

# Memorandum

To: SB743 Liaisons  
DOT Environmental Managers

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Subject: CHANGES TO NATIONAL CENTER FOR SUSTAINABLE TRANSPORTATION (NCST) TOOL FOR VMT ANALYSIS

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## Summary of Key Points

- Lane-mile and VMT data used for the NCST Induced Travel Calculator has been updated through 2019.
- Use of the NCST Induced Travel Calculator is allowed (not mandated) for High Occupancy Toll (HOT) Lane addition projects, which supersedes guidance contained in the Transportation Analysis Framework (TAF) and Transportation Analysis Under CEQA (TAC).
- Two exceptions to analyzing HOV lanes as equivalent to GP lanes:
  1. HOV lane additions to existing two-lane highways,
  2. HOV 3+ lane additions.
- Clarification that the following lane conversions are unlikely to induce travel:
  1. GP lane to HOV, HOT or fully priced lane,
  2. HOV to HOT lane,
  3. HOV or HOT lane to fully priced lane, and
  4. HOV-2+ to HOV-3+ or higher.

Caltrans published the First Edition of two guidance documents in September 2020 for the analysis of transportation impacts using Vehicle Miles Traveled (VMT): Transportation Analysis Framework (TAF) and Transportation Analysis Under CEQA (TAC). This memorandum addresses some updates regarding VMT analysis tools and methods. Those performing VMT analysis for projects on the State Highway System should be aware of these updates and their potential use in their evaluations of induced travel. Material here is considered reliable but is subject to change as VMT-related CEQA practice and case law develops.

## NCST Induced Travel Calculator data update

The NCST Induced Travel Calculator has been updated with lane-mile and VMT data through 2019. A hot topic on the Caltrans SB 743 site, "Data Updates Completed in the NCST Induced Travel Calculator," provides more details, at: <https://dot.ca.gov/programs/sustainability/sb-743/hot-topic-2>.

## Use of the NCST Calculator for Evaluation of High Occupancy Toll (HOT) and High Occupancy Vehicle (HOV) Lane Additions

- A. The authors of the NCST Calculator have updated the guidance for the use of the tool in the tool's documentation, at: <https://travelcalculator.ncst.ucdavis.edu/about.html>.

The website contains documentation related to the calculator's purpose and scope, including a section stating that the calculator's use is not appropriate in all circumstances or for all purposes. However, it also includes a number of caveats, including one that has been updated since the publication of the First Edition of the TAF (underline added for emphasis):

The calculator is conservatively limited to use for additions of general-purpose, high-occupancy vehicle (HOV), and high-occupancy toll (HOT) lanes. It should not be used for additions of pure toll lanes (where all users, even HOVs, must pay a toll). Hundreds of both general-purpose and HOV lane mile additions were included in the two principal studies used to derive the elasticities for the calculator (Duranton and Turner, 2011; Cervero and Hansen, 2002; Legislative Analyst's Office, 2000). While few HOT lanes had been added to publicly owned roadways before the end of the data collection periods for those two studies, studies using data from more recent periods (after more HOT lanes had been opened) have estimated similar induced travel elasticities (e.g. Hymel, 2019; Graham et al., 2014; Melo et al., 2012). Furthermore, because HOT lanes allow more vehicles than HOV lanes (high-occupancy vehicles plus drivers willing to pay to use the lane), they would logically have at least as large induced travel effects as HOV lanes.

The September 2020 First Edition of the TAF states that the NCST Calculator should not be used to evaluate HOT lane additions to the State Highway System. Based on the updates to the NCST Calculator Tool documentation noted above, it has been determined that the NCST Calculator can be used for analysis of HOT Lane addition projects, either exclusively, or as a benchmark to results from a Transportation Demand Model (TDM).

B. Additionally, the Department's induced-VMT analysis review process has provided new understanding of travel demand from various HOV lane applications. The NCST calculator treats an HOV lane addition as the equivalent to a GP lane addition in terms of induced VMT. This guidance is based on a common scenario, where HOV-2+ lanes are added to multilane facilities, which are already carrying HOV-2s. In that case, the HOVs may simply sort themselves in their own lane, creating more GP capacity in the other lanes.

However, as projects have moved through the process, two exceptions have arisen:

- Addition of HOV lanes to an existing two-lane (one-lane each way) highway. In this case, the project team demonstrated there would be too few HOVs to sort themselves into the new lane in a way that would create a full new lane for GP vehicles. In this case, the modeled result for induced VMT was acceptable, even though it was not within 20 percent of the figure from the NCST Calculator.
- While HOV lanes commonly refer to 2+ persons per vehicle, HOV lanes designated for 3+ persons per vehicle have also existed in California for many years. The original decision to treat HOV lanes similarly to GP lanes did not distinguish between HOV-2+ and higher HOV occupancy restrictions. This issue has arisen in preliminary discussions with project teams, who have reasonably suggested the calculator may overestimate induced VMT for HOV-3+ and higher levels.

In both cases – an HOV lane added to a single existing lane or an added HOV-3+ or higher lane – analysis with a TDM that results in an induced-VMT estimate more than 20 percent below the NCST calculator can be acceptable, assuming the required methods and checks of the TDM are followed.

It is anticipated that the TAF will be updated with these changes. Table 1. In the TAF and TAC will be updated as follows (changes in italics):

Table 1. Selection Matrix for Preferred Induced Travel Assessment Method of Projects on the SHS (see note 1).

<b>Project Type/Location</b>	<b>GP or HOV Lane Addition to Interstate</b> <i>(see note 2)</i>	<b>GP or HOV Lane Addition to Class 2 and 3 State Routes</b> <i>(see note 2)</i>	<b>HOT Lane Addition to Interstate</b>	<b>HOT Lane Addition to Class 2 and 3 State Routes</b>	<b>Other VMT-inducing Projects and Alternatives</b>
<b>County in MSA with Class I Facility</b>	Apply the NCST Calculator by MSA and/or TDM benchmarked with NCST Calculator <i>(see note 3)</i> .	Apply the NCST Calculator by county and/or TDM benchmarked with NCST Calculator <i>(see note 2)</i> .	Apply the NCST Calculator by MSA, TDM, and/or other quantitative methods <i>(see notes 3 &amp; 4)</i> .	Apply the NCST Calculator by county, TDM, and/or other quantitative methods <i>(see notes 3 &amp; 4)</i> .	Apply TDM or other quantitative methods <i>(see note 3)</i> .
<b>Other MSA County</b>	Apply TDM or other quantitative methods <i>(see note 3)</i> .	Apply the NCST Calculator by county and/or TDM benchmarked with NCST Calculator <i>(see note 2)</i> .	Apply TDM or other quantitative methods <i>(see note 3)</i> .	Apply the NCST Calculator by county, TDM, and/or other quantitative methods <i>(see notes 3 &amp; 4)</i> .	Apply TDM or other quantitative methods <i>(see note 3)</i> .
<b>Rural County</b>	Apply TDM or other quantitative methods <i>(see note 3)</i> .	Apply TDM or other quantitative methods <i>(see note 3)</i> .	Apply TDM or other quantitative methods <i>(see note 3)</i> .	Apply TDM or other quantitative methods <i>(see note 3)</i> .	Apply TDM or other quantitative methods <i>(see note 3)</i> .

## Table Notes

1. If preferred methods are not available, qualitative assessment is acceptable as shown in Figure 5.
2. Induced VMT estimates from HOV additions to two-lane (one lane per direction) facilities and HOV-3+ or higher additions may be outside the plus-minus 20 percent range of the NCST Calculator estimate.

3. TDMS must be checked for applicability as described in Sections 4.4 and 4.5.
4. TDM may be benchmarked with NCST Calculator.

### NCST Calculator Use for Evaluation of High Occupancy Toll (HOT) Lane Conversions

Sec 5.1.1 of Transportation Analysis under CEQA provides a list of project types that can be screened as unlikely to induce travel. One of those types is “changing lane management in a manner that would not substantially increase vehicle travel.” To clarify, the following conversions are unlikely to induce travel assuming no change in managed lane occupancy:

- GP lane to HOV, HOT or fully priced lane.
- HOV to HOT lane.
- HOV or HOT lane to fully priced lane.
- HOV-2+ to HOV-3+ or higher.

It is anticipated that the next edition of the TAF will contain this language.

### Conclusion

The SB 743 Implementation team will continue to monitor changes that may impact its existing guidance documents and provide updates as they become available. For any questions regarding this or any other SB 743 implementation questions, please contact:

[SB743.implementation@dot.ca.gov](mailto:SB743.implementation@dot.ca.gov).