

# **Transportation Partnership and Cooperation (TRANSPAC) TAC Meeting – February 25, 2021**

## **Communication Received from the Public**

**From:** Kristen Altbaum <[altbaum@icloud.com](mailto:altbaum@icloud.com)>

**Sent:** Tuesday, January 26, 2021 6:23 PM

**To:** Tiffany Gephart <[Tiffany@graybowenscott.com](mailto:Tiffany@graybowenscott.com)>; Matthew Todd <[Matt@graybowenscott.com](mailto:Matt@graybowenscott.com)>

**Subject:** Public Comment ahead of discussion about Gateway Policy Changes

Tiffany, please kindly submit the following comments to Transpac TAC and Board and please inform me prior to this subject being discussed. Thank you so much.

RE: Transpac's weigh in on the Lamorinda Gateway Constraints policy change to allow for a right-hand turn and short length extension (new solo lanes) along Pleasant Hill Rd in Lafayette to westbound hwy 24.

Transpac TAC and Board,

I am writing you in advance of your February 11th meeting at which you will be asked to weigh in on a possible Lamorinda Gateway Constraints policy change to allow for a right-hand turn and short length extension (new solo lanes) along Pleasant Hill Rd in Lafayette to westbound hwy 24. Transpac's input on this is a requirement since any changes to the corridor would potentially impact commuters who reside in Transpac's jurisdiction. These commuters include me and many of my immediate neighbors within unincorporated CCC, as well as many residents in northeast Lafayette, Pleasant Hill, Martinez; and jurisdictions to the northeast of Hwy's 680/4 who regularly use Pleasant Hill Rd to bypass Hwy 680.

Astonishingly, this amendment to the Lamorinda Action Plan's Gateway Constraint's Policy is being requested AFTER Lafayette's project approval of the 315 unit "Terraces" apartment complex (O'Brien Land Homes) at the intersection of Pleasant Hill and Deer Hill Roads in order to mitigate the significant environmental impacts of this potential development. The development is currently being litigated between the City of Lafayette and the citizen group "Save Lafayette". It is worth noting that O'Brien Homes is paying Lafayette's legal fees during this lawsuit. Had the development been rejected by Lafayette, Lafayette would have had to pay its own legal fees against the developer. This project therefore, may well have been approved to circumvent legal exposure (Lafayette choose to pass litigation exposure to the citizen action group "Save Lafayette" instead of defending the CEQA requirements themselves) versus being approved based on project merit and considerate CEQA analysis.

As a resident of this very congested corridor and a Measure C and J tax payor, I am adamant that the CCTA and its subgroups take seriously the policies, goals and objectives outlined in the Lamorinda Acton Plan <https://ccta.net/wp-content/uploads/2018/10/59cd5bd512c34.pdf> that are very specific about how to handle growth along Pleasant Hill Rd and other corridors within Lamorinda. For your convenience, I've summarized these policies, goals and objectives in the last part of this email.

My neighbors and I firmly believe that Lafayette's requested gateway constraints amendment for more solo lanes does not correlate with the Lamorinda Action Plan's policy goals and objectives since 1995, *particularly since more solo capacity will be filled up with traffic app commuters filling that capacity*, negating any useful benefit. This corridor is plagued by WAZE traffic. **We've seen school commutes along this corridor mushroom 4+ fold in the short span of 10 years and we are desperate for multimodal solutions to get our children SAFELY to school.** There needs to be more metering at, or

close to, the hwy 680 offramps in the a.m hours. A one-car-per-green metering system at the intersection of Rancho View and Taylor is worth consideration also.

Lafayette has done NOTHING useful to elevate our concerns, or these ideas, with the CCTA despite this intersection being the most heavily congested intersection of their city. Lafayette/SWAT didn't even encourage Pleasant Hill Road to be a named priority in the 2020 TEP...for this reason, we were united and vocally opposed to Spring 2020 transportation tax increases. We have felt marginalized and powerless despite massive constituent uproar and our school Superintendents and our school bus company raising alarms. This discontent will only worsen and grow if: 1) we are denied potentially life saving mitigation (efficient evacuation from fire, bike and ped safety, and emergency vehicle access are our main concerns; we feel "boxed in" during peak travel and despondent at not being able to get our children to school efficiency and reliably); and, 2) if developer interests appear to supersede the health and safety of residents.

Just so you understand the issues we face on a regular basis (pre-covid):

I'd like to share this video with you today and hopefully at the meeting on February 11.

Please allow this video link to load. The left, congested lane, is an average non-covid southbound commute on PH Rd. **Please watch this through its entirety.**

<https://www.youtube.com/watch?v=UwIx0o7ITs0>

This is what an average p.m. Deer Hill eastbound commute looks like from BART 1.5 miles to Pleasant Hill Rd:



These are what average side streets to Pleasant Hill Rd look like during a.m. peak:



This one is 3 miles from the bottle neck of PH and Deer Hill Rd. - these cars are not waiting at a light or stop sign, they are crawling ever so slowly over 3 miles. Multiple people have seen Acalanes High School students passing around 10-15 of these cars at a time on the wrong side of the road, just to try and make it to 1st period time!





DOZENS MORE photos and videos can be found on the Facebook group: <https://www.facebook.com/groups/1753415531541790>, which has been in existence since 2016. You can scroll back to 2016 and see the frustration of residents over the congestion and bottleneck at Pleasant Hill and Deer Hill Roads. I created this group after being HORRIFIED as to how long it was taking our students to get to school - school commutes rose from 6 minutes to over 35 over just 3 miles. 6 miles to Stanley Middle School often takes over an hour.

Don't simply take my word for it. Our local school principals and superintendents have written multiple letters with concerns about student tardiness and safety, as did ex fire Chief Carmen, and our school bus company. These are just a few of the letters that were written. I'm happy to forward additional letters.

## LAMORINDA SCHOOL BUS PROGRAM

A cooperative effort by the communities of Lafayette, Orinda, Moraga and the Contra Costa Transportation Authority to mitigate traffic.

November 9, 2017

Lafayette City Council

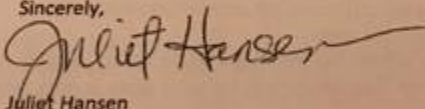
Re: Reliez Valley Rd.

Dear Mayor Anderson and Council Members:

The Lamorinda School Bus Program has experienced increased traffic on Reliez Valley Rd. over the last several years as noted in First Student's letter to the Reliez Valley Residents for Reduced Traffic (RVRTT) dated October 13, 2017. The increased traffic has resulted in earlier pick up times in the a.m. for all three school buses running through the Reliez Valley/Pleasant Hill Rd. corridor. The illegal and unsafe passing of school buses by private vehicles on Reliez Valley Rd. is also an ongoing issue. We have requested (and received) enforcement from the Lafayette Police Department, but unfortunately the problem persists.

Please feel free to contact me with any questions at (925) 299-3216 or [jhansen@ci.lafayette.ca.us](mailto:jhansen@ci.lafayette.ca.us).

Sincerely,



Juliet Hansen

Program Manager

Lamorinda School Bus Program

TJKM, Lafayette's and O'Brien's (the developer's) chosen transportation consultant on the Terraces, would most recently have you believe that Pleasant Hill Rd delays are < 2.0, which coincidentally is the PH Rd. level of service threshold stipulated by the Lamorinda Action Plan (page 25), but TJKM's analysis is not considered credible for *multiple* reasons. One such concern that calls TJKM's credibility into question is talked about by County Connection in reference to evacuating students from Springhill Elementary and Acalanes High School:

The second credibility issue with TJKM stems from their OWN ANALYSIS in the Pleasant Hill Rd Corridor Study of 2017 <https://www.lovelafayette.org/home/showpublisheddocument?id=3995>, in which they say these same turn lane/short lane segments (added as an amendment to the Gateway Policy) **won't offer any material benefit**: "under highly congested situations like this one, further lengthening of the right-turn lane or even adding an additional right turn lane will not have any material benefit on the southbound through movement, as one would typically expect." Page 2

Residents take issue with many more perceived TJKM omissions and falsehoods.

Since Lafayette residents have been so distrusting of TJKM, we hired Elite Transportation <https://elitetransportationgroupinc.com/projects/>, whose clients include FHWA, Caltrans, MTC, SFCTA, VTA just to name a few, to provide detailed traffic analysis and evacuation modeling ahead of O'Brien's Terraces vote by Lafayette City Council. We also asked Streetlight Data for data on the corridor. Both Elite Transportation and Streetlight Data were aligned in their analysis:

Lafayette City Council ignored the Elite and Streetlight Data and preferred to use the TJKM data for project approval even though TJKM left out incredible amounts of metrics such as:

TJMK ADMITTED TO NOT HAVING STUDIED THE *ADDITIONAL TERRACES STUDENTS* IN CROSSWALKS AND HOW THOSE PEDESTRIANS WOULD AFFECT TRAFFIC THAT ALREADY EXISTS. THIS IS WHAT THAT INTERSECTION WILL LOOK LIKE, SO I ASK YOU - HOW EFFECTIVE WILL A NEW RIGHT HAND TURN LANE BE, WHEN IT A) IS FILLED UP WITH MORE WAZE TRAFFIC COMING OF HWY 680 (WHEN WE CREATE MORE CAPACITY FOR SOLO OCCUPANT CARS, THE TRAFFIC APP ALGORITHMS SHIFT THE TRAFFIC TO "FILL UP" THAT CAPACITY; AND 2) HAS TO TURN AGAINST, AND WAIT FOR, A SLEW OF NEW TERRACES STUDENTS WALKING TO SPRINGHILL AND ACALANES DURING PEAK?





The CCTA and subsets like Transpac and SWAT have a responsibility to Measure C and J tax payers to make good on the goals and objectives laid out in the Lamorinda Action Plan as to how growth is to be managed, PARTICULARLY BECAUSE THIS INTERSECTION IS WITHIN A HIGH RISK FIRE ZONE.

To that end, I will remind you what the Lamorinda Action Plan <https://ccta.net/wp-content/uploads/2018/10/59cd5bd512c34.pdf> says:

2008, page 5:

*1) where appropriate, provide priority for buses, carpools; Establish and maintain LOS standards on major arterials. 2) Reduce automobile demand by promoting and accommodating ridesharing, transit, bicycling, walking, and telecommuting. 3) Discourage freeway bypass traffic on Lamorinda roads.*

2008, page 6:

1. *Pursue actions to meet or sustain service objectives that will reduce reliance on single occupant automobile travel.*
2. *Avoid the addition of roadway capacity for single-occupant vehicles.*
3. *Enhance mobility by providing alternative travel options.*
4. *Actions should not lead to an increase in the use of BART parking in Lamorinda by people driving into the area from outside communities.*
5. *Pursue actions to improve safety of travelers by all modes.*

6. *Encourage through-trips and interregional travel to stay on freeways and discourage diversion of these trips to arterial and local streets as a mechanism for ensuring intraregional mobility.*
7. *Maintain capacity constraints at selected gateways*
- 8.
9. *2008*Page 7
1. *Establish CCCTA bus service on Pleasant Hill Road and/or Taylor Boulevard that has a composite frequency of at least two buses per hour during peak commute and school times (6:30 AM – 9:30 AM and 3:30 PM – 6:30 PM) and direct connection to the Lafayette BART station.*
2. *Maintain school bus service on Pleasant Hill Road and Taylor Boulevard.*
3. *Maintain a maximum wait time for drivers on side streets wishing to access Pleasant Hill Road or Taylor Boulevard of one signal cycle or less.*
4. *Maintain peak hour peak direction delay index of 2.0 or lower.”*

*Proposed Actions for Pleasant Hill Rd (Lamorinda Action Plans 2008, page 25):*

- 4) If the CCCTA cannot increase service to Acalanes School, evaluate the feasibility of augmenting the existing school bus program to add the high school as funding permits*
- 6) Support development of HOV lane programs on all freeways and regional routes where feasible*
- 7) Support the provision of public transit service in the Pleasant Hill Road / Taylor Boulevard Corridor with connections to BART and other CCCTA services in Lafayette*
- 8) Support the provision of Park and Ride lots north of Lafayette's segment of Pleasant Hill Road*
- 10) Investigate appropriate mechanisms, including maintaining existing roadway lanes and widths and restrictive signal timing, to discourage use of Pleasant Hill Road as a substitute for freeway travel*
- 11) Support pedestrian and bicycle safety improvements around schools, trailheads, and at intersections and along the bikeway network*
- 12) Work with TRANSPAC to develop a traffic management program to encourage delay in order to discourage use of westbound/southbound traffic using Pleasant Hill Road to bypass the I-680 SR 24 interchange*

So I ask, if CCTA permits a solo occupant short lane segment and turn lane, and resources are spent on this, is CCTA doing its job per the goals and objectives of the Lamorinda Action Plan? CCTA needs to FOLLOW THE LAMORINDA ACTION PLAN, PAID FOR BY TAX PAYERS. THIS IS HOW WE COME TO TRUST the CCTA. **They should NOT MODIFY THE GATEWAY CONSTRAINT POLICY WITHOUT MINIMALLY REQUIRING PEDESTRIAN BRIDGES, PROTECTED BIKE LANES, MORE BUSING, AND CARPOOL LANES DURING PEAK TRAVEL ALONG PLEASANT HILL RD.** They should not modify the gateway policy for concessions for a developer - this is UNPRECEDENTED in Contra Costa County, BUT will become the new norm, if approved.

MAKE CIRCULATION IN THIS AREA THE BEST IT CAN BE: **more efficient without adding more solo cars from hwy 680 and safe around school zones.** Lafayette approved this project to avoid a lawsuit with the developer. Their mistakes that lead to this fiasco date back to at least 2010. Adding hundreds of new pedestrians to this grade F intersection is DEADLY. Adding so many cars to this grade F intersection is DEADLY. Adding fire load to this intersection is DEADLY. Adding more solo lanes across from a high school is deadly. Adding unprotected ped and bike lanes to this intersection is DEADLY.

THIS AREA NEEDS A HOLISTIC PLAN CONCEPTUALIZED BY A SOPHISTICATED, STATE-OF-THE-ART TRANSPORTATION CONSULTANT AND REALIZED BY CCTA FUNDS THAT

TAXPAYERS APPROVED. PIECEMEALING AND DESIGNING STREETS BASED ON DEVELOPER INTERESTS WILL RESULT IN DEATH. MY CONSCIENCE AND LOVE FOR MY COMMUNITY'S CITIZENS REQUIRES THAT I MAKE SURE YOU ARE AWARE OF THIS AHEAD OF ANY DECISION YOU MAKE TO SUPPORT AMENDING A POLICY THAT WAS ORIGINALLY DRAFTED TO CIRCUMVENT THE VERY SITUATION WE NOW FIND OURSELVES IN.

PLEASE DO THE RIGHT THING AND DO NOT APPEASE THE DEVELOPER, OR A CITY BENT ON HELPING THE DEVELOPER, AT THE COST OF RESIDENTS' HEALTH AND SAFETY. IF A POLICY MUST BE AMENDED, AMEND IT WITH LANGUAGE THAT SUPPORTS THE GOALS AND OBJECTIVES THAT ARE ALREADY DEFINED.

Thanks and Sincerely,

KRISTEN ALTBAUM

3293 Theresa Lane, Lafayette 94549 (unincorporated CCCounty)

**I reside in Transpac.** My kids go to Lafayette schools and I

founded <https://www.facebook.com/groups/1753415531541790> Lafayette for School and Evacuation Routes in 2016.

925-285-8309



# acalan.es Union High School District

1212 Pleasant Hill Road, Lafayette, CA 94549

[www.acalan.es.k12.ca.us](http://www.acalan.es.k12.ca.us)

925-280-3900 ♦ Fax 925-280-3903

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## SCHOOLS

Acalanes Adult Education  
*Walnut Creek*

Acalanes Center for  
Independent Study  
*Walnut Creek*

Acalanes High School  
*Lafayette*

Campolindo High School  
*Moraga*

Las Lomas High School  
*Walnut Creek*

Miramonte High School  
*Orinda*

To whom it may concern:

A group of Acalanes High School parents and students have made me aware increasing congestion on Reliez Valley Road and in the residential neighborhoods surrounding the road in the cities of Pleasant Hill and Lafayette and unincorporated Contra Costa County. The Reliez Valley Road congestion during commute hours has been growing significantly over time as the route seems to be identified in mapping apps as “fastest” and as an alternative for commute traffic that would normally utilize Highways 68/24 or Pleasant Hill Road, thoroughfares that were engineered and designed for commuter volume of traffic.

Reliez Valley Road was not designed for this level of traffic. While I have not studied the flow, nor do I have any training to analyze traffic patterns, I do have significant concern regarding the safety of our students coming to our schools during commute hours from the neighborhoods on and surrounding Reliez Valley Road.

This seems to be a problem that should raise great alarm and action for the agencies that have jurisdiction and can provide regulatory measures to control traffic and address safety issues.

Sincerely,

John Nickerson

Superintendent

Acalanes Union High School District

# County Connection

2477 Arnold Industrial Way   Concord, CA 94520-5326   (925) 676-1976   [countyconnection.com](http://countyconnection.com)

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August 21, 2020

The Honorable Mayor Mike Anderson and members of the City Council  
City of Lafayette  
3675 Mt. Diablo Blvd. #210  
Lafayette, CA 94549

Dear Mayor Anderson and Council Members,

It has been brought to my attention that during your city council meeting of Monday, August 10, 2020, the prospect of the Central Contra Costa Transit Authority (County Connection) providing evacuations in the event of a wildfire in Lafayette relative to a council discussion on a proposed housing development came up. My understanding is that this was raised by Renee Powell of TJKM Transportation Consultants.

When this was first brought to my attention by Don Tatzin – who as you know represents the City of Lafayette on the County Connection Board of Directors – we thoroughly checked with our staff and found that no one on our staff recalls speaking with anyone regarding the proposed project in question, or about the topic of wild fire evacuation, or with someone from TJKM at all. So, we next made several attempts to contact TJKM and Renee Powell for more information regarding the conversation she stated she had with us. As of the morning of Friday, August 21, 2020, we have not heard back from her or her firm.

However, since the topic of any role County Connection might have in a wildfire evacuation in Lafayette was raised, let me briefly outline our likely role.

County Connection is part of the Contra Costa County Emergency Response Plan under the county Office of Emergency Services (OES). When an emergency arises such as a wildfire, earthquake, flood, etc., the County activates its Emergency Operations Command (EOC). We in turn report to them in a declared emergency. The EOC reaches out to County Connection with requests for whatever they might need to respond to the emergency. We then assess in the moment how we can best respond.

How we can respond is totally dependent on the various factors that exist in the moment of a particular emergency. These factors could include but are not limited to: traffic, the exact nature of the emergency, the distance of the evacuation from our resources, and how quickly we can get employees organized to respond who might not be at work in the moment. To further elaborate, there are no pre fixed numbers of buses or vehicles pre assigned to different kinds of emergencies.

Likewise, we might get called to respond to a very fast, limited in scope emergency by a local police or fire department. As with county declared emergencies, how fast and deep we can respond to such calls are very dependent on the type of factors noted above. Again, these decisions would be made in the moment.

Clayton • Concord • Contra Costa County • Danville • Lafayette • Martinez  
Moraga • Orinda • Pleasant Hill • San Ramon • Walnut Creek

**CENTRAL CONTRA COSTA TRANSIT AUTHORITY**



I hope you find this helpful and clarifying relative to the potential role of County Connection during a natural disaster such as a wildfire. If anyone wishes to discuss this topic further, please contact me directly by text or call at 925-383-2268, or via email at [ramacier@cccta.org](mailto:ramacier@cccta.org).

Sincerely,



Rick Ramacier  
General Manager/CEO  
Central Contra Costa Transit Authority  
2477 Arnold Industrial Way  
Concord, CA 94520  
925-680-2050

cc. Don Tatzin, County Connection Board Member  
Greg Wolff, City of Lafayette Planning Director  
Renee Powell, TJKM Transportation Consultants  
Ruby Horta, County Connection Director of Planning, Marketing, & Innovation



August 24, 2020

**Re: Terraces of Lafayette Emergency Evacuation Traffic Impact Study**

Dear Mayor and Council Members

Apologies for the lateness in getting this to you, but we have been working on this since we got the latest TJKM memo on Tuesday. Attached is another memo prepared by Elite that reviews the TJKM memorandum dated August 10, 2020, which was a response to Elite's last memo of August 8, 2020. In addition, Elite has now run various simulations of the TJKM model, firstly to check they could duplicate TJKM's results, which they did, but then to look deeper at the results to answer some critical questions, such as "how many vehicles can actually get out if there was a fire". **Elite's findings are shocking**, and are summarized as follows:

1. Within the Terraces project including the Trap lane, of the 551 cars assumed, only 208 are able to get out in the first hour of the evacuation. 343 will be stuck. If there is no Trap lane **only 16 cars will make it out in the first hour** - 535 cars will be stuck in their driveways and unable to get to Pleasant Hill Road. This directly contradicts what the fire chief has been saying that he is not worried about the Terraces because it is by the freeway.
2. For evacuating traffic from the surrounding area, the situation is also bad. **If there is no trap lane built with the project, an additional 553 neighborhood cars will be stuck in their driveways after the first hour and unable to get to Pleasant Hill Road.** Adding the trap lane drops this to 152 extra cars stuck, but that is still 152 cars too many.
3. This explains TJKM's earlier conclusion that the Terraces only adds 10 to 16 seconds extra delay on Pleasant Hill Road; this is because the majority of evacuation traffic from the Terraces can't even make it to Pleasant Hill Road.
4. Another direct result is that TJKM's assumption that some parents will be able to pick up students from the schools on their way out is invalid – some of these parents don't even make it to Pleasant Hill Road in the first hour.
5. Elite looked at TJKM's response that although they started with an empty network, they did seed the network with some traffic before the evacuation begins. This is true, but TJKM only seeded it with enough traffic to form a back up from Deer Hill Road half way to Springhill Road. See page 8 of TJKM's memo for an illustration. This is not heavy commute hour traffic, and so the model is not being at all conservative in this respect.
6. Note that all these results are based on TJKM's assumption in the model that there will not be any traffic congestion on Highway 24. In fact, the situation will be much worse if Highway 24 is

backed up, which is likely. Elite addresses on page 9 of their memo TJKM's response that Highway 24 traffic does not matter – it does!

7. On page 10 of their memo, Elite also responds to TJKM's claims that the on-ramps to Highway 24 will have the capacity to handle the extra evacuation traffic that will be generated by the Terraces – that is not true.

In summary, it is clear from Elite's comprehensive report that the TJKM evacuation model actually shows that **the Terraces will impose significant safety threats on both the surrounding neighborhood as well as the residents within the project itself** due to the traffic congestion and emergency evacuation delays. You should therefore deny this project at your meeting this evening.

Sincerely,

Colin Elliott on behalf of Michael Griffiths

Attached:

1. Elite Peer Review memo dated 8/23/2020



# Memorandum

**Date:** August 23, 2020

**To:** Michael Griffiths

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

**Subject:** **Peer Review of TJKM's Evacuation Models and Response Memo for Terraces of Lafayette Traffic Impact Study**

TJKM, the traffic study consultant for the proposed Terraces of Lafayette Project, released a memorandum dated August 10, 2020, in response to ETG's comments regarding TJKM's emergency evacuation modeling and analysis. The purpose of this memorandum is to provide a summary of our latest findings based on a review of the TJKM's response memo and evacuation models.

TJKM's evacuation models were developed for AM and PM peak hours using Synchro/SimTraffic, a commonly used software package for arterial operations. TJKM's evacuation model files were organized for the following six scenarios ("Project" is referred as the Terraces of Lafayette):

- **Evac 1** – Evacuation (without project) in the AM Peak
- **Evac 1 + Project** – Evacuation plus project, with trap lane<sup>1</sup>, in the AM Peak
- **Evac 1 + Project Variant** – Evacuation plus project, no trap lane, in the AM Peak
- **Evac 2** – Evacuation (without project) in the PM Peak
- **Evac 2 + Project** – Evacuation plus project, with trap lane, in the PM Peak
- **Evac 2 + Project Variant** – Evacuation plus project, no trap lane, in the PM Peak

In TJKM's memo, "denied entry vehicles", which will be explained in the next, were not reported. We reran SimTraffic simulation for the AM peak scenarios using the Synchro files and the same parameters that TJKM provided, as listed below:

- 5 runs per synchro file
- 10-minute seeding interval
- 60-minute analysis interval
- Random seed 1412

The SimTraffic simulation reports are attached in **Appendix**. We were able to replicate majority of the performance measures that were included in TJKM's memo. In addition, we also reported "denied entry vehicles", for both systemwide and individual intersections (see **Appendix**).

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<sup>1</sup> 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.



## DENIED ENTRY VEHICLES (WAITING TO ENTER THE TRAFFIC NETWORK)

**Denied entry vehicles** (i.e., unserved vehicles) are the vehicles that are still waiting to enter the traffic network by the end of the traffic analysis period. We checked and found many denied entry vehicles in TJKM's evaluation models. For instance, in the AM peak hour evacuation model (7:00-8:00 AM), the number of denied entry vehicles including the Terraces of Lafayette project is **more than 3,400 vehicles** under the trap lane scenario (**Table 1**), or **more than 3,800 vehicles** under the no trap lane scenario (**Table 2**). This means that by 8:00 AM (the end of the traffic analysis period), there would still be more than 3,400 vehicles (under the trap lane scenario), or more than 3,800 vehicles (under the no trap lane scenario), waiting to get onto streets for evacuation.

**Table 1. Systemwide Denied Entry Vehicles – AM Peak, with Project, with Trap Lane**

| Interval #1 Information Recording |        |        |        |        |        |        |
|-----------------------------------|--------|--------|--------|--------|--------|--------|
| Start Time                        | 7:00   |        |        |        |        |        |
| End Time                          | 8:00   |        |        |        |        |        |
| Total Time (min)                  | 60     |        |        |        |        |        |
| Volumes adjusted by PHF.          |        |        |        |        |        |        |
| Run Number                        | 1      | 2      | 3      | 4      | 5      | Avg    |
| Vehs Entered                      | 2263   | 2295   | 2244   | 2328   | 2313   | 2288   |
| Vehs Exited                       | 2102   | 2093   | 2083   | 2150   | 2194   | 2124   |
| Starting Vehs                     | 258    | 221    | 256    | 240    | 270    | 249    |
| Ending Vehs                       | 419    | 423    | 417    | 418    | 389    | 413    |
| Denied Entry Before               | 144    | 118    | 171    | 165    | 170    | 154    |
| Denied Entry After                | 3606   | 3495   | 3527   | 3411   | 3573   | 3521   |
| Travel Distance (mi)              | 1958   | 1940   | 1912   | 1998   | 1993   | 1960   |
| Travel Time (hr)                  | 2184.8 | 2082.6 | 2177.1 | 2092.5 | 2164.7 | 2140.3 |
| Total Delay (hr)                  | 2116.4 | 2014.8 | 2109.6 | 2022.3 | 2095.0 | 2071.6 |
| Total Stops                       | 8764   | 8548   | 8324   | 9019   | 8972   | 8724   |
| Fuel Used (gal)                   | 547.6  | 524.9  | 544.9  | 528.3  | 545.2  | 538.2  |

**Table 2. Systemwide Denied Entry Vehicles – AM Peak, with Project, No Trap Lane (Project Variant)**

| Interval #1 Information Recording |        |        |        |        |        |        |
|-----------------------------------|--------|--------|--------|--------|--------|--------|
| Start Time                        | 7:00   |        |        |        |        |        |
| End Time                          | 8:00   |        |        |        |        |        |
| Total Time (min)                  | 60     |        |        |        |        |        |
| Volumes adjusted by PHF.          |        |        |        |        |        |        |
| Run Number                        | 1      | 2      | 3      | 4      | 5      | Avg    |
| Vehs Entered                      | 1791   | 1861   | 1881   | 1826   | 1818   | 1836   |
| Vehs Exited                       | 1693   | 1741   | 1734   | 1705   | 1729   | 1721   |
| Starting Vehs                     | 305    | 291    | 290    | 275    | 312    | 295    |
| Ending Vehs                       | 403    | 411    | 437    | 396    | 401    | 410    |
| Denied Entry Before               | 150    | 161    | 149    | 162    | 161    | 157    |
| Denied Entry After                | 4006   | 3989   | 3958   | 4088   | 3989   | 4005   |
| Travel Distance (mi)              | 1583   | 1638   | 1617   | 1626   | 1663   | 1625   |
| Travel Time (hr)                  | 2421.0 | 2442.9 | 2410.2 | 2434.6 | 2418.7 | 2425.5 |
| Total Delay (hr)                  | 2365.5 | 2385.8 | 2353.9 | 2378.2 | 2361.2 | 2368.9 |
| Total Stops                       | 5726   | 6207   | 5810   | 6056   | 6244   | 6009   |
| Fuel Used (gal)                   | 590.3  | 597.6  | 588.3  | 594.4  | 592.5  | 592.6  |





We checked the project driveway connecting with Pleasant Hill Road, and saw that the project driveway is still packed with vehicles by the end of the traffic analysis period (see **Figure 1**). We then checked and found that there were more than 500 denied entry vehicles under the trap lane scenario (**Table 3**), or more than 700 denied entry vehicles under the no trap lane scenario (**Table 4**). Only 12 vehicles, or 2%, would be able to get out of the Terraces of Lafayette community during the 7:00-8:00 AM one-hour evacuation period under the no trap lane scenario. Even with the trap lane scenario, only 217 vehicles, or 30%, would be able to get out of the Terraces of Lafayette community. The denied entry vehicles would not show up on the short project driveway. To better visualize the stack of the denied entry vehicles, we “artificially” extended the project driveway, as shown in **Figure 1**. Majority of vehicles could not even leave Terraces of Lafayette community after the one-hour evacuation period.

**Table 3. Denied Entry Vehicles at Project Driveway – AM Peak, with Project, with Trap Lane**

**11: Pleasant Hill Road & Project Dwy Performance by movement**

| Movement            | EBR    | NBT | SBT  | All   |
|---------------------|--------|-----|------|-------|
| Denied Delay (hr)   | 294.0  | 0.0 | 0.0  | 294.0 |
| Denied Del/Veh (s)  | 1369.0 | 0.0 | 0.0  | 446.0 |
| Total Delay (hr)    | 7.0    | 0.0 | 13.7 | 20.7  |
| Total Del/Veh (s)   | 112.7  | 0.0 | 31.4 | 40.6  |
| Stop Delay (hr)     | 7.5    | 0.0 | 11.1 | 18.6  |
| Stop Del/Veh (s)    | 120.4  | 0.0 | 25.4 | 36.5  |
| Vehicles Entered    | 217    | 39  | 1561 | 1817  |
| Vehicles Exited     | 217    | 39  | 1558 | 1814  |
| Hourly Exit Rate    | 217    | 39  | 1558 | 1814  |
| Input Volume        | 735    | 35  | 4244 | 5014  |
| % of Volume         | 30     | 111 | 37   | 36    |
| Denied Entry Before | 31     | 0   | 0    | 31    |
| Denied Entry After  | 556    | 0   | 0    | 556   |

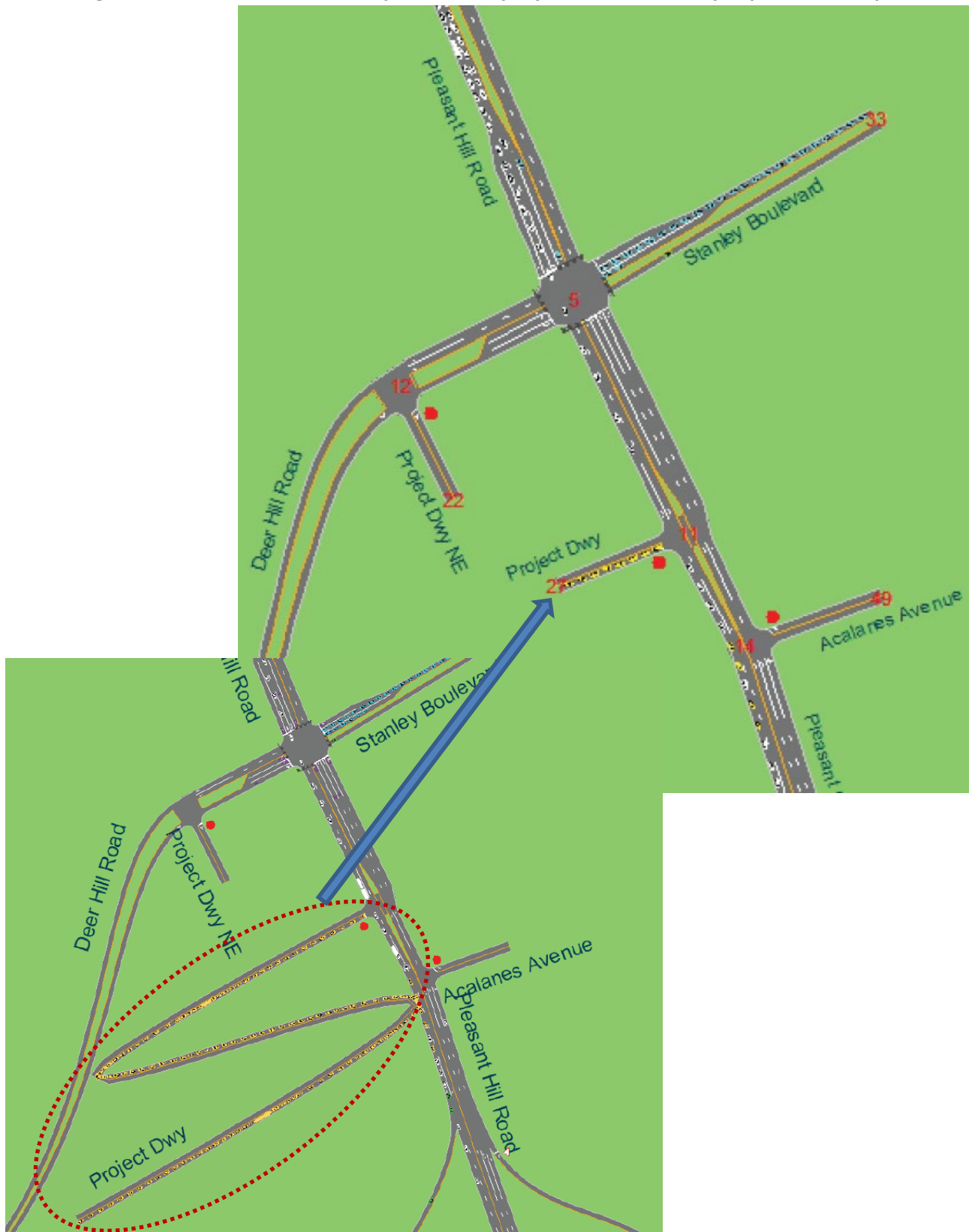
**Table 4. Denied Entry Vehicles at Project Driveway – AM Peak, with Project, No Trap Lane (Project Variant)**

**11: Pleasant Hill Road & Project Dwy Performance by movement**

| Movement            | EBR    | NBT | SBT  | All   |
|---------------------|--------|-----|------|-------|
| Denied Delay (hr)   | 420.6  | 0.0 | 0.0  | 420.6 |
| Denied Del/Veh (s)  | 1907.0 | 0.0 | 0.0  | 688.9 |
| Total Delay (hr)    | 7.9    | 0.0 | 8.2  | 16.2  |
| Total Del/Veh (s)   | 1361.7 | 0.0 | 21.5 | 40.6  |
| Stop Delay (hr)     | 8.0    | 0.0 | 4.7  | 12.6  |
| Stop Del/Veh (s)    | 1366.8 | 0.0 | 12.2 | 31.7  |
| Vehicles Entered    | 13     | 39  | 1365 | 1417  |
| Vehicles Exited     | 12     | 39  | 1365 | 1416  |
| Hourly Exit Rate    | 12     | 39  | 1365 | 1416  |
| Input Volume        | 735    | 35  | 4244 | 5014  |
| % of Volume         | 2      | 111 | 32   | 28    |
| Denied Entry Before | 61     | 0   | 0    | 61    |
| Denied Entry After  | 781    | 0   | 0    | 781   |



Figure 1. Pleasant Hill Road & Project Driveway (by end of traffic analysis period in AM peak)





We noticed that TJKM assumed a peak hour factor (PHF) of 0.75 in the evacuation models. The PHF is usually used to convert the hourly traffic volume into the flow rate that represents the busiest 15 minutes of the rush hour.

$$PHF = \frac{\text{Total Hourly Traffic Volume}}{(\text{Peak 15-Minute Traffic Volume with the Hour}) \times 4}$$

Using a PHF of 0.75 means that the analysis flow rate (i.e., peak 15-minute traffic flow rate) is 33.3% more than the hourly traffic volume.

Different from a typical intersection delay and level of service (LOS) analysis, the purpose of an evacuation model is mainly focused on how quickly the evacuation can be achieved. Therefore, using PHFs may not be appropriate for evacuation analyses. We then ran SimTraffic simulation for the AM peak scenarios using the same Synchro files and primary parameters, with the only change of PHF from 0.75 to 1.0. The SimTraffic simulation reports based on PHF of 1.0 are attached in **Appendix**.

Even with a PHF of 1.0, we still found that there would be more than 300 denied entry vehicles under the trap lane scenario (**Table 5**), or more than 500 denied entry vehicles under the no trap lane scenario (**Table 6**). Only 13 vehicles, or 2%, would be able to get out of the Terraces of Lafayette community during the 7:00-8:00 AM one-hour evacuation period under the no trap lane scenario. Even with the trap lane scenario, only 210 vehicles, or 38%, would be able to get out of the Terraces of Lafayette community.

**Table 5. Denied Entry Vehicles at Project Driveway – AM Peak, with Project, with Trap Lane (PHF=1.0)**

#### 11: Pleasant Hill Road & Project Dwy Performance by movement

| Movement            | EBR    | NBT | SBT  | All   |
|---------------------|--------|-----|------|-------|
| Denied Delay (hr)   | 205.8  | 0.0 | 0.0  | 205.8 |
| Denied Del/Veh (s)  | 1266.7 | 0.0 | 0.0  | 341.3 |
| Total Delay (hr)    | 7.0    | 0.0 | 14.4 | 21.3  |
| Total Del/Veh (s)   | 115.4  | 0.0 | 32.9 | 42.3  |
| Stop Delay (hr)     | 7.4    | 0.0 | 11.8 | 19.2  |
| Stop Del/Veh (s)    | 123.2  | 0.0 | 27.0 | 38.1  |
| Vehicles Entered    | 211    | 26  | 1560 | 1797  |
| Vehicles Exited     | 210    | 26  | 1556 | 1792  |
| Hourly Exit Rate    | 210    | 26  | 1556 | 1792  |
| Input Volume        | 551    | 26  | 3183 | 3760  |
| % of Volume         | 38     | 100 | 49   | 48    |
| Denied Entry Before | 31     | 0   | 0    | 31    |
| Denied Entry After  | 374    | 0   | 0    | 374   |



**Table 6. Denied Entry Vehicles at Project Driveway – AM Peak, with Project, No Trap Lane (Project Variant) (PHF=1.0)**

**11: Pleasant Hill Road & Project Dwy Performance by movement**

| Movement            | EBR    | NBT | SBT  | All   |
|---------------------|--------|-----|------|-------|
| Denied Delay (hr)   | 333.1  | 0.0 | 0.0  | 333.1 |
| Denied Del/Veh (s)  | 1956.2 | 0.0 | 0.0  | 598.1 |
| Total Delay (hr)    | 8.0    | 0.0 | 8.0  | 16.1  |
| Total Del/Veh (s)   | 1374.8 | 0.0 | 21.0 | 40.7  |
| Stop Delay (hr)     | 8.1    | 0.0 | 4.5  | 12.5  |
| Stop Del/Veh (s)    | 1380.2 | 0.0 | 11.7 | 31.7  |
| Vehicles Entered    | 13     | 25  | 1367 | 1405  |
| Vehicles Exited     | 13     | 25  | 1368 | 1406  |
| Hourly Exit Rate    | 13     | 25  | 1368 | 1406  |
| Input Volume        | 551    | 26  | 3183 | 3760  |
| % of Volume         | 2      | 96  | 43   | 37    |
| Denied Entry Before | 65     | 0   | 0    | 65    |
| Denied Entry After  | 600    | 0   | 0    | 600   |

The denied entry vehicles exist on other streets too, including Stanley Boulevard, Spring Hill Road, Quandt Road, and Reliez Valley Road, as shown in **Figure 2**. Keep it in mind that Stanley Boulevard is mainly for evacuating students from Acalanes High School, and denied entry vehicles (i.e., waiting to enter the traffic network) would be more than 900.

With so many denied entry vehicles systemwide (>3,400 vehicles under the trap lane scenario, or >3,800 vehicles under the no trap lane scenario), and 98% of vehicles under the no trap lane scenario (or more than 60% under the trap lane scenario) could not even leave Terraces of Lafayette community after the one-hour evacuation period, TJKM's evacuation models apparently lack credibility and the results coming out of the evacuation models are simply invalid.



Figure 2. Streets with Significant Denied Entry Vehicles (by end of traffic analysis period in AM peak)

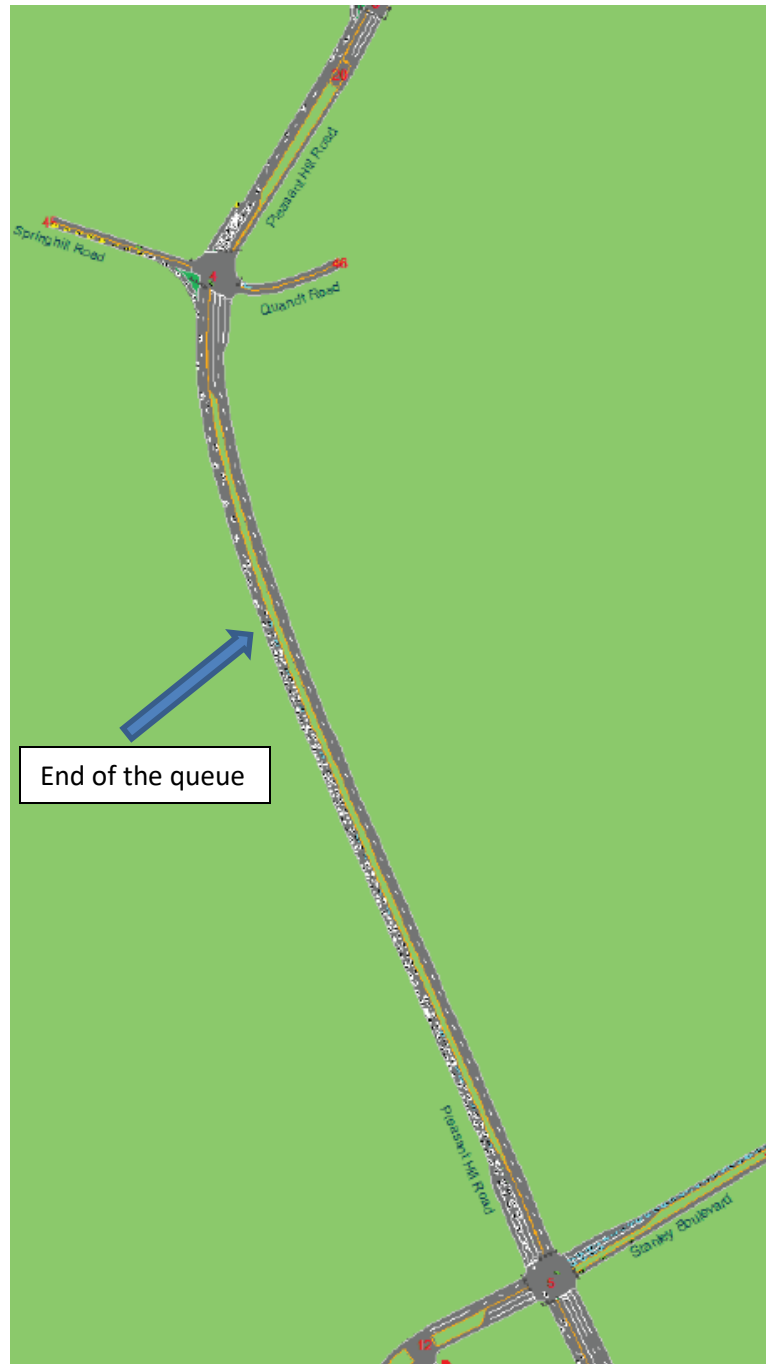




## BACKGROUND TRAFFIC

In their response memo, TJKM mentioned that they included a 10-minute “seeding” period (i.e., 6:50-7:00 AM). We ran the 10-minute seeding period, and found that traffic was only backed up to somewhere between Deer Hill Road/Stanley Boulevard and Spring Hill Road/Quant Road, as shown in **Figure 3**.

**Figure 3. Traffic Condition (by end of 10-minute seeding period in AM peak)**





However, it is well known that the Pleasant Hill Road backs up much further upstream at 7:00 AM during the morning peak. There should have been many more vehicles (i.e., “background traffic”) already in the roadway system when the evacuation starts during the AM peak hour.

In their response memo, TJKM claimed that “By including both evacuation traffic and normal commute traffic, these vehicles would be double counted.” This would only be true if all of the traffic on Pleasant Hill Road would come only from Lafayette. However, Pleasant Hill Road carries traffic from many surrounding cities and communities. The right approach is to load the roadway network so that at the beginning of the evacuation (i.e., 7:00 AM during the morning peak), the modeled traffic condition represents what would look like during a normal day without evacuation. After that, no new non-evacuation traffic would enter Pleasant Hill Road from the north once a roadblock has been set up after the evacuation order is given. However, TJKM’s evacuation models did not follow the right approach, and therefore significantly underestimated background traffic. Adding background traffic could make traffic delay exponentially worse.

## SR 24 CAPACITY CONSTRAINT

The evacuation models assumed that all evacuating vehicles would use SR 24 to leave Lafayette – 50% would travel eastbound (EB) and 50% would travel westbound (WB). We raised the question that the evacuation models ended at the on-ramps (both EB and WB) and did not model or put capacity constraints on SR 24 mainline freeway, as illustrated in **Figure 4**. By doing this, TJKM assumed that SR 24 would have “unlimited” capacity to absorb the additional evacuating traffic. This assumption is unrealistic since SR 24 is already congested (WB in AM and EB in PM) and does not have enough extra capacity to accommodate the significant amount increase of traffic due to evacuation.

In their response memo, TJKM did not address this concern directly. It is only simply stated that “the evacuation traffic volumes are already extremely conservative.”

Here is a simple example for the AM peak hour to illustrate the importance of SR 24 capacity constraint. Again, this example is for illustration purposes and it does not replace detailed and accurate modeling.

- Same assumption of all evacuating vehicles would use SR 24 to leave Lafayette – 50% would travel EB and 50% would travel WB.
- In the AM peak hour (7:00-8:00 AM), SR 24 WB has a capacity constraint – assuming 900 vehicles are able to get on and use SR 24 in the WB direction.
- Traffic demand during the evacuation is 1,800 vehicles to use the SR 24 WB on-ramp.
- With the above assumptions, vehicles cannot be fully evacuated in two hours (i.e.,  $1,800/900 = 2$ ). In other words, **one additional hour** is needed after the one-hour peak period. However, with all the above assumptions except for the SR 24 capacity constraint, as modelled by TJKM, vehicles can be fully evacuated within the one-hour peak period.
- Additional evacuating traffic coming out of the Terraces of Lafayette community is 551 vehicles (based on TJKM’s memo dated June 22, 2020). Now adding half of them to the SR 24 WB direction,

the additional 275 vehicles (i.e.,  $551/2 = 275$ ) coming out of the Terraces of Lafayette community would cause additional 18 minutes (i.e.,  $275/900 \times 60 = 18$ ) to evacuate.

Therefore, the evacuation models must have significantly underestimated the level of traffic congestion, and the impacts of which is that traffic is unable to get onto the SR 24 freeway and gets backed up on surface streets.

**Figure 4. Evacuation Models Ended at On-Ramps**



## ON-RAMP CAPACITY CONSTRAINT

We stated in our previous memo that the single-lane on-ramps (both EB and WB) may not be able to handle the significant amount of traffic getting onto SR 24 freeway during the peak hours, with a maximum capacity of 1,900 vehicles per hour per lane at on-ramps assuming no congestion on the freeway onto which the traffic merges. TJKM responded by stating that “it is not an absolute limit, and exceeding 1,900 vehicles per hour per lane does not immediately result in gridlock or excessive delays. In addition, the sections of SR-24 where the westbound and eastbound ramps enter the freeway feature long auxiliary lanes, such that evacuation traffic would have ample time to merge into the other travel lanes without slowing down ramp traffic.”

- On-Ramp Capacity:** TJKM stated that on-ramp maximum capacity of 1,900 vehicles per hour per lane “it is not an absolute limit”. Traffic Engineers generally use 1,900 vehicles under the close to “ideal” condition without traffic congestion or traffic flow breakdown. 1,900 vehicles per hour per lane corresponds to 1.9 seconds in headway (i.e.,  $3,600 \text{ seconds}/1,900 = 1.9$ ). Headway is a



measure of the temporal space between two vehicles. Specifically, the headway is the time that elapses between the arrival of the leading vehicle and the following vehicle at the designated test point. In fact, on-ramp capacity drops when traffic is congested (traffic flow breakdown), causing “productivity loss”. It is not uncommon to see on-ramp capacity drops to 1,200 vehicles per hour per lane or less when traffic follow breaks down. Under the emergency evacuation condition, traffic typically breaks down due to many factors such as poor visibility (due to smoke), rubbernecking, panicking, etc. We agree that the on-ramp capacity is not an absolute limit; instead, it drops significantly under the emergency evacuation condition. In this perspective, traffic congestion would be even much worse.

- **Auxiliary Lanes:** TJKM stated that “the sections of SR-24 where the westbound and eastbound ramps enter the freeway feature long auxiliary lanes, such that evacuation traffic would have ample time to merge into the other travel lanes without slowing down ramp traffic.” Auxiliary lanes on SR 24 do not help when traffic is already congested (WB in AM and EB in PM) while much more additional traffic is being loaded onto SR 24 due to emergency evacuation.

## CONCLUSION

In conclusion, the evacuation models that TJKM developed has critical fatal flaws. The results generated from the evacuation models are invalid and should not be used for any decision-making.



## APPENDIX

### SimTraffic Simulation Reports

- PHF = 0.75 (TJKM's assumption)
  - **Evac 1** – Evacuation (without project) in the AM Peak
  - **Evac 1 + Project** – Evacuation plus project, with trap lane, in the AM Peak
  - **Evac 1 + Project Variant** – Evacuation plus project, no trap lane, in the AM Peak
- PHF = 1.0
  - **Evac 1** – Evacuation without project in the AM Peak
  - **Evac 1 + Project** – Evacuation plus project, with trap lane, in the AM Peak
  - **Evac 1 + Project Variant** – Evacuation plus project, no trap lane, in the AM Peak



PHF = 0.75 (TJKM's assumption)

**Evac 1** – Evacuation (without project) in the AM Peak

# SimTraffic Simulation Summary

## Evacuation Scenario 1

08/23/2020

### Summary of All Intervals

| Run Number              | 1      | 2      | 3      | 4      | 5      | Avg    |
|-------------------------|--------|--------|--------|--------|--------|--------|
| Start Time              | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   |
| End Time                | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   |
| Total Time (min)        | 70     | 70     | 70     | 70     | 70     | 70     |
| Time Recorded (min)     | 60     | 60     | 60     | 60     | 60     | 60     |
| # of Intervals          | 2      | 2      | 2      | 2      | 2      | 2      |
| # of Recorded Intervals | 1      | 1      | 1      | 1      | 1      | 1      |
| Vehs Entered            | 1839   | 1799   | 1853   | 1780   | 1801   | 1815   |
| Vehs Exited             | 1731   | 1727   | 1714   | 1677   | 1712   | 1712   |
| Starting Vehs           | 281    | 306    | 248    | 270    | 292    | 279    |
| Ending Vehs             | 389    | 378    | 387    | 373    | 381    | 380    |
| Denied Entry Before     | 111    | 134    | 82     | 89     | 97     | 102    |
| Denied Entry After      | 3211   | 3348   | 3053   | 3274   | 3192   | 3215   |
| Travel Distance (mi)    | 1650   | 1646   | 1657   | 1635   | 1633   | 1644   |
| Travel Time (hr)        | 1970.3 | 2079.1 | 1891.0 | 2004.2 | 1963.6 | 1981.7 |
| Total Delay (hr)        | 1913.1 | 2022.1 | 1833.3 | 1947.6 | 1906.9 | 1924.6 |
| Total Stops             | 6129   | 6226   | 6137   | 6034   | 6042   | 6113   |
| Fuel Used (gal)         | 490.2  | 515.2  | 471.8  | 497.7  | 486.6  | 492.3  |

### Interval #0 Information Seeding

|                                 |      |
|---------------------------------|------|
| Start Time                      | 6:50 |
| End Time                        | 7:00 |
| Total Time (min)                | 10   |
| No data recorded this interval. |      |

### Interval #1 Information Recording

|                          |      |
|--------------------------|------|
| Start Time               | 7:00 |
| End Time                 | 8:00 |
| Total Time (min)         | 60   |
| Volumes adjusted by PHF. |      |

| Run Number           | 1      | 2      | 3      | 4      | 5      | Avg    |
|----------------------|--------|--------|--------|--------|--------|--------|
| Vehs Entered         | 1839   | 1799   | 1853   | 1780   | 1801   | 1815   |
| Vehs Exited          | 1731   | 1727   | 1714   | 1677   | 1712   | 1712   |
| Starting Vehs        | 281    | 306    | 248    | 270    | 292    | 279    |
| Ending Vehs          | 389    | 378    | 387    | 373    | 381    | 380    |
| Denied Entry Before  | 111    | 134    | 82     | 89     | 97     | 102    |
| Denied Entry After   | 3211   | 3348   | 3053   | 3274   | 3192   | 3215   |
| Travel Distance (mi) | 1650   | 1646   | 1657   | 1635   | 1633   | 1644   |
| Travel Time (hr)     | 1970.3 | 2079.1 | 1891.0 | 2004.2 | 1963.6 | 1981.7 |
| Total Delay (hr)     | 1913.1 | 2022.1 | 1833.3 | 1947.6 | 1906.9 | 1924.6 |
| Total Stops          | 6129   | 6226   | 6137   | 6034   | 6042   | 6113   |
| Fuel Used (gal)      | 490.2  | 515.2  | 471.8  | 497.7  | 486.6  | 492.3  |

## 1: Pleasant Hill Road & Rancho View Drive Performance by movement

| Movement            | EBR | SBT | All |
|---------------------|-----|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.2 | 0.1 | 0.2 |
| Total Delay (hr)    | 0.2 | 0.1 | 0.2 |
| Total Del/Veh (s)   | 3.6 | 6.3 | 4.1 |
| Stop Delay (hr)     | 0.1 | 0.0 | 0.2 |
| Stop Del/Veh (s)    | 2.8 | 4.5 | 3.1 |
| Vehicles Entered    | 176 | 36  | 212 |
| Vehicles Exited     | 175 | 36  | 211 |
| Hourly Exit Rate    | 175 | 36  | 211 |
| Input Volume        | 173 | 33  | 206 |
| % of Volume         | 101 | 109 | 102 |
| Denied Entry Before | 0   | 0   | 0   |
| Denied Entry After  | 0   | 0   | 0   |

## 2: Pleasant Hill Road & Greenvaley Drive Performance by movement

| Movement            | EBR | WBL   | SBT | All  |
|---------------------|-----|-------|-----|------|
| Denied Delay (hr)   | 0.0 | 0.0   | 0.0 | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0   | 0.0 | 0.0  |
| Total Delay (hr)    | 0.1 | 19.7  | 0.3 | 20.1 |
| Total Del/Veh (s)   | 3.4 | 144.5 | 5.2 | 95.1 |
| Stop Delay (hr)     | 0.1 | 18.6  | 0.2 | 18.9 |
| Stop Del/Veh (s)    | 3.5 | 136.2 | 3.4 | 89.3 |
| Vehicles Entered    | 56  | 479   | 212 | 747  |
| Vehicles Exited     | 55  | 467   | 212 | 734  |
| Hourly Exit Rate    | 55  | 467   | 212 | 734  |
| Input Volume        | 56  | 637   | 207 | 900  |
| % of Volume         | 98  | 73    | 102 | 82   |
| Denied Entry Before | 0   | 0     | 0   | 0    |
| Denied Entry After  | 0   | 0     | 0   | 0    |

### 3: Pleasant Hill Road & Reliez Valle Road Performance by movement

| Movement            | EBR    | SBT  | All   |
|---------------------|--------|------|-------|
| Denied Delay (hr)   | 571.5  | 0.0  | 571.5 |
| Denied Del/Veh (s)  | 1365.2 | 0.0  | 918.1 |
| Total Delay (hr)    | 17.5   | 8.3  | 25.7  |
| Total Del/Veh (s)   | 199.0  | 39.8 | 87.2  |
| Stop Delay (hr)     | 17.5   | 6.7  | 24.3  |
| Stop Del/Veh (s)    | 199.8  | 32.4 | 82.2  |
| Vehicles Entered    | 303    | 734  | 1037  |
| Vehicles Exited     | 297    | 727  | 1024  |
| Hourly Exit Rate    | 297    | 727  | 1024  |
| Input Volume        | 1499   | 900  | 2399  |
| % of Volume         | 20     | 81   | 43    |
| Denied Entry Before | 8      | 0    | 8     |
| Denied Entry After  | 1204   | 0    | 1204  |

### 4: Pleasant Hill Road & Springhill Road/Quandt Road Performance by movement

| Movement            | EBR    | WBL   | WBT   | NBL  | SBT   | SBR  | All   |
|---------------------|--------|-------|-------|------|-------|------|-------|
| Denied Delay (hr)   | 354.3  | 42.1  | 6.4   | 0.0  | 0.0   | 0.0  | 402.8 |
| Denied Del/Veh (s)  | 1456.1 | 485.6 | 480.4 | 0.0  | 0.0   | 0.0  | 641.6 |
| Total Delay (hr)    | 9.9    | 7.9   | 1.2   | 0.1  | 32.3  | 2.5  | 53.8  |
| Total Del/Veh (s)   | 201.6  | 123.7 | 126.0 | 96.5 | 123.9 | 93.5 | 131.2 |
| Stop Delay (hr)     | 10.2   | 7.7   | 1.1   | 0.1  | 32.5  | 2.6  | 54.2  |
| Stop Del/Veh (s)    | 207.6  | 120.7 | 121.8 | 94.2 | 124.8 | 94.5 | 132.0 |
| Vehicles Entered    | 167    | 228   | 33    | 5    | 922   | 97   | 1452  |
| Vehicles Exited     | 166    | 223   | 32    | 5    | 897   | 94   | 1417  |
| Hourly Exit Rate    | 166    | 223   | 32    | 5    | 897   | 94   | 1417  |
| Input Volume        | 857    | 297   | 45    | 5    | 2168  | 231  | 3603  |
| % of Volume         | 19     | 75    | 71    | 100  | 41    | 41   | 39    |
| Denied Entry Before | 11     | 1     | 0     | 0    | 0     | 0    | 12    |
| Denied Entry After  | 709    | 84    | 15    | 0    | 0     | 0    | 808   |

5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard Performance by movement

| Movement            | WBL    | NBT  | NBR | SBL   | SBT   | All   |
|---------------------|--------|------|-----|-------|-------|-------|
| Denied Delay (hr)   | 573.7  | 0.0  | 0.0 | 0.0   | 0.0   | 573.7 |
| Denied Del/Veh (s)  | 1606.0 | 0.0  | 0.0 | 0.0   | 0.0   | 792.8 |
| Total Delay (hr)    | 23.6   | 0.0  | 0.0 | 13.0  | 140.8 | 177.4 |
| Total Del/Veh (s)   | 320.2  | 17.2 | 2.9 | 373.8 | 389.2 | 369.9 |
| Stop Delay (hr)     | 23.4   | 0.0  | 0.0 | 12.3  | 137.2 | 172.9 |
| Stop Del/Veh (s)    | 317.5  | 15.6 | 2.9 | 353.2 | 379.4 | 360.7 |
| Vehicles Entered    | 238    | 7    | 26  | 112   | 1174  | 1557  |
| Vehicles Exited     | 241    | 7    | 26  | 113   | 1139  | 1526  |
| Hourly Exit Rate    | 241    | 7    | 26  | 113   | 1139  | 1526  |
| Input Volume        | 1212   | 6    | 29  | 291   | 3032  | 4570  |
| % of Volume         | 20     | 117  | 90  | 39    | 38    | 33    |
| Denied Entry Before | 82     | 0    | 0   | 0     | 0     | 82    |
| Denied Entry After  | 1048   | 0    | 0   | 0     | 0     | 1048  |

6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp Performance by movement

| Movement            | SBT | SBR | All |
|---------------------|-----|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.0 | 0.0 | 0.0 |
| Total Delay (hr)    | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s)   | 0.1 | 4.8 | 4.1 |
| Stop Delay (hr)     | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.0 | 0.0 | 0.0 |
| Vehicles Entered    | 2   | 11  | 13  |
| Vehicles Exited     | 2   | 11  | 13  |
| Hourly Exit Rate    | 2   | 11  | 13  |
| Input Volume        | 7   | 28  | 35  |
| % of Volume         | 29  | 39  | 37  |
| Denied Entry Before | 0   | 0   | 0   |
| Denied Entry After  | 0   | 0   | 0   |

7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road Performance by movement

| Movement            | SBT | All |
|---------------------|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.1 | 0.1 |
| Total Delay (hr)    | 0.0 | 0.0 |
| Total Del/Veh (s)   | 1.8 | 1.8 |
| Stop Delay (hr)     | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.1 | 0.1 |
| Vehicles Entered    | 28  | 28  |
| Vehicles Exited     | 28  | 28  |
| Hourly Exit Rate    | 28  | 28  |
| Input Volume        | 29  | 29  |
| % of Volume         | 97  | 97  |
| Denied Entry Before | 0   | 0   |
| Denied Entry After  | 0   | 0   |

14: Pleasant Hill Road & Acalanes Avenue Performance by movement

| Movement            | NBT | SBT  | All  |
|---------------------|-----|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0 | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 4.5  | 4.5  |
| Total Del/Veh (s)   | 0.3 | 11.8 | 11.6 |
| Stop Delay (hr)     | 0.0 | 1.4  | 1.4  |
| Stop Del/Veh (s)    | 0.0 | 3.7  | 3.6  |
| Vehicles Entered    | 33  | 1377 | 1410 |
| Vehicles Exited     | 33  | 1376 | 1409 |
| Hourly Exit Rate    | 33  | 1376 | 1409 |
| Input Volume        | 35  | 4244 | 4279 |
| % of Volume         | 94  | 32   | 33   |
| Denied Entry Before | 0   | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    |



### 15: Pleasant Hill Road Performance by movement

| Movement            | WBR | SBT  | SBR  | All  |
|---------------------|-----|------|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0  | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 3.7  | 2.9  | 6.5  |
| Total Del/Veh (s)   | 0.7 | 18.8 | 15.1 | 16.6 |
| Stop Delay (hr)     | 0.0 | 0.4  | 0.4  | 0.8  |
| Stop Del/Veh (s)    | 0.0 | 2.1  | 2.2  | 2.1  |
| Vehicles Entered    | 33  | 697  | 679  | 1409 |
| Vehicles Exited     | 33  | 695  | 681  | 1409 |
| Hourly Exit Rate    | 33  | 695  | 681  | 1409 |
| Input Volume        | 35  | 2140 | 2104 | 4279 |
| % of Volume         | 94  | 32   | 32   | 33   |
| Denied Entry Before | 0   | 0    | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    | 0    |

### 16: Pleasant Hill Road Performance by movement

| Movement            | SBT  | All  |
|---------------------|------|------|
| Denied Delay (hr)   | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0  | 0.0  |
| Total Delay (hr)    | 1.3  | 1.3  |
| Total Del/Veh (s)   | 6.7  | 6.7  |
| Stop Delay (hr)     | 0.0  | 0.0  |
| Stop Del/Veh (s)    | 0.0  | 0.0  |
| Vehicles Entered    | 695  | 695  |
| Vehicles Exited     | 695  | 695  |
| Hourly Exit Rate    | 695  | 695  |
| Input Volume        | 2140 | 2140 |
| % of Volume         | 32   | 32   |
| Denied Entry Before | 0    | 0    |
| Denied Entry After  | 0    | 0    |

### 17: Pleasant Hill Road Performance by movement

| Movement            | SBT | SBR  | All  |
|---------------------|-----|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.1  | 0.1  |
| Total Delay (hr)    | 0.0 | 1.3  | 1.3  |
| Total Del/Veh (s)   | 7.3 | 6.3  | 6.3  |
| Stop Delay (hr)     | 0.0 | 0.6  | 0.6  |
| Stop Del/Veh (s)    | 1.7 | 3.2  | 3.1  |
| Vehicles Entered    | 13  | 716  | 729  |
| Vehicles Exited     | 13  | 716  | 729  |
| Hourly Exit Rate    | 13  | 716  | 729  |
| Input Volume        | 35  | 2140 | 2175 |
| % of Volume         | 37  | 33   | 34   |
| Denied Entry Before | 0   | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    |

### Total Network Performance

|                     |        |
|---------------------|--------|
| Denied Delay (hr)   | 1613.5 |
| Denied Del/Veh (s)  | 1154.8 |
| Total Delay (hr)    | 311.1  |
| Total Del/Veh (s)   | 535.4  |
| Stop Delay (hr)     | 289.0  |
| Stop Del/Veh (s)    | 497.3  |
| Vehicles Entered    | 1815   |
| Vehicles Exited     | 1712   |
| Hourly Exit Rate    | 1712   |
| Input Volume        | 37038  |
| % of Volume         | 5      |
| Denied Entry Before | 102    |
| Denied Entry After  | 3215   |

Arterial Level of Service: NB Pleasant Hill Road

| Cross Street      | Node | Delay<br>(s/veh) | Travel<br>time (s) | Dist<br>(mi) | Arterial<br>Speed |
|-------------------|------|------------------|--------------------|--------------|-------------------|
| Acalanes Avenue   | 14   | 0.3              | 20.2               | 0.1          | 11                |
|                   | 11   | 0.0              | 4.0                | 0.0          | 34                |
| Stanley Boulevard | 5    | 17.2             | 24.2               | 0.1          | 12                |
| Quandt Road       | 4    | 96.5             | 141.4              | 0.4          | 11                |
| Total             |      | 113.9            | 189.8              | 0.6          | 12                |

Arterial Level of Service: SB Pleasant Hill Road

| Cross Street         | Node | Delay<br>(s/veh) | Travel<br>time (s) | Dist<br>(mi) | Arterial<br>Speed |
|----------------------|------|------------------|--------------------|--------------|-------------------|
| Rancho View Drive    | 1    | 6.3              | 21.5               | 0.2          | 26                |
|                      | 19   | 1.3              | 16.3               | 0.1          | 33                |
| Greenvalley Drive    | 2    | 5.2              | 12.0               | 0.1          | 21                |
| Reliez Valle Road    | 3    | 39.1             | 63.3               | 0.3          | 14                |
|                      | 20   | 24.2             | 27.8               | 0.0          | 4                 |
| Springhill Road      | 4    | 123.9            | 133.4              | 0.1          | 3                 |
| Deer Hill Road       | 5    | 359.4            | 398.0              | 0.4          | 4                 |
|                      | 11   | 19.5             | 28.0               | 0.1          | 10                |
| Acalanes Avenue      | 14   | 11.8             | 15.8               | 0.0          | 9                 |
|                      | 15   | 18.8             | 25.0               | 0.1          | 9                 |
|                      | 16   | 6.7              | 16.1               | 0.1          | 24                |
|                      | 17   | 7.3              | 16.4               | 0.1          | 16                |
| Mt. Diablo Boulevard | 6    | 4.8              | 12.9               | 0.1          | 19                |
| SR 24 EB Off Ramp    | 7    | 1.8              | 4.6                | 0.1          | 48                |
| Total                |      | 630.0            | 791.1              | 1.7          | 8                 |

# Queuing and Blocking Report

## Evacuation Scenario 1

08/23/2020

### Intersection: 1: Pleasant Hill Road & Rancho View Drive

| Movement              | EB  | SB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | LTR | T   | TR  |
| Maximum Queue (ft)    | 91  | 48  | 11  |
| Average Queue (ft)    | 42  | 11  | 1   |
| 95th Queue (ft)       | 73  | 37  | 8   |
| Link Distance (ft)    | 306 | 773 | 773 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

### Intersection: 2: Pleasant Hill Road & Greenvalley Drive

| Movement              | EB  | WB  | B60 | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|
| Directions Served     | LTR | LT  | T   | T   | TR  |
| Maximum Queue (ft)    | 56  | 611 | 112 | 55  | 75  |
| Average Queue (ft)    | 14  | 562 | 73  | 12  | 31  |
| 95th Queue (ft)       | 35  | 664 | 112 | 37  | 63  |
| Link Distance (ft)    | 333 | 494 | 53  | 288 | 288 |
| Upstream Blk Time (%) |     | 82  | 84  |     |     |
| Queuing Penalty (veh) |     | 0   | 0   |     |     |
| Storage Bay Dist (ft) |     |     |     |     |     |
| Storage Blk Time (%)  |     | 76  |     |     |     |
| Queuing Penalty (veh) |     | 0   |     |     |     |

### Intersection: 3: Pleasant Hill Road & Reliez Valle Road

| Movement              | EB  | EB  | SB   | SB   |
|-----------------------|-----|-----|------|------|
| Directions Served     | L   | R   | T    | T    |
| Maximum Queue (ft)    | 467 | 486 | 360  | 366  |
| Average Queue (ft)    | 283 | 457 | 200  | 198  |
| 95th Queue (ft)       | 631 | 473 | 292  | 304  |
| Link Distance (ft)    | 438 | 438 | 1259 | 1259 |
| Upstream Blk Time (%) | 33  | 96  |      |      |
| Queuing Penalty (veh) | 0   | 0   |      |      |
| Storage Bay Dist (ft) |     |     |      |      |
| Storage Blk Time (%)  |     |     |      | 34   |
| Queuing Penalty (veh) |     |     |      | 0    |

Intersection: 4: Pleasant Hill Road & Springhill Road/Quandt Road

| Movement              | EB  | WB  | NB  | SB   | SB   | SB  | B20 | B20  |
|-----------------------|-----|-----|-----|------|------|-----|-----|------|
| Directions Served     | LTR | LTR | L   | T    | T    | R   | T   | T    |
| Maximum Queue (ft)    | 370 | 255 | 20  | 523  | 520  | 96  | 217 | 222  |
| Average Queue (ft)    | 338 | 231 | 3   | 470  | 470  | 76  | 169 | 181  |
| 95th Queue (ft)       | 355 | 246 | 15  | 612  | 625  | 140 | 262 | 266  |
| Link Distance (ft)    | 318 | 213 |     | 414  | 414  |     | 127 | 127  |
| Upstream Blk Time (%) | 100 | 89  |     | 86   | 88   |     | 28  | 86   |
| Queuing Penalty (veh) | 0   | 0   |     | 1036 | 1053 |     | 331 | 1036 |
| Storage Bay Dist (ft) |     |     | 200 |      |      | 71  |     |      |
| Storage Blk Time (%)  |     |     |     | 87   | 81   | 0   |     |      |
| Queuing Penalty (veh) |     |     |     | 0    | 188  | 3   |     |      |

Intersection: 5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard

| Movement              | WB  | WB  | NB  | NB  | SB  | SB   | SB   |
|-----------------------|-----|-----|-----|-----|-----|------|------|
| Directions Served     | L   | LT  | T   | R   | L   | T    | T    |
| Maximum Queue (ft)    | 225 | 554 | 32  | 47  | 275 | 2267 | 2401 |
| Average Queue (ft)    | 194 | 524 | 3   | 11  | 183 | 2238 | 2366 |
| 95th Queue (ft)       | 304 | 543 | 17  | 34  | 335 | 2325 | 2480 |
| Link Distance (ft)    |     | 504 | 347 | 347 |     | 2220 | 2220 |
| Upstream Blk Time (%) |     | 95  |     |     |     | 40   | 94   |
| Queuing Penalty (veh) |     | 0   |     |     |     | 672  | 1556 |
| Storage Bay Dist (ft) | 185 |     |     |     | 175 |      |      |
| Storage Blk Time (%)  | 9   | 97  |     |     | 6   | 28   | 66   |
| Queuing Penalty (veh) | 52  | 587 |     |     | 88  | 81   | 0    |

Intersection: 6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Queuing and Blocking Report  
Evacuation Scenario 1

08/23/2020

Intersection: 7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road

| Movement              | SB |
|-----------------------|----|
| Directions Served     | T  |
| Maximum Queue (ft)    | 3  |
| Average Queue (ft)    | 0  |
| 95th Queue (ft)       | 2  |
| Link Distance (ft)    |    |
| Upstream Blk Time (%) |    |
| Queuing Penalty (veh) |    |
| Storage Bay Dist (ft) |    |
| Storage Blk Time (%)  |    |
| Queuing Penalty (veh) |    |

Intersection: 8: Brown Avenue/Miller Drive & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Intersection: 9: First Street/Sierra Vista Way & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |



Intersection: 10: SR 24 WB Ramps/Laurel Drive & Deer Hill Road

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 14: Pleasant Hill Road & Acalanes Avenue

Movement SB SB B11 B11

Directions Served T T T T

Maximum Queue (ft) 190 254 400 387

Average Queue (ft) 45 206 186 334

95th Queue (ft) 142 305 430 436

Link Distance (ft) 147 147 347 347

Upstream Blk Time (%) 1 20 1 7

Queuing Penalty (veh) 17 428 25 146

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 15: Pleasant Hill Road

Movement SB

Directions Served TR

Maximum Queue (ft) 361

Average Queue (ft) 183

95th Queue (ft) 427

Link Distance (ft) 266

Upstream Blk Time (%) 6

Queuing Penalty (veh) 117

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

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Intersection: 16: Pleasant Hill Road

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Movement

Directions Served  
Maximum Queue (ft)  
Average Queue (ft)  
95th Queue (ft)  
Link Distance (ft)  
Upstream Blk Time (%)  
Queuing Penalty (veh)  
Storage Bay Dist (ft)  
Storage Blk Time (%)  
Queuing Penalty (veh)

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Intersection: 17: Pleasant Hill Road

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| Movement              | SB  |
|-----------------------|-----|
| Directions Served     | TR  |
| Maximum Queue (ft)    | 217 |
| Average Queue (ft)    | 80  |
| 95th Queue (ft)       | 174 |
| Link Distance (ft)    | 314 |
| Upstream Blk Time (%) | 0   |
| Queuing Penalty (veh) | 0   |
| Storage Bay Dist (ft) |     |
| Storage Blk Time (%)  |     |
| Queuing Penalty (veh) |     |

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Network Summary

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Network wide Queuing Penalty: 7415

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PHF = 0.75 (TJKM's assumption)

**Evac 1 + Project** – Evacuation plus project, with trap lane, in the AM  
Peak

### Summary of All Intervals

| Run Number              | 1      | 2      | 3      | 4      | 5      | Avg    |
|-------------------------|--------|--------|--------|--------|--------|--------|
| Start Time              | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   |
| End Time                | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   |
| Total Time (min)        | 70     | 70     | 70     | 70     | 70     | 70     |
| Time Recorded (min)     | 60     | 60     | 60     | 60     | 60     | 60     |
| # of Intervals          | 2      | 2      | 2      | 2      | 2      | 2      |
| # of Recorded Intervals | 1      | 1      | 1      | 1      | 1      | 1      |
| Vehs Entered            | 2263   | 2295   | 2244   | 2328   | 2313   | 2288   |
| Vehs Exited             | 2102   | 2093   | 2083   | 2150   | 2194   | 2124   |
| Starting Vehs           | 258    | 221    | 256    | 240    | 270    | 249    |
| Ending Vehs             | 419    | 423    | 417    | 418    | 389    | 413    |
| Denied Entry Before     | 144    | 118    | 171    | 165    | 170    | 154    |
| Denied Entry After      | 3606   | 3495   | 3527   | 3411   | 3573   | 3521   |
| Travel Distance (mi)    | 1958   | 1940   | 1912   | 1998   | 1993   | 1960   |
| Travel Time (hr)        | 2184.8 | 2082.6 | 2177.1 | 2092.5 | 2164.7 | 2140.3 |
| Total Delay (hr)        | 2116.4 | 2014.8 | 2109.6 | 2022.3 | 2095.0 | 2071.6 |
| Total Stops             | 8764   | 8548   | 8324   | 9019   | 8972   | 8724   |
| Fuel Used (gal)         | 547.6  | 524.9  | 544.9  | 528.3  | 545.2  | 538.2  |

### Interval #0 Information Seeding

|                                 |      |
|---------------------------------|------|
| Start Time                      | 6:50 |
| End Time                        | 7:00 |
| Total Time (min)                | 10   |
| No data recorded this interval. |      |

### Interval #1 Information Recording

|                          |      |
|--------------------------|------|
| Start Time               | 7:00 |
| End Time                 | 8:00 |
| Total Time (min)         | 60   |
| Volumes adjusted by PHF. |      |

| Run Number           | 1      | 2      | 3      | 4      | 5      | Avg    |
|----------------------|--------|--------|--------|--------|--------|--------|
| Vehs Entered         | 2263   | 2295   | 2244   | 2328   | 2313   | 2288   |
| Vehs Exited          | 2102   | 2093   | 2083   | 2150   | 2194   | 2124   |
| Starting Vehs        | 258    | 221    | 256    | 240    | 270    | 249    |
| Ending Vehs          | 419    | 423    | 417    | 418    | 389    | 413    |
| Denied Entry Before  | 144    | 118    | 171    | 165    | 170    | 154    |
| Denied Entry After   | 3606   | 3495   | 3527   | 3411   | 3573   | 3521   |
| Travel Distance (mi) | 1958   | 1940   | 1912   | 1998   | 1993   | 1960   |
| Travel Time (hr)     | 2184.8 | 2082.6 | 2177.1 | 2092.5 | 2164.7 | 2140.3 |
| Total Delay (hr)     | 2116.4 | 2014.8 | 2109.6 | 2022.3 | 2095.0 | 2071.6 |
| Total Stops          | 8764   | 8548   | 8324   | 9019   | 8972   | 8724   |
| Fuel Used (gal)      | 547.6  | 524.9  | 544.9  | 528.3  | 545.2  | 538.2  |

### 1: Pleasant Hill Road & Rancho View Drive Performance by movement

| Movement            | EBR | SBT | All |
|---------------------|-----|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.2 | 0.1 | 0.2 |
| Total Delay (hr)    | 0.2 | 0.1 | 0.2 |
| Total Del/Veh (s)   | 3.8 | 5.4 | 4.1 |
| Stop Delay (hr)     | 0.1 | 0.0 | 0.2 |
| Stop Del/Veh (s)    | 2.9 | 3.8 | 3.0 |
| Vehicles Entered    | 177 | 34  | 211 |
| Vehicles Exited     | 176 | 33  | 209 |
| Hourly Exit Rate    | 176 | 33  | 209 |
| Input Volume        | 173 | 33  | 206 |
| % of Volume         | 102 | 100 | 101 |
| Denied Entry Before | 0   | 0   | 0   |
| Denied Entry After  | 0   | 0   | 0   |

### 2: Pleasant Hill Road & Greenvaley Drive Performance by movement

| Movement            | EBR | WBL   | SBT | All  |
|---------------------|-----|-------|-----|------|
| Denied Delay (hr)   | 0.0 | 0.0   | 0.0 | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0   | 0.0 | 0.0  |
| Total Delay (hr)    | 0.1 | 20.1  | 0.3 | 20.5 |
| Total Del/Veh (s)   | 3.9 | 148.6 | 5.7 | 97.7 |
| Stop Delay (hr)     | 0.1 | 19.1  | 0.2 | 19.4 |
| Stop Del/Veh (s)    | 4.1 | 140.8 | 3.9 | 92.2 |
| Vehicles Entered    | 59  | 475   | 209 | 743  |
| Vehicles Exited     | 59  | 464   | 209 | 732  |
| Hourly Exit Rate    | 59  | 464   | 209 | 732  |
| Input Volume        | 56  | 637   | 207 | 900  |
| % of Volume         | 105 | 73    | 101 | 81   |
| Denied Entry Before | 0   | 0     | 0   | 0    |
| Denied Entry After  | 0   | 0     | 0   | 0    |

### 3: Pleasant Hill Road & Reliez Valle Road Performance by movement

| Movement            | EBR   | SBT  | All   |
|---------------------|-------|------|-------|
| Denied Delay (hr)   | 400.7 | 0.0  | 400.7 |
| Denied Del/Veh (s)  | 962.4 | 0.0  | 646.6 |
| Total Delay (hr)    | 15.4  | 6.5  | 21.8  |
| Total Del/Veh (s)   | 88.9  | 31.0 | 57.3  |
| Stop Delay (hr)     | 13.7  | 5.1  | 18.8  |
| Stop Del/Veh (s)    | 79.2  | 24.6 | 49.4  |
| Vehicles Entered    | 609   | 732  | 1341  |
| Vehicles Exited     | 606   | 725  | 1331  |
| Hourly Exit Rate    | 606   | 725  | 1331  |
| Input Volume        | 1499  | 900  | 2399  |
| % of Volume         | 40    | 81   | 55    |
| Denied Entry Before | 7     | 0    | 7     |
| Denied Entry After  | 890   | 0    | 890   |

### 4: Pleasant Hill Road & Springhill Road/Quandt Road Performance by movement

| Movement            | EBR    | WBL   | WBT   | NBL  | SBT  | SBR  | All   |
|---------------------|--------|-------|-------|------|------|------|-------|
| Denied Delay (hr)   | 381.4  | 20.4  | 3.7   | 0.0  | 0.0  | 0.0  | 405.4 |
| Denied Del/Veh (s)  | 1544.3 | 254.1 | 269.8 | 0.0  | 0.0  | 0.0  | 570.4 |
| Total Delay (hr)    | 9.2    | 7.5   | 1.4   | 0.1  | 21.9 | 2.0  | 42.0  |
| Total Del/Veh (s)   | 224.5  | 108.8 | 117.4 | 81.8 | 65.0 | 53.8 | 84.7  |
| Stop Delay (hr)     | 9.4    | 7.2   | 1.3   | 0.1  | 19.4 | 1.8  | 39.3  |
| Stop Del/Veh (s)    | 229.7  | 104.7 | 112.5 | 81.0 | 57.8 | 50.3 | 79.3  |
| Vehicles Entered    | 138    | 247   | 42    | 5    | 1198 | 129  | 1759  |
| Vehicles Exited     | 137    | 244   | 41    | 5    | 1175 | 128  | 1730  |
| Hourly Exit Rate    | 137    | 244   | 41    | 5    | 1175 | 128  | 1730  |
| Input Volume        | 857    | 297   | 45    | 5    | 2168 | 231  | 3603  |
| % of Volume         | 16     | 82    | 91    | 100  | 54   | 55   | 48    |
| Denied Entry Before | 40     | 0     | 0     | 0    | 0    | 0    | 40    |
| Denied Entry After  | 751    | 42    | 7     | 0    | 0    | 0    | 800   |



5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard Performance by movement

| Movement            | WBL    | NBT  | NBR | SBL  | SBT  | All   |
|---------------------|--------|------|-----|------|------|-------|
| Denied Delay (hr)   | 564.4  | 0.0  | 0.0 | 0.0  | 0.0  | 564.4 |
| Denied Del/Veh (s)  | 1578.8 | 0.0  | 0.0 | 0.0  | 0.0  | 725.7 |
| Total Delay (hr)    | 21.7   | 0.0  | 0.0 | 3.5  | 24.7 | 50.0  |
| Total Del/Veh (s)   | 326.5  | 12.8 | 3.7 | 97.3 | 64.6 | 100.7 |
| Stop Delay (hr)     | 21.5   | 0.0  | 0.0 | 3.3  | 21.4 | 46.2  |
| Stop Del/Veh (s)    | 323.2  | 11.6 | 3.9 | 91.1 | 55.9 | 93.1  |
| Vehicles Entered    | 214    | 7    | 32  | 128  | 1346 | 1727  |
| Vehicles Exited     | 215    | 7    | 32  | 128  | 1346 | 1728  |
| Hourly Exit Rate    | 215    | 7    | 32  | 128  | 1346 | 1728  |
| Input Volume        | 1212   | 6    | 29  | 291  | 3032 | 4570  |
| % of Volume         | 18     | 117  | 110 | 44   | 44   | 38    |
| Denied Entry Before | 72     | 0    | 0   | 0    | 0    | 72    |
| Denied Entry After  | 1073   | 0    | 0   | 0    | 0    | 1073  |

6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp Performance by movement

| Movement            | SBR | All |
|---------------------|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.0 | 0.0 |
| Total Delay (hr)    | 0.0 | 0.0 |
| Total Del/Veh (s)   | 6.2 | 6.2 |
| Stop Delay (hr)     | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.0 | 0.0 |
| Vehicles Entered    | 8   | 8   |
| Vehicles Exited     | 8   | 8   |
| Hourly Exit Rate    | 8   | 8   |
| Input Volume        | 35  | 35  |
| % of Volume         | 23  | 23  |
| Denied Entry Before | 0   | 0   |
| Denied Entry After  | 0   | 0   |

7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road Performance by movement

| Movement            | SBT | All |
|---------------------|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.1 | 0.1 |
| Total Delay (hr)    | 0.0 | 0.0 |
| Total Del/Veh (s)   | 1.9 | 1.9 |
| Stop Delay (hr)     | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.1 | 0.1 |
| Vehicles Entered    | 34  | 34  |
| Vehicles Exited     | 34  | 34  |
| Hourly Exit Rate    | 34  | 34  |
| Input Volume        | 35  | 35  |
| % of Volume         | 97  | 97  |
| Denied Entry Before | 0   | 0   |
| Denied Entry After  | 0   | 0   |

11: Pleasant Hill Road & Project Dwy Performance by movement

| Movement            | EBR    | NBT | SBT  | All   |
|---------------------|--------|-----|------|-------|
| Denied Delay (hr)   | 294.0  | 0.0 | 0.0  | 294.0 |
| Denied Del/Veh (s)  | 1369.0 | 0.0 | 0.0  | 446.0 |
| Total Delay (hr)    | 7.0    | 0.0 | 13.7 | 20.7  |
| Total Del/Veh (s)   | 112.7  | 0.0 | 31.4 | 40.6  |
| Stop Delay (hr)     | 7.5    | 0.0 | 11.1 | 18.6  |
| Stop Del/Veh (s)    | 120.4  | 0.0 | 25.4 | 36.5  |
| Vehicles Entered    | 217    | 39  | 1561 | 1817  |
| Vehicles Exited     | 217    | 39  | 1558 | 1814  |
| Hourly Exit Rate    | 217    | 39  | 1558 | 1814  |
| Input Volume        | 735    | 35  | 4244 | 5014  |
| % of Volume         | 30     | 111 | 37   | 36    |
| Denied Entry Before | 31     | 0   | 0    | 31    |
| Denied Entry After  | 556    | 0   | 0    | 556   |

#### 14: Pleasant Hill Road & Acalanes Avenue Performance by movement

| Movement            | NBT | SBT  | All  |
|---------------------|-----|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0 | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 8.4  | 8.4  |
| Total Del/Veh (s)   | 0.3 | 16.9 | 16.6 |
| Stop Delay (hr)     | 0.0 | 8.1  | 8.1  |
| Stop Del/Veh (s)    | 0.0 | 16.4 | 16.1 |
| Vehicles Entered    | 39  | 1775 | 1814 |
| Vehicles Exited     | 39  | 1768 | 1807 |
| Hourly Exit Rate    | 39  | 1768 | 1807 |
| Input Volume        | 35  | 4979 | 5014 |
| % of Volume         | 111 | 36   | 36   |
| Denied Entry Before | 0   | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    |

#### 15: Pleasant Hill Road Performance by movement

| Movement            | WBR | SBT  | SBR  | All  |
|---------------------|-----|------|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0  | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 10.4 | 1.6  | 12.0 |
| Total Del/Veh (s)   | 0.7 | 41.4 | 6.8  | 23.9 |
| Stop Delay (hr)     | 0.0 | 11.6 | 0.2  | 11.9 |
| Stop Del/Veh (s)    | 0.0 | 46.5 | 0.9  | 23.6 |
| Vehicles Entered    | 39  | 898  | 869  | 1806 |
| Vehicles Exited     | 39  | 890  | 869  | 1798 |
| Hourly Exit Rate    | 39  | 890  | 869  | 1798 |
| Input Volume        | 35  | 2507 | 2472 | 5014 |
| % of Volume         | 111 | 36   | 35   | 36   |
| Denied Entry Before | 0   | 0    | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    | 0    |

16: Pleasant Hill Road Performance by movement

| Movement            | SBT  | All  |
|---------------------|------|------|
| Denied Delay (hr)   | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0  | 0.0  |
| Total Delay (hr)    | 16.4 | 16.4 |
| Total Del/Veh (s)   | 65.5 | 65.6 |
| Stop Delay (hr)     | 18.7 | 18.7 |
| Stop Del/Veh (s)    | 74.5 | 74.5 |
| Vehicles Entered    | 890  | 890  |
| Vehicles Exited     | 884  | 884  |
| Hourly Exit Rate    | 884  | 884  |
| Input Volume        | 2507 | 2507 |
| % of Volume         | 35   | 35   |
| Denied Entry Before | 0    | 0    |
| Denied Entry After  | 0    | 0    |

17: Pleasant Hill Road Performance by movement

| Movement            | SBT  | SBR  | All  |
|---------------------|------|------|------|
| Denied Delay (hr)   | 0.2  | 19.5 | 19.7 |
| Denied Del/Veh (s)  | 93.6 | 76.9 | 77.0 |
| Total Delay (hr)    | 0.1  | 14.9 | 15.1 |
| Total Del/Veh (s)   | 64.0 | 60.2 | 60.2 |
| Stop Delay (hr)     | 0.2  | 17.4 | 17.6 |
| Stop Del/Veh (s)    | 70.0 | 70.2 | 70.2 |
| Vehicles Entered    | 8    | 876  | 884  |
| Vehicles Exited     | 8    | 875  | 883  |
| Hourly Exit Rate    | 8    | 875  | 883  |
| Input Volume        | 35   | 2507 | 2542 |
| % of Volume         | 23   | 35   | 35   |
| Denied Entry Before | 0    | 2    | 2    |
| Denied Entry After  | 0    | 37   | 37   |

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Total Network Performance

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|                     |        |
|---------------------|--------|
| Denied Delay (hr)   | 1758.9 |
| Denied Del/Veh (s)  | 1090.0 |
| Total Delay (hr)    | 312.7  |
| Total Del/Veh (s)   | 443.8  |
| Stop Delay (hr)     | 287.8  |
| Stop Del/Veh (s)    | 408.4  |
| Vehicles Entered    | 2288   |
| Vehicles Exited     | 2124   |
| Hourly Exit Rate    | 2124   |
| Input Volume        | 44058  |
| % of Volume         | 5      |
| Denied Entry Before | 154    |
| Denied Entry After  | 3521   |

Arterial Level of Service: NB Pleasant Hill Road

| Cross Street      | Node | Delay<br>(s/veh) | Travel<br>time (s) | Dist<br>(mi) | Arterial<br>Speed |
|-------------------|------|------------------|--------------------|--------------|-------------------|
| Acalanes Avenue   | 14   | 0.3              | 20.3               | 0.1          | 11                |
| Project Dwy       | 11   | 0.0              | 4.1                | 0.0          | 33                |
| Stanley Boulevard | 5    | 12.8             | 19.5               | 0.1          | 15                |
|                   | 37   | 1.7              | 9.9                | 0.1          | 30                |
| Quandt Road       | 4    | 81.8             | 118.9              | 0.4          | 11                |
| Total             |      | 96.5             | 172.8              | 0.6          | 13                |

Arterial Level of Service: SB Pleasant Hill Road

| Cross Street         | Node | Delay<br>(s/veh) | Travel<br>time (s) | Dist<br>(mi) | Arterial<br>Speed |
|----------------------|------|------------------|--------------------|--------------|-------------------|
| Rancho View Drive    | 1    | 5.4              | 20.8               | 0.2          | 26                |
|                      | 19   | 1.1              | 15.6               | 0.1          | 34                |
| Greenvalley Drive    | 2    | 5.7              | 12.5               | 0.1          | 21                |
| Reliez Valle Road    | 3    | 28.0             | 51.8               | 0.3          | 17                |
|                      | 20   | 14.3             | 18.0               | 0.0          | 7                 |
| Springhill Road      | 4    | 65.0             | 74.5               | 0.1          | 5                 |
|                      | 37   | 198.8            | 234.1              | 0.4          | 6                 |
| Deer Hill Road       | 5    | 64.6             | 72.6               | 0.1          | 4                 |
| Project Dwy          | 11   | 31.6             | 40.1               | 0.1          | 7                 |
| Acalanes Avenue      | 14   | 17.6             | 21.7               | 0.0          | 6                 |
|                      | 15   | 41.4             | 47.5               | 0.1          | 5                 |
|                      | 16   | 65.5             | 74.9               | 0.1          | 5                 |
|                      | 17   | 64.0             | 166.8              | 0.1          | 3                 |
| Mt. Diablo Boulevard | 6    | 6.2              | 14.2               | 0.1          | 17                |
| SR 24 EB Off Ramp    | 7    | 1.9              | 4.7                | 0.1          | 48                |
| Total                |      | 611.1            | 869.5              | 1.7          | 8                 |



Intersection: 1: Pleasant Hill Road & Rancho View Drive

| Movement              | EB  | SB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | LTR | T   | TR  |
| Maximum Queue (ft)    | 83  | 37  | 16  |
| Average Queue (ft)    | 43  | 9   | 1   |
| 95th Queue (ft)       | 72  | 31  | 9   |
| Link Distance (ft)    | 306 | 773 | 773 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

Intersection: 2: Pleasant Hill Road & Greenvalley Drive

| Movement              | EB  | WB  | B60 | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|
| Directions Served     | LTR | LT  | T   | T   | TR  |
| Maximum Queue (ft)    | 60  | 607 | 112 | 64  | 71  |
| Average Queue (ft)    | 15  | 567 | 73  | 15  | 32  |
| 95th Queue (ft)       | 39  | 637 | 109 | 45  | 64  |
| Link Distance (ft)    | 333 | 494 | 53  | 288 | 288 |
| Upstream Blk Time (%) |     | 85  | 87  |     |     |
| Queuing Penalty (veh) |     | 0   | 0   |     |     |
| Storage Bay Dist (ft) |     |     |     |     |     |
| Storage Blk Time (%)  |     | 77  |     | 0   |     |
| Queuing Penalty (veh) |     | 0   |     | 0   |     |

Intersection: 3: Pleasant Hill Road & Reliez Valle Road

| Movement              | EB  | EB  | SB   | SB   |
|-----------------------|-----|-----|------|------|
| Directions Served     | L   | R   | T    | T    |
| Maximum Queue (ft)    | 454 | 488 | 332  | 355  |
| Average Queue (ft)    | 271 | 459 | 183  | 195  |
| 95th Queue (ft)       | 627 | 478 | 280  | 308  |
| Link Distance (ft)    | 438 | 438 | 1259 | 1259 |
| Upstream Blk Time (%) | 18  | 83  |      |      |
| Queuing Penalty (veh) | 0   | 0   |      |      |
| Storage Bay Dist (ft) |     |     |      |      |
| Storage Blk Time (%)  |     |     |      | 30   |
| Queuing Penalty (veh) |     |     |      | 0    |

Intersection: 4: Pleasant Hill Road & Springhill Road/Quandt Road

| Movement              | EB  | WB  | NB  | SB  | SB  | SB  | B20 | B20 |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | L   | T   | T   | R   | T   | T   |
| Maximum Queue (ft)    | 365 | 272 | 24  | 512 | 519 | 96  | 208 | 214 |
| Average Queue (ft)    | 337 | 235 | 3   | 379 | 380 | 71  | 103 | 125 |
| 95th Queue (ft)       | 354 | 256 | 15  | 625 | 640 | 139 | 241 | 277 |
| Link Distance (ft)    | 318 | 217 |     | 406 | 406 |     | 127 | 127 |
| Upstream Blk Time (%) | 100 | 82  |     | 42  | 52  |     | 13  | 46  |
| Queuing Penalty (veh) | 0   | 0   |     | 502 | 621 |     | 153 | 551 |
| Storage Bay Dist (ft) |     |     | 200 |     |     | 71  |     |     |
| Storage Blk Time (%)  |     |     |     | 56  | 58  | 0   |     |     |
| Queuing Penalty (veh) |     |     |     | 0   | 133 | 2   |     |     |

Intersection: 5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard

| Movement              | WB  | WB  | NB  | NB  | SB  | SB  | SB  | SB  | B37  | B37  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
| Directions Served     | L   | LT  | T   | R   | L   | T   | T   | T   | T    | T    |
| Maximum Queue (ft)    | 225 | 556 | 21  | 34  | 275 | 446 | 446 | 450 | 1878 | 2010 |
| Average Queue (ft)    | 110 | 524 | 2   | 11  | 175 | 373 | 393 | 413 | 1622 | 1741 |
| 95th Queue (ft)       | 276 | 543 | 14  | 33  | 309 | 521 | 443 | 458 | 2450 | 2592 |
| Link Distance (ft)    |     | 504 | 342 | 342 |     | 351 | 351 | 351 | 1832 | 1832 |
| Upstream Blk Time (%) |     | 96  |     |     |     | 26  | 36  | 40  | 20   | 76   |
| Queuing Penalty (veh) |     | 0   |     |     |     | 285 | 395 | 439 | 340  | 1267 |
| Storage Bay Dist (ft) | 185 |     |     |     | 175 |     |     |     |      |      |
| Storage Blk Time (%)  | 0   | 92  |     |     | 8   | 6   |     | 60  |      |      |
| Queuing Penalty (veh) | 0   | 558 |     |     | 80  | 19  |     | 0   |      |      |

Intersection: 6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Intersection: 7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road

| Movement              | SB |
|-----------------------|----|
| Directions Served     | T  |
| Maximum Queue (ft)    | 7  |
| Average Queue (ft)    | 0  |
| 95th Queue (ft)       | 6  |
| Link Distance (ft)    |    |
| Upstream Blk Time (%) |    |
| Queuing Penalty (veh) |    |
| Storage Bay Dist (ft) |    |
| Storage Blk Time (%)  |    |
| Queuing Penalty (veh) |    |

Intersection: 8: Brown Avenue/Miller Drive & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Intersection: 9: First Street/Sierra Vista Way & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Intersection: 10: SR 24 WB Ramps/Laurel Drive & Deer Hill Road

Movement

Directions Served  
Maximum Queue (ft)  
Average Queue (ft)  
95th Queue (ft)  
Link Distance (ft)  
Upstream Blk Time (%)  
Queuing Penalty (veh)  
Storage Bay Dist (ft)  
Storage Blk Time (%)  
Queuing Penalty (veh)

Intersection: 11: Pleasant Hill Road & Project Dwy

| Movement              | EB  | SB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | R   | T   | T   | TR  |
| Maximum Queue (ft)    | 216 | 390 | 391 | 394 |
| Average Queue (ft)    | 183 | 154 | 327 | 324 |
| 95th Queue (ft)       | 199 | 383 | 459 | 484 |
| Link Distance (ft)    | 164 | 342 | 342 | 342 |
| Upstream Blk Time (%) | 100 | 2   | 14  | 11  |
| Queuing Penalty (veh) | 0   | 21  | 201 | 159 |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 12: Project Dwy NE & Deer Hill Road

Movement

Directions Served  
Maximum Queue (ft)  
Average Queue (ft)  
95th Queue (ft)  
Link Distance (ft)  
Upstream Blk Time (%)  
Queuing Penalty (veh)  
Storage Bay Dist (ft)  
Storage Blk Time (%)  
Queuing Penalty (veh)

Intersection: 13: Project Dwy SW & Deer Hill Road

Movement

Directions Served  
Maximum Queue (ft)  
Average Queue (ft)  
95th Queue (ft)  
Link Distance (ft)  
Upstream Blk Time (%)  
Queuing Penalty (veh)  
Storage Bay Dist (ft)  
Storage Blk Time (%)  
Queuing Penalty (veh)

Intersection: 14: Pleasant Hill Road & Acalanes Avenue

| Movement              | SB  | SB   | SB  |
|-----------------------|-----|------|-----|
| Directions Served     | T   | T    | T   |
| Maximum Queue (ft)    | 166 | 267  | 238 |
| Average Queue (ft)    | 34  | 230  | 174 |
| 95th Queue (ft)       | 110 | 305  | 277 |
| Link Distance (ft)    | 152 | 152  | 152 |
| Upstream Blk Time (%) | 1   | 94   | 11  |
| Queuing Penalty (veh) | 10  | 1555 | 180 |
| Storage Bay Dist (ft) |     |      |     |
| Storage Blk Time (%)  |     |      |     |
| Queuing Penalty (veh) |     |      |     |

Intersection: 15: Pleasant Hill Road

| Movement              | SB  | SB   | SB  |
|-----------------------|-----|------|-----|
| Directions Served     | T   | T    | R   |
| Maximum Queue (ft)    | 60  | 369  | 287 |
| Average Queue (ft)    | 12  | 336  | 103 |
| 95th Queue (ft)       | 50  | 408  | 228 |
| Link Distance (ft)    | 262 | 262  | 262 |
| Upstream Blk Time (%) |     | 96   | 0   |
| Queuing Penalty (veh) |     | 1586 | 5   |
| Storage Bay Dist (ft) |     |      |     |
| Storage Blk Time (%)  |     |      |     |
| Queuing Penalty (veh) |     |      |     |

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Intersection: 16: Pleasant Hill Road

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| Movement              | SB   |
|-----------------------|------|
| Directions Served     | T    |
| Maximum Queue (ft)    | 540  |
| Average Queue (ft)    | 512  |
| 95th Queue (ft)       | 545  |
| Link Distance (ft)    | 302  |
| Upstream Blk Time (%) | 99   |
| Queuing Penalty (veh) | 1240 |
| Storage Bay Dist (ft) |      |
| Storage Blk Time (%)  |      |
| Queuing Penalty (veh) |      |

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Intersection: 17: Pleasant Hill Road

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| Movement              | SB  | SB  |
|-----------------------|-----|-----|
| Directions Served     | T   | TR  |
| Maximum Queue (ft)    | 125 | 532 |
| Average Queue (ft)    | 4   | 506 |
| 95th Queue (ft)       | 63  | 530 |
| Link Distance (ft)    | 314 | 314 |
| Upstream Blk Time (%) | 0   | 99  |
| Queuing Penalty (veh) | 0   | 830 |
| Storage Bay Dist (ft) |     |     |
| Storage Blk Time (%)  |     |     |
| Queuing Penalty (veh) |     |     |

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Network Summary

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|                                     |
|-------------------------------------|
| Network wide Queuing Penalty: 11131 |
|-------------------------------------|



PHF = 0.75 (TJKM's assumption)

**Evac 1 + Project Variant**– Evacuation plus project, no trap lane, in the  
AM Peak

### Summary of All Intervals

| Run Number              | 1      | 2      | 3      | 4      | 5      | Avg    |
|-------------------------|--------|--------|--------|--------|--------|--------|
| Start Time              | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   |
| End Time                | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   |
| Total Time (min)        | 70     | 70     | 70     | 70     | 70     | 70     |
| Time Recorded (min)     | 60     | 60     | 60     | 60     | 60     | 60     |
| # of Intervals          | 2      | 2      | 2      | 2      | 2      | 2      |
| # of Recorded Intervals | 1      | 1      | 1      | 1      | 1      | 1      |
| Vehs Entered            | 1791   | 1861   | 1881   | 1826   | 1818   | 1836   |
| Vehs Exited             | 1693   | 1741   | 1734   | 1705   | 1729   | 1721   |
| Starting Vehs           | 305    | 291    | 290    | 275    | 312    | 295    |
| Ending Vehs             | 403    | 411    | 437    | 396    | 401    | 410    |
| Denied Entry Before     | 150    | 161    | 149    | 162    | 161    | 157    |
| Denied Entry After      | 4006   | 3989   | 3958   | 4088   | 3989   | 4005   |
| Travel Distance (mi)    | 1583   | 1638   | 1617   | 1626   | 1663   | 1625   |
| Travel Time (hr)        | 2421.0 | 2442.9 | 2410.2 | 2434.6 | 2418.7 | 2425.5 |
| Total Delay (hr)        | 2365.5 | 2385.8 | 2353.9 | 2378.2 | 2361.2 | 2368.9 |
| Total Stops             | 5726   | 6207   | 5810   | 6056   | 6244   | 6009   |
| Fuel Used (gal)         | 590.3  | 597.6  | 588.3  | 594.4  | 592.5  | 592.6  |

### Interval #0 Information Seeding

|                  |      |
|------------------|------|
| Start Time       | 6:50 |
| End Time         | 7:00 |
| Total Time (min) | 10   |

No data recorded this interval.

### Interval #1 Information Recording

|                  |      |
|------------------|------|
| Start Time       | 7:00 |
| End Time         | 8:00 |
| Total Time (min) | 60   |

Volumes adjusted by PHF.

| Run Number           | 1      | 2      | 3      | 4      | 5      | Avg    |
|----------------------|--------|--------|--------|--------|--------|--------|
| Vehs Entered         | 1791   | 1861   | 1881   | 1826   | 1818   | 1836   |
| Vehs Exited          | 1693   | 1741   | 1734   | 1705   | 1729   | 1721   |
| Starting Vehs        | 305    | 291    | 290    | 275    | 312    | 295    |
| Ending Vehs          | 403    | 411    | 437    | 396    | 401    | 410    |
| Denied Entry Before  | 150    | 161    | 149    | 162    | 161    | 157    |
| Denied Entry After   | 4006   | 3989   | 3958   | 4088   | 3989   | 4005   |
| Travel Distance (mi) | 1583   | 1638   | 1617   | 1626   | 1663   | 1625   |
| Travel Time (hr)     | 2421.0 | 2442.9 | 2410.2 | 2434.6 | 2418.7 | 2425.5 |
| Total Delay (hr)     | 2365.5 | 2385.8 | 2353.9 | 2378.2 | 2361.2 | 2368.9 |
| Total Stops          | 5726   | 6207   | 5810   | 6056   | 6244   | 6009   |
| Fuel Used (gal)      | 590.3  | 597.6  | 588.3  | 594.4  | 592.5  | 592.6  |

1: Pleasant Hill Road & Rancho View Drive Performance by movement

| Movement            | EBR | SBT | All |
|---------------------|-----|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.2 | 0.1 | 0.2 |
| Total Delay (hr)    | 0.2 | 0.1 | 0.3 |
| Total Del/Veh (s)   | 3.9 | 7.2 | 4.4 |
| Stop Delay (hr)     | 0.1 | 0.0 | 0.2 |
| Stop Del/Veh (s)    | 3.0 | 5.4 | 3.4 |
| Vehicles Entered    | 173 | 31  | 204 |
| Vehicles Exited     | 174 | 31  | 205 |
| Hourly Exit Rate    | 174 | 31  | 205 |
| Input Volume        | 173 | 33  | 206 |
| % of Volume         | 101 | 94  | 100 |
| Denied Entry Before | 0   | 0   | 0   |
| Denied Entry After  | 0   | 0   | 0   |

2: Pleasant Hill Road & Greenvally Drive Performance by movement

| Movement            | EBR | WBL   | SBT | All  |
|---------------------|-----|-------|-----|------|
| Denied Delay (hr)   | 0.0 | 0.0   | 0.0 | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0   | 0.0 | 0.0  |
| Total Delay (hr)    | 0.1 | 20.0  | 0.3 | 20.3 |
| Total Del/Veh (s)   | 3.4 | 148.1 | 5.0 | 97.5 |
| Stop Delay (hr)     | 0.1 | 18.9  | 0.2 | 19.2 |
| Stop Del/Veh (s)    | 3.6 | 140.1 | 3.3 | 91.8 |
| Vehicles Entered    | 60  | 476   | 205 | 741  |
| Vehicles Exited     | 60  | 462   | 204 | 726  |
| Hourly Exit Rate    | 60  | 462   | 204 | 726  |
| Input Volume        | 56  | 637   | 207 | 900  |
| % of Volume         | 107 | 73    | 99  | 81   |
| Denied Entry Before | 0   | 0     | 0   | 0    |
| Denied Entry After  | 0   | 0     | 0   | 0    |

### 3: Pleasant Hill Road & Reliez Valle Road Performance by movement

| Movement            | EBR    | SBT  | All   |
|---------------------|--------|------|-------|
| Denied Delay (hr)   | 587.1  | 0.0  | 587.1 |
| Denied Del/Veh (s)  | 1383.1 | 0.0  | 937.6 |
| Total Delay (hr)    | 17.4   | 10.8 | 28.2  |
| Total Del/Veh (s)   | 207.6  | 52.3 | 97.2  |
| Stop Delay (hr)     | 17.6   | 9.3  | 26.9  |
| Stop Del/Veh (s)    | 209.6  | 45.1 | 92.6  |
| Vehicles Entered    | 290    | 726  | 1016  |
| Vehicles Exited     | 284    | 714  | 998   |
| Hourly Exit Rate    | 284    | 714  | 998   |
| Input Volume        | 1499   | 900  | 2399  |
| % of Volume         | 19     | 79   | 42    |
| Denied Entry Before | 8      | 0    | 8     |
| Denied Entry After  | 1238   | 0    | 1238  |

### 4: Pleasant Hill Road & Springhill Road/Quandt Road Performance by movement

| Movement            | EBR    | WBL   | WBT   | NBL  | SBT   | SBR   | All   |
|---------------------|--------|-------|-------|------|-------|-------|-------|
| Denied Delay (hr)   | 355.8  | 29.6  | 4.4   | 0.0  | 0.0   | 0.0   | 389.8 |
| Denied Del/Veh (s)  | 1474.0 | 367.2 | 397.6 | 0.0  | 0.0   | 0.0   | 638.7 |
| Total Delay (hr)    | 9.9    | 7.8   | 1.1   | 0.1  | 32.8  | 2.8   | 54.5  |
| Total Del/Veh (s)   | 191.0  | 122.8 | 130.0 | 87.9 | 130.5 | 99.5  | 134.8 |
| Stop Delay (hr)     | 10.2   | 7.6   | 1.1   | 0.1  | 33.2  | 2.9   | 55.0  |
| Stop Del/Veh (s)    | 197.1  | 119.8 | 126.3 | 85.6 | 131.8 | 101.7 | 136.0 |
| Vehicles Entered    | 177    | 227   | 31    | 5    | 894   | 99    | 1433  |
| Vehicles Exited     | 176    | 222   | 30    | 5    | 865   | 97    | 1395  |
| Hourly Exit Rate    | 176    | 222   | 30    | 5    | 865   | 97    | 1395  |
| Input Volume        | 857    | 297   | 45    | 5    | 2168  | 231   | 3603  |
| % of Volume         | 21     | 75    | 67    | 100  | 40    | 42    | 39    |
| Denied Entry Before | 16     | 0     | 0     | 0    | 0     | 0     | 16    |
| Denied Entry After  | 692    | 63    | 9     | 0    | 0     | 0     | 764   |

5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard Performance by movement

| Movement            | WBL    | NBT  | NBR | SBL   | SBT   | All   |
|---------------------|--------|------|-----|-------|-------|-------|
| Denied Delay (hr)   | 570.7  | 0.0  | 0.0 | 0.0   | 0.2   | 570.9 |
| Denied Del/Veh (s)  | 1589.0 | 0.0  | 0.0 | 0.0   | 0.6   | 792.0 |
| Total Delay (hr)    | 23.8   | 0.0  | 0.0 | 13.1  | 142.7 | 179.7 |
| Total Del/Veh (s)   | 318.8  | 18.9 | 2.4 | 387.3 | 397.2 | 375.6 |
| Stop Delay (hr)     | 23.6   | 0.0  | 0.0 | 12.6  | 140.5 | 176.7 |
| Stop Del/Veh (s)    | 315.9  | 16.8 | 2.5 | 371.1 | 391.1 | 369.4 |
| Vehicles Entered    | 243    | 5    | 33  | 112   | 1152  | 1545  |
| Vehicles Exited     | 242    | 5    | 33  | 108   | 1123  | 1511  |
| Hourly Exit Rate    | 242    | 5    | 33  | 108   | 1123  | 1511  |
| Input Volume        | 1212   | 6    | 29  | 291   | 3032  | 4570  |
| % of Volume         | 20     | 83   | 114 | 37    | 37    | 33    |
| Denied Entry Before | 72     | 0    | 0   | 0     | 0     | 72    |
| Denied Entry After  | 1050   | 0    | 0   | 0     | 0     | 1050  |

6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp Performance by movement

| Movement            | SBR | All |
|---------------------|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.0 | 0.0 |
| Total Delay (hr)    | 0.0 | 0.0 |
| Total Del/Veh (s)   | 4.4 | 4.4 |
| Stop Delay (hr)     | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.0 | 0.0 |
| Vehicles Entered    | 10  | 10  |
| Vehicles Exited     | 10  | 10  |
| Hourly Exit Rate    | 10  | 10  |
| Input Volume        | 35  | 35  |
| % of Volume         | 29  | 29  |
| Denied Entry Before | 0   | 0   |
| Denied Entry After  | 0   | 0   |

7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road Performance by movement

| Movement            | SBT | All |
|---------------------|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.1 | 0.1 |
| Total Delay (hr)    | 0.0 | 0.0 |
| Total Del/Veh (s)   | 1.7 | 1.7 |
| Stop Delay (hr)     | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.1 | 0.1 |
| Vehicles Entered    | 35  | 35  |
| Vehicles Exited     | 35  | 35  |
| Hourly Exit Rate    | 35  | 35  |
| Input Volume        | 35  | 35  |
| % of Volume         | 100 | 100 |
| Denied Entry Before | 0   | 0   |
| Denied Entry After  | 0   | 0   |

11: Pleasant Hill Road & Project Dwy Performance by movement

| Movement            | EBR    | NBT | SBT  | All   |
|---------------------|--------|-----|------|-------|
| Denied Delay (hr)   | 420.6  | 0.0 | 0.0  | 420.6 |
| Denied Del/Veh (s)  | 1907.0 | 0.0 | 0.0  | 688.9 |
| Total Delay (hr)    | 7.9    | 0.0 | 8.2  | 16.2  |
| Total Del/Veh (s)   | 1361.7 | 0.0 | 21.5 | 40.6  |
| Stop Delay (hr)     | 8.0    | 0.0 | 4.7  | 12.6  |
| Stop Del/Veh (s)    | 1366.8 | 0.0 | 12.2 | 31.7  |
| Vehicles Entered    | 13     | 39  | 1365 | 1417  |
| Vehicles Exited     | 12     | 39  | 1365 | 1416  |
| Hourly Exit Rate    | 12     | 39  | 1365 | 1416  |
| Input Volume        | 735    | 35  | 4244 | 5014  |
| % of Volume         | 2      | 111 | 32   | 28    |
| Denied Entry Before | 61     | 0   | 0    | 61    |
| Denied Entry After  | 781    | 0   | 0    | 781   |

#### 14: Pleasant Hill Road & Acalanes Avenue Performance by movement

| Movement            | NBT | SBT  | All  |
|---------------------|-----|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0 | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 4.8  | 4.8  |
| Total Del/Veh (s)   | 0.2 | 12.4 | 12.1 |
| Stop Delay (hr)     | 0.0 | 1.7  | 1.7  |
| Stop Del/Veh (s)    | 0.0 | 4.3  | 4.2  |
| Vehicles Entered    | 39  | 1377 | 1416 |
| Vehicles Exited     | 39  | 1376 | 1415 |
| Hourly Exit Rate    | 39  | 1376 | 1415 |
| Input Volume        | 35  | 4979 | 5014 |
| % of Volume         | 111 | 28   | 28   |
| Denied Entry Before | 0   | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    |

#### 15: Pleasant Hill Road Performance by movement

| Movement            | WBR | SBT  | SBR  | All  |
|---------------------|-----|------|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0  | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 3.6  | 3.0  | 6.6  |
| Total Del/Veh (s)   | 0.6 | 19.1 | 15.3 | 16.7 |
| Stop Delay (hr)     | 0.0 | 0.4  | 0.4  | 0.8  |
| Stop Del/Veh (s)    | 0.0 | 2.1  | 2.1  | 2.1  |
| Vehicles Entered    | 39  | 676  | 701  | 1416 |
| Vehicles Exited     | 39  | 676  | 701  | 1416 |
| Hourly Exit Rate    | 39  | 676  | 701  | 1416 |
| Input Volume        | 35  | 2507 | 2472 | 5014 |
| % of Volume         | 111 | 27   | 28   | 28   |
| Denied Entry Before | 0   | 0    | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    | 0    |

#### 16: Pleasant Hill Road Performance by movement

| Movement            | SBT  | All  |
|---------------------|------|------|
| Denied Delay (hr)   | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0  | 0.0  |
| Total Delay (hr)    | 1.2  | 1.2  |
| Total Del/Veh (s)   | 6.6  | 6.6  |
| Stop Delay (hr)     | 0.0  | 0.0  |
| Stop Del/Veh (s)    | 0.0  | 0.0  |
| Vehicles Entered    | 676  | 676  |
| Vehicles Exited     | 675  | 675  |
| Hourly Exit Rate    | 675  | 675  |
| Input Volume        | 2507 | 2507 |
| % of Volume         | 27   | 27   |
| Denied Entry Before | 0    | 0    |
| Denied Entry After  | 0    | 0    |

#### 17: Pleasant Hill Road Performance by movement

| Movement            | SBT | SBR  | All  |
|---------------------|-----|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0 | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 1.0  | 1.0  |
| Total Del/Veh (s)   | 6.9 | 5.0  | 5.1  |
| Stop Delay (hr)     | 0.0 | 0.4  | 0.4  |
| Stop Del/Veh (s)    | 1.0 | 2.0  | 2.0  |
| Vehicles Entered    | 10  | 700  | 710  |
| Vehicles Exited     | 10  | 699  | 709  |
| Hourly Exit Rate    | 10  | 699  | 709  |
| Input Volume        | 35  | 2507 | 2542 |
| % of Volume         | 29  | 28   | 28   |
| Denied Entry Before | 0   | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    |



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Total Network Performance

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|                     |        |
|---------------------|--------|
| Denied Delay (hr)   | 2043.4 |
| Denied Del/Veh (s)  | 1259.4 |
| Total Delay (hr)    | 325.5  |
| Total Del/Veh (s)   | 549.9  |
| Stop Delay (hr)     | 305.5  |
| Stop Del/Veh (s)    | 516.0  |
| Vehicles Entered    | 1836   |
| Vehicles Exited     | 1721   |
| Hourly Exit Rate    | 1721   |
| Input Volume        | 40731  |
| % of Volume         | 4      |
| Denied Entry Before | 157    |
| Denied Entry After  | 4005   |

Arterial Level of Service: NB Pleasant Hill Road

| Cross Street      | Node | Delay<br>(s/veh) | Travel<br>time (s) | Dist<br>(mi) | Arterial<br>Speed |
|-------------------|------|------------------|--------------------|--------------|-------------------|
| Acalanes Avenue   | 14   | 0.2              | 20.2               | 0.1          | 11                |
| Project Dwy       | 11   | 0.0              | 4.1                | 0.0          | 34                |
| Stanley Boulevard | 5    | 18.9             | 26.8               | 0.1          | 11                |
| Quandt Road       | 4    | 87.9             | 129.0              | 0.4          | 12                |
| Total             |      | 107.0            | 180.0              | 0.6          | 12                |

Arterial Level of Service: SB Pleasant Hill Road

| Cross Street         | Node | Delay<br>(s/veh) | Travel<br>time (s) | Dist<br>(mi) | Arterial<br>Speed |
|----------------------|------|------------------|--------------------|--------------|-------------------|
| Rancho View Drive    | 1    | 7.2              | 22.7               | 0.2          | 24                |
|                      | 19   | 1.3              | 15.6               | 0.1          | 34                |
| Greenvalley Drive    | 2    | 5.0              | 11.8               | 0.1          | 22                |
| Reliez Valle Road    | 3    | 49.1             | 72.3               | 0.3          | 12                |
|                      | 20   | 26.2             | 29.9               | 0.0          | 4                 |
| Springhill Road      | 4    | 130.5            | 139.9              | 0.1          | 3                 |
| Deer Hill Road       | 5    | 360.6            | 399.0              | 0.4          | 4                 |
| Project Dwy          | 11   | 20.9             | 29.5               | 0.1          | 10                |
| Acalanes Avenue      | 14   | 12.5             | 16.6               | 0.0          | 8                 |
|                      | 15   | 19.1             | 25.3               | 0.1          | 9                 |
|                      | 16   | 6.6              | 16.0               | 0.1          | 24                |
|                      | 17   | 6.9              | 16.3               | 0.1          | 16                |
| Mt. Diablo Boulevard | 6    | 4.4              | 12.9               | 0.1          | 19                |
| SR 24 EB Off Ramp    | 7    | 1.7              | 4.5                | 0.1          | 49                |
| Total                |      | 652.1            | 812.3              | 1.7          | 7                 |

Queuing and Blocking Report  
Evacuation Scenario 1 plus Project Variant

AM PEAK  
08/23/2020

Intersection: 1: Pleasant Hill Road & Rancho View Drive

| Movement              | EB  | SB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | LTR | T   | TR  |
| Maximum Queue (ft)    | 91  | 41  | 22  |
| Average Queue (ft)    | 45  | 11  | 1   |
| 95th Queue (ft)       | 75  | 34  | 9   |
| Link Distance (ft)    | 306 | 773 | 773 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

Intersection: 2: Pleasant Hill Road & Greenvalley Drive

| Movement              | EB  | WB  | B60 | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|
| Directions Served     | LTR | LT  | T   | T   | TR  |
| Maximum Queue (ft)    | 51  | 611 | 114 | 53  | 79  |
| Average Queue (ft)    | 14  | 566 | 74  | 11  | 29  |
| 95th Queue (ft)       | 35  | 656 | 113 | 34  | 66  |
| Link Distance (ft)    | 333 | 494 | 53  | 288 | 288 |
| Upstream Blk Time (%) |     | 84  | 87  |     |     |
| Queuing Penalty (veh) |     | 0   | 0   |     |     |
| Storage Bay Dist (ft) |     |     |     |     |     |
| Storage Blk Time (%)  |     | 76  |     | 0   |     |
| Queuing Penalty (veh) |     | 0   |     | 0   |     |

Intersection: 3: Pleasant Hill Road & Reliez Valle Road

| Movement              | EB  | EB  | SB   | SB   |
|-----------------------|-----|-----|------|------|
| Directions Served     | L   | R   | T    | T    |
| Maximum Queue (ft)    | 455 | 481 | 425  | 447  |
| Average Queue (ft)    | 218 | 456 | 230  | 228  |
| 95th Queue (ft)       | 582 | 471 | 381  | 408  |
| Link Distance (ft)    | 438 | 438 | 1259 | 1259 |
| Upstream Blk Time (%) | 21  | 97  |      |      |
| Queuing Penalty (veh) | 0   | 0   |      |      |
| Storage Bay Dist (ft) |     |     |      |      |
| Storage Blk Time (%)  |     |     |      | 41   |
| Queuing Penalty (veh) |     |     |      | 0    |

Queuing and Blocking Report  
Evacuation Scenario 1 plus Project Variant

AM PEAK  
08/23/2020

Intersection: 4: Pleasant Hill Road & Springhill Road/Quandt Road

| Movement              | EB  | WB  | NB  | SB   | SB   | SB  | B20 | B20  |
|-----------------------|-----|-----|-----|------|------|-----|-----|------|
| Directions Served     | LTR | LTR | L   | T    | T    | R   | T   | T    |
| Maximum Queue (ft)    | 372 | 263 | 21  | 530  | 527  | 96  | 214 | 236  |
| Average Queue (ft)    | 337 | 231 | 2   | 477  | 478  | 79  | 174 | 186  |
| 95th Queue (ft)       | 353 | 248 | 11  | 599  | 609  | 138 | 256 | 263  |
| Link Distance (ft)    | 318 | 213 |     | 414  | 414  |     | 127 | 127  |
| Upstream Blk Time (%) | 100 | 83  |     | 88   | 90   |     | 31  | 88   |
| Queuing Penalty (veh) | 0   | 0   |     | 1062 | 1077 |     | 368 | 1061 |
| Storage Bay Dist (ft) |     |     | 200 |      |      | 71  |     |      |
| Storage Blk Time (%)  |     |     |     | 89   | 84   | 0   |     |      |
| Queuing Penalty (veh) |     |     |     | 0    | 194  | 4   |     |      |

Intersection: 5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard

| Movement              | WB  | WB  | NB  | NB  | SB  | SB   | SB   |
|-----------------------|-----|-----|-----|-----|-----|------|------|
| Directions Served     | L   | LT  | T   | R   | L   | T    | T    |
| Maximum Queue (ft)    | 225 | 556 | 27  | 42  | 275 | 2273 | 2409 |
| Average Queue (ft)    | 204 | 523 | 2   | 11  | 185 | 2245 | 2372 |
| 95th Queue (ft)       | 299 | 542 | 14  | 32  | 342 | 2275 | 2427 |
| Link Distance (ft)    |     | 504 | 342 | 342 |     | 2220 | 2220 |
| Upstream Blk Time (%) |     | 95  |     |     |     | 42   | 95   |
| Queuing Penalty (veh) |     | 0   |     |     |     | 693  | 1585 |
| Storage Bay Dist (ft) | 185 |     |     |     | 175 |      |      |
| Storage Blk Time (%)  | 8   | 97  |     |     | 6   | 27   | 69   |
| Queuing Penalty (veh) | 49  | 586 |     |     | 85  | 80   | 0    |

Intersection: 6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Intersection: 7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road

| Movement              | SB |
|-----------------------|----|
| Directions Served     | T  |
| Maximum Queue (ft)    | 10 |
| Average Queue (ft)    | 0  |
| 95th Queue (ft)       | 5  |
| Link Distance (ft)    |    |
| Upstream Blk Time (%) |    |
| Queuing Penalty (veh) |    |
| Storage Bay Dist (ft) |    |
| Storage Blk Time (%)  |    |
| Queuing Penalty (veh) |    |

Intersection: 8: Brown Avenue/Miller Drive & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Intersection: 9: First Street/Sierra Vista Way & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Intersection: 10: SR 24 WB Ramps/Laurel Drive & Deer Hill Road

Movement

Directions Served  
Maximum Queue (ft)  
Average Queue (ft)  
95th Queue (ft)  
Link Distance (ft)  
Upstream Blk Time (%)  
Queuing Penalty (veh)  
Storage Bay Dist (ft)  
Storage Blk Time (%)  
Queuing Penalty (veh)

Intersection: 11: Pleasant Hill Road & Project Dwy

| Movement              | EB  | SB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | R   | T   | TR  |
| Maximum Queue (ft)    | 202 | 399 | 396 |
| Average Queue (ft)    | 179 | 223 | 342 |
| 95th Queue (ft)       | 198 | 460 | 416 |
| Link Distance (ft)    | 176 | 342 | 342 |
| Upstream Blk Time (%) | 100 | 2   | 8   |
| Queuing Penalty (veh) | 0   | 37  | 174 |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

Intersection: 12: Project Dwy NE & Deer Hill Road

Movement

Directions Served  
Maximum Queue (ft)  
Average Queue (ft)  
95th Queue (ft)  
Link Distance (ft)  
Upstream Blk Time (%)  
Queuing Penalty (veh)  
Storage Bay Dist (ft)  
Storage Blk Time (%)  
Queuing Penalty (veh)

Intersection: 13: Project Dwy SW & Deer Hill Road

Movement

Directions Served  
Maximum Queue (ft)  
Average Queue (ft)  
95th Queue (ft)  
Link Distance (ft)  
Upstream Blk Time (%)  
Queuing Penalty (veh)  
Storage Bay Dist (ft)  
Storage Blk Time (%)  
Queuing Penalty (veh)

Intersection: 14: Pleasant Hill Road & Acalanes Avenue

| Movement              | SB  | SB  |
|-----------------------|-----|-----|
| Directions Served     | T   | T   |
| Maximum Queue (ft)    | 186 | 264 |
| Average Queue (ft)    | 50  | 226 |
| 95th Queue (ft)       | 147 | 279 |
| Link Distance (ft)    | 150 | 150 |
| Upstream Blk Time (%) | 1   | 24  |
| Queuing Penalty (veh) | 19  | 590 |
| Storage Bay Dist (ft) |     |     |
| Storage Blk Time (%)  |     |     |
| Queuing Penalty (veh) |     |     |

Intersection: 15: Pleasant Hill Road

| Movement              | SB  |
|-----------------------|-----|
| Directions Served     | TR  |
| Maximum Queue (ft)    | 353 |
| Average Queue (ft)    | 165 |
| 95th Queue (ft)       | 408 |
| Link Distance (ft)    | 266 |
| Upstream Blk Time (%) | 5   |
| Queuing Penalty (veh) | 112 |
| Storage Bay Dist (ft) |     |
| Storage Blk Time (%)  |     |
| Queuing Penalty (veh) |     |

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Intersection: 16: Pleasant Hill Road

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Movement

Directions Served  
Maximum Queue (ft)  
Average Queue (ft)  
95th Queue (ft)  
Link Distance (ft)  
Upstream Blk Time (%)  
Queuing Penalty (veh)  
Storage Bay Dist (ft)  
Storage Blk Time (%)  
Queuing Penalty (veh)

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Intersection: 17: Pleasant Hill Road

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| Movement              | SB  |
|-----------------------|-----|
| Directions Served     | TR  |
| Maximum Queue (ft)    | 184 |
| Average Queue (ft)    | 73  |
| 95th Queue (ft)       | 144 |
| Link Distance (ft)    | 314 |
| Upstream Blk Time (%) |     |
| Queuing Penalty (veh) |     |
| Storage Bay Dist (ft) |     |
| Storage Blk Time (%)  |     |
| Queuing Penalty (veh) |     |

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Network Summary

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Network wide Queuing Penalty: 7775

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PHF = 1.0

**Evac 1** – Evacuation (without project) in the AM Peak

## Summary of All Intervals

| Run Number              | 1      | 2      | 3      | 4      | 5      | Avg    |
|-------------------------|--------|--------|--------|--------|--------|--------|
| Start Time              | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   |
| End Time                | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   |
| Total Time (min)        | 70     | 70     | 70     | 70     | 70     | 70     |
| Time Recorded (min)     | 60     | 60     | 60     | 60     | 60     | 60     |
| # of Intervals          | 2      | 2      | 2      | 2      | 2      | 2      |
| # of Recorded Intervals | 1      | 1      | 1      | 1      | 1      | 1      |
| Vehs Entered            | 1829   | 1780   | 1769   | 1792   | 1766   | 1788   |
| Vehs Exited             | 1731   | 1679   | 1706   | 1700   | 1710   | 1706   |
| Starting Vehs           | 281    | 262    | 307    | 270    | 292    | 282    |
| Ending Vehs             | 379    | 363    | 370    | 362    | 348    | 362    |
| Denied Entry Before     | 111    | 105    | 100    | 89     | 97     | 101    |
| Denied Entry After      | 1982   | 2023   | 2037   | 1992   | 2107   | 2029   |
| Travel Distance (mi)    | 1600   | 1579   | 1608   | 1611   | 1609   | 1601   |
| Travel Time (hr)        | 1351.0 | 1392.4 | 1406.7 | 1353.8 | 1407.4 | 1382.3 |
| Total Delay (hr)        | 1295.1 | 1337.5 | 1350.7 | 1297.7 | 1351.6 | 1326.5 |
| Total Stops             | 6213   | 6007   | 6125   | 6099   | 6108   | 6112   |
| Fuel Used (gal)         | 348.4  | 356.7  | 360.7  | 349.6  | 362.3  | 355.5  |

## Interval #0 Information Seeding

|                                     |      |
|-------------------------------------|------|
| Start Time                          | 6:50 |
| End Time                            | 7:00 |
| Total Time (min)                    | 10   |
| Volumes adjusted by Growth Factors. |      |
| No data recorded this interval.     |      |

## Interval #1 Information Recording

|                                     |      |
|-------------------------------------|------|
| Start Time                          | 7:00 |
| End Time                            | 8:00 |
| Total Time (min)                    | 60   |
| Volumes adjusted by Growth Factors. |      |

| Run Number           | 1      | 2      | 3      | 4      | 5      | Avg    |
|----------------------|--------|--------|--------|--------|--------|--------|
| Vehs Entered         | 1829   | 1780   | 1769   | 1792   | 1766   | 1788   |
| Vehs Exited          | 1731   | 1679   | 1706   | 1700   | 1710   | 1706   |
| Starting Vehs        | 281    | 262    | 307    | 270    | 292    | 282    |
| Ending Vehs          | 379    | 363    | 370    | 362    | 348    | 362    |
| Denied Entry Before  | 111    | 105    | 100    | 89     | 97     | 101    |
| Denied Entry After   | 1982   | 2023   | 2037   | 1992   | 2107   | 2029   |
| Travel Distance (mi) | 1600   | 1579   | 1608   | 1611   | 1609   | 1601   |
| Travel Time (hr)     | 1351.0 | 1392.4 | 1406.7 | 1353.8 | 1407.4 | 1382.3 |
| Total Delay (hr)     | 1295.1 | 1337.5 | 1350.7 | 1297.7 | 1351.6 | 1326.5 |
| Total Stops          | 6213   | 6007   | 6125   | 6099   | 6108   | 6112   |
| Fuel Used (gal)      | 348.4  | 356.7  | 360.7  | 349.6  | 362.3  | 355.5  |

## 1: Pleasant Hill Road & Rancho View Drive Performance by movement

| Movement            | EBR | SBT | All |
|---------------------|-----|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.2 | 0.1 | 0.2 |
| Total Delay (hr)    | 0.1 | 0.0 | 0.2 |
| Total Del/Veh (s)   | 3.5 | 5.4 | 3.8 |
| Stop Delay (hr)     | 0.1 | 0.0 | 0.1 |
| Stop Del/Veh (s)    | 2.7 | 4.1 | 2.9 |
| Vehicles Entered    | 131 | 24  | 155 |
| Vehicles Exited     | 131 | 24  | 155 |
| Hourly Exit Rate    | 131 | 24  | 155 |
| Input Volume        | 130 | 25  | 155 |
| % of Volume         | 101 | 96  | 100 |
| Denied Entry Before | 0   | 0   | 0   |
| Denied Entry After  | 0   | 0   | 0   |

## 2: Pleasant Hill Road & Greenvaley Drive Performance by movement

| Movement            | EBR | WBL  | SBT | All  |
|---------------------|-----|------|-----|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0 | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0  | 0.0 | 0.0  |
| Total Delay (hr)    | 0.0 | 11.9 | 0.2 | 12.2 |
| Total Del/Veh (s)   | 2.8 | 90.1 | 5.4 | 64.9 |
| Stop Delay (hr)     | 0.0 | 10.8 | 0.2 | 11.0 |
| Stop Del/Veh (s)    | 3.0 | 81.4 | 3.7 | 58.4 |
| Vehicles Entered    | 44  | 467  | 154 | 665  |
| Vehicles Exited     | 44  | 461  | 155 | 660  |
| Hourly Exit Rate    | 44  | 461  | 155 | 660  |
| Input Volume        | 42  | 478  | 155 | 675  |
| % of Volume         | 105 | 96   | 100 | 98   |
| Denied Entry Before | 0   | 0    | 0   | 0    |
| Denied Entry After  | 0   | 0    | 0   | 0    |

### 3: Pleasant Hill Road & Reliez Valle Road Performance by movement

| Movement            | EBR    | SBT  | All   |
|---------------------|--------|------|-------|
| Denied Delay (hr)   | 340.2  | 0.0  | 340.2 |
| Denied Del/Veh (s)  | 1091.5 | 0.0  | 687.3 |
| Total Delay (hr)    | 17.0   | 6.6  | 23.7  |
| Total Del/Veh (s)   | 157.5  | 35.4 | 80.1  |
| Stop Delay (hr)     | 16.8   | 5.4  | 22.2  |
| Stop Del/Veh (s)    | 155.7  | 28.7 | 75.2  |
| Vehicles Entered    | 376    | 660  | 1036  |
| Vehicles Exited     | 369    | 660  | 1029  |
| Hourly Exit Rate    | 369    | 660  | 1029  |
| Input Volume        | 1124   | 675  | 1799  |
| % of Volume         | 33     | 98   | 57    |
| Denied Entry Before | 6      | 0    | 6     |
| Denied Entry After  | 746    | 0    | 746   |

### 4: Pleasant Hill Road & Springhill Road/Quandt Road Performance by movement

| Movement            | EBR    | WBL   | WBT   | NBL  | SBT   | SBR  | All   |
|---------------------|--------|-------|-------|------|-------|------|-------|
| Denied Delay (hr)   | 256.6  | 6.0   | 1.0   | 0.0  | 0.0   | 0.0  | 263.6 |
| Denied Del/Veh (s)  | 1364.6 | 96.2  | 92.9  | 0.0  | 0.0   | 0.0  | 482.6 |
| Total Delay (hr)    | 10.0   | 6.9   | 1.2   | 0.1  | 31.9  | 2.8  | 52.9  |
| Total Del/Veh (s)   | 206.2  | 114.7 | 114.1 | 99.9 | 122.7 | 94.6 | 128.9 |
| Stop Delay (hr)     | 10.3   | 6.8   | 1.1   | 0.1  | 31.9  | 2.9  | 53.0  |
| Stop Del/Veh (s)    | 212.2  | 111.7 | 110.2 | 97.4 | 122.8 | 95.7 | 129.3 |
| Vehicles Entered    | 166    | 216   | 36    | 3    | 918   | 107  | 1446  |
| Vehicles Exited     | 165    | 212   | 36    | 3    | 896   | 103  | 1415  |
| Hourly Exit Rate    | 165    | 212   | 36    | 3    | 896   | 103  | 1415  |
| Input Volume        | 643    | 223   | 34    | 4    | 1626  | 173  | 2703  |
| % of Volume         | 26     | 95    | 106   | 75   | 55    | 60   | 52    |
| Denied Entry Before | 11     | 1     | 0     | 0    | 0     | 0    | 12    |
| Denied Entry After  | 511    | 8     | 1     | 0    | 0     | 0    | 520   |

5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard Performance by movement

| Movement            | WBL    | NBT  | NBR | SBL   | SBT   | All   |
|---------------------|--------|------|-----|-------|-------|-------|
| Denied Delay (hr)   | 422.6  | 0.0  | 0.0 | 0.0   | 0.0   | 422.6 |
| Denied Del/Veh (s)  | 1507.7 | 0.0  | 0.0 | 0.0   | 0.0   | 659.7 |
| Total Delay (hr)    | 24.0   | 0.0  | 0.0 | 13.3  | 141.8 | 179.2 |
| Total Del/Veh (s)   | 315.9  | 29.4 | 3.3 | 380.3 | 396.7 | 377.1 |
| Stop Delay (hr)     | 23.9   | 0.0  | 0.0 | 12.7  | 138.9 | 175.6 |
| Stop Del/Veh (s)    | 313.5  | 27.4 | 3.4 | 363.3 | 388.7 | 369.4 |
| Vehicles Entered    | 246    | 4    | 21  | 115   | 1157  | 1543  |
| Vehicles Exited     | 248    | 3    | 22  | 112   | 1123  | 1508  |
| Hourly Exit Rate    | 248    | 3    | 22  | 112   | 1123  | 1508  |
| Input Volume        | 909    | 4    | 22  | 218   | 2274  | 3427  |
| % of Volume         | 27     | 75   | 100 | 51    | 49    | 44    |
| Denied Entry Before | 83     | 0    | 0   | 0     | 0     | 83    |
| Denied Entry After  | 763    | 0    | 0   | 0     | 0     | 763   |

6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp Performance by movement

| Movement            | SBR | All |
|---------------------|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.0 | 0.0 |
| Total Delay (hr)    | 0.0 | 0.0 |
| Total Del/Veh (s)   | 4.5 | 4.5 |
| Stop Delay (hr)     | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.0 | 0.0 |
| Vehicles Entered    | 12  | 12  |
| Vehicles Exited     | 12  | 12  |
| Hourly Exit Rate    | 12  | 12  |
| Input Volume        | 26  | 26  |
| % of Volume         | 46  | 46  |
| Denied Entry Before | 0   | 0   |
| Denied Entry After  | 0   | 0   |

7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road Performance by movement

| Movement            | SBT | All |
|---------------------|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.1 | 0.1 |
| Total Delay (hr)    | 0.0 | 0.0 |
| Total Del/Veh (s)   | 1.8 | 1.8 |
| Stop Delay (hr)     | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.2 | 0.2 |
| Vehicles Entered    | 29  | 29  |
| Vehicles Exited     | 29  | 29  |
| Hourly Exit Rate    | 29  | 29  |
| Input Volume        | 26  | 26  |
| % of Volume         | 112 | 112 |
| Denied Entry Before | 0   | 0   |
| Denied Entry After  | 0   | 0   |

14: Pleasant Hill Road & Acalanes Avenue Performance by movement

| Movement            | NBT | SBT  | All  |
|---------------------|-----|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0 | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 4.5  | 4.5  |
| Total Del/Veh (s)   | 0.2 | 11.9 | 11.7 |
| Stop Delay (hr)     | 0.0 | 1.4  | 1.4  |
| Stop Del/Veh (s)    | 0.0 | 3.8  | 3.7  |
| Vehicles Entered    | 25  | 1372 | 1397 |
| Vehicles Exited     | 25  | 1372 | 1397 |
| Hourly Exit Rate    | 25  | 1372 | 1397 |
| Input Volume        | 26  | 3183 | 3209 |
| % of Volume         | 96  | 43   | 44   |
| Denied Entry Before | 0   | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    |

### 15: Pleasant Hill Road Performance by movement

| Movement            | WBR | SBT  | SBR  | All  |
|---------------------|-----|------|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0  | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 3.7  | 2.9  | 6.5  |
| Total Del/Veh (s)   | 0.6 | 19.0 | 15.1 | 16.8 |
| Stop Delay (hr)     | 0.0 | 0.4  | 0.4  | 0.9  |
| Stop Del/Veh (s)    | 0.0 | 2.3  | 2.3  | 2.3  |
| Vehicles Entered    | 25  | 689  | 683  | 1397 |
| Vehicles Exited     | 25  | 689  | 683  | 1397 |
| Hourly Exit Rate    | 25  | 689  | 683  | 1397 |
| Input Volume        | 26  | 1605 | 1578 | 3209 |
| % of Volume         | 96  | 43   | 43   | 44   |
| Denied Entry Before | 0   | 0    | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    | 0    |

### 16: Pleasant Hill Road Performance by movement

| Movement            | SBT  | All  |
|---------------------|------|------|
| Denied Delay (hr)   | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0  | 0.0  |
| Total Delay (hr)    | 1.3  | 1.3  |
| Total Del/Veh (s)   | 6.6  | 6.6  |
| Stop Delay (hr)     | 0.0  | 0.0  |
| Stop Del/Veh (s)    | 0.0  | 0.0  |
| Vehicles Entered    | 689  | 689  |
| Vehicles Exited     | 689  | 689  |
| Hourly Exit Rate    | 689  | 689  |
| Input Volume        | 1605 | 1605 |
| % of Volume         | 43   | 43   |
| Denied Entry Before | 0    | 0    |
| Denied Entry After  | 0    | 0    |

### 17: Pleasant Hill Road Performance by movement

| Movement            | SBT | SBR  | All  |
|---------------------|-----|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 1.0  | 1.1  |
| Total Del/Veh (s)   | 7.8 | 5.3  | 5.3  |
| Stop Delay (hr)     | 0.0 | 0.4  | 0.4  |
| Stop Del/Veh (s)    | 1.8 | 2.1  | 2.1  |
| Vehicles Entered    | 12  | 705  | 717  |
| Vehicles Exited     | 12  | 704  | 716  |
| Hourly Exit Rate    | 12  | 704  | 716  |
| Input Volume        | 26  | 1605 | 1631 |
| % of Volume         | 46  | 44   | 44   |
| Denied Entry Before | 0   | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    |

### Total Network Performance

|                     |        |
|---------------------|--------|
| Denied Delay (hr)   | 1027.1 |
| Denied Del/Veh (s)  | 968.7  |
| Total Delay (hr)    | 299.5  |
| Total Del/Veh (s)   | 521.3  |
| Stop Delay (hr)     | 277.9  |
| Stop Del/Veh (s)    | 483.8  |
| Vehicles Entered    | 1788   |
| Vehicles Exited     | 1706   |
| Hourly Exit Rate    | 1706   |
| Input Volume        | 27792  |
| % of Volume         | 6      |
| Denied Entry Before | 101    |
| Denied Entry After  | 2029   |



Arterial Level of Service: NB Pleasant Hill Road

| Cross Street      | Node | Delay<br>(s/veh) | Travel<br>time (s) | Dist<br>(mi) | Arterial<br>Speed |
|-------------------|------|------------------|--------------------|--------------|-------------------|
| Acalanes Avenue   | 14   | 0.2              | 20.1               | 0.1          | 11                |
|                   | 11   | 0.0              | 4.0                | 0.0          | 34                |
| Stanley Boulevard | 5    | 29.4             | 36.5               | 0.1          | 8                 |
| Quandt Road       | 4    | 99.9             | 148.7              | 0.4          | 11                |
| Total             |      | 129.5            | 209.3              | 0.6          | 11                |

Arterial Level of Service: SB Pleasant Hill Road

| Cross Street         | Node | Delay<br>(s/veh) | Travel<br>time (s) | Dist<br>(mi) | Arterial<br>Speed |
|----------------------|------|------------------|--------------------|--------------|-------------------|
| Rancho View Drive    | 1    | 5.4              | 20.6               | 0.2          | 27                |
|                      | 19   | 0.9              | 16.0               | 0.1          | 33                |
| Greenvalley Drive    | 2    | 5.4              | 12.3               | 0.1          | 21                |
| Reliez Valle Road    | 3    | 31.8             | 55.7               | 0.3          | 16                |
|                      | 20   | 23.5             | 27.1               | 0.0          | 4                 |
| Springhill Road      | 4    | 122.7            | 132.1              | 0.1          | 3                 |
| Deer Hill Road       | 5    | 365.6            | 404.1              | 0.4          | 4                 |
|                      | 11   | 19.1             | 27.7               | 0.1          | 10                |
| Acalanes Avenue      | 14   | 11.9             | 15.9               | 0.0          | 9                 |
|                      | 15   | 19.0             | 25.1               | 0.1          | 9                 |
|                      | 16   | 6.6              | 16.0               | 0.1          | 24                |
|                      | 17   | 7.8              | 16.2               | 0.1          | 16                |
| Mt. Diablo Boulevard | 6    | 4.5              | 12.4               | 0.1          | 20                |
| SR 24 EB Off Ramp    | 7    | 1.8              | 4.6                | 0.1          | 49                |
| Total                |      | 625.8            | 785.8              | 1.7          | 8                 |

# Queuing and Blocking Report

## Evacuation Scenario 1

08/23/2020

### Intersection: 1: Pleasant Hill Road & Rancho View Drive

| Movement              | EB  | SB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | LTR | T   | TR  |
| Maximum Queue (ft)    | 68  | 32  | 11  |
| Average Queue (ft)    | 37  | 6   | 0   |
| 95th Queue (ft)       | 65  | 25  | 5   |
| Link Distance (ft)    | 306 | 773 | 773 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

### Intersection: 2: Pleasant Hill Road & Greenvalley Drive

| Movement              | EB  | WB  | B60 | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|
| Directions Served     | LTR | LT  | T   | T   | TR  |
| Maximum Queue (ft)    | 34  | 562 | 73  | 47  | 71  |
| Average Queue (ft)    | 9   | 413 | 19  | 9   | 26  |
| 95th Queue (ft)       | 24  | 637 | 74  | 32  | 58  |
| Link Distance (ft)    | 333 | 494 | 53  | 288 | 288 |
| Upstream Blk Time (%) |     | 22  | 12  |     |     |
| Queuing Penalty (veh) |     | 0   | 0   |     |     |
| Storage Bay Dist (ft) |     |     |     |     |     |
| Storage Blk Time (%)  |     | 67  |     | 0   |     |
| Queuing Penalty (veh) |     | 0   |     | 0   |     |

### Intersection: 3: Pleasant Hill Road & Reliez Valle Road

| Movement              | EB  | EB  | SB   | SB   |
|-----------------------|-----|-----|------|------|
| Directions Served     | L   | R   | T    | T    |
| Maximum Queue (ft)    | 454 | 486 | 339  | 344  |
| Average Queue (ft)    | 237 | 456 | 177  | 175  |
| 95th Queue (ft)       | 599 | 474 | 273  | 281  |
| Link Distance (ft)    | 438 | 438 | 1259 | 1259 |
| Upstream Blk Time (%) | 24  | 94  |      |      |
| Queuing Penalty (veh) | 0   | 0   |      |      |
| Storage Bay Dist (ft) |     |     |      |      |
| Storage Blk Time (%)  |     |     |      | 26   |
| Queuing Penalty (veh) |     |     |      | 0    |

Intersection: 4: Pleasant Hill Road & Springhill Road/Quandt Road

| Movement              | EB  | WB  | NB  | SB  | SB  | SB  | B20 | B20 |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | L   | T   | T   | R   | T   | T   |
| Maximum Queue (ft)    | 368 | 254 | 15  | 521 | 527 | 96  | 212 | 215 |
| Average Queue (ft)    | 336 | 227 | 1   | 470 | 472 | 76  | 161 | 179 |
| 95th Queue (ft)       | 353 | 257 | 8   | 597 | 611 | 140 | 252 | 267 |
| Link Distance (ft)    | 318 | 213 |     | 414 | 414 |     | 127 | 127 |
| Upstream Blk Time (%) | 99  | 70  |     | 83  | 87  |     | 22  | 82  |
| Queuing Penalty (veh) | 0   | 0   |     | 748 | 784 |     | 202 | 736 |
| Storage Bay Dist (ft) |     |     | 200 |     |     | 71  |     |     |
| Storage Blk Time (%)  |     |     |     | 86  | 82  | 0   |     |     |
| Queuing Penalty (veh) |     |     |     | 0   | 142 | 2   |     |     |

Intersection: 5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard

| Movement              | WB  | WB  | NB  | NB  | SB  | SB   | SB   |
|-----------------------|-----|-----|-----|-----|-----|------|------|
| Directions Served     | L   | LT  | T   | R   | L   | T    | T    |
| Maximum Queue (ft)    | 225 | 547 | 23  | 38  | 275 | 2273 | 2408 |
| Average Queue (ft)    | 210 | 523 | 3   | 9   | 173 | 2241 | 2368 |
| 95th Queue (ft)       | 283 | 537 | 15  | 30  | 328 | 2310 | 2462 |
| Link Distance (ft)    |     | 504 | 347 | 347 |     | 2220 | 2220 |
| Upstream Blk Time (%) |     | 95  |     |     |     | 42   | 95   |
| Queuing Penalty (veh) |     | 0   |     |     |     | 520  | 1178 |
| Storage Bay Dist (ft) | 185 |     |     |     | 175 |      |      |
| Storage Blk Time (%)  | 8   | 97  |     |     | 4   | 26   | 66   |
| Queuing Penalty (veh) | 36  | 441 |     |     | 51  | 56   | 0    |

Intersection: 6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Queuing and Blocking Report  
Evacuation Scenario 1

08/23/2020

Intersection: 7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road

| Movement              | SB |
|-----------------------|----|
| Directions Served     | T  |
| Maximum Queue (ft)    | 5  |
| Average Queue (ft)    | 0  |
| 95th Queue (ft)       | 3  |
| Link Distance (ft)    |    |
| Upstream Blk Time (%) |    |
| Queuing Penalty (veh) |    |
| Storage Bay Dist (ft) |    |
| Storage Blk Time (%)  |    |
| Queuing Penalty (veh) |    |

Intersection: 8: Brown Avenue/Miller Drive & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Intersection: 9: First Street/Sierra Vista Way & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Intersection: 10: SR 24 WB Ramps/Laurel Drive & Deer Hill Road

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 14: Pleasant Hill Road & Acalanes Avenue

Movement SB SB B11 B11

Directions Served T T T T

Maximum Queue (ft) 167 258 387 387

Average Queue (ft) 36 209 196 337

95th Queue (ft) 119 296 420 420

Link Distance (ft) 147 147 347 347

Upstream Blk Time (%) 1 20 1 6

Queuing Penalty (veh) 9 324 13 99

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 15: Pleasant Hill Road

Movement SB SB

Directions Served T TR

Maximum Queue (ft) 11 354

Average Queue (ft) 0 191

95th Queue (ft) 8 441

Link Distance (ft) 266 266

Upstream Blk Time (%) 6

Queuing Penalty (veh) 94

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

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Intersection: 16: Pleasant Hill Road

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Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

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Intersection: 17: Pleasant Hill Road

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Movement

SB

SB

Directions Served

T

TR

Maximum Queue (ft)

14

165

Average Queue (ft)

0

75

95th Queue (ft)

10

147

Link Distance (ft)

314

314

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

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Network Summary

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Network wide Queuing Penalty: 5435

$$\text{PHF} = 1.0$$

**Evac 1 + Project** – Evacuation plus project, with trap lane, in the AM  
Peak

## Summary of All Intervals

| Run Number              | 1      | 2      | 3      | 4      | 5      | Avg    |
|-------------------------|--------|--------|--------|--------|--------|--------|
| Start Time              | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   |
| End Time                | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   |
| Total Time (min)        | 70     | 70     | 70     | 70     | 70     | 70     |
| Time Recorded (min)     | 60     | 60     | 60     | 60     | 60     | 60     |
| # of Intervals          | 2      | 2      | 2      | 2      | 2      | 2      |
| # of Recorded Intervals | 1      | 1      | 1      | 1      | 1      | 1      |
| Vehs Entered            | 2313   | 2278   | 2198   | 2250   | 2209   | 2249   |
| Vehs Exited             | 2165   | 2144   | 2089   | 2068   | 2058   | 2105   |
| Starting Vehs           | 258    | 231    | 256    | 249    | 270    | 256    |
| Ending Vehs             | 406    | 365    | 365    | 431    | 421    | 397    |
| Denied Entry Before     | 144    | 167    | 171    | 169    | 170    | 165    |
| Denied Entry After      | 2127   | 2179   | 2246   | 2233   | 2121   | 2181   |
| Travel Distance (mi)    | 1976   | 1959   | 1927   | 1894   | 1879   | 1927   |
| Travel Time (hr)        | 1489.0 | 1424.4 | 1515.3 | 1507.4 | 1458.8 | 1479.0 |
| Total Delay (hr)        | 1419.8 | 1355.7 | 1448.0 | 1441.1 | 1392.7 | 1411.4 |
| Total Stops             | 9117   | 8435   | 8871   | 8651   | 8322   | 8680   |
| Fuel Used (gal)         | 391.0  | 376.5  | 395.1  | 393.7  | 380.7  | 387.4  |

## Interval #0 Information Seeding

|                                     |      |
|-------------------------------------|------|
| Start Time                          | 6:50 |
| End Time                            | 7:00 |
| Total Time (min)                    | 10   |
| Volumes adjusted by Growth Factors. |      |
| No data recorded this interval.     |      |

## Interval #1 Information Recording

|                                     |      |
|-------------------------------------|------|
| Start Time                          | 7:00 |
| End Time                            | 8:00 |
| Total Time (min)                    | 60   |
| Volumes adjusted by Growth Factors. |      |

| Run Number           | 1      | 2      | 3      | 4      | 5      | Avg    |
|----------------------|--------|--------|--------|--------|--------|--------|
| Vehs Entered         | 2313   | 2278   | 2198   | 2250   | 2209   | 2249   |
| Vehs Exited          | 2165   | 2144   | 2089   | 2068   | 2058   | 2105   |
| Starting Vehs        | 258    | 231    | 256    | 249    | 270    | 256    |
| Ending Vehs          | 406    | 365    | 365    | 431    | 421    | 397    |
| Denied Entry Before  | 144    | 167    | 171    | 169    | 170    | 165    |
| Denied Entry After   | 2127   | 2179   | 2246   | 2233   | 2121   | 2181   |
| Travel Distance (mi) | 1976   | 1959   | 1927   | 1894   | 1879   | 1927   |
| Travel Time (hr)     | 1489.0 | 1424.4 | 1515.3 | 1507.4 | 1458.8 | 1479.0 |
| Total Delay (hr)     | 1419.8 | 1355.7 | 1448.0 | 1441.1 | 1392.7 | 1411.4 |
| Total Stops          | 9117   | 8435   | 8871   | 8651   | 8322   | 8680   |
| Fuel Used (gal)      | 391.0  | 376.5  | 395.1  | 393.7  | 380.7  | 387.4  |



### 1: Pleasant Hill Road & Rancho View Drive Performance by movement

| Movement            | EBR | SBT | All |
|---------------------|-----|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.1 | 0.1 | 0.1 |
| Total Delay (hr)    | 0.1 | 0.0 | 0.2 |
| Total Del/Veh (s)   | 3.5 | 5.8 | 3.9 |
| Stop Delay (hr)     | 0.1 | 0.0 | 0.1 |
| Stop Del/Veh (s)    | 2.8 | 4.2 | 3.0 |
| Vehicles Entered    | 133 | 23  | 156 |
| Vehicles Exited     | 133 | 23  | 156 |
| Hourly Exit Rate    | 133 | 23  | 156 |
| Input Volume        | 130 | 25  | 155 |
| % of Volume         | 102 | 92  | 101 |
| Denied Entry Before | 0   | 0   | 0   |
| Denied Entry After  | 0   | 0   | 0   |

### 2: Pleasant Hill Road & Greenvaley Drive Performance by movement

| Movement            | EBR | WBL   | SBT | All  |
|---------------------|-----|-------|-----|------|
| Denied Delay (hr)   | 0.0 | 0.0   | 0.0 | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0   | 0.0 | 0.0  |
| Total Delay (hr)    | 0.0 | 13.6  | 0.2 | 13.9 |
| Total Del/Veh (s)   | 2.7 | 101.7 | 5.2 | 73.8 |
| Stop Delay (hr)     | 0.0 | 12.5  | 0.2 | 12.7 |
| Stop Del/Veh (s)    | 3.0 | 93.2  | 3.6 | 67.3 |
| Vehicles Entered    | 39  | 469   | 156 | 664  |
| Vehicles Exited     | 38  | 463   | 156 | 657  |
| Hourly Exit Rate    | 38  | 463   | 156 | 657  |
| Input Volume        | 42  | 478   | 155 | 675  |
| % of Volume         | 90  | 97    | 101 | 97   |
| Denied Entry Before | 0   | 0     | 0   | 0    |
| Denied Entry After  | 0   | 0     | 0   | 0    |

### 3: Pleasant Hill Road & Reliez Valle Road Performance by movement

| Movement            | EBR   | SBT  | All   |
|---------------------|-------|------|-------|
| Denied Delay (hr)   | 183.4 | 0.0  | 183.4 |
| Denied Del/Veh (s)  | 578.6 | 0.0  | 367.2 |
| Total Delay (hr)    | 14.4  | 4.6  | 19.0  |
| Total Del/Veh (s)   | 72.8  | 24.8 | 49.4  |
| Stop Delay (hr)     | 12.4  | 3.6  | 15.9  |
| Stop Del/Veh (s)    | 62.7  | 19.0 | 41.5  |
| Vehicles Entered    | 698   | 657  | 1355  |
| Vehicles Exited     | 692   | 658  | 1350  |
| Hourly Exit Rate    | 692   | 658  | 1350  |
| Input Volume        | 1124  | 675  | 1799  |
| % of Volume         | 62    | 97   | 75    |
| Denied Entry Before | 8     | 0    | 8     |
| Denied Entry After  | 443   | 0    | 443   |

### 4: Pleasant Hill Road & Springhill Road/Quandt Road Performance by movement

| Movement            | EBR    | WBL  | WBT  | NBL  | SBT  | SBR  | All   |
|---------------------|--------|------|------|------|------|------|-------|
| Denied Delay (hr)   | 277.0  | 0.8  | 0.1  | 0.0  | 0.0  | 0.0  | 278.0 |
| Denied Del/Veh (s)  | 1445.2 | 13.3 | 15.6 | 0.0  | 0.0  | 0.0  | 434.5 |
| Total Delay (hr)    | 9.2    | 5.0  | 0.8  | 0.1  | 21.5 | 1.9  | 38.4  |
| Total Del/Veh (s)   | 221.2  | 78.3 | 84.8 | 80.9 | 62.7 | 52.3 | 77.8  |
| Stop Delay (hr)     | 9.4    | 4.7  | 0.8  | 0.1  | 19.1 | 1.8  | 35.9  |
| Stop Del/Veh (s)    | 226.4  | 74.7 | 80.3 | 80.3 | 55.8 | 49.2 | 72.6  |
| Vehicles Entered    | 141    | 226  | 34   | 4    | 1220 | 129  | 1754  |
| Vehicles Exited     | 141    | 225  | 33   | 4    | 1196 | 127  | 1726  |
| Hourly Exit Rate    | 141    | 225  | 33   | 4    | 1196 | 127  | 1726  |
| Input Volume        | 643    | 223  | 34   | 4    | 1626 | 173  | 2703  |
| % of Volume         | 22     | 101  | 97   | 100  | 74   | 73   | 64    |
| Denied Entry Before | 40     | 0    | 0    | 0    | 0    | 0    | 40    |
| Denied Entry After  | 549    | 0    | 0    | 0    | 0    | 0    | 549   |

5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard Performance by movement

| Movement            | WBL    | NBT  | NBR | SBL  | SBT  | All   |
|---------------------|--------|------|-----|------|------|-------|
| Denied Delay (hr)   | 429.5  | 0.0  | 0.0 | 0.0  | 0.0  | 429.5 |
| Denied Del/Veh (s)  | 1546.1 | 0.0  | 0.0 | 0.0  | 0.0  | 619.4 |
| Total Delay (hr)    | 22.1   | 0.0  | 0.0 | 3.5  | 24.5 | 50.2  |
| Total Del/Veh (s)   | 326.7  | 19.3 | 3.6 | 95.9 | 64.4 | 101.8 |
| Stop Delay (hr)     | 21.8   | 0.0  | 0.0 | 3.3  | 21.3 | 46.4  |
| Stop Del/Veh (s)    | 323.3  | 17.4 | 3.8 | 89.6 | 55.8 | 94.2  |
| Vehicles Entered    | 218    | 4    | 22  | 129  | 1341 | 1714  |
| Vehicles Exited     | 218    | 4    | 22  | 131  | 1342 | 1717  |
| Hourly Exit Rate    | 218    | 4    | 22  | 131  | 1342 | 1717  |
| Input Volume        | 909    | 4    | 22  | 218  | 2274 | 3427  |
| % of Volume         | 24     | 100  | 100 | 60   | 59   | 50    |
| Denied Entry Before | 82     | 0    | 0   | 0    | 0    | 82    |
| Denied Entry After  | 782    | 0    | 0   | 0    | 0    | 782   |

6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp Performance by movement

| Movement            | SBR | All |
|---------------------|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.0 | 0.0 |
| Total Delay (hr)    | 0.0 | 0.0 |
| Total Del/Veh (s)   | 5.8 | 5.8 |
| Stop Delay (hr)     | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.0 | 0.0 |
| Vehicles Entered    | 7   | 7   |
| Vehicles Exited     | 7   | 7   |
| Hourly Exit Rate    | 7   | 7   |
| Input Volume        | 26  | 26  |
| % of Volume         | 27  | 27  |
| Denied Entry Before | 0   | 0   |
| Denied Entry After  | 0   | 0   |

7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road Performance by movement

| Movement            | SBT | All |
|---------------------|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.1 | 0.1 |
| Total Delay (hr)    | 0.0 | 0.0 |
| Total Del/Veh (s)   | 1.9 | 1.9 |
| Stop Delay (hr)     | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.3 | 0.3 |
| Vehicles Entered    | 31  | 31  |
| Vehicles Exited     | 31  | 31  |
| Hourly Exit Rate    | 31  | 31  |
| Input Volume        | 26  | 26  |
| % of Volume         | 119 | 119 |
| Denied Entry Before | 0   | 0   |
| Denied Entry After  | 0   | 0   |

11: Pleasant Hill Road & Project Dwy Performance by movement

| Movement            | EBR    | NBT | SBT  | All   |
|---------------------|--------|-----|------|-------|
| Denied Delay (hr)   | 205.8  | 0.0 | 0.0  | 205.8 |
| Denied Del/Veh (s)  | 1266.7 | 0.0 | 0.0  | 341.3 |
| Total Delay (hr)    | 7.0    | 0.0 | 14.4 | 21.3  |
| Total Del/Veh (s)   | 115.4  | 0.0 | 32.9 | 42.3  |
| Stop Delay (hr)     | 7.4    | 0.0 | 11.8 | 19.2  |
| Stop Del/Veh (s)    | 123.2  | 0.0 | 27.0 | 38.1  |
| Vehicles Entered    | 211    | 26  | 1560 | 1797  |
| Vehicles Exited     | 210    | 26  | 1556 | 1792  |
| Hourly Exit Rate    | 210    | 26  | 1556 | 1792  |
| Input Volume        | 551    | 26  | 3183 | 3760  |
| % of Volume         | 38     | 100 | 49   | 48    |
| Denied Entry Before | 31     | 0   | 0    | 31    |
| Denied Entry After  | 374    | 0   | 0    | 374   |

#### 14: Pleasant Hill Road & Acalanes Avenue Performance by movement

| Movement            | NBT | SBT  | All  |
|---------------------|-----|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0 | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 8.6  | 8.6  |
| Total Del/Veh (s)   | 0.2 | 17.6 | 17.3 |
| Stop Delay (hr)     | 0.0 | 8.4  | 8.4  |
| Stop Del/Veh (s)    | 0.0 | 17.2 | 16.9 |
| Vehicles Entered    | 26  | 1766 | 1792 |
| Vehicles Exited     | 26  | 1758 | 1784 |
| Hourly Exit Rate    | 26  | 1758 | 1784 |
| Input Volume        | 26  | 3734 | 3760 |
| % of Volume         | 100 | 47   | 47   |
| Denied Entry Before | 0   | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    |

#### 15: Pleasant Hill Road Performance by movement

| Movement            | WBR | SBT  | SBR  | All  |
|---------------------|-----|------|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0  | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 10.7 | 1.6  | 12.3 |
| Total Del/Veh (s)   | 0.6 | 42.8 | 6.6  | 24.6 |
| Stop Delay (hr)     | 0.0 | 12.0 | 0.2  | 12.2 |
| Stop Del/Veh (s)    | 0.0 | 48.3 | 0.8  | 24.5 |
| Vehicles Entered    | 26  | 889  | 869  | 1784 |
| Vehicles Exited     | 26  | 882  | 870  | 1778 |
| Hourly Exit Rate    | 26  | 882  | 870  | 1778 |
| Input Volume        | 26  | 1880 | 1854 | 3760 |
| % of Volume         | 100 | 47   | 47   | 47   |
| Denied Entry Before | 0   | 0    | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    | 0    |

### 16: Pleasant Hill Road Performance by movement

| Movement            | SBT  | All  |
|---------------------|------|------|
| Denied Delay (hr)   | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0  | 0.0  |
| Total Delay (hr)    | 16.6 | 16.6 |
| Total Del/Veh (s)   | 66.3 | 66.3 |
| Stop Delay (hr)     | 18.9 | 18.9 |
| Stop Del/Veh (s)    | 75.5 | 75.5 |
| Vehicles Entered    | 882  | 882  |
| Vehicles Exited     | 882  | 882  |
| Hourly Exit Rate    | 882  | 882  |
| Input Volume        | 1880 | 1880 |
| % of Volume         | 47   | 47   |
| Denied Entry Before | 0    | 0    |
| Denied Entry After  | 0    | 0    |

### 17: Pleasant Hill Road Performance by movement

| Movement            | SBT   | SBR  | All  |
|---------------------|-------|------|------|
| Denied Delay (hr)   | 0.2   | 14.9 | 15.2 |
| Denied Del/Veh (s)  | 106.7 | 59.3 | 59.7 |
| Total Delay (hr)    | 0.1   | 15.0 | 15.1 |
| Total Del/Veh (s)   | 59.2  | 60.5 | 60.4 |
| Stop Delay (hr)     | 0.1   | 17.5 | 17.6 |
| Stop Del/Veh (s)    | 63.0  | 70.6 | 70.5 |
| Vehicles Entered    | 7     | 876  | 883  |
| Vehicles Exited     | 7     | 875  | 882  |
| Hourly Exit Rate    | 7     | 875  | 882  |
| Input Volume        | 26    | 1880 | 1906 |
| % of Volume         | 27    | 47   | 46   |
| Denied Entry Before | 0     | 2    | 2    |
| Denied Entry After  | 1     | 30   | 31   |

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Total Network Performance

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|                     |        |
|---------------------|--------|
| Denied Delay (hr)   | 1113.6 |
| Denied Del/Veh (s)  | 905.0  |
| Total Delay (hr)    | 297.8  |
| Total Del/Veh (s)   | 428.5  |
| Stop Delay (hr)     | 274.0  |
| Stop Del/Veh (s)    | 394.3  |
| Vehicles Entered    | 2249   |
| Vehicles Exited     | 2105   |
| Hourly Exit Rate    | 2105   |
| Input Volume        | 33042  |
| % of Volume         | 6      |
| Denied Entry Before | 165    |
| Denied Entry After  | 2181   |

Arterial Level of Service: NB Pleasant Hill Road

| Cross Street      | Node | Delay<br>(s/veh) | Travel<br>time (s) | Dist<br>(mi) | Arterial<br>Speed |
|-------------------|------|------------------|--------------------|--------------|-------------------|
| Acalanes Avenue   | 14   | 0.2              | 20.2               | 0.1          | 11                |
| Project Dwy       | 11   | 0.0              | 4.1                | 0.0          | 33                |
| Stanley Boulevard | 5    | 19.3             | 27.1               | 0.1          | 10                |
|                   | 37   | 1.8              | 9.7                | 0.1          | 31                |
| Quandt Road       | 4    | 80.9             | 116.6              | 0.4          | 11                |
| Total             |      | 102.1            | 177.8              | 0.6          | 13                |

Arterial Level of Service: SB Pleasant Hill Road

| Cross Street         | Node | Delay<br>(s/veh) | Travel<br>time (s) | Dist<br>(mi) | Arterial<br>Speed |
|----------------------|------|------------------|--------------------|--------------|-------------------|
| Rancho View Drive    | 1    | 5.8              | 21.2               | 0.2          | 26                |
|                      | 19   | 1.0              | 16.4               | 0.1          | 33                |
| Greenvalley Drive    | 2    | 5.2              | 12.0               | 0.1          | 21                |
| Reliez Valle Road    | 3    | 20.2             | 43.9               | 0.3          | 21                |
|                      | 20   | 11.5             | 15.1               | 0.0          | 8                 |
| Springhill Road      | 4    | 62.7             | 72.2               | 0.1          | 5                 |
|                      | 37   | 196.3            | 231.5              | 0.4          | 6                 |
| Deer Hill Road       | 5    | 64.4             | 72.3               | 0.1          | 4                 |
| Project Dwy          | 11   | 33.0             | 41.4               | 0.1          | 7                 |
| Acalanes Avenue      | 14   | 18.2             | 22.3               | 0.0          | 6                 |
|                      | 15   | 42.8             | 48.9               | 0.1          | 5                 |
|                      | 16   | 66.3             | 75.6               | 0.1          | 5                 |
|                      | 17   | 59.2             | 189.6              | 0.1          | 4                 |
| Mt. Diablo Boulevard | 6    | 5.8              | 13.5               | 0.1          | 18                |
| SR 24 EB Off Ramp    | 7    | 1.9              | 4.7                | 0.1          | 48                |
| Total                |      | 594.2            | 880.6              | 1.7          | 8                 |



Queuing and Blocking Report  
Evacuation Scenario 1 plus Project

08/23/2020

Intersection: 1: Pleasant Hill Road & Rancho View Drive

| Movement              | EB  | SB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | LTR | T   | TR  |
| Maximum Queue (ft)    | 76  | 46  | 16  |
| Average Queue (ft)    | 39  | 7   | 1   |
| 95th Queue (ft)       | 64  | 28  | 7   |
| Link Distance (ft)    | 306 | 773 | 773 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

Intersection: 2: Pleasant Hill Road & Greenvalley Drive

| Movement              | EB  | WB  | B60 | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|
| Directions Served     | LTR | LT  | T   | T   | TR  |
| Maximum Queue (ft)    | 34  | 585 | 84  | 47  | 61  |
| Average Queue (ft)    | 10  | 446 | 27  | 10  | 23  |
| 95th Queue (ft)       | 26  | 659 | 87  | 31  | 52  |
| Link Distance (ft)    | 333 | 494 | 53  | 288 | 288 |
| Upstream Blk Time (%) |     | 32  | 26  |     |     |
| Queuing Penalty (veh) |     | 0   | 0   |     |     |
| Storage Bay Dist (ft) |     |     |     |     |     |
| Storage Blk Time (%)  |     | 70  |     | 0   |     |
| Queuing Penalty (veh) |     | 0   |     | 0   |     |

Intersection: 3: Pleasant Hill Road & Reliez Valle Road

| Movement              | EB  | EB  | SB   | SB   |
|-----------------------|-----|-----|------|------|
| Directions Served     | L   | R   | T    | T    |
| Maximum Queue (ft)    | 467 | 487 | 270  | 294  |
| Average Queue (ft)    | 281 | 459 | 147  | 161  |
| 95th Queue (ft)       | 634 | 478 | 215  | 228  |
| Link Distance (ft)    | 438 | 438 | 1259 | 1259 |
| Upstream Blk Time (%) | 17  | 80  |      |      |
| Queuing Penalty (veh) | 0   | 0   |      |      |
| Storage Bay Dist (ft) |     |     |      |      |
| Storage Blk Time (%)  |     |     |      | 20   |
| Queuing Penalty (veh) |     |     |      | 0    |

Queuing and Blocking Report  
Evacuation Scenario 1 plus Project

08/23/2020

Intersection: 4: Pleasant Hill Road & Springhill Road/Quandt Road

| Movement              | EB  | WB  | NB  | SB  | SB  | SB  | B20 | B20 |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | L   | T   | T   | R   | T   | T   |
| Maximum Queue (ft)    | 368 | 258 | 15  | 506 | 515 | 96  | 212 | 229 |
| Average Queue (ft)    | 336 | 211 | 2   | 375 | 383 | 62  | 94  | 130 |
| 95th Queue (ft)       | 353 | 278 | 10  | 632 | 651 | 137 | 222 | 278 |
| Link Distance (ft)    | 318 | 217 |     | 406 | 406 |     | 127 | 127 |
| Upstream Blk Time (%) | 100 | 32  |     | 37  | 51  |     | 8   | 41  |
| Queuing Penalty (veh) | 0   | 0   |     | 337 | 458 |     | 69  | 371 |
| Storage Bay Dist (ft) |     |     | 200 |     |     | 71  |     |     |
| Storage Blk Time (%)  |     |     |     | 56  | 57  | 0   |     |     |
| Queuing Penalty (veh) |     |     |     | 0   | 98  | 2   |     |     |

Intersection: 5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard

| Movement              | WB  | WB  | NB  | NB  | SB  | SB  | SB  | SB  | B37  | B37  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
| Directions Served     | L   | LT  | T   | R   | L   | T   | T   | T   | T    | T    |
| Maximum Queue (ft)    | 225 | 550 | 22  | 43  | 275 | 442 | 447 | 441 | 1884 | 2009 |
| Average Queue (ft)    | 108 | 522 | 2   | 8   | 174 | 366 | 392 | 410 | 1590 | 1711 |
| 95th Queue (ft)       | 271 | 536 | 13  | 29  | 316 | 523 | 454 | 467 | 2522 | 2656 |
| Link Distance (ft)    |     | 504 | 342 | 342 |     | 351 | 351 | 351 | 1832 | 1832 |
| Upstream Blk Time (%) |     | 96  |     |     |     | 23  | 33  | 41  | 21   | 76   |
| Queuing Penalty (veh) |     | 0   |     |     |     | 193 | 278 | 337 | 260  | 943  |
| Storage Bay Dist (ft) | 185 |     |     |     | 175 |     |     |     |      |      |
| Storage Blk Time (%)  |     | 92  |     |     | 9   | 4   |     | 60  |      |      |
| Queuing Penalty (veh) |     | 418 |     |     | 69  | 9   |     | 0   |      |      |

Intersection: 6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Intersection: 7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road

| Movement              | SB |
|-----------------------|----|
| Directions Served     | T  |
| Maximum Queue (ft)    | 5  |
| Average Queue (ft)    | 0  |
| 95th Queue (ft)       | 4  |
| Link Distance (ft)    |    |
| Upstream Blk Time (%) |    |
| Queuing Penalty (veh) |    |
| Storage Bay Dist (ft) |    |
| Storage Blk Time (%)  |    |
| Queuing Penalty (veh) |    |

Intersection: 8: Brown Avenue/Miller Drive & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Intersection: 9: First Street/Sierra Vista Way & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Intersection: 10: SR 24 WB Ramps/Laurel Drive & Deer Hill Road

Movement

Directions Served  
Maximum Queue (ft)  
Average Queue (ft)  
95th Queue (ft)  
Link Distance (ft)  
Upstream Blk Time (%)  
Queuing Penalty (veh)  
Storage Bay Dist (ft)  
Storage Blk Time (%)  
Queuing Penalty (veh)

Intersection: 11: Pleasant Hill Road & Project Dwy

| Movement              | EB  | SB  | SB  | SB  |
|-----------------------|-----|-----|-----|-----|
| Directions Served     | R   | T   | T   | TR  |
| Maximum Queue (ft)    | 218 | 395 | 389 | 391 |
| Average Queue (ft)    | 184 | 156 | 346 | 337 |
| 95th Queue (ft)       | 201 | 366 | 416 | 447 |
| Link Distance (ft)    | 164 | 342 | 342 | 342 |
| Upstream Blk Time (%) | 100 | 2   | 15  | 10  |
| Queuing Penalty (veh) | 0   | 17  | 158 | 109 |
| Storage Bay Dist (ft) |     |     |     |     |
| Storage Blk Time (%)  |     |     |     |     |
| Queuing Penalty (veh) |     |     |     |     |

Intersection: 12: Project Dwy NE & Deer Hill Road

Movement

Directions Served  
Maximum Queue (ft)  
Average Queue (ft)  
95th Queue (ft)  
Link Distance (ft)  
Upstream Blk Time (%)  
Queuing Penalty (veh)  
Storage Bay Dist (ft)  
Storage Blk Time (%)  
Queuing Penalty (veh)

Intersection: 13: Project Dwy SW & Deer Hill Road

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 14: Pleasant Hill Road & Acalanes Avenue

| Movement              | SB  | SB   | SB  |
|-----------------------|-----|------|-----|
| Directions Served     | T   | T    | T   |
| Maximum Queue (ft)    | 164 | 267  | 237 |
| Average Queue (ft)    | 36  | 237  | 184 |
| 95th Queue (ft)       | 122 | 258  | 270 |
| Link Distance (ft)    | 152 | 152  | 152 |
| Upstream Blk Time (%) | 1   | 97   | 11  |
| Queuing Penalty (veh) | 12  | 1208 | 140 |
| Storage Bay Dist (ft) |     |      |     |
| Storage Blk Time (%)  |     |      |     |
| Queuing Penalty (veh) |     |      |     |

Intersection: 15: Pleasant Hill Road

| Movement              | SB  | SB   | SB  |
|-----------------------|-----|------|-----|
| Directions Served     | T   | T    | R   |
| Maximum Queue (ft)    | 56  | 370  | 283 |
| Average Queue (ft)    | 11  | 341  | 106 |
| 95th Queue (ft)       | 47  | 363  | 244 |
| Link Distance (ft)    | 262 | 262  | 262 |
| Upstream Blk Time (%) |     | 99   | 0   |
| Queuing Penalty (veh) |     | 1230 | 5   |
| Storage Bay Dist (ft) |     |      |     |
| Storage Blk Time (%)  |     |      |     |
| Queuing Penalty (veh) |     |      |     |

Intersection: 16: Pleasant Hill Road

| Movement              | SB  |
|-----------------------|-----|
| Directions Served     | T   |
| Maximum Queue (ft)    | 542 |
| Average Queue (ft)    | 512 |
| 95th Queue (ft)       | 534 |
| Link Distance (ft)    | 302 |
| Upstream Blk Time (%) | 100 |
| Queuing Penalty (veh) | 939 |
| Storage Bay Dist (ft) |     |
| Storage Blk Time (%)  |     |
| Queuing Penalty (veh) |     |

Intersection: 17: Pleasant Hill Road

| Movement              | SB  | SB  |
|-----------------------|-----|-----|
| Directions Served     | T   | TR  |
| Maximum Queue (ft)    | 188 | 535 |
| Average Queue (ft)    | 15  | 505 |
| 95th Queue (ft)       | 123 | 526 |
| Link Distance (ft)    | 314 | 314 |
| Upstream Blk Time (%) | 0   | 99  |
| Queuing Penalty (veh) | 0   | 622 |
| Storage Bay Dist (ft) |     |     |
| Storage Blk Time (%)  |     |     |
| Queuing Penalty (veh) |     |     |

Network Summary

|                                    |
|------------------------------------|
| Network wide Queuing Penalty: 8283 |
|------------------------------------|

PHF = 1.0

**Evac 1 + Project Variant**– Evacuation plus project, no trap lane, in the  
AM Peak

SimTraffic Simulation Summary  
Evacuation Scenario 1 plus Project Variant

08/23/2020

Summary of All Intervals

| Run Number              | 1      | 2      | 3      | 4      | 5      | Avg    |
|-------------------------|--------|--------|--------|--------|--------|--------|
| Start Time              | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   |
| End Time                | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   |
| Total Time (min)        | 70     | 70     | 70     | 70     | 70     | 70     |
| Time Recorded (min)     | 60     | 60     | 60     | 60     | 60     | 60     |
| # of Intervals          | 2      | 2      | 2      | 2      | 2      | 2      |
| # of Recorded Intervals | 1      | 1      | 1      | 1      | 1      | 1      |
| Vehs Entered            | 1718   | 1770   | 1818   | 1793   | 1804   | 1781   |
| Vehs Exited             | 1667   | 1680   | 1753   | 1687   | 1699   | 1696   |
| Starting Vehs           | 332    | 280    | 318    | 278    | 287    | 299    |
| Ending Vehs             | 383    | 370    | 383    | 384    | 392    | 380    |
| Denied Entry Before     | 188    | 149    | 166    | 161    | 143    | 161    |
| Denied Entry After      | 2724   | 2604   | 2474   | 2543   | 2560   | 2582   |
| Travel Distance (mi)    | 1573   | 1588   | 1620   | 1618   | 1608   | 1601   |
| Travel Time (hr)        | 1799.8 | 1669.5 | 1677.1 | 1653.3 | 1680.2 | 1696.0 |
| Total Delay (hr)        | 1745.0 | 1614.2 | 1620.7 | 1597.2 | 1624.2 | 1640.3 |
| Total Stops             | 6005   | 6096   | 6145   | 6278   | 6138   | 6134   |
| Fuel Used (gal)         | 447.6  | 420.7  | 423.1  | 417.9  | 422.6  | 426.4  |

Interval #0 Information Seeding

|                                     |      |
|-------------------------------------|------|
| Start Time                          | 6:50 |
| End Time                            | 7:00 |
| Total Time (min)                    | 10   |
| Volumes adjusted by Growth Factors. |      |
| No data recorded this interval.     |      |

Interval #1 Information Recording

|                                     |      |
|-------------------------------------|------|
| Start Time                          | 7:00 |
| End Time                            | 8:00 |
| Total Time (min)                    | 60   |
| Volumes adjusted by Growth Factors. |      |

| Run Number           | 1      | 2      | 3      | 4      | 5      | Avg    |
|----------------------|--------|--------|--------|--------|--------|--------|
| Vehs Entered         | 1718   | 1770   | 1818   | 1793   | 1804   | 1781   |
| Vehs Exited          | 1667   | 1680   | 1753   | 1687   | 1699   | 1696   |
| Starting Vehs        | 332    | 280    | 318    | 278    | 287    | 299    |
| Ending Vehs          | 383    | 370    | 383    | 384    | 392    | 380    |
| Denied Entry Before  | 188    | 149    | 166    | 161    | 143    | 161    |
| Denied Entry After   | 2724   | 2604   | 2474   | 2543   | 2560   | 2582   |
| Travel Distance (mi) | 1573   | 1588   | 1620   | 1618   | 1608   | 1601   |
| Travel Time (hr)     | 1799.8 | 1669.5 | 1677.1 | 1653.3 | 1680.2 | 1696.0 |
| Total Delay (hr)     | 1745.0 | 1614.2 | 1620.7 | 1597.2 | 1624.2 | 1640.3 |
| Total Stops          | 6005   | 6096   | 6145   | 6278   | 6138   | 6134   |
| Fuel Used (gal)      | 447.6  | 420.7  | 423.1  | 417.9  | 422.6  | 426.4  |



1: Pleasant Hill Road & Rancho View Drive Performance by movement

| Movement            | EBR | SBT | All |
|---------------------|-----|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.2 | 0.1 | 0.2 |
| Total Delay (hr)    | 0.1 | 0.0 | 0.2 |
| Total Del/Veh (s)   | 3.5 | 6.8 | 4.0 |
| Stop Delay (hr)     | 0.1 | 0.0 | 0.1 |
| Stop Del/Veh (s)    | 2.7 | 5.1 | 3.1 |
| Vehicles Entered    | 135 | 26  | 161 |
| Vehicles Exited     | 135 | 26  | 161 |
| Hourly Exit Rate    | 135 | 26  | 161 |
| Input Volume        | 130 | 25  | 155 |
| % of Volume         | 104 | 104 | 104 |
| Denied Entry Before | 0   | 0   | 0   |
| Denied Entry After  | 0   | 0   | 0   |

2: Pleasant Hill Road & Greenvaley Drive Performance by movement

| Movement            | EBR | WBL  | SBT | All  |
|---------------------|-----|------|-----|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0 | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0  | 0.0 | 0.0  |
| Total Delay (hr)    | 0.0 | 10.7 | 0.2 | 11.0 |
| Total Del/Veh (s)   | 3.2 | 82.0 | 5.0 | 58.4 |
| Stop Delay (hr)     | 0.0 | 9.6  | 0.2 | 9.8  |
| Stop Del/Veh (s)    | 3.4 | 73.3 | 3.4 | 52.0 |
| Vehicles Entered    | 45  | 457  | 160 | 662  |
| Vehicles Exited     | 45  | 454  | 159 | 658  |
| Hourly Exit Rate    | 45  | 454  | 159 | 658  |
| Input Volume        | 42  | 478  | 155 | 675  |
| % of Volume         | 107 | 95   | 103 | 97   |
| Denied Entry Before | 0   | 0    | 0   | 0    |
| Denied Entry After  | 0   | 0    | 0   | 0    |

### 3: Pleasant Hill Road & Reliez Valle Road Performance by movement

| Movement            | EBR    | SBT  | All   |
|---------------------|--------|------|-------|
| Denied Delay (hr)   | 366.7  | 0.0  | 366.7 |
| Denied Del/Veh (s)  | 1156.1 | 0.0  | 733.9 |
| Total Delay (hr)    | 17.0   | 7.7  | 24.7  |
| Total Del/Veh (s)   | 170.9  | 41.0 | 86.2  |
| Stop Delay (hr)     | 17.1   | 6.4  | 23.4  |
| Stop Del/Veh (s)    | 171.0  | 34.2 | 81.8  |
| Vehicles Entered    | 348    | 657  | 1005  |
| Vehicles Exited     | 340    | 655  | 995   |
| Hourly Exit Rate    | 340    | 655  | 995   |
| Input Volume        | 1124   | 675  | 1799  |
| % of Volume         | 30     | 97   | 55    |
| Denied Entry Before | 12     | 0    | 12    |
| Denied Entry After  | 794    | 0    | 794   |

### 4: Pleasant Hill Road & Springhill Road/Quandt Road Performance by movement

| Movement            | EBR    | WBL   | WBT   | NBL  | SBT   | SBR   | All   |
|---------------------|--------|-------|-------|------|-------|-------|-------|
| Denied Delay (hr)   | 232.9  | 5.0   | 0.9   | 0.0  | 0.0   | 0.0   | 238.9 |
| Denied Del/Veh (s)  | 1302.1 | 78.2  | 89.6  | 0.0  | 0.0   | 0.0   | 450.7 |
| Total Delay (hr)    | 9.8    | 6.7   | 1.2   | 0.1  | 32.7  | 3.0   | 53.4  |
| Total Del/Veh (s)   | 181.3  | 106.8 | 120.8 | 81.7 | 129.3 | 109.9 | 131.2 |
| Stop Delay (hr)     | 10.2   | 6.5   | 1.1   | 0.1  | 32.9  | 3.0   | 53.8  |
| Stop Del/Veh (s)    | 187.4  | 103.4 | 116.2 | 79.8 | 130.5 | 111.8 | 132.2 |
| Vehicles Entered    | 186    | 223   | 35    | 5    | 894   | 97    | 1440  |
| Vehicles Exited     | 185    | 220   | 35    | 5    | 869   | 93    | 1407  |
| Hourly Exit Rate    | 185    | 220   | 35    | 5    | 869   | 93    | 1407  |
| Input Volume        | 643    | 223   | 34    | 4    | 1626  | 173   | 2703  |
| % of Volume         | 29     | 99    | 103   | 125  | 53    | 54    | 52    |
| Denied Entry Before | 15     | 0     | 0     | 0    | 0     | 0     | 15    |
| Denied Entry After  | 458    | 9     | 1     | 0    | 0     | 0     | 468   |

5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard Performance by movement

| Movement            | WBL    | NBT  | NBR | SBL   | SBT   | All   |
|---------------------|--------|------|-----|-------|-------|-------|
| Denied Delay (hr)   | 392.5  | 0.0  | 0.0 | 0.0   | 0.0   | 392.5 |
| Denied Del/Veh (s)  | 1474.8 | 0.0  | 0.0 | 0.0   | 0.0   | 625.7 |
| Total Delay (hr)    | 24.1   | 0.0  | 0.0 | 13.2  | 142.1 | 179.4 |
| Total Del/Veh (s)   | 329.5  | 21.8 | 2.9 | 374.4 | 394.4 | 377.1 |
| Stop Delay (hr)     | 23.9   | 0.0  | 0.0 | 12.5  | 139.4 | 175.8 |
| Stop Del/Veh (s)    | 327.1  | 19.9 | 3.0 | 354.8 | 386.9 | 369.6 |
| Vehicles Entered    | 238    | 5    | 21  | 115   | 1159  | 1538  |
| Vehicles Exited     | 235    | 5    | 21  | 113   | 1132  | 1506  |
| Hourly Exit Rate    | 235    | 5    | 21  | 113   | 1132  | 1506  |
| Input Volume        | 909    | 4    | 22  | 218   | 2274  | 3427  |
| % of Volume         | 26     | 125  | 95  | 52    | 50    | 44    |
| Denied Entry Before | 69     | 0    | 0   | 0     | 0     | 69    |
| Denied Entry After  | 720    | 0    | 0   | 0     | 0     | 720   |

6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp Performance by movement

| Movement            | SBR | All |
|---------------------|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.0 | 0.0 |
| Total Delay (hr)    | 0.0 | 0.0 |
| Total Del/Veh (s)   | 4.9 | 4.9 |
| Stop Delay (hr)     | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.0 | 0.0 |
| Vehicles Entered    | 8   | 8   |
| Vehicles Exited     | 8   | 8   |
| Hourly Exit Rate    | 8   | 8   |
| Input Volume        | 26  | 26  |
| % of Volume         | 31  | 31  |
| Denied Entry Before | 0   | 0   |
| Denied Entry After  | 0   | 0   |

7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road Performance by movement

| Movement            | SBT | All |
|---------------------|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.1 | 0.1 |
| Total Delay (hr)    | 0.0 | 0.0 |
| Total Del/Veh (s)   | 1.7 | 1.7 |
| Stop Delay (hr)     | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.0 | 0.0 |
| Vehicles Entered    | 23  | 23  |
| Vehicles Exited     | 23  | 23  |
| Hourly Exit Rate    | 23  | 23  |
| Input Volume        | 26  | 26  |
| % of Volume         | 88  | 88  |
| Denied Entry Before | 0   | 0   |
| Denied Entry After  | 0   | 0   |

11: Pleasant Hill Road & Project Dwy Performance by movement

| Movement            | EBR    | NBT | SBT  | All   |
|---------------------|--------|-----|------|-------|
| Denied Delay (hr)   | 333.1  | 0.0 | 0.0  | 333.1 |
| Denied Del/Veh (s)  | 1956.2 | 0.0 | 0.0  | 598.1 |
| Total Delay (hr)    | 8.0    | 0.0 | 8.0  | 16.1  |
| Total Del/Veh (s)   | 1374.8 | 0.0 | 21.0 | 40.7  |
| Stop Delay (hr)     | 8.1    | 0.0 | 4.5  | 12.5  |
| Stop Del/Veh (s)    | 1380.2 | 0.0 | 11.7 | 31.7  |
| Vehicles Entered    | 13     | 25  | 1367 | 1405  |
| Vehicles Exited     | 13     | 25  | 1368 | 1406  |
| Hourly Exit Rate    | 13     | 25  | 1368 | 1406  |
| Input Volume        | 551    | 26  | 3183 | 3760  |
| % of Volume         | 2      | 96  | 43   | 37    |
| Denied Entry Before | 65     | 0   | 0    | 65    |
| Denied Entry After  | 600    | 0   | 0    | 600   |

#### 14: Pleasant Hill Road & Acalanes Avenue Performance by movement

| Movement            | NBT | SBT  | All  |
|---------------------|-----|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0 | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 4.7  | 4.7  |
| Total Del/Veh (s)   | 0.2 | 12.3 | 12.1 |
| Stop Delay (hr)     | 0.0 | 1.6  | 1.6  |
| Stop Del/Veh (s)    | 0.0 | 4.0  | 4.0  |
| Vehicles Entered    | 25  | 1381 | 1406 |
| Vehicles Exited     | 25  | 1382 | 1407 |
| Hourly Exit Rate    | 25  | 1382 | 1407 |
| Input Volume        | 26  | 3734 | 3760 |
| % of Volume         | 96  | 37   | 37   |
| Denied Entry Before | 0   | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    |

#### 15: Pleasant Hill Road Performance by movement

| Movement            | WBR | SBT  | SBR  | All  |
|---------------------|-----|------|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0  | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 3.7  | 2.9  | 6.6  |
| Total Del/Veh (s)   | 0.6 | 19.0 | 15.3 | 16.8 |
| Stop Delay (hr)     | 0.0 | 0.4  | 0.4  | 0.8  |
| Stop Del/Veh (s)    | 0.0 | 2.1  | 2.1  | 2.1  |
| Vehicles Entered    | 25  | 694  | 688  | 1407 |
| Vehicles Exited     | 25  | 697  | 686  | 1408 |
| Hourly Exit Rate    | 25  | 697  | 686  | 1408 |
| Input Volume        | 26  | 1880 | 1854 | 3760 |
| % of Volume         | 96  | 37   | 37   | 37   |
| Denied Entry Before | 0   | 0    | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    | 0    |

#### 16: Pleasant Hill Road Performance by movement

| Movement            | SBT  | All  |
|---------------------|------|------|
| Denied Delay (hr)   | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0  | 0.0  |
| Total Delay (hr)    | 1.3  | 1.3  |
| Total Del/Veh (s)   | 6.6  | 6.6  |
| Stop Delay (hr)     | 0.0  | 0.0  |
| Stop Del/Veh (s)    | 0.0  | 0.0  |
| Vehicles Entered    | 697  | 697  |
| Vehicles Exited     | 697  | 697  |
| Hourly Exit Rate    | 697  | 697  |
| Input Volume        | 1880 | 1880 |
| % of Volume         | 37   | 37   |
| Denied Entry Before | 0    | 0    |
| Denied Entry After  | 0    | 0    |

#### 17: Pleasant Hill Road Performance by movement

| Movement            | SBT | SBR  | All  |
|---------------------|-----|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0 | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 1.0  | 1.0  |
| Total Del/Veh (s)   | 7.6 | 4.8  | 4.8  |
| Stop Delay (hr)     | 0.0 | 0.3  | 0.3  |
| Stop Del/Veh (s)    | 1.2 | 1.7  | 1.7  |
| Vehicles Entered    | 8   | 716  | 724  |
| Vehicles Exited     | 8   | 714  | 722  |
| Hourly Exit Rate    | 8   | 714  | 722  |
| Input Volume        | 26  | 1880 | 1906 |
| % of Volume         | 31  | 38   | 38   |
| Denied Entry Before | 0   | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    |

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Total Network Performance

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|                     |        |
|---------------------|--------|
| Denied Delay (hr)   | 1331.4 |
| Denied Del/Veh (s)  | 1098.6 |
| Total Delay (hr)    | 308.8  |
| Total Del/Veh (s)   | 535.6  |
| Stop Delay (hr)     | 287.7  |
| Stop Del/Veh (s)    | 499.0  |
| Vehicles Entered    | 1781   |
| Vehicles Exited     | 1696   |
| Hourly Exit Rate    | 1696   |
| Input Volume        | 30546  |
| % of Volume         | 6      |
| Denied Entry Before | 161    |
| Denied Entry After  | 2582   |

Arterial Level of Service: NB Pleasant Hill Road

| Cross Street      | Node | Delay<br>(s/veh) | Travel<br>time (s) | Dist<br>(mi) | Arterial<br>Speed |
|-------------------|------|------------------|--------------------|--------------|-------------------|
| Acalanes Avenue   | 14   | 0.2              | 20.2               | 0.1          | 11                |
| Project Dwy       | 11   | 0.0              | 4.1                | 0.0          | 34                |
| Stanley Boulevard | 5    | 21.8             | 29.1               | 0.1          | 10                |
| Quandt Road       | 4    | 81.7             | 122.2              | 0.4          | 13                |
| Total             |      | 103.8            | 175.6              | 0.6          | 13                |

Arterial Level of Service: SB Pleasant Hill Road

| Cross Street         | Node | Delay<br>(s/veh) | Travel<br>time (s) | Dist<br>(mi) | Arterial<br>Speed |
|----------------------|------|------------------|--------------------|--------------|-------------------|
| Rancho View Drive    | 1    | 6.8              | 22.1               | 0.2          | 25                |
|                      | 19   | 1.2              | 15.8               | 0.1          | 34                |
| Greenvalley Drive    | 2    | 5.0              | 11.9               | 0.1          | 22                |
| Reliez Valle Road    | 3    | 37.7             | 61.6               | 0.3          | 15                |
|                      | 20   | 24.4             | 28.0               | 0.0          | 4                 |
| Springhill Road      | 4    | 129.3            | 138.7              | 0.1          | 3                 |
| Deer Hill Road       | 5    | 358.8            | 396.8              | 0.4          | 4                 |
| Project Dwy          | 11   | 20.5             | 29.0               | 0.1          | 10                |
| Acalanes Avenue      | 14   | 12.4             | 16.4               | 0.0          | 8                 |
|                      | 15   | 19.0             | 25.1               | 0.1          | 9                 |
|                      | 16   | 6.6              | 16.0               | 0.1          | 24                |
|                      | 17   | 7.6              | 17.2               | 0.1          | 15                |
| Mt. Diablo Boulevard | 6    | 4.9              | 13.5               | 0.1          | 18                |
| SR 24 EB Off Ramp    | 7    | 1.7              | 4.5                | 0.1          | 50                |
| Total                |      | 635.7            | 796.7              | 1.7          | 8                 |



Queuing and Blocking Report  
Evacuation Scenario 1 plus Project Variant

08/23/2020

Intersection: 1: Pleasant Hill Road & Rancho View Drive

| Movement              | EB  | SB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | LTR | T   | TR  |
| Maximum Queue (ft)    | 77  | 45  | 16  |
| Average Queue (ft)    | 38  | 8   | 1   |
| 95th Queue (ft)       | 63  | 30  | 7   |
| Link Distance (ft)    | 306 | 773 | 773 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

Intersection: 2: Pleasant Hill Road & Greenvalley Drive

| Movement              | EB  | WB  | B60 | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|
| Directions Served     | LTR | LT  | T   | T   | TR  |
| Maximum Queue (ft)    | 44  | 567 | 56  | 50  | 64  |
| Average Queue (ft)    | 11  | 385 | 10  | 9   | 25  |
| 95th Queue (ft)       | 29  | 611 | 51  | 31  | 57  |
| Link Distance (ft)    | 333 | 494 | 53  | 288 | 288 |
| Upstream Blk Time (%) |     | 12  | 5   |     |     |
| Queuing Penalty (veh) |     | 0   | 0   |     |     |
| Storage Bay Dist (ft) |     |     |     |     |     |
| Storage Blk Time (%)  |     | 63  |     | 0   |     |
| Queuing Penalty (veh) |     | 0   |     | 0   |     |

Intersection: 3: Pleasant Hill Road & Reliez Valle Road

| Movement              | EB  | EB  | SB   | SB   |
|-----------------------|-----|-----|------|------|
| Directions Served     | L   | R   | T    | T    |
| Maximum Queue (ft)    | 459 | 488 | 358  | 394  |
| Average Queue (ft)    | 253 | 456 | 187  | 189  |
| 95th Queue (ft)       | 615 | 491 | 312  | 337  |
| Link Distance (ft)    | 438 | 438 | 1259 | 1259 |
| Upstream Blk Time (%) | 27  | 94  |      |      |
| Queuing Penalty (veh) | 0   | 0   |      |      |
| Storage Bay Dist (ft) |     |     |      |      |
| Storage Blk Time (%)  |     |     |      | 28   |
| Queuing Penalty (veh) |     |     |      | 0    |

Queuing and Blocking Report  
Evacuation Scenario 1 plus Project Variant

08/23/2020

Intersection: 4: Pleasant Hill Road & Springhill Road/Quandt Road

| Movement              | EB  | WB  | NB  | SB  | SB  | SB  | B20 | B20 |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | L   | T   | T   | R   | T   | T   |
| Maximum Queue (ft)    | 369 | 258 | 16  | 526 | 525 | 96  | 207 | 220 |
| Average Queue (ft)    | 338 | 223 | 2   | 476 | 476 | 76  | 164 | 183 |
| 95th Queue (ft)       | 355 | 265 | 9   | 581 | 604 | 140 | 245 | 262 |
| Link Distance (ft)    | 318 | 213 |     | 414 | 414 |     | 127 | 127 |
| Upstream Blk Time (%) | 100 | 64  |     | 86  | 90  |     | 24  | 85  |
| Queuing Penalty (veh) | 0   | 0   |     | 775 | 809 |     | 213 | 762 |
| Storage Bay Dist (ft) |     |     | 200 |     |     | 71  |     |     |
| Storage Blk Time (%)  |     |     |     | 89  | 84  | 0   |     |     |
| Queuing Penalty (veh) |     |     |     | 0   | 145 | 2   |     |     |

Intersection: 5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard

| Movement              | WB  | WB  | NB  | NB  | SB  | SB   | SB   |
|-----------------------|-----|-----|-----|-----|-----|------|------|
| Directions Served     | L   | LT  | T   | R   | L   | T    | T    |
| Maximum Queue (ft)    | 225 | 547 | 28  | 29  | 275 | 2274 | 2410 |
| Average Queue (ft)    | 212 | 521 | 3   | 8   | 192 | 2241 | 2371 |
| 95th Queue (ft)       | 276 | 536 | 15  | 28  | 344 | 2292 | 2451 |
| Link Distance (ft)    |     | 504 | 342 | 342 |     | 2220 | 2220 |
| Upstream Blk Time (%) |     | 95  |     |     |     | 41   | 95   |
| Queuing Penalty (veh) |     | 0   |     |     |     | 506  | 1182 |
| Storage Bay Dist (ft) | 185 |     |     |     | 175 |      |      |
| Storage Blk Time (%)  | 11  | 97  |     |     | 4   | 30   | 68   |
| Queuing Penalty (veh) | 52  | 440 |     |     | 47  | 64   | 0    |

Intersection: 6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Queuing and Blocking Report  
Evacuation Scenario 1 plus Project Variant

08/23/2020

Intersection: 7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road

| Movement              | SB |
|-----------------------|----|
| Directions Served     | T  |
| Maximum Queue (ft)    | 2  |
| Average Queue (ft)    | 0  |
| 95th Queue (ft)       | 2  |
| Link Distance (ft)    |    |
| Upstream Blk Time (%) |    |
| Queuing Penalty (veh) |    |
| Storage Bay Dist (ft) |    |
| Storage Blk Time (%)  |    |
| Queuing Penalty (veh) |    |

Intersection: 8: Brown Avenue/Miller Drive & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Intersection: 9: First Street/Sierra Vista Way & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Queuing and Blocking Report  
Evacuation Scenario 1 plus Project Variant

08/23/2020

Intersection: 10: SR 24 WB Ramps/Laurel Drive & Deer Hill Road

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 11: Pleasant Hill Road & Project Dwy

Movement

EB

SB

SB

Directions Served

R

T

TR

Maximum Queue (ft)

204

392

380

Average Queue (ft)

180

212

338

95th Queue (ft)

199

435

410

Link Distance (ft)

176

342

342

Upstream Blk Time (%)

100

1

7

Queuing Penalty (veh)

0

23

114

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 12: Project Dwy NE & Deer Hill Road

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Queuing and Blocking Report  
Evacuation Scenario 1 plus Project Variant

08/23/2020

Intersection: 13: Project Dwy SW & Deer Hill Road

Movement

Directions Served  
Maximum Queue (ft)  
Average Queue (ft)  
95th Queue (ft)  
Link Distance (ft)  
Upstream Blk Time (%)  
Queuing Penalty (veh)  
Storage Bay Dist (ft)  
Storage Blk Time (%)  
Queuing Penalty (veh)

Intersection: 14: Pleasant Hill Road & Acalanes Avenue

| Movement              | SB  | SB  |
|-----------------------|-----|-----|
| Directions Served     | T   | T   |
| Maximum Queue (ft)    | 180 | 257 |
| Average Queue (ft)    | 48  | 214 |
| 95th Queue (ft)       | 146 | 294 |
| Link Distance (ft)    | 150 | 150 |
| Upstream Blk Time (%) | 1   | 22  |
| Queuing Penalty (veh) | 15  | 409 |
| Storage Bay Dist (ft) |     |     |
| Storage Blk Time (%)  |     |     |
| Queuing Penalty (veh) |     |     |

Intersection: 15: Pleasant Hill Road

| Movement              | SB  |
|-----------------------|-----|
| Directions Served     | TR  |
| Maximum Queue (ft)    | 351 |
| Average Queue (ft)    | 179 |
| 95th Queue (ft)       | 424 |
| Link Distance (ft)    | 266 |
| Upstream Blk Time (%) | 5   |
| Queuing Penalty (veh) | 89  |
| Storage Bay Dist (ft) |     |
| Storage Blk Time (%)  |     |
| Queuing Penalty (veh) |     |

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Intersection: 16: Pleasant Hill Road

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Movement

Directions Served  
Maximum Queue (ft)  
Average Queue (ft)  
95th Queue (ft)  
Link Distance (ft)  
Upstream Blk Time (%)  
Queuing Penalty (veh)  
Storage Bay Dist (ft)  
Storage Blk Time (%)  
Queuing Penalty (veh)

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Intersection: 17: Pleasant Hill Road

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| Movement              | SB  |
|-----------------------|-----|
| Directions Served     | TR  |
| Maximum Queue (ft)    | 161 |
| Average Queue (ft)    | 67  |
| 95th Queue (ft)       | 128 |
| Link Distance (ft)    | 314 |
| Upstream Blk Time (%) |     |
| Queuing Penalty (veh) |     |
| Storage Bay Dist (ft) |     |
| Storage Blk Time (%)  |     |
| Queuing Penalty (veh) |     |

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Network Summary

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Network wide Queuing Penalty: 5648

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# 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 95<sup>th</sup> 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, 8<sup>th</sup> Edition. Since the 10<sup>th</sup> edition of the Manual was published in 2017, the updated traffic study calculated trip generation based on the latest Manual (i.e., 10<sup>th</sup> 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 10<sup>th</sup> 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 8<sup>th</sup> and 10<sup>th</sup> 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)**



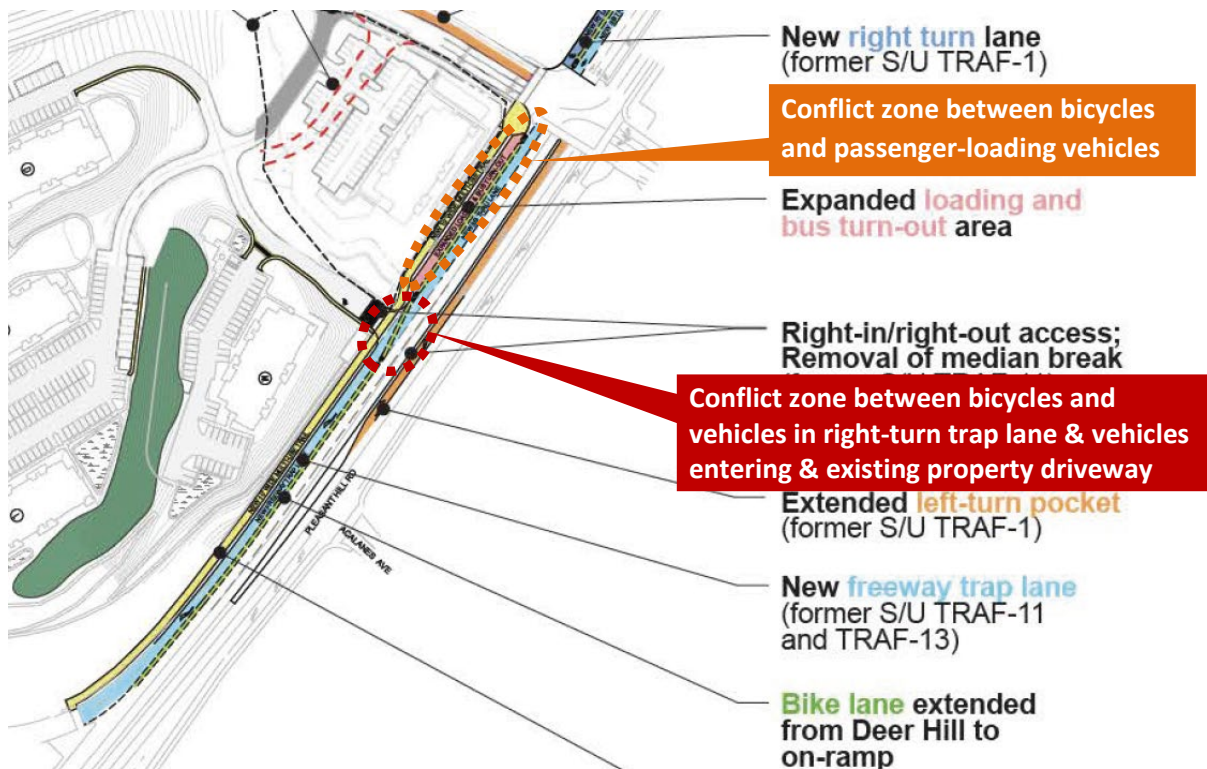
### Bike Lane

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

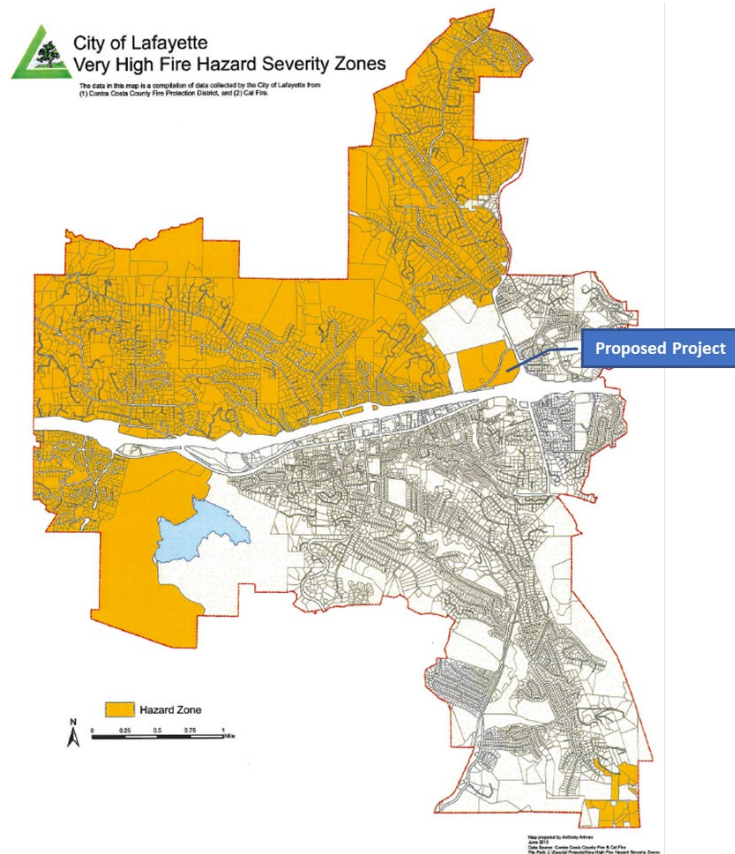
It is worth noting that the proposed project is located in the Very High Fire Hazard Severity Zones (VHFHSZ) according to the City Ordinance No. 620 (**Figure 4**). Given the facts that: 1) semi-rural/urban interface wildfires have become a new reality; 2) all three fire stations within the study area 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 Lafayette<sup>1</sup>**



## 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 95<sup>th</sup> percentile queue lengths included in the queuing and blocking reports (Appendix

<sup>1</sup> <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.

October 13, 2017

Kristen Altbaum  
Reliez Valley Residents for Reduced Traffic

To Whom It May Concern:

First Student received a request to comment on the issues that we are experiencing related to increased traffic on/around Reliez Valley Rd. in the town of Lafayette, CA and its effect on school bus service.

First Students has three (3) routes that uses Reliez Valley Rd. in its daily runs for the Lamorinda School Bus Program, which serves the Springhill Elementary and Stanley Intermediate schools.

We have three (3) primary concerns:

1. The safety of the students coming to and standing at the bus stops awaiting the bus arrival.
2. The increase in route times, caused by the heavier traffic and the necessity to make the pickup times earlier, which increases the overall ride time.
3. The increase in the number of cars running the school bus red lights while we're picking up students. This is caused by the cars "stacking up" behind the bus because there is only two (2) pullout areas where cars can safely pass.

First Student fully supports any initiative designed to reduce traffic and make the school bus ride safer and more efficient.

Thank you for the opportunity to comment on this issue.

Please do not hesitate to contact me if you have further questions.

Best Regards,



Henry J. Cooper  
Location Manager  
[Henry.cooper@firstgroup.com](mailto:Henry.cooper@firstgroup.com)

CC: Juliet Hanson, Program Manager, Lamorinda School Bus Transportation Agency  
Dave Collins, First Student, Area General Manager

## Contra Costa County



## Fire Protection District

February 1, 2018

To Whom It May Concern:

Residents of the Reliez Valley Road neighborhoods in Lafayette have voiced concerns regarding travelling on Reliez Valley Road, particularly during the A.M. commute.

Based on photographs provided by the neighbors and the personal experiences of Fire District staff moving through the area, there has obviously been a marked increase in congestion through the corridor. Although a significant number of people moving through the area are going to the local schools, the congestion cannot be attributed to school traffic alone. A significant number of vehicles are using Taylor Road, Reliez Valley Road, and Pleasant Hill Road as bypasses to Interstate 680. It is not uncommon for morning traffic on Taylor Road to back up onto Geary Road.

The traffic situation through this area definitely has an impact on fire responses. Engine 2, responding from Geary Road to calls along the Taylor Road corridor, has significantly increased response times during that time of the morning. If there were to be a fire call, or a severe medical call, on Reliez Valley Road, we might experience significant difficulty in getting to the scene. This is the case even if traveling in the non-commute direction because of people passing illegally and just general congestion. Making a left turn across the traffic direction would be especially difficult.

While the traffic situation is a definite concern during the school year, there is not much improvement when school is on break. We bring this to your attention because there is a high level of wildland fire danger in certain areas of Reliez Valley Road. During a high wind event, the combination of high traffic congestion from commuters and potential evacuee traffic could make response into the area very difficult for fire resources.

The Contra Costa County Fire Protection District is supportive of all solutions that would improve the quality of life for the residents along the Reliez Valley Road corridor. Any solutions that help the residents would also improve our ability to respond in the case of an emergency. We do not feel that doing nothing is a viable option.

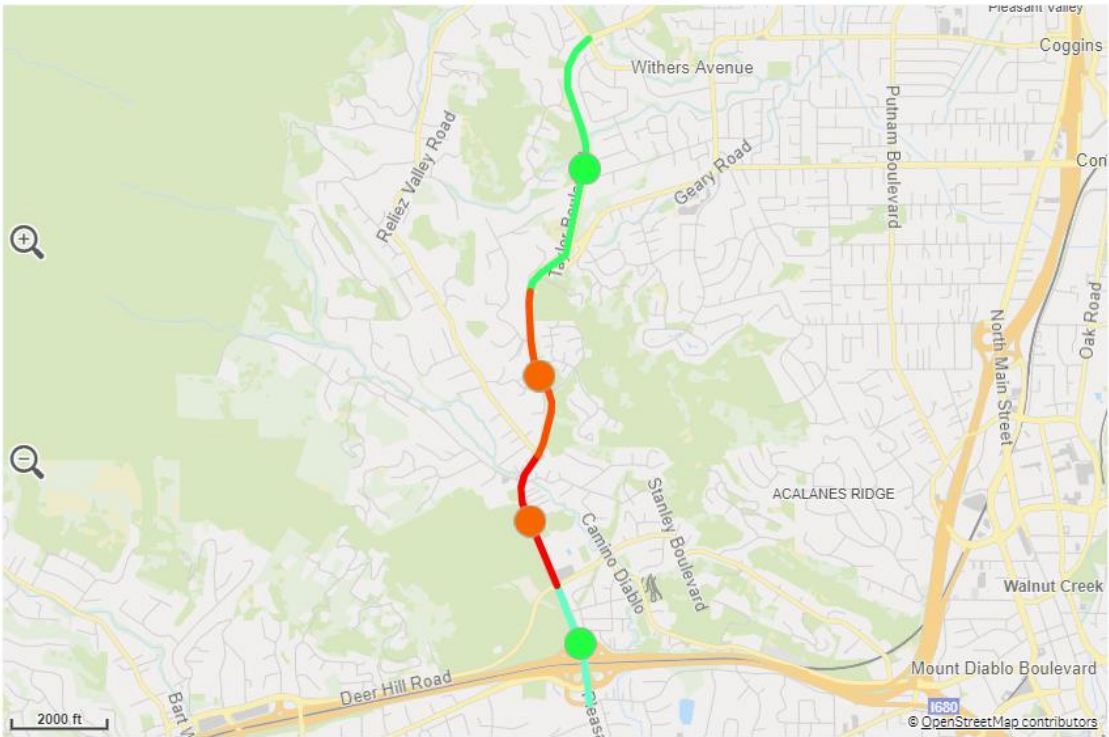
The Fire District would welcome the opportunity to meet with stakeholders in order to evaluate possible solutions. Please let us know if you identify anything specific that we can do to help.

Sincerely,

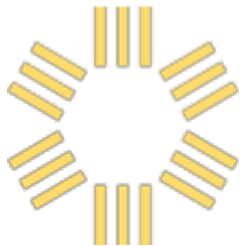
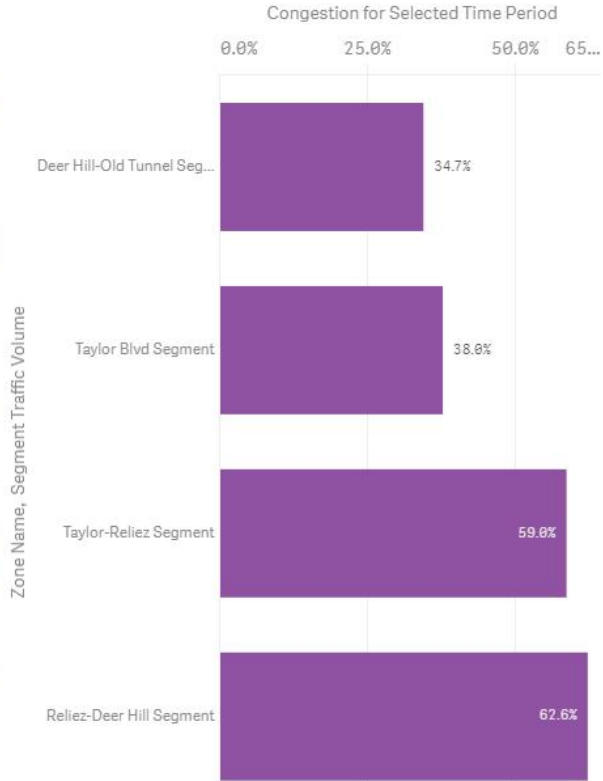
  
Jeff Carman  
Fire Chief

Heatmap of Congestion

Colors indicate the on each Segment during the selected time period.



Congestion



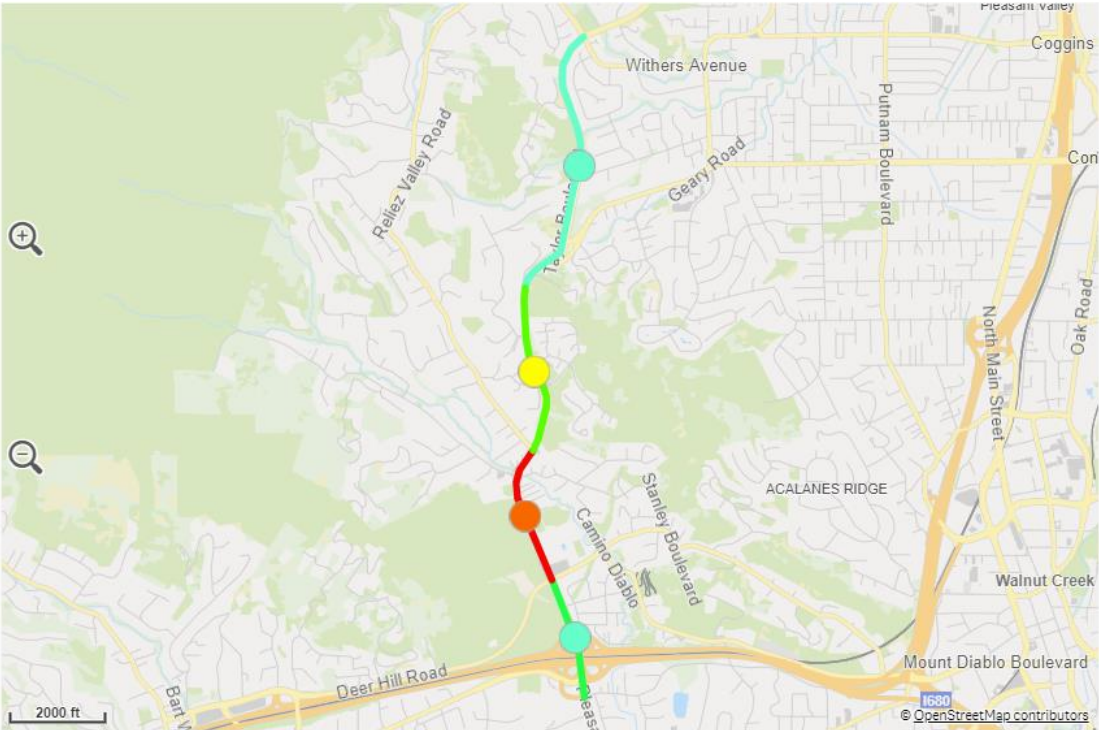
SB Peak AM (7:00-9:00am)

STREETLIGHT DATA PROPRIETARY AND CONFIDENTIAL

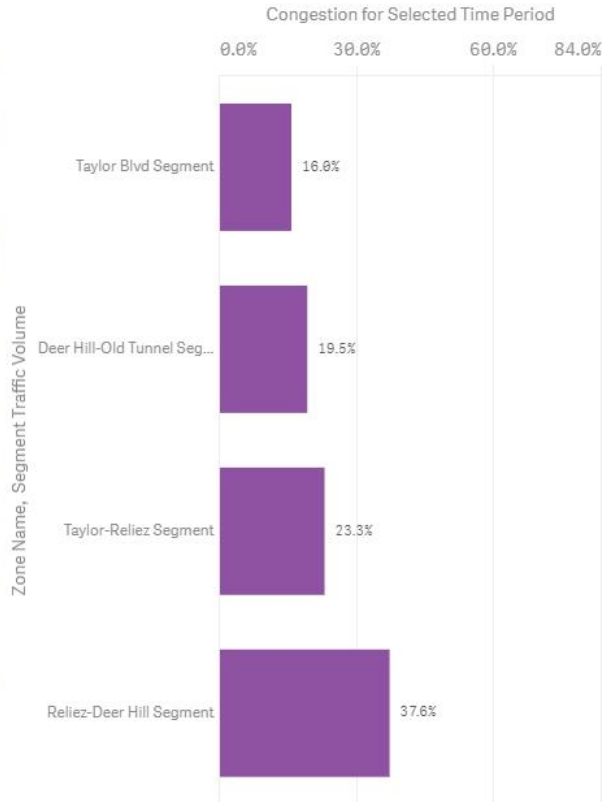


Heatmap of Congestion

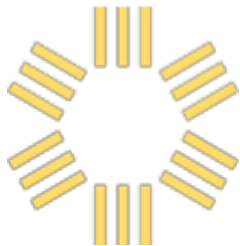
Colors indicate the on each Segment during the selected time period.



Congestion



NB Peak PM (4:00-7:00pm)





## ***Lafayette School District***

3477 School Street ♦ Lafayette, CA 94549

(925) 927-3500 ~Fax: (925) 284-1525

[www.lafsd.org](http://www.lafsd.org)

Supervisor, Federal D. Glover

[district5@bos.cccounty.us](mailto:district5@bos.cccounty.us)

Dear Supervisor Glover,

I know that issues related to the increasing amount of traffic in our community are, understandably, a high priority. Most recently, parents who live in residential neighborhoods along Reliez Valley Road have made me aware that traffic congestion on this road during commute hours has been growing significantly. Complicating this further is the fact that residents who live on streets directly off Reliez Valley Road have no other choice but to use this road as their primary way to travel out of their neighborhood. With the significant increase in traffic, families who work and/or must get their children to school are arriving late because they are forced to wait thirty to forty minutes to travel a few short miles when drive times should be ten to fifteen minutes.

Based on information I have received, the added congestion on Reliez Valley Road is due, in part, to the fact that it has been identified in traffic-mapping 'apps' as the fastest, best alternative for commuters when there is heavy traffic on Highways 24 and 680. Anyone who has traveled this route knows that Reliez Valley Road was never designed for this level of traffic. While I am not an expert in the analysis of traffic patterns, the level of traffic in this area causes me great concern both for the safety of our students and for the well-being of residents in our community.

Please know that representatives from the Lafayette School District do meet regularly with the City of Lafayette and the Lafayette Police Department to discuss traffic and circulation issues at our schools and surrounding areas. We will continue to emphasize the critical need to address safety issues and find effective ways to control traffic in this area.

Respectfully,

Rachel Zinn  
Superintendent



August 24, 2020

**Re: Terraces of Lafayette Emergency Evacuation Traffic Impact Study**

Dear Mayor and Council Members

Apologies for the lateness in getting this to you, but we have been working on this since we got the latest TJKM memo on Tuesday. Attached is another memo prepared by Elite that reviews the TJKM memorandum dated August 10, 2020, which was a response to Elite's last memo of August 8, 2020. In addition, Elite has now run various simulations of the TJKM model, firstly to check they could duplicate TJKM's results, which they did, but then to look deeper at the results to answer some critical questions, such as "how many vehicles can actually get out if there was a fire". **Elite's findings are shocking**, and are summarized as follows:

1. Within the Terraces project including the Trap lane, of the 551 cars assumed, only 208 are able to get out in the first hour of the evacuation. 343 will be stuck. If there is no Trap lane **only 16 cars will make it out in the first hour** - 535 cars will be stuck in their driveways and unable to get to Pleasant Hill Road. This directly contradicts what the fire chief has been saying that he is not worried about the Terraces because it is by the freeway.
2. For evacuating traffic from the surrounding area, the situation is also bad. **If there is no trap lane built with the project, an additional 553 neighborhood cars will be stuck in their driveways after the first hour and unable to get to Pleasant Hill Road.** Adding the trap lane drops this to 152 extra cars stuck, but that is still 152 cars too many.
3. This explains TJKM's earlier conclusion that the Terraces only adds 10 to 16 seconds extra delay on Pleasant Hill Road; this is because the majority of evacuation traffic from the Terraces can't even make it to Pleasant Hill Road.
4. Another direct result is that TJKM's assumption that some parents will be able to pick up students from the schools on their way out is invalid – some of these parents don't even make it to Pleasant Hill Road in the first hour.
5. Elite looked at TJKM's response that although they started with an empty network, they did seed the network with some traffic before the evacuation begins. This is true, but TJKM only seeded it with enough traffic to form a back up from Deer Hill Road half way to Springhill Road. See page 8 of TJKM's memo for an illustration. This is not heavy commute hour traffic, and so the model is not being at all conservative in this respect.
6. Note that all these results are based on TJKM's assumption in the model that there will not be any traffic congestion on Highway 24. In fact, the situation will be much worse if Highway 24 is



backed up, which is likely. Elite addresses on page 9 of their memo TJKM's response that Highway 24 traffic does not matter – it does!

7. On page 10 of their memo, Elite also responds to TJKM's claims that the on-ramps to Highway 24 will have the capacity to handle the extra evacuation traffic that will be generated by the Terraces – that is not true.

In summary, it is clear from Elite's comprehensive report that the TJKM evacuation model actually shows that **the Terraces will impose significant safety threats on both the surrounding neighborhood as well as the residents within the project itself** due to the traffic congestion and emergency evacuation delays. You should therefore deny this project at your meeting this evening.

Sincerely,

Colin Elliott on behalf of Michael Griffiths

Attached:

1. Elite Peer Review memo dated 8/23/2020



# Memorandum

**Date:** August 23, 2020

**To:** Michael Griffiths

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

**Subject:** **Peer Review of TJKM's Evacuation Models and Response Memo for Terraces of Lafayette Traffic Impact Study**

TJKM, the traffic study consultant for the proposed Terraces of Lafayette Project, released a memorandum dated August 10, 2020, in response to ETG's comments regarding TJKM's emergency evacuation modeling and analysis. The purpose of this memorandum is to provide a summary of our latest findings based on a review of the TJKM's response memo and evacuation models.

TJKM's evacuation models were developed for AM and PM peak hours using Synchro/SimTraffic, a commonly used software package for arterial operations. TJKM's evacuation model files were organized for the following six scenarios ("Project" is referred as the Terraces of Lafayette):

- **Evac 1** – Evacuation (without project) in the AM Peak
- **Evac 1 + Project** – Evacuation plus project, with trap lane<sup>1</sup>, in the AM Peak
- **Evac 1 + Project Variant** – Evacuation plus project, no trap lane, in the AM Peak
- **Evac 2** – Evacuation (without project) in the PM Peak
- **Evac 2 + Project** – Evacuation plus project, with trap lane, in the PM Peak
- **Evac 2 + Project Variant** – Evacuation plus project, no trap lane, in the PM Peak

In TJKM's memo, "denied entry vehicles", which will be explained in the next, were not reported. We reran SimTraffic simulation for the AM peak scenarios using the Synchro files and the same parameters that TJKM provided, as listed below:

- 5 runs per synchro file
- 10-minute seeding interval
- 60-minute analysis interval
- Random seed 1412

The SimTraffic simulation reports are attached in **Appendix**. We were able to replicate majority of the performance measures that were included in TJKM's memo. In addition, we also reported "denied entry vehicles", for both systemwide and individual intersections (see **Appendix**).

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<sup>1</sup> 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.



## DENIED ENTRY VEHICLES (WAITING TO ENTER THE TRAFFIC NETWORK)

**Denied entry vehicles** (i.e., unserved vehicles) are the vehicles that are still waiting to enter the traffic network by the end of the traffic analysis period. We checked and found many denied entry vehicles in TJKM's evaluation models. For instance, in the AM peak hour evacuation model (7:00-8:00 AM), the number of denied entry vehicles including the Terraces of Lafayette project is **more than 3,400 vehicles** under the trap lane scenario (**Table 1**), or **more than 3,800 vehicles** under the no trap lane scenario (**Table 2**). This means that by 8:00 AM (the end of the traffic analysis period), there would still be more than 3,400 vehicles (under the trap lane scenario), or more than 3,800 vehicles (under the no trap lane scenario), waiting to get onto streets for evacuation.

**Table 1. Systemwide Denied Entry Vehicles – AM Peak, with Project, with Trap Lane**

| Interval #1 Information Recording |        |        |        |        |        |        |
|-----------------------------------|--------|--------|--------|--------|--------|--------|
| Start Time                        | 7:00   |        |        |        |        |        |
| End Time                          | 8:00   |        |        |        |        |        |
| Total Time (min)                  | 60     |        |        |        |        |        |
| Volumes adjusted by PHF.          |        |        |        |        |        |        |
| Run Number                        | 1      | 2      | 3      | 4      | 5      | Avg    |
| Vehs Entered                      | 2263   | 2295   | 2244   | 2328   | 2313   | 2288   |
| Vehs Exited                       | 2102   | 2093   | 2083   | 2150   | 2194   | 2124   |
| Starting Vehs                     | 258    | 221    | 256    | 240    | 270    | 249    |
| Ending Vehs                       | 419    | 423    | 417    | 418    | 389    | 413    |
| Denied Entry Before               | 144    | 118    | 171    | 165    | 170    | 154    |
| Denied Entry After                | 3606   | 3495   | 3527   | 3411   | 3573   | 3521   |
| Travel Distance (mi)              | 1958   | 1940   | 1912   | 1998   | 1993   | 1960   |
| Travel Time (hr)                  | 2184.8 | 2082.6 | 2177.1 | 2092.5 | 2164.7 | 2140.3 |
| Total Delay (hr)                  | 2116.4 | 2014.8 | 2109.6 | 2022.3 | 2095.0 | 2071.6 |
| Total Stops                       | 8764   | 8548   | 8324   | 9019   | 8972   | 8724   |
| Fuel Used (gal)                   | 547.6  | 524.9  | 544.9  | 528.3  | 545.2  | 538.2  |

**Table 2. Systemwide Denied Entry Vehicles – AM Peak, with Project, No Trap Lane (Project Variant)**

| Interval #1 Information Recording |        |        |        |        |        |        |
|-----------------------------------|--------|--------|--------|--------|--------|--------|
| Start Time                        | 7:00   |        |        |        |        |        |
| End Time                          | 8:00   |        |        |        |        |        |
| Total Time (min)                  | 60     |        |        |        |        |        |
| Volumes adjusted by PHF.          |        |        |        |        |        |        |
| Run Number                        | 1      | 2      | 3      | 4      | 5      | Avg    |
| Vehs Entered                      | 1791   | 1861   | 1881   | 1826   | 1818   | 1836   |
| Vehs Exited                       | 1693   | 1741   | 1734   | 1705   | 1729   | 1721   |
| Starting Vehs                     | 305    | 291    | 290    | 275    | 312    | 295    |
| Ending Vehs                       | 403    | 411    | 437    | 396    | 401    | 410    |
| Denied Entry Before               | 150    | 161    | 149    | 162    | 161    | 157    |
| Denied Entry After                | 4006   | 3989   | 3958   | 4088   | 3989   | 4005   |
| Travel Distance (mi)              | 1583   | 1638   | 1617   | 1626   | 1663   | 1625   |
| Travel Time (hr)                  | 2421.0 | 2442.9 | 2410.2 | 2434.6 | 2418.7 | 2425.5 |
| Total Delay (hr)                  | 2365.5 | 2385.8 | 2353.9 | 2378.2 | 2361.2 | 2368.9 |
| Total Stops                       | 5726   | 6207   | 5810   | 6056   | 6244   | 6009   |
| Fuel Used (gal)                   | 590.3  | 597.6  | 588.3  | 594.4  | 592.5  | 592.6  |



We checked the project driveway connecting with Pleasant Hill Road, and saw that the project driveway is still packed with vehicles by the end of the traffic analysis period (see **Figure 1**). We then checked and found that there were more than 500 denied entry vehicles under the trap lane scenario (**Table 3**), or more than 700 denied entry vehicles under the no trap lane scenario (**Table 4**). Only 12 vehicles, or 2%, would be able to get out of the Terraces of Lafayette community during the 7:00-8:00 AM one-hour evacuation period under the no trap lane scenario. Even with the trap lane scenario, only 217 vehicles, or 30%, would be able to get out of the Terraces of Lafayette community. The denied entry vehicles would not show up on the short project driveway. To better visualize the stack of the denied entry vehicles, we “artificially” extended the project driveway, as shown in **Figure 1**. Majority of vehicles could not even leave Terraces of Lafayette community after the one-hour evacuation period.

**Table 3. Denied Entry Vehicles at Project Driveway – AM Peak, with Project, with Trap Lane**

**11: Pleasant Hill Road & Project Dwy Performance by movement**

| Movement            | EBR    | NBT | SBT  | All   |
|---------------------|--------|-----|------|-------|
| Denied Delay (hr)   | 294.0  | 0.0 | 0.0  | 294.0 |
| Denied Del/Veh (s)  | 1369.0 | 0.0 | 0.0  | 446.0 |
| Total Delay (hr)    | 7.0    | 0.0 | 13.7 | 20.7  |
| Total Del/Veh (s)   | 112.7  | 0.0 | 31.4 | 40.6  |
| Stop Delay (hr)     | 7.5    | 0.0 | 11.1 | 18.6  |
| Stop Del/Veh (s)    | 120.4  | 0.0 | 25.4 | 36.5  |
| Vehicles Entered    | 217    | 39  | 1561 | 1817  |
| Vehicles Exited     | 217    | 39  | 1558 | 1814  |
| Hourly Exit Rate    | 217    | 39  | 1558 | 1814  |
| Input Volume        | 735    | 35  | 4244 | 5014  |
| % of Volume         | 30     | 111 | 37   | 36    |
| Denied Entry Before | 31     | 0   | 0    | 31    |
| Denied Entry After  | 556    | 0   | 0    | 556   |

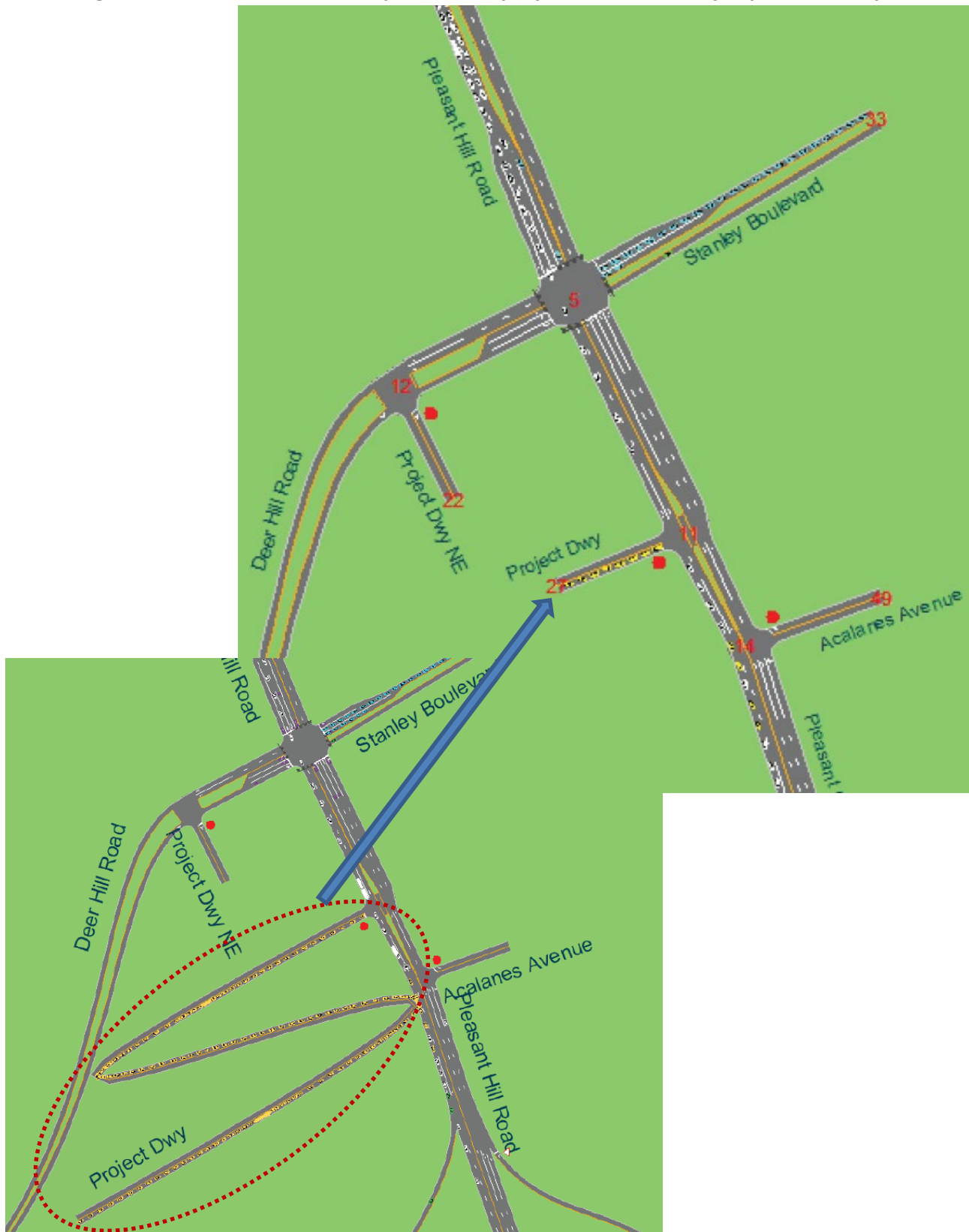
**Table 4. Denied Entry Vehicles at Project Driveway – AM Peak, with Project, No Trap Lane (Project Variant)**

**11: Pleasant Hill Road & Project Dwy Performance by movement**

| Movement            | EBR    | NBT | SBT  | All   |
|---------------------|--------|-----|------|-------|
| Denied Delay (hr)   | 420.6  | 0.0 | 0.0  | 420.6 |
| Denied Del/Veh (s)  | 1907.0 | 0.0 | 0.0  | 688.9 |
| Total Delay (hr)    | 7.9    | 0.0 | 8.2  | 16.2  |
| Total Del/Veh (s)   | 1361.7 | 0.0 | 21.5 | 40.6  |
| Stop Delay (hr)     | 8.0    | 0.0 | 4.7  | 12.6  |
| Stop Del/Veh (s)    | 1366.8 | 0.0 | 12.2 | 31.7  |
| Vehicles Entered    | 13     | 39  | 1365 | 1417  |
| Vehicles Exited     | 12     | 39  | 1365 | 1416  |
| Hourly Exit Rate    | 12     | 39  | 1365 | 1416  |
| Input Volume        | 735    | 35  | 4244 | 5014  |
| % of Volume         | 2      | 111 | 32   | 28    |
| Denied Entry Before | 61     | 0   | 0    | 61    |
| Denied Entry After  | 781    | 0   | 0    | 781   |



Figure 1. Pleasant Hill Road & Project Driveway (by end of traffic analysis period in AM peak)





We noticed that TJKM assumed a peak hour factor (PHF) of 0.75 in the evacuation models. The PHF is usually used to convert the hourly traffic volume into the flow rate that represents the busiest 15 minutes of the rush hour.

$$PHF = \frac{\text{Total Hourly Traffic Volume}}{(\text{Peak 15-Minute Traffic Volume with the Hour}) \times 4}$$

Using a PHF of 0.75 means that the analysis flow rate (i.e., peak 15-minute traffic flow rate) is 33.3% more than the hourly traffic volume.

Different from a typical intersection delay and level of service (LOS) analysis, the purpose of an evacuation model is mainly focused on how quickly the evacuation can be achieved. Therefore, using PHFs may not be appropriate for evacuation analyses. We then ran SimTraffic simulation for the AM peak scenarios using the same Synchro files and primary parameters, with the only change of PHF from 0.75 to 1.0. The SimTraffic simulation reports based on PHF of 1.0 are attached in **Appendix**.

Even with a PHF of 1.0, we still found that there would be more than 300 denied entry vehicles under the trap lane scenario (**Table 5**), or more than 500 denied entry vehicles under the no trap lane scenario (**Table 6**). Only 13 vehicles, or 2%, would be able to get out of the Terraces of Lafayette community during the 7:00-8:00 AM one-hour evacuation period under the no trap lane scenario. Even with the trap lane scenario, only 210 vehicles, or 38%, would be able to get out of the Terraces of Lafayette community.

**Table 5. Denied Entry Vehicles at Project Driveway – AM Peak, with Project, with Trap Lane (PHF=1.0)**

#### 11: Pleasant Hill Road & Project Dwy Performance by movement

| Movement            | EBR    | NBT | SBT  | All   |
|---------------------|--------|-----|------|-------|
| Denied Delay (hr)   | 205.8  | 0.0 | 0.0  | 205.8 |
| Denied Del/Veh (s)  | 1266.7 | 0.0 | 0.0  | 341.3 |
| Total Delay (hr)    | 7.0    | 0.0 | 14.4 | 21.3  |
| Total Del/Veh (s)   | 115.4  | 0.0 | 32.9 | 42.3  |
| Stop Delay (hr)     | 7.4    | 0.0 | 11.8 | 19.2  |
| Stop Del/Veh (s)    | 123.2  | 0.0 | 27.0 | 38.1  |
| Vehicles Entered    | 211    | 26  | 1560 | 1797  |
| Vehicles Exited     | 210    | 26  | 1556 | 1792  |
| Hourly Exit Rate    | 210    | 26  | 1556 | 1792  |
| Input Volume        | 551    | 26  | 3183 | 3760  |
| % of Volume         | 38     | 100 | 49   | 48    |
| Denied Entry Before | 31     | 0   | 0    | 31    |
| Denied Entry After  | 374    | 0   | 0    | 374   |

**Table 6. Denied Entry Vehicles at Project Driveway – AM Peak, with Project, No Trap Lane (Project Variant) (PHF=1.0)****11: Pleasant Hill Road & Project Dwy Performance by movement**

| Movement            | EBR    | NBT | SBT  | All   |
|---------------------|--------|-----|------|-------|
| Denied Delay (hr)   | 333.1  | 0.0 | 0.0  | 333.1 |
| Denied Del/Veh (s)  | 1956.2 | 0.0 | 0.0  | 598.1 |
| Total Delay (hr)    | 8.0    | 0.0 | 8.0  | 16.1  |
| Total Del/Veh (s)   | 1374.8 | 0.0 | 21.0 | 40.7  |
| Stop Delay (hr)     | 8.1    | 0.0 | 4.5  | 12.5  |
| Stop Del/Veh (s)    | 1380.2 | 0.0 | 11.7 | 31.7  |
| Vehicles Entered    | 13     | 25  | 1367 | 1405  |
| Vehicles Exited     | 13     | 25  | 1368 | 1406  |
| Hourly Exit Rate    | 13     | 25  | 1368 | 1406  |
| Input Volume        | 551    | 26  | 3183 | 3760  |
| % of Volume         | 2      | 96  | 43   | 37    |
| Denied Entry Before | 65     | 0   | 0    | 65    |
| Denied Entry After  | 600    | 0   | 0    | 600   |

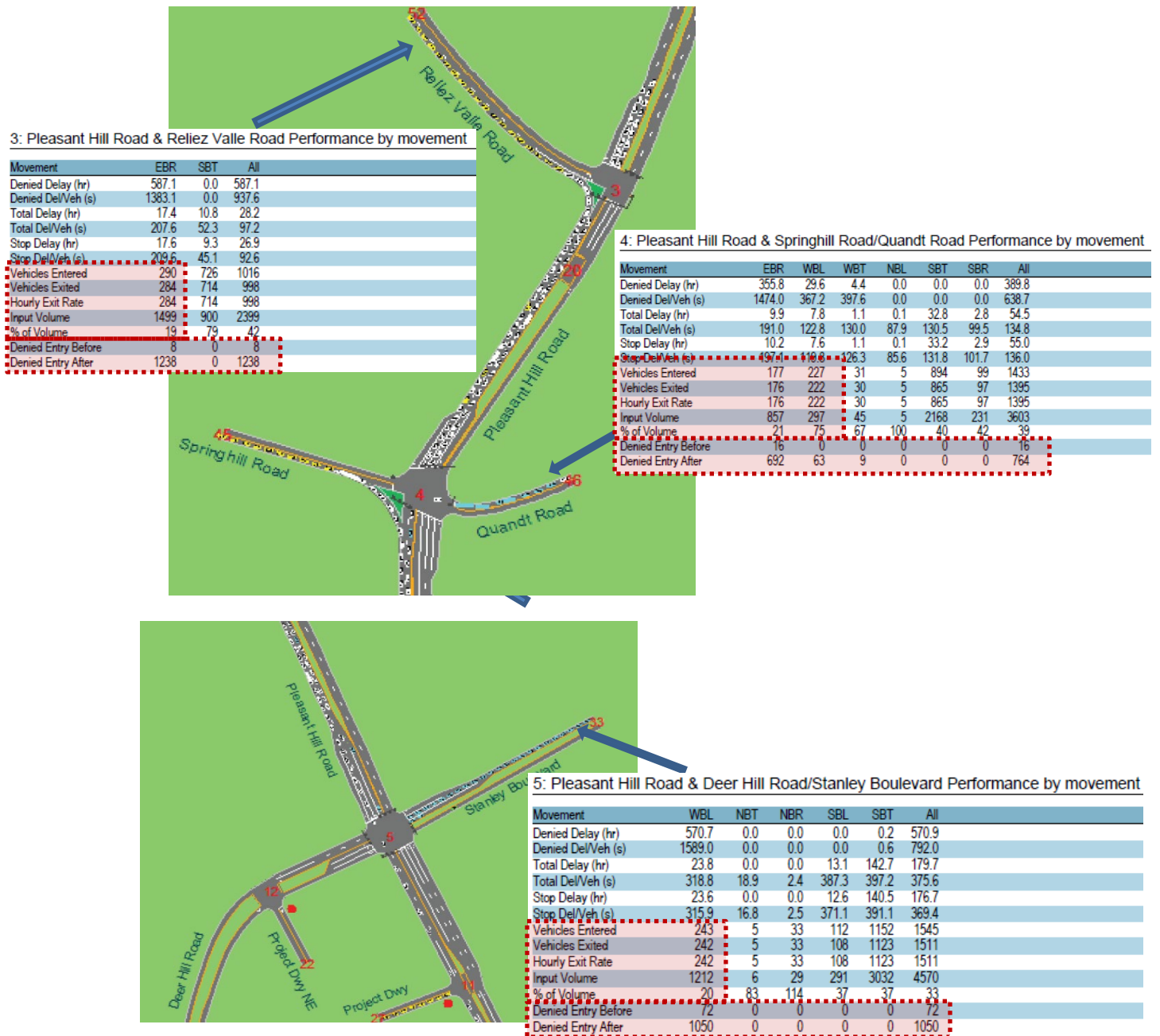
The denied entry vehicles exist on other streets too, including Stanley Boulevard, Spring Hill Road, Quandt Road, and Reliez Valley Road, as shown in **Figure 2**. Keep it in mind that Stanley Boulevard is mainly for evacuating students from Acalanes High School, and denied entry vehicles (i.e., waiting to enter the traffic network) would be more than 900.

With so many denied entry vehicles systemwide (>3,400 vehicles under the trap lane scenario, or >3,800 vehicles under the no trap lane scenario), and 98% of vehicles under the no trap lane scenario (or more than 60% under the trap lane scenario) could not even leave Terraces of Lafayette community after the one-hour evacuation period, TJKM's evacuation models apparently lack credibility and the results coming out of the evacuation models are simply invalid.





Figure 2. Streets with Significant Denied Entry Vehicles (by end of traffic analysis period in AM peak)

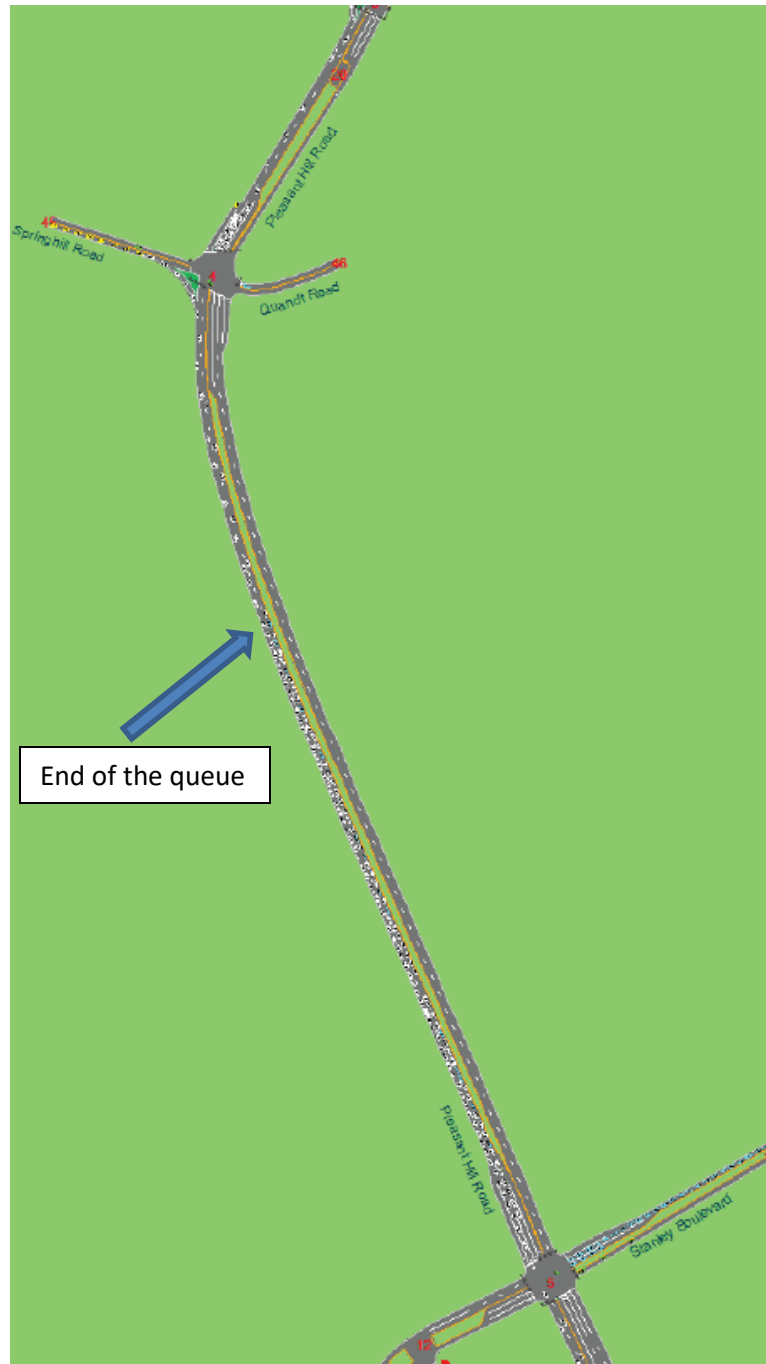




## BACKGROUND TRAFFIC

In their response memo, TJKM mentioned that they included a 10-minute “seeding” period (i.e., 6:50-7:00 AM). We ran the 10-minute seeding period, and found that traffic was only backed up to somewhere between Deer Hill Road/Stanley Boulevard and Spring Hill Road/Quant Road, as shown in **Figure 3**.

**Figure 3. Traffic Condition (by end of 10-minute seeding period in AM peak)**





However, it is well known that the Pleasant Hill Road backs up much further upstream at 7:00 AM during the morning peak. There should have been many more vehicles (i.e., “background traffic”) already in the roadway system when the evacuation starts during the AM peak hour.

In their response memo, TJKM claimed that “By including both evacuation traffic and normal commute traffic, these vehicles would be double counted.” This would only be true if all of the traffic on Pleasant Hill Road would come only from Lafayette. However, Pleasant Hill Road carries traffic from many surrounding cities and communities. The right approach is to load the roadway network so that at the beginning of the evacuation (i.e., 7:00 AM during the morning peak), the modeled traffic condition represents what would look like during a normal day without evacuation. After that, no new non-evacuation traffic would enter Pleasant Hill Road from the north once a roadblock has been set up after the evacuation order is given. However, TJKM’s evacuation models did not follow the right approach, and therefore significantly underestimated background traffic. Adding background traffic could make traffic delay exponentially worse.

## SR 24 CAPACITY CONSTRAINT

The evacuation models assumed that all evacuating vehicles would use SR 24 to leave Lafayette – 50% would travel eastbound (EB) and 50% would travel westbound (WB). We raised the question that the evacuation models ended at the on-ramps (both EB and WB) and did not model or put capacity constraints on SR 24 mainline freeway, as illustrated in **Figure 4**. By doing this, TJKM assumed that SR 24 would have “unlimited” capacity to absorb the additional evacuating traffic. This assumption is unrealistic since SR 24 is already congested (WB in AM and EB in PM) and does not have enough extra capacity to accommodate the significant amount increase of traffic due to evacuation.

In their response memo, TJKM did not address this concern directly. It is only simply stated that “the evacuation traffic volumes are already extremely conservative.”

Here is a simple example for the AM peak hour to illustrate the importance of SR 24 capacity constraint. Again, this example is for illustration purposes and it does not replace detailed and accurate modeling.

- Same assumption of all evacuating vehicles would use SR 24 to leave Lafayette – 50% would travel EB and 50% would travel WB.
- In the AM peak hour (7:00-8:00 AM), SR 24 WB has a capacity constraint – assuming 900 vehicles are able to get on and use SR 24 in the WB direction.
- Traffic demand during the evacuation is 1,800 vehicles to use the SR 24 WB on-ramp.
- With the above assumptions, vehicles cannot be fully evacuated in two hours (i.e.,  $1,800/900 = 2$ ). In other words, **one additional hour** is needed after the one-hour peak period. However, with all the above assumptions except for the SR 24 capacity constraint, as modelled by TJKM, vehicles can be fully evacuated within the one-hour peak period.
- Additional evacuating traffic coming out of the Terraces of Lafayette community is 551 vehicles (based on TJKM’s memo dated June 22, 2020). Now adding half of them to the SR 24 WB direction,

the additional 275 vehicles (i.e.,  $551/2 = 275$ ) coming out of the Terraces of Lafayette community would cause additional 18 minutes (i.e.,  $275/900 \times 60 = 18$ ) to evacuate.

Therefore, the evacuation models must have significantly underestimated the level of traffic congestion, and the impacts of which is that traffic is unable to get onto the SR 24 freeway and gets backed up on surface streets.

**Figure 4. Evacuation Models Ended at On-Ramps**



## ON-RAMP CAPACITY CONSTRAINT

We stated in our previous memo that the single-lane on-ramps (both EB and WB) may not be able to handle the significant amount of traffic getting onto SR 24 freeway during the peak hours, with a maximum capacity of 1,900 vehicles per hour per lane at on-ramps assuming no congestion on the freeway onto which the traffic merges. TJKM responded by stating that “it is not an absolute limit, and exceeding 1,900 vehicles per hour per lane does not immediately result in gridlock or excessive delays. In addition, the sections of SR-24 where the westbound and eastbound ramps enter the freeway feature long auxiliary lanes, such that evacuation traffic would have ample time to merge into the other travel lanes without slowing down ramp traffic.”

- On-Ramp Capacity:** TJKM stated that on-ramp maximum capacity of 1,900 vehicles per hour per lane “it is not an absolute limit”. Traffic Engineers generally use 1,900 vehicles under the close to “ideal” condition without traffic congestion or traffic flow breakdown. 1,900 vehicles per hour per lane corresponds to 1.9 seconds in headway (i.e.,  $3,600 \text{ seconds}/1,900 = 1.9$ ). Headway is a



measure of the temporal space between two vehicles. Specifically, the headway is the time that elapses between the arrival of the leading vehicle and the following vehicle at the designated test point. In fact, on-ramp capacity drops when traffic is congested (traffic flow breakdown), causing “productivity loss”. It is not uncommon to see on-ramp capacity drops to 1,200 vehicles per hour per lane or less when traffic follow breaks down. Under the emergency evacuation condition, traffic typically breaks down due to many factors such as poor visibility (due to smoke), rubbernecking, panicking, etc. We agree that the on-ramp capacity is not an absolute limit; instead, it drops significantly under the emergency evacuation condition. In this perspective, traffic congestion would be even much worse.

- **Auxiliary Lanes:** TJKM stated that “the sections of SR-24 where the westbound and eastbound ramps enter the freeway feature long auxiliary lanes, such that evacuation traffic would have ample time to merge into the other travel lanes without slowing down ramp traffic.” Auxiliary lanes on SR 24 do not help when traffic is already congested (WB in AM and EB in PM) while much more additional traffic is being loaded onto SR 24 due to emergency evacuation.

## CONCLUSION

In conclusion, the evacuation models that TJKM developed has critical fatal flaws. The results generated from the evacuation models are invalid and should not be used for any decision-making.



## APPENDIX

### SimTraffic Simulation Reports

- PHF = 0.75 (TJKM's assumption)
  - **Evac 1** – Evacuation (without project) in the AM Peak
  - **Evac 1 + Project** – Evacuation plus project, with trap lane, in the AM Peak
  - **Evac 1 + Project Variant** – Evacuation plus project, no trap lane, in the AM Peak
- PHF = 1.0
  - **Evac 1** – Evacuation without project in the AM Peak
  - **Evac 1 + Project** – Evacuation plus project, with trap lane, in the AM Peak
  - **Evac 1 + Project Variant** – Evacuation plus project, no trap lane, in the AM Peak

PHF = 0.75 (TJKM's assumption)

**Evac 1** – Evacuation (without project) in the AM Peak

# SimTraffic Simulation Summary

## Evacuation Scenario 1

08/23/2020

### Summary of All Intervals

| Run Number              | 1      | 2      | 3      | 4      | 5      | Avg    |
|-------------------------|--------|--------|--------|--------|--------|--------|
| Start Time              | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   |
| End Time                | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   |
| Total Time (min)        | 70     | 70     | 70     | 70     | 70     | 70     |
| Time Recorded (min)     | 60     | 60     | 60     | 60     | 60     | 60     |
| # of Intervals          | 2      | 2      | 2      | 2      | 2      | 2      |
| # of Recorded Intervals | 1      | 1      | 1      | 1      | 1      | 1      |
| Vehs Entered            | 1839   | 1799   | 1853   | 1780   | 1801   | 1815   |
| Vehs Exited             | 1731   | 1727   | 1714   | 1677   | 1712   | 1712   |
| Starting Vehs           | 281    | 306    | 248    | 270    | 292    | 279    |
| Ending Vehs             | 389    | 378    | 387    | 373    | 381    | 380    |
| Denied Entry Before     | 111    | 134    | 82     | 89     | 97     | 102    |
| Denied Entry After      | 3211   | 3348   | 3053   | 3274   | 3192   | 3215   |
| Travel Distance (mi)    | 1650   | 1646   | 1657   | 1635   | 1633   | 1644   |
| Travel Time (hr)        | 1970.3 | 2079.1 | 1891.0 | 2004.2 | 1963.6 | 1981.7 |
| Total Delay (hr)        | 1913.1 | 2022.1 | 1833.3 | 1947.6 | 1906.9 | 1924.6 |
| Total Stops             | 6129   | 6226   | 6137   | 6034   | 6042   | 6113   |
| Fuel Used (gal)         | 490.2  | 515.2  | 471.8  | 497.7  | 486.6  | 492.3  |

### Interval #0 Information Seeding

|                  |      |
|------------------|------|
| Start Time       | 6:50 |
| End Time         | 7:00 |
| Total Time (min) | 10   |

No data recorded this interval.

### Interval #1 Information Recording

|                  |      |
|------------------|------|
| Start Time       | 7:00 |
| End Time         | 8:00 |
| Total Time (min) | 60   |

Volumes adjusted by PHF.

| Run Number           | 1      | 2      | 3      | 4      | 5      | Avg    |
|----------------------|--------|--------|--------|--------|--------|--------|
| Vehs Entered         | 1839   | 1799   | 1853   | 1780   | 1801   | 1815   |
| Vehs Exited          | 1731   | 1727   | 1714   | 1677   | 1712   | 1712   |
| Starting Vehs        | 281    | 306    | 248    | 270    | 292    | 279    |
| Ending Vehs          | 389    | 378    | 387    | 373    | 381    | 380    |
| Denied Entry Before  | 111    | 134    | 82     | 89     | 97     | 102    |
| Denied Entry After   | 3211   | 3348   | 3053   | 3274   | 3192   | 3215   |
| Travel Distance (mi) | 1650   | 1646   | 1657   | 1635   | 1633   | 1644   |
| Travel Time (hr)     | 1970.3 | 2079.1 | 1891.0 | 2004.2 | 1963.6 | 1981.7 |
| Total Delay (hr)     | 1913.1 | 2022.1 | 1833.3 | 1947.6 | 1906.9 | 1924.6 |
| Total Stops          | 6129   | 6226   | 6137   | 6034   | 6042   | 6113   |
| Fuel Used (gal)      | 490.2  | 515.2  | 471.8  | 497.7  | 486.6  | 492.3  |

## 1: Pleasant Hill Road & Rancho View Drive Performance by movement

| Movement            | EBR | SBT | All |
|---------------------|-----|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.2 | 0.1 | 0.2 |
| Total Delay (hr)    | 0.2 | 0.1 | 0.2 |
| Total Del/Veh (s)   | 3.6 | 6.3 | 4.1 |
| Stop Delay (hr)     | 0.1 | 0.0 | 0.2 |
| Stop Del/Veh (s)    | 2.8 | 4.5 | 3.1 |
| Vehicles Entered    | 176 | 36  | 212 |
| Vehicles Exited     | 175 | 36  | 211 |
| Hourly Exit Rate    | 175 | 36  | 211 |
| Input Volume        | 173 | 33  | 206 |
| % of Volume         | 101 | 109 | 102 |
| Denied Entry Before | 0   | 0   | 0   |
| Denied Entry After  | 0   | 0   | 0   |

## 2: Pleasant Hill Road & Greenvally Drive Performance by movement

| Movement            | EBR | WBL   | SBT | All  |
|---------------------|-----|-------|-----|------|
| Denied Delay (hr)   | 0.0 | 0.0   | 0.0 | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0   | 0.0 | 0.0  |
| Total Delay (hr)    | 0.1 | 19.7  | 0.3 | 20.1 |
| Total Del/Veh (s)   | 3.4 | 144.5 | 5.2 | 95.1 |
| Stop Delay (hr)     | 0.1 | 18.6  | 0.2 | 18.9 |
| Stop Del/Veh (s)    | 3.5 | 136.2 | 3.4 | 89.3 |
| Vehicles Entered    | 56  | 479   | 212 | 747  |
| Vehicles Exited     | 55  | 467   | 212 | 734  |
| Hourly Exit Rate    | 55  | 467   | 212 | 734  |
| Input Volume        | 56  | 637   | 207 | 900  |
| % of Volume         | 98  | 73    | 102 | 82   |
| Denied Entry Before | 0   | 0     | 0   | 0    |
| Denied Entry After  | 0   | 0     | 0   | 0    |



### 3: Pleasant Hill Road & Reliez Valle Road Performance by movement

| Movement            | EBR    | SBT  | All   |
|---------------------|--------|------|-------|
| Denied Delay (hr)   | 571.5  | 0.0  | 571.5 |
| Denied Del/Veh (s)  | 1365.2 | 0.0  | 918.1 |
| Total Delay (hr)    | 17.5   | 8.3  | 25.7  |
| Total Del/Veh (s)   | 199.0  | 39.8 | 87.2  |
| Stop Delay (hr)     | 17.5   | 6.7  | 24.3  |
| Stop Del/Veh (s)    | 199.8  | 32.4 | 82.2  |
| Vehicles Entered    | 303    | 734  | 1037  |
| Vehicles Exited     | 297    | 727  | 1024  |
| Hourly Exit Rate    | 297    | 727  | 1024  |
| Input Volume        | 1499   | 900  | 2399  |
| % of Volume         | 20     | 81   | 43    |
| Denied Entry Before | 8      | 0    | 8     |
| Denied Entry After  | 1204   | 0    | 1204  |

### 4: Pleasant Hill Road & Springhill Road/Quandt Road Performance by movement

| Movement            | EBR    | WBL   | WBT   | NBL  | SBT   | SBR  | All   |
|---------------------|--------|-------|-------|------|-------|------|-------|
| Denied Delay (hr)   | 354.3  | 42.1  | 6.4   | 0.0  | 0.0   | 0.0  | 402.8 |
| Denied Del/Veh (s)  | 1456.1 | 485.6 | 480.4 | 0.0  | 0.0   | 0.0  | 641.6 |
| Total Delay (hr)    | 9.9    | 7.9   | 1.2   | 0.1  | 32.3  | 2.5  | 53.8  |
| Total Del/Veh (s)   | 201.6  | 123.7 | 126.0 | 96.5 | 123.9 | 93.5 | 131.2 |
| Stop Delay (hr)     | 10.2   | 7.7   | 1.1   | 0.1  | 32.5  | 2.6  | 54.2  |
| Stop Del/Veh (s)    | 207.6  | 120.7 | 121.8 | 94.2 | 124.8 | 94.5 | 132.0 |
| Vehicles Entered    | 167    | 228   | 33    | 5    | 922   | 97   | 1452  |
| Vehicles Exited     | 166    | 223   | 32    | 5    | 897   | 94   | 1417  |
| Hourly Exit Rate    | 166    | 223   | 32    | 5    | 897   | 94   | 1417  |
| Input Volume        | 857    | 297   | 45    | 5    | 2168  | 231  | 3603  |
| % of Volume         | 19     | 75    | 71    | 100  | 41    | 41   | 39    |
| Denied Entry Before | 11     | 1     | 0     | 0    | 0     | 0    | 12    |
| Denied Entry After  | 709    | 84    | 15    | 0    | 0     | 0    | 808   |

5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard Performance by movement

| Movement            | WBL    | NBT  | NBR | SBL   | SBT   | All   |
|---------------------|--------|------|-----|-------|-------|-------|
| Denied Delay (hr)   | 573.7  | 0.0  | 0.0 | 0.0   | 0.0   | 573.7 |
| Denied Del/Veh (s)  | 1606.0 | 0.0  | 0.0 | 0.0   | 0.0   | 792.8 |
| Total Delay (hr)    | 23.6   | 0.0  | 0.0 | 13.0  | 140.8 | 177.4 |
| Total Del/Veh (s)   | 320.2  | 17.2 | 2.9 | 373.8 | 389.2 | 369.9 |
| Stop Delay (hr)     | 23.4   | 0.0  | 0.0 | 12.3  | 137.2 | 172.9 |
| Stop Del/Veh (s)    | 317.5  | 15.6 | 2.9 | 353.2 | 379.4 | 360.7 |
| Vehicles Entered    | 238    | 7    | 26  | 112   | 1174  | 1557  |
| Vehicles Exited     | 241    | 7    | 26  | 113   | 1139  | 1526  |
| Hourly Exit Rate    | 241    | 7    | 26  | 113   | 1139  | 1526  |
| Input Volume        | 1212   | 6    | 29  | 291   | 3032  | 4570  |
| % of Volume         | 20     | 117  | 90  | 39    | 38    | 33    |
| Denied Entry Before | 82     | 0    | 0   | 0     | 0     | 82    |
| Denied Entry After  | 1048   | 0    | 0   | 0     | 0     | 1048  |

6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp Performance by movement

| Movement            | SBT | SBR | All |
|---------------------|-----|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.0 | 0.0 | 0.0 |
| Total Delay (hr)    | 0.0 | 0.0 | 0.0 |
| Total Del/Veh (s)   | 0.1 | 4.8 | 4.1 |
| Stop Delay (hr)     | 0.0 | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.0 | 0.0 | 0.0 |
| Vehicles Entered    | 2   | 11  | 13  |
| Vehicles Exited     | 2   | 11  | 13  |
| Hourly Exit Rate    | 2   | 11  | 13  |
| Input Volume        | 7   | 28  | 35  |
| % of Volume         | 29  | 39  | 37  |
| Denied Entry Before | 0   | 0   | 0   |
| Denied Entry After  | 0   | 0   | 0   |

7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road Performance by movement

| Movement            | SBT | All |
|---------------------|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.1 | 0.1 |
| Total Delay (hr)    | 0.0 | 0.0 |
| Total Del/Veh (s)   | 1.8 | 1.8 |
| Stop Delay (hr)     | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.1 | 0.1 |
| Vehicles Entered    | 28  | 28  |
| Vehicles Exited     | 28  | 28  |
| Hourly Exit Rate    | 28  | 28  |
| Input Volume        | 29  | 29  |
| % of Volume         | 97  | 97  |
| Denied Entry Before | 0   | 0   |
| Denied Entry After  | 0   | 0   |

14: Pleasant Hill Road & Acalanes Avenue Performance by movement

| Movement            | NBT | SBT  | All  |
|---------------------|-----|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0 | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 4.5  | 4.5  |
| Total Del/Veh (s)   | 0.3 | 11.8 | 11.6 |
| Stop Delay (hr)     | 0.0 | 1.4  | 1.4  |
| Stop Del/Veh (s)    | 0.0 | 3.7  | 3.6  |
| Vehicles Entered    | 33  | 1377 | 1410 |
| Vehicles Exited     | 33  | 1376 | 1409 |
| Hourly Exit Rate    | 33  | 1376 | 1409 |
| Input Volume        | 35  | 4244 | 4279 |
| % of Volume         | 94  | 32   | 33   |
| Denied Entry Before | 0   | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    |

### 15: Pleasant Hill Road Performance by movement

| Movement            | WBR | SBT  | SBR  | All  |
|---------------------|-----|------|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0  | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 3.7  | 2.9  | 6.5  |
| Total Del/Veh (s)   | 0.7 | 18.8 | 15.1 | 16.6 |
| Stop Delay (hr)     | 0.0 | 0.4  | 0.4  | 0.8  |
| Stop Del/Veh (s)    | 0.0 | 2.1  | 2.2  | 2.1  |
| Vehicles Entered    | 33  | 697  | 679  | 1409 |
| Vehicles Exited     | 33  | 695  | 681  | 1409 |
| Hourly Exit Rate    | 33  | 695  | 681  | 1409 |
| Input Volume        | 35  | 2140 | 2104 | 4279 |
| % of Volume         | 94  | 32   | 32   | 33   |
| Denied Entry Before | 0   | 0    | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    | 0    |

### 16: Pleasant Hill Road Performance by movement

| Movement            | SBT  | All  |
|---------------------|------|------|
| Denied Delay (hr)   | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0  | 0.0  |
| Total Delay (hr)    | 1.3  | 1.3  |
| Total Del/Veh (s)   | 6.7  | 6.7  |
| Stop Delay (hr)     | 0.0  | 0.0  |
| Stop Del/Veh (s)    | 0.0  | 0.0  |
| Vehicles Entered    | 695  | 695  |
| Vehicles Exited     | 695  | 695  |
| Hourly Exit Rate    | 695  | 695  |
| Input Volume        | 2140 | 2140 |
| % of Volume         | 32   | 32   |
| Denied Entry Before | 0    | 0    |
| Denied Entry After  | 0    | 0    |

### 17: Pleasant Hill Road Performance by movement

| Movement            | SBT | SBR  | All  |
|---------------------|-----|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.1  | 0.1  |
| Total Delay (hr)    | 0.0 | 1.3  | 1.3  |
| Total Del/Veh (s)   | 7.3 | 6.3  | 6.3  |
| Stop Delay (hr)     | 0.0 | 0.6  | 0.6  |
| Stop Del/Veh (s)    | 1.7 | 3.2  | 3.1  |
| Vehicles Entered    | 13  | 716  | 729  |
| Vehicles Exited     | 13  | 716  | 729  |
| Hourly Exit Rate    | 13  | 716  | 729  |
| Input Volume        | 35  | 2140 | 2175 |
| % of Volume         | 37  | 33   | 34   |
| Denied Entry Before | 0   | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    |

### Total Network Performance

|                     |        |
|---------------------|--------|
| Denied Delay (hr)   | 1613.5 |
| Denied Del/Veh (s)  | 1154.8 |
| Total Delay (hr)    | 311.1  |
| Total Del/Veh (s)   | 535.4  |
| Stop Delay (hr)     | 289.0  |
| Stop Del/Veh (s)    | 497.3  |
| Vehicles Entered    | 1815   |
| Vehicles Exited     | 1712   |
| Hourly Exit Rate    | 1712   |
| Input Volume        | 37038  |
| % of Volume         | 5      |
| Denied Entry Before | 102    |
| Denied Entry After  | 3215   |

Arterial Level of Service: NB Pleasant Hill Road

| Cross Street      | Node | Delay (s/veh) | Travel time (s) | Dist (mi) | Arterial Speed |
|-------------------|------|---------------|-----------------|-----------|----------------|
| Acalanes Avenue   | 14   | 0.3           | 20.2            | 0.1       | 11             |
|                   | 11   | 0.0           | 4.0             | 0.0       | 34             |
| Stanley Boulevard | 5    | 17.2          | 24.2            | 0.1       | 12             |
| Quandt Road       | 4    | 96.5          | 141.4           | 0.4       | 11             |
| Total             |      | 113.9         | 189.8           | 0.6       | 12             |

Arterial Level of Service: SB Pleasant Hill Road

| Cross Street         | Node | Delay (s/veh) | Travel time (s) | Dist (mi) | Arterial Speed |
|----------------------|------|---------------|-----------------|-----------|----------------|
| Rancho View Drive    | 1    | 6.3           | 21.5            | 0.2       | 26             |
|                      | 19   | 1.3           | 16.3            | 0.1       | 33             |
| Greenvalley Drive    | 2    | 5.2           | 12.0            | 0.1       | 21             |
| Reliez Valle Road    | 3    | 39.1          | 63.3            | 0.3       | 14             |
|                      | 20   | 24.2          | 27.8            | 0.0       | 4              |
| Springhill Road      | 4    | 123.9         | 133.4           | 0.1       | 3              |
| Deer Hill Road       | 5    | 359.4         | 398.0           | 0.4       | 4              |
|                      | 11   | 19.5          | 28.0            | 0.1       | 10             |
| Acalanes Avenue      | 14   | 11.8          | 15.8            | 0.0       | 9              |
|                      | 15   | 18.8          | 25.0            | 0.1       | 9              |
|                      | 16   | 6.7           | 16.1            | 0.1       | 24             |
|                      | 17   | 7.3           | 16.4            | 0.1       | 16             |
| Mt. Diablo Boulevard | 6    | 4.8           | 12.9            | 0.1       | 19             |
| SR 24 EB Off Ramp    | 7    | 1.8           | 4.6             | 0.1       | 48             |
| Total                |      | 630.0         | 791.1           | 1.7       | 8              |

Queuing and Blocking Report  
Evacuation Scenario 1

08/23/2020

Intersection: 1: Pleasant Hill Road & Rancho View Drive

| Movement              | EB  | SB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | LTR | T   | TR  |
| Maximum Queue (ft)    | 91  | 48  | 11  |
| Average Queue (ft)    | 42  | 11  | 1   |
| 95th Queue (ft)       | 73  | 37  | 8   |
| Link Distance (ft)    | 306 | 773 | 773 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

Intersection: 2: Pleasant Hill Road & Greenvalley Drive

| Movement              | EB  | WB  | B60 | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|
| Directions Served     | LTR | LT  | T   | T   | TR  |
| Maximum Queue (ft)    | 56  | 611 | 112 | 55  | 75  |
| Average Queue (ft)    | 14  | 562 | 73  | 12  | 31  |
| 95th Queue (ft)       | 35  | 664 | 112 | 37  | 63  |
| Link Distance (ft)    | 333 | 494 | 53  | 288 | 288 |
| Upstream Blk Time (%) |     | 82  | 84  |     |     |
| Queuing Penalty (veh) |     | 0   | 0   |     |     |
| Storage Bay Dist (ft) |     |     |     |     |     |
| Storage Blk Time (%)  |     | 76  |     |     |     |
| Queuing Penalty (veh) |     | 0   |     |     |     |

Intersection: 3: Pleasant Hill Road & Reliez Valle Road

| Movement              | EB  | EB  | SB   | SB   |
|-----------------------|-----|-----|------|------|
| Directions Served     | L   | R   | T    | T    |
| Maximum Queue (ft)    | 467 | 486 | 360  | 366  |
| Average Queue (ft)    | 283 | 457 | 200  | 198  |
| 95th Queue (ft)       | 631 | 473 | 292  | 304  |
| Link Distance (ft)    | 438 | 438 | 1259 | 1259 |
| Upstream Blk Time (%) | 33  | 96  |      |      |
| Queuing Penalty (veh) | 0   | 0   |      |      |
| Storage Bay Dist (ft) |     |     |      |      |
| Storage Blk Time (%)  |     |     |      | 34   |
| Queuing Penalty (veh) |     |     |      | 0    |

# Queuing and Blocking Report

## Evacuation Scenario 1

08/23/2020

### Intersection: 4: Pleasant Hill Road & Springhill Road/Quandt Road

| Movement              | EB  | WB  | NB  | SB   | SB   | SB  | B20 | B20  |
|-----------------------|-----|-----|-----|------|------|-----|-----|------|
| Directions Served     | LTR | LTR | L   | T    | T    | R   | T   | T    |
| Maximum Queue (ft)    | 370 | 255 | 20  | 523  | 520  | 96  | 217 | 222  |
| Average Queue (ft)    | 338 | 231 | 3   | 470  | 470  | 76  | 169 | 181  |
| 95th Queue (ft)       | 355 | 246 | 15  | 612  | 625  | 140 | 262 | 266  |
| Link Distance (ft)    | 318 | 213 |     | 414  | 414  |     | 127 | 127  |
| Upstream Blk Time (%) | 100 | 89  |     | 86   | 88   |     | 28  | 86   |
| Queuing Penalty (veh) | 0   | 0   |     | 1036 | 1053 |     | 331 | 1036 |
| Storage Bay Dist (ft) |     |     | 200 |      |      | 71  |     |      |
| Storage Blk Time (%)  |     |     |     | 87   | 81   | 0   |     |      |
| Queuing Penalty (veh) |     |     |     | 0    | 188  | 3   |     |      |

### Intersection: 5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard

| Movement              | WB  | WB  | NB  | NB  | SB  | SB   | SB   |
|-----------------------|-----|-----|-----|-----|-----|------|------|
| Directions Served     | L   | LT  | T   | R   | L   | T    | T    |
| Maximum Queue (ft)    | 225 | 554 | 32  | 47  | 275 | 2267 | 2401 |
| Average Queue (ft)    | 194 | 524 | 3   | 11  | 183 | 2238 | 2366 |
| 95th Queue (ft)       | 304 | 543 | 17  | 34  | 335 | 2325 | 2480 |
| Link Distance (ft)    |     | 504 | 347 | 347 |     | 2220 | 2220 |
| Upstream Blk Time (%) |     | 95  |     |     |     | 40   | 94   |
| Queuing Penalty (veh) |     | 0   |     |     |     | 672  | 1556 |
| Storage Bay Dist (ft) | 185 |     |     |     | 175 |      |      |
| Storage Blk Time (%)  | 9   | 97  |     |     | 6   | 28   | 66   |
| Queuing Penalty (veh) | 52  | 587 |     |     | 88  | 81   | 0    |

### Intersection: 6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |



## Queuing and Blocking Report Evacuation Scenario 1

08/23/2020

### Intersection: 7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road

| Movement              | SB |
|-----------------------|----|
| Directions Served     | T  |
| Maximum Queue (ft)    | 3  |
| Average Queue (ft)    | 0  |
| 95th Queue (ft)       | 2  |
| Link Distance (ft)    |    |
| Upstream Blk Time (%) |    |
| Queuing Penalty (veh) |    |
| Storage Bay Dist (ft) |    |
| Storage Blk Time (%)  |    |
| Queuing Penalty (veh) |    |

### Intersection: 8: Brown Avenue/Miller Drive & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

### Intersection: 9: First Street/Sierra Vista Way & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

## Queuing and Blocking Report

### Evacuation Scenario 1

08/23/2020

#### Intersection: 10: SR 24 WB Ramps/Laurel Drive & Deer Hill Road

##### Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

#### Intersection: 14: Pleasant Hill Road & Acalanes Avenue

##### Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

#### Intersection: 15: Pleasant Hill Road

##### Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

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Intersection: 16: Pleasant Hill Road

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Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

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Intersection: 17: Pleasant Hill Road

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Movement

SB

Directions Served

TR

Maximum Queue (ft)

217

Average Queue (ft)

80

95th Queue (ft)

174

Link Distance (ft)

314

Upstream Blk Time (%)

0

Queuing Penalty (veh)

0

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

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Network Summary

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Network wide Queuing Penalty: 7415

PHF = 0.75 (TJKM's assumption)

**Evac 1 + Project** – Evacuation plus project, with trap lane, in the AM  
Peak

### Summary of All Intervals

| Run Number              | 1      | 2      | 3      | 4      | 5      | Avg    |
|-------------------------|--------|--------|--------|--------|--------|--------|
| Start Time              | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   |
| End Time                | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   |
| Total Time (min)        | 70     | 70     | 70     | 70     | 70     | 70     |
| Time Recorded (min)     | 60     | 60     | 60     | 60     | 60     | 60     |
| # of Intervals          | 2      | 2      | 2      | 2      | 2      | 2      |
| # of Recorded Intervals | 1      | 1      | 1      | 1      | 1      | 1      |
| Vehs Entered            | 2263   | 2295   | 2244   | 2328   | 2313   | 2288   |
| Vehs Exited             | 2102   | 2093   | 2083   | 2150   | 2194   | 2124   |
| Starting Vehs           | 258    | 221    | 256    | 240    | 270    | 249    |
| Ending Vehs             | 419    | 423    | 417    | 418    | 389    | 413    |
| Denied Entry Before     | 144    | 118    | 171    | 165    | 170    | 154    |
| Denied Entry After      | 3606   | 3495   | 3527   | 3411   | 3573   | 3521   |
| Travel Distance (mi)    | 1958   | 1940   | 1912   | 1998   | 1993   | 1960   |
| Travel Time (hr)        | 2184.8 | 2082.6 | 2177.1 | 2092.5 | 2164.7 | 2140.3 |
| Total Delay (hr)        | 2116.4 | 2014.8 | 2109.6 | 2022.3 | 2095.0 | 2071.6 |
| Total Stops             | 8764   | 8548   | 8324   | 9019   | 8972   | 8724   |
| Fuel Used (gal)         | 547.6  | 524.9  | 544.9  | 528.3  | 545.2  | 538.2  |

### Interval #0 Information Seeding

|                  |      |
|------------------|------|
| Start Time       | 6:50 |
| End Time         | 7:00 |
| Total Time (min) | 10   |

No data recorded this interval.

### Interval #1 Information Recording

|                  |      |
|------------------|------|
| Start Time       | 7:00 |
| End Time         | 8:00 |
| Total Time (min) | 60   |

Volumes adjusted by PHF.

| Run Number           | 1      | 2      | 3      | 4      | 5      | Avg    |
|----------------------|--------|--------|--------|--------|--------|--------|
| Vehs Entered         | 2263   | 2295   | 2244   | 2328   | 2313   | 2288   |
| Vehs Exited          | 2102   | 2093   | 2083   | 2150   | 2194   | 2124   |
| Starting Vehs        | 258    | 221    | 256    | 240    | 270    | 249    |
| Ending Vehs          | 419    | 423    | 417    | 418    | 389    | 413    |
| Denied Entry Before  | 144    | 118    | 171    | 165    | 170    | 154    |
| Denied Entry After   | 3606   | 3495   | 3527   | 3411   | 3573   | 3521   |
| Travel Distance (mi) | 1958   | 1940   | 1912   | 1998   | 1993   | 1960   |
| Travel Time (hr)     | 2184.8 | 2082.6 | 2177.1 | 2092.5 | 2164.7 | 2140.3 |
| Total Delay (hr)     | 2116.4 | 2014.8 | 2109.6 | 2022.3 | 2095.0 | 2071.6 |
| Total Stops          | 8764   | 8548   | 8324   | 9019   | 8972   | 8724   |
| Fuel Used (gal)      | 547.6  | 524.9  | 544.9  | 528.3  | 545.2  | 538.2  |

### 1: Pleasant Hill Road & Rancho View Drive Performance by movement

| Movement            | EBR | SBT | All |
|---------------------|-----|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.2 | 0.1 | 0.2 |
| Total Delay (hr)    | 0.2 | 0.1 | 0.2 |
| Total Del/Veh (s)   | 3.8 | 5.4 | 4.1 |
| Stop Delay (hr)     | 0.1 | 0.0 | 0.2 |
| Stop Del/Veh (s)    | 2.9 | 3.8 | 3.0 |
| Vehicles Entered    | 177 | 34  | 211 |
| Vehicles Exited     | 176 | 33  | 209 |
| Hourly Exit Rate    | 176 | 33  | 209 |
| Input Volume        | 173 | 33  | 206 |
| % of Volume         | 102 | 100 | 101 |
| Denied Entry Before | 0   | 0   | 0   |
| Denied Entry After  | 0   | 0   | 0   |

### 2: Pleasant Hill Road & Greenvaley Drive Performance by movement

| Movement            | EBR | WBL   | SBT | All  |
|---------------------|-----|-------|-----|------|
| Denied Delay (hr)   | 0.0 | 0.0   | 0.0 | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0   | 0.0 | 0.0  |
| Total Delay (hr)    | 0.1 | 20.1  | 0.3 | 20.5 |
| Total Del/Veh (s)   | 3.9 | 148.6 | 5.7 | 97.7 |
| Stop Delay (hr)     | 0.1 | 19.1  | 0.2 | 19.4 |
| Stop Del/Veh (s)    | 4.1 | 140.8 | 3.9 | 92.2 |
| Vehicles Entered    | 59  | 475   | 209 | 743  |
| Vehicles Exited     | 59  | 464   | 209 | 732  |
| Hourly Exit Rate    | 59  | 464   | 209 | 732  |
| Input Volume        | 56  | 637   | 207 | 900  |
| % of Volume         | 105 | 73    | 101 | 81   |
| Denied Entry Before | 0   | 0     | 0   | 0    |
| Denied Entry After  | 0   | 0     | 0   | 0    |

### 3: Pleasant Hill Road & Reliez Valle Road Performance by movement

| Movement            | EBR   | SBT  | All   |
|---------------------|-------|------|-------|
| Denied Delay (hr)   | 400.7 | 0.0  | 400.7 |
| Denied Del/Veh (s)  | 962.4 | 0.0  | 646.6 |
| Total Delay (hr)    | 15.4  | 6.5  | 21.8  |
| Total Del/Veh (s)   | 88.9  | 31.0 | 57.3  |
| Stop Delay (hr)     | 13.7  | 5.1  | 18.8  |
| Stop Del/Veh (s)    | 79.2  | 24.6 | 49.4  |
| Vehicles Entered    | 609   | 732  | 1341  |
| Vehicles Exited     | 606   | 725  | 1331  |
| Hourly Exit Rate    | 606   | 725  | 1331  |
| Input Volume        | 1499  | 900  | 2399  |
| % of Volume         | 40    | 81   | 55    |
| Denied Entry Before | 7     | 0    | 7     |
| Denied Entry After  | 890   | 0    | 890   |

### 4: Pleasant Hill Road & Springhill Road/Quandt Road Performance by movement

| Movement            | EBR    | WBL   | WBT   | NBL  | SBT  | SBR  | All   |
|---------------------|--------|-------|-------|------|------|------|-------|
| Denied Delay (hr)   | 381.4  | 20.4  | 3.7   | 0.0  | 0.0  | 0.0  | 405.4 |
| Denied Del/Veh (s)  | 1544.3 | 254.1 | 269.8 | 0.0  | 0.0  | 0.0  | 570.4 |
| Total Delay (hr)    | 9.2    | 7.5   | 1.4   | 0.1  | 21.9 | 2.0  | 42.0  |
| Total Del/Veh (s)   | 224.5  | 108.8 | 117.4 | 81.8 | 65.0 | 53.8 | 84.7  |
| Stop Delay (hr)     | 9.4    | 7.2   | 1.3   | 0.1  | 19.4 | 1.8  | 39.3  |
| Stop Del/Veh (s)    | 229.7  | 104.7 | 112.5 | 81.0 | 57.8 | 50.3 | 79.3  |
| Vehicles Entered    | 138    | 247   | 42    | 5    | 1198 | 129  | 1759  |
| Vehicles Exited     | 137    | 244   | 41    | 5    | 1175 | 128  | 1730  |
| Hourly Exit Rate    | 137    | 244   | 41    | 5    | 1175 | 128  | 1730  |
| Input Volume        | 857    | 297   | 45    | 5    | 2168 | 231  | 3603  |
| % of Volume         | 16     | 82    | 91    | 100  | 54   | 55   | 48    |
| Denied Entry Before | 40     | 0     | 0     | 0    | 0    | 0    | 40    |
| Denied Entry After  | 751    | 42    | 7     | 0    | 0    | 0    | 800   |

5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard Performance by movement

| Movement            | WBL    | NBT  | NBR | SBL  | SBT  | All   |
|---------------------|--------|------|-----|------|------|-------|
| Denied Delay (hr)   | 564.4  | 0.0  | 0.0 | 0.0  | 0.0  | 564.4 |
| Denied Del/Veh (s)  | 1578.8 | 0.0  | 0.0 | 0.0  | 0.0  | 725.7 |
| Total Delay (hr)    | 21.7   | 0.0  | 0.0 | 3.5  | 24.7 | 50.0  |
| Total Del/Veh (s)   | 326.5  | 12.8 | 3.7 | 97.3 | 64.6 | 100.7 |
| Stop Delay (hr)     | 21.5   | 0.0  | 0.0 | 3.3  | 21.4 | 46.2  |
| Stop Del/Veh (s)    | 323.2  | 11.6 | 3.9 | 91.1 | 55.9 | 93.1  |
| Vehicles Entered    | 214    | 7    | 32  | 128  | 1346 | 1727  |
| Vehicles Exited     | 215    | 7    | 32  | 128  | 1346 | 1728  |
| Hourly Exit Rate    | 215    | 7    | 32  | 128  | 1346 | 1728  |
| Input Volume        | 1212   | 6    | 29  | 291  | 3032 | 4570  |
| % of Volume         | 18     | 117  | 110 | 44   | 44   | 38    |
| Denied Entry Before | 72     | 0    | 0   | 0    | 0    | 72    |
| Denied Entry After  | 1073   | 0    | 0   | 0    | 0    | 1073  |

6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp Performance by movement

| Movement            | SBR | All |
|---------------------|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.0 | 0.0 |
| Total Delay (hr)    | 0.0 | 0.0 |
| Total Del/Veh (s)   | 6.2 | 6.2 |
| Stop Delay (hr)     | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.0 | 0.0 |
| Vehicles Entered    | 8   | 8   |
| Vehicles Exited     | 8   | 8   |
| Hourly Exit Rate    | 8   | 8   |
| Input Volume        | 35  | 35  |
| % of Volume         | 23  | 23  |
| Denied Entry Before | 0   | 0   |
| Denied Entry After  | 0   | 0   |



7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road Performance by movement

| Movement            | SBT | All |
|---------------------|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.1 | 0.1 |
| Total Delay (hr)    | 0.0 | 0.0 |
| Total Del/Veh (s)   | 1.9 | 1.9 |
| Stop Delay (hr)     | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.1 | 0.1 |
| Vehicles Entered    | 34  | 34  |
| Vehicles Exited     | 34  | 34  |
| Hourly Exit Rate    | 34  | 34  |
| Input Volume        | 35  | 35  |
| % of Volume         | 97  | 97  |
| Denied Entry Before | 0   | 0   |
| Denied Entry After  | 0   | 0   |

11: Pleasant Hill Road & Project Dwy Performance by movement

| Movement            | EBR    | NBT | SBT  | All   |
|---------------------|--------|-----|------|-------|
| Denied Delay (hr)   | 294.0  | 0.0 | 0.0  | 294.0 |
| Denied Del/Veh (s)  | 1369.0 | 0.0 | 0.0  | 446.0 |
| Total Delay (hr)    | 7.0    | 0.0 | 13.7 | 20.7  |
| Total Del/Veh (s)   | 112.7  | 0.0 | 31.4 | 40.6  |
| Stop Delay (hr)     | 7.5    | 0.0 | 11.1 | 18.6  |
| Stop Del/Veh (s)    | 120.4  | 0.0 | 25.4 | 36.5  |
| Vehicles Entered    | 217    | 39  | 1561 | 1817  |
| Vehicles Exited     | 217    | 39  | 1558 | 1814  |
| Hourly Exit Rate    | 217    | 39  | 1558 | 1814  |
| Input Volume        | 735    | 35  | 4244 | 5014  |
| % of Volume         | 30     | 111 | 37   | 36    |
| Denied Entry Before | 31     | 0   | 0    | 31    |
| Denied Entry After  | 556    | 0   | 0    | 556   |

#### 14: Pleasant Hill Road & Acalanes Avenue Performance by movement

| Movement            | NBT | SBT  | All  |
|---------------------|-----|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0 | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 8.4  | 8.4  |
| Total Del/Veh (s)   | 0.3 | 16.9 | 16.6 |
| Stop Delay (hr)     | 0.0 | 8.1  | 8.1  |
| Stop Del/Veh (s)    | 0.0 | 16.4 | 16.1 |
| Vehicles Entered    | 39  | 1775 | 1814 |
| Vehicles Exited     | 39  | 1768 | 1807 |
| Hourly Exit Rate    | 39  | 1768 | 1807 |
| Input Volume        | 35  | 4979 | 5014 |
| % of Volume         | 111 | 36   | 36   |
| Denied Entry Before | 0   | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    |

#### 15: Pleasant Hill Road Performance by movement

| Movement            | WBR | SBT  | SBR  | All  |
|---------------------|-----|------|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0  | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 10.4 | 1.6  | 12.0 |
| Total Del/Veh (s)   | 0.7 | 41.4 | 6.8  | 23.9 |
| Stop Delay (hr)     | 0.0 | 11.6 | 0.2  | 11.9 |
| Stop Del/Veh (s)    | 0.0 | 46.5 | 0.9  | 23.6 |
| Vehicles Entered    | 39  | 898  | 869  | 1806 |
| Vehicles Exited     | 39  | 890  | 869  | 1798 |
| Hourly Exit Rate    | 39  | 890  | 869  | 1798 |
| Input Volume        | 35  | 2507 | 2472 | 5014 |
| % of Volume         | 111 | 36   | 35   | 36   |
| Denied Entry Before | 0   | 0    | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    | 0    |

#### 16: Pleasant Hill Road Performance by movement

| Movement            | SBT  | All  |
|---------------------|------|------|
| Denied Delay (hr)   | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0  | 0.0  |
| Total Delay (hr)    | 16.4 | 16.4 |
| Total Del/Veh (s)   | 65.5 | 65.6 |
| Stop Delay (hr)     | 18.7 | 18.7 |
| Stop Del/Veh (s)    | 74.5 | 74.5 |
| Vehicles Entered    | 890  | 890  |
| Vehicles Exited     | 884  | 884  |
| Hourly Exit Rate    | 884  | 884  |
| Input Volume        | 2507 | 2507 |
| % of Volume         | 35   | 35   |
| Denied Entry Before | 0    | 0    |
| Denied Entry After  | 0    | 0    |

#### 17: Pleasant Hill Road Performance by movement

| Movement            | SBT  | SBR  | All  |
|---------------------|------|------|------|
| Denied Delay (hr)   | 0.2  | 19.5 | 19.7 |
| Denied Del/Veh (s)  | 93.6 | 76.9 | 77.0 |
| Total Delay (hr)    | 0.1  | 14.9 | 15.1 |
| Total Del/Veh (s)   | 64.0 | 60.2 | 60.2 |
| Stop Delay (hr)     | 0.2  | 17.4 | 17.6 |
| Stop Del/Veh (s)    | 70.0 | 70.2 | 70.2 |
| Vehicles Entered    | 8    | 876  | 884  |
| Vehicles Exited     | 8    | 875  | 883  |
| Hourly Exit Rate    | 8    | 875  | 883  |
| Input Volume        | 35   | 2507 | 2542 |
| % of Volume         | 23   | 35   | 35   |
| Denied Entry Before | 0    | 2    | 2    |
| Denied Entry After  | 0    | 37   | 37   |

---

Total Network Performance

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|                     |        |
|---------------------|--------|
| Denied Delay (hr)   | 1758.9 |
| Denied Del/Veh (s)  | 1090.0 |
| Total Delay (hr)    | 312.7  |
| Total Del/Veh (s)   | 443.8  |
| Stop Delay (hr)     | 287.8  |
| Stop Del/Veh (s)    | 408.4  |
| Vehicles Entered    | 2288   |
| Vehicles Exited     | 2124   |
| Hourly Exit Rate    | 2124   |
| Input Volume        | 44058  |
| % of Volume         | 5      |
| Denied Entry Before | 154    |
| Denied Entry After  | 3521   |

Arterial Level of Service: NB Pleasant Hill Road

| Cross Street      | Node | Delay (s/veh) | Travel time (s) | Dist (mi) | Arterial Speed |
|-------------------|------|---------------|-----------------|-----------|----------------|
| Acalanes Avenue   | 14   | 0.3           | 20.3            | 0.1       | 11             |
| Project Dwy       | 11   | 0.0           | 4.1             | 0.0       | 33             |
| Stanley Boulevard | 5    | 12.8          | 19.5            | 0.1       | 15             |
|                   | 37   | 1.7           | 9.9             | 0.1       | 30             |
| Quandt Road       | 4    | 81.8          | 118.9           | 0.4       | 11             |
| Total             |      | 96.5          | 172.8           | 0.6       | 13             |

Arterial Level of Service: SB Pleasant Hill Road

| Cross Street         | Node | Delay (s/veh) | Travel time (s) | Dist (mi) | Arterial Speed |
|----------------------|------|---------------|-----------------|-----------|----------------|
| Rancho View Drive    | 1    | 5.4           | 20.8            | 0.2       | 26             |
|                      | 19   | 1.1           | 15.6            | 0.1       | 34             |
| Greenvalley Drive    | 2    | 5.7           | 12.5            | 0.1       | 21             |
| Reliez Valle Road    | 3    | 28.0          | 51.8            | 0.3       | 17             |
|                      | 20   | 14.3          | 18.0            | 0.0       | 7              |
| Springhill Road      | 4    | 65.0          | 74.5            | 0.1       | 5              |
|                      | 37   | 198.8         | 234.1           | 0.4       | 6              |
| Deer Hill Road       | 5    | 64.6          | 72.6            | 0.1       | 4              |
| Project Dwy          | 11   | 31.6          | 40.1            | 0.1       | 7              |
| Acalanes Avenue      | 14   | 17.6          | 21.7            | 0.0       | 6              |
|                      | 15   | 41.4          | 47.5            | 0.1       | 5              |
|                      | 16   | 65.5          | 74.9            | 0.1       | 5              |
|                      | 17   | 64.0          | 166.8           | 0.1       | 3              |
| Mt. Diablo Boulevard | 6    | 6.2           | 14.2            | 0.1       | 17             |
| SR 24 EB Off Ramp    | 7    | 1.9           | 4.7             | 0.1       | 48             |
| Total                |      | 611.1         | 869.5           | 1.7       | 8              |

Queuing and Blocking Report  
Evacuation Scenario 1 plus Project

AM PEAK  
08/23/2020

Intersection: 1: Pleasant Hill Road & Rancho View Drive

| Movement              | EB  | SB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | LTR | T   | TR  |
| Maximum Queue (ft)    | 83  | 37  | 16  |
| Average Queue (ft)    | 43  | 9   | 1   |
| 95th Queue (ft)       | 72  | 31  | 9   |
| Link Distance (ft)    | 306 | 773 | 773 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

Intersection: 2: Pleasant Hill Road & Greenvalley Drive

| Movement              | EB  | WB  | B60 | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|
| Directions Served     | LTR | LT  | T   | T   | TR  |
| Maximum Queue (ft)    | 60  | 607 | 112 | 64  | 71  |
| Average Queue (ft)    | 15  | 567 | 73  | 15  | 32  |
| 95th Queue (ft)       | 39  | 637 | 109 | 45  | 64  |
| Link Distance (ft)    | 333 | 494 | 53  | 288 | 288 |
| Upstream Blk Time (%) |     | 85  | 87  |     |     |
| Queuing Penalty (veh) |     | 0   | 0   |     |     |
| Storage Bay Dist (ft) |     |     |     |     |     |
| Storage Blk Time (%)  |     | 77  |     | 0   |     |
| Queuing Penalty (veh) |     | 0   |     | 0   |     |

Intersection: 3: Pleasant Hill Road & Reliez Valle Road

| Movement              | EB  | EB  | SB   | SB   |
|-----------------------|-----|-----|------|------|
| Directions Served     | L   | R   | T    | T    |
| Maximum Queue (ft)    | 454 | 488 | 332  | 355  |
| Average Queue (ft)    | 271 | 459 | 183  | 195  |
| 95th Queue (ft)       | 627 | 478 | 280  | 308  |
| Link Distance (ft)    | 438 | 438 | 1259 | 1259 |
| Upstream Blk Time (%) | 18  | 83  |      |      |
| Queuing Penalty (veh) | 0   | 0   |      |      |
| Storage Bay Dist (ft) |     |     |      |      |
| Storage Blk Time (%)  |     |     |      | 30   |
| Queuing Penalty (veh) |     |     |      | 0    |

Queuing and Blocking Report  
Evacuation Scenario 1 plus Project

AM PEAK  
08/23/2020

Intersection: 4: Pleasant Hill Road & Springhill Road/Quandt Road

| Movement              | EB  | WB  | NB  | SB  | SB  | SB  | B20 | B20 |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | L   | T   | T   | R   | T   | T   |
| Maximum Queue (ft)    | 365 | 272 | 24  | 512 | 519 | 96  | 208 | 214 |
| Average Queue (ft)    | 337 | 235 | 3   | 379 | 380 | 71  | 103 | 125 |
| 95th Queue (ft)       | 354 | 256 | 15  | 625 | 640 | 139 | 241 | 277 |
| Link Distance (ft)    | 318 | 217 |     | 406 | 406 |     | 127 | 127 |
| Upstream Blk Time (%) | 100 | 82  |     | 42  | 52  |     | 13  | 46  |
| Queuing Penalty (veh) | 0   | 0   |     | 502 | 621 |     | 153 | 551 |
| Storage Bay Dist (ft) |     |     | 200 |     |     | 71  |     |     |
| Storage Blk Time (%)  |     |     |     | 56  | 58  | 0   |     |     |
| Queuing Penalty (veh) |     |     |     | 0   | 133 | 2   |     |     |

Intersection: 5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard

| Movement              | WB  | WB  | NB  | NB  | SB  | SB  | SB  | SB  | B37  | B37  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
| Directions Served     | L   | LT  | T   | R   | L   | T   | T   | T   | T    | T    |
| Maximum Queue (ft)    | 225 | 556 | 21  | 34  | 275 | 446 | 446 | 450 | 1878 | 2010 |
| Average Queue (ft)    | 110 | 524 | 2   | 11  | 175 | 373 | 393 | 413 | 1622 | 1741 |
| 95th Queue (ft)       | 276 | 543 | 14  | 33  | 309 | 521 | 443 | 458 | 2450 | 2592 |
| Link Distance (ft)    |     | 504 | 342 | 342 |     | 351 | 351 | 351 | 1832 | 1832 |
| Upstream Blk Time (%) |     | 96  |     |     |     | 26  | 36  | 40  | 20   | 76   |
| Queuing Penalty (veh) |     | 0   |     |     |     | 285 | 395 | 439 | 340  | 1267 |
| Storage Bay Dist (ft) | 185 |     |     |     | 175 |     |     |     |      |      |
| Storage Blk Time (%)  | 0   | 92  |     |     | 8   | 6   |     | 60  |      |      |
| Queuing Penalty (veh) | 0   | 558 |     |     | 80  | 19  |     | 0   |      |      |

Intersection: 6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Intersection: 7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road

| Movement              | SB |
|-----------------------|----|
| Directions Served     | T  |
| Maximum Queue (ft)    | 7  |
| Average Queue (ft)    | 0  |
| 95th Queue (ft)       | 6  |
| Link Distance (ft)    |    |
| Upstream Blk Time (%) |    |
| Queuing Penalty (veh) |    |
| Storage Bay Dist (ft) |    |
| Storage Blk Time (%)  |    |
| Queuing Penalty (veh) |    |

Intersection: 8: Brown Avenue/Miller Drive & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Intersection: 9: First Street/Sierra Vista Way & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |



Intersection: 10: SR 24 WB Ramps/Laurel Drive & Deer Hill Road

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 11: Pleasant Hill Road & Project Dwy

| Movement | EB | SB | SB | SB |
|----------|----|----|----|----|
|----------|----|----|----|----|

|                   |   |   |   |    |
|-------------------|---|---|---|----|
| Directions Served | R | T | T | TR |
|-------------------|---|---|---|----|

|                    |     |     |     |     |
|--------------------|-----|-----|-----|-----|
| Maximum Queue (ft) | 216 | 390 | 391 | 394 |
|--------------------|-----|-----|-----|-----|

|                    |     |     |     |     |
|--------------------|-----|-----|-----|-----|
| Average Queue (ft) | 183 | 154 | 327 | 324 |
|--------------------|-----|-----|-----|-----|

|                 |     |     |     |     |
|-----------------|-----|-----|-----|-----|
| 95th Queue (ft) | 199 | 383 | 459 | 484 |
|-----------------|-----|-----|-----|-----|

|                    |     |     |     |     |
|--------------------|-----|-----|-----|-----|
| Link Distance (ft) | 164 | 342 | 342 | 342 |
|--------------------|-----|-----|-----|-----|

|                       |     |   |    |    |
|-----------------------|-----|---|----|----|
| Upstream Blk Time (%) | 100 | 2 | 14 | 11 |
|-----------------------|-----|---|----|----|

|                       |   |    |     |     |
|-----------------------|---|----|-----|-----|
| Queuing Penalty (veh) | 0 | 21 | 201 | 159 |
|-----------------------|---|----|-----|-----|

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 12: Project Dwy NE & Deer Hill Road

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 13: Project Dwy SW & Deer Hill Road

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 14: Pleasant Hill Road & Acalanes Avenue

| Movement | SB | SB | SB |
|----------|----|----|----|
|----------|----|----|----|

|                   |   |   |   |
|-------------------|---|---|---|
| Directions Served | T | T | T |
|-------------------|---|---|---|

|                    |     |     |     |
|--------------------|-----|-----|-----|
| Maximum Queue (ft) | 166 | 267 | 238 |
|--------------------|-----|-----|-----|

|                    |    |     |     |
|--------------------|----|-----|-----|
| Average Queue (ft) | 34 | 230 | 174 |
|--------------------|----|-----|-----|

|                 |     |     |     |
|-----------------|-----|-----|-----|
| 95th Queue (ft) | 110 | 305 | 277 |
|-----------------|-----|-----|-----|

|                    |     |     |     |
|--------------------|-----|-----|-----|
| Link Distance (ft) | 152 | 152 | 152 |
|--------------------|-----|-----|-----|

|                       |   |    |    |
|-----------------------|---|----|----|
| Upstream Blk Time (%) | 1 | 94 | 11 |
|-----------------------|---|----|----|

|                       |    |      |     |
|-----------------------|----|------|-----|
| Queuing Penalty (veh) | 10 | 1555 | 180 |
|-----------------------|----|------|-----|

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 15: Pleasant Hill Road

| Movement | SB | SB | SB |
|----------|----|----|----|
|----------|----|----|----|

|                   |   |   |   |
|-------------------|---|---|---|
| Directions Served | T | T | R |
|-------------------|---|---|---|

|                    |    |     |     |
|--------------------|----|-----|-----|
| Maximum Queue (ft) | 60 | 369 | 287 |
|--------------------|----|-----|-----|

|                    |    |     |     |
|--------------------|----|-----|-----|
| Average Queue (ft) | 12 | 336 | 103 |
|--------------------|----|-----|-----|

|                 |    |     |     |
|-----------------|----|-----|-----|
| 95th Queue (ft) | 50 | 408 | 228 |
|-----------------|----|-----|-----|

|                    |     |     |     |
|--------------------|-----|-----|-----|
| Link Distance (ft) | 262 | 262 | 262 |
|--------------------|-----|-----|-----|

|                       |  |    |   |
|-----------------------|--|----|---|
| Upstream Blk Time (%) |  | 96 | 0 |
|-----------------------|--|----|---|

|                       |  |      |   |
|-----------------------|--|------|---|
| Queuing Penalty (veh) |  | 1586 | 5 |
|-----------------------|--|------|---|

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

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Intersection: 16: Pleasant Hill Road

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| Movement              | SB   |
|-----------------------|------|
| Directions Served     | T    |
| Maximum Queue (ft)    | 540  |
| Average Queue (ft)    | 512  |
| 95th Queue (ft)       | 545  |
| Link Distance (ft)    | 302  |
| Upstream Blk Time (%) | 99   |
| Queuing Penalty (veh) | 1240 |
| Storage Bay Dist (ft) |      |
| Storage Blk Time (%)  |      |
| Queuing Penalty (veh) |      |

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Intersection: 17: Pleasant Hill Road

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| Movement              | SB  | SB  |
|-----------------------|-----|-----|
| Directions Served     | T   | TR  |
| Maximum Queue (ft)    | 125 | 532 |
| Average Queue (ft)    | 4   | 506 |
| 95th Queue (ft)       | 63  | 530 |
| Link Distance (ft)    | 314 | 314 |
| Upstream Blk Time (%) | 0   | 99  |
| Queuing Penalty (veh) | 0   | 830 |
| Storage Bay Dist (ft) |     |     |
| Storage Blk Time (%)  |     |     |
| Queuing Penalty (veh) |     |     |

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Network Summary

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|                                     |
|-------------------------------------|
| Network wide Queuing Penalty: 11131 |
|-------------------------------------|

PHF = 0.75 (TJKM's assumption)

**Evac 1 + Project Variant**– Evacuation plus project, no trap lane, in the  
AM Peak

### Summary of All Intervals

| Run Number              | 1      | 2      | 3      | 4      | 5      | Avg    |
|-------------------------|--------|--------|--------|--------|--------|--------|
| Start Time              | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   |
| End Time                | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   |
| Total Time (min)        | 70     | 70     | 70     | 70     | 70     | 70     |
| Time Recorded (min)     | 60     | 60     | 60     | 60     | 60     | 60     |
| # of Intervals          | 2      | 2      | 2      | 2      | 2      | 2      |
| # of Recorded Intervals | 1      | 1      | 1      | 1      | 1      | 1      |
| Vehs Entered            | 1791   | 1861   | 1881   | 1826   | 1818   | 1836   |
| Vehs Exited             | 1693   | 1741   | 1734   | 1705   | 1729   | 1721   |
| Starting Vehs           | 305    | 291    | 290    | 275    | 312    | 295    |
| Ending Vehs             | 403    | 411    | 437    | 396    | 401    | 410    |
| Denied Entry Before     | 150    | 161    | 149    | 162    | 161    | 157    |
| Denied Entry After      | 4006   | 3989   | 3958   | 4088   | 3989   | 4005   |
| Travel Distance (mi)    | 1583   | 1638   | 1617   | 1626   | 1663   | 1625   |
| Travel Time (hr)        | 2421.0 | 2442.9 | 2410.2 | 2434.6 | 2418.7 | 2425.5 |
| Total Delay (hr)        | 2365.5 | 2385.8 | 2353.9 | 2378.2 | 2361.2 | 2368.9 |
| Total Stops             | 5726   | 6207   | 5810   | 6056   | 6244   | 6009   |
| Fuel Used (gal)         | 590.3  | 597.6  | 588.3  | 594.4  | 592.5  | 592.6  |

### Interval #0 Information Seeding

|                  |      |
|------------------|------|
| Start Time       | 6:50 |
| End Time         | 7:00 |
| Total Time (min) | 10   |

No data recorded this interval.

### Interval #1 Information Recording

|                  |      |
|------------------|------|
| Start Time       | 7:00 |
| End Time         | 8:00 |
| Total Time (min) | 60   |

Volumes adjusted by PHF.

| Run Number           | 1      | 2      | 3      | 4      | 5      | Avg    |
|----------------------|--------|--------|--------|--------|--------|--------|
| Vehs Entered         | 1791   | 1861   | 1881   | 1826   | 1818   | 1836   |
| Vehs Exited          | 1693   | 1741   | 1734   | 1705   | 1729   | 1721   |
| Starting Vehs        | 305    | 291    | 290    | 275    | 312    | 295    |
| Ending Vehs          | 403    | 411    | 437    | 396    | 401    | 410    |
| Denied Entry Before  | 150    | 161    | 149    | 162    | 161    | 157    |
| Denied Entry After   | 4006   | 3989   | 3958   | 4088   | 3989   | 4005   |
| Travel Distance (mi) | 1583   | 1638   | 1617   | 1626   | 1663   | 1625   |
| Travel Time (hr)     | 2421.0 | 2442.9 | 2410.2 | 2434.6 | 2418.7 | 2425.5 |
| Total Delay (hr)     | 2365.5 | 2385.8 | 2353.9 | 2378.2 | 2361.2 | 2368.9 |
| Total Stops          | 5726   | 6207   | 5810   | 6056   | 6244   | 6009   |
| Fuel Used (gal)      | 590.3  | 597.6  | 588.3  | 594.4  | 592.5  | 592.6  |

### 1: Pleasant Hill Road & Rancho View Drive Performance by movement

| Movement            | EBR | SBT | All |
|---------------------|-----|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.2 | 0.1 | 0.2 |
| Total Delay (hr)    | 0.2 | 0.1 | 0.3 |
| Total Del/Veh (s)   | 3.9 | 7.2 | 4.4 |
| Stop Delay (hr)     | 0.1 | 0.0 | 0.2 |
| Stop Del/Veh (s)    | 3.0 | 5.4 | 3.4 |
| Vehicles Entered    | 173 | 31  | 204 |
| Vehicles Exited     | 174 | 31  | 205 |
| Hourly Exit Rate    | 174 | 31  | 205 |
| Input Volume        | 173 | 33  | 206 |
| % of Volume         | 101 | 94  | 100 |
| Denied Entry Before | 0   | 0   | 0   |
| Denied Entry After  | 0   | 0   | 0   |

### 2: Pleasant Hill Road & Greenvally Drive Performance by movement

| Movement            | EBR | WBL   | SBT | All  |
|---------------------|-----|-------|-----|------|
| Denied Delay (hr)   | 0.0 | 0.0   | 0.0 | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0   | 0.0 | 0.0  |
| Total Delay (hr)    | 0.1 | 20.0  | 0.3 | 20.3 |
| Total Del/Veh (s)   | 3.4 | 148.1 | 5.0 | 97.5 |
| Stop Delay (hr)     | 0.1 | 18.9  | 0.2 | 19.2 |
| Stop Del/Veh (s)    | 3.6 | 140.1 | 3.3 | 91.8 |
| Vehicles Entered    | 60  | 476   | 205 | 741  |
| Vehicles Exited     | 60  | 462   | 204 | 726  |
| Hourly Exit Rate    | 60  | 462   | 204 | 726  |
| Input Volume        | 56  | 637   | 207 | 900  |
| % of Volume         | 107 | 73    | 99  | 81   |
| Denied Entry Before | 0   | 0     | 0   | 0    |
| Denied Entry After  | 0   | 0     | 0   | 0    |

### 3: Pleasant Hill Road & Reliez Valle Road Performance by movement

| Movement            | EBR    | SBT  | All   |
|---------------------|--------|------|-------|
| Denied Delay (hr)   | 587.1  | 0.0  | 587.1 |
| Denied Del/Veh (s)  | 1383.1 | 0.0  | 937.6 |
| Total Delay (hr)    | 17.4   | 10.8 | 28.2  |
| Total Del/Veh (s)   | 207.6  | 52.3 | 97.2  |
| Stop Delay (hr)     | 17.6   | 9.3  | 26.9  |
| Stop Del/Veh (s)    | 209.6  | 45.1 | 92.6  |
| Vehicles Entered    | 290    | 726  | 1016  |
| Vehicles Exited     | 284    | 714  | 998   |
| Hourly Exit Rate    | 284    | 714  | 998   |
| Input Volume        | 1499   | 900  | 2399  |
| % of Volume         | 19     | 79   | 42    |
| Denied Entry Before | 8      | 0    | 8     |
| Denied Entry After  | 1238   | 0    | 1238  |

### 4: Pleasant Hill Road & Springhill Road/Quandt Road Performance by movement

| Movement            | EBR    | WBL   | WBT   | NBL  | SBT   | SBR   | All   |
|---------------------|--------|-------|-------|------|-------|-------|-------|
| Denied Delay (hr)   | 355.8  | 29.6  | 4.4   | 0.0  | 0.0   | 0.0   | 389.8 |
| Denied Del/Veh (s)  | 1474.0 | 367.2 | 397.6 | 0.0  | 0.0   | 0.0   | 638.7 |
| Total Delay (hr)    | 9.9    | 7.8   | 1.1   | 0.1  | 32.8  | 2.8   | 54.5  |
| Total Del/Veh (s)   | 191.0  | 122.8 | 130.0 | 87.9 | 130.5 | 99.5  | 134.8 |
| Stop Delay (hr)     | 10.2   | 7.6   | 1.1   | 0.1  | 33.2  | 2.9   | 55.0  |
| Stop Del/Veh (s)    | 197.1  | 119.8 | 126.3 | 85.6 | 131.8 | 101.7 | 136.0 |
| Vehicles Entered    | 177    | 227   | 31    | 5    | 894   | 99    | 1433  |
| Vehicles Exited     | 176    | 222   | 30    | 5    | 865   | 97    | 1395  |
| Hourly Exit Rate    | 176    | 222   | 30    | 5    | 865   | 97    | 1395  |
| Input Volume        | 857    | 297   | 45    | 5    | 2168  | 231   | 3603  |
| % of Volume         | 21     | 75    | 67    | 100  | 40    | 42    | 39    |
| Denied Entry Before | 16     | 0     | 0     | 0    | 0     | 0     | 16    |
| Denied Entry After  | 692    | 63    | 9     | 0    | 0     | 0     | 764   |

5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard Performance by movement

| Movement            | WBL    | NBT  | NBR | SBL   | SBT   | All   |
|---------------------|--------|------|-----|-------|-------|-------|
| Denied Delay (hr)   | 570.7  | 0.0  | 0.0 | 0.0   | 0.2   | 570.9 |
| Denied Del/Veh (s)  | 1589.0 | 0.0  | 0.0 | 0.0   | 0.6   | 792.0 |
| Total Delay (hr)    | 23.8   | 0.0  | 0.0 | 13.1  | 142.7 | 179.7 |
| Total Del/Veh (s)   | 318.8  | 18.9 | 2.4 | 387.3 | 397.2 | 375.6 |
| Stop Delay (hr)     | 23.6   | 0.0  | 0.0 | 12.6  | 140.5 | 176.7 |
| Stop Del/Veh (s)    | 315.9  | 16.8 | 2.5 | 371.1 | 391.1 | 369.4 |
| Vehicles Entered    | 243    | 5    | 33  | 112   | 1152  | 1545  |
| Vehicles Exited     | 242    | 5    | 33  | 108   | 1123  | 1511  |
| Hourly Exit Rate    | 242    | 5    | 33  | 108   | 1123  | 1511  |
| Input Volume        | 1212   | 6    | 29  | 291   | 3032  | 4570  |
| % of Volume         | 20     | 83   | 114 | 37    | 37    | 33    |
| Denied Entry Before | 72     | 0    | 0   | 0     | 0     | 72    |
| Denied Entry After  | 1050   | 0    | 0   | 0     | 0     | 1050  |

6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp Performance by movement

| Movement            | SBR | All |
|---------------------|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.0 | 0.0 |
| Total Delay (hr)    | 0.0 | 0.0 |
| Total Del/Veh (s)   | 4.4 | 4.4 |
| Stop Delay (hr)     | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.0 | 0.0 |
| Vehicles Entered    | 10  | 10  |
| Vehicles Exited     | 10  | 10  |
| Hourly Exit Rate    | 10  | 10  |
| Input Volume        | 35  | 35  |
| % of Volume         | 29  | 29  |
| Denied Entry Before | 0   | 0   |
| Denied Entry After  | 0   | 0   |



7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road Performance by movement

| Movement            | SBT | All |
|---------------------|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.1 | 0.1 |
| Total Delay (hr)    | 0.0 | 0.0 |
| Total Del/Veh (s)   | 1.7 | 1.7 |
| Stop Delay (hr)     | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.1 | 0.1 |
| Vehicles Entered    | 35  | 35  |
| Vehicles Exited     | 35  | 35  |
| Hourly Exit Rate    | 35  | 35  |
| Input Volume        | 35  | 35  |
| % of Volume         | 100 | 100 |
| Denied Entry Before | 0   | 0   |
| Denied Entry After  | 0   | 0   |

11: Pleasant Hill Road & Project Dwy Performance by movement

| Movement            | EBR    | NBT | SBT  | All   |
|---------------------|--------|-----|------|-------|
| Denied Delay (hr)   | 420.6  | 0.0 | 0.0  | 420.6 |
| Denied Del/Veh (s)  | 1907.0 | 0.0 | 0.0  | 688.9 |
| Total Delay (hr)    | 7.9    | 0.0 | 8.2  | 16.2  |
| Total Del/Veh (s)   | 1361.7 | 0.0 | 21.5 | 40.6  |
| Stop Delay (hr)     | 8.0    | 0.0 | 4.7  | 12.6  |
| Stop Del/Veh (s)    | 1366.8 | 0.0 | 12.2 | 31.7  |
| Vehicles Entered    | 13     | 39  | 1365 | 1417  |
| Vehicles Exited     | 12     | 39  | 1365 | 1416  |
| Hourly Exit Rate    | 12     | 39  | 1365 | 1416  |
| Input Volume        | 735    | 35  | 4244 | 5014  |
| % of Volume         | 2      | 111 | 32   | 28    |
| Denied Entry Before | 61     | 0   | 0    | 61    |
| Denied Entry After  | 781    | 0   | 0    | 781   |

#### 14: Pleasant Hill Road & Acalanes Avenue Performance by movement

| Movement            | NBT | SBT  | All  |
|---------------------|-----|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0 | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 4.8  | 4.8  |
| Total Del/Veh (s)   | 0.2 | 12.4 | 12.1 |
| Stop Delay (hr)     | 0.0 | 1.7  | 1.7  |
| Stop Del/Veh (s)    | 0.0 | 4.3  | 4.2  |
| Vehicles Entered    | 39  | 1377 | 1416 |
| Vehicles Exited     | 39  | 1376 | 1415 |
| Hourly Exit Rate    | 39  | 1376 | 1415 |
| Input Volume        | 35  | 4979 | 5014 |
| % of Volume         | 111 | 28   | 28   |
| Denied Entry Before | 0   | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    |

#### 15: Pleasant Hill Road Performance by movement

| Movement            | WBR | SBT  | SBR  | All  |
|---------------------|-----|------|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0  | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 3.6  | 3.0  | 6.6  |
| Total Del/Veh (s)   | 0.6 | 19.1 | 15.3 | 16.7 |
| Stop Delay (hr)     | 0.0 | 0.4  | 0.4  | 0.8  |
| Stop Del/Veh (s)    | 0.0 | 2.1  | 2.1  | 2.1  |
| Vehicles Entered    | 39  | 676  | 701  | 1416 |
| Vehicles Exited     | 39  | 676  | 701  | 1416 |
| Hourly Exit Rate    | 39  | 676  | 701  | 1416 |
| Input Volume        | 35  | 2507 | 2472 | 5014 |
| % of Volume         | 111 | 27   | 28   | 28   |
| Denied Entry Before | 0   | 0    | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    | 0    |

#### 16: Pleasant Hill Road Performance by movement

| Movement            | SBT  | All  |
|---------------------|------|------|
| Denied Delay (hr)   | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0  | 0.0  |
| Total Delay (hr)    | 1.2  | 1.2  |
| Total Del/Veh (s)   | 6.6  | 6.6  |
| Stop Delay (hr)     | 0.0  | 0.0  |
| Stop Del/Veh (s)    | 0.0  | 0.0  |
| Vehicles Entered    | 676  | 676  |
| Vehicles Exited     | 675  | 675  |
| Hourly Exit Rate    | 675  | 675  |
| Input Volume        | 2507 | 2507 |
| % of Volume         | 27   | 27   |
| Denied Entry Before | 0    | 0    |
| Denied Entry After  | 0    | 0    |

#### 17: Pleasant Hill Road Performance by movement

| Movement            | SBT | SBR  | All  |
|---------------------|-----|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0 | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 1.0  | 1.0  |
| Total Del/Veh (s)   | 6.9 | 5.0  | 5.1  |
| Stop Delay (hr)     | 0.0 | 0.4  | 0.4  |
| Stop Del/Veh (s)    | 1.0 | 2.0  | 2.0  |
| Vehicles Entered    | 10  | 700  | 710  |
| Vehicles Exited     | 10  | 699  | 709  |
| Hourly Exit Rate    | 10  | 699  | 709  |
| Input Volume        | 35  | 2507 | 2542 |
| % of Volume         | 29  | 28   | 28   |
| Denied Entry Before | 0   | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    |

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Total Network Performance

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|                     |        |
|---------------------|--------|
| Denied Delay (hr)   | 2043.4 |
| Denied Del/Veh (s)  | 1259.4 |
| Total Delay (hr)    | 325.5  |
| Total Del/Veh (s)   | 549.9  |
| Stop Delay (hr)     | 305.5  |
| Stop Del/Veh (s)    | 516.0  |
| Vehicles Entered    | 1836   |
| Vehicles Exited     | 1721   |
| Hourly Exit Rate    | 1721   |
| Input Volume        | 40731  |
| % of Volume         | 4      |
| Denied Entry Before | 157    |
| Denied Entry After  | 4005   |

Arterial Level of Service: NB Pleasant Hill Road

| Cross Street      | Node | Delay<br>(s/veh) | Travel<br>time (s) | Dist<br>(mi) | Arterial<br>Speed |
|-------------------|------|------------------|--------------------|--------------|-------------------|
| Acalanes Avenue   | 14   | 0.2              | 20.2               | 0.1          | 11                |
| Project Dwy       | 11   | 0.0              | 4.1                | 0.0          | 34                |
| Stanley Boulevard | 5    | 18.9             | 26.8               | 0.1          | 11                |
| Quandt Road       | 4    | 87.9             | 129.0              | 0.4          | 12                |
| Total             |      | 107.0            | 180.0              | 0.6          | 12                |

Arterial Level of Service: SB Pleasant Hill Road

| Cross Street         | Node | Delay<br>(s/veh) | Travel<br>time (s) | Dist<br>(mi) | Arterial<br>Speed |
|----------------------|------|------------------|--------------------|--------------|-------------------|
| Rancho View Drive    | 1    | 7.2              | 22.7               | 0.2          | 24                |
|                      | 19   | 1.3              | 15.6               | 0.1          | 34                |
| Greenvalley Drive    | 2    | 5.0              | 11.8               | 0.1          | 22                |
| Reliez Valle Road    | 3    | 49.1             | 72.3               | 0.3          | 12                |
|                      | 20   | 26.2             | 29.9               | 0.0          | 4                 |
| Springhill Road      | 4    | 130.5            | 139.9              | 0.1          | 3                 |
| Deer Hill Road       | 5    | 360.6            | 399.0              | 0.4          | 4                 |
| Project Dwy          | 11   | 20.9             | 29.5               | 0.1          | 10                |
| Acalanes Avenue      | 14   | 12.5             | 16.6               | 0.0          | 8                 |
|                      | 15   | 19.1             | 25.3               | 0.1          | 9                 |
|                      | 16   | 6.6              | 16.0               | 0.1          | 24                |
|                      | 17   | 6.9              | 16.3               | 0.1          | 16                |
| Mt. Diablo Boulevard | 6    | 4.4              | 12.9               | 0.1          | 19                |
| SR 24 EB Off Ramp    | 7    | 1.7              | 4.5                | 0.1          | 49                |
| Total                |      | 652.1            | 812.3              | 1.7          | 7                 |

Queuing and Blocking Report  
Evacuation Scenario 1 plus Project Variant

AM PEAK  
08/23/2020

Intersection: 1: Pleasant Hill Road & Rancho View Drive

| Movement              | EB  | SB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | LTR | T   | TR  |
| Maximum Queue (ft)    | 91  | 41  | 22  |
| Average Queue (ft)    | 45  | 11  | 1   |
| 95th Queue (ft)       | 75  | 34  | 9   |
| Link Distance (ft)    | 306 | 773 | 773 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

Intersection: 2: Pleasant Hill Road & Greenvalley Drive

| Movement              | EB  | WB  | B60 | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|
| Directions Served     | LTR | LT  | T   | T   | TR  |
| Maximum Queue (ft)    | 51  | 611 | 114 | 53  | 79  |
| Average Queue (ft)    | 14  | 566 | 74  | 11  | 29  |
| 95th Queue (ft)       | 35  | 656 | 113 | 34  | 66  |
| Link Distance (ft)    | 333 | 494 | 53  | 288 | 288 |
| Upstream Blk Time (%) |     | 84  | 87  |     |     |
| Queuing Penalty (veh) |     | 0   | 0   |     |     |
| Storage Bay Dist (ft) |     |     |     |     |     |
| Storage Blk Time (%)  |     | 76  |     | 0   |     |
| Queuing Penalty (veh) |     | 0   |     | 0   |     |

Intersection: 3: Pleasant Hill Road & Reliez Valle Road

| Movement              | EB  | EB  | SB   | SB   |
|-----------------------|-----|-----|------|------|
| Directions Served     | L   | R   | T    | T    |
| Maximum Queue (ft)    | 455 | 481 | 425  | 447  |
| Average Queue (ft)    | 218 | 456 | 230  | 228  |
| 95th Queue (ft)       | 582 | 471 | 381  | 408  |
| Link Distance (ft)    | 438 | 438 | 1259 | 1259 |
| Upstream Blk Time (%) | 21  | 97  |      |      |
| Queuing Penalty (veh) | 0   | 0   |      |      |
| Storage Bay Dist (ft) |     |     |      |      |
| Storage Blk Time (%)  |     |     |      | 41   |
| Queuing Penalty (veh) |     |     |      | 0    |

Queuing and Blocking Report  
Evacuation Scenario 1 plus Project Variant

AM PEAK  
08/23/2020

Intersection: 4: Pleasant Hill Road & Springhill Road/Quandt Road

| Movement              | EB  | WB  | NB  | SB   | SB   | SB  | B20 | B20  |
|-----------------------|-----|-----|-----|------|------|-----|-----|------|
| Directions Served     | LTR | LTR | L   | T    | T    | R   | T   | T    |
| Maximum Queue (ft)    | 372 | 263 | 21  | 530  | 527  | 96  | 214 | 236  |
| Average Queue (ft)    | 337 | 231 | 2   | 477  | 478  | 79  | 174 | 186  |
| 95th Queue (ft)       | 353 | 248 | 11  | 599  | 609  | 138 | 256 | 263  |
| Link Distance (ft)    | 318 | 213 |     | 414  | 414  |     | 127 | 127  |
| Upstream Blk Time (%) | 100 | 83  |     | 88   | 90   |     | 31  | 88   |
| Queuing Penalty (veh) | 0   | 0   |     | 1062 | 1077 |     | 368 | 1061 |
| Storage Bay Dist (ft) |     |     | 200 |      |      | 71  |     |      |
| Storage Blk Time (%)  |     |     |     | 89   | 84   | 0   |     |      |
| Queuing Penalty (veh) |     |     |     | 0    | 194  | 4   |     |      |

Intersection: 5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard

| Movement              | WB  | WB  | NB  | NB  | SB  | SB   | SB   |
|-----------------------|-----|-----|-----|-----|-----|------|------|
| Directions Served     | L   | LT  | T   | R   | L   | T    | T    |
| Maximum Queue (ft)    | 225 | 556 | 27  | 42  | 275 | 2273 | 2409 |
| Average Queue (ft)    | 204 | 523 | 2   | 11  | 185 | 2245 | 2372 |
| 95th Queue (ft)       | 299 | 542 | 14  | 32  | 342 | 2275 | 2427 |
| Link Distance (ft)    |     | 504 | 342 | 342 |     | 2220 | 2220 |
| Upstream Blk Time (%) |     | 95  |     |     |     | 42   | 95   |
| Queuing Penalty (veh) |     | 0   |     |     |     | 693  | 1585 |
| Storage Bay Dist (ft) | 185 |     |     |     | 175 |      |      |
| Storage Blk Time (%)  | 8   | 97  |     |     | 6   | 27   | 69   |
| Queuing Penalty (veh) | 49  | 586 |     |     | 85  | 80   | 0    |

Intersection: 6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Intersection: 7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road

| Movement              | SB |
|-----------------------|----|
| Directions Served     | T  |
| Maximum Queue (ft)    | 10 |
| Average Queue (ft)    | 0  |
| 95th Queue (ft)       | 5  |
| Link Distance (ft)    |    |
| Upstream Blk Time (%) |    |
| Queuing Penalty (veh) |    |
| Storage Bay Dist (ft) |    |
| Storage Blk Time (%)  |    |
| Queuing Penalty (veh) |    |

Intersection: 8: Brown Avenue/Miller Drive & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Intersection: 9: First Street/Sierra Vista Way & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |



Intersection: 10: SR 24 WB Ramps/Laurel Drive & Deer Hill Road

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 11: Pleasant Hill Road & Project Dwy

| Movement | EB | SB | SB |
|----------|----|----|----|
|----------|----|----|----|

|                   |   |   |    |
|-------------------|---|---|----|
| Directions Served | R | T | TR |
|-------------------|---|---|----|

|                    |     |     |     |
|--------------------|-----|-----|-----|
| Maximum Queue (ft) | 202 | 399 | 396 |
|--------------------|-----|-----|-----|

|                    |     |     |     |
|--------------------|-----|-----|-----|
| Average Queue (ft) | 179 | 223 | 342 |
|--------------------|-----|-----|-----|

|                 |     |     |     |
|-----------------|-----|-----|-----|
| 95th Queue (ft) | 198 | 460 | 416 |
|-----------------|-----|-----|-----|

|                    |     |     |     |
|--------------------|-----|-----|-----|
| Link Distance (ft) | 176 | 342 | 342 |
|--------------------|-----|-----|-----|

|                       |     |   |   |
|-----------------------|-----|---|---|
| Upstream Blk Time (%) | 100 | 2 | 8 |
|-----------------------|-----|---|---|

|                       |   |    |     |
|-----------------------|---|----|-----|
| Queuing Penalty (veh) | 0 | 37 | 174 |
|-----------------------|---|----|-----|

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 12: Project Dwy NE & Deer Hill Road

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 13: Project Dwy SW & Deer Hill Road

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 14: Pleasant Hill Road & Acalanes Avenue

Movement

SB

SB

Directions Served

T

T

Maximum Queue (ft)

186

264

Average Queue (ft)

50

226

95th Queue (ft)

147

279

Link Distance (ft)

150

150

Upstream Blk Time (%)

1

24

Queuing Penalty (veh)

19

590

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 15: Pleasant Hill Road

Movement

SB

Directions Served

TR

Maximum Queue (ft)

353

Average Queue (ft)

165

95th Queue (ft)

408

Link Distance (ft)

266

Upstream Blk Time (%)

5

Queuing Penalty (veh)

112

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

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Intersection: 16: Pleasant Hill Road

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Movement

Directions Served  
Maximum Queue (ft)  
Average Queue (ft)  
95th Queue (ft)  
Link Distance (ft)  
Upstream Blk Time (%)  
Queuing Penalty (veh)  
Storage Bay Dist (ft)  
Storage Blk Time (%)  
Queuing Penalty (veh)

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Intersection: 17: Pleasant Hill Road

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| Movement              | SB  |
|-----------------------|-----|
| Directions Served     | TR  |
| Maximum Queue (ft)    | 184 |
| Average Queue (ft)    | 73  |
| 95th Queue (ft)       | 144 |
| Link Distance (ft)    | 314 |
| Upstream Blk Time (%) |     |
| Queuing Penalty (veh) |     |
| Storage Bay Dist (ft) |     |
| Storage Blk Time (%)  |     |
| Queuing Penalty (veh) |     |

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Network Summary

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Network wide Queuing Penalty: 7775

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PHF = 1.0

**Evac 1** – Evacuation (without project) in the AM Peak

# SimTraffic Simulation Summary

## Evacuation Scenario 1

08/23/2020

### Summary of All Intervals

| Run Number              | 1      | 2      | 3      | 4      | 5      | Avg    |
|-------------------------|--------|--------|--------|--------|--------|--------|
| Start Time              | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   |
| End Time                | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   |
| Total Time (min)        | 70     | 70     | 70     | 70     | 70     | 70     |
| Time Recorded (min)     | 60     | 60     | 60     | 60     | 60     | 60     |
| # of Intervals          | 2      | 2      | 2      | 2      | 2      | 2      |
| # of Recorded Intervals | 1      | 1      | 1      | 1      | 1      | 1      |
| Vehs Entered            | 1829   | 1780   | 1769   | 1792   | 1766   | 1788   |
| Vehs Exited             | 1731   | 1679   | 1706   | 1700   | 1710   | 1706   |
| Starting Vehs           | 281    | 262    | 307    | 270    | 292    | 282    |
| Ending Vehs             | 379    | 363    | 370    | 362    | 348    | 362    |
| Denied Entry Before     | 111    | 105    | 100    | 89     | 97     | 101    |
| Denied Entry After      | 1982   | 2023   | 2037   | 1992   | 2107   | 2029   |
| Travel Distance (mi)    | 1600   | 1579   | 1608   | 1611   | 1609   | 1601   |
| Travel Time (hr)        | 1351.0 | 1392.4 | 1406.7 | 1353.8 | 1407.4 | 1382.3 |
| Total Delay (hr)        | 1295.1 | 1337.5 | 1350.7 | 1297.7 | 1351.6 | 1326.5 |
| Total Stops             | 6213   | 6007   | 6125   | 6099   | 6108   | 6112   |
| Fuel Used (gal)         | 348.4  | 356.7  | 360.7  | 349.6  | 362.3  | 355.5  |

### Interval #0 Information Seeding

|                                     |      |
|-------------------------------------|------|
| Start Time                          | 6:50 |
| End Time                            | 7:00 |
| Total Time (min)                    | 10   |
| Volumes adjusted by Growth Factors. |      |
| No data recorded this interval.     |      |

### Interval #1 Information Recording

|                                     |      |
|-------------------------------------|------|
| Start Time                          | 7:00 |
| End Time                            | 8:00 |
| Total Time (min)                    | 60   |
| Volumes adjusted by Growth Factors. |      |

| Run Number           | 1      | 2      | 3      | 4      | 5      | Avg    |
|----------------------|--------|--------|--------|--------|--------|--------|
| Vehs Entered         | 1829   | 1780   | 1769   | 1792   | 1766   | 1788   |
| Vehs Exited          | 1731   | 1679   | 1706   | 1700   | 1710   | 1706   |
| Starting Vehs        | 281    | 262    | 307    | 270    | 292    | 282    |
| Ending Vehs          | 379    | 363    | 370    | 362    | 348    | 362    |
| Denied Entry Before  | 111    | 105    | 100    | 89     | 97     | 101    |
| Denied Entry After   | 1982   | 2023   | 2037   | 1992   | 2107   | 2029   |
| Travel Distance (mi) | 1600   | 1579   | 1608   | 1611   | 1609   | 1601   |
| Travel Time (hr)     | 1351.0 | 1392.4 | 1406.7 | 1353.8 | 1407.4 | 1382.3 |
| Total Delay (hr)     | 1295.1 | 1337.5 | 1350.7 | 1297.7 | 1351.6 | 1326.5 |
| Total Stops          | 6213   | 6007   | 6125   | 6099   | 6108   | 6112   |
| Fuel Used (gal)      | 348.4  | 356.7  | 360.7  | 349.6  | 362.3  | 355.5  |

## 1: Pleasant Hill Road & Rancho View Drive Performance by movement

| Movement            | EBR | SBT | All |
|---------------------|-----|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.2 | 0.1 | 0.2 |
| Total Delay (hr)    | 0.1 | 0.0 | 0.2 |
| Total Del/Veh (s)   | 3.5 | 5.4 | 3.8 |
| Stop Delay (hr)     | 0.1 | 0.0 | 0.1 |
| Stop Del/Veh (s)    | 2.7 | 4.1 | 2.9 |
| Vehicles Entered    | 131 | 24  | 155 |
| Vehicles Exited     | 131 | 24  | 155 |
| Hourly Exit Rate    | 131 | 24  | 155 |
| Input Volume        | 130 | 25  | 155 |
| % of Volume         | 101 | 96  | 100 |
| Denied Entry Before | 0   | 0   | 0   |
| Denied Entry After  | 0   | 0   | 0   |

## 2: Pleasant Hill Road & Greenvally Drive Performance by movement

| Movement            | EBR | WBL  | SBT | All  |
|---------------------|-----|------|-----|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0 | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0  | 0.0 | 0.0  |
| Total Delay (hr)    | 0.0 | 11.9 | 0.2 | 12.2 |
| Total Del/Veh (s)   | 2.8 | 90.1 | 5.4 | 64.9 |
| Stop Delay (hr)     | 0.0 | 10.8 | 0.2 | 11.0 |
| Stop Del/Veh (s)    | 3.0 | 81.4 | 3.7 | 58.4 |
| Vehicles Entered    | 44  | 467  | 154 | 665  |
| Vehicles Exited     | 44  | 461  | 155 | 660  |
| Hourly Exit Rate    | 44  | 461  | 155 | 660  |
| Input Volume        | 42  | 478  | 155 | 675  |
| % of Volume         | 105 | 96   | 100 | 98   |
| Denied Entry Before | 0   | 0    | 0   | 0    |
| Denied Entry After  | 0   | 0    | 0   | 0    |

### 3: Pleasant Hill Road & Reliez Valle Road Performance by movement

| Movement            | EBR    | SBT  | All   |
|---------------------|--------|------|-------|
| Denied Delay (hr)   | 340.2  | 0.0  | 340.2 |
| Denied Del/Veh (s)  | 1091.5 | 0.0  | 687.3 |
| Total Delay (hr)    | 17.0   | 6.6  | 23.7  |
| Total Del/Veh (s)   | 157.5  | 35.4 | 80.1  |
| Stop Delay (hr)     | 16.8   | 5.4  | 22.2  |
| Stop Del/Veh (s)    | 155.7  | 28.7 | 75.2  |
| Vehicles Entered    | 376    | 660  | 1036  |
| Vehicles Exited     | 369    | 660  | 1029  |
| Hourly Exit Rate    | 369    | 660  | 1029  |
| Input Volume        | 1124   | 675  | 1799  |
| % of Volume         | 33     | 98   | 57    |
| Denied Entry Before | 6      | 0    | 6     |
| Denied Entry After  | 746    | 0    | 746   |

### 4: Pleasant Hill Road & Springhill Road/Quandt Road Performance by movement

| Movement            | EBR    | WBL   | WBT   | NBL  | SBT   | SBR  | All   |
|---------------------|--------|-------|-------|------|-------|------|-------|
| Denied Delay (hr)   | 256.6  | 6.0   | 1.0   | 0.0  | 0.0   | 0.0  | 263.6 |
| Denied Del/Veh (s)  | 1364.6 | 96.2  | 92.9  | 0.0  | 0.0   | 0.0  | 482.6 |
| Total Delay (hr)    | 10.0   | 6.9   | 1.2   | 0.1  | 31.9  | 2.8  | 52.9  |
| Total Del/Veh (s)   | 206.2  | 114.7 | 114.1 | 99.9 | 122.7 | 94.6 | 128.9 |
| Stop Delay (hr)     | 10.3   | 6.8   | 1.1   | 0.1  | 31.9  | 2.9  | 53.0  |
| Stop Del/Veh (s)    | 212.2  | 111.7 | 110.2 | 97.4 | 122.8 | 95.7 | 129.3 |
| Vehicles Entered    | 166    | 216   | 36    | 3    | 918   | 107  | 1446  |
| Vehicles Exited     | 165    | 212   | 36    | 3    | 896   | 103  | 1415  |
| Hourly Exit Rate    | 165    | 212   | 36    | 3    | 896   | 103  | 1415  |
| Input Volume        | 643    | 223   | 34    | 4    | 1626  | 173  | 2703  |
| % of Volume         | 26     | 95    | 106   | 75   | 55    | 60   | 52    |
| Denied Entry Before | 11     | 1     | 0     | 0    | 0     | 0    | 12    |
| Denied Entry After  | 511    | 8     | 1     | 0    | 0     | 0    | 520   |

5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard Performance by movement

| Movement            | WBL    | NBT  | NBR | SBL   | SBT   | All   |
|---------------------|--------|------|-----|-------|-------|-------|
| Denied Delay (hr)   | 422.6  | 0.0  | 0.0 | 0.0   | 0.0   | 422.6 |
| Denied Del/Veh (s)  | 1507.7 | 0.0  | 0.0 | 0.0   | 0.0   | 659.7 |
| Total Delay (hr)    | 24.0   | 0.0  | 0.0 | 13.3  | 141.8 | 179.2 |
| Total Del/Veh (s)   | 315.9  | 29.4 | 3.3 | 380.3 | 396.7 | 377.1 |
| Stop Delay (hr)     | 23.9   | 0.0  | 0.0 | 12.7  | 138.9 | 175.6 |
| Stop Del/Veh (s)    | 313.5  | 27.4 | 3.4 | 363.3 | 388.7 | 369.4 |
| Vehicles Entered    | 246    | 4    | 21  | 115   | 1157  | 1543  |
| Vehicles Exited     | 248    | 3    | 22  | 112   | 1123  | 1508  |
| Hourly Exit Rate    | 248    | 3    | 22  | 112   | 1123  | 1508  |
| Input Volume        | 909    | 4    | 22  | 218   | 2274  | 3427  |
| % of Volume         | 27     | 75   | 100 | 51    | 49    | 44    |
| Denied Entry Before | 83     | 0    | 0   | 0     | 0     | 83    |
| Denied Entry After  | 763    | 0    | 0   | 0     | 0     | 763   |

6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp Performance by movement

| Movement            | SBR | All |
|---------------------|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.0 | 0.0 |
| Total Delay (hr)    | 0.0 | 0.0 |
| Total Del/Veh (s)   | 4.5 | 4.5 |
| Stop Delay (hr)     | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.0 | 0.0 |
| Vehicles Entered    | 12  | 12  |
| Vehicles Exited     | 12  | 12  |
| Hourly Exit Rate    | 12  | 12  |
| Input Volume        | 26  | 26  |
| % of Volume         | 46  | 46  |
| Denied Entry Before | 0   | 0   |
| Denied Entry After  | 0   | 0   |



7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road Performance by movement

| Movement            | SBT | All |
|---------------------|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.1 | 0.1 |
| Total Delay (hr)    | 0.0 | 0.0 |
| Total Del/Veh (s)   | 1.8 | 1.8 |
| Stop Delay (hr)     | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.2 | 0.2 |
| Vehicles Entered    | 29  | 29  |
| Vehicles Exited     | 29  | 29  |
| Hourly Exit Rate    | 29  | 29  |
| Input Volume        | 26  | 26  |
| % of Volume         | 112 | 112 |
| Denied Entry Before | 0   | 0   |
| Denied Entry After  | 0   | 0   |

14: Pleasant Hill Road & Acalanes Avenue Performance by movement

| Movement            | NBT | SBT  | All  |
|---------------------|-----|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0 | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 4.5  | 4.5  |
| Total Del/Veh (s)   | 0.2 | 11.9 | 11.7 |
| Stop Delay (hr)     | 0.0 | 1.4  | 1.4  |
| Stop Del/Veh (s)    | 0.0 | 3.8  | 3.7  |
| Vehicles Entered    | 25  | 1372 | 1397 |
| Vehicles Exited     | 25  | 1372 | 1397 |
| Hourly Exit Rate    | 25  | 1372 | 1397 |
| Input Volume        | 26  | 3183 | 3209 |
| % of Volume         | 96  | 43   | 44   |
| Denied Entry Before | 0   | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    |

### 15: Pleasant Hill Road Performance by movement

| Movement            | WBR | SBT  | SBR  | All  |
|---------------------|-----|------|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0  | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 3.7  | 2.9  | 6.5  |
| Total Del/Veh (s)   | 0.6 | 19.0 | 15.1 | 16.8 |
| Stop Delay (hr)     | 0.0 | 0.4  | 0.4  | 0.9  |
| Stop Del/Veh (s)    | 0.0 | 2.3  | 2.3  | 2.3  |
| Vehicles Entered    | 25  | 689  | 683  | 1397 |
| Vehicles Exited     | 25  | 689  | 683  | 1397 |
| Hourly Exit Rate    | 25  | 689  | 683  | 1397 |
| Input Volume        | 26  | 1605 | 1578 | 3209 |
| % of Volume         | 96  | 43   | 43   | 44   |
| Denied Entry Before | 0   | 0    | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    | 0    |

### 16: Pleasant Hill Road Performance by movement

| Movement            | SBT  | All  |
|---------------------|------|------|
| Denied Delay (hr)   | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0  | 0.0  |
| Total Delay (hr)    | 1.3  | 1.3  |
| Total Del/Veh (s)   | 6.6  | 6.6  |
| Stop Delay (hr)     | 0.0  | 0.0  |
| Stop Del/Veh (s)    | 0.0  | 0.0  |
| Vehicles Entered    | 689  | 689  |
| Vehicles Exited     | 689  | 689  |
| Hourly Exit Rate    | 689  | 689  |
| Input Volume        | 1605 | 1605 |
| % of Volume         | 43   | 43   |
| Denied Entry Before | 0    | 0    |
| Denied Entry After  | 0    | 0    |

### 17: Pleasant Hill Road Performance by movement

| Movement            | SBT | SBR  | All  |
|---------------------|-----|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 1.0  | 1.1  |
| Total Del/Veh (s)   | 7.8 | 5.3  | 5.3  |
| Stop Delay (hr)     | 0.0 | 0.4  | 0.4  |
| Stop Del/Veh (s)    | 1.8 | 2.1  | 2.1  |
| Vehicles Entered    | 12  | 705  | 717  |
| Vehicles Exited     | 12  | 704  | 716  |
| Hourly Exit Rate    | 12  | 704  | 716  |
| Input Volume        | 26  | 1605 | 1631 |
| % of Volume         | 46  | 44   | 44   |
| Denied Entry Before | 0   | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    |

### Total Network Performance

|                     |        |
|---------------------|--------|
| Denied Delay (hr)   | 1027.1 |
| Denied Del/Veh (s)  | 968.7  |
| Total Delay (hr)    | 299.5  |
| Total Del/Veh (s)   | 521.3  |
| Stop Delay (hr)     | 277.9  |
| Stop Del/Veh (s)    | 483.8  |
| Vehicles Entered    | 1788   |
| Vehicles Exited     | 1706   |
| Hourly Exit Rate    | 1706   |
| Input Volume        | 27792  |
| % of Volume         | 6      |
| Denied Entry Before | 101    |
| Denied Entry After  | 2029   |

Arterial Level of Service: NB Pleasant Hill Road

| Cross Street      | Node | Delay<br>(s/veh) | Travel<br>time (s) | Dist<br>(mi) | Arterial<br>Speed |
|-------------------|------|------------------|--------------------|--------------|-------------------|
| Acalanes Avenue   | 14   | 0.2              | 20.1               | 0.1          | 11                |
|                   | 11   | 0.0              | 4.0                | 0.0          | 34                |
| Stanley Boulevard | 5    | 29.4             | 36.5               | 0.1          | 8                 |
| Quandt Road       | 4    | 99.9             | 148.7              | 0.4          | 11                |
| Total             |      | 129.5            | 209.3              | 0.6          | 11                |

Arterial Level of Service: SB Pleasant Hill Road

| Cross Street         | Node | Delay<br>(s/veh) | Travel<br>time (s) | Dist<br>(mi) | Arterial<br>Speed |
|----------------------|------|------------------|--------------------|--------------|-------------------|
| Rancho View Drive    | 1    | 5.4              | 20.6               | 0.2          | 27                |
|                      | 19   | 0.9              | 16.0               | 0.1          | 33                |
| Greenvalley Drive    | 2    | 5.4              | 12.3               | 0.1          | 21                |
| Reliez Valle Road    | 3    | 31.8             | 55.7               | 0.3          | 16                |
|                      | 20   | 23.5             | 27.1               | 0.0          | 4                 |
| Springhill Road      | 4    | 122.7            | 132.1              | 0.1          | 3                 |
| Deer Hill Road       | 5    | 365.6            | 404.1              | 0.4          | 4                 |
|                      | 11   | 19.1             | 27.7               | 0.1          | 10                |
| Acalanes Avenue      | 14   | 11.9             | 15.9               | 0.0          | 9                 |
|                      | 15   | 19.0             | 25.1               | 0.1          | 9                 |
|                      | 16   | 6.6              | 16.0               | 0.1          | 24                |
|                      | 17   | 7.8              | 16.2               | 0.1          | 16                |
| Mt. Diablo Boulevard | 6    | 4.5              | 12.4               | 0.1          | 20                |
| SR 24 EB Off Ramp    | 7    | 1.8              | 4.6                | 0.1          | 49                |
| Total                |      | 625.8            | 785.8              | 1.7          | 8                 |

Queuing and Blocking Report  
Evacuation Scenario 1

08/23/2020

Intersection: 1: Pleasant Hill Road & Rancho View Drive

| Movement              | EB  | SB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | LTR | T   | TR  |
| Maximum Queue (ft)    | 68  | 32  | 11  |
| Average Queue (ft)    | 37  | 6   | 0   |
| 95th Queue (ft)       | 65  | 25  | 5   |
| Link Distance (ft)    | 306 | 773 | 773 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

Intersection: 2: Pleasant Hill Road & Greenvalley Drive

| Movement              | EB  | WB  | B60 | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|
| Directions Served     | LTR | LT  | T   | T   | TR  |
| Maximum Queue (ft)    | 34  | 562 | 73  | 47  | 71  |
| Average Queue (ft)    | 9   | 413 | 19  | 9   | 26  |
| 95th Queue (ft)       | 24  | 637 | 74  | 32  | 58  |
| Link Distance (ft)    | 333 | 494 | 53  | 288 | 288 |
| Upstream Blk Time (%) |     | 22  | 12  |     |     |
| Queuing Penalty (veh) |     | 0   | 0   |     |     |
| Storage Bay Dist (ft) |     |     |     |     |     |
| Storage Blk Time (%)  |     | 67  |     | 0   |     |
| Queuing Penalty (veh) |     | 0   |     | 0   |     |

Intersection: 3: Pleasant Hill Road & Reliez Valle Road

| Movement              | EB  | EB  | SB   | SB   |
|-----------------------|-----|-----|------|------|
| Directions Served     | L   | R   | T    | T    |
| Maximum Queue (ft)    | 454 | 486 | 339  | 344  |
| Average Queue (ft)    | 237 | 456 | 177  | 175  |
| 95th Queue (ft)       | 599 | 474 | 273  | 281  |
| Link Distance (ft)    | 438 | 438 | 1259 | 1259 |
| Upstream Blk Time (%) | 24  | 94  |      |      |
| Queuing Penalty (veh) | 0   | 0   |      |      |
| Storage Bay Dist (ft) |     |     |      |      |
| Storage Blk Time (%)  |     |     |      | 26   |
| Queuing Penalty (veh) |     |     |      | 0    |

# Queuing and Blocking Report

## Evacuation Scenario 1

08/23/2020

### Intersection: 4: Pleasant Hill Road & Springhill Road/Quandt Road

| Movement              | EB  | WB  | NB  | SB  | SB  | SB  | B20 | B20 |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | L   | T   | T   | R   | T   | T   |
| Maximum Queue (ft)    | 368 | 254 | 15  | 521 | 527 | 96  | 212 | 215 |
| Average Queue (ft)    | 336 | 227 | 1   | 470 | 472 | 76  | 161 | 179 |
| 95th Queue (ft)       | 353 | 257 | 8   | 597 | 611 | 140 | 252 | 267 |
| Link Distance (ft)    | 318 | 213 |     | 414 | 414 |     | 127 | 127 |
| Upstream Blk Time (%) | 99  | 70  |     | 83  | 87  |     | 22  | 82  |
| Queuing Penalty (veh) | 0   | 0   |     | 748 | 784 |     | 202 | 736 |
| Storage Bay Dist (ft) |     |     | 200 |     |     | 71  |     |     |
| Storage Blk Time (%)  |     |     |     | 86  | 82  | 0   |     |     |
| Queuing Penalty (veh) |     |     |     | 0   | 142 | 2   |     |     |

### Intersection: 5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard

| Movement              | WB  | WB  | NB  | NB  | SB  | SB   | SB   |
|-----------------------|-----|-----|-----|-----|-----|------|------|
| Directions Served     | L   | LT  | T   | R   | L   | T    | T    |
| Maximum Queue (ft)    | 225 | 547 | 23  | 38  | 275 | 2273 | 2408 |
| Average Queue (ft)    | 210 | 523 | 3   | 9   | 173 | 2241 | 2368 |
| 95th Queue (ft)       | 283 | 537 | 15  | 30  | 328 | 2310 | 2462 |
| Link Distance (ft)    |     | 504 | 347 | 347 |     | 2220 | 2220 |
| Upstream Blk Time (%) |     | 95  |     |     |     | 42   | 95   |
| Queuing Penalty (veh) |     | 0   |     |     |     | 520  | 1178 |
| Storage Bay Dist (ft) | 185 |     |     |     | 175 |      |      |
| Storage Blk Time (%)  | 8   | 97  |     |     | 4   | 26   | 66   |
| Queuing Penalty (veh) | 36  | 441 |     |     | 51  | 56   | 0    |

### Intersection: 6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

## Queuing and Blocking Report

### Evacuation Scenario 1

08/23/2020

#### Intersection: 7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road

| Movement              | SB |
|-----------------------|----|
| Directions Served     | T  |
| Maximum Queue (ft)    | 5  |
| Average Queue (ft)    | 0  |
| 95th Queue (ft)       | 3  |
| Link Distance (ft)    |    |
| Upstream Blk Time (%) |    |
| Queuing Penalty (veh) |    |
| Storage Bay Dist (ft) |    |
| Storage Blk Time (%)  |    |
| Queuing Penalty (veh) |    |

#### Intersection: 8: Brown Avenue/Miller Drive & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

#### Intersection: 9: First Street/Sierra Vista Way & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

## Queuing and Blocking Report

### Evacuation Scenario 1

08/23/2020

#### Intersection: 10: SR 24 WB Ramps/Laurel Drive & Deer Hill Road

##### Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

#### Intersection: 14: Pleasant Hill Road & Acalanes Avenue

##### Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

#### Intersection: 15: Pleasant Hill Road

##### Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)



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Intersection: 16: Pleasant Hill Road

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Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

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Intersection: 17: Pleasant Hill Road

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Movement

SB

SB

Directions Served

T

TR

Maximum Queue (ft)

14

165

Average Queue (ft)

0

75

95th Queue (ft)

10

147

Link Distance (ft)

314

314

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

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Network Summary

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Network wide Queuing Penalty: 5435

PHF = 1.0

**Evac 1 + Project** – Evacuation plus project, with trap lane, in the AM  
Peak

# SimTraffic Simulation Summary

## Evacuation Scenario 1 plus Project

08/23/2020

### Summary of All Intervals

| Run Number              | 1      | 2      | 3      | 4      | 5      | Avg    |
|-------------------------|--------|--------|--------|--------|--------|--------|
| Start Time              | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   |
| End Time                | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   |
| Total Time (min)        | 70     | 70     | 70     | 70     | 70     | 70     |
| Time Recorded (min)     | 60     | 60     | 60     | 60     | 60     | 60     |
| # of Intervals          | 2      | 2      | 2      | 2      | 2      | 2      |
| # of Recorded Intervals | 1      | 1      | 1      | 1      | 1      | 1      |
| Vehs Entered            | 2313   | 2278   | 2198   | 2250   | 2209   | 2249   |
| Vehs Exited             | 2165   | 2144   | 2089   | 2068   | 2058   | 2105   |
| Starting Vehs           | 258    | 231    | 256    | 249    | 270    | 256    |
| Ending Vehs             | 406    | 365    | 365    | 431    | 421    | 397    |
| Denied Entry Before     | 144    | 167    | 171    | 169    | 170    | 165    |
| Denied Entry After      | 2127   | 2179   | 2246   | 2233   | 2121   | 2181   |
| Travel Distance (mi)    | 1976   | 1959   | 1927   | 1894   | 1879   | 1927   |
| Travel Time (hr)        | 1489.0 | 1424.4 | 1515.3 | 1507.4 | 1458.8 | 1479.0 |
| Total Delay (hr)        | 1419.8 | 1355.7 | 1448.0 | 1441.1 | 1392.7 | 1411.4 |
| Total Stops             | 9117   | 8435   | 8871   | 8651   | 8322   | 8680   |
| Fuel Used (gal)         | 391.0  | 376.5  | 395.1  | 393.7  | 380.7  | 387.4  |

### Interval #0 Information Seeding

|                                     |      |
|-------------------------------------|------|
| Start Time                          | 6:50 |
| End Time                            | 7:00 |
| Total Time (min)                    | 10   |
| Volumes adjusted by Growth Factors. |      |
| No data recorded this interval.     |      |

### Interval #1 Information Recording

|                                     |      |
|-------------------------------------|------|
| Start Time                          | 7:00 |
| End Time                            | 8:00 |
| Total Time (min)                    | 60   |
| Volumes adjusted by Growth Factors. |      |

| Run Number           | 1      | 2      | 3      | 4      | 5      | Avg    |
|----------------------|--------|--------|--------|--------|--------|--------|
| Vehs Entered         | 2313   | 2278   | 2198   | 2250   | 2209   | 2249   |
| Vehs Exited          | 2165   | 2144   | 2089   | 2068   | 2058   | 2105   |
| Starting Vehs        | 258    | 231    | 256    | 249    | 270    | 256    |
| Ending Vehs          | 406    | 365    | 365    | 431    | 421    | 397    |
| Denied Entry Before  | 144    | 167    | 171    | 169    | 170    | 165    |
| Denied Entry After   | 2127   | 2179   | 2246   | 2233   | 2121   | 2181   |
| Travel Distance (mi) | 1976   | 1959   | 1927   | 1894   | 1879   | 1927   |
| Travel Time (hr)     | 1489.0 | 1424.4 | 1515.3 | 1507.4 | 1458.8 | 1479.0 |
| Total Delay (hr)     | 1419.8 | 1355.7 | 1448.0 | 1441.1 | 1392.7 | 1411.4 |
| Total Stops          | 9117   | 8435   | 8871   | 8651   | 8322   | 8680   |
| Fuel Used (gal)      | 391.0  | 376.5  | 395.1  | 393.7  | 380.7  | 387.4  |

## 1: Pleasant Hill Road & Rancho View Drive Performance by movement

| Movement            | EBR | SBT | All |
|---------------------|-----|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.1 | 0.1 | 0.1 |
| Total Delay (hr)    | 0.1 | 0.0 | 0.2 |
| Total Del/Veh (s)   | 3.5 | 5.8 | 3.9 |
| Stop Delay (hr)     | 0.1 | 0.0 | 0.1 |
| Stop Del/Veh (s)    | 2.8 | 4.2 | 3.0 |
| Vehicles Entered    | 133 | 23  | 156 |
| Vehicles Exited     | 133 | 23  | 156 |
| Hourly Exit Rate    | 133 | 23  | 156 |
| Input Volume        | 130 | 25  | 155 |
| % of Volume         | 102 | 92  | 101 |
| Denied Entry Before | 0   | 0   | 0   |
| Denied Entry After  | 0   | 0   | 0   |

## 2: Pleasant Hill Road & Greenvaley Drive Performance by movement

| Movement            | EBR | WBL   | SBT | All  |
|---------------------|-----|-------|-----|------|
| Denied Delay (hr)   | 0.0 | 0.0   | 0.0 | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0   | 0.0 | 0.0  |
| Total Delay (hr)    | 0.0 | 13.6  | 0.2 | 13.9 |
| Total Del/Veh (s)   | 2.7 | 101.7 | 5.2 | 73.8 |
| Stop Delay (hr)     | 0.0 | 12.5  | 0.2 | 12.7 |
| Stop Del/Veh (s)    | 3.0 | 93.2  | 3.6 | 67.3 |
| Vehicles Entered    | 39  | 469   | 156 | 664  |
| Vehicles Exited     | 38  | 463   | 156 | 657  |
| Hourly Exit Rate    | 38  | 463   | 156 | 657  |
| Input Volume        | 42  | 478   | 155 | 675  |
| % of Volume         | 90  | 97    | 101 | 97   |
| Denied Entry Before | 0   | 0     | 0   | 0    |
| Denied Entry After  | 0   | 0     | 0   | 0    |

### 3: Pleasant Hill Road & Reliez Valle Road Performance by movement

| Movement            | EBR   | SBT  | All   |
|---------------------|-------|------|-------|
| Denied Delay (hr)   | 183.4 | 0.0  | 183.4 |
| Denied Del/Veh (s)  | 578.6 | 0.0  | 367.2 |
| Total Delay (hr)    | 14.4  | 4.6  | 19.0  |
| Total Del/Veh (s)   | 72.8  | 24.8 | 49.4  |
| Stop Delay (hr)     | 12.4  | 3.6  | 15.9  |
| Stop Del/Veh (s)    | 62.7  | 19.0 | 41.5  |
| Vehicles Entered    | 698   | 657  | 1355  |
| Vehicles Exited     | 692   | 658  | 1350  |
| Hourly Exit Rate    | 692   | 658  | 1350  |
| Input Volume        | 1124  | 675  | 1799  |
| % of Volume         | 62    | 97   | 75    |
| Denied Entry Before | 8     | 0    | 8     |
| Denied Entry After  | 443   | 0    | 443   |

### 4: Pleasant Hill Road & Springhill Road/Quandt Road Performance by movement

| Movement            | EBR    | WBL  | WBT  | NBL  | SBT  | SBR  | All   |
|---------------------|--------|------|------|------|------|------|-------|
| Denied Delay (hr)   | 277.0  | 0.8  | 0.1  | 0.0  | 0.0  | 0.0  | 278.0 |
| Denied Del/Veh (s)  | 1445.2 | 13.3 | 15.6 | 0.0  | 0.0  | 0.0  | 434.5 |
| Total Delay (hr)    | 9.2    | 5.0  | 0.8  | 0.1  | 21.5 | 1.9  | 38.4  |
| Total Del/Veh (s)   | 221.2  | 78.3 | 84.8 | 80.9 | 62.7 | 52.3 | 77.8  |
| Stop Delay (hr)     | 9.4    | 4.7  | 0.8  | 0.1  | 19.1 | 1.8  | 35.9  |
| Stop Del/Veh (s)    | 226.4  | 74.7 | 80.3 | 80.3 | 55.8 | 49.2 | 72.6  |
| Vehicles Entered    | 141    | 226  | 34   | 4    | 1220 | 129  | 1754  |
| Vehicles Exited     | 141    | 225  | 33   | 4    | 1196 | 127  | 1726  |
| Hourly Exit Rate    | 141    | 225  | 33   | 4    | 1196 | 127  | 1726  |
| Input Volume        | 643    | 223  | 34   | 4    | 1626 | 173  | 2703  |
| % of Volume         | 22     | 101  | 97   | 100  | 74   | 73   | 64    |
| Denied Entry Before | 40     | 0    | 0    | 0    | 0    | 0    | 40    |
| Denied Entry After  | 549    | 0    | 0    | 0    | 0    | 0    | 549   |

5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard Performance by movement

| Movement            | WBL    | NBT  | NBR | SBL  | SBT  | All   |
|---------------------|--------|------|-----|------|------|-------|
| Denied Delay (hr)   | 429.5  | 0.0  | 0.0 | 0.0  | 0.0  | 429.5 |
| Denied Del/Veh (s)  | 1546.1 | 0.0  | 0.0 | 0.0  | 0.0  | 619.4 |
| Total Delay (hr)    | 22.1   | 0.0  | 0.0 | 3.5  | 24.5 | 50.2  |
| Total Del/Veh (s)   | 326.7  | 19.3 | 3.6 | 95.9 | 64.4 | 101.8 |
| Stop Delay (hr)     | 21.8   | 0.0  | 0.0 | 3.3  | 21.3 | 46.4  |
| Stop Del/Veh (s)    | 323.3  | 17.4 | 3.8 | 89.6 | 55.8 | 94.2  |
| Vehicles Entered    | 218    | 4    | 22  | 129  | 1341 | 1714  |
| Vehicles Exited     | 218    | 4    | 22  | 131  | 1342 | 1717  |
| Hourly Exit Rate    | 218    | 4    | 22  | 131  | 1342 | 1717  |
| Input Volume        | 909    | 4    | 22  | 218  | 2274 | 3427  |
| % of Volume         | 24     | 100  | 100 | 60   | 59   | 50    |
| Denied Entry Before | 82     | 0    | 0   | 0    | 0    | 82    |
| Denied Entry After  | 782    | 0    | 0   | 0    | 0    | 782   |

6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp Performance by movement

| Movement            | SBR | All |
|---------------------|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.0 | 0.0 |
| Total Delay (hr)    | 0.0 | 0.0 |
| Total Del/Veh (s)   | 5.8 | 5.8 |
| Stop Delay (hr)     | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.0 | 0.0 |
| Vehicles Entered    | 7   | 7   |
| Vehicles Exited     | 7   | 7   |
| Hourly Exit Rate    | 7   | 7   |
| Input Volume        | 26  | 26  |
| % of Volume         | 27  | 27  |
| Denied Entry Before | 0   | 0   |
| Denied Entry After  | 0   | 0   |

7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road Performance by movement

| Movement            | SBT | All |
|---------------------|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.1 | 0.1 |
| Total Delay (hr)    | 0.0 | 0.0 |
| Total Del/Veh (s)   | 1.9 | 1.9 |
| Stop Delay (hr)     | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.3 | 0.3 |
| Vehicles Entered    | 31  | 31  |
| Vehicles Exited     | 31  | 31  |
| Hourly Exit Rate    | 31  | 31  |
| Input Volume        | 26  | 26  |
| % of Volume         | 119 | 119 |
| Denied Entry Before | 0   | 0   |
| Denied Entry After  | 0   | 0   |

11: Pleasant Hill Road & Project Dwy Performance by movement

| Movement            | EBR    | NBT | SBT  | All   |
|---------------------|--------|-----|------|-------|
| Denied Delay (hr)   | 205.8  | 0.0 | 0.0  | 205.8 |
| Denied Del/Veh (s)  | 1266.7 | 0.0 | 0.0  | 341.3 |
| Total Delay (hr)    | 7.0    | 0.0 | 14.4 | 21.3  |
| Total Del/Veh (s)   | 115.4  | 0.0 | 32.9 | 42.3  |
| Stop Delay (hr)     | 7.4    | 0.0 | 11.8 | 19.2  |
| Stop Del/Veh (s)    | 123.2  | 0.0 | 27.0 | 38.1  |
| Vehicles Entered    | 211    | 26  | 1560 | 1797  |
| Vehicles Exited     | 210    | 26  | 1556 | 1792  |
| Hourly Exit Rate    | 210    | 26  | 1556 | 1792  |
| Input Volume        | 551    | 26  | 3183 | 3760  |
| % of Volume         | 38     | 100 | 49   | 48    |
| Denied Entry Before | 31     | 0   | 0    | 31    |
| Denied Entry After  | 374    | 0   | 0    | 374   |

#### 14: Pleasant Hill Road & Acalanes Avenue Performance by movement

| Movement            | NBT | SBT  | All  |
|---------------------|-----|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0 | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 8.6  | 8.6  |
| Total Del/Veh (s)   | 0.2 | 17.6 | 17.3 |
| Stop Delay (hr)     | 0.0 | 8.4  | 8.4  |
| Stop Del/Veh (s)    | 0.0 | 17.2 | 16.9 |
| Vehicles Entered    | 26  | 1766 | 1792 |
| Vehicles Exited     | 26  | 1758 | 1784 |
| Hourly Exit Rate    | 26  | 1758 | 1784 |
| Input Volume        | 26  | 3734 | 3760 |
| % of Volume         | 100 | 47   | 47   |
| Denied Entry Before | 0   | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    |

#### 15: Pleasant Hill Road Performance by movement

| Movement            | WBR | SBT  | SBR  | All  |
|---------------------|-----|------|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0  | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 10.7 | 1.6  | 12.3 |
| Total Del/Veh (s)   | 0.6 | 42.8 | 6.6  | 24.6 |
| Stop Delay (hr)     | 0.0 | 12.0 | 0.2  | 12.2 |
| Stop Del/Veh (s)    | 0.0 | 48.3 | 0.8  | 24.5 |
| Vehicles Entered    | 26  | 889  | 869  | 1784 |
| Vehicles Exited     | 26  | 882  | 870  | 1778 |
| Hourly Exit Rate    | 26  | 882  | 870  | 1778 |
| Input Volume        | 26  | 1880 | 1854 | 3760 |
| % of Volume         | 100 | 47   | 47   | 47   |
| Denied Entry Before | 0   | 0    | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    | 0    |



### 16: Pleasant Hill Road Performance by movement

| Movement            | SBT  | All  |
|---------------------|------|------|
| Denied Delay (hr)   | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0  | 0.0  |
| Total Delay (hr)    | 16.6 | 16.6 |
| Total Del/Veh (s)   | 66.3 | 66.3 |
| Stop Delay (hr)     | 18.9 | 18.9 |
| Stop Del/Veh (s)    | 75.5 | 75.5 |
| Vehicles Entered    | 882  | 882  |
| Vehicles Exited     | 882  | 882  |
| Hourly Exit Rate    | 882  | 882  |
| Input Volume        | 1880 | 1880 |
| % of Volume         | 47   | 47   |
| Denied Entry Before | 0    | 0    |
| Denied Entry After  | 0    | 0    |

### 17: Pleasant Hill Road Performance by movement

| Movement            | SBT   | SBR  | All  |
|---------------------|-------|------|------|
| Denied Delay (hr)   | 0.2   | 14.9 | 15.2 |
| Denied Del/Veh (s)  | 106.7 | 59.3 | 59.7 |
| Total Delay (hr)    | 0.1   | 15.0 | 15.1 |
| Total Del/Veh (s)   | 59.2  | 60.5 | 60.4 |
| Stop Delay (hr)     | 0.1   | 17.5 | 17.6 |
| Stop Del/Veh (s)    | 63.0  | 70.6 | 70.5 |
| Vehicles Entered    | 7     | 876  | 883  |
| Vehicles Exited     | 7     | 875  | 882  |
| Hourly Exit Rate    | 7     | 875  | 882  |
| Input Volume        | 26    | 1880 | 1906 |
| % of Volume         | 27    | 47   | 46   |
| Denied Entry Before | 0     | 2    | 2    |
| Denied Entry After  | 1     | 30   | 31   |

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Total Network Performance

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|                     |        |
|---------------------|--------|
| Denied Delay (hr)   | 1113.6 |
| Denied Del/Veh (s)  | 905.0  |
| Total Delay (hr)    | 297.8  |
| Total Del/Veh (s)   | 428.5  |
| Stop Delay (hr)     | 274.0  |
| Stop Del/Veh (s)    | 394.3  |
| Vehicles Entered    | 2249   |
| Vehicles Exited     | 2105   |
| Hourly Exit Rate    | 2105   |
| Input Volume        | 33042  |
| % of Volume         | 6      |
| Denied Entry Before | 165    |
| Denied Entry After  | 2181   |

Arterial Level of Service  
Evacuation Scenario 1 plus Project

08/23/2020

Arterial Level of Service: NB Pleasant Hill Road

| Cross Street      | Node | Delay (s/veh) | Travel time (s) | Dist (mi) | Arterial Speed |
|-------------------|------|---------------|-----------------|-----------|----------------|
| Acalanes Avenue   | 14   | 0.2           | 20.2            | 0.1       | 11             |
| Project Dwy       | 11   | 0.0           | 4.1             | 0.0       | 33             |
| Stanley Boulevard | 5    | 19.3          | 27.1            | 0.1       | 10             |
|                   | 37   | 1.8           | 9.7             | 0.1       | 31             |
| Quandt Road       | 4    | 80.9          | 116.6           | 0.4       | 11             |
| Total             |      | 102.1         | 177.8           | 0.6       | 13             |

Arterial Level of Service: SB Pleasant Hill Road

| Cross Street         | Node | Delay (s/veh) | Travel time (s) | Dist (mi) | Arterial Speed |
|----------------------|------|---------------|-----------------|-----------|----------------|
| Rancho View Drive    | 1    | 5.8           | 21.2            | 0.2       | 26             |
|                      | 19   | 1.0           | 16.4            | 0.1       | 33             |
| Greenvalley Drive    | 2    | 5.2           | 12.0            | 0.1       | 21             |
| Reliez Valle Road    | 3    | 20.2          | 43.9            | 0.3       | 21             |
|                      | 20   | 11.5          | 15.1            | 0.0       | 8              |
| Springhill Road      | 4    | 62.7          | 72.2            | 0.1       | 5              |
|                      | 37   | 196.3         | 231.5           | 0.4       | 6              |
| Deer Hill Road       | 5    | 64.4          | 72.3            | 0.1       | 4              |
| Project Dwy          | 11   | 33.0          | 41.4            | 0.1       | 7              |
| Acalanes Avenue      | 14   | 18.2          | 22.3            | 0.0       | 6              |
|                      | 15   | 42.8          | 48.9            | 0.1       | 5              |
|                      | 16   | 66.3          | 75.6            | 0.1       | 5              |
|                      | 17   | 59.2          | 189.6           | 0.1       | 4              |
| Mt. Diablo Boulevard | 6    | 5.8           | 13.5            | 0.1       | 18             |
| SR 24 EB Off Ramp    | 7    | 1.9           | 4.7             | 0.1       | 48             |
| Total                |      | 594.2         | 880.6           | 1.7       | 8              |

Queuing and Blocking Report  
Evacuation Scenario 1 plus Project

08/23/2020

Intersection: 1: Pleasant Hill Road & Rancho View Drive

| Movement              | EB  | SB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | LTR | T   | TR  |
| Maximum Queue (ft)    | 76  | 46  | 16  |
| Average Queue (ft)    | 39  | 7   | 1   |
| 95th Queue (ft)       | 64  | 28  | 7   |
| Link Distance (ft)    | 306 | 773 | 773 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

Intersection: 2: Pleasant Hill Road & Greenvalley Drive

| Movement              | EB  | WB  | B60 | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|
| Directions Served     | LTR | LT  | T   | T   | TR  |
| Maximum Queue (ft)    | 34  | 585 | 84  | 47  | 61  |
| Average Queue (ft)    | 10  | 446 | 27  | 10  | 23  |
| 95th Queue (ft)       | 26  | 659 | 87  | 31  | 52  |
| Link Distance (ft)    | 333 | 494 | 53  | 288 | 288 |
| Upstream Blk Time (%) |     | 32  | 26  |     |     |
| Queuing Penalty (veh) |     | 0   | 0   |     |     |
| Storage Bay Dist (ft) |     |     |     |     |     |
| Storage Blk Time (%)  |     | 70  |     | 0   |     |
| Queuing Penalty (veh) |     | 0   |     | 0   |     |

Intersection: 3: Pleasant Hill Road & Reliez Valle Road

| Movement              | EB  | EB  | SB   | SB   |
|-----------------------|-----|-----|------|------|
| Directions Served     | L   | R   | T    | T    |
| Maximum Queue (ft)    | 467 | 487 | 270  | 294  |
| Average Queue (ft)    | 281 | 459 | 147  | 161  |
| 95th Queue (ft)       | 634 | 478 | 215  | 228  |
| Link Distance (ft)    | 438 | 438 | 1259 | 1259 |
| Upstream Blk Time (%) | 17  | 80  |      |      |
| Queuing Penalty (veh) | 0   | 0   |      |      |
| Storage Bay Dist (ft) |     |     |      |      |
| Storage Blk Time (%)  |     |     |      | 20   |
| Queuing Penalty (veh) |     |     |      | 0    |

Queuing and Blocking Report  
Evacuation Scenario 1 plus Project

08/23/2020

Intersection: 4: Pleasant Hill Road & Springhill Road/Quandt Road

| Movement              | EB  | WB  | NB  | SB  | SB  | SB  | B20 | B20 |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | L   | T   | T   | R   | T   | T   |
| Maximum Queue (ft)    | 368 | 258 | 15  | 506 | 515 | 96  | 212 | 229 |
| Average Queue (ft)    | 336 | 211 | 2   | 375 | 383 | 62  | 94  | 130 |
| 95th Queue (ft)       | 353 | 278 | 10  | 632 | 651 | 137 | 222 | 278 |
| Link Distance (ft)    | 318 | 217 |     | 406 | 406 |     | 127 | 127 |
| Upstream Blk Time (%) | 100 | 32  |     | 37  | 51  |     | 8   | 41  |
| Queuing Penalty (veh) | 0   | 0   |     | 337 | 458 |     | 69  | 371 |
| Storage Bay Dist (ft) |     |     | 200 |     |     | 71  |     |     |
| Storage Blk Time (%)  |     |     |     | 56  | 57  | 0   |     |     |
| Queuing Penalty (veh) |     |     |     | 0   | 98  | 2   |     |     |

Intersection: 5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard

| Movement              | WB  | WB  | NB  | NB  | SB  | SB  | SB  | SB  | B37  | B37  |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
| Directions Served     | L   | LT  | T   | R   | L   | T   | T   | T   | T    | T    |
| Maximum Queue (ft)    | 225 | 550 | 22  | 43  | 275 | 442 | 447 | 441 | 1884 | 2009 |
| Average Queue (ft)    | 108 | 522 | 2   | 8   | 174 | 366 | 392 | 410 | 1590 | 1711 |
| 95th Queue (ft)       | 271 | 536 | 13  | 29  | 316 | 523 | 454 | 467 | 2522 | 2656 |
| Link Distance (ft)    |     | 504 | 342 | 342 |     | 351 | 351 | 351 | 1832 | 1832 |
| Upstream Blk Time (%) |     | 96  |     |     |     | 23  | 33  | 41  | 21   | 76   |
| Queuing Penalty (veh) |     | 0   |     |     |     | 193 | 278 | 337 | 260  | 943  |
| Storage Bay Dist (ft) | 185 |     |     |     | 175 |     |     |     |      |      |
| Storage Blk Time (%)  |     | 92  |     |     | 9   | 4   |     | 60  |      |      |
| Queuing Penalty (veh) |     | 418 |     |     | 69  | 9   |     | 0   |      |      |

Intersection: 6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Queuing and Blocking Report  
Evacuation Scenario 1 plus Project

08/23/2020

Intersection: 7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road

| Movement              | SB |
|-----------------------|----|
| Directions Served     | T  |
| Maximum Queue (ft)    | 5  |
| Average Queue (ft)    | 0  |
| 95th Queue (ft)       | 4  |
| Link Distance (ft)    |    |
| Upstream Blk Time (%) |    |
| Queuing Penalty (veh) |    |
| Storage Bay Dist (ft) |    |
| Storage Blk Time (%)  |    |
| Queuing Penalty (veh) |    |

Intersection: 8: Brown Avenue/Miller Drive & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Intersection: 9: First Street/Sierra Vista Way & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Queuing and Blocking Report  
Evacuation Scenario 1 plus Project

08/23/2020

Intersection: 10: SR 24 WB Ramps/Laurel Drive & Deer Hill Road

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 11: Pleasant Hill Road & Project Dwy

| Movement | EB | SB | SB | SB |
|----------|----|----|----|----|
|----------|----|----|----|----|

|                   |   |   |   |    |
|-------------------|---|---|---|----|
| Directions Served | R | T | T | TR |
|-------------------|---|---|---|----|

|                    |     |     |     |     |
|--------------------|-----|-----|-----|-----|
| Maximum Queue (ft) | 218 | 395 | 389 | 391 |
|--------------------|-----|-----|-----|-----|

|                    |     |     |     |     |
|--------------------|-----|-----|-----|-----|
| Average Queue (ft) | 184 | 156 | 346 | 337 |
|--------------------|-----|-----|-----|-----|

|                 |     |     |     |     |
|-----------------|-----|-----|-----|-----|
| 95th Queue (ft) | 201 | 366 | 416 | 447 |
|-----------------|-----|-----|-----|-----|

|                    |     |     |     |     |
|--------------------|-----|-----|-----|-----|
| Link Distance (ft) | 164 | 342 | 342 | 342 |
|--------------------|-----|-----|-----|-----|

|                       |     |   |    |    |
|-----------------------|-----|---|----|----|
| Upstream Blk Time (%) | 100 | 2 | 15 | 10 |
|-----------------------|-----|---|----|----|

|                       |   |    |     |     |
|-----------------------|---|----|-----|-----|
| Queuing Penalty (veh) | 0 | 17 | 158 | 109 |
|-----------------------|---|----|-----|-----|

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 12: Project Dwy NE & Deer Hill Road

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Queuing and Blocking Report  
Evacuation Scenario 1 plus Project

08/23/2020

Intersection: 13: Project Dwy SW & Deer Hill Road

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 14: Pleasant Hill Road & Acalanes Avenue

Movement

SB

SB

SB

Directions Served

T

T

T

Maximum Queue (ft)

164

267

237

Average Queue (ft)

36

237

184

95th Queue (ft)

122

258

270

Link Distance (ft)

152

152

152

Upstream Blk Time (%)

1

97

11

Queuing Penalty (veh)

12

1208

140

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 15: Pleasant Hill Road

Movement

SB

SB

SB

Directions Served

T

T

R

Maximum Queue (ft)

56

370

283

Average Queue (ft)

11

341

106

95th Queue (ft)

47

363

244

Link Distance (ft)

262

262

262

Upstream Blk Time (%)

99

0

Queuing Penalty (veh)

1230

5

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)



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Intersection: 16: Pleasant Hill Road

---

| Movement              | SB  |
|-----------------------|-----|
| Directions Served     | T   |
| Maximum Queue (ft)    | 542 |
| Average Queue (ft)    | 512 |
| 95th Queue (ft)       | 534 |
| Link Distance (ft)    | 302 |
| Upstream Blk Time (%) | 100 |
| Queuing Penalty (veh) | 939 |
| Storage Bay Dist (ft) |     |
| Storage Blk Time (%)  |     |
| Queuing Penalty (veh) |     |

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Intersection: 17: Pleasant Hill Road

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| Movement              | SB  | SB  |
|-----------------------|-----|-----|
| Directions Served     | T   | TR  |
| Maximum Queue (ft)    | 188 | 535 |
| Average Queue (ft)    | 15  | 505 |
| 95th Queue (ft)       | 123 | 526 |
| Link Distance (ft)    | 314 | 314 |
| Upstream Blk Time (%) | 0   | 99  |
| Queuing Penalty (veh) | 0   | 622 |
| Storage Bay Dist (ft) |     |     |
| Storage Blk Time (%)  |     |     |
| Queuing Penalty (veh) |     |     |

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Network Summary

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|                                    |
|------------------------------------|
| Network wide Queuing Penalty: 8283 |
|------------------------------------|

PHF = 1.0

**Evac 1 + Project Variant**– Evacuation plus project, no trap lane, in the  
AM Peak

# SimTraffic Simulation Summary

## Evacuation Scenario 1 plus Project Variant

08/23/2020

### Summary of All Intervals

| Run Number              | 1      | 2      | 3      | 4      | 5      | Avg    |
|-------------------------|--------|--------|--------|--------|--------|--------|
| Start Time              | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   | 6:50   |
| End Time                | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   | 8:00   |
| Total Time (min)        | 70     | 70     | 70     | 70     | 70     | 70     |
| Time Recorded (min)     | 60     | 60     | 60     | 60     | 60     | 60     |
| # of Intervals          | 2      | 2      | 2      | 2      | 2      | 2      |
| # of Recorded Intervals | 1      | 1      | 1      | 1      | 1      | 1      |
| Vehs Entered            | 1718   | 1770   | 1818   | 1793   | 1804   | 1781   |
| Vehs Exited             | 1667   | 1680   | 1753   | 1687   | 1699   | 1696   |
| Starting Vehs           | 332    | 280    | 318    | 278    | 287    | 299    |
| Ending Vehs             | 383    | 370    | 383    | 384    | 392    | 380    |
| Denied Entry Before     | 188    | 149    | 166    | 161    | 143    | 161    |
| Denied Entry After      | 2724   | 2604   | 2474   | 2543   | 2560   | 2582   |
| Travel Distance (mi)    | 1573   | 1588   | 1620   | 1618   | 1608   | 1601   |
| Travel Time (hr)        | 1799.8 | 1669.5 | 1677.1 | 1653.3 | 1680.2 | 1696.0 |
| Total Delay (hr)        | 1745.0 | 1614.2 | 1620.7 | 1597.2 | 1624.2 | 1640.3 |
| Total Stops             | 6005   | 6096   | 6145   | 6278   | 6138   | 6134   |
| Fuel Used (gal)         | 447.6  | 420.7  | 423.1  | 417.9  | 422.6  | 426.4  |

### Interval #0 Information Seeding

|                                     |      |
|-------------------------------------|------|
| Start Time                          | 6:50 |
| End Time                            | 7:00 |
| Total Time (min)                    | 10   |
| Volumes adjusted by Growth Factors. |      |
| No data recorded this interval.     |      |

### Interval #1 Information Recording

|                                     |      |
|-------------------------------------|------|
| Start Time                          | 7:00 |
| End Time                            | 8:00 |
| Total Time (min)                    | 60   |
| Volumes adjusted by Growth Factors. |      |

| Run Number           | 1      | 2      | 3      | 4      | 5      | Avg    |
|----------------------|--------|--------|--------|--------|--------|--------|
| Vehs Entered         | 1718   | 1770   | 1818   | 1793   | 1804   | 1781   |
| Vehs Exited          | 1667   | 1680   | 1753   | 1687   | 1699   | 1696   |
| Starting Vehs        | 332    | 280    | 318    | 278    | 287    | 299    |
| Ending Vehs          | 383    | 370    | 383    | 384    | 392    | 380    |
| Denied Entry Before  | 188    | 149    | 166    | 161    | 143    | 161    |
| Denied Entry After   | 2724   | 2604   | 2474   | 2543   | 2560   | 2582   |
| Travel Distance (mi) | 1573   | 1588   | 1620   | 1618   | 1608   | 1601   |
| Travel Time (hr)     | 1799.8 | 1669.5 | 1677.1 | 1653.3 | 1680.2 | 1696.0 |
| Total Delay (hr)     | 1745.0 | 1614.2 | 1620.7 | 1597.2 | 1624.2 | 1640.3 |
| Total Stops          | 6005   | 6096   | 6145   | 6278   | 6138   | 6134   |
| Fuel Used (gal)      | 447.6  | 420.7  | 423.1  | 417.9  | 422.6  | 426.4  |

### 1: Pleasant Hill Road & Rancho View Drive Performance by movement

| Movement            | EBR | SBT | All |
|---------------------|-----|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.2 | 0.1 | 0.2 |
| Total Delay (hr)    | 0.1 | 0.0 | 0.2 |
| Total Del/Veh (s)   | 3.5 | 6.8 | 4.0 |
| Stop Delay (hr)     | 0.1 | 0.0 | 0.1 |
| Stop Del/Veh (s)    | 2.7 | 5.1 | 3.1 |
| Vehicles Entered    | 135 | 26  | 161 |
| Vehicles Exited     | 135 | 26  | 161 |
| Hourly Exit Rate    | 135 | 26  | 161 |
| Input Volume        | 130 | 25  | 155 |
| % of Volume         | 104 | 104 | 104 |
| Denied Entry Before | 0   | 0   | 0   |
| Denied Entry After  | 0   | 0   | 0   |

### 2: Pleasant Hill Road & Greenvaley Drive Performance by movement

| Movement            | EBR | WBL  | SBT | All  |
|---------------------|-----|------|-----|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0 | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0  | 0.0 | 0.0  |
| Total Delay (hr)    | 0.0 | 10.7 | 0.2 | 11.0 |
| Total Del/Veh (s)   | 3.2 | 82.0 | 5.0 | 58.4 |
| Stop Delay (hr)     | 0.0 | 9.6  | 0.2 | 9.8  |
| Stop Del/Veh (s)    | 3.4 | 73.3 | 3.4 | 52.0 |
| Vehicles Entered    | 45  | 457  | 160 | 662  |
| Vehicles Exited     | 45  | 454  | 159 | 658  |
| Hourly Exit Rate    | 45  | 454  | 159 | 658  |
| Input Volume        | 42  | 478  | 155 | 675  |
| % of Volume         | 107 | 95   | 103 | 97   |
| Denied Entry Before | 0   | 0    | 0   | 0    |
| Denied Entry After  | 0   | 0    | 0   | 0    |

### 3: Pleasant Hill Road & Reliez Valle Road Performance by movement

| Movement            | EBR    | SBT  | All   |
|---------------------|--------|------|-------|
| Denied Delay (hr)   | 366.7  | 0.0  | 366.7 |
| Denied Del/Veh (s)  | 1156.1 | 0.0  | 733.9 |
| Total Delay (hr)    | 17.0   | 7.7  | 24.7  |
| Total Del/Veh (s)   | 170.9  | 41.0 | 86.2  |
| Stop Delay (hr)     | 17.1   | 6.4  | 23.4  |
| Stop Del/Veh (s)    | 171.0  | 34.2 | 81.8  |
| Vehicles Entered    | 348    | 657  | 1005  |
| Vehicles Exited     | 340    | 655  | 995   |
| Hourly Exit Rate    | 340    | 655  | 995   |
| Input Volume        | 1124   | 675  | 1799  |
| % of Volume         | 30     | 97   | 55    |
| Denied Entry Before | 12     | 0    | 12    |
| Denied Entry After  | 794    | 0    | 794   |

### 4: Pleasant Hill Road & Springhill Road/Quandt Road Performance by movement

| Movement            | EBR    | WBL   | WBT   | NBL  | SBT   | SBR   | All   |
|---------------------|--------|-------|-------|------|-------|-------|-------|
| Denied Delay (hr)   | 232.9  | 5.0   | 0.9   | 0.0  | 0.0   | 0.0   | 238.9 |
| Denied Del/Veh (s)  | 1302.1 | 78.2  | 89.6  | 0.0  | 0.0   | 0.0   | 450.7 |
| Total Delay (hr)    | 9.8    | 6.7   | 1.2   | 0.1  | 32.7  | 3.0   | 53.4  |
| Total Del/Veh (s)   | 181.3  | 106.8 | 120.8 | 81.7 | 129.3 | 109.9 | 131.2 |
| Stop Delay (hr)     | 10.2   | 6.5   | 1.1   | 0.1  | 32.9  | 3.0   | 53.8  |
| Stop Del/Veh (s)    | 187.4  | 103.4 | 116.2 | 79.8 | 130.5 | 111.8 | 132.2 |
| Vehicles Entered    | 186    | 223   | 35    | 5    | 894   | 97    | 1440  |
| Vehicles Exited     | 185    | 220   | 35    | 5    | 869   | 93    | 1407  |
| Hourly Exit Rate    | 185    | 220   | 35    | 5    | 869   | 93    | 1407  |
| Input Volume        | 643    | 223   | 34    | 4    | 1626  | 173   | 2703  |
| % of Volume         | 29     | 99    | 103   | 125  | 53    | 54    | 52    |
| Denied Entry Before | 15     | 0     | 0     | 0    | 0     | 0     | 15    |
| Denied Entry After  | 458    | 9     | 1     | 0    | 0     | 0     | 468   |

5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard Performance by movement

| Movement            | WBL    | NBT  | NBR | SBL   | SBT   | All   |
|---------------------|--------|------|-----|-------|-------|-------|
| Denied Delay (hr)   | 392.5  | 0.0  | 0.0 | 0.0   | 0.0   | 392.5 |
| Denied Del/Veh (s)  | 1474.8 | 0.0  | 0.0 | 0.0   | 0.0   | 625.7 |
| Total Delay (hr)    | 24.1   | 0.0  | 0.0 | 13.2  | 142.1 | 179.4 |
| Total Del/Veh (s)   | 329.5  | 21.8 | 2.9 | 374.4 | 394.4 | 377.1 |
| Stop Delay (hr)     | 23.9   | 0.0  | 0.0 | 12.5  | 139.4 | 175.8 |
| Stop Del/Veh (s)    | 327.1  | 19.9 | 3.0 | 354.8 | 386.9 | 369.6 |
| Vehicles Entered    | 238    | 5    | 21  | 115   | 1159  | 1538  |
| Vehicles Exited     | 235    | 5    | 21  | 113   | 1132  | 1506  |
| Hourly Exit Rate    | 235    | 5    | 21  | 113   | 1132  | 1506  |
| Input Volume        | 909    | 4    | 22  | 218   | 2274  | 3427  |
| % of Volume         | 26     | 125  | 95  | 52    | 50    | 44    |
| Denied Entry Before | 69     | 0    | 0   | 0     | 0     | 69    |
| Denied Entry After  | 720    | 0    | 0   | 0     | 0     | 720   |

6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp Performance by movement

| Movement            | SBR | All |
|---------------------|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.0 | 0.0 |
| Total Delay (hr)    | 0.0 | 0.0 |
| Total Del/Veh (s)   | 4.9 | 4.9 |
| Stop Delay (hr)     | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.0 | 0.0 |
| Vehicles Entered    | 8   | 8   |
| Vehicles Exited     | 8   | 8   |
| Hourly Exit Rate    | 8   | 8   |
| Input Volume        | 26  | 26  |
| % of Volume         | 31  | 31  |
| Denied Entry Before | 0   | 0   |
| Denied Entry After  | 0   | 0   |

7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road Performance by movement

| Movement            | SBT | All |
|---------------------|-----|-----|
| Denied Delay (hr)   | 0.0 | 0.0 |
| Denied Del/Veh (s)  | 0.1 | 0.1 |
| Total Delay (hr)    | 0.0 | 0.0 |
| Total Del/Veh (s)   | 1.7 | 1.7 |
| Stop Delay (hr)     | 0.0 | 0.0 |
| Stop Del/Veh (s)    | 0.0 | 0.0 |
| Vehicles Entered    | 23  | 23  |
| Vehicles Exited     | 23  | 23  |
| Hourly Exit Rate    | 23  | 23  |
| Input Volume        | 26  | 26  |
| % of Volume         | 88  | 88  |
| Denied Entry Before | 0   | 0   |
| Denied Entry After  | 0   | 0   |

11: Pleasant Hill Road & Project Dwy Performance by movement

| Movement            | EBR    | NBT | SBT  | All   |
|---------------------|--------|-----|------|-------|
| Denied Delay (hr)   | 333.1  | 0.0 | 0.0  | 333.1 |
| Denied Del/Veh (s)  | 1956.2 | 0.0 | 0.0  | 598.1 |
| Total Delay (hr)    | 8.0    | 0.0 | 8.0  | 16.1  |
| Total Del/Veh (s)   | 1374.8 | 0.0 | 21.0 | 40.7  |
| Stop Delay (hr)     | 8.1    | 0.0 | 4.5  | 12.5  |
| Stop Del/Veh (s)    | 1380.2 | 0.0 | 11.7 | 31.7  |
| Vehicles Entered    | 13     | 25  | 1367 | 1405  |
| Vehicles Exited     | 13     | 25  | 1368 | 1406  |
| Hourly Exit Rate    | 13     | 25  | 1368 | 1406  |
| Input Volume        | 551    | 26  | 3183 | 3760  |
| % of Volume         | 2      | 96  | 43   | 37    |
| Denied Entry Before | 65     | 0   | 0    | 65    |
| Denied Entry After  | 600    | 0   | 0    | 600   |

#### 14: Pleasant Hill Road & Acalanes Avenue Performance by movement

| Movement            | NBT | SBT  | All  |
|---------------------|-----|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0 | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 4.7  | 4.7  |
| Total Del/Veh (s)   | 0.2 | 12.3 | 12.1 |
| Stop Delay (hr)     | 0.0 | 1.6  | 1.6  |
| Stop Del/Veh (s)    | 0.0 | 4.0  | 4.0  |
| Vehicles Entered    | 25  | 1381 | 1406 |
| Vehicles Exited     | 25  | 1382 | 1407 |
| Hourly Exit Rate    | 25  | 1382 | 1407 |
| Input Volume        | 26  | 3734 | 3760 |
| % of Volume         | 96  | 37   | 37   |
| Denied Entry Before | 0   | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    |

#### 15: Pleasant Hill Road Performance by movement

| Movement            | WBR | SBT  | SBR  | All  |
|---------------------|-----|------|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.1 | 0.0  | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 3.7  | 2.9  | 6.6  |
| Total Del/Veh (s)   | 0.6 | 19.0 | 15.3 | 16.8 |
| Stop Delay (hr)     | 0.0 | 0.4  | 0.4  | 0.8  |
| Stop Del/Veh (s)    | 0.0 | 2.1  | 2.1  | 2.1  |
| Vehicles Entered    | 25  | 694  | 688  | 1407 |
| Vehicles Exited     | 25  | 697  | 686  | 1408 |
| Hourly Exit Rate    | 25  | 697  | 686  | 1408 |
| Input Volume        | 26  | 1880 | 1854 | 3760 |
| % of Volume         | 96  | 37   | 37   | 37   |
| Denied Entry Before | 0   | 0    | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    | 0    |



### 16: Pleasant Hill Road Performance by movement

| Movement            | SBT  | All  |
|---------------------|------|------|
| Denied Delay (hr)   | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0  | 0.0  |
| Total Delay (hr)    | 1.3  | 1.3  |
| Total Del/Veh (s)   | 6.6  | 6.6  |
| Stop Delay (hr)     | 0.0  | 0.0  |
| Stop Del/Veh (s)    | 0.0  | 0.0  |
| Vehicles Entered    | 697  | 697  |
| Vehicles Exited     | 697  | 697  |
| Hourly Exit Rate    | 697  | 697  |
| Input Volume        | 1880 | 1880 |
| % of Volume         | 37   | 37   |
| Denied Entry Before | 0    | 0    |
| Denied Entry After  | 0    | 0    |

### 17: Pleasant Hill Road Performance by movement

| Movement            | SBT | SBR  | All  |
|---------------------|-----|------|------|
| Denied Delay (hr)   | 0.0 | 0.0  | 0.0  |
| Denied Del/Veh (s)  | 0.0 | 0.0  | 0.0  |
| Total Delay (hr)    | 0.0 | 1.0  | 1.0  |
| Total Del/Veh (s)   | 7.6 | 4.8  | 4.8  |
| Stop Delay (hr)     | 0.0 | 0.3  | 0.3  |
| Stop Del/Veh (s)    | 1.2 | 1.7  | 1.7  |
| Vehicles Entered    | 8   | 716  | 724  |
| Vehicles Exited     | 8   | 714  | 722  |
| Hourly Exit Rate    | 8   | 714  | 722  |
| Input Volume        | 26  | 1880 | 1906 |
| % of Volume         | 31  | 38   | 38   |
| Denied Entry Before | 0   | 0    | 0    |
| Denied Entry After  | 0   | 0    | 0    |

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Total Network Performance

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|                     |        |
|---------------------|--------|
| Denied Delay (hr)   | 1331.4 |
| Denied Del/Veh (s)  | 1098.6 |
| Total Delay (hr)    | 308.8  |
| Total Del/Veh (s)   | 535.6  |
| Stop Delay (hr)     | 287.7  |
| Stop Del/Veh (s)    | 499.0  |
| Vehicles Entered    | 1781   |
| Vehicles Exited     | 1696   |
| Hourly Exit Rate    | 1696   |
| Input Volume        | 30546  |
| % of Volume         | 6      |
| Denied Entry Before | 161    |
| Denied Entry After  | 2582   |

Arterial Level of Service  
Evacuation Scenario 1 plus Project Variant

08/23/2020

Arterial Level of Service: NB Pleasant Hill Road

| Cross Street      | Node | Delay (s/veh) | Travel time (s) | Dist (mi) | Arterial Speed |
|-------------------|------|---------------|-----------------|-----------|----------------|
| Acalanes Avenue   | 14   | 0.2           | 20.2            | 0.1       | 11             |
| Project Dwy       | 11   | 0.0           | 4.1             | 0.0       | 34             |
| Stanley Boulevard | 5    | 21.8          | 29.1            | 0.1       | 10             |
| Quandt Road       | 4    | 81.7          | 122.2           | 0.4       | 13             |
| Total             |      | 103.8         | 175.6           | 0.6       | 13             |

Arterial Level of Service: SB Pleasant Hill Road

| Cross Street         | Node | Delay (s/veh) | Travel time (s) | Dist (mi) | Arterial Speed |
|----------------------|------|---------------|-----------------|-----------|----------------|
| Rancho View Drive    | 1    | 6.8           | 22.1            | 0.2       | 25             |
|                      | 19   | 1.2           | 15.8            | 0.1       | 34             |
| Greenvalley Drive    | 2    | 5.0           | 11.9            | 0.1       | 22             |
| Reliez Valle Road    | 3    | 37.7          | 61.6            | 0.3       | 15             |
|                      | 20   | 24.4          | 28.0            | 0.0       | 4              |
| Springhill Road      | 4    | 129.3         | 138.7           | 0.1       | 3              |
| Deer Hill Road       | 5    | 358.8         | 396.8           | 0.4       | 4              |
| Project Dwy          | 11   | 20.5          | 29.0            | 0.1       | 10             |
| Acalanes Avenue      | 14   | 12.4          | 16.4            | 0.0       | 8              |
|                      | 15   | 19.0          | 25.1            | 0.1       | 9              |
|                      | 16   | 6.6           | 16.0            | 0.1       | 24             |
|                      | 17   | 7.6           | 17.2            | 0.1       | 15             |
| Mt. Diablo Boulevard | 6    | 4.9           | 13.5            | 0.1       | 18             |
| SR 24 EB Off Ramp    | 7    | 1.7           | 4.5             | 0.1       | 50             |
| Total                |      | 635.7         | 796.7           | 1.7       | 8              |

Queuing and Blocking Report  
Evacuation Scenario 1 plus Project Variant

08/23/2020

Intersection: 1: Pleasant Hill Road & Rancho View Drive

| Movement              | EB  | SB  | SB  |
|-----------------------|-----|-----|-----|
| Directions Served     | LTR | T   | TR  |
| Maximum Queue (ft)    | 77  | 45  | 16  |
| Average Queue (ft)    | 38  | 8   | 1   |
| 95th Queue (ft)       | 63  | 30  | 7   |
| Link Distance (ft)    | 306 | 773 | 773 |
| Upstream Blk Time (%) |     |     |     |
| Queuing Penalty (veh) |     |     |     |
| Storage Bay Dist (ft) |     |     |     |
| Storage Blk Time (%)  |     |     |     |
| Queuing Penalty (veh) |     |     |     |

Intersection: 2: Pleasant Hill Road & Greenvalley Drive

| Movement              | EB  | WB  | B60 | SB  | SB  |
|-----------------------|-----|-----|-----|-----|-----|
| Directions Served     | LTR | LT  | T   | T   | TR  |
| Maximum Queue (ft)    | 44  | 567 | 56  | 50  | 64  |
| Average Queue (ft)    | 11  | 385 | 10  | 9   | 25  |
| 95th Queue (ft)       | 29  | 611 | 51  | 31  | 57  |
| Link Distance (ft)    | 333 | 494 | 53  | 288 | 288 |
| Upstream Blk Time (%) |     | 12  | 5   |     |     |
| Queuing Penalty (veh) |     | 0   | 0   |     |     |
| Storage Bay Dist (ft) |     |     |     |     |     |
| Storage Blk Time (%)  |     | 63  |     | 0   |     |
| Queuing Penalty (veh) |     | 0   |     | 0   |     |

Intersection: 3: Pleasant Hill Road & Reliez Valle Road

| Movement              | EB  | EB  | SB   | SB   |
|-----------------------|-----|-----|------|------|
| Directions Served     | L   | R   | T    | T    |
| Maximum Queue (ft)    | 459 | 488 | 358  | 394  |
| Average Queue (ft)    | 253 | 456 | 187  | 189  |
| 95th Queue (ft)       | 615 | 491 | 312  | 337  |
| Link Distance (ft)    | 438 | 438 | 1259 | 1259 |
| Upstream Blk Time (%) | 27  | 94  |      |      |
| Queuing Penalty (veh) | 0   | 0   |      |      |
| Storage Bay Dist (ft) |     |     |      |      |
| Storage Blk Time (%)  |     |     |      | 28   |
| Queuing Penalty (veh) |     |     |      | 0    |

Queuing and Blocking Report  
Evacuation Scenario 1 plus Project Variant

08/23/2020

Intersection: 4: Pleasant Hill Road & Springhill Road/Quandt Road

| Movement              | EB  | WB  | NB  | SB  | SB  | SB  | B20 | B20 |
|-----------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| Directions Served     | LTR | LTR | L   | T   | T   | R   | T   | T   |
| Maximum Queue (ft)    | 369 | 258 | 16  | 526 | 525 | 96  | 207 | 220 |
| Average Queue (ft)    | 338 | 223 | 2   | 476 | 476 | 76  | 164 | 183 |
| 95th Queue (ft)       | 355 | 265 | 9   | 581 | 604 | 140 | 245 | 262 |
| Link Distance (ft)    | 318 | 213 |     | 414 | 414 |     | 127 | 127 |
| Upstream Blk Time (%) | 100 | 64  |     | 86  | 90  |     | 24  | 85  |
| Queuing Penalty (veh) | 0   | 0   |     | 775 | 809 |     | 213 | 762 |
| Storage Bay Dist (ft) |     |     | 200 |     |     | 71  |     |     |
| Storage Blk Time (%)  |     |     |     | 89  | 84  | 0   |     |     |
| Queuing Penalty (veh) |     |     |     | 0   | 145 | 2   |     |     |

Intersection: 5: Pleasant Hill Road & Deer Hill Road/Stanley Boulevard

| Movement              | WB  | WB  | NB  | NB  | SB  | SB   | SB   |
|-----------------------|-----|-----|-----|-----|-----|------|------|
| Directions Served     | L   | LT  | T   | R   | L   | T    | T    |
| Maximum Queue (ft)    | 225 | 547 | 28  | 29  | 275 | 2274 | 2410 |
| Average Queue (ft)    | 212 | 521 | 3   | 8   | 192 | 2241 | 2371 |
| 95th Queue (ft)       | 276 | 536 | 15  | 28  | 344 | 2292 | 2451 |
| Link Distance (ft)    |     | 504 | 342 | 342 |     | 2220 | 2220 |
| Upstream Blk Time (%) |     | 95  |     |     |     | 41   | 95   |
| Queuing Penalty (veh) |     | 0   |     |     |     | 506  | 1182 |
| Storage Bay Dist (ft) | 185 |     |     |     | 175 |      |      |
| Storage Blk Time (%)  | 11  | 97  |     |     | 4   | 30   | 68   |
| Queuing Penalty (veh) | 52  | 440 |     |     | 47  | 64   | 0    |

Intersection: 6: Pleasant Hill Road & Mt. Diablo Boulevard/SR 24 EB On Ramp

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Queuing and Blocking Report  
Evacuation Scenario 1 plus Project Variant

08/23/2020

Intersection: 7: Pleasant Hill Road & SR 24 EB Off Ramp/Old Tunnel Road

| Movement              | SB |
|-----------------------|----|
| Directions Served     | T  |
| Maximum Queue (ft)    | 2  |
| Average Queue (ft)    | 0  |
| 95th Queue (ft)       | 2  |
| Link Distance (ft)    |    |
| Upstream Blk Time (%) |    |
| Queuing Penalty (veh) |    |
| Storage Bay Dist (ft) |    |
| Storage Blk Time (%)  |    |
| Queuing Penalty (veh) |    |

Intersection: 8: Brown Avenue/Miller Drive & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Intersection: 9: First Street/Sierra Vista Way & Deer Hill Road

| Movement              |
|-----------------------|
| Directions Served     |
| Maximum Queue (ft)    |
| Average Queue (ft)    |
| 95th Queue (ft)       |
| Link Distance (ft)    |
| Upstream Blk Time (%) |
| Queuing Penalty (veh) |
| Storage Bay Dist (ft) |
| Storage Blk Time (%)  |
| Queuing Penalty (veh) |

Queuing and Blocking Report  
Evacuation Scenario 1 plus Project Variant

08/23/2020

Intersection: 10: SR 24 WB Ramps/Laurel Drive & Deer Hill Road

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 11: Pleasant Hill Road & Project Dwy

Movement

EB

SB

SB

Directions Served

R

T

TR

Maximum Queue (ft)

204

392

380

Average Queue (ft)

180

212

338

95th Queue (ft)

199

435

410

Link Distance (ft)

176

342

342

Upstream Blk Time (%)

100

1

7

Queuing Penalty (veh)

0

23

114

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 12: Project Dwy NE & Deer Hill Road

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Queuing and Blocking Report  
Evacuation Scenario 1 plus Project Variant

08/23/2020

Intersection: 13: Project Dwy SW & Deer Hill Road

Movement

Directions Served  
Maximum Queue (ft)  
Average Queue (ft)  
95th Queue (ft)  
Link Distance (ft)  
Upstream Blk Time (%)  
Queuing Penalty (veh)  
Storage Bay Dist (ft)  
Storage Blk Time (%)  
Queuing Penalty (veh)

Intersection: 14: Pleasant Hill Road & Acalanes Avenue

Movement SB SB

Directions Served T T  
Maximum Queue (ft) 180 257  
Average Queue (ft) 48 214  
95th Queue (ft) 146 294  
Link Distance (ft) 150 150  
Upstream Blk Time (%) 1 22  
Queuing Penalty (veh) 15 409  
Storage Bay Dist (ft)  
Storage Blk Time (%)  
Queuing Penalty (veh)

Intersection: 15: Pleasant Hill Road

Movement SB

Directions Served TR  
Maximum Queue (ft) 351  
Average Queue (ft) 179  
95th Queue (ft) 424  
Link Distance (ft) 266  
Upstream Blk Time (%) 5  
Queuing Penalty (veh) 89  
Storage Bay Dist (ft)  
Storage Blk Time (%)  
Queuing Penalty (veh)



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Intersection: 16: Pleasant Hill Road

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Movement

Directions Served  
Maximum Queue (ft)  
Average Queue (ft)  
95th Queue (ft)  
Link Distance (ft)  
Upstream Blk Time (%)  
Queuing Penalty (veh)  
Storage Bay Dist (ft)  
Storage Blk Time (%)  
Queuing Penalty (veh)

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Intersection: 17: Pleasant Hill Road

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Movement SB

Directions Served TR  
Maximum Queue (ft) 161  
Average Queue (ft) 67  
95th Queue (ft) 128  
Link Distance (ft) 314  
Upstream Blk Time (%)  
Queuing Penalty (veh)  
Storage Bay Dist (ft)  
Storage Blk Time (%)  
Queuing Penalty (veh)

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Network Summary

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Network wide Queuing Penalty: 5648



# City of Lafayette

## Very High Fire Hazard Severity Zones

The data in this map is a compilation of data collected by the City of Lafayette from (1) Contra Costa County Fire Protection District, and (2) Cal Fire.

