SUBJECT: SEPULVEDA PASS CORRIDOR SYSTEMS PLANNING STUDY

ACTION: RECEIVE AND FILE

RECOMMENDATION

Receive and file this interim report on the Sepulveda Pass Corridor Systems Planning Study.

ISSUE

The Sepulveda Pass Corridor (I-405 Connector) is the last of the twelve transit corridors included in the Measure R expenditure plan and is identified in our adopted Long Range Transportation Plan (LRTP) with a 2039 delivery date. As the project is undefined in terms of mode and length, we initiated a Systems Planning Study to evaluate the range of possible concepts that could be implemented. This report presents the interim findings.

DISCUSSION

The Sepulveda Pass provides a crucial transportation link across the Santa Monica Mountains between the heavy concentration of households in the San Fernando Valley and major employment and activity centers in Los Angeles County’s Westside region. The I-405 Freeway is ranked as one of the most traveled urban highways in the nation by the Federal Highway Administration (FHWA) with Average Annual Daily Traffic of 374,000 in 2010. A 13-mile stretch of the Freeway, from Getty Center Drive to the I-105 (Century Freeway), was recently ranked as the third most congested freeway segment in the United States. In addition, the US-101 and I-10 interchanges with the I-405, to the north and south respectively, consistently rank among the five most congested freeway interchanges in the country. The I-405 Sepulveda Pass Improvements Project which is currently under construction will address some of these congestion issues when it is completed in about a year. However, demand is still expected to exceed
capacity as growth in travel demand expands in this corridor and no special provisions have been included in the current construction project for transit.

The I-405 varies between four to six general purpose lanes in each direction and includes a continuous HOV lane in the southbound direction from the I-5/I-405 split in the northern San Fernando Valley to the Orange County line. The I-405 Sepulveda Pass Improvements Project, currently underway, will add a 10-mile HOV lane in the northbound direction of the I-405 between the I-10 and the US-101 freeways. This will complete the I-405 HOV lanes in both directions between the I-5 and the Orange County line.

**Systems Planning**

The current Systems Planning Study is the earliest phase of project development and precedes the traditional Alternatives Analysis Study or Environmental Impact Studies. Travel demand modeling is being conducted as well as initial rough order of magnitude (ROM) costing for a range of highway, transit and multi-modal improvements.

The Study Area being evaluated extends approximately 30 miles from the Sylmar/San Fernando Metrolink Station in the northern San Fernando Valley to the Los Angeles International Airport (LAX) (Attachment A). Transit modes being considered include heavy rail (HRT), light rail (LRT) and bus rapid transit (BRT). In addition, highway improvements that could incorporate congestion pricing strategies such as high occupancy toll (HOT) lanes in both surface and below grade configurations are being explored. We are also evaluating whether the full length of the study area is the most cost effective transportation investment area or whether a shorter segment is more cost effective.

The Measure R expenditure plan identified $1 billion for this project, which is based on the recommendations from the I-405 Sepulveda Pass Improvements Project Environmental Study conducted jointly by Caltrans and FHWA, which envisioned a BRT project that would utilize three to four direct access ramps located on both the north and south sides of the Sepulveda Pass. We are working collaboratively with our Public Private Partnership (PPP) staff in developing feasible transit and highway concepts that could be implemented with the $1 billion available through Measure R and reserved through the adopted LRTP as well as concepts that go beyond the funding presently available for the project. We are also coordinating with the staff assessing alternatives for the East San Fernando Valley North/South Transit Corridor Van Nuys and/or Sepulveda Boulevards to ensure compatibility between projects in the San Fernando Valley and with the Airport Metro Connector and Crenshaw/LAX LRT Projects to insure compatibility on the Westside and South Bay.

**Concepts Being Considered**

Attachment B shows the six system concepts that were developed to represent a range of different systems planning concepts. These progress from lower cost at-grade bus...
improvements to higher cost highway and transit options that utilize tunnels under the mountains and various configurations of highway and transit connections north and south of the Sepulveda Pass.

- **Concept #1: Van Nuys/Seepulveda BRT**
  This concept utilizes BRT technology that could serve as a southern extension of the East San Fernando Valley North/South transit corridor, if BRT is selected as the appropriate transit mode for that corridor. The southern extension would extend for six miles through the Sepulveda Pass and another 12 miles to connect to the LAX/Transit Gateway Center.

  Although a dedicated arterial bus lane would be preferred, this is challenging in many areas due to right-of-way and traffic constraints. This BRT line would therefore primarily follow arterial streets (configuration to be determined), except for a segment in the Sepulveda Pass where the BRT is envisioned to operate during peak periods on the shoulder of the I-405 Freeway.

  This would be the lowest cost concept with approximately six miles of freeway running, 12 miles in the San Fernando Valley and 12 miles on the Westside following Sepulveda Boulevard to LAX. The cost of this concept would range from $72-$82 million for the freeway improvements with bus priority treatment north and south of the Pass. The East San Fernando Valley North/South Transit Corridor project is currently exploring transit options on Van Nuys and/or Sepulveda Boulevard with $170.1 million reserved through the adopted LRTP. The total cost of the 30-mile long corridor would potentially reach $252 million.

- **Concept #2: BRT in At-Grade Freeway Managed Lanes**
  This concept utilizes BRT technology, but combines the transit improvement with the implementation of managed lanes on the I-405 Freeway for 29 miles between the I-5 split in the north San Fernando Valley to the I-105 Freeway near LAX. One additional lane would be added in the Sepulveda Pass and paired with the HOV lanes that currently exist and are in construction to create two managed HOT lanes in each direction that would also serve 3+ HOV service without tolls.

  It appears, at this time, that one additional lane in each direction could be accomplished mostly through restriping (narrow the shoulders, 11' General Purpose lanes, 12' HOT lanes) and some spot-widening within the existing Caltrans right-of-way in the southbound direction. North and south of the Sepulveda Pass the one existing HOV lane would be converted to a HOT lane with 3+ HOV service.

  Various types of bus service could utilize the managed lanes with access and egress at interim points to serve various levels of transit service including Metro Rapid, LAX Flyaway and Commuter Express Lines. Due to the steep grades over the Sepulveda Pass and the need to maintain HOT lane speeds, buses using these lanes would need to maintain posted speeds using larger engines.
Standard buses would need to use general purpose lanes in the steeper climbing segments of the Sepulveda Pass.

It is anticipated that this alternative could be completed within the $1 billion reserved in the LRTP. In addition, the tolling component could potentially help to subsidize further improvements such as direct access ramps at selected locations and connections to the intersecting transit lines.

- **Concept #3: BRT with Aerial/Viaduct Managed Lanes**
  This concept is being carried to reflect the current Caltrans’ Corridor Concept Plan which calls for the future construction of an aerial viaduct above the I-405 in the Sepulveda Pass between the US-101 and I-10. Although this is the Caltrans adopted plan for future upgrades of the I-405 Freeway, Caltrans and FHWA project did not select this option for the current widening project, but rather chose in favor of at-grade freeway improvements. Similar to Concept #2, two HOT lanes in each direction would be built on an elevated structure through the Sepulveda Pass, freeing the existing at-grade HOV lanes to be used as a dedicated busway.

  Various types of bus service could utilize the bus lanes with access and egress at interim points to serve various levels of transit service including Metro Rapid, LAX Flyaway and Commuter Express Lines. It is anticipated that this alternative would carry several fundamental drawbacks and seismic safety concerns which have been previously documented in the I-405 HOV Viaduct Feasibility Study Memo included in the I-405 Sepulveda Pass Improvements Project Environmental Study. As a result, this concept will be documented in the final report for this study, but is not expected to be carried forward into future phases of analysis for further performance, feasibility and cost evaluations.

- **Concept #4: BRT with Tolled Highway Tunnel**
  This concept consists of a tunnel beneath the Sepulveda Pass with four toll lanes (two per direction) that would extend for approximately 11 miles with a northern portal at US-101 and a southern portal near Venice or Santa Monica Boulevard. The northern portal would have connectors to the west side of US-101 as well as from further north on the I-405.

  Metro’s Tolling Policy, adopted in July 2009 for the I-10 and I-110 Express Lanes project, have been set with the minimum and maximum toll rates at $0.25 and $1.40 per mile, respectively (scheduled to open in October 2012 and February 2013, respectively). Tolls will vary based on traffic levels (demand) in the corridors to ensure free flowing (45 mph or greater) conditions, even during peak periods. A parallel freeway-oriented BRT similar to the one for Concept #2 could be operated either in the tunnel or on the surface HOV lane.

  Costs for this tunnel would be comparable to a similar tunnel project that is under construction in Seattle. The Alaska Highway Tunnel is 1.8 miles in length and is
being constructed as a 58’ diameter large bore tunnel with two travel lanes in each direction at a cost of approximately $1.0 billion per mile. Comparable costs per mile could be expected for an 11 mile tunnel in the Sepulveda Pass.

- **Concept #5: Fixed-Guideway LRT**
  This concept utilizes LRT technology that could serve as a southern extension of the East San Fernando Valley North/South Transit Corridor, if LRT is selected as the appropriate transit mode. The route could extend in a tunnel beneath the mountains from either Van Nuys or Sepulveda Boulevards in the Valley for at least six miles to a portal on the Westside that could be located near Sunset Boulevard at the UCLA Campus, or farther south in a tunnel to the Metro Purple Line or Expo Line. Ultimately, the full LRT project could extend for up to 29 miles, if it were to extend from near the Sylmar/San Fernando Station in the north San Fernando Valley to the Century/Aвиation Station near LAX where it could potentially interline with the Crenshaw/LAX or Metro Green Line.

  Costs for a LRT tunnel could be compared to the Eastside Gold Line Extension tunnel segment, the Westside Subway Extension or the Regional Connector LRT Project. Based on these projects, two 20-foot diameter tunnels could range between $300-$400 million per mile. LRT segments above ground could be compared to the Crenshaw/LAX LRT or Expo LRT which range from $75-$200 million per mile.

- **Concept #6: Integrated 58-Foot Tunnel Concept (Hybrid)**
  This concept borrows from concepts currently being developed by the PPP Team for a large bore tunnel approximately 60-feet in diameter that would be operated as a PPP by a toll concessionaire who would be charged with the responsibility to finance, build, operate and maintain the project in return for revenues generated by the toll facility and any additional public subsidy that might be required. The project could operate solely as a highway tunnel with transit buses or as a highway tunnel with a rail transit component. There would be intermediate access points at Santa Monica Boulevard and Howard Hughes Parkway. In order to maximize profitability, the rail component is envisioned by the PPP team to operate as a private shuttle that would begin near the Van Nuys Metrolink Station and continue south into the tunnel and continue through the Westside to LAX.

Attachment C is a matrix comparing the six concepts above in terms of their profile, PPP potential, ROM costs in 2012 dollars (excluding access ramps and rolling stock), transit and freeway/tollway characteristics.

**NEXT STEPS**

We will continue working with the PPP and the East San Fernando Valley Transit Corridor planning staffs in evaluating the systems planning concepts. The final concept
report is anticipated to be completed in Fall 2012. A Livability grant application has been submitted to FTA for the Alternatives Analysis Study.

ATTACHMENTS

A. Map of the Sepulveda Pass Systems Planning Study Area
B. Maps of the Systems Planning Study Concepts
C. Comparative Table

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Concept #1: Van Nuys/Sepulveda BRT
Concept #2: At-Grade Freeway Managed Lanes

Legend:
- Managed Lanes (HOT 3+)
- Bus Rapid Transit
- Direct Access Ramps
- Ingress/Egress
- Transfer Station

ML Route Length: 29.0 Miles
BRT Route Length: 28.5 Miles

Sepulveda Pass Corridor Systems Planning Study
Concept #3: Highway Aerial Managed Lane

Viaduct Length: 9.9 Miles
BRT Route Length: 21.2 Miles

Legend
- Bus Rapid Transit
- Highway Viaduct
- North Terminus
- Potential South Terminus
- BRT Station
- Existing Transit Line
- Future Transit Line
Concept #5: Fixed-Guideway Light Rail Tunnel

LRT Route Length: 27.8 Miles
Tunnel Length: 5.6 Miles

Legend

- LRT At-Grade
- LRT Tunnel
- Tunnel Portal
- In-Line Station

Existing Transit Line
Future Transit Line

Sepulveda Pass Corridor Systems Planning Study
Concept #6: Integrated 58-Foot Tunnel Concept (Hybrid)

Legend
- Private Shuttle Tunnel
- Highway Tunnel
- Access Point
- Tunnel Portals
- Directional DART's
- In-Line Stations
- Existing Transit Line
- Future Transit Line

Shuttle Tunnel Length: 20.7 Miles
Highway Tunnel Length: 21.0 Miles
## Comparative Analysis

### Concept Families

<table>
<thead>
<tr>
<th>Profile</th>
<th>Concept (Lane configurations in each direction)</th>
<th>1 Sepulveda BRT</th>
<th>2 Managed Lanes</th>
<th>3 Highway Viaduct</th>
<th>4 Toll Tunnel</th>
<th>5 Fixed Guideway Rail</th>
<th>6 Highway and Shuttle Tunnel</th>
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</thead>
<tbody>
<tr>
<td>P3 Potential</td>
<td>At-Grade</td>
<td>No</td>
<td>Maybe</td>
<td>Maybe</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
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<td>ROM Costs (excl. access ramps and rolling stock) (2012 $)</td>
<td>$72 - $2.5 M</td>
<td>$40 - $50 M</td>
<td>N/A</td>
<td>$10.5 - $12.5 B (one single bore tunnel segment)</td>
<td>$4.5 - $5.5 B (at-grade plus single bore tunnel segments)</td>
<td>Up to $16 - $18 B (two single bore tunnels)</td>
<td></td>
</tr>
<tr>
<td>Transit Mode</td>
<td>Rubbertine bus with signal priority, queue jumpers</td>
<td>Rubbertine bus with DARs*</td>
<td>Rubbertine bus</td>
<td>Rubbertine bus with DARs</td>
<td>At-grade Light Rail Transit with tunnel section under Santa Monica Blvd.</td>
<td>Privately operated rail shuttle in tunnel</td>
<td></td>
</tr>
<tr>
<td>Approximate Route</td>
<td>Sylmar Metrolink to Century/Aviation</td>
<td>Sylmar Metrolink to Century/Aviation</td>
<td>Sylmar Metrolink to Expo Line</td>
<td>Ventura Blvd to Santa Monica Blvd. or Venice Blvd.</td>
<td>Sylmar Metrolink to Century/Aviation</td>
<td>Van Nuys Metrolink to Century/Aviation</td>
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</tr>
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<td>Exclusive Lane or Guideway</td>
<td>Partial</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
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<tr>
<td>Metro Rail or Bus Guideway Connectors</td>
<td>ESFV, Orange, Purple, Expo, Crenshaw/LAX, GreenLine</td>
<td>ESFV, Orange, Purple, Expo, Crenshaw/LAX, GreenLine</td>
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<td>None</td>
<td>ESFV, Orange, Purple, Expo, Crenshaw/LAX, GreenLine</td>
<td>ESFV, Orange, Purple, Expo, Crenshaw/LAX, GreenLine</td>
<td></td>
</tr>
<tr>
<td>Freeway/Interchange</td>
<td>Approximate Route Length</td>
<td>6 miles (freeway shoulder)</td>
<td>30 miles</td>
<td>10 miles (arterial)</td>
<td>10 miles (tunnel)</td>
<td>28 miles (3.6 miles tunnel)</td>
<td>16 miles (twin tunnel)</td>
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<td>Lane Configuration</td>
<td>Use of freeway shoulder over the Sepulveda Pass and Sepulveda</td>
<td>5 GP + 2 HOT (Shermaman Way - 1-10)</td>
<td>5 GP + 2 HOT (viaduct from Magnolia to 1-10)</td>
<td>2 Toll Lanes (each direction)</td>
<td>N/A</td>
<td>2 Toll Lanes (each direction)</td>
<td></td>
</tr>
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<td>Lane Policies</td>
<td>Peak period only use of freeway shoulders</td>
<td>HDT 3+</td>
<td>HDT 3+</td>
<td>Tollway (excludes trucks)</td>
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<td>Tollway (excludes trucks)</td>
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</tr>
<tr>
<td>Direct Access Ramps</td>
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<td>Orange Line (bus only), US 101, Santa Monica, Howard Hughes</td>
<td>None</td>
<td>Orange Line via flyover, US 101 direct connector</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

* DAR = Direct Access Ramp

Sepulveda Pass Corridor Systems Planning Study