Grade Crossing Methodology

> Overview of LA Metro Grade Crossing Safety Policy
> Alignment Segments & Engineering Issues
> Milestone 1 Analysis
> Milestone 2 Analysis & Next Steps
Process Overview

Preliminary Planning
- Project Description
- Roadway Volumes
- Train Frequencies

M1
- Initial Screening
  - Initial Assessment
    - At Grade Should be Feasible
    - Further Study Required
    - Likely Grade Separation

Preliminary Engineering
- Site Conditions
  - Concept Designs
  - Traffic Control
  - Rail Operations

M2
- Detailed Analysis
  - Further Study
    - Safety Issues & Mitigations
    - Traffic Operations
    - Rail Operations

Final Engineering
- PE Level Design
  - Refined Volume Data
  - Additional Safety Information

M3
- Institutional & Policy Level Considerations
- CPUC Grade Crossing Applications

Validation
- Final Technical Findings
  - At Grade Design and Operational Requirements
  - Grade Separate

Final Decision
Milestone 1
Screening Chart

NOTES:
- ROADWAY VOLUME IS PEAK HOUR, HIGHEST PER LANE FLOW RATE
- ADAPTED FROM INSTITUTE OF TRANSPORTATION ENGINEERS INFORMATIONAL REPORT, LIGHT RAIL TRANSIT GRADE SEPARATION GUIDELINES, 1992, THRESHOLD 1 AND THRESHOLD 2 COMBINED.
## Configuration & Traffic Control

<table>
<thead>
<tr>
<th>Segment</th>
<th>Configuration</th>
<th>Traffic Control</th>
<th>LRT Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern Alignment</td>
<td>Majority Grade Separated</td>
<td>Not applicable</td>
<td>55 mph</td>
</tr>
<tr>
<td>Pacific Street</td>
<td>Street Running LRT</td>
<td>Traffic Signals with Transit Priority</td>
<td>35 mph</td>
</tr>
<tr>
<td>Randolph Street</td>
<td>Median Running LRT with Freight Track</td>
<td>Traffic Signals &amp; Railroad Devices</td>
<td>35 mph</td>
</tr>
<tr>
<td>San Pedro Subdivision</td>
<td>Freight Corridor with Frontage Road(s)</td>
<td>Railroad Devices (with Traffic Signal Preemption)</td>
<td>55 mph</td>
</tr>
<tr>
<td>Pacific Electric Right-of-Way</td>
<td>Former Interurban with Freight Track</td>
<td>Railroad Devices (with Traffic Signal Preemption)</td>
<td>55 mph</td>
</tr>
</tbody>
</table>
Northern Alignment Options
(routes and configurations under study)
Gold Line at Main St.
Expo Line at Venice
Pacific Boulevard
Median-running LRT
Expo Line at Western
Randolph Street
Median-running LRT along freight track

Randolph St.
(Median running LRT along freight track)
Metro Blue Line at Vernon

*Installation of pedestrian gates is in progress.*
San Pedro Subdivision
LRT along freight corridor

San Pedro Subdivision
(LRT along freight rail corridor with frontage roads)
Pacific Electric ROW
LRT along abandoned corridor
Pedestrian Gate at Wardlow Road
Milestone 2 / Next Steps

- Analysis Flowchart
- Transit Priority vs. Preemption
- Queue Check / Need for Preemption
- Safety Concerns and Mitigation
- Safety and Operational Trade-offs
Analysis Flowchart

Milestone 1

Milestone 2
# Safety Concerns and Mitigation

<table>
<thead>
<tr>
<th>Issue</th>
<th>Treatment</th>
</tr>
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<tbody>
<tr>
<td>Traffic Queuing</td>
<td>Anti-queuing traffic control measures; grade separate</td>
</tr>
<tr>
<td>Approach and Corner Sight Distance</td>
<td>Supplemental active warning devices; reduce train speed</td>
</tr>
<tr>
<td>Visual Obstruction/ Sign Clutter</td>
<td>Remove unnecessary signs &amp; signals</td>
</tr>
<tr>
<td>High Prevailing Traffic Speed</td>
<td>Reduce speed limit; speed warning signs; traffic control device timing</td>
</tr>
<tr>
<td>Large Truck Percentage</td>
<td>Re-route if better alternatives exist; assure adequate track clearance green provided</td>
</tr>
<tr>
<td>Heavy Pedestrian Volumes</td>
<td>Channelization, active warning devices; traffic control officers when present</td>
</tr>
<tr>
<td>Emergency Vehicle Access Route</td>
<td>Provide alternate route(s); active advance warning device</td>
</tr>
<tr>
<td>High Collision Location</td>
<td>Modify channelization and traffic control to address collision types</td>
</tr>
<tr>
<td>Gate Drive Around Potential</td>
<td>Medians, four-quadrant gates; photo enforcement</td>
</tr>
<tr>
<td>Delineation and Roadway Marking</td>
<td>Improve delineation; use retro-reflective materials</td>
</tr>
<tr>
<td>Traffic Control Observance</td>
<td>Assure signs are legible and well placed; conduct spot enforcement campaigns</td>
</tr>
</tbody>
</table>
Safety and Operational Trade-Offs

Traffic Operations

Safety

Rail Operations
Questions?