The Crenshaw/LAX Project...
Foundation for Metro Green Line to LAX

- 8.5 mile extension
- Metro Exposition Line (Crenshaw Exposition) to Metro Green Line (Aviation/LAX Station)
- 6 new stations (+2 stations as construction bid options)
- New maintenance facility A
- Builds first mile of Metro Green Line Extension to Aviation/Century Station B
- Forecasted opening: 2018
Metro Green Line to LAX

Project Overview

- Goal: Connect the regional transit network to LAX
- Connection can take many forms
- Long Range Transportation Plan
  - Metro funding: $200 M (Measure R)
  - Opening year 2028 (could be as soon as 2018-2020 with funding from America Fast Forward, the airport and/or other sources)
- Additional non-Metro funding will need to be secured
Additional funding is required

- Measure R funded project: $200M ($2008) \(\rightarrow\) All rail alternatives (including light rail and automated people mover) require much more than this

- Project is contingent upon additional contributions from Los Angeles World Airports (LAWA) and/or other sources

- This planning process identifies feasible alternatives and develops preliminary cost estimates to determine funding needs

- Until funding is secured, no project can be adopted for construction

- Less expensive projects may have a higher likelihood of implementation

<table>
<thead>
<tr>
<th>Measure R</th>
<th>Additional Funding Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>$200M</td>
<td></td>
</tr>
</tbody>
</table>

**Total Cost of Alternative**
### Funding U.S. Airport Transit Systems

**March 2012**

<table>
<thead>
<tr>
<th>Airport System</th>
<th>Total Capital Cost ($M) (indexed to 2010$)</th>
<th>Funding Contributions ($M) (indexed to 2010$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Francisco (SFO)</td>
<td>$2,347</td>
<td>$770 Local</td>
</tr>
<tr>
<td></td>
<td>39.3 million*</td>
<td>BART ↔ AirTrain(APM)</td>
</tr>
<tr>
<td>New York (JFK)</td>
<td>$2,338</td>
<td>$2,338 Airport</td>
</tr>
<tr>
<td></td>
<td>46.5 million*</td>
<td>AirTrain (APM)</td>
</tr>
<tr>
<td>Miami (MIA)</td>
<td>$1,014</td>
<td>$557 Local</td>
</tr>
<tr>
<td></td>
<td>35.7 million*</td>
<td>Metro Rail ↔ MIA Mover (APM)</td>
</tr>
<tr>
<td>Minneapolis (MSP)</td>
<td>$724</td>
<td>$85 Local</td>
</tr>
<tr>
<td></td>
<td>32.0 million*</td>
<td>Metro Transit</td>
</tr>
</tbody>
</table>

*Annual Airport Passengers (2010)

59.1 million annual passengers passed through LAX in 2010
Types of Connections

Direct Light Rail Transit (LRT) Branch
- Metro goes to the airport
- Metro Green Line direct connection

Circulator
- Airport (Circulator) goes to Metro
- New transit system tailored to address the airport’s unique travel demands/operating environment

Intermediate LRT and Circulator
- Metro (LRT) and Airport (Circulator) meet in the middle

Modified LRT Trunk
- Metro goes through the airport
- Direct connection for Metro Green & Crenshaw/LAX lines
- Parallels an alignment to be constructed as part of the Crenshaw/LAX line
Modes

Light Rail Transit (LRT)

Automated People Mover (APM)

Bus Rapid Transit (BRT) (Elevated Busway)
Alignments

On-Airport (in Terminal area)

Off-Airport
Two-Stage Screening Process

Initial Connection Concepts
- Direct LRT Branch
  - Mode + Alignments
- Circulator
  - Mode + Alignments
- Intermediate LRT & Circulator
  - Mode + Alignments
- Modified LRT Trunk
  - Mode + Alignments

Stage I Screening
- Screened Alternatives (27)
  - Alternative
  - Alternative
  - Alternative

Stage II Screening
- Alternatives Carried into EIS/EIR
- Additional Funding needs to be Identified
  - Build Alternative
  - Build Alternative

March 2012
We Screen Alternatives Using Common Evaluation Criteria

Stage I – Emphasizes Feasibility

- **Mode**
  - Appropriate for Connection Type
- **Off-Airport**
  - Physical fit and constructability
  - Avoid encroachment into Runway Protection Zone (RPZ)
- **On-Airport**
  - Walking distance from station to terminal
  - Average total travel time (transit ride + walk)
  - Construction cost

Stage II – Emphasizes Performance and Cost

- **Travel Time**
- **Reliability**
- **Convenience**
- **Construction Cost**
  - (Metro only has $200M available, all rail alternatives cost much more than this)
- **Potential Environmental Impacts** (e.g., visual, traffic)
- **Operating Characteristics**
- **Constructability**
- **Compatibility with airport and transportation system plans**
Stage I
Screening
Off-Airport Options – Direct LRT Branch

* Exact route and station location dependent on future LAX plans in area
Off-Airport Options – Circulator
Off-Airport Options – Intermediate LRT & Circulator

Stage I
Stage II

98th North

Station and Route Options*

1994 SEIR

Pedestrian Bridge

* Exact route and station location dependent on future LAX plans in area
Off-Airport Options
Modified LRT Trunk

Through LAX

Connection to Existing Metro Green Line Aerial Structure near Douglas St

Airport Blvd with Circulator

Airport Blvd

Metro

Planned
LRT/Alignment Advances to Stage II
Tunnel Portal
Potential Station
Metro Green & Crenshaw/LAX Line and Station (Existing)
Metro Green & Crenshaw/LAX Line (Planned)
Metro Crenshaw/LAX Transit Corridor

March 2012
On-Airport Options*
Rail & BRT Alignments and Station Options

Aerial or Tunnel

TBIT
Tom Bradley International Terminal

Rail Alignment
Bus Alignment
Potential Station

* Apply to Direct LRT Branch, Circulator and Intermediate Connection Types
With More Stations…

- Capital Costs increase
- Walk distance and walk time decrease
- **Total** travel times (transit ride + walk)
  - decrease from 1 to 3 stations
  - but then increase with 4 or more stations
On-Airport Options – 4 Alignments Carried Forward

All rail options require additional funding

- **Lowest Rail Cost**
  - Aerial (Rail)
    - T3 T2 T1
    - Lowest Rail Cost
    - Best Average Travel Time
  
- **Balances Cost and Travel Time**
  - Aerial (Rail)
    - T3 T2 T1
    - Lowest Cost and Walk Time
  
- **Best Average Travel Time**
  - Tunnel (Rail)
    - T3 T2 T1
  
- **Lowest Cost and Walk Time**
  - At-Grade (BRT)
    - T3 T2 T1
Stage I Screening Results

Direct LRT Branch
6 Alternatives

Circulator
8 Alternatives

Intermediate LRT & Circulator
8 Alternatives

Modified LRT Trunk
5 Alternatives

27 Alternatives Carried into Stage II Screening
Stage II Screening
Trade-offs
Passenger Convenience

**Depending on future airport plans, alternatives have 5,000-10,000 additional riders who drive to the LAX area and ride to terminals.

<table>
<thead>
<tr>
<th>Alternative Connection Types</th>
<th>Number of Transfers</th>
<th>Vertical Level Changes</th>
<th>Average Travel Time Saved (min)</th>
<th>Airport Transit Riders per Day**</th>
<th>Capital Cost ($M) ($200M is available)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct LRT Branch</td>
<td>0-1</td>
<td>2-4</td>
<td>11</td>
<td>4,900-5,400</td>
<td>$540 - $1,160</td>
</tr>
<tr>
<td>Circulator (APM/BRT)</td>
<td>1</td>
<td>1-4</td>
<td>9</td>
<td>4,600-5,100</td>
<td>$624-$1,250 (APM)</td>
</tr>
<tr>
<td>Intermediate LRT &amp; Circulator</td>
<td>1-2</td>
<td>4-6</td>
<td>7</td>
<td>3,600-4,300</td>
<td>$680-$1,370 (APM)</td>
</tr>
<tr>
<td>Modified LRT Trunk</td>
<td>0-1</td>
<td>2-4</td>
<td>16</td>
<td>4,700-6,100</td>
<td>$940-$1,460</td>
</tr>
</tbody>
</table>

Average travel time saved/added dependent on station location

*APM/BRT: Automated People Mover/Bus Rapid Transit*
### Trade-offs

#### Direct LRT Branch vs. Through LAX

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Average Travel Time* (minutes)</th>
<th>Ridership** (Transit Riders per Day)</th>
<th>Capital Cost ($M) ($200M is available)</th>
<th>Constructability Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct LRT Branch</strong></td>
<td><strong>29-30</strong></td>
<td><strong>5,300-5,400</strong></td>
<td><strong>$540-$1,160</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Through LAX</strong></td>
<td><strong>25</strong></td>
<td><strong>6,100</strong></td>
<td><strong>$940-$1,130</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Average from Norwalk, Expo, and South Bay

**Add 5,000 to 10,000 for airport area park and ride passengers**
### Trade-offs

#### Alignments in the Airport Terminal Area

<table>
<thead>
<tr>
<th>On-Airport Options</th>
<th>Capital Cost ($M) ($200M is available)</th>
<th>Average Total Travel Time to Terminal (min)</th>
<th>Average Walk Dist. to Terminal (feet)</th>
<th>Potential Visual Impacts to Theme Building</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerial (Rail)</td>
<td>$620-$740</td>
<td>32.2</td>
<td>820</td>
<td></td>
</tr>
<tr>
<td>Tunnel (Rail)</td>
<td>$1,040-$1,250</td>
<td>31.5</td>
<td>820</td>
<td></td>
</tr>
<tr>
<td>Aerial (Rail)</td>
<td>$1,060-$1,270</td>
<td>31.2</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>At-Grade (BRT)</td>
<td>$110-$130</td>
<td>34.3</td>
<td>200</td>
<td>Add 5-10 minutes under severe traffic congestion</td>
</tr>
</tbody>
</table>
## Trade-offs
### Century Boulevard vs. 98th Street

<table>
<thead>
<tr>
<th>Alternative</th>
<th>98th St</th>
<th>Century Blvd</th>
<th>Average Number of Vertical Level Changes</th>
<th>Average Travel Time (minutes)</th>
<th>Capital Cost (millions)</th>
<th>Potential Impacts</th>
<th>Visual, Traffic/Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct LRT Branch</td>
<td>2</td>
<td>3.3</td>
<td>29-30</td>
<td>540-1,160</td>
<td>Visual, Traffic/Access</td>
<td>Visual, Traffic/Access</td>
<td></td>
</tr>
</tbody>
</table>

Average from Norwalk, Expo, and South Bay
Breakout Sessions

- Ten minutes per station
- Bell will ring when it is time to move to the next station
- Rotate clockwise through the tables
- Return to seats for a recap

#1 Passenger Convenience

#2 Direct LRT Branch vs. Through LAX

#3 On-Airport Alignments

#4 Century Blvd. vs. 98th Street

• Ten minutes per station
• Bell will ring when it is time to move to the next station
• Rotate clockwise through the tables
• Return to seats for a recap
Upcoming Activities

Community Workshops (February-March)

Metro Board Meeting (April)

Environmental Scoping Meetings (Late Spring)

Environmental Document Preparation (2012-2013)

Stakeholder Outreach and Coordination with LAWA