, e71. (Abstract form the American Heart Association Conference on Cardiovascular Disease Epidemiology and Prevention. Full report currently in review).

Miller, K.A.; Siscovick, D.S.; Sheppard, L.; Shepherd, K.; Anderson, G.; Kaufman, J.D. Long-term Exposure to Air Pollution and Incidence of Cardiovascular Events in Women. *N England J Med* (2007), 365:5, 447-458.

Morgan, M.G., M. Henrion; Uncertainty: a guide to dealing with uncertainty in quantitative risk and policy analysis. (New York: Cambridge University Press). (1990).

Motallebi, N. Conversion Factors for Secondary Formation of PM-Nitrate from NO_x Emissions. An internal report in Research Division, California Air Resources Board, (2006)

Motallebi N., Taylor C.A., and Croes B.E. Particulate matter in California: Part 2 - Spatial, temporal, and compositional patterns of PM2.5, PM10-2.5, and PM10. *J. Air & Waste Manag. Assoc.* (2003), 53 (12), 1517-1530.

Nafstad, P.; Håheim, L.L.; Wisløff, T.; Gram, F.; Oftedal, B.; Holme, I.; Hjermann, I.; Leren, P. Urban Air Pollution and Mortality in a Cohort of Norwegian Men; *Environ. Health Perspect.* (2004), *112,* 610-615.

National Research Council (NRC). Estimating the public health benefits of proposed air pollution regulations. The National Academies Press: Washington, D.C. (2002).

Ostro B.; Browdwin, R.; Green, S.; Feng, W.; Lipsett, M. Fine Particulate Air Pollution and Mortality in Nine California Counties: Results from CALFINE. Env Health Persp (2006) V114:29-33.

Pope, C.A., III; Thun, M.J.; Namboodiri, M.M.; Dockery, D.W.; Evans, J.S.; Speizer, F.E.; Heath, J.C.W. Particulate Air Pollution as a Predictor of Mortality in a Prospective Study of U.S. Adults; *Am. J. Respir. Crit. Care. Med.* (1995), *151,* 669-674.

Pope, C.A.; III; Burnett, R.T.; Thun, M.J.; Calle, E.E.; Krewski, D.; Ito, K.; Thurston, G.D. Lung Cancer, Cardiopulmonary Mortality, and Long-Term Exposure to Fine Particulate Air Pollution; *J. Am. Med. Assoc.* (2002), *287,* 1132-1141.

Pope, C.A.; III; Burnett, R.T.; Thurston, G.D.; Thun, M.J.; Calle, E.E.; Krewski, D.; Godleski, J.J. Cardiovascular Mortality and Long-Term Exposure to Particulate Air Pollution: Epidemiological Evidence of General Pathophysiological Pathways of Disease; *Circulation* (2004), *109,* 71-77.

Pope, C.A.; Respiratory disease associated with community air pollution and a steel

mill, Utah Valley. *American Journal of Public Health* (1989), 79(5): 623-628.

Pope, C.A.; Respiratory hospital admissions associated with PM10 pollution in Utah, Salt Lake, and Cache Valleys. *Archives of Environmental Health* (1991), 46(2): 90-97.

Pope, C. A., M. J. Thun, et al.; Particulate air-pollution as a predictor of mortality in a prospective-study of U.S. adults. *American Journal of Respiratory and Critical Care Medicine* (1995), 151(3): 669-674.

Pope, C.A.; Particulate pollution and health: a review of the Utah valley experience. *Journal of Exposure Analysis and Environmental Epidemiology* (1996), 6(1): 23-34.

Pope, C.A,; III; Dockery, D.W.; Health Effects of Fine Particulate Air Pollution: Lines that Connect; J. Air & Waste Manage. Assoc. (2006) 56:709-742.

Roman, H.A.; Walker, K.D.; Walsh, T.L.; Conner, L.; Richmond, H.M.; Hubbell, B.J.; Kinney, P.L. Expert Judgment Assessment of the Mortality Impact of Changes in Ambient Fine Particulate Matter in the U.S. Env Sci and Tech. Published on Web 02/27/2008.

Samet, J. M.; F. Dominici, et al.; The National Morbidity, Mortality, and Air Pollution Study Part I: Methods and Methodologic Issues. Research Report 94, Health Effects Institute, Boston, MA. (2000a).

Samet, J. M.; S. L. Zeger, et al.; The National Morbidity, Mortality, and Air Pollution Study Part II: Morbidity and Mortality from Air Pollution in the United States. Research Report 94, Health Effects Institute, Boston, MA. (2000b).

Schwartz J.; Dochery, D.; Neas, L.M. Is Daily Mortality Associated Specifically with Fine Particles? Air and Waste Manage Assoc (1996) 46:927-939.

Schwartz, J.; Laden, F.; Zanobetti. The concentration-response relation between PM2.5 and daily deaths. Env Health Persp (2002) 110, 10: 1025-1029.

Sun, Q., A. Wang, et al.; Long-term air pollution exposure and acceleration of atherosclerosis and vascular inflammation in an animal model. *Journal of the American Medical Association* (2005), 294(23): 3003-3010.

U.S. Environmental Protection Agency. (2004). Final regulatory impact analysis: control of emissions from non-road diesel engines. Office of Transportation and Air Quality. EPA-420-R-04-007. (2004).

U.S. Environmental Protection Agency, Science Advisory Board. (2004). Advisory on plans for health effects analysis in the analytical plan for EPA's second prospective analysis – benefits and costs of the Clean Air Act, 1990-2020. Advisory by the Health Effects Subcommittee of the Advisory Council on Clean Air Compliance Analysis. EPA-SAB-COUNCIL-ADV-04-002.

U.S. Environmental Protection Agency. (2005) Regulatory impact analysis for the final Clean Air Interstate Rule. Office of Air and Radiation. EPA-452/R-05-002. (2005).

Walker, K.D.; Industrial Economics, Inc. Memorandum to Jim Neumann, Henry Roman, and Tyra Gettleman, Industrial Economics, Inc. Appropriate Number of Experts for the Particulate Matter Expert Judgment Project. November 11, (2004).

Willis, A.; M. Jerrett, et al.; The association between sulfate air pollution and mortality at the county scale: an exploration of the impact of scale on a long-term exposure study. *Journal of Toxicology and Environmental Health, Part A* (2003) 66(16-19): 1605-1624.

Woodruff, T.J.; Grillo, J.; Schoendorf, K.C. The Relationship between Selected Causes of Postneonatal Infant Mortality and Particulate Air Pollution in the United States; *Environ. Health Perspect.* (1997), *105,* 608-612.

Woodruff, T.J.; Parker, J.D.; Schoendorf, K.C. Fine Particulate Matter (PM2.5) Air Pollution and Selected Causes of Postneonatal Infant Mortality in California. *Environ. Health Perspect.* (2006), *114,* 786-790.

APPENDICES

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Appendix 1 (PM2.5 Exposures)

Below are estimated basin-specific PM 2.5 population-weighted concentrations for years 2004 to 2006 used in this report.

Air Basin	Census 2000 Population	PM2.5 ($\mu g/m^3$) Year 2004	PM2.5 ($\mu g/m^3$) Year 2005	PM2.5 ($\mu g/m^3$) Year 2006
Great Basin Valleys	32,006	6.18	6.69	3.44
Lake County	58,309	4.96	5.17	5.63
Lake Tahoe	46,200	4.31	3.55	3.63
Mojave Desert	816,742	9.16	8.80	8.50
Mountain Counties	408,039	7.60	7.41	8.39
North Central Coast	710,598	7.00	7.12	7.18
North Coast	310,061	7.11	6.98	7.49
Northeast Plateau	87,578	4.91	4.71	5.25
Sacramento Valley	2,334,277	11.41	10.84	11.82
Salton Sea	465,886	9.69	9.55	8.78
San Diego County	2,813,833	12.61	10.98	11.06
San Francisco Bay	6,605,921	11.51	10.70	10.69
San Joaquin Valley	3,189,385	16.32	16.48	16.74
South Central Coast	1,400,455	10.09	9.57	9.23
South Coast	14,592,351	17.57	16.09	14.87
Statewide	***33,871,641***	**14.34**	**13.36**	**12.91**

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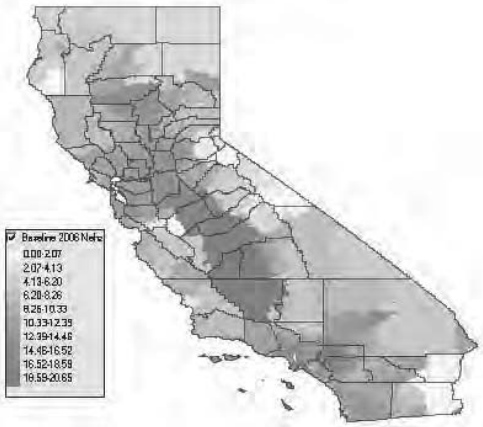
PM2.5 Air Quality Monitoring Program in California

California's air quality monitoring program provides information used for determining which areas violate standards, characterizing the sources that contribute to pollution, determining background concentrations, assessing pollution transport, and supporting health studies and other research. To assess the nature and extent of the PM2.5 problem in California, ARB and air districts have significantly expanded the PM2.5 monitoring program since late 1998. The PM2.5 mass data used in this analysis have been derived from a variety of routine and special monitoring programs and databases. We analyzed the following ambient air quality data:

- 2004-2006 PM2.5 mass from the Federal Reference Method (FRM) monitors. California's PM2.5 monitoring network now includes 90 FRM monitoring sites. The FRM sites collect 24-hour mass data using federally approved methods, which means they satisfy specific federal regulatory requirements.
- 2004-2006 PM2.5 mass data from the Interagency Monitoring of Protected Visual Environments (IMPROVE) program. Since 1985, this program implemented an extensive long term monitoring program to establish the current visibility conditions, track changes in visibility and determine causal mechanism for the visibility impairment in the National Parks and Wilderness Areas. The IMPROVE sampler is programmed to collect two 24-hour duration samples per week.

2006 Particulate Matter

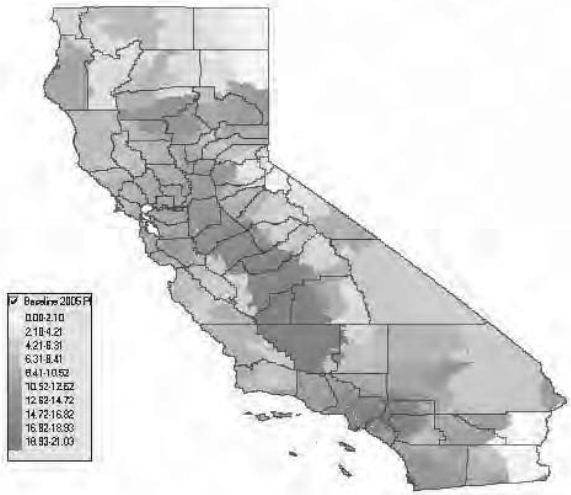
Inverse Distance Squared Interpolation



A-7

2005 Particulate Matter

Inverse Distance Squared Interpolation



A-6

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Appendix 2 (Methodology for Estimating Health Impacts Avoided by Strategies Designed to Attain the Standards)

In addition to examining the mortality impacts associated with exposures above certain PM2.5 levels, it is important to assess the health benefits of attaining the established ambient air quality standards. When evaluating the impacts associated with implementing strategies designed to attain an ambient air quality standard, we project a future scenario when the highest observed PM measurements are below the established standard – bringing the air basin into attainment of the standard. In this scenario, measurements at all sites within each air basin are also lower compared to current levels; hence their values are "rolled back" to reflect the attainment scenario. As shown in the section labeled "Justification for rollback" below, PM2.5 measurements within several air basins have declined at fairly consistent rates over time, justifying the assumption of a constant rate of reduction within each basin. Details on each step of this "rollback" methodology used to estimate the health impacts avoided by implementing strategies to attain the standards follow.

STEP 1: Obtain PM concentrations for all sites in California

The observed PM2.5 concentrations are obtained for years 2004, 2005, and 2006. In addition to the routine monitoring network, data from the IMPROVE (Interagency Monitoring for Protected Visual Environments) are included in the analysis. See Appendix 1 for a description of these special monitoring data. Annual averages of quarterly means are calculated for each site for consistency with the national and state definition of the PM standard attainment designations.

Consistent with the proportional roll-back procedure applied in the ozone standard staff report (CARB 2004) and published in JAWMA (Ostro et al. 2006), the PM annual averages of quarterly averages are rolled into attainment of a standard as follows.

Denote:

`Current PM`	= current annual PM value
`Basin Max`	= highest value in each basin during 2003-2005
`Background`	= background PM2.5 concentration of 2.5 μg/m^3
`Standard`	= 15 μg/m^3 for the federal, 12 μg/m^3 for the state
`Attainment PM`	= rolled-back PM value in the "attainment" scenario

First, the rollback factor for each basin was calculated as follows:

```
if Basin Max > Standard then
```

$$\text{Rollback Factor} = \frac{\text{Standard} - \text{Background}}{\text{Basin Max} - \text{Background}}$$

```
else
   Rollback Factor = 1
```

For log-linear functions, the health impact is

$\Delta Y = -Y_O [\exp (-\beta * \Delta PM - 1)] * pop$, where

Y_O = baseline mortality rates, which include all-case deaths for the population over age 30. We used the mortality rate for the year 2005 to calculate health impacts for years 2004, 2005 and 2006.

β = beta coefficient derived from the relative risk of epidemiologic study results.

ΔPM = the difference between the current ambient PM concentration and the rolled-back or attainment PM level.

pop = population age 30 or above in each census block, from US Census for each year (2004-2006).

Note that the baseline mortality rate and population are available for various subgroups (age 30-34, 35-44, 45-54, 55-64, 65-74, 75-84, 85+). The health impact is actually calculated for each subgroup at the census track level. After each change in health impacts is calculated for each census track, we sum across the results for an air basin or for the entire state. Heath impacts are calculated for each year; they are then averaged over three years to reduce the influence of any year with unusual meteorology on the overall results.

Justification for Rollback

In the discussion above, the roll-back methodology was based on an assumption of a constant rate of PM2.5 reductions within each basin. The validity of this assumption was investigated through an empirical analysis of historical PM2.5 data using various data sources. We examined the rate of decrease in PM levels in Mountain Counties, South Coast, San Francisco Bay Area, San Joaquin Valley, and Sacramento Valley Air Basins, where there were sufficient data between 2000 and 2005. The three-year measured average PM concentration above background of 2.5 $\mu g/m^3$ for each site within a given air basin was calculated for 2000-2003 and 2003-2005, and the rate of reduction considered. As shown in the following table, our analysis indicated that over the years, PM levels decreased at similar rates across sites within each of air basins examined in California.

That is, for each air basin, we assumed that only the portion of the PM2.5 average above background will decrease as progress toward attainment of a standard takes place. Thus, for each air basin, the rollback factor represents the percentage reduction needed to bring the basin high towards attainment of a standard.

Next, for all sites within the basin, the portion of the current PM annual average above background was shrunk by the rollback factor, as follows:

```
if Current PM > Background then

   Attainment PM = Background + (Rollback Factor)×(Current PM - Background)
else

   Attainment PM = Current PM
```

The assumption of applying a basin-specific rollback factor to all sites within each basin is justified by the investigation detailed below. Further, it is consistent with air quality plans which are aimed at attaining an appropriate air quality standard by designing programs that would bring down ambient measurements at the high site and at the same time reduce levels at other sites within each basin.

STEP 2: Estimate PM concentration per census tract

The concentration per census tract is estimated using the ambient annual average PM2.5 concentrations measured at monitoring sites. This step is done with BenMAP[9], a software program developed by the U.S. EPA for estimating and mapping health impacts associated with air pollution. BenMAP interpolates PM concentrations using nearby monitored values with the inverse distance weighted squared method.

The interpolation is confined to a 50-kilometer radius, with the weight assigned to each nearby monitored PM value as the inverse square of the distance from the monitor to the location of interpolation. In some areas of California, there may be no monitoring information within 50 kilometers. In these cases, the concentration that will be assigned will be from the closest monitor, regardless of the distance. The end result is a smooth contour surface of PM values throughout the entire state. The interpolated value is then assigned to each census block center. This step is performed for each of the three years.

The same procedure is applied to obtain observed as well as rolled-back exposures in each tract. This step is performed for each of the three years.

STEP 3: Estimate mortality impact

The concentration-response functions are applied to calculate mortality impacts due to long-term changes in PM exposure, using county-specific baseline incidence rates from the Center for Disease Control[10].

[9] http://www.epa.gov/air/benmap/download.html
[10] http://wonder.cdc.gov/mortSQL.html

Appendix 3 (Methodology for Estimating Ambient Concentrations of Particulate Matter from Diesel-Fueled Engine Emissions)

Introduction

This document outlines a method to estimate annual average concentrations of diesel particulate matter (DPM) over large spatial scales. It consists of a simple variation of receptor model, which use measurements of ambient chemical concentrations to infer source contributions, known as the tracer species method.[1] A basic assumption in this method is that the ambient concentration of a tracer species, C, may be used alone to infer the ambient concentration of a pollutant from a specific source, S:

$$S = \alpha C,$$

where α is a scale factor that is independent of location. In the estimation of DPM, we take C to be the ambient concentration of NO_x and S to be the ambient concentration of DPM less than 2.5 µm (DPM2.5). The factor α relates the concentration of PM produced by diesel-fueled engine emissions to the concentration of NO_x produced by all sources. In the following section, we demonstrate that estimates for α based on the emission inventory (EI) and on source apportionment (SA) studies agree within calculated uncertainties. We approximate the distribution of α values over counties by a Gaussian distribution with mean 0.023 and standard deviation 0.006 (for the year 2000). This single value for α and associated dispersion may be used to infer DPM concentrations from measurements of ambient NO_x concentrations in all air basins.

Background

The primary interest of the California Air Resources Board in the estimation of ambient DPM concentrations is for assessment of potential cancer risk. For this purpose, annual average ambient concentrations of DPM are needed. These values are used to calculate lifetime average daily doses[2]; multiplication of the average daily inhalation dose over 70 years with a cancer potency factor gives inhalation cancer risk estimates. In previous estimates[3] of DPM10 concentrations, the Air Resources Board (1998) used a method based on ambient total PM10 concentrations. In this approach, one of two factors, rural or urban, which were determined from chemical mass balance source apportionment studies (CMB) and emission inventory estimates (EI), was used to scale PM10 measurement values to obtain estimates of DPM10 concentrations. Air basins that had more or less diesel to total PM10 emissions than the base case had these DPM10 estimates scaled by another factor (that was determined from the EI): the ratio of air basin to base case value of the relative DPM10 to total PM10 emissions. Application of this method, therefore, depends on several elements, the most important of which are: measurements of ambient PM10 concentrations, previous source apportionment work in specific air basins (base cases), and emission inventory estimates. These components are also the primary weaknesses of the method. Specifically, PM10 contains predominantly crustal material and the fraction associated with diesel PM is very small - at most approximately 0.065; early CMB studies may not

Trends in Annual average PM2.5 Above Background, 2000-02 to 2003-05

Basin Name	County	Site	PM2.5 above background (µg/m^3)		% Change above background since 2000-02 (period2-period1)/period1
			2000-02 (period1)	2003-05 (period2)	
Mountain Counties	Calaveras	San Andreas-Gold Strike Road	6.5	5.3	-19%
	Nevada	Truckee-Fire Station	6.0	4.4	-26%
South Coast	Los Angeles	Lynwood	21.1	16.3	-23%
	Los Angeles	Pasadena-S Wilson Avenue	17.7	14.3	-19%
	Riverside	Riverside-Rubidoux	26.4	20.2	-24%
San Francisco Bay Area	Alameda	Fremont-Chapel Way	9.2	6.5	-29%
	Alameda	Livermore-793 Rincon Avenue	9.8	6.9	-30%
	San Mateo	Redwood City	8.7	6.5	-25%
	Solano	Vallejo-304 Tuolumne Street	10.1	7.5	-25%
	Sonoma	Santa Rosa-5th Street	8.0	5.7	-29%
San Joaquin Valley	Fresno	Fresno-Hamilton and Winery	16.9	14.8	-13%
	Kern	Bakersfield-Golden State Highway	20.4	16.5	-19%
	San Joaquin	Stockton-Hazelton Street	12.8	10.6	-17%
	Stanislaus	Modesto-14th Street	15.2	11.5	-24%
Sacramento Valley	Butte	Chico-Manzanita Avenue	12.1	10.1	-17%
	Placer	Roseville-N Sunrise Blvd	9.9	7.5	-25%

References for Appendix 2

CARB 2004. California Air Resources Board. Staff Report: Review of the California Ambient Air Quality Standard for Ozone, available at:
ftp://ftp.arb.ca.gov/carbis/research/aaqs/ozone-rs/rev-staff/vol4.pdf

Ostro B.C.; Tran, H.; Levy, JI. 2006. The Health Benefits of Reduced Tropospheric Ozone in California. *Journal of the Air & Waste Management Association* **56**:1007-1021.

be as accurate as more recent organic marker species-based CMB methods; and early emission inventory estimates may not be as accurate in accounting for all source emissions as more recent models. We believe the proposed use of ambient NO_x concentrations is more direct than the PM10 method to estimate DPM concentrations: close linkage of diesel-engine produced NO_x to total emitted NO_x – about half total NO_x emissions are from NO_x from diesel sources – and relatively good correlation of ambient with recent emission inventory estimates for α.

Methods

In this section, we develop an approximate value for α, the ratio of ambient DPM to NO_x concentrations. First, we compare the ratio of ambient concentrations DPM/ NO_x from several source apportionment (SA) studies with the ratio of annual emissions $(DPM/NO_x)_e$ from the 2000 emission inventory (EI). Currently, the source apportionment studies are considered the best available methods for determining ambient DPM concentrations (at selected monitoring sites); agreement between the SA and EI estimates of α is used to support the use of a single α value for the whole state of California. Second, based on this favorable comparison, we use the distribution of county EI estimates for the $(DPM/NO_x)_e$ to determine an average and standard deviation for α.

In the following, we estimate the ratio of DPM to NO_x concentrations for ambient air for two year-long and several short-term source apportionment modeling studies with co-located NO_x measurements. These studies utilize organic chemical speciation for chemical mass balance (CMB) apportionment of PM, which is considered to be essential for the accurate separation of gasoline from diesel-fueled engine emissions. A substantial source of uncertainty in all these studies, however, is in the off-road diesel source contribution. These sources are captured by CMB modeling only to the extent the emissions are similar in chemical composition to those of on-road diesel trucks. In light of the emission inventory estimate that approximately half the diesel contribution to PM and NO_x is from off-road sources, this poorly understood aspect of SA modeling warrants qualifications in all CMB estimates of DPM.

The first considered year-long PM source apportionment work was part of the Children's Health Study (CHS 1995), in which James Schauer carried out organic chemical PM CMB studies for 11 sites in the South Coast Air Basin.[4,5] Hence, 11 annual average values for DPM and NO_x concentrations are available from this work. Two of the sites are centrally located (North Long Beach and Riverside), while the rest are in more or less outlying areas. The second considered SA study was carried out as part of the Central Regional Particulate Air Quality Study (CRPAQS 2000) by Desert Research Institute (DRI) in the San Joaquin Valley.[6] From this work, 6 estimates of annual average DPM and associated NO_x are available. Most of these sites are in urban areas (with the exception of Bethel Island). Although J. Chow of DRI used a different methodology to measure elemental and organic carbon (IMPROVE method) than used by J. Schauer for CHS (NIOSH method), DRI utilized similar specific organic chemical markers for combustion sources. In addition to these long-term measurements, side-by-side CMB modeling was done at two sites for one week each in southern California in

1999 by the two foremost organic marker CMB modelers, E. Fujita and J. Schauer, as part of the Diesel-Gasoline Particulate Split Study (2000).[7,8,9] An unexpected result from this study is that apportionment of PM depends on the specific carbon measurement method utilized (to determine relative organic/elemental carbon). Such differences in apportionment are currently not incorporated into uncertainty estimates. We also note that the Diesel-Gasoline Particulate Split Study raised several important, but still unresolved, questions in the interpretation of CMB modeling results. Specifically, SA estimates may be very sensitive to the choice of source profiles used; e.g. the characteristics of the "average" driving cycle, categories of vehicles, composition of the fleet (e.g. inclusion of high emitter categories such as gasoline "smoker" vehicles) and, information about average high emitter organic species emissions. These aspects bear directly upon SA attribution estimates in a poorly understood manner. Results from several recent short-term apportionment studies that do not utilize CMB modeling are also included below; these studies provide further evidence for a wide range of DPM estimates. Based on a comparison of SA and EI results, we develop an estimate of the DPM/ NO_x ratio from the EI.

Results

Figure 1 shows site-to-site variation of source apportionment estimates of the ratio (annual average DPM10 concentration)/(annual average total NO_x concentration) from the CHS (1995). The sampling sites are described in the CHS Final Report and represent 11 communities in the South Coast Air Basin; these include four urban sites, two sites in a mountainous region, one desert site, three rural coastal sites, and one rural inland site. NO_x measurements and filter samples (organic chemical marker measurements) were taken at the same locations. A straight average over all 11 sites of the ratio DPM10/ NO_x, gives the mean value as 0.024 (0.011), where here and in the following the value in parentheses denotes the standard deviation. An alternative estimate based on regression of DPM10 concentrations against ambient NO_x concentrations (over 11 sites) gives 0.022 (0.009); see Fig. 2. In this, and all following regressions, the intercept is set to zero, which makes the regression less sensitive to scatter and is physically meaningful, as one expects that diesel emissions tend to zero with total NO_x emissions. Removal of an outlying value (for Mira Loma) gives a slope of 0.026 (0.006), which is also shown in Fig. 2.

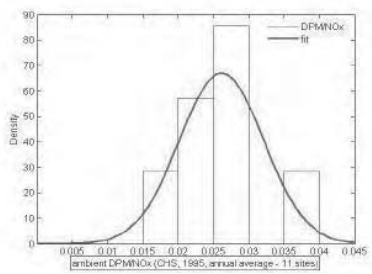


Figure 1

study investigated the sources of uncertainties in the relative contributions of diesel and gasoline vehicle emissions to PM2.5 in the south coast (2001) – the Gasoline/Diesel PM Split Study.[7,8,9] In this work, James Schauer (University of Wisconsin, Madison) and Eric Fujita (Desert Research Institute) collected samples side-by-side for sources (57 light duty gasoline and 34 heavy duty diesel vehicles) and ambient air (two sites Los Angeles, N. Main, and Azusa), and carried out independent chemical and SA data analyses. The SA results show a lack of agreement between diesel PM estimates: apportionment of PM to diesel emission sources by the two groups differ by approximately a factor of two; see Fig. 4. Estimates for DPM2.5/ NO_x are: .010 (.003) Schauer and .023 (.004) Fujita. Because ambient and vehicle emission samples were collected side-by-side, these results indicate that the disparity in DPM estimates are driven by differences in SA methodology, which includes differences in carbon measurement methods (NIOSH vs. IMPROVE), organic marker chemical species, and chemical marker profiles for vehicles. Without *a priori* information about which method is more accurate, we believe both estimates should be weighted equally, giving DPM/ NO_x = .0165 (.009).

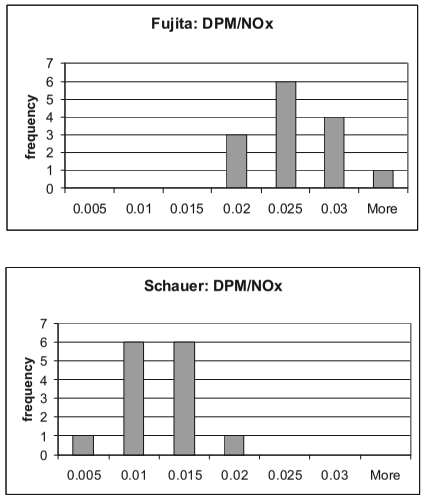


Figure 4

Recent analyses of ambient PM by Livermore National Laboratory (LLNL) in 2007 and ARB's Monitoring and Laboratory Division (MLD) in 2003 gave estimates of DPM concentrations that are similar to J. Schauer's, but not E. Fujita's, results for the Gasoline/Diesel PM Split study: DPM concentrations on the order of 1 μg/m^3 (precise estimates and analyses with colocated NO_x measurements await further work). These values would presumably support the lower DPM/ NO_x ratio of .01 (with a likely relative uncertainty of 50 percent). These studies used methods other than CMB to apportion PM to diesel sources: LLNL utilized fossil carbon measurements (based on Carbon 14) and MLD utilized n-octadecane as a tracer. LLNL show that the average fossil elemental carbon (FEC) at Wilmington is approximately 1.05 μg/m^3 (based on the limited data), and the average FEC at Roseville is approximately 0.65 μg/m^3, which, assuming that all FEC is from diesel emissions and that OC emissions from diesels are small in comparison, may be considered upper bound DPM concentrations. MLD's study yielded estimates of DPM for Wilmington as 1.2 μg/m^3 and Sacramento as 0.8 μg/m^3, and the statewide average as 1.0 μg/m^3. These estimates, however, differ by

As expected, the dispersion in α is much larger over individual measurements of DPM/ NO_x than it is for the regression coefficient. It is unclear which choice of error is best for use in personal exposure estimates that use population weighting. The site-specific DPM/ NO_x values, Fig. 1, are best estimates for local DPM/ NO_x ratios, though specific meteorology and lack of population weighting may emphasize unrepresentative values. Similarly, DPM/ NO_x ratios obtained from linear regression (with zero intercept) are highly influenced by data with large NO_x and/or DPM values. Because ambient NO_x concentrations may not be related to population density, we believe the statistics for the ratio DPM/ NO_x are better estimates than regression coefficients for DPM exposure-related work. We take the standard deviation of the distribution as the measure of uncertainty in α for SA studies.

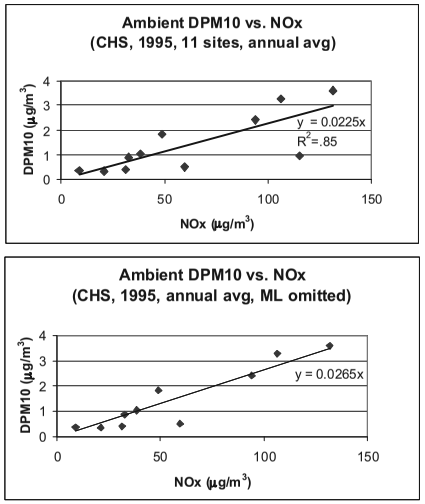


Figure 2

The other year-long SA estimate for α is from CRPAQS (DRI, 2000) for the San Joaquin Valley. A straight average of the ratio of SA DPM to NO_x concentration for 6 sites in SJV gives 0.017 (0.009). Figure 3 shows a regression of SA ambient DPM against NO_x, which gives a slope of 0.015 (0.004). As for the previous SA work, we take the standard deviation (0.009) from the distribution of DPM/ NO_x values as an indicator of the variability in ambient ratios.

We note that the relative variability of DPM/ NO_x in both studies is very large: standard deviation/average ~ .5 (.011/.024, .009/.017). We believe this large uncertainty in SA estimates best captures local variation of source composition, mixing, chemical reactions and other factors. Hence, this order of uncertainty is expected in any estimate of DPM based on ambient NO_x concentrations.

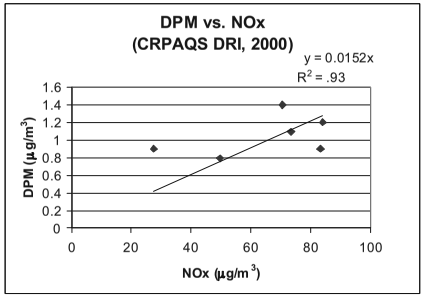


Figure 3

A recent short-term SA modeling

over a factor of 2 from the recent MATES III organic marker CMB estimate of more than 3 μg/m^3 in 2004-2005 (in Wilmington). Therefore, while these two independent estimates, yielding approximately 1 μg/m^3 ambient diesel PM (in the South Coast air basin), provide further support for the lower end of DPM/ NO_x ratio, considerable uncertainty remains (CHS, Schauer's Diesel/Gasoline PM Split, and MATES III support higher DPM concentration estimates).

A comparison of the above SA estimates with the emission inventory can not be made directly: emission inventory estimates are for whole counties while SA estimates are specific to monitoring sites and implicitly take into account meteorology, chemistry and deposition. Hence we compare average values for DPM/ NO_x from the previous SA studies with EI estimates of DPM to total NO_x emission ratios. For this purpose, the EI estimates for DPM and total NO_x emission rates for individual counties are utilized.[10] These estimates may be visualized as tons of pollutants emitted each day into a well mixed box covering each county, with removal rates of DPM and NO_x proportionately the same. The assumption of equal removal rates is difficult to verify, given that the rates are caused by deposition, chemical reactions, and flow out of air basins. Further, while the atmospheric lifetimes for DPM and NO_x are typically very different (greater and less than a few days, respectively), which would bias the ratio of DPM/ NO_x toward higher values, the mean residence time of an air parcel in a coastal air basin is often a few hours, which would greatly lessen the difference in removal rates. Given this rough basin lifetime, we assume in the following equal removal rates for NO_x and DPM, and take the overall agreement between SA and EI estimates as support for this assumption.

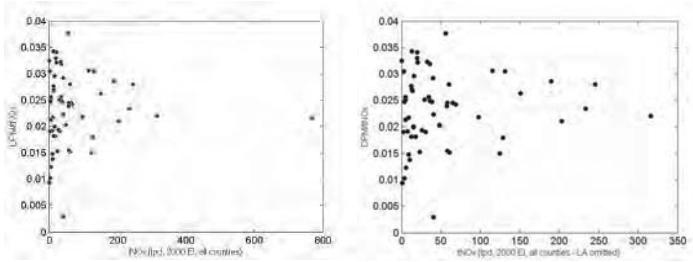


Figure 5

Emissions inventory estimates incorporate spatial and temporal averaging over large scales and therefore may be used to estimate average ambient DPM/ NO_x ratios directly (in this and following expressions, we abbreviate total NO_x by NO_x alone). A plot of (DPM/ NO_x) against NO_x for all counties in California is shown in Fig. 5. Omission of Los Angeles county, which contributes an extremely high value of NO_x (average tons per day), results in the second plot in Fig. 5. These scatter plots show that the ratios DPM/NO_x are clustered about an average and that the dispersion depends on the

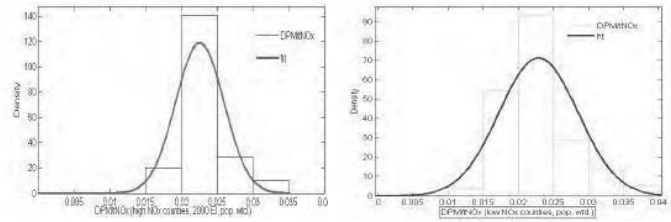


Figure 6

average annual NO_x emission rate. The second plot in Fig. 5 shows that a separation of high-NO_x from lower-NO_x emission counties occurs with a division around an annual average of 80 tons per day. (High- NO_x counties are listed in the section Results.) High-NO_x counties are highly urban and have similar composition of diesel to non-diesel emission sources. To better capture exposure-related estimates of DPM/ NO_x, each county value is weighted by its population; weighted histograms are approximated by normal distributions. Figure 6 shows the high- and low-NO_x emission distributions for α. The mean and standard deviation for α are: 0.023 (0.003) for the high-NO_x county estimate and 0.023 (0.006) for the low-NO_x county estimate. In summary, the distribution for the factor α is described by a single mean value, independent of high and low-NO_x counties, and a dispersion that depends on whether the county is highly urban or not. We take the greater deviation of DPM/ NO_x ratio for low- NO_x counties as measure of the variability that is locally encountered within air basins.

The above estimates of the ratio DPM/NO_x from the EI-population weighted and SA studies compare well, given the relatively large uncertainty: EI: county average 0.023 (0.006); and SA: SC 0.026 (0.006), SJV 0.017 (0.009), and Gasoline/Diesel PM (GDPM) Split SCAB 0.017 (.009); see Fig. 7. This agreement between EI and SA estimates for α motivates the use of a single scaling factor for the whole state of California to estimate annual average concentrations of DPM from annual average measurements of NO_x. We take the EI

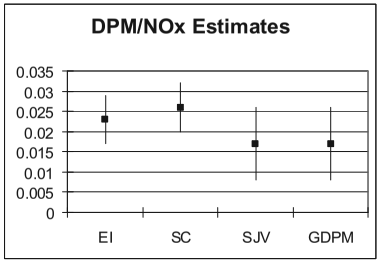


Figure 7

A comparison of DPM concentration estimates for the year 2000 from the proposed NO_x-scaling method (proposed) with the projections from the previous PM10-scaling method[3] is given in Table 1. The overall agreement between DPM concentration estimates is good, and for the six highest population air basins is very good. More specifically, the six highest population air basins contain over 90 percent of the population of California and contribute greater than 96 percent of the population weighted DPM concentration; in each of these air basins, the difference between the proposed and the previous DPM concentrations is less than approximately 20 percent (of the previous estimate). It should be noted that the previous estimates use a baseline year 1990 and are projected forward by a decade based on linear rollback, and so do not constitute the best approximation for year 2000. Greater variation of agreement between proposed and previous methods is found for lower population air basins. Many factors contribute to this variability, several of which are: the larger dispersion in the DPM to NO_x ratio (.006), uncertainty in application of PM10 scaling method to regions less similar to the SJV, and greater influence of localized emission sources. Altogether, the proposed, population-weighted DPM concentration for California is increased by 11 percent over the previous estimate. This high level of agreement between the population-weighted DPM estimates gives confidence that the proposed method is consistent with the previous technique and represents a viable approach to estimate DPM exposure.

In summary, the proposed method to estimate ambient DPM concentrations has distinct advantages over the previous PM10 method as well as several important limitations. The primary strengths of the method include the strong relation of DPM to (total) NO_x; simple application; estimates of uncertainty intervals; and ability to capture sub-county variations in DPM concentrations. In addition to these strengths, the approach is tied directly to the ARB emission inventory, and links bottom-up EI estimates with top-down SA estimates. Several limitations and caveats also bear on applications of the method. The limitations include all assumptions sufficient for application of EI estimates to ambient air, such as well-mixed air parcels (county scale), proportional removal rates for NO_x and DPM, proportionally uniform emission rates for all NO_x and DPM sources, etc. Verification of these assumptions is in general not possible; instead, agreement between EI and SA estimates is taken as best available evidence. The uncertainty intervals produced by the estimation method are based on variations between low- NO_x counties and reflect differences in relative emission sources (primarily diesel vs. non-diesel). As such, the uncertainty describes the confidence in α to accurately describe local NO_x emission sources. Further work is needed in strengthening the understanding of the contribution of various emission sources to ambient concentrations of both gases and particles. In this respect, source apportionment work that utilizes organic marker species is the best available approach; ideally, highly time-resolved studies would allow better characterization and support for single species scaling estimates, such as the NO_x-scaling method. Finally, off-road diesel sources, which are a large source of uncertainty in current CMB modeling, need to be explicitly included in future source apportionment studies (i.e. chemically characterize emissions as a function of operating mode and construct a source profile for CMB modeling work).

values for the average and standard deviations low-NO_x emission counties as best estimates for DPM/ NO_x; these counties capture some of the variation in emission sources that is encountered locally. The value α = 0.023 (0.006) is a population weighted estimate of DPM/NO_x for all locations in California; the standard deviation indicates the uncertainty in this choice of α for a given county.

Conclusions

Based on the agreement between SA and EI estimates of the scaling factor α, the ratio DPM/total NO_x, we propose the use of a single value of α for estimating the population-weighted annual average ambient DPM concentration for California. These DPM estimates depend upon the network of ambient NO_x measurements from the ARB monitoring sites. In the following, we outline a method to calculate such averages. First, the annual average DPM concentration at each monitoring site is estimated as the product of annual average NO_x concentration value and α. The uncertainty associated with this DPM estimate is the product of the annual average NO_x measurement value and the low-NO_x county standard deviation, .006. [Although not utilized, the following twelve counties are considered high-NO_x (annual average NO_x more than .80 tons per day): Los Angeles, San Bernardino, Kern, San Diego, Orange, Riverside, Alameda, Fresno, Santa Clara, Contra Costa, San Joaquin, and Sacramento; the remaining 46 counties are considered low-NO_x counties.] From this set of spatially discrete DPM concentration estimates a smooth DPM concentration surface may be constructed using kriging or other methods. In remote areas without monitoring sites, the smoothing method may be modified to incorporate a minimum concentration, which reflects a nonzero background value (or such areas may be removed, if the population is sufficiently small). Second, census data for California is used to approximate a population density surface (population fraction per unit area) and the product of the population density and DPM concentration surfaces (pointwise) is taken. This product may be integrated over any region and divided by the fraction of California population within that region to give a population-weighted average DPM concentration; in particular, integration of the product may be performed over the state to give an average population-weighted ambient DPM concentration. Once ambient diesel PM concentrations have been estimated for a baseline year (2000), linear rollback techniques may be used to project concentrations for future years.

DPM concentration estimates (μg/m^3)			
Air Basin	Population	Previous	Proposed
Great Basin Valleys	32006	0.1	0.18
Lake County	58309	0.2	0.54
Lake Tahoe	46200	0.4	0.24
Mojave Desert	816742	0.1	1.46
Mountain Counties	408039	0.1	0.43
North Central Coast	710598	0.8	0.59
North Coast	310061	0.8	0.33
Northeast Plateau	87578	0.7	0.18
Sacramento Valley	2334277	1.3	1.02
Salton Sea	465886	1.5	1.29
San Diego County	2813833	1.4	1.49
San Francisco Bay	6605921	1.6	1.62
San Joaquin Valley	3189385	1.3	1.36
South Central Coast	1399218	1.1	0.93
South Coast	14592351	2.4	2.90
Statewide (pop. wtd.)	33870404	1.8	2.00

Table 1

References for Appendix 3

1 Henry R., Lewis C., Hopke P., and Williamson H., *Review of Receptor Model Fundamentals* (1984) Atmospheric Environment 18, 1507-1515.

2 *Air Toxics Hot Spots Program Risk Assessment Guidelines, Appendix D Risk Assessment Procedures to Evaluate Particulate Emissions from Diesel-Fueled Engines, 2003,* Office of Environmental Health Hazard Assessment.

3 *Estimate of Ambient PM10 Concentrations from Directly Emitted Emissions from Diesel Engines, Appendix III, Part A, Exposure Assessment from Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant* (1998). Report to the California Air Resources Board.

4 Manchester J., Schauer J., and Cass G. *Determination of the Elemental Carbon, Organic Compounds and Source Contributions to Atmospheric Particles During the Southern California Children's Health Study: Part B; The Distribution of Particle-Phase Organic Compounds in the Atmosphere and Source Contributions to Atmospheric Particulate Matter Concentrations During the Southern California Children's Health Study, 1995.* Final Report for California Air Resources Board.

5 Manchester-Neesvig J. B., Schauer J. J., and Cass G. R., *The Distribution of Particle-Phase Organic Compounds in the Atmosphere and their Use for Source Apportionment during the Southern California Children's Health Study* (2003) Journal of the Air and Waste Management Association. 53, 1065-1079.

6 Chow J., Chen L.W., Lowenthal D., Doraiswamy P., Park K., Kohl S., Trimble D., and Watson J. *California Regional PM10/PM2.5 Air Quality Study (CRPAQS): Initial Data Analysis of Field Program Measurements, Final Report, 2005* for the California Air Resources Board.

7 The DOE Gasoline/Diesel PM Split Study, Presentations by D. Lawson, E. Fujita and J. Schauer, California Air Resources Board Seminars webpage; and DOE/NREL Gasoline/Diesel PM Split Study webpage.

8 Fujita E., Campbell D., Arnott W.P., Chow J., and Zelinska B., *Evaluations of the Chemical Mass Balance Method for Determining Contributions of Gasoline and Diesel Exhaust to Ambient Carbonaceous Aerosols* (2007) Journal of the Air and Waste Management Association. 57, 721-740.

9 Lough G. and Schauer J., *Sensitivity of Source Apportionment of Urban Particulate Matter to Uncertainty in Motor Vehicle Emissions Profiles* (2007) Journal of the Air and Waste Management Association. 57, 1200-1213.

10 California Air Resources Board, 2007 Emission Inventory, Planning and Technical Support Division.

Appendix 4 (Peer Review Process and Results)

Cal/EPA has a new Interagency Agreement with the University of California (UC) for External Scientific Peer Review. The Agreement incorporates guidelines for Cal/EPA organizations requesting external review. Reviewer candidates are independently identified by the University of California at Berkeley, Institute of the Environment, in collaboration with UC colleagues.

The request for reviewers to the Cal/EPA Project Director for the proposed methodology resulted in six reviewers being identified and approved for this assignment. Collectively their expertise is based on research in the following areas: chronic obstructive pulmonary disease related to air pollution; statistical analysis of epidemiological data; particle formation and measurements in air; air quality risk management; air pollution and daily mortality associations; and epidemiology. These reviewers received a draft report dated August 23, 2007 and evaluated whether CARB staff correctly interpreted the results published in the literature, including U.S. EPA's expert elicitation, and whether staff correctly developed methods for estimating premature deaths associated with public exposures to ambient PM. The peer reviewers provided staff with written comments on a draft of this report. Staff then addressed and incorporated the results of the peer review into this report.

In addition, the peer reviewers considered the two scenarios and concluded that mortality C-R functions can be applied to small areas and populations, as long as uncertainties and limitations are explicitly stated, including:

- The composition of PM must be limited to sources known to be toxic, such as diesel PM.
- For small populations, the risk can be described as the risk reduced by a certain percentage.
- Demographics of the affected population should reflect the general demographics of the population considered in the original epidemiological studies.
- The concentration of PM should not vary significantly for the population affected.

The peer reviewers also suggested that staff consider that the concentration of PM may vary by an order of magnitude over a distance of 0.5 km, and fine scale modeling may be needed. They also cautioned that the demographics of the small population may not reflect the county population, and adjusting the incidence rate for age, gender and socioeconomic status differences may be needed.

Based on their expertise, two of the peer reviewers were also asked to comment on the proposed methodology for estimating diesel PM concentrations. Their comments are also included in this appendix.

The peer reviewers and their affiliations are:

Jeffrey Brook, Ph.D.
Environment Canada
Adjunct Professor
Public Health Sciences/Chemical Engineering
University of Toronto

Mark D. Eisner, M.D., M.P.H.
Associate Professor
Pulmonary and Critical Care Division
UC San Francisco

Richard C. Flagan, Ph.D.
Professor
Chemical Engineering/Environmental Science and Engineering
California Institute of Technology

Alan Hubbard, Ph.D.
Assistant Professor
Biostatistics
UC Berkeley

Joel Kaufman, M.D., M.P.H.
Professor
Environmental and Occupational Health Sciences
University of Washington

Joel Schwartz, Ph.D.
Professor
Environmental Health/Epidemiology
Harvard University

A. Comments on General Methodology Described in the Draft Report

In this section, a summary of comments from the peer reviewers is presented, followed by individual comments from the six experts.

Summary of Peer Reviewer Comments
On General Methodology Described in the August 2007 Draft Report

Issue	J Brook	M Eisner	R Flagan	A Hubbard	J Kaufman	J Schwartz
Credible Range	10% ok. Upper and lower bounds could be better.	Good.	10% ok. No comment on range.	10% is good.	Good. Should discuss Miller 2007 and newer publications.	Did not fully discuss opinion.
Sensitivity Analysis	Results presented show wider ranges than adopted as credible range. Recommend pooling all 12 expert or 10 expert distributions, but recognize the lower limit of 0 would be problematic.	Delete Jerrett 2005 in one sensitivity run. Pool results of all studies in another run.	No comment.	Consider using sensitivity results to develop upper and lower bounds of credible range.	Do not include both Pope and Jerrett in one run.	Can pool Pope with Jerrett. Point out bias in Adventist study. Add Laden's results on PM change between periods and give Laden more weight.
Cut-off Level	7 ug/m3 is good.	7 ug/m3 is not well-justified. Consider 2.5 ug/m3 as an alternative.	Need to justify dropping 0 ug/m3. Should consider no threshold.	No comment.	No comment.	7 ug/m3 is not defensible. Should use 2.5 ug/m3.
Roll-back	Reasonable. Clarify the use of background 2.5 ug/m3.	No comment.	Revise the formulae and explanations.	Reasonable	No comment.	Revise description for rollback method; as written, it is unrealistic.
Overall	Good.	Good.	Need clarity in several places.	Good.	Good.	Generally good.

A.1 Jeffery Brook

Scientific Review of the Air Resources Board (ARB)
Draft Report on "Methodology for Estimating the
Premature Deaths Associated with Long-term
Exposures to Fine Particulate Matter in California"

Reviewer: Dr. Jeffrey R. Brook, Senior Research Scientist, Environment Canada; Adjunct Professor, University of Toronto.

Comments

The comments below focus on the three key components identified in Attachment II. In reviewing the material provided I have considered whether the methodology described represents sound scientific knowledge, judgment, methods and practices. Although knowledge on $PM_{2.5}$ health effects and $PM_{2.5}$ exposure has advanced dramatically in the past 10+ years, understanding of the issue is far from complete. Much remains to be learned about the relative toxicity of different particles based upon their physical and chemical features and how they vary by source and as a result of atmospheric processes. The role of gaseous pollutants in the mix that people breathe and their interactions with and interactive effects with particles also requires clarification. The possibility that the net effect a given particle type can have on health also varies by endpoint (e.g., cardiovascular vs. respiratory mortality) and according to a person's susceptibility is also very real and not well understood. Furthermore, any information we have on these issues has yet to provide a means for more refined concentration-response functions (CRF). Consequently, a significant amount of assumptions must necessarily underlie any method for estimating avoided mortalities associated with decreasing $PM_{2.5}$ concentrations. Above all, this requires scientific judgment, with frank discussion of the assumptions made and the limitations of the method. Overall, the ARB draft report meets these criteria, although below are some comments that may help improve the document and spark some further thinking.

The development of a credible range based on expert opinions from a panel of experts selected by U.S. EPA

ARB's use of the U.S. EPA expert panel process implies two key assumptions:

- That the EPA process was appropriate and rigorous and represents the best approach to developing a CRF given the existing uncertainties, which are exemplified by the range of coefficients found in the different studies considered.
- That all the studies considered by the U.S. EPA (EPA) are relevant for the population and exposure conditions present in California.

In terms of the first assumption, the ARB is fully justified in building on the U.S. EPA's effort for two reasons. Firstly, the EPA's effort was itself thoroughly reviewed and, although there were some concerns expressed by its reviewers, it was deemed to be necessary and of high quality. For an assessment of the CRF relating premature mortality to long term $PM_{2.5}$ exposure, it is unlikely that this effort and its outcome could

be improved upon, given current information.

The second assumption is more difficult to judge due to the limited number of cohort studies of the premature risk posed by long term $PM_{2.5}$ exposure (as represented by an annual or multi-year average ambient concentration). The ARB staff adequately discussed this issue in the draft report. Given the fact that some of the studies were from populations in California, entirely or in part, and the lack of any evidence indicating that the study results are not applicable to California, I find that this assumption is justified.

Therefore, the information used by the ARB staff to develop the low, central and high CRF estimates is appropriate. Among these values, the central estimate of 10% is well explained. Using the median of the medians among all the experts involved in the EPA process is scientifically acceptable. It reflects current knowledge and I do not think that there are any other reasonable approaches that could have been followed. Furthermore, the sensitivity analysis supports this value and so it is well-justified

The values selected for the low and high points in the range are more difficult to assess and the ARB staff pointed out the challenge of determining these points. The question is whether or not the values identified have led to a credible range. From my perspective this is equally difficult to assess since no criteria were provided for what constitutes credible. I will assume here that credible means that there is some science-based evidence to support the range and that the high and low values are reasonable in terms of leaning towards being somewhat conservative and hence not likely to be controversial. Based upon this definition it is my view that the range of 4% to 16% is credible.

There are some important issues that should be addressed in the final version of the report. Firstly, it (the final report) should provide ARB's view of what the high and low values of the CRF actually signify. On page 5 of the report it is stated that they are an uncertainty interval, but is that truly what they are? Perhaps they represent uncertainty in a more subjective manner, but not in the purely objective, quantitative sense that some readers may expect from uncertainty values. Secondly, and related to the first point, the final report should provide a discussion of how ARB would use (i.e., communicate) results calculated from the upper and lower limits. Given how they were determined, it does not seem, as indicated above and below, that truly they express the degree of uncertainty about the central estimate. These comments are somewhat outside pure scientific review, however, selecting the range involves both objectivity and subjectivity and thus, it is important to clarify what the purpose or meaning of those values is expected to be. Ultimately, that is the only way to guide their quantification and application.

In the final report the way in which the upper and lower values in the range were determined needs to be explained in more detail to assist readers in assessing their scientific credibility. The general concept of bounding the range based upon the larger value from the "Six Cities follow up" and the lower value from the ACS is clearly

described. The reason for doing this is that the ARB staff speculated that developing the upper and lower bound from the full spectrum of expert opinions may be highly influenced by their "high" and "low" opinions. This may be possible, however, the full outcome of the expert solicitation should not be taken lightly. In their independent and collective deliberations they were equally aware of which studies were the key ones (i.e., ACS and Six Cities) and which ones could inform the possible range or uncertainty. In the draft report it is stated in the middle of page 27 that "Staff chose to rely on empirical evidence to bound the central estimate." I assume that what is meant by "empirical evidence" is that the result of a single study is considered to be empirical because it was purely a quantitative, statistical analysis, as opposed to expert opinion. The final report should clarify this and indicate exactly how 4% and 16% were obtained.

The upper bound of 16% appears to be in Table 1 (directly from Laden et al.). This value is further supported as being a plausible based upon the recent ACS L.A. sub-study (Jerrett et al., 2005). However, both of these studies (i.e., Laden et al. and Jerrett et al.) had upper confidence limits of 26-30% and so choosing the risk coefficients obviously is not recognizing the full range of uncertainty found in that research. Thus, a key point to realize is that ARB's recommended upper bound is smaller than the upper confidence limits of some of the studies and of some of the expert panel member's opinions. Thus, ARB has leaned towards being conservative on this issue. This is a prudent choice and any impact or benefit calculations using the upper bound should be less likely to be controversial. The final report should consider pointing this out.

The lower bound is potentially more controversial. It is also not clear where 4% came from based upon information in the figures or on Table 1. Thus, as indicated above, the final report needs to expand the middle paragraph in page 27 with more specifics. More about the lower bound will be discussed in the next section on sensitivity analysis.

Sensitivity Analysis

This analysis is important due to the lack of a single best approach to determine upper and lower bounds (i.e., the credible range) and the central or mean CRF. It helps support the values proposed by the ARB. Given the available information, the method developed by the ARB staff is scientifically acceptable in that multiple approaches were considered and evaluated against the recommended values. However, it is noted that ARB's range is narrower than any of these approaches. For the upper end, this implies that ARB is being conservative, but this is not the case in the choice of a larger lower end.

One difficulty from the results of the sensitivity analysis and from the range recommended by ARB is that any of the seven approaches included in the sensitivity analysis could probably be rationalized as being a credible approach. Overall, the most objective ones are probably #6 and #7 as they essentially remove ARB staff from the equation. If credible scientists rigorously polled highly reputable experts and other experts carefully reviewed the process (i.e., EPA's expert elicitation), then why not let that process speak for itself (i.e., used #6 or #7 to get the range)?

Although it is hard to follow how the draft report's description of what the random effects approach is supposed to account for (i.e., that the different values may have come from different distributions due to there being different CRFs potentially because of varying $PM_{2.5}$ composition) justifies its use for pooling expert opinions, the bottom line is that it is probably a more conservative approach than just taking a variance-weighted average. However, the challenge is that Table 3 shows that a lower limit of zero was obtained. There is a big difference between zero and 4% (the lower bound selected by ARB). Thus, the final report needs to provide a reason for the lower limit being positive and why that is more credible. I suggest that there is more than enough *in vivo* and *in vitro* toxicological data and human clinical data (i.e., biological plausibility) to support the notion that $PM_{2.5}$ does have an effect. Thus, it is highly likely that the lower bound is not zero and the evidence for this is much greater today than 10 years ago. Furthermore, given the tendency for the more recent cohort analyses and intervention studies to yield larger effects than the earlier work probably supports the larger lower range (i.e., 4%) compared to the other non-zero lower bounds derived from the sensitivity analysis.

The overall picture is that I do feel that sensitivity analysis provides some added and valuable scientific rigor to ARB's work, it was reasonably well done and it helps support what I agree to be a credible range of 4-16%.

Estimation of premature death associated with exposures to $PM_{2.5}$

The approach ARB proposes to use is discussed on pages 30-34. My opinion is that what is proposed is based upon sound scientific knowledge, judgment, methods and practices. Where possible, units should be stated for the variables in the equations (Y_0 and ß). The available $PM_{2.5}$ data are used appropriately to estimate the population exposure. Although the interpolation method used to assign monitoring site $PM_{2.5}$ concentrations to census blocks is relatively simple and does not consider terrain features or prevailing meteorological features that might distribute the particles differently across the state, it would require considerably more work to gain any improvements. Newer approaches such as land-use regression or data fusion are currently beyond the scope of the current draft report. ARB should check the maps in Appendix 1. The interpolation and contouring results for the latter two years and for the far SE portion of the state look different that I would expect given the concentrations around the nearest monitoring sites. Clearly, this would have little impact on any results.

Three cut-off levels, below which there are no benefits (avoided mortalities) to further reductions in annual average $PM_{2.5}$, were discussed in the report. Given the lack or information regarding the true value, if one exists given the ranges of susceptibility in the population and the possibility that it would be different for different endpoints or causes of mortality, the proposed value of 7 $\mu g/m^3$ represents sound scientific judgment. I agree that 2.5 $\mu g/m^3$ is too low and there are not sufficient data to adequately evaluate if annual average $PM_{2.5}$ levels between 2.5 and 7.0 $\mu g/m^3$ are associated with changes in mortality rate or whether or not ß is different in this range. However, using a value as low as 7 $\mu g/m^3$ as opposed to 12 $\mu g/m^3$ is well-justified based upon the ACS range and Pope et al.'s findings. Furthermore, time series studies indicate that there are acute mortalities occurring in communities with annual averages less than 12 $\mu g/m^3$. Thus,

this value is clearly too high.

To better understand the impact of these different cut-off values the ARB may want to consider future sensitivity studies where the number of avoided mortalities due to a proposed policy or a roll-back to attainment is computed using each of the values and then are compared. In the context of the types of changes in emissions to be expected via new policies on "goods movement", it seems unlikely that the use of 2.5 or 7 $\mu g/m^3$ for the cut-off would make much difference. However, using different values between 7 and 12 $\mu g/m^3$ could affect such results.

In the second part of this section of the draft report, where ARB describes how to determine ?PM given the max concentration in a basin and the cut-off value, there is one key assumption. That is that any roll-back strategy (i.e., the emissions reductions to attain the standard) to get the BasinMax into attainment will proportionately affect all other $PM_{2.5}$ monitoring sites and hence the population exposures within the basin. This is a reasonable assumption for crude roll-back analyses and, in general, data in the Appendix support it. However, in the context of the types of changes in emissions to be expected via new policies on "goods movement" this assumption would not likely hold. Clearly, ARB must be aware of this fact and would be constructing much more detailed base case and future case exposure maps under different policy scenarios. Finally, in this part ARB has set BG=2.5 $\mu g/m^3$. It is not clear to me if this is where the new cut-off value would be used. If this is the case, then I presume that 2.5 $\mu g/m^3$ is a "typo". If this is not the case then where and how does the cut-off value enter into the estimation of avoided health impacts?

Final Comments

The draft report and the methodology described are scientifically sound given current information on $PM_{2.5}$ health effects. The range for the CRF is credible and reasonably conservative and, as pointed out in the draft report, the true benefits that can be ascribed to reducing $PM_{2.5}$ are likely to be larger still because of endpoints that currently cannot be quantified. There are parts of the draft report that would benefit from some clarification and additional discussion, as noted above.

A.2 Mark D. Eisner

Critique of "Methodology for estimating the premature deaths associated with long-term exposures to fine airborne particulate matter in California." ARB, California EPA.

Mark D. Eisner, MD, MPH
UCSF

1. DEVELOPMENT OF A CREDIBLE RANGE BASED ON EXPERT OPINION

The elicitation process used by U.S. EPA and adapted by this report is robust and appropriate.

The issue of geographic appropriateness regarding the health effects estimates for $PM_{2.5}$ was discussed on page 24. One issue to consider is potential interactions between SOx, ozone, and $PM_{2.5}$. Because ozone and SOx levels vary geographically, would the health effects of PM differ in California vs. other areas with different ozone and SOx levels?

2. SENSITIVITY ANALYSIS

The use of the ACS and Six Cities studies to develop the upper and lower uncertainty limits does not take into account the variability around the risk estimates from each study (i.e, the 95% confidence intervals). The authors should consider an additional sensitivity analysis in which the lower 95% CI bound of the ACS and the upper 95% CI bound of the Six Cities studies are used. This would better reflect the variability implicit in those estimates.

On page 27 it is stated that it is technically incorrect to pool non-independent results from the same underlying cohort study (i.e., Pope 2002 and Jerrett 2005). It is therefore difficult to understand why it was done. The effect is to give greater weight to the ACS study. Consideration should be given to deleting the Jerrett analysis from the sensitivity analysis.

A suggestion for an additional sensitivity analysis would be to pool the results of all studies that measure $PM_{2.5}$ and all cause mortality, even those that have issues of genearlizability to the overall California population (e.g,. ASHMOG). The inclusion of non-generalizable studies would appear to be a less serious issue that the inclusion of more than one analysis of the same study (i.e., non-independence).

3. ESTIMATION OF PREMATURE DEATH

Estimation of PM concentration. It is stated on p.30 that there may be no monitoring information within 50 km. More information should be provided about what proportion of census blocks for which this is true. A sensitivity analysis excluding these centers should be considered to evaluate the impact of these centers on the effect estimates for

$PM_{2.5}$ and mortality.

Estimation of the mortality impact (p.30). The equation indicates a Beta coefficient. One presumes that this is for a 1 ug/m^3 $PM_{2.5}$ increment, but this should be clarified. In addition, there is a discrepancy between the baseline death rates, which includes all deaths over the entire population of all ages, and the "pop" variable which includes the population aged 30 years or greater. Can the baseline death rate and population variables be based on the same age ranges?

The issue of a $PM_{2.5}$ cut-off value. The analysis uses a cut-off $PM_{2.5}$ value of 7ug/m^3. Yet it is stated that 11/12 experts agreed that health effects may be observed at all levels of $PM_{2.5}$. The proposed analysis defines all exposure less than 7ug/m3 as zero exposure. This does not seem appropriate given the lack of evidence for a threshold effect. At a minimum, an alternate analysis that allows for linear extrapolation down to the background level of 2.5ug/m^3 should be performed.

On page 37 the statement is made that "Although the literature mostly favors a no-threshold model, without empirical evidence for PM effect between 2.5 and 7ug/m^3 we recommend that no premature deaths be associated with PM exposures in this range. As discussed above, this seems illogical. Although the functional form of the relationship between $PM_{2.5}$ and mortality in this range is not known, assumption of a linear relationship would appear to be more sound than to assume no health effects at all.

There are no results presented for the roll-back analysis. The methodology is presented, but the results are not.

A.3 Richard Flagan

Review of Proposed Methodology to Estimate Premature Deaths Associated with Long-Term Exposures to Fine Airborne Particulate Matter in California. (R. Flagen)

The methodologies described in this report are based upon results of a series of epidemiological cohort studies that provide an empirical basis for estimating premature deaths associated with exposure to fine particulate matter. At the same time, the challenges faced by the researchers who performed those studies raise fundamental questions about strategies for monitoring air quality, and that limit the resolution of the statistical analyses. The studies that were ascribed the highest reliability by the experts consulted in the EPA study employed $PM_{2.5}$ measurements of atmospheric, fine particle mass concentrations. Decades of such measurements at community monitoring stations in a number of cities have enabled the development of the methodology outlined in this report. Recent literature raises serious questions that suggest that $PM_{2.5}$may just be the tip of the iceberg - that associations with smaller particles should be explored, but the data for such proactive studies neither exist nor are likely to become available in the near future.

Traditional aerosol exposure monitoring reports only mass concentrations in a few broad size ranges: PM_{10} - particles smaller than 10 μm in diameter (Dp<10 μm), and $PM_{2.5}$ - fine particles for which Dp<2.5 μm. Exposures to fine particles are associated with a range of health consequences (Pope and Dockery, 2006) from increased asthmatic symptoms (McConnell et al., 1999) to decreased lung growth (Gauderman et al., 2000, Gauderman et al., 2002) to mortality (Pope et al., 2002, Jerrett et al., 2005). Mass based PM_{10} and $PM_{2.5}$ measurements are, for several reasons, blunt instruments for the assessment of exposures to potentially harmful particulate matter. Within any size fraction, the mass concentration is biased to the largest particles in the included size range. Numerous studies provide evidence that particle mass is not the best measure for potential health effects of fine particles, and that the smallest particles in the fine particle size fraction may have the most profound health effects (Oberdorster, 2000; Donaldson, et al. 2002). These effects cannot be found in epidemiological studies because the vast majority of air quality measurements are limited to those parameters that are covered in present regulations. This is a fundamental failing of the present air quality monitoring system. Until air quality monitoring goes beyond the presently regulated quantities, it will remain impossible to develop health effect associations with suspected, but unregulated (and hence unmeasured) atmospheric contaminants.

A more effective partnership between epidemiologists and health researchers, atmospheric scientists, and regulatory agencies will be required if emerging health problems are to be identified without decades of delay as fine particulate matter health impacts have required. This will require investment in the measurement infrastructure in addition to acquisition of health-related atmospheric exposure data. Instruments need to be developed that can provide data on contaminants of interest that meet the stringent needs of epidemiological studies, especially the ability to provide robust data at a cost that is compatible with extended duration, large scale studies. Lacking such foresight,

future attempts to assess health impacts will, like the present studies, be forced to rely on studies that do not fully constrain the exposure assessments.

The present methodology document does not address the questions raised above, but rather works within the constraints of the existing air quality and epidemiological data. In the discussion that follows, I have focused my comments on three basic questions that arise from the proposed methodology.

> *Question 1: Does the methodology in the present report provide a rigorous basis for the new relationship for estimating premature deaths associated with long-term exposures to fine particulate matter in California?*

The methodology is based upon a careful review of the relevant literature; with emphasis upon the studies that are most widely accepted for provide the best quantitative estimates for the prediction of premature death rates. The data employed in those studies is limited, as outlined above, and some of the studies did not even have the full $PM_{2.5}$ data. In spite of the atmospheric data challenges, the studies produce a remarkably consistent picture of the effects of fine particle exposures. The methodology development study has also consulted EPA expert evaluations of the previous studies, which involved interviews to elicit assessments from 12 world-renouned experts on health effects of air pollutants. The CARB analysis of those studies considered subtle factors that might have influenced the EPA recommendations, and provide a clear basis for the recommendation that the relative risk of exposure to PM2.5 be a 10% increase in premature death rate per 10 $\mu g/m^3$ increase of $PM_{2.5}$ exposures.

> *Question 2: Does the methodology provide a reasonable basis for the assessment of the threshold for the effect of $PM_{2.5}$ exposure on the premature death rate?*

Here, I have difficulty in understanding the rationale presented for the premature death rate. The report notes that the suggested threshold of 7 $\mu g/m^3$ corresponds to the lowest levels observed in the Pope et al. (2002) study. Eleven of the twelve experts consulted by the EPA discounted the idea that a threshold exists in the influence of $PM_{2.5}$ on the premature death rate. The experts who favored epidemiological studies for determination of threshold effects conceeded that definitive studies needed to ascribe a threshold would be difficult or impossible.

In their considerations for the present methodology report, the CARB considered three alternatives for a threshold value, 2, 12, and 2.5 $\mu g/m^3$. No justification is provided for excluding 0 g/m^3 in their evaluation. One of the twelve experts consulted by the EPA thought that the shape of the concentration-response function may change at 7 $\mu g/m^3$, suggesting that this level may serve as a possible threshold. A suspected change in the shape of a continuous function by one of 12 experts seems a tenuous basis for saying that any effects below this value should be neglected. As stated in the report, Pope et al. (2002) do show that levels as low as 7 $\mu g/m^3$ can be associated with premature death. Lacking data below that value, that study could not quantitatively assess effects below that value.

The basis for the ascribed threshold seems to be that there is no empirical evidence for mortality effects below the values measured in the ACS study. No evidence other than a single speculation by one of twelve experts consulted by the EPA is provided in support

for the existence of a threshold at all. Applying the proportionality outlined by the proposed methodology to clean regions suggests that the assignment of a threshold may underestimate the premature death rate by 2.5 to 7% for the population in those regions. Lacking some empirical or physiological rationale for assuming that a threshold exists, I seriously question the inclusion of a threshold value.

Question 3: Is the methodology for estimating health impacts avoided by strategies designed to attain the standards reasonable and justified?

The methodology for estimating the health impacts avoided of strategies designed to attain air quality standards is convoluted and confusing. The Ostro reference on which it is supposedly based does not appear in the bibliography, nor does it appear as cited when I do a brief literature search. I have attempted to see if I can rationalize the approach taken. Unfortunately, the meaning or significance of PM_{attain} is not described. When I go through the algebra for the case where PM_{max} exceeds the standard, I do not recover a meaningful quantity to tell me the meaning or purpose of the reduction factor or PM_{attain}. The statement of the roll-back/attainment model needs to be rewritten to make it clear and unambiguous. It appears that PM_{attain} is intended to mean the PM level that one would estimate from the current year loadings if the PM levels were rolled back to meet the standard.
This would allow for year-to-year fluctuations in PM loadings in estimating health impacts, which seems reasonable.

Given a workable model, existing data would be used to estimate PM concentrations in each census block, using interpolation where local data are not available. Census data would then be used to estimate the population exposed. This seems reasonable. Results from census blocks would then be used to determine population-weighted exposure for each county, and applied to subsequent mortality impact assessments. Since more localized census block assessments are being determined in the methodology, one could also do exposure assessments and mortality impact assessments. Depending upon the nature of the mortality impact model used this could lead to different estimations of mortality than areal averaging of exposure data would suggest.

In estimating the mortality impact, the methodology does not state explicitly what model is to be employed, but rather provides an example of a log-linear function whose origin is not stated. This appears to be the result of applying Poisson statistics to the estimation of the number of deaths occurring in a population. As such, there appears to be a typographical error in the equation which, if I am correct, should read

$$\Delta Y = Y_0 [\exp(\Delta PM) - 1] * pop$$

It should be noted that this model introduces the nonlinearities in the statistics described above that raise questions about the use of county average exposures rather than census tract exposures in estimating mortality effects. Further, its application requires that the mathematical estimation of the change in PM levels be unambiguous, which not the case in the present methodology report.

In summary, the proposed methodology document needs work to make it clear to the

reader. The basis for the proportionality constant is based upon good scientific reasoning. The decision to impose a threshold needs to be better justified if it is to be maintained. Moreover, if it is maintained, the methodology for estimating excess deaths needs to reflect that quantity. The mathematical statements in the report require particular attention to correct a number of apparent errors. The bibliography should include all papers cited.

References

1. Pope CA, Dockery DW. Health effects of fine particulate air pollution: Lines that connect. Journal of the Air and Waste Management Association 56:709-742 (2006).

2. McConnell R, Berhane K, Gilliland F, London SJ, Vora H, Avol E, Gauderman WJ, Margolis HG, Lurmann F, Thomas DC, Peters JM. Air pollution and bronchitic symptoms in Southern California children with asthma. Environmental Health Perspectives 107:757-760 (1999).

3. Gauderman WJ, McConnell R, Gilliland F, London S, Thomas D, Avol E, Vora H, Berhane K, Rappaport EB, Lurmann F, Margolis HG, Peters J. Association between air pollution and lung function growth in southern California children. American Journal of Respiratory and Critical Care Medicine 162:1383-1390 (2000).

4. Gauderman WJ, Gilliland GF, Vora H, Avol E, Stram D, McConnell R, Thomas D, Lurmann F, Margolis HG, Rappaport EB, Berhane K, Peters JM. Association between air pollution and lung function growth in Southern California children – Results from a second cohort. American Journal of Respiratory and Critical Care Medicine 166:76-84 (2002).

5. Pope CA, Burnett RT, Thun MJ, Calle EE, Krewski D, Ito K, Thurston GD. Lung cancer, cardiopulmonary mortality, and long-term exposure to fine particulate air pollution. Journal of the American Medical Association 287:1132-1141 (2002).

6. Jerrett M, Burnett RT, Ma R, Pope CA, Krewski D, Newbold KB, Thurston G, Shi YL, Finkelstein N, Calle EE, Thun MJ. Spatial analysis of air pollution and mortality in Los Angeles. Epidemiology 16:727-736 (2005).

7. Oberdorster, G. Toxicology of ultrafine particles: in vivo studies, Phil. Trans. Roy. Soc. London A - Math. Phys. Engr. Sci. 358: 2719-2739 (2000).

8. Donaldson, K. and Brown, D. and Clouter, A. and Duffin, R. and MacNee, W. and Renwick, L. and Tran, L. and Stone, V. The pulmonary toxicology of ultrafine particles. J. Aerosol Med. 15: 313-220 (2002).

A.4 Alan Hubbard

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SCHOOL OF PUBLIC HEALTH
Division of Biostatistics October 1, 2007

Comments on *Methodology for Estimating the Premature Deaths Associated with Long-term Exposures to Fine Airborne Particulate Matter in California.*

Development of a credible range based on expert opinions from a panel of experts selected by U.S. EPA.

This section concerns the standardized methodology used to combine the opinions of 12 experts regarding the health hazards of PM2.5. This results is, per question asked, a set of subjective percentiles characterizing of the probability distribution (sort of an informal posterior probability) of the parameters relating PM2.5 to pre-mature death. For instance, the percentiles of the distribution specifying the slope of the dose-response relationship of PM2.5 and pre-mature death (that is, the change in mortality versus change in 1 $\mu g/m_3$ of PM2.5). These percentiles characterize both the central tendency of this distribution but also the range of probable values.

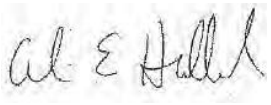
I agree that performing a formal aggregation of the expert opinions on the effect-size of PM2.5 exposure as well as providing formal inference would be unwarranted here. First, the sample size is small (only 12) and so any inferential procedures would be based on strong assumptions. Second, it is a stretch to think of this as a random draw of 12 experts from a large population of potential experts, which renders formal inference problematic. So, I think using the median values of the experts' median values seems a reasonable choice for the estimate of the effect size.

Sensitivity Analyses
I am not sure how to interpret taking the upper confidence bound from one study and lower one from other. I think a more defensible method for calculating the uncertainty bounds on the effect estimate would be a more formal method, such as those presented in the sensitivity analyses. For instance, taking the medians of the 95% credible ranges of the various experts. I could also see avoiding the entire expert panel and using the two main studies to derive the estimates and uncertainty bounds. In fact, the sensitivity analyses lead me to think, why not just do a formal meta-analysis since the report appears to be approximating that informally? However, because the analyses do not differ substantially, both in the mean and the range estimates, for the actual estimates and credibility bounds it is a moot point. My only technical comment, which is alluded to in the report, is that two of the studies use the same data and so the analyses formally combining the estimates really only have two independent studies which would certainly

make the confidence limits reported in Table 3 (2 through 5) increase if one accounted properly for this dependence.
Methods for estimating health impacts associated with PM exposures
These appear sensible to me, finding the relative risk for a change in PM2.5 exposure based on the consensus effect size and based on changing each region from it's typical exposure (as described in the report) to the roll-back value (or 0 if roll-back value bigger than typical exposure).

Other Comments

I would add a concern about they main studies that the 12 reviewers did not share, which Jerret, et al. (2005) exemplifies. That is, the adjustment for a large number of confounders in regression models. For instance, Jerret, et al. (2005) adjust for some 40+ confounders. Given how these confounders are entered are typically arbitrary (e.g., linear terms) the final results depend strongly arbitrary choices of model structures. Nonparametric causal inference, assuming you have measured all the confounders, requires that one has an unexposed person precisely matched (on all confounders) for every exposed person. Of course, with continuous exposure and high-dimensional covariates (confounders) this is impossible, so models are assumed. In this case, because the space of possible models is huge, one can only examine a tiny fraction of them, or just arbitrarily choose one. Treating the model as known, which is I know commonly done, really gives distorted inference at the end. The are techniques, which are no panacea, but at least attack this curse of dimensionality in a practical way and provide statistical inference at the end which is more commiserate with the lack of knowledge about the true underlying model. Broadly, these "causal inference" techniques are implemented using inverse weighted procedures (such as estimated of the so-called marginal structure model using inverse probability of treatment weighted estimators) – other more robust estimators are possible. My guess is they would provide at least very different inference (standard errors).



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A.5 Joel Kaufman

Peer review of draft report entitled "Methodology for Estimating the Premature Deaths Associated with Long-term Exposures to Fine Airborne Particulate Matter in California" draft not dated / version not numbered, but received with cover letter dated August 27, 2007.

Reviewer: Joel Kaufman
General comments:

In general, this is a reasonably well-written description of a methodology, which is basically sound and well-reasoned. I have a few major and a few minor quibbles. I will sort my comments into the sections provided in Attachment II of the mailing, to the extent possible.

1. **Development of a credible range based on expert opinions from a panel of experts selected by U.S. EPA**.

The expert elicitation process seems reasonable as a way to determine a credible range. I am puzzled by the introductory comments which indicate that the process would take into account newer studies, when the expert elicitation did not have access to most of that newer information. In particular, the introduction and Table I include studies not fully considered by the experts in that process. I would advise that the whole process needs to take into account available literature at the time of the document, OR say that you are relying on what was available at the time of the expert elicitation. I think that the dismissal of the Miller et al NEJM paper is a bit facile—since cardiovascular disease is the leading cause of premature mortality and the presumed cause of most PM-related excess mortality, to say that this study can't be included due to not providing estimates of all-cause mortality strikes this reader as difficult to defend. Most epidemiologists strongly prefer research that studies cause-specific mortality to all-cause mortality as being much more robust and meaningful. Again, I would advise that the process either needs to include this study or say that the whole process is based on information published at the time of the expert elicitation. If including the Miller et al paper, I think that the credible range needs to be expanded upward, since this paper not only has a larger magnitude effect-estimate, but also has improved information on exposure measurement, outcome assessment, and control of confounding compared with Six Cities and ACS.

2. **Sensitivity analysis**.

The section on the concentration-response relationship seems reasonable. I presume that the request for peer review is interested in the section on sensitivity analysis included in this section. I think this is basically fine, though I don't think it is reasonable to include both Jerrett and Pope papers in same pooling; should use one or the other. Also, BenMap is not described or cited in full, so a reader doesn't know what this application does "under the hood" and whether it has been validated in some way.

3. **Estimation of premature death associated with exposures to PM2.5.**

Assuming that the issues are resolved with regard to the mortality impact (see comments above), then this seems largely reasonable. I am a bit confused by what was done in Step 4. In particular, does the process take into account the age-distribution for each county? It would seem that age-standardization (between the population in the cohort studies and counties for which projections are being done) would be optimal for this, and if you can't do it for some reason, you need to do some simulations regarding various age-distributions to show that the results are robust to varying age-distributions. I fear that mortality impact forecasting will not be robust to different age-distributions of these counties when compared to the cohorts under study. Step five refers to death rates over the entire population of all ages, then pop refers to population age 30 or above in each county.

The Big Picture

(a) In reading the proposed methodology, are there any additional scientific issues that are part of the scientific basis of the proposed methodology not described above?

No.

(b) Taken as a whole, is the scientific portion of the proposed methodology based upon sound scientific knowledge methods, and practices?

I am mostly concerned about the incorporation or non-incorporation of research published since the expert-elicitation. The methodology needs to be more clear about this.

A.6 Joel Schwartz

Friday, September 28, 2007
Linda Tombras Smith, Ph.D.
Chief, Health and Exposure Assessment Branch
Air Resources Board

Dear Dr Smith

I have reviewed the proposed methodology for the estimation of PM benefits as a result of alternative environmental standards in California. I found the methodology generally reasonable, but felt there was room for improvement. My specific comments are below.

Sincerely,

Joel Schwartz
Professor of Environmental Epidemiology
Harvard School of Public Health
Director, Harvard Center for Risk Analysis

I continue to be puzzled by benefit methodologies that say there is no evidence for a threshold, and then assume a de facto threshold for computing benefits. The only rational way to explain this is that the authors have very strong priors that are virtually immune to data. In that case, the authors owe us:
a) An explanation of those priors
b) A Bayesian analysis that shows us quantitatively how strong the priors had to be to result in the assumption of a threshold.
c) An alternative analysis assuming no threshold.

The likely absence of a threshold means that there would be health benefits associated with reducing exposures even in communities in attainment of the standards. Recognizing this, the European Union has adopted regulations that require percentage rollbacks in all areas, even when in attainment of their guidelines. While it is not my job to recommend alternative regulations, it is worth noting that some approaches to achieving attainment in non-attainment areas will produce reductions in exposure in attainment areas. A good example is the US EPA Clean Air Interstate Rule. These benefits should be estimated, and when a choice of approaches is available to reach attainment, the consideration of those benefits would then be available.

In 1970, Lave and Seskin published a paper regression age standardized mortality rates in US cities against average particle concentrations in those cities. The advantage of that study was that the mortality experience of the entire population of each city was

compared to the average of the population- oriented monitors in the city. While individual exposures differed from the mean exposure, it seemed reasonable to assume that the exposure error was Berkson, and produced no downward bias in the estimated effect, since the average of all persons experience was being compared to the average exposure. The difficulty was that no individual level covariates were controlled, raising questions about confounding (e.g. by SES, smoking, or occupational exposures) and ecological bias.

The studies that EPA and CARB have relied on have alleviated that problem by using cohorts, with individual covariates. The problem with most of those cohort studies is that they are convenience samples, and unlike Lave and Seskin, do not capture the population mortality experience or the population average difference from the monitored exposure. If the convenience sample differed in health and exposure from the population mean identically in all locations, this would be less of a problem. However, there is no reason to believe this is true. Specifically the friends of the ACS volunteers in city A may represent a healthier, and less exposed subset of city A then they do in city B. This, clearly, can introduce bias into the estimates.

First there is potential confounding if, for example, the cities with higher exposures had systematically less healthy subjects recruited. I know of no reason to assume that this bias will always be in the same direction. However, it does introduce a greater uncertainty (above the statistical uncertainty derived from the standard error of the estimate) into the estimate from such a study. Moreover, the greater the possibility of the relation between sample health and population health varying from city to city, the greater this additional uncertainty. Second, there is no longer any reason to assume that the exposure error is predominantly Berkson. This, fairly unambiguously introduces a downward bias.

These concerns apply to all of the cohort studies, with the obvious exception of the Six City Study. The Six City Study chose a neighborhood within each city, recruited a **random** sample of that neighborhood, and put a population oriented monitor in the middle of each neighborhood. Most subjects lived within a few kilometers of that central monitor, and the assumption of Berkson error seems valid. Further, bias due to differential sampling in different locations was eliminated by the random sampling. This means that the extra source of uncertainty, and extra downward bias, present in the other studies is not present in the Six City Analysis, requiring that it be given greater weight. This does not comport with the approach of treating it as the high estimate.

The two studies standing in greatest contrast to this are the Adventist study and the VA study. While the Adventist study recruited from the same population (Adventists) everywhere, they did not necessarily live in locations within counties that had the same relation between exposure and county monitors in each location. While the Methodology discusses this study viz a viz generalizability, this potential source of bias is not discussed. The VA cohort of hypertensives could not control for cardiovascular medicine, despite known large geographic differences in the use of such medicine in hypertensives. For example, beta blockers are more commonly prescribed in the

Northeast than the rest of the US. This presents a substantial risk of confounding, since, for example, sulfate levels are higher than average in the Northeast. In addition the sampling frame is unclear, and may represent a different subset of the population in different cities. Again, the Methodology only discusses generalizability for this study, and not the high potential for bias. Hence I would give these studies less weight, and suggest at least a brief discussion of the issues raised above with respect to all studies.
The second point is that most of the cohort studies, including the original Six City Study, have contrasted a surrogate for long-term exposure with long term survival. They tell us that people live less long in more polluted cities. But the question that CARB needs to answer in order to do an analysis of the benefits of **reducing** air pollution is what mortality reduction accompanies a reduction in exposure. A cross-sectional analysis of mortality rates and air pollution does not tell us that, no matter how sophisticated the Cox proportionate hazard model is. It is an extrapolation to estimate change in mortality for change in pollution. However, the Laden paper provides precisely the estimate that CARB needs. In that sense, it is the only relevant study. Allowing that the extrapolation of the other studies is never the less reasonable, one still needs to give less weight to extrapolations than to studies directly addressing the question. These issues should be recognized and discussed in the health summary. Moreover, the summary of the Laden paper (Table 1) merely quotes the cross-sectional mortality analysis for the extended follow-up, and does not mention, let alone focus on, the coefficient relating change in mortality to change in pollution between two follow-up periods. This should be corrected. Again, greater weight should be given to the Laden study, and it should not be treated as the upper bound estimate.

Regarding the pooling procedure, the methodology correctly identifies issues, such as lack of calibration, which make formal pooling more difficult. However, their central tendency is, in fact, an unweighted median of medians, which is a form of pooling. What is left out is a formal estimate of the statistical uncertainty about that estimate. Instead ranges are taken by looking at the individual studies. That is a reasonable approach, but it could benefit from the alternative, also reasonable approach, of doing a formal estimation of uncertainty.

A meta-analysis has the great advantage of producing an estimate of how much variation among studies is likely due to chance versus true variation in result across study. This could be applied to the underlying studies to estimate statistical uncertainty. Of course, this does not capture the other sources of uncertainty, such as potential confounding, the issues I raised above, etc. That is the reason for expert elicitation—to provide a formal way to capture such uncertainty. That said, the variation in estimates across experts likely reflects both some true variation in how they assess these issue, and interpret the studies underlying their judgment, as well as some stochastic variability. A meta-analysis of their judgments can help estimate how much of the observed heterogeneity across them would be expected by chance and how much represents true uncertainty. Similarly, a Bayesian pooling could examine posterior distributions of estimates based on more or less informative priors. This would be a nice sensitivity analysis to the chosen approach. It would also avoid the difficulty highlighted by the Methodology—that high and low opinions of experts, essentially the outliers of

judgment, would drive the range. The random effects meta-analysis or Bayesian pooling approaches shrink these extremes toward the mean, and provide shrunken range of plausible dose-response curves.

I don't see any problem of pooling Jerrett with Pope, while formally it is a subset of the Pope study, the exposure gradient is entirely within urban area, while Pope's exposure gradient is entirely across urban areas. So these really are different analyses.

I am not sure what Benmap does to estimate random effects meta-analysis. Is it method of moments? Maximum Likelihood? REML? The meta-analysis program in stata will do all three, and I recommend REML.

Inverse distance weighting is a reasonable method for estimating census block level PM2.5 concentrations. If possible some consideration should be given to incorporating traffic density data. For example, regress measured annual PM2.5 at each monitor against traffic density in the block containing the monitor, and use this to adjust the smoothed estimates for each block, which will not otherwise capture the local traffic effects. I recognize this is a nontrivial effort.

Again, I am concerned with the use of a cutoff of 7 $\mu g/m^3$. It not only flies in the face of the expert judgment, it has potentially important consequences. If an strategy to bring one area into attainment results in the lowering of PM2.5 to, for example, 6 $\mu g/m^3$, then CARB will assume there are no health benefits associated with that reduction. Given the empirical and theoretical arguments against a threshold, this would seem to be an approach that would systematically underestimate benefits, and hence systematically bias control strategies towards those that only have local impacts, against those that also impact neighboring bcations which are already in attainment. For this reason, I recommend using the background PM2.5 concentration as the cutoff in computing benefits.

I believe that the rollback scenarios are unrealistic. They imply that only locations that exceed the standard rollback by the rollback factor, while sites within the same air basin that meet the standard do not reduce further. But the control strategies that bring the non-attainment sites into attainment will undoubtedly reduce concentrations at all locations in the air basin, regardless of attainment status. Hence this scenario systematically underestimates the benefits of pollution reduction strategies. What if you took the empirical distribution of PM2.5 concentrations in an airshed and rolled the entire distribution down, until the standard was met at all sites. That seems a more likely scenario.

B. Comments on Application to Specific Emission Sources

In this section, a summary of comments from the peer reviewers is presented, followed by individual comments from the six experts.

Summary of Peer Reviewer Comments

On ARB's Proposed Methodology for Estimating Health Impacts Associated with Exposures to Specific Emission Sources

Issue	J. Brook	M Eisner	R Flagan	A Hubbard	J Kaufman	J Schwartz
Modeled Data						
Aggregate grid cells	Yes	Appropriate, but small grid cells may lead to high variability and uncertainty	No comment	Appropriate considering C-R function accuracy	Yes, uncertainties need to be explicitly stated	Yes, appropriate. Errors tend to cancel. Not appropriate to report grid cell result
Applying county incidence rate to smaller area	Within county death rates vary by age, SES.	Yes, but adjust for age and sex distribution of population	Small population samples may introduce systematic uncertainties, in exposure, susceptibility.	Depends on assumptions of C-R function and accuracy of incidence rate.	Yes, appropriate.	Death rates likely higher near port and railyard due to lower SES. Applying county incidence rate underestimates mortality. Age also important
Minimum size population	5,000 to 50,000	Will depend on variability and confidence intervals	No comment	No comment	Depends on confidence intervals.	Pop size determines noise in estimate. Smaller excess death predictions have higher uncertainty
Demographics	Risk will vary by age and health status	Age, sex, race and ethnicity may be different in small pop versus county	Small pop samples may introduce systematic uncertainties, both in exposure, and susceptibility.	If C-R function vary by demographic characteristics, then they become important.	Estimates need to be standardized by age and gender.	Very important. See above.
Single source appropriate	CRF will vary depending on source of PM	Yes, with above caveats	No comment	No comment	Depends on robustness of modeling.	Yes, with concerns above.
Type of source	Yes	Yes	PM from CR function in epi study may differ from the single source. If from DPM, approach may provide lower-	No comment	The method would be applicable and needed in certain regions, esp for ammonium nitrate.	2ndary more uniform and more certain. Wood smoke and traffic likely underestimate mortality because efficient exposure.

Issue		J. Brook	M Eisner	R Flagan	A Hubbard	J Kaufman	J Schwartz
				bound estimate.			
	Other		No comment	No comment	CRF and incidence rate must be same in small/large pops	Emphasize uncertainty at each stage, esp exposure.	No comment.
Emissions Data							
	Appropriate	Only if CRF applies to source and concentration well estimated	Variability and confidence intervals will be an issue	This approach assumes that there is no threshold, which may not be an issue near sources.	Yes, appropriate	Depends on accuracy of emissions inventories.	Yes, appropriate. C-R function may need adjusting. For example, diesel PM may need higher C-R.
	Minimum size	Larger more like CRF	Uncertain	No comment	Same as comments above	Depends on confidence intervals.	Same as comments above
	Demographics	Pop should be like CRF study.	No comment	No comment	Pop demographics should be the same as C-R function.	Estimates need to be standardized by age and gender.	Demographics affect incidence rate.
	Type of source	Yes	Yes, potentially	No comment	No comment	2ndary PM would be more difficult due to chemistry.	Not appropriate to use linear rollback for 2ndary PM because complex chemistry.
	Other	Sensitivity analysis and population mobility;	Is it too imprecise to be meaningful? Is the population exposed to point source similar to epi study population?		Perhaps in log-linear or linear dose-response model, the relative hazard is equivalent to what is proposed, but this will not be true in general.	Emphasize accurate estimates of uncertainty at each stage, esp exposure, and incorporate these uncertainties into calculation of CI.	

B.1 Jeffery Brook

Brief Comments on Proposed Methodology for Estimating Health Impacts Associated with Exposures to Specific Emission Sources

Reviewer: Dr. Jeffrey R. Brook, Senior Research Scientist, Environment Canada; Adjunct Professor, University of Toronto.

The proposed methodologies clearly represent a logical and thought out effort to address the issue of estimating health benefits associated with air pollutant reductions associated with specific sources that tend to impact more localized areas. As in any such assessment, the reliability, representativeness and true meaning of the concentration-response function (CRF) to be applied is an important consideration. The health endpoint(s) considered are also important and a fixation on premature mortality only tells a part of the story. In the applications described in this document the issues of differential susceptibility and differential toxicity/potency of particulate matter of different compositions likely become increasingly important. The former implies that the one CRF may not be ideal, especially in applying it to smaller geographic subsets of the population where there may be spatial clustering of demographic groups (population characteristics) in term of age, race, SES and possible pre-existing conditions that influence susceptibility. Ideally, to get a better feel for these issues, sensitivity analyses based upon a range of realistic assumptions about variability or potential biases, driven by true small scale data on spatial variations in PM levels and composition and population characteristics may provide insights as to how the bottom-line: reduced premature mortality; changes or becomes more uncertain could be helpful.

A. Methodology based on modeled concentrations

The assumes that the incidence rate for the county is the same in each grid cell.
It seems logical to expect that this is variable spatially within a county and areas of higher incidence rate would be pointing towards populations with greater susceptibility and/or greater exposures. SES may be a proxy as could age. It would be worthwhile to examine how these vary among grid squares using census data or any data that might be accessible.
This assumes that the susceptibility distribution of the population in the grid is the same as in the population used to derive the CRF.
There are perhaps two core issues:
Is the CRF the same for different types of PM?
How do we know that all people in an area will see the same size decrease in exposure?
Original CRF's are calibrated to 'area monitors' and so we have some confidence that the changes in mass detected at these monitors reflect the average change in exposure across the population. This is not as safe of an assumption at the local scale.
Responses to Questions for peer reviewers:

Is it appropriate to estimate PM mortality for each grid cell, then sum the results across the grids?
Conceptually, this seems OK, but issues related to the next questions raise concerns.

Is it appropriate to use countywide incidence rates for applications to smaller populations within a given county?
The potential for the validity of this assumption to vary by county seems relatively high. A look at how census-based data on demographics (age, sex, race, SES) varies spatially within counties would shed some light on this. If census data are not sufficient then perhaps property values, percentages of residential property types could be obtained and would be informative. It seems likely there will be counties where variable incidence rate could be expected. Given this, then one needs to consider if the CRF would be different among segments of the population with a higher mortality rate. If we hypothesize that a higher incidence rate is due to a greater prevalence of a pre-existing condition such as TII diabetes (DM) or to an older population then we should expect that a 'general' CRF would be too small. If higher incidence rate is related to SES and the lifestyles that increase the rate then the jury is still out as to whether this itself makes a person more susceptible to air pollution.

How limited can the population size be? What is the minimum affected population size that would make this type of calculation meaningful?
This potentially also varies by geographic region. The more homogenous a population and the more that population is similar to those in ACS and Six Cities the smaller the size that could be considered. Again some sensitivity analyses with census and other spatial data on populations may shed some light on this. If I had to guess I would say 50,000 would mostly likely be safe and there are places were you might be able to get away with about 5000.

Are the population demographics important?
Absolutely, and other variations in susceptibility. There have been acute studies done that show that risk increases with age and it varies depending upon pre-existing conditions such as CHF, DM, COPD, HT, unstable plaque.

Would this methodology be appropriate to estimate the impacts associated with a single source or a limited number of sources of PM?
Most researchers hypothesize that different PM (i.e., from a different source or of a different chemical composition) have different toxicities. Are they different enough to be reflected in a population based CRF is an open question, but it is logical to expect that the CRF should vary by PM type and individual susceptibility. Certainly, evidence grows that traffic PM is a concern and we know about the hazardous nature of DPM. Controlled human exposure studies also seem to get much clearer effects when these are done with diesel exhaust vs. general CAPS from ambient air.

Is the source of PM important in this application?
Yes it is important.

Could this methodology be used if the PM is from gasoline combustion or woodsmoke, or a non-combustion type of source?
If we had robust, population-based CRFs for each source. However, obtaining these and having proof that they are significantly different from one another continues to be very illusive. The issue of endpoints comes up too although the one here is mortality. To some extent, these differences are likely encompassed by the low and high ranges of the CRF and so we may hypothesize that using the same CRF and range (upper and lower bounds) for all different PM includes such variations in the uncertainty or bounds. The issue of what co-pollutants (gases) are associated with the different PM types may magnify the differences between sources, however, and in acute studies (time series) the total risk from two or multi-pollutant models are larger and potentially more stable than just the PM risk alone. See Burnett's et al.'s *Cdn J of Pub Health* paper (Reference below).

Also, in addition to directly emitted PM emissions (primary PM), the conversion of nitrogen oxides to ammonium nitrates (secondary PM) can be modeled. Should one consider the relative contribution of secondary sources compared to the primary PM source in a small population?
Ideally yes, but the PM exposures in the studies that the CRFs have been derived from included both types of PM. One bottom line is that we are getting more confidence that certain PM is more potent, in epi studies, than general PM (e.g., traffic or diesel or possibly metal-enriched PM). Tox studies support this notion of particles being different (DTT assays, etc). But, one should be aware that fine particle nitrate (pNO3), which is semi-volatile does not necessary condense on particles alone. There are likely secondary organics including N-containing species, which can also include amines, that partition more to particles when the thermodynamics also favors pNO3 formation. Of course, actual exposure potential is also an issue here in that in some climates semi-volatile species don't penetrate and/or persist indoors as much as, black carbon, sulfate or heavy PAHs, for example.

What other criteria should be used to determine when such an estimation is appropriate?
Sensitivity analyses

B. <u>Methodology based on emissions data only</u>

Use ARB's estimated county-specific PM2.5 concentrations attributed to diesel sources in year 2000 (CARB 1998).

How well can this be done and what basis is there for assuming that the annual diesel PM concentration is the same across the county when we know it is not? It will be much higher closer to the source(s) of interest, but perhaps one could argue that the actual magnitude varies spatially but the ultimate change in mass will be more uniform across the county. Actually, I don't think so. It might be somewhat more justifiable to assume that the percent change in mass is uniform and then one needs to know the spatial

details of the concentration relative to the population. However, if we consider the typical application of a CRF over a larger area or the actual data used to get the CRF then we have to acknowledge that within that base population there is already

Responses to Questions for peer reviewers:

Is it appropriate to estimate PM mortality based solely on the emissions from a particular source?

This can be reasonable if the relationship between emissions and ambient concentration is linear and correctly quantified (i.e., the data used to get the ratio are reliable and appropriately applied). For the case of DPM, having an appropriate CRF, as opposed to a CRF from total PM2.5, is an issue, just as discussed above.

How limited can the size of the population affected by the emissions from a single source be?
It can be very limited if the source is small, if its location is such that the prevailing winds very consistently blow the emissions in a very consistent direction such as with the sea breeze blowing a plume inland. Other meteorological factors can also limit the size.

What is the minimum affected population size that would make this type of calculation meaningful?
This depends upon the distribution of susceptibility in the population. The larger the size the more likely the distribution will look like the average and more importantly like the population that the original CRF came from. Assuming this is not an issue then the size can be small if the exposure change is known reliably.

What should the population demographics be?
Like those where the CRF came from, in every sense. This was mentioned above.

Is the source of PM important in this application?
Yes, as in my previous discussion.

As described in the previous section, could other sources of PM be considered? It would depend upon the ability to have reliable emissions for the county and reliable estimates of the amount of PM mass in the air that is from that source.

Also, should one consider the relative contribution of secondary PM compared to primary PM?
Same issues as raised above.

What other criteria should be used to determine when such an estimation is appropriate?
Sensitivity analyses of the impact of spatial heterogeneity in population demographics and exposure using reasonable assumptions should be considered.

Population mobility may become more important because the smaller the area influenced by the source(s) of concern the more likely it could be that individuals in the surrounding population move out of the zone of influence regularly and for long periods and also possibly move into the area or at least to where concentrations go up.

References

Burnett R.T., Cakmak S. and Brook J.R., 1998 The effect of the urban ambient air pollution mix on daily mortality rates in Canadian Cities. *Canadian J. Public Health*, **89**(3):152-156.

B.2 Mark Eisner

Proposed Methodology for Estimating Health Impacts Associated with Exposures to Specific Emission Sources

Health impacts from PM exposure are commonly estimated at the statewide or a similarly large geographic scale because (in part) these estimates are based on epidemiologic studies that relied on single ambient air monitoring stations to represent regional exposures to the pollutant. Our interest is in refining and applying such estimation techniques to finer scales, for small populations being affected by small changes in pollutant concentrations that would result from a single or few sources of emissions. The peer reviewers are being asked to comment on these applications.

Below is a summary of two methodologies that could be used to estimate health impacts associated with exposures to PM resulting from specific sources in a limited geographical area. The discussion is divided into two sections based on available information on the pollutant concentration: a) modeled concentrations and b) emissions data. Examples using ports and goods movement are shown to facilitate the discussion.

A. Methodology based on modeled concentrations

In the first scenario, suppose an air dispersion model is used to estimate ambient concentrations of PM in a limited geographic area affected by emissions from a specific source or group of sources. Examples would be locomotive emissions at a rail yard or all sources of diesel (trucks, locomotives, ships) at a California port or harbor. In this scenario, the annual average ambient diesel PM concentration would be estimated by grid cells using a model such as U.S. EPA ISCST3. For each grid cell, the premature death could be estimated based on a concentration-response (C-R) function, the population in that grid cell, and the baseline countywide incidence rates. The total impacts for the affected population in the modeling domain would then be obtained by summing the results from each grid cell.

Hypothetical Example:
A small 2 mile by 2 mile region next to a rail yard within county X has about 10,000 persons over the age of 30, exposed to an estimated diesel PM annual-average concentration of 0.2 $\mu g/m^3$. Using the baseline death rate of 0.009 death/person/year in county X and the C-R function of 10% increase in premature death risk per 10-$\mu g/m^3$ increase in PM2.5 exposure, we would estimate about 0.9 death to result from this small population being exposed to PM.
Questions for peer reviewers:

- Is it appropriate to estimate PM mortality for each grid cell, then sum the results across the grids? It may be appropriate, but one issue will be small grid cell sizes leading to the potential for high variability or uncertainty of results.
- Is it appropriate to use countywide incidence rates for applications to smaller populations within a given county? If this is adjusted for differences in the age and sex distribution of the population, it is probably valid.

- How limited can the population size be? What is the minimum affected population size that would make this type of calculation meaningful? This will depend on variability and the size of the resultant confidence intervals (i.e., if the CI is too wide and the uncertainty is too high, then the results will be less meaningful)
- Are the population demographics important? Yes, because differences in the age-sex distribution of the small population vs. countywide population could introduce confounding. If there are differences in race-ethnicity, effect modification could potentially be an issue as well.
- Would this methodology be appropriate to estimate the impacts associated with a single source or a limited number of sources of PM? Yes, with the limitations above.
- Is the source of PM important in this application? Could this methodology be used if the PM is from gasoline combustion or woodsmoke, or a non-combustion type of source? Also, in addition to directly emitted PM emissions (primary PM), the conversion of nitrogen oxides to ammonium nitrates (secondary PM) can be modeled. Should one consider the relative contribution of secondary sources compared to the primary PM source in a small population? Yes.-
- What other criteria should be used to determine when such an estimation is appropriate?

B. Methodology based on emissions data only

When it is not feasible to model PM concentrations, emissions can be used to estimate health impacts as an alternative methodology. For example, to estimate health impacts associated with Goods Movement activities in the port of Los Angeles, an emissions inventory approach was used as shown below. Details for this methodology can be found in the CARB 2006 report.

5. Use ARB's estimated county-specific PM2.5 concentrations attributed to diesel sources in year 2000 (CARB 1998).
6. Calculate the premature deaths for the base year 2000 by applying a C-R function to the exposed population for a county.
7. Associate the health impacts with the total diesel PM emission inventory for that county in the base year 2000 to determine the number of tons emitted per annual death. This is called the "tons-per-death" factor for the county.
8. Apply the tons-per-death factor to the diesel PM emission inventory for a single source to estimate the average annual deaths associated only with exposure to these emissions, adjusting for population growth between the year of interest and the base year 2000[11]. Note that the diesel PM emissions from the single source may be small compared to the county's emission inventory used in step 3 above.

[11] The impact for year 2005 Goods Movement emissions would be calculated by dividing the emissions by the "tons per death" factor in each county, multiplied by the ratio of year 2005 population over year 2000 population.

Hypothetical Example:

ARB estimated that the diesel PM concentration in county Y is 2 μg/m^3 for year 2000. This value is used in conjunction with the county's population of 800,000 persons and baseline death rate of 0.009 death/person/year to derive an estimated 136 premature deaths. The total diesel PM emission inventory in county Y is 1,360 tons in year 2000; hence, the tons-per-death factor is 10. A single source which produces 20 annual tons of diesel PM emissions in year 2005 is then estimated to be responsible for about 2.2 premature deaths by using (20 tons/10 tons-per-death) * (880,000 persons/800,000 persons), where 880,000 indicates the county's population in 2005.

Questions for peer reviewers:

- Is it appropriate to estimate PM mortality based solely on the emissions from a particular source? An issue will be the variability of estimates and how wide the confidence interval will be for estimation of the impact of a single source.
- How limited can the size of the population affected by the emissions from a single source be? What is the minimum affected population size that would make this type of calculation meaningful? Uncertain
- What should the population demographics be?
- Is the source of PM important in this application? As described in the previous section, could other sources of PM be considered? Yes, potentially. Also, should one consider the relative contribution of secondary PM compared to primary PM?
- What other criteria should be used to determine when such an estimation is appropriate? Key issues are variability / precision of the estimate (is it too unprecise to be meaningful); genearlizability (is the population exposed to the point source sufficiently similar to that from which health effects estimates were derived); impact of specific types of PM.

References

CARB 1998. California Air Resources Board, Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant. Appendix III. Part A: Exposure Assessment, available at http://www.arb.ca.gov/toxics/id/summary/diesel_a.pdf.

CARB 2006. California Air Resources Board, "Quantification of the Health Impacts and Economic Valuation of Air Pollution From Ports and Goods Movement in California." Appendix A in Emission Reduction Plan for Ports and Goods Movement. March 22, 2006, available at http://www.CARB.ca.gov/planning/gmerp/march21plan/appendix_a.pdf

B.3 Richard Flagan

Comments on Proposed Methodology for Estimating Health Impacts Associated with Exposures to Specific Emission Sources

In my comments on the proposed methodology for county-wide estimation of health impacts, I raised a question that becomes even more important when one seeks to apply that methodology to estimate health impacts of specific emission sources: present

air quality data is obtained using equipment that provides mass based measurements of relatively coarse size fractions (PM2.5 and PM10) from instruments located at a small number of monitoring stations.

Numerous recent studies indicate that small particles that contribute little to the aerosol mass loading may impact health much more significantly than their mass concentrations would suggest (Oberdorster et al., 2000; Donaldson et al., 200). Moreover, studies of health impacts of exposures to ultrafine particles near busy highways (Brunekreef et al., 1997), combined with direct measurements of ultrafine particles as a function of distance from the highway (Zhu et al., 2002; Shi et al., 2001; Zhang et al., 2005; Jacobson et al., 2005), raise questions about the suitability of data obtained at present community monitoring stations for assessing health impacts of some of the sources identified in this proposed methodology; community monitoring stations have traditionally been located some distance from local sources to prevent biasing *samples* in the way that *exposures* will naturally be biased. The aforementioned highway studies reported substantial concentration, and hence exposure, variations over distances of a few hundred meters. The probabilistic health impact model is exponential in PM exposure (if my interpretation of the original methodology report is correct), so averaging exposures over a range with substantial variations will underestimate the health impacts on those individuals closest to the source if such variations are important for the sources of interest. Thus, it is reasonable to consider alternate approaches when addressing individual sources.

Coupling of emission data with an air dispersion model could address these variations in exposure, although the 2 mile by 2 mile grid cell suggested in the example calculation would miss the effects seen in the exposures to diesel emissions near highways carrying significant heavy-duty truck traffic. If the model were based upon the interpolation of data from the carefully sited community monitoring stations, exposure estimates might differ significantly from reality. Moreover, if the model only addresses dispersion, excluding the coagulation, condensation, evaporation, and chemical reaction processes that have been found to lead to the observed rapid variations in fine particle concentrations, exposure estimates may be further compromised.

What is missing in the present epidemiological data is an assessment of the impact of particular constituents of the atmospheric aerosol, either alone or in combination with other constituents of the aerosol or, perhaps, gaseous pollutants. When one applies the broad area results to a specific source, there is a danger that the local emissions doseresponse function may differ dramatically from that of the urban air-shed average. Exposure to a high PM2.5 level near a harbor or rail yard with a large influence of diesel emission would be very different than an equal mass exposure to a marine aerosol (sea salt) at the beach. On the other hand, if the local source is reflective of major pollutant emissions in the urban area, application of the empirical dose-response function could be an excellent approximation; in other cases, it might provide a lower-bound estimate of the health impacts.

The use of the emissions-data-only approach assumes that the health impacts are

B.4 Alan Hubbard

I will answer the questions below, but make a few general comments first. I am not an expert in risk assessment and I assume this document is addressing different methods of risk assessment given the parameters (dose-response) of PM exposure and baseline population mortality risk have been estimated. My expertise is in estimating these parameters, not risk assessment based on the estimated parameters. Thus, my comments should be taken in this context.

Proposed Methodology for Estimating Health Impacts Associated with Exposures to Specific Emission Sources

Health impacts from PM exposure are commonly estimated at the statewide or a similarly large geographic scale because (in part) these estimates are based on epidemiologic studies that relied on single ambient air monitoring stations to represent regional exposures to the pollutant. Our interest is in refining and applying such estimation techniques to finer scales, for small populations being affected by small changes in pollutant concentrations that would result from a single or few sources of emissions. The peer reviewers are being asked to comment on these applications.

Below is a summary of two methodologies that could be used to estimate health impacts associated with exposures to PM resulting from specific sources in a limited geographical area. The discussion is divided into two sections based on available information on the pollutant concentration: a) modeled concentrations and b) emissions data. Examples using ports and goods movement are shown to facilitate the discussion.

A. Methodology based on modeled concentrations

In the first scenario, suppose an air dispersion model is used to estimate ambient concentrations of PM in a limited geographic area affected by emissions from a specific source or group of sources. Examples would be locomotive emissions at a rail yard or all sources of diesel (trucks, locomotives, ships) at a California port or harbor. In this scenario, the annual average ambient diesel PM concentration would be estimated by grid cells using a model such as U.S. EPA ISCST3. For each grid cell, the premature death could be estimated based on a concentration-response (C-R) function, the population in that grid cell, and the baseline countywide incidence rates. The total impacts for the affected population in the modeling domain would then be obtained by summing the results from each grid cell.

Hypothetical Example:

A small 2 mile by 2 mile region next to a rail yard within county X has about 10,000 persons over the age of 30, exposed to an estimated diesel PM annual-average concentration of 0.2 $\mu g/m^3$. Using the baseline death rate of 0.009 death/person/year in county X and the C-R function of 10% increase in premature death risk per 10-$\mu g/m^3$ increase in PM2.5 exposure, we would estimate about 0.9 death to result from this small population being exposed to PM.

strictly linear in particulate-mass concentration; one important implication of this result is that the hypothesized threshold for health effects is dropped from consideration. This may not be an issue since, when near sources, concentrations below the threshold are unlikely. This model assumes that all sources impact health equally on a mass emission basis. Lacking more detailed information about the origins of the health impacts, the approach should provide reasonable estimates.

Small population samples may introduce systematic uncertainties, both in exposure and in susceptibility. On the other hand, applying the health effects correlations to a spatially resolved population exposure may give better estimates of aggregate impacts than would calculations based upon exposures averaged over a city, particularly if the response function is nonlinear.

References

Brunekreef B, Janssen NAH, deHartog J, Harssema H, Knape M, vanVliet P. Air pollution from truck traffic and lung function in children living near motorways. *Epidemiology* 8:298-303 (1997).

Donaldson, K., Stone, V., Gilmour, P.S., Brown, D.M., and MacNee, W. Ultrafine particles: mechanisms of lung injury. Phil. Trans. Roy. Soc. A-Math. Phys. Engr. Sci. 358: 2741--2748 (2000).

Jacobson MZ, Kittelson DB, Watts WF. Enhanced coagulation due to evaporation and its effect on nanoparticle evolution. *Environmental Science and Technology* 39:9486-9492 (2005).

Oberdorster, G. Toxicology of ultrafine particles: in vivo studies. Phil. Trans. Roy. Soc. A-Math. Phys. Engr. Sci., 358: 2719--2739 (2000).

Pope CA, Burnett RT, Thun MJ, Calle EE, Krewski D, Ito K, Thurston GD. Lung cancer, cardiopulmonary mortality, and long-term exposure to fine particulate air pollution. *Journal of the American Medical Association* 287:1132-1141 (2002).

Pope CA, Dockery DW. Health effects of fine particulate air pollution: Lines that connect. *Journal of the Air and Waste Management Association* 56:709-742 (2006).

Shi JP, Evans DE, Khan AA, Harrison RM. Sources and concentration of nanoparticles (< 10 nm diameter) in the urban atmosphere. *Atmospheric Environment* 35:1193-1202 (2001).

Zhang KM, Wexler AS, Niemeier DA, Zhu YF, Hinds WC, Sioutas C. Evolution of particle number distribution near roadways. Part III: Traffic analysis and on-road size resolved particulate emission factors. *Atmospheric Environment* 39:4155-4166 (2005).

Zhu YF, Hinds WC, Kim S, Shen S, Sioutas C. Study of ultrafine particles near a major highway with heavy-duty diesel traffic. *Atmospheric Environment* 36:4323-4335 (2002).

Questions for peer reviewers:

- Is it appropriate to estimate PM mortality for each grid cell, then sum the results across the grids?

Given the accuracy of dose-response model and baseline mortality estimate, I can not see an obvious reasons why this would not be appropriate.

- Is it appropriate to use countywide incidence rates for applications to smaller populations within a given county?

That depends on the modeling assumptions of the dose response and the accuracy of the baseline hazard rate in the small population: is the relative hazard (RH) for a unit increase in PM the same, no matter what the baseline characteristics (is there no effect modification) and can one estimate accurately the baseline hazard in this group?

- How limited can the population size be? What is the minimum affected population size that would make this type of calculation meaningful?

Not qualified to answer this. Depends on how generally the dose-response model applies.

- Are the population demographics important?

In so much as the dose-response model varies by the demographic characteristics, then they become important.

- Would this methodology be appropriate to estimate the impacts associated with a single source or a limited number of sources of PM?

Not qualified to answer this.

- Is the source of PM important in this application? Could this methodology be used if the PM is from gasoline combustion or woodsmoke, or a non-combustion type of source? Also, in addition to directly emitted PM emissions (primary PM), the conversion of nitrogen oxides to ammonium nitrates (secondary PM) can be modeled. Should one consider the relative contribution of secondary sources compared to the primary PM source in a small population?

Not qualified to answer this.

- What other criteria should be used to determine when such an estimation is appropriate?

Just main points above – to determine the number of excess deaths due to PM accurately, requires that the dose-response model and baseline rate, as estimated on a larger population, are the same in smaller sub-populations.

B. Methodology based on emissions data only

When it is not feasible to model PM concentrations, emissions can be used to estimate health impacts as an alternative methodology. For example, to estimate health impacts

associated with Goods Movement activities in the port of Los Angeles, an emissions inventory approach was used as shown below. Details for this methodology can be found in the CARB 2006 report.

9. Use ARB's estimated county-specific PM2.5 concentrations attributed to diesel sources in year 2000 (CARB 1998).
10. Calculate the premature deaths for the base year 2000 by applying a C-R function to the exposed population for a county.
11. Associate the health impacts with the total diesel PM emission inventory for that county in the base year 2000 to determine the number of tons emitted per annual death. This is called the "tons-per-death" factor for the county.
12. Apply the tons-per-death factor to the diesel PM emission inventory for a single source to estimate the average annual deaths associated only with exposure to these emissions, adjusting for population growth between the year of interest and the base year 2000[12]. Note that the diesel PM emissions from the single source may be small compared to the county's emission inventory used in step 3 above.

[12] The impact for year 2005 Goods Movement emissions would be calculated by dividing the emissions by the "tons per death" factor in each county, multiplied by the ratio of year 2005 population over year 2000 population.

Hypothetical Example:

ARB estimated that the diesel PM concentration in county Y is 2 $\mu g/m^3$ for year 2000. This value is used in conjunction with the county's population of 800,000 persons and baseline death rate of 0.009 death/person/year to derive an estimated 136 premature deaths. The total diesel PM emission inventory in county Y is 1,360 tons in year 2000; hence, the tons-per-death factor is 10. A single source which produces 20 annual tons of diesel PM emissions in year 2005 is then estimated to be responsible for about 2.2 premature deaths by using (20 tons/10 tons-per-death) * (880,000 persons/800,000 persons), where 880,000 indicates the county's population in 2005.

Questions for peer reviewers:

- Is it appropriate to estimate PM mortality based solely on the emissions from a particular source?

Seems appropriate to me.

- How limited can the size of the population affected by the emissions from a single source be? What is the minimum affected population size that would make this type of calculation meaningful?

Comments in previous example about the population size apply here.

- What should the population demographics be?

Distribution of demographic characteristics should be the same as those used to estimate the dose-response.

- Is the source of PM important in this application? As described in the previous section, could other sources of PM be considered? Also, should one consider the relative contribution of secondary PM compared to primary PM?

Not qualified to answer this.

- What other criteria should be used to determine when such an estimation is appropriate?

I have a more general comment about the parameter of interest. My guess is that the parameter of interest is the relative hazard (or excess deaths due to PM) comparing the current situation (distribution of PM) to a counterfactual scenario where a particular point source is removed. For instance, using the dose-response model, determine the excess deaths based on current PM concentrations (equivalent in the example to 1360 tons) and a scenario based on the concentration that would result when a particular point source is removed (in the example, 1360-20=1340 tons). Perhaps in a log-linear or linear dose-response model, the results are equivalent to what is proposed, but this will not be true in general.

References

CARB 1998. California Air Resources Board, Proposed Identification of Diesel Exhaust

as a Toxic Air Contaminant. Appendix III. Part A: Exposure Assessment, available at http://www.arb.ca.gov/toxics/id/summary/diesel_a.pdf.

CARB 2006. California Air Resources Board, "Quantification of the Health Impacts and Economic Valuation of Air Pollution From Ports and Goods Movement in California." Appendix A in Emission Reduction Plan for Ports and Goods Movement. March 22, 2006, available at http://www.CARB.ca.gov/planning/gmerp/march21plan/appendix_a.pdf

B.5 Joel Kaufman

Proposed Methodology for Estimating Health Impacts Associated with Exposures to Specific Emission Sources

Health impacts from PM exposure are commonly estimated at the statewide or a similarly large geographic scale because (in part) these estimates are based on epidemiologic studies that relied on single ambient air monitoring stations to represent regional exposures to the pollutant. Our interest is in refining and applying such estimation techniques to finer scales, for small populations being affected by small changes in pollutant concentrations that would result from a single or few sources of emissions. The peer reviewers are being asked to comment on these applications.

Below is a summary of two methodologies that could be used to estimate health impacts associated with exposures to PM resulting from specific sources in a limited geographical area. The discussion is divided into two sections based on available information on the pollutant concentration: a) modeled concentrations and b) emissions data. Examples using ports and goods movement are shown to facilitate the discussion.

A. Methodology based on modeled concentrations

In the first scenario, suppose an air dispersion model is used to estimate ambient concentrations of PM in a limited geographic area affected by emissions from a specific source or group of sources. Examples would be locomotive emissions at a rail yard or all sources of diesel (trucks, locomotives, ships) at a California port or harbor. In this scenario, the annual average ambient diesel PM concentration would be estimated by grid cells using a model such as U.S. EPA ISCST3. For each grid cell, the premature death could be estimated based on a concentration-response (C-R) function, the population in that grid cell, and the baseline countywide incidence rates. The total impacts for the affected population in the modeling domain would then be obtained by summing the results from each grid cell.

Hypothetical Example:

A small 2 mile by 2 mile region next to a rail yard within county X has about 10,000 persons over the age of 30, exposed to an estimated diesel PM annual-average concentration of 0.2 $\mu g/m^3$. Using the baseline death rate of 0.009 death/person/year in county X and the C-R function of 10% increase in premature death risk per 10-$\mu g/m^3$ increase in PM2.5 exposure, we would estimate about 0.9 death to result from this small population being exposed to PM.

Questions for peer reviewers:

- Is it appropriate to estimate PM mortality for each grid cell, then sum the results across the grids?
  - Probably it is, but the uncertainties of estimates need to be explicitly stated.

- Is it appropriate to use countywide incidence rates for applications to smaller populations within a given county?
  - This is probably the most appropriate approach
- How limited can the population size be? What is the minimum affected population size that would make this type of calculation meaningful?
  - This needs to be answered based on calculation of the confidence intervals from the calculation.
- Are the population demographics important?
  - Yes, especially age and gender; estimates need to be standardized by age and gender. Race/Ethnicity would be of secondary importance.
- Would this methodology be appropriate to estimate the impacts associated with a single source or a limited number of sources of PM?
  - That depends on the robustness of the source-specific models. I would imagine that a limited number of sources could be modeled robustly in specific areas of the state.
- Is the source of PM important in this application? Could this methodology be used if the PM is from gasoline combustion or woodsmoke, or a non-combustion type of source? Also, in addition to directly emitted PM emissions (primary PM), the conversion of nitrogen oxides to ammonium nitrates (secondary PM) can be modeled. Should one consider the relative contribution of secondary sources compared to the primary PM source in a small population?
  - I would think the method would be applicable and would be needed in certain regions of the state, esp for ammonium nitrate.
- What other criteria should be used to determine when such an estimation is appropriate?
  - I would again emphasize the use of accurate estimates of uncertainty at each stage of the process (especially exposure estimation), and incorporating these uncertainties into the calculation of confidence intervals.

B. Methodology based on emissions data only

When it is not feasible to model PM concentrations, emissions can be used to estimate health impacts as an alternative methodology. For example, to estimate health impacts associated with Goods Movement activities in the port of Los Angeles, an emissions inventory approach was used as shown below. Details for this methodology can be found in the CARB 2006 report.

1. Use ARB's estimated county-specific PM2.5 concentrations attributed to diesel sources in year 2000 (CARB 1998).
2. Calculate the premature deaths for the base year 2000 by applying a C-R function to the exposed population for a county.
3. Associate the health impacts with the total diesel PM emission inventory for that county in the base year 2000 to determine the number of tons emitted per annual death. This is called the "tons-per-death" factor for the county.

4. Apply the tons-per-death factor to the diesel PM emission inventory for a single source to estimate the average annual deaths associated only with exposure to these emissions, adjusting for population growth between the year of interest and the base year 2000[13]. Note that the diesel PM emissions from the single source may be small compared to the county's emission inventory used in step 3 above.

[13] The impact for year 2005 Goods Movement emissions would be calculated by dividing the emissions by the "tons per death" factor in each county, multiplied by the ratio of year 2005 population over year 2000 population.

Hypothetical Example:

ARB estimated that the diesel PM concentration in county Y is 2 $\mu g/m^3$ for year 2000. This value is used in conjunction with the county's population of 800,000 persons and baseline death rate of 0.009 death/person/year to derive an estimated 136 premature deaths. The total diesel PM emission inventory in county Y is 1,360 tons in year 2000; hence, the tons-per-death factor is 10. A single source which produces 20 annual tons of diesel PM emissions in year 2005 is then estimated to be responsible for about 2.2 premature deaths by using (20 tons/10 tons-per-death) * (880,000 persons/800,000 persons), where 880,000 indicates the county's population in 2005.

Questions for peer reviewers:

- Is it appropriate to estimate PM mortality based solely on the emissions from a particular source?
  - The issue again is the accuracy of the emission inventories.
- How limited can the size of the population affected by the emissions from a single source be? What is the minimum affected population size that would make this type of calculation meaningful?
  - This needs to be answered based on calculation of the confidence intervals from the calculation.
- What should the population demographics be?
  - Estimates need to be standardized by age and gender.
- Is the source of PM important in this application? As described in the previous section, could other sources of PM be considered? Also, should one consider the relative contribution of secondary PM compared to primary PM?
  - It is my understanding that estimates of exposure to secondary PM requires modeling as described above so would not be easily done in this approach.
- What other criteria should be used to determine when such an estimation is appropriate?
  - I would again emphasize the use of accurate estimates of uncertainty at each stage of the process (especially exposure estimation), and incorporating these uncertainties into the calculation of confidence intervals.

References

CARB 1998. California Air Resources Board, Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant. Appendix III. Part A: Exposure Assessment, available at http://www.arb.ca.gov/toxics/id/summary/diesel_a.pdf.

B.6 Joel Schwartz

Additional Comments of Joel Schwartz

Here are my responses to the additional questions asked about local risk estimation.

General Comment: The expected value of uncertainty is not zero. Yet if a risk assessment is not done, all statements of qualification to the contrary not withstanding, decision makers will tend to make decisions as if the risk is zero. This is clearly inappropriate. Hence, the appropriate think is always to do a risk assessment, but to appropriately qualify the uncertainties. When the direction of likely bias is known, say that. Equally importantly, when the uncertainty is as likely to be an underestimate as an overestimate, say that. These statements are more important than actual estimates of the magnitude of the uncertainty for three reasons. First, they are subject to less error. It is easier to determine the sign of an effect than its magnitude. Second, they are important for decision making—an intelligent decision maker needs to know if most of the uncertainty would push the estimates in a particular direction. And third, if the estimates are likely unbiased (that is, as likely an overestimate as an underestimate), then while any particular decision may, in the light of future further evidence, have over or under estimated the risk benefit ratio, on average, such decisions will be the correct ones, and that is also important for decision makers to know. So my general comment is yes, do the risk estimation, but….spend a good amount of effort identifying the sources of uncertainty, their likely direction of bias if any, and their likely magnitude. But do something.

One key issue that applies to most of what follows is the question of whether it is best to use the same C-R relationship between PM of different sources and mortality. The most commonly available information is for PM2.5. However, the Dutch cohort, which has just produced a new report, clearly sees effect estimates for traffic particles (measured as BS) that are larger than the average estimate for PM2.5. This suggests that Diesel particles, the major source of black particles, are more than averagely toxic.

Specific Comments:
Questions for peer reviewers:

- *Is it appropriate to estimate PM mortality for each grid cell, then sum the results across the grids?*

  Yes, it is appropriate to estimate mortality within small grid cells, because that better captures the highly non-uniform distribution of the exposure across the county. If done reasonably, and summed across all grid cells within the county, many of the sources of error will tend to cancel out for the sum over the county. It would be appropriate, after paying attention to my further comments below, to report that sum. It would not be appropriate to report the values in each cell, because the high degree of uncertainty within them makes the individual cell estimates too noisy to base more local risk decisions on, and too noisy to communicate to the residents.

CARB 2006. California Air Resources Board, “Quantification of the Health Impacts and Economic Valuation of Air Pollution From Ports and Goods Movement in California.” Appendix A in Emission Reduction Plan for Ports and Goods Movement. March 22, 2006, available at http://www.CARB.ca.gov/planning/gmerp/march21plan/appendix_a.pdf

- *Is the source of PM important in this application? Could this methodology be used if the PM is from gasoline combustion or woodsmoke, or a non-combustion type of source? Also, in addition to directly emitted PM emissions (primary PM), the conversion of nitrogen oxides to ammonium nitrates (secondary PM) can be modeled. Should one consider the relative contribution of secondary sources compared to the primary PM source in a small population?*

The approaches are applicable to other sources. Care again, is critical. First of all, since a major source of both bias and uncertainty is the variation in the baseline mortality rate in small areas, sources that are more homogeneously distributed, such as secondary secondary nitrates, are actually easier to deal with. While the attributable risk in each area will be smaller because the risk is not as concentrated geographically, this is actually an advantage in coming up with an estimate of overall effect. Of course, the estimates are only as good as the model, and models for secondary aerosols, whether nitrates, organic carbon, or whatever, have two parts—dispersion, similar to the models for primary particles, and atmospheric chemistry, which adds a layer of complexity and uncertainty. But unless there is evidence from monitored data that the models are biased, it is still reasonable to use them, subject to the usual caveats.

Wood smoke is a tricky one because it is emitted from low chimneys, near where people live, and one expects that the exposure efficiency is much greater than the models would estimate. This is also true for traffic particles, and please examine the literature on exposure efficiency. Basically, the probability of such a particle making it into a lung is greater than would be expected from models that predict exposure on scales of a few hundred meters and larger. There is immediate exposure from the source to people right there that is usually underestimated by models that focus on the pollutant when it is better mixed.

As I noted in the introduction, there is the issue of whether the same PM2.5 coefficient should be used for all sources.

- *What other criteria should be used to determine when such an estimation is appropriate?*

2nd Method: Questions for peer reviewers:

- *Is it appropriate to estimate PM mortality based solely on the emissions from a particular source?*

It is certainly appropriate. The issue is whether the coefficient should be adjusted. I think that the evidence is probably strong enough to suggest a larger coefficient for Diesel particles, and not yet clear for others. After all, what one is presumably estimating is the incremental increase in mortality for an increment in particles. So, if you know enough to use a different C-R, do so. If you don't, then as far as you can tell, the average one (i.e. the one for PM2.5), is appropriate.

- *How limited can the size of the population affected by the emissions from a single source be? What is the minimum affected population size that would make this type of calculation meaningful?*

- *Is it appropriate to use countywide incidence rates for applications to smaller populations within a given county?*

This requires more care. If the distribution of population characteristics that determine baseline rates is random with respect to exposure, than again, performing such estimates creates random noise, which cancels out when averaged over all cells. However, it is unlikely that this is the case. Consider the examples, such as a port or rail yard, where concentrations of diesel particles likely falls off quickly with distance. Clearly, exposure is concentrated closer to the source. What about susceptibility? Death rates are considerably higher in persons of lower socio-economic condition, and such persons are much more likely to live close to undesirable activities, such as rail yards. Hence it would be appropriate to take this into account. SES data is available on the block group level, which is a geographic area with a typical population of 1500, so this information could be easily obtained by your 4 sq mile grid cells. Baseline mortality rates by county may not be computed by SES routinely. However, it would be better to look at the relative mortality by SES for the entire state, and apply that relative ratio to the County mortality in the county of interest, and then, based on census data, calculate an adjusted baseline mortality rate in each grid cell. Why? Because if poorer people live closer to the sources of emissions and have higher baseline mortality rates, ignoring this is a source of bias, whereas the procedure outlined above has considerable uncertainty, but no obvious bias. No doubt, better approaches could be derived.

A related issue is age. Mortality rates vary considerably by age, and small areas can differ substantially from the county average. I recently did an analysis where an entire census block group was an elderly housing complex. Clearly, it had a considerably different baseline mortality rate. Whether this is an issue or not in your assessments I do not know. But you should certainly check to see whether the population age distribution is different in your 4 square mile cell than in the county as a whole. If they are similar, fine, if there is a substantial difference, you can adjust as above.

- *How limited can the population size be? What is the minimum affected population size that would make this type of calculation meaningful?*

What the population size determines is the noise in the estimate. Meaningful is a different question. A model that predicts 2 excess deaths in one case and 50 in another presumably has considerable uncertainty bands around those estimates. What is less uncertain is that the effect in the first case is smaller than the effect in the second. This is presumably meaningful.

- *Are the population demographics important?*

Very important. See above.

- *Would this methodology be appropriate to estimate the impacts associated with a single source or a limited number of sources of PM?*

Yes, subject to the concerns stated above.

C. Comments on Diesel PM Methodology

Two of the peer reviewers had expertise relevant to the development of the methodology for estimating diesel PM concentrations. Their comments are included in this section.

This is really the same question (and answer as for the other method).

- *What should the population demographics be?*

It is important to take demographics into account as they at minimum affect baseline mortality. There is also some evidence of differential effects of PM.

- *Is the source of PM important in this application? As described in the previous section, could other sources of PM be considered? Also, should one consider the relative contribution of secondary PM compared to primary PM?*

It would not be appropriate to use linear rollback from emissions for secondary particles, as there are substantial nonlinearities in the atmospheric chemistry. Other sources could be considered, but again, as above, some attention needs to be paid to the intake fraction literature.

- *What other criteria should be used to determine when such an estimation is appropriate?*

C.1 Jeffery Brook

Brief Comments on Methodology for Estimating Ambient Concentrations of Particulate Matter from Diesel-Fueled Engine Emissions

Reviewer: Dr. Jeffrey R. Brook, Senior Research Scientist, Environment Canada; Adjunct Professor, University of Toronto.

In light of the amount of information available, the proposed methodology is reasonable. Linking diesel particulate matter to NO_x concentration is attractive given a relatively large number of NO_x monitoring sites. The cross-checking with the past approach and with an alternate approach to determine α based upon source apportionment helps strengthen the results and ARB has highlighted assumptions and uncertainties and the overall lack of all the desired information clearly in this report.

A few issues to consider (along with the attached marked up version of the report):

The lower DRI estimate is discounted too readily based upon limited arguments. Why were 1995 and 2000 results compared to get 1.8 instead of comparisons this report implies were done for the gasoline-diesel split study? What is the possibility that the lower DRI result is due to changing engine technologies so that diesel particulate matter (DPM) emissions are less relative to NO_x? In comparing these two years and groups the larger number of sample days considered by DRI should also carry some weight in the decision. If the DRI results are reconsidered then this suggests that the source apportionment approach may be leading to a lower α than selected here. This implies that the ARB approach is less conservative.

It should also be noted that the source apportionment approach to get DPM typically apportions the diesel contribution to OC and then scales to total PM. This potentially ignores the amount of EC that is from diesel emissions, as well as some inorganic species such as trace metals and primary sulfate. These additional PM constituents would likely increase the value of α.

In general, given the additional loss mechanism for NO_x in the atmosphere (chemical) compared to fine DPM, the expectation would be that α derived from ambient data would be larger than that derived from the emissions inventory. The results here, using Schauer's source apportionment values, support this. The DRI do not. However, it may well be that the DPM from the emissions inventory does include more than just organics and so the resulting α is larger. Thus, it would be useful for some more information on how the emissions inventory DPM is determined. Is this through the typical applications of the MOBILE emissions model with currently accepted emission factors?

Comments on Methodology for Estimating Ambient Concentrations of

Particulate Matter from Diesel-Fueled Engine Emissions

The proposed methodology would employ NO_x data to estimate particulate matter from diesel-fueled engine emissions. The approach is reasonable given that diesel-fueled engines are responsible for a major portion of the NO_x emissions state-wide, but only a small fraction of the particulate matter. Previously, diesel particulate matter was taken to be proportional to the PM10 mass concentration, a very tenuous assumption even though different scaling factors were applied in urban or rural environments. The use of PM10 is particularly problematic since the mechanisms of formation of particles larger than 2.5µm (or even 1µm) differ dramatically from those that produce smaller particles. The coarse part of the size range of PM10 is dominated by crustal materials; PM2.5 contains less, but still significant crustal and mechanically generated material.

The proposed methodology examines results from Schauer et al., and from the DRI group of Chow and coworkers. One citation is to work of Fujita et al., which appears to be reported only in a web page and is likely to be work that has not undergone critical peer review. The methodology uses the Schauer work as the primary reference. The results of the two studies appear to be in reasonable agreement, at least when corrected by the ratio of the means (1.8). Comparing the correlations shown in Fig. 3 (CHS, 1995) and Fig. 4 (DRI, 2000) one sees striking differences. The earlier study shows a correlation that appears to be consistent with a zero-intercept; the later one has fewer and more scattered data that do not appear consistent with the zero-intercept to which the correlation was forced. One outlier was removed from the early data to improve the fit; the uncertainty in the slope observed when it was not removed was comparable to that obtained in the later data set, a possible indication that the more recent experiments included a broader range of locations than did the earlier ones.

The comparison of the DPM/NO_x ratios suggests that at higher levels the range of values of the ratio decreases, but the means do not vary with the NO_x emission rates. This suggests that the method may provide useful estimates, with some caveats. The NO_x measurements are measured at community monitoring stations. The method proposes using an interpolation method to generate a smooth DPM curve from that sparse data set. For basin-wide exposure estimates, this approach will probably be reasonable; however it will likely underestimate the concentrations near sources because the community monitoring site locations have been chosen to minimize local source effects. Concentrations of some types of diesel particle vary dramatically with distance from highways or other sources as do some health effects (Brunekreef et al., 1997; Zhu et al., 2002; Shi et al., 2001; Zhang et al., 2005; Jacobson et al., 2005). Care will have to be exercised to ensure that the data smoothing does not introduce negative biases in regions that are strongly influenced by local emissions. For basin-wide estimates, this may be a relatively minor point, but it could be important for some calculations.

Minor points on report formatting

The report presents a number of figures, without limited discussion. The figures require

C.2 Richard Flagan

Comments on Methodology for Estimating Ambient Concentrations of Particulate Matter from Diesel-Fueled Engine Emissions

Richard C. Flagan, Ph.D.
California Institute of Technology

The proposed methodology would employ NO_x data to estimate particulate matter from diesel-fueled engine emissions. The approach is reasonable given that diesel-fueled engines are responsible for a major portion of the NO_x emissions state-wide, but only a small fraction of the particulate matter. Previously, diesel particulate matter was taken to be proportional to the PM10 mass concentration, a very tenuous assumption even though different scaling factors were applied in urban or rural environments. The use of PM10 is particularly problematic since the mechanisms of formation of particles larger than 2.5μm (or even 1μm) differ dramatically from those that produce smaller particles. The coarse part of the size range of PM10 is dominated by crustal materials; PM2.5 contains less, but still significant crustal and mechanically generated material.

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References

Brunekreef B, Janssen NAH, deHartog J, Harssema H, Knape M, vanVliet P. Air pollution from truck traffic and lung function in children living near motorways. *Epidemiology* 8:298-303 (1997).

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Monitoring and Modeling of Ultrafine Particles and Black Carbon at the Los Angeles International Airport

John R. Froines, UCLA
University of California, Los Angeles

Final Report
ARB Contract #04-325

Froines presents to SCAQMD in 4/30/06

49 says good toxicological evidence that UFP cause inflammation in the lungs.

March 5, 2007

Prepared for the California Air Resources Board and the California Environmental Protection Agency

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ARB provided field study equipment, including a Scanning Mobility Particle Sizer, Condensation Particle Counter, Aethalometer, laptop computers, E-BAM, canisters with associated sampling trains, and cartridges with associated sampling devices. The South Coast Air Quality Management District granted access to their monitoring site near Hastings/Westchester Blvd, Los Angeles. We also thank Los Angeles World Airports (LAWA) for the access to the airfield runway location and to the Proud Bird Field.

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The statements and conclusions in this Report are those of the contractor and not necessarily those of the California Air Resources Board. The mention of commercial products, their source, or their use in connection with material reported herein is not to be construed as actual or implied endorsement of such products.

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EXECUTIVE SUMMARY

Background

A study monitoring and modeling ultrafine particles and black carbon was performed at and in the vicinity of Los Angeles International Airport. Airports are important sources of particulate matter in urban airsheds yet regulators and public health agencies have little data available to them that address the characteristics of particles emitted from aircraft and the potential impact on exposure in adjacent communities. Previous efforts to study airport-related particulate matter have generally relied on time integrated measurements and instruments that do not capture ultrafine combustion particles emitted from aircraft. This study attempted to address this important data gap, on a scale that was exploratory in nature and thus somewhat limited in scope. The study results provide an initial characterization of ultrafine particulate matter associated with LAX aircraft operations that provides the basis for further in-depth studies including PM compositional characterization, toxicology and health effects studies.

Methods

The project was comprised of three field studies, performed in Los Angeles in 2005-2006, and a modeling component. The field studies used near real time instruments to measure number concentrations of UFP with high temporal resolution. Overall size distributions of UFP and concentrations of particles at selected sizes were obtained 140m downwind of a major aircraft take-off location, a background reference site to the north of the airport that is minimally influenced by aircraft pollution, and six community sites located 1.8 – 3.5 km to the east of LAX in a primarily residential area. Number concentrations of 15 nm particles only were studied at ten sites in a field immediately to the east of LAX, at distances ranging from 220-610m from the point on the runway at which take off is typically initiated. Sampling for black carbon mass and $PM_{2.5}$ mass was performed concurrent with the UFP work at most of the sampling sites in the field studies. At the airport location, monitoring was performed for carbon monoxide, carbon dioxide, polycyclic aromatic hydrocarbons, and selected volatile organic compounds. Data on time varying factors such as aircraft arrivals and departures, wind speed and direction, temperature and traffic counts were collected from airport sources to assist with statistical analysis of temporal variability in particle concentrations.

Results

Size distribution and total particle counts of ultrafine particles monitored immediately downwind of aircraft take off showed very high concentrations of UFP. At this sampling site, the greatest numbers of particles were observed at a particle size of approximately 15 nm. The peaks in the temporal profiles of UFP number concentrations occurred during aircraft take off events. In the second field study, the downwind study, 15 nm particles were measured simultaneously at the take off runway and at five locations east (downwind) of the runway, to see whether take off associated spikes in particle levels could be detected at these distances (ranging from 210-660m). The results show clearly that the temporal pattern of particle number concentrations at downwind sites are driven by runway activity. UFP number concentrations at the background reference site were substantially lower than at the runway and the size distribution was notably different. UFP levels monitored at six community sites were intermediate between the concentrations observed at the airport runway and those at the background location. The size distribution of UFP collected at the community sites was similar in shape to that of the runway site, with the peak

ABSTRACT

A study to monitor and model ultrafine particles (UFP) and black carbon was performed at and in the vicinity of Los Angeles International Airport. Previous research on airport sources of particulate matter has generally relied on time integrated measurements, using instruments that do not capture the ultrafine combustion particles emitted from aircraft. This project was comprised of three field studies, performed in Los Angeles in 2005-2006, and a modeling component. Field studies used near real time instruments to measure the number concentrations of UFP with high temporal resolution. Size distributions of ultrafine particles collected immediately downwind of aircraft take off showed very high number concentrations of UFP, with the highest numbers found at a particle size of approximately 15 nm. The highest spikes in the time profile of UFP number concentrations were clearly correlated with aircraft take off events. Time averaged concentrations of $PM_{2.5}$ mass and two carbonyl compounds, formaldehyde and acrolein, were elevated at the airport site relative to a background reference site. Other volatile organic compound concentrations were unremarkable. 15 nm particles can be detected 600 m east of LAX, and spikes of particle number were again associated temporally with aircraft activity. Farther downwind, number concentrations of UFP collected in a residential community approximately 2-3 km east of LAX were intermediate in concentration between the airport runway and the background reference site. The curve shape of the UFP size distribution at the community sites was similar to that of the runway site, with peak particle numbers occurring between 10 and 20 nm. While number concentrations of very small particles were high at the community locations studied, the mass-based measures of particulate matter exposure used in this study, black carbon and $PM_{2.5}$ concentration, did not indicate elevated exposures in the community. The results of the project demonstrate that in-use commercial aircraft at LAX emit large quantities of UFP at the lower end of currently measurable particle size ranges. 10-20 nm particles emitted from aircraft are also present at relatively high number concentrations in an adjacent community but an expanded and more in-depth study is needed to determine whether aircraft are indeed the source. In addition, toxicological research on aircraft emitted particulate matter is needed to characterize the potential public health impacts, and a complete chemical characterization of aircraft emitted PM is important to enhance understanding of exposure and public health implications.

1. Introduction

1.1 Objectives and Specific Aims

The objectives of this study "Monitoring and Modeling of Ultrafine Particles and Black Carbon at the Los Angeles International Airport (LAX) were:

1) To characterize number concentrations of ultrafine particles (UFP) and black carbon mass concentration associated with aircraft take-offs, using near real-time monitoring instruments.
2) To examine concentrations of UFP numbers and black carbon mass in ambient air at and near LAX as a function of temporal and spatial patterns of aircraft traffic, local meteorology and other time-varying factors that could potentially explain variability.
3) To investigate the contribution of aircraft emissions to local ambient PM in neighborhoods downwind of LAX.

The study was designed to investigate the following hypotheses:

1) Aircraft arrivals and departures at LAX emit UFP, $PM_{2.5}$ and black carbon resulting in levels at the airport that are detectable above ambient background.
2) A concentration gradient of aircraft emitted PM extends from LAX to community sites downwind of the airport.
3) The concentration gradient can be explained by air dispersion processes, mainly as a function of the distance from the airport sources, wind speed and direction, and by the time-varying source strength of airport operations.

Five specific aims were developed to address the hypotheses and pursue the research objectives.

Specific Aim 1: To measure UFP number concentration, $PM_{2.5}$ mass concentration and black carbon mass concentration at a near source site and an upwind background site, during two seasons. (pertains to Objective 1 and hypothesis 1)

Specific Aim 2: To characterize dispersion of aircraft emissions by assessing the UFP number concentration and black carbon mass concentration within 600 m downwind of take-off emissions. (This aim pertains to objective 1 and hypothesis 2 and was developed and approved as an additional aim by the contract officer during the period of the contract).

Specific Aim 3: To perform a statistical analysis of highly time-resolved data collected in the first two aims to explain the time-varying nature of pollutant concentrations by temporal patterns in aircraft activity, in the context of other time varying factors such as local meteorology. (addresses objective 2 and hypotheses 1, 2).

Specific Aim 4: To examine the potential contribution of dispersed aircraft PM to community exposure levels in the vicinity of LAX, using instruments installed at the near source site simultaneously with instruments installed at various sites in an adjacent community.

numbers occurring between 10 and 20 nm. Neither black carbon mass nor $PM_{2.5}$ mass was elevated in the community. The findings of the study have implications for the impact of aircraft emissions on air quality on both a local and regional scale, and for the estimation of PM exposure from major sources.

Conclusions

Field studies were carried out in three phases: at the airport, immediately downwind of the airport, and further downwind in a nearby community. The near-source study found that in-use commercial aircraft at LAX emit large quantities of UFP at the lower end of the measurable particle size range. Spikes of 15 nm particles can be detected, and associated temporally with aircraft activity, 600m east of LAX. 10-20 nm particles are also present at relatively high number concentrations in a residential community approximately [redacted] but these UFP could not be definitively associated with aircraft. Temporal correlation of UFP with aircraft activity patterns was not feasible for the community data because of the long time gap between field observations and official aircraft activity log data collected at LAX. However, indirect evidence from the study indicates that it is likely that approaching aircraft are a key source of temporal spikes on UFP size-selected particle and also for the peak of particles in the 10-20 nm range observed in the overall size distribution of UFPs at these locations. Motor vehicle emissions from I-405 were considered as another potential source, but it was concluded that freeway sources are unlikely to explain spikes of particle numbers observed at community sites. Potential differences in size distribution, chemical characteristics and community exposure between particles emitted during take off in comparison to particles emitted while aircraft are approaching is an area for further study. While number concentrations of very small particles were high at the community locations studied, the mass-based measures of particulate matter exposure used in this study, black carbon and $PM_{2.5}$ concentration, did not indicate elevated exposures in the community. Black carbon and $PM_{2.5}$ do not appear to be adequate for describing exposure to aircraft derived particulate matter. Toxicological research on aircraft emitted particulate matter is needed in order to characterize the potential public health impacts, and a complete chemical characterization of aircraft emitted PM is needed to enhance understanding of exposure and toxicology findings.

The findings from these exploratory studies were limited in their ability to address airport PM emissions. AQMD concluded that the monitoring site chosen to capture airport emissions was also highly influenced by vehicle traffic along Aviation Boulevard. It was difficult to make conclusions regarding the sources of the PM measured at this site. EC levels at an Aviation Blvd. site nearest to the airport were higher than those measured at other points along Aviation, which suggested that LAX was a contributing source of EC, but the methods used were unable to differentiate sources. The data for PM10 mass did not show clearly that the site nearest the airport had the highest levels. It may be that PM10 is an insensitive measurement, since it is expected that airport operations have a greater impact on UFP and fine PM levels than on coarse PM downwind of the airport. AQMD concluded that "it is not possible to determine what portion of the measured PM10 values are due to operations at LAX, traffic associated with the movement of goods and passengers in and out of LAX, non-LAX related traffic on the major arterials (Aviation Blvd, and the 405 freeway), or some other source" (AQMD 2000a).

Comparison of pollutant levels across the selected monitoring locations indicated that in general, PM10 mass, EC, OC, and mobile source-related air toxics (benzene, 1,3 butadiene, and formaldehyde) were more concentrated east of the airport than at a comparison site north of the airport, consistent with airport sources and prevailing west to east winds playing a role. Benzene and 1,3 butadiene levels showed a decreasing concentration gradient with increasing distance from the airport (AQMD 2000a). Proximity to heavy traffic corridors (Aviation Blvd and the 405 Freeway) appeared to result in higher PM, EC, OC and mobile source air toxics measurements, regardless of the location with respect to the airport (AQMD 2001). The findings suggest that the time-integrated sampling methods used in these studies may have obscured the impact of airport sources on local community exposure levels.

Two AQMD studies reported on microscopic analysis of PM fallout collected on glass plates under the LAX landing path. In the first study (AQMD 2000a), combusted oil soot particles greater than 50 microns were observed, and the authors concluded that aircraft could be contributing to soot fallout. However, in a second study conducted in spring 2000 (AQMD 2000b), these large, pitted particles suggestive of high temperature oil combustion were not reported; fallout composition was not inconsistent with other areas of the LA basin. AQMD was unable to conclude whether LAX contributes to large particle fallout at the study sites.

Pilot studies designed by ARB investigators to compare variation in fine and UFP measured in communities to levels measured at fixed site monitors found that very high counts of small particles (<600nm) were present downwind of LAX (Westerdahl et al, 2003a & b). Distribution of particle numbers by size showed that maximum particle counts were in the 10-20nm range, indicating combustion as the likely source. A small-scale study by Bloch (2002) suggested that jet engines may emit high concentrations of ultrafine particles in or near airports.

Together, the available studies suggest that the airport or nearby major traffic arterials may contribute to greater PM levels in communities on the east side of LAX than on the north and south sides, consistent with the location of traffic arterials and the predominant west to east wind patterns near the coast. The studies are relatively limited. UFP monitoring was done only in the pilot work by ARB. Spatial distribution of UFP has not been studied in communities adjacent to

Specific Aim 5: To model the dispersion of aircraft emitted black carbon near LAX, using measurement data collected in Aims 1 and 2 to evaluate model predictions.

1.2 Background and Rationale

The South Coast air basin is a non-attainment area for the California fine particulate matter ($PM_{2.5}$) ambient air quality standard, and will be designated as a non-attainment area under the national $PM_{2.5}$ standard at the end of this year. No health-based standards are in place for ultrafine particulate matter (UFP), yet these particles possess properties that raise significant health concerns. Ambient UFP often contain high levels of redox-cycling organic compounds. These particles generate oxygen radicals, have greater potency to induce oxidative stress responses than larger particles, and are associated with inflammatory effects in lung tissue and cultured cells (Li et al, 2003; Donaldson et al, 2002). After inhalation, UFP can translocate to extrapulmonary tissues, such as brain and liver (Oberdorster, 2004), and are taken up by cells to lodge in mitochondria, producing toxic effects in these organelles (Xia et al, 2004). While effects in epidemiological studies have been more difficult to establish due largely to exposure assessment issues, UFP have been implicated in exacerbation of asthma (Peters et al, 1997) and with cardiovascular effects (Elder et al, 2004). Due to the likely role of UFP in the toxicity and health effects associated with combustion-related particulate air pollution, improved understanding of ambient exposure levels and the relative contributions of key airborne particulate matter (PM) sources to UFP exposure is needed. It is critical to characterize spatial variation in contribution of PM sources to ambient UFP, since some sources may be responsible for especially high impacts in nearby communities. The studies reported here have provided data that will help to clarify the role Los Angeles International Airport (LAX) as a source of ambient UFP at the airport and in adjacent communities, and provide the basis for further detailed studies of LAX associated PM.

The contribution of aircraft emissions to PM exposure levels, and to UFP in particular, could be significant. Recent PM studies carried out near freeways (Zhu et al. 2002a&b) have demonstrated a concentration gradient for UFP, black carbon, and CO; concentrations many times higher than ambient were measured immediately adjacent to freeways with exponential decrease in particle number observed over distances of 100-300 meters. Similarly, communities in close proximity to major airports could experience elevated levels of combustion-related PM that derive from aircraft and other airport activities. Fixed site routine monitoring sites provide little information about the spatial variability in PM levels that is needed to evaluate the impact of near-source exposures from sources such as motor vehicle and airport traffic. In addition, the complex temporal patterns of emissions from aircraft are difficult to resolve with routine time-integrated monitoring methods.

While the potential importance of airport-related sources has been recognized in recent years few studies have reported measurements of particulate air pollution at or near large airports. The South Coast Air Quality Management District (AQMD) conducted a series of monitoring campaigns during the years from 1998 – 2001 (AQMD 2000a, 2000b, 2001). Dustfall of large particles, volatile organic compounds (VOC), carbon monoxide (CO), PM10 mass, organic (OC) and elemental carbon (EC) were among the endpoints measured at several locations in the vicinity of LAX. The AQMD studies used time-integrated sampling methods, typically sampling over 8 – 24 hour periods.

LAX. With the absence of effective source tracers for jet fuel and lack of studies that address the size-resolved composition of ambient particulate, it has not been possible to partition the impacts of aircraft emissions from those of motor vehicles on the ground. The time-integrated sampling approach used in the AQMD studies apparently lacks the sensitivity to detect potentially large quantities of emissions from aircraft operations over repeated short time periods.

Given this background, the current study was proposed to focus on UFP at and in the vicinity of LAX, using instruments with high time resolution to capture the high temporal variability in aircraft source emissions. Monitoring locations were selected to minimize the confounding impact of traffic arterials. The relative contribution of aircraft and other mobile source factors to the overall impact of the airport on ambient PM is an important question in the design of effective control strategies, but is difficult to address at this time due to inadequate availability of source tracers. This study applied statistical analysis of time resolved measurement data as an alternate approach to source tracer methods to assess the contribution of aircraft emissions to downwind PM levels. The work reported here will build the groundwork for in-depth studies of particle composition and relevant gaseous and vapor phase pollutants in the future.

2. Near Source Study

2.1 Overview

The general objective of the first project component was to measure target pollutant levels during aircraft take-off as near to a busy runway as practicable, and compare the results to measurements taken at an upwind background location. Semi-continuous instruments to monitor UFP number concentrations, particle size distribution and black carbon were assembled, installed, and operated at a near-source site at LAX immediately downwind (about 140 m) of a major departure runway. Time integrated instruments were used to monitor fine $PM_{2.5}$, CO_2, selected polycyclic aromatic hydrocarbons (PAH) and organic vapor phase compounds. The upwind site was installed with the same instruments, to provide background data for comparison. The main near-source study was carried out in September 2005; a limited second study was performed in Feb/March 2006 to enable evaluation of seasonal effects on the research findings.

The purposes of monitoring PM at the near source site were 1) to determine which measured pollutants displayed elevated concentrations at the runway in comparison to the background site, and 2) to determine how PM and associated pollutant measures varied with airport operations, especially exhaust from aircraft take-off thrust. To accomplish these purposes, data analysis included a comparison of summary statistics from the near-source and the background sites followed by a detailed analysis of the time profiles of ultrafine particle concentrations at the runway, in the context of aircraft departure times provided by LAX.

2.2 Methods

LAX and Meteorology

Los Angeles International Airport (LAX) is the world's fifth busiest passenger airport and ranks sixth in air cargo capacity. LAX is located at the western border of the South Coast Air Basin near the Pacific Ocean (N 33°56.55', W 118°24.48'). In 2003, LAX accommodated about 55 million passengers and 2 million tons of goods (LAX, 2004). Flights into and out of LAX typically proceed from east to west, with 96% of the departures to the west over the ocean and 94% of the arrivals landing from the east. Two runways are located to the north and two are to the south of the LAX central terminal complex. On average, 1,700 to 2,200 aircraft movements occur daily at LAX.

Specific Sampling Sites

The two sites used in this study were selected to contrast a near-source (blast fence) location at LAX with a background reference site that is upwind of LAX. Figure 2-1 shows the relative locations of the two sampling sites.



Figure 2-2: Bird's eye view of runway 25R and the LAX blast fence near source sampling location

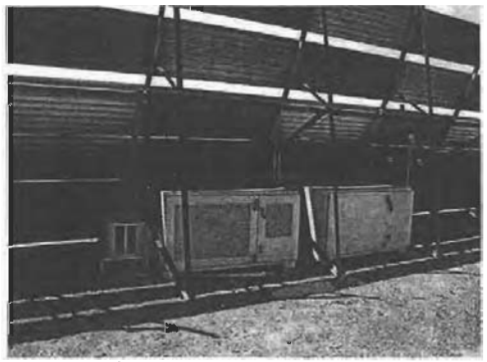


Figure 2-3: Close up view of the LAX blast fence sampling site

Upwind Background site: An upwind sampling site in a residential area north of LAX was chosen as a reference location. The site experiences a prevailing sea breeze, with no major PM sources upwind. There are two high schools nearby, which may introduce some bus emissions to the area, and there is light local traffic. This location is operated by the South Coast Air Quality Management District (AQMD), who generously provided access for the duration of the study.

Sampling Dates

Field sampling was performed during two time periods. The summer field study took place September 23-29, 2005. Sampling was performed over 24 hour intervals for time-integrated instruments and continuously for real-time instruments, starting at 12:00 pm on September 23



Figure 2-1: Locations of near source site at LAX blast fence (BF) and background reference sites (AQMD).

Downwind/Near-Source site: The near-source monitoring site was located at the east end of runway 25R at LAX. Runway 25R is primarily used for aircraft taking off to the west, directly against the prevailing wind, and accommodates 40% of the total departures at LAX. Some aircraft arrive on runway 25R but departures dominate runway activity. The runway sampling location is ideally positioned to capture emissions from aircraft take-off thrust: planes initiate take off close to the sampling site, then accelerate westward down the runway and away from the sampling site. Three fences, called "blast" fences, are positioned north to south across the end of runway 25R, and are designed to buffer the blast of jet exhaust associated with take off. Figure 2-2 illustrates the locations of the major and minor blast fences. The blast fence location is approximately 140m from the point on the runway at which departing aircraft initiate take-off. Two glass-fiber cabinets that accommodated the instruments used in this study sit underneath the major blast fence, and were made available to us by Los Angeles World Airports. The cabinets are equipped with power sources and provide protection for the equipment from the turbulent air and coarse dust clouds that regularly occur at this location. Figure 2-3 shows a close-up of the sampling site. An electrical panel connects power lines to the cabinets and distributed power outlets to which pumps and samplers were connected. An air-conditioning unit is available to provide cooling needed for the instruments placed inside the cabinet. The sampling probes for the SMPS/CPC and Aethalometer were initially inserted through slits in the fencing, to sample the air stream on the runway side of the blast fence, directly facing aircraft emission plume. However, in 2006 sampling campaigns the probes were placed behind the blast fence, with a cyclone to remove large particles, due to concerns that large particles blown by the blast clogged the orifice of the SMPS inlet and resulted in invalid data and potential damage to instruments.

and ending at 14:00 pm on September 29, 2006. The winter field study was limited to the near source site (blast fence); data were not collected at the AQMD background site due to limited availability of instrumentation. At the blast fence, the winter sampling took place over several days in late February and early March, 2006, using a more limited set of instruments than the summer study.

Instrumentation and Sampling Methods

Descriptions of the instruments used in the study are provided below. The instrumentation is also relevant to the dispersion and community studies that are reported in Sections 3 and 4 of this report, below.

For the summer study, a set of instruments was installed at each of the two sampling sites: a SMPS/CPC along with a laptop computer for data integration, an Aethalometer, an E-BAM Particulate Monitor, a Tisch Sampler, a canister sampler for butadiene, benzene and acrolein, and a cartridge sampler for formaldehyde. In addition, meteorological data and CO concentrations collected at the AQMD site were supplemental to this study. Table 2-1 summarizes the instruments and the time intervals over which they were used in the monitoring protocol.

Table 2-1-- Instruments used in the Airport Study

Site	Target Parameter(s)	Instrument (Suppler, Model)	Sampling Interval
AQMD	Black Carbon	Aethalometers (Magee Scientific, AE-20)	5 minutes
AQMD	$PM_{2.5}$	E-BAM (Met One Instruments)	30 minutes
AQMD	Particle Size Distribution	SMPS (DMA 3081)/ CPC (3785) (TSI)	2 minutes
AQMD	PAHs	Tisch Sampler (Tisch Environmental Inc. 1202)	~ 24 hrs
AQMD	Butadiene/Benzene/Acrolein	Canister sampler (ARB supplied)	~ 24 hrs
AQMD	Formaldehyde	Cartridge sampler (ARB supplied)	~ 24 hrs
LAX	Black Carbon	Aethalometers (Magee Scientific, AE-20)	5 or 10 minutes
LAX	$PM_{2.5}$	E-BAM (Met One Instruments)	60 minutes
LAX	UFP Total or Size-specific Conc.	SMPS (DMA 3081)/ CPC (3025) (TSI)	1 second
LAX	Particle Size Distribution	SMPS (DMA 3081)/ CPC (3025) (TSI)	2 minutes
LAX	PAHs	Tisch Sampler (Tisch Environmental Inc. 1202)	~ 24 hrs
LAX	Butadiene/Benzene/Acrolein	Canister sampler (ARB supplied)	~ 24 hrs
LAX	Formaldehyde	Cartridge sampler (ARB supplied)	~ 24 hrs

A SMPS (TSI Classifier model: 3080, DMA model: 3081)/CPC (TSI model 3785) along with a laptop computer were used to measure particle concentrations and size distributions, ranging

from 7.64 to 289 nm in 102 size bins, at the AQMD background site. A second SMPS (TSI Classifier model: 3080, DMA model; 3081)/CPC (TSI model 3025), measuring particles in sizes from 6.15 to 225 nm in 101 size bins was used at the blast fence. In the two-minute scans performed for size distributions, particles are scanned for 100 seconds followed by a down scan that allows the voltage to be reset (down scan) for 20 seconds. Particle numbers in dN/dlogDp were generated for each size bin during each two-minute scan. The instruments were frequently checked for proper functioning. Upon identifying abnormal responses, if any, they were examined and properly maintained in the field, such as cleaning of inlet impactor. All data were handled by TSI-provided software, Aerosol Instrument Manager (AIM) 5.3.1. ASCII coded data were exported from the AIM software and subsequently analyzed by Microsoft Excel or SAS software (SAS Institute, Cary, NC).

The SMPS/CPC was also used to conduct near continuous monitoring by performing particle counts over very short time intervals, to better capture take-off emissions. In these measurements, the DMA of the SMPS was adjusted to monitor a specific particle size and the CPC was used to count particle concentrations at the desired size every second, providing a real-time monitoring approach that could capture temporal variability in particle number concentrations. In the September study, monitoring was done for 7, 10, 20, 30, 50, 100, 150, and 200 nm on September 23 and at 8, 10, 15, 20, 30, 50, 75, 100, 150 and 200 nm particles on September 28. The monitoring time periods for one second scans lasted from 11 min to 77 minutes. In the winter study, similar one second scans were conducted for particles at 10, 15, 20, 30, 50, and 100 nm, on February 28, March 1 and 2.

Aethalometers (Magee Scientific, model AE-20) were used to measure black carbon (BC) at 880 nm. The instruments were set up to measure average BC concentrations over 5 minute intervals in the September study and over 10 minute intervals in the winter study. Data was retrieved from the instruments daily.

E-BAMs (Met One Instruments) were installed to measure $PM_{2.5}$ at the LAX blast fence and the AQMD background site during the September study. The instrument operated continuously for 168 hrs. Hourly averaged concentrations were retrieved from the instruments after termination of monitoring efforts at the end of the sampling campaign periods, whether sampling duration was set up for 30 or 60 minutes.

CO_2 concentrations were measured at the LAX blast fence by a Q-Trak, which was set to integrate the concentration over one minute interval. As explained below, the instrument did not perform adequately under the field conditions, and the data were not pursued.

A Tisch Model 1202 sampler (Tisch, Cleves, OH) was deployed to obtain ambient samples of polycyclic aromatic hydrocarbon (PAH) species. The sampling train was the same as was reported in Eiguren-Fernandez et al. (2004). The unit contained a $PM_{2.5}$ cyclone inlet, a fall column chamber, a filter holder, a PUF-XAD-4 resin holder, an electronic controller, a mass flow meter, and a vacuum pump. A sampling matrix that comprised XAD-4 resin and a Teflon coated glass fiber filter (TCGFF, 10.4cm) was used to collect vapor- and particle-phase PAHs, respectively. Collection of vapor-phase PAHs was carried out using 20g of XAD-4 (Acros Organics, NJ) resin held in a glass cylinder between two 400 mesh stainless steel screens, and a

2" PUF plug placed behind the screen to hold the ensemble together. The TCGFFs were cleaned by sonication using a solvent mix of dichloromethane:methanol and letting them dry in the oven till no odor was detected. In preparation for field use, PUFs were cleaned with distilled water and "compress-cleaned" using a mixture of hexane:methanol:methylene chloride (5:3:2 v/v) prior to matrix loading. After cleaning, PUFs were dried in an oven until no solvent odor could be readily detected. The XAD-4 resin was cleaned with triplicate rinses of water and methanol, using a Millipore filtering system. Cleaning was carried out in a Soxhlet system using methanol for 24 h, followed by methylene chloride for two 24 h periods. Once the XAD-4 was cleaned, it was placed in a vacuum oven at 40–50◦C for 2–3 days until no odor was detected. Ten vapor- and particle-phase 24-hour samples were collected at the blast fence and the background site from September 23 to September 28, 2005. No Tisch sampling was performed during the winter campaign. Vapor- and particle-phase samples were analyzed separately to assess differences in the PAH profiles at each site. Sampled volume, measured by the sampler's mass flow meter, is corrected to 21.1◦C and 1 atm. Prior to sampling, laboratory-prepared sampling matrices were stored in a conventional freezer and their transport to and from the field was accomplished using a cooler containing frozen blue ice. Once the samples were collected and returned to the laboratory, they were placed in a freezer until extraction and analysis. Previous work has shown that backup filters were not needed (PAH levels on backups were below LOD under the sampling and analysis methods used) (Eiguren-Fernandez et al, 2004).

SUMMA polished stainless steel canisters were used to collect ambient air for chemical analysis for 1,3-butadiene, benzene, and acrolein. In the field, a sampling train provided by ARB was connected to a canister. The train consists of metal tubing with an open-end for air entry, a critical orifice with a screw for flow control, a pressure gauge to measure canister vacuum pressure, metal tubing for connecting the train and the canister, and a concrete block stand to hold the sampling train. Canisters were initially depressed to –30 psi prior to use in the field. After connecting the sampling train and the canister, airflow at 0.003 liter per minute was calibrated at the beginning of each sampling. Sampling lasted for about 24 hrs. Air pressures at the beginning and at the end of sampling were recorded.

Cartridges containing silica gel (coated with acidified 2,4-dinitrophenylhydrazine, DNPH) as a solid absorbent were used to trap formaldehyde in ambient air. The cartridge was connected to a sampling train, consisting of a holding tripod and a pump drawing a flow rate at 0.7 liters per minute for a 24-hour period.

Chemical Analytical Methods

Details of the PAH quantification procedure have been described previously (Eiguren-Fernandez and Miguel 2003). Briefly, TCGFFs were extracted by ultrasonication with 15 mL of methylene chloride. The extraction procedure was performed in amber glass vials under yellowlight conditions. The extract was filtered and the volume reduced to ~5 mL; 1 mL was used for analysis; the remainder was frozen. The XAD- 4 was also extracted by sonication. A 1mL aliquot was injected directly into the HPLC-FL system to measure naphthalene, acenaphthene, and fluorene. Another 1mL aliquot was concentrated to ~100uL for the analysis of higher molecular weight PAHs. One field matrix blank was extracted and analyzed for approximately every ten samples. PAH concentrations measured in blank filters and XAD-4 blanks were subtracted from the concentrations found in the samples. Eiguren-Fernandez et al. (2004) have

reported that the collection efficiency of the system ranges from 93–97% of the lower MW PAHs, including naphthalene, phenanthrene, fluoranthene, and pyrene. SRM 1649a was used to determine the analytical procedure precision (4.2%) and recovery efficiency (85%).

Canisters and cartridges were transferred to ARB for analysis following ARB protocols. Briefly, 1,3 butadiene and benzene were analyzed by capillary column gas chromatography with photo ionization detector (Method MLD057). In summary, an air sample is introduced into the analytical system from a pressurized canister through stainless steel or Teflon tubing with the aid of a mass flow controller (MFC) and a vacuum system. A digital readout attached to the MFC provides a visual indication of the proper sample flow during sampling. The sample passes through a Nafion dryer to remove moisture from the gas stream. It is trapped on a cryotrap at -150 °C. At this temperature, the desired components are solidified, while fixed gases, such as nitrogen (N_2), oxygen (O_2), and carbon dioxide (CO_2), and methane (CH_4) pass through the cryotrap to the vent. The system is then purged with ultra pure N_2 to flush sample remaining in the tubing or bypassing it on to the cryotrap, and to remove any excess light impurities. The cryotrap is isolated and rapidly heated to 125°C, followed by injection of the sample onto a DB-VRX capillary column. After a short hold at 125°C, the trap temperature is raised to a final temperature of 190°C. The sample mixture is separated into individual components by their interaction with the capillary column stationary phase in the temperature- programmed gas chromatography. A photo ionization detector detects the eluting components. 1,3-butadiene and benzene are subsequently identified and quantified, based upon the relative retention time.

High performance liquid chromatography (HPLC) (ARB Method MLD022) was used to determine level of formaldehyde collected into absorbent cartridges. During sampling, formaldehyde reacts with the DNPH to form hydrazone derivative. Acetonitrile is used to elute the derivative from the cartridges. The eluted derivative was quantified by reverse-phase HPLC with ultraviolet absorption detection at 360 mm.

Data Analysis

Outliers in the SMPS size distribution data were detected by identifying unusual increases in the value(s) of a particular size bin, in comparison to a typically smooth size distribution. These outliers are occasionally found in SMPS/CPC-generated data and were usually orders of magnitude higher than typical values found in the same size bin. Infrequent zero values were encountered in the SMPS/CPC data, and were removed from further analyses. Negative values from aethalometers were also removed from statistical analysis.

Meteorological data: Surface and upper air meteorological data collected at the AQMD reference site were used to analyze the meteorological conditions for the sampling campaign periods.

Summary statistics (mean and standard deviation) were computed for all measured pollutants. SMPS data collected over the duration of each study period were combined to generate an average size distribution for both the near source and background sites. Statistical computation and graph plotting were performed by SAS software (Version 9.1, SAS Institute, Cary, NC) or Excel 2000 (Microsoft Corporation).

concentrations at the AQMD background site (data not shown). To better focus study results on the influence of the airport and reduce potential complications introduced by differential effects of the fire on our two monitoring locations, data collected during the wildfire was excluded from statistical analyses.

Size Distributions of Ultrafine Particles

Data from the two minute SMPS/CPC scans were averaged to yield an overall size distribution of particle number concentration at each location. In the September study, a total of 4,639 SMPS scans were recorded at the blast fence and 5,250 SMPS scans were recorded at the AQMD site. The size distribution for the winter campaign is based on 1,100 two minute scans conducted on February 22, 23, and 24. Aggregation of the data obtained from the SMPS yields a robust representative particle size distribution of each site, depicted in Figure 2-4 as the relationship between average mobility diameter, Dp (nm), and concentration dN/dlogDp. Zero values were excluded. The distribution at the LAX blast fence in September '05 included particles ranging from 6.15 to 225 nm (mean particle diameter). The instrument used in the winter campaign and at the AQMD background site measures particles from 7.64 to 289 nm.

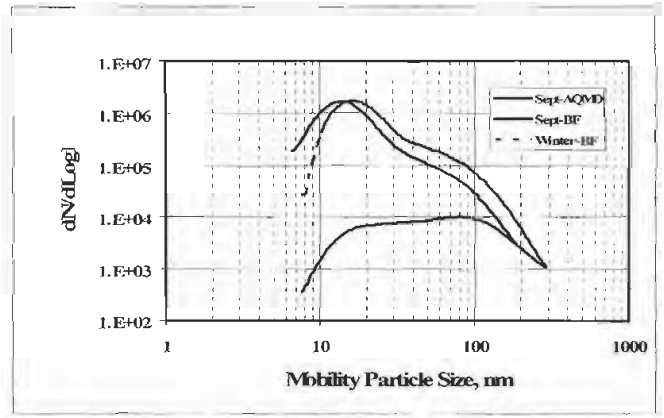


Figure 2-4: SMPS 120 second scans from near source and background sites, aggregated for each location/sampling time. AQMD is the background site, BF is the blast fence near source site at the LAX runway

Inspection of Figure 2-4 shows that the distribution of particle size measured at the blast fence is unimodal, with the peak number concentration occurring in the nucleation range at 14 nm ($dN/dlogDp = 1.4 \times 10^6$) in the summer study and 16.3 nm ($dN/dlogDp=1.3 \times 10^6$ #/cm^3) during the winter study. A shoulder in the distributions between 50 and 90 nm indicates a slight secondary mode in the accumulation range, for both summer and winter studies. The concentration of particles smaller than the peak mode averages between 1.4×10^5 #/cm^3 to 1.4×10^6 #/ cm^3 at the blast fence. Concentrations of particles larger than the mode decrease gradually

Analysis of size-specific SMPS/CPC data from one second scans: A temporal profile of particle concentration was plotted from the one second CPC output for each particle size that was sampled. To analyze the highly resolved time vs. concentration data with respect to aircraft emissions, air traffic activity data were obtained from Los Angeles World Airports (LAWA). The data includes the logged departure time, arrival time, aircraft type and airline identification number for flight activity at each runway. "Arrival" and "departure" time is logged by the control tower when a plane passes detection radar, and these logs times are not necessarily coincident with the time at which a plane and its emissions are closest to the sampling instruments. In order to investigate the specific impact of aircraft take offs on ultrafine particles in each size range, the peaks in the particle concentration time profiles were matched with departure events from the airport logs, by manual inspection of the two related time series (concentration and aircraft activity). The range of peak concentrations, mean, standard deviation, geometric mean, and geometric standard deviation for each selected size were computed. In addition, the data from selected take-off events were used to model the aircraft emission during the complete cycle of an aircraft turning onto the runway, idling, and accelerating down the runway away from the blast fence sampling location, based on field notes collected during sampling.

SAS Proc GLM was used to test the differences in volatile organic compound concentrations between the near source and the background sites as well as between two sampling campaigns.

2.3 Results

Meteorology

The local meteorological conditions during the study were mostly typical. In the summer study, conducted from September 21 to 27, 2005, a sea breeze developed in the morning leading to westerly and southwesterly winds over LAX from about 8 to 9 AM to early evening at a maximum speed of 8 - 11 mph. Lighter northeasterly winds from 1 to 3 mph associated with a land breeze appeared from midnight to early morning. The diurnal variations of temperature at LAX ranged from a daily minimum of about 57 °F in the early morning to daily maximums of 67 to 76 °F around noontime. High relative humidity persists at LAX due to the influence of marine air. In the winter study, the average temperature was 54 °F, with average daily minimum of 47.8 °F and average daily maximum of 60.3 °F during the study period. Winter wind speed averaged 4.6 mph, ranging from 0 to 16 mph, mostly typical sea breezes for this location.

Wildfire

During the September study period there was a wildfire in Topanga Canyon, in the Thousand Oaks region north of the Santa Monica Mountains. The fire began in the late afternoon on September 28 and continued to the conclusion of the summer sampling campaign. The wildfire was located about 25 km northwest of LAX. During this period, there was also a weak Santa Ana event September 28-29 that resulted in a slight shift from the normal meteorological patterns. The typical southwesterly sea breeze over LAX reduced slightly to 4 – 6 mph during the daytime on September 29. The wind directions remained mostly normal. The maximum temperature reached 92° F with a relative humidity down to 27 %, lower than typical humidity. In spite of mostly southwesterly winds, a temporal analysis of aethalometer, SMPS/CPC and PAH data suggested that the wildfire plume resulted in increased black carbon, PM, and PAH

Size specific particle counts over very short time intervals were performed to capture changes in particle concentration due to isolated aircraft take-off events. The one-second size specific data yielded a complex set of concentration vs. time data for several selected sizes of ultrafine particles. For each of the particle sizes monitored at the blast fence, the temporal profile of measured concentration was highly variable with many prominent peaks in the data. These peaks were associated with aircraft takeoffs, confirmed by inspection of LAX aircraft activity logs. Figure 2-6 depicts the concentration profile of 15 nm particles measured at the blast fence between 13:48 to 14:24 pm on September 28, with departing flights marked by asterisks. This time series clearly shows the variation in particle concentrations emitted from various aircraft taking off during the monitored time period. Specific airline identifiers are omitted, until a more complete analysis of aircraft makes and models can be undertaken. In the absence of a take off event, 15 nm particle concentrations ranged from 60 to 150 #/cm^3, the baseline of the time profile in Figure 2-6. During take-off, aircraft generated large numbers of particles, ranging up to 28,000/cm^3. The data from several of the particle sizes that were monitored showed a similar temporal pattern of peaks associated with aircraft activity to that in Figure 2-6 (data not shown).

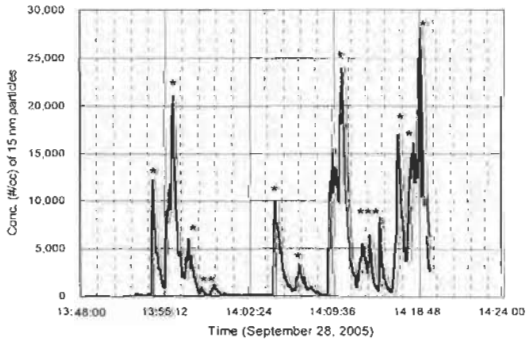


Figure 2-6: Temporal profile of 15 nm particles at the blast fence associated with aircraft activity. *Aircraft take off events.

The size specific data were also used to analyze the emissions of single cycles of all aircraft take-offs that occurred during a selected time period for the study, during which detailed field notes had been collected. A typical example of a take-off cycle is shown in Figure 2-7, which depicts the time profile of the concentration of 30 nm particles at the blast fence while an aircraft prepared for take-off from LAX. The aircraft traveled east on the 25R taxiway to the blast fence for departure. As shown in Figure 2-7, the concentrations of 30 nm particles gradually increased from a baseline level ~40 #/cc to ~ 2,800 #/cc. Upon arrival near the blast fence, the aircraft made a 180-degree turn from the taxiway (facing east) onto the 25R runway (facing west). The jet blast rotated in a clockwise direction from the west to the east, resulting in a slight decrease in particle concentration. Following the 180-degree turn, the pilot initiated take-off, increasing the

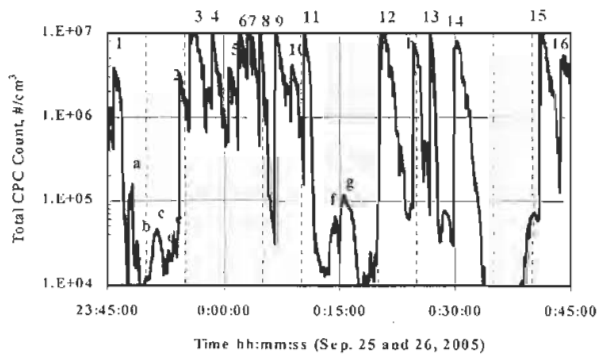
with size, down to about 2 x 10^3 #/ cm^3 for 255nm particles. Slight differences in the size distributions between September and the winter sampling campaigns might be contributed to different CPC models as well as the placements of sampling probes at the blast fence.

At the AQMD background site, the size distribution is substantially different. Particle number concentrations are lower throughout the size range and the distribution of particles by size is notably different from that at the blast fence. The defined peak in the 14 – 16 nm size range that characterizes the near source location is absent from the background reference site. At the background site, particles are more evenly distributed across the size range sampled by our instruments, with a weakly defined peak mode at about 80 nm. The concentration dN/dlogDp at 80nm is approximately 1 x 10^4 #/cm^3.

Total Particle Concentrations

The CPC was used to determine the total concentration of particles within the size range 7 to <300 nm at the blast fence and background site, in one-second scans. At the blast fence, approximately 2% of the data points exceeded 9.99 x 10^6 #/cm^3, the upper limit of CPC reporting (TSI, 1999). Without the peak concentrations, averages drawn from this data are not informative to describe UFP numbers at the blast fence. A preliminary analysis has been performed of the total count data as a temporal profile. Figure 2-5 shows a selected time series of total counts, with LAX aircraft activity marked in numerals and letters. Numerals correspond to aircraft take-offs on runway 25R. Letters correspond to departures and arrivals on the parallel runway situated slightly to the south, runway 25L. Spikes in UFP concentration are clearly correlated with activity.

Figure 2-5: Time Profile of Total CPC Counts and Identification of Aircraft at Runways 25R and 25L



Size Specific Particle Concentrations

0.89 ± 1.2 μg/m^3 (n=1,713). The difference between the two sites was statistically significant ($p < 0.001$).

$PM_{2.5}$

Time averaged mass concentrations of $PM_{2.5}$ are shown in Table 2-2. The mean concentration at the LAX blast fence during the September study was 37.1 ± 15.4 μg/m^3, which was significantly greater ($p < 0.001$) than concentrations measured at the background site (14.3 ± 9.9 μg/m^3). Daily mean $PM_{2.5}$ concentrations of the LAX site varied between 32 to 42 μg/m^3 and were consistently significantly greater than the daily means (9 to 18 μg/m^3) at the AQMD site ($P < 0.001$ for daily comparisons). Because each measurement is an hourly average, an analysis showing temporal association of $PM_{2.5}$ with aircraft activity is not possible at this time.

Table 2-2: $PM_{2.5}$ concentrations (in μg/m^3) at the blast fence and background reference site (2005 summer study).

Date	AQMD Mean ± SD	LAX-BF Mean ± SD
9/23/2005	17.8 ± 11.6	42.1 ± 10.9
9/24/2005	16.8 ± 11.2	36.0 ± 17.7
9/25/2005	14.0 ± 7.2	39.9 ± 14.9
9/26/2005	13.8 ± 10.3	36.9 ± 17.8
9/27/2005	9.3 ± 10.2	32.7 ± 21.5
9/28/2005	14.8 ± 9.8	37.9 ± 12.1
9/29/2005	13.3 ± 8.4	33.9 ± 8.5
Overall	14.3 ± 10.4	37.1 ± 15.4*

*T-test of the difference between the two sites was significant, p<0.001

$PM_{2.5}$ Polycyclic Aromatic Hydrocarbons

The results of the 5-day September 2005 sampling campaign for PAHs are summarized in Table 2-3. PAH concentrations at the background site are available for the September period only as noted in the methods section, above. Data collected during the Topanga Canyon wildfire was excluded, since PAH concentrations increased notably at the background site during that time and could therefore obscure the PAH profile associated with the airport (data not shown). At both the near source and reference sites naphthalene comprised 80-85% of the total vapor-phase PAH mass. Higher naphthalene levels were found at the LAX blast fence than at the reference site. Overall, the levels of vapor-phase PAH were consistently higher at the LAX blast fence but the differences between locations for individual species were not statistically significant.

Particle-phase PAH also differed between the two sites. The semivolatile PAHs (from phenanthrene to chrysene) were consistently higher at the LAX blast fence than the background site. On the other hand, the high molecular weigh PAHs (from benzo[*a*]pyrene to indeno[*1,2,3-cd*]pyrene) were lower at the blast fence than the background site. Benzo[*ghi*]perylene was the highest concentration particle phase PAH at the background site. The differences in concentrations of individual particle-phase PAHs between the two sites are not statistically significant.

engine thrust level. The concentration of 30 nm particles dramatically elevated from 1,560 #/cm^3 to 17, 200 #/cm^3, a more than 10-fold increase. The aircraft accelerated along the runway, traveling toward the west away from the sampling location, continuously emitting particles that were blown by jet blast and later transported by prevailing wind toward the blast fence. The particles in this case were dispersed and the concentration (C, in #/cm^3) exhibited decay characteristics that were described by exponential decay according to the following equation: $C = C_0 \times e^{-kt} = 17{,}121 \times e^{-0.08575*T}$ (R^2=0.9927), where T = 0 is the second when the take-off was initiated and C_0 (in#/cc) represents a characteristic constant for emissions of 30 nm particles for a specific take off event. It might be dependent upon the particle size and type of aircraft. The model constant k exhibits characteristics similar to particle dispersion in ambient or other physical processes, which might be dependent upon meteorological factors. Although the temporal profile in taxiing and idling prior to take off may vary substantially with specific events, the overall pattern of decay associated with take-offs was very similar. Note that Figure 2-6 is consistent with exponential decay following each peak.

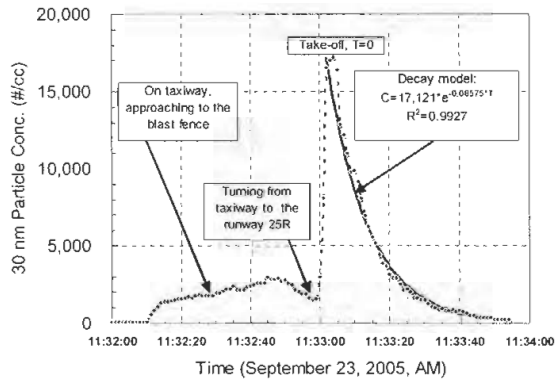


Figure 2-7: Temporal Profile of 30 nm particles during a take off event

Black Carbon

The aethalometers was run at the blast fence for 131 continuous hours in September 2005, and 46 hours in May 2006. Sampling intervals were set to 5 min. in September and 10 min. in May. The September 2005 data provided 1,274 observations, with overall average black carbon concentrations at this location of 13.9 ± 14.3 μg/m^3. The May 2006 average was 14.0 ± 10.2 μg/m^3 (n=142). The averages for the two sampling periods were not significantly different from each other. At the background reference (AQMD) site, the instrument (5 min intervals) ran for 147 hours in September 2005. The average concentration of black carbon at AQMD site was

Table 2-3: Vapor and Particle phase PAH concentrations at AQMD background site and LAX blast fence

		AQMD		LAX_BF	
Phase	PAH	Mean	SD	Mean	SD
Unit: pg/m³					
Particle	Naphthalene	-	-	14.1	-
"	Fluorene	13.7	-	-	-
"	Phenanthrene	111.1	88.1	175.6	54.6
"	Anthracene	4.7	3.4	10.5	7.4
"	Fluoranthene	91.0	117.3	161.7	48.8
"	Pyrene	106.1	113.4	134.7	63.1
"	Benz[a]anthracene	23.0	19.7	36.4	34.7
"	Chrysene	48.4	46.1	78.2	55.7
"	Benzo[b]fluoranthene	55.6	38.3	56.0	42.8
"	Benzo[k]fluoranthene	22.9	17.9	18.7	15.5
"	Benzo[a]pyrene	46.7	43.0	28.1	33.2
"	Dibenz[a,h]anthracene	7.5	6.1	2.7	0.6
"	Benzo[ghi]perylene	121.2	101.0	49.0	57.1
"	Indeno[1,2,3-cd]pyrene	48.5	36.0	18.3	15.7
Unit: ng/m³					
Vapor	Naphthalene	55.8	55.9	82.5	64.5
"	Acenaphthene	1.4	1.9	2.8	1.7
"	Fluorene	2.1	2.4	4.7	1.9
"	Phenanthrene	2.0	1.7	4.8	1.8
"	Anthracene	0.1	0.1	0.4	0.2
"	Fluoranthene	0.4	0.1	0.8	0.2
"	Pyrene	0.5	0.2	1.1	0.5
"	Benz[a]anthracene	0.2	0.1	0.2	0.1

Volatile Organic Compounds

Concentration data for four VOCs of interest are summarized in Table 2-4. Comparisons between the two locations, and the two sampling times, are presented in Table 2-5. The mean concentration of formaldehyde at the blast fence was significantly (3-fold) higher than that at the AQMD background site ($p = 0.006$), when data from both periods were combined. Acrolein was also higher at LAX blast fence than at the background site ($p=0.034$), after adjusting for the difference between two sampling campaigns ($p=0.006$). Note that two of three acrolein measurements in May 2005 were below the limit of detection (LOD). These values were estimated by LOD/2. There were no statistically significant differences in concentrations of benzene or butadiene between the two monitoring sites nor between the two sampling periods,

although butadiene was elevated at the blast fence in September. Concentrations of other VOCs measured during the May 2006 field study are shown in Appendix A; no significant differences were seen between the two sites in VOCs other than those presented in Table 2-4, and most compounds could not be detected.

Table 2-4: Concentrations (in ppb) of measured VOCs at the near source (LAX_BF) and background (AQMD) sites during Sep05 and May06 sampling campaigns

		AQMD		LAX_BF	
Compound	Period	Mean (N)	Std	Mean (N)	Std
Acrolein	May06	0.52 (3)[a]	0.30[a]	0.90 (3)	0.10
	Sep05	1.03 (3)	0.35	1.26 (4)	0.08
Benzene	May06	0.09 (3)[a]	0.03[a]	0.27 (3)	0.04
	Sep05	0.42 (3)	0.29	0.52 (4)	0.57
1,3-Butadiene	May06	_[b]	_[b]	0.16 (3)[a]	0.11[a]
	Sep05	0.15 (3)	0.08	0.36 (4)	0.23
Formaldehyde	Sep05	0.53 (5)	0.22	1.70 (5)	0.66

[a] 1 or 2 values were below the limit of detection (LOD) and were estimated by LOD/2

[b] All 3 values were less than LOD

Table 2-5: Comparisons of VOCs between sites and between two sampling campaigns

Compound	Comparison	p-value
Acrolein	AQMD vs LAX_BF	0.034*
	Sep05 vs May06	0.006*
Benzene	AQMD vs LAX_BF	0.472
	Sep05 vs May06	0.163
1,3-Butadiene	AQMD vs LAX_BF	0.148
	Sep05 vs May06	0.170
Formaldehyde	AQMD vs LAX_BF	0.006*

*Statistically significant difference

Problems Encountered during the study

Overall, the study at the blast fence was successful. The research objectives were mostly accomplished. The near source field site poses challenges associated with the high levels of dust and noise, which pose problems for successful operation of instrumentation and create discomfort for field staff.

Initially, inlet tubing for the SMPS and Aethalometer were placed upstream of the blast fence, through slits in the fencing. But the high PM concentrations including coarse dusts clogged the orifice upstream of the impactor, reduced flow to the instruments, and produced invalid readings. Based on this experience, later sampling was performed with the tubing outside of the white protective cabinets but behind the blast fence. A cyclone was added to filter out large particles that could damage the instruments. As the results show, very high particle counts are still obtained after relocating probes to reduce the impact of coarse dusts.

The probe of the Q-Trak became heavily contaminated with what appeared to be oily residuals from aircraft exhaust mixed with dust. This eventually damaged the sensors. Although we attempted to re-calibrate the sensors, the resulting data were judged questionable or invalid. The Q-trak is typically used in relatively clean ambient environments. If used again in a setting like the blast fence, we recommend that the Q-Trak sensor be better protected from dust.

Technical problems with canister sampling: Although instructions were followed for canister operation there was an unexpected pressure drop in some canisters, resulting in invalid canister samples for two days at the AQMD site and one day at the LAX blast fence.

Permit to access the LAX airfield: Since LAWA has stringent security procedures, we encountered a long delay (about 3 months) to obtain security clearances, badges, and driving permits to the airfield. Security badges and permits were not obtained until September 19, 2005, delaying the onset of field work.

2.4 Discussion

Despite difficulties associated with the LAX field environment, the near source study successfully measured size distribution and size specific concentrations of ultrafine particles immediately downwind of a busy airport runway. Other pollutant concentrations were measured at both the near source and background locations for comparison, and have laid the groundwork for further work to characterize aircraft emissions and the impact of LAX on local air quality. Manuscripts are in preparation reporting results of the near source study, and will be submitted for publication in the upcoming months.

A central finding from the study is that the size distribution of ultrafine particles is notably different at the airport blast fence location (near source) in comparison to the background reference site (Figure 2-4). Note that the size distributions presented in Figure 2-4 represent averages of thousands of SMPS scans. At the blast fence, these aggregate distributions thus reflect samples that occurred during aircraft take off events as well as intermittent background particle levels. Significant differences between the near source site and background were found in the shape of the distribution as well as the average number concentrations across the distribution. The near source site was associated with much higher concentrations of UFP below 100 nm than was the reference site. The maximum concentration difference of 300 fold between the two sampling sites occurred for particles at the concentration mode of the near source distribution (14-16 nm): the average blast fence concentration of 14 nm particles in the summer study was 1.38×10^6 compared to 4.65×10^3 at the background reference site. The size distribution at the near source site has a pronounced mode at 14-16 nm, and particle number concentrations fall off gradually with particle size beyond the mode, reaching background levels at 200nm. In contrast, UFP concentrations at the background site did not vary substantially with size during the time periods sampled. At the reference site, the distribution of number concentrations increases gradually between about 15 and 80 nm; concentrations fall off at either end of that size range. There was a weak mode at 80 nm.

The size distribution of UFP particle numbers at the blast fence distribution reflects aircraft take off emissions at this location. The aggregate size distribution of the background site, in contrast,

may result from a combination of multiple sources. Examination of hourly-average size distributions at the background site indicates that the shape of the distribution varied at different times of day (data not shown). The aggregate distribution can be described as a combination of two mono-modal distributions and a third distribution without a clearly defined mode.

There was little seasonal effect on the distribution of particle number concentrations at the near source site. The distribution was shifted slightly to larger particle sizes, so that the mode was close to 16 than 14 nm during the winter campaign. This finding may reflect the cooler temperatures, increasing condensation of vapors. It may also be due to a slight systematic difference between the instruments used during the two sampling campaigns.

The very high variability in time vs. concentration profiles such as Figure 2-5 and 2-6 were explained in part by correlating peak particle number concentrations with aircraft take off event obtained from LAWA activity data. The largest spikes of both total particle counts and 15 nm particle counts recorded at the blast fence could be matched in time with aircraft take offs. The finding that spikes were associated with aircraft activity held for each of the UFP sizes that were monitored at the blast fence; the 15 nm temporal profile was selected for illustration in the results section, above. The UFP concentration peaks occur against a background concentration that is orders of magnitude lower in concentration and with substantially less temporal variability. For a future publication, we hope to analyze the data by aircraft type to determine what aircraft features are associated with the greatest emission of UFP. In addition, we are performing analysis of the mathematical properties of concentration decay curves in the 1 sec size specific datasets that describe dispersion of particles emitted at take off, as in Figure 2-7. The peaks and decays examined to date indicate that plume behavior generally follows an exponential decay process.

Average black carbon and $PM_{2.5}$ levels at the blast fence were significantly higher than average levels at the background site. This difference is presumably attributable largely to aircraft take off emissions with some additional contribution from ground activity at LAX. There are not other major PM sources in the immediate vicinity of the sampling site. The instruments used for BC and $PM_{2.5}$ measurements produced data that was time integrated over 5 minutes for black carbon and 60 minutes for $PM_{2.5}$ so that we were not able to match specific peaks of these pollutants with individual aircraft activity, as was possible for the UFP data.

In general, the results of the PAH sampling suggest that aircraft emissions are not unusually high in PAH. PAH at LAX were compared to the reference site which, like the airport, experiences fresh sea breezes during the day and the absence of significant upwind sources. The results show that there were no statistically significant differences in the levels of individual PAH species between the near source and background reference site. However, the pattern of concentrations observed was different at the blast fence vs. the background site. The blast fence was enriched for semi-volatile PAH relative to the background location. LAX had lower concentrations of heavy PAH however, especially notable for benzo[ghi]perylene, often considered a marker for light duty vehicle traffic (Table 2-3). The latter finding suggests that the background site was influenced by vehicular traffic to a greater extent than we had predicted, perhaps due to easterly flows during nighttime hours.

It is potentially informative to compare the results to PAH data for other locations in the Los Angeles Basin that were studied previously, using similar methodology (Eiguren-Fernandez et al, 2004). The blast fence concentrations of the lightest vapor phase PAH (naphthalene through anthracene) were within the range of values seen at other LAB sites. Fluoranthene, pyrene and benz[a]anthracene were somewhat elevated at the blast fence relative to both the AQMD background site and other sampled LAB locations. In contrast we observed that the heaviest particle phase PAH that were studied (dibenz[a,h]anthracene, benzo[ghi]perylene and indeno[1,2,3-cd]pyrene) were found at concentrations that fall in the lower end of the range observed in other community samples, and were lower than the levels measured at the background reference site. It should be noted that ambient concentrations of high molecular weight particle phase PAH are highly temperature dependent with increased concentrations in cold relative to warm weather. This renders comparisons of our findings to the annual average concentrations measured in Eiguren-Fernandez somewhat tenuous. As a general finding, it can be concluded that the data suggest a discernable difference in the pattern of concentrations of individual PAH species observed at the blast fence when compared to average patterns in the community.

Because naphthalene is a carcinogen and present at relatively high levels in the LAB, it was of interest to determine if aircraft could be an important source. Naphthalene levels were higher at the blast fence relative to background, and while the difference did not reach statistical significance the finding suggests that aircraft may be a relevant source of naphthalene. It should be noted, however, that the average naphthalene concentration measured at the LAX blast fence was within the range of annual average naphthalene concentrations measured at twelve LAB locations. Most of the communities studied likely experience a greater influence of roadway vehicles and other upwind sources than does the LAX blast fence location. The blast fence PAH concentrations were clearly greater than those measured in Lompoc, a rural community. The finding that much of the mass of vapor phase PAH at both the LAX and background locations was attributable to naphthalene is consistent with observations reported for several locations in the Los Angeles basin (Eiguren-Fernandez et al, 2004).

Concentrations of some VOC compounds were elevated at the blast fence relative to the background site. However, the marked differences between the two locations that were found in PM were not reflected in the VOC data. Formaldehyde levels were significantly higher than background at the near source site, which suggests LAX operations might be an important source of ambient formaldehyde. The concentrations were perhaps not remarkable in comparison to ambient levels in urban locations, but the blast fence location reflects aircraft and other airport sources alone, against a relatively pristine background of sea air, during typical meteorological conditions. Acrolein levels at the blast fence were also elevated relative to the background site. The acrolein findings are less conclusive due to technical difficulties in measuring this reactive carbonyl compound. Several measurements were below detection limits. Acrolein levels in Sep 05 sampling campaign were significantly higher than those in May 06 sampling campaign. Since acrolein is an atmospheric breakdown product as well as a primary emission, the seasonal difference may be attributable to higher ambient temperatures during September. The daily high temperature during Sep 05 sampling campaign was between 19 to 30°C; while during May 06 sampling campaign it ranges between 17.2 to 17.8°C.

3. Downwind Study

3.1 Overview

The study was designed to examine number concentrations of UFP and black carbon mass concentrations within a 600 m downwind of the near source blast fence site. In studies of ultrafine particles near busy freeways, it has been reported that the high levels of UFP measured at the freeway approach background levels within 300 m downwind (Zhu et al, 2002a, 2002b). It was therefore of interest to conduct a parallel study for the airport to enable comparison of particle dispersion between these two sources of combustion UFP. A study precisely parallel to the freeway studies is not possible for aircraft runways. Freeway emissions may be considered a line source of pollutant due to relatively continuous traffic flow. An airport runway carries relatively few aircraft. The large plume of exhaust emitted at departure and the minutes that elapse between aircraft departures create very high temporal variability over narrow time intervals, in contrast to a freeway. Another key difference from the freeway scenario is that jet exhaust travels at high velocity from the engine thrust toward sampling locations so that the plumes might be carried farther from the site of emission.

Taking these factors into consideration, a limited experiment was designed to examine UFP particle number concentrations and black carbon mass concentration at locations intermediate between the blast fence and the community sites, which are further to the east and would be studied subsequently. One second CPC scans at 15 nm were performed at five locations, at increasing distance downwind of the take-off runway, 25R. Aethalometers collected black carbon mass concentrations simultaneously, and a weather station was included in the van used for mobile sampling. Sampling was conducted in a field east of LAX that contains landing lights to guide arriving aircraft to runways 25R and 25L. To assess downwind concentrations from departing aircraft, five locations at increasing distance from runway 25R were selected, using the landing light structures as a guide to the downwind trajectory from the runway. A more limited number of samples were taken at similar downwind distances underneath the landing path to runway 25L, which is primarily used for arriving aircraft and was thus expected to have a different spatial distribution of pollutant levels.

The study addressed the following hypotheses:

1. Concentrations of UFP numbers and black carbon mass downwind of the departure runway are intermediate between concentrations measured at the blast fence and those further downwind, in residential communities
2. A concentration gradient, with decreasing concentration over distance from the source of take-off plumes will be observed.
3. In the absence of source tracer analysis, highly time-resolved data can be used to infer the source of particles downwind from the airport, by matching the pattern of particle concentrations observed with the pattern at the blast fence.

The hypotheses assume predominance of southwesterly sea breezes parallel to the runways, the most typical pattern at LAX.

3.2 Methods

Instrumentation and Sampling Locations

Two SMPS/CPCs and two aethalometers (one of each provided by ARB and one of each by the Southern California Particle Center), and a Wizard III weather station were assembled for this study. One set of equipment, including the weather station, was installed at the blast fence to provide near source reference data. The other set of instruments was installed in a minivan and driven into a field located downwind of LAX immediately across Aviation Boulevard from the near source location at the 25R blast fence. This field is referred to as the Proud Bird field and houses the LAX landing lights. Battery packs served as the power source for the instruments in the minivan. The van was parked at 5 different locations along the downwind trajectories from runways 25R and 25L in the Proud Bird field (see map in Figure 3-1). Sample sites 1-5 were located from 10m to 400m downwind of the east side of Aviation Blvd, in line with runway 25R. Sites BF, 1, 2, 3, 4, and 5 were 140, 220, 250, 310, 410 and 610 meters downwind of the source (the point along the runway at which take off is typically initiated, marked 'T ' on Figure 3-1). Sampling sites A-E beneath the aircraft approach route to runway 25L were spaced at similar distances: 13, 44, 88, 165, and 348 meters from the east margin of Aviation, equivalent to approximately 620, 660, 700, 780 and 960 meters downwind of the point along the runway where landing is primarily located (indicated by 'L' on Figure 3-1).



Figure 3-1: Aerial map showing Proud Bird field and dispersion study sites. L: 25L Landing Point; T: 25R Take-off Point; BF: Blast Fence, 140 m distance from Point T; Red Marked sampling sites: 1-220m, 2-250m, 3-310m, 4-410m, and 5-610m from Point T; Green Marked sampling sites: A-620m, B-660m, C-700m, D-780m, E-960m from Point L.

Sampling Times

Sampling in the Proud Bird field occurred during two weeks in May 2006. Data was collected downwind from 25R over four days. Monitoring was performed at each location for approximately 2 hours on each of four different days. The data from the four days was combined for each site to enable analysis of summary statistics for black carbon and 15 nm PM.

Monitoring was performed under the landing path to 25L on one day, during which each of the five downwind sites was sampled for about 2 hours.

Traffic Data

Aviation Blvd. runs north/south, immediately upwind of the field in which the dispersion study was conducted. An automatic traffic counter installed by City of Los Angeles was used to monitor traffic during the study period. In addition, a single 44-minute sampling of 15 nm particle counts was performed at about midday on May 30, 2006 at a parking lot on the west side of Aviation Blvd. The location is not marked in Figure 3-1, but is at the bottom margin of the photo, due south of site 1 and A. This location is not influenced by aircraft on LAX runways and was selected to evaluate the potential impact of street traffic on the downwind study sites.

Data Analysis

Meteorological data were obtained from SCAQMD. Each measurement of 15 nm particles or black carbon was assigned a wind direction, based on hourly wind data. Wind data are expressed as compass degrees, with 0 being due north. If the wind was from 200 to 290 degrees (corresponding to west and southwesterly winds), the data were considered to be under prevailing wind conditions, bringing aircraft emissions to the downwind sites. These data were considered "wind adjusted" and were included in analysis.

Runway 25L is occasionally used for aircraft departures, and this occurred several times during the sampling. In order to create a clearer basis for comparing plumes from arriving aircraft to departing aircraft, the 15 nm particle data collected downwind of 25L was sorted to exclude data associated with aircraft take offs on 25L.

Box-whisker plots were generated in SAS to compare the data obtained at different sampling locations. The lines at the top of, within, and at the bottom of the box of a box-whisker plot represent the 3rd quartile, median, and 1st quartile of the data, respectively. The whiskers extend up to the highest extreme and down to the lowest extreme of the data, thus defining the range of the data. The upper quartiles of the wind-adjusted data sets were examined separately. From the near-source study, it was apparent that the blast fence experiences sharp spikes of short time duration when aircraft take off and these peaks in the data are clearly distinguished from a general background level that displayed a much lower temporal variability. Taking the upper quartile of measurements is an approximation for manual selection of peaks in the data that are attributable to aircraft plumes. Temporal profiles of particle concentrations were plotted for selected sampling runs. As in the near source study, the time profiles were matched to aircraft activity, to assess whether the spikes in concentration can be attributed to aircraft sources.

3.3 Results

15 nm Particles from 25R

Figure 3-2 presents the number concentrations of 15 nm particles, at increasing distances downwind of the departure runway, 25R. The box plots summarize all the data collected over the duration of monitoring at the blast fence and locations 1 through 5 as depicted in Figure 3-1. The observed concentrations are highly variable. The range of observed concentrations decreases slightly with distance, but remains highly variable. Average number concentrations of 15 nm particles did not change substantially with distance. The graphical analysis was repeated,

using only the top quartile of concentrations, to illustrate how the highest concentrations varied with distance (Figure 3-3). Plotting only the top quartile of concentrations is a surrogate for manually inspecting the time series profiles of the data and selecting those concentration peaks that are associated with aircraft departures. The peak concentrations, as represented by the top quartile of data, show a pronounced decrease with increasing distance from the runway.

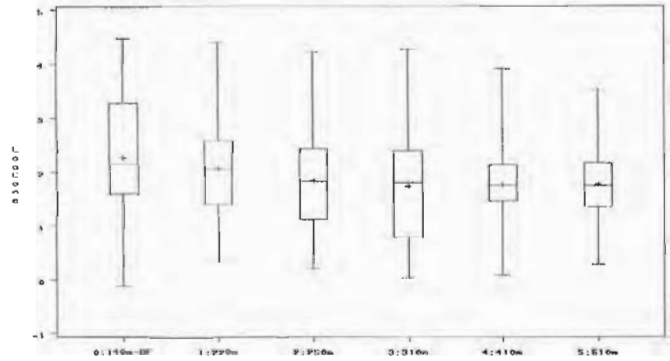


Figure 3-2: Box plot of 15 nm particle data collected downwind of runway 25R. Locations are described in meters from aircraft take off position. BF: blast fence.

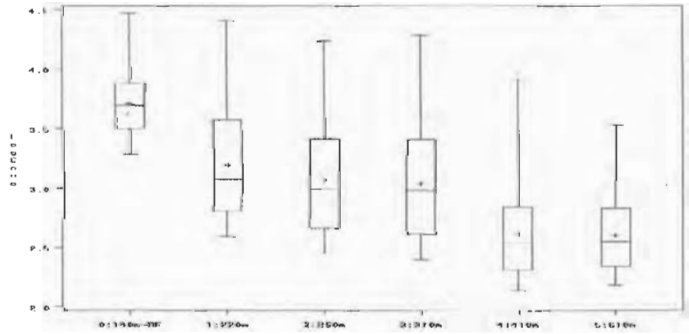


Figure 3-3: Box plot of upper quartile of 15 nm particle data collected downwind of runway 25R. Locations are described in meters from aircraft take off position. BF: blast fence.

Temporal profiles of 15 nm PM as measured at downwind locations were compared to profiles of simultaneous measurements at the blast fence near source site. Data from downwind locations 2 and 3 were plotted to illustrate the results. Figure 3-4 depicts the temporal variation in 15 nm particle number concentrations at the blast fence (red profile) and downwind site 2 (blue profile).

Site 2 is approximately 110 m from the blast fence, and 250m from the source (the point on runway 25R at which take off is typically initiated). The data at the two locations was collected simultaneously during a period of approximately 30 minutes. The time profiles of particle concentration are very similar. The largest spikes of particle concentration are those associated with take off events, noted in the figure by numerals. Table 3-1 lists the aircraft activity noted by LAX during this period, for comparison with the figure. Take-off spikes of UFP were clearly detected at the downwind site, with a time lag of approximately 15-20 seconds. Figure 3-5 compares 15 nm number concentrations at the blast fence to Site 3, which is 170 m downwind of the blast fence and 310 m from the point of take-off. Again, UFP spikes observed at the blast fence are clearly detected downwind, with a time lag of approximately 20 seconds. Note that during the time period when there were no take-offs, there were no concentration spikes at either the blast fence or downwind location.

Table 3-1: Aircraft departures on runway 25R associated with data profiled in Figure 3-4.

Label	Time	ID	Type
1	16:02:08	UAL326	B752
2	16:03:59	AAL2454	MD82
3	16:06:08	SQC7987	B744
4	16:08:03	XAARQ	LJ31
5	16:09:27	COA1503	B738
6	16:11:55	AAL1744	MD83
7	16:16:36	AAL22	B762
8	16:18:08	SKW6526	CRJ2
9	16:19:08	UAL116	B763
10	16:22:22	EGF087	SF34
11	16:26:41	SKW6508	CRJ2
12	16:28:55	UAL28	B752
13	16:30:37	DLH453	A343
14	16:37:55	AAL180	B762
15	16:40:00	AAL1546	MD83
16	16:42:32	SKW6507	CRJ2

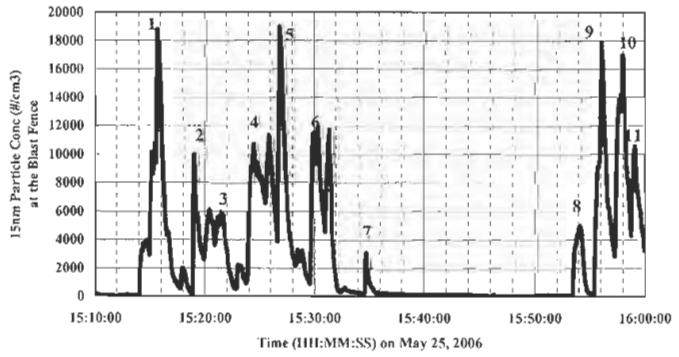


Figure 3-5: Temporal profile of 15 nm particle concentrations at the LAX blast fence (red, upper), and a site 170 m downwind of the blast fence (blue, lower), during the same time period. Aircraft departures logged by LAX are noted with numerals, see Table 3-2 for details.

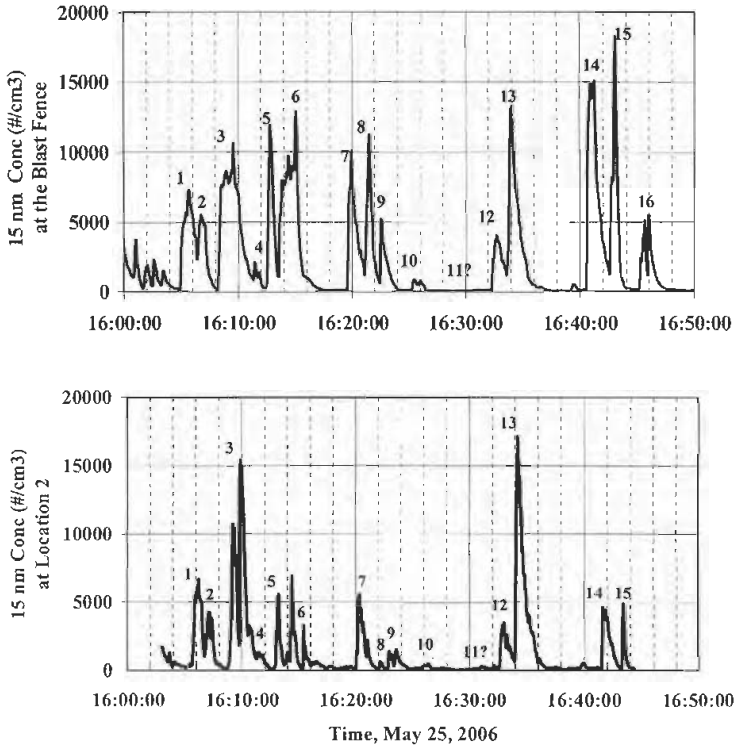


Figure 3-4: Temporal profile of 15 nm particle concentrations at the LAX blast fence(red, upper), and a site 110 m downwind of the blast fence (blue, lower) during the same time period. Aircraft departures logged by LAX are noted with numerals, see Table 3-1 for details.

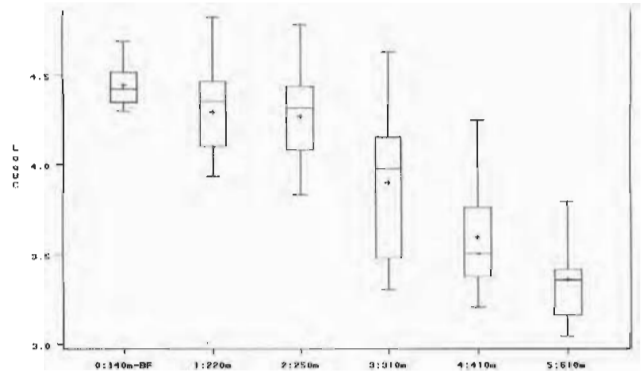


Figure 3-7: Box plot of upper quartile of black carbon data collected downwind of runway 25R. Locations are described in meters from aircraft take off position. BF: blast fence.

15 nm Particles and Black Carbon from Runway 25L

A similar analysis to that described above for data collected downwind of runway 25R was performed for a set of locations under the landing approach to runway 25L. As noted in methods, we excluded the data associated with occasional aircraft departures on this runway, to enhance comparison of arriving and departing aircraft emissions. Box plots of 15 nm particle concentrations using the complete data set or the top quartile only are shown in Figures 3-8 and 3-9, respectively. Data on 15 nm particles from both runways are also summarized in Table 3-3. The average concentrations of particles (all data) were not significantly different than average concentrations observed downwind of runway 25R. Concentrations of 15 nm PM averaged roughly 100/cm^3 at all locations; the average concentration did not show a pattern with distance. Looking just at the top quartile of concentrations, the pronounced decrease over distance that was observed for the departure runway 25R does not appear downwind of 25L. Black carbon concentrations downwind of 25L did decrease with distance, and this was apparent when looking at either the complete data set (Figure 3-10) or the top quartile only (Figure 3-11).

Table 3-2: Aircraft departures on runway 25R associated with data profiled in Figure 3-5

Label	1	2	3	4	5	6	7	8	9	10	11
Time	15:15	15:17	15:19	15:22	15:23	15:26	15:31	15:50	15:52	15:54	15:55
ID	SIA011	UAL164	N86TW	ACA744	DLH457	COA1597	AAL768	EGF085	CAL005	AAL2452	UAL114
Type	B744	B752	F2TH	A320	B744	B737	MD83	SF34	B744	B738	B763

Black Carbon from 25R

Figures 3-6 and 3-7 summarize black carbon concentrations at the blast fence and downwind sites 1-5, using all or just the upper quartile of data, respectively. The peak concentrations of black carbon (as estimated by the top quartile of the data in figure 3-6) fall off with distance. A concentration gradient is less evident when the complete data set is plotted, as seen in figure 3-6.

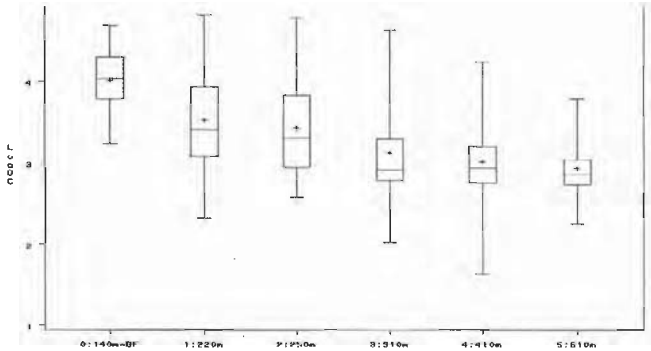


Figure 3-6: Box plot of all black carbon data collected downwind of runway 25R. Locations are described in meters from aircraft take off position. BF: blast fence.

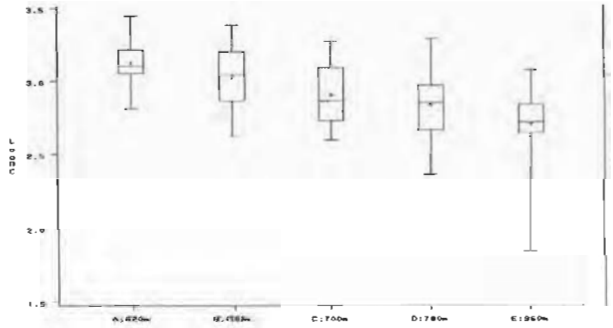


Figure 3-10: Box plot of black carbon data collected downwind of runway 25L. Locations are described in meters from aircraft landing point.

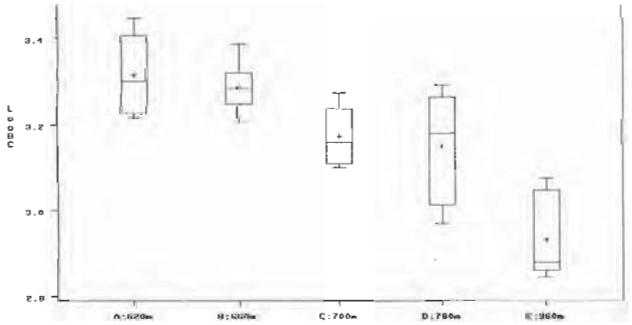


Figure 3-11: Box plot of upper quartile of black carbon data collected downwind of runway 25L. Locations are described in meters from aircraft landing point.

Table 3-3 presents summary data for 15 nm PM number concentrations, presented in the figures above. The data collected at the blast fence and in the 40-minute sampling performed adjacent to Aviation Blvd, but upwind of the runways is included for comparison. The 90th percentile particle concentrations were significantly higher downwind of 25R in comparison to 25L and this held for all five distances from the runways. Recall that data collected during occasional departures on runway 25L were excluded to better characterize any differences between arriving and departing aircraft effects. The difference between runways is less notable at the median particle number concentrations, which reflect background concentrations in the area.

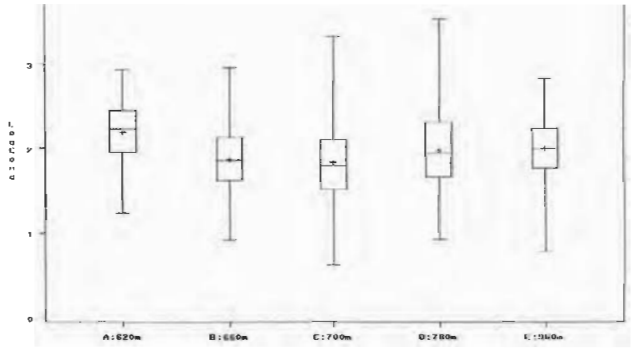


Figure 3-8: Box plot of 15 nm particle data collected downwind of runway 25L. Locations are described in meters from aircraft landing point.

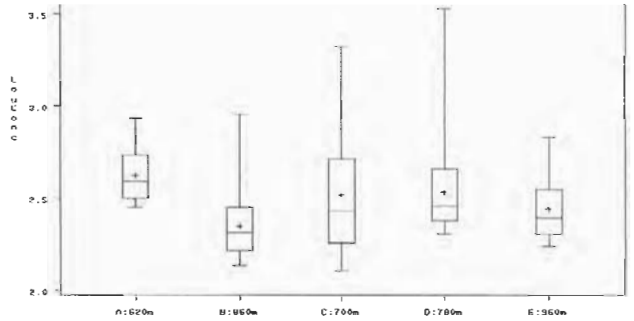


Figure 3-9: Box plot of upper quartile of 15 nm particle data collected downwind of runway 25L. Locations are described in meters from aircraft landing point.

Table 3-3: 15nm Particle Concentrations (dN/dlogDp in #/cm^3) at LAX blast fence (BF), near Aviation Blvd, and study locations in the Proud Bird Field (PBF)

Location	1st Quartile	Median	3rd Quartile	90% Percentile
LAX BF-140 m[a]	55	247	2655	6936
PBF - 25R:				
1 – 220 m[a]	25	115	390	1640
2 – 250 m[a]	14	70	277	1380
3 – 310 m[a]	6	66	248	1460
4 – 410 m[a]	29	58	136	430
5 – 610 m[a]	23	56	152	442
PBF - 25L:				
A – 620 m[b]	89	169	281	419
B – 660 m[b]	41	72	137	229
C – 700 m[b]	33	61	128	344
D – 780 m[b]	45	88	204	320
E – 960 m[b]	57	99	173	281
Aviation Blvd traffic	32	39	57	82

[a]Distances from the take-off point of runway 25R.
[b]Distances from the landing point of runway 25L.

Problems Encountered during the study

No significant technical problems were encountered during the downwind study.

3.4 Discussion

Near-continuous sampling of 15 nm particles at locations 220-610m downwind of runway 25R at LAX was the major focus of the downwind study. Simultaneous sampling was carried out at the near source site (the 25R blast fence), and some exploratory sampling beneath the approach to runway 25L was also performed. Black carbon mass concentrations were collected at all field locations in the downwind study. Data were analyzed by summary statistics and analysis of temporal profiles of 15 nm particle number concentrations, after reducing the data set to those observations collected during prevailing wind conditions. Size distribution data were not collected in this study due to the exploratory scope. Rather, the purpose was to carry out near real time sampling to capture temporal variability in 15 nm PM associated with aircraft activity.

As a general finding, number concentrations of 15 nm particles and concentrations of black carbon measured at downwind locations were lower than at the blast fence, indicating that aerosol associated with aircraft take-off disperses over the study distances (220-610 m from aircraft and 80-470 m from the blast fence). This finding supports the first hypothesis. The size distribution of UFP number was not assessed, so it is not currently known whether the size distribution undergoes shape changes as the plume moves away from the source.

With regard to the second and third hypotheses, that a concentration gradient downwind from take-offs would be observed and that simultaneous sampling at the blast fence would allow source identification, the findings are somewhat more complicated although the data do support both hypotheses. An important finding is illustrated in figures 3-4 and 3-5. The temporal profiles of 15 nm particles collected 110 and 170 m downwind of the blast fence were very

similar to the profiles of particles collected simultaneously at the blast fence. The times of particle concentration peaks in the two downwind site profiles could be matched to the times of aircraft departures, with a somewhat variable time lags between the official recorded take off time, the observed spike of UFP at the blast fence, and the spikes observed farther downwind. Before the study was initiated, there was concern that obstruction of take off exhaust by the blast fence may complicate dispersion of aircraft exhaust plumes. However, the data demonstrate that exhaust plumes resulting from aircraft take-offs are easily detectable 300m downwind, within seconds after aircraft take-offs. Exhaust plumes from aircraft are emitted forcefully, and the results in Figures 3-4 and 3-5 indicate that aircraft exhaust plumes can travel considerable distances. While the impact of such 'forced' dispersion would be the subject of further research, take-off blasts could be felt by field staff at downwind sampling sites, providing some empirical evidence that the blast fence only impedes some part of the force and UFP are carried farther from the source than, for example, has been observed with passive dispersion from freeway traffic. Studies of UFP dispersion at busy freeways have reported that UFP concentrations diminish to background levels over distances of 100-300 m. An additional feature of interest is apparent in figure 3-5: during a time period when no take-offs occurred on runway 25R, 15 nm PM concentrations were low and steady at both the blast fence and downwind locations. This observation demonstrates again that downwind peak concentrations are dependent on aircraft activity.

Figures 3-3 and 3-7 show a consistent downwind decay for the upper quartile measurements of 15 nm particles and black carbon, respectively. Again, the results demonstrate that the blast fence does not entirely disperse aircraft take-off plumes and a spatial concentration gradient is formed from take-off derived particles, in agreement with the second study hypothesis. One explanation is that the vertical air redirection by the blast fence occurs only for the first few seconds along the approximately 90- second take-offs. As aircraft travel westward toward the Pacific Ocean, the exhaust plume may gradually mix with ambient air and become part of air parcels carried by prevailing wind along the trajectory over the downwind study sites.

It should be noted that the five downwind locations could not be sampled simultaneously so that the data cannot describe the dispersion behavior any single plume moving across the field. Some of the inter-location variation in the downwind field site may therefore arise from time-varying factors such as different aircraft, slight changes in meteorology, and local road traffic flux all of which may complicate comparisons between sampling locations. Wind direction has been accounted for to some extent by excluding data collected during times when the wind direction was from other than 200-290 degrees. The potential complications of the serial sampling are also offset somewhat by the fact that each location downwind of 25R on four different days.

Despite the clear association of peak particle concentrations at the downwind locations with peaks at the blast fence, the average concentration of 15 nm particles did not vary substantially with increasing distance from the blast fence (figure 3-2). The finding that average concentrations were not location dependent suggests that there is a background level of 15 nm particles at the downwind locations that is not directly influenced by take-off events. When data primarily associated with take off peaks was analyzed separately (by selecting the upper quartile of concentrations) a dispersion pattern across locations became apparent (figure 3-3). There is a clear spatial gradient in the highest concentration spikes, decreasing over distance. Comparing

15 nm PM concentrations downwind of the take-off vs. landing runways, the average concentration under the landing path was somewhat lower than downwind of take offs but acrosol appears to distribute across the study field resulting in relatively homogenous time-averaged concentrations at all locations. Peak concentrations were clearly not spatially homogeneous though, and showed a clear trend to decrease with distance from take-offs, as discussed above.

A second concern during study planning was the potential inference of particles emitted by vehicles traveling on Aviation Blvd. A test SMPS/CPC monitoring was performed at a location immediately to the east of Aviation Blvd., but south of the downwind study sites and the airport runways. Particle concentrations were low, as shown in Table 3-3. A temporal analysis of that data (not shown) did not identify peaks with the characteristic shape and duration associated with aircraft, but did display a pattern typical of passing vehicles. Aviation traffic appears to contribute at low levels to background particle concentrations but does not produce peak concentrations comparable to aircraft, and so the two sources are easily distinguished in temporal analyses, and by limiting analysis at the downwind sites to the upper quartile of data. The findings show that traffic along Aviation Blvd has a negligible impact on the interpretation of the peak concentrations observed in this study.

Analysis of the concentrations of black carbon downwind of runway 25R yielded a similar pattern of findings to that observed for 15 nm particles at the same locations. Average concentrations of black carbon did not show a trend to decrease with distance. The top quartile of concentrations, which presumably reflects carbon contained in take-off plumes, did show a decreasing trend with increasing distance from the runway, as was observed with 15 nm PM. An analysis of temporal profiles of black carbon, in parallel to the figures describing 15 nm particles over time, could not performed for black carbon because the Aethalometer data is integrated over 5 minute intervals while aircraft take-off plumes show decay over periods of about one minute.

Under the landing path, concentrations of 15nm particles did not show a spatial gradient over the distances measured, regardless of whether the entire data set or top quartile was plotted. Note that particle concentrations collected during take-offs were not included, to emphasize particle concentrations that occur during landings. The lack of a spatial gradient can be attributed to the fact that aircraft-derived PM at these locations is emitted overhead from landing aircraft in contrast to the directional source (take-off exhaust) that creates the spatial gradient at locations downwind of 25R. Temporal analysis of particles at landing path locations did identify peaks of particle number concentration when aircraft passed overhead (data not shown). The peaks were substantial compared to background levels that occurred between landing aircraft, but were lower in concentration than peaks associated with aircraft take offs. The temporal patterns of particles under the landing path should be further analyzed as only a preliminary analysis has been done to date. The findings suggest that both departing and arriving aircraft emit 15 nm PM, but to assess whether the size distribution of emissions from landing aircraft differs from that observed for aircraft take-offs requires performing complete size distribution scans, and could not be done in this study.

In contrast to the findings on 15nm PM, black carbon concentrations clearly increased closer to the airport, under the landing path. It is not clear why black carbon would show the expected

increase as planes draw closer overhead, yet a related pattern was not observed for 15 nm UFP. It is possible that increasing black carbon is not so much a function of the overhead distance of the plane, but of engine conditions for decelerating aircraft that result in higher black carbon emissions in the final moments of deceleration, while having a limited effect on the number concentrations of the very smallest particles.

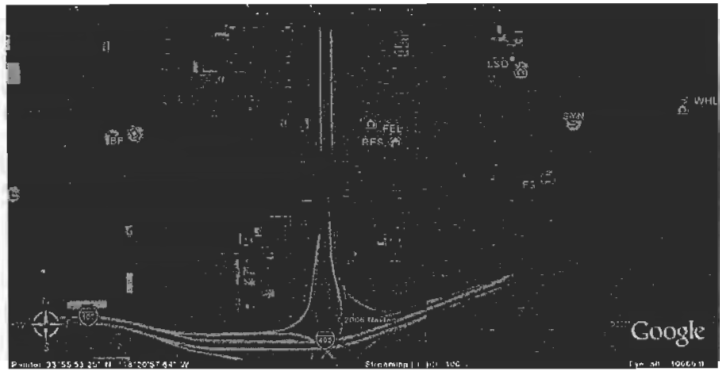


Figure 4-1: Location of six community sites. Red dotted line: aircraft landing path with a gliding angle ~ 3°. L: 25L Landing Point; T: 25R Take-off Point; BF: Blast Fence; FEL: Felton School; RES: a Buford local resident; SYN: a synagogue; WHL: Whelan School; FS: Fire Station; LSD: Lennox School District.

Table 4-1: Characteristics of six community sites

Site	Distance from I-405 (m)	Position relative to the landing path	Estimated aircraft altitude (m)
Felton School	200	120 m north	97
Local Resident	337	Directly beneath	104
Synagogue	1325	Directly beneath	156
Whelan School	1810	Directly beneath	182
Fire Station	1170	300 m south	150
Lennox School District	1030	300 m north	140

Monitoring Campaign

The field study took place in June 2006. At the beginning of each monitoring effort at a community site, a relatively safe and convenient location was chosen to park the minivan, to minimize effects of local traffic. The above mentioned instruments were installed at the synagogue from June 6 to 10, at the backyard of the local resident in the sampling area from June 12 to 15, at the fire station from June 15 to 19, at Whelan School from June 20 to 23, at Felton School from June 23 to 26, and at Lennox School District from June 26 to 30, 2006. Sampling intervals for each instrument were as stated above.

4. Community Study

4.1 Overview

The objective of the community study was to conduct an initial characterization of UFP in neighborhoods downwind of LAX, and to investigate the potential contribution of aircraft emissions to local ambient PM levels. A minivan installed with monitoring equipment was deployed to monitor 15 nm particle number concentrations, size distribution of particles ranging from less than 10 to 200 nm and black carbon. An E-BAM mass monitor was installed beside the minivan to monitor hourly levels of $PM_{2.5}$. This equipment was deployed for 3 days at each of 6 different community sites downwind of LAX runways and east of I-405. Three of the six sites selected were located directly beneath the aircraft landing path. The other three were 1) slightly north of the landing path and close to I-405, 2) north of the landing path at a greater distance from I-405, and 3) south of the landing path and distant from the I-405.

The study attempted to address the following hypotheses:

1. Ambient black carbon and UFP levels are elevated in communities downwind of LAX relative to an upwind reference site.
2. Elevated black carbon and UFP levels at downwind community sites are attributable to westward dispersion of plumes emitted at LAX and emissions from landing aircraft that pass directly overhead.
3. Community sites directly beneath the landing path experience greater UFP and black carbon levels than those to either side of the approach.

4.2 Methods

Instrumentation and Sampling Locations

A SMPS (TSI, model 3080, DMA model 381) along with a CPC (TSI, model 3025) were connected to a laptop computer to measure particle size distribution from 6.15 to 225 nm. Concentration of 15 nm particles was monitored over one second intervals by fixing the size in the SMPS. An Aethalometer (Magee Scientific, AE-20) was used to monitor black carbon over 3-5 minute time intervals. Instruments were set up in a minivan, with power supplied by 4 marine batteries installed in the vehicle. An E-BAM mass monitor (Met One) was installed near the minivan to monitor hourly $PM_{2.5}$.

Sampling locations were selected in the Lennox and Inglewood areas, downwind of LAX, east of I-405, and north of I-105. Figure 4-1 shows the location of six community sites, with reference to the blast fence (BF) near source site, aircraft take-off point (T) on runway 25R, and aircraft landing point (L) on 25L. Detailed characteristics of the sites are shown in Table 4-1.

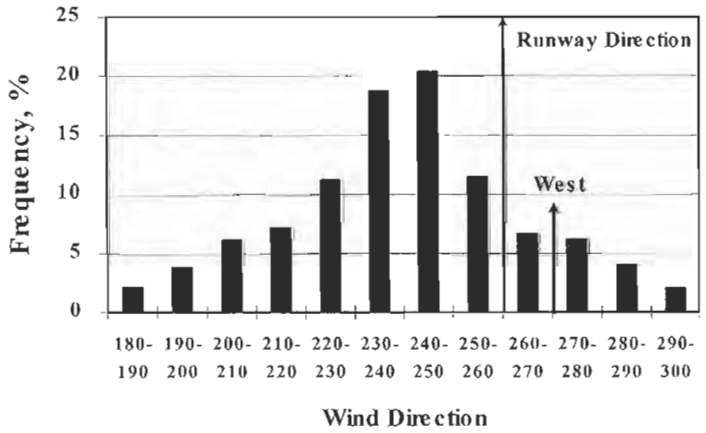


Figure 4-2: Distribution of wind direction in June 2006

Particle Size Distributions

Figure 4-3 depicts the particle size distributions obtained at community sites, based on averages of all SMPS scans collected during winds from 200-290°. Size distributions from the near source blast fence site (LAX-BF) and background reference site (AQMD) are included for comparison. For particles less than 40 nm, average concentrations are less than those of the near source site and are greater than those of the background site. In contrast, average concentrations of particles greater than 80 nm are slightly lower than those of the near source as well as the background sites.

Figure 4-4 depicts the size distributions obtained from SMPS scans at three selected community sites: resident, synagogue, and Whelan sites. These sites are located directly beneath the landing path (see figure 4-1). Smaller particles (< 15 nm) increase in concentration from east to west. The mode of the distribution shifts to a smaller particle size as aircraft approach. In contrast, larger particles (15-50 nm) tend to increase slightly in number over the same distances.

Figure 4-5 depicts UFP size distributions for the community sites not beneath the landing path, the fire station (300 m south of the landing path) and Lennox School District (300 m north of the landing path). For particles sizes less than 160 nm, number concentrations in Lennox School District are significantly higher than those measured at the fire station.

Data Analysis

Meteorological data were obtained from SCAQMD. Each measurement was assigned a wind direction, based on hourly wind direction. Data were included under prevailing wind conditions if the wind direction was between 200 and 290 degrees (0 degree = wind blowing from the north). Otherwise, the data were excluded from the analyses presented below.

Method for Calculating $PMN_{10\text{-}100}$:

A metric called $PMN_{10\text{-}100}$ was developed for analysis. $PMN_{10\text{-}100}$ is the total PM number concentrations for mobility particle sizes between 10 to 100 nm. In this study, SMPS and CPC were coupled together to collect PM size distribution from 6.15 to 225 nm in mobility sizes by CPC model 3025 and 3022 and from 7.64 to 289 nm in the sizes by CPC model 3785. Thus, sums of all PM number concentrations among various CPC models yield incompatible results. $PMN_{10\text{-}100}$ provides a convenient parameter to measure total counts of an important subset of UFP. Estimation of $PMN_{10\text{-}100}$ should be based on a comparable time period at each location. In this study, 2-minute size scans were performed and are the basis of the computed metrics. Zero values occur in the SMPS/CPC scan data. The zero value of a desired size were substituted by the average number concentration of non-missing and non-zero values from three sizes less than and three sizes greater than the desired size within the same size distribution for a time period. Number concentrations of particle sizes between 10 to 100 nm were summed first to obtain a raw $PMN_{10\text{-}100}$. Hourly concentrations were then estimated by averaging the raw $PMN_{10\text{-}100}$ for each hour of interest. Site specific statistics of hourly $PMN_{10\text{-}100}$, as shown in Table, were estimated by all wind adjusted hourly $PMN_{10\text{-}100}$ collected for a sampling site. Mean, standard deviation, and number of wind adjusted hourly $PMN_{10\text{-}100}$ were reported.

4.3 Results

Wind Pattern

Figure 4-2 shows the frequency of wind direction occurred during the study period. Wind directions are described by compass direction, with 0° being due north. Wind direction data was grouped into 10° intervals, from 180° to 300°. The LAX runway is situated at 260° relative to the community. During the community study period, winds arose most frequently from 230° to 250° (nearly 40%), somewhat more southerly than the direction of the runway and the expected prevailing winds. The wind direction may have resulted in a decrease in LAX-associated plumes at the study sites compared to what was expected during planning of the study.

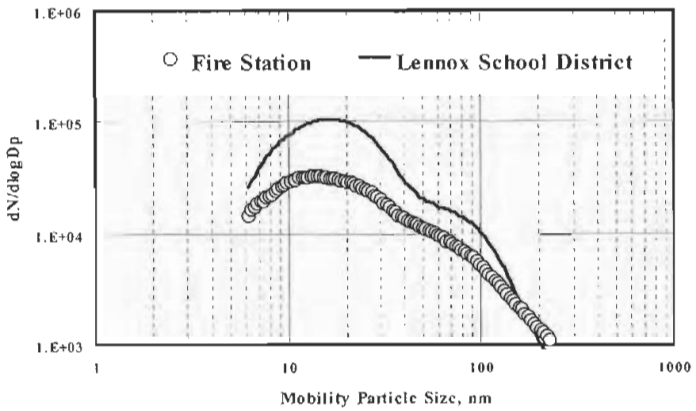


Figure 4-5: Particle size distribution of fire station and Lennox School District sites. These two locations are situated approx. 300 m S and N of the direct landing path, respectively.

15 nm Particles

Table 4-2 shows concentration profiles, indicated by the 1st, 2nd (median), 3rd quartiles and 90% percentile, of 15 nm particles at 6 community sites. Within the community, there is no clear pattern associated with the distance from the airport among these six sites. Overall, the concentrations of 15 nm PM in the community are lower than those measured at the blast fence and downwind of 25R in the downwind study and approximately equal to those measured at locations downwind of 25L (compare to Table 3-3).

Table 4-2: 15 nm Particle Concentration (dN/dlogDp in #/cm^3) Profile at 6 Community Sites

	Statistics Matrices for 15nm Particle Concentration Profile			
Location	1st Quartile	Median	3rd Quartile	90% Percentile
Felton School	36	86	180	279
Local Resident	66	131	229	326
Synagogue	51	164	276	402
Whelan School	48	94	205	350
Fire Station	42	83	179	261
Lennox School District	66	123	192	229

$PM_{2.5}$

Table 4-3 shows concentrations of $PM_{2.5}$ at the 6 community sites, with reference to the overall means and standard deviations of AQMD and blast fence sites. In the community sites, $PM_{2.5}$

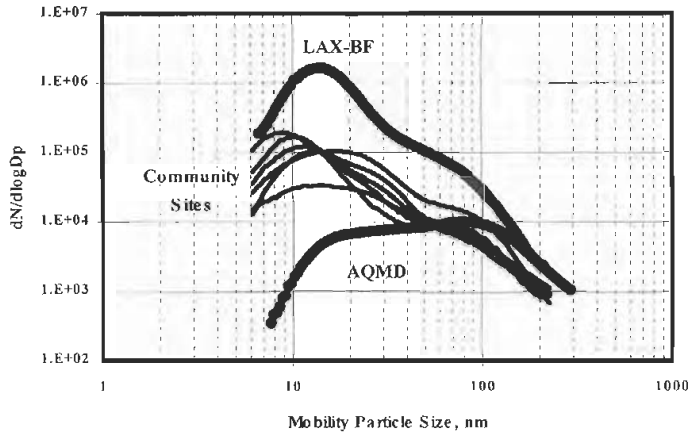


Figure 4-3: Particle size distributions of the six community sites in relation to the near source LAX blast fence (LAX-BF) and the background AQMD site.

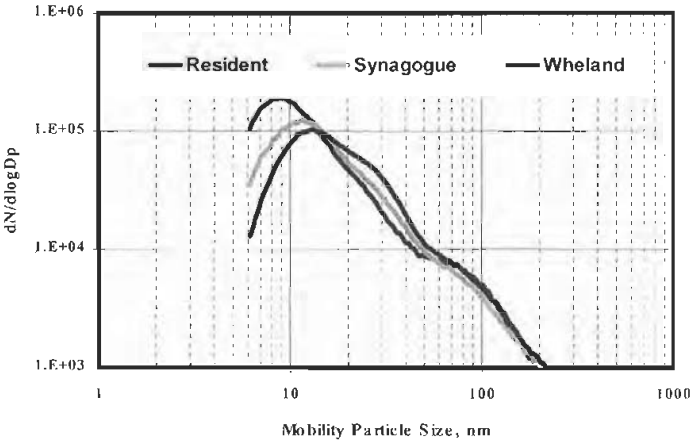


Figure 4-4: Particle size distributions of three community sites located directly beneath the landing path, arrayed west to east from "resident" to "Whelan"

Loss of the data due to non-responsiveness of the instruments was minimal. The invalid data was easily identified during data QA/QC procedures.

4.4 Discussion

The central finding of the community study is that the size distribution of ultrafine particle number concentrations in the community is clearly distinct from the UFP size distribution at the background reference site (Figure 4-3, with supporting data in Tables 4-2 and 3-3). The mode of the UFP number concentration was near the 10-20nm range at all six locations in this community; no such mode was seen at a nearby background site located in a community that is neither downwind of LAX nor beneath aircraft flight patterns. The concentrations of particles at sizes <50 nm were substantially higher at all six community sites than at the background site and were intermediate between the levels observed at the LAX blast fence near source site and the background site. While aircraft cannot be unequivocally identified as the source of the number concentration peak (between about 10 and 20 nm), it is highly likely that aircraft approaching LAX contribute to the observed UFP. It is also possible that advection of emissions from the airport itself also elevate UFP concentrations in this community. This preliminary result should be followed up with studies designed to determine the relative source contributions of major UFP sources that could affect the community.

A recent publication reported SMPS size distributions for eight Los Angeles area communities (Singh et al, 2006) and provides an informative context for interpreting the distributions obtained here. The UFP size distributions reported by Singh et al. varied with location and showed substantial seasonal effects. In all eight of the Singh et al. locations he SMPS mobility diameter at which the greatest number of particles was observed (the mode of the distribution) occurred at a larger particle size than in the communities downwind of LAX studied here. None of these other eight communities are known to be affected by airport derived emissions. Several of them experience heavy road traffic emissions. The comparison provides support for the conclusion that airport or aircraft emissions may be responsible for the peak of UFP in the 10-20 nm range measured in the current study, while road traffic including I-405 is less likely to explain it.

The significant differences between the fire station site and Lennox School District (Figure 4-5 and Table 4-3) are also of interest. Concentrations of UFP were greater at the school district site than the fire station, as indicated by the distribution height in figure 4-5 and in the average concentration of $PMN_{10\text{-}100}$ in Table 4-3. The difference between Lennox and the fire station was especially marked for particles in the 10-20 nm range. The relationship of the community sampling sites shown in Figure 4-1 to the average wind directions measured during the field study indicates that during the study period, the school district location was somewhat downwind from the landing path while the fire station was somewhat upwind. Thus, wind dispersion of emissions from approaching aircraft toward Lennox and away from the fire station may explain the difference in UFP exposure levels observed at the two sites. Both locations are roughly 1 km from the I-405 freeway. At this distance, the contribution of UFP from I-405 traffic, a potential confounding source, should be limited (Zhu et al, 2002). Further, any detectable effect of I-405 is expected to be equivalent at the two sites since they are situated at an equivalent distance east of the freeway. This line of reasoning suggests that I-405 has a limited effect on UFP concentration at these sites.

vary between 8 – 23 $\mu g/m^3$. The overall average in this community is 15.6 ± 12.0 $\mu g/m^3$, a level similar to that at AQMD site. The overall community $PM_{2.5}$ level is significantly lower than that measured at the blast fence 23.7 ± 18.5 $\mu g/m^3$ ($p<0.001$).

Black Carbon

Table 4-3 lists overall black carbon mass concentrations from all six sites with reference to the levels at the blast fence and AQMD background site. The community average black carbon mass concentration is approximately equal to the background concentrations measured at the AQMD site. Both the community and AQMD have significantly lower black carbon than the blast fence.

$PMN_{10\text{-}100}$

Table 4-3 contains number concentrations of UFP in the size range of 10-100 nm, collected in two minute SMPS scans at six community sites. $PMN_{10\text{-}100}$ at the near source and background sites are provided for comparison. At the near source site, $PMN_{10\text{-}100}$ averaged 5.3×10^5 particles/cm^3. At the background reference site, AQMD, the average concentration was 76-fold lower, 7×10^3. Concentrations of $PMN_{10\text{-}100}$ at the community sites were intermediate, and ranged between 2.0 and 5.4×10^4 particles/cm^3.

Table 4-3: $PM_{2.5}$ mass, black carbon mass, and $PMN_{10\text{-}100}$[a] concentration at six community sites LAX blast fence and background reference site

Location	$PM_{2.5}$[b] Mean (N) ± SD $\mu g/m^3$	Black Carbon Mean (N) ± SD $\mu g/m^3$	$PMN_{10\text{-}100}$ Mean (N) ± SD x 1,000 particles/cm^3
LAX Blast Fence	23.7 (1,497) ± 18.5	13.9 (1,416) ± 13.9	532 (70) ± 292
Community	15.6 (467) ± 12.0	1.3 (5,487) ± 1.2	38 (108) ±25
Felton School	18.7 (63) ± 12.6	1.2 (765) ± 0.7	40 (5) ± 8
Local Resident	8.2 (62) ± 11.6	1.0 (832) ± 0.6	39 (15) ± 9
Synagogue	11.5 (85) ± 8.3	1.0 (786) ± 0.6	43 (17) ± 27
Whelan School	22.7 (71) ± 11.6	1.1 (1,100) ± 0.6	44 (22) ± 22
Fire Station	17.3 (94) ± 9.9	1.3 (987) ± 1.1	20 (31) ± 12
Lennox SD	15.1 (92) ± 13.0	1.9 (1,017) ± 2.1	54 (18) ± 35
Background Site (AQMD)	14.3 (133) ± 10.4	0.9 (1,713) ± 1.2	7 (77) ± 10

[a] $PMN_{10\text{-}100}$ is the number concentration of particles size from 10-100 nm (see methods).
[b] PM2.5 data from Summer 2005 and 2006 were combined for BF and AQMD

Problems Encountered during the study

The SMPS/CPC was found to be non-responsive in the morning of June 26, 2006. The instruments were restarted, air flow was checked and the tubing and impactor were cleaned. The non-responsiveness or false readings due to incorrect flow (judged by flow indicator) were found periodically during the sampling time period at Lennox School District from June 26 to 30, 2006.

5. Modeling Study

5.1 Overview

The objective of this component of the project was to develop a model for the dispersion of LAX aircraft emissions. The model uses four two-way nested domains to simulate the LAX aircraft emission sources, dispersion to community sampling sites, as well as regional impacts in the Los Angeles air basin. The configurations of the model, detailed treatment of emissions from various aircraft, estimation of black carbon emissions, calibration of the model with near-source measured data, and calculations of black carbon dispersion to community sampling sites are reported below.

5.2 Model Configurations

A three-dimensional high-resolution version of the Surface Meteorology and Ozone Generation (SMOG) model coupled with the PSU/NCAR Fifth Generation Mesoscale Model (MM5) (Lu et al. 1995, 1997a) is being employed to quantify the impact of aircraft emitted black carbon in the vicinity of LAX. The SMOG/MM5 joint model is an Eulerian grid model that includes meteorological and microphysical processes and accounts for local terrain effects on winds and turbulence. Several numerical techniques have been applied in its transport code including a time splitting algorithm, a finite element method for horizontal transport, and a finite difference scheme for vertical advection and diffusion. These techniques provide efficient and accurate solutions for transport calculations with minimized computer memory demand. Aerosol processes include nucleation, coagulation, condensational growth and evaporation, sedimentation, and aqueous chemistry. The performance of the SMOG modeling system has been evaluated by comparing predictions against measurements (Lu et al., 1997b, 2003). The SMOG model has been successfully used to predict ozone concentrations throughout the South Coast Air Basin, to explain the causes of elevated pollution layers observed over Los Angeles, to calculate trace metal deposition on land and coastal waters, and to study PAH distributions and human exposure in Southern California (Lu et al. 1995, 2003 and 2005).

In order to cover the LAX with fine resolution and include the impacts of LAX aircraft emissions on the Los Angeles basin, the model is configured to use four two-way nested domains. Table 5-1 lists the domains used for the simulation. Domain 1 covers the Los Angeles basin. Domains 2 and 3 are intermediate domains that allow the change of winds to propagate into the inner domain, as well as the dispersion of black carbon from the inner domain to the outer Los Angeles domain. Domain 4 includes the LAX aircraft emission sources and community sampling sites. Figure 5-1 shows the locations of the 4 domains in the Los Angeles basin.

Table 5-1. Domains used for the simulation

Domains	Horizontal Resolution	Purposes
Domain 1	8.1 km	The Los Angeles basin
Domain 2	2.7 km	Intermediate domain
Domain 3	0.9 km	Intermediate domain
Domain 4	0.3 km	LAX aircraft sources and community sampling sites

It is interesting to note that the difference in UFP levels between the Lennox and fire station sites were not reflected in $PM_{2.5}$ levels, which were actually slightly higher at the fire station. Black carbon was higher at Lennox, but the difference was not as pronounced as for UFP. These findings imply that future studies designed to investigate the impact of landing aircraft on community exposure should emphasize instruments capable of capturing UFP as small as 10nm. $PM_{2.5}$ is a poor indicator of exposure to aircraft emitted PM.

Figure 4-4 compares the shape and height of the UFP size distribution at three of the six community sites. The sites, labeled resident, synagogue, and Whelan, are located directly beneath the typical approach to runway 25L at LAX (Table 4-1). These sites are arrayed in a west to east direction over which the altitude of approaching aircraft progressively decreases. Assuming a 3 degree approach angle, aircraft are estimated to be 180m over the Whelan site, 160m over the synagogue, and 100m over the resident site. Comparing the SMPS data in Figure 4-4, resident, the most westward site, had higher concentration of UFP and a smaller particle size mode relative to the most easterly site at Whelan School, consistent with increasing proximity to a fresh source such as aircraft. In addition, the finding suggests a possible aging effect on aircraft emissions such that the particle size distribution is shifted to slightly greater particle sizes as distance from the source increases (sampling further to the east). Changes in chemical and physical characteristics of aircraft-emitted particles could occur between emission from the approaching aircraft and the time the plume reaches ground level monitoring equipment. A related process occurs along a horizontal scale for motor vehicle particles emitted on the 405 freeway (Zhu et al, 2002). UFP measured at increasing distances from freeways were found to increase in size and decrease in number concentration as distance increased. These changes were observed over distances within a few hundred meters from the freeway.

In addition to UFP, the study collected data on PM2.5 and black carbon mass concentrations at the six community sites. Average concentrations of black carbon and $PM_{2.5}$ mass were not notably elevated in the community relative to a background reference site upwind of LAX, except at the Whelan School location at which $PM_{2.5}$ mass was clearly above background. This site appears to be influenced by an unidentified source of fine PM. Interpretations of comparisons to the background site are limited because this site was not sampled during the time period of the community study. The community study was performed in June 2006, and the background data derive from sampling in September 2005. Note that only $PM_{2.5}$ was elevated at Whelan School while the concentrations of UFP and black carbon were not notably different from the other community sites. The data in Table 4-3 show that UFP number concentrations are not correlated with mass based measures such as $PM_{2.5}$, although they do show a somewhat improved correlation with black carbon in comparison to $PM_{2.5}$. Future studies of the impact of aircraft on PM exposure in adjacent neighborhoods need to carefully consider relevant measures, and must focus on UFP, if the results are to be informative.

five specific operating modes in an LTO are: Approach, Taxi/idle-in, Taxi/idle-out, Takeoff, Climb-out (Figure 5-2).

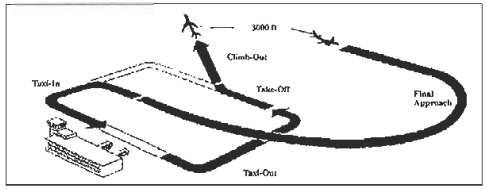


Figure 5-2. The ICAO landing and take-off cycle (LTO).

A sixth operating mode, reverse thrust, often is included in a standard LTO cycle but is not included in EPA's procedure (FAA, 2005). After aircraft land, engine thrust reversal typically is used to slow the aircraft to taxi speed (otherwise the aircraft is slowed using only the wheel brakes). Reverse thrust is now considered by EPA as an official mode and should be included in calculation procedures as a sixth operating mode when applicable. Since reverse thrust engine operating conditions are similar to takeoff, time spent in reverse thrust should be combined with takeoff mode emission indices and fuel flow as a means of accounting for reverse thrust mode emissions. Aircraft reverse thrust typically is applied for 15-20 seconds on landing.

The LTO cycle provides a basis for calculating aircraft emissions. During each mode of operation, aircraft engines of a given aircraft category operate at a fairly standard power setting. Emissions for a given operation mode and aircraft can thus be calculated by knowing emission factors for specific aircraft engines at the power settings of interest.

Table 5-2. Representative LTO cycle times for several aircraft categories (in minutes) (FAEED, 1995)

CATEGORY	IDLE TIME	TAKEOFF TIME	CLIMBOUT TIME	APPROACH TIME
JUMBO JET	26	0.7	2.2	4
LONG RANGE JET	26	0.7	2.2	4
MEDIUM RANGE JET	26	0.7	2.2	4
AIR CARRIER TURBOPROP	26	0.5	2.2	4.5
BUSINESS JET	13	0.4	0.5	1.6
GENERAL AVIATION TURBOPROP	26	0.5	2.5	4.5
GENERAL AVIATION PISTON	16	0.3	4.98	6
PISTON TRANSPORT	13	0.6	5	4.6
HELICOPTER	7	0	6.5	6.5
MILITARY TRANSPORT	26	0.5	2.5	4.5
MILITARY JET	13	0.4	0.5	1.6
MILITARY PISTON	13	0.6	5	4.6

During the LTO cycle, aircraft operate for different periods of time in various modes depending on their particular category, the local meteorological conditions, and operational considerations at a given airport. The "Time-In-Mode," or TIM, is typically used to categorize the time of

The model is initiated with NCEP (National Center for Environmental Prediction) ETA model analyses for specific dates. Aircraft activity data from the LAX airport for the date periods are used to calculate emissions at specific locations and time. The activity data includes aircraft engine types, departure/arrival time and status, and runways used for each aircraft (see below for detail). The black carbon (BC) emissions from each aircraft are estimated using an empirical formula from the literature, and then calibrated with the near-source measurements collected at the blast fence site. BC is treated as an inert tracer in the SMOG/MM5 model without chemical transformation.

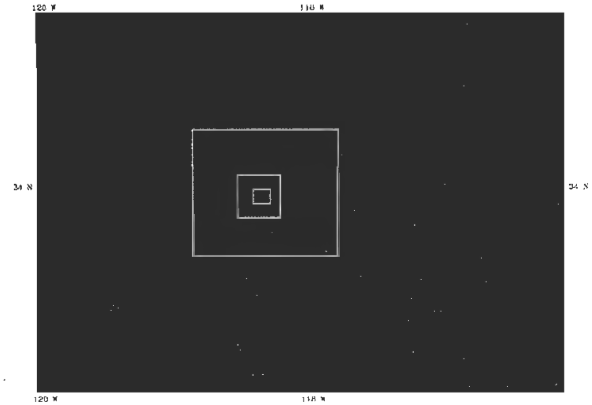


Figure 5-1. Model domains and locations used for the LAX simulation

5.3 *Aircraft Emissions Factors*

Aircraft emissions were calculated with standard LTO cycles for various aircraft and engine types. For each aircraft, the emission factors for the aircraft's specific engine at each power setting or mode of operation, as well as the time spend in each modes and the fuel flow rate at each mode, are used to compute the emission rates for various pollutants. Then the emission factors are applied to the activity of aircraft in LAX airport to calculate the emissions at a given time and location. This emission calculation procedure is consistent with EPA's Procedure for Emission Inventory Preparation (EPA, 1992), Vol. IV, Chapter 5, except that aircraft emissions at any given time and location is calculated as described instead of lump sum of an inventory period. For our study of instantaneous emissions, the time and location of aircraft emissions will be identified for dispersion calculation.

Standard LTO Cycle and Time-In-Mode

The aircraft operations of interest within the boundary layer are defined as the landing and takeoff (LTO) cycle. The cycle begins when the aircraft approaches the airport on its descent from cruising altitude, lands, and taxis to the gate. It continues as the aircraft taxis back out to the runway for subsequent takeoff and climbout as it heads back up to cruising altitude. Thus, the

operation taking these factors into consideration. Table 5-2 shows representative LTO cycle times for several aircraft categories (FAEED, 1995).

Aircraft Engine Types, Number of Engines and Emission Factors
The emissions characteristics of aircraft vary by number and type of engine used. The engines used on each aircraft type must be determined to select the emission factors for emission calculation. The FAA Aircraft Engine Emission Database (FAEED) (FAEED, 1995) includes information on the engines mounted on specific aircraft with the operating mode-specific pollutant emission rates for those engines. Many aircraft use only a single engine model, while others have been certified to use engines from two or three different manufacturers. When a single engine is listed for an aircraft model, emissions data for that engine are used. For aircraft with engines from more than one manufacturer, defining the specific engine mix used on the fleet of aircraft operating at a specific airport may be extremely difficult. Individual airlines probably are the only source of detailed fleet data on specific engine models and they likely do not have it readily available. The market share information from the FAA Aircraft Engine Emission Database is used for selecting engine models if available. Some aircraft types are not included in the FAEED. In the majority of cases, these models were variations of aircraft that were included in FAEED. For missing models, the activity was assigned to its nearest equivalent. The number of engines mounted in an aircraft is also provided in the database. A special table was created for our modeling project to link the aircraft types in the LAX activity database to the aircraft type table with engine types.

The aircraft engine is the source of emissions of the key pollutants that result from fuel combustion. Emission rates vary depending on the fuel consumption rate and engine specific design factors. The operating parameters used in the standard for the LTO cycle can be used as default values in calculating emissions. The test data of exhaust emissions of those aircraft engines that have entered production are included in ICAO Aircraft Engine Emissions DataBank (ICAO, 2006).

The ICAO Aircraft Engine Emissions DataBank provides emission indices (i.e., emission factors) and average fuel consumption rates for aircraft engines. Generally, emission factors are listed in pounds of pollutant per 1000 pounds of fuel consumed and fuel flow is listed in pounds per minute. However, very few measurements have been made of particulate emissions from aircraft engines. Particulate emission rates were poorly correlated with smoke numbers measured in ICAO databand. An alternative method is used to estimate black carbon emissions.

Aircraft Activities at LAX
The LAX aircraft activity and fleet data, including time of activity, aircraft type, arrival or departure, runway used, and airline operators, were kindly provided by LAX sources. The activity data provides the modes of a specific aircraft's operations at any given time, which define the landing and take-off at specific runway. A sample of the aircraft activity data is shown in the Table 5-3.

Table 5-3. Aircraft Activity Data Table from LAX.

AIRPORT	WALL TIME	ACID	ACTYPE	DAO	RUNWAY	AIRLINE CODE
LAX	9/20/05 12:00 AM	CPA088	B744	A	25L	CPA
LAX	9/20/05 12:02 AM	UAL991	A320	D	25R	UAL
LAX	9/20/05 12:03 AM	TDX2898	B742	D	25L	TDX
LAX	9/20/05 12:06 AM	AAL30	B762	D	25R	AAL
LAX	9/20/05 12:08 AM	DAL1475	B763	D	24L	DAL
LAX	9/20/05 12:10 AM	THT101	A343	D	25R	THT
LAX	9/20/05 12:12 AM	NKS709	A321	D	25R	NKS
LAX	9/20/05 12:14 AM	VFR5227	????	O		VFR
LAX	9/20/05 12:14 AM	QFA108	B744	D	07L	QFA

The runways from South to North in LAX are 07R/25L, 07L/25R, 06R/24L and 06L/24R.

Aircraft Location Calculation
Aircraft emission locations for a specific TIM are complicated to calculate. Tables of each runway will be used for emission location calculation. Aircraft landing and takeoff speed varies from one to another. For median-sized civilian aircraft, the landing speed of 200 kph and take-off speed of 250 kph is reasonable.

Approach: Assuming aircraft is approaching along a straight line and landed at position X, the aircraft should be at landing speed * approaching time when at 915m height. (~ 13 km for 200 kph approaching time and 4 min TIM_{appro}). The location of aircraft at time t is $V_{appro} * (t_{land} - t)$ from the airport and at altitude 915m / $TIM_{appro} * (t_{land} - t)$, where $t < t_{land}$.

Reverse thrust: A 15-20 s reverse thrust is applied at this time to decelerate the aircraft in addition to wheel braking. Since the engine operation in reverse thrust mode is similar to take-off, the take-off engine parameters are used for reverse thrust. The deceleration distance is $X = 0.5 * a * t^2 = 0.5 * ((V_{appro} - V_{taxi})/TIM_{reverse}) * (t - t_{land})^2$, where $t_{Rev} > t > t_{land}$ and 15 s for $TIM_{reverse}$ is assumed.

Taxi-In: Distributed along the distance between runways to terminal building for TIM_{Idle_in} time.

Taxi-Out: Distributed along the distance between runways to terminal building for TIM_{Idle_out} time.

Take-Off: The aircraft accelerates to the take-off speed in Take-Off time. The location of the aircraft will be at $X - X0 = 0.5 * a * t^2 = 0.5 * (V_{TakeOff}/TIM_{takeoff}) * t^2$.

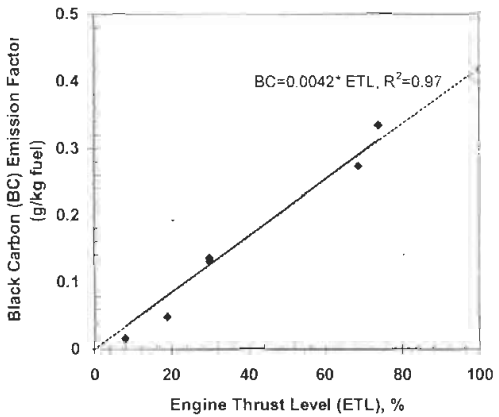


Figure 5-3. A linear relationship between black carbon emission factor and aircraft engine thrust level.

However, measurements from one aircraft cannot represent a range of aircraft with different engine types and capacities, from piston private aircraft to jumbo jets, in the LAX. In the project, near-source measurements of black-carbon have been used to calibrate BC emissions simulated in the model.

We first applied the relationship from Petzold et al. (1999) to LAX aircraft for each aircraft and each LTO cycle. Fuel consumption in each operating mode is a function of aircraft/engine types. The estimates are used to calculate aircraft emission and dispersion over the model domain. Since the model uses a time step of 0.9 seconds for domain 4, emission patterns at each location and time can be resolved in very details. The modeled values at the blast fence location are used to compare with measurements at the same location.

In the calibration step, we calculate the modeled averaged value at the blast fence location and compare it with the mean value measured at the blast fence location. The ratio of the measured mean to the modeled mean is then used to scale the emission rates in the Petzold et al.'s relationship. The final calibrated relationship is used in the LAX aircraft emissions for model prediction. An example of the calibrated predictions at the blast fence location is shown in Figure 5-4. Time-resolved, actual aircraft operations data were used to estimate BC production in the modeling runs. The take-off and landing of each individual aircraft from/to the blast fence can be identified as peaks in the figure.

Climb-out: Aircraft will continue to accelerate during climb-out. Assume aircraft climbs at an average angle θ and ignore the acceleration factor, the distance of aircraft from take-off location should be 915m / TIM_{climb} * ctan (θ) * t and at height of 915m / TIM_{climb} * t.

The wall time of activities is the landing and take-off time. Therefore, TIM_{appro} before landing, model start to calculate emissions for the aircraft until $TIM_{reverse}$ + TIM_{Idle_in} passed landing. For take-off, the emission calculation starts TIM_{Idle_out} time before takeoff, and $TIM_{takeoff}$ + TIM_{climb} after take off.

5.4 Estimate and Calibrate Black Carbon Emissions

PM emissions result from the incomplete combustion of fuel. High power operations, such as takeoff and climbout, produce the highest PM emission rates due to the high fuel consumption under those conditions. PM emission test data for aircraft engines are sparse. For most turbine engines, EPA does limit the amount of smoke that may be emitted. This limit is specified as a smoke number. However, attempts to derive correlations between smoke number and particulates emission rates are not satisfactory.

Petzold et al. (1999) measured characteristic parameters of black carbon aerosol (BC) emitted from jet engine during ground tests and in-flight behind an aircraft. BC emitted from aircraft varies from 0.015 to 0.333 g BC/kg fuel, and depends on engine thrust levels (ETL) which range from 8% to 74% (Table 5-4). As shown in Figure 5-3, the BC emission factor (g/kg fuel) exhibits a linear relationship with ETL, as follows: BC (g/kg fuel) = 0.0042*ETL (%), R^2=0.97.

Table 5-4. Aircraft engine thrust level and estimated BC emission factor of the operating modes in the ICAO standard LTO cycle

Operating Mode	Engine Thrust Level (ETL)	Estimated BC Emission Factor (g/kg fuel)[a]
Approach	30	0.126
Taxi/Idle	7	0.029
Take-off/Reverse Thrust	100	0.420
Climb	85	0.357

[a] Estimated by EC = 0.0042*ETL

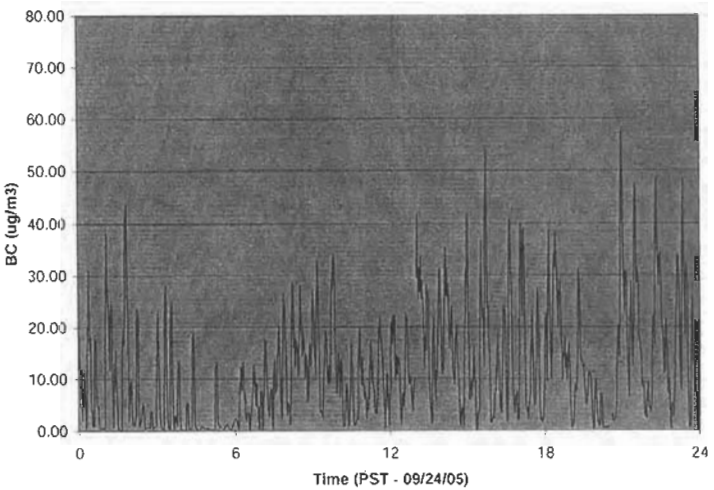


Figure 5-5a. Model predicted concentrations at blast fence with 5-minutes running average.

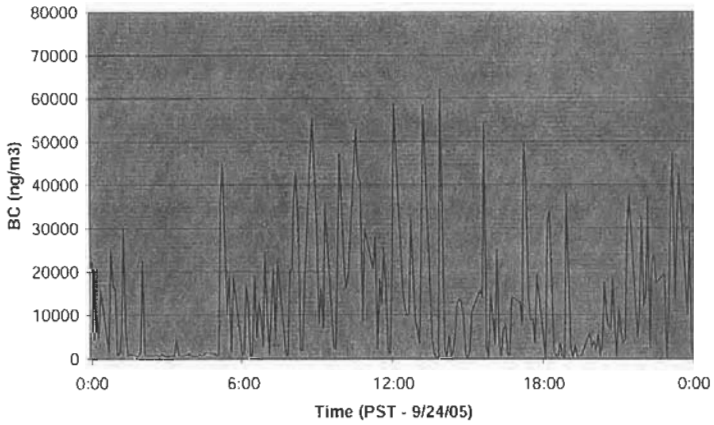


Figure 5-5b. BC measurements at the blast fence location (averaged every 5 minutes).

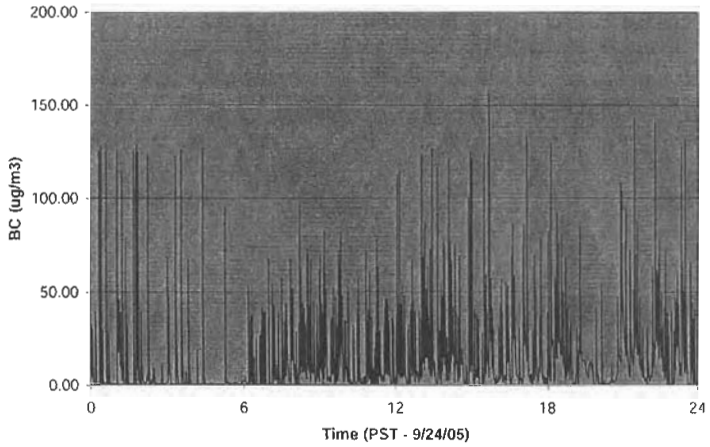


Figure 5-4. Model predicted aircraft signals at the blast fence location. The emission rates have been calibrated. The take-off and landing of aircraft near the blast fence location are shown as peaks in the figure.

Since the BC measurements at the blast fence location were averaged over every 5 minutes, a similar average has also been conducted on the model predicted values. The results are shown in Figure 5-5a and b. Since the model uses a single aircraft to account for all aircraft types and BC emission rates, the line-by-line match is imperfect. However, the main features of the measurements can be seen in the prediction, including the range of peak values.

5.5 *Dispersion of Aircraft Emissions to Community Locations*

The black carbon emissions from aircraft activities at LAX are predicted to have significant effects on the adjacent communities through out the day. In the morning before the onset of sea-breeze winds are usually calm and disorganized, and light winds in the boundary layer confine pollutants in a local area. Black carbon is drifting near the vicinity of the airport (Figure 5-6), leading to high concentrations in near the area.

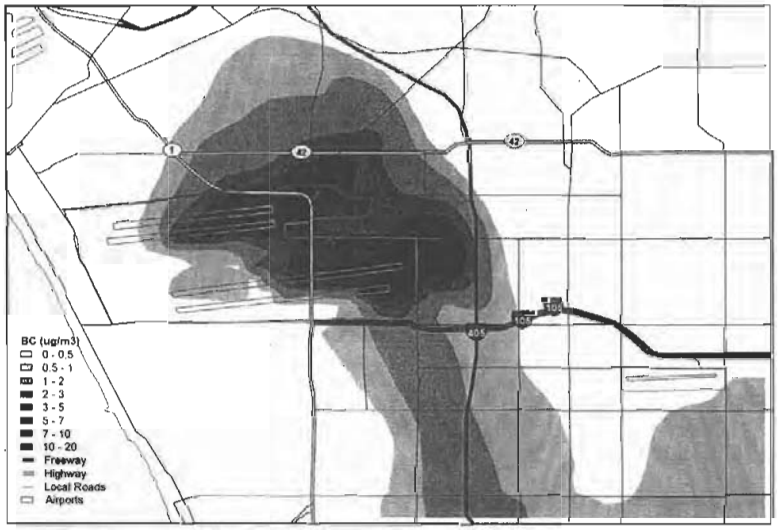


Figure 5-6. Averaged black carbon concentrations from 09/24/2005 8:00 to 9:00 PST near LAX.

By the later morning and afternoon black carbon moves to the east across the downwind communities by the onshore sea-breeze (Figure 5-7). The heavy traffic in the airport during the daytime produces significant BC that not only affects the downwind community area but also the entire Los Angeles basin (not shown).

In the evening, the winds become disorganized again. Black carbon tends to drift near the airport (Figure 5-8). Land-breeze may build-up later at night and in the early morning that may transport BC to the ocean surface.

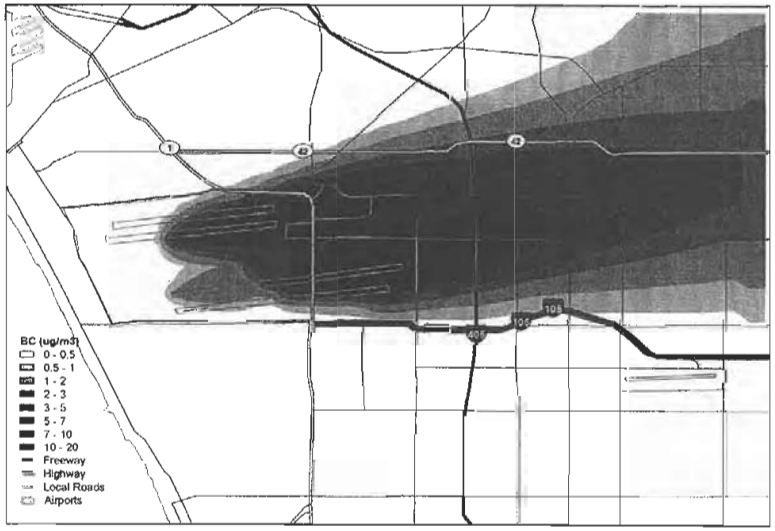


Figure 5-7. Averaged black carbon concentrations from 09/24/2005 13:00: to 14:00 PST from LAX. The sea breeze moves the black carbon to the east.



Figure 5-8. Averaged black carbon concentrations from 09/24/2005 23:00 to 24:00 PST.

5.6 . *Discussion*

A three-dimensional high-resolution version of the MM5/SMOG was used to quantify the impact of aircraft-emitted black carbon in the vicinity of LAX. Four two-way nested domains are used to cover the LAX with fine resolution, as well as the impacts of LAX aircraft emissions on the Los Angeles basin. The model has demonstrated the capabilities to simulate both near source emissions and emission plumes on the regional scale.

Aircraft emissions were calculated with standard LTO cycles for various aircraft and engine types. For each aircraft, the emission factors for the aircraft's specific engine at each power setting or mode of operation, as well as the time spend in each modes and the fuel flow rate at each mode, are used to compute the emission rates for various pollutants. For our study of instantaneous emissions, the time and location of aircraft emissions are identified for dispersion calculation.

The near-source measurements of black-carbon have been used to calibrate black carbon emissions simulated in the model. We first applied the relationship from Petzold et al. (1999) to LAX aircraft for each aircraft and each LTO cycle, and then calculate the modeled averaged value at the blast fence location and compare it with the mean value measured at the blaster fence location. The ratio of the measured mean to the modeled mean is then used to scale the

emission rates in the Petzold et al.'s relationship. The calibrated relationship is used in the LAX aircraft emissions for model prediction.

The averaged concentrations near community sites predicted by the model show distinct patterns. A daytime sea-breeze moves black carbon to the east, while weak nighttime flow distributes black carbon in the vicinity of the airport. The heavy traffic in the airport produces significant BC that not only affects the downwind community area but also the entire Los Angeles basin.

It will be of future interest to compare measurements of black carbon from community sites with modeled results and to compare the impacts of airport black carbon with other sources in the Los Angeles basin.

6. Overall Summary and Conclusions

A successful study of ultrafine particles and black carbon in the vicinity of the Los Angeles International Airport was performed using near continuous monitoring methods. Particular attention was focused on characterizing the size distribution of ultrafine particles associated with near source aircraft emissions. Previous aerosol monitoring at and near airports has generally applied time-integrated methods, which are not able to capture the time varying nature of aircraft emissions. Further, $PM_{2.5}$ and other mass based metrics do not provide complete characterization of the combustion particles from aircraft, which are predominantly in the ultrafine range and thus do not necessarily contribute extensive PM 2.5 mass concentration on a regional scale. The project was proposed to explore monitoring methods that could provide more useful characterization of airport impacts on local and regional air quality. The study has developed groundwork for in-depth future studies that could be used for emissions inventory development, community exposure estimates, toxicological characterization, and regulatory purposes.

The project comprised three field investigations and a modeling component. Field studies were first performed to capture near source emissions, immediately downwind of a runway. The second field study was designed to assess dispersion behavior of aircraft emissions plumes 200-600 m downwind of the point at which aircraft typically initiate take-off. The third field study was an exploratory study in a residential community downwind of the airport. The community study was designed to identify which pollutants are elevated relative to background, and to use spatial and temporal patterns in the data to discern likely sources, including aircraft, of those pollutants. The modeling project was focused on developing a tool for predicting the dispersion of black carbon emitted from aircraft to sampling sites and more broadly in the regional airshed.

The major finding from the near source study is the size distribution of ultrafine particle number concentration collected at a location as near as practicable to aircraft take offs. The distribution has a single dominant mode: the highest number concentration was found at a mobility diameter of 14-16 nm, and a gradual decrease in concentration with increasing size was observed under the sampling conditions of the study. The near source site was studied in the summer and in the winter; little difference was seen in the size distribution with season. The other key finding from the near source study resulted from one second SMPS scans at set particle sizes. These scans were able to capture the very high temporal variability in ultrafine particle concentrations that occurs at the runway location. By matching the temporal profile with the concurrent time series of aircraft activity data, peaks in the concentration vs. time profiles were matched with pulses of emissions associated with aircraft take offs. This confirmed that the elevated levels of ultrafine PM observed at the near source site relative to the background site are attributable to aircraft. Black carbon and PM 2.5 were also elevated relative to background, but the time integrated nature of the instrumentation for these pollutant metrics renders conclusions as to source more difficult. PAH levels were not especially high at the blast fence, a perhaps unexpected finding from this study. The pattern of relative concentrations of individual PAH species appears to differ from the patterns observed in community studies conducted previously, in that semivolatile compounds were enriched relative to heavier PAH species. If confirmed in further analyses, it is possible that there is a profile of relative PAH concentrations specific to aircraft emissions that could be useful in source studies.

In the downwind study, CPC counts of 15 nm particles were collected at five downwind locations, spaced at increasing distances from the blast fence. During monitoring at each location, simultaneous monitoring was conducted at the blast fence for comparison. Peaks of 15 nm particles that occurred at the blast fence associated with aircraft take offs were matched with peaks observed at distances up to 600 meters downwind, with time lags of less than one minute between the blast fence and downwind sites. Inspection of aircraft activity data provided confirmation that peaks in the temporal profiles of particle number concentrations at the downwind sites are due to aircraft emissions. There was not a spatial gradient in the average particle number concentrations of 15nm PM as distance increases from 200-600 meters downwind of the source but a spatial gradient was clearly evident in the upper quartile of 15 nm particle number concentrations, such that the greatest spikes in 15 nm particle concentration were observed nearer the runway and the magnitude of spikes decreased with distance from the source. The top quartile of black carbon mass concentrations also decreased with distance from the source of take-off emissions. 15nm PM and black carbon were higher downwind of the take of runway in comparison to the field sites that were located beneath a landing path, suggesting that the lower engine thrust of arriving aircraft results in lower particulate emissions than does take-off.

The community study involved sampling at six locations in one neighborhood. Three locations were directly beneath the approach to runway 25L at LAX used by arriving aircraft. The major finding from the field work is that the size distribution of UFP included a dominant mode at 10-20 nm at all the community sites, clearly distinct from the size distribution of UFP that was observed at the background reference site and similar in shape to that observed at the LAX near-source site. Particle number concentrations of UFP were clearly elevated at all community sites relative to the background site. Indirect evidence led to the conclusion that the smallest UFP observed in the community study could be derived from approaching aircraft and were not likely to originate from I-405. This area is downwind of the 405 freeway (study sites range from 0.2 to 1.8 km east of the freeway), and sampling did not include a reference site that is downwind of the 405 but not LAX, so the conclusion is based on indirect evidence. In contrast to the findings on UFP, $PM_{2.5}$ and black carbon levels were not significantly elevated at the community sites studied. One exception for $PM_{2.5}$ was noted. The data overall suggest that residents of this community are exposed to high levels of very small particles. Depending upon the toxicological properties of these particles, the finding could have important health implications. Further work is needed to build upon the exploratory findings in the community study to more fully characterize community exposures, their sources, and potential risks to human health.

Table 6-1 presents summary statistics of selected data from the three field studies, to enable comparison across the studies. The AQMD background site had the lowest concentrations of all the measures of particulate pollution studied: number concentration of UFP, black carbon mass and $PM_{2.5}$ mass. The blast fence near source site had the highest concentrations. The community sites were intermediate between blast fence and background for UFP number concentrations, while the mass-based measures were not significantly elevated over background at these community sites. There is a clear difference between locations in the highest spikes of 15 nm particles, as summarized by the 90th percentile level of the values measured in the three studies. The largest peaks in number concentration were measured at and downwind of the 25R

7. Recommendations for Future Research

The results of this relatively limited study have provided important findings, but also fulfilled the exploratory goals of building a basis for future work to more fully characterize the contribution of aircraft and other airport activities to local and regional air quality. The studies provide the basis to conclude that aircraft emit substantial quantities of UFP and the impact of these emissions should be pursued. The study also highlights the utility of data that is highly resolved over time, and over the PM size range for describing PM source emissions. In general, more work is needed to characterize the composition, toxicological properties and contribution to local and regional pollution levels of aircraft derived PM. Specific recommendations that follow directly upon the current project findings follow:

1. A more detailed analysis of UFP concentration vs. time profiles collected in the one second SMPS scans at the blast fence should be undertaken, to determine whether we can identify aircraft characteristics such as model, engine type, wake size, or other metrics that could explain varying emissions levels observed at the blast fence. We have collected a substantial dataset that could be used for this purpose.
2. The size specific scan data should also be analyzed to determine mathematical properties of the decay behavior of aircraft take off plumes at the near source site. Such data is important for modeling the impact of emissions on surrounding air quality.
3. A complete set of CO and CO_2 data should be obtained along with total UFP concentrations at the blast fence to assist in development of emissions factors for in-use commercial aircraft at a field site. This would enable comparison to other field-derived PM emission factors. Because we did not observe a pronounced seasonal effect, this could be achieved with a relatively short sampling campaign.
4. A study of chemical characteristics of PM at the near source site would be valuable for several purposes, including toxicological implications and possible development of a source signature profile for use in source apportionment models. To focus on PM emitted by aircraft, chemical analysis of 15 nm particles would be of particular interest. Chemical composition of UFP collected at blast fence could also be compared to the composition of UFP collected in the community. It would be of interest to assess composition of the peak aircraft mode as well as a larger mode that may be more influenced by road traffic at the community locations. Composition data could be developed as an additional tool to the statistical analysis of temporal patterns used in this study to address the question of differential source impacts on the community.
5. Temporal analysis of particle number concentrations downwind of aircraft take-off should be extended to an analysis of study data collected beneath the approach to the LAX. Some data is available from this study for a preliminary analysis.
6. To better characterize the offsite plume movement of aircraft UFP, it would be very useful to have a complete size distribution for at least one of the sites described in our downwind study. Due to limited resources, only 15 nm PM were sampled, but a more complete characterization would provide the link needed for better inference about plume movement into community sites. Size distribution data would also enhance understanding of the fate of 15 nm PM as the aerosol disperses.

blast fence. The 90th percentile concentrations of 15 nm PM at the community sites and downwind study locations beneath the 25L landing path were less than at sites affected directly by aircraft take off plumes. Note that the percentile levels for 15 nm particle concentration are given as ranges for the downwind and community sites because there were 5 and 6 locations, resspectively, in these studies

Table 6-1: Summary statistics from three field studies of 15 nm ultrafine particles (UFP), total number concentration of UFP in sizes between 10 to 100 nm (PMN_{10-100}), black carbon (BC), and particulate matters in particles less than 2.5 µm

	15nm UFP #/cm³			PMN_{10-100} 1,000 #/cm³	BC µg/m³	$PM_{2.5}$ µg/m³
Location	Median	75th percentile	90th percentile	Mean ± Std	Mean ± Std	Mean ± Std
AQMD	-	-	-	7 ± 10	0.9 ± 1.2	14.3 ± 10.4
Blast Fence	247	2,655	6,936	532 ± 292	15.9 ± 13.9	23.7 ± 18.5
Downwind - 25R	56-115	152-390	442-1,640	--	4.6 ± 8.6	-
Downwind - 25L	61-169	128-281	229-419	--	1.0 ± 0.5	-
Community Sites	83-164	179-276	229-402	38 ± 25	1.3 ± 1.2	15.6 ± 12.0

The modeling project developed a model of dispersion of LAX aircraft emissions, represented by black carbon mass concentrations. Model development included a detailed treatment of black carbon emissions from various aircraft based upon currently available data. The model was calibrated with black carbon data measured at the near-source site. When the model was then used to calculate black carbon dispersion to community sampling sites, concentrations were predicted that were consistent with measured black carbon levels in the community.

7. As a general recommendation, ultrafine particle number concentration, and especially particles in the 10-20nm range should be considered a relevant metric for estimating human exposure to aircraft emissions, recognizing that other combustions sources also contribute to this size range. The results of the current study suggest that using only mass based metrics as indicators of exposure would not be adequate to characterize exposure at the community sites.
8. A detailed analysis of PM concentration vs. time profiles should be undertaken to develop more complete conclusions from the data we have collected in communities adjacent to LAX. We have tentatively concluded that the high numbers of 10-20 nm PM measured in these communities is due to aircraft, but further analysis is needed to support the conclusion. It is also important to learn whether landing aircraft passing over the community or advection of plumes from departing aircraft which, although more distant, are operating at a much higher engine thrust level, are a greater source of UFP at the community sites that were studied.
9. The community study would have benefited from concurrent monitoring at reference sites to address the question of the relative contribution of road and freeway traffic to measured UFP, black carbon and $PM_{2.5}$ levels. A study that performed concurrent SMPS monitoring at one of the community sites and a reference site such as Lloyd school that is affected by local traffic and the 405 but is not typically downwind of LAX would be very informative. Other control sites such as a reference upwind of both the 405 and LAX may be important to create a complete picture.
10. Data collected in the community should be used to perform calibration of the black carbon model, as was done with the near source data.
11. Development of source tracers for jet aircraft emissions would be very useful, and would obviate the need for the complex inferential approach to source attribution that relies upon analysis of temporal patterns of PM concentration.
12. There is not a literature that addresses the toxicity of or health effects of exposure to aircraft derived PM. In the short run, a high volume sample collected at LAX could be used in established toxicological experiments, in association with complete speciation of the particulate samples. In the longer run, research is needed to determine the physical, chemical and toxicological properties of the 10-20 nm particles that make up the concentration peak of take-off emissions, and to compare the toxicity of aircraft emitted PM to PM from other sources. In addition, community health studies should be a long term research goal. Because of the implications for public health, it is essential to link exposure to toxicological outcomes.

8. References

Blevins, L. G., Mulholland, G. W., Benner, Jr. B. A., and Steel, E. B. (2002) Morphology and chemistry of aircraft engine soot. *Proceedings of the 2002 Spring Technical Meeting of the Western States Section of the Combustion Institute*. The Combustion Institute, Pittsburgh, PA, MS014.

Blevins, L. G. (2003) Particulate matter emitted from aircraft engines. AIAA/ICAS International Air and Space Symposium and Exposition: The Next 100 Years. 14-17 July, Dayton, Ohio. AIAA 2003-2764.

Eiguren-Fernandez, A., Miguel AH (2003). "Determination of Semi-Volatile and Particulate Polycyclic Aromatic Hydrocarbons in SRM 1649a and PM2.5 Samples by HPLC-Fluorescence." Polycyclic Aromatic Compounds 23: 193-205.

Eiguren-Fernandez, A., Miguel AH, Froines JR, Thurairatnam S, Avol E (2004). "Seasonal and Spatial Variations of Polycyclic Aromatic Hydrocarbons in Vapor-Phase and PM2.5 in Southern California Urban and Rural Communities." Aerosol Science & Technology 38: 447-455.

EPA 1992, Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources, EPA420-R-92-009.

FAA 2005, Air Quality Procedures for Civilian Airports and Air Force Bases. Air Quality Handbook, Appendix D: Aircraft Emission Methodology, http://www.faa.gov/regulations_policies/policy_guidance/envir_policy/airquality_handbook/

FAEED, FAA Aircraft Engine Emission User Guide and Database. U.S. Environmental Protection Agency Technology Transfer Network, Office of Mobile Sources (OMS) Bulletin Board System, 1995.

Hering S. V., Flagan, R.C., & Friedlander, S. K. (1978) Design and evaluation of new low-pressure impactor. *Environ. Sci. Technol.* **12**, 667-673.

ICAO 2006, ICAO Aircraft Engine Emissions DataBank (http://www.caa.co.uk)

Kittleson, D. B. (1998) Engines and nanoparticles: A review *J. Aerosol Sci.* **29**, 575.

Lu R, Turco RP (1995) Air pollution transport in a coastal environment: Part II. Threedimensional simulations over the Los Angeles basin, *Atmospheric Environment*, Part A, 29, 1499-1518.

Lu R, Turco RP, Jacobson MZ (1997a) An integrated air pollution modeling system for urban and regional scales: Part I: Structure and performance, *J Geophys Res* 102:6063-6079.

Lu R, Turco RP, Jacobson MZ (1997b) An integrated air pollution modeling system for urban and regional scales: Part II: Simulations for SCAQS 1987, J Geophys Res 102:6081-6098.

Lu R, Turco RP, Stolzenbach K, Friedlander SK, Xiong C, Schiff K, Wang G (2003) Dry deposition of airborne trace metals on the Los Angeles Basin and adjacent coastal waters. J Geophys Res 108(D2):4074, doi:10.1029/2001JD001446.

Lu, R., J. Wu, R. P. Turco, A. Winer, R. Atkinson, J. Arey, S. Paulson, F. Lurmann, A. H. Miguel and A. Eiguren-Fernandez, "Naphthalne distributions and human exposure in the South Coast Air Basin,", *Atmos. Environ.*, **39**, 489–507, 2005.

Singh, M, Phuleria HC, Bowers K, Sioutas C. (2006). Seasonal and spatial trends in particle number concentrations and size distributions at the children's health study sites in Southern California. Journal of Exposure Science and Environmental Epidemiology **16**, 3–18.

Xiong, C., Friedlander, S. K. (2001) Morphological properties of atmospheric aerosol aggregates. *Proc. Natl. Acad. Sci. USA.* **98**, 11851-11856.
Zhu, Y. F., Hinds, W. C., Kim, S., and Sioutas, C. (2002) Concentration and Size Distribution of Ultrafine Particles Near a Major Highway. *Air Waste Manage Assoc.* **52**, 1032.

Appendix A

Air toxics sampled at the LAX blast fence and the AQMD background reference site three days during the downwind study in May 2006.

AQMD West (Site 1)

Sampling Date	5/2/2006		5/3/2006		5/4/2006	
LIMS ID	TX007314		TX007316		TX007318	
Dilution Factor	2.08		2.17		2.25	
	Concentration (ppb)	Detection Limit (ppb)	Concentration (ppb)	Detection Limit (ppb)	Concentration (ppb)	Detection Limit (ppb)
1,1,1-Trichloroethane	<.02	0.02	<.02	0.02	<.02	0.02
1,2-Dichloroethane	<.04	0.04	<.04	0.04	<.05	0.05
1,3-Butadiene	<.08	0.08	<.09	0.09	<.09	0.09
Acetone	7.9	0.6	5.4	0.7	3.4	0.7
Acetonitrile	<.6	0.6	<.7	0.7	<.7	0.7
Acrolein	**0.867**	0.6	<.7	0.7	<.7	0.7
Acrylonitrile	<.6	0.6	<.7	0.7	<.7	0.7
Benzene	**0.108**	0.1	**0.102**	0.1	<.1	0.1
Bromomethane	<.06	0.06	<.07	0.07	<.07	0.07
Carbon disulfide	<.2	0.2	<.2	0.2	<.2	0.2
Chlorobenzene	<.2	0.2	<.2	0.2	<.2	0.2
Chloroform	<.04	0.04	<.04	0.04	<.05	0.05
cis-1,3-Dichloropropene	<.2	0.2	<.2	0.2	<.2	0.2
Dibromoethane	<.04	0.04	<.04	0.04	<.05	0.05
Dichloromethane	0.22	0.2	<.2	0.2	<.2	0.2
Ethanol	2	1	1.3	1.1	<1.1	1.1
Ethylbenzene	<.4	0.4	<.4	0.4	<.5	0.5
Freon 11	0.24	0.02	0.24	0.02	0.25	0.02
Freon 113	0.062	0.04	0.059	0.04	0.059	0.05
Freon 12	0.54	0.04	0.53	0.04	0.52	0.05
m/p-Xylene	<.4	0.4	<.4	0.4	<.5	0.5
m-Dichlorobenzene	<.6	0.6	<.7	0.7	<.7	0.7
o-Dichlorobenzene	<.6	0.6	<.7	0.7	<.7	0.7
o-Xylene	<.2	0.2	<.2	0.2	<.2	0.2
p-Dichlorobenzene	<.6	0.6	<.7	0.7	<.7	0.7
Perchloroethylene	0.04	0.02	0.026	0.02	<.02	0.02
Styrene	<.2	0.2	<.2	0.2	<.2	0.2
Toluene	1.2	0.4	1.2	0.4	<.5	0.5
trans-1,3-Dichloropropene	<.2	0.2	<.2	0.2	<.2	0.2
Trichloroethylene	<.04	0.04	<.04	0.04	<.05	0.05
Vinyl chloride	<.04	0.04	<.04	0.04	<.05	0.05

LAX Blast Fence (Site 2)

Sampling Date	5/2/2006		5/3/2006		5/4/2006	
LIMS ID	TX007317		TX007332		TX007315	
Dilution Factor	2.15		1.977		2.16	
	Concentration (ppb)	Detection Limit (ppb)	Concentration (ppb)	Detection Limit (ppb)	Concentration (ppb)	Detection Limit (ppb)
1,1,1-Trichloroethane	<.02	0.02	<.02	0.02	< 02	0.02
1,2-Dichloroethane	<.04	0.04	<.04	0.04	<.04	0.04
1,3-Butadiene	**0.245**	0.09	<.08	0.08	**0.199**	0.09
Acetone	4.1	0.6	3.5	0.6	3.5	0.6
Acetonitrile	<.6	0.6	<.6	0.6	<.6	0.6
Acrolein	**0.970**	0.6	**0.952**	0.6	**0.786**	0.6
Acrylonitrile	<.6	0.6	<.6	0.6	<.6	0.6
Benzene	**0.312**	0.1	**0.263**	0.1	**0.238**	0.1
Bromomethane	<.06	0.06	<.06	0.06	<.06	0.06
Carbon disulfide	<.2	0.2	<.2	0.2	<.2	0.2
Chlorobenzene	<.2	0.2	<.2	0.2	<.2	0.2
Chloroform	<.04	0.04	<.04	0.04	<.04	0.04
cis-1,3-Dichloropropene	<.2	0.2	<.2	0.2	<.2	0.2
Dibromoethane	<.04	0.04	<.04	0.04	<.04	0.04
Dichloromethane	<.2	0.2	<.2	0.2	<.2	0.2
Ethanol	1.6	1.1	1.1	1	<1.1	1.1
Ethylbenzene	<.4	0.4	< 4	0.4	<.4	0.4
Freon 11	0.24	0.02	0.25	0.02	0.24	0.02
Freon 113	0.062	0.04	0.071	0.04	0.06	0.04
Freon 12	0.54	0.04	0.54	0.04	0.54	0.04
m/p-Xylene	<.4	0.4	<.4	0 4	<.4	0.4
m-Dichlorobenzene	<.6	0.6	<.6	0.6	<.6	0.6
o-Dichlorobenzene	<.6	0.6	<.6	0.6	<.6	0.6
o-Xylene	<.2	0.2	<.2	0.2	<.2	0.2
p-Dichlorobenzene	<.6	0.6	<.6	0.6	<.6	0.6
Perchloroethylene	0.043	0.02	0.022	0.02	<.02	0.02
Styrene	<.2	0.2	<.2	0.2	< 2	0.2
Toluene	1.7	0.4	1	0.4	0.48	0.4
trans-1,3-Dichloropropene	<.2	0.2	<.2	0.2	<.2	0.2
Trichloroethylene	<.04	0.04	< 04	0.04	<.04	0.04
Vinyl chloride	<.04	0.04	<.04	0.04	<.04	0.04