LAX CONNECTED

Board of Airport Commissioners
Ground Transportation Workshop
May 5, 2014

Workshop Goals

- Share our work - No decisions will be made today!
- Provide overview of general objectives and elements for LAX's ground transportation system.
- Demonstrate planning progress on critical elements.
- Outline future steps needed to deliver a new ground transportation system at LAX.

Ground Transportation Workshop

Agenda

- Key Problems
- Overview of the Solution

- Consolidated Rent-A-Car Center (CONRAC)
- Automated People Mover (APM)
- Intermodal Transportation Facility (ITF/LAX Connect)
- Metro
- Roadways

- Key Factors of Success
- Timeline

Not Enough Curb

Curb is too short and too shallow.

Outer Curb Between Traffic lanes.

Poor passenger experience now. Increased demand will make this worse.

Mode Conflict

Shared roadway and curb creates conflict between private, commercial, and service vehicles.

Limited Roadways

Roadway capacity saturated during peaks.

Low predictability for passengers.

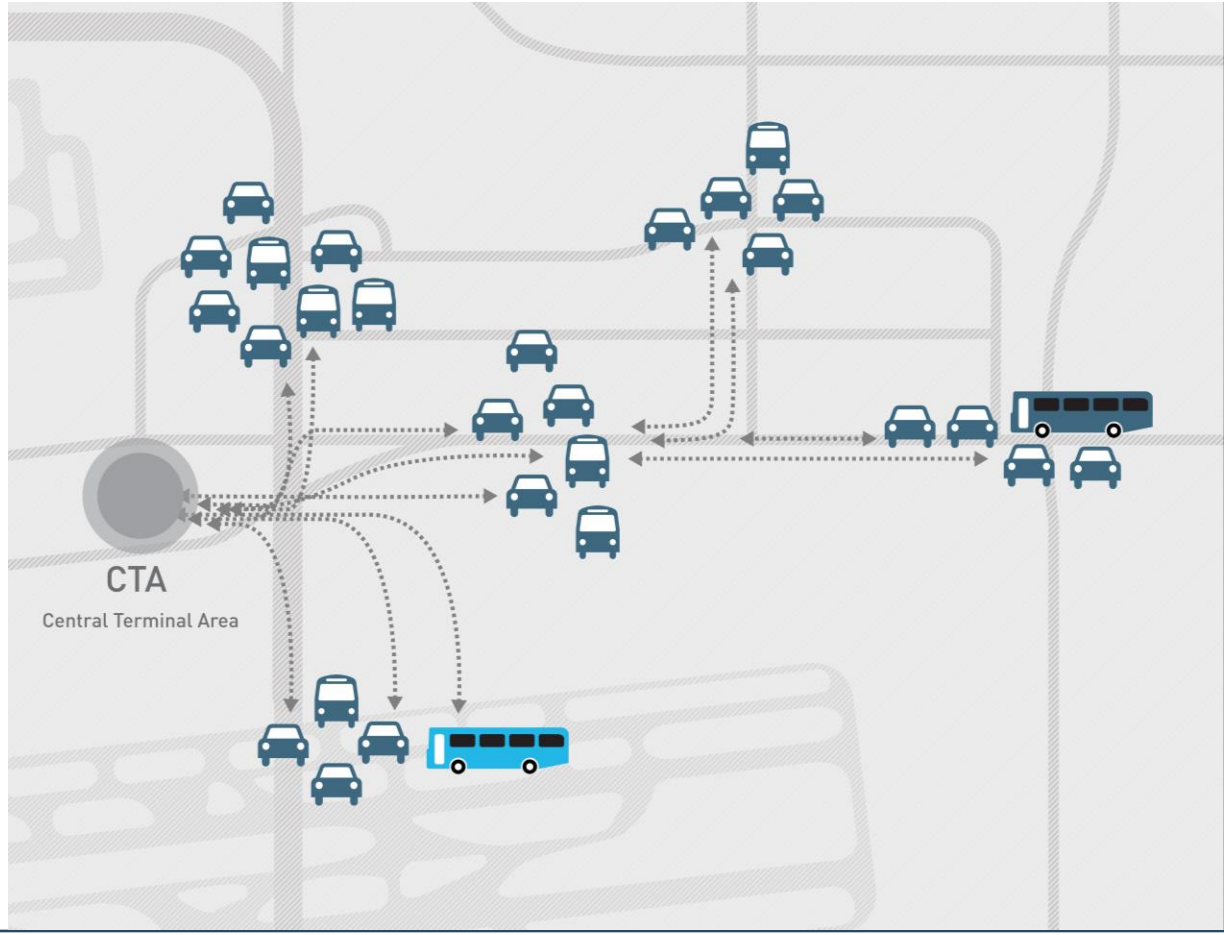
Peaks will be longer as activity increases.

Single Option System

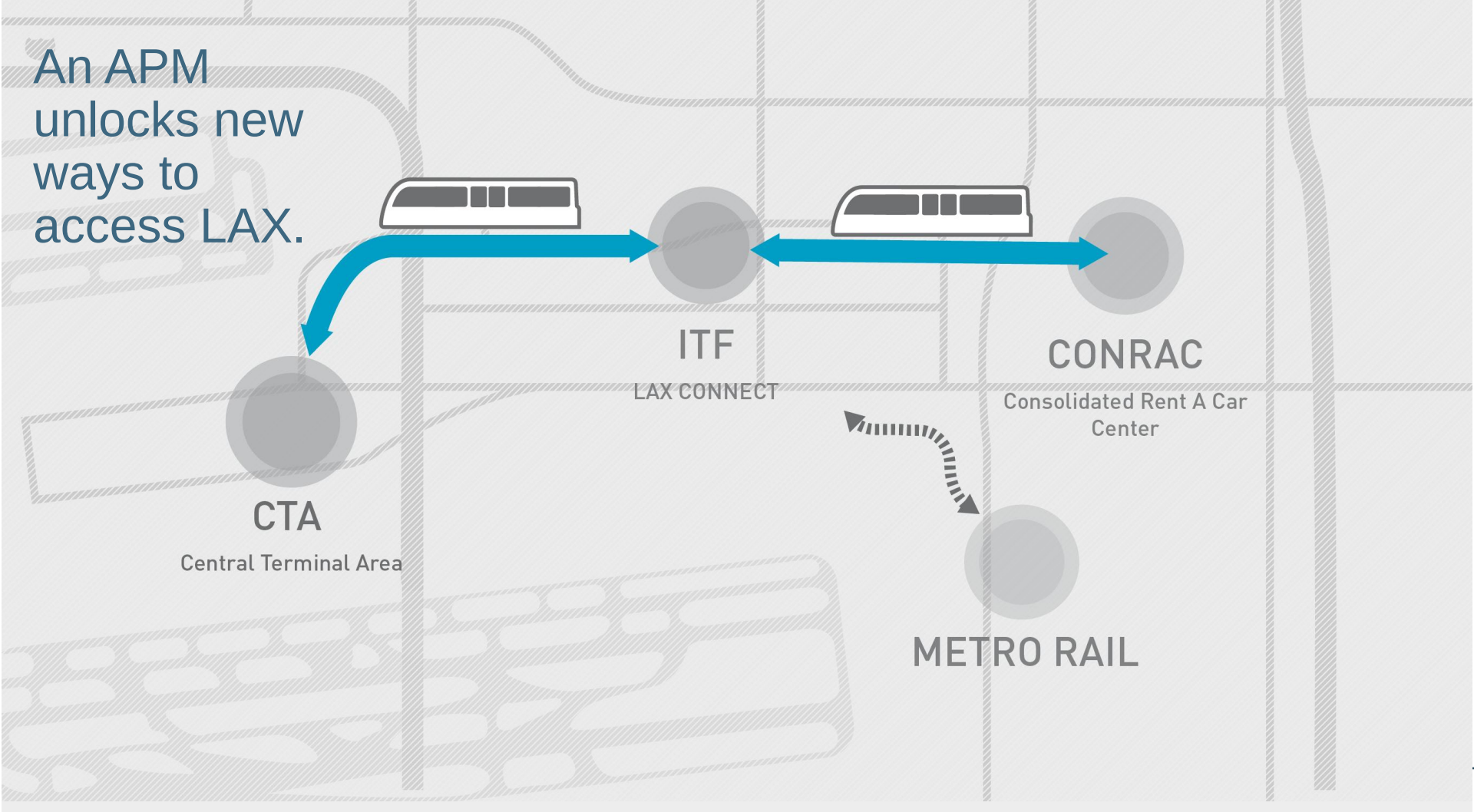
Regardless of mode choice, all airport users end up using the existing roadway and curb.

Opportunities for new roadway or curb in the CTA is limited.

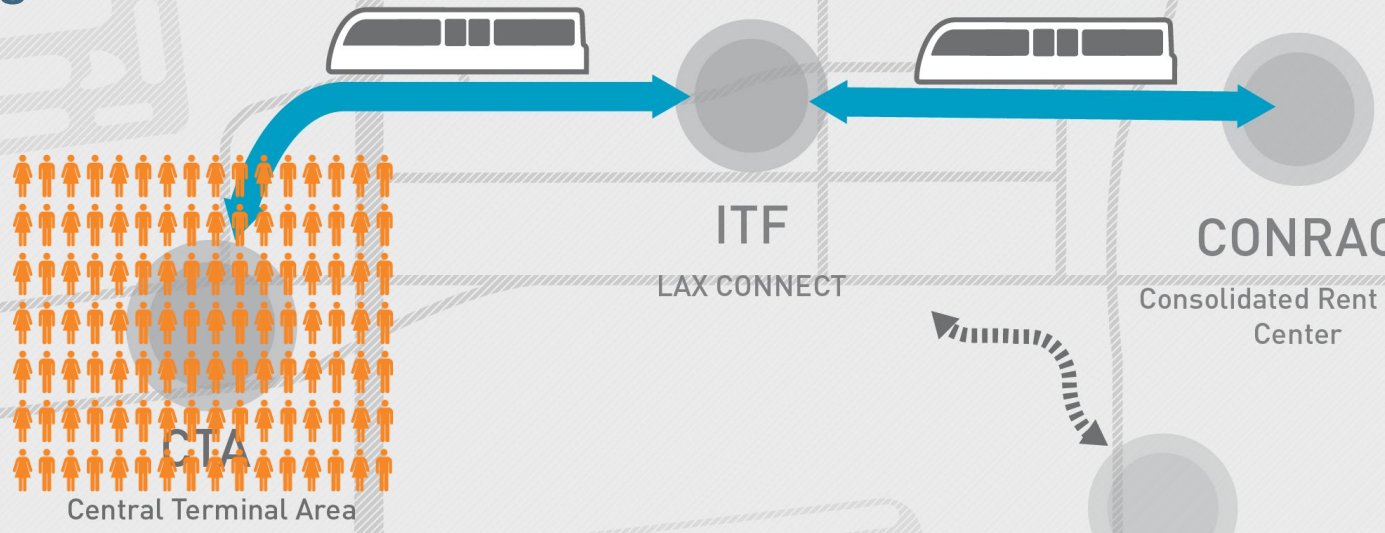
LAWA does not have the facilities to efficiently or conveniently shift modes outside of the CTA to relieve congestion and improve the level of service.



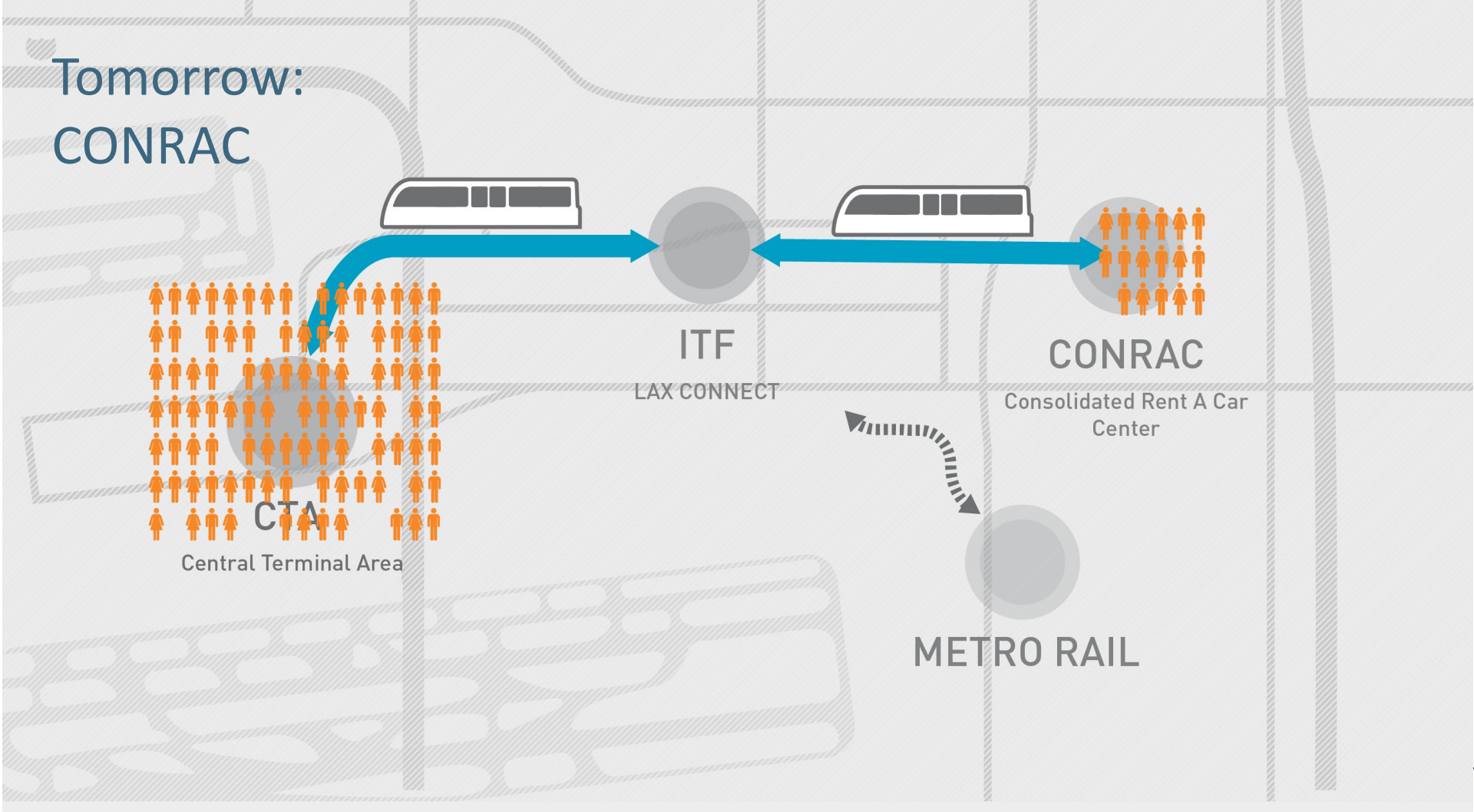
An APM unlocks new ways to access LAX.



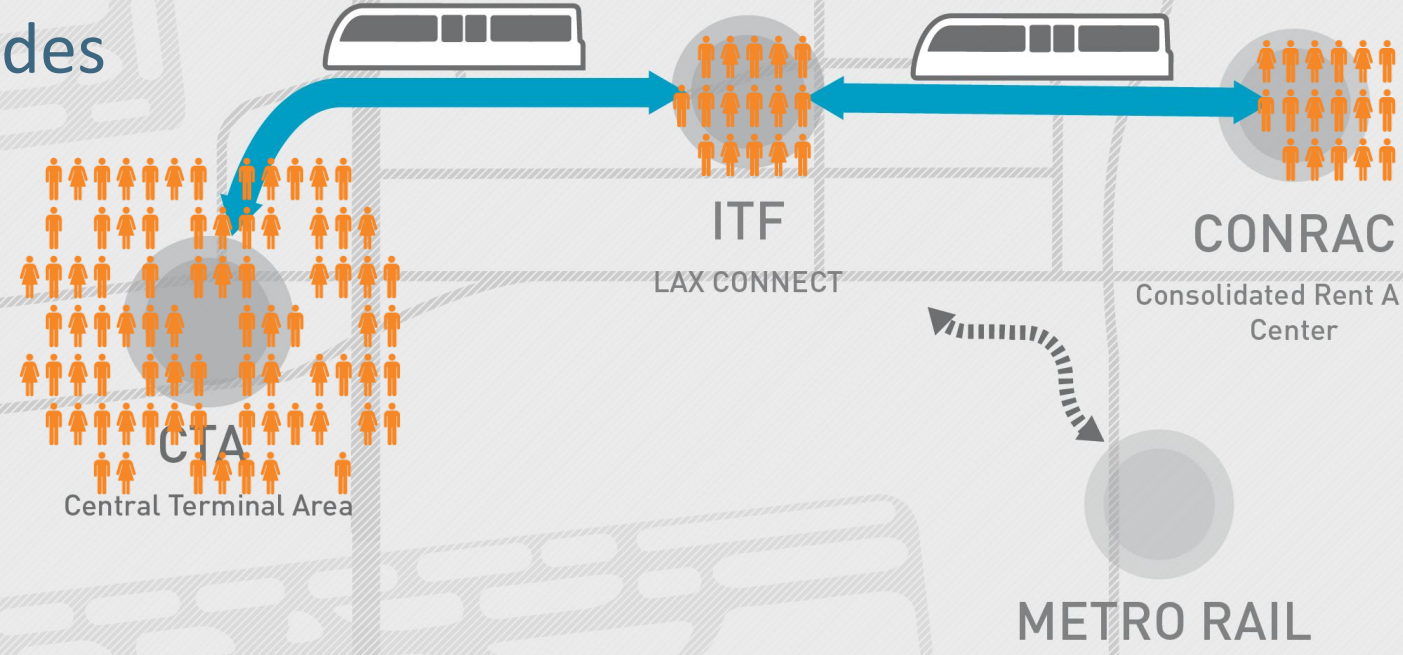
Today's Congestion



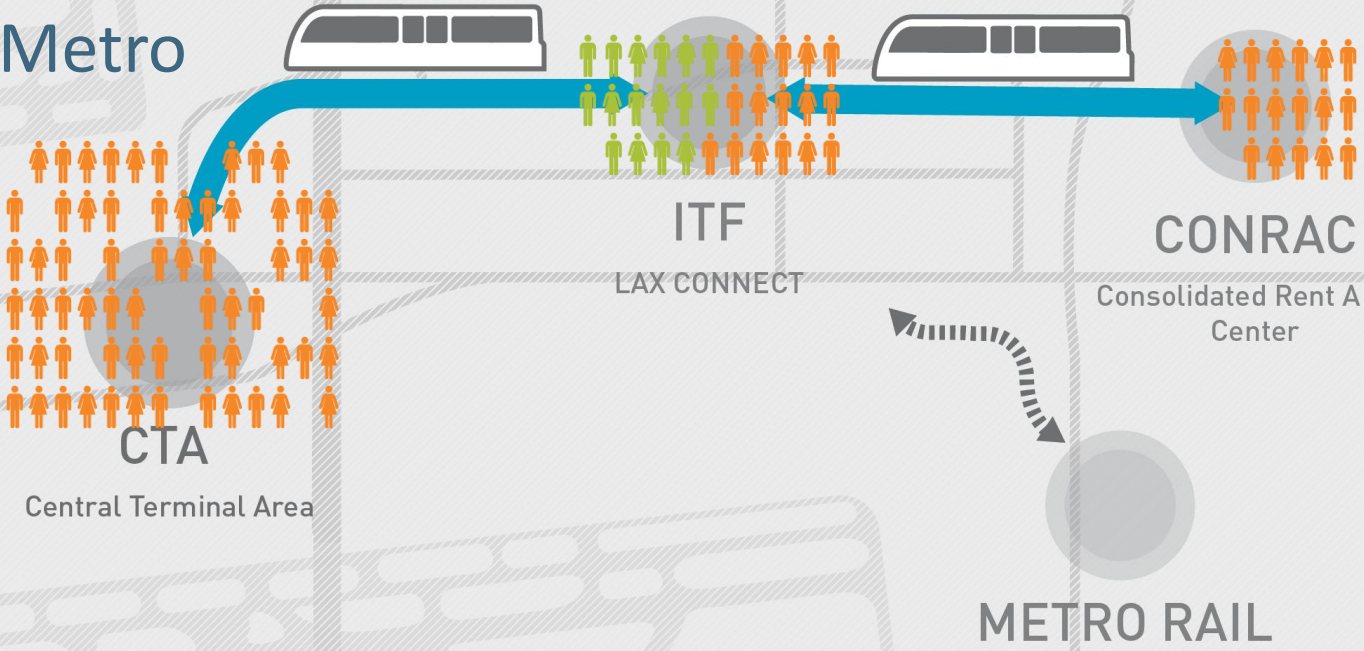
Tomorrow:
CONRAC

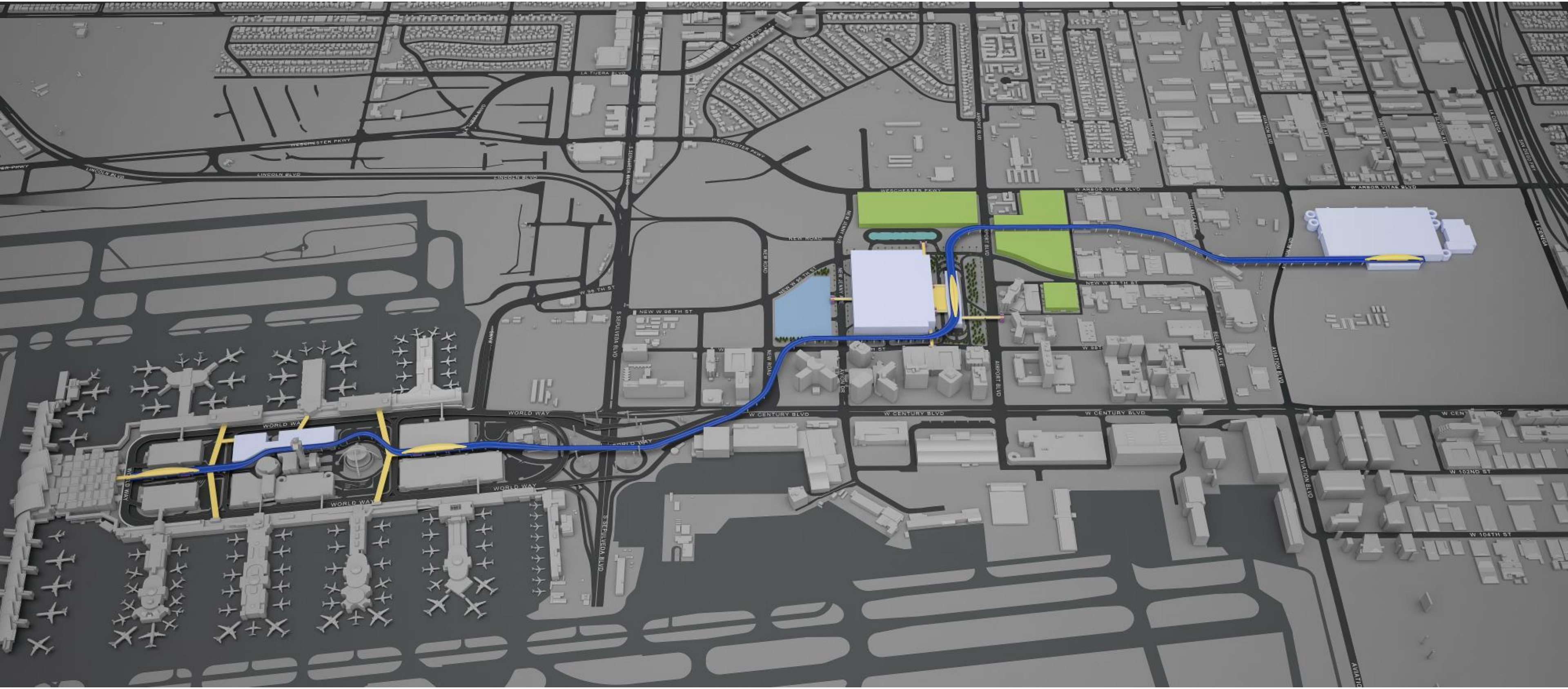


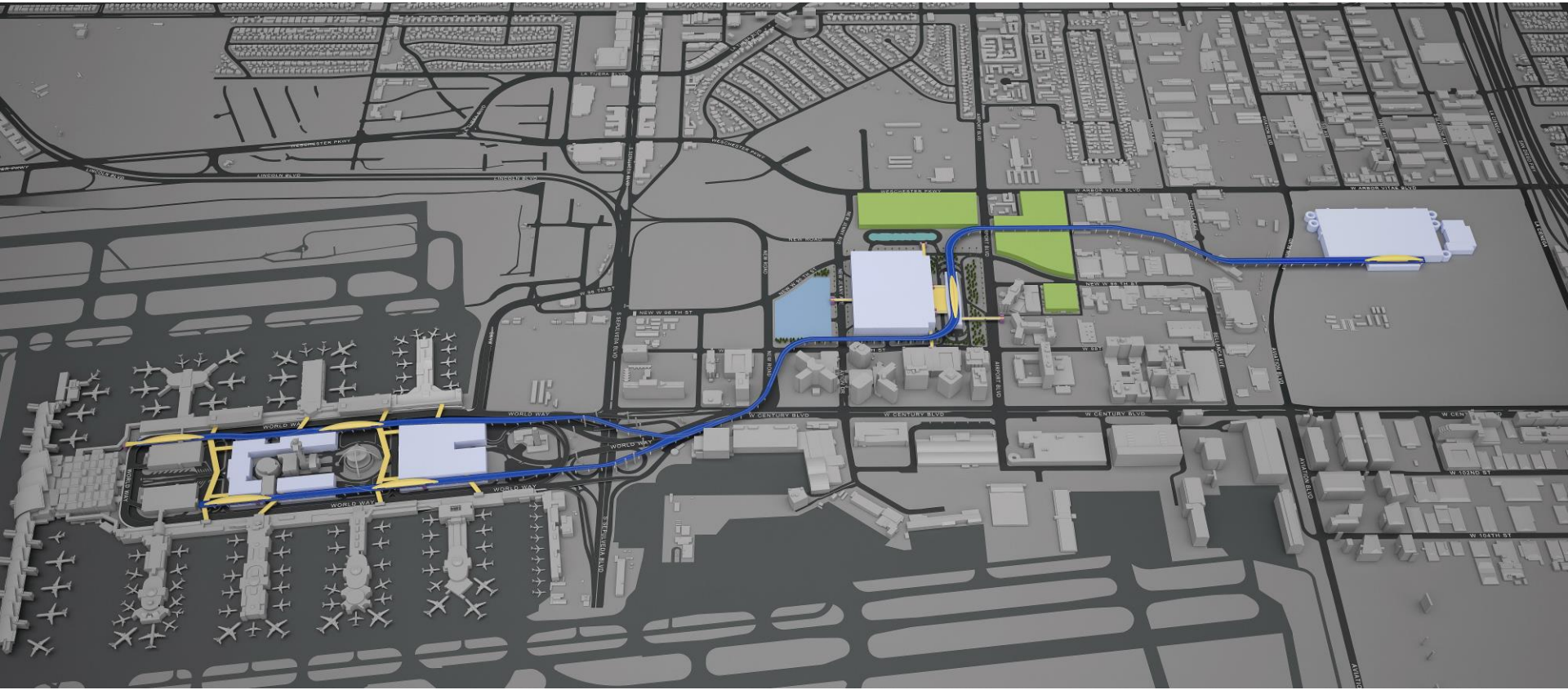
Tomorrow: ITF Commercial Modes



Tomorrow: Private Vehicles And Metro




LA TIJERA BLVD
WESCHESTER PKWY
LINCOLN BLVD
S SEPULVEDA BLVD
W 96 TH ST
NEW W 96 TH ST
NEW ROAD
NEW JENNY AVE
AIRPORT BLVD
W ARBOR VITAE BLVD
NEW W 98 TH ST
BELLANCA AVE
AVIATION BLVD
W CENTURY BLVD
WORLD WAY
W 102ND ST
W 104TH ST


WORLD WAY
W CENTURY BLVD
AIRPORT BLVD
SEPULVEDA BLVD
NEW W 98 TH ST
W 102ND ST
W 104TH ST

Program Focus

Define a new ground transportation system for LAX that is:

- Constructible
- Financially sustainable
- Offers a High-Quality Passenger Experience

Getting Into the Details

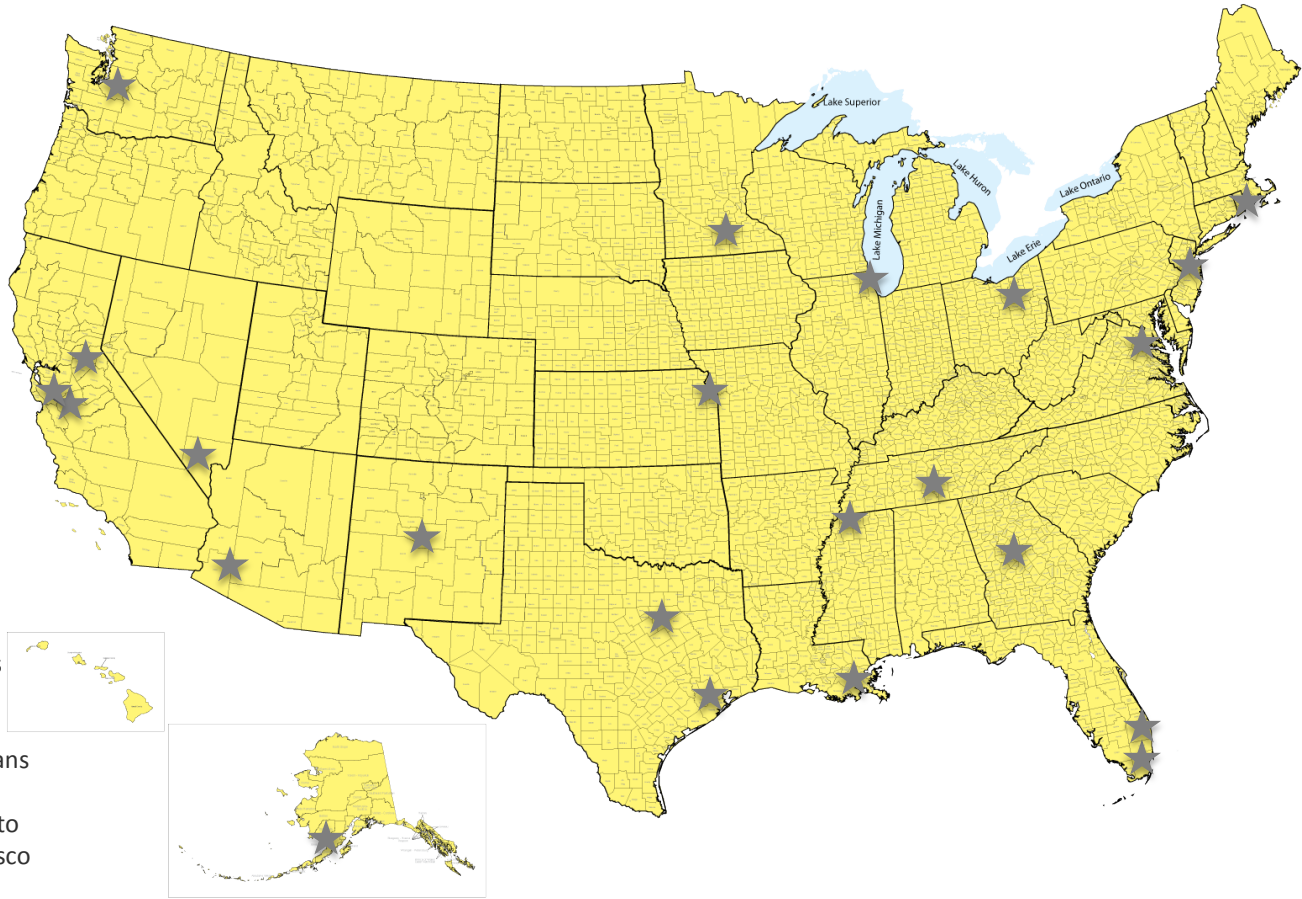
- Details provided today are the result of initial planning efforts, and represent concepts only.
- Prior to entering the project delivery phase, all program elements must undergo environmental review, preliminary design and engineering, and an extensive procurement process.
- LAWA will be conducting outreach concerning these proposals to solicit feedback from airport stakeholders.

CONRAC

Making Renting and Returning a Car Simple and Efficient

Case Studies

Over 20 CONRAC facilities have been built in the last 16 years



List of Airports with Operating CONRACs

ABQ – Albuquerque
AKG – Anchorage
ATL – Atlanta
BOS – Boston Logan
BWI – Baltimore/Washington
MDW – Chicago Midway
CLE – Cleveland
DFW – Dallas/Fort Worth
FTL – Fort Lauderdale/Hollywood
IAH – Houston
MCI – Kansas City
LAS – Las Vegas
MEM – Memphis
MIA – Miami
JWN – Nashville
MSY – New Orleans
PHX – Phoenix
SMF – Sacramento
SFO – San Francisco
SJC – San Jose
SEA – Seattle

Case Studies

- Provide:
  - Better customer service
  - Reduced roadway/curb congestion
  - Improved air quality
  - Economies of scale
- Access mode options:
  - Walk
  - Bus
  - APM
- Landside constrained airports use APM access, including:
  - ATL
  - MIA
  - SFO

Phoenix Sky Harbor International Airport

Miami International Airport

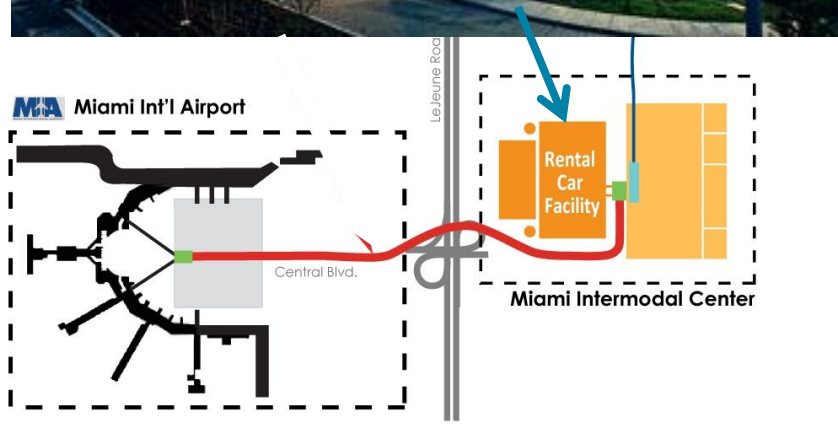
San Jose International Airport

Atlanta International Airport

Case Studies

Miami International Airport

- Opened in 2010
- Initial access via consolidated buses
- APM Access provided after the first year
- Reduced roadway and curb congestion

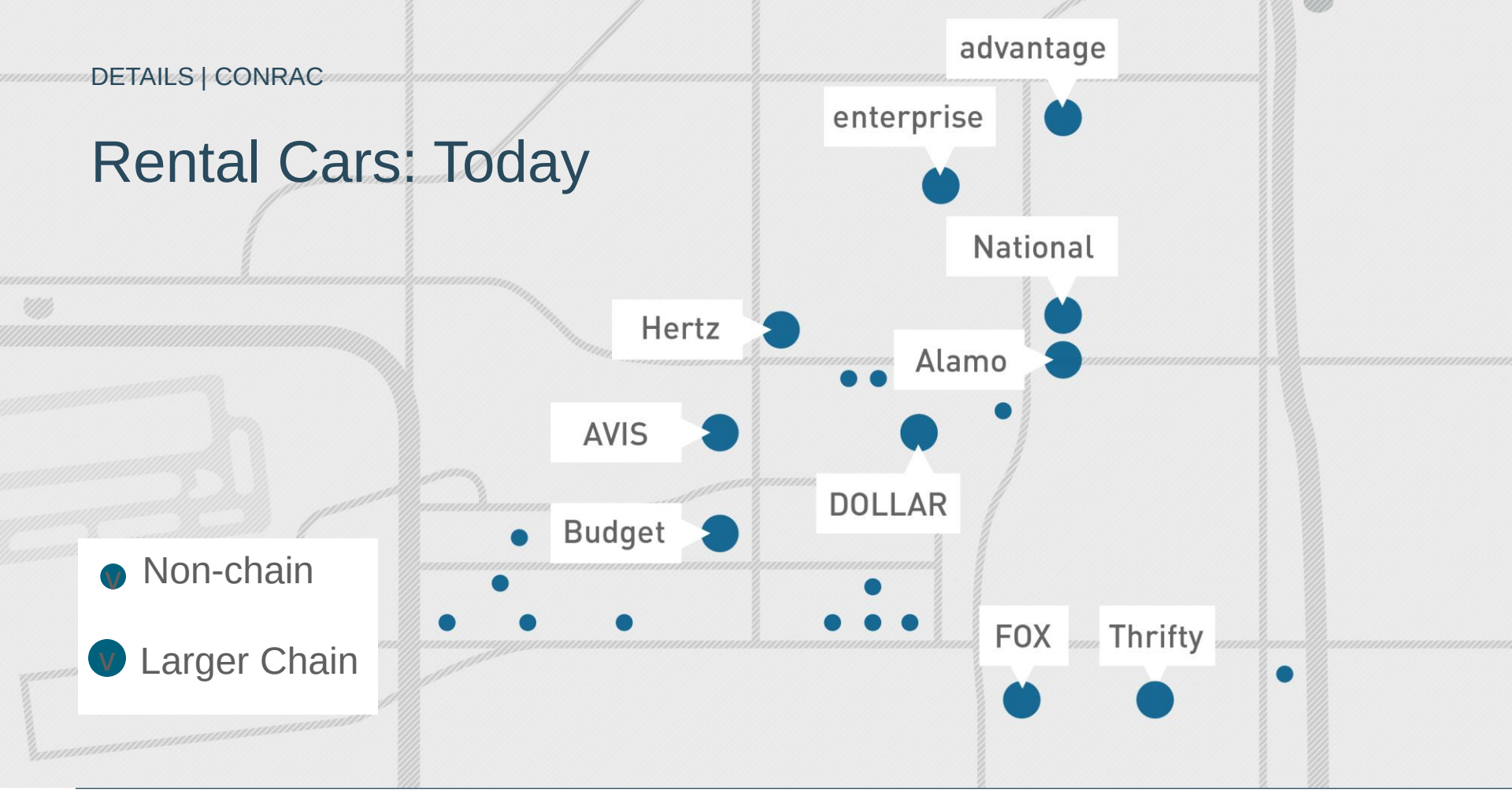


Case Studies

San Jose International Airport

- Opened in 2010
- Directly adjacent to Terminal B
- 3,000 vehicle facility
- Reduced operating cost
- Reduced curb congestion by 20%

Rental Cars: Today



Rental Cars: Tomorrow

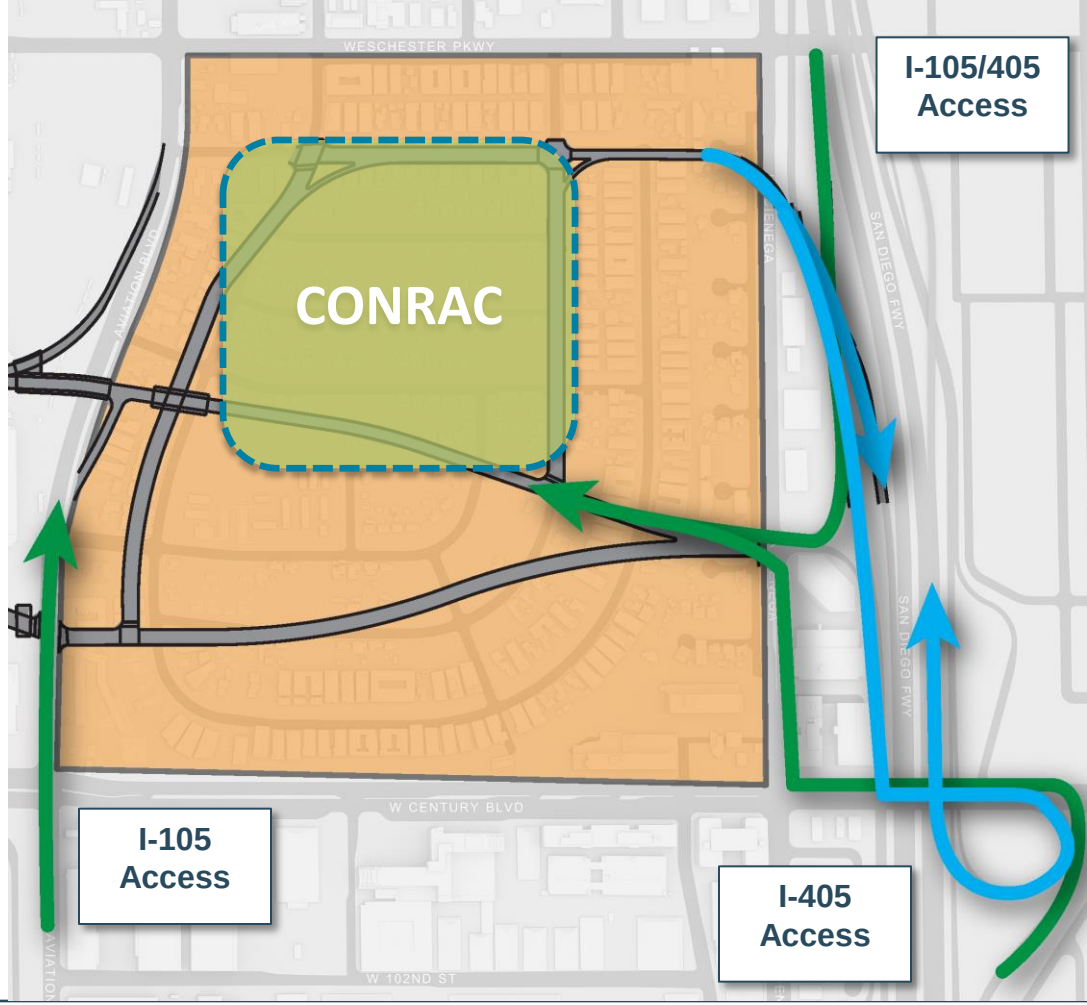
CTA Congestion Relief

- Will reduce the number of people on the CTA roadway and curb by approximately 17%.
- Approximately 9% of assigned curb would become available for reprogramming.

Efficient Roadway Access

Efficient access to and from the CONRAC is essential.

Major ramp revisions necessary to allow direct freeway transitions for rental car customers.



Key Findings & Next Steps

Key Findings

- Provides predictable congestion relief to CTA roadway/curbs
- Good roadway access to/from freeway to improve visitor ease of access
- Internal elements of CONRAC facility straightforward based on most recent CONRAC designs

Next Steps

- Site Plan and Right-Sizing Planning efforts (underway)
- Discussions with Rental Car Companies (underway)
- Develop solutions for roadway access (underway)
- Develop Project Phasing and Delivery Strategy
- Initiate environmental review

APM

The Backbone of the Future Ground Transportation System

Details

APM

Common characteristics for APMs around the country are:

- Designed for airport passengers
- Automated & Grade Separated
- 24-Hour Service
- Very short wait times at station (3 minutes or less)
- Free for airport users
- Designed to last 30+ years

Phoenix Int. Airport - Sky Harbor

Miami Int. Airport – Mia Mover

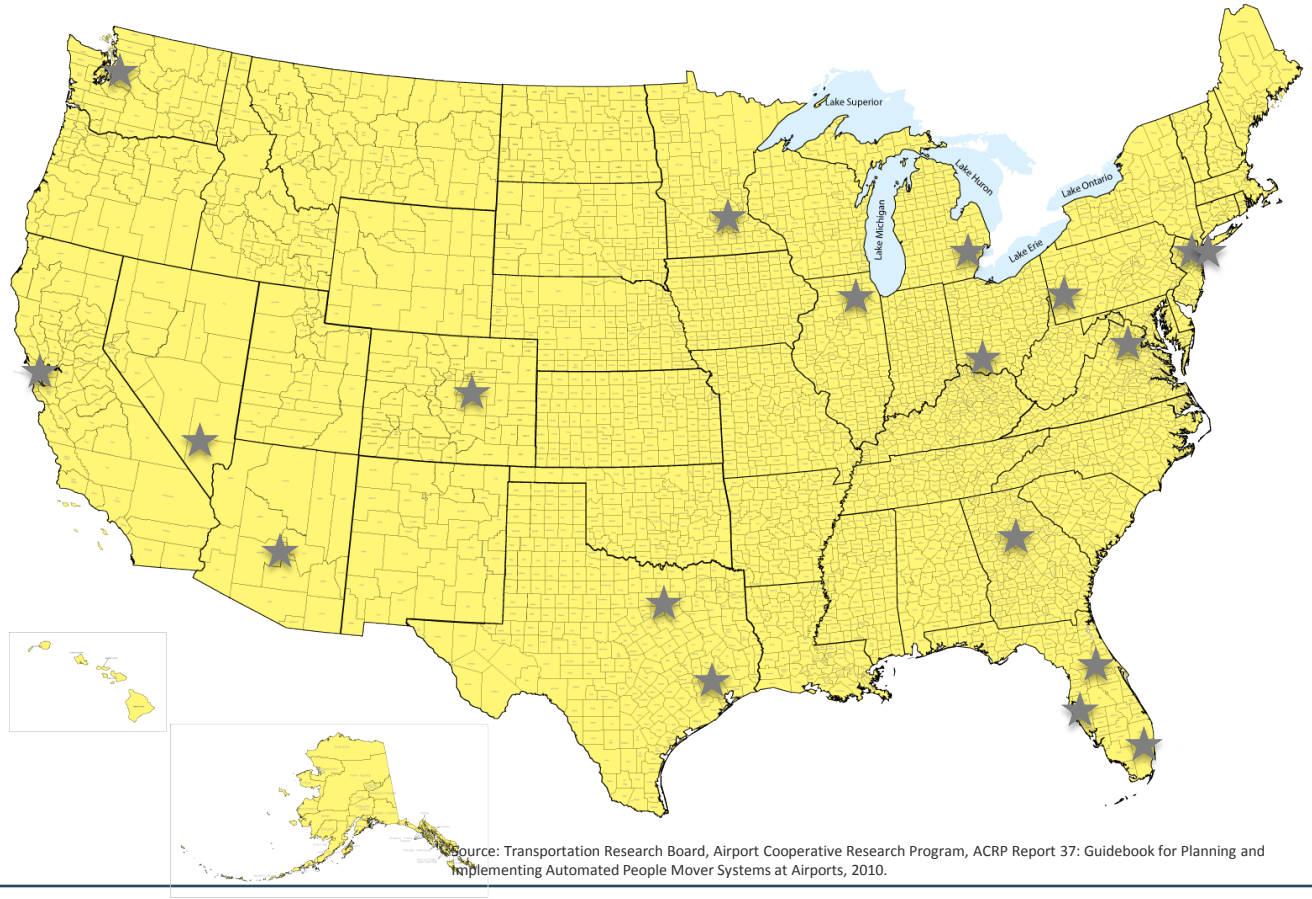
JFK - AirTrain

Dallas / Fort Worth Int. Airport

U.S. Airports with Automated People Mover Systems

List of Airports

ATL – Atlanta
ORD – Chicago
CVG – Cincinnati
DFW – Dallas/Fort Worth
DEN – Denver
DTW – Detroit
IAH – Houston
LAS – Las Vegas
MIA – Miami
MSP – Minneapolis/St. Paul
JFK – New York
EWR – Newark
MCO – Orlando
PIT – Pittsburgh
PHX – Phoenix
SFO – San Francisco
SEA – Seattle
TPA – Tampa
IAD – Washington Dulles



Key

★ = airside or landside system

Source: Transportation Research Board, Airport Cooperative Research Program, ACRP Report 37: Guidebook for Planning and Implementing Automated People Mover Systems at Airports, 2010.

Landside APM Case Studies

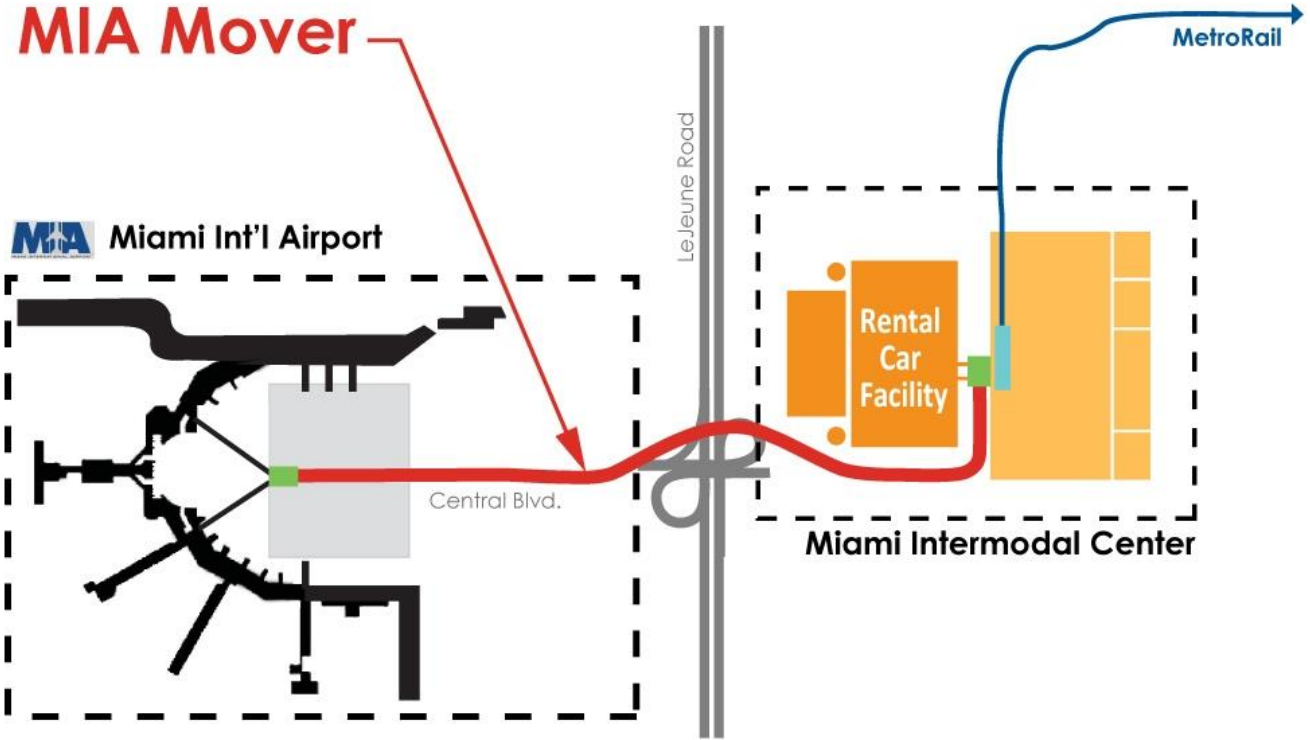
Phoenix Sky Harbor International Airport

JFK International Airport

Miami International Airport

Case Study MIA Mover

- Serves passenger access to/from CONRAC and intermodal facility
- 1.25 mile, 2-station, pinched loop system



Case Study
PHX Sky Train

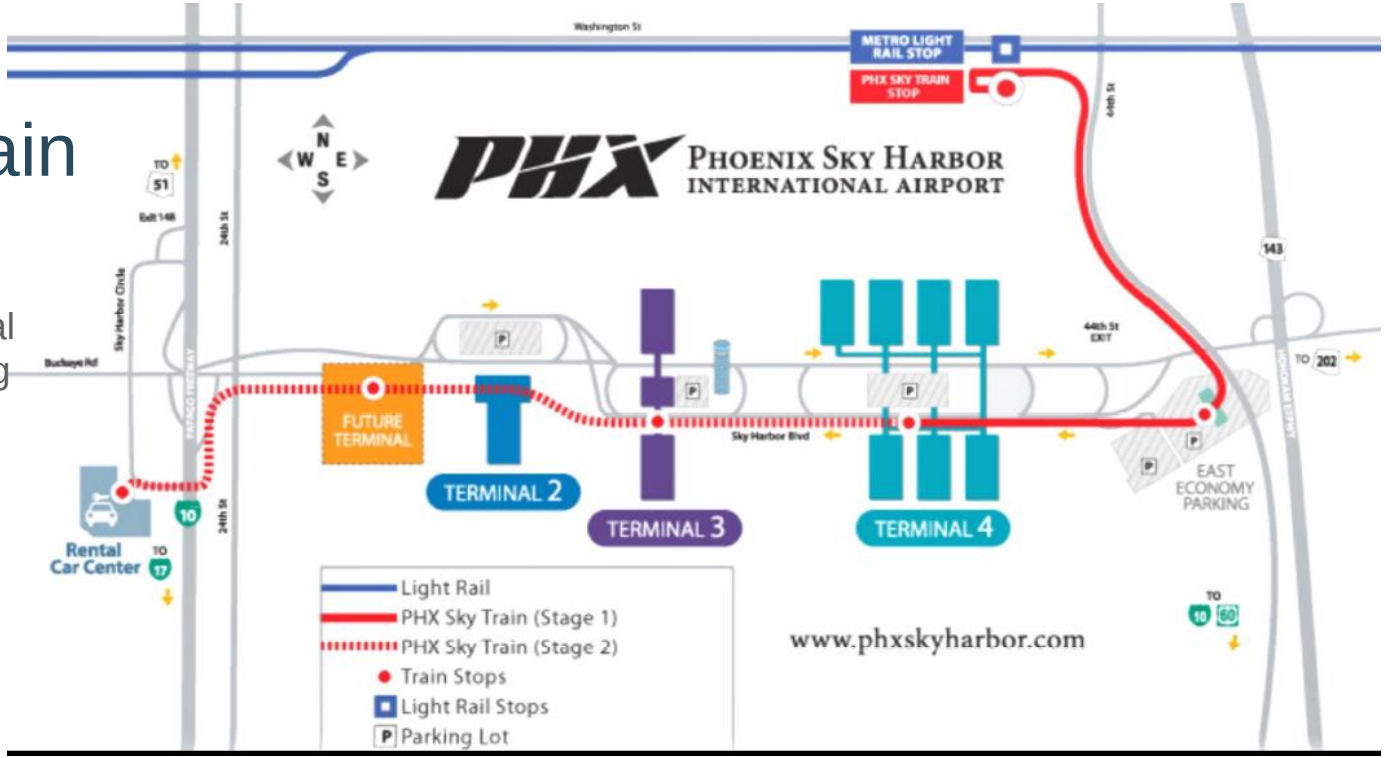
Stage 1

- Serves passengers access to/from regional rail and remote parking

- 1.7 mile, 3 station, pinched loop system

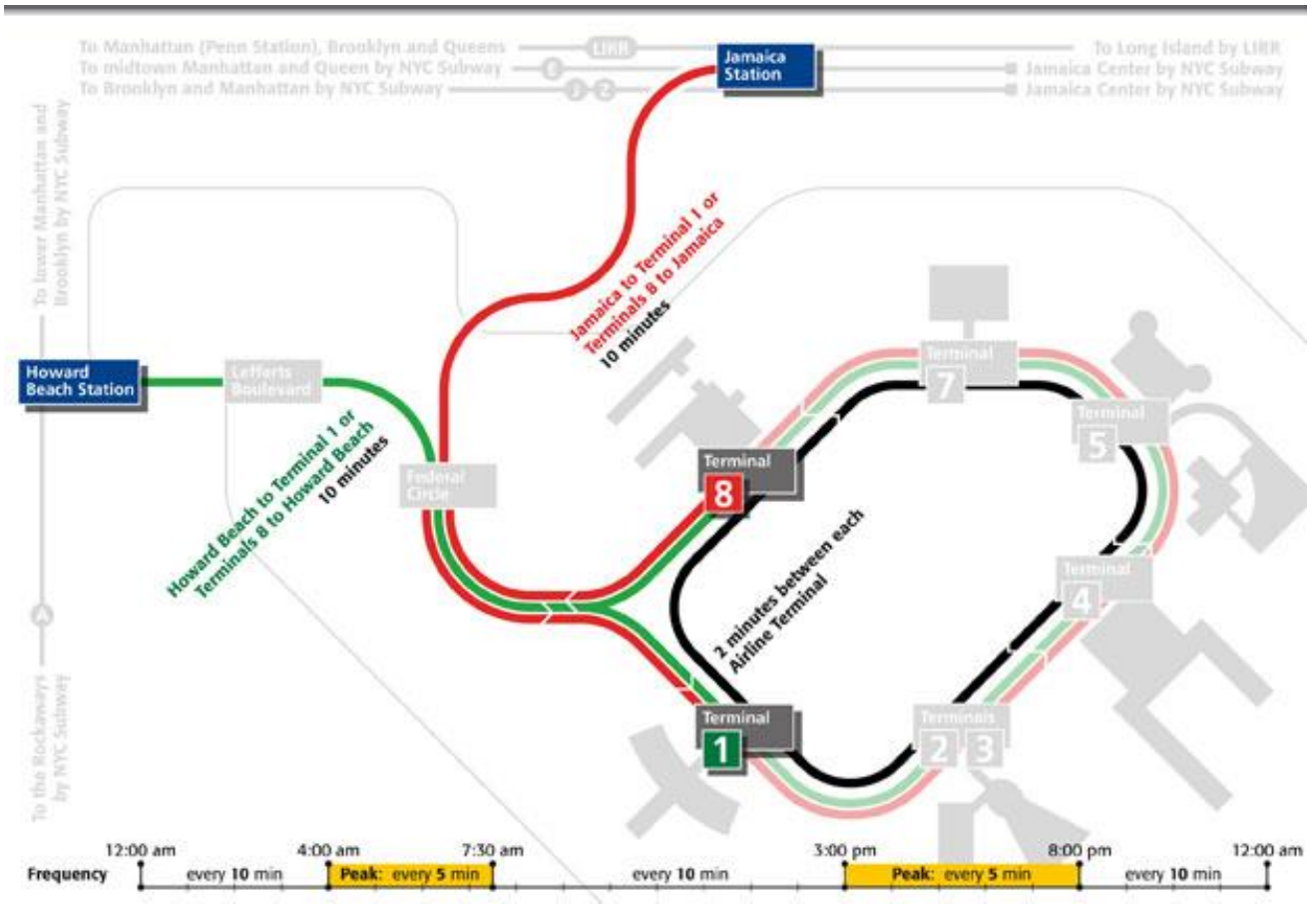
Stage 2

- Potential Service to CONRAC



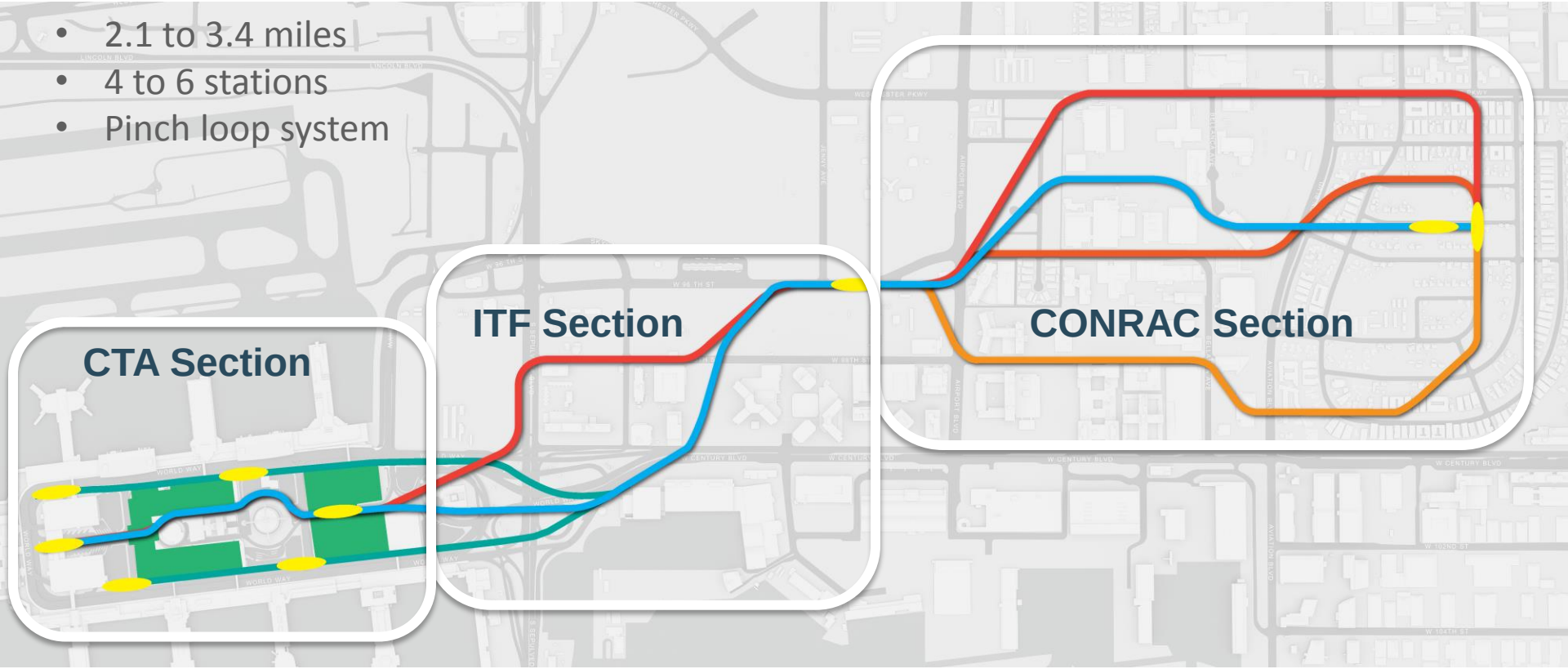
Case Study JFK AirTrain

- Serves passenger inter-terminal connectivity, CONRAC, regional rail
- 8.1 mile, 10-station, loop system

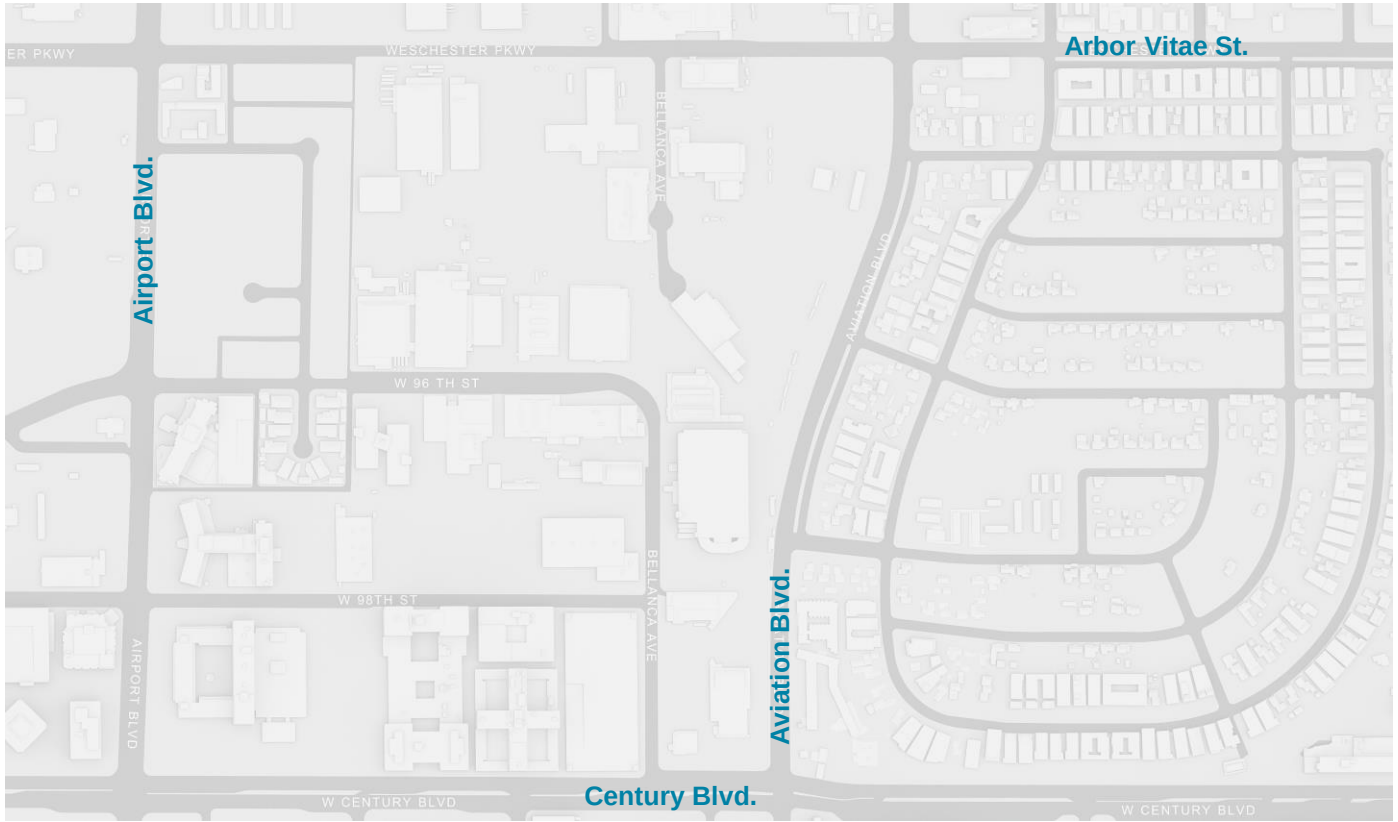


APM Alignment Options

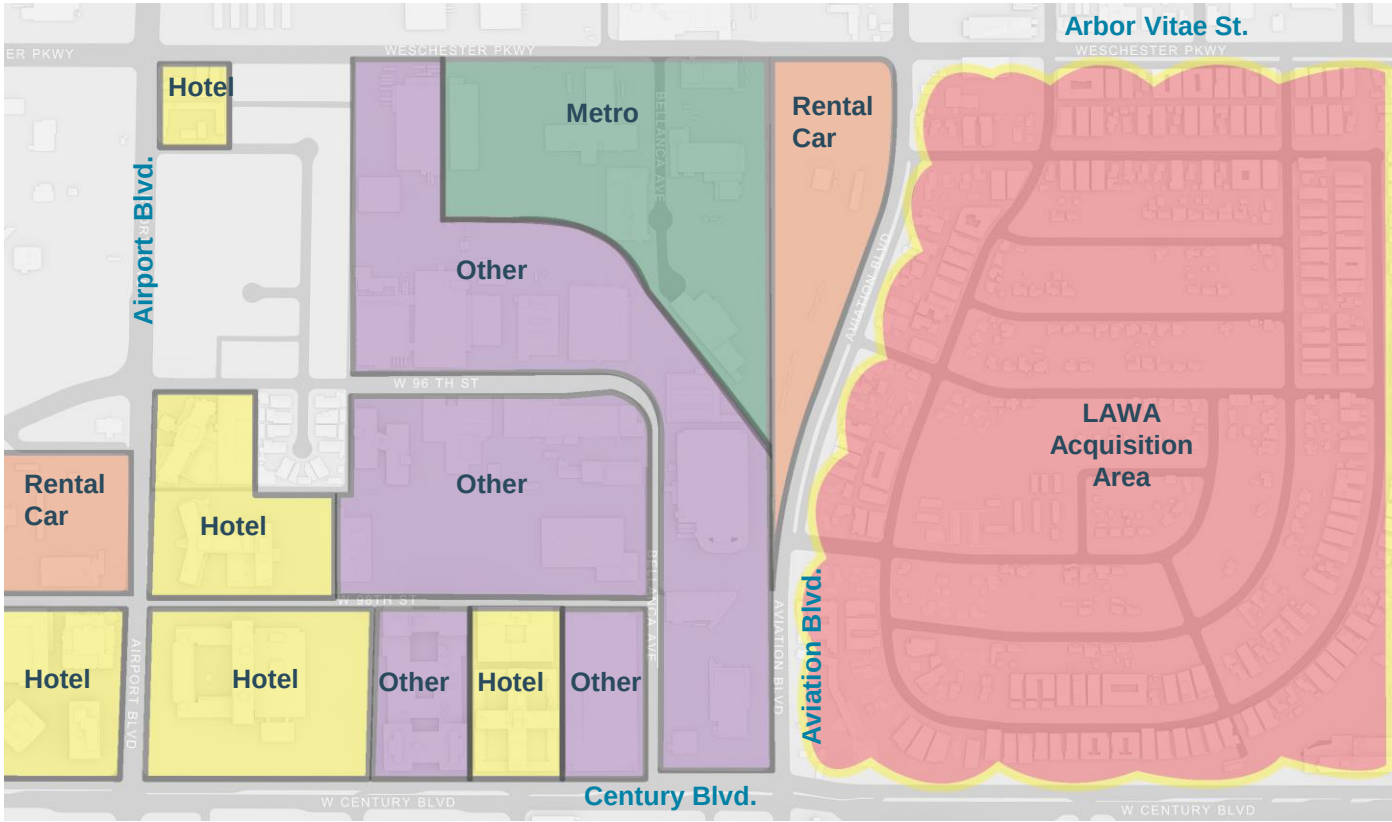
- 2.1 to 3.4 miles
- 4 to 6 stations
- Pinch loop system



CONRAC Section - Alignment Options

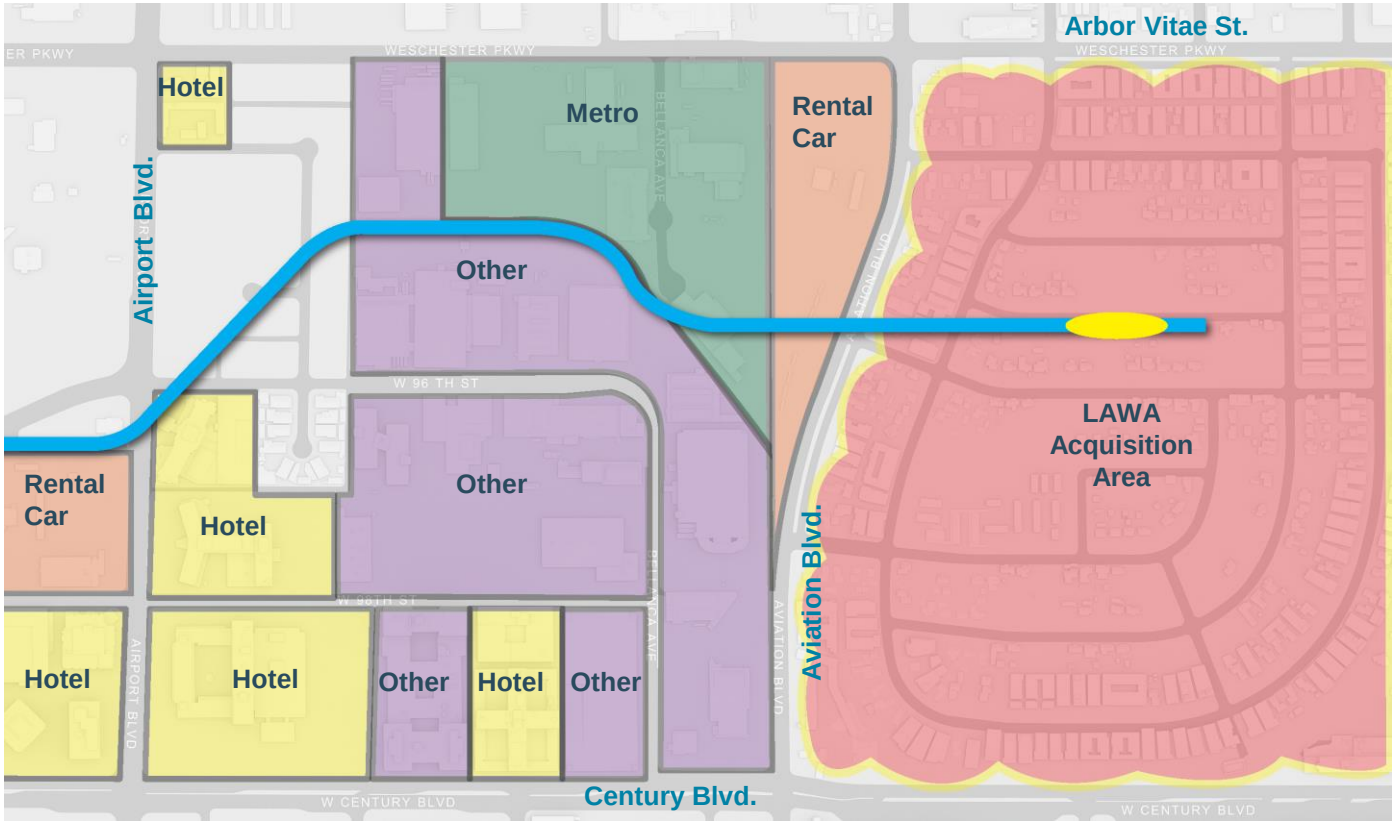


Property Ownership



Preferred Alignment - "Backlot"

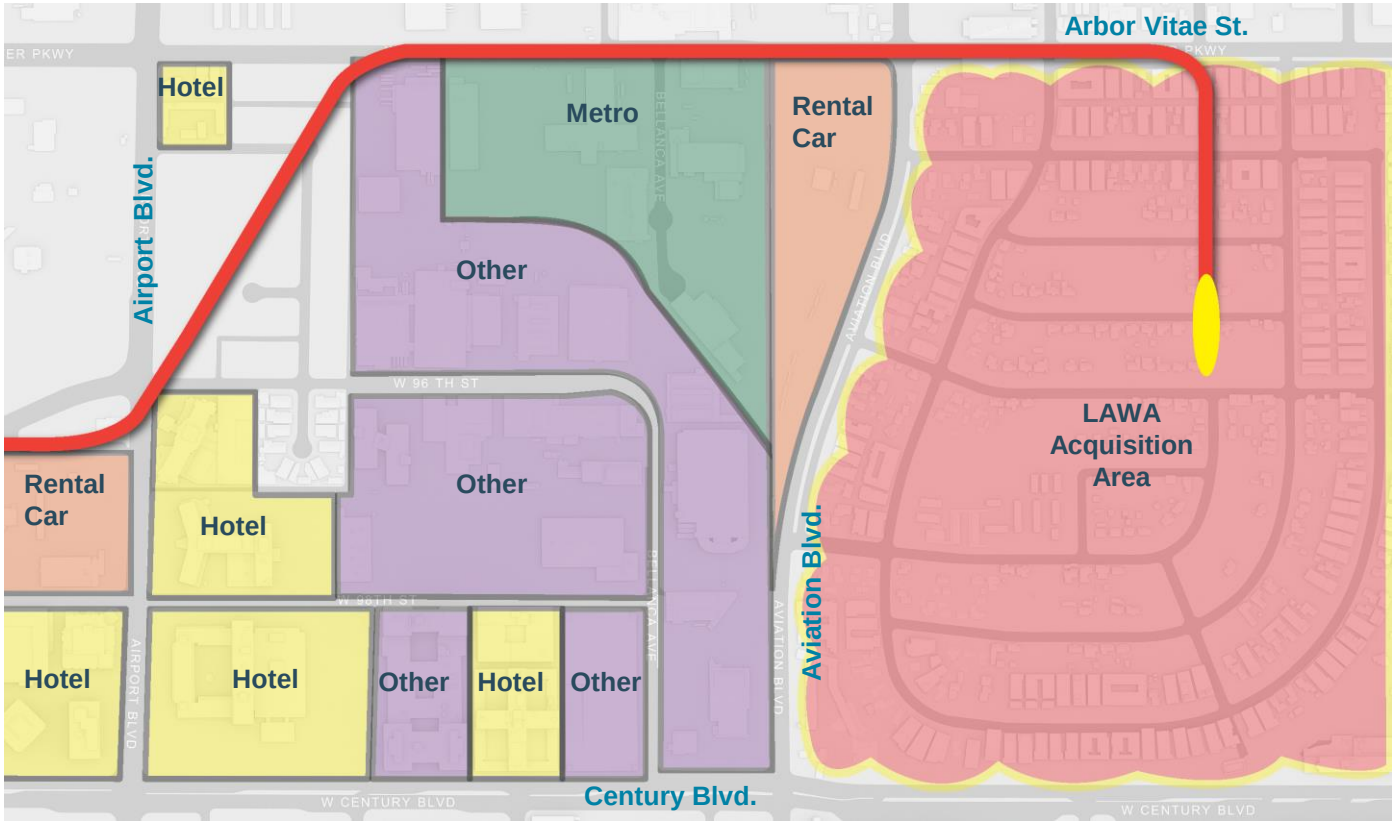
- Alignment through "backlot" area minimizes roadway closures during and after construction
- Reduces guide way length
- ROW acquisition is required



Preferred Option

Alignment Option – Arbor Vitae

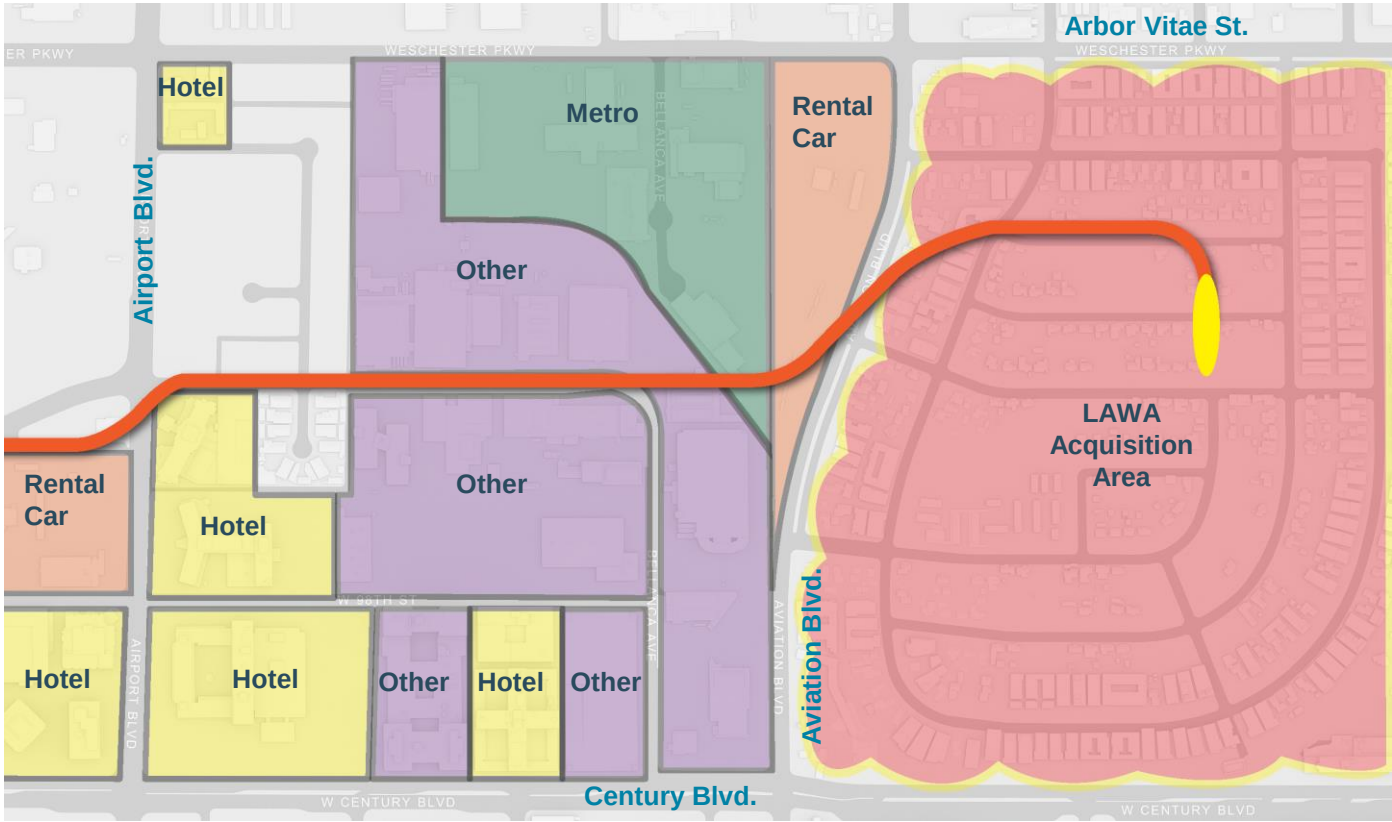
- Arbor Vitae St. alignment is possible
- Longest guideway length of all options
- ROW acquisition is required



Arbor Vitae St. Alignment

Discarded Option – 96th Street

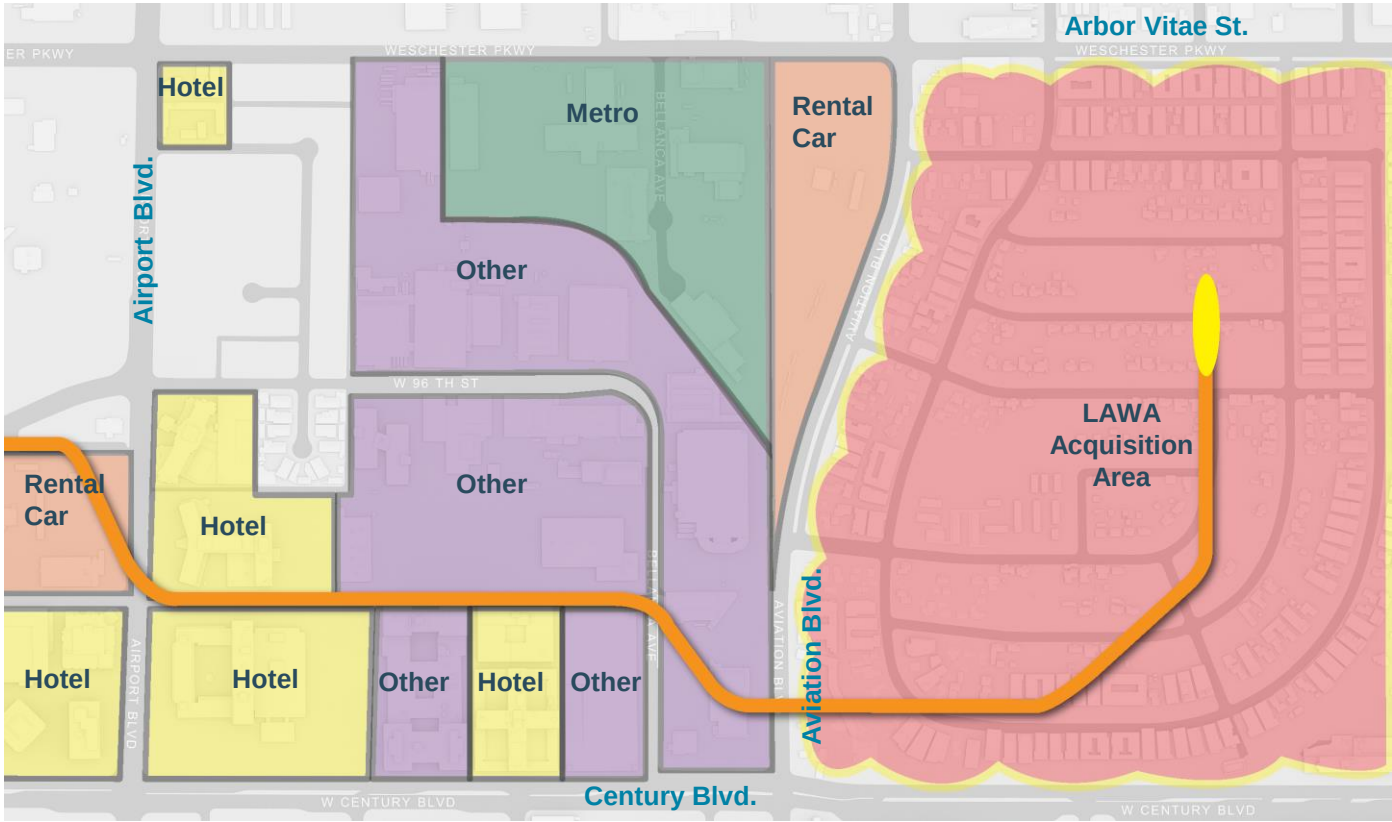
- Construction would require lengthy roadway closure due to limited corridor



96th St. Alignment

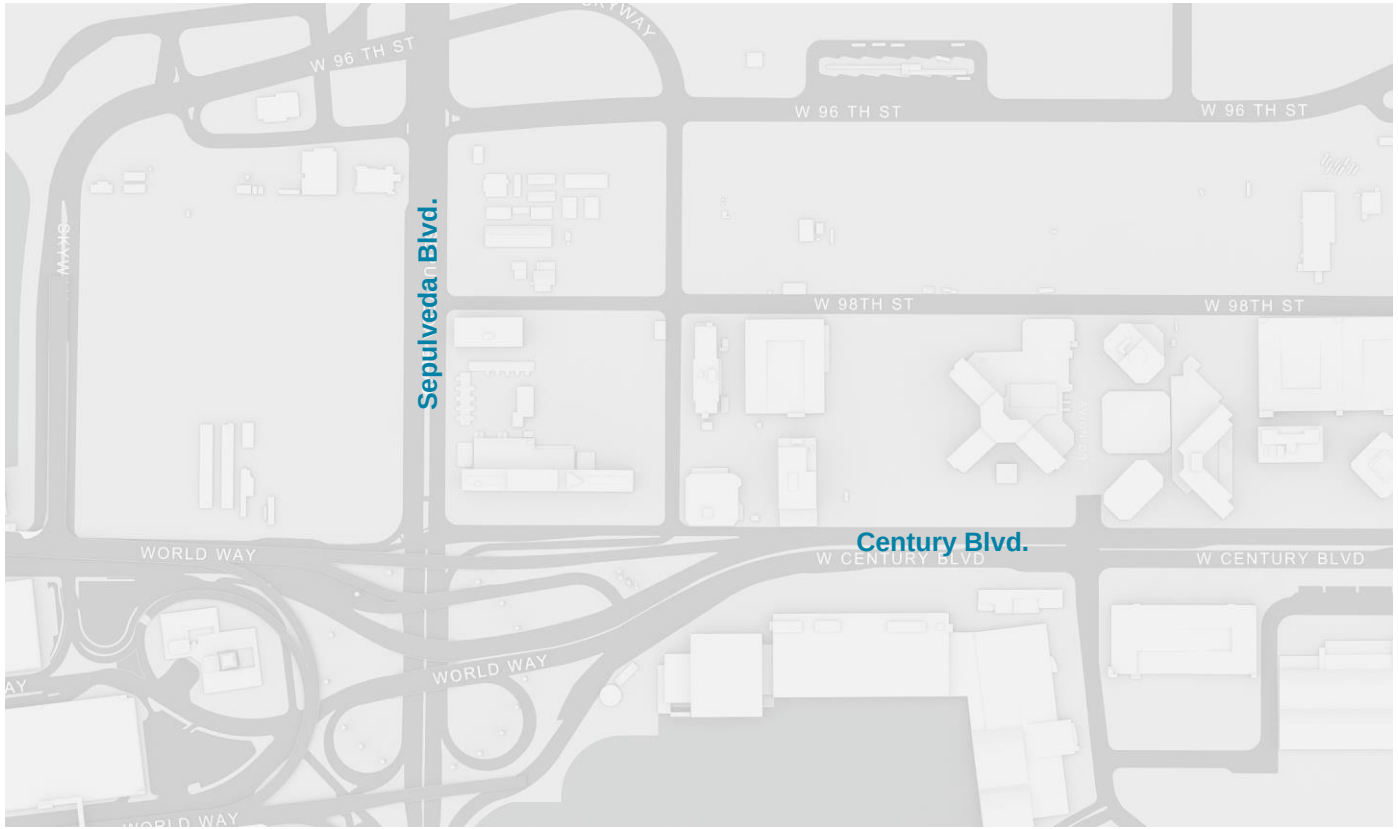
Discarded Option – 98th Street

- Construction would require lengthy roadway closure due to limited corridor

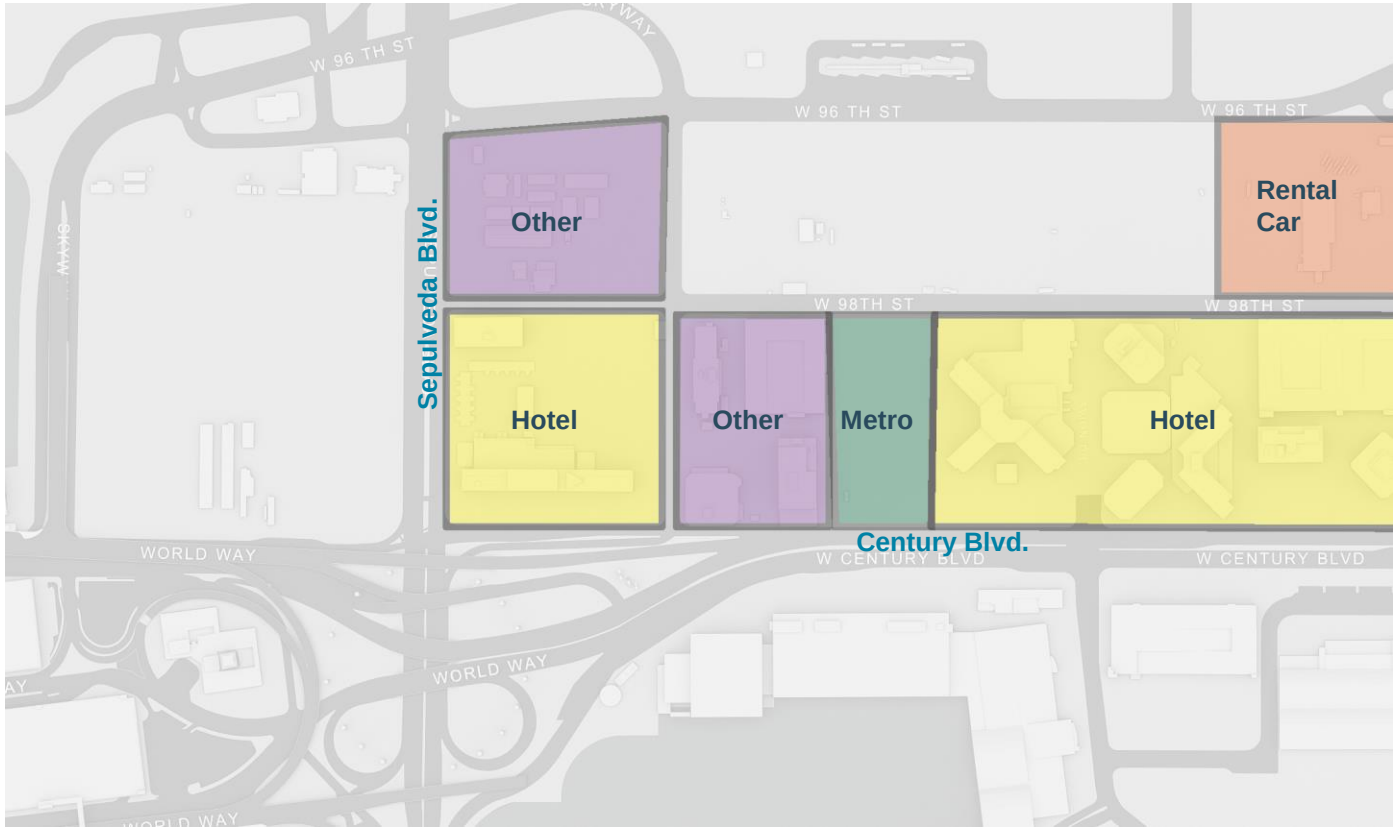


98th St. Alignment

ITF Section - Alignment Options



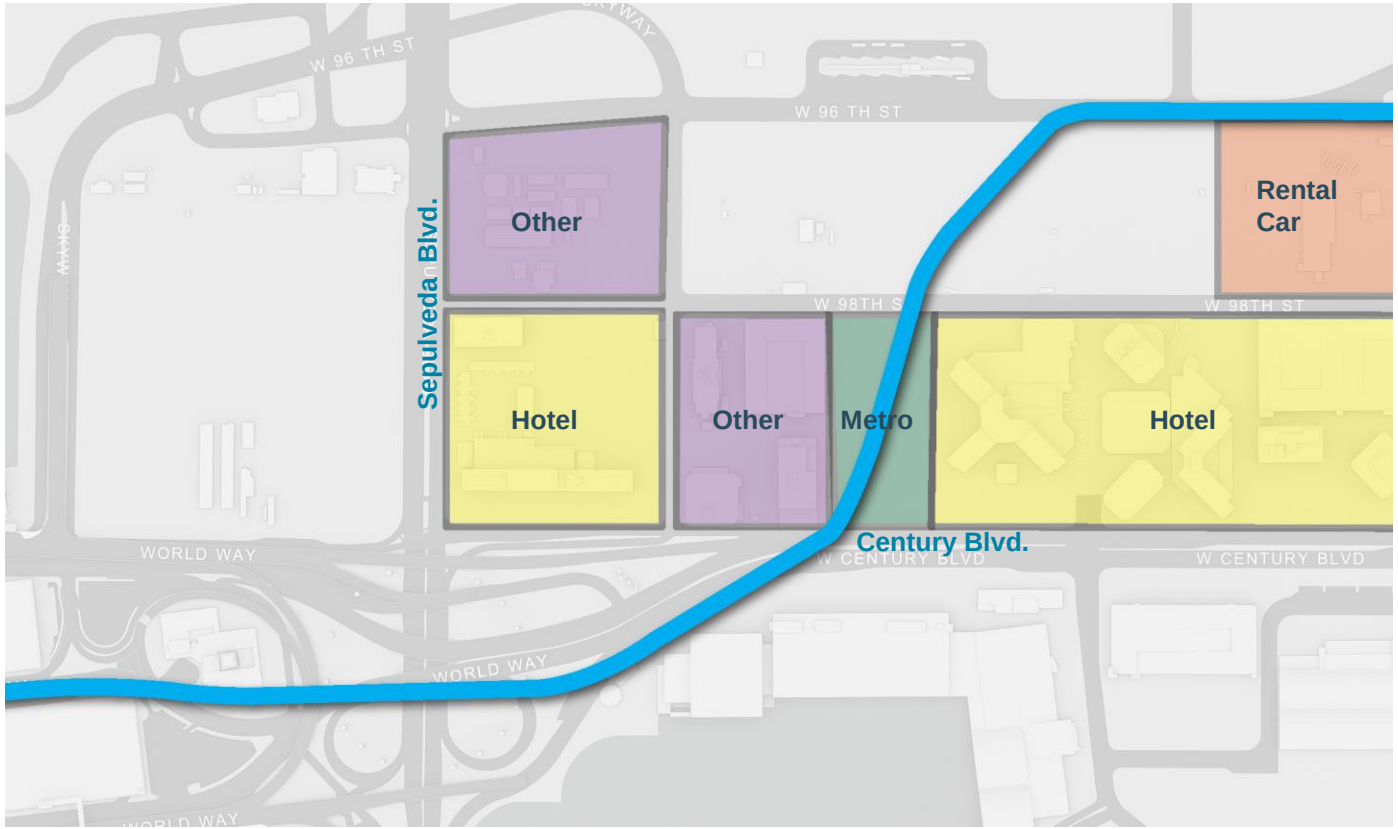
ITF Section - Property Ownership



Preferred Alignment

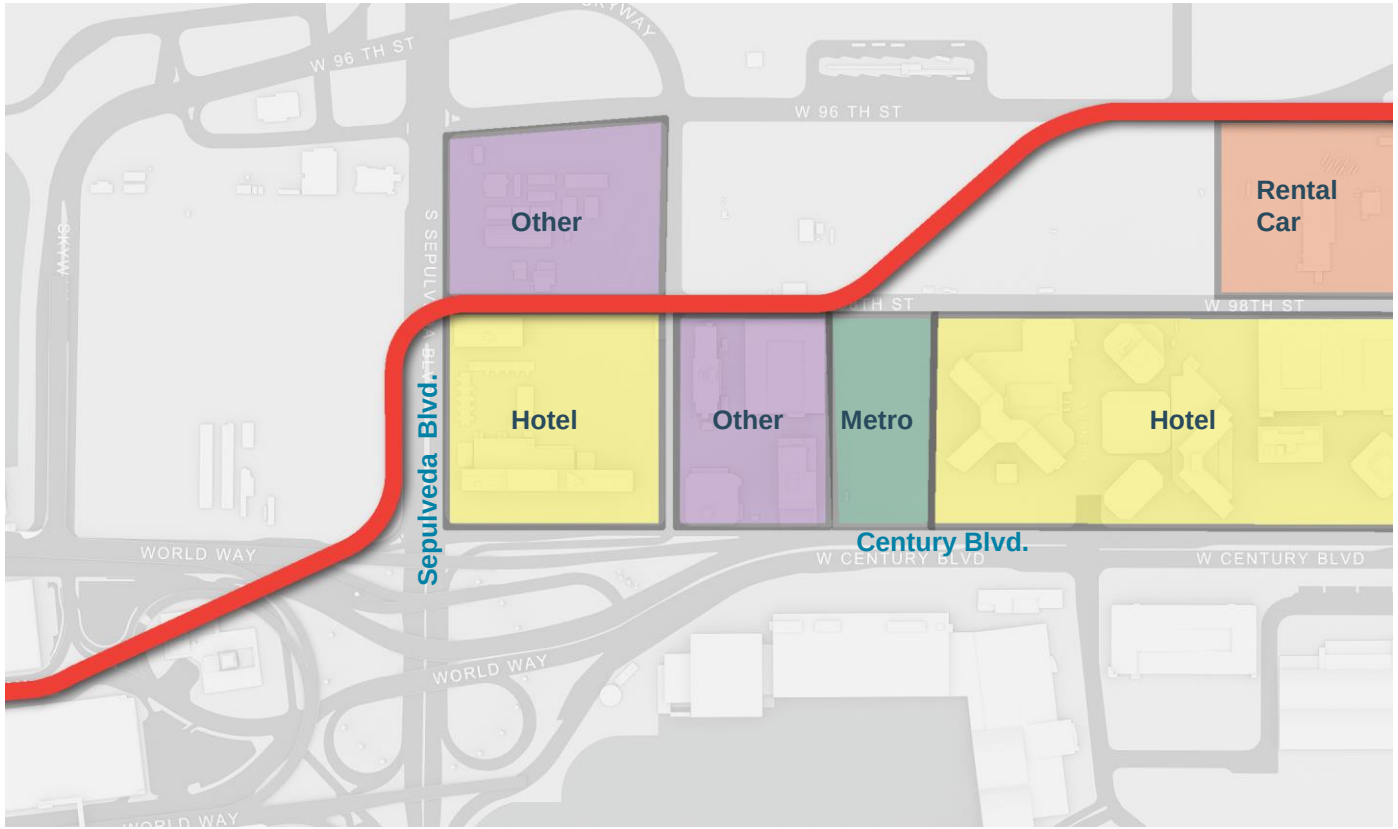
- “Century”

- Avoids Park One
- Requires Metro lot right-of-way



Alignment Option - Park One Alignment

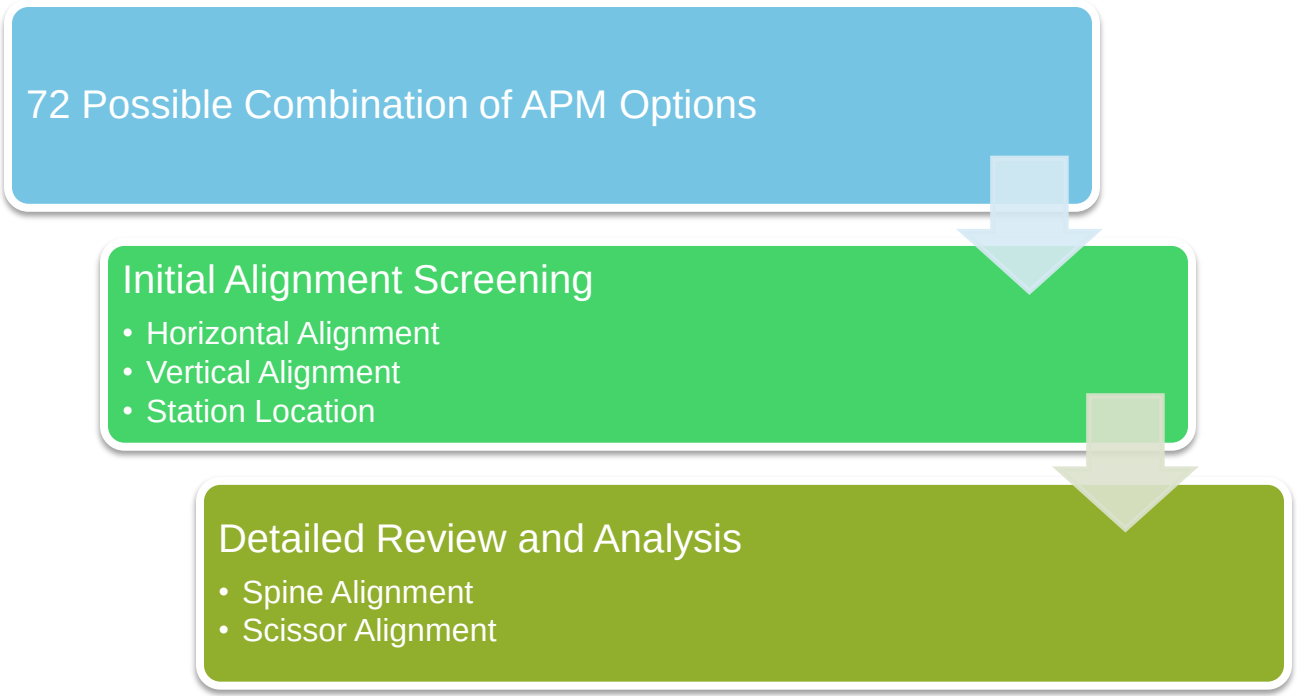
- Restricts development of Park One
- Presents phasing challenges



DETAILS | APM

CTA Options

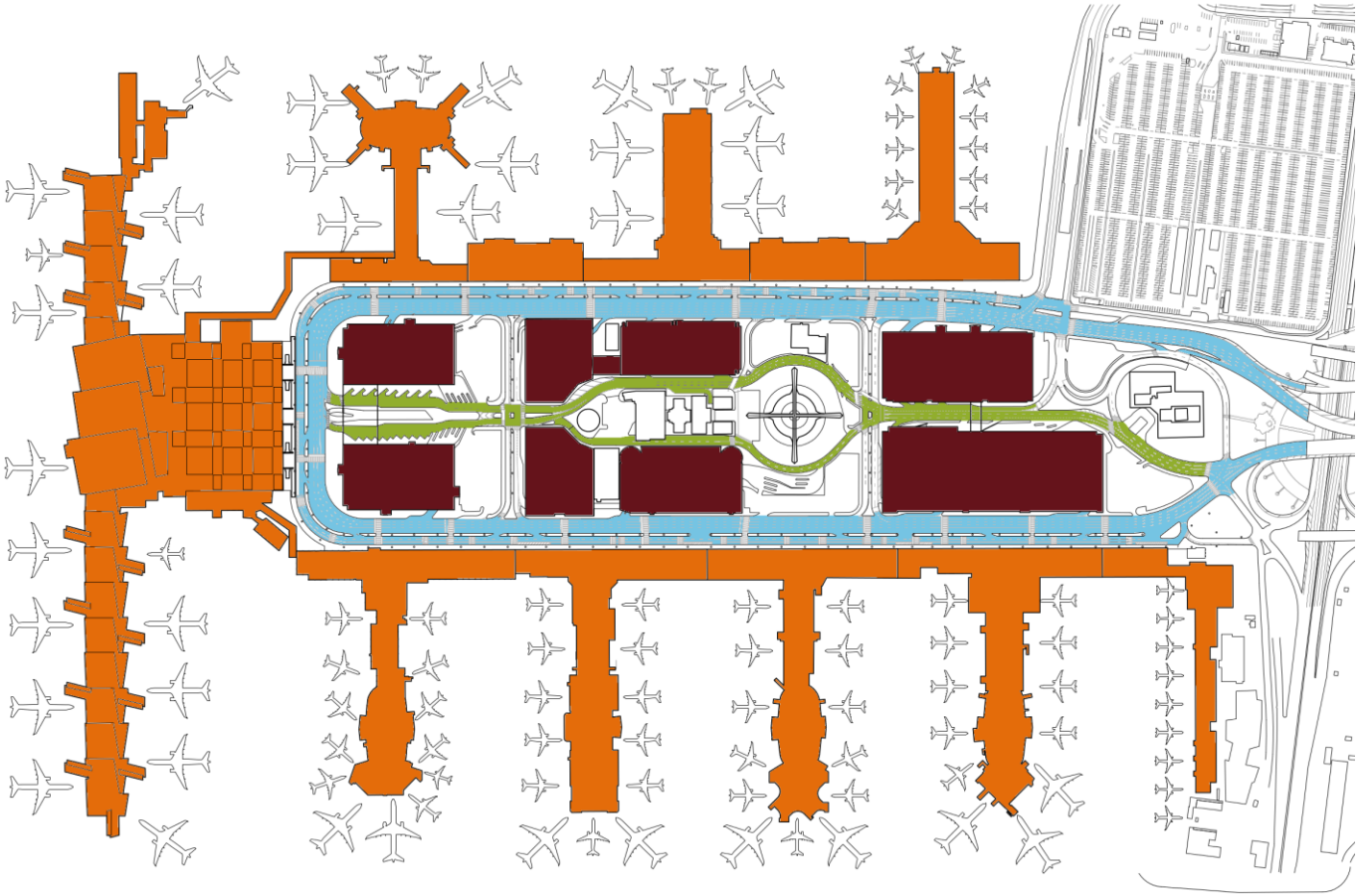
CTA Alignment Screening



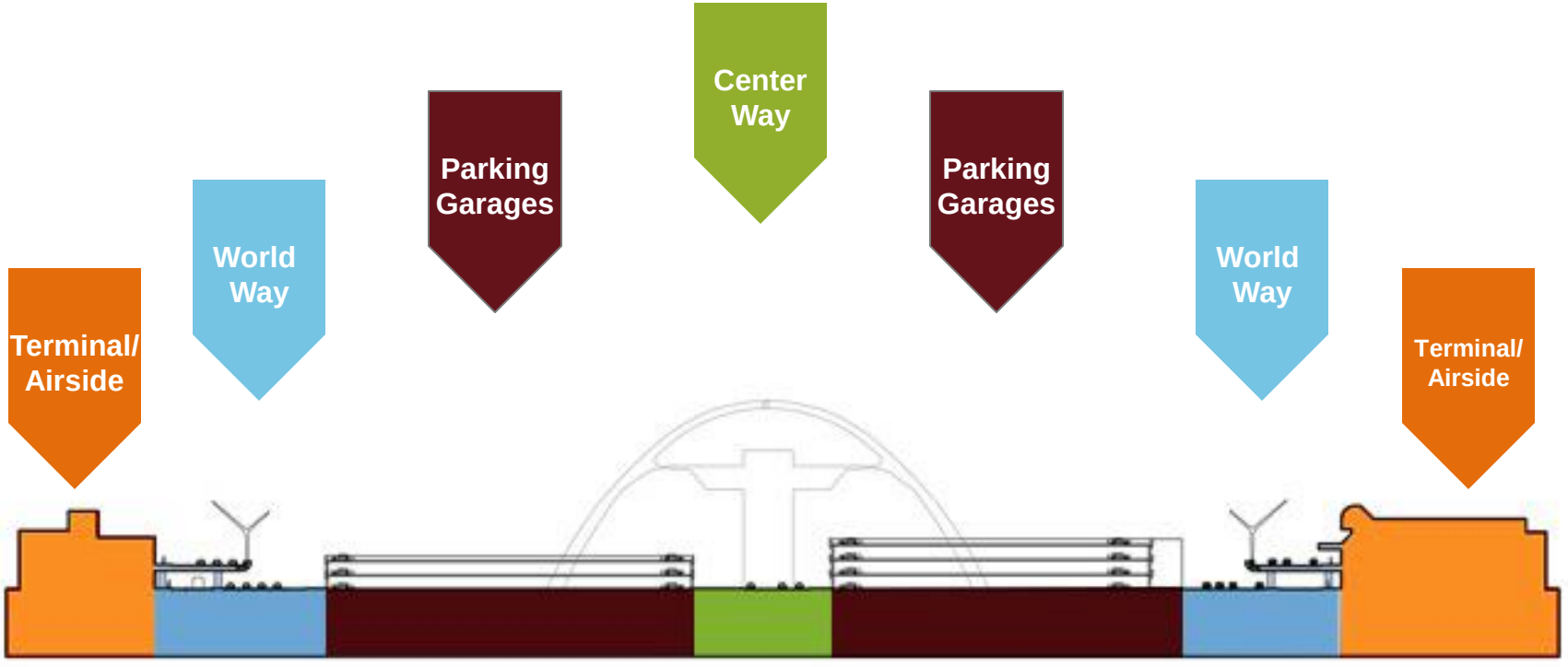
Key Factors – Construction in the CTA

CTA Challenges

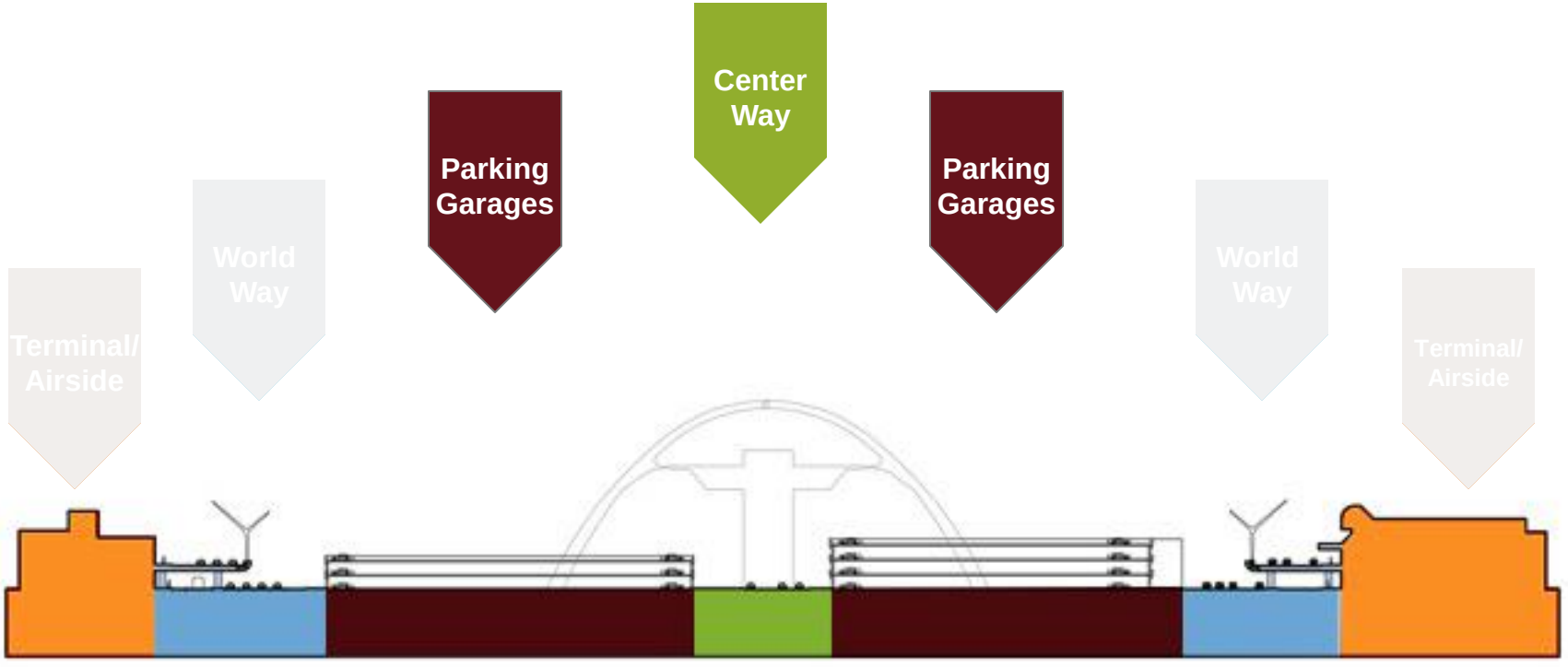
Constrained land area in the CTA



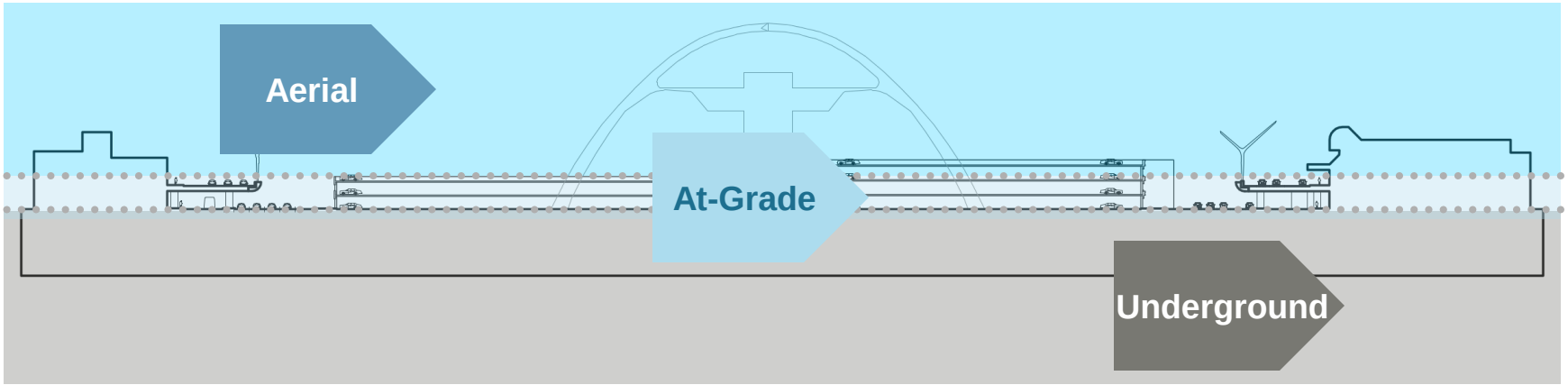
⟷ Horizontal Alignment Possibilities



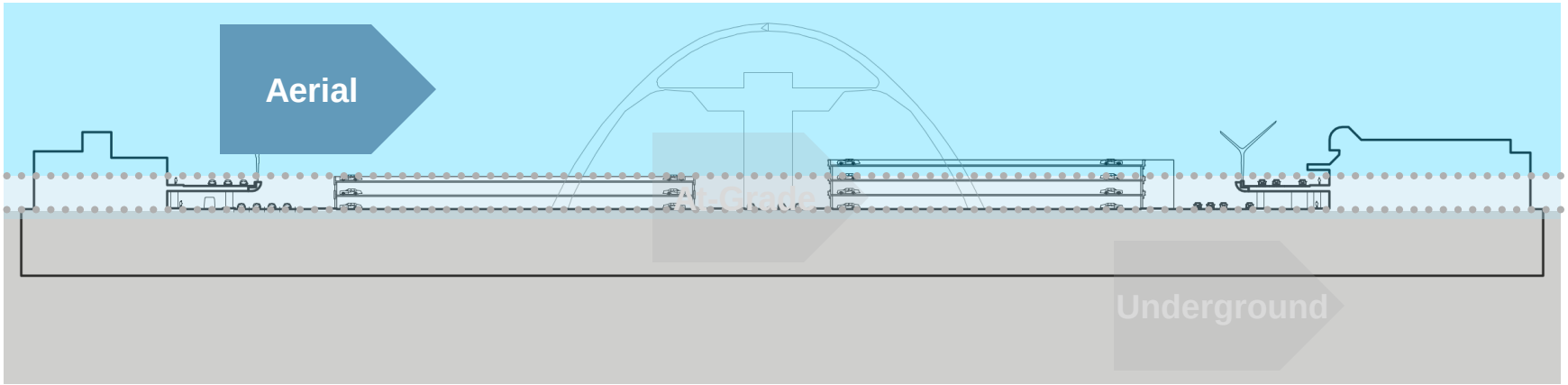
Horizontal Alignment Possibilities



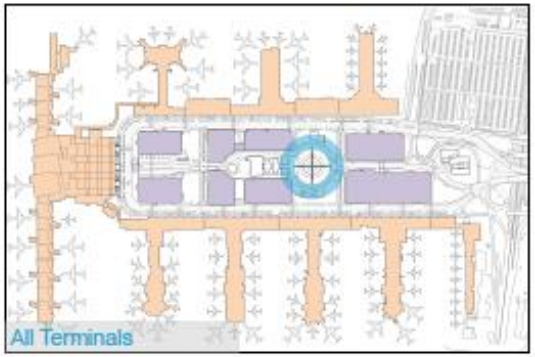
Vertical Alignments Possibilities



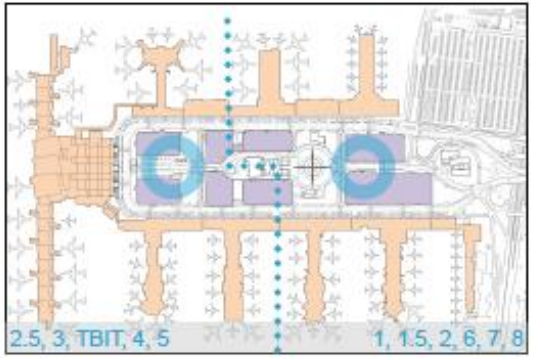
Vertical Alignments Possibilities



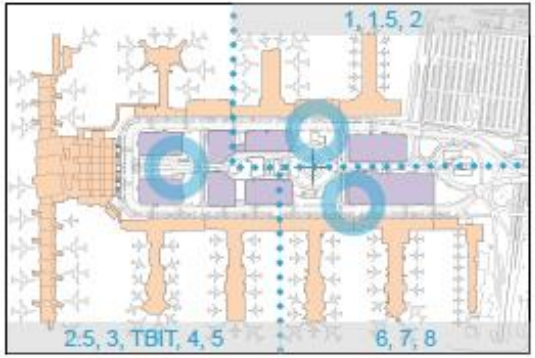
Station Options Considered



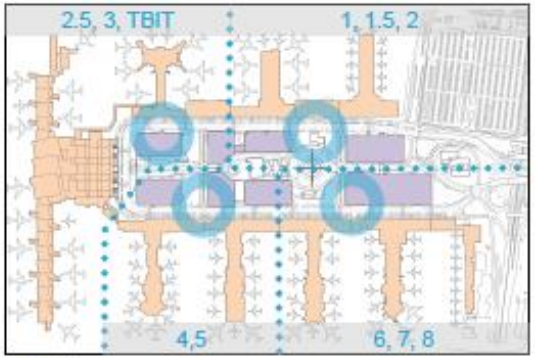
1 Station



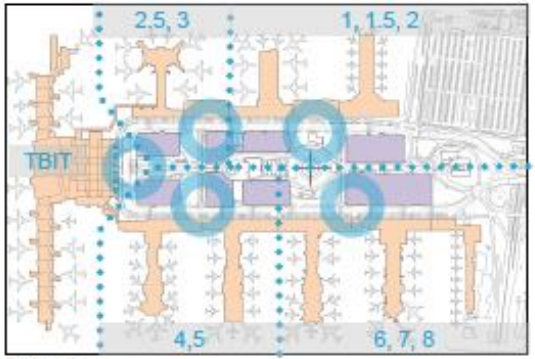
2 Stations



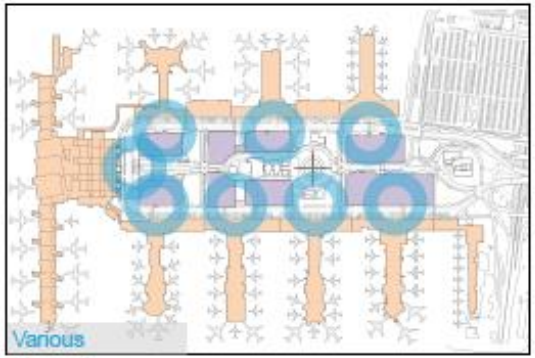
3 Stations



4 Stations



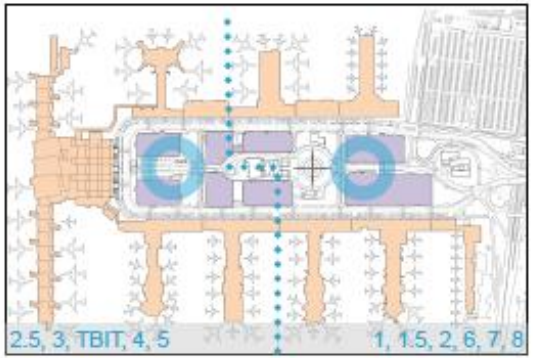
5 Stations



6+ Stations

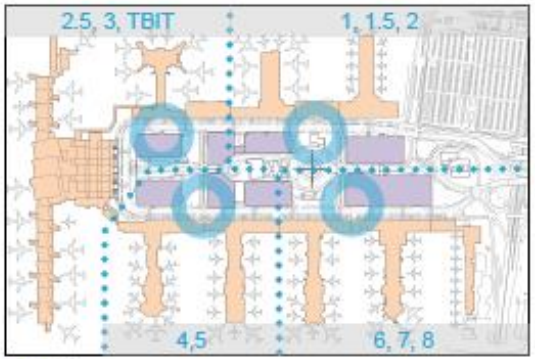
Station Options Considered

1 Station



2 Stations

3 Stations



4 Stations

5 Stations

6+ Stations

Summary of Initial Screening Options

Horizontal Alignment	Vertical Alignment	Number of Stations
Terminal/Airside	Aerial	1
World Way	At-Grade	2
Parking Garages	Underground	3
Center Way		4
		5
72 possible combinations		6+

Summary of Initial Screening Options

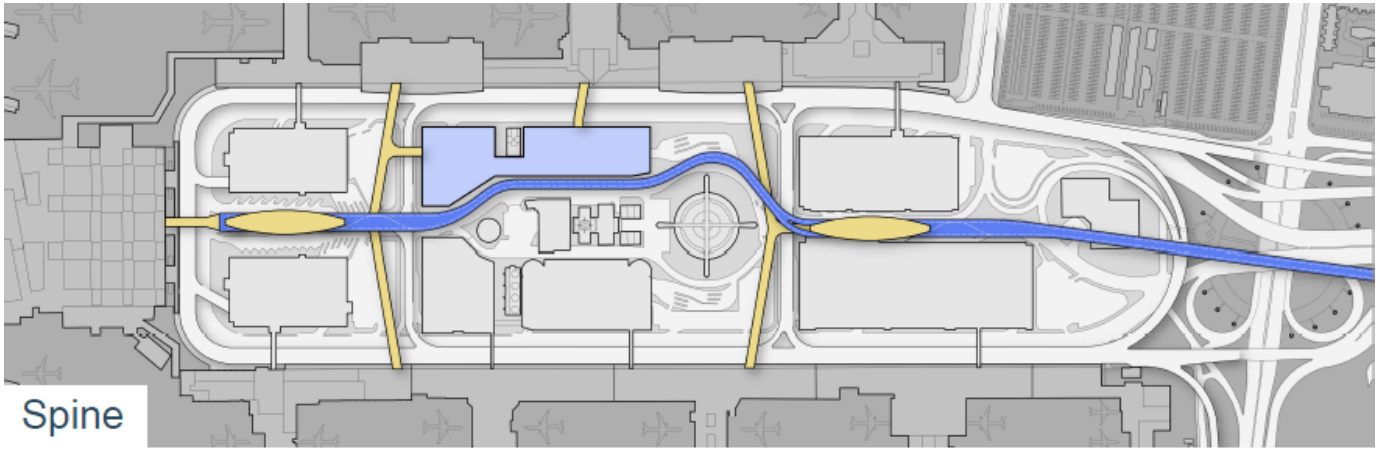
Horizontal Alignment	Vertical Alignment	Number of Stations
	Aerial	
		2
Parking Garages		
Center Way		4

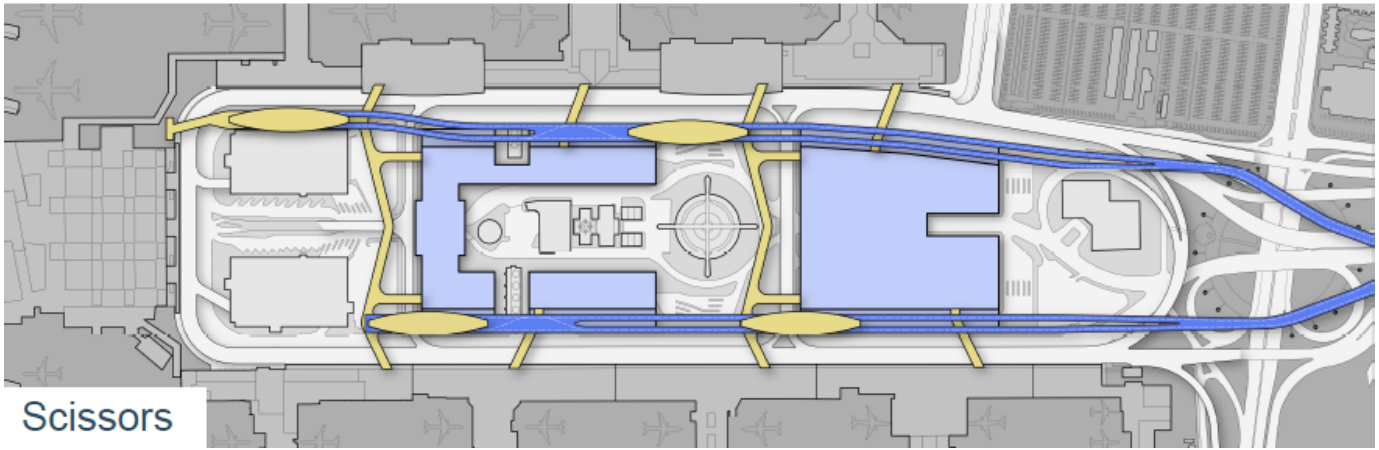
These options have been packaged into two alternatives:

- **2-Station Spine** (Center Way, Aerial, 2 stations)
- **4-Station Scissors** (Parking Garages, Aerial, 4 stations)

Comparative Review

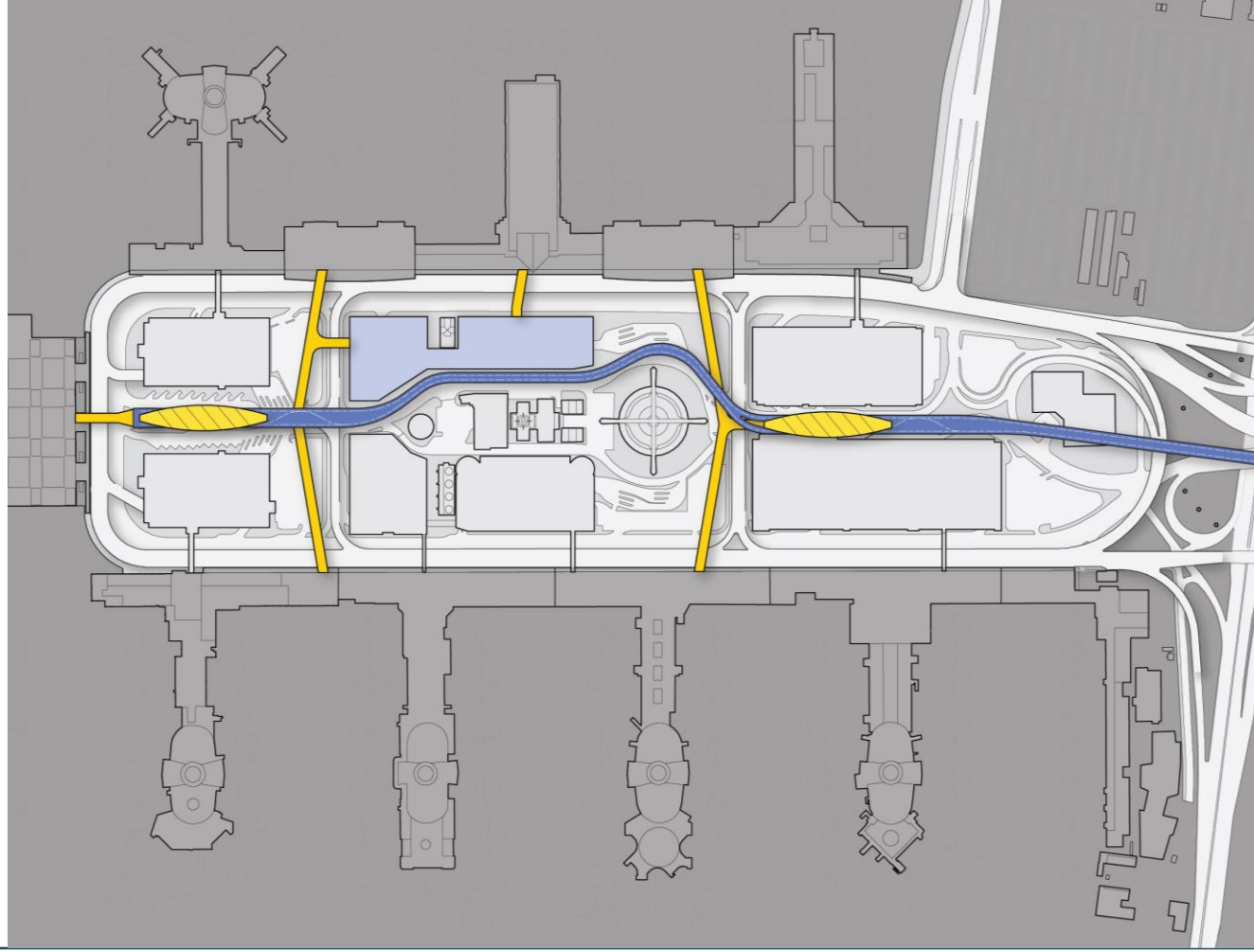
- Constructability
- Passenger Experience
- Cost



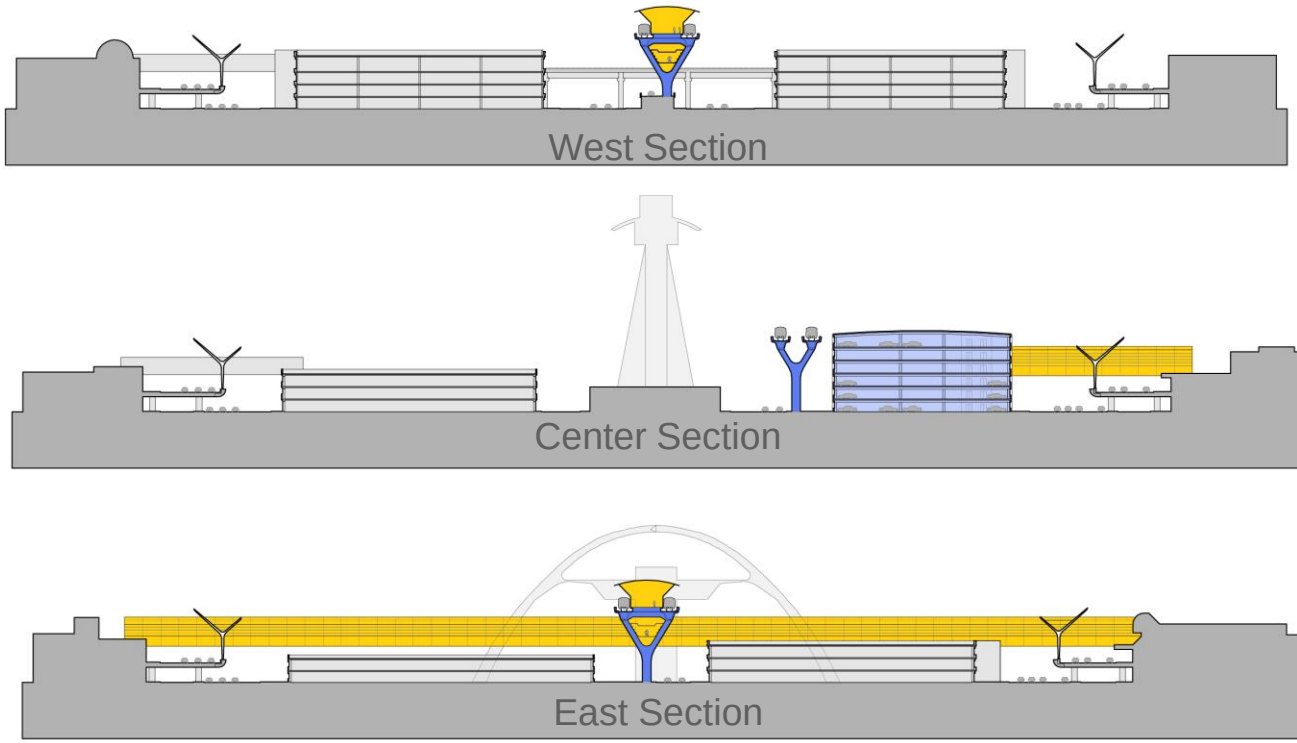


Spine Alignment

- Single Alignments along Center Way
- Two stations
- Walkways connect the APM stations to the terminals
- Reconstruction of two parking garages



Spine Alignment

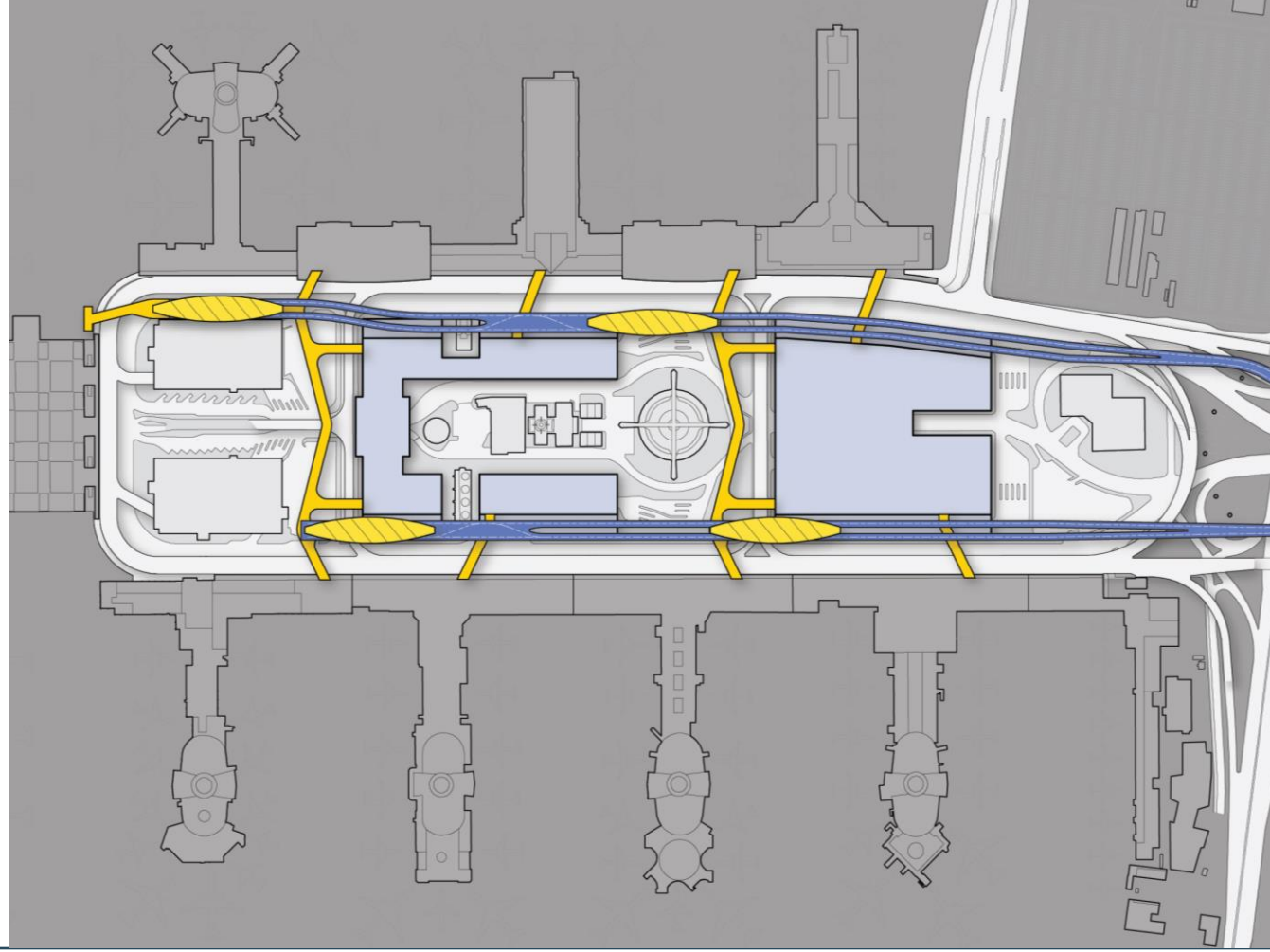


Spine Alignment

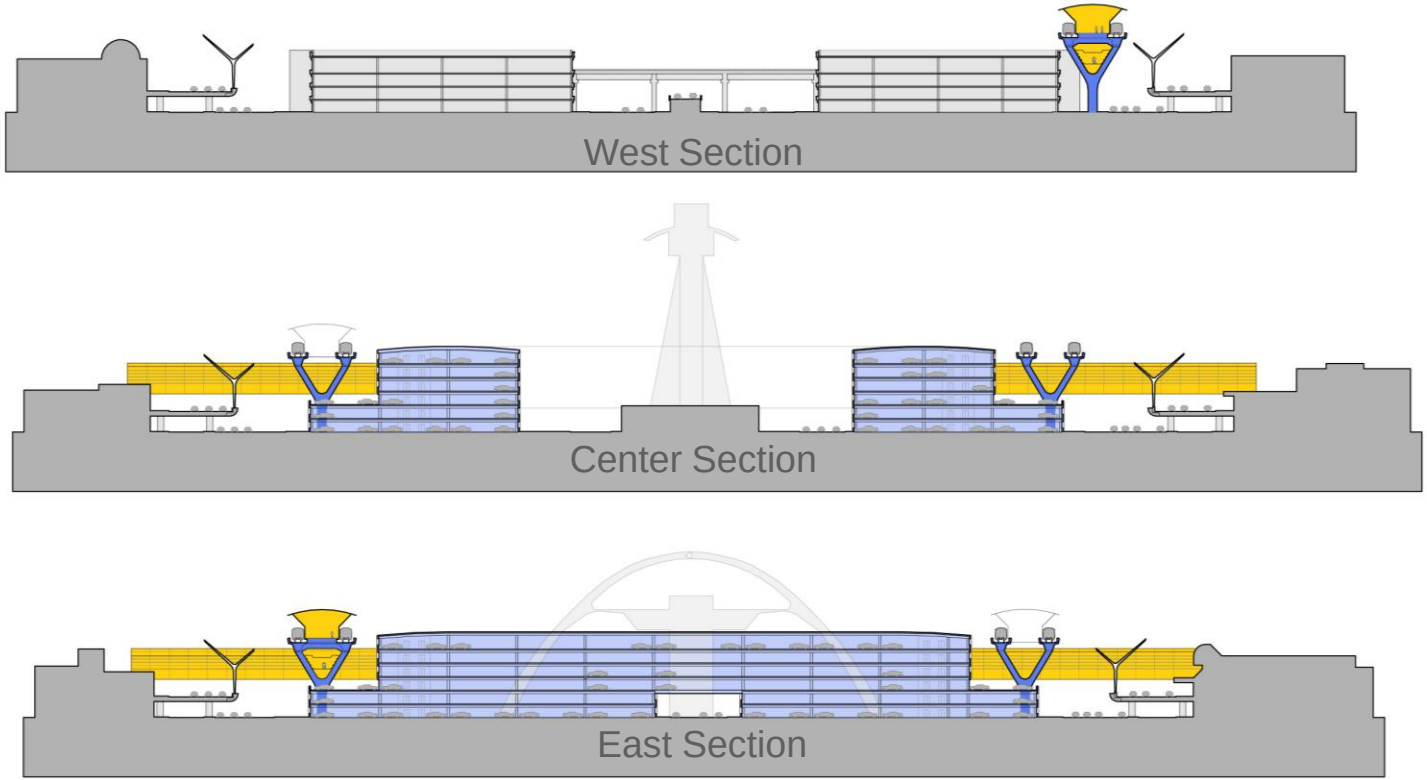
Concept Rendering

Scissor Alignment

- Dual Alignments along World integrated into/ around parking garages
- Four stations
- Walkways providing access to the terminals and parking garages
- Reconstruction of six parking garages



Scissor Alignment



Scissor Alignment

Concept Rendering

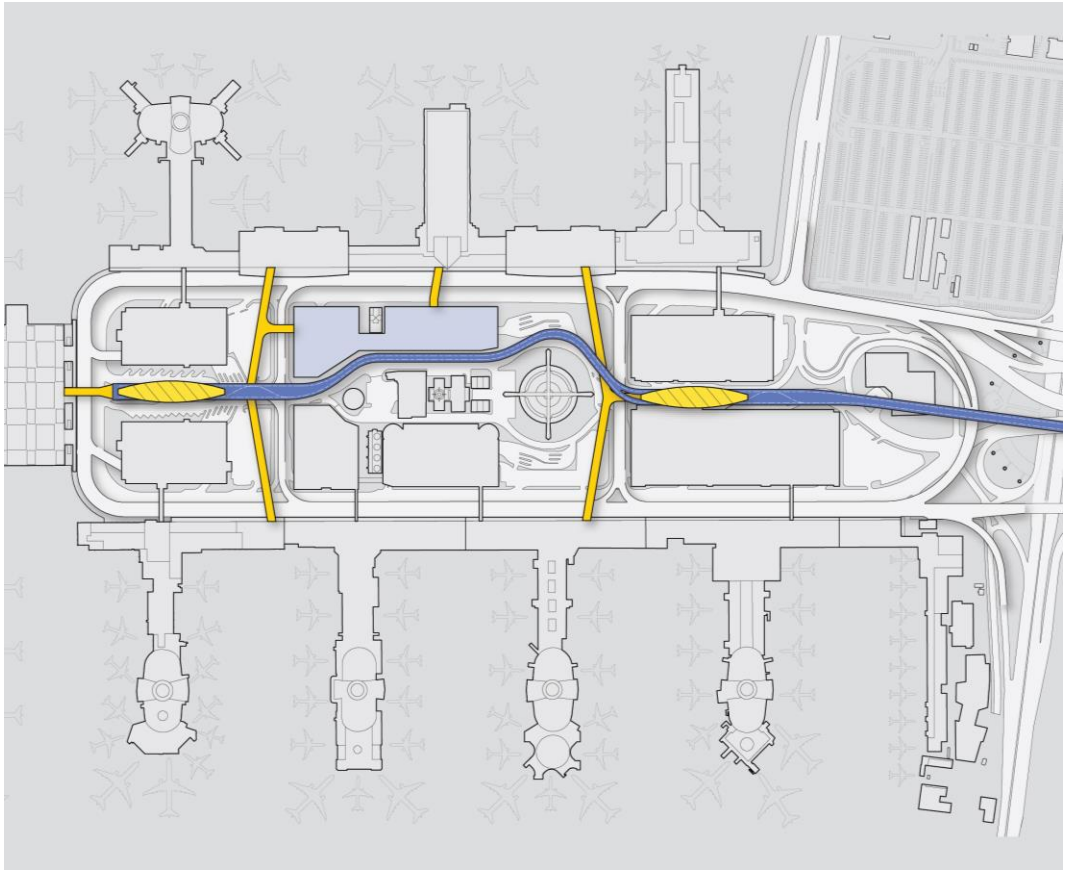
APM - Constructability

- Feasibility Assessment
- Provides High-level analysis of potential construction phasing/ sequencing for comparative purposes.

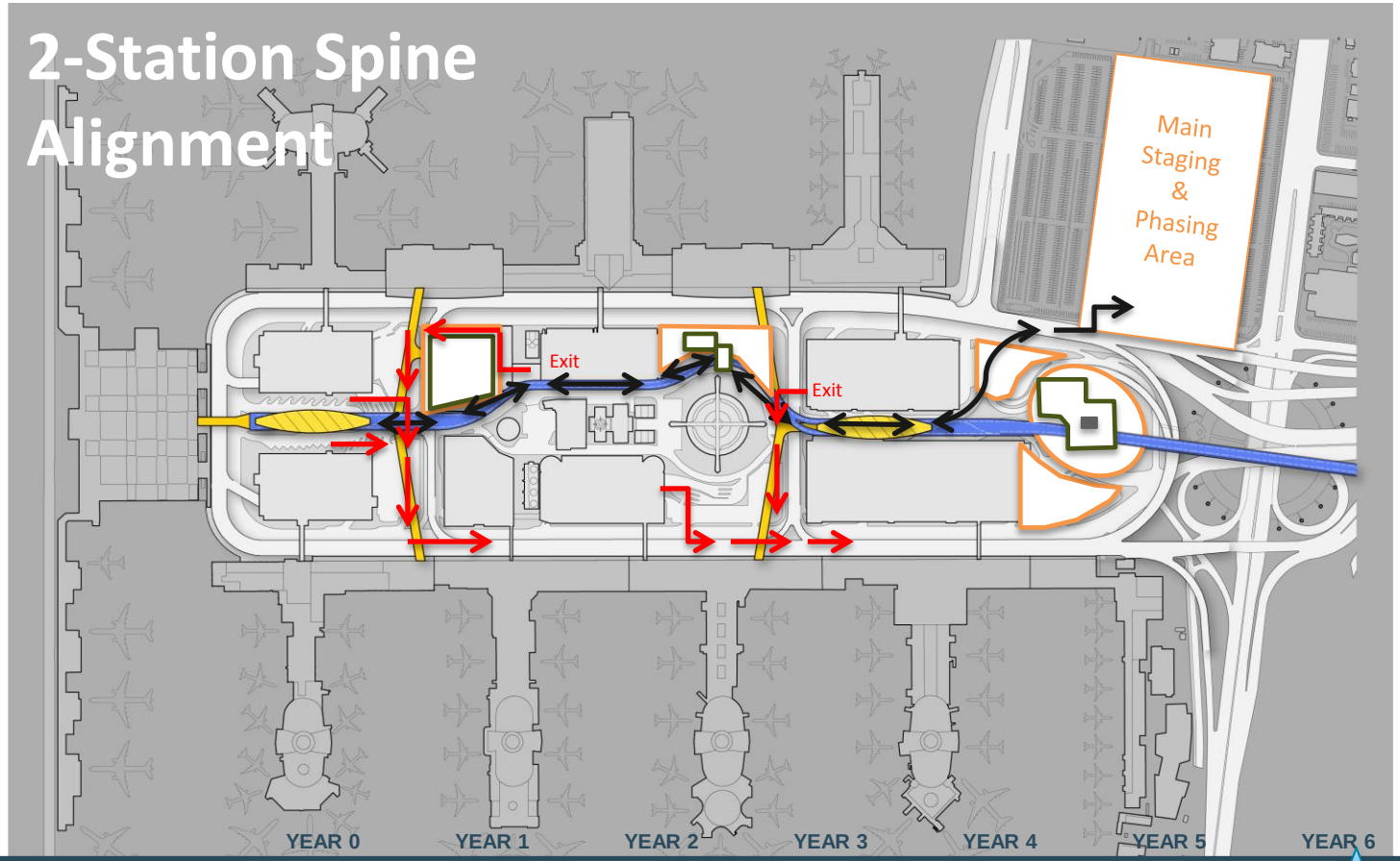
Construction Phasing –

2 Station Spine APM Alignment

Assumption: Phasing represents a fully functioning APM system independent from other project elements.



2-Station Spine Alignment

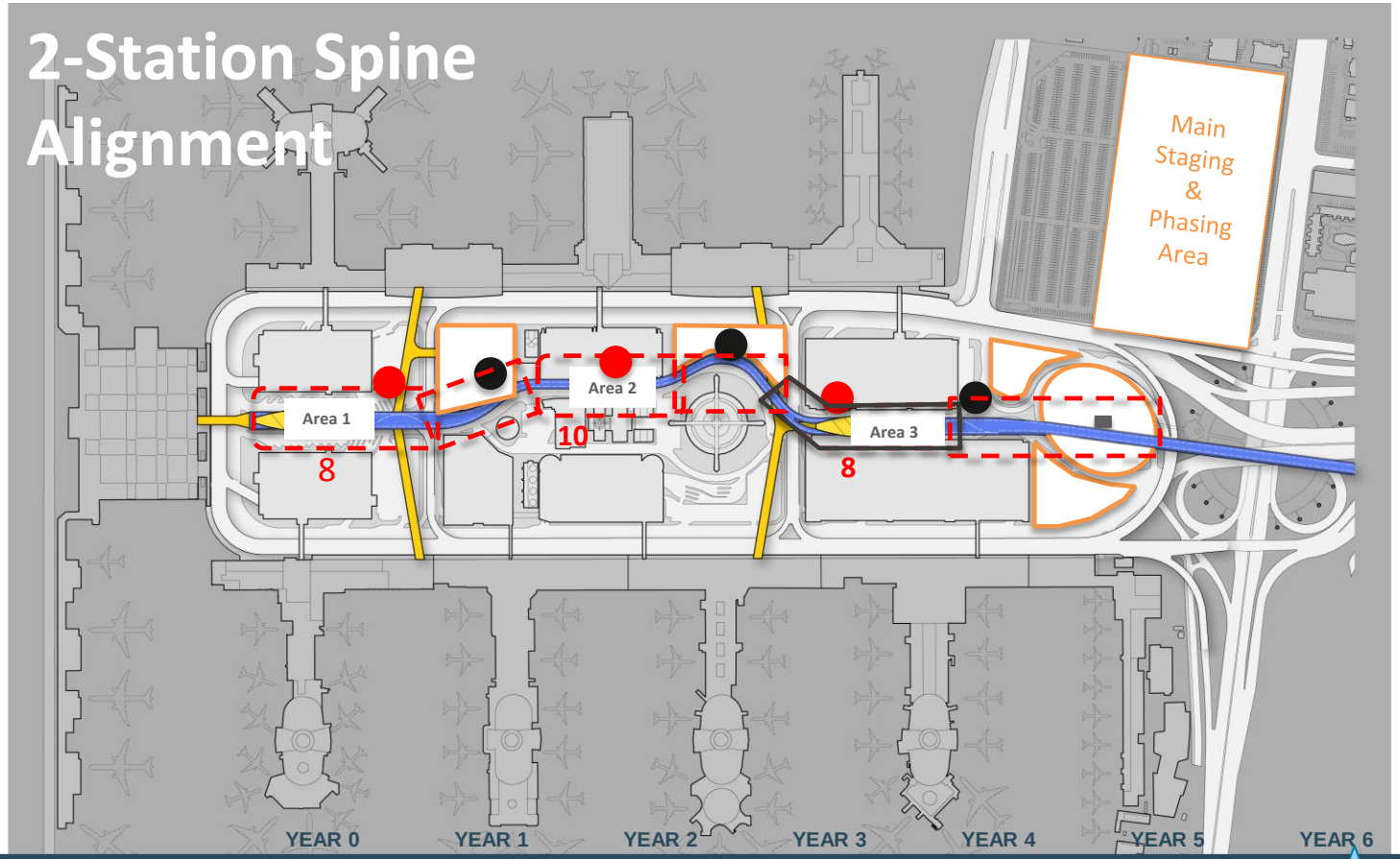


Construction Impacts

- Closure of Center Way, increasing traffic on World Way
- Closure of P2 garages, part of Park One

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8
Construction Duration									
Quarter	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4

2-Station Spine Alignment

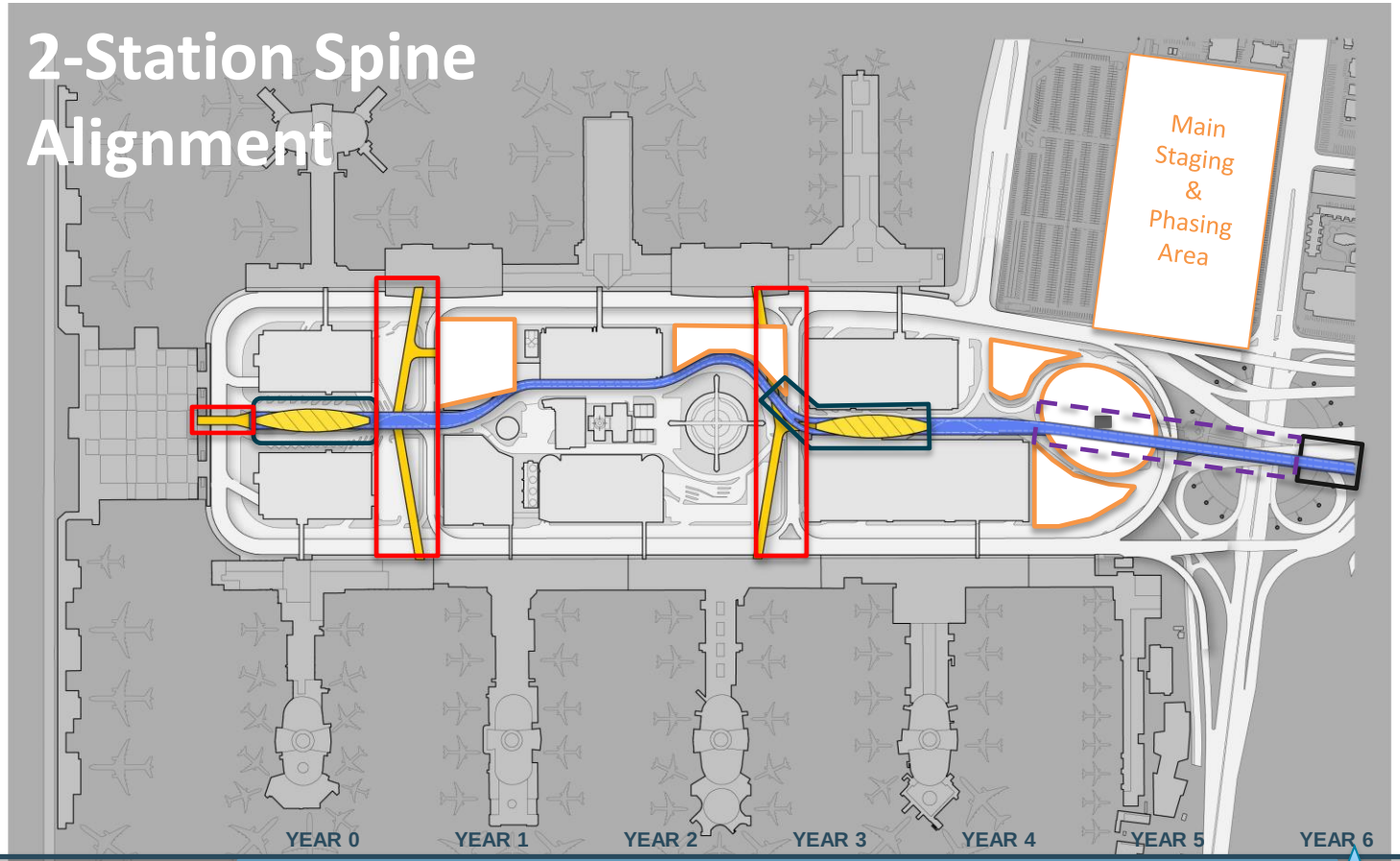


Construction Impacts

- Construction focused on Center of CTA

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8
Construction Duration									
Quarter	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4

2-Station Spine Alignment



Construction Impacts

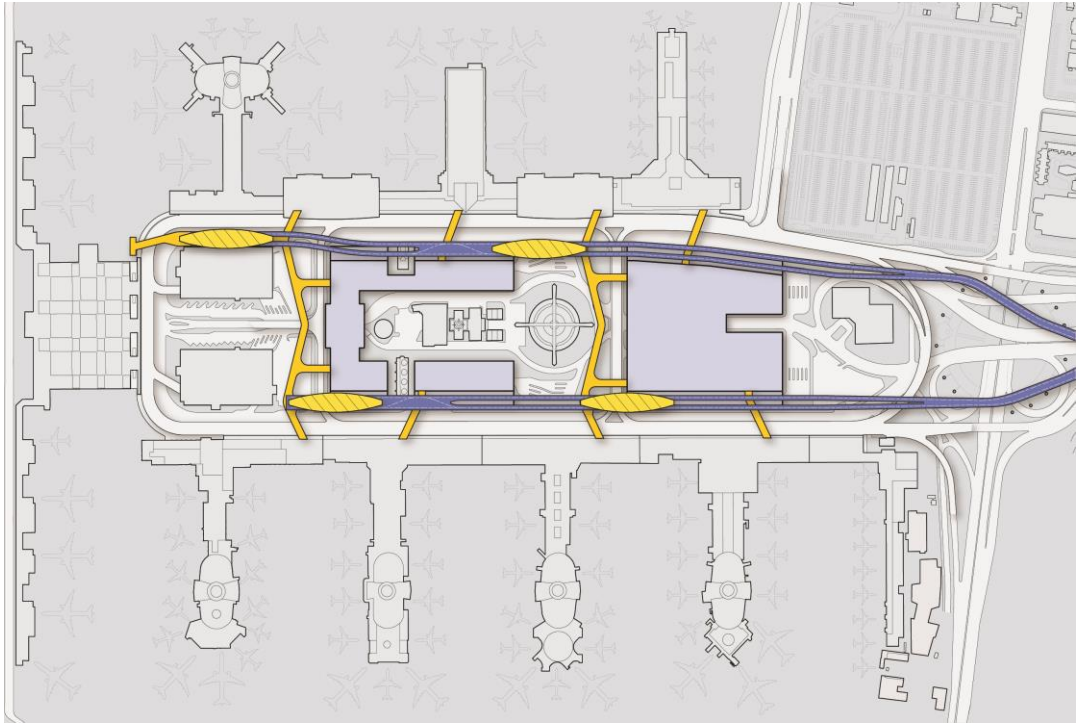
- Terminals and World Way Impacted During Pedestrian Bridge Construction

Construction Phasing –

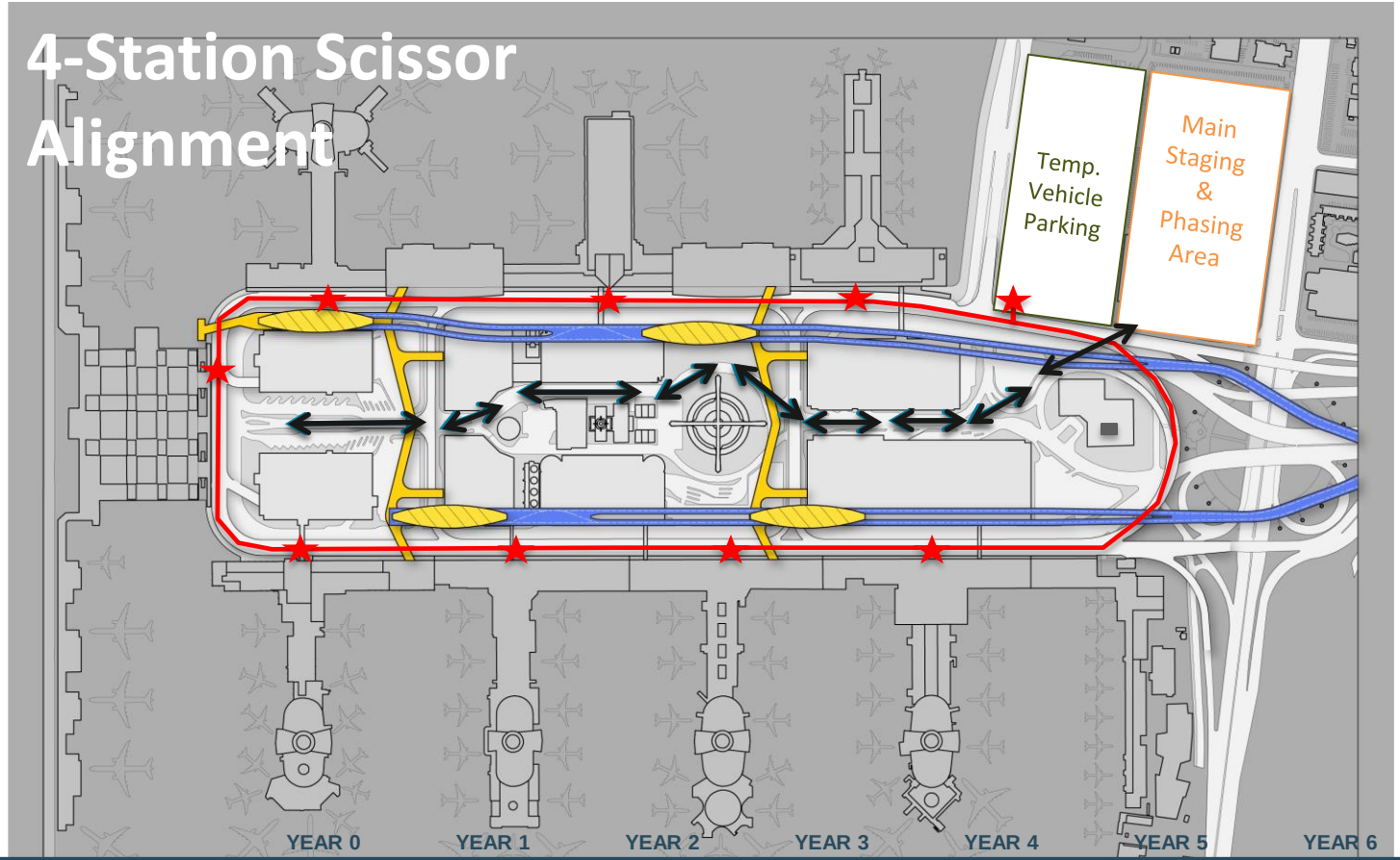
4 Station Scissor APM Alignment

Prime Focus:
- Evaluate constructability

Assumption:
- Phasing represents a fully functioning independent APM system from other project elements.



4-Station Scissor Alignment

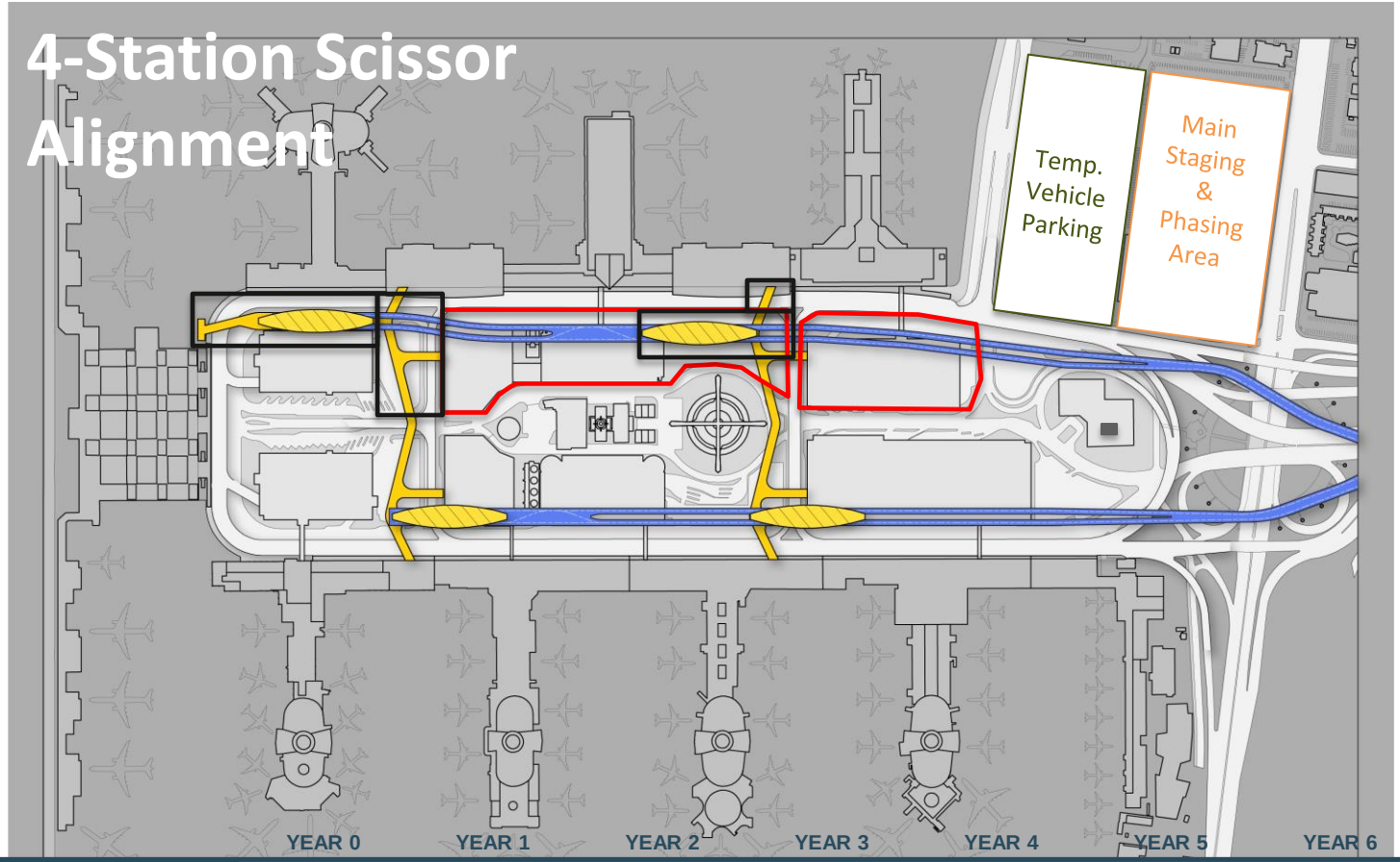


Construction Impacts

- Parking closures
  - Phase 1: Park One, P1, P2
  - Phase 2: Park One, P5, P6, P7

Construction Duration	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8
Quarter	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4

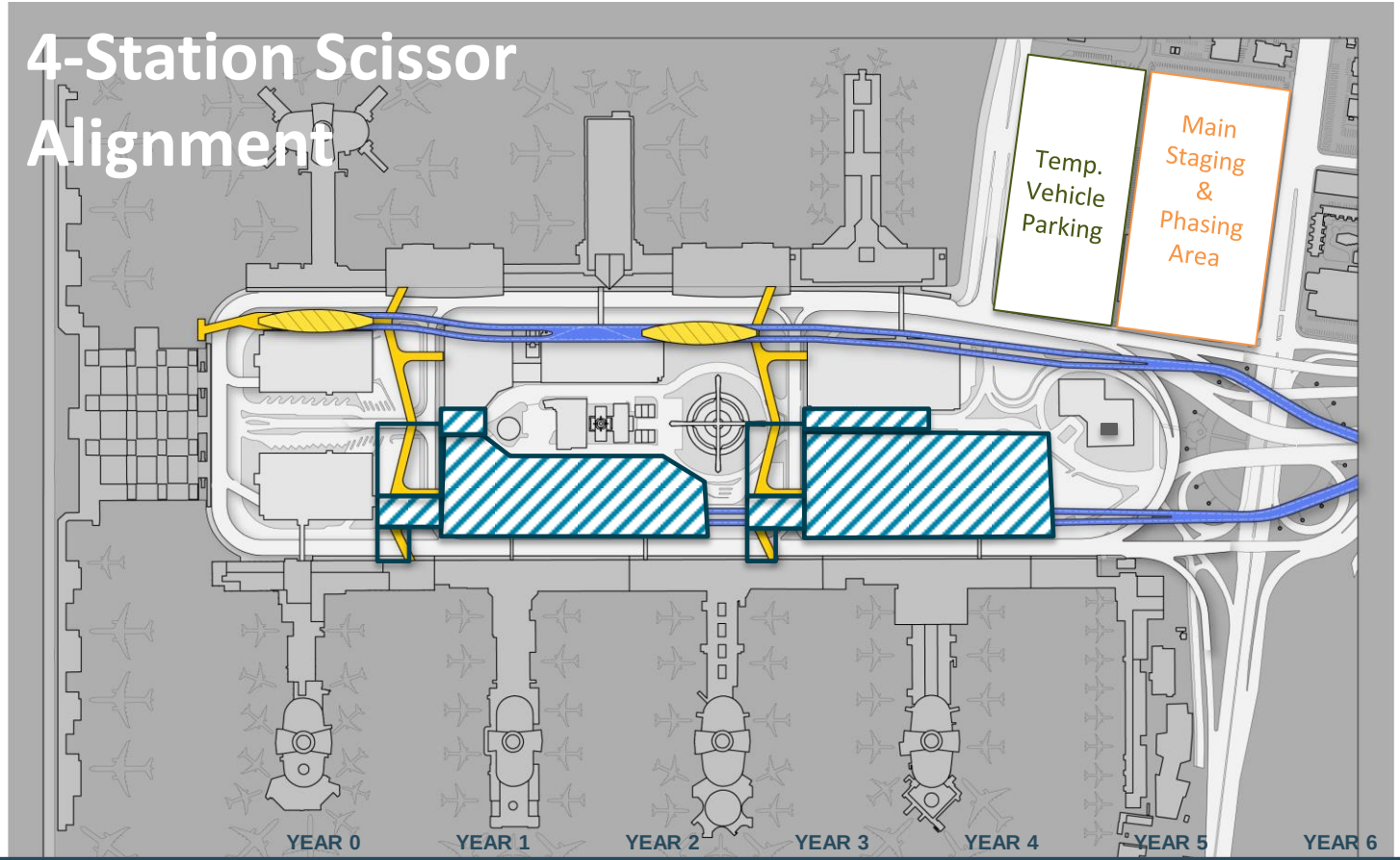
4-Station Scissor Alignment



Construction Impacts

- Northside developed in first phase

4-Station Scissor Alignment



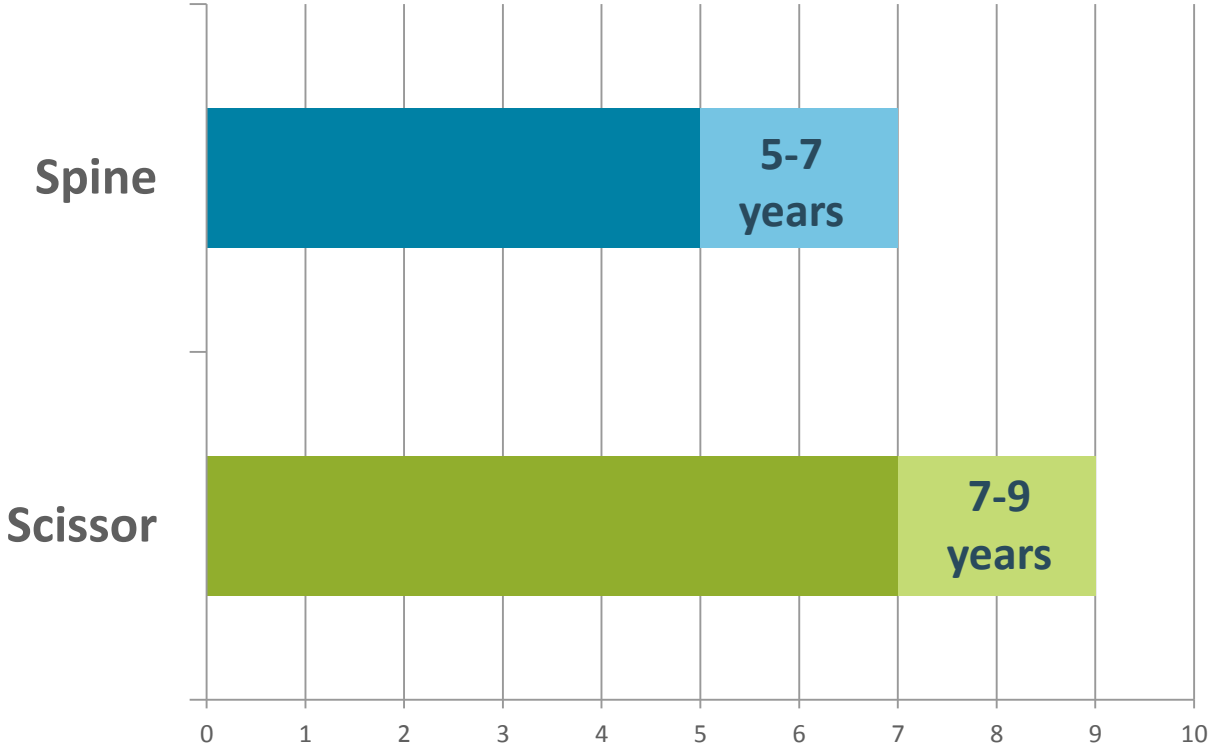
Construction Impacts

- Southside in second phase

	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8
Construction Duration									
Quarter	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4	1 | 2 | 3 | 4

APM – Construction Duration

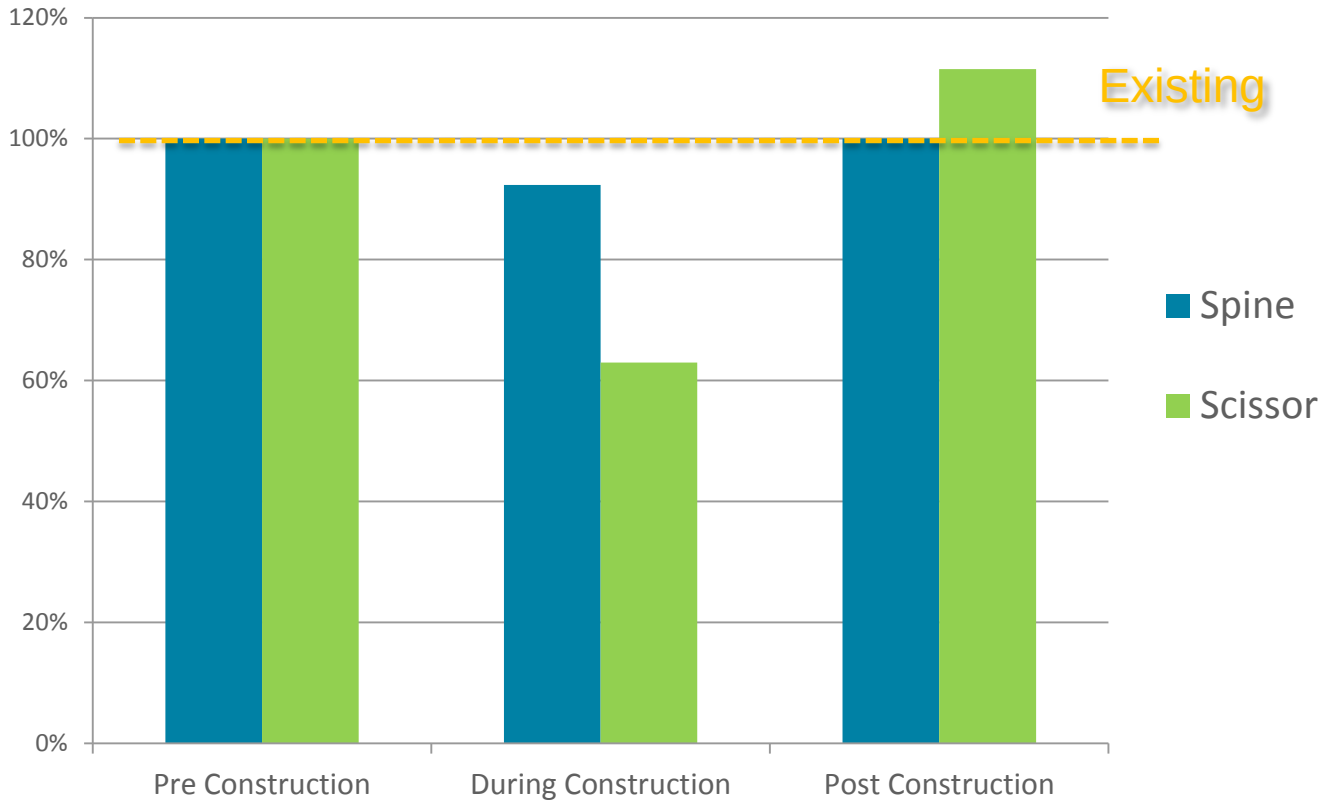
- Constructability analysis produced estimated duration.
- Ranges address uncertainties, including contemporaneous construction
- Construction would simultaneously occur off-airport as well.



CTA Parking Changes

Spine
- 10% loss during construction
- No change after completion

Scissor
- 40% loss during construction
- 15% increase after completion

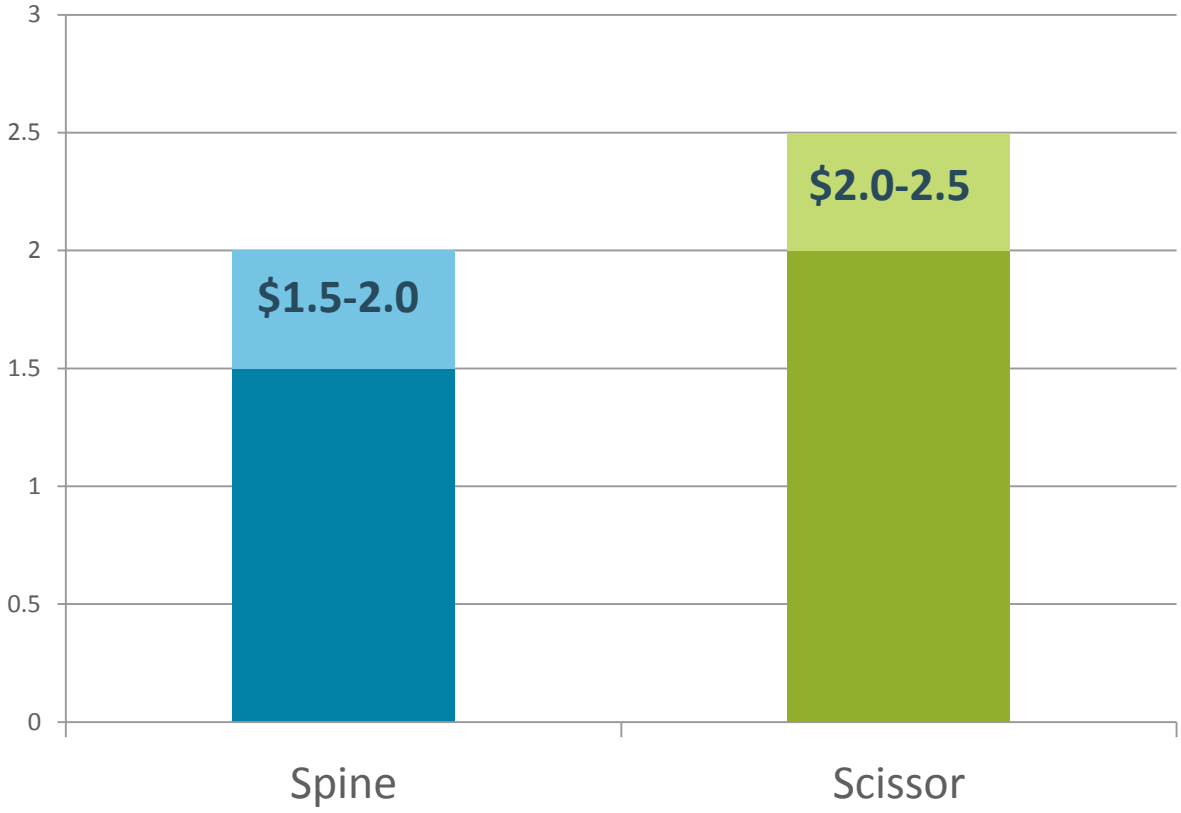


Capital Cost

ROM Cost Estimate
(in billions)

APM Guideway and System

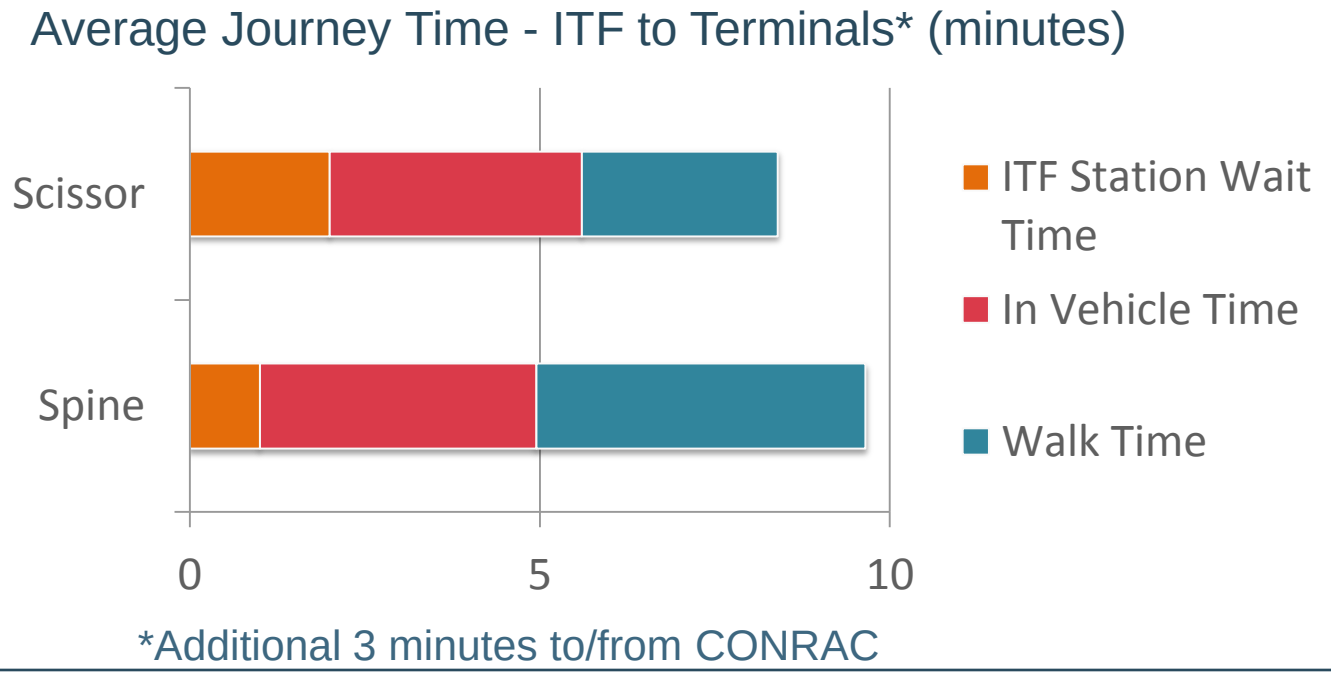
- Range of cost is provided due to high-level uncertainty of these estimates
- Difference between options is due primarily to:
  - Length of guideway
  - Parking garage reconstruction



Passenger Convenience

Spine
- 1-2 minute higher overall journey times
- Single train operation

Scissor
- Longer wait time at APM stations
- Dual train operation



*Additional 3 minutes to/from CONRAC

APM CTA Alignment Summary Comparison

Option	Construction Duration	Development Cost	Passenger Journey Time (ITF to Terminals)
Spine	5-7 years	$1.5-2 B	9-11 min.
Scissor	7-9 years	$2-2.5 B	8-10 min.

Key Findings

- “Backlot” is optimal alignment for CONRAC section of APM.
- “Century” is optimal alignment for ITF section of APM.
- Congestion relief in CTA determined by increment of users boarding the system.
- Significant traffic and parking mitigations will be needed for the duration of construction of the APM in the CTA.
- Procurement preparation and process will be complex and is expected to take several years.

Next Steps

- Resolve rights-of-way issues outside of CTA (underway)
- Refine financial analysis for APM options including potential lost parking revenue (underway)
- Develop CTA roadway and curb improvements schedule (underway)
- Recommend a preferred alignment in the CTA (underway)
- Further develop details regarding APM interface with terminals
- Develop strategic parking plan to account for parking changes during and after APM construction
- Initiate environmental review
- Launch system procurement preparation

ITF (LAX Connect)

Creating Convenience and Choice for Air Travelers

Key Features

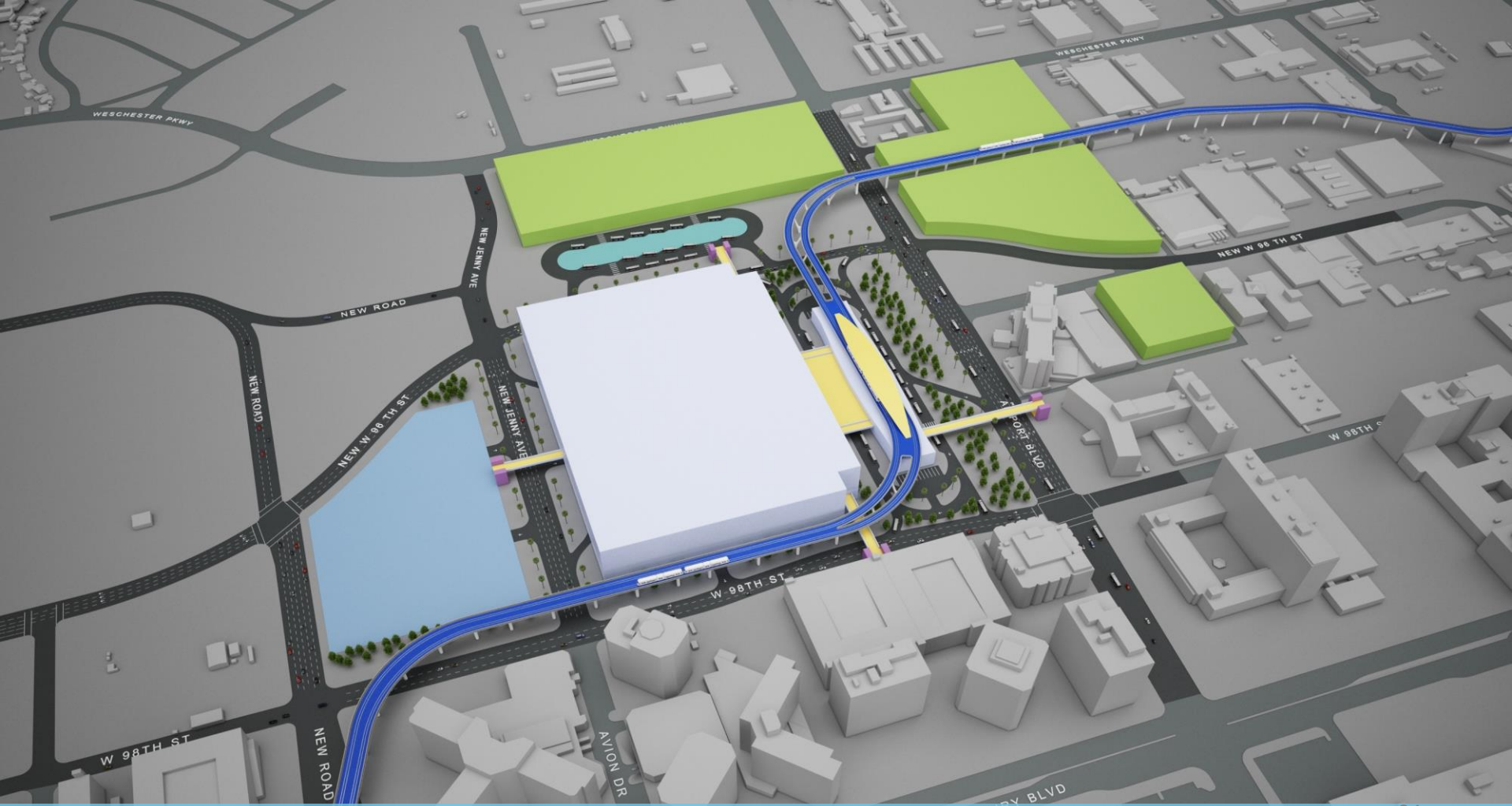
Planned ITF Feature	LAX ITF
APM Portal	☒
Replacement Commercial Vehicle Curb	☒
Alternate Private Vehicle Drop-off	☒
Bag Check	☒
Parking	☒
Meet and Greet Area	☒
Regional Rail Connection	☒
Potential Collateral Development	☒

Key Features

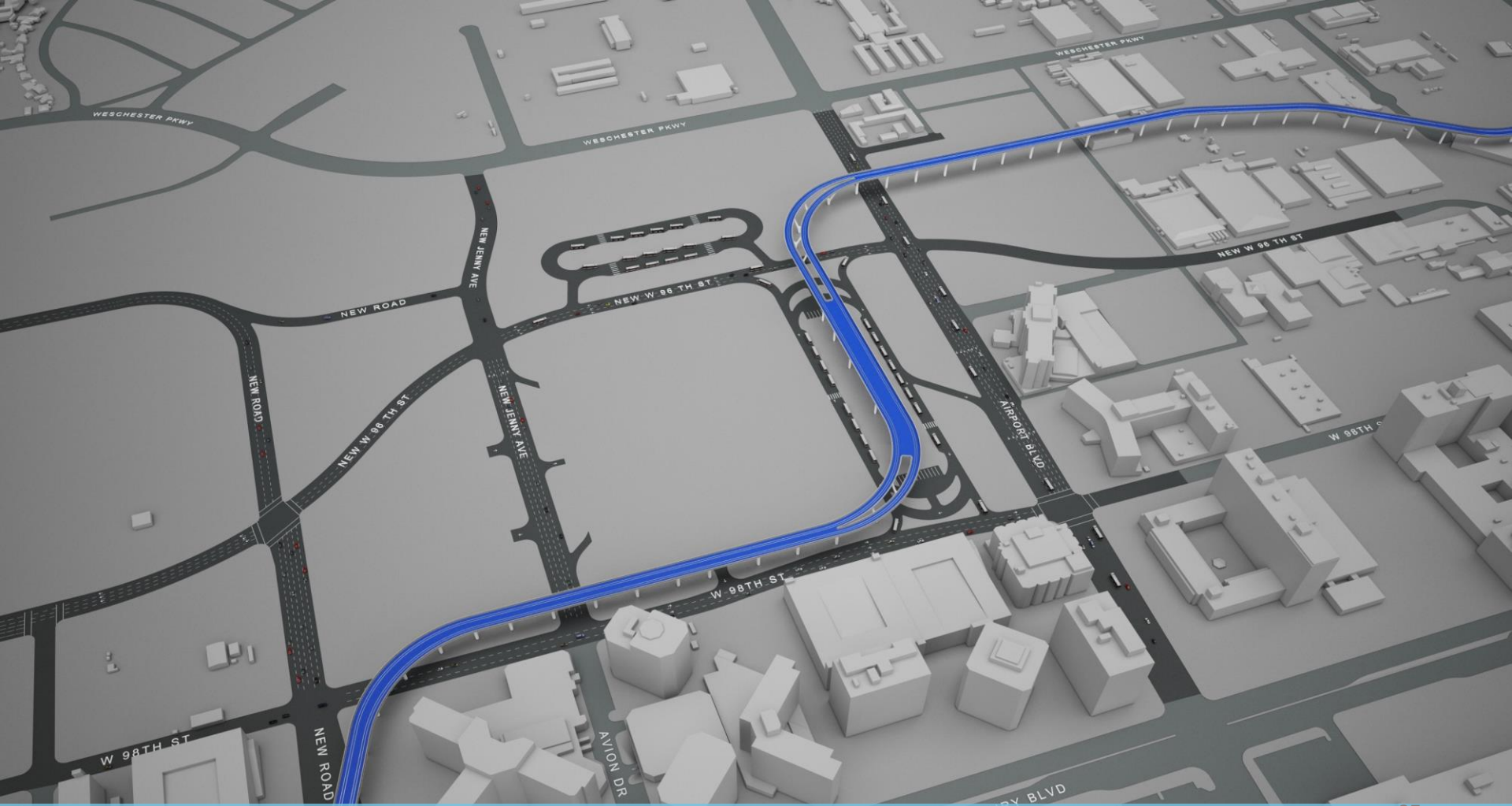
Partial/Potential ☐

ITF Feature	LAX ITF	Atlanta	Miami	Phoenix	Newark
APM Portal	☒	☒	☒	☒	☒
Replacement Commercial Vehicle Curb	☒			☐	☐
Alternate Private Vehicle Drop-off	☒		☐	☐	☐
Bag Check	☒			☒	
Parking	☒				☒
Meet and Greet Area	☒			☐	
Regional Rail Connection	☒		☒	☒	☒
Potential Collateral Development	☒	☒			

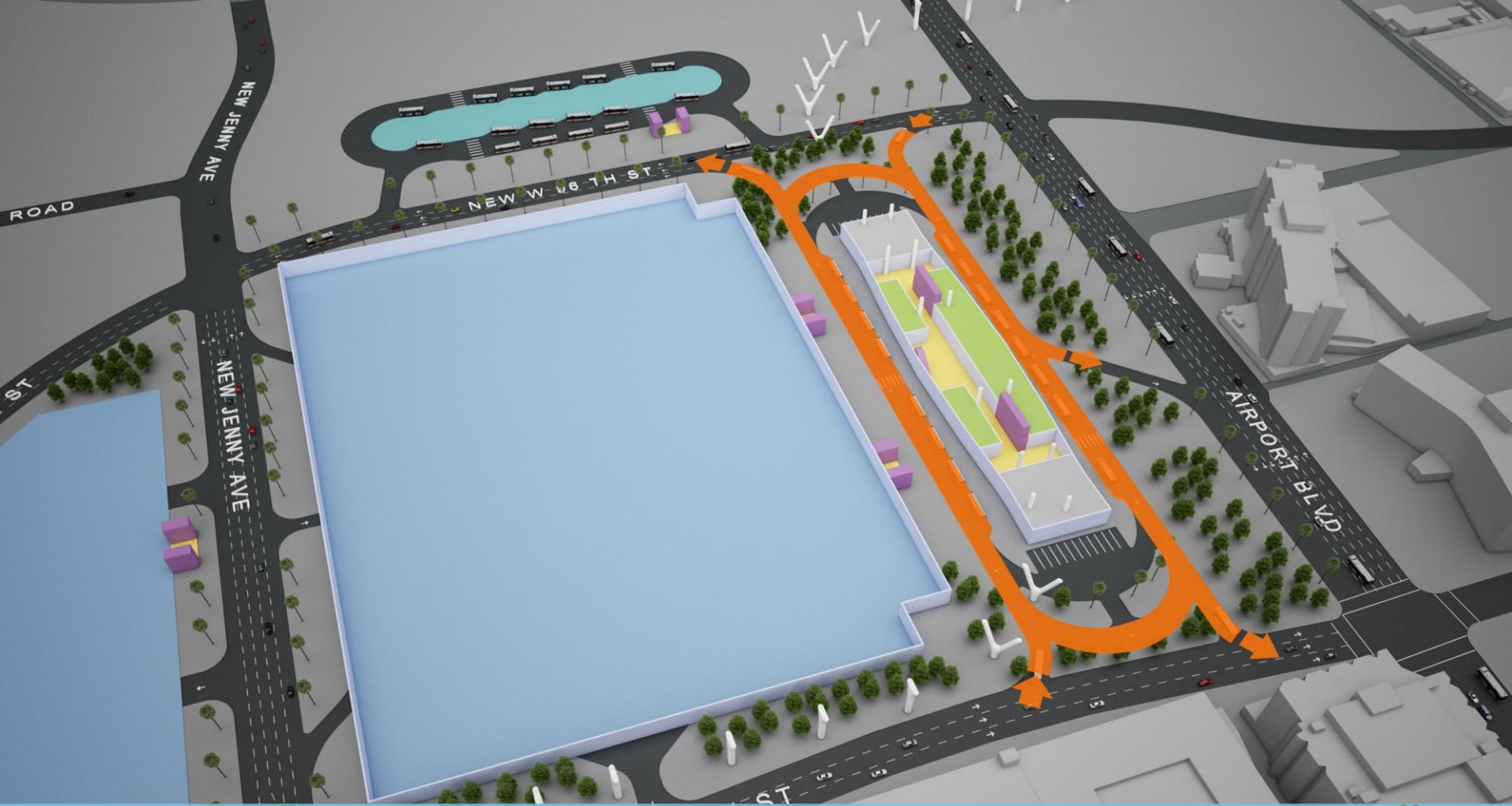
EXISTING CONDITION



FULL BUILD OUT POTENTIAL CONCEPT



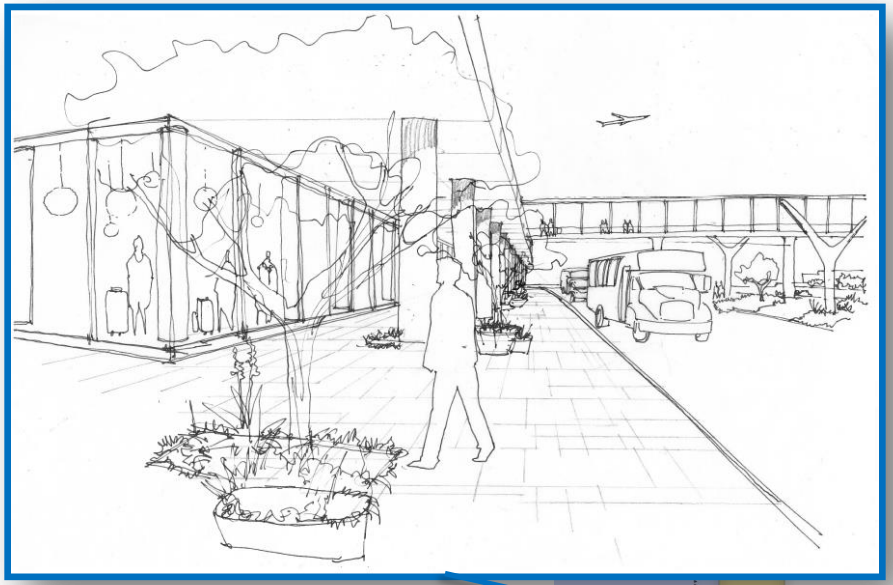
APM ALIGNMENT AND NEW ROADWAY CONFIGURATION

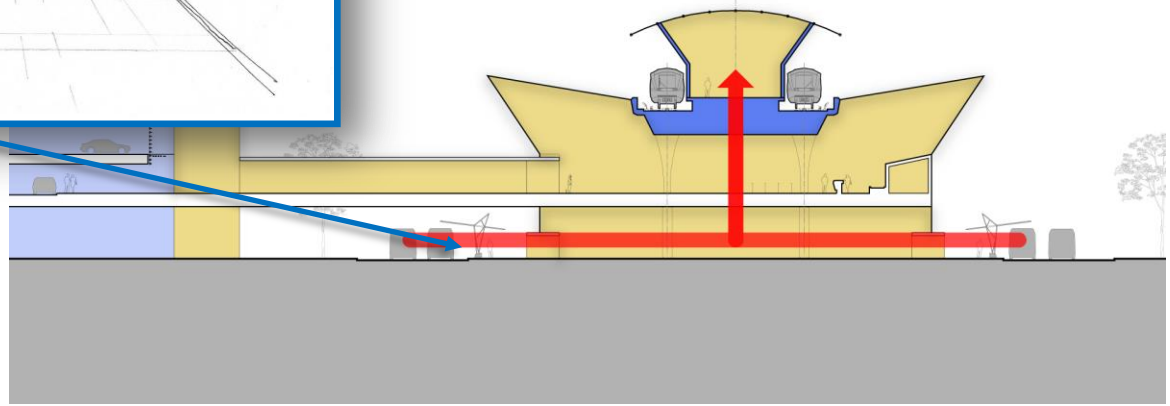


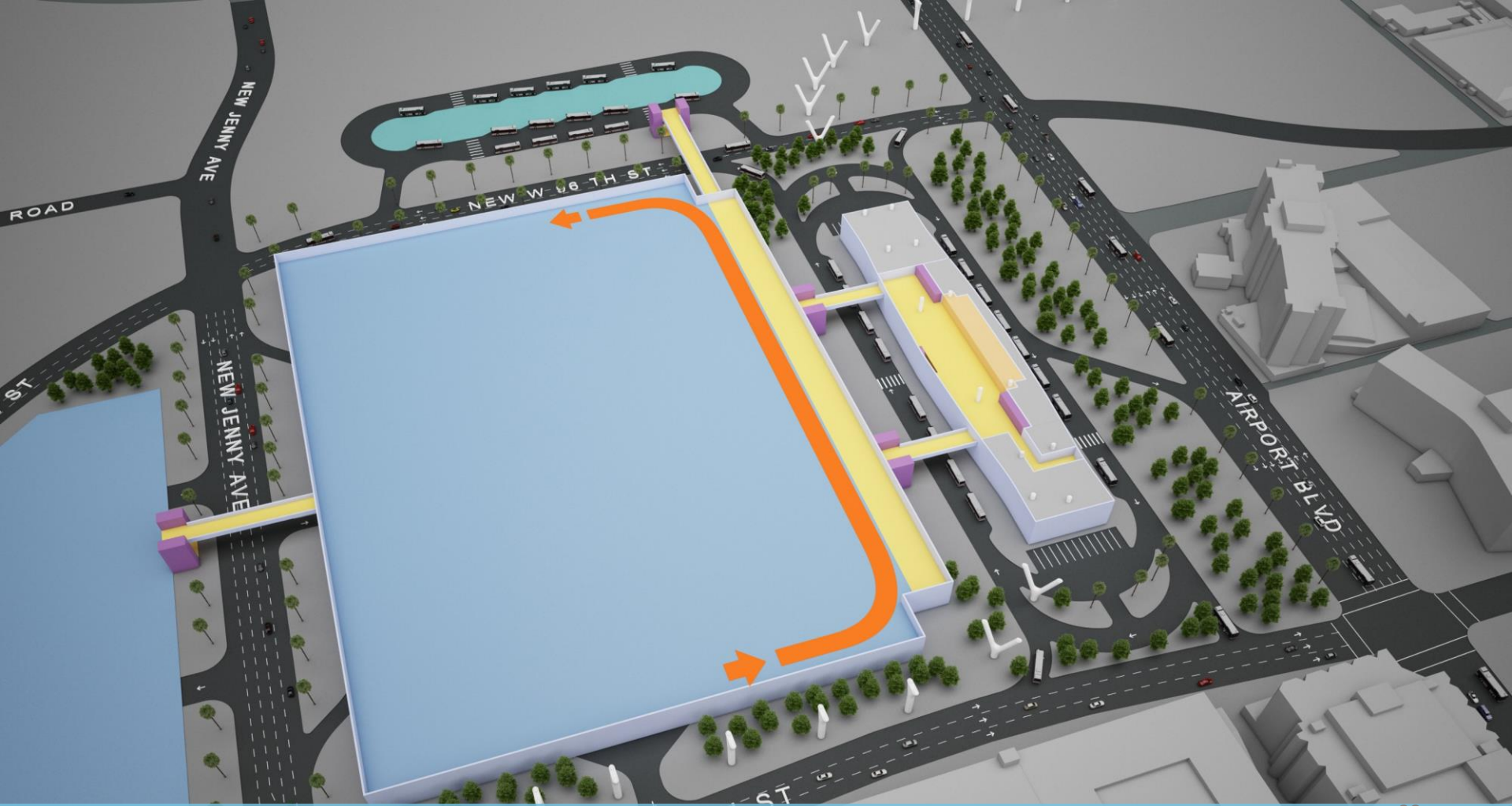
PATH OF TRAVEL IN AND OUT OF THE ITF COMMERCIAL VEHICLE ROTARY

ITF

Commercial Vehicle Rotary



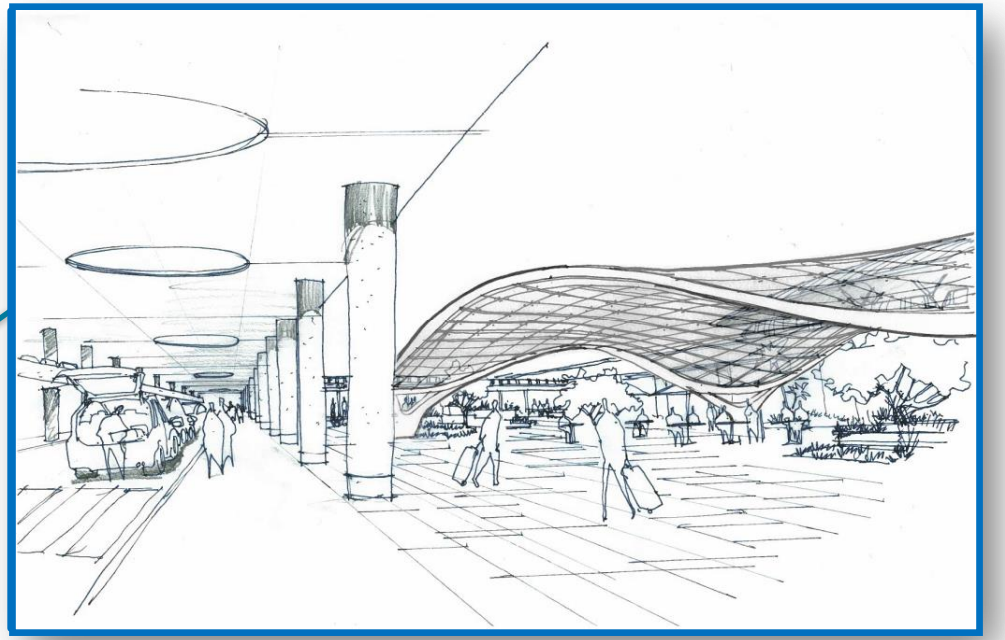


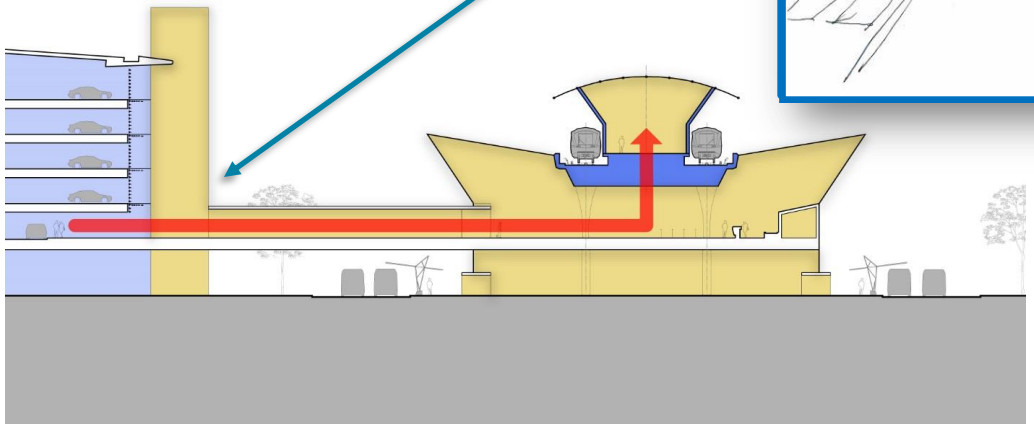


PRIVATE AUTO PASSENER DROP OFF CURB

ITF –

Private Vehicle Drop Off Curb

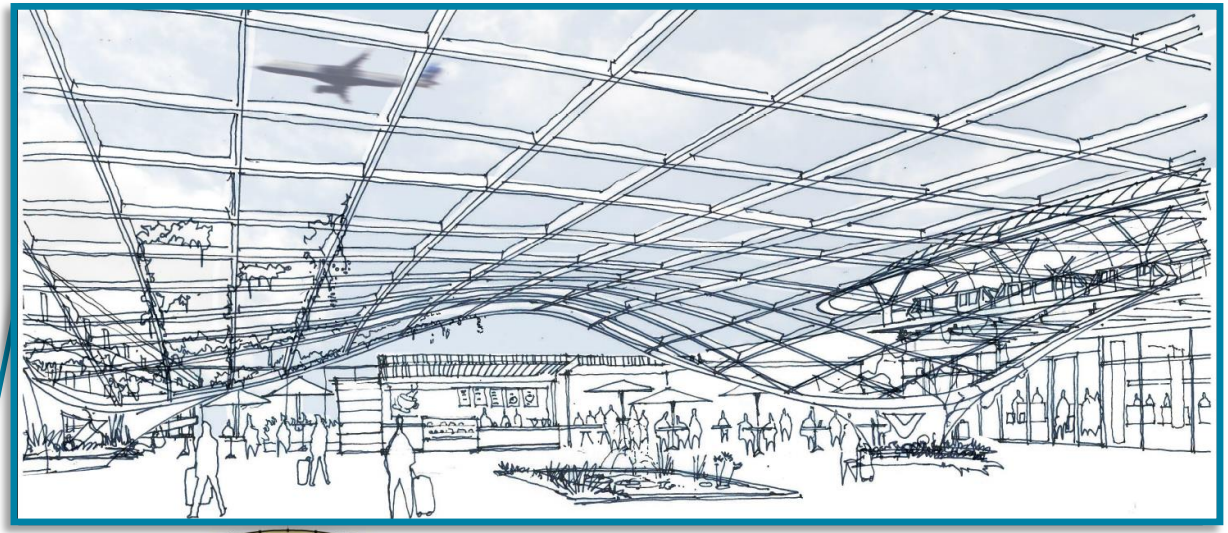


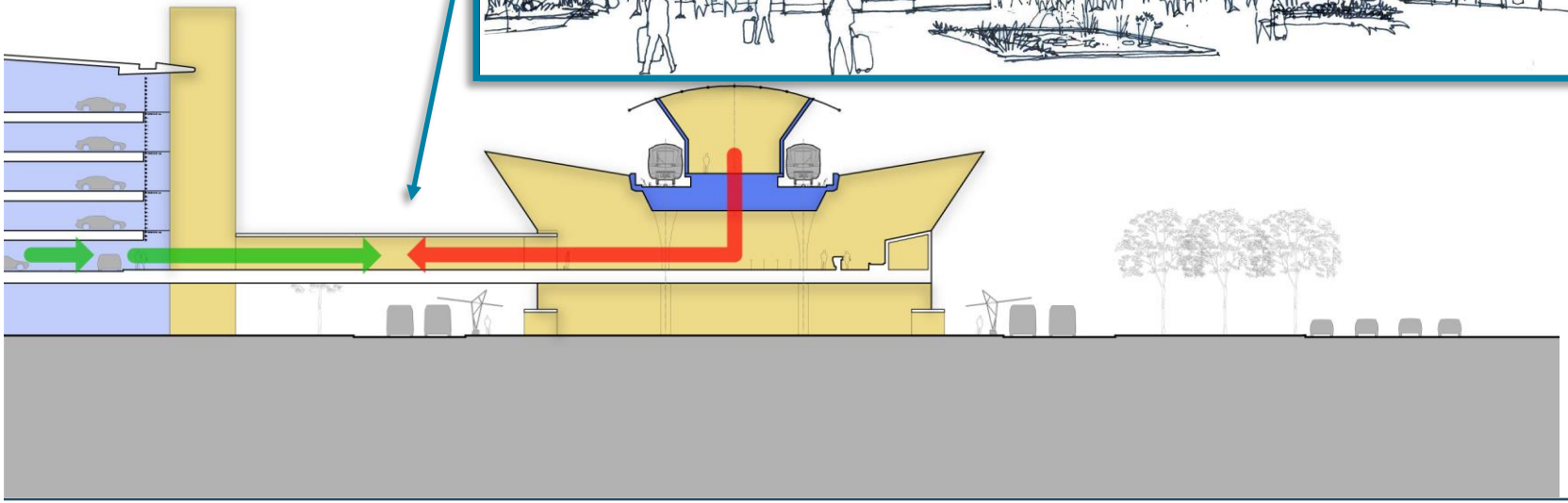


ITF–
Meet and Greet Plaza

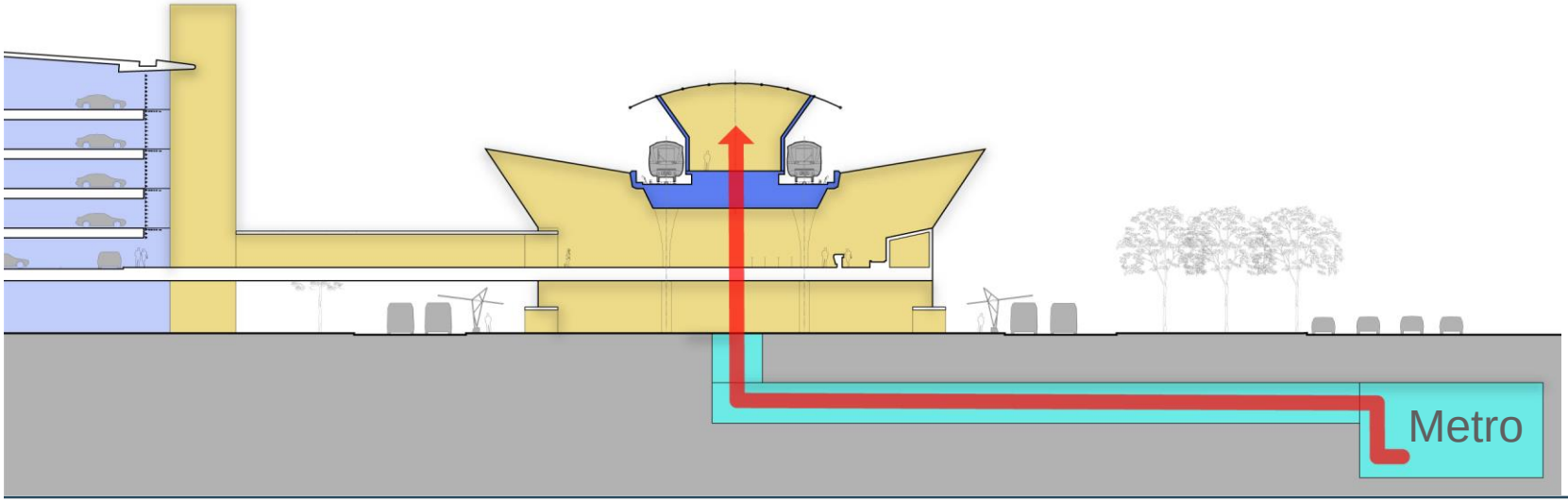
MEET AND GREET PLAZA LOCATION

ITF –
Meet and Greet Plaza





ITF – Metro Connection

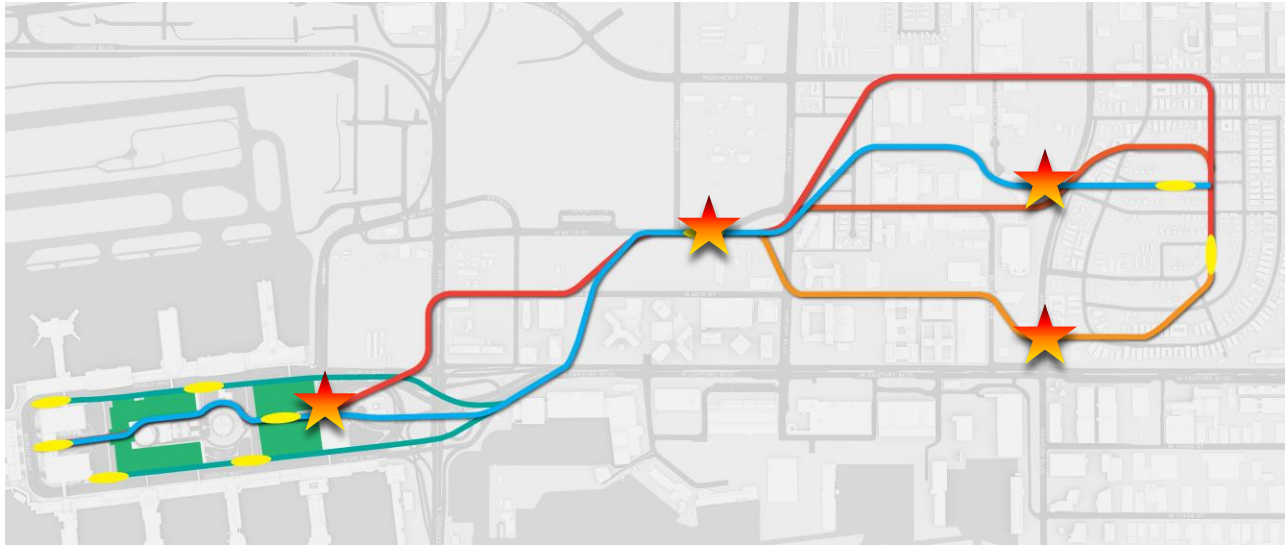


Metrorail Connection to LAX

Metro is considering at least 6 options to connect Metrorail to LAX.

Metro's decision will still lead passengers to utilize the APM system to arrive at their terminals.

LAWA can accommodate Metro at any of 4 locations.



Connection to LAX Connect

Strong preference to have Metro connections occur at the ITF.

- Centers intermodal activity at ITF
- Would provide most services to those travelling on Metro

Metro Graphic

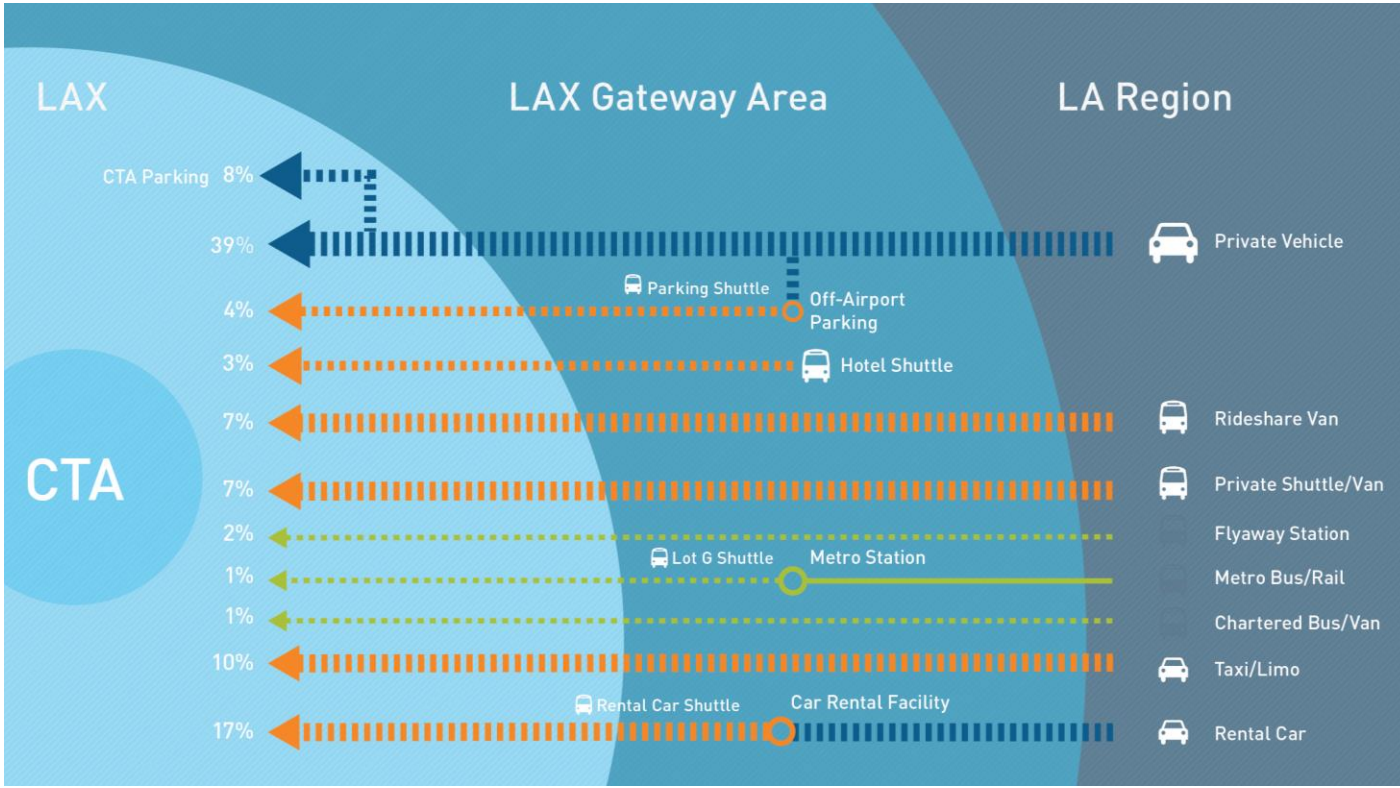
Metro Studies – the Airport Metro Connector

Regardless of Metro's decision, LAWA will work to ensure a seamless rail-to-rail connection for airport users.

CTA Congestion Relief

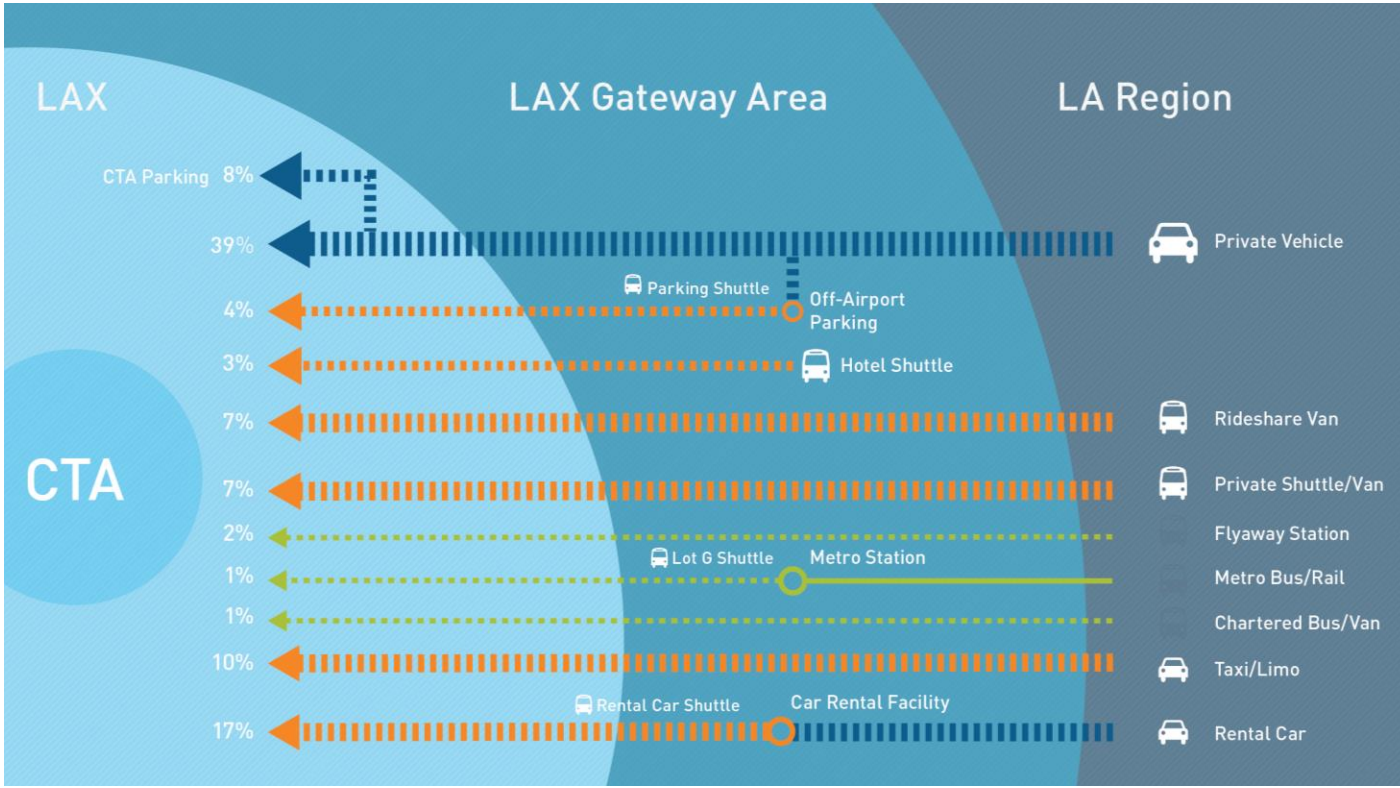
The amount of relief the ITF could provide to the CTA is dependent on changes to:

- Resident behavior.
- LAWA's policy and regulatory framework.



Changing Behavior

- Certain features at the ITF might influence resident behavior:
  - Remote bag check
  - Meet and Greet Plaza
- Another way to change behavior is to dramatically improve roadway access to the ITF.



Disneyland

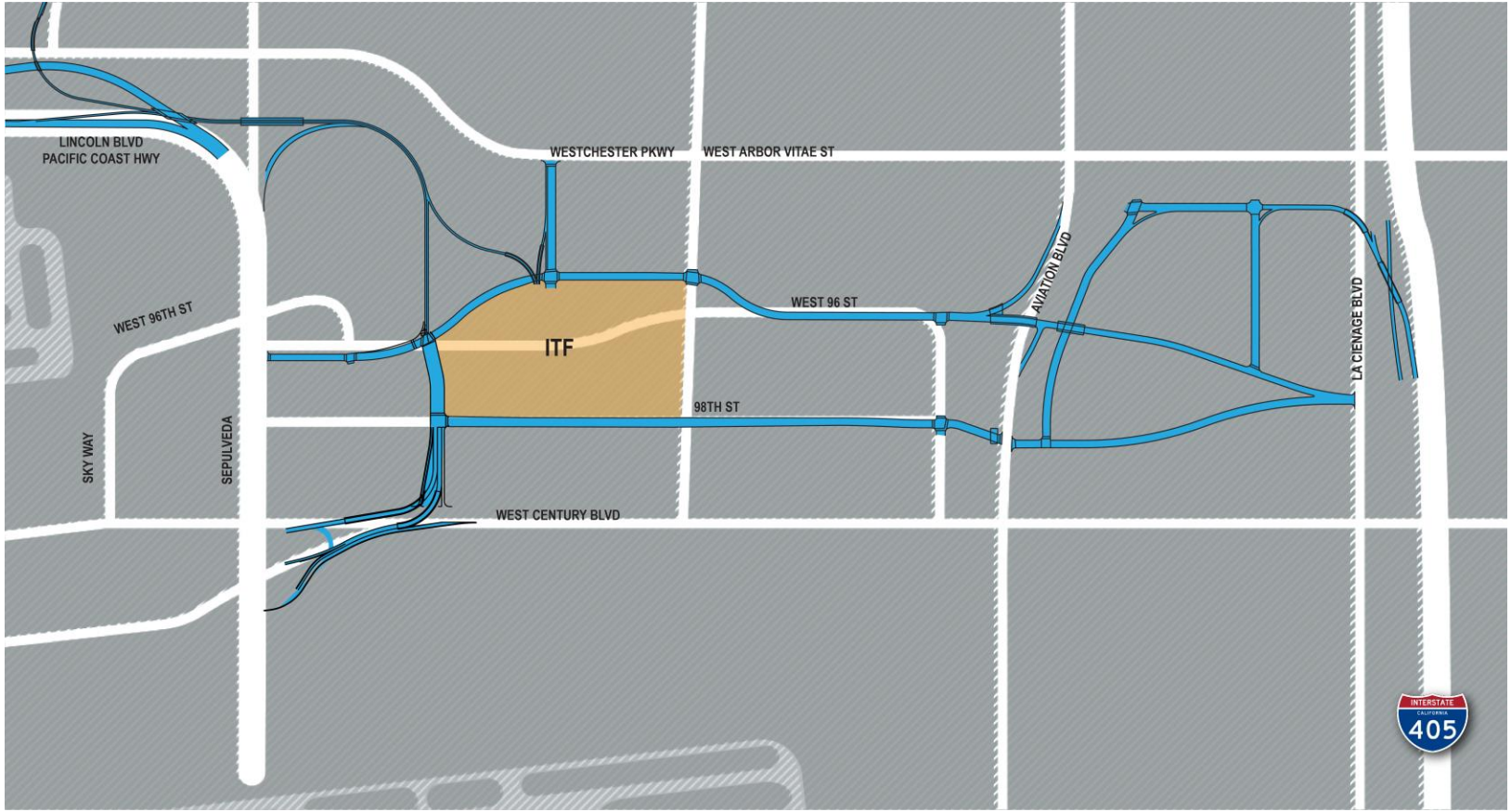
A Dedicated Roadway System to Protect Neighborhood Streets

Direct Freeway Access & Dedicated Lanes

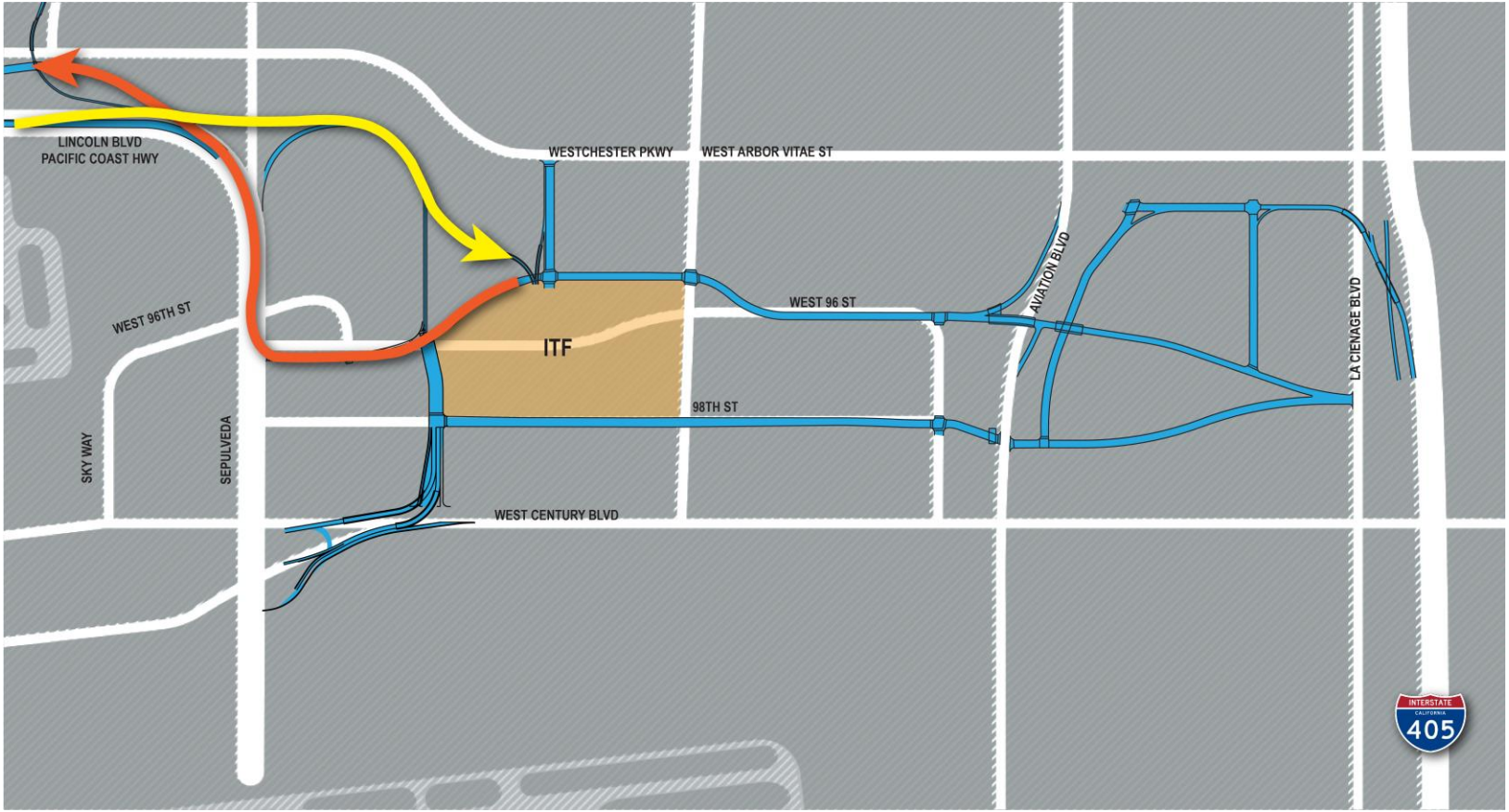
Dedicated Roadway System

Existing Routes to the CTA

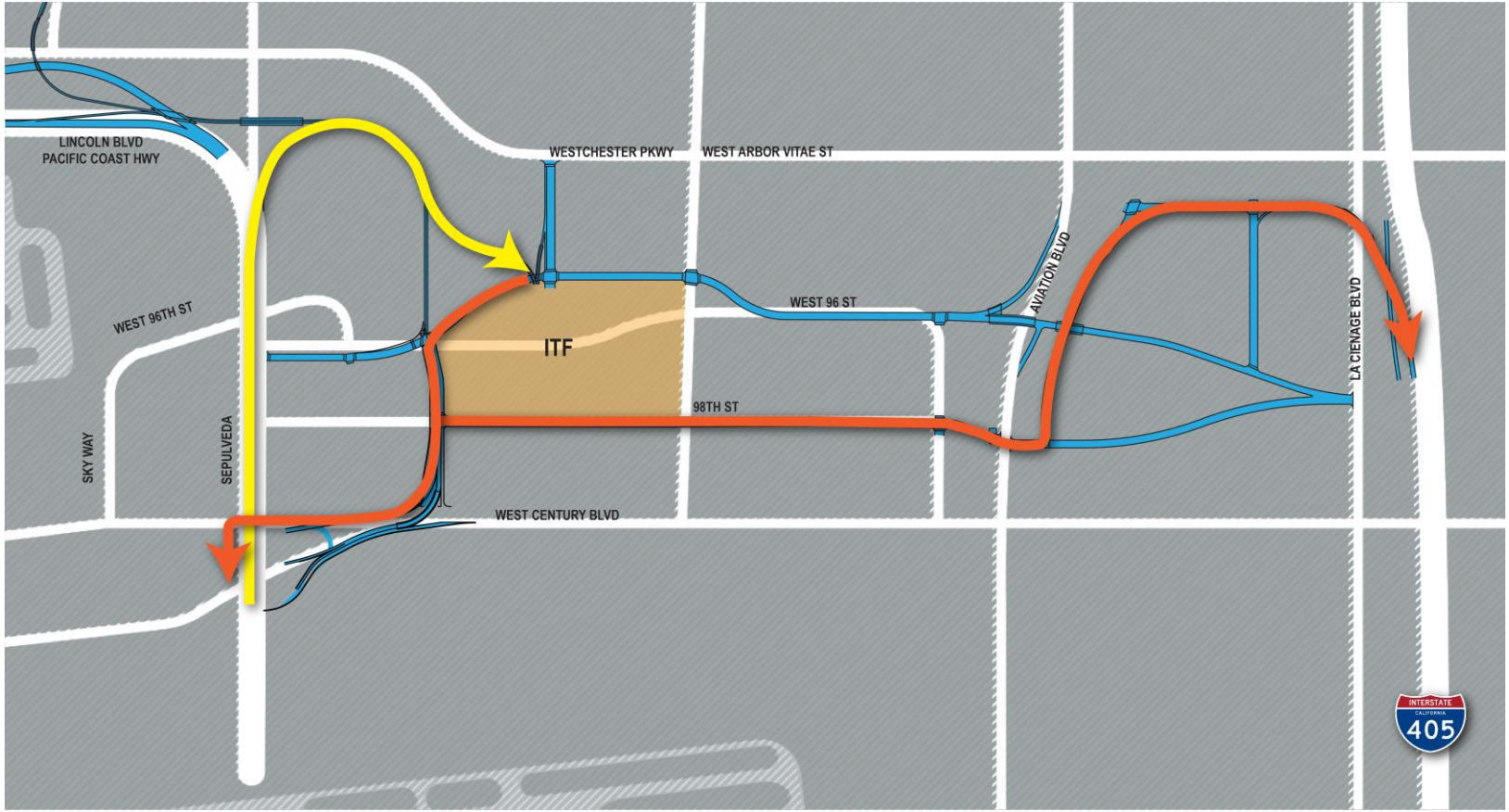
Future Roadway Network



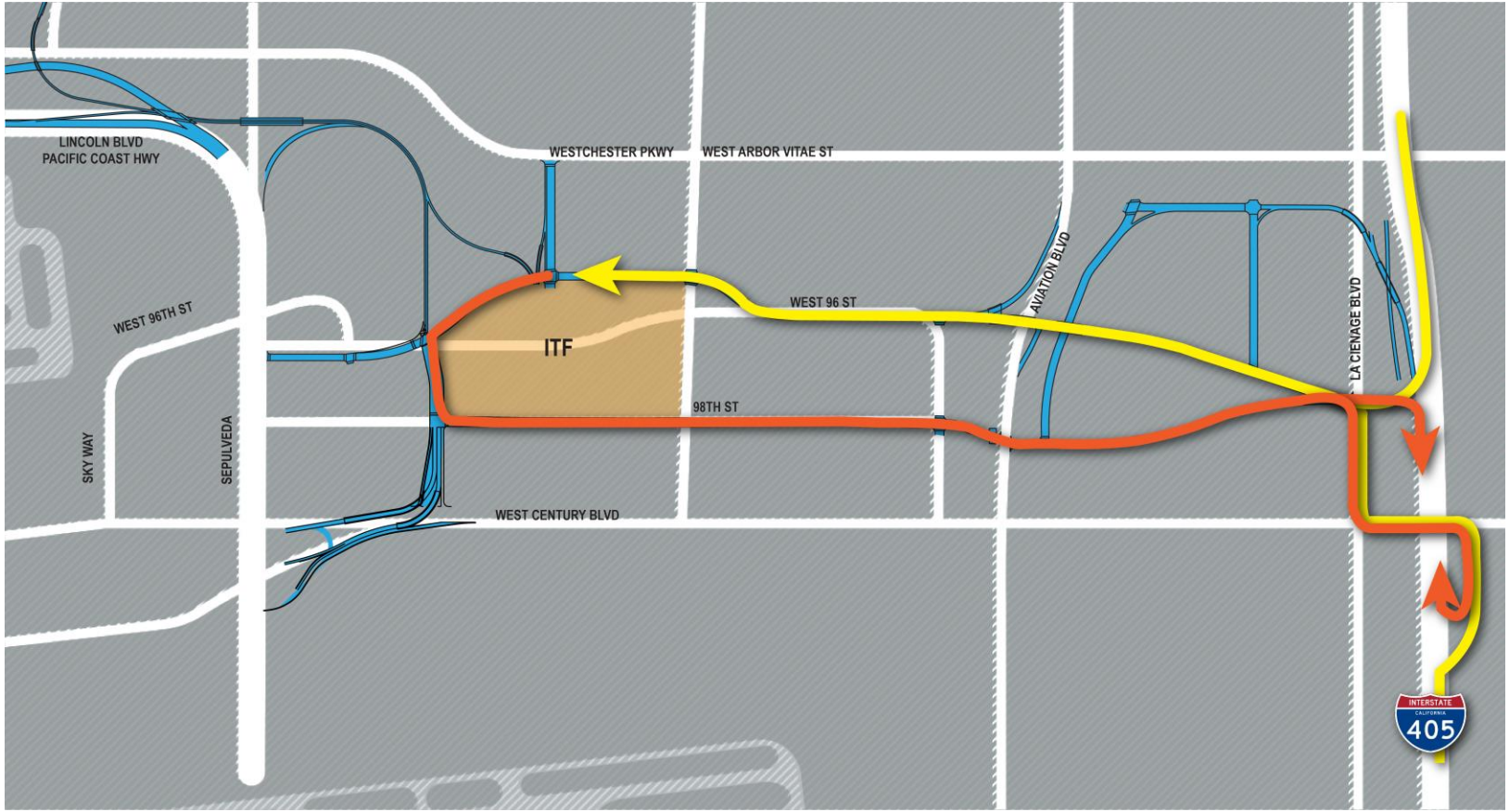
Future Traffic Flows – to/from Northwest



Future Traffic Flows – to/from the South

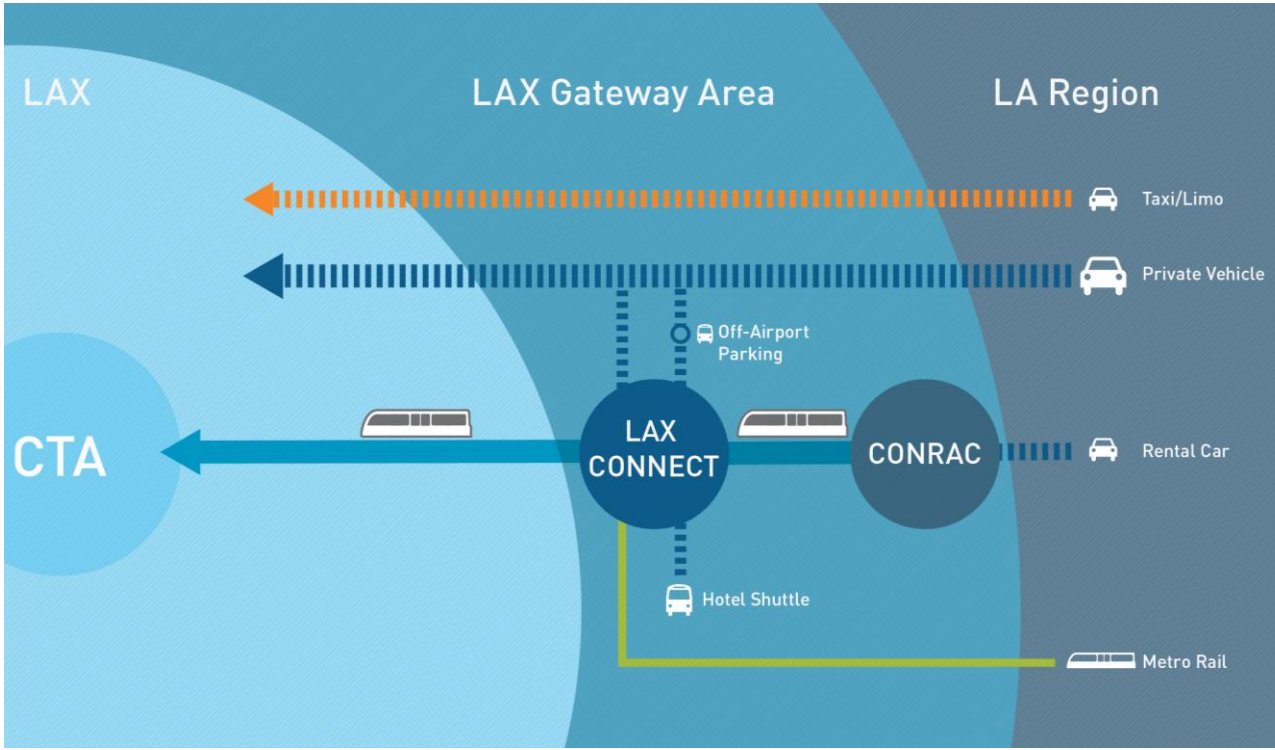


Future Traffic Flows – to/from I-405



CTA Congestion Relief – Policies

- Ground transportation Infrastructure improvements will create the opportunity for CTA congestion relief.
- CTA access policies will ultimately provide the means for maximizing and balancing the improved ground transportation system.



Key Findings

- First of a kind
- Several viable site plans
- CTA congestion relief relies on changes to resident driver behavior:
  - Intuitive roadway access
  - Convenience – such as remote ticketing and baggage-check
- Incremental ITF investment should be linked to clear added value – in terms of CTA congestion relief.
- Collateral development planning needs to follow ITF site plan and program.

Next Steps

- Develop a needs-based phasing strategy (underway)
- Refine the roadway concept (underway)
- Research potential passenger utilization of facility
- Reach out to airport stakeholders
- Align LAWA’s ground transportation regulatory and business arrangements to support the development of the plan
- Initiate environmental review
- Complete a feasibility study of remote bag-check operation
- Initiate necessary rights-of-way acquisition

The Path Forward

Key Factors of Success

- Solutions cannot simply “move the problem” to another location
- Deployment of new system ideally based on demands on CTA
- Maintain operation of airport during construction
- High adoption rate by airport users
- System must integrate into terminals seamlessly
- Buy-in from airport stakeholders

LAX Ground Transportation Program

Timeline

- Concept Analysis and Refinement
- Procure Environmental Consultants
- Stakeholder outreach

- Preferred Alternatives
- Initiate Environmental Review(s)
- Initiate Procurement (APM)

- Procurement (Other Projects)
- Design & Engineering
- Construction/ Project Delivery