CSTDM Training

VMT Analysis for SB 743

presented to

Caltrans

presented by

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Think Forward

VMT Analysis Background

- New SB 743 guidelines require project to be evaluated in terms of VMT impact
- Regional models or the California Statewide Travel Demand Model (CSTDM) can be used
  - Regional models may be better at capturing VMT due to more detailed highway networks and trip patterns
  - CSTDM VMT summaries are readily available and can be obtained from Caltrans via website? http://www.dot.ca.gov/hq/tpp/offices/omsp/SB743.html
    - Similar summaries can be developed for regional models

VMT Analysis

- New projects may need to be evaluated using VMT and trip length information for either home or work TAZ
- Residential projects → home zone information:
  - Household VMT by TAZ or Home-based VMT by TAZ
  - Home-based (HB) work, HB shopping, HB other trip lengths
- Office projects → employment zone information:
  - Employee household VMT by TAZ and HB work VMT by TAZ
  - Worker commute length by TAZ
- Retail projects evaluated in terms of total VMT change
  - Retail may increase or decrease VMT due to re-routing

SB 743 Thresholds

- Thresholds are used to determine whether the project will have a less than significant impact on VMT
- Residential projects:
  - Existing city household VMT per capita minus 15% AND
  - Existing regional household VMT per capita minus 15%
- Office projects:
  - Existing regional VMT per employee minus 15%
- Retail projects:
  - Net decrease in VMT

SB 743 Thresholds Cont'd

- Local-serving retail creates a less than significant impact
- Regional-serving retail can lead to longer trips and needs to be evaluated in terms of net change in VMT
- Mixed-use project components should be evaluated independently
  - Can take credit for internal capture
- Transportation projects (such as adding highway lanes) need to be evaluated in terms of impact on VMT
  - Change in VMT calculated using a model or elasticites
  - Threshold as of 2015: 2,075,220 VMT/year

VMT Change: Residential

- **Step 1**. Determine average household VMT/capita or home-based VMT/capita where at project location
  - » Based on regional model or CSTDM
- **Step 2**. Compare the VMT/capita from above to the regional and city thresholds (VMT/capita - 15%)
  - » If VMT/capita from step 1 lower than both thresholds, project assumed to have less than significant impact on VMT (you're done!)
- **Step 3**. Use CalEEMod to estimate the project VMT
  - » Use project area specific trip lengths
- **Step 4**. Consider mitigation measures in your analysis (they help the project meet threshold)

VMT Change: Office

- Step 1. Determine average VMT/employee or home-based-work VMT/employee at project location
  - Based on the regional model or CSTDM
- Step 2. Compare the VMT/employee from above to the regional threshold (VMT/employee - 15%)
  - If VMT/capita from step 1 is lower than threshold, project assumed to have less than significant impact on VMT (you're done!)
- Step 3. Consider mitigation measures in your analysis

VMT Change: Retail

- Locally-serving retail is assumed to have a less than significant impact on VMT (you're done)
- For regionally-serving retail, a travel demand model run needs to be conducted to evaluate the impact of re-routing and changes in mode choice on VMT

VMT Change: Transportation Projects

- Only need to consider when the project can lead to an induced demand and hence higher VMT
  - Addition of through lanes on existing or new highways, including general purpose lanes, HOV lanes, peak period lanes, auxiliary lanes, and lanes through grade-separated interchanges
  - Less Than Significant: pavement rehab, maintenance, transit, bike, pedestrian https://www.opr.ca.gov/docs/Revised_VMT_CEQA_Guidelines_Proposal_January_20_2016.pdf
- Step 1. Determine VMT elasticity from research based on the facility functional type
  - Elasticity = %Change in VMT / %Change in lane miles
- Step 2. Calculate % Change in lane miles as % of total lane miles for the functional class and multiply by total functional class miles
- Step 3. Compare the resulting VMT/year to the threshold

SB 743 Case Study 1

- New mixed use residential and retail development located at the corner of Stockton Blvd and T St.
  - 214 multifamily units
  - 24 single family houses
  - 6,000 square feet of locally-serving retail
- Locally-serving retail has less than significant impact
  - Only used to capture internal residential trip making activity

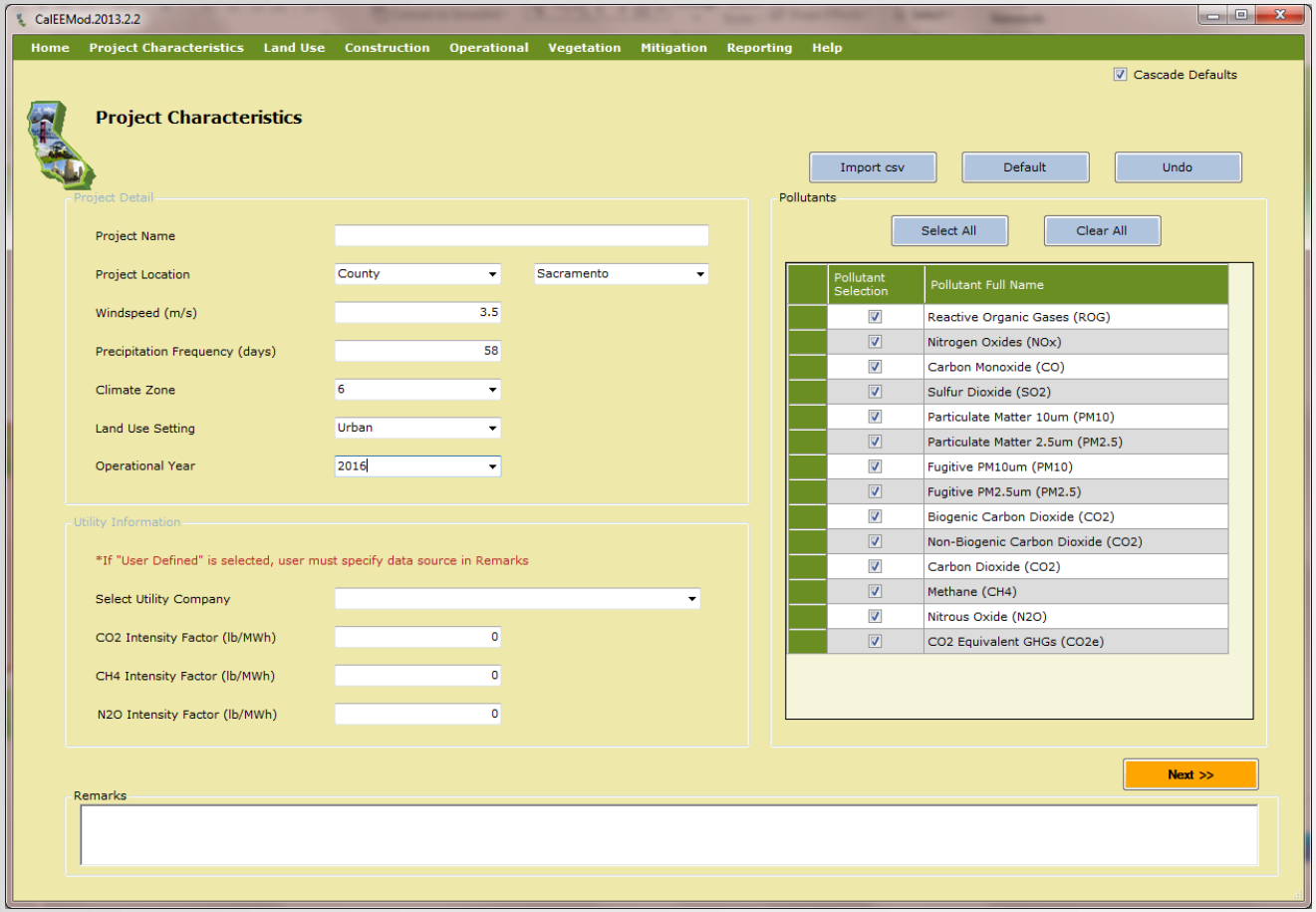
Model Information

- CSTDM summaries were used to get the following information:
  - Project TAZ: 538
  - VMT per capita: 12.1
  - Home-based VMT per capita: 8.4
  - HBW trip length: 8.08 miles
  - HBShop trip length: 4.32 miles
  - HBO trip length: 3.81 miles

Trips Analysis

- SACOG average VMT rate: 16.8 VMT per capita
- City of Sacramento average VMT rate: 15.8
- SB 743 guidelines suggest less than significant project impact if trip rate is 15% below regional average
- This project's overall trip rate is 28% below regional average and 23% below the city threshold
- No further analysis is needed but will be conducted for demonstration purposes

CalEEMod Inputs



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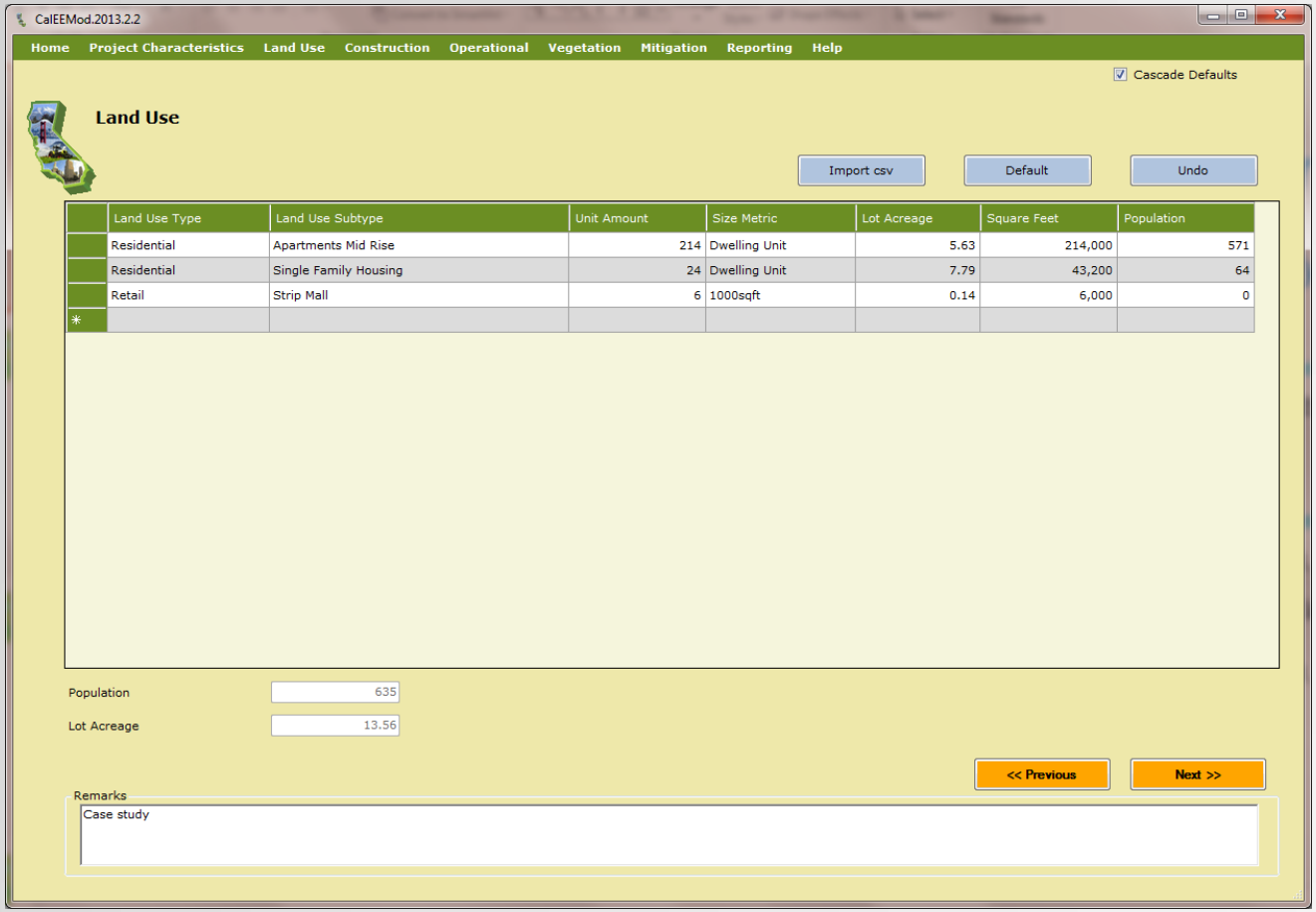

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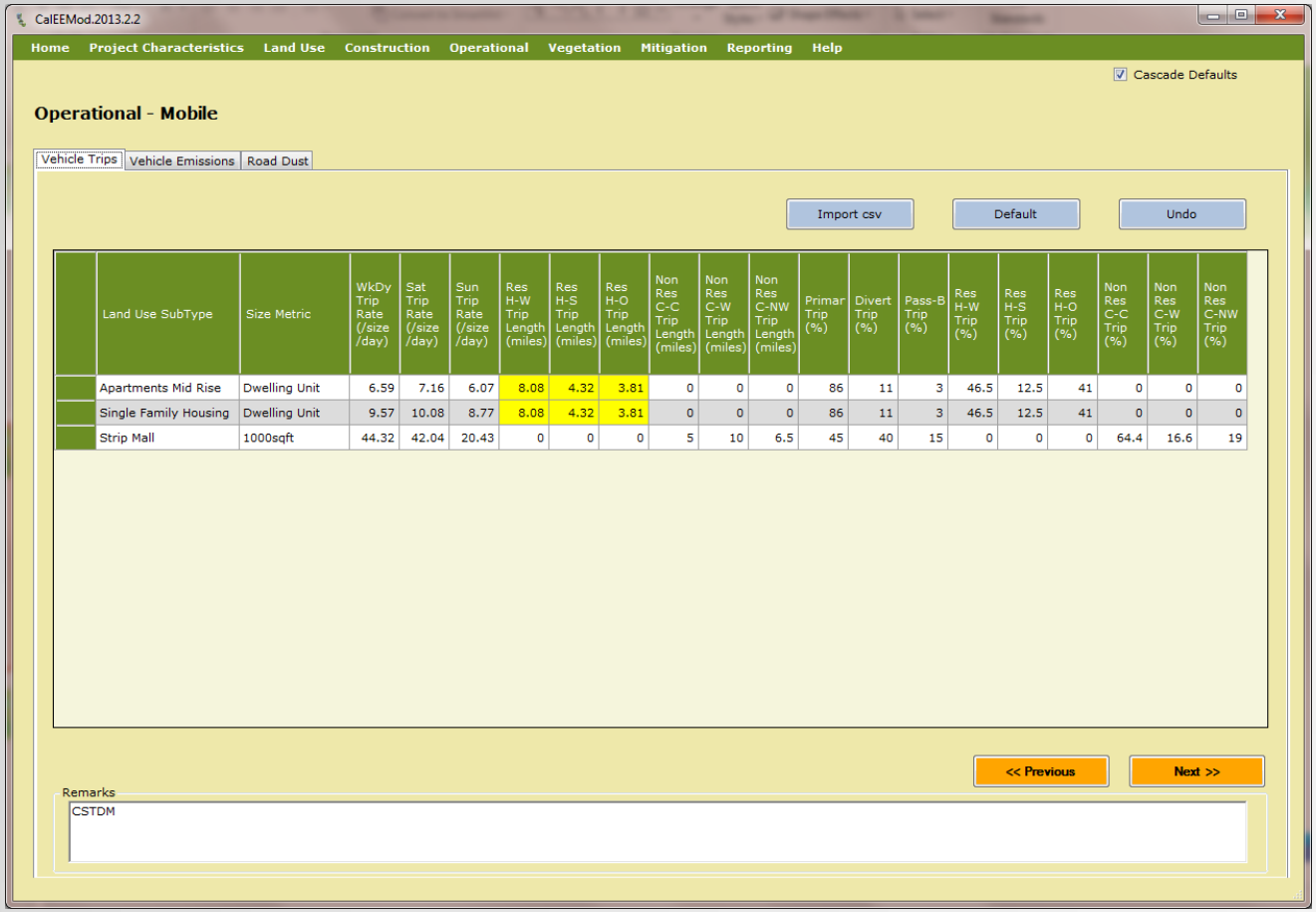

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Results

- Unmitigated VMT:
  - Apartments mid rise= 2,673,841
  - Single Family Housing=433,117
  - Total=3,106,958
- Based on AHSC GGQM off model calculation, project VMT reduction is 40% (max possible)
- Resulting VMT: 1,864,175
- Resulting VMT per capita: 2,936
- Threshold based on 85% of regional VMT per capita: 3,971
- While regional models may have different VMT numbers, the results of the analysis should be similar

SB 743 Case Study 2

- Medical Center in Mission Viejo
  - 110,000 square feet of space located between Crown Valley Pkwy and Marguerite Pkwy
- VMT/employee in the SCAG region:
  - 1. Add Work VMT table to CSTDM TAZ layer
  - 2. Join SCAG region layer to CSTDM TAZ+VMT layer using spatial join
  - 3. Extract TAZs within SCAG region and calculate average VMT per employee
  - 4. Locate the project and determine VMT per employee
  - 5. Check against 85% of regional VMT per employee threshold

Model Information

- CSTDM summaries were used to get the following information:
  - Project TAZ: 6043
  - VMT: 15.3 miles per employee

Trips Analysis

- SCAG average VMT rate: 15.9 VMT per employee
- SB 743 guidelines suggest less than significant project impact if trip rate is 15% below regional average (13.5 VMT/employee)
- This project's overall trip rate is above the threshold, hence it will have significant impact on VMT
- Need to consider mitigation strategies to reduce the VMT/employee by 12%

SB 743 Case Study 3

- Addition of 2.2 lane-miles of freeway in Kern County
- Most recent study on induced travel reveals an elasticity of 1.03 for freeways
- 2.2 lane-miles out of 670.47 lane-miles of California highway including freeways/expressways corresponds to 0.328% increase
- Change in VMT = Change in lane-miles of freeways/ expressways * Total VMT on freeways/expressways * Elasticity
  - 0.328% * 2,333,940,000 * 1.03 = 7,884,982 VMT
- Exceeds the threshold of 2,075,220 VMT/year and requires mitigation