

**Appendix G – Part 2**  
**2019 Fehr & Peers VMT Assessment Memo**



## MEMORANDUM

Date: October 25, 2019  
To: David Storer and Kathy Pease, City of Sonoma  
From: Kari McNickle and Ian Barnes, Fehr & Peers  
Subject: Hotel Project Sonoma Vehicle-Miles of Travel (VMT) Estimate

WC19-3578

---

The Hotel Project Sonoma proposes to construct 62 hotel rooms and associated restaurant uses at 153 West Napa Street/541 First Street West in central Sonoma, California. The proposed project would include the demolition of existing, occupied uses on site, including approximately 3,550 square feet of retail uses and 11,320 square feet of warehousing uses. A revised Draft EIR (RDEIR) for the project, completed by Placeworks with W-Trans as the transportation subconsultant, was circulated for public review in July 2018. The Transportation and Traffic section of the RDEIR noted that the project would result in a significant environmental impact due to project generated vehicle-miles traveled (VMT). This finding was reached through a qualitative evaluation. The RDEIR included mitigation measures to reduce the impact to a less-than-significant level.

Subsequently, Fehr & Peers was retained to revise the mitigation options for the proposed project, including a menu of potential VMT-reducing transportation demand management (TDM) measures and a monitoring program to ensure compliance. After discussions with City staff regarding the mitigation measure, it was determined that quantifying the VMT generated by the proposed project would be important to ensure the viability of the VMT mitigation measure.

The following memorandum outlines the data and methods used in the estimate of the weekday and weekend daily VMT generated by the proposed Hotel Project Sonoma development.

### Background

The need to analyze VMT in the Transportation section of environmental documents is largely driven by the changes to CEQA as a result of Senate Bill 743 (2013). An update of the CEQA Guidelines that comply with SB 743 was certified on December 28, 2018 and the California Governor's Office of Planning and Research (OPR) has developed a non-binding Technical Advisory on Evaluating Transportation Impacts in CEQA (December 2018) to help guide VMT-based impact analysis. The Technical Advisory outlines considerations for methods to estimate project generated



VMT and corresponding VMT impact significance thresholds. These considerations include, but are not limited to, the following:

- Estimate methods of VMT for a proposed project should track the full length of the trip, and trips should not be truncated at a model or political boundary (i.e. city limit, county line, MPO boundary)
- Estimates should be for weekday daily VMT, and can include either VMT generated by automobiles and light trucks, or all trips.<sup>1</sup>
- A travel demand model can be used for estimating VMT, assuming that a project would be well represented in the model.
- Other data sources, such as mobile device data, can be used to supplement the VMT estimate, especially in cases where a travel demand model may not be an appropriate tool.

Per the revised CEQA Guidelines (in force as of April 2019), agencies are not required to use VMT as a transportation impact metric until July 1, 2020.

## VMT Estimate Methodology

The Sonoma County Transportation Authority (SCTA) travel demand model is currently being updated (in part, by Fehr & Peers) to assist lead agencies in assessing travel demand consistent with the technical guidance provided by OPR in response to SB 743; the updated SCTA model was not available for analysis as of September 2019.

In lieu of the local travel demand model, Fehr & Peers used mobile device data, also colloquially known as “Big Data,” to estimate a general average trip length for hotels in the Sonoma Valley area. This “spreadsheet method” multiplies the average trip lengths by the estimated weekday trip generation estimates as documented in the RDEIR to arrive at an estimate of VMT.

Over the past nine years Fehr & Peers has worked and built relationships with various “Big Data” providers and has successfully utilized origin-destination data passively and anonymously obtained from mobile devices to quantify the flow of devices for a variety of planning studies. One such provider, StreetLight Data, recently partnered with a new data provider Cuebiq, a next generation location intelligence company. As a result of this partnership StreetLight Data’s total device sample size increased to more than 60 million devices, representing roughly 15 to 20 percent of the adult US population. Cuebiq’s data is generated by mobile applications that use Location-Based Services

---

<sup>1</sup> The Technical Advisory emphasizes that lead agencies retain discretion to set CEQA significance thresholds and analysis methods. Weekend VMT has been calculated in this analysis to assist in the analysis of greenhouse gas (GHG) emissions, whereas the weekday VMT has been calculated for both the CEQA transportation analysis and GHG emissions analysis.



(LBS). LBS data allows StreetLight Data to ascertain complex activity-based metrics such as classifying devices into residents, workers, and visitors to a geographic area and the determination of each device's home and work location as well as the purpose of their trips. This is made possible by the ability to geographically tag the devices to land use or places in addition to roadway segments, providing a complete accounting of trips made by devices using LBS. The spatial resolution and geographic tagging also make the data suitable for analyzing trips to and from unique land use types and for determining the length of each device trip, which can then be combined and analyzed to determine the trip length distribution and average trip length of trips to and from specific geographic areas. Cuebiq data is also available for the entirety of the United States and Canada and thus able to capture the full length of the trip consistent with SB 743 guidelines.

LBS trip length data was purchased for three hotel sites in the vicinity of the proposed project site; these sites were as similar as possible to the proposed project, with the limitation of needing to be able to isolate trips exclusively generated by these locations. Trips associated with hotels closer to the Sonoma Plaza area cannot be isolated due to the small footprint of the hotels and/or the lack of dedicated on-site parking for the hotel facility. The three selected sites were:

- Fairmont Sonoma Mission Inn (100 Boyes Boulevard, Sonoma)
- The Lodge at Sonoma Renaissance Resort (1325 Broadway, Sonoma)
- MacArthur Place Hotel (29 East MacArthur Street, Sonoma)

The boundaries of the mobile device trip length data analysis was regional in nature to capture trips with origins or destinations in the larger Bay Area region, including the City of San Francisco and the San Francisco and Oakland airports, thus satisfying the recommendation that the full lengths of trip be captured. The data sample included a total of 27,335 trips throughout 2018.

## Project Unadjusted/Benchmark Weekday VMT Estimate

The LBS dataset was processed to isolate trips occurring during weekdays, per the OPR guidance for the estimate of VMT. An average trip length was calculated for each sample site, which indicated a range of average trip lengths from 17.9 miles per trip to 19.9 miles per trip. The average trip length over the sites was 18.6 miles.

The Hotel Project Sonoma Revised Draft EIR (July 2018) estimated that the proposed project will generate a total of 518 trips per weekday (as presented in RDEIR Table 4.10-5). Multiplying the 518 weekday daily trips by an average trip length of 18.6 miles results in a project VMT estimate of



about 9,635 vehicle-miles traveled per weekday. This estimation process, along with the individual hotel site trip lengths, is presented below in Table 1.

TABLE 1: UNADJUSTED/BENCHMARK PROJECT WEEKDAY VMT ESTIMATE

	Data	Value
A	Average Trip Length: Fairmont Sonoma Mission Inn	17.9 miles
B	Average Trip Length: The Lodge at Sonoma Renaissance Resort	18.0 miles
C	Average Trip Length: MacArthur Place Hotel	19.9 miles
$D = (A + B + C)/3$	Average Hotel Trip Length	18.6 miles
E	RDEIR Weekday Daily Trip Generation	518 trips
$F = D \times E$	Project Weekday Daily VMT Estimate	9,635 VMT

Source: Fehr & Peers, September 2019

The RDEIR trip generation estimate used traditional trip generation analysis techniques, including the use of the ITE Trip Generation Manual, which does not account for the influence of the built environment on trip making or the project's removal of existing uses. Land use context in particular (i.e., land use density, diversity of uses, etc.) influences the ability to make trips by walking, bicycling, and transit. The results presented in Table 1 assume no reductions for proximity to supporting land uses and no reductions for existing uses on site that will be removed; thus, the results in Table 1 represent an unadjusted, general benchmark for VMT generated by a 62 room hotel development in the City of Sonoma. Including refinements for proximity to supporting land uses or the removal of existing uses in the calculation would better represent the project's change in site VMT.

## Refined Project Weekday VMT Estimate

As noted previously, the estimate provided in Table 1 does not account for the existing uses on site, nor does it account for any reductions associated with nearby compatible land uses, including, but not limited to, restaurants, retail, winery tasting rooms, historical sites, or art galleries.

### VMT Generated by Existing Uses

The project applicant provided the City and Fehr & Peers data regarding the number of employees, customers and deliveries for each of the existing uses on site. The trip making characteristics data for the existing uses on site are presented in Table 2:



TABLE 2: EXISTING USES ON-SITE AND TRIP MAKING CHARACTERISTICS

Occupancy Type and Number of Trips	Estimated Trip Length	Vehicle-Miles of Travel Generated
117 West Napa Street – 3,100 Square Feet of Warehouse		
1 Delivery Trip	46 miles, round trip	46 VMT
12 Delivery Drivers (Delivery Trip)	28 miles per route	336 VMT
12 Delivery Drivers (Commute Trips)	22 miles round trip	264 VMT
135 West Napa Street – 5,346 Square Feet of Office plus 2,220 Square Feet of Warehouse		
15 Employees (Commute Trips)	34 miles round trip	510 VMT
2 Visitors per Day	60 miles round trip	120 VMT
2 Daily Deliveries	50 miles round trip	100 VMT
153 West Napa Street – 4,750 Square Feet of Retail Space		
2 Employees (Commute Trips)	6 miles round trip	12 VMT
16 Customer Trips per Day	36 miles round trip	576 VMT
1 Furniture Delivery Trip	116 miles round trip	116 VMT
1 UPS/FedEx Trip	50 miles round trip	50 VMT
Weekday VMT Estimate for Existing Land Uses		2,130 VMT

Source: Project applicant, September 2019

### Built-Environment Reduction

The proposed project is located one-half block (i.e. walking distance) away from the Sonoma Plaza commercial district; the Plaza area includes several visitor-focused land uses that would attract trips from the proposed project. This is in contrast to the three LBS trip length sample sites, which are generally located further away from complementary land uses. Additionally, the trip generation estimates presented in the RDEIR are based on data from the ITE Trip Generation Manual, which includes data largely from freestanding, auto trip-oriented land uses. Therefore, the unadjusted VMT calculation presented in Figure 1 is likely to overestimate Hotel Project Sonoma’s total VMT generated by overestimating the vehicle trip generation.

Fehr & Peers refined the vehicle trip generation estimate using the MXD+ mixed-use trip generation methodology as applied in the MainStreet program. The MXD+ model was originally developed as part of [U.S. EPA research](#) to better account for the built environment influence on trip making. When mixed land uses are located in close proximity to one another, more trips between



destinations can be made by walking, bicycling, and transit. The MXD+ methodology estimated a reduction of about 7.5 percent from the original unadjusted vehicle trip generation based on the local built environment characteristics. Most of this reduction is expected to come from ability of people to complete trips by walking or bicycling to nearby destinations.

### Project Adjusted VMT

Based on the data presented in Table 1 and Table 2, the estimated project VMT was adjusted. This calculation is presented in Table 3, below.

TABLE 3: ESTIMATED PROJECT EFFECT ON WEEKDAY VMT

Data		Value
A	Project Unadjusted Weekday VMT Estimate	9,635 VMT
B	Built-Environment Reduction	7.5%
$C = A * (100\% - B)$	Project Adjusted Weekday VMT Estimate	8,909 VMT
D	Estimated Existing VMT	2,130 VMT
$E = C - D$	Net Project Weekday VMT	+6,779 VMT

Source: Fehr & Peers, September 2019

### Project Weekend VMT Estimate

The project weekend VMT estimate was prepared using a methodology similar to that of the refined project weekday VMT estimate methodology. The following parameters were incorporated into the weekend VMT estimate analysis:

- Saturday and Sunday trips estimated based on data from the ITE Trip Generation Manual, 10<sup>th</sup> Edition for Land Use Code 310 (Hotel)
- Average weekday trip length per LBS data of 20.9 miles<sup>2</sup>
- Only the existing uses at 153 West Napa Street generate VMT on the weekend (754 VMT, per Table 1)
- Built-environment reduction of 7.5 percent retained, with the understanding that a greater reduction could be reasonable if hotel patrons have a higher degree of interaction with the Sonoma Plaza area on the weekend than they do on the weekday.

<sup>2</sup> Average weekend trip lengths per LBS data:

Fairmont Sonoma Mission Inn = 21.9 miles, The Lodge at Sonoma Renaissance Resort = 19.0 miles, MacArthur Place Hotel = 21.9 miles



The project weekend VMT estimate is presented in Table 4.

TABLE 4: ESTIMATED PROJECT EFFECT ON WEEKEND VMT

Data		Saturday Value	Sunday Value
A	Unadjusted Weekend Daily Trip Generation	508 trips	369 trips
B	Built-Environment Reduction	7.5%	7.5%
C = A * (100%-B)	Adjusted Weekend Daily Trip Generation	470 trips	341 trips
D	Weekend Average Hotel Trip Length	20.9 miles	20.9 miles
E = C * D	Project Unadjusted Weekday VMT Estimate	9,823 VMT	7,127 VMT
F	Estimated Existing Weekend VMT	754 VMT	754 VMT
G = F - E	Net Project Weekend VMT	+9,069 VMT	+6,373 VMT

Sources: Project applicant and Fehr & Peers, September 2019

## Conclusions

In summary, the proposed Hotel Project Sonoma is estimated to generate an unadjusted weekday VMT of 9,635 vehicle-miles of travel per weekday. After taking into account the existing uses on site proposed for removal and the influence of the built-environment on Hotel Project Sonoma's vehicle trip generation, the net project weekday VMT estimate is an increase of 6,779. The net project weekend VMT estimate is an increase of 9,069 on Saturdays and 6,373 on Sundays.

This concludes our assessment of estimated VMT for the Hotel Project Sonoma. Please call Ian Barnes or Kari McNickle at (925) 930-7100 if you have any questions.





The City of Sonoma has not yet formally adopted CEQA thresholds of significance based on the metric of vehicle-miles traveled (VMT) as prescribed by Senate Bill 743 (2013). Because a VMT-based CEQA threshold of significance has not yet been adopted by the City, the determination that mitigation would reduce the VMT impact to a less than significant level requires additional investigation and evidence. The CEQA Statute and Guidelines establish an expectation for lead agencies to mitigate impacts to the extent feasible. As such, a reasonable basis for determining appropriate mitigation is to establish feasible VMT reduction expectations based on the project's land use context.

The publication *Quantifying Greenhouse Gas Mitigation Measures* (California Air Pollution Control Officers Association, 2010) suggests that the generalized maximum VMT reduction potential for a land use project in a suburban center context is 15 percent. Given the type of project in question (tourist-serving hotel) and land use context (Sonoma Plaza area), the 15 percent reduction in VMT was established as a performance metric to include in the proposed mitigation measure.

The specific mitigation action is to require that the project applicant (or project site operator) select and implement a combination of the strategies from Table 1 such that the VMT generated by the project would be 15 percent below the calculated benchmark for a typical, similar sized hotel project in the Sonoma Valley (described further in this document). Table 1 consists of transportation demand management (TDM) strategies that are designed to reduce vehicle trips or trip lengths. For each strategy, the menu provides a detailed description along with potential VMT reductions and the intended users of the strategies.

### Project VMT Benchmark Estimate and Mitigation Performance Target

A benchmark VMT estimate for a typical, similarly sized hotel project was prepared and documented in a technical memorandum, provided as Attachment A. The estimate was prepared by Fehr & Peers using mobile device data, also colloquially known as "Big Data," to estimate an average trip length for hotels in the Sonoma Valley area. The specific type of mobile device data used in the analysis is known as Location Based Services (LBS) data, which passively and anonymously tracks trips from mobile devices, primarily smart phones. LBS data is carrier-neutral and uses multiple location technologies, providing few gaps in coverage and high spatial precision. This data captures the full length of trip, consistent with Senate Bill 743 guidelines.

Trip length data was acquired and averaged for three hotel sites in the vicinity of the proposed project site, and multiplied by the estimated trip generation included as part of the Hotel Project Sonoma Revised Draft EIR (July 2018). From this process, a project benchmark VMT estimate of 9,635 vehicle-miles traveled per weekday was calculated. This benchmark estimate takes no additional



reductions for proximity of the project site to compatible land uses that may be accessed by walking, bicycling or transit, and thus the benchmark represents the VMT generated by a typical, 62 room hotel project in the Sonoma Valley where most visitors and employees drive to the site.

Based on this benchmark VMT estimate, the mitigation measures selected by the project applicant from Table 1 must reduce the total project generated vehicle-miles traveled per weekday to a performance target of 8,189 vehicle-miles in order to meet the 15 percent reduction target for a less than significant impact. The effectiveness of the mitigation measures must be monitored to ensure compliance with the performance target.

The project site is located very near the Sonoma Plaza area, and it is likely that a portion of the trips generated by the project would be made by walking or bicycling to/from compatible land uses in the Sonoma Plaza area. As noted in the analysis of Attachment A, it is estimated that the actual trip generation for the proposed project would be 7.5 percent lower than the number of weekday trips estimated in the RDEIR, as the trip generation estimate in the RDEIR assumes no reductions for walking or bicycling to nearby destinations.

This estimated trip generation reduction represents approximately one-half of the project VMT reduction necessary to meet the performance target of 8,189 vehicle-miles per weekday. Therefore, the project must implement TDM strategies from Table 1 such that project VMT would be reduced by the remaining 7.5 percent required to meet the performance target, as demonstrated by monitoring (described below).

The mitigation measure is that, prior to the issuance of a building permit, the Project Applicant (or project site operator) shall prepare a VMT Strategy Report that includes the following items:

- Identification of baseline VMT estimate from travel surveys or commercially available mobile-device data
- Identification of selected TDM strategies per Table 1
- Demonstration of how the VMT generated by the project would be 15 percent below the calculated baseline value through a combination of selected measures and the project's proximity to nearby compatible land uses

After implementing the TDM strategies selected in the VMT Strategy Report upon occupancy of the project, the effectiveness of these measures relative to the performance target noted previously must be monitored, as described in the following subsection.



## Monitoring

The project shall be monitored by the City or by the project application/operator on an annual basis to determine the efficacy of the selected TDM strategies in achieving the performance target of 8,189 vehicle-miles of travel generated per weekday by the project site. The monitoring shall include project generated VMT estimates compatible with the methodology used to estimate benchmark VMT so that performance comparisons can be made. An annual monitoring memorandum shall be submitted to City staff. If the project site is found not to be in compliance with the mitigation measure, the project must incorporate additional TDM strategies from Table 1 to meet the performance target. Alternatively, the project applicant/operator may propose new strategies that develop over time to further reduce project generated VMT if substantial evidence is provided to support the efficacy of the strategy.

Implementation of the mitigation measure and monitoring program would reduce the project VMT impact to less-than-significant.

Table 1: Menu of VMT-Reducing Transportation Demand Management Strategies

Strategy	Description	% VMT Reduction	Target
Unbundle Parking Costs from Property Cost	Separate parking from hotel stay costs, requiring those who wish to purchase parking to do so at an additional cost.	2.6 – 13.0%	Guests
Commuter Trip Reduction Program	Implement a multi-strategy program that encompasses a combination of individual measures, designed to discourage single-occupancy vehicle trips and encourage alternate modes such as carpooling, transit, walking, and biking. The program should include: <ul style="list-style-type: none"><li>- Carpooling encouragement</li><li>- Ride-matching assistance</li><li>- Preferential carpool parking</li><li>- Flexible work schedules for carpools</li><li>- Half time transportation coordinator</li><li>- Vanpool assistance</li><li>- Bicycle end-trip facilities (parking, showers and lockers)</li></ul>	1.0 – 6.0%	Employees



Table 1: Menu of VMT-Reducing Transportation Demand Management Strategies

Strategy	Description	% VMT Reduction	Target
Ride-sharing Program	Increasing vehicle occupancy by ride sharing will result in fewer cars driving the same trip, and thus a decrease in VMT. The project will promote ride-sharing programs through a multi-faceted approach such as: <ul style="list-style-type: none"> <li>- Designating passenger loading, unloading, and waiting areas for ride-sharing vehicles</li> <li>- Providing a web site or message board for coordinating rides</li> <li>- Promoting ride-matching apps such as Waze Carpool, Carma, or the Sonoma County 511 program.</li> </ul>	2.5 – 8.3%	Employees
Subsidized or Discounted Transit Program	Provide subsidized/discounted daily or monthly public transit passes. The project may also provide free transfers between all shuttles and transit to participants.	0.3 – 20.0%	Both
Commute Trip Reduction Marketing	Implement marketing strategies that promote commute alternatives to employees. Strategies may include new employee orientation of trip reduction and alternative mode options, event promotion, and publications.	0.9 – 26.0%	Employees
New Employee Commute Orientation	Incorporate information on commute alternatives and benefits into orientation and new-hire packets for employees.	Limited unless bundled with companion strategies	Employees
Employee Parking "Cash-Out"	The project will require employers to offer employee parking "cash-out." The term "cash-out" is used to describe the employer providing employees with a choice of forgoing their current subsidized/free parking for a cash payment equivalent to the cost of the parking space to the employer.	3.0 – 7.7%	Employees
Transportation Resource Guide	Provide "How to Get Around" resources to guests. Include concierge service information about non-motorized and alternative transportation options for the area.	Unknown.	Guest