Shifting Gears in Transportation Analysis

Revised CEQA Guidelines Proposal
Implementing SB 743
Webinar Logistics

- Session is being recorded
- Muted lines
- Clarifying questions during the presentation
- Longer questions at the end
- Questions by text box
- If technical problems call: (855) 352-9002
Agenda

1. Background
2. Updated draft
3. Case studies
4. Next steps
5. Related initiatives
   1. Caltrans TAG-TISG
   2. General plans and impact fees
Background
Analysis of infill
development using LOS
Analysis of infill development using LOS

Relatively little vehicle travel loaded onto the network
Analysis of infill development using LOS

Relatively little vehicle travel loaded onto the network

...but numerous LOS impacts
Analysis of greenfield development using LOS
Analysis of greenfield development using LOS

Typically three to four times the vehicle travel loaded onto the network relative to infill development.
Analysis of greenfield development using LOS

Typically three to four times the vehicle travel loaded onto the network relative to infill development

...but relatively few LOS impacts

Traffic generated by the project is disperse enough by the time it reaches congested areas that it doesn’t trigger LOS thresholds, even though it contributes broadly to regional congestion.
Level of Service F

Source: Neighborhoods.org
Problems with LOS as a Measure of Transportation Impact

1. Punishes last-in, inhibits infill, pushes development outward
2. “Solves” local congestion, exacerbates regional congestion
3. Inhibits transit
4. Inhibits active transport
5. Measures mobility, not access; shows failure when we succeed
6. Measures mobility poorly; fails to optimize network even for autos
7. Forces more road construction than we can afford to maintain
8. Hard to calculate and inaccurate
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**Denver 1982**
- Travel Time Index: 1.09
- Average travel time: 50.6 minutes (46.4 mins + 4.2 mins)
- Extra rush hour delay: 4 minutes

**Denver 2007**
- Travel Time Index: 1.31
- Average travel time: 49.6 minutes (37.9 mins + 11.7 mins)
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Braess’s Paradox
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<table>
<thead>
<tr>
<th>No.</th>
<th>Intersection</th>
<th>Peak Hour</th>
<th>Existing CMA</th>
<th>LOS</th>
<th>Without Project CMA</th>
<th>LOS</th>
<th>With Project CMA</th>
<th>LOS</th>
<th>Without Project Mitigation</th>
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<th>With Project + Mitigation</th>
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<td>0.615 E</td>
<td>0.002 A</td>
<td>0.615 E</td>
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<tr>
<td>15</td>
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<td>PM</td>
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<td>1.294 F</td>
<td>0.024 F</td>
</tr>
</tbody>
</table>
Opportunities/benefits in shift from LOS to VMT

1. Remove a key barrier to infill, TOD
2. Streamline transit and active transportation projects
3. VMT is easier to model
4. VMT is already in use
5. Reduction in infrastructure capital and maintenance costs
6. Attack regional congestion more effectively
7. Health benefits (active transport & transit trips)
8. GHG reduction
## Impacts of High VMT Development

### Environment
- Emissions
  - GHG
  - Regional pollutants
- Energy use
  - Transportation energy
  - Building energy
- Water
  - Water use
  - Runoff – flooding
  - Runoff – pollution
- Consumption of open space
  - Sensitive habitat
  - Agricultural land

### Health
- Collisions
- Physical activity
- Emissions
  - GHGs
  - Regional pollutants
- Mental health

### Cost
- Increased costs to state and local government
  - Roads
  - Other infrastructure
  - Schools
  - Services
- Increased private transportation cost
- Increased building costs (due to parking costs)
- Reduced productivity per acre due to parking
- Housing supply/demand mismatch → future blight
Estimating *tour-based* VMT

1. Residence to Coffee Shop
2. Coffee Shop to Work
3. Work to Sandwich Shop
4. Sandwich Shop to Work
5. Work to Residence
6. Residence to Store
7. Store to Residence
Estimating *tour-based* VMT

1. Residence to Coffee Shop
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1. Residence to Coffee Shop
2. Coffee Shop to Work
3. Work to Sandwich Shop
4. Sandwich Shop to Work
5. Work to Residence
6. Residence to Store
7. Store to Residence

"Household" VMT
Estimating *trip-based* VMT

1. Residence to Work
2. Work to Residence
3. Home to Coffee Shop
4. Coffee Shop to Store
5. Store to Home
Estimating *trip-based* VMT

1. Residence to Work
2. Work to Residence
3. Home to Coffee Shop
4. Coffee Shop to Store
5. Store to Home

"Home-based" VMT
Continue to recommend:

- Primary metric of transportation impact statewide is VMT
- Use VMT screening maps for residential and office projects
- Presume development near transit leads to a less than significant impact*
- Recommendation that transit, active transportation projects presumed less than significant
- More stringent thresholds may be applied at lead agency discretion

*exceptions:
- FAR > 0.75
- Parking > minimum requirements
- Inconsistent with SCS
General Comment:
- Technical advice is better given in a Technical Advisory

Update:
• Technical advice moved from Guidelines into a Technical Advisory
Comments on recommended residential project threshold:
- Need flexibility in threshold setting
- Average not good enough for state goals such as GHG reduction

Updated residential threshold recommendation:
• 15 percent below regional or city VMT/cap
Comment on recommended **office project threshold**:
- Average not good enough for state goals such as GHG reduction

**Updated office threshold recommendation:**
- **15 percent below** regional VMT/cap
Why 15 percent?

- Caltrans Strategic Plan: Reduce VMT/cap 15% by 2020
- SB 375 targets ≈ 15% collectively statewide
- AB 32 Scoping plan recommends local governments set GHG reduction targets at 15% below existing by 2020
- Research shows 15% VMT mitigation is generally achievable (see CAPCOA’s *Quantifying Greenhouse Gas Mitigation Measures*)
Comment on recommended *retail project methodology and threshold*:

- New retail tends to redirect trips, rather than generate new trips

*Updated recommendation:*

• Assess retail with “Net VMT” approach
• Retail which increases VMT compared to previous shopping patterns may be considered significant
• Local-serving retail presumed less than significant
Mixed-use development

- Can consider each use separately, compare to threshold for that use
- Each use should take credit for internal capture due to proximity of other uses in project

Example: Residential-retail—if near transit, locally serving retail, recommend presumed less than significant
Recommendation for **land use plans**:

- **Specific plans**: Same as land use projects
- **General plans**: Consistency with SCS (aggregate across jurisdiction)

Recommendation for **RTP-SCSs**:

- **Sufficient VMT reductions to achieve ARB-specified GHG target**
Comment on transportation project methodology:
- Analysis may be burdensome for small transportation projects
- Project type problematic as a significance threshold

Updated recommendation:
• Clarification of project types which might induce measurable/substantial VMT (and which wouldn’t)
• VMT threshold rather than project type threshold
• Fair share threshold, considering VMT allowable to achieve 2030 GHG reduction target
• Simple method using researched elasticities
Comment: Rural is different
• Update: Recommendation that rural projects choose thresholds on a case-by-case basis

Comment: Might trigger EIR for very small projects
• Update: Recommend a small projects screening threshold – 100 vehicle trips per day

Comment: Concerns about impacts to transit
• Update: Addition of riders not an impact; blocking stations or routes may be an impact
Recommendations for addressing traffic safety:

SB 743
• Specifies that existing traffic safety methodologies needn’t be removed from CEQA
• Does not suggest additional safety analysis

Technical Advisory
• Does not recommend additional safety analysis
• Provides broad recommendations regarding approach on any traffic safety analysis that might be undertaken under CEQA
Recommendations for addressing traffic safety:
1. Reduce motor vehicle speeds
2. Increase driver attention
3. Protect vulnerable road users
4. Reduce overall VMT and sprawl

Use caution:
- Measures which address safety by increasing automobile throughput or speed frequently create other safety issues
- Be mindful of tradeoffs that compromise vulnerable road user safety
VMT Data

California Statewide Travel Demand Model is up and running
- Assistance with trip lengths for sketch models
- Assistance with setting thresholds
- Assistance generating VMT screening maps

Data and TAZ map posted on Caltrans website:
http://www.dot.ca.gov/hq/tpp/offices/omsp/SB743.html

Source: California Statewide Travel Demand Model
Case Studies

1. Residential-retail mixed use (Stockton and T)
2. Office building (Mission Viejo Medical Center)
3. Roadway expansion (Hypothetical project)
Residential-retail mixed use VMT calculation

Project characteristics:
• 214 multifamily d.u.
• 24 single family d.u.
• 6000 s.f. locally-serving retail
• 0.27mi from light rail station
• Surrounding residential exhibits 12.1 VMT/cap, compared to recommended threshold 14.2 VMT/cap
Residential-retail mixed use VMT calculation

• 0.27mi from light rail station
• Surrounding residential exhibits 12.1 VMT/cap, compared to recommended threshold 14.2 VMT/cap

In location where existing residences exhibit VMT below the recommended threshold

February 2016
Threshold calculation: Use CSTDM Data

VMT Analysis for Project, including Mitigation:
Follow AHSC Greenhouse Gas Quantification Methodology (GGQM), using CalEEMod, plus input trip lengths from the CSTDM

CSTDM *home-based* VMT data provide common data source across
• Project VMT calculation
• Project VMT mitigation calculation

Project VMT mitigation is calculated within CalEEMod as a percent reduction
Office VMT calculation

Project characteristics:

- 110,000 square feet of office space located west of Medical Center Road, between Crown Valley Parkway and Marguerite Parkway, Mission Viejo, CA
Threshold VMT calculation: Use CSTDM Data

Project VMT calculation: Use CSTDM Data

Mitigation VMT calculation: Use CAPCOA’s *Quantifying Greenhouse Gas Mitigation Measures*

<table>
<thead>
<tr>
<th>Mitigation Measure</th>
<th>Percent Reduction</th>
<th>Substantial Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation a 9/80 workweek for 10 percent of employees</td>
<td>0.7%</td>
<td>CAPCOA TRT-6</td>
</tr>
<tr>
<td>Provide a transit subsidy to all employees of 1.49/day</td>
<td>7.3%</td>
<td>CAPCOA TRT-4</td>
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<tr>
<td>Implement car sharing program</td>
<td>0.4%</td>
<td>CAPCOA TRT-9</td>
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<tr>
<td>Provide an employee vanpool program</td>
<td>2%</td>
<td>CAPCOA TRT-11</td>
</tr>
<tr>
<td>Implement a $6 daily employee parking charge</td>
<td>6.8%</td>
<td>CAPCOA TRT-14</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17.2%</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: *Quantifying Greenhouse Gas Mitigation Measures*, CAPCOA

**CSTDM home-based** VMT data provide common data source across

- Project VMT calculation
- Threshold VMT calculation

Project VMT mitigation is calculated as a percent reduction
Roadway expansion project VMT calculation

**Threshold calculation:** Use ARB Vision Model estimate of VMT we can have in the state and still meet our 2030 GHG goals. Divvy that VMT between the total number of transportation projects in the state.

**Project VMT calculation:**
- Use elasticities supplied by the academic literature on induced travel
- Use PEMS lane mile and VMT data
Roadway expansion project VMT calculation

**Project Characteristics:** Hypothetical highway expansion, adding 2.2 lane miles to a highway in Kern County

Elasticity = [% Change in VMT] / [% Change in Lane Miles]

or

VMT Impact = [% Change in Lane-Miles] * [baseline VMT on those lane-mi] * [elasticity]

Plugging in data from Kern County and Duranton and Turner (2011):

VMT Impact = 0.328% * 2,333,940,000 existing VMT * 1.0 = **7,658,312 VMT/year**
Roadway expansion project VMT calculation

Calculation of transportation project fair-share significance threshold:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>California Statewide VMT (2014)</td>
<td>185,320,000,000 VMT/year</td>
</tr>
<tr>
<td>Allowable increase by 2030 (4 percent)</td>
<td>7,412,800,000 VMT/year</td>
</tr>
<tr>
<td>Estimated total transportation projects in California, expected completion date 2015-2030</td>
<td>3,572 Projects^8</td>
</tr>
<tr>
<td>Fair share VMT per transportation project</td>
<td>2,075,220 VMT/year</td>
</tr>
</tbody>
</table>
Roadway expansion project VMT calculation

Project VMT > Threshold VMT

(7,658,312 VMT/year > 2,075,220 VMT/year)

So the project would lead to a significant impact

Mitigation might include:
• Tolling on new or existing lanes
• Management of new or existing lanes
• Provide park and ride facilities
• Provide a vanpool program
Next Steps

- Public review ends February 29, 2016
- Finalize proposal
- Natural Resources Agency formal rulemaking process
- SB 743 effective late 2016 or early 2017
- 2 year opt-in period
- Implementation required statewide late 2018 or early 2019
Transportation Analysis Guidelines and Transportation Impact Study Guidelines (TAG-TISG)

- Caltrans is developing
  - New methods for analyzing the effects of transportation projects (TAG)
  - New approaches to characterize land use project impact on the state highway system (TISG)
- Will benefit from broad stakeholder involvement
Use Ad-hoc, LOS-triggered mitigation (highly problematic)

Use LOS to help plan roadway capacity; use number of units or square footage to estimate project impact (not ideal)

Use LOS to help plan roadway capacity; use VMT to estimate project impact (okay)

Use accessibility metric to plan network; use VMT to estimate project impact (ideal)

Balance auto mobility with other interests, e.g. cost, neighborhood vibrancy, air quality, GHGs, human health, etc.
General Plans and Impact Fees

- SB 743 leaves existing impact fee programs in place
- Local governments can develop VMT-based impact fee programs to ease the CEQA burden and broaden the types of improvements that could be funded
General Question & Answer
Thanks!

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