Congestion Hot Spots for the SR-91 / I-605 / I-405 Corridor
Feasibility Analysis and PSRs

MULTI-MODAL TRANSPORTATION PROJECTS IMPACTS, ANALYSIS & RESULTS

By Jerry R. Wood
Director of Engineering
Gateway Cities Council of Governments
for OLDA/PEROW
September 12, 2012
WHAT REGIONAL TRANSPORTATION PROJECTS AFFECT GATEWAY CITIES?

Legend

2012 Regional Transportation Projects

- I-710 EIR/ES (with freight corridor)
- I-5 EIR/ES [I-605 south to County Line] – Construction Project
- I-5 EIR/ES [I-605 to I-210] EIR/ES
- Orange and Los Angeles Intercounty Transportation Study
- SR-60 Car-Pool Lanes Additions
- East Side Light Rail Study [alignment not selected]
- Orange Line Transit Study ETW/Santa Ana Branch Study [approximate alignment]
- ITS Implementation Plan for Goods Movement
- SCAG Comprehensive Regional Goods Movement Plan and Implementation Strategy [no alignment selected]
- Metrolink Expansion
- California High Speed Rail
- Amtrak
- Green Line
- Park-N-Ride Lots
- Telegraph Rd. Signal Synchronization Project, typical [other arterial highway signal synchronization projects not shown]
- Local and Regional Transit [Bus] Service
- SR-91/605-405 Congestion Hot-Spot Projects
- SR-22/405/5-805 Car-Pool Connector Ramp Project [by OCTA]
- SR-91 Lane Additions [by OCTA]
- I-110 Toll Lane Addition
- BVSP or UP mainline track additions or change for freight trains
- I-405 Improvements [by OCTA]
**HOW IS GATEWAY CITIES INVOLVED WITH ALL THESE REGIONAL TRANSPORTATION PROJECTS?**

<table>
<thead>
<tr>
<th>FORMED PARTNERSHIPS</th>
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<tr>
<td>Partnerships have been formed with many other agencies.</td>
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<table>
<thead>
<tr>
<th>FORMED CORRIDOR PROJECTS</th>
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<tbody>
<tr>
<td>Corridor Projects have been formed to address various projects as follows:</td>
</tr>
<tr>
<td>- I-5</td>
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<tr>
<td>- I-710</td>
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<tr>
<td>- SR-91/I-605/I-405</td>
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<tr>
<td>- Orange Line Development Authority and PE/W. Santa Ana Branch</td>
</tr>
<tr>
<td>- LOSSAN (High Speed Rail, Metrolink, Amtrak)</td>
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<tr>
<td>- Light Rail (East Side Light Rail-Phase II)</td>
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<td>- Freight Corridor</td>
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<thead>
<tr>
<th>ADDRESSED OTHER REGIONAL TRANSPORTATION PROJECTS</th>
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<tr>
<td>Other regional transportation projects are also being addressed, such as:</td>
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<tr>
<td>- Blue Line – Light Rail</td>
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<tr>
<td>- Green Line – Light Rail</td>
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<tr>
<td>- Arterial Highways</td>
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<tr>
<td>- Intelligent Transportation Systems (Technology)</td>
</tr>
<tr>
<td>- I-405 Toll Lanes <em>(Possible)</em></td>
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<tr>
<td>- LA-Orange County Intercounty Transportation Project</td>
</tr>
<tr>
<td>- Local and Regional Bus Service</td>
</tr>
<tr>
<td>- Park-N-Ride Lots</td>
</tr>
<tr>
<td>- Transit Centers</td>
</tr>
<tr>
<td>- Non-Motorized Transportation</td>
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</tbody>
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<table>
<thead>
<tr>
<th>AIR QUALITY &amp; HEALTH</th>
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<tbody>
<tr>
<td>Air Quality and Health is the number one issue for Gateway Cities, and is being addressed with the following projects:</td>
</tr>
<tr>
<td>- I-710 Air Quality/Health Risk Assessment</td>
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<tr>
<td>- Gateway Cities Air Quality Action Plan</td>
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<tr>
<td>- Sustainable Communities Strategies</td>
</tr>
</tbody>
</table>
Gateway Cities addresses all of the transportation issues and projects with a strategic approach as shown on this diagram.

- The various projects are grouped into categories and addressed individually and then collectively to determine inter-relationships and synergies.
- Each piece is currently being evaluated and will be brought together in the Gateway Cities Transportation Strategic Plan, now underway.

**WHAT’S STILL MISSING?**

- Goods Movement Coordination with Logistic Industry Participation (underway)
- State/Federal Agencies Participation
- Additional Funding and Financing for all Infrastructure Improvements (been initiated)
- Zero-Emission Transportation Technology Implementation/Business Plan (to be initiated soon)
SNAP-SHOT and STATUS OF TRANSPORTATION INITIATIVES & PROJECTS IN GATEWAY CITIES

TRANSPORTATION TECHNOLOGY
- Intelligent Transportation Systems (ITS) Integration Plan for Goods Movement c/2008
- ITS Implementation Plan pp/pc/2012
- Zero Emissions Vehicle Transportation pp
- Transportation System Management/Transportation Demand Management Projects (TSM/TDM) pp/pc/2012
- ITS Projects pp

AIR QUALITY INITIATIVES
- Gateway Cities Air Quality Action Plan pp/pc/2012
- POLB and POLA Clean Air Action Plan (CAAP) uwo-c/2006
- Railroad Equipment Upgrades uwo
- GCCOG as Sub-Regional Sustainable Communities Strategy SB375 (and AB 32) Delegation c/2011
- I-710 Air Quality/Health Risk Assessment pc/2012
- I-710 Freight Corridor with Zero-Emission Vehicles pp-uw

GOODS MOVEMENT
- Grade Separations uwo
- Main Line Track Additions uwo
- Rail Yards uwo
- SCAG Goods Movement Study c/2012
- I-710 Freight Corridor P3 study uwo

LEGEND
- c = completed
- pp = planned project
- pc= projected completion
- uw = underway
- uwo = underway by others

WHAT’S STILL MISSING?
- Goods Movement Coordination with Logistic Industry Participation uw
- State/Federal Agencies Participation uw
- Additional Funding for All Infrastructure Improvements uw
- Zero-Emission Transportation Technology Implementation / Business Plan / Demonstration Projects pp

*SEE FOLLOWING SLIDES FOR ADDITIONAL DETAILS ON ALL TRANSPORTATION INITIATIVES.
### TRANSIT & MULTIMODAL INITIATIVES

- **High Speed Rail** *currently underway by others*
- **Metrolink** *currently underway by others*
- **Amtrak** *currently underway by others*
  *Being examined together in the LOSSAN Corridor*
- **PE/W. Santa Ana Branch Study**
  *projected completion date/2012*
- **Orange Line Development Authority Studies (OLDA)**
  *underway*
- **Eastside Extension Study**
  *projected completion date/2012*
- **Local, Sub-Regional and Regional Bus Service Improvements**
  *underway*
- **Light Rail and Bus Services, including:**
  - **Green Line**
  - **Blue Line**
  - **Orange Line** *underway*
91/605/405 TRANSPORTATION STUDY and its CENTRAL ROLE IN REGIONAL TRANSPORTATION PLANNING

91-605-405 TRANSPORTATION INITIATIVES

- 91/605 Needs Assessment completion date/2005
- 91/605/405 Initial Corridor Studies completion date/2008
- 91/605/405 Congestion “Hot Spot” Projects and Feasibility Analysis projected completion date/2012-2013
The 91/605/405 Feasibility Study includes:

- Developing numerous traffic models for the study area with various transportation options
- Developing geometric improvement plans for I-405, I-605 and SR-91
- Analysis of about 200+ major intersections
- Coordinating with other studies
- Developing impacts of multi-modal projects on the study area
- Developing a comprehensive site list of all other existing and proposed transportation projects that affect the study area
- Determining congestion Hot Spots
- Analyzing potential funding sources

**Status – completion late 2012 or early 2013**

The 91/605/405 study area transportation issues are significantly impacted by a lot of other transportation projects.
WHAT DOES THE 91/605/405 FREEWAYS CONGESTION LOOK LIKE IN THE FUTURE?

91/605/405 Congestion

- No Build Worst Case Peak Hour Summary
- Future Freeway Congestion in 2035

91/605/405 Congestion Analysis Improvement Concepts:

- To address anticipated congestion, travel demand model runs were prepared for:
  - Existing
  - No Build 2035
  - No Build 2035 plus North/South I-710 Freight Corridor
  - 2035 Improvement Concept “A”
For Concept “A” Improvements include:

- Generally one lane in each direction on freeway corridors
- Various replacement/addition of auxiliary lanes
- No significant ramp reconfigurations
- Freight corridor ramps from I-710 to SR 91 East

91/605/405 Initial Model Run Analysis Summary for Concept “A” Only

<table>
<thead>
<tr>
<th>Freeway VMT &amp; Delay</th>
<th>2035 No Build</th>
<th>North/South Freight Corridor</th>
<th>Corridor Improvement Concept ‘A’</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trucks VMT</strong></td>
<td></td>
<td>+1%</td>
<td>+6%</td>
</tr>
<tr>
<td><strong>Autos VMT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>VMT (1000's)</strong></td>
<td>8,000</td>
<td>8,000</td>
<td>8,000</td>
</tr>
<tr>
<td><strong>Delay (HRS-1000s)</strong></td>
<td></td>
<td>-3%</td>
<td>-9%</td>
</tr>
<tr>
<td></td>
<td>200</td>
<td>180</td>
<td>160</td>
</tr>
</tbody>
</table>

- Trucks VMT
- Autos VMT
- Trucks Delay
- Autos Delay
91/605/405 2035 INTERSECTIONS LEVEL OF SERVICE (LOS) ANALYSIS TRAFFIC MODELING RESULTS

- Completed LOS analysis using HCM
- 200+ arterial intersections and ramp locations
- 40 to be selected for further review
- Looked at “LOS Only” and “Multiple Variables”

Assessed multiple attributes:
- LOS (existing and future 2035)
- Change in vehicle delay
- Change in volume/capacity
- Total peak hour volume
- Change in peak hour volumes
- Queue length

91/405/605 AM Peak Hour Intersection LOS

91/405/605 PM Peak Hour Intersection LOS
NOTE:
These 400 to 500 intersections have all been modeled by various corridor projects and about 150 are currently proposed to be improved.
To understand the impacts of other transportation projects, the following 91/605/405 Traffic Model Runs were also prepared.

- **Traffic Model Runs Completed:**
  - Existing
  - No Build 2035
  - No Build 2035 plus North/South I-710 Freight Corridor and East/West Freight Corridor
  - 2035 No Build Plus Multimodal Improvements
  - 2035 No Build Plus Various Express Lane Alternatives
  - 2035 Improvement Concept “A”
  - 2035 Improvement Concept “B”
  - 2035 Improvement Concept “C”
  - Multi-Modal Run
  - Arterial Improvement Concepts
The traffic model runs were conducted to evaluate the potential benefits and impacts associated with implementing known and a “maximum potential” set of multi-modal improvements in addition to geometric improvements to the freeways.

- 18 official traffic model runs completed
- Many more “testing” traffic runs conducted
- Model runs focused on:
  - No-build baseline scenario
  - Concepts A, B and C geometrics
  - Express Lanes
  - HOV Connectors
  - Multi-modal investments
  - ITS
  - Freight Corridor and other freight improvements

Specifically: How will the freeway and arterial system operate with the inclusion of the maximum potential combination of other transportation improvements and programs?
The traffic model runs were conducted to evaluate the potential benefits and impacts associated with implementing known and a “maximum potential” set of multi-modal improvements in addition to freeways geometric improvements.

Specifically: how will the freeway and arterial system operate with the inclusion of the maximum potential combination of other improvements and programs?

- Study Area has low transit services as compared to rest of L.A. County
- Study Area trip growth from Existing-to-2035 No Build is approximately 10%
- A few major transit projects are planned for Study Area

QUESTION: What effect will transit improvements have on Study Area congestion?
To fully understand impacts of other transportation projects as part of the 91/605/405 study, the multi-modal study was prepared. The multi-modal study assessed the existing, future or potential capabilities of alternative modes of transportation with the following objectives:

- **To reduce or relieve or impact traffic on freeway and arterial facilities**
  - and to
- **Understand the relationships among various multi-modal improvements and the freeway and arterial systems**
Definition of Trip Types Studied

- **Internal Trips** – Trips with one or both ends within Gateway Cities study area such as someone who lives/works/shops here.
- **Through Trips** – Trips which pass through Gateway Cities study area without stopping – generally on the freeway, but could also be on some arterials.

*Note: Various multi-modal improvements affect internal vs. through trips differently*

Three Types of Outcomes

1) Reducing “internal” auto trips via shifting them to other modes or eliminating them
2) Reducing “through” auto trips via shifting them to other modes.
3) Shift trips to other facilities (e.g. truck/freight corridors, HOV lanes) from general purpose freeway lanes and reducing vehicle delay (Intelligent Transportation Systems or Toll Facilities).

Multi-Modal Analysis Included:

- **Passenger Rail Projects**
  - California High Speed Rail (HSR) (new service)
  - Pacific Electric Right of Way/West Santa Ana Branch Transit Line (new service)
  - Metrolink (service improvements)
  - Amtrak (service improvements)
  - Metro Gold Line LRT East Extension Phase II
- **Bus Service Expansion**
- **Non-Motorized Transportation (Pedestrian/Bicycle) Usage**
- **New HOV-HOV Connectors**
- **Express Lanes** (High Occupancy/Toll (HOT) Managed Lanes)
- **Freight Related Transportation Improvements** (SCIG, ICTF and East/West freight corridor are included in Run 20, but not Run 19)
- **Transportation Demand Management**
- **Intelligent Transportation Systems**
WHAT ARE THE MAJOR NON-ROADWAY PROJECTS?

- Improvements to existing transit service (bus, commuter rail)
- Potential major capital investment:
  - Gold Line Eastside Extension: $1.65 Billion
  - Green Line Norwalk Extension: $360 million
  - High-Speed Rail (plus Metrolink and Amtrak)
  - PEROW
  - Other major transit projects fall outside study area
- Travel Demand Management
  - Gateway SCS: has potential for 8% reduction in employee commute trips which results in reduction of total trips ~1%
WHAT ARE THE MODELING RESULTS FOR MAXIMUM INVESTMENTS IN OTHER TRANSPORTATION MODES?

Model Run 19 shows these results:

- Test freeway concepts with other regional improvements
- **Run 19:**
  - Concept A Highway Improvements, plus
  - Maximum investment in other modes and programs

**FREEWAYS**

- Combined Benefit to **Delay** = 18% to 22% over 2035 baseline (No-build)
- Thus, up to 22% reduction in overall vehicle delay on freeways
- About half of reduction due to Concept B, half due to other multi-modal improvements
- Serve 6% more Vehicle Miles Travelled

**FREeways**

<table>
<thead>
<tr>
<th>VMT</th>
<th>DELAY</th>
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<tr>
<td>2035 No Build</td>
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<tr>
<td>Corridor Improvement Concept ‘A’</td>
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</tr>
<tr>
<td>Maximum Multimodal Improvements (Run 19)</td>
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</tr>
<tr>
<td>8000</td>
<td>120</td>
</tr>
<tr>
<td>9000</td>
<td>160</td>
</tr>
<tr>
<td>1000</td>
<td>200</td>
</tr>
</tbody>
</table>

- **VMT (1000’s):**
  - Auto VMT
  - Truck VMT
- **Delay (Hrs. – 1000’s):**
  - Auto Delay
  - Truck Delay
WHAT ARE THE MODELING RESULTS FOR MAXIMUM INVESTMENTS IN OTHER TRANSPORTATION MODES? (continued)

Model Run 19 results:

**ARTERIALS**

**VMT**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Auto VMT</th>
<th>Truck VMT</th>
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<tbody>
<tr>
<td>2035 No Build</td>
<td></td>
<td></td>
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<tr>
<td>Corridor Improvement Concept 'A'</td>
<td>-4%</td>
<td>-6%</td>
</tr>
<tr>
<td>Maximum Multimodal Improvements (Run 19)</td>
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</table>

**DELAY**

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<tr>
<td>Corridor Improvement Concept 'A'</td>
<td>-9%</td>
<td>-18%</td>
</tr>
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<td>Maximum Multimodal Improvements (Run 19)</td>
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</tbody>
</table>

**ARTERIAL RESULTS**

- Combined Benefit to Delay = 18% to 22% over 2035 baseline (No-build)
- Thus, up to 22% reduction in overall vehicle delay on freeways
- About 10% of reduction due to Concept B, half due to other multi-modal improvements
- Reduces Arterial Vehicle Miles Travelled by up to 8%
SUMMARY - MULTI-MODAL IMPROVEMENTS
ALTERNATIVE MODE POTENTIAL AUTO TRIP REDUCTION

2035 No-Build Study Area Mode Split

Auto Trips 79.4%

Bus Transit 1.3%
Bike 1.0%
Work at Home 0.8%
Rail Transit 0.4%
Walk 15.1%
Truck 2.0%

Auto Trips Reduced 6.4%

2035 with Maximum Investment Study Area Mode Split

Auto Trips 73%

Bus Transit 0.9%
Bike 1.3%
Work at Home 1.2%
Rail Transit 1.4%
Walk 20.0%
Truck 2.0%

2035 Potential for Alternative Modes to Reduce Daily Study Area Trips (Max. Invest.)

Study Area Mode Split (2035)

Walk 4.9% reduction
Work at Home 0.6% reduction
Bike 0.3% reduction

Potential Auto Trip Reduction from Other Modes

*Rail Transit less the shift from bus transit
SUMMARY - MULTI-MODAL IMPROVEMENTS
TRAFFIC MODEL RUNS

- Rail Transit: 1.0%
- Bus Transit: -0.4%
- Non-Motorized: 5.2%
- TDM: 0.6%
- Total = 6.4%

2035 “Internal” Auto Trips Reduced by Alternative Modes (Max. Invest.)

- Amtrak: 0.4%
- Metrolink: 5.9%
- California HSR: 2.9%
- PEROW: 4.6%
- Total = 9.0%

All Daily Through Trips = 650,000

2035 “Through” Trips Reduced by Other Modes (Max. Invest.)
Maximum Multi-Modal Investment could reduce future “internal” auto trips by approximately 6%.
Largest reduction due to increase in walk and bike.
Walk and bike are local trips and do not reduce freeway volumes.
Through trips could be reduced by 9% (~60,000 daily trips) due to Amtrak, Metrolink, HSR, PEROW.
N/S Freight Corridor could potentially reduce up to 10,000 trucks off of SR-91, up to 13,000 trucks off of I-605, and up to 5,000 trucks off of I-105.
Transit station expansion will impact local streets while facilitating transit usage.
Potential Hot Spots for Analysis

- Growth in transit ridership
- Potential demand for parking
- Access issues
- Surrounding land use considerations
- I-605/Washington Boulevard: future Gold Line Extension Station
- I-105/I-605: Existing termination of Green Line
- Norwalk/Santa Fe Springs Station:
  - Metrolink
  - High Speed Rail
  - Green Line Extension
Complete Phase I Strategic Transportation Plan  
*completed 2012*

- List of all transportation projects
- Qualitative analysis of inter-relationships between major transportation projects
- Funding sources development and evaluation

Begin Phase II Strategic Transportation Plan  
*to be completed in 2013*

- Traffic Modeling *(micro-simulation combined with travel demand projects)* for all of Gateway Cities
  - At least 25 traffic model runs *(for all transportation projects and various combinations of options)*
- Develop funding / financing plan for transportation projects
- Complete by end of 2013 (or early 2014)
- Use as tool for transportation coordination between all transportation projects and for sustainability analyses and coordination
Thank you

Questions?

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