

Technical Memorandum

Date: November 5, 2019
To: Erik Ruehr, VRPA
Bruce Griesenbeck and Maricela Salazar, SACOG
From: Jimmy Fong, Jinghua Xu, and Ronald T. Milam, Fehr & Peers
Subject: **Trip Length Adjustments for SB 743 VMT Analysis**

Introduction

SB 743 implementation has created the need to modify travel demand models to ensure they capture the full trip length for those trips that start or end outside the model boundary. This need stems from the CEQA guidance listed below and the general desire to avoid arbitrary truncation of trip lengths based on model or political boundaries.

- According to the Technical Advisory, the assessment should cover the full area in which driving patterns are expected to change, including induced growth impacts and cumulative impacts. OPR states that the VMT estimation should not be truncated at a modeling or jurisdictional boundary for convenience of analysis when travel behavior is substantially affected beyond that boundary. (p. 6 and 23 - Technical Advisory on Evaluating Transportation Impacts in CEQA, OPR, December 2018)
- CEQA Guidelines section 15277:
 - “... Any emissions or discharges that would have a significant effect on the environment in the State of California are subject to CEQA where a California public agency has authority over the emissions or discharges.” Since VMT is the key input for mobile emissions, tracking the full length of trips is essential for complying with this expectation.

Since all travel demand models in California have boundaries, they truncate trip lengths to varying degrees. Truncation tends to be most severe at the edge of the model boundary and when the modeled area exhibits a high proportion of external travel (i.e., from a suburban area in one region to a job center in another region). To compensate for the influence of model boundaries, the following steps can be used to modify trip lengths through model gateways.



Trip Length Adjustment Process

Adjusting the length of trips leaving a model boundary requires appending extra distance at the model gateway zone (or external centroid) connector as outlined below. This process results in new gateway distances that are weighted based on the amount and location of external travel origins and destinations. Other adjustment methods that are available include appending extra trip lengths to each individual origin-destination (OD) trip pair in the model or expanding the model's zone structure to cover a larger area. Both of the methods are much more resource and time intensive and are not covered further in this memo.

1. Model IX and XI Trips at Gateways

The first step of this process is to determine trip volume leaving or entering the model boundary. These are referred to in the remainder of this memo as internal-to-external (IX) and external-to-internal (XI) trips. This data can be generated either from OD trip matrices or by conducting a select zone analysis to track trips to the model gateways. The volume at the gateways for this purpose should not include external-to-external (XX) through trips. A table that identifies all gateways, IX volume, and XI volume should be prepared similar to the example below from the Mendocino Council of Governments (MCOG) model.

Table 1: Example Model Gateway and IX, XI Link Volumes Table

Gateway ID	Gateway	Link ID	IX Volume	XI Volume
7081	SR 1 - South	7081	1,190	1,190
7083	US 101 - South	7083	5,004	5,004
7082	US 101 - North	7082	567	567
7085	SR 20 - East	7085	3,529	3,529
7086	SR 175 - East	7086	551	551

2. Origin-Destination Data between Model and External Areas

Determining the full length of trips leaving or entering a model boundary requires an OD dataset that includes flows between the model area and the area external to the model. How much of the external area to include is an important question. Per the CEQA guidance cited, the full length of trip between their start and end is desired. Whether this extends outside of California has not been legally tested so it is possible that capturing trip lengths even beyond state limits could be necessary. An appropriate OD dataset should be chosen based on the details of your project, context of the study area, level of CEQA risk, and available time and budget for analysis. An assessment of each of the OD data sources is presented the Table 2.



Table 2: Origin-Destination Data Assessment

Origin-Destination Data Sources	Description	Advantages	Disadvantages
Available travel demand model larger than local model	<p>All regional models in California nest within the California State Travel Demand Model (CSTDM).</p> <p>All local models (i.e., city models) nest within the CSTDM and their respective regional models.</p>	<ul style="list-style-type: none"> • CSTDM Includes TAZs for the entire state of California • Regional models are often the source model for local model variants, so they have a high compatibility for making gateway adjustments. • CSTDM and regional models include changes in travel patterns over time between base and future years. 	<ul style="list-style-type: none"> • Larger models may have greater aggregation and only coarse correspondence between TAZs in the smaller model. • Regional models may not fully capture full trip length. • CSTDM has not been recently calibrated and validated. • CSTDM truncates trip at state boundary.
California Household Travel Survey (CHTS)	Survey of California resident travel that documents full length of OD travel.	<ul style="list-style-type: none"> • Robust sample with data available for most cities and counties above 50,000 population. Data may be sufficient for smaller jurisdictions based on a review of the sample • Includes all trip purposes. 	<ul style="list-style-type: none"> • Insufficient detail below city level. • 2012 data may not reflect recent changes in travel patterns. • Does not include data about future travel.
Longitudinal Employer-Household Dynamics Data (LEHD)	Employer/Employee data showing locations of where employees live and work, visualized in an online portal with export to OD tables, produced by the U.S. Census Bureau.	<ul style="list-style-type: none"> • Data available at the census tract level (or custom TAZ structure). • 2017 data is current. • Quick production of OD data. 	<ul style="list-style-type: none"> • Employment data is only relevant for calculating trip lengths for home-based work trips, does not include other trip purposes. • Does not include data about future travel.
Mobile device OD Data	Data from smartphone/GPS devices that can be used to estimate OD trip tables associated with specific gateways.	<ul style="list-style-type: none"> • Data available at small scales (i.e., 250-meter grid cell, census block group, or custom traffic analysis zone). • Data scale allows isolation of specific land uses in many cases. • 2019 data available from multiple vendors. • Data includes all 365 days of the year and can be aggregated. • Limited trip length truncation. • Includes all trip purposes. 	<ul style="list-style-type: none"> • Minimum purchase cost is about \$5000, more expensive if greater detail/number of zones is desired. • Does not include data about future travel.



3. Gateway Identification

After identifying an appropriate OD data source, the next step requires determining the gateway(s) based on the model used in your project, which trips from the OD data source would travel through. An assessment of options for this process is presented in Table 3.

Table 3: Gateway Identification Methods and Assessment

Data Source	Gateway Identification Method
Available travel demand model larger than local model	<ul style="list-style-type: none"> • A highway skimming procedure to determine the gateway used for each OD pair for each assignment time period. This method is not able to track more than one gateway for an OD pair. • A select zone and select link assignment procedure to determine the gateway(s) for an OD pair. This method requires more processing/computing time – dependent on the specific travel model and software.
Mobile Device OD Data	<ul style="list-style-type: none"> • Data purchase includes identification of gateway locations and automatic filtering to create associated OD trip tables.
Streamlined selection with Google Maps (or online mapping program)	<ul style="list-style-type: none"> • Spreadsheet template that creates a link to Google Maps for each OD pair, manual identification of gateway(s) in the routing is required. • An off-model, quick assessment tool, suitable for limited number of OD pairs. • Not able to quantify the split across multiple routes/gateways (if applicable) for an OD pair. • Time consuming; not suitable for large number of OD pairs due to manual process.

4. Weighted Average Trip Length Beyond Model Gateways

The trip length adjustment process ultimately requires calculating the weighted average distance beyond each model gateway. A list of options for this process is identified in Table 4. Some of the processes calculate the distance beyond the model gateway directly; while other processes generate distance between each OD pair first, with a separate calculation for distance beyond the model gateway.



Table 4: Trip Length Beyond Model Boundary – Methods and Assessment

Data Source	Trip Length Method Description
Available travel demand model larger than local model	<ul style="list-style-type: none"> Creates a new link variable equal to the link length for all the links external to the local model and 0 for all the links internal to the local model, and then uses a highway skimming procedure to skim this link variable to generate the total distance outside of the gateway for each OD pair for each assignment time period. Uses a select zone and select link assignment procedure to generate the volume distribution for each selected gateway, and calculates the weighted average distance based on the select link volume associated with each gateway.
CHTS	<ul style="list-style-type: none"> Estimates total OD distances between origin-destination for each trip record. Calculates the distance from the trip-end within the model boundary to the gateway for each record, based on the distance skim from the model, and subtracts it from the total CHTS OD distance to generate external trip length for each trip record. Aggregates the external trip distance across all the trip records to generate average external trip distance for each gateway.
Mobile Device OD Data	<ul style="list-style-type: none"> Distance between origins-destinations through each gateway are provided in the dataset. Calculates the distance from the trip-end within the model boundary to the gateway based on the distance skim from the model and subtracts it from the total mobile device OD distance to generate external trip length for each gateway.
Streamlined selection with Google Maps (or online mapping program)	<ul style="list-style-type: none"> Links to Google Maps and generates a path for each OD pair. Calculates the distance between the manually identified gateway(s) and the trip end location external to the model boundary, based on the shortest travel time path between the OD pair.

Process Summary

An analyst can mix and match the procedures based on the most appropriate method for each step. For example, if CHTS is the most appropriate OD dataset to generate external trip length estimates, the user can generate the OD trip matrices based on CHTS while following the TAZ structure of the CSTDM, then identify local model gateways in the CSTDM highway network, and calculate the average trip length beyond each gateway, using the distance skims of the CSTDM, weighted by trips from the CHTS OD trip matrices.



Trip Length Adjustment User Guide and Resources

This section provides a user-guide and links to resources for the data sources and processes previously described in this memorandum.

California Statewide Travel Demand Model (CSTDM)

Caltrans maintains and updates the California Statewide Travel Demand Model, and provides resources regarding the model on their website:

- <https://dot.ca.gov/programs/transportation-planning/multi-modal-system-planning/statewide-modeling>

Information regarding the previous version of the CSTDM is no longer available on Caltrans' website. Caltrans is currently in the process of updating the statewide travel demand model. Requests regarding statewide modeling should be directed to Caltrans.

An example of the CSTDM used for OD data, gateway selection, and trip length beyond local model gateways is described below:

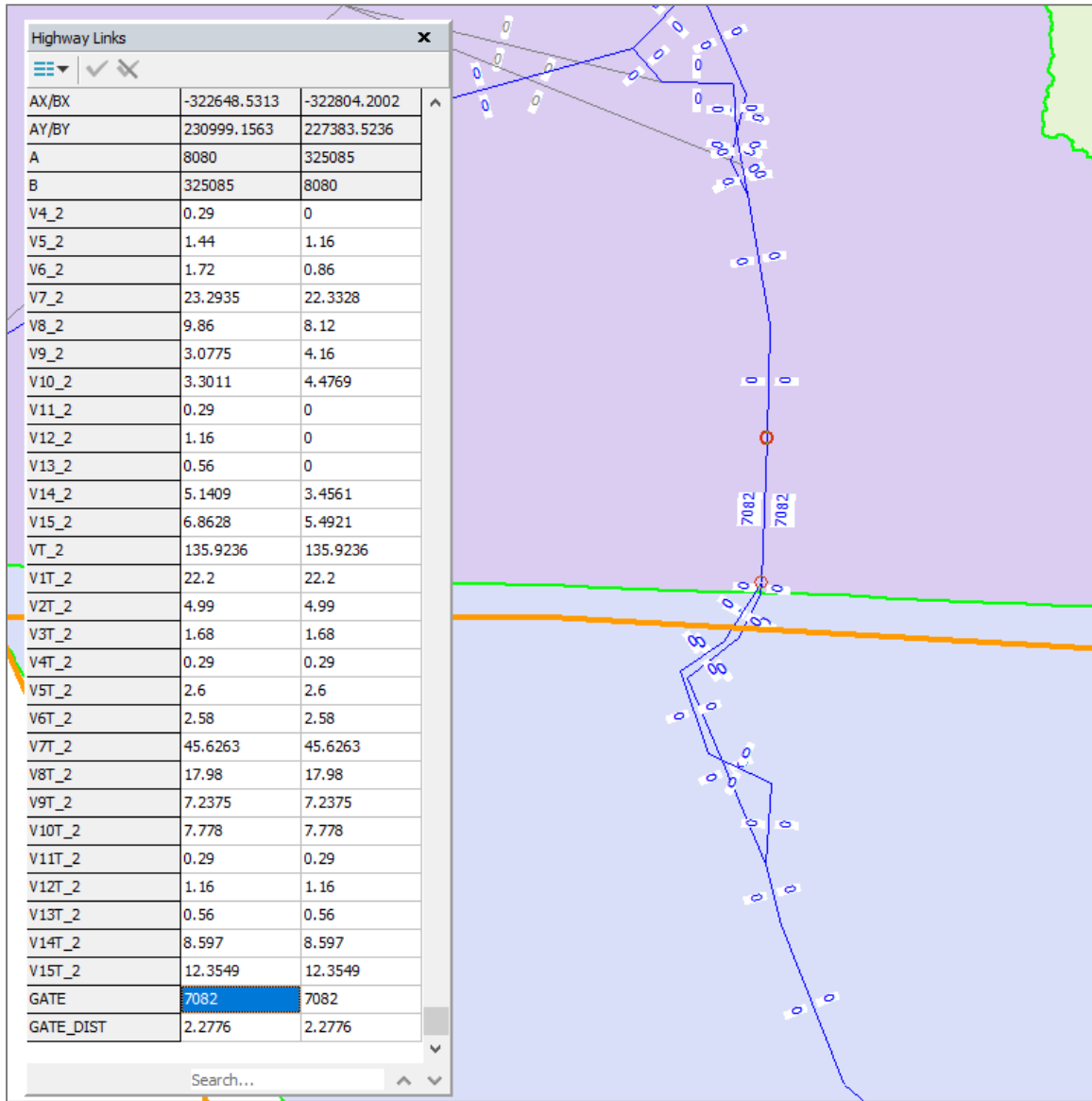
- Create correspondence between Study Area TAZs within local/regional model to the Statewide Model TAZs, similar to the example from the Mendocino Council of Governments (MCOG) Model, as shown in Table 5.

Table 5: Example TAZ Correspondence Table

MCOG TAZ	CSTDM TAZ
1	256
3	259
5	259
6	259
7	259
8	260
9	260
10	260

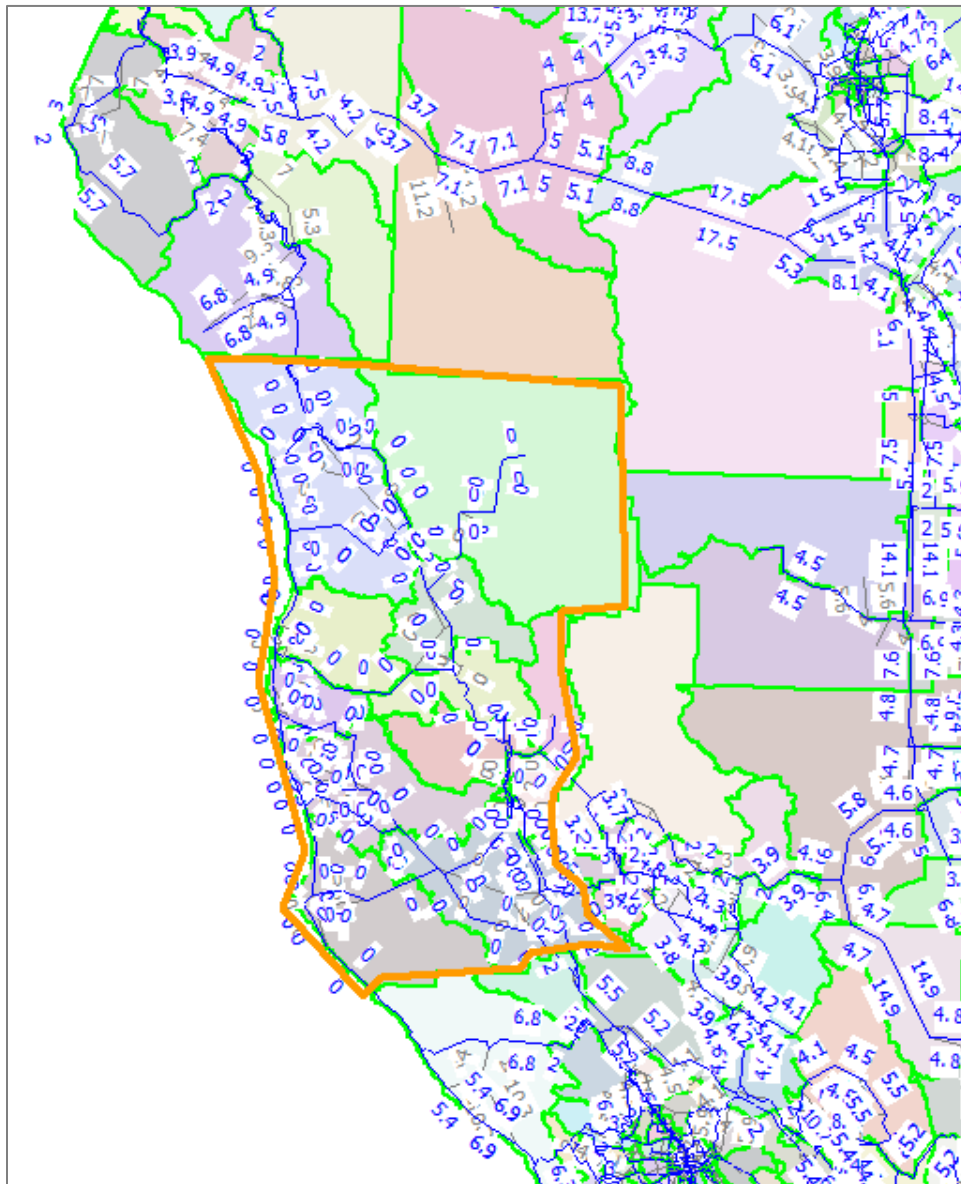


- Add "Gate" attribute to CSTDM roadway network links and set "Gate" equal to gateway id only for those links identified as the locations corresponding to the local/regional model gateways.





- Add "Gate_Dist" attribute to CSTDM roadway network links and set "Gate_Dist" equal to the link distance for those links outside the local/regional model boundary. All the CSTDM roadway links inside the local/regional model boundary will have a "Gate_Dist" attribute of 0.





- Run a highway skim on the CSTDM roadway network to skim the shortest travel time between each OD pair, tracking the gateway and distance outside the local model boundary. A sample Cube Voyager script for this step is included in the Appendix. An example output of this process is presented in Table 6.

Table 6: Example OD with Gate Identification and Distance Beyond Local Model

CSTDM Origin TAZ	CSTDM Destination TAZ	Volume	Gateway ID	Distance Beyond Local Model Boundary (mi)
246	2	0.21	7082	189.31
246	108	0.1	7082	82.73
246	118	0.42	7082	13.65
246	119	0.29	7082	22.88
246	139	0.13	7085	167.35
246	141	0.07	7085	169.53
246	173	0.25	7082	106.45
246	201	0.07	7085	126.73

- For each gateway, summarize the average distance beyond the local model boundary weighted by volume at each gateway. An example is presented in Table 7.

Table 7: Example Weighted Average Distance Beyond Local Model Boundary

Gateway ID	Gateway	Weighted Average Distance Beyond Local Model Boundary (mi)
7081	SR 1 - South	28.4
7083	US 101 - South	63.2
7082	US 101 - North	44.7
7085	SR 20 - East	46.4
7086	SR 175 - East	15.9

- Tag the gateway distance from the above step using CSTDM to the gateways in the local/regional model and multiply to the gateway volume from the local/regional model to determine the gateway external VMT to the local/regional model. Make sure not to double-count any overlap distance that's already accounted for in the VMT calculation from the local/regional model. An example for this calculation for IX trips from the MCOG model is shown in Table 8.



Table 8: Example Adjustment Gateway and IX, XI Link Volumes Table

Gateway	Weighted Average Distance Beyond Local Model Boundary (From CSTDM)	MCOG IX Volume	MCOG IX VMT Beyond Local Model Boundary
SR 1 - South	28.4	1,190	33,796
US 101 - South	63.2	5,004	316,253
US 101 - North	44.7	567	25,345
SR 20 - East	46.4	3,529	163,746
SR 175 - East	15.9	551	8,761

California Household Travel Survey (CHTS)

CHTS data was collected by Caltrans and is shared on the following website.

- <https://www.nrel.gov/transportation/secure-transportation-data/tsdc-california-travel-survey.html>

An example of CHTS data filtered for IX trips for Mendocino County is shown below. This example requires processing of the survey data and specific formatting such that it contains trip origin, destination, distance, and volume information.

oTract	oPlace	oCounty	dTract	dPlace	dCounty	distance_fine	time	avgSpeed	numVehTrips
6045010200	Unincorporated	Mendocino	6023011500	Unincorporated	Humboldt	24	30	50	232.2
6045010200	Unincorporated	Mendocino	6023011500	Unincorporated	Humboldt	24	30	50	0
6045010400	Fort Bragg	Mendocino	6033001000	Kelseyville	Lake	86	120	45	491.32
6045010500	Fort Bragg	Mendocino	6001450752	Dublin	Alameda	194	330	35	486.56
6045010700	Willits	Mendocino	6023001000	Arcata	Humboldt	133	170	45	0
6045010700	Willits	Mendocino	6023001000	Arcata	Humboldt	134	170	45	261.41
6045010700	Willits	Mendocino	6023011500	Unincorporated	Humboldt	60	70	50	62.31
6045010700	Willits	Mendocino	6023011500	Unincorporated	Humboldt	72	120	35	210.39
6045010700	Willits	Mendocino	6033000802	Clearlake	Lake	64	65	60	164
6045010700	Willits	Mendocino	6033001000	Kelseyville	Lake	51	70	45	221.9
6045010700	Willits	Mendocino	6075016500	San Francisco	San Francisco	134	155	50	0
6045010700	Willits	Mendocino	6075016500	San Francisco	San Francisco	135	155	50	49.48
6045010700	Willits	Mendocino	6081604800	Millbrae	San Mateo	149	200	45	89.91
6045010700	Willits	Mendocino	6097153403	Sebastopol	Sonoma	89	120	45	0
6045010700	Willits	Mendocino	6105000400	Mad River	Trinity	123	285	25	191.16
6045010801	Unincorporated	Mendocino	6097152000	Santa Rosa	Sonoma	71	90	45	46.84
6045010802	Unincorporated	Mendocino	6055201700	Angwin	Napa	83	120	40	103.69
6045010900	Unincorporated	Mendocino	6023011100	Rio Dell	Humboldt	128	190	40	129.99
6045010900	Unincorporated	Mendocino	6033000300	North Lake	Lake	28	60	30	274.5
6045010900	Unincorporated	Mendocino	6033000400	Lakeport	Lake	34	40	50	916.13
6045011002	Unincorporated	Mendocino	6001421700	Berkeley	Alameda	159	195	50	240.48



Longitudinal Employer-Household Dynamics Data (LEHD)

LEHD data can be accessed using the following online resource.

- <https://onthemap.ces.census.gov/>

OD data using this resource can be identified by searching a study area (City, County, or can upload a shapefile with specific geography) and looking at the “Destination” Analysis Type.

- For IX trips, use the “Home” setting for Home/Work Area
- For XI trips, use the “Work” setting for Home/Work Area

The screenshot displays the OnTheMap web application interface. The main window shows a map of Chico, CA, with a search bar and a list of search results. The 'Analysis Settings' dialog box is open, showing the following configuration:

- Destination Analysis in 2017 by All Jobs**
- Home/Work Area:** Work (selected)
- Analysis Type:** Destination (selected)
- Year:** 2017 (selected)
- Job Type:** All Jobs (selected)

The 'Jobs Counts by Places (Cities, CDPs, etc.)' table shows the following data for 2017:

Place	Count	Share
All Places (Cities, CDPs, etc.)	45,393	100.0%
Chico city, CA	20,524	45.2%
Paradise town, CA	2,493	5.5%
Durham CDP, CA	629	2.0%
Magalia CDP, CA	781	1.7%
Orzville city, CA	709	1.6%
Redding city, CA	596	1.3%
Orland city, CA	593	1.3%
Yuba City city, CA	625	1.2%
Sacramento city, CA	396	0.9%
Thermalite CDP, CA	312	0.7%
All Other Locations	17,548	38.7%



Mobile Device OD Data

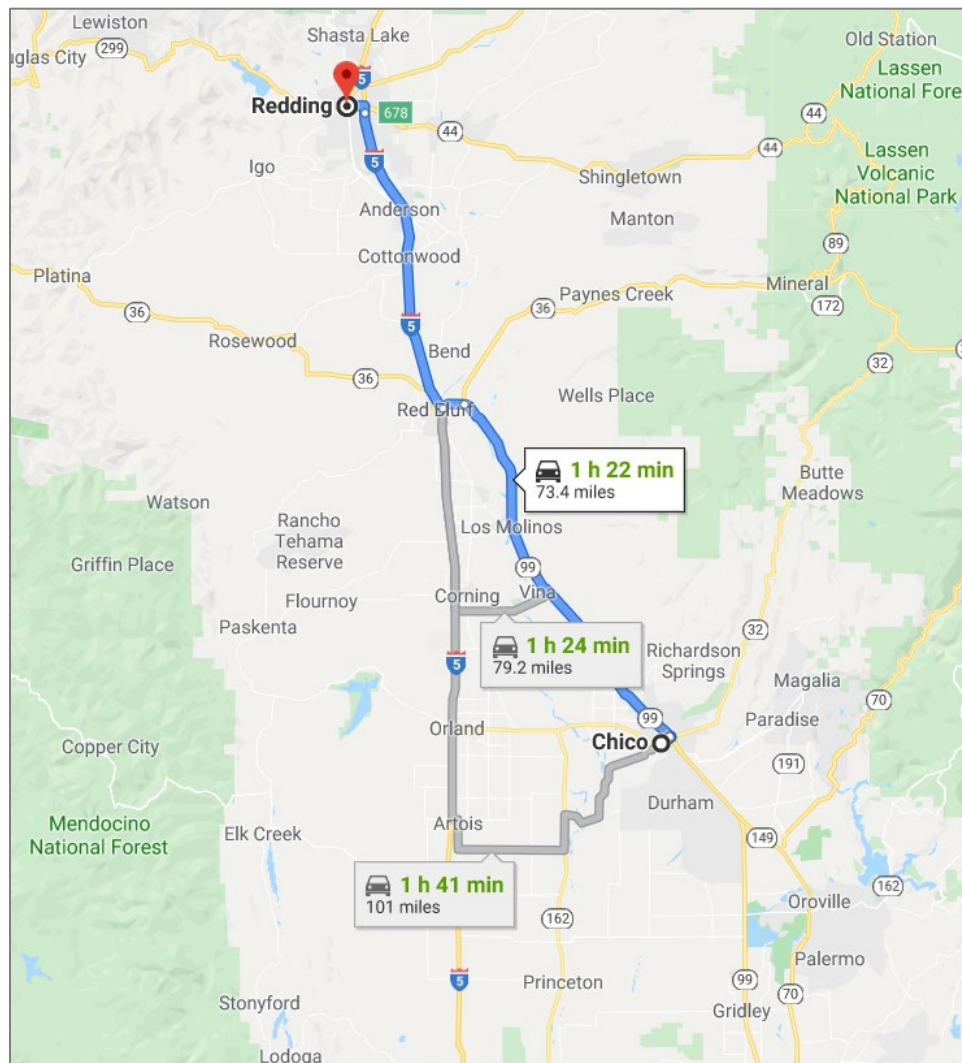
Streetlight is one vendor that can provide data for OD, gateway identification, and trip lengths. A middle filter analysis is needed to determine which particular gateway a trip passes through. An example showing IX trips from Chico to areas beyond the Butte Council of Governments (BCAG) Model boundary is presented below.

Type of Travel	Origin Zone ID	Origin Zone Name	Middle Filter Zone ID	Middle Filter Zone Name	Destination Zone ID	Destination Zone Name	Day Type	Day Part	Total O-M-D Traffic (Sample Trip Counts)
Personal	6	Biggs	1	CA 99 North of	16	Tehama County	1: Weekday (M-Th)	0: All Day (12am-12am)	3
Personal	6	Biggs	1	CA 99 North of	23	Shasta County	1: Weekday (M-Th)	0: All Day (12am-12am)	2
Personal	6	Biggs	9	Honcut Rd	30	Yuba County	1: Weekday (M-Th)	0: All Day (12am-12am)	3
Personal	6	Biggs	11	CA 70 South of	20	Nevada County	1: Weekday (M-Th)	0: All Day (12am-12am)	1
Personal	6	Biggs	11	CA 70 South of	26	Placer County	1: Weekday (M-Th)	0: All Day (12am-12am)	2
Personal	6	Biggs	11	CA 70 South of	30	Yuba County	1: Weekday (M-Th)	0: All Day (12am-12am)	4
Personal	6	Biggs	12	Larkin Rd	28	Sutter County	1: Weekday (M-Th)	0: All Day (12am-12am)	2
Personal	6	Biggs	12	Larkin Rd	30	Yuba County	1: Weekday (M-Th)	0: All Day (12am-12am)	1
Personal	6	Biggs	13	CA 99 South of	19	Glenn County	1: Weekday (M-Th)	0: All Day (12am-12am)	1
Personal	6	Biggs	13	CA 99 South of	26	Placer County	1: Weekday (M-Th)	0: All Day (12am-12am)	1
Personal	6	Biggs	13	CA 99 South of	27	Sacramento County	1: Weekday (M-Th)	0: All Day (12am-12am)	49
Personal	6	Biggs	13	CA 99 South of	28	Sutter County	1: Weekday (M-Th)	0: All Day (12am-12am)	174
Personal	6	Biggs	13	CA 99 South of	29	Yolo County	1: Weekday (M-Th)	0: All Day (12am-12am)	7
Personal	6	Biggs	13	CA 99 South of	30	Yuba County	1: Weekday (M-Th)	0: All Day (12am-12am)	17
Personal	6	Biggs	14	Almond Orchard	28	Sutter County	1: Weekday (M-Th)	0: All Day (12am-12am)	3
Personal	6	Biggs	15	Gridley Road	18	Colusa County	1: Weekday (M-Th)	0: All Day (12am-12am)	3
Personal	6	Biggs	17	Biggs-Willows Rd	18	Colusa County	1: Weekday (M-Th)	0: All Day (12am-12am)	3
Personal	6	Biggs	17	Biggs-Willows Rd	19	Glenn County	1: Weekday (M-Th)	0: All Day (12am-12am)	8
Personal	6	Biggs	19	Ord Ferry Road	19	Glenn County	1: Weekday (M-Th)	0: All Day (12am-12am)	1
Personal	6	Biggs	20	CA 32 Hamilton	19	Glenn County	1: Weekday (M-Th)	0: All Day (12am-12am)	2
Personal	7	Chico	1	CA 99 North of	16	Tehama County	1: Weekday (M-Th)	0: All Day (12am-12am)	2482
Personal	7	Chico	1	CA 99 North of	19	Glenn County	1: Weekday (M-Th)	0: All Day (12am-12am)	6
Personal	7	Chico	1	CA 99 North of	23	Shasta County	1: Weekday (M-Th)	0: All Day (12am-12am)	643
Personal	7	Chico	1	CA 99 North of	27	Sacramento County	1: Weekday (M-Th)	0: All Day (12am-12am)	2
Personal	7	Chico	1	CA 99 North of	30	Yuba County	1: Weekday (M-Th)	0: All Day (12am-12am)	1
Personal	7	Chico	3	CA 32 North of	14	Plumas County	1: Weekday (M-Th)	0: All Day (12am-12am)	19
Personal	7	Chico	3	CA 32 North of	16	Tehama County	1: Weekday (M-Th)	0: All Day (12am-12am)	4



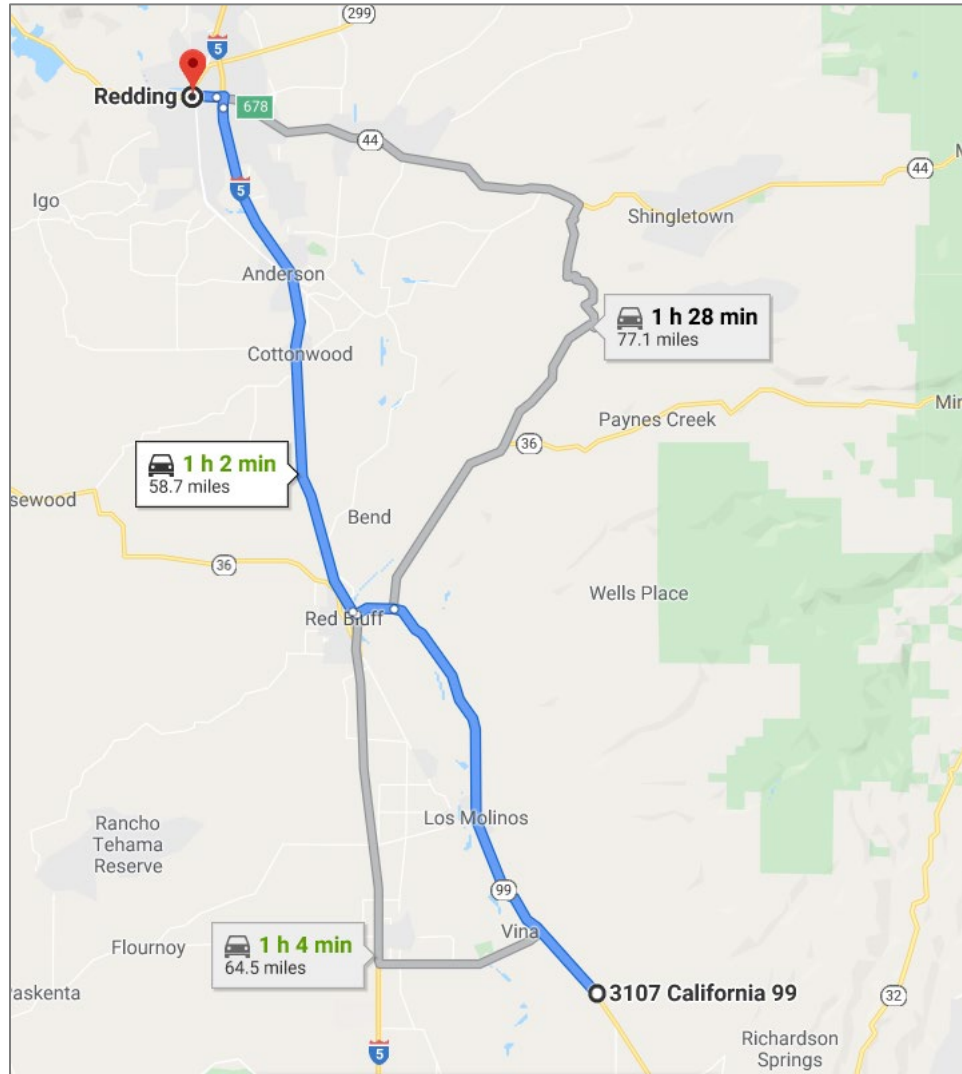
Google Maps (for Gateway Identification and Trip Length Beyond Local Model Gateways)

Google Maps (or similar online mapping tool) can be used as a quick tool for gateway identification and for determining trip lengths beyond a local model boundary. An example of trips from Chico leaving the BCAG model boundary to Redding is shown below. Trips for this OD pair pass through the gateway on SR 99 (based on the shortest travel time).





After a gateway is identified, the distance from the gate location to the trip end outside of the local model boundary can also be searched, as shown below.





Appendix (Cube Voyager Sample Script)

```
;TAZs from local model within the CSTDM
Project1='246-261'
;=====
; PM peak period highway skim
RUN PGM=highway
NETI=..\LoadedNetworks\HwyNetwork_Loaded_PM_?.net ; input network
MATO=Skim_PM_?.mat, MO=1-4, NAME=TIME,GATE,GATE_DIST,FULL_DIST ; output skim matrix
  PHASE=ILOOP
  PATH=LI.TIME_2,MW[1]=PATHTRACE(LI.TIME_2), MW[2]=PATHTRACE(LI.GATE), MW[3]=PATHTRACE(LI.GATE_DIST),
MW[4]=PATHTRACE(LI.DISTANCE)
endphase
ENDRUN
;=====
; Summarize OD Volumes and Skim Matrices
RUN PGM=MATRIX
  MATI[1]=..\TripTables\OD_?.mat
  MATI[2]=Skim_PM_?.mat
  MATO=OD_Gate_VMT_?.mat, MO=1-6, name=VOL_DAY,GATE,GATE_DIST,GATE_VMT_DAY,FULL_DIST,FULL_VMT
  MW[1]=mi.1.1 + mi.1.2 + mi.1.3 + mi.1.4 + mi.1.5 + mi.1.6 + mi.1.7 + mi.1.8 + mi.1.9 + mi.1.10 + mi.1.11 + mi.1.12 +
  mi.1.13 + mi.1.14 + mi.1.15 + mi.1.16 + mi.1.17 + mi.1.18 + mi.1.19 + mi.1.20 + mi.1.21 + mi.1.22 + mi.1.23 + mi.1.24 +
  mi.1.25 + mi.1.26 + mi.1.27 + mi.1.28 + mi.1.29 + mi.1.30 + mi.1.31 + mi.1.32 + mi.1.33 + mi.1.34 + mi.1.35 + mi.1.36 +
  mi.1.37 + mi.1.38 + mi.1.39 + mi.1.40 + mi.1.41 + mi.1.42 + mi.1.43 + mi.1.44 + mi.1.45 + mi.1.46 + mi.1.47 + mi.1.48 +
  mi.1.49 + mi.1.50 + mi.1.51 + mi.1.52 + mi.1.53 + mi.1.54 + mi.1.55 + mi.1.56 + mi.1.57 + mi.1.58 + mi.1.59 + mi.1.60
  MW[2]=mi.2.2
  MW[3]=mi.2.3
  MW[4]=MW[1]*MW[3]
  MW[5]=mi.2.4
  MW[6]=MW[1]*MW[5]
ENDRUN
;=====
; Export to CSV
run pgm=matrix
filei mati[1] = OD_Gate_VMT_?.mat
fileo mato[1]= OD_Gate_VMT_?_IX.csv, MO=1-6, FORMAT=csv, PATTERN=IJM:V, DEC=d, DELIMITER=',
fileo mato[2]= OD_Gate_VMT_?_XI.csv, MO=7-12, FORMAT=csv, PATTERN=IJM:V, DEC=d, DELIMITER=',
  IF (I=@Project1@)
    MW[1]=MI.1.1 EXCLUDE=@Project1@
    MW[2]=MI.1.2 EXCLUDE=@Project1@
    MW[3]=MI.1.3 EXCLUDE=@Project1@
    MW[4]=MI.1.4 EXCLUDE=@Project1@
    MW[5]=MI.1.5 EXCLUDE=@Project1@
    MW[6]=MI.1.6 EXCLUDE=@Project1@
  ELSE
    MW[1]=0
    MW[2]=0
    MW[3]=0
    MW[4]=0
    MW[5]=0
    MW[6]=0
  ENDIF
JLOOP
IF (I=@Project1@ & J=@Project1@)
  MW[7]=0
  MW[8]=0
```



```
MW[9]=0
MW[10]=0
MW[11]=0
MW[12]=0
ELSEIF (J=@Project1@)
  MW[7]=MI.1.1
  MW[8]=MI.1.2
  MW[9]=MI.1.3
  MW[10]=MI.1.4
  MW[11]=MI.1.5
  MW[12]=MI.1.6
ELSE
  MW[7]=0
  MW[8]=0
  MW[9]=0
  MW[10]=0
  MW[11]=0
  MW[12]=0
ENDIF
ENDJLOOP
ENDRUN
```