



May 17, 2020

Re: Terraces of Lafayette Updated Traffic Impact Study

Dear Planning Commissioners

I refer to my letter dated April 2, 2020 that included a peer review of the TJKM Traffic Study prepared by Elite Transportation Group (ETG), a copy of which is attached.

The peer review memo by ETG raised numerous significant issues and shortcomings with the TJKM report, some of which were also raised by CalTrans in its letter to the City dated March 5, 2020. **TJKM has responded inadequately and incorrectly to the issues raised by CalTrans, and has completely ignored the other 8 important issues raised by Dr. Zhang in the ETG memo.**

We asked ETG to review TJKM's memo of April 7, 2020 responding to Caltrans, in light of another report prepared by TJKM in 2017 about delays on the Pleasant Hill Road Corridor. **ETG's new memo dated May 14, 2020 is attached and confirms our worst fears concerning TJKM's work.**

The Delay Indexes used by TJKM for Pleasant Hill Road and Highway 24 are based on outdated (2013) information instead of more recent 2017 CCTA MTSO results. TJKM's stated reason for this is because "the 2017 results showed large increases in reported peak direction delay index between 2013 and 2017, on both Pleasant Hill Road and SR-24." Anyone that lives in the area knows that traffic increased substantially as the economy came out of the Great Recession. Furthermore, TJKM had done their own travel time runs for the 2017 Pleasant Hill Road Corridor study, but chose to ignore them. TJKM's travel time runs support the MTSO results and yet they used outdated 2013 information instead. The MTSO figures are also supported by ETG's independent travel time runs done in October 2019.

The result of TJKM using the 2013 figures is that the Delay Indexes they calculate for Pleasant Hill Road and Highway 24 are both significantly and, it would appear, deliberately understated. Based on the correct data, the project would have an un-mitigatable significant adverse impact on Pleasant Hill Road, regardless of the Gateway Constraint Policy.

Another example of TJKM trying to downplay the impacts of the Terraces is their statement that under the Institute of Transportation Engineers (ITE) Trip Generation, 10th Edition, which was published in 2017, the Resumed Project could now be classified as "Multi-family Housing, Mid-rise", and would have a lower per unit daily trip generation rate than the data TJKM was directed to use by City staff (it seems Staff were alert on this occasion to TJKM's attempts to downplay the impacts). TJKM's statement about this now being a Mid-rise project is incorrect and misleading as there are seven 2-story and seven 3-story apartment buildings in the proposed project, and a 2-story clubhouse. This is not a Mid-Rise

project like those that are more typically found in urban centers and where the occupants are not as reliant on cars for transportation.

Finally, you will see that TJKM has failed to respond to the safety concerns raised by Caltrans and ETG about the weaving that would be caused by the Pleasant Hill Road left turn lane extension. TJKM has not responded because they know it is not safe. This is another un-mitigatable significant adverse impact.

In conclusion, the TJKM report is both biased and inadequate and the traffic study needs to be re-done by a different firm before it can be accepted as part of the EIR. Alternatively, you can deny the project based on the unmitigable issues raised in the ETG memo of March 5 and their current memo. We therefore again request that you give time for Dr. Zhang to present his findings at the Commission meeting.

Sincerely,

Michael Griffiths

President, Save Lafayette

Attached:

1. Peer Review of Additional Traffic Studies by ETG dated 5/14/2020
2. Save Lafayette Letter dated 4/2/2020 re Terraces of Lafayette Traffic Updated Impact Study
3. Peer Review of Traffic Impact Study Report by ETG dated 3/5/2020



Memorandum

Date: May 14, 2020

To: Michael Griffiths

From: Lin Zhang, PhD, PE, TE, PTOE
Elite Transportation Group, Inc. (ETG)

Subject: Peer Review of Additional Traffic Studies for the Proposed Terraces of Lafayette Project

The City of Lafayette has released a staff report for the May 18, 2020 Planning Commission meeting (hereinafter referred to as **Staff Report**). This Staff Report does not respond to the serious questions raised in our memorandum dated March 5, 2020.

However, TJKM, the traffic impact study consultant for the proposed Terraces of Lafayette Project, prepared a memorandum in response to a Caltrans letter dated March 5, 2020. Caltrans raised several questions in its letter, and among them are the following two major ones which were also raised in our memorandum dated March 5, 2020:

- **Delay Index** – Why 2013 monitoring results were used instead of 2017 monitoring results to project 2019 conditions? **This has resulted in TJKM significantly understating the existing congestion levels on both Highway 24 and Pleasant Hill Road.**
- **Pleasant Hill Left-Turn Lane Extension** – A portion of vehicles exiting the westbound SR 24 off-ramp will have to weave into the northbound Pleasant Hill Road left-turn lane and then turn left onto Deer Hill Road. While extending the left-turn lane would help storage capacity, it may negatively impact the weaving segment from westbound SR 24 off-ramp to northbound Pleasant Hill left-turn lane. With the extended left-turn lane and the existing congested PM traffic on northbound Pleasant Hill Road, vehicles moving from the off-ramp to the left-turn lane would be unable to move to the left-turn lane. **This safety risk has not been addressed by TJKM.**

DELAY INDEX

The Delay Index (DI) is an expression of the amount of time required to travel between two points during the peak hour as compared to the free-flow travel time baseline. Delay index is defined as:

$$\text{Delay Index} = \frac{\text{Congested Peak-Hour Travel Time}}{\text{Free-Flow Travel Time}}$$

TJKM estimated the 2019 delay indices for both Pleasant Hill Road and SR 24 by using the Contra Costa Transportation Authority (CCTA) 2013 Multimodal Traffic Service Objectives (MTSO) monitoring results and growth rates between 2013 and 2019. It was stated in their report that the CCTA 2017 MTSO monitoring results for Pleasant Hill Road



and SR 24 overestimated the existing delay index, therefore, the 2013 results were used to estimate the 2019 delay index. In the response to the Caltrans letter, TJKM also claimed that “it was determined that the 2013 monitoring results were likely more accurate and should be used as the basis for the impact analysis.”

However, the 2017 MTSO monitoring results were based on INRIX data. INRIX gathers and aggregates data collected from a wide range of anonymous GPS-equipped devices (e.g., smartphones), and thus provides much better coverage of travel time data compared to traditional travel time tach runs (i.e., floating car survey). INRIX data has been validated and recognized as a reliable data source, and has been used by many agencies and organizations nationwide and locally in the Bay Area for congestion monitoring and other traffic-related projects.

In addition, our travel time runs on Pleasant Hill Road conducted on October 22, 2019, showed that the existing delay indices were higher but close to the 2017 monitoring results, as shown in **Table 1** below. The table also lists the CCTA 2017 MTSO delay indices, as well as the 2019 projected delay indices calculated by TJKM, and TJKM’s Pleasant Hill Road Corridor Study results, described in more details below. As you can see, TJKM’s 2019 projected delay indices, which were based on the 2013 MTSO monitoring results, are much lower than the 2017 MTSO delay index and our travel time run results on October 22, 2019.

Table 1. Travel Time and Delay Index - Pleasant Hill Road

Direction	Period	ETG Average Travel Time (min)	ETG Free-Flow Travel Time (min)	ETG Delay Index	2017 MTSO Delay Index	2017 TJKM PHR Corridor Study Delay Index	2019 TJKM Projected for Terraces EIR Addendum
SB	AM Peak	16.4	5.5	2.98	2.4	2.20 – 2.92	1.34
NB	School Peak	7.4	5.5	1.35	-	N/A	-
NB	PM Peak	11.4	5.5	2.07	2.0	N/A	1.74

To further investigate this, we noticed that TJKM conducted a **Pleasant Hill Road Corridor Study**¹ in 2017. For this study, AM peak hour travel time runs were conducted in February and April 2016. The average travel time between Rancho View Drive and Deer Hill Road/Stanley Blvd (1.05 miles) was 7:18, or 7.3 minutes, which was equivalent of an average travel speed of 8.6 mph. The free-flow travel time for this segment was approximately 2.5 minutes, or 25 mph. With these data, delay index for Pleasant Hill Road would be $7.3/2.5 = \underline{2.92}$, which was higher than 2.4 as reported in the CCTA 2017 MTSO and close to 2.98 as calculated based on our travel time runs conducted October 22, 2019. This study also conducted AM peak hour travel time runs in November 2016 after the implementation of their proposed improvements on the Pleasant Hill Road. The average travel time was 5:32, or 5.5 minutes, which was equivalent of an average travel speed of 11.4 mph. With this, delay index for Pleasant Hill Road would be $5.5/2.5 = \underline{2.20}$, which was close to 2.4 as reported in the CCTA 2017 MTSO. In any case, TJKM’s **2017 Pleasant Hill Road Corridor Study** revealed that delay indices on Pleasant Hill Road were close to the CCTA 2017 MTSO monitoring results, and much higher than TJKM’s 2019 projected delay

¹ **Pleasant Hill Road Corridor Study – Final Project Report**, City of Lafayette, Prepared by TJKM, February 2017.



indices which was based on the 2013 MTSO monitoring results and have been used in the Terraces Addendum and Staff Report.

Based on all the information presented above, our assessment is that the projected delay indices calculated by TJKM significantly underestimated the congestion level on Pleasant Hill Road.

For SR 24 between the Caldecott Tunnel and I-680, TJKM used the 2013 MTSO monitoring results too, instead of the 2017 CCTA MTSO ones. TJKM claimed that the 2017 MTSO monitoring results for SR 24 overestimated the existing delay index, and therefore the 2013 results were used to estimate the 2019 delay index. As stated earlier, the 2017 MTSO monitoring results were based on INRIX data which has been validated and recognized as a reliable data source. We also performed a quick check using the Google Map peak-period travel times to calculate the delay index, as shown in **Table 2**. It can be seen that the Google Map-based delay indices are similar to the 2017 MTSO delay indices. Our assessment is that the projected delay indices calculated by TJKM significantly underestimated the congestion level on SR 24.

Table 2. Travel Time and Delay Index – SR 24

Direction	Period	Google Average Travel Time (min)	Free-Flow Travel Time (min)	Delay Index	2017 MTSO Delay Index	2019 Projected (TJKM)
WB	AM Peak	20.3	10	2.03	2.0	1.7
EB	PM Peak	22.9	10	2.29	2.3	1.4

PLEASANT HILL LEFT-TURN LANE EXTENSION

The northbound to westbound left-turn lane at the intersection of Pleasant Hill Road/Deer Hill Road/Stanley Boulevard is proposed to extend further south. In the response to the Caltrans letter, TJKM claimed that “the new modified northbound geometry shows less than one percent change in travel time”. However, this extension will result in approximately 600 feet only between the westbound SR 24 off-ramp and the extended northbound left-turn lane. Based on the estimated project trip generation, during the PM peak hour, there will be about 30 project-generated vehicles which will have to cross three lanes in order to access the left-turn lane from the westbound SR 24 off-ramp in such a short distance. Crossing three lanes in this heavily congested short segment (approximately 600 feet) will pose significant safety risks. TJKM claimed that the additional weaving would cause <1% of change in travel time. The key question, however, is about safety risk which TJKM did not answer.



April 2, 2020

Save Lafayette,
3220 Ronino Way,
Lafayette CA. 94549

Re: Terraces of Lafayette Updated Traffic Impact Study

Dear Planning Commissioners

As you are aware, Save Lafayette has expressed serious reservations in the past about using TJKM to undertake an updated traffic study for the Terraces, because of its conflict of interest in having been previously hired by the developer. Since City staff showed no interest in correcting this situation, Save Lafayette decided to hire an independent traffic consultant to undertake a peer review of the January 2020 updated report prepared by TJKM.

Save Lafayette has hired Elite Transportation Group, whose principals – Lawrence Liao and Lin Zhang – are highly experienced and respected traffic engineers, with clients such as BART, SFMTA, the Federal Highway Administration, and Caltrans, as well as various Bay Area cities. A copy of the peer review memo prepared by Dr. Zhang is attached for you to read.

You will see from the memo that it raises numerous significant issues and shortcomings with the TJKM report, ***all of which will need to be addressed before it can be accepted and included in the supplemental EIR for the Project.***

Following are some of the major issues raised by Dr. Zhang in his memo:

- The Delay Indexes used by TJKM for Pleasant Hill Road and Highway 24 are based on outdated (2013) information and therefore significantly underestimated. Based on the correct data, the project would have an unmitigatable significant adverse impact on Pleasant Hill Road.
- The emergency vehicle preemption (EVP) system recommended by TJKM as a mitigation measure to offset the impact of the project on emergency vehicle access will NOT work during congested or peak times. This is therefore also a significant adverse impact that cannot be mitigated.
- The impacts during construction have incorrectly assumed an 8-hour workday and therefore significantly understate the impacts of dump truck traffic on local streets during the massive grading that would be required. Yet another significant adverse impact.
- The impact of the significant reduction in the size of the passenger pick-up zone on the west side of Pleasant Hill Road, south of Deer Hill Road has not been considered.
- The safety conflicts between the proposed bike lane, trap lane, loading zone and entrance driveway on Pleasant Hill Road have not been adequately reviewed.
- The property's location in a VHFHSZ fire zone and the proposed project's impact on evacuation routes and emergency first-responder access have not been considered and should have been. Also, the impacts of PG&E power shut-offs have not been considered. These are all serious safety shortcomings in this new reality of high fire risk.
- The impact of the project on the intersection of Deer Hill Road and Laurel Drive has not been considered.

In conclusion, the TJKM report is inadequate and needs to be revised before it can be accepted as part of the EIR. Alternatively, you can deny the project based on the unmitigable issues raised in the Elite memo. We therefore request that you allow fifteen minutes for Dr. Zhang and his colleague to present their findings at the next Commission meeting on April 27.

In addition, as you know, a project can be denied if there is just one significant adverse impact that cannot be mitigated. There are numerous unmitigable problems with The Terraces. Additional new and essential EIR related material that is being prepared by Impact Science should be made available for the public to

review at least a month before any further meetings are scheduled on the Terraces proposal. Many of these are significant health and safety issues – this project would literally put people’s lives at risk. Lafayette is allowing plenty of new housing elsewhere in more suitable locations – this project is not worth the risks and should not be rushed through without the opportunity for full public participation.

Sincerely,

Michael Griffiths

President, Save Lafayette

Attached: Terraces of Lafayette Traffic Impact Study Report Review



Memorandum

Date: 3/5/2020

To: Michael Griffiths

From: Lin Zhang, PhD, PE, TE, PTOE
Elite Transportation Group, Inc. (ETG)

Subject: **Peer Review of Updated Traffic Study for the Proposed Terraces of Lafayette Project**

EXECUTIVE SUMMARY

This memorandum provides a summary of a peer review of the updated traffic impact study prepared by TJKM (hereinafter referred to as **updated traffic study**) for the proposed Terraces of Lafayette Project (hereinafter referred to as **proposed project**). The following areas are identified by Elite Transportation Group, Inc. (ETG) either unmitigable or inadequate:

- It was not clear whether the traffic analysis models used for the queueing and weaving analyses were calibrated to the local traffic condition. The conclusions drawn upon the model results would be questionable if the models were not properly calibrated.
- The proposed project would result in a significant and unavoidable impacts on the level of service at Pleasant Hill Road/Deer Hill Road intersection, as well as delay on Pleasant Hill Road.
- The projected delay indices used in the updated traffic study significantly underestimated the congestion level on Pleasant Hill Road and SR 24.
- Crossing three lanes for vehicles existing westbound SR 24 off-ramp to access the extended northbound left-turn lane at the intersection of Pleasant Hill Road/Deer Hill Road in this heavily congested short segment (approximately 600 feet only) will not only cause additional delay, but also pose safety risks. However, these impacts were not fully studied or mitigated.
- For a congested and gridlocked arterial such as Pleasant Hill Road during peak hours, installing Emergency vehicle preemption (EVP) would not fully mitigate the impact of the proposed project on emergency response time.
- The net loss of 15 parking spaces on Pleasant Hill Road would result in a significant impact on passenger loading.
- The proposed bicycle lane between Deer Hill Road and SR 24 on-ramp would create major conflict zones between bicycles and passenger-loading vehicles, between bicycles and vehicles in the trap lane, and between bicycles and vehicles entering & existing the property driveway.
- Analysis of impacts to traffic, noise, and pollution was not performed for the massive amount of heavy trucks in the grading stage of construction (approximately 45 heavy truck trips per hour).
- The updated traffic study lacks an analysis to quantify the traffic impact of the proposed project during wildfires and PG&E's power shut-offs. Also, an evacuation plan for the residents inside the Very High Fire Hazard Severity Zones (VHFHSZ) needs to be developed or updated.
- The updated traffic study omitted the analysis of the significant impact of the proposed project on westbound queues at the intersection of Laurel Drive/Deer Hill Road in the AM peak period under the Plus Project scenarios.



FIELD VISIT

To gain local knowledge of the study area, ETG conducted a field visit along Pleasant Hill Road between Withers Avenue and Old Tunnel Road, and Deer Hill Road between First Street and Pleasant Hill Road on October 22, 2019 (Tuesday), during AM peak, School peak, and PM peak periods.

On Pleasant Hill Road, our observations indicated that it experienced the most congestion in the southbound direction during the AM peak period. The southbound queue in the AM peak period extended as far as 1,500 feet north of Rancho View Drive. In the PM peak period, the northbound Pleasant Hill Road experienced congestion near the intersection at Pleasant Hill Road and Stanley Blvd/Deer Hill Rd, with the longest queue extending about 2,000 feet south of this intersection.

On Deer Hill Road, it was observed that there was an excessive left-turn queue on the westbound approach at the intersection of Deer Hill Road and Laurel Drive in the AM peak period. During the PM peak period, the eastbound Deer Hill Road experienced severe congestion with the longest queue extending more than one mile from the intersection of Pleasant Hill Road/Deer Hill Road/Stanley Boulevard.

ETG also conducted several travel time runs during the field visit. **Table 1** lists the average travel times and the delay indices in each peak direction of Pleasant Hill Road between Withers Avenue and Old Tunnel Road (approximately 2.8 miles). Note that the delay indices were calculated using the estimated free-flow travel time from Google Maps. Each average travel time was based on several travel time runs. **Table 1** also lists the Contra Costa Transportation Authority (CCTA) 2017 Multimodal Traffic Service Objectives (MTSO) delay indices, as well as the 2019 projected delay indices calculated by TJKM. The delay indices will be discussed in more detail in the next section.

Table 1. Travel Time and Delay Index - Pleasant Hill Road

Direction	Period	Average Travel Time (min)	Free-Flow Travel Time (min)	Delay Index	2017 MTSO Delay Index	2019 Projected (TJKM)
SB	AM Peak	16.4	5.5	2.98	2.4	1.34
NB	School Peak	7.4	5.5	1.35	-	-
NB	PM Peak	11.4	5.5	2.07	2.0	1.74

PEER REVIEW FINDINGS

Latest Traffic Data

The updated traffic study collected the turning movement counts at all 17 study intersections on April 30, 2019, and one intersection only at Pleasant Hill Road/Deer Hill Road/Stanley Boulevard on May 2, 2019. The counts at all study intersections were later scaled up based on the day-to-day traffic variation at the Pleasant Hill Road/Deer Hill Road/Stanley Boulevard intersection between April 30 and May 2, 2019, for the analysis.



The typical practice of collecting turning movement counts at an intersection is to collect counts on two midweek days and use the average for analysis. It is not certain that it was a budget constraint that did not allow the new data collection to cover two days at all study intersections. However, scaling up counts to a higher level would result in a more conservative analysis.

For the signal timing data, the updated study used the latest timings at intersections on Pleasant Hill Road provided by the City of Lafayette. However, for other signalized study intersections not on Pleasant Hill Road, default parameters were assumed, instead of using the actual signal timings, for unstated reasons.

Study Area Coverage

The study area in the updated study remains the same as the 2012 study. Based on our field visit observations, this study area is sufficient for the traffic impact analysis of the proposed Terraces of Lafayette project.

Analysis Methodologies

ETG evaluated the methodologies used in the updated traffic study, including the following:

- **Traffic Forecast** – The updated study used the latest CCTA Traffic Forecasting Model base year (2018) and future year (2040) outputs to calculate the annual average growth rate. This growth rate was later applied to the adjusted 2019 counts to estimate 2040 traffic. This is a reasonable and common practice.
- **Level of Service (LOS) Analysis** – The updated study used the Highway Capacity Manual (HCM) 2010 methodologies to determine LOS for the study intersections. This is different from the 2012 study that used the HCM 2000 methodologies, but is compliant with CCTA's preference as listed in the CCTA Technical Procedures.
- **Signal Warrant** – The updated study conducted peak hour signal warrant analyses for unsignalized intersections using the 2014 California Manual on Uniform Traffic Control Devices (MUTCD), which is the latest version of the manual. This is a reasonable and common practice.
- **Queuing Analysis** – Similar to the 2012 study, the updated study used the simulation approach to conduct queuing analysis. The simulated 95th percentile queue lengths were used to determine whether the existing turn-lanes provide sufficient storage. However, it was not mentioned in the report whether the simulation model was calibrated to the local traffic condition. Model calibration is the process of adjusting model parameters (which initially are defaults) to obtain a model that replicates the existing traffic conditions. Model calibration is critical in that it ensures that a traffic simulation model is able to reproduce the local traffic condition and is proper to use for analyzing alternatives or scenarios. For a corridor study, travel time is the most common performance measure that is used in model calibration. It was not clear from the updated study report if the traffic analysis models were calibrated. If the traffic analysis models were not calibrated, then the models would be unreliable and the conclusions drawn from the analysis would be questionable. TJKM should explain the calibration methods used.
- **Weaving Analysis** – It was concerned that the proposed project would worsen the weaving condition on Pleasant Hill Road between freeway ramps and nearby intersections. The updated study employed a similar simulation approach as used in the 2012 study to evaluate the impact



of the proposed project on weaving activities. However, it was not mentioned in the report whether the simulation model was calibrated to the local traffic condition.

- **Delay Index** – The Delay Index (DI) is an expression of the amount of time required to travel between two points during the peak hour as compared to the free-flow travel time baseline. The delay index is defined as: $Delay\ Index = \frac{Congested\ Peak-Hour\ Travel\ Time}{Free-Flow\ Travel\ Time}$. The updated traffic study estimated the 2019 delay indices for Pleasant Hill Road and SR 24 by using the 2013 MTSO monitoring results and growth rates between 2013 and 2019. It was stated in the report that the 2017 MTSO monitoring results for Pleasant Hill Road and SR 24 overestimated the existing delay index, therefore, the 2013 results were used to estimate the 2019 delay index. However, the 2017 MTSO monitoring results were based on INRIX data. INRIX gathers and aggregates data collected from a wide range of anonymous GPS-equipped devices (e.g., smartphones), and thus provides much better coverage of travel time data compared to traditional travel time tach runs (i.e., floating car survey). INRIX data has been validated and recognized as a reliable data source, and has been used by many agencies and organizations nationwide and locally in the Bay Area for congestion monitoring and other traffic-related projects. In addition, our travel time runs on Pleasant Hill Road conducted on October 22, 2019, show that the existing delay indices are higher but close to the 2017 monitoring results (**Table 1**). Therefore, our assessment is that the projected delay indices used in the updated traffic study significantly underestimated the congestion level on Pleasant Hill Road. See below under the heading Impacts on SR 24 for our similar comments on the impacts on Highway 24.

Trip Generation Calculations

The 2012 study calculated trip generations using the ITE Trip Generation Manual, 8th Edition. Since the 10th edition of the Manual was published in 2017, the updated traffic study calculated trip generation based on the latest Manual (i.e., 10th edition). However, because the new trip generation resulted in fewer trips than the original one in the 2012 study, the updated traffic study used the original trip generation for the analysis. As stated in the report, the proposed project was classified as “Multifamily Housing (Mid-Rise)” according to the latest Manual but was classified as “Apartments” based on the older version of the Manual. The change of land use classification would result in over a 25% reduction in trip generation, although it is unclear how such a change is warranted since we understand that half the buildings are 2-story and half are 3-story. The updated study report included the 10th Edition-based trip generation for comparison purposes only, but applied the higher trip generation used in the 2012 study.

We verified and confirmed that the trip generation calculations using both the 8th and 10th Edition of the Traffic Generation Manual in the updated traffic study report are valid.

Trip Distribution Assumptions

The updated study retained the trip distribution that was manually estimated in the 2012 study, because “it was determined that the ‘plus project’ model results could not be relied upon”. It was not certain if it was caused by the model not being sensitive to the proposed project.

We reviewed the assumed trip distribution and they are reasonable given the traffic conditions in the study area.

Assumptions for Future Year Cumulative Scenarios

The future year was set as 2040 in the updated traffic study, which is reasonable and consistent with the future year of the latest CCTA Traffic Forecasting Model. The growth rate used to estimate 2040 traffic was derived based on the CCTA model outputs of the base year and future year. This is a common practice.

Impacts on Emergency Vehicles

Emergency vehicle preemption (EVP) system was recommended in the original study as the mitigation measure for the impact of the proposed project on emergency response time. Opticom, as one of the widely used EVP equipment in the US, was mentioned in the original study. EVP was retained in the updated traffic study to mitigate the impact on emergency response time.

While EVP enables faster emergency response, congestion and gridlock can prevent emergency vehicles from reaching the preemptive detection range at equipped signalized intersections. The priority logic used in the current EVP equipment (e.g., Opticom) does not consider congested queuing conditions such as the one on Pleasant Hill Road as shown in **Figure 1**. The technique that uses queue-based offset to adjust preemption time is still at the research and development stage, and thus not available to use yet.

Figure 1. Emergency Vehicle Stuck in Traffic Congestion on Pleasant Hill Road





Our assessment is that EVP equipment (e.g., Opticom) can help reduce emergency response time under non-congested or slightly-congested traffic conditions. However, for a congested and gridlocked arterial such as Pleasant Hill Road during the peak hours, the impact on emergency response time due to additional congestion caused by the proposed project is unlikely to be fully mitigated by installing EVP equipment. No analysis in the updated traffic report has shown emergency response time reduction by using EVP equipment on Pleasant Hill Road. Therefore, this impact is deemed significant and unavoidable.

Impacts during Construction

According to the traffic study report, grading on the proposed project site during construction would result in approximately 25,000 to 30,000 haul trips over a nine-month period. The traffic study assumed five-day work weeks, this would result in an average of approximately 150 haul trips per day, for a total of 300 truck trips (150 arriving empty, 150 leaving full) per day. The traffic study report suggested that large trucks should be prohibited during the hours of 7:00 to 9:00 a.m. and 3:00 to 7:00 p.m. on any school day, and 7:00 to 9:00 a.m. and 4:00-7:00 p.m. on any non-school weekday. This would result in six (6) to seven (7) hours per workday for active hauling operations. However, the traffic study report assumed eight (8) hours per workday instead, which resulted in an average of approximately 40 truck trips per hour. Our estimate is an average of approximately 45 truck trips per hour. This large amount of heavy truck traffic during construction will result in not only excessive intersection delay at the intersection of Pleasant Hill Road and Deer Hill Road/Stanley Boulevard, but also new traffic hazards when changing lanes or making wide turns when maneuvering on Pleasant Hill Road and Deer Hill Road. The updated traffic study report recommended to limit truck traffic to off-peak times, but did not analyze the potential impacts. Analysis should have been performed considering the massive amount of heavy trucks in the grading stage of construction (approximately 45 heavy truck trips per hour). The noise and pollution impacts of this amount of truck activity should be analyzed elsewhere in the CEQA analysis.

Weaving Activities

It was concerned that the proposed project would worsen the weaving condition on Pleasant Hill Road between freeway ramps and nearby intersections, especially when the original design allows full access at the proposed driveway on Pleasant Hill Road. The revised design has prohibited left-turn in/out at this driveway. In addition, the simulation experiments carried out in the updated traffic study show that the additional traffic due to the proposed project has little impact on traffic speeds along this weaving section. However, it was not clear in the updated traffic study report if the simulation models were calibrated to represent the real congestion level on Pleasant Hill Road. If the traffic analysis models were not calibrated, then the models would be unreliable and the conclusions drawn from the analysis would be questionable.

Furthermore, the updated traffic study states that the northbound to westbound left-turn lane at the intersection of Pleasant Hill Road/Deer Hill Road/Stanley Boulevard will be extended further south. This will result in approximately 600 feet only between the westbound SR 24 to northbound Pleasant Hill Road off-ramp and the extended northbound left-turn lane. Based on the estimated project trip generation, during the PM peak hour, there will be about 30 project-generated vehicles which will have to cross three lanes in order to access the left-turn lane from the off-ramp. Crossing three lanes in this



heavily congested short segment (approximately 600 feet) will not only cause additional delay, but also pose safety risks. However, these impacts were not fully studied or mitigated in the updated traffic study.

Impacts on SR 24

The updated traffic study used delay index to evaluate the impacts of the proposed project on SR 24 between the Caldecott Tunnel and I-680. It was stated in the report that the 2017 MTSO monitoring results for SR 24 overestimated the existing delay index, and therefore the 2013 results were used to estimate the 2019 delay index. As stated earlier, the 2017 MTSO monitoring results were based on INRIX data which has been validated and recognized as a reliable data source. We also performed a quick check using the Google Map peak-period travel times to calculate the delay index, as shown in **Table 2**. It can be seen that the Google Map-based delay indices are similar to the 2017 MTSO delay indices. Our assessment is that the projected delay indices used in the updated traffic study significantly underestimated the congestion level on SR 24.

Table 2. Travel Time and Delay Index – SR 24

Direction	Period	Average Travel Time (min)	Free-Flow Travel Time (min)	Delay Index	2017 MTSO Delay Index	2019 Projected (TJKM)
WB	AM Peak	20.3	10	2.03	2.0	1.7
EB	PM Peak	22.9	10	2.29	2.3	1.4

Site Access

As stated in the updated study report, several changes were made in the updated site plan:

- Driveway on Pleasant Hill Road permits only right-turn in/out
- Relocated east driveway on Deer Hill Road permits full access with an exclusive left-turn lane
- Relocated west driveway on Deer Hill Road permits only right-turn in/out and left-turn out with a median refuge lane

Our assessment is that compared to the original design used in the 2012 study, these changes would reduce interruptions to the existing traffic on Pleasant Hill Road and Deer Hill Road. The relocated east driveway on Deer Hill Road is further away from the intersection at Pleasant Hill Road/Deer Hill Road, which would provide more left-turn lane storage and some safety benefits, although allowing left turns out of this driveway could still be problematic given limited visibility, the steepness of Deer Hill Road at this point and the speed and momentum of traffic coming down the hill in off-peak times.

Parking Supply inside Development

The updated study used the same parking requirements by unit size as in the 2012 study. The calculated parking demand is 511 spaces and the updated parking supply is 557 spaces, which is slightly different from the original parking supply of 567 spaces. The conclusion that the project would have a less-than-significant impact on surrounding roadways since parking supply inside the development is sufficient.

Passenger Loading and On-Street Parking

As stated in the updated traffic study report, the proposed project would remove 19 on-street parking spaces along Pleasant Hill Road south of Deer Hill Road. These parking spaces are heavily used especially for student pick-ups in the afternoon for the nearby Acalanes High School, as illustrated in **Figure 2**. It was stated in the report that the new loading area could accommodate approximately eight (8) waiting vehicles. However, there is already an existing passenger loading zone between the intersection of Pleasant Hill Road/Deer Hill Road and the existing parking spaces that accommodate about four (4) vehicles. The net loss of 15 parking spaces (i.e., $19+4-8=15$) would result in a significant impact on passenger loading in the study area, which contradicts the conclusion in the updated traffic study report.

Figure 2. Utilization of Existing Passenger Loading Zone & Parking Spaces (West Side of Pleasant Hill Road, South of Deer Hill Road)



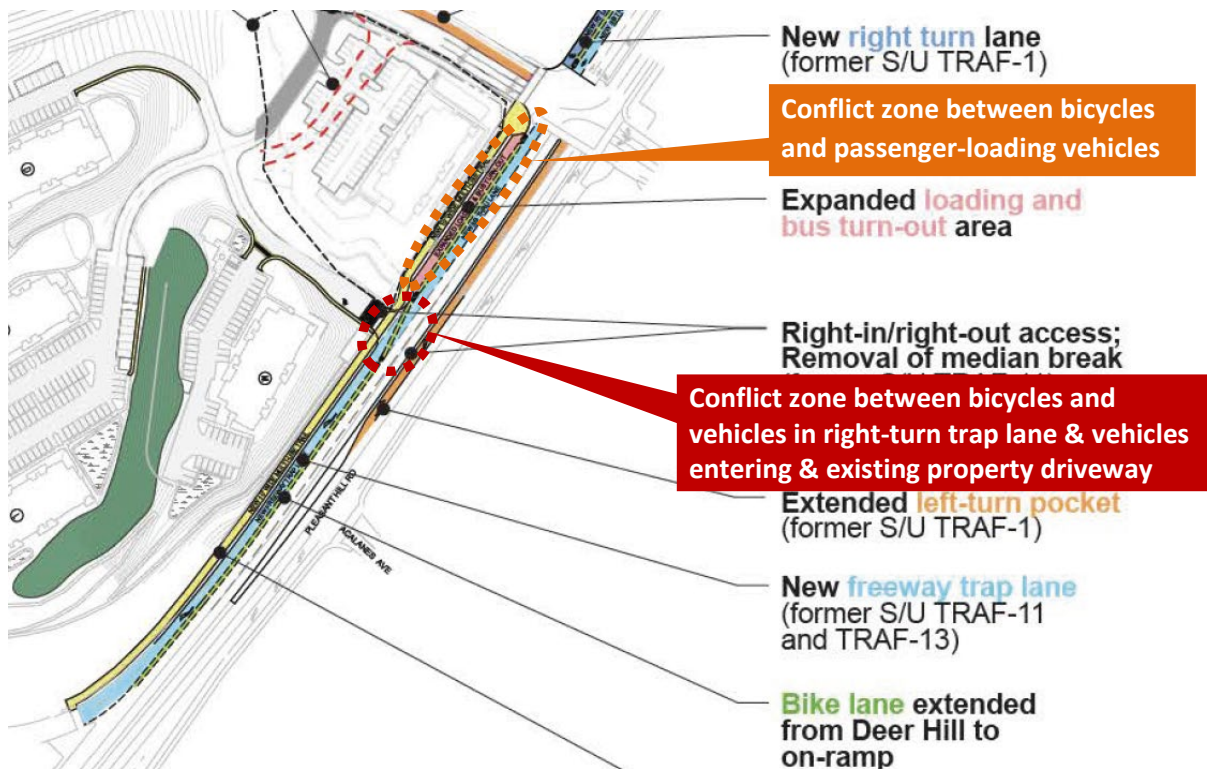
Bike Lane

The proposed bicycle lane between Deer Hill Road and SR 24 on-ramp would be located between the right-turn trap lane and through lanes, as illustrated in **Figure 3**. This will create two major neighboring conflict zones for bicycles, as listed below.

- Conflict zone between bicycles and passenger-loading vehicles, as illustrated in the area circled in orange.
- Conflict zone between bicycles and vehicles in the right-turn trap lane where bicycles need to cross the trap lane, and between bicycles and vehicles entering & exiting the property driveway, as illustrated in the area circled in red.

The updated traffic study did not address these significant conflicts in the neighboring conflict zones between bicycles and vehicles.

Figure 3. Bicycle Conflict Zones



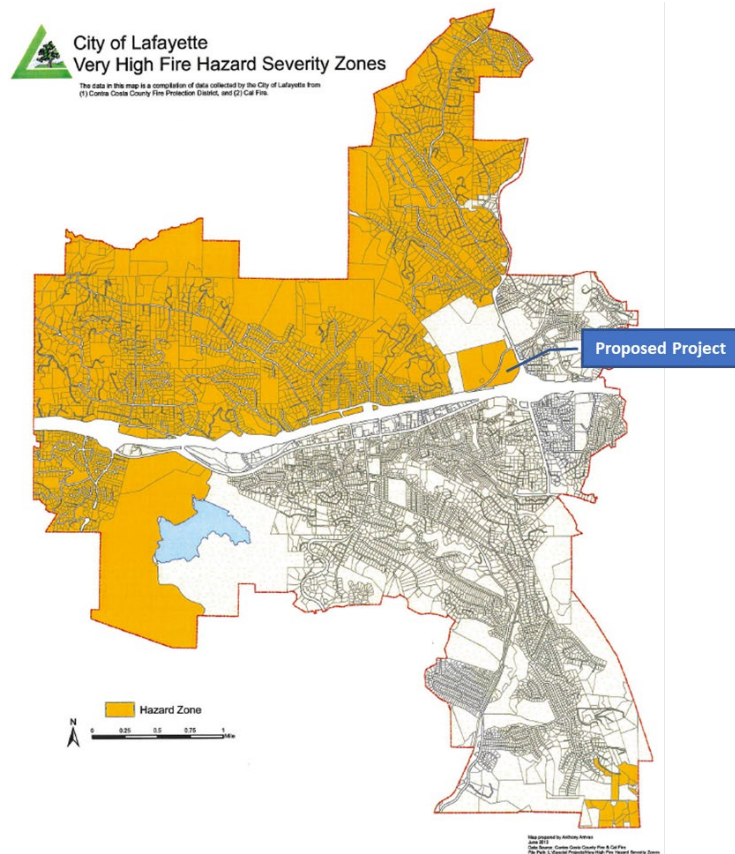
Wildfire, PG&E Power Shut-off, and Evacuation Plan

It is worth noting that the proposed project is located in the Very High Fire Hazard Severity Zones (VHFHSZ) according to the City Ordinance No. 620 (**Figure 4**). Given the facts that: 1) semi-rural/urban interface wildfires have become a new reality; 2) all three fire stations within the study area use Pleasant Hill Road, and 3) all three fire stations fail to meet the target response time of five minutes, the extra delay on Pleasant Hill Road caused by the proposed project would worsen emergency response time as well as resident evacuation.

In addition, PG&E's power shut-offs, as a proactive measure to help avoid wildfires, have been affecting the study area and surrounding areas. As a consequence, affected signalized intersections become all-way-stop-controlled intersections due to traffic signal blackout (which would also affect any proposed EVP system also). It is recommended that the study should include an analysis to quantify the traffic impact of the proposed project under such conditions.

In addition, an evacuation plan for the residents in the area should be considered and how the proposed project would impact evacuation routes and emergency vehicles access if the proposed 315 units are being evacuated at the same time.

Figure 4. Very High Fire Hazard Severity Zones, City of Lafayette¹



Other Issues

Significant and Unavoidable Impacts – According to the updated traffic study report, the proposed project would result in significant and unavoidable impacts on the level of service at the intersection of Pleasant Hill Road/Deer Hill Road/Stanley Boulevard and the delay index on Pleasant Hill Road, unless a third southbound through lane were added to Pleasant Hill Road between north of Deer Hill Road and SR-24. However, as discussed earlier, the projected delay indices used in the updated traffic study significantly underestimated the congestion level on Pleasant Hill Road. Therefore, it cannot be claimed for sure that a third southbound through lane will be able to mitigate the proposed project. In addition, the Gateway Constraints Policy outlined in the Lamorinda Action Plan precludes adding more through lanes. Pleasant Hill Road is used as an alternative route by traffic heading south on I-680 in the AM Peak period. One of the rationales for the Gateway Constraints Policy is the recognition that any improvement in through traffic flow on Pleasant Hill Road is likely to attract more traffic from I-680. Therefore, this impact is considered significant and unmitigable.

Excessive Queue at Laurel Drive/Deer Hill Road – During our field visit, excessive left-turn queues were observed on the westbound approach of Laurel Drive/Deer Hill Road intersection in the AM peak period. According to the 95th percentile queue lengths included in the queuing and blocking reports (Appendix

¹ <https://www.lovelafayette.org/Home/ShowDocument?id=1950>



C, D, E and F in the updated traffic study report), the proposed project would cause significant impact at this intersection under Existing Plus Project scenario. No discussion on this impact or corresponding mitigation measures were mentioned in the updated traffic study.

SUMMARY

Elite Transportation Group, Inc. (ETG) conducted a peer review of the updated traffic study report for the proposed Terraces of Lafayette project. The following areas are identified either unmitigable or inadequate:

- It was not clear from the updated traffic study report whether the traffic analysis models were calibrated to the local traffic condition before being used for traffic analysis, including queuing and weaving analysis. If the traffic analysis models were not calibrated, then the models would be unreliable and the conclusions drawn from the analysis would be questionable.
- The proposed project would result in significant and unavoidable impacts on the level of service at the intersection of Pleasant Hill Road/Deer Hill Road/Stanley Boulevard and the delay index on Pleasant Hill Road, unless a third southbound through lane were added to Pleasant Hill Road between north of Deer Hill Road and SR 24. However, the projected delay indices used in the updated traffic study significantly underestimated the congestion level on Pleasant Hill Road. Therefore, it cannot be claimed that a third southbound through lane will certainly be able to mitigate the proposed project. In addition, the Gateway Constraints Policy outlined in the Lamorinda Action Plan precludes adding more through lanes. Pleasant Hill Road is used as an alternative route by traffic heading south on I-680 in the AM Peak period. One of the rationales for the Gateway Constraints Policy is the recognition that any improvement in through traffic flow on Pleasant Hill Road is likely to attract more traffic from I-680. Therefore, this impact is considered significant and unmitigable.
- The updated traffic study stated that the 2017 MTSO monitoring results for Pleasant Hill Road and SR 24 overestimated the existing delay index, therefore, the 2013 results were used to estimate the 2019 delay index. However, the 2017 MTSO results were based on INRIX data, which has been validated and recognized as a reliable data source and has been used in many traffic-related projects. In addition, our travel time runs on Pleasant Hill Road conducted on October 22, 2019, show that the existing delay indices are higher but close to the 2017 monitoring results. The Google map-based delay indices are similar to the 2017 MTSO delay indices on SR 24. Therefore, our assessment is that the projected delay indices used in the updated traffic study significantly underestimated the congestion level on Pleasant Hill Road and SR 24.
- The northbound to westbound left-turn lane at the intersection of Pleasant Hill Road/Deer Hill Road/Stanley Boulevard will be extended further south based on the project site plan and the updated traffic study, which will result in approximately 600 feet only between the westbound SR 24 to northbound Pleasant Hill Road off-ramp and the extended northbound left-turn lane. During the PM peak hour, there will be about 30 project-generated vehicles exiting westbound SR 24 off-ramp which will have to cross three lanes in order to access the northbound left-turn lane. Crossing three lanes in this heavily congested short segment (approximately 600 feet) would not only cause additional delay, but also pose safety risks. However, these impacts were not fully studied or mitigated in the updated traffic study.
- Emergency vehicle preemption (EVP) equipment can help reduce emergency response time under non-congested or slightly-congested traffic conditions. For a congested and gridlocked arterial such as Pleasant Hill Road during peak hours, installing EVP would not fully mitigate the



impact of the proposed project on emergency response time. No analysis in the updated traffic report has shown emergency response time reduction by using EVP equipment on Pleasant Hill Road. This impact is deemed significant and unavoidable.

- The proposed project would remove 19 on-street parking spaces along Pleasant Hill Road south of Deer Hill Road. These parking spaces are heavily used especially for student pick-ups in the afternoon for the nearby Acalanes High School. It was stated in the report that the new loading area could accommodate approximately eight (8) waiting vehicles. The existing passenger loading zone can accommodate about four (4) vehicles. The net loss of 15 parking spaces would result in a significant impact on passenger loading in the study area and therefore deemed significant.
- The proposed bicycle lane between Deer Hill Road and SR 24 on-ramp would be located between the right-turn trap lane and through lanes. This will create major neighboring conflict zones - between bicycles and passenger-loading vehicles, between bicycles and vehicles in the right-turn trap lane where bicycles need to cross the trap lane, and between bicycles and vehicles entering & existing the property driveway. These significant conflicts in the conflict zones were not addressed in the updated traffic study.
- Grading on the proposed project site during construction would result in approximately 25,000 to 30,000 haul trips over a nine-month period. Our estimation shows 45 trucks per hour for seven (7) hours per weekday given that the construction trucks will avoid peak hours. This large amount of heavy truck traffic during construction will result in not only excessive intersection delay at the intersection of Pleasant Hill Road and Deer Hill Road/Stanley Boulevard, but also new traffic hazards when changing lanes or making wide turns when maneuvering on Pleasant Hill Road and Deer Hill Road. The updated traffic study report recommended to limit truck traffic to off-peak times, but did not analyze the potential impacts. Analysis should have been performed considering the massive amount of heavy trucks in the grading stage of construction (approximately 45 heavy truck trips per hour). The noise and pollution impacts of this amount of truck activity should be analyzed elsewhere in the CEQA analysis.
- Considering that the proposed project is located in the Very High Fire Hazard Severity Zones (VHFHSZ), as well as PG&E's power shut-offs as a proactive measure to help avoid wildfires, the study should include an analysis to quantify the traffic impact of the proposed project under such conditions. In addition, an evacuation plan for the residents inside the VHFHSZ needs to be developed or updated, given the new reality of wildfires and proximity to Acalanes High School buildings and student parking lot.
- During the field visit, excessive left-turn queues were observed on the westbound approach at the intersection of Laurel Drive/Deer Hill Road in the AM peak period. According to the 95th percentile queue lengths included in the queuing and blocking reports, the proposed project would cause a significant impact at this intersection under the Plus Project scenarios. No discussion on this impact or corresponding mitigation measures were mentioned in the updated traffic study.