California Senate Bill 743 Implementation Assistance Project:
Case Studies on Using Vehicle Miles Traveled to Evaluate Transportation Impacts in CEQA

The Cannery Mixed-Use Project (Davis, CA) Case Study

January 2020

The SB 743 Implementation Assistance Project was coordinated by the
Urban Sustainability Accelerator, a joint program of the
Toulan School of Urban Studies and Planning and the
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Participating Agencies

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We make special mention here of some of the most active participants: **Mike McKeever** (who initiated the project), former CEO of the Sacramento Area Council of Governments; **Chris Ganson** (a leading participant in every phase), with the California Governor's Office of Planning and Research; **Jeannie Lee** (who led the Legal Advisory Committee), also with the California Governor's Office of Planning and Research; **Kate White** with the California State Transportation Agency; **Bruce Griesenbeck** with the Sacramento Area Council of Governments; **Ping Chang** with the Southern California Association of Governments; **Ron Milam** at Fehr & Peers Transportation Consultants; and **Jamey Volker** at Volker Law Offices, and PhD candidate in Transportation Technology and Policy at UC Davis.

Many thanks also to the project team: **Robert Liberty**, Project Manager and **Judy Walton**, Project Coordinator, both with the Urban Sustainability Accelerator at Portland State University; **Lynn Peterson**, former Secretary of Transportation for Washington State (now President of the Metro Council of metropolitan Portland, Oregon); and finally the late **Sam Seskin**, nationally recognized transportation consultant.

Fregonese Associates assisted with preparation of communication materials and three case studies.

The analysis for this particular case study on The Cannery mixed-use development project in Davis was carried out by **Amy Lee** at the Sacramento Area Council of Governments (SACOG) with significant technical support by **Jamey Volker** (see above), **Gordon Garry** at SACOG, and other SACOG staff.

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Case Study: The Cannery Mixed-Use Project (Davis, CA)

1. About the SB 743 Implementation Assistance Project

This case study is one of five undertaken as part of the SB 743 Implementation Assistance Project: From Driving More to Driving Less, a collaboration among California state agencies and metropolitan planning organizations, consulting professionals and project staff (see Appendix A). The project was managed by the Urban Sustainability Accelerator at Portland State University.

The purpose of the project was to assist with the development and implementation of new Guidelines governing transportation impact analysis under CEQA (California Environmental Quality Act). These were being drafted to carry out the groundbreaking provisions of California Senate Bill 743, which fundamentally changed transportation impact analysis as part of CEQA compliance. The updated CEQA Guidelines were adopted in December 2018 during the course of this project.

The nationally important feature of SB 743 (passed in 2013) was the elimination of auto delay, level of service (LOS), and similar measures of traffic congestion or vehicular capacity as a basis for determining the significant transportation impacts of new projects. Charged with selecting a replacement metric and developing associated guidance, the Governor's Office of Planning and Research (OPR) chose Vehicle Miles Traveled (VMT) – i.e., the amount and distance of automobile travel attributable to a project – as the preferred CEQA transportation metric going forward.

That shift necessitated corresponding changes in how transportation impacts are to be mitigated – from such methods as widening roads or adding turn lanes to improve LOS standards, to measures such as increasing transit service or instituting parking fees to reduce project-generated VMT.

The five case studies that form the core of this project represent a sample of previously approved land use and transportation projects, selected by the project's leadership to highlight different topics in implementing OPR's updated guidelines and technical guidance being drafted at the time. Each case study draws on a project's environmental impact report (EIR) and related documents prepared under the former LOS maintenance standard as a basis for illustrating what a new, VMT-based transportation impact analysis would look like, pursuant to the updated CEQA statute, guidelines, and technical advisory.

You can find more details about the project on the website at https://www.sb743.org. This includes the other case studies, related workshops, and a resource library.

Disclaimer: The approach and technical methods used here are illustrations of how the new CEQA analysis can be approached; they are not endorsements of that approach by any of the participating governments or technical experts. Reasonable minds can and do differ regarding how to implement the Guidelines. That was true even among the distinguished experts who contributed to these case studies. CEQA gives lead agencies significant discretion in how they undertake their CEQA responsibilities and these case studies illustrate ways in which that discretion can be exercised.

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2. The Cannery Project Description

(a) Project Overview

The Cannery is a 100-acre, mixed-use, redevelopment project within the City of Davis in Yolo County, California. The project proposes a mix of land uses consisting of low, medium, and high-density residential uses; a mixed-use business park; a neighborhood center; and parks and open spaces (greenbelts, agricultural buffers, an urban farm, etc.). According to the project's Draft Environmental Impact Report (DEIR),[1] the project would include up to 551 residential dwelling units[2] and up to 236,000 square feet of mixed-use commercial, office and high-density residential uses (DEIR, pp. 2.0-4 and 2.0-9).

The project site, formerly the location of a Hunt-Wesson tomato canning plant, is at the north-central edge of Davis, about three miles north of downtown and ten miles from Sacramento. While the site is within the incorporated boundary of the City of Davis, it lies on the city's edge - its northern and eastern boundaries are coterminous with Davis's city limits. Similarly, while the city of Davis is within the Greater Sacramento Area, it lies at the edge of this area, along the region's southern boundary.

The City Council approved the applications for The Cannery in December 2013. The New Home Company completed the land purchase and began demolition in April 2014.

Reasons for selection as a case study

The Cannery project was selected for a case study because of its mix of uses and its location at a city's edge (Davis) as well as on the edge of a major urban region (Sacramento), and within the commutershed of a two major urban regions, Sacramento and the San Francisco Bay area (See Figure 3). This case study tested methods of forecasting VMT[3] for mixed-use residential projects and projects at a region's edge, where transportation impacts are likely to be experienced beyond regional boundaries and outside the boundaries of regional travel models.

A variety of methods may be used to quantify and analyze a project's VMT. The choice of thresholds and method is ultimately at the discretion of lead agencies. This case study focuses on methods recommended in OPR's *Technical Advisory on Evaluating Transportation Impacts in CEQA (December 2018)*, with additional analyses and caveats introduced due to the unique characteristics of the project.

(b) Project Details

The residential component of the project consists of up to 551 residential dwelling units (as mentioned above) and up to 40 accessory dwelling units.[4] Of the total, 110 are planned as affordable housing units. Types and styles of housing include ownership and rental housing, and detached and attached homes in low, medium, and high densities, with an average density of 9.5 units per acre (DEIR, pp. 2.0-5, 2.0-9 and 2.0-10).

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[1] *Draft Environmental Impact Report for The Cannery Project*, SCH# 2012032022, February 2013. Prepared for the City of Davis by De Novo Planning Group. Hereafter "DEIR." Available at https://www.cityofdavis.org/city-hall/community-development-and-sustainability/development-projects/the-cannery/environmental-review.

[2] This represents a reduction from the 610 residential units described in the NOP and analyzed in the DEIR as a conservative scenario.

[3] VMT means vehicle miles traveled. See Appendix B, Glossary, for definitions of terms and acronyms used herein.

[4] The figure for accessory dwelling units ranges in the DEIR from "20 to 64," to "45," to "40."

A 15.1-acre neighborhood mixed-use site - with a 6.4-acre West Side and 8.7-acre East Side - is planned along the Cannery's frontage with East Covell Boulevard. Together the East and West Sides could accommodate up to 236,000 square feet of uses, and employment opportunities for approximately 600 to 850 jobs. The area could also accommodate an additional 24 residential dwelling units (DEIR, p. 2.0-11).

The project also includes 27.7 acres of open space – including a detention basin, agricultural buffers, an urban farm, and greenbelts – and 5.77 acres of park space.

The projected population of the Cannery is 1,493, based on 2.71 persons per household (DEIR, p. 2.0-7).

Figure 1 (Table 2-2 in the DEIR) summarizes the project's land uses. Figure 2 (Table 2-5 in the DEIR) shows a conceptual plan for 171,270 square feet of the neighborhood mixed-use area.[5]

[5] This figure, 171,270 sq. ft., was reduced by the applicant from the original figure of 236,000 sq. ft. in the Notice of Preparation issued for the EIR.

TABLE 2-2: LAND USE SUMMARY

	Acres (gross)	Square Footage	Units	Average Density (gross)	Acreage as a Percentage of Total Area
Residential					
Residential – Low Density	15.3		87	5.4 du/ac	
Residential – Medium Density	27.4		212	7.8 du/ac	
Residential – High Density	11.3		228	20.0 du/ac	
Residential subtotal	54.0		527	9.5 du/ac	53.9%
Neighborhood Mixed-Use					
West Side	6.5	71,600	12		
East Side	8.7	99,670	12		
Neighborhood Mixed-Use subtotal	15.2	171,270	24		15.2%
Open Space					
Greenbelt	2.8				
West Edge – Open Space/Detention Basin	3.9				
North Edge – Ag Buffer/Detention Basin	6.7				
East Edge – Ag Buffer/Urban Farm	7.4				
Open Space subtotal	20.8				20.8%
Parks/Recreation					
Neighborhood Park	6.8				
Southwest Park	0.6				
Parks/Recreation subtotal	7.4				7.4%
Clubhouse	0.8				0.8%
Public/Semi-Public					
Well Site	0.2				
Public/Semi-Public subtotal	0.2				0.2%
East Covell Boulevard	1.7				1.7%
	100.1	171,270	551		100.0%

Figure 1: Proposed land uses for the Cannery Project. (Source: Cannery DEIR, Table 2-2.)

TABLE 2-5: NEIGHBORHOOD MIXED-USE CONCEPTUAL PLAN

	Building	Stories	Use	Square Footage					Res Units
				Retail/ Restaurant	Flex Use	Market Stands	Residential	Total	
East Side	A	1	Retail	9,500				9,500	
	B	1	Restaurant	5,950				5,950	
	C	1+	Market Hall	11,940				11,940	
	D	2	Restaurant	6,100				6,100	
	E	2	Apartments (over C)				25,480	25,480	12
	F	1	Retail	5,000				5,000	
	G	1	Retail	4,500				4,500	
	H	1	Retail	6,500				6,500	
	I	2	Office (over G/H)		12,500			12,500	
	J	1	Retail	11,000				11,000	
	K	1	Market Stands/ Bicycle Parking			1,200		1,200	
				60,490	12,500	1,200	25,480	99,670	12
West Side	L	1	Market Stands/ Bicycle Parking			1,200		1,200	
	M	1	Flex – Office/R&D		12,400			12,400	
	N	1	Flex – Office/R&D		6,700			6,700	
	O	1	Flex – Office/R&D		10,000			10,000	
	P	1	Flex – Office/R&D		8,000			8,000	
	Q	1	Flex – Office/R&D		6,000			6,000	
	R	2 or 3	Live/Work Units				24,000	24,000	12
	S	1	Daycare/School/Tutor	3,300				3,300	
				3,300	43,100	1,200	24,000	71,600	12
Total - East Side and West Side				**63,790**	**55,600**	**2,400**	**49,480**	**171,270**	**24**

Figure 2: Conceptual Plan for The Cannery's Neighborhood Mixed-Use Area. (Source: Cannery DEIR, Table 2-5.)

Location and existing conditions

The project is located at 1111 East Covell Boulevard. The site is generally a slanted rectangle, bordered on the south by Covell Boulevard and on the west by the Union Pacific Railroad (UPRR) line and the F Street drainage channel. Its northern and eastern boundaries, as mentioned above, are coterminous with the Davis City Limits and the Yolo County boundary. The lands immediately to the north and east of the project are zoned Limited Industrial (M-L) under the jurisdiction of Yolo County, and are seasonally farmed with rotating annual crops. Residential neighborhoods are located west of the UPRR line and F Street Channel. South of the site, across East Covell Boulevard, are multi-family residential and office uses (DEIR, p. 2.0-1).

The project site, as mentioned above, is the former location of the Hunt-Wesson tomato canning facility, which was constructed in 1961 and closed in 1999. In 2000 the City rezoned the project site from Industrial to PD-1-00 (Planned Development-Industrial) to allow for the possible development of a business park. The site is designated in the General Plan as Industrial (see Figure 5). A few building foundations from the obsolete cannery remained in the southern portion of the site, while the northern portion, once intended for facilities plant expansion, remains undeveloped. In October 2010 the Davis City Council authorized a pre-application process for the project site. In September 2011, ConAgra

submitted a formal application for The Cannery. The Cannery broke ground in 2014 and remains under construction at the time of this writing, although many homes are already built and occupied[6].

The location of The Cannery is illustrated in Figures 3, 4 and 5 below (Figures 2-1, 2-2, and 2-3 in the DEIR). A site-specific map is provided in Figure 6 (Figure 2-5 in the DEIR).

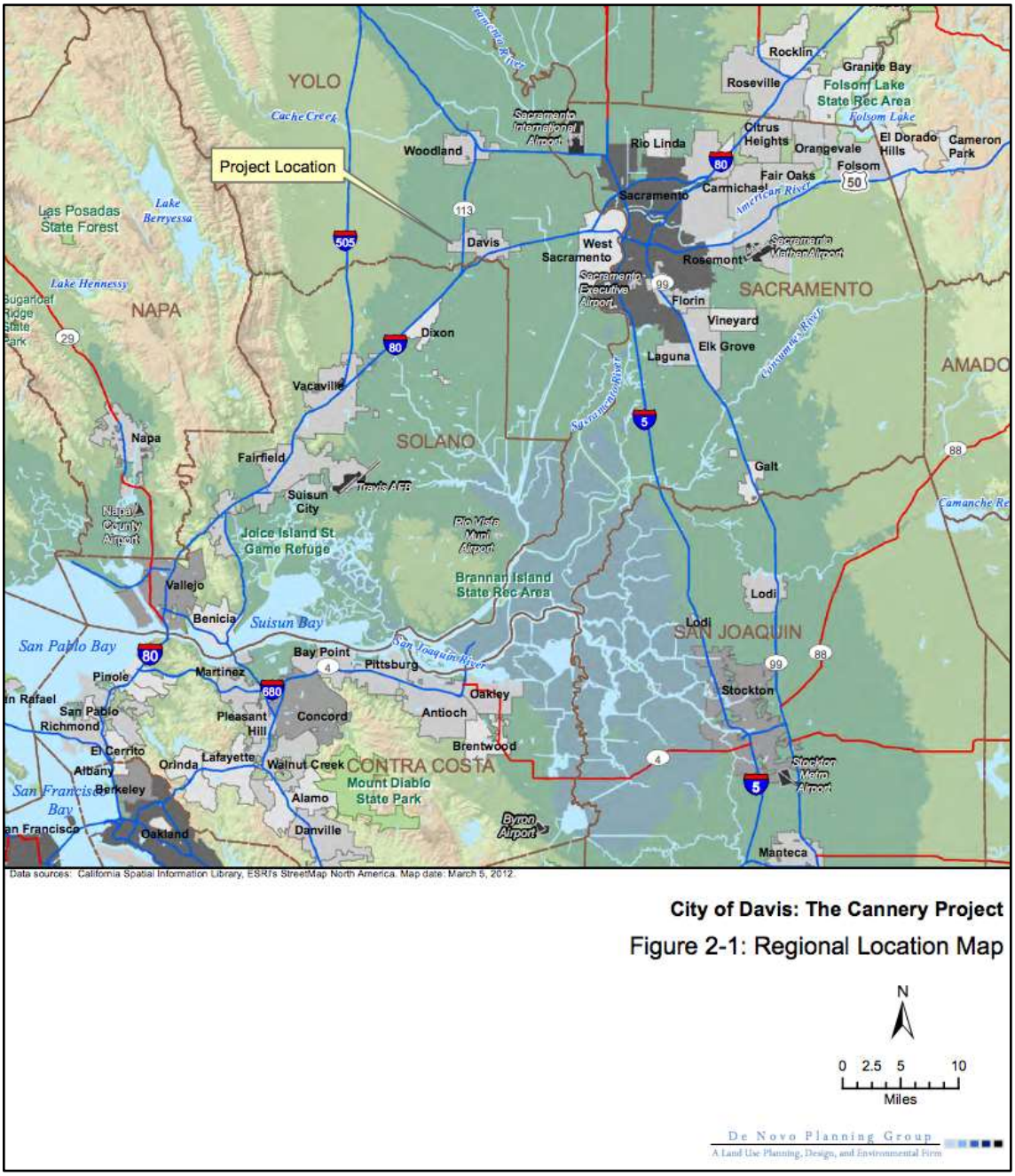

Figure 3: The Cannery's inter-regional location. (Source: Cannery DEIR, Figure 2-1.)

[6] https://livecannerydavis.com/news/groundbreaking-ceremony-marks-start-construction-cannery-davis

Figure 4: The Cannery project's vicinity. (Source: Cannery DEIR, Figure 2-2.)

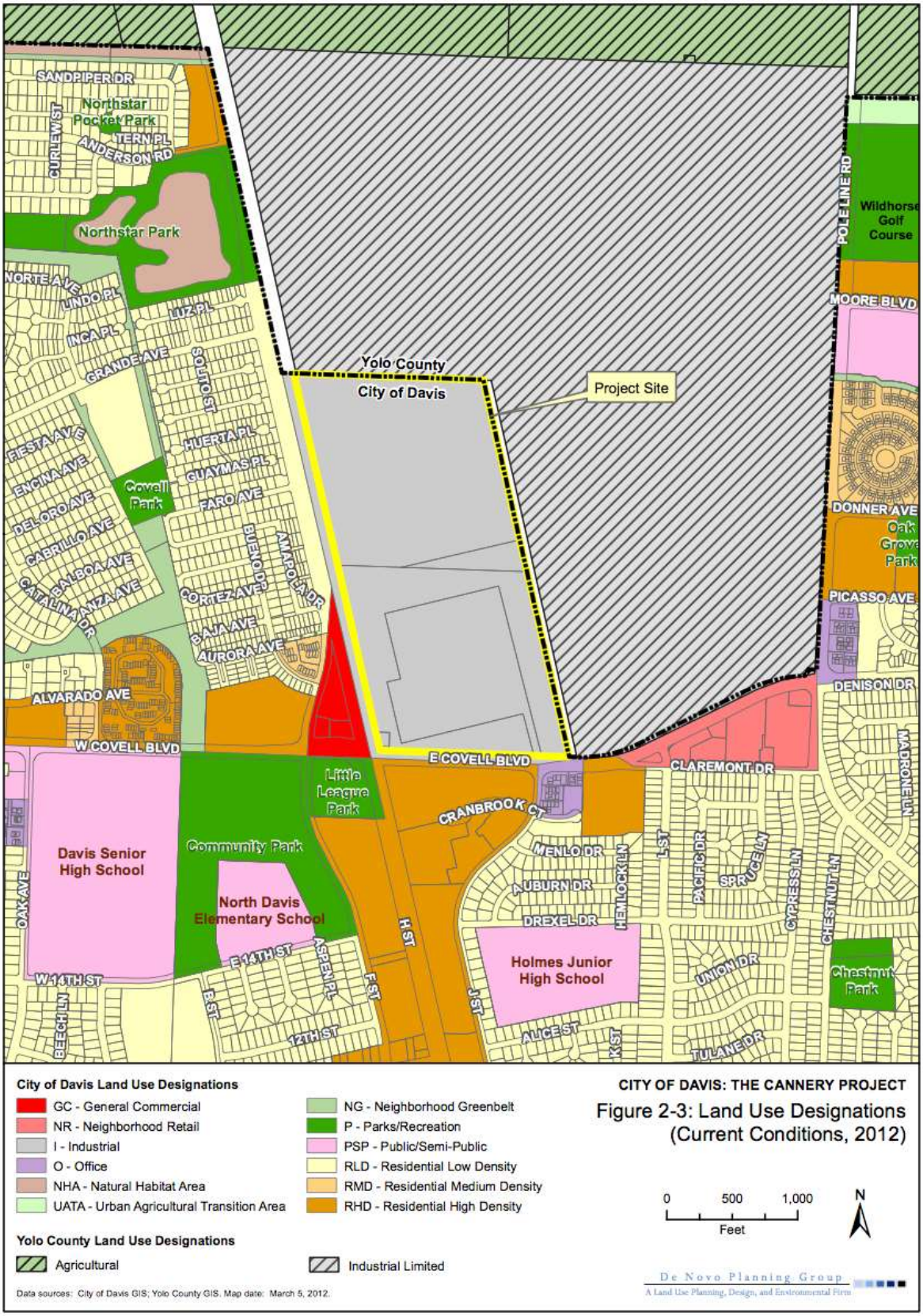

Figure 5: The Cannery's land use context. (Source: Cannery DEIR, Figure 2-3.)

Figure 6: The Cannery's initial proposed land use plan. (Source: Cannery DEIR, Figure 2-5.)

3. CEQA Analysis

This section compares approaches to a CEQA transportation impact analysis before and after SB 743's implementation. We examine the following four topics of relevance to The Cannery project case study:

(a) New CEQA exemption provided by SB 743 (land use projects only)
(b) Thresholds of significance (for transportation impacts)
(c) Transportation impact analysis
(d) Mitigation measures

(a) New CEQA Exemption Provided by SB 743

SB 743 created a new, statutory exemption from CEQA review for certain types of land use projects (see Pub. Resources Code § 21155.4). Specifically it exempts a residential, employment center,[7] or mixed-use development (including a subdivision or zoning change) that is:

(1) Proposed within a transit priority area, as defined in Public Resources Code section 21099(a)(7).
(2) Undertaken to implement and is consistent with a specific plan for which an EIR has been certified.
(3) Consistent with the relevant Sustainable Communities Strategy or alternative planning strategy approved by the California Air Resources Board (CARB).[8]

This exemption, however, does not apply in the case of The Cannery, since the project was not undertaken to implement a specific plan (criterion #2 above).

(b) Thresholds of Significance

Screening thresholds for transportation impacts

OPR's *Technical Advisory on Transportation Impact Analysis in CEQA* (2018) describes two types of thresholds for assessing transportation impacts: preliminary, or "screening" thresholds and "numeric" thresholds.

Many agencies use screening thresholds in the Initial Study phase of the CEQA process to "quickly identify when a project should be expected to cause a less-than-significant impact without conducting a detailed study" (Technical Advisory, p. 12). Often the checklist questions in Appendix G of the Guidelines are used for this purpose. Appendix G criteria are based on the research of OPR but compliance with any threshold does not relieve a lead agency of the obligation to consider substantial evidence indicating that the project's effects may still be significant (CEQA Guidelines, § 15064(b)(2)).

LOS screening thresholds (pre-SB 743)

In the case of the Cannery project, the City as lead agency most likely concluded at the start that a traffic analysis would be needed, so did not perform a screening analysis for transportation impacts. If it had, it

[7] As defined in Public Resources Code Section 21099(1)(b).

[8] "Approved by" means that CARB, pursuant to Section 65080(H)(2)(b) of the Government Code, has accepted an MPO's determination that the SCS or alternative planning strategy would, if implemented, achieve the GHG emissions reduction targets.

might have used criteria in the "Transportation/Traffic" section of Guidelines Appendix G (as they appeared in 2012) for the initial screening. Two of those criteria are relevant to this case study:

> a) Would the project conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation…?
>
> (b) Would the project conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency…?

With passage of SB 743, both of the above criteria in Appendix G were modified to reflect a change in the acceptable transportation impact metric from LOS to VMT.

VMT screening thresholds (post SB 743)

For land use projects, OPR's *Technical Advisory on Evaluating Transportation Impacts in CEQA* suggests several ways lead agencies may screen out projects from having to conduct a detailed VMT impact analysis (pp. 12-15). These screening thresholds are separate from Appendix G criteria. Thresholds relevant to this case study are:

- **Small projects** – projects that would generate fewer than 110 auto trips per day[9] can be presumed to cause a less-than-significant transportation impact.
- **Low-VMT areas (map-based screening)[10]** – residential and office projects that locate in areas with low VMT[11] and incorporate similar features as their surrounding area (such as density, mix of uses, and transit accessibility) can be screened out from further analysis. New development in such areas would likely result in a similar level of VMT. Note: this screen does not apply to retail projects, since the significance threshold for such projects is any increase in net VMT.
- **Projects near transit –** residential, retail, office, and mixed-use projects proposed within ½ mile of an existing "major transit stop" or an existing stop along a "high-quality transit corridor"[12] can be presumed to cause a less than significant transportation impact (Guidelines, § 15064.3 (b)(1)). This presumption does not apply, however, if project-specific or location-specific information indicates that the project will still generate significant levels of VMT.[13]

[9] That is, absent substantial evidence that the project would generate a potentially significant level of VMT, or the project's inconsistency with a Sustainable Communities Strategy (SCS) or general plan.

[10] The term "map-based" screening derives from the use of maps created with VMT data (e.g., from a travel survey or travel demand model) that can illustrate areas currently below threshold VMT.

[11] For residential projects, "low VMT area" includes areas that exhibit average VMT per capita that is below 85% of existing city or regional household VMT per capita. For office projects, it includes areas that exhibit VMT per employee below 85% of existing regional VMT per employee. Retail projects are not eligible for this screening, as any net increase in VMT would be considered significant. (Technical Advisory, pp. 16-17).

[12] See Glossary for definitions of "major transit stop" and "high quality transit corridor."

[13] For example, if the project (a) has a Floor Area Ratio (FAR) of less than 0.75; (b) includes more parking for use by residents, customers, or employees of the project than required by the jurisdiction; (c) is inconsistent with the applicable Sustainable Communities Strategy; and/or (d) replaces affordable residential units with a smaller number of moderate- or high-income residential units (Technical Advisory, p. 14).

Absent contrary information, a project that meets one or more of the criteria above may be presumed to have a less-than-significant transportation impact as measured by VMT.

Importantly, for mixed-use projects (such as The Cannery) the *Technical Advisory* (p. 17) recommends that the lead agency either evaluate each use separately and compare results to the appropriate threshold, or simply focus analysis on the dominant use.[14] Combining land uses for VMT analysis is not recommended.[15] The next section shows how a VMT screening might be conducted for the Cannery project.

Applying VMT screening thresholds to the Cannery project

We assessed each component of the Cannery project for potential screening, as described below. To save space, we do not present the office screening analysis for Threshold 2 below, as an identical process is conducted and described in our Empire Lakes case study. However, if it were conducted, the office screening analysis would mirror the residential screening analysis, using the California Statewide Travel Demand Model (CSTDM) or regional model data.

The results of the preliminary screening tests for the Cannery project are as follows:

Screening Threshold 1: Small project.
With 550 proposed dwelling units and at least 600 jobs, the Cannery could not be considered a "small project" generating fewer than 110 vehicle trips per day. It would thus not be screened out by this criterion.

Screening Threshold 2: Location in a low-VMT area (office, residential)
The project site is located on a former industrial facility in a TAZ with nearly exclusively agricultural uses and high household (residential) VMT – greater than 115% of the 2012 Regional Average Household VMT per capita (see Figure 7). If built out as planned, the project would have higher residential densities and similar transit accessibility as the low-VMT neighborhoods to the project's south and west. Given this, the lead agency could argue that, even though the project is not located *"in"* a low-VMT area," it would perform similarly to or better than the development in "*adjacent"* low-VMT areas. If this were assumed, the residential portion of the project could potentially be screened out from further VMT analysis.

For mixed-use projects, as stated earlier, OPR's *Technical Advisory on Evaluating Transportation Impacts in CEQA* (p. 17) recommends evaluating each component independently and applying the relevant significance threshold, or considering only the project's dominant use in the impact analysis. The residential component of the Cannery project may be identified as the dominant use since half of the 100-acre site is planned for residential use, and the 15-acre "mixed-use" area will contain additional residences (and almost all of the remaining area is parks and open space (see Figure 6 above).

[14] The "dominant use" would be determined by the agency, either pursuant to an established policy or on a case-by-case basis supported by substantial evidence.

[15] Doing so may result in an inaccurate impact assessment, streamlining certain mixes of uses in a manner disconnected from policy objectives or environmental outcomes.

Therefore, the entire project could be screened out from further analysis based on the dominant residential component alone - assuming there is no substantial evidence indicating that the project would still cause significant transportation impacts.

However, a lead agency might not want to rely on the assumption that the Cannery project as a whole will perform similarly to the adjacent low-VMT areas, and conduct a VMT analysis to confirm the accuracy and validity of the screening results, as was done in this case study.

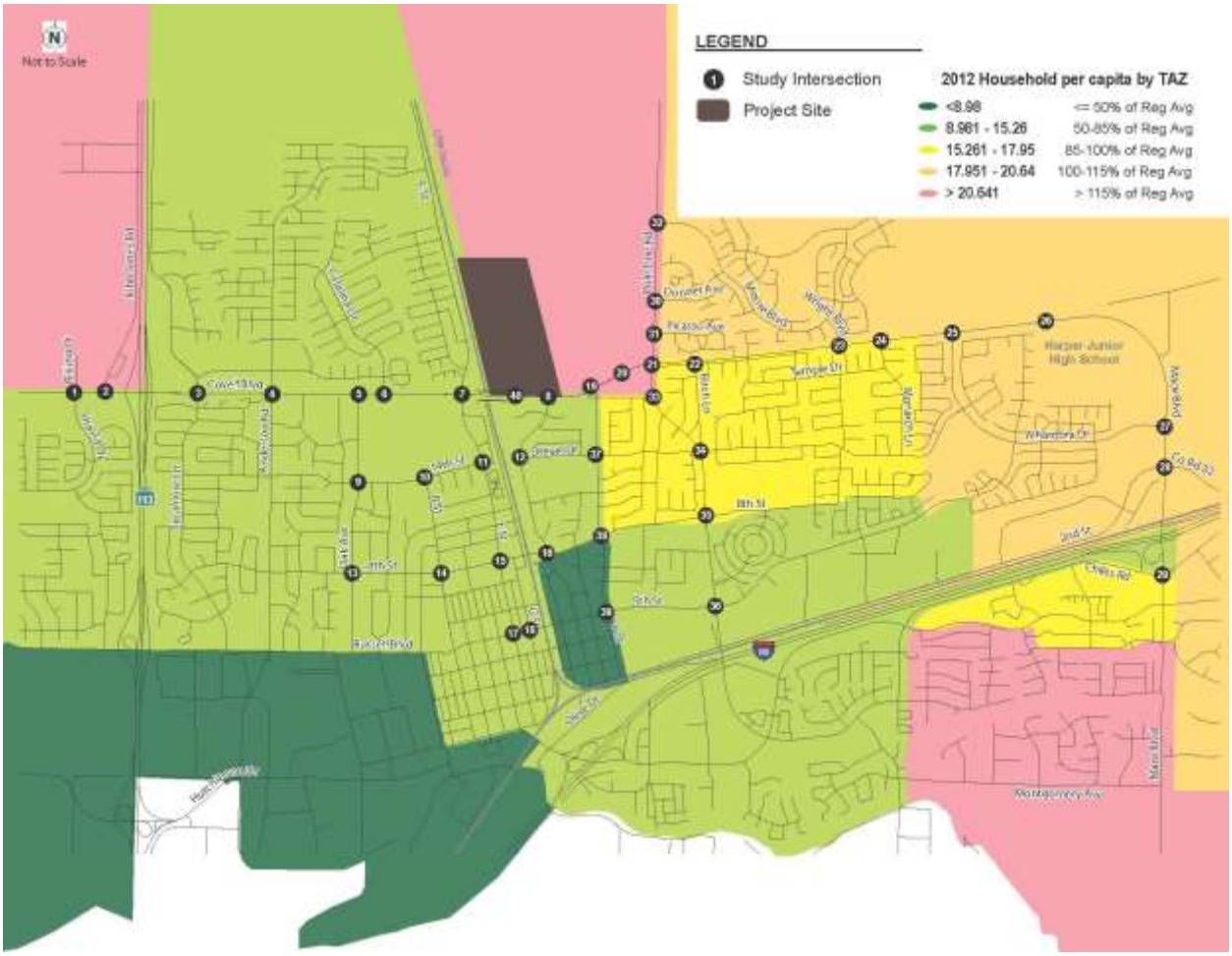

Figure 7: The Cannery's location within a TAZ with greater than 115% of 2012 Regional Average Household VMT per capita. (Source: SACOG SACSIM data, 2017.)

Screening Threshold 3: Location near transit (for all land uses including mixed use).
It is important to note here that there are slight differences in how "near transit" is conceptualized in CEQA. The main difference hinges on the allowed planning horizon for "major transit stops." To be eligible for CEQA screening or streamlining, a project may be required to be within a half mile of:

(a) An *existing* major transit stop – this applies to most land use projects for screening purposes (see Pub. Resources Code, § 15064.3(b) ["Criteria for Analyzing Transportation Impacts"] and the Technical Advisory, pp. 13-14).

(b) An existing or *planned* major stop that is included in a Transportation Improvement Program (TIP) – this applies to SB 743's "transit priority areas" (see Pub. Resources Code, § 21099(a)(7)); and also applies to "infill projects" eligible for streamlined review (see Guidelines, Appendix M, § II).

(c) An existing or planned major stop that is included in a Regional Transportation Plan (RTP) – this applies to SB 375's "transit priority projects" (see Pub. Resources Code, § 21155(b)). Note: RTPs generally have longer planning horizons than the typical 2-year time horizons in TIPs (in "b" above) and would thus likely include more major transit stops.

Maps of areas "near transit" will include different numbers of transit stops based on the planning horizon allowed, and will thus encompass different geographies. Lead agencies should be careful to use the correct map for the correct purpose.

An appropriate screening map in the case of the Cannery Project would show the project's location with respect to a map of the entire area within a half mile of an *existing* major transit stop or a stop along an *existing* high quality transit corridor, per the definition in Public Resources Code section 15064.3(b), "Criteria for Analyzing Transportation Impacts".[16] We have labeled that area a High-Quality Transit Area (HQTA). Figure 8 shows the resulting map. Note that The Cannery lies outside this HQTA.

Many California MPOs, in preparing their RTPs/SCSs, have used the time horizon allowed for major transit stops under SB 375 (see Pub. Resources Code, § 21155(b)) to map their "High Quality Transit Areas" (HQTAs).[17] These HQTAs typically show all areas within a half-mile of an existing or *planned* major transit stop (or high-quality transit corridor) in the applicable RTP. Figure 9 shows the Cannery project's location with respect to such a map produced for SACOG's RTP/SCS.

Note that The Cannery lies inside the HQTA in Figure 9, since it is a larger area than in Figure 8. However, since Figure 8 is the relevant map for VMT screening under SB 743, the project does not pass the "near transit" screening threshold, and cannot be presumed to have a less-than-significant VMT impact. This illustrates the importance of using the proper map to perform the "near transit" screening.

[16] Unless the Cannery project were in a "Transit Priority Area" as defined by SB 743, but that is not the case.

[17] HQTAs are not defined in statute; however, they are based on the definitions of "major transit stop" and "high quality transit corridor" as identified in the State Public Resources Code.

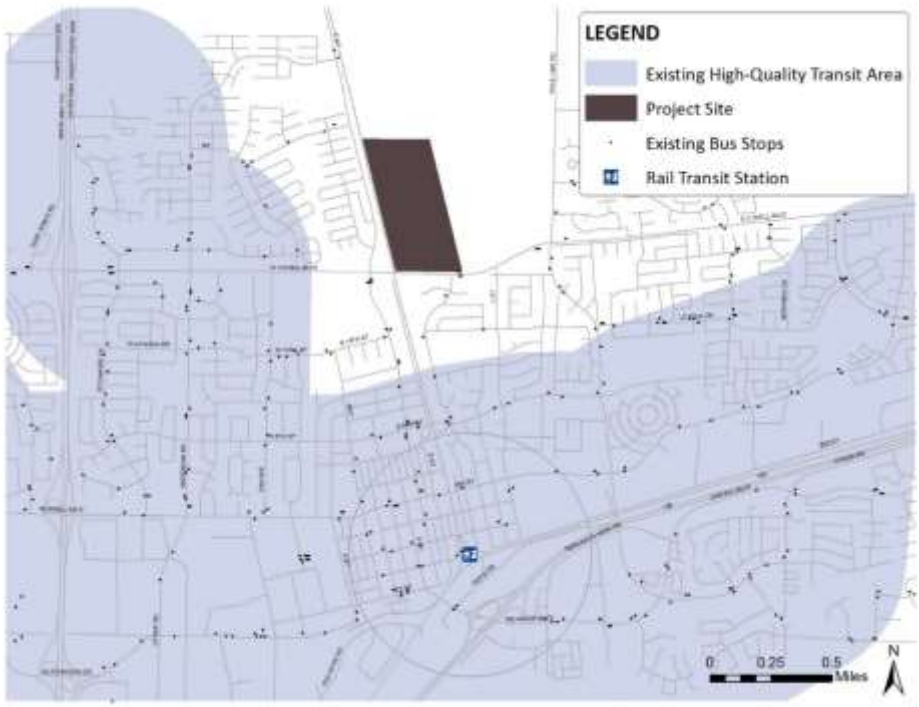

Figure 8: The Cannery's location in relation to a High-Quality Transit Area, mapped using criteria in CEQA Guidelines section 15064.3(b) for determining the significance of transportation impacts.

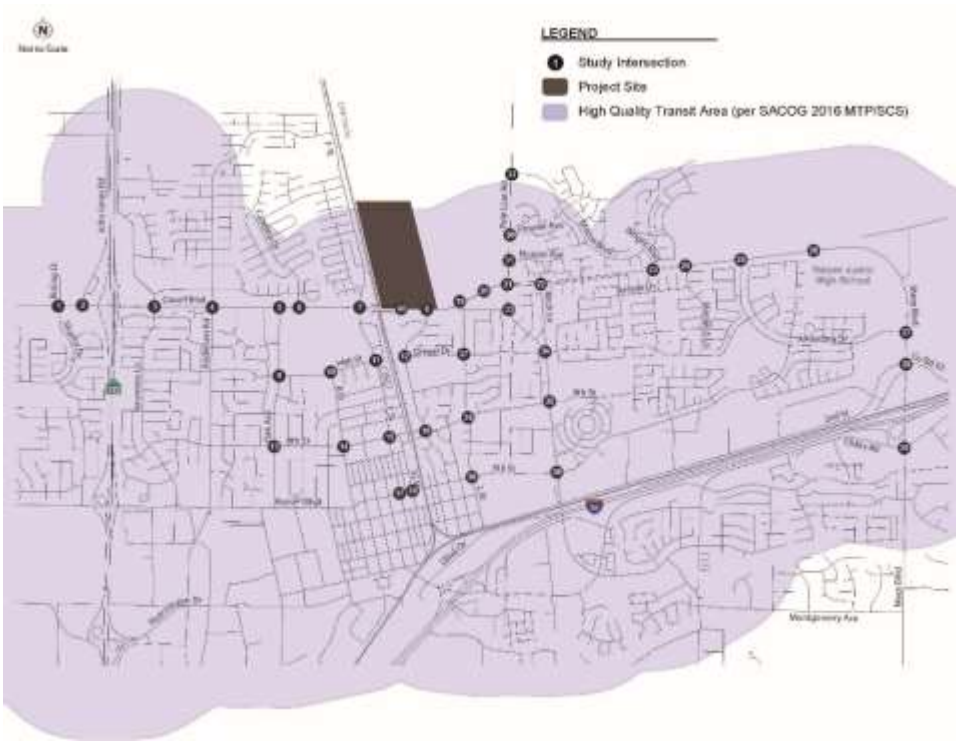

Figure 9: The Cannery's location in relation to a High Quality Transit Area, mapped for SACOG's 2016 MTP/SCS.

In applying VMT-based screening thresholds, the lead agency could have chosen to rely on a map-based screening of the dominant use (Screening Threshold 2 above) to conclude there would be no significant VMT impact. However, in this case study we proceeded to conduct a full VMT analysis for residential – the dominant use – to check the accuracy of the screening results.

Numeric thresholds for transportation impacts

If the screening thresholds do not support a presumption that a project will have less-than-significant impacts, lead agencies should conduct a detailed analysis to determine whether the project will exceed well-founded numeric thresholds of significance. These thresholds are usually developed and published by the lead agency in general plans and/or policy documents.

Numeric thresholds for LOS analysis (pre-SB 743)

The Cannery DEIR employed thresholds of significance based on policies in Davis's General Plan[18] as well as recommended/example thresholds in the CEQA Guidelines (prior to SB 743 implementation).[19] Relevant to this case study[20] are the following thresholds for determining significant traffic impacts as measured by LOS:

- For signalized intersections, operations reach LOS F
- For signalized intersections already at LOS F, the project increases delay by 5 seconds or more
- For unsignalized intersections, operations reach LOS F
- For unsignalized intersections already at LOS F and that meet peak hour signal warrant, the project increases overall traffic volume by more than 1%
- For unsignalized intersections already at LOS F but that do not meet peak hour signal warrant, the project adds sufficient traffic volume to meet a signal warrant

Intersection and roadway operations at LOS E or better are acceptable. The application of the above thresholds is described in the "Transportation Impact Analysis" section of this case study.

Impact thresholds for VMT analysis (post-SB 743)

With VMT replacing LOS as a measure of transportation impacts of new projects, lead agencies must choose new thresholds of significance based on VMT. OPR's *Technical Advisory for Evaluating Transportation Impacts in CEQA* (2018) offers the following set of numeric, VMT thresholds of significance for various project types (pp. 15-17).[21] An impact is significant if it exceeds the threshold; otherwise it is presumed to be less-than-significant unless there is substantial evidence to the contrary.

[18] As amended through 2013. See specifically the General Plan's Transportation Element and also EIR section 3.14.4 ("Regulatory Setting"), pp. 3.14-21 through 3.14-24.

[19] These thresholds, developed and published by the city as lead agency, cover every project and plan within the local jurisdiction; they are not unique to The Cannery.

[20] The full transportation impact analysis in the DEIR included other impacts such as emergency vehicle access, but this case study focuses on traffic impacts only, as measured by LOS.

[21] The Technical Advisory also recommends that project analysis consider "both short- and long-term effects on VMT" (p. 4). Long-term effects are typically covered within a cumulative impacts analysis. The Cumulative VMT analysis may consider the project's effect on VMT forecasts contained in the RTP/SCS (or RTP for non-MPO areas).

- Residential projects – 15% below existing VMT per capita, measured as either city or regional household VMT per capita (Technical Advisory, p. 15). This threshold can be applied to either household (i.e., tour-based) or home-based (i.e., trip-based) VMT assessments.[22]
- Office projects – 15% below existing regional VMT per employee.
- Retail projects - A net increase in total VMT.

For other land use types in the Cannery project (such as parks) the lead agency may develop its own more specific thresholds. Further, it is the discretion of the lead agency to choose thresholds for its jurisdiction that are supported by "substantial evidence," as stated in CEQA Guideline §15064.7(c).

Methods for determining figures for the thresholds listed above include travel demand models, sketch models, spreadsheet models, research, and data (Technical Advisory, p. 30). The next section demonstrates how to determine residential VMT thresholds using regional travel demand models and sketch models.

1. Calculating residential VMT thresholds

Regional and city household VMT per capita can be calculated directly from the California Statewide Travel Demand Model (CSTDM) data hosted by Caltrans.[23] The thresholds derived from these per capita VMT figures are shown in Table 1. If a lead agency relies on the CSTDM, it may also need to obtain specific trip rates and trip lengths from local or regional models and be willing to use those for the individual project analysis.

Table 1: Regional and City Residential VMT Thresholds (Derived from CSTDM)

	Threshold
2010 regional home-based VMT per capita	12.8
2010 city home-based VMT per capita	10.4
15% below regional household VMT per capita	10.9
15% below city household VMT per capita	8.8

Comparing VMT thresholds from the CSTDM to a project-based VMT estimate from a sketch tool such as CalEEMod is not an "apples-to-apples" comparison because trip rates assumed by the CSTDM are not the same as those used in CalEEMod (CalEEMod's default trip rates are from ITE). That said, trip lengths from the CSTDM can be input into CalEEMod, as mentioned in OPR's *Technical Advisory* (pp. 30-31), to achieve an "apples-to-apples" comparison.

Besides statewide models such as the CSTDM, regional and city travel demand models could also be used to calculate the regional and city household VMT per capita. These would then be compared to the project-based VMT estimates found with SACSIM (SACOG's travel model), to ensure an apples-to-apples comparison. Residential thresholds found with SACSIM are shown in Table 2.

[22] The agency, however, must be consistent in its VMT measurement approach throughout the analysis to maintain an "apples-to-apples" comparison.

[23] Available at https://dot.ca.gov/programs/transportation-planning

Table 2: Regional and City Residential VMT Thresholds Derived from SACSIM		
	City	**Regional**
2012 household VMT per capita	13.8	17.9
15% below 2012 household VMT per capita	11.7	15.3

2. Calculating office VMT thresholds

The thresholds and VMT estimates for the office component of the Cannery project would mirror the analyses used for the residential component, using CSTDM or a regional travel model for threshold determination, and CalEEMod or a regional travel model for project-level VMT estimation.

A lead agency would summarize its office land uses, model the associated VMT generation in CalEEMod or commute trips in regional travel model outputs, and normalize total VMT by the number of employees in the jurisdiction.

A calculation of office-generated VMT was carried out this way in the Empire Lakes case study. For an illustration of this approach, see the Mission Viejo Medical Center case study in OPR's January 2016 *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA* (pp. IV:53-54).[24]

3. Calculating retail VMT thresholds

The Cannery project includes a General Plan Amendment to create a new land use category, "Neighborhood Mixed-Use." Allowable uses within the new category include "retail and service uses to serve the daily needs for goods and services of surrounding City residents and businesses such as groceries, restaurants, pharmaceuticals, dry cleaning, printing, office supplies, and similar uses" (DEIR, p. 2.0-6). The goals and objectives are to provide "neighborhood-serving retail" (DEIR, p. 2.0-2), also called "local-serving retail."

The *Technical Advisory* suggests that "generally retail development with no store larger than 50,000 square feet can be considered local-serving," and that since such development "tends to shorten trips and reduce VMT by adding retail opportunities into the urban fabric and thereby improving retail destination proximity," lead agencies "generally may presume such development creates a less-than-significant transportation impact." However, it adds: "Because lead agencies will best understand their own communities and the likely travel behaviors of future project users, they are likely in the best position to decide when a project will likely be local-serving" (Technical Advisory, pp.16-17) [25]

While the Cannery's proposed total retail area is over 50,000 square feet, the largest proposed retail space is 11,940 square feet - see Figure 2 (Table 2-5 in the DEIR) - and thus could be presumed to cause a less-than-significant transportation impact. However, a conservative approach would include an analysis of VMT with and without the retail component to determine the "net effect" on VMT. This

[24] http://www.opr.ca.gov/docs/Revised_VMT_CEQA_Guidelines_Proposal_January_20_2016.pdf

[25] Also from the Technical Advisory: "Many cities and counties define local-serving and regional-serving retail in their zoning codes. Lead agencies may refer to those local definitions when available, but should also consider any project-specific information, such as market studies or economic impacts analyses that might bear on customers' travel behavior."

could be done with a regional travel model or other methods – see case study on the Irwindale Regional Shopping Center.

(c) Transportation Impact Analysis

LOS-based impact analysis (CEQA pre-SB 743)

Chapter 3.14 ("Transportation and Circulation") of the Cannery DEIR analyzes potential impacts of the project on the surrounding transportation system. Thresholds of significance, discussed above, were used to identify potentially significant transportation impacts from the proposed project.

Before SB 743, the vehicle operational and performance impacts to the local transportation network were measured by level of service (LOS).[26] The Cannery DEIR used LOS analysis methods outlined in the Highway Capacity Manual (2000).

A primary component of LOS analysis is estimated trip generation. Project trip generation, expected internalization, and pass-by trips were estimated based on the Mixed-Use (MXD) Trip Generation Model developed by Fehr & Peers and several academic researchers. Trip generation is also a primary component of VMT analysis, so analyses and adjustments made to trip generation for LOS purposes are also pertinent to future VMT analysis. Thus, the land uses and units in Tables 3 and 4 below are also used for the VMT analysis in the following section.

Table 3: Project Trip Generation (Source: DEIR Table 3.14-4)

Land Use	ITE Land Use Code	Units[1]	Trip Rate (Daily)[2]	Daily Trips
Single family residential	210	336 DUs	12.82	4,308
Apartments	220	314 DUs	5.96	1,871
Retail	820	78.67 ksf	54.40	4,280
Office	710	157.33 ksf	17.50	2,753
Park	412	4.7 acres	3.40	16
Community center	495	5.5 ksf	22.88	126
			Gross Trips	13,354
			Internal Trips	-620
			Pass-By Trips	-694
			New (External) Trips	**12,040**

[1] *"DUs" = dwelling units; "ksf" = thousand square feet*

[2] *Trip rates based on data from City of Davis Travel Demand Model for uses except Community Center, for which trip rates were obtained from Trip Generation (ITE, 2008).*

Table 4: External Trips by Travel Mode (DEIR Table 3.14-5)

Travel Mode	Daily Trips
Total External Trips	12,040
External Trips by Walk/Bike	963
External Trips by Transit	482
External Trips by Vehicle	**10,595**

[17]Because the lead agency concluded the project was eligible for CEQA streamlining under SB 375, as discussed above, it did not analyze The Cannery's impacts on the regional transportation network in the DEIR.

The DEIR characterized these trip generation rates as "slightly conservative" (p. 3.14-18). For the City of Davis, the regional travel demand model estimated a combined bike/walk/transit mode share of 27 percent (p. 3.14-16). This mode share was contrasted with the regional active mode share of just 8.7 percent, which was used to provide "strong evidence" that adjustments to trip generation rates were justified in order to account for the higher level of walking, biking, and transit within Davis compared to the typical suburban areas from which the figures in Table 4 were originally derived (p. 3.14-16).[27]

The DEIR analyzed LOS at 39 local intersections as well as on local roadways, bicycle facilities, transit facilities, and transit services. Traffic surveys and bicycle/pedestrian counts were conducted twice at seven intersections. The transportation analysis examined existing conditions as well as five land use scenarios that featured different build-out levels of adjacent developments as they differently impact the congestion of the study intersections under cumulative conditions.

The cumulative traffic analysis was based on the city's General Plan and General Plan Update[28] as well as full buildout of the UC Davis 2003 Long Range Development Plan. The cumulative traffic scenarios and assumptions are described in greater detail in DEIR sections 3.14 and 4.0. Two cumulative "no project" scenarios were analyzed to account for the uncertainty of development on the adjacent Covell Village property (DEIR, 4.0-12).

The project was found to cause a "significant" impact at one intersection if not mitigated, and a "potentially significant" impact at several study intersections (with already unacceptable LOS) under cumulative conditions if not mitigated. With proposed mitigation measures, the first impact was considered "significant and unavoidable" while the second was considered less than cumulatively considerable - *i.e.,* "less than significant" – primarily due to contributions to intersection improvements. The four other potential transportation impacts were found to be "less than significant" without mitigation (DEIR, pp. ES-6 to ES-32 and pp. 4.0-13 to 4.0-14).

It is worth noting that references to transportation impacts are also found in the DEIR's Greenhouse Gas & Climate Change chapter (Ch. 3.7). However, no analysis of VMT was conducted in this chapter because, as explained, "the proposed project is consistent with SACOG's SCS, and as such, this EIR does not include an analysis of potential impacts from cars and light-duty trucks on global climate change" (DEIR, p. 3.7-18).

VMT analysis (CEQA post-SB 743)

Similar to calculating thresholds of significance, there are several potential ways to estimate a project's VMT impacts. Lead agencies have discretion as to which VMT estimation method is used, as long as the method is consistent with that used to set the significance threshold, and the method's validity is supported by "substantial evidence." A range of VMT estimation methods evaluated in scholarly research may provide the requisite substantial evidence.

Regional models can provide data for project-generated VMT. Sketch models such as URBEMIS (Urban Emissions Model), used in the Cannery DEIR, can also be used. The Technical Advisory (p. 30) mentions

[27] 2000 U.S. Census data for North Davis alone showed a "Drive Alone/Carpool" journey-to-work mode share of 74.1 percent and an active mode share (bicycling, walking, public transit) of nearly 22 percent (DEIR, p. 3.14-16)

[28] Specifically, the City of Davis General Plan (May 2001) and the Program EIR for the City of Davis General Plan Update and Project EIR for Establishment of a New Junior High School (General Plan Update EIR) (January 2000).

the use of another sketch model, CalEEMod.[29] As noted earlier, whatever method a lead agency selects to estimate project VMT, the same method should also be used to find threshold VMT (or vice versa) and to assess VMT reduction from mitigation measures.

The Cannery's LOS transportation analysis included estimates for five different land use scenarios. The Cannery's VMT analysis would likely include estimates for each of those same scenarios, including cumulative effects.

1. Sketch models

CalEEMod (California Emissions Estimator Model) is similar in methodology to the URBEMIS model used in the Cannery DEIR. Both use ITE trip generation rates as defaults, which are multiplied by trip lengths that can be specified by users.[30] Both include calculations that adjust VMT based on project-specific and surrounding land use characteristics.

Table 5 illustrates the use of CalEEMod to estimate project-generated VMT for the residential component of the project. Housing types and number of units are the same as those used in the transportation analysis for LOS in the Cannery DEIR (Chapter 3.14). VMT estimates in Table 5 use trip length inputs from the California Statewide Travel Demand Model (CSTDM). Lead agencies could choose to use trip lengths from either the CSTDM or the relevant regional travel demand model.

Table 5: Project Household VMT using CalEEMod (with Average City Trip Lengths from CSTDM)

Land Use Type	ITE Code	Dwelling Units	Daily VMT
Single family housing	210	336	19,456
Condo/townhouse	230	314	10,459
Total VMT			29,915
Total population[1]			1,859
Unadjusted Project Household VMT per Capita			**16.1**

[1]*Based on CalEEMod estimate of 2.86 people per dwelling unit. The DEIR indicates an average size of 2.71.*

CalEEMod includes calculated adjustments to account for land use and project characteristics that differ from "typical suburban developments" upon which ITE Trip Generation Manual data are based (CAPCOA Quantifying Greenhouse Gas Mitigation Measures, 2010). While CalEEMod calls these calculated adjustments "mitigations," they are different in concept from mitigation measures as defined by CEQA. The adjustments made for this project, their impacts, and the authority for the adjustment are shown in Table 6 on the next page.

[29] OPR demonstrates CalEEMod's use in a mixed-use project (Stockton & T case study) in its January 2016 *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA,* p. IV:48.

[30] See http://www.aqmd.gov/caleemod/user's-guide

Table 6: Calculated "Land Use / Location" Reductions in CalEEMod Applied to the Cannery[1]	
Increase Density (LUT-1)	
Project residential density	9.5 dwelling units/acres
Elasticity	0.07 (Boarnet & Handy 2010)
% VMT Reduction	1.8%
% VMT Reduction Taken (Cap: 30%)	1.8%
Increase Diversity (LUT-3)	
Land use index	0.75
Elasticity	0.09 (Ewing & Cervero 2010)
% VMT reduction	36%
% VMT reduction taken (cap: 30%)	30%
Increase Destination Accessibility (LUT-4)	
Distance to job center	3 miles
Elasticity	0.2 (Ewing & Cervero 2010)
% VMT reduction	15%
% VMT reduction taken (cap: 30%)	15%
Transit Access (LUT-5)	
Distance to transit	0.25
Elasticity	0.67 (Lund, Cervero, & Wilson 2004)
% VMT reduction (cap: 30%)	16.08%
Integrate Affordable Housing (LUT-6)	
Percent affordable units	20%
Elasticity	0.04 (Nelson\Nygaard 2005)
% VMT reduction	16.1%
% VMT reduction taken (cap: 30%)	16.1%
Improve Project Design (LUT-9)	
Intersection density	221 intersections per square mile
Elasticity	0.12 (Ewing & Cervero 2010)
% VMT reduction	61.8%
% VMT reduction taken (cap: 30%)	30%
Total VMT reduction from land use / location	93.6%
Cap on VMT reduction from land use / location (Suburban Center[2])	15%
Total VMT reduction taken	**15%**
Adjusted project household VMT per capita	**13.7**

[1] *Figures drawn from "Quantifying Greenhouse Gas Mitigation Measures," CAPCOA, August 2010. Found here: http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf*

[2] *"Suburban Center" is one option for "context area" built within CalEEMod. It is defined as "a cluster of multi-use development within dispersed, low-density, automobile dependent land use patterns," which could describe The Cannery's context. The choice of context area requires professional judgment that rests with the lead agency. It impacts the total reduction potential of CalEEMod adjustments. For example, had the "Suburban" category been used instead, the maximum reduction would have been 10 percent.*

A range of other adjustments not demonstrated in Table 6 can be made to the project's VMT within CalEEMod. These include adjustments based on the following:

- Neighborhood/Site Enhancements – multi-modal improvements, traffic calming, etc.
- Parking Policy/Pricing – parking supply reductions, parking pricing, etc.
- Commute Trip Reduction Programs – ridesharing programs, teleworking, etc.
- Transit System Improvements – transit access improvements, local shuttles, etc.

- Road Pricing/Management – area or cordon pricing, park-and-ride lots, etc.
- Vehicles – electric or hybrid vehicles, etc.

Use of these adjustments could further reduce the household VMT figures generated by the Cannery project; however, lead agencies should be careful when applying these adjustments in addition to adjusting trip lengths within CalEEMod so as to not double-count the effects of the built environment on VMT. "Increase Destination Accessibility (LUT-4)" is one adjustment in particular that should not be used in conjunction with adjusted trip lengths. Lead agency discretion should be exercised for the others.

Per the *Technical Advisory*, the Cannery's project-generated, home-based household VMT per capita (in this case calculated with CalEEMod) should be compared to the city or regional home-based VMT thresholds (calculated using CSDTM data) to determine if the project causes a significant impact. The results are shown in Table 7.

Table 7: CSTDM Threshold-to-Project VMT Comparison

	City	Regional
Cannery home-based household VMT per capita[1]	13.7	
Threshold: 85% of city and regional home-based household VMT per capita[2]	8.8	10.9
Project VMT per capita > Threshold VMT per capita?	Yes	Yes
Significant Impact?	Yes	

[1] *From CalEEMod using CSTDM's city average trip lengths*
[2] *From CSTDM*

2. Regional travel demand models

SACSIM data was used to analyze the Cannery's project-generated VMT in comparison to SACSIM's 2012 threshold VMT. The parcel-level, activity-based model allows isolation of the households within the project site, which is compared to the average household VMT in the city and region in a baseline year (2012). This comparison is shown in Table 8.

Table 8: SACSIM Threshold VMT vs. SACSIM Project VMT

	City	Regional
Cannery project household VMT per capita	15.7	
Threshold: 85% of 2012 household VMT per capita	11.7	15.3
Project VMT per capita > Threshold VMT per capita?	Yes	Yes
Significant impact?	Yes	

Both the CSTDM and SACSIM analyses showed that the home-based trips from the Cannery project would exceed the threshold of significance (85% of the current city or regional VMT per capita), and thus the residential component of the project would cause a significant transportation impact.

Other considerations for transportation impact analysis

Location at the edge of a city or region

The location of the Cannery project on both the urban and regional edge could lead to truncating the calculation of trip lengths at the regional boundaries of travel models, which use political boundaries. Truncation of trips could result in inaccurately low VMT estimates for both the threshold and project.

The analysis below demonstrates a data source and method to better understand worker flows, and thus how typical (or not) the commute patterns of the project's residents might be. The results of this analysis could inform the selection of trip lengths in CalEEMod for determination of project-generated VMT. Other data sources for this analysis include the California Household Travel Survey and CSTDM, as well as big data sources such as StreetLight.

Table 9 shows an origin-destination matrix comparing commute patterns of Davis residents to residents of the rest of the SACOG region. Data are from the Longitudinal Employer-Household Dynamics (LEHD) 2012 Origin-Destination Employment Statistics (LODES) data[31]. LEHD is a program of the US Census Bureau.

Table 9 shows that only about 75 percent of Davis residents commute within SACOG's jurisdictional boundaries. It also shows that Davis residents commute to the Bay Area at roughly equivalent (if not slightly lower) rates as residents of the six counties in the SACOG region.

Table 9: Percentage of Workers by Place of Residence (2012 LEHD)

Place of Residence		Workplace								
		Davis	SACOG	San Joaquin County	Solano County	East Bay	North Bay	South Bay	SF Peninsula	Other
Residence	Davis	35.7	38.7	1.3	5.3	2.3	1.5	0.7	1.3	11.7
	El Dorado	0.6	58.2	1.1	0.8	4.0	0.9	2.5	3.1	26.2
	Placer	0.7	68.1	1.1	1.0	3.9	1.0	2.5	3.1	16.3
	Sacramento	1.3	72.2	2.0	1.3	4.1	1.0	2.2	3.1	10.4
	Sutter	0.7	54.8	0.8	1.5	3.0	0.9	1.8	3.1	28.1
	Yolo	14.6	51.2	1.3	5.1	3.9	1.6	1.4	2.4	15.3
	Yuba	0.8	58.6	1.2	1.7	3.6	1.2	0.8	1.4	31.5

Home workers

The percentage of Davis residents who work from home should also be included in the analysis of commute patterns. Table 10 shows the "work from home" share of Davis compared to the rest of the SACOG region by county (Davis is in Yolo County). The share of Davis residents who work at home (5.2 percent) is roughly equivalent to the SACOG region (5.5 percent) and higher than several counties, including Yolo. This should be used in conjunction with LEHD worker flow data, because LEHD data captures "workplaces" that may in fact be remote company headquarters, where the employees work from home or satellite offices. Here, as in other aspects of VMT analysis, other approaches to estimating the value of this variable may be available.

[31] https://lehd.ces.census.gov/data/

Table 10: Share of Residents Who Work from Home (Percent, 2013 ACS 5-Year Estimates)	
Place of Residence	**Work from Home (Percent)**
Davis	5.2
El Dorado	7.6
Placer	7.8
Sacramento	4.9
Sutter	3.9
Yolo	4.4
Yuba	5.3
SACOG Region	5.5

(d) Mitigation Measures

LOS mitigation

Impacts of each project alternative and its associated measures to mitigate impacts on LOS standards were discussed in the Cannery DEIR (see Executive Summary, pp. ES-27 to ES-32). Mitigation included the following congestion management measures:

- Prohibit outbound left bound turns from a driveway via construction of raised median
- Construct a refuge island within median to enable westbound merges more easily
- Install traffic signals at two intersections, including traffic timing to create more gaps in traffic
- Modify permitted turn movements at three driveways using turn-only lanes and medians
- Accept LOS F in accordance with General Plan MOB Policy 1.1, part C
- Contribute "fair share funding" to cover proportionate costs of intersection improvements at four intersections.

This list is illustrative of the mitigation actions and costs required under the former LOS standard. As a result of SB 743, mitigation measures triggered by LOS degradation at certain locations are no longer required by CEQA. However, congestion-based mitigation measures could still be required by city policy, or via mechanisms other than CEQA.

VMT mitigation

The extent of mitigation required to reduce VMT-based transportation impacts of the Cannery project to less than significant depends on the amount of VMT exceeding the threshold, which in turn is determined by the method used to find the threshold, at least for the residential component as demonstrated in this case study. The CSTDM and regional travel model methods both demonstrate that the residential component of the Cannery may be presumed to have significant impacts before mitigation. For a discussion of mitigation of VMT from residential projects, see Case Study 5 on Empire Lakes.

5. Insights and Policy Implications

(a) Implications for Policy Makers

When considering proposed higher residential density and mixed-use developments, policy makers in rural locations and smaller cities such as Davis should remember that the VMT-reducing benefits of a greater mix of uses and higher residential densities in a project may be overshadowed by long work

commutes to major employment centers. Under these circumstances, a lead agency may want to consider mitigation strategies other than (or in addition to,) project-based mitigation.

Workshops and papers generated by this project described the legal and administrative precedents for regional approaches that may be preferable to or more effective than project level or local VMT mitigation strategies. Regional approaches include tiering approaches (an established practice in CEQA), regional planning, and creating a regional mitigation bank. In lieu fees have also "been found to be valid mitigation where there is both a commitment to pay fees and evidence that mitigation will actually occur" (Technical Advisory, p. 27).

Another approach, developed in the course of this case study, is the concept of VMT mitigation offset exchanges, a form of market approach with parallels to both carbon trading and the transfer of development rights. Video and slide presentations on this concept are available on the project website at www.SB743.org.[32]

In budgeting for CEQA analyses, policy makers governing lead agencies will need to consider whether and how their staff can have the resources and technical capacity to generate VMT calculations for trips outside their MPO region.

(b) Technical Insights for Lead Agency Staff

Three key insights for technical staff resulted from this case study:

1. Development projects on the edge of a metropolitan region may generate trips to or from places outside the regional boundaries that are unaccounted for in many regional travel models. An analysis using a worker flow matrix (see Table 10) can inform lead agencies of the magnitude of this missing component of VMT estimates for such projects.

2. Sketch models can be used in conjunction with travel demand models, although care should be taken that (a) VMT reduction measures are not double-counted, and (b) threshold determination, project VMT assessment, and assessment of VMT reduction from mitigation should be apples-to-apples in terms of comparability.

3. It is important to choose an assessment approach that measures VMT accurately for the particular project. For example, if using a travel demand model near a model boundary, it is important to verify that the model is able to assess trips that extend beyond its boundary in order to fully capture the project's VMT impact.

4. The screening analysis indicated that the Cannery project could meet the map-based residential screening threshold and thus avoid a fuller VMT impact analysis in the EIR. However, the project-level VMT analysis indicates that the residential component of the project could cause a significant transportation impact. This highlights the importance for lead agencies to demonstrate in the record that a project would "incorporate similar features" as its surrounding

[32] See also Elkind, Lamm and Prather, "An Analysis of Vehicle Miles Traveled Banking and Exchange Frameworks," published by the Center for Law, Energy and the Environment and the Institute for Transportation Studies at UC Berkeley (October 2018).

low-VMT area (i.e., density, mix of uses, transit accessibility, etc.), and therefore “exhibit similarly low VMT” which would qualify it for screening (Technical Advisory, p. 10). Similar to the traffic congestion analysis performed in the Cannery DEIR, the VMT analysis could use factors such as local mode share (percent of trips taken by vehicle, bicycle, transit, et cetera) to explain the project’s context that may not be fully captured by sketch models.

Appendix A:
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Appendix B:
Glossary of Terms and Acronyms Used in Case Studies

CalEEMod – California Emissions Estimator Model.

Caltrans – California Department of Transportation.

CAPCOA – California Air Pollution Control Officers Association.

CARB – California Air Resources Board.

CEQA – California Environmental Quality Act.

CMP – Congestion Management Program. The California state CMP requires urbanized counties to prepare their own CMPs in order to receive their share of gas tax revenue.

CRC – California Code of Regulations, which contains the CEQA Guidelines.

CSTDM – California Statewide Travel Demand Model.

DEIR – Draft Environmental Impact Report.

EIR – Environmental Impact Report.

HOV – High Occupancy Vehicle.

HQTA – High-Quality Transit Area. While not defined in statute, the term is used by some MPOs for mapping purposes, and is generally based on definitions of "major transit stop" and "high quality transit corridor" in the State Public Resources Code (specifically the section implementing SB 375, the Sustainable Communities Strategy). SCAG, for example, defines an HQTA for mapping purposes as "the area within one-half mile from major transit stops and high quality transit corridors."

HQTC– High Quality Transit Corridor, defined in CEQA as a corridor with fixed route bus service with service intervals of 15 minutes or less during peak commute hours.

Infill Site – defined in CEQA as a lot located within an urban area that has been previously developed, or on a vacant site where at least 75% of the perimeter of the site adjoins, or is separated only by an improved public right-of-way from parcels that are developed with qualified urban uses.

LOS – Level of Service, a standard for measuring vehicle delay, initially designed as a performance standard for highways. It is sometimes described as a ratio between the volume of vehicles and the capacity of a roadway. LOS standards in the Highway Capacity Manual (HCM) and AASHTO Geometric Design of Highways and Streets ("Green Book") use letters A through F, with A being the best and F the worst. LOS "A" describes free flow and "F" describes stop-and-go movement and gridlock.

Low-VMT Area – an area that exhibits VMT below the designated numeric threshold. For residential projects, this includes areas such as transportation analysis zones, or TAZs, that exhibit average VMT per capita less than or equal to 85% of existing city or regional household VMT per capita (Technical Advisory, p. 12).

Major Transit Stop – a site containing an existing rail station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service intervals of 15 minutes or less during the morning and afternoon peak commute periods (Pub. Resources Code, § 21064.3). Major transit stops may be included in a regional transportation plan.

MPO – Metropolitan Planning Organization. Federal law requires that any urbanized area with a population of at least 50,000 be guided and maintained by a regional entity known as a metropolitan planning organization. SB 375 details specific roles for California MPOs, expanding their role in regional planning. Eighteen MPOs are designated in California, accounting for approximately 98% of the state's population.

OPR – California Governor's Office of Planning and Research.

PRC or **Pub. Resources Code** – Public Resources Code for the state of California, which contains the CEQA statutes.

RTP – Regional Transportation Plan. A long-term blueprint of a region's transportation system, which identifies and analyzes transportation needs of the metropolitan region and creates a framework for project priorities. Usually RTPs are conducted every five years and plan for thirty years into the future. They are normally the product of recommendations put forth and studies carried out by an MPO, with the participation of dozens of transportation and infrastructure specialists.

SACOG – Sacramento Area Council of Governments, one of the largest MPOs in California.

SACSIM – Sacramento Activity-Based Travel Simulation model, used for regional travel forecasting.

SANBAG – San Bernardino Associated Governments. SANBAG (or "SanBAG") was the regional transportation planning agency and MPO for San Bernardino County, and the funding agency for the county's transit systems. In January 2017, SANBAG split into the San Bernardino County Transportation Authority (SBCTA) and the San Bernardino Council of Governments (SBCOG).

SB 375 – California Senate Bill 375, the "Sustainable Communities and Climate Protection Act of 2008," which is an effort to reduce greenhouse gases by requiring each MPO to develop a "Sustainable Communities Strategy" that integrates transportation, land-use and housing policies to plan for achievement of the greenhouse gas emissions target for their region.

SB 743 – California Senate Bill 743, passed in 2013 – the subject of these case studies.

SCAG – Southern California Association of Governments, the MPO for six of the ten counties in Southern California (Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura). It is the largest MPO in the country, representing over 18.5 million people in an area covering over 38,000 square miles.

SCS – Sustainable Communities Strategy, required by SB 375.

TA – Technical Advisory. OPR publishes a series of these advisories on CEQA-related aspects.

TAZ – Traffic Analysis Zone (or "Transportation Analysis Zone"), the unit of geography most commonly used in transportation planning models. The population of a zone varies, but a zone of under 3,000 people is common for a typical metropolitan planning software. The spatial extent also varies, ranging from very large areas in an exurb to a few city blocks or buildings in a central business district.

TIP – Transportation Improvement Program.

TPA – Transit Priority Area. An area within one-half mile of a major transit stop that is existing or planned, if the planned stop is scheduled to be completed within the planning horizon included in a Transportation Improvement Program adopted pursuant to sections 450.216 and 450.322 of Title 23 of the Code of Federal Regulations (Pub. Resources Code § 21099(a)(7)).

TPP – Transit Priority Project. A TPP meets these specifications: (1) contains at least 50 percent residential use, based on total building square footage and, if the project contains between 26% and 50% nonresidential uses, a floor area ratio of not less than 0.75; (2) provides a minimum net density of

at least 20 dwelling units per acres; and (3) is within one-half mile of a major transit stop or high-quality transit corridor included in a regional transportation plan (Pub. Resources Code, § 21155(b)).

URBEMIS – URBan EMISsions model, used for quantifying emissions from land use projects.

VMT – Vehicle Miles Traveled, which as a result of SB 743 replaces LOS as the metric for measuring transportation impact under CEQA.