

# Optimization of Airspace and Procedures in the Metroplex



## SoCal Metroplex Project Overview Brief

To: Los Angeles World Airport  
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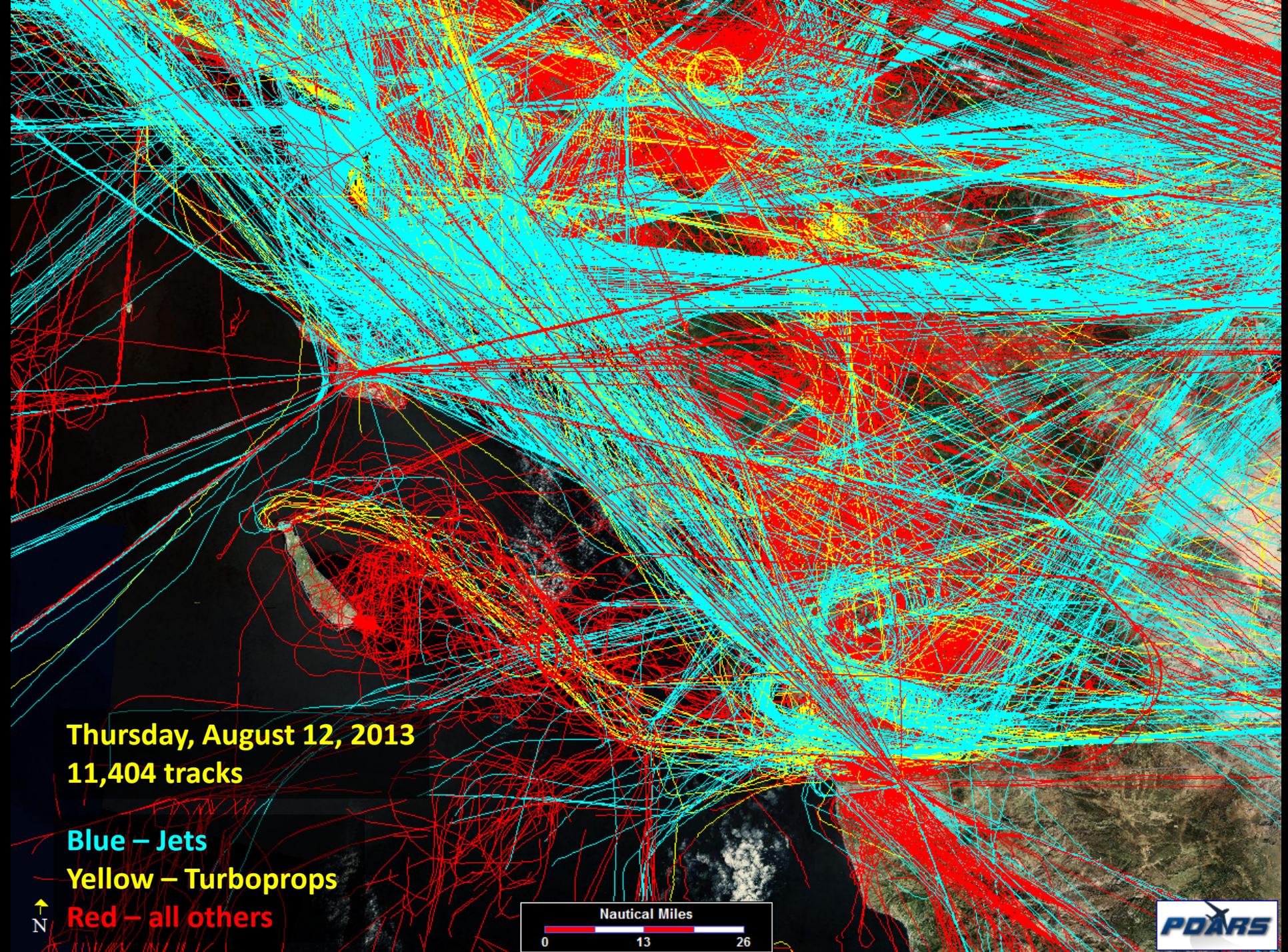
Federal Aviation  
Administration



# Agenda

- **SoCal Metroplex Project Background**
- **Scope of Work**
- **Environmental Assessment**
- **Benefits**
- **Challenges**
- **Implementation**





Thursday, August 12, 2013  
11,404 tracks

Blue – Jets

Yellow – Turboprops

Red – all others



# Metroplex and NextGen

- **The purpose of the project is to improve airspace efficiency and reduce complexity**
- **RTCA's Task Force 5 recommendations for NextGen implementation included:**
  - **Focus on major metropolitan areas**
  - **Optimize flight paths and climb/descent profiles**
  - **Institute collaborative teams to broadly proliferate existing PBN experience and expertise**
  - **Promote RNAV “everywhere” and RNP (Required Navigational Performance) “where beneficial”**
  - **Integrate airspace and procedure design**
  - **Decouple operations arriving and departing adjacent airports**
  - **Use 3 NM and terminal separation rules wherever possible**



# Southern California Metroplex Scope

- **Scope of work**
  - **Metroplex is an optimized approach to integrated airspace and procedures projects**
    - Proposed solutions center on PBN procedures and airspace redesign
  - **Airspace and procedures solutions are limited to those that can be achieved without producing significant noise increases**
    - Noise impacts assessed and reported in an Environmental Assessment (EA)
    - Draft EA will include a noise analysis and track/altitude information
    - Years modeled: 2015 and 2020 forecast conditions
    - Preliminary analysis shows no significant noise increases in the 65 DNL



# Design

- **The SoCal Design Team worked in cooperation with Industry**
- **Procedure design was focused on establishing Optimized Profile Descents (OPD) where feasible**
  - **Terrain and closely spaced airports contributed to design challenges**
  - **Where OPDs were not feasible the Design Team developed solutions with Industry to improve procedures over current conditions**
  - **RNP approaches attached to the end of a STAR were also developed with Industry partners**

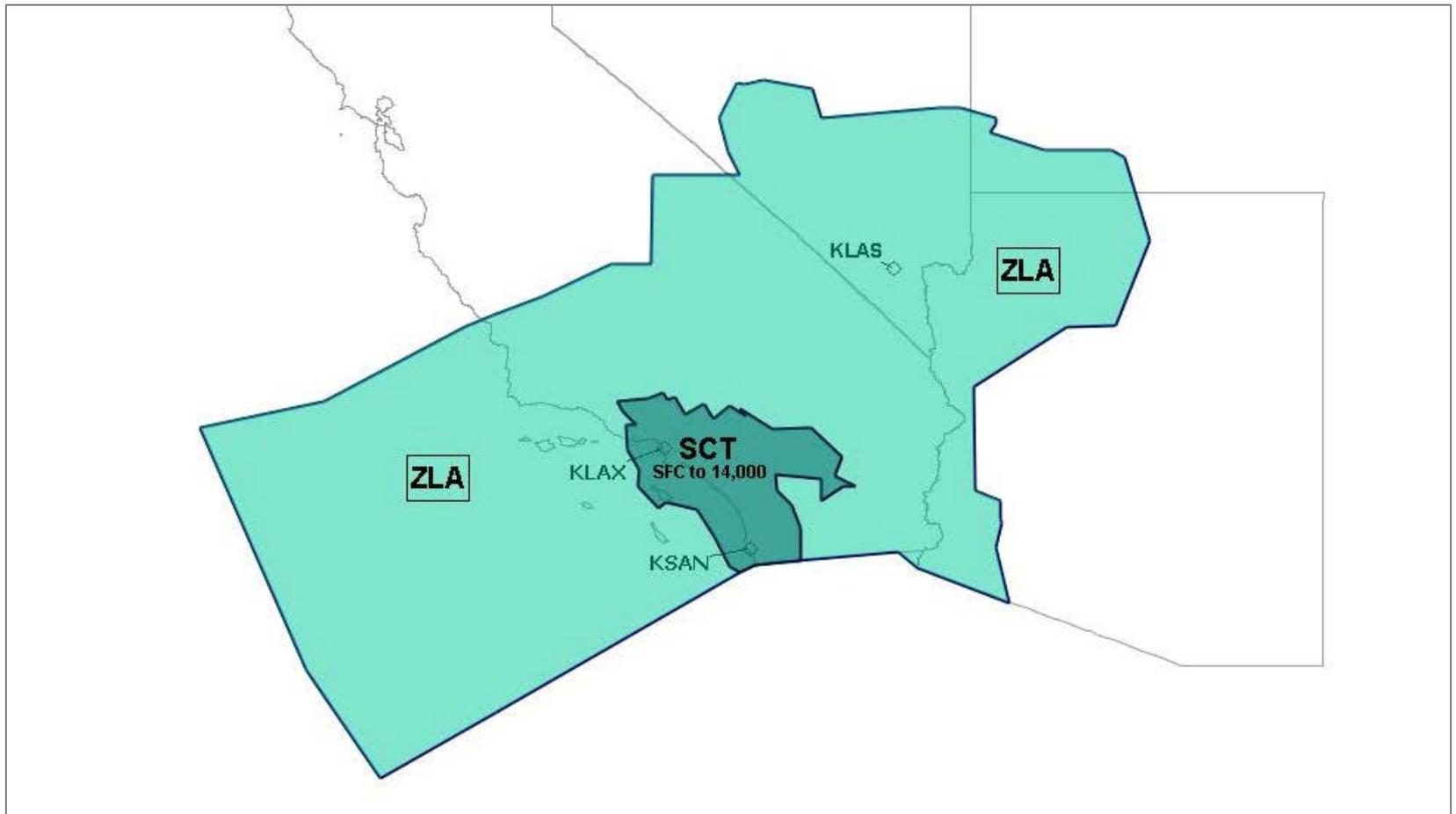


# SoCal Metroplex Airports

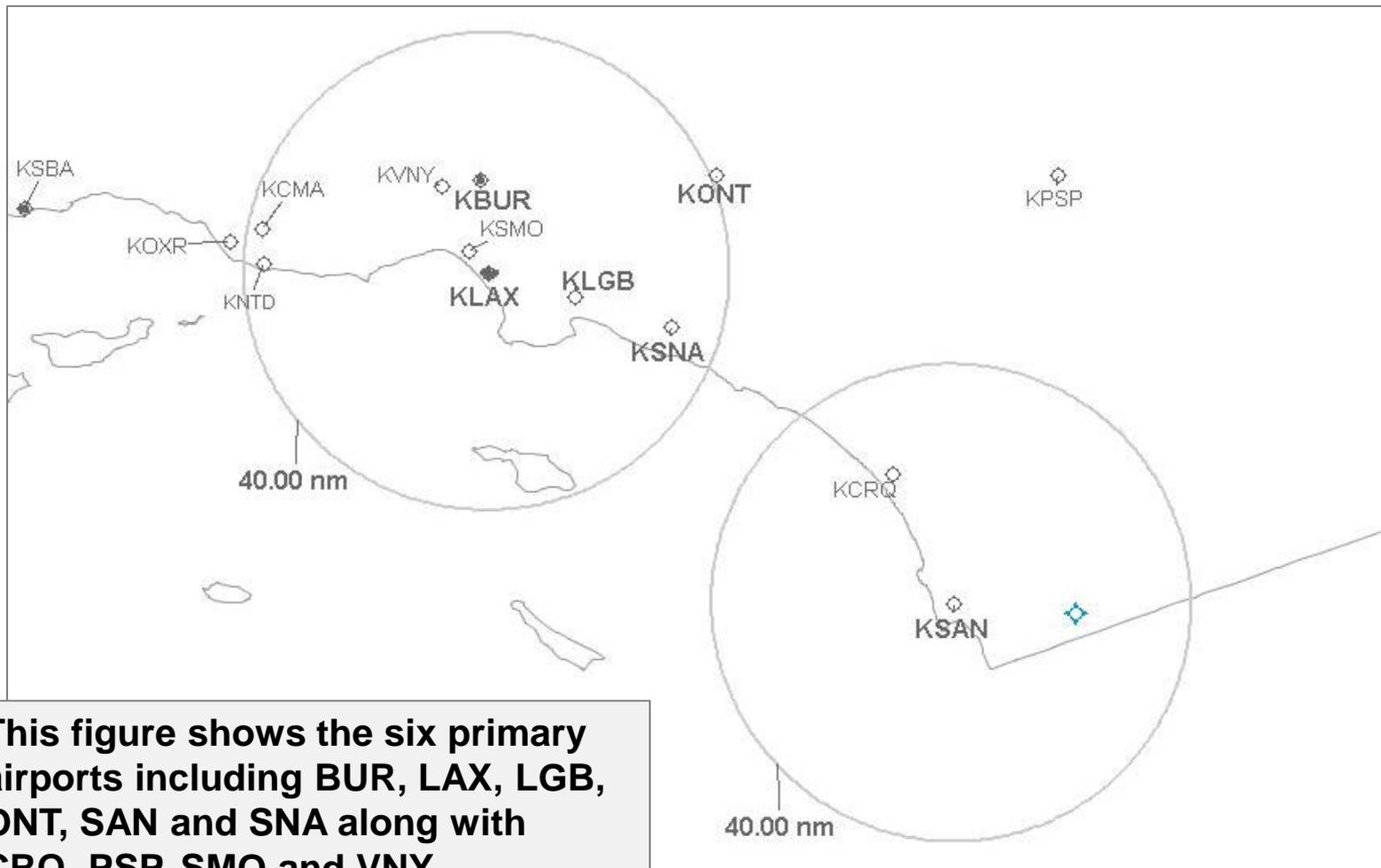
- **The Southern California Metroplex consists of airspace delegated to the SCT and ZLA**
- **Interactive operations at eight SCT airports were examined closely**
  - **Los Angeles International Airport (LAX)**
  - **San Diego International Airport (SAN)**
  - **Bob Hope Airport (BUR)**
  - **Ontario International Airport (ONT)**
  - **John Wayne Airport – Orange County (SNA)**
  - **Long Beach/Daugherty Field (LGB)**
  - **Santa Monica Municipal Airport (SMO)**
  - **Van Nuys Airport (VNY)**



# SoCal Metroplex Delegated Airspace



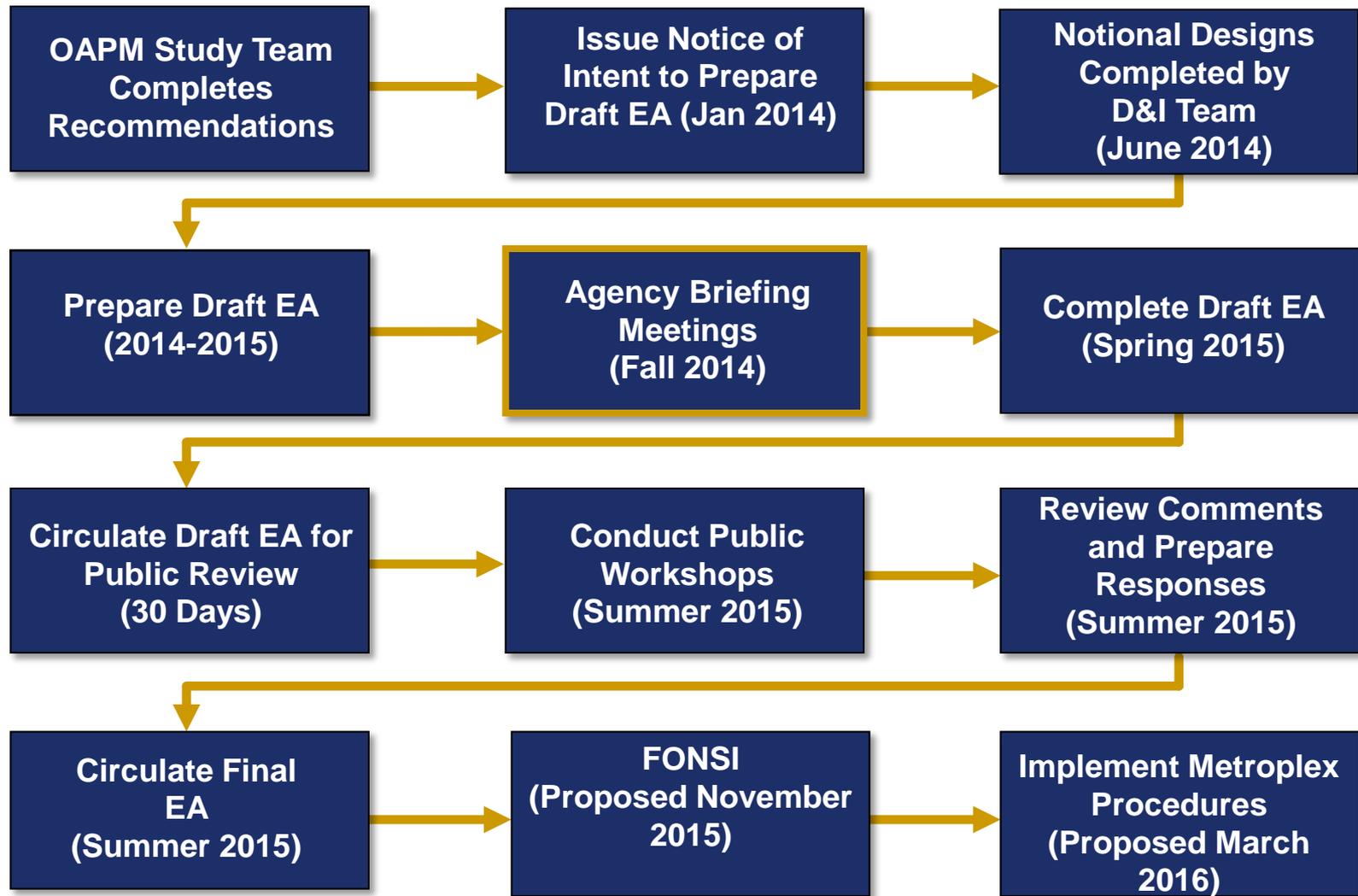
# SoCal Metroplex Area of Interest



**This figure shows the six primary airports including BUR, LAX, LGB, ONT, SAN and SNA along with CRQ, PSP, SMO and VNY**



# SoCal Metrolplex Environmental Process



# Purpose & Need of Metroplex EA

- **Main Purpose of Metroplex**
  - **To enhance efficiency in the SoCal Metroplex**
    - **Reduce Complexity**
    - **Provide Predictability**
    - **Provide Flexibility**





# Public Workshops

15-Jun-15	16-Jun-15	17-Jun-15	18-Jun-15	19-Jun-15
	Public Workshop SNA	Public Workshop SMO	Public Workshop LAX	
22-Jun-15	23-Jun-15	24-Jun-15	25-Jun-15	26-Jun-15
Public Workshop SAN	Public Workshop PSP	Public Workshop <del>LGB</del> -Torrance	Public Workshop <del>Redondo Beach</del> LGB	
29-Jun-15	30-Jun-15	1-Jul-15	2-Jul-15	3-Jul-15
Public Workshop VTU	Public Workshop SBA	Public Workshop BUR		



# Summary of Potential Benefits

## Qualitative Benefits

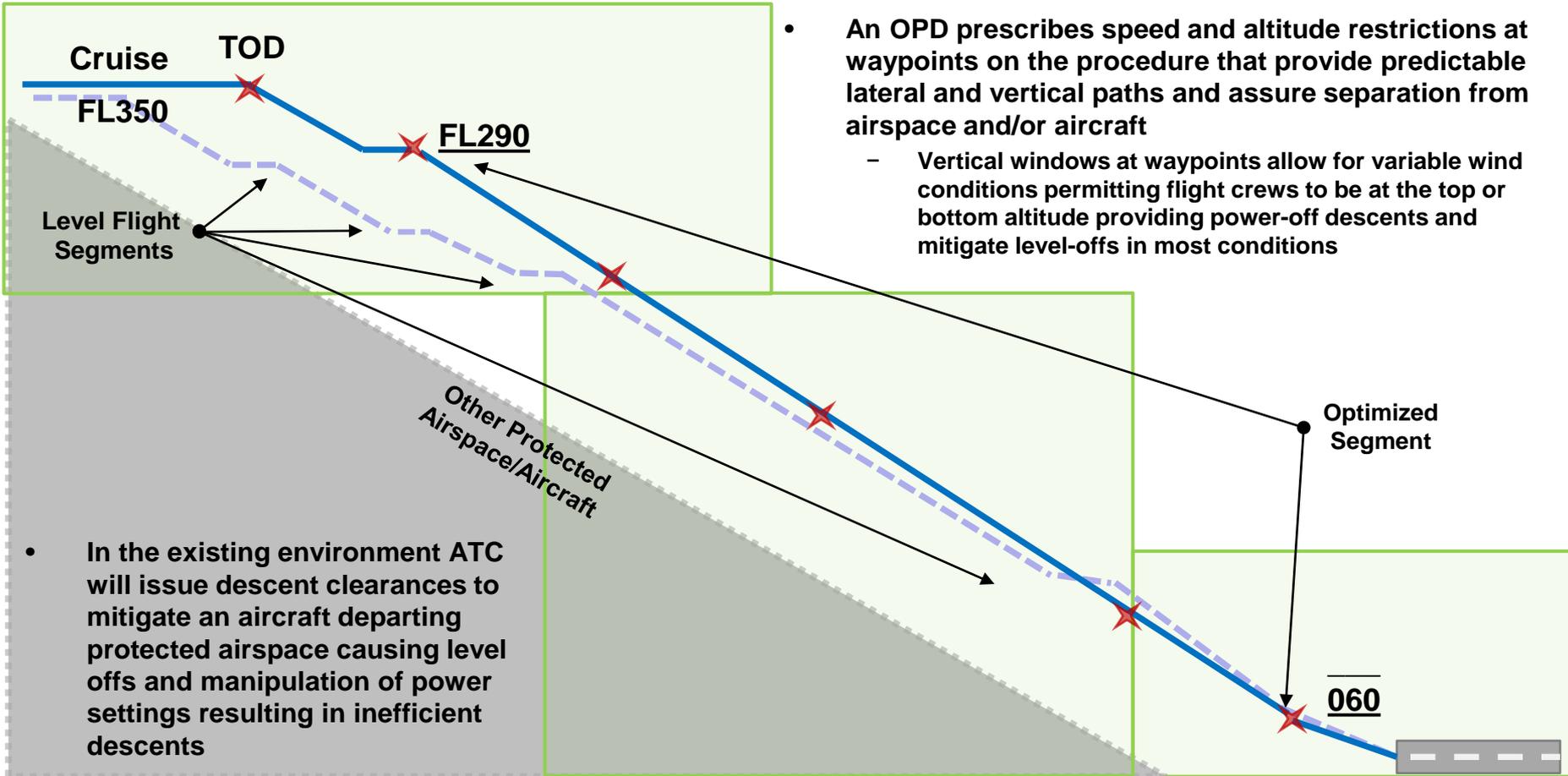
- Reduced ATC task complexity
- Reduced communications (flight deck and controller)
  - Reduced phraseology
  - Reduced frequency congestion
- Reduced pilot workload
- Repeatable, predictable flight paths
- Accurate fuel planning
- Laterally or vertically segregated flows where practical

## Quantitative Benefits

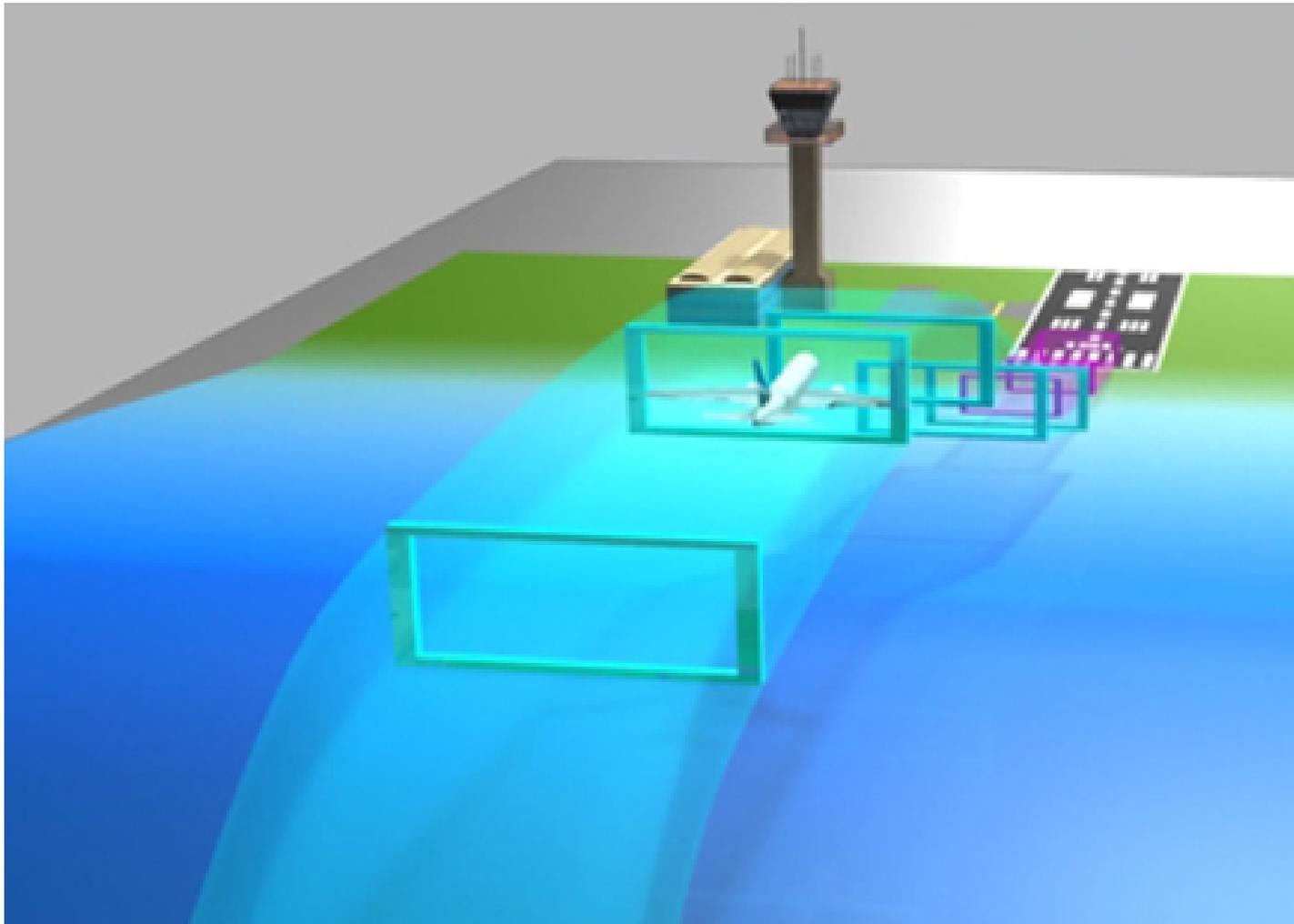
	Low	High
Estimated Annual Fuel Savings: SIDs and STARs (Dollars)	\$9.94M	\$22.68M
Estimated Annual Fuel Savings: SIDs and STARs (Gallons)	3.36M	7.72M
Estimated Annual Carbon Savings: SIDs and STARs (Metric Tons)	34K	77K
Estimated Annual ADOC Savings: LAX Dual Independent Finals	\$3.99M	
Estimated Annual Fuel Savings: SMO / LAX Interactions	\$200K	\$260K
<i>Estimated Annual Savings: TOTAL</i>	<i>\$14.13M</i>	<i>\$26.93M</i>



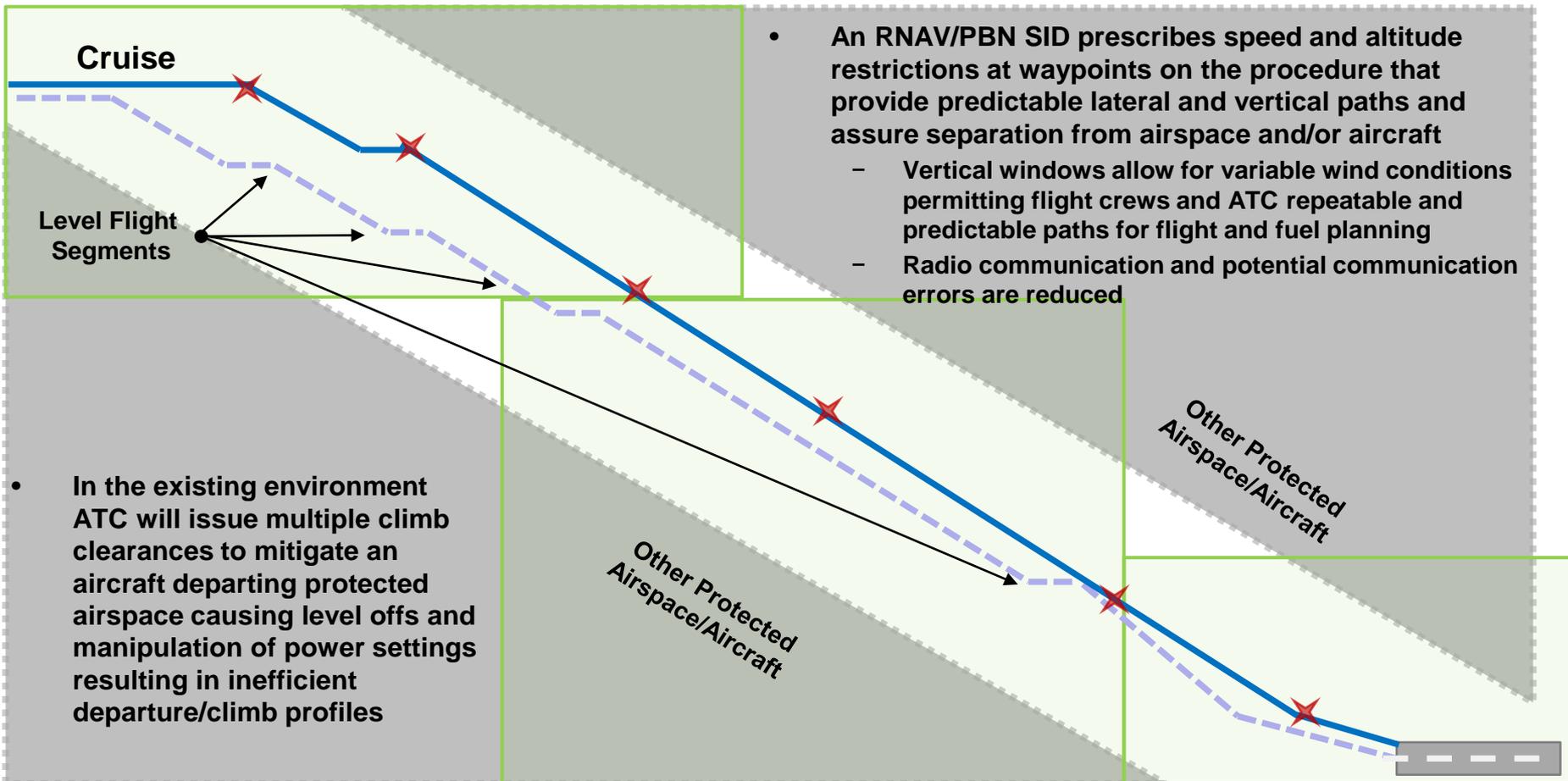
# Optimized Profile Descent Example (Arrival)



# Optimized Guidance



# Optimized Climb Profile Example (Departure)



# SoCal Metroplex Proposed Procedures

RNAV STARs	RNAV SIDs	Conventional STARs	Conventional SIDs	RNAV/RNP Approaches
<b>37</b>	<b>50</b>	<b>25</b>	<b>44</b>	<b>22</b>

## LAX Specific

RNAV STARs	RNAV SIDs	Conventional STARs	Conventional SIDs	RNAV/RNP Approaches
<b>12/6</b>	<b>12</b>	<b>0</b>	<b>1</b>	<b>8</b>

**Note: 38 existing approach procedures will require amendment**



# Challenges

## (1 of 2)

- **LAX runway projects as of 04/28/2015**
  - Runway 06L/24R unavailable from 06/29/2015 through 10/15/2015
  - Runway 24L approach threshold relocation 11/15/2015 through 05/15/2016
  - Runway 6R approach threshold displaced 05/15/2016 through 09/30/2016
  - Runway 25R approach threshold relocation 10/01/2016 through 01/15/2017
  - Runway 07L/25R closed 01/16/2016 through 05/30/2017
  - Runway 07R/25L resurfacing
    - TBD (forecast closure 01/01/2018 through 05/31/2018)
  - Flight Checks dependent on runway projects



# Challenges

## (2 of 2)

- **LAX MagVar**
- **SoCal MagVar**
- **SCT STARS Transition**
- **International Coordination**
  - **Mazatlán ACC and Tijuana Approach Control**
- **Achievement of OPD Benefits**
- **Department of Defense Airspace Expansions**



# SoCal Metroplex Abbreviated Work Plan

Activity	Date	Complete
Design Phase Start	10/15/2012	✓
Restart SoCal Metroplex	08/26/2013	✓
Restart SoCal Metroplex	10/21/2013	✓
Notional Design Complete	6/9/2014	✓
Facilitation of SRM Panel Complete	7/11/2014	✓
EA Affected Enviro Section	8/8/2014	✓
Final Safety Document Complete	12/12/2014	✓
EA Enviro Consequences Sect	2/23/2015	✓
Safety Doc Signatures Complete	2/13/2015	✓
SMS Process Complete	4/27/2015	✓
Draft EA	6/10/2015	
Final EA FONSI	11/11/2015	
A/S and Procedures SMS Process Complete	11/11/2015	
Implementation Phase Start	8/28/2015	
Procedure Implementation Complete	9/15/2016	



# Proposed Implementation

<b>Group</b>	<b>Chart Date</b>	<b>SoCal Due Date</b>	<b>WSA FPT Due Date</b>
<b>Group 1A</b>	<b>02/04/2016 (hold until 3/31 /2016)</b>	<b>5/17/2015</b>	<b>7/17/2015</b>
<b>Group 1B</b>	<b>3/31/2016</b>	<b>7/10/2015</b>	<b>9/11/2015</b>
<b>Group 2</b>	<b>5/26/2016</b>	<b>9/4/2015</b>	<b>11/6/2015</b>
<b>Group 3</b>	<b>7/21/2016</b>	<b>10/30/2015</b>	<b>1/1/2016</b>
<b>Group 4 TBD</b>	<b>9/15/2016</b>	<b>12/24/2015</b>	<b>2/26/2016</b>
<b>Group 5 TBD</b>	<b>11/10/16</b>	<b>2/22/2016</b>	<b>4/22/2016</b>





# Points of Contact

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# QUESTIONS?



# Acronym Definitions

- **ATC: Air Traffic Control**
- **EA: Environmental Assessment**
- **NextGen: Next Generation Air Transportation System**
- **OAPM: Optimization of Airspace and Procedures in the Metroplex**
- **OPD: Optimized profile descent**
- **PBN: Performance based navigation**
- **RTCA: Radio Technical Commission for Aeronautics**
- **RNAV: Area Navigation**
- **RNP :Required Navigation Performance**
- **SCT: Southern California Terminal Radar Approach Control**
- **SID: Standard Instrument Departure**
- **SoCal: Southern California**
- **STAR: Standard Terminal Arrival Route**
- **ZLA: Los Angeles Air Traffic Control Center**

