Air Quality, Health Risk & Greenhouse Gas Technical Studies Key Findings

presented to the
Technical Advisory Committee
January 18, 2012
<table>
<thead>
<tr>
<th>Technical Studies Briefing Agenda</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Project Purpose &amp; Need</td>
</tr>
<tr>
<td>• Project Alternatives</td>
</tr>
<tr>
<td>• Air Quality Background</td>
</tr>
<tr>
<td>• Key Analyses</td>
</tr>
<tr>
<td>• Project Findings &amp; Mitigation Strategies</td>
</tr>
<tr>
<td>• Analysis Linkage with Community Impact Assessment (CIA) and DEIR/DEIS</td>
</tr>
</tbody>
</table>
Project Purpose and Need

1. Improve air quality and public health
2. Improve traffic safety
3. Provide a modern design for the I-710
4. Address projected traffic volume increase
5. Address projected growth in population, employment and economic activity related to goods movement
Project Alternatives Review

No Build Improvements
- Planned and Committed Projects in 2008 RTIP
- Enhanced Goods Movement by Rail
- Clean Trucks Program
- Expanded Night Gate Ops at Ports
- I-710 Pavement Rehabilitation
- Traffic Signal coordination

TSM/TDM and ITS
- Ramp Metering
- Improved Arterial Signage
- Peak Period Parking Restrictions
- Increased Transit Service
- Upgraded Traffic Signals (ITS)

Arterial System Improvements
- Signal Timing Improvements
- Local Arterial Intersection Improvements at 42 Locations

I-710 Widening
- Widen the I-710 up to 10 Lanes
- Modernize Geometric Design of all of the Local I-710 Interchanges

Freight Corridor
- Separate Four-Lane Freight Corridor
Air Quality and Health Risk Background

- SCAQMD Air Quality Management Plan
  - Air quality will improve as Plan is implemented
  - New standards will require new plans

- SCAQMD MATES III
  - Highest risk areas in port areas, goods movement corridors

- San Pedro Bay Ports’ Clean Air Action Plan (CAAP)
  - Goal: 85% reduction in risk by 2020 (forecast: 74% reduction)
# Brief Review of AQ/HRA Analyses

<table>
<thead>
<tr>
<th>Typical EIR/EIS</th>
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<tr>
<td>✓ Carbon Monoxide (CO) quantitative assessment and local “hotspot” dispersion modeling of CO concentrations for conformity analysis</td>
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<tr>
<td>✓ PM2.5/PM10 (particulate matter/dust) <em>qualitative</em> assessment for conformity analysis</td>
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<tr>
<td>✓ Diesel Exhaust qualitative assessment (identify sensitive receptors)</td>
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<tr>
<td>✓ Mobile Source Air Toxics (MSAT) qualitative assessment</td>
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<tr>
<td>✓ Construction impacts (identify standard emission/dust control measures)</td>
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<table>
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<tr>
<th>I-710 EIR/EIS</th>
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<tr>
<td>✓ Greenhouse Gases quantitative assessment</td>
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<tr>
<td>✓ Construction emissions quantification (total project)</td>
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<tr>
<td>✓ Full dispersion modeling of ambient concentrations of criteria pollutants near the I-710</td>
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<tr>
<td>✓ Full dispersion modeling health risk assessment for six Priority MSATs near the I-710</td>
</tr>
<tr>
<td>✓ Qualitative Ultrafine Particulate incremental impact analysis</td>
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<tr>
<td>✓ Qualitative PM2.5 Mortality incremental impact analysis</td>
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I-710 Air Quality Study Areas
Key Analyses

Air Quality and Health Risk: Putting It All Together
Project Alternative Incremental Impact Changes for all Analyses

- Emissions
  - NOx
  - CO
  - PM$_{2.5}$
  - PM$_{10}$
  - VOCs
  - SO$_x$
  - Air Toxics

- Pollutant Concentrations
  - NO$_2$
  - CO
  - PM$_{2.5}$
  - PM$_{10}$

- Health Risk
  - Cancer Risk
  - Hazard Indices
    - (Acute, Chronic)

- qualitative in italics
Traffic Emissions

- **Exhaust emissions:**
  - CARB models, accounts for recent regulations
  - Includes tire, brake wear

- **Entrained road dust:**
  - Used EPA model (January 2011): dust in air increases with vehicle miles travelled (VMT)
  - Recent SCAQMD/CARB proposed method
    - Based on EPA model, but revised local inputs (silt loading, etc.)
    - $PM_{10}$ and $PM_{2.5}$ lower, particularly $PM_{2.5}$
    - Future year PM constant unless roadway is lengthened
  
  ➢ **Implication:** entrained (and total) $PM_{10}$ and $PM_{2.5}$ impacts overestimated
I-710 Area of Interest Key Findings

• AQ/HR emissions ↓ in 2035 (all alternatives) compared to 2008
  – Emissions (and related impacts) ↓ compared to 2008*,**,
  – Regulations/programs reduce emissions faster than trips increase

• AQ/HR emissions generally ↓ for the Build Alternatives compared to the 2035 No-Build Alternative (particularly away from the I-710)
  – Emissions (and related impacts) lower in Build Alternatives except for PM$_{10}$**, and PM$_{2.5}$** in some locations (exhaust PM emissions ↓)
  – Benefits in 2035 Build Alternatives due to less traffic on local roads and increased mobility

• Impacts vary among locations along the I-710

* Exceptions: SO$_2$ and total PM$_{10}$ (increased vehicle miles travelled)
** Entrained road dust increases inconsistent with new SCAQMD method
NO$_x$ Emissions Changes

Relative Comparison of Project Alternatives to 2008 Baseline NO$_x$ Emissions
Diesel Particulate Matter (DPM) Changes

Relative Comparison of Project Alternatives to 2008 Baseline DPM Emissions

<table>
<thead>
<tr>
<th>Analysis Year/Alternative</th>
<th>DPM Emissions Index</th>
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<tbody>
<tr>
<td>2008</td>
<td>1.00</td>
</tr>
<tr>
<td>2035 Alt 1</td>
<td>0.10</td>
</tr>
<tr>
<td>2035 Alt 5A</td>
<td>0.10</td>
</tr>
<tr>
<td>2035 Alt 6A</td>
<td>0.10</td>
</tr>
<tr>
<td>2035 Alt 6B</td>
<td>0.10</td>
</tr>
<tr>
<td>2035 Alt 6C</td>
<td>0.10</td>
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Legend:
- DPM Emissions in I-710 Area of Interest
- DPM Emissions in I-710 Near Roadway Study Area
Near-Roadway (I-710 AERMOD) Key Findings*

- **Compared to 2008**: health risks, PM$_{10}$, PM$_{2.5}$ and NO$_2$ in residential areas**

- **Compared to 2035 No-Build (Alt 1)**:
  - Cancer risk:
    - Alts 6B & 6C: less than Alt 1
    - Alts 5A & 6A: greater than Alt 1
  - Some near-freeway (<300m) concentration impacts**
  - Alternatives 6B and 6C generally have lowest impacts
  - Potential impacts at the north end of the I-710 Freeway
    - Greater truck activity in 2035 and in Build Alternatives
    - Trucks conservatively assumed no longer zero emissions after exiting the freight corridor

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* I-710 freeway sources only; assumes weekday emissions for 365 days/year

** Some impacts ↑ near freeway because of entrained PM$_{10}$ dust increases (which are inconsistent with the proposed SCAQMD method)
Other Results and Key Findings*

• Ultrafine Particulates (UFP)
  – Exhaust PM$_{2.5}$ used in analysis
  – 2035 emissions less than 2008 (Basin, Study Area, I-710)
  – Only Alternative 6A has impacts at some modeling grid receptors (all less than 100m from I-710)

• Premature Mortality**
  – Total PM$_{2.5}$ used in analysis
  – 2035 emissions less than 2008 except for Alt 6A near I-710
  – Potential impacts** at some modeling grid receptors less than 300m from I-710; decreases at other grid receptors

* Assumes weekday emissions for 365 days/year
** Impacts essentially the same as ultrafines if proposed SCAQMD method used for entrained road dust
Construction Key Findings

• Construction impacts (worst-case schedule)
  – Single-segment peak-day emissions
    • Greatest peak-day emissions during mainline widening/shifting
    • All emissions, except NO$_x$, lower than SCAQMD significance thresholds
  – Simultaneous construction on all segments analyzed but improbable

• Analysis assumptions
  – Rule 403 compliance, watering schedule
  – Not included: recently adopted Metro Green Construction Policy

• Phasing and scheduling could further reduce peak emissions
Traffic Greenhouse Gas Key Findings

- Greenhouse gases ↑ from 2008 baseline
  - ~ 22M tonnes CO$_2$e/year
  - Does not account for recent regulations

- Greenhouse gases ↓ In Freight Corridor Build Alternatives Compared to 2035 No-Build

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<thead>
<tr>
<th>Scenario</th>
<th>CO$_2$e (tons/year)</th>
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<tr>
<td>Alt 5A vs. Alt 1</td>
<td>670</td>
</tr>
<tr>
<td>Alt 6A vs. Alt 1</td>
<td>-120,000</td>
</tr>
<tr>
<td>Alt 6B vs. Alt 1</td>
<td>-600,000</td>
</tr>
<tr>
<td>Alt 6C vs. Alt 1</td>
<td>-490,000</td>
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Potential Construction Mitigation Measures

• Analysis of Construction Impacts
  – Analysis does not account for Metro’s Green Construction Policy
  – Assumes “default” Rule 403 watering (50% control)

• Potential Construction Mitigation Measures
  – Additional watering, if feasible and effective
  – Phasing and scheduling could potentially reduce peak emissions
Linkage to CIA and DEIR/DEIS

- Community Impact Assessment Report
  - Air quality and health risk results will be used in certain CIA analyses

- DEIR/DEIS impact assessment
  - AQ/HRA Technical Reports will be used in preparation of the DEIR/DEIS

- DEIR/DEIS significance determinations
  - Made by Caltrans (Lead Agency)
  - Caltrans will use SCAQMD Significance Thresholds as part of its CEQA significance determinations
  - Mitigations
Next Steps

- Review technical studies key findings with I-710 Committees
- Incorporate technical studies into DEIR/DEIS
- Draft EIR/EIS available for public and agency review and comment in Early 2012
- Formal public review and comment opportunities during circulation period