Traffic Impact Study Report

Church of the Valley Expansion and Memory Care Facility

City of San Ramon, California

July 31, 2018

TJKM

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EXECUTIVE SUMMARY

This report summarizes the results of the Traffic Impact Study (TIS) conducted for the proposed school expansion and memory care facility to be located at 19001 San Ramon Valley Boulevard in the City of San Ramon. The purpose of this traffic impact study is to evaluate the potential traffic impacts resulting from the development of the proposed project on the surrounding transportation system.

The proposed project consists of two parts, both located on the site of an existing church and private elementary school. First, it would add a memory care facility providing up to 54 beds with approximately 29 employees. Second, it would add a new, separate education building to accommodate up to 60 pre-school anstudents and 135 K-8 grade students, for a total of 195 students and 17 staff members. The existing school currently enrolls 40 students, although it is permitted to enroll up to 80 students.

The report also includes evaluations and recommendations concerning project site access and on-site circulation for vehicles, bicycles, and pedestrians, and an evaluation of on-site vehicle parking supply.

To evaluate the impacts on the transportation infrastructure due to the addition of traffic from the proposed project, City staff requested that three study intersections be evaluated during the weekday a.m. peak. The study intersections and roadway segments were evaluated under *Existing No Project* and *Existing plus Project* scenarios. For the purposes of this analysis, potential traffic operational effects from the proposed project are identified based on established traffic operational thresholds of the City of San Ramon.

Project Trip Generation

The proposed memory care facility and school expansion are together expected to generate 801 daily vehicular trips, of which 143 vehicle trips (79 inbound and 64 outbound) are generated during the a.m. peak hour.

Existing Conditions

Under this scenario, all intersections operate at acceptable LOS D or better. Extensive southbound queuing at Montevideo Drive was observed in the morning peak hour due to traffic generated by the nearby high school, which extended as far as the project site. Traffic simulation of the study area was calibrated to reflect field observations at this intersection.

Existing plus Project Conditions

Under this scenario, the southern driveway operates at LOS D or better. Both the signalized intersection of San Ramon Valley Boulevard & Montevideo Drive and the southern driveway operate at LOS D (acceptable) or LOS E (unacceptable), depending on signal timing. Based on the City of San Ramon impact criteria the project is expected to have a **less-than-significant** impact at all study intersections under Existing plus Project Conditions. There is no justification to signalize study intersections or make other changes to intersection controls. TJKM recommends adding a "Keep Clear" pavement marking to prevent southbound queuing from blocking vehicles entering or exiting the main project driveway. Simulated results for southbound queuing at Montevideo Drive were also found to be dependent on signal timing at this intersection. It is noted that potential blockage of the driveway would occur around 8:15 a.m. due to

high school traffic, which is after most preschool traffic occurs and before K-8 students arrive. Calculated and simulated queuing analysis may therefore overestimate the project's contributions by disregarding the offset drop-off periods of the schools involved.

Pedestrian, Bicycle and Transit Impacts

Pedestrian access to the site will be via an existing sidewalk on San Ramon Valley Boulevard. There is a pair of bus stops within the vicinity of the project site, served by one bus route on weekdays. San Ramon Valley Boulevard has Class II bike lanes on both sides of the street, and Montevideo Drive is a designated Class III bicycle route. The proposed project does not conflict with existing and planned pedestrian or bicycle facilities and will add very few trips to existing transit facilities, which can be accommodated by the existing transit capacity. Therefore, there will be no degrading of pedestrian, bicycle, or transit facilities related to the school, preschool, or memory care center operations.

On-Site Circulation

TJKM examined the project site plan (dated July 12, 2018) in order to evaluate the adequacy of on-site two-way vehicle circulation including vans and emergency vehicles. Based on the evaluation and current site plan, circulation appears to be sufficient for two-way flow through the 25-foot-wide parking aisles nearest the street and along the northern side of the existing classroom building, during periods of congestion. However, the school has developed a circulation plan for school drop-off and pick-up, which will be implemented with on-site guidance by teachers and parent volunteers. TJKM evaluated this circulation plan and the staggered start times proposed for the school and considers them adequate to mitigate congestion on site and on neighboring streets.

Parking

The City of San Ramon parking standards require projects to provide on-site parking based on land use and project size. Based on the City's requirements, 128 spaces are required for the existing sanctuary (used on Sundays), and 37 are required for the existing administration building (used on weekdays). Parking observations indicated that the existing parking utilization is approximately 75 spaces on Sunday mornings and seven on weekdays. The preschool, expanded K-8 school, and memory care facility would increase these parking requirements to 95 on weekdays and 153 on weekends. The total required parking for all uses would be 223 spaces. However, as the church and school operate on separate days and never simultaneously, it is not expected that parking demand would ever exceed 153. The project applicant is applying for a Use Permit to allow such shared parking, based on the requirements for Sundays when parking would be most used. The provided parking supply of 154 spaces is sufficient to ensure there are no parking impacts on the adjoining neighborhood. With the provision of a Use Permit allowing shared parking, the provided parking supply would comply with City of San Ramon requirements.

INTRODUCTION

This report summarizes the results of the Traffic Impact Study (TIS) conducted for the proposed school and memory care facility to be located at 19001 San Ramon Valley Boulevard on the western side of San Ramon Valley Boulevard between Morgan Drive and Ellingson Way in the City of San Ramon, CA.

The proposed project consists of two parts, both located on the site of an existing church and private elementary school. 1) A 54-bed memory care facility with approximately 28 employees. 2) A new, separate education building to accommodate up to 60 preschool students and 135 K-8 grade students, for a total of 195 students and 17 staff members. The existing school currently enrolls 40 students, although it is permitted to enroll up to 80 students. The memory care facility would house up to 54 residents, with 28 employees providing 24-hour staffing, and a small number of visitors primarily in the evening and on weekends.

This chapter discusses the TIA purpose, project study area, analysis scenarios and levels of service methodology, and criteria used to identify significant impacts.

STUDY INTERSECTIONS AND SCENARIOS

TJKM evaluated traffic conditions at three study intersections during the a.m. peak hour of a typical weekday. Two of the intersections are existing driveways at the project site. The peak period observed was between 7 a.m. – 9 a.m. The highest single one-hour period recorded for the peak period is used in the analysis. The study periods, study intersections and roadway study segments were selected by the City of San Ramon staff. The study intersections and associated traffic controls are as follows:

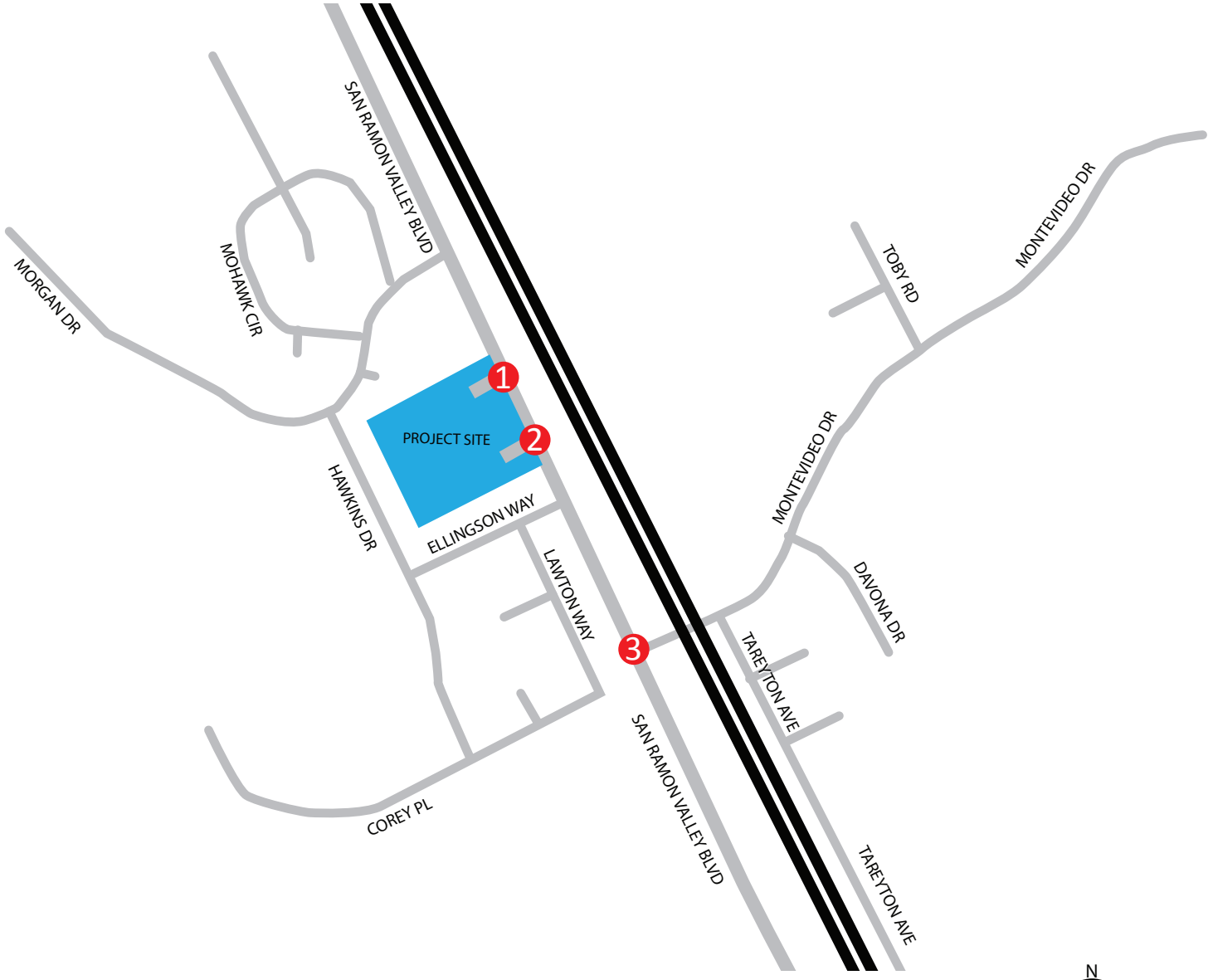
1. Northern Driveway/San Ramon Valley Boulevard (Unsignalized)
2. Southern Driveway/San Ramon Valley Boulevard (Unsignalized)
3. San Ramon Valley Boulevard/Montevideo Drive (Signalized)

Figure 1 illustrates the study intersections and the vicinity map of the proposed project. **Figure 2** shows the proposed project site plan, dated July 12, 2018.

This study addresses the following two traffic scenarios:

1. **Existing Conditions** – This scenario evaluates all the study locations based on existing traffic volumes, lane geometry and traffic controls.
2. **Existing plus Project Conditions** – This scenario is identical to Existing Conditions, but with the addition of traffic from the proposed project.

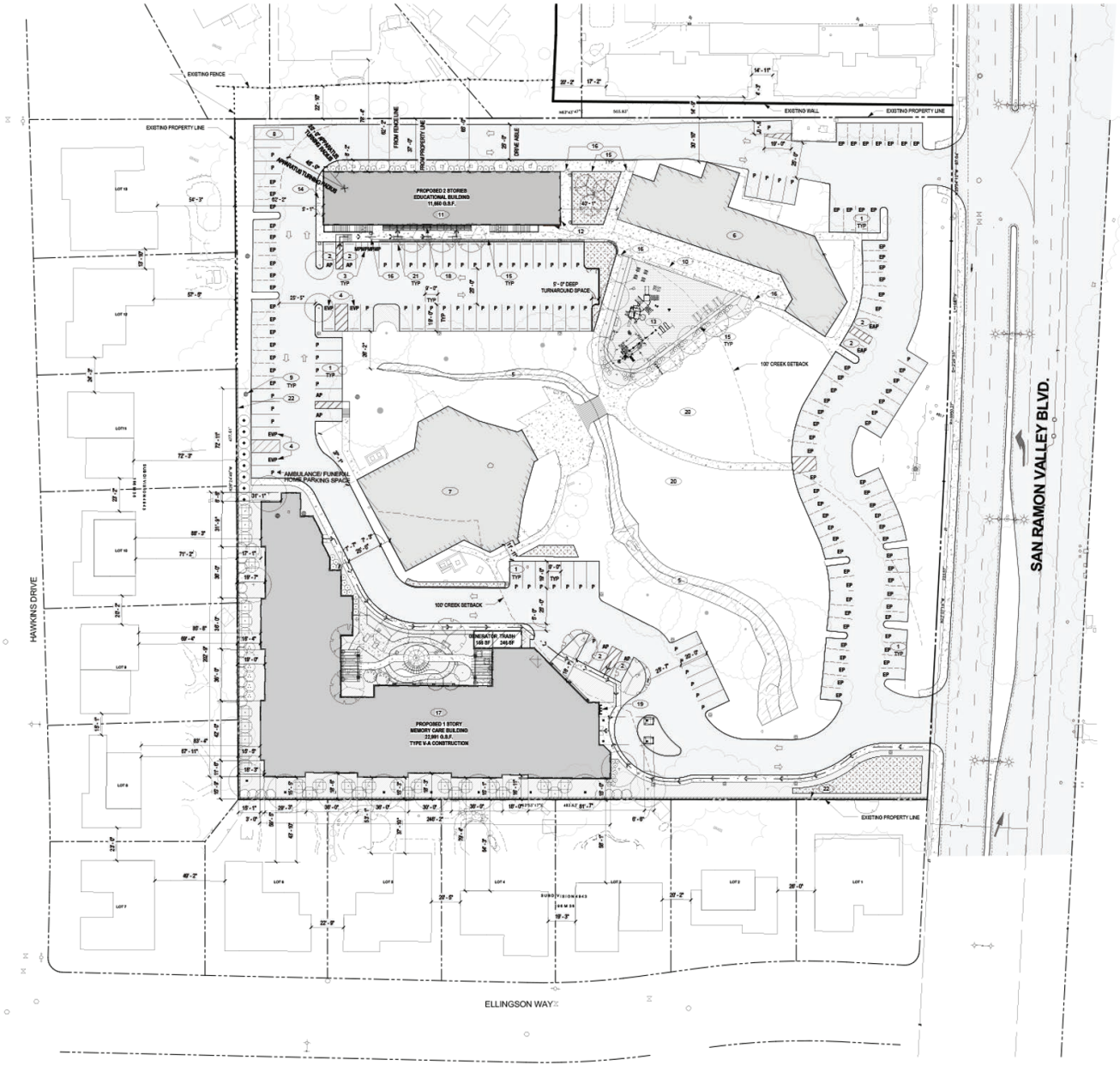
Vicinity Map



LEGEND

X Study Intersection

Site Plan



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STUDY METHODOLOGY

This section describes the methods used to determine the traffic conditions for each scenario described above. It includes descriptions of the data requirements, the analysis methodologies, and the applicable level of service standards.

Level of Service Analysis Methodology

LOS is a qualitative measure that describes operational conditions as they relate to the traffic stream and perceptions by motorists and passengers. The LOS generally describes these conditions in terms of such factors as speed, travel time, delays, freedom to maneuver, traffic interruptions, comfort, convenience, and safety. The operational LOS are given letter designations from A to F, with A representing the best operating conditions (free-flow) and F the worst (severely congested flow with high delays). Intersections generally are the capacity-controlling locations with respect to traffic operations on arterial and collector streets in urban areas.

Signalized Intersections

The study intersection under traffic signal control was analyzed using the 2000 Highway Capacity Manual (HCM) Operations Methodology for signalized intersections described in Chapter 16 (HCM 2000). This methodology determines LOS based on average control delay per vehicle for the overall intersection during peak hour intersection operating conditions. The LOS methodology is approved and adopted by the City of San Ramon. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. **Table 1** summarizes the relationship between the control delay and LOS for signalized intersections. The average control delay for signalized intersections was calculated using Synchro 10 analysis software.

Table 1: Signalized Intersection Delay and LOS Definitions

Level of Service	Description	Average Control Delay
A	Little or no traffic delay	≤10
B	Short Traffic delays	>10 – 20
C	Average traffic delays	>20 – 35
D	Long traffic delays	>35 – 55
E	Very long traffic delays	>55 – 80
F	Extreme traffic delays	>80

Source: Highway Capacity Manual 2000, Chapter 17 (Transportation Research Board, 2010)
Average Control Delay per vehicle in seconds

Unsignalized Intersections

The study intersections under stop control (unsignalized) were analyzed using the 2000 HCM Operations Methodology for unsignalized intersections described in Chapter 17 (HCM 2000). LOS ratings for stop-sign controlled intersections are based on the average control delay expressed in seconds per vehicle. At one- or two-way stop sign intersections, the control delay is calculated for each movement, not for the

intersection as a whole. For approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. The average control delay for unsignalized intersections was calculated using Synchro 10 analysis software and was correlated to an LOS designation as shown in **Table 2**.

Table 2: Unsignalized Intersection Delay and LOS Definitions

Level of Service	Description	Average Control Delay
A	Little or no traffic delay	≤10
B	Short Traffic delays	>10 – 15
C	Average traffic delays	>15 – 25
D	Long traffic delays	>25 – 35
E	Very long traffic delays	>35 – 50
F	Extreme traffic delays	>50

Source: Highway Capacity Manual 2000, Chapter 17 (Transportation Research Board, 2010)
Average Control Delay per vehicle in seconds

Significant Impact Criteria and Level of Service Standards

City of San Ramon

The transportation impact analysis assesses how the study area's transportation system would operate with the implementation of the proposed project. The potential impacts were identified by applying a set of significance criteria based on the California Environmental Quality Act (CEQA) guidelines and set forth by the City of San Ramon, and CCTA.

The City of San Ramon General Plan has established the following performance benchmarks for signalized intersections within its jurisdiction:

- If intersection operations degrade from an acceptable level (LOS D or better) to an unacceptable level (LOS E or F) during peak hour operations

Level of service analyses at unsignalized intersections are generally used to determine the need for modification in type of intersection control (i.e., all-way stop or signalization). As part of this evaluation, traffic volumes, delays, and traffic signal warrants are evaluated to determine if the existing intersection control is appropriate.

The City of San Ramon does not have officially adopted significance criteria for unsignalized intersections. Based on previous studies, significant impacts are defined to occur when the addition of project traffic causes the average intersection delay for all-way stop-controlled intersections or the worst movement/approach for side-street stop-controlled intersections to degrade to LOS F and the intersection satisfies peak hour traffic signal warrant from the MUTCD.

EXISTING CONDITIONS

This section describes existing conditions in the immediate project site vicinity, including roadway facilities, bicycle and pedestrian facilities, and available transit service. In addition, existing traffic volumes and operations are presented for the study intersection, including the results of LOS calculations.

EXISTING SETTING AND ROADWAY SYSTEM

Important roadways adjacent to the project site are discussed below:

San Ramon Valley Boulevard within the project vicinity is a four lane, north-south arterial street connecting the Town of Danville in the north and the City of Dublin in the south and designated a route of regional significance in the City of San Ramon 2035 General Plan. The posted speed limit within the project vicinity is 45 mph. Two driveways from the project site are provided on San Ramon Valley Road.

Montevideo Drive within the project vicinity is a two lane, east-west Collector Street connecting San Ramon Valley Boulevard in the west and Alcosta Boulevard in the east. The posted speed limit within the project vicinity is 25 mph. This roadway provides local access to residential land uses and the nearby San Ramon Athan Downs Park.

Morgan Drive within the project vicinity is a two lane, north-south collector street connecting Bollinger Canyon Road in the north and San Ramon Valley Boulevard in the southeast. The posted speed limit within the project vicinity is 25 mph. This roadway provides local access to residential land uses.

Ellingson Way within the project vicinity is a two lane, east-west local street connecting San Ramon Valley Boulevard in the east and Hawkins Drive in the west. The posted speed limit within the project vicinity is 25 mph. This roadway provides local access to residential land uses.

EXISTING PEDESTRIAN FACILITIES

Walkability is defined as the ability to travel easily and safely between various origins and destinations without having to rely on automobiles or other motorized travel. The ideal "walkable" community includes wide sidewalks, a mix of land uses such as residential, employment, and shopping opportunities, a limited number of conflict points with vehicle traffic, and easy access to transit facilities and services.

Pedestrian facilities consist of crosswalks, sidewalks, pedestrian signals, and off-street paths, which provide safe and convenient routes for pedestrians to access the destinations such as institutions, businesses, public transportation, and recreation facilities.

In the project vicinity, study intersections are unsignalized and controlled by stop signs, with the exception of the signalized intersection of San Ramon Valley Boulevard and Montevideo Drive. The San Ramon Valley Boulevard/Morgan Drive intersection is a side-street stop-controlled intersection with a crosswalk marked with ladder striping across the south leg crossing San Ramon Valley Boulevard, providing access to a northbound bus stop. This crosswalk is equipped with accessible curb ramps, adequate pavement legends, and pedestrian crossing signage to alert drivers on San Ramon Valley Boulevard to yield to pedestrians. The intersection of San Ramon Valley Boulevard/Ellingson Way is a side-street stop-controlled intersection without crosswalks. The intersection of San Ramon Valley

Boulevard and Montevideo Drive is a signalized intersection with standard crosswalks across the south leg and the east leg, crossing San Ramon Valley Boulevard and Montevideo Drive, respectively. These crosswalks are equipped with accessible curb ramps and pedestrian signal heads. There are continuous sidewalks provided on the western side of San Ramon Valley Boulevard throughout the project vicinity and along both sides of all side streets. All the existing sidewalks are approximately 5 feet wide. There is adequate street lighting in the vicinity.

The existing pedestrian facilities in the study area are shown in **Figure 3.** Existing peak hour pedestrian counts are provided in **Appendix A.**

Existing Bicycle Facilities

Bicycle facilities include the following:

- Bike Paths (Class I) – Paved trails that are separated from roadways
- Bike Lanes (Class II) – Lanes on roadways designated for use by bicycles through striping, pavement legends, and signs
- Bike Routes (Class III) – Designated roadways for bicycle use by signs or other markings which may or may not include additional pavement width for cyclists

Class II bicycle lanes are provided on San Ramon Valley Boulevard along both sides within the project vicinity. Montevideo Drive is a Class III bicycle route. There are adequate signage/markings for the bicyclists to maneuver without confusion. Overall, existing bicycle facilities provide adequate connectivity between the proposed project site and the adjacent residential neighborhoods.

The existing bicycle facilities in the study area are shown in **Figure 3.** Existing peak hour bicycle counts are provided in **Appendix A.**

Existing Transit Facilities

There is one pair of bus stops in the immediate vicinity of the project site, located on San Ramon Valley Boulevard at the San Ramon Valley Road/Morgan Drive intersection, less than 500 feet north of the project driveway.

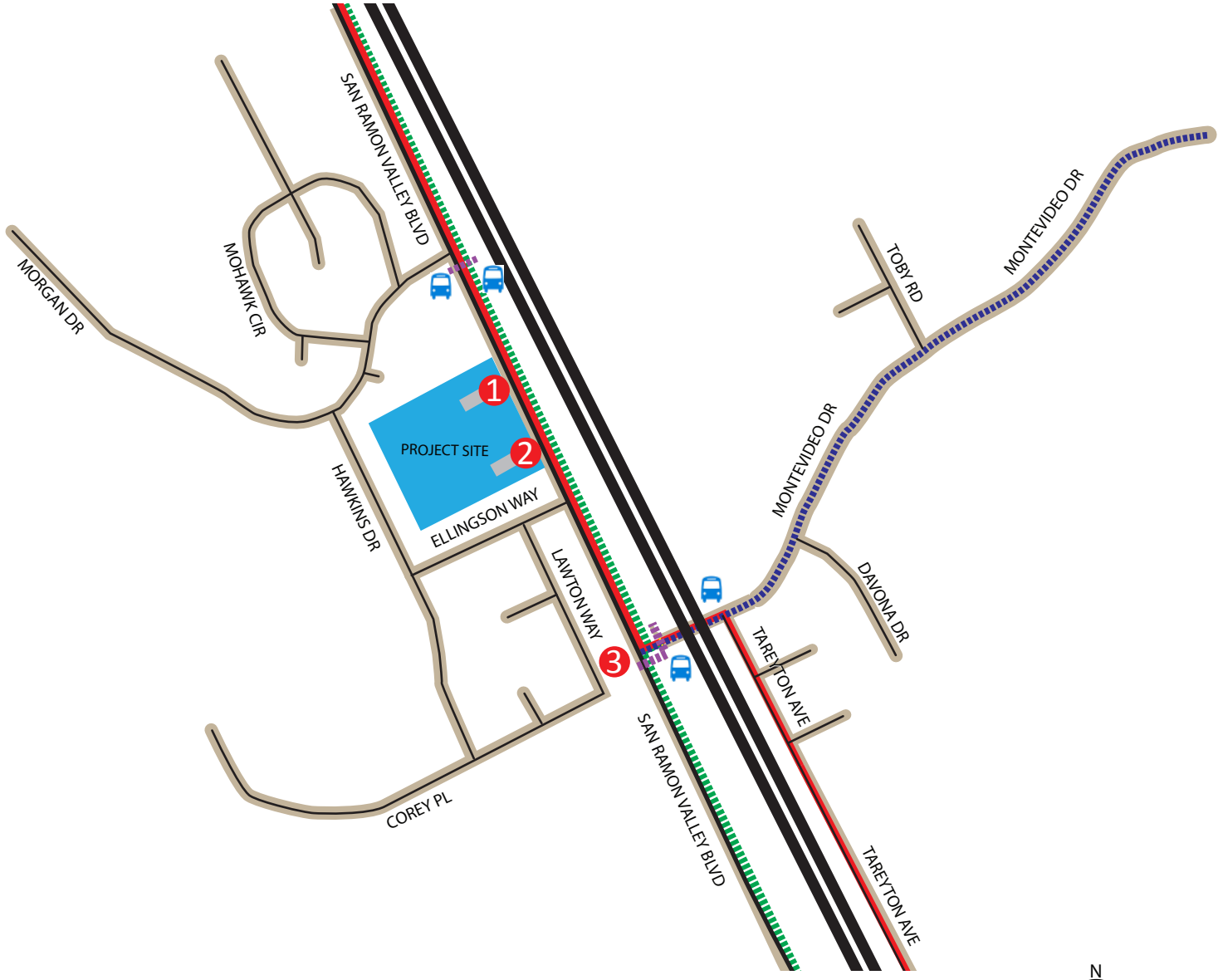
County Connection provides bus service to various communities in Contra Costa County including the city of San Ramon. It operates local and school buses and is a paratransit service provider. Buses are generally equipped with front-loading racks that can hold up to two bicycles. In the immediate vicinity of the proposed project, Bus Route #9 provides weekday service to the project site and vicinity. **Table 3** describes the services and frequency for the transit services. The existing transit facilities in the study area are shown in **Figure 3.**

Table 3: Existing Transit Services

Route #	From	To	Weekdays	
			Operating Hours	Headway (minutes)
36	San Ramon Transit Center	Dublin BART	6:20 a.m. – 9:00 p.m.	60

Source: County Connection website

Existing Pedestrian, Bicycle and Transit Facilities



LEGEND

- Study Intersection
- Bus Stop
- Crosswalk
- Sidewalk
- Bike Lanes (class II)
- Bike Route (class III)
- Transit Route 36

Intersection Level of Service Analysis – Existing Conditions

This scenario evaluates the study intersections based on existing traffic volumes, lane geometry and traffic controls. The existing operations of the study intersections were evaluated for the highest one-hour volume during the weekday morning peak period. Turning movement counts for vehicles, bicycles, and pedestrians were conducted during typical weekday day a.m. peak periods (7 – 9 a.m.) at the study intersections in February 2016. **Appendix A** includes all data sheets for the collected vehicle, bicycle, and pedestrian counts. **Figure 4** illustrates the existing traffic volumes, lane geometries and controls at the study intersections. The peak hours observed for existing traffic were 7:30-8:30 a.m. at the northern driveway, 7:45-8:45 a.m. at the southern driveway, and 7:45-8:45 a.m. at San Ramon Valley Boulevard & Montevideo Drive. The peak hour factors calculated from the existing turning movement counts were used for the study intersections for the Existing Conditions analysis. Signal timing (cycle length and splits) was optimized using Synchro 10 software to reflect the best-case level of service at the signalized intersection for existing traffic volumes and peak hour factors. The results of the LOS analysis using the HCM 2000 methodology and Synchro 10 software program for Existing Conditions are summarized in **Table 4**.

Under this scenario, all intersections operate at LOS D or better during the a.m. peak period. The LOS C conditions at the norther driveway are possible due to a two-stage left turn for exiting vehicles. It should be noted that the isolated intersection analysis defined in the HCM 2000 methodology does not take into account traffic from nearby intersections and thus may result in better level of service than that observed in the field. LOS worksheets are provided in **Appendix C**.

Table 4: Intersection Level of Service Analysis – Existing Conditions

ID	Intersection	Intersection Control	Peak Hour[1]	Existing Conditions	
				Average Delay[2]	LOS[3]
1	North Driveway/San Ramon Valley Boulevard	One-Way Stop	AM	21.0	C
2	South Driveway/San Ramon Valley Boulevard	One-Way Stop	AM	21.5	C
3	San Ramon Valley Boulevard/Montevideo Drive	Signalized	AM	51.0	D

Notes:
[1] AM – morning peak hour (between 7 and 9 a.m.),
[2] Total control delay for the worst movement is presented for side-street stop-controlled intersections.
[3] LOS – Level of Service calculations conducted using the Synchro 10 level of service analysis software package, which applies the methodology described in the 2000 HCM.
Bold text indicates intersection operates at a deficient Level of Service.

Queuing – Existing Conditions

At the request of City staff, TJKM also analyzed queuing known to occur on the southbound approach to the intersection of San Ramon Valley Boulevard & Montevideo Drive. The calculated 95th percentile queue length reflects the highest queue length expected in the peak 15 minutes of the peak period. The calculated 95th percentile queues for the southbound approach were analyzed using the HCM 2000 Queue methodology contained in the Synchro 10 software. Queuing was also simulated using SimTraffic 10 software, and both calculated and simulated queue lengths were compared to field observations.

Table 5 summarizes observed and calculated 95th percentile queue lengths at the intersection of San Ramon Valley Road & Montevideo Drive under existing conditions. Detailed calculations and simulation reports are included in **Appendix C**. Queues develop in the southbound left turn due to a.m. traffic destined for by the nearby California High School. Turning movement counts collected on a typical Thursday showed that the peak 15 minutes during the morning peak period occurred between 8:00 and 8:15 a.m., which is consistent with the high school's bell schedule. The first regular period begins at 8:25 a.m. on most days and, with an early period at 7:30 a.m. On Wednesdays, the early period begins at 8:35 a.m.

Field observations were conducted during the peak 15 minute period and found that southbound queues extended far beyond the left turn pocket and into through lanes, ending between the two project driveways. The peak queues block both the intersection of San Ramon Valley Boulevard & Ellison Drive and the southern project driveway. This indicates an existing queue length of over 820 feet. It was observed that the queueing was worsened by the presence of backup from the all-way stop at the intersection of Montevideo Drive & Davona Drive, which caused traffic to back up the approximately 700 feet to the signalized intersection at San Ramon Valley Boulevard. The intersection of Montevideo Drive & Davona Drive is located on the most direct route from San Ramon Valley Boulevard to the high school and therefore experiences significant traffic during the high school drop-off times.

Based on the turning movement counts collected and an analysis of the intersection of San Ramon Valley Boulevard & Montevideo Drive in isolation, the southbound left turn lane is oversaturated during the peak period, with a calculated 95th percentile queue of at least 438 feet. However, this does not adequately reflect the full extent of queuing experienced on the southbound approach of this intersection. The turn pocket length is approximately 425 feet, so the queuing vehicles would be expected to extend into the through lanes upstream of the turn pocket. When the 95th percentile volume exceeds the capacity of a turn lane, calculated queue lengths can become unreliable.

Due to the limitations of the HCM 2000 isolated intersection analysis to adequately reflect existing queuing conditions, a SimTraffic model of the surrounding roadway network was developed and calibrated to approximate existing traffic volumes and peak hour factors. Simulations conducted on this network were able to reflect the observed existing conditions and showed traffic congestion backed up to the southern driveway at Church of the Valley. Simulation results were averaged for three model runs. Snapshots of simulated queuing conditions and detailed queuing reports are included in **Appendix C**. It should be noted that the reported 95th percentile queue length for the left turn movement does not take into account the merging of left turning and through traffic upstream of the turn pocket. The reported queuing of the through lane, due to overflow of the left turn pocket, does adequately reflect the observed queueing conditions. The 95th percentile queue length was approximately 830 feet in the left most through lane, consistent with observed queues of over 820 feet.

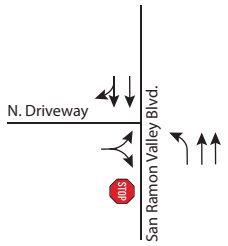
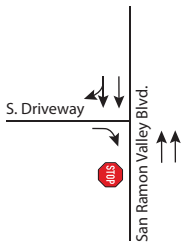
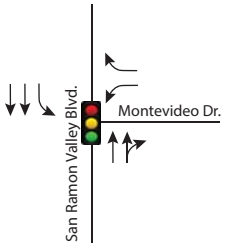
Table 5: 95th Percentile Queue Lengths – Existing Conditions

Movement	Storage Length/ Link Distance	Observed	Synchro	SimTraffic
Southbound Left	425	Overflow	#438	487
Southbound Through	592	>820	62	830

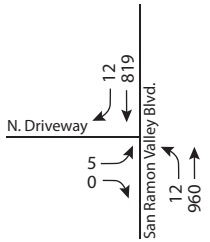
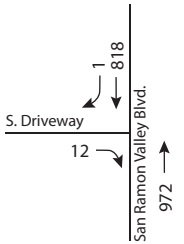
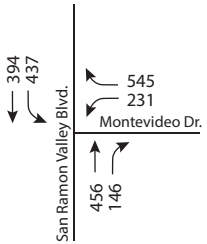
Notes:
All lengths are in feet
Synchro queues are maximum after two cycles.
95th percentile volume exceeds capacity: queue may be longer.
Southbound Through queue length reported for the left most lane

Existing Conditions, Peak Hour Traffic Volumes, Lane Geometry and Controls

Existing Geometry and Controls

San Ramon Valley Blvd. and North Driveway	San Ramon Valley Blvd. and South Driveway	San Ramon Valley Blvd and Montevideo Dr.
		

Existing Volumes

San Ramon Valley Blvd. and North Driveway	San Ramon Valley Blvd. and South Driveway	San Ramon Valley Blvd. and Montevideo Dr.
		

LEGEND

- X Study Intersection
- Traffic Signal
- STOP Stop Sign
- xx AM Peak Hour Volumes

N

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EXISTING PLUS PROJECT CONDITIONS

This analysis scenario presents the impacts of the proposed project at the study intersections and surrounding roadway system. This scenario is similar to Existing Conditions, but with the addition of traffic from the proposed project.

PROJECT TRIP GENERATION

TJKM developed estimated project trip generation for the proposed project based on published trip generation rates from the ITE publication *Trip Generation Manual* (10th Edition. TJKM used published trip rates for the ITE Land Uses Private School, K-8 (ITE Code 534), Day Care Center (ITE Code 565), and Nursing Home (ITE Code 620). It was assumed that the existing private school enrolls 40 students, although they are approved to enroll up to 80 students. The expected trips generated by these existing 40 students were subtracted from those generated by the planned school and preschool to determine the net increase in school-related trips. Although memory care facilities involve less focus on skilled nursing and typically have a smaller number of visitors, the land use Nursing Home was used for a conservative estimate of project trips. The expected operations schedule for the memory care facility can be found in **Appendix B** and specifies staff shift changes outside of typical a.m. or p.m. peak periods.

Table 6 shows the trips expected to be generated by the proposed project. The proposed project is expected to generate approximately 801 daily net new trips, including 143 weekday a.m. peak hour trips (79 inbound trips, 64 outbound trips). Schools tend to have an afternoon peak period that occurs between 3 and 4 p.m., whereas preschools and day care centers tend to peak at the same time as adjacent street traffic, between 4 and 6 p.m. The expected operations schedule for the schools and preschool, found in **Appendix B**, is consistent with these offset peak times. The hours of operation of the preschool will be from 7:00 a.m. to 5:00 p.m. from Monday to Friday. The drop-off time is from 7:00 a.m. to 7:45 a.m., and pickup time is from 4:30 p.m. to 5:00 p.m. The K-8 school would have separate schedules for K-5 and 6-8 grades. Grades K-5 would be in class between 9:00 a.m. and 3:00 p.m., with drop-off times from 8:45 a.m. to 9:00 a.m. and pickup times from 3:00 p.m. to 3:15 p.m. Grades 6-8 would be in class between 9:15 a.m. and 3:45 p.m., with drop-off times from 9:00 a.m. to 9:30 a.m. and pickup times from 3:45 p.m. to 4:00 p.m. The church operates in the evening and weekends, and the preschool and schools are closed during that time. However, the church may use the expanded facilities for Sunday school. The City requested analysis of the a.m. peak hour only, primarily due to the morning-only queuing at the southbound left turn lane of San Ramon Valley Boulevard & Montevideo Drive.

The offset morning schedules among the grade level groups result in fewer impacts on parking lots, at driveways, and on surrounding streets. In addition, the K-8 traffic actually occurs well after the queuing issues related to California High School. The early period at the high school begins at 7:30 a.m. four days a week and at 8:35 a.m. on Wednesdays. The first regular period begins at 8:25 a.m. four days a week and at 9:25 a.m. on Wednesdays. For this study, it was conservatively assumed that the operations and peaking of the new school, memory care, and California High School occur at the same time.

Many school and day-care parents drop off children on their way to work, in effect making their trips pass-by trips, with no net increase in traffic to the system, except at project driveways. In other schools,

TJKM has utilized pass-by rates of 25 percent, passed on parent surveys. For this case, TJKM utilized 0 pass-by trips, making this trip generation conservative. The combined morning trip generation from both schools therefore represents a worst-case scenario for the proposed project.

Table 6: Project Trip Generation

	Land Use[1]	*Size*	*Daily*		*AM Peak*				
			Rate	*Trips*	*Rate*	*In:Out*	*In*	*Out*	*Total*
Proposed	Private School, K-8 (534)	135 Students	4.11	497	0.91	55:45	61	49	110
Proposed	Day Care Center (565)	60 Students	4.09	303	0.78	53:47	31	27	58
Existing	*Private School, K-8 (534)*	*40 Students*	*4.11*	*-164*	*0.91*	*55:45*	*-20*	*-16*	*-36*
Net School Trips				**636**			**73**	**61**	**134**
Proposed	Memory Care[2]	54 Beds	3.06	165	0.17	72:28	6	3	9
Total Trips				**801**			**79**	**64**	**143**

Notes:
[1] Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 10th Edition, 2017
[2] For Memory Care, see employee chart in Appendix B for details

Project Trip Distribution and Assignment

Trip distribution is a process that determines in what proportion vehicles would be expected to travel between the project site and various destinations outside the project study area. Trip assignment also determines the various routes that vehicles would take from the project site to each destination using the calculated trip distribution. Trip distribution assumptions for the proposed project were developed based on existing travel patterns and knowledge of the study area.

The distribution assumptions are as follows:

- 30 percent to/50 percent from San Ramon Valley Boulevard to the north
- 50 percent to/30 percent from San Ramon Valley Boulevard to the south
- 20 percent to/from Montevideo Drive

Figure 5 illustrates the trip distribution percentages and trip assignment project volumes developed for the proposed project. The assigned project trips were then added to traffic volumes under Existing Conditions to generate Existing plus Project Conditions traffic volumes.

Intersection Level of Service Analysis – Existing plus Project Conditions

Intersection levels of service were calculated with the new traffic added by the proposed project to evaluate the operating conditions of the intersections and identify potential impacts to the roadway system. The analysis assumed that vehicles turning right out of the driveways were split evenly between the northern driveway and the southern driveway. The peak hour factors calculated from the existing turning movement counts were used for the study intersections for the Existing plus Project Conditions analysis. Existing plus Project Conditions were evaluate using both the signal timing optimized for Existing Conditions and new signal timing optimized for Existing plus Project Conditions. It should be noted that signal optimization in Synchro 10 considers a signalized intersection in isolation and does not take into account traffic conditions at nearby intersections. The results of the intersection level of service

calculations for Existing plus Project Conditions are presented in **Table 7**. **Appendix C** contains the corresponding calculation sheets. The results for Existing Conditions are included for comparison purposes, along with the projected increases in delay for both timing scenarios. The changes in delay between Existing and Existing plus Project Conditions are used to identify significant impacts. It is possible for trips added to a minor turning movement to reduce the average delay for the intersection, as found in the signalized intersection of San Ramon Valley Boulevard and Montevideo Drive. **Figure 5** shows projected turning movement volumes at all the study intersections for Existing plus Project Conditions.

Under Existing plus Project Conditions, the southern driveway on San Ramon Valley Boulevard would continue to operate at LOS C. The signalized intersection of San Ramon Valley Boulevard & Montevideo Drive would degrade to LOS E, as would the northern driveway, due to operations at the upstream signalized intersection. However, the level of service at San Ramon Valley Boulevard & Montevideo Drive is dependent on the specific signal timing used in the analysis: if the signal timing optimized for Existing Conditions is used, the level of service drops to an unacceptable LOS E. However, if the cycle length and splits are optimized for Existing plus Project conditions, it maintains LOS D and experiences an overall reduction in delay of approximately four seconds. This is due to the addition of traffic to minor movements and a longer proportion of green time for the southbound left turn movement. Operational improvements at this intersection would also allow the northern driveway to maintain an acceptable LOS D.

It should be noted that the intersection analysis defined in the HCM 2000 methodology for signalized intersections differs from that for unsignalized intersections in how it accounts for nearby intersections. Unsignalized intersections are analyzed with factors related to the operations at upstream signalized intersections. Signalized intersections, by contrast, are analyzed in isolation and do not take into account traffic from other nearby intersections. This may result in better calculated level of service than that observed in the field. Calculation sheets for both scenarios are included in **Appendix C**. Based on the City of San Ramon impact criteria the project is expected to have a *less-than-significant impact* at all the study intersections.

Table 7: Intersection Level of Service Analysis – Existing plus Project Conditions

No	Intersections	Control	Existing Conditions		Existing with Project Conditions			Existing with Project Conditions (Optimized Timing)		
			Delay[2]	LOS[3]	Delay	LOS	Change in Delay[4] (Sec)	Delay	LOS	Change in Delay (Sec)
1	North Driveway & San Ramon Valley Blvd.	One-Way Stop	21.0	C	35.2	E	14.2	34.8	D	13.8
2	South Driveway & San Ramon Valley Blvd.	One-Way Stop	21.5	C	24.9	C	3.4	24.9	C	3.4
3	San Ramon Valley Blvd & Montevideo Dr.	Signalized	51.0	D	**56.4**	**E**	**5.4**	46.8	D	-4.2

Notes:
[1] AM – morning peak hour (between 7 and 9 a.m.),
[2] Total control delay for the worst movement is presented for side-street stop-controlled intersections.
[3] Level of Service calculations conducted using the Synchro 10 level of service analysis software package, which applies the methodology described in the 2000 HCM.
[4] Change in delay between Existing and Existing plus Project Conditions.

Bold text indicates intersection operates at a deficient Level of Service.

The peak-hour signal warrant from the California Manual of Uniform Traffic Control Devices (CA MUTCD) was evaluated for the unsignalized northern driveway, which operates at an unacceptable LOS F under Existing and Existing plus Project Conditions, to determine if a traffic signal is warranted. This intersection does not meet, or come close to meeting, CA MUTCD peak hour signal warrants in the a.m. peak hour for either Existing or Existing plus Project Conditions. The total volume of vehicles exiting the driveway is only 52 after the addition of project trips, well below the minimum threshold of 100 vehicles on a 1-lane minor street approach to warrant a traffic signal. MUTCD peak hour signal warrants sheets are contained in **Appendix D**. TJKM also found that the intersection does not come close to warranting an all way stop control, which requires a minimum volume on the minor approach of at least 140 vehicles every hour for 8 hours or a large number of collisions that would be reduced with the addition of the stop sign. An all way stop at this intersection would add two stop signs, stopping northbound and southbound traffic on San Ramon Valley Boulevard and adding significant delay on this arterial without notably improving safety.

This study concludes that no changes are needed to the study intersections.

Queuing – Existing plus Project Conditions

Queuing known to occur at the intersection of San Ramon Valley Road and Montevideo Drive was analyzed with the new traffic added by the proposed project to evaluate operating conditions. As shown in **Figure 5**, the project would add 85 total vehicles to this intersection, including 13 vehicles to the southbound left turn lane during the peak hour. This is an increase in traffic of 3.8 percent to the whole intersection and three percent to left turn movement. Queuing on the southbound approach was analyzed using both HCM 2000 Queue methodology in Synchro 10 and traffic simulation in SimTraffic 10, for both timing scenarios discussed above. **Table 8** summarizes observed and reported 95th percentile queue lengths at the intersection of San Ramon Valley Road & Montevideo Drive under both Existing plus Project scenarios. Results for Existing Conditions are included for comparison purposes. Detailed calculations, simulation reports, and simulation graphics are included in **Appendix D**. As with level of service, the degree of queuing was dependent on the specific signal timing used for each Existing plus Project scenario. As seen with Existing Conditions, the calculated queue lengths varied significantly between the isolated intersection analysis using the HCM 2000 Queue methodology, and the SimTraffic simulation considering the three study intersections and additional nearby intersections.

Based on the HCM 2000 Queue methodology, the calculated 95th percentile queue would be at least 459 feet if signal timing is unchanged from existing conditions. However, due to the volume exceeding capacity for the southbound left turn lane, the queue could be longer. The increased queue length is due to a higher volume entering the intersection without a corresponding increase in green time. With signal optimization increasing both cycle length and the proportion of green time for the southbound movements, the calculated 95th percentile queues would be 416 feet, a reduction from existing conditions. Under these conditions, the calculated 95th percentile queue could be fully contained within the 425 foot long turn pocket.

Existing plus Project conditions were also simulated for both timing scenarios. With the conditions of the surrounding roadway taken into account, the changes in calculated 95th percentile queue lengths were

substantially different from the isolated intersection analysis. Both timing scenarios resulted in simulated queue lengths for both southbound left and southbound through movements. The queuing simulated with optimized signal timing was higher than that under the Existing timing plan, the opposite of the calculated queue results. With the addition of project traffic, queueing for the southbound left movement would increase to 517-531, and queuing at the southbound through movement would increase to 893-913. The range of increases for the southbound through movement indicates that queuing conditions are strongly influenced by variations in signal timing, regardless of minor volume changes.

Due to the extensive queuing observed in the field under existing conditions, and the variation in queue lengths depending on signal timing, it is possible that queued vehicles could extend as far as the northern (main) project driveway. If this occurs, it may block vehicles attempting to turn left into or out of the driveway. TJKM recommends the addition of a "Keep Clear" pavement marking on the southbound lanes to maintain access to the northern driveway. It is noted that potential blockage of the driveway would only occur around 8:15 a.m., four days a week, due to high school traffic. This is after most preschool traffic occurs (7:00-7:45 a.m.) and before the K-8 students arrive (8:45-9:30 a.m.). Existing plus Project queuing results may therefore overestimate the impact of project traffic on queue lengths.

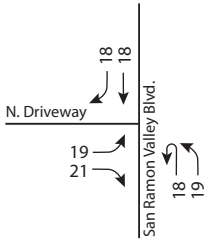
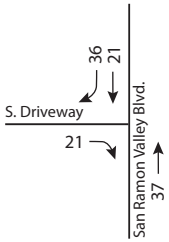
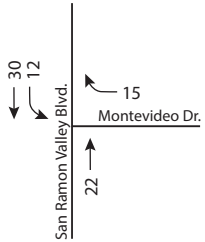
Table 8: 95th Percentile Queue Lengths – Existing plus Project Conditions

Movement	Storage Length/ Link Distance	Existing Conditions			Existing plus Project Conditions		Existing plus Project Conditions--Optimized	
		Observed	Synchro	SimTraffic	Synchro	SimTraffic	Synchro	SimTraffic
Southbound Left	425	Overflow	#438	487	#459	517	416	531
Southbound Through	592	>820	62	830	67	893	66	913

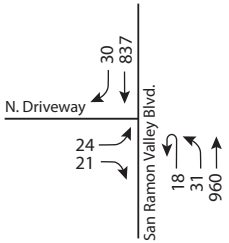
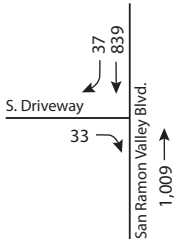
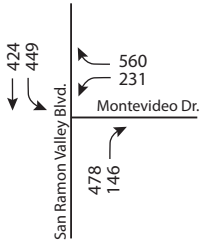
Notes:
All lengths are in feet
Synchro queues are maximum after two cycles.
95th percentile volume exceeds capacity: queue may be longer.
Southbound Through queue length reported for the left most lane

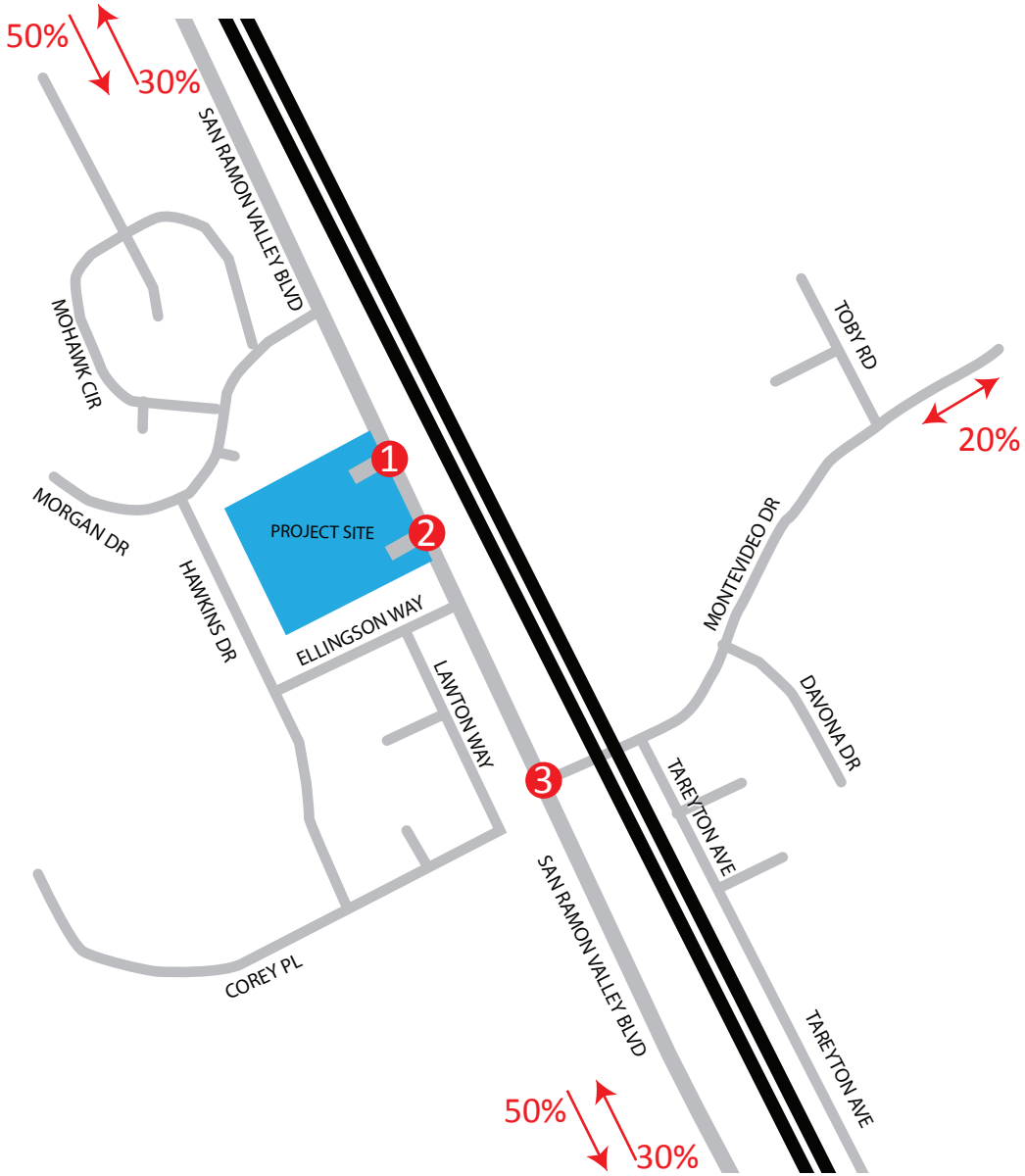
Existing Plus Project Conditions, Trip Distribution, Assignments and Peak Hour Traffic Volumes

Project Trips

San Ramon Valley Blvd. and North Driveway	San Ramon Valley Blvd. and South Driveway	San Ramon Valley Blvd and Montevideo Dr.
		

Existing Plus Project Conditions

San Ramon Valley Blvd. and North Driveway	San Ramon Valley Blvd. and South Driveway	San Ramon Valley Blvd. and Montevideo Dr
		



LEGEND

- Study Intersection
- Traffic Signal
- Stop Sign
- xx AM Peak Hour Volumes
- x% Trip Distribution

SITE ACCESS AND ON-SITE CIRCULATION AND OTHER IMPACTS

Site Access

This section analyzes site access and internal circulation for vehicles, pedestrians and bicycles based on the site plan (dated May 23, 2018) presented on **Figure 2**. TJKM reviewed internal and external access for the project site for vehicles, pedestrians, and bicycles.

TJKM reviewed the proposed project site plan to evaluate on-site access to the project. The access to the project site will be via two driveways on San Ramon Valley Boulevard, one with all movements and one right in/right out only.

The northern driveway on San Ramon Valley Boulevard is approximately 450 feet to the south of the intersection of San Ramon Valley Boulevard and Morgan Drive and is approximately 22 feet wide. The southern driveway on San Ramon Valley Boulevard is approximately 350 feet to the south of the northern driveway and is approximately 26 feet wide. Based on the evaluation, the driveways are expected to be adequate for passenger vehicles accessing the site. Existing drive aisles vary between 22 and 32 feet. The current project site plan would not alter the existing narrow drive aisles or add a passenger loading zone for the schools. Based on the evaluation and currently available site plan, circulation appears to be satisfactory for two-way flow through the parking aisles and for passenger loading for the schools during periods of congestion.

TJKM also examined the project site plan in order to evaluate the adequacy of circulation for on-site vehicles, vans and emergency vehicles. The internal circulation was reviewed for issues related to queueing, turning radii, and safety and circulation aisles. The circulation aisles accommodate at least one-way travel for larger vehicles, and the turning radii appear to be adequate for passenger vehicles, vans and emergency vehicles. Emergency vehicles can access the project via either of the entrance driveways. Overall, the on-site circulation is satisfactory during periods of congestion, there is sufficient space to accommodate any outbound queuing that may occur at the northern driveway without spilling onto San Ramon Valley Boulevard or preventing southbound vehicles from entering. The project should not result in any significant impacts on City streets.

Circulation Plan

The school has developed a circulation plan for school drop-off and pick-up, shown in **Figure 6**, defining circulation directions, a primary passenger loading zone, and a drop-off parking zone. This plan would be implemented with on-site guidance by teachers and parent volunteers in order to minimize congestion. The 1st through 8th grade students would be dropped off in a loading zone along the eastern side of the parking lot, close to both driveways. Preschool and kindergarten students would be dropped off at a drop-off parking zone along the south side of the proposed classroom building to allow parents to escort their children inside. **Appendix B** includes the school operation schedule, which would stagger the school start times for preschool, elementary, and middle school students. This will minimize the number of vehicles in the parking lot at any one time during the drop-off period between 7:00 a.m. and 9:30 a.m.

TJKM considers this site plan and operation schedule adequate, therefore, the impact to City streets is *less-than significant*.

PEDESTRIAN ACCESS

Pedestrian access to the project site will be facilitated by existing sidewalks on San Ramon Valley Boulevard. In the project vicinity, the two study intersections at the driveways are unsignalized, and one is signalized. There are continuous sidewalks present on the west side of San Ramon Valley Boulevard and along both sides of all other streets in the project vicinity. All the existing sidewalks are approximately five feet wide in the project area. There is adequate street lighting in the vicinity. The proposed project provides adequate and appropriate facilities for safe non-motorized mobility. The proposed project will have adequate pedestrian access to the project site from the surrounding area. The proposed project does not conflict with existing pedestrian facilities; therefore, the impact to pedestrian facilities is *less-than-significant*.

BICYCLE ACCESS

There are existing bike lanes on San Ramon Valley Boulevard on both the sides of the roadway within the vicinity of project and for its full length within the City of San Ramon. There is also an existing Class III Bike route on Montevideo Drive. The project does not conflict with existing and planned bicycle facilities; therefore, the impact to bicycle facilities is *less-than-significant***.**

TRANSIT

The proposed project will generate very few trips via transit services, which can be accommodated by the existing transit capacity and hence the project is anticipated to have a *less-than-significant impact* on transit facilities.

PARKING

The City of San Ramon Zoning Ordinance (Division D3, Chapter III) parking standards require projects to provide on-site parking based on land use and project size. The California Building Code (§11B-208) specifies the placement and required number of accessible parking spaces based on the total amount of parking provided, reflecting the requirements of the Americans with Disabilities Act (§208). **Table 9** shows the parking requirements for each use present on the site once both the new classroom building and memory care facility are completed. The existing sanctuary would only be used for services, generally Sunday mornings. It is expected that the existing administration building will be used primarily on weekdays, with occasional Sunday use by those already attending services in the sanctuary. The total parking utilization would therefore be distinct on weekdays and Sundays, indicating that a shared parking agreement between the school and church would be justified. The project applicant is applying for a Use Permit from the City of San Ramon to permit such a shared parking arrangement, to allow the project to supply the number of spaces required on the day with higher parking demand.

Parking counts for the existing church use were conducted on a typical Sunday morning during 9 a.m. and 10:30 a.m. services and found that there were 43 occupied parking spaces at 9:30 a.m. and 75 occupied spaces at 10:40 a.m. A count conducted on a typical weekday morning when the existing school was in

session found only seven spaces occupied and observed that all other vehicles entering the site dropped off passengers. The church parking is largely unoccupied on weekdays and approximately half full on a typical Sunday morning during services. Sunday and weekday parking occupancy are included in **Table 9**.

Based on the City's requirements and the California Building Code, the Sunday parking requirement will be 153 spaces (including six accessible). The weekday requirement is 95 spaces (including four accessible). A total of 154 parking spaces are provided, including eight accessible spaces, which satisfies the required parking supply. If all land uses are considered together, the total parking requirement would be 223 parking spaces. The site plan shows that accessible spaces are distributed close to the main entrances of each building. Bicycle parking will be provided as needed. Based on the proposed parking spaces to be provided on site and considering shared parking, no parking impacts are projected on City streets. If a Use Permit for shared parking is approved, the parking supply of 154 spaces would be considered **adequate**.

This project is therefore anticipated to have no impacts related to site access, pedestrian access, bicycle and transit usage, and parking.

Table 9: Parking Requirements for Combined Uses

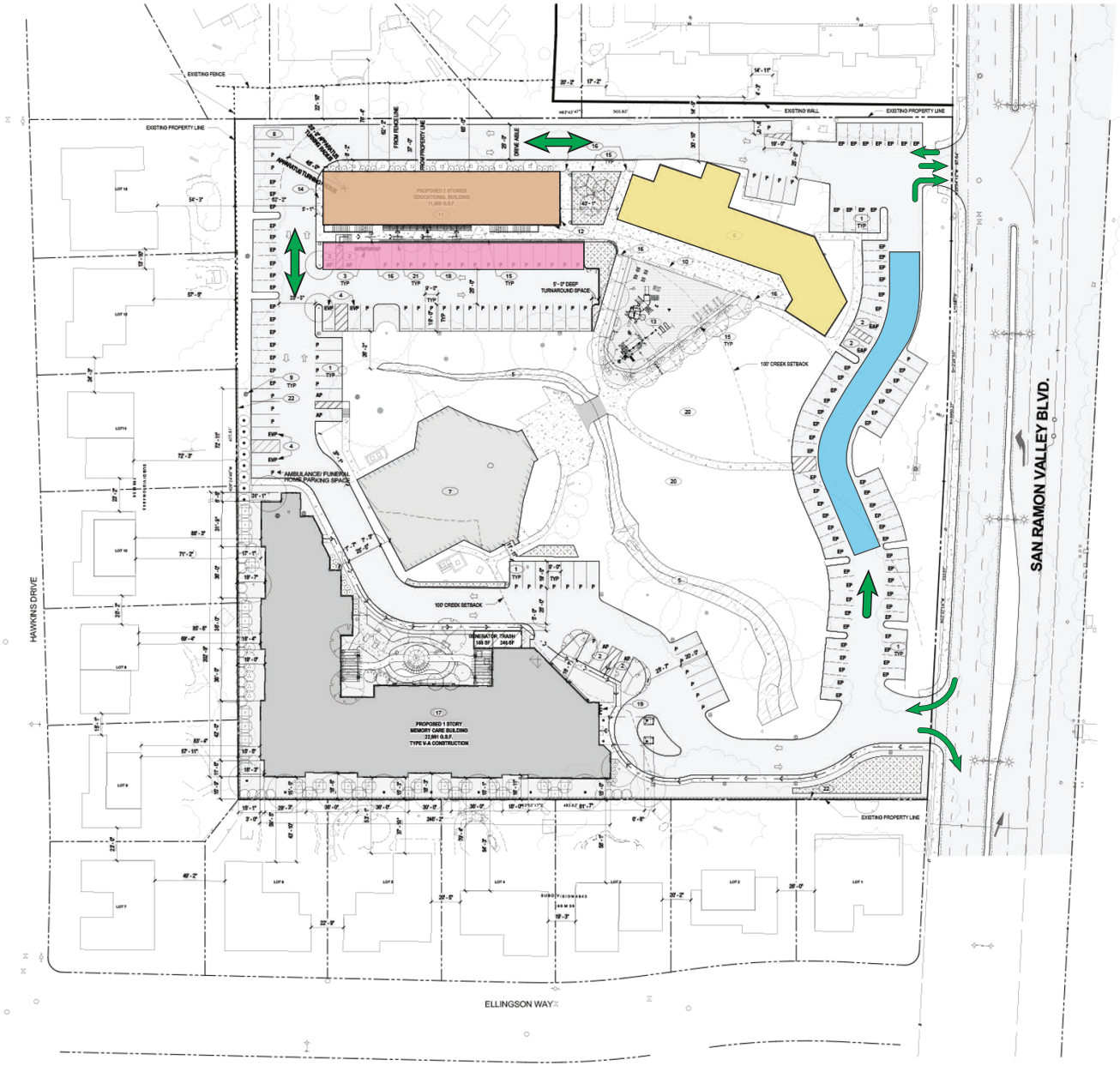
Description	***Land Use***	***Size***	***Parking Ratio***	***Required Spaces (ADA included[1])***
Pre-K & Kindergarten *Weekdays only*	Kindergarten and nursery schools	74 Students 9 Employees	1 Space/10 Children 1 Space/3 Employees	7+3 = 10
Grade 1-8 *Weekdays only*	Elementary/middle schools	121 Students 8 Employees	1 Space/8 Students 1 Space/Employee	15+8 = 23
Memory Care	Residential care homes, seven or more clients	54 Beds 29 Units	1 Space/3 Beds 1 Space/4 Units	18+5 = 25
Administration Building *Used on weekdays only, includes fellowship hall*	Meeting facility – place of worship	120 Seats 4 Offices 3 Classrooms	1 Space/4 Fixed Seat 1 Space/Office or Classroom	30+4+3 = 37
Sanctuary *Used on Sundays only*	Meeting facility – place of worship	500 Seats 1 Office 2 Classrooms	1 Space/4 Fixed Seat 1 Space/Office or Classroom	125+1+2 = 128
			Weekday Required	**95 (4)**
			Weekday Occupied[2]	*7*
			Sunday Required	**153 (6)**
			Sunday Occupied[2]	*43-75*
			Aggregate Required	**223 (7)**
			Provided	**154 (8)**

Notes:

[1] ADA spaces: minimum number included depends on total parking lot size requirement. Must include 1 van accessible.
76-100 total: 4 accessible
101-150 total: 5 accessible
151-200 total: 6 accessible
201-300 total: 7 accessible

[2] Occupancy numbers reflect observed parking utilization by existing uses

Circulation Plan for School Expansion



CONCLUSIONS

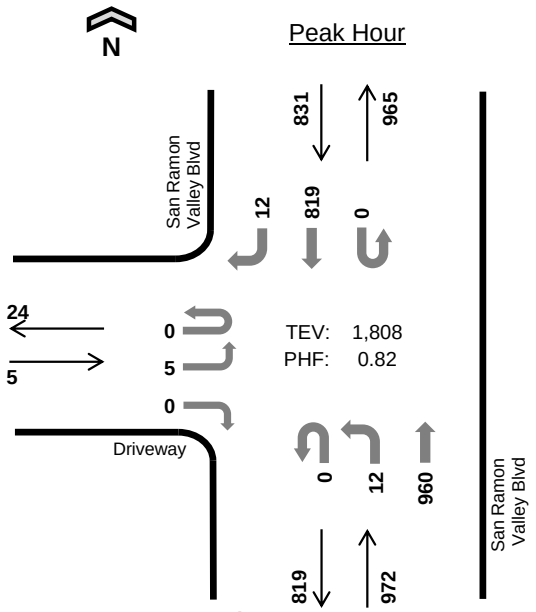
- The proposed school expansion and memory care center are expected to generate 801 net daily vehicular trips, of which 143 vehicle trips (79 inbound and 64 outbound) are generated during the a.m. peak hour.
- Under Existing Conditions, all intersections operate at acceptable LOS D or better.
- Under Existing plus Project Conditions, the southern driveway operates at LOS D or better. Both the signalized intersection of San Ramon Valley Boulevard & Montevideo Drive and the southern driveway operate at LOS D (acceptable) or LOS E (unacceptable), depending on signal timing. Based on the City of San Ramon impact criteria the project is expected to have a **less-than-significant impact** at all study intersections under Existing plus Project Conditions. No changes are needed at study intersections as a result of this project.
- Pedestrian access to the site will be via existing sidewalks on San Ramon Valley Boulevard and other surrounding streets. There is a pair of bus stops within the vicinity of the project site, served by one weekday bus route. The proposed project does not conflict with existing and planned pedestrian or bicycle facilities and will add very few trips to existing transit facilities, which can be accommodated by the existing transit capacity. Therefore, the project introduces no impacts to pedestrian, bicycle, and transit facilities.
- TJKM examined the project site plan in order to evaluate the adequacy of on-site two-way vehicle circulation including vans and emergency vehicles. Based on the evaluation and currently available site plan, circulation appears to be adequate for two-way flow through the parking aisles nearest the street and along the northern side of the existing classroom building during periods of congestion. TJKM examined the proposed circulation plan and operations schedule for the school and found that it adequately mitigated on-site congestion that would otherwise occur during the school drop-off and pick-up periods.
- Based on the proposed ample supply of parking spaces to be provided on site, no parking impacts are projected either on-site or on City streets.
- The project would have a modest contribution to the queueing already occurring at the intersection of San Ramon Valley Boulevard and Montevideo Drive, which is partially due to traffic backing up from the unsignalized intersection of Montevideo Drive & Davona Drive. Due to the extensive queuing observed in the field under existing conditions, it is possible that queued vehicles could extend as far as the northern (main) project driveway. If this occurs, it may block vehicles attempting to turn left into or out of the driveway. TJKM recommends the addition of a "Keep Clear" pavement marking to maintain access to the driveway. It should be noted that the existing queuing due to high school traffic occurs at a different portion of the morning peak period than traffic generated by the proposed project. Calculated and simulated queuing analysis may therefore overestimate the project's contributions by disregarding the offset drop-off periods of the schools involved.

Appendix A – Existing Turning Movement Counts

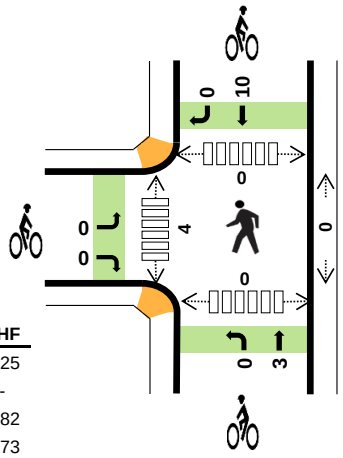
San Ramon Valley Blvd

-

Date: 03/09/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:30 AM to 8:30 AM



	HV %:	PHF
EB	0.0%	0.25
WB	-	-
NB	1.1%	0.82
SB	1.8%	0.73
TOTAL	1.4%	0.82



Two-Hour Count Summaries

Interval Start		Driveway Eastbound UT	LT	TH	RT	0 Westbound UT	LT	TH	RT	San Ramon Valley Blvd Northbound UT	LT	TH	RT	San Ramon Valley Blvd Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM		0	1	0	0	0	0	0	0	0	1	109	0	0	0	145	0	256	0
7:15 AM		0	1	0	0	0	0	0	0	0	1	202	0	0	0	155	4	363	0
7:30 AM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**185**	**0**	**0**	**0**	**148**	**1**	**335**	0
7:45 AM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**226**	**0**	**0**	**0**	**252**	**3**	**482**	1,436
8:00 AM		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**262**	**0**	**0**	**0**	**282**	**3**	**549**	1,729
8:15 AM		**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**287**	**0**	**0**	**0**	**137**	**5**	**442**	**1,808**
8:30 AM		0	2	0	1	0	0	0	0	0	3	222	0	0	0	99	2	329	1,802
8:45 AM		0	3	0	0	0	0	0	0	0	2	201	0	0	0	97	2	305	1,625
Count Total		0	12	0	1	0	0	0	0	0	19	1,694	0	0	0	1,315	20	3,061	0
Peak Hour	**All**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**12**	**960**	**0**	**0**	**0**	**819**	**12**	**1,808**	**0**
	HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**0**	**0**	**0**	**15**	**0**	**26**	**0**
	HV%	**-**	**0%**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0%**	**1%**	**-**	**-**	**-**	**2%**	**0%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	0	0	1	3	*4*	0	0	0	1	*1*	0	0	0	0	*0*
7:15 AM	0	0	3	5	*8*	0	0	1	2	*3*	0	1	1	1	*3*
7:30 AM	**0**	**0**	**4**	**3**	***7***	**0**	**0**	**1**	**3**	***4***	**0**	**0**	**0**	**0**	*0*
7:45 AM	**0**	**0**	**0**	**6**	***6***	**0**	**0**	**2**	**4**	***6***	**0**	**1**	**0**	**0**	*1*
8:00 AM	**0**	**0**	**4**	**2**	***6***	**0**	**0**	**0**	**2**	***2***	**0**	**1**	**0**	**0**	*1*
8:15 AM	**0**	**0**	**3**	**4**	***7***	**0**	**0**	**0**	**1**	***1***	**0**	**2**	**0**	**0**	***2***
8:30 AM	0	0	2	5	*7*	0	0	0	0	*0*	0	1	0	0	*1*
8:45 AM	0	0	4	4	*8*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	0	21	32	*53*	0	0	4	13	*17*	0	6	1	1	*8*
Peak Hr	**0**	**0**	**11**	**15**	***26***	**0**	**0**	**3**	**10**	***13***	**0**	**4**	**0**	**0**	***4***

Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Driveway				0				San Ramon Valley Blvd				San Ramon Valley Blvd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	4	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	5	0	8	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**3**	**0**	**7**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**6**	25
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**2**	**0**	**6**	27
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**4**	**0**	**7**	**26**
8:30 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	5	0	7	26
8:45 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	8	28
Count Total	0	0	0	0	0	0	0	0	0	0	21	0	0	0	32	0	53	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**0**	**0**	**0**	**15**	**0**	**26**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	Driveway			0			San Ramon Valley Blvd			San Ramon Valley Blvd			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	0
7:15 AM	0	0	0	0	0	0	0	1	0	0	2	0	3	0
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**3**	**0**	**4**	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**4**	**0**	**6**	14
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	15
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**13**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	9
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Count Total	0	0	0	0	0	0	0	4	0	0	13	0	17	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**10**	**0**	**13**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

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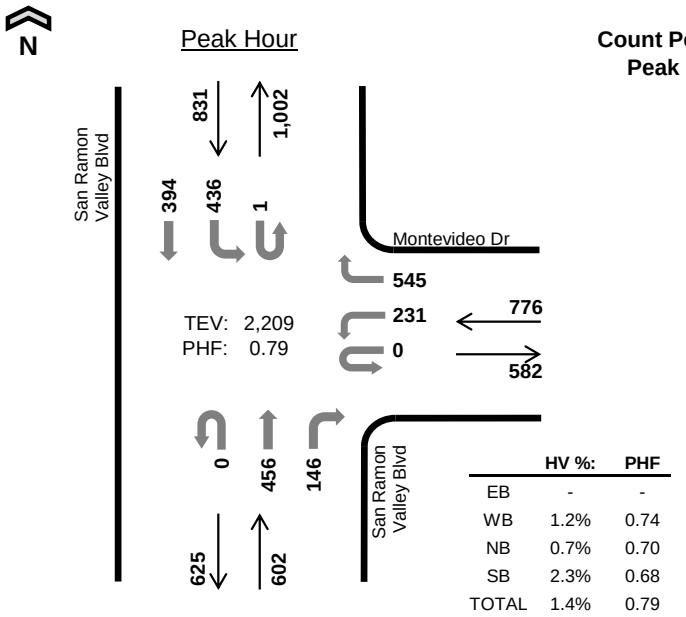
San Ramon _San Ramon Valley TMVCS Location 2
Thursday 3/9/2017
IDAX Data Solutions

Time	IN	OUT
7:00	0	1
7:15	0	0
7:30	0	0
7:45	1	1
8:00	0	0
8:15	0	5
8:30	0	5
8:45	0	2
Total	**1**	**14**

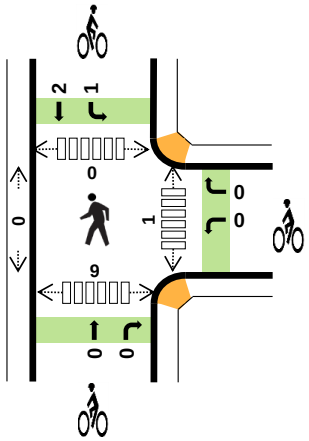
Hourly	In	Out	Total
7:00-8:00	1	2	3
7:15-8:15	1	1	2
7:30-8:30	1	6	7
7:45-8:45	**1**	**11**	**12**
8:00-9:00	0	12	12

San Ramon Valley Blvd
Montevideo Dr

Date: 03/09/2017
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM



	HV %:	PHF
EB	-	-
WB	1.2%	0.74
NB	0.7%	0.70
SB	2.3%	0.68
TOTAL	1.4%	0.79



Two-Hour Count Summaries

Interval Start		0 Eastbound				Montevideo Dr Westbound				San Ramon Valley Blvd Northbound				San Ramon Valley Blvd Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	0	0	0	0	45	0	73	0	0	37	14	0	91	35	0	295	0
7:15 AM		0	0	0	0	0	47	0	149	0	0	60	13	2	111	43	0	425	0
7:30 AM		0	0	0	0	0	77	0	102	0	0	82	12	0	70	78	0	421	0
7:45 AM		**0**	**0**	**0**	**0**	**0**	**72**	**0**	**107**	**0**	**0**	**108**	**18**	**0**	**130**	**83**	**0**	**518**	1,659
8:00 AM		**0**	**0**	**0**	**0**	**0**	**47**	**0**	**132**	**0**	**0**	**124**	**92**	**0**	**162**	**142**	**0**	**699**	2,063
8:15 AM		**0**	**0**	**0**	**0**	**0**	**62**	**0**	**200**	**0**	**0**	**99**	**17**	**0**	**102**	**89**	**0**	**569**	2,207
8:30 AM		**0**	**0**	**0**	**0**	**0**	**50**	**0**	**106**	**0**	**0**	**125**	**19**	**1**	**42**	**80**	**0**	**423**	**2,209**
8:45 AM		0	0	0	0	0	45	0	76	0	0	126	15	0	36	61	0	359	2,050
Count Total		0	0	0	0	0	445	0	945	0	0	761	200	3	744	611	0	3,709	0
Peak Hour	**All**	**0**	**0**	**0**	**0**	**0**	**231**	**0**	**545**	**0**	**0**	**456**	**146**	**1**	**436**	**394**	**0**	**2,209**	**0**
	HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**	**0**	**0**	**3**	**1**	**0**	**9**	**10**	**0**	**32**	**0**
	HV%	**-**	**-**	**-**	**-**	**-**	**0%**	**-**	**2%**	**-**	**-**	**1%**	**1%**	**0%**	**2%**	**3%**	**-**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	2	2	*4*	0	0	0	1	*1*	0	0	0	0	*0*
7:15 AM	0	4	1	7	*12*	0	0	0	2	*2*	0	0	0	3	*3*
7:30 AM	0	1	6	3	*10*	0	0	0	0	*0*	0	0	0	1	*1*
7:45 AM	**0**	**0**	**0**	**7**	***7***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**0**	**3**	*4*
8:00 AM	**0**	**2**	**2**	**2**	***6***	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**4**	*4*
8:15 AM	**0**	**4**	**0**	**5**	***9***	**0**	**0**	**0**	**2**	***2***	**0**	**0**	**0**	**2**	*2*
8:30 AM	**0**	**3**	**2**	**5**	***10***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:45 AM	0	2	2	1	*5*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	0	16	15	32	*63*	0	0	0	6	*6*	1	0	0	13	*14*
Peak Hr	**0**	**9**	**4**	**19**	***32***	**0**	**0**	**0**	**3**	***3***	**1**	**0**	**0**	**9**	***10***

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Two-Hour Count Summaries - Heavy Vehicles

Interval Start	0				Montevideo Dr				San Ramon Valley Blvd				San Ramon Valley Blvd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	4	0
7:15 AM	0	0	0	0	0	1	0	3	0	0	1	0	0	5	2	0	12	0
7:30 AM	0	0	0	0	0	1	0	0	0	0	4	2	0	2	1	0	10	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**2**	**0**	**7**	33
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**2**	**0**	**0**	**1**	**1**	**0**	**6**	35
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**1**	**4**	**0**	**9**	32
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**1**	**1**	**0**	**2**	**3**	**0**	**10**	**32**
8:45 AM	0	0	0	0	0	0	0	2	0	0	1	1	0	0	1	0	5	30
Count Total	0	0	0	0	0	2	0	14	0	0	11	4	0	18	14	0	63	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**	**0**	**0**	**3**	**1**	**0**	**9**	**10**	**0**	**32**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	0			Montevideo Dr			San Ramon Valley Blvd			San Ramon Valley Blvd			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	2	0	2	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	3
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	3
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	3
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Count Total	0	0	0	0	0	0	0	0	0	1	5	0	6	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**3**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

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Appendix B – Memory Care and School Operation Schedules

Proposed COV School Schedule

	Start Time	End Time	Students	Drop Off Time	Pick Up Time	Staff	Arrival	Departure
Preschool	7:00 a.m.	5:00 p.m.	60	7:00 a.m. - 7:45 a.m.	4:30 p.m. - 5:00 p.m.	8	6:30 a.m.	5:15 p.m.
Subtotal			60			8		
Kindergarten	9:00 a.m.	3:00 p.m.	14	8:45 a.m. - 9:00 a.m.	3:00 p.m. - 3:15 p.m.	1	8:30 a.m.	4:30 p.m.
1st Grade	9:00 a.m.	3:00 p.m.	14	8:45 a.m. - 9:00 a.m.	3:00 p.m. - 3:15 p.m.	1	8:30 a.m.	4:30 p.m.
2nd Grade	9:00 a.m.	3:00 p.m.	14	8:45 a.m. - 9:00 a.m.	3:00 p.m. - 3:15 p.m.	1	8:30 a.m.	4:30 p.m.
3rd Grade	9:00 a.m.	3:00 p.m.	14	8:45 a.m. - 9:00 a.m.	3:00 p.m. - 3:15 p.m.	1	8:30 a.m.	4:30 p.m.
4th Grade	9:00 a.m.	3:00 p.m.	14	8:45 a.m. - 9:00 a.m.	3:00 p.m. - 3:15 p.m.	1	8:30 a.m.	4:30 p.m.
5th Grade	9:00 a.m.	3:00 p.m.	16	8:45 a.m. - 9:00 a.m.	3:00 p.m. - 3:15 p.m.	1	8:30 a.m.	4:30 p.m.
Subtotal			86			6		
6th Grade	9:15 a.m.	3:45 p.m.	16	9:00 a.m. - 9:30 a.m.	3:45 p.m. - 4:00 p.m.	1	8:45 a.m.	4:45 p.m.
7th Grade	9:15 a.m.	3:45 p.m.	16	9:00 a.m. - 9:30 a.m.	3:45 p.m. - 4:00 p.m.	1	8:45 a.m.	4:45 p.m.
8th Grade	9:15 a.m.	3:45 p.m.	17	9:00 a.m. - 9:30 a.m.	3:45 p.m. - 4:00 p.m.	1	8:45 a.m.	4:45 p.m.
Subtotal			49			3		
Total			195	students		17	staff	

DRAFT ESTIMATE OF TRAFFIC COUNT FOR SAN RAMON MEMORY CARE

ESTIMATED EMPLOYEE SHIFT TIMES

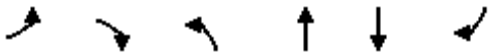
The 6 Employee Shifts Are:

Shift 1:	5:30 am to 1:30 pm	6	associates
Shift 2:	6:30 am to 2:30 pm	5	associates
Shift 3:	10:45 am to 6:45 pm	3	associates
Shift 4:	11:00 am to 7:00 pm	5	associates
Shift 5:	3:00 pm to 11:00 pm	6	associates
Shift 6:	10:30 pm to 6:30 am	3	associates
		28	

	Employees		Vehicle Trips		Total Site	Visitor/Misc.	Total Site
	Enter	Exit	Enter	Exit	Employee Trips	Trips	Trips
5-6 am	6		6		6		6
6-7 am	5	3	5	3	8		8
7-8 am							
9-10 am						2	2
10-11 am	3		3		3	2	5
11-12 am	5		5		5		5
12-1 pm						2	2
1-2 pm		6		6	6	2	8
2-3 pm		5		5	5		5
3-4 pm	6		6		6		6
4-5 pm							
5-6 pm							
6-7 pm		3		3	3	4	7
7-8 pm		5		5	5	2	7
8-9 pm							
9-10 pm							
10-11 pm	3	6	3	6	9		9
11-12 am							
					56	14	70

As the proposed facility would be dedicated fully to memory care, this type of residential care facility does not have residents that own or drive vehicles. Given residents status, typical outside visitations by family are also limited and typically occur during weekday evenings or weekends. As such, vehicle trips are limited to employees, miscellaneous business trips (deliveries, medical trips, office duties, etc.), and limited visitations.

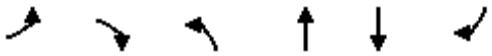
Appendix C – Existing Conditions Level of Service and Peak Hour Signal Warrant Worksheets



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	0	12	960	819	12
Future Volume (Veh/h)	5	0	12	960	819	12
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.25	0.25	0.82	0.82	0.73	0.73
Hourly flow rate (vph)	20	0	15	1171	1122	16
Pedestrians	4					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)				1261		
pX, platoon unblocked	0.91					
vC, conflicting volume	1750	573	1142			
vC1, stage 1 conf vol	1134					
vC2, stage 2 conf vol	616					
vCu, unblocked vol	1625	573	1142			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	100	98			
cM capacity (veh/h)	245	461	605			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	20	15	586	586	748	390
Volume Left	20	15	0	0	0	0
Volume Right	0	0	0	0	0	16
cSH	245	605	1700	1700	1700	1700
Volume to Capacity	0.08	0.02	0.34	0.34	0.44	0.23
Queue Length 95th (ft)	7	2	0	0	0	0
Control Delay (s)	21.0	11.1	0.0	0.0	0.0	0.0
Lane LOS	C	B				
Approach Delay (s)	21.0	0.1			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	36.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	12	0	972	818	1
Future Volume (Veh/h)	0	12	0	972	818	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	0	15	0	1215	1023	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				881		
pX, platoon unblocked	0.85					
vC, conflicting volume	1630	1023	1024			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1397	1023	1024			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	94	100			
cM capacity (veh/h)	113	233	674			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	15	608	608	1023	1
Volume Left	0	0	0	0	0
Volume Right	15	0	0	0	1
cSH	233	1700	1700	1700	1700
Volume to Capacity	0.06	0.36	0.36	0.60	0.00
Queue Length 95th (ft)	5	0	0	0	0
Control Delay (s)	21.5	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	21.5	0.0		0.0	
Approach LOS	C				

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	53.1%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	231	545	456	146	437	394
Future Volume (vph)	231	545	456	146	437	394
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.96		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	3392		1770	3539
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	1583	3392		1770	3539
Peak-hour factor, PHF	0.74	0.74	0.70	0.70	0.68	0.68
Adj. Flow (vph)	312	736	651	209	643	579
RTOR Reduction (vph)	0	454	30	0	0	0
Lane Group Flow (vph)	312	282	830	0	643	579
Confl. Peds. (#/hr)	9			1	1	
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	20.8	20.8	32.1		31.5	68.1
Effective Green, g (s)	20.8	20.8	32.1		31.5	68.1
Actuated g/C Ratio	0.21	0.21	0.33		0.32	0.70
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	376	336	1112		569	2461
v/s Ratio Prot	0.18		c0.24		c0.36	0.16
v/s Ratio Perm		c0.18				
v/c Ratio	0.83	0.84	0.75		1.13	0.24
Uniform Delay, d1	36.9	36.9	29.3		33.2	5.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	14.0	16.5	4.6		78.9	0.2
Delay (s)	50.9	53.4	33.9		112.1	5.6
Level of Service	D	D	C		F	A
Approach Delay (s)	52.7		33.9			61.7
Approach LOS	D		C			E

Intersection Summary			
HCM 2000 Control Delay	51.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	97.9	Sum of lost time (s)	13.5
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	312	736	860	643	579
v/c Ratio	0.83	0.93	0.75	1.13	0.24
Control Delay	56.2	28.5	33.2	111.4	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	56.2	28.5	33.2	111.4	6.0
Queue Length 50th (ft)	187	102	246	~486	65
Queue Length 95th (ft)	223	110	224	#438	62
Internal Link Dist (ft)	279		703		592
Turn Bay Length (ft)				425	
Base Capacity (vph)	416	813	1140	570	2460
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.75	0.91	0.75	1.13	0.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Summary of All Intervals

Run Number	1	2	3	Avg
Start Time	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	3317	2284	2280	2625
Vehs Exited	3278	2100	2079	2486
Starting Vehs	148	121	135	135
Ending Vehs	187	305	336	276
Travel Distance (mi)	1799	1220	1170	1396
Travel Time (hr)	206.4	617.3	600.3	474.6
Total Delay (hr)	153.3	582.0	566.2	433.8
Total Stops	7068	6260	6630	6650
Fuel Used (gal)	107.4	179.0	174.4	153.6

Interval #0 Information Seeding

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

Volumes adjusted by PHF, Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

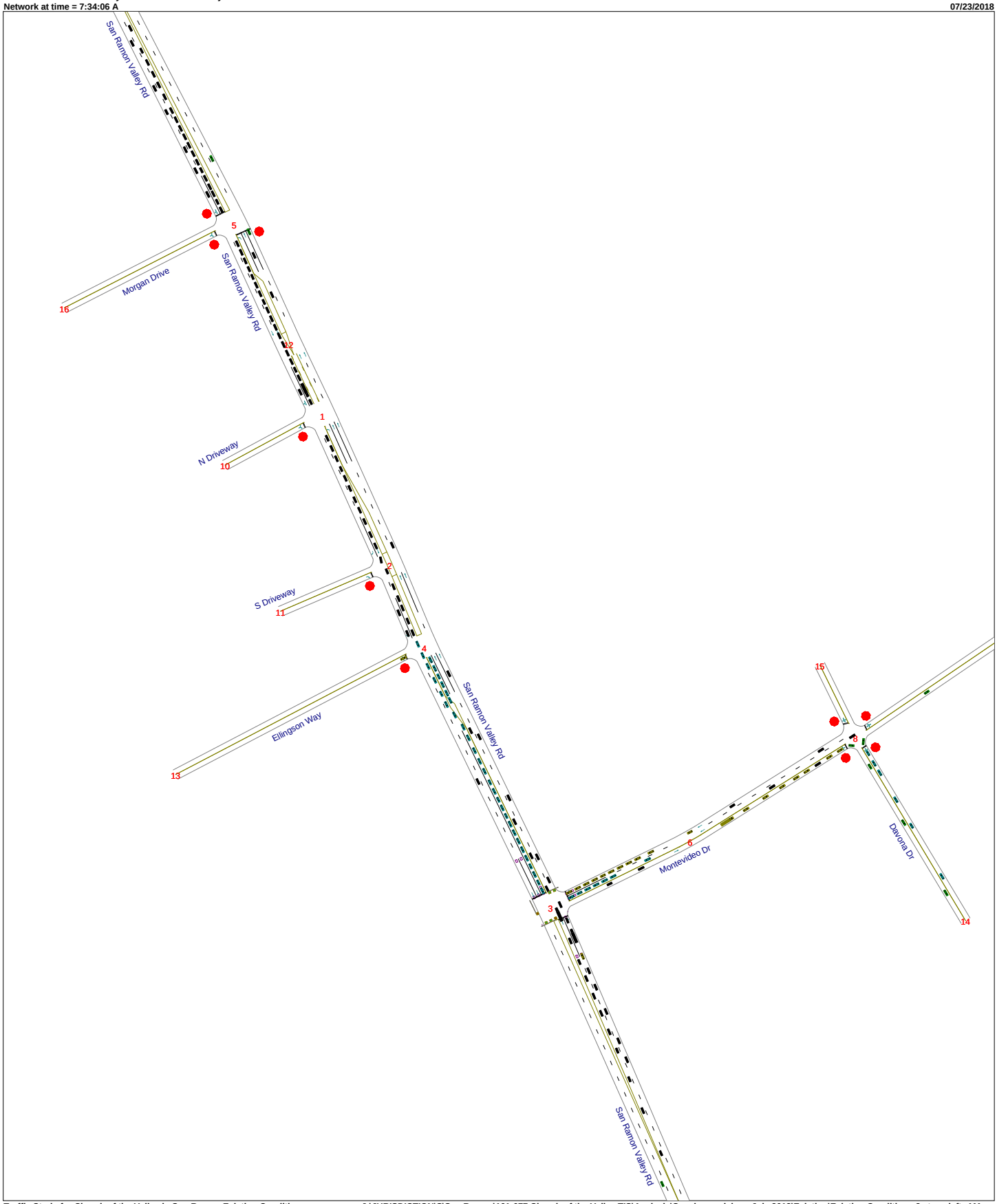
Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	Avg
Vehs Entered	3317	2284	2280	2625
Vehs Exited	3278	2100	2079	2486
Starting Vehs	148	121	135	135
Ending Vehs	187	305	336	276
Travel Distance (mi)	1799	1220	1170	1396
Travel Time (hr)	206.4	617.3	600.3	474.6
Total Delay (hr)	153.3	582.0	566.2	433.8
Total Stops	7068	6260	6630	6650
Fuel Used (gal)	107.4	179.0	174.4	153.6

Intersection: 3: San Ramon Valley Rd & Montevideo Dr

Movement	WB	WB	B6	B6	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	T	TR	L	T	T
Maximum Queue (ft)	261	375	253	302	605	604	485	720	614
Average Queue (ft)	110	333	123	208	422	397	484	664	217
95th Queue (ft)	262	396	343	504	836	849	487	830	600
Link Distance (ft)	285	285	398	398	750	750		614	614
Upstream Blk Time (%)	0	63	0	37	34	34		64	0
Queuing Penalty (veh)	1	304	1	180	0	0		356	1
Storage Bay Dist (ft)							425		
Storage Blk Time (%)							73	0	
Queuing Penalty (veh)							210	0	


San Ramon Valley Rd
Morgan Drive
San Ramon Valley Rd
N Driveway
S Driveway
Ellingson Way
San Ramon Valley Rd
Montevideo Dr
Davona Dr
San Ramon Valley Rd
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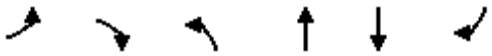
Appendix D – Existing plus Project Conditions Level of Service and Peak Hour Signal Warrant Worksheets

Movement	EBL	EBR	NBU	NBL	NBT	SBT	SBR
Lane Configurations							
Traffic Volume (veh/h)	24	23	20	32	960	838	32
Future Volume (Veh/h)	24	23	20	32	960	838	32
Sign Control	Stop				Free	Free	
Grade	0%				0%	0%	
Peak Hour Factor	0.25	0.25	0.92	0.82	0.82	0.73	0.73
Hourly flow rate (vph)	96	92	0	39	1171	1148	44
Pedestrians	4						
Lane Width (ft)	12.0						
Walking Speed (ft/s)	3.5						
Percent Blockage	0						
Right turn flare (veh)							
Median type					None	TWLTL	
Median storage veh)						2	
Upstream signal (ft)					1261		
pX, platoon unblocked	0.92		0.00				
vC, conflicting volume	1838	600	0	1196			
vC1, stage 1 conf vol	1174						
vC2, stage 2 conf vol	664						
vCu, unblocked vol	1734	600	0	1196			
tC, single (s)	6.8	6.9	0.0	4.1			
tC, 2 stage (s)	5.8						
tF (s)	3.5	3.3	0.0	2.2			
p0 queue free %	58	79	0	93			
cM capacity (veh/h)	229	442	0	577			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	188	39	586	586	765	427
Volume Left	96	39	0	0	0	0
Volume Right	92	0	0	0	0	44
cSH	300	577	1700	1700	1700	1700
Volume to Capacity	0.63	0.07	0.34	0.34	0.45	0.25
Queue Length 95th (ft)	98	5	0	0	0	0
Control Delay (s)	35.2	11.7	0.0	0.0	0.0	0.0
Lane LOS	E	B				
Approach Delay (s)	35.2	0.4			0.0	
Approach LOS	E					

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	34	0	1012	841	40
Future Volume (Veh/h)	0	34	0	1012	841	40
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	0	43	0	1265	1051	50
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)				881		
pX, platoon unblocked	0.84					
vC, conflicting volume	1684	1051	1101			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1424	1051	1101			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	81	100			
cM capacity (veh/h)	106	223	630			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	43	632	632	1051	50
Volume Left	0	0	0	0	0
Volume Right	43	0	0	0	50
cSH	223	1700	1700	1700	1700
Volume to Capacity	0.19	0.37	0.37	0.62	0.03
Queue Length 95th (ft)	17	0	0	0	0
Control Delay (s)	24.9	0.0	0.0	0.0	0.0
Lane LOS	C				
Approach Delay (s)	24.9	0.0		0.0	
Approach LOS	C				

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	54.3%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	231	561	480	146	450	426
Future Volume (vph)	231	561	480	146	450	426
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.96		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	3398		1770	3539
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1770	1583	3398		1770	3539
Peak-hour factor, PHF	0.74	0.74	0.70	0.70	0.68	0.68
Adj. Flow (vph)	312	758	686	209	662	626
RTOR Reduction (vph)	0	447	28	0	0	0
Lane Group Flow (vph)	312	311	867	0	662	626
Confl. Peds. (#/hr)	9			1	1	
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	21.5	21.5	32.1		31.5	68.1
Effective Green, g (s)	21.5	21.5	32.1		31.5	68.1
Actuated g/C Ratio	0.22	0.22	0.33		0.32	0.69
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	385	345	1106		565	2444
v/s Ratio Prot	0.18		c0.26		c0.37	0.18
v/s Ratio Perm		c0.20				
v/c Ratio	0.81	0.90	0.78		1.17	0.26
Uniform Delay, d1	36.6	37.5	30.1		33.5	5.7
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	12.2	25.4	5.6		94.9	0.3
Delay (s)	48.8	62.9	35.7		128.5	6.0
Level of Service	D	E	D		F	A
Approach Delay (s)	58.8		35.7			69.0
Approach LOS	E		D			E

Intersection Summary			
HCM 2000 Control Delay	56.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	98.6	Sum of lost time (s)	13.5
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	312	758	895	662	626
v/c Ratio	0.81	0.96	0.79	1.17	0.26
Control Delay	53.8	33.7	35.2	127.0	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	33.7	35.2	127.0	6.3
Queue Length 50th (ft)	187	130	261	~511	72
Queue Length 95th (ft)	223	135	236	#459	67
Internal Link Dist (ft)	279		703		592
Turn Bay Length (ft)				425	
Base Capacity (vph)	413	808	1131	566	2443
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.76	0.94	0.79	1.17	0.26

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Summary of All Intervals

Run Number	1	2	3	Avg
Start Time	6:50	6:50	6:50	6:50
End Time	8:00	8:00	8:00	8:00
Total Time (min)	70	70	70	70
Time Recorded (min)	60	60	60	60
# of Intervals	2	2	2	2
# of Recorded Intervals	1	1	1	1
Vehs Entered	3003	2912	3509	3142
Vehs Exited	2913	2788	3509	3069
Starting Vehs	163	144	148	147
Ending Vehs	253	268	148	218
Travel Distance (mi)	1563	1491	1860	1638
Travel Time (hr)	377.5	417.2	290.1	361.6
Total Delay (hr)	331.4	373.1	235.1	313.2
Total Stops	6057	5942	6990	6331
Fuel Used (gal)	137.2	144.3	127.7	136.4

Interval #0 Information Seeding

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

Volumes adjusted by PHF, Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

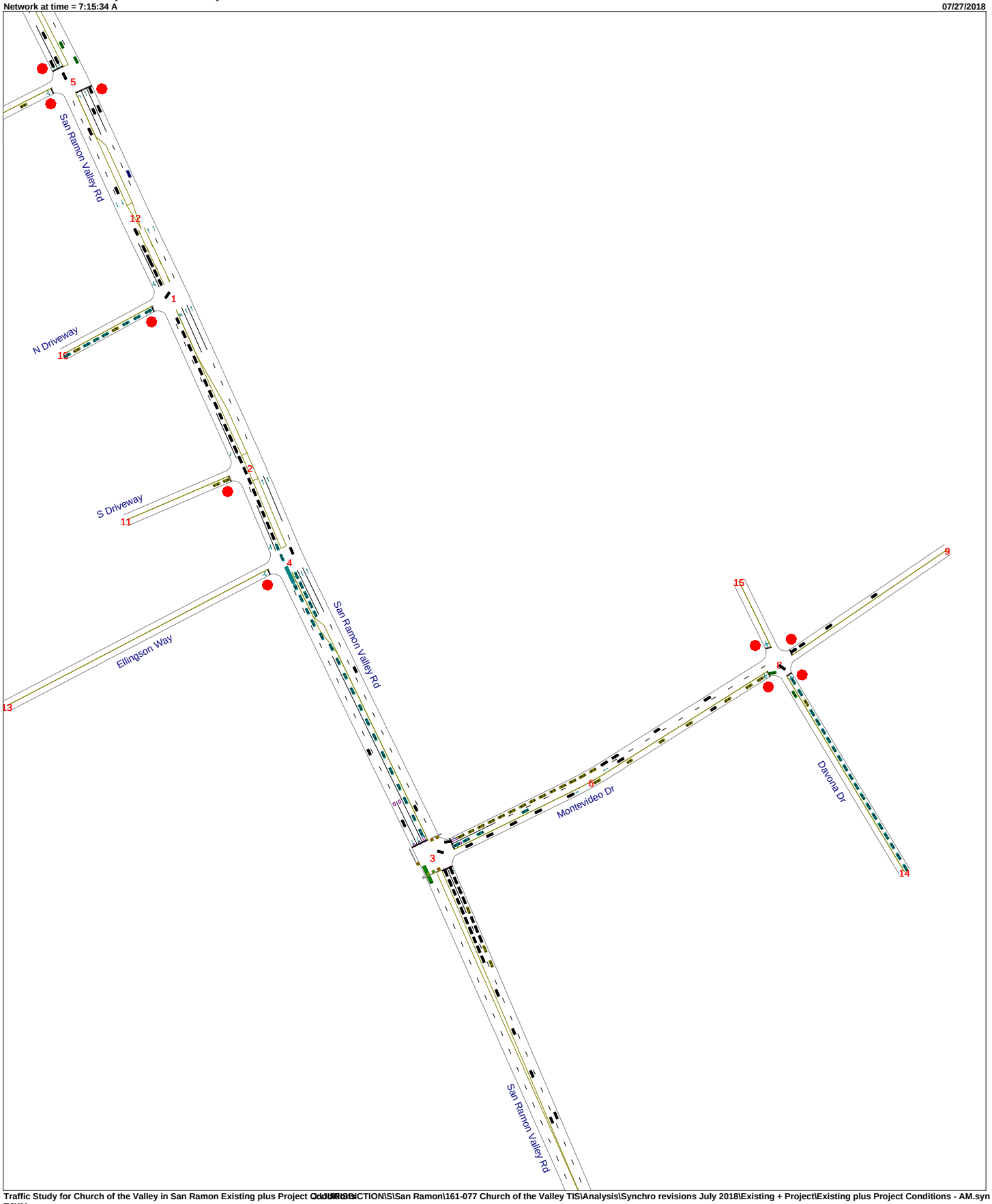
Start Time	7:00
End Time	8:00
Total Time (min)	60

Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	Avg
Vehs Entered	3003	2912	3509	3142
Vehs Exited	2913	2788	3509	3069
Starting Vehs	163	144	148	147
Ending Vehs	253	268	148	218
Travel Distance (mi)	1563	1491	1860	1638
Travel Time (hr)	377.5	417.2	290.1	361.6
Total Delay (hr)	331.4	373.1	235.1	313.2
Total Stops	6057	5942	6990	6331
Fuel Used (gal)	137.2	144.3	127.7	136.4

Intersection: 3: San Ramon Valley Rd & Montevideo Dr

Movement	WB	WB	B6	B6	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	T	TR	L	T	T
Maximum Queue (ft)	302	386	293	347	635	614	485	724	614
Average Queue (ft)	141	349	115	215	341	315	479	620	215
95th Queue (ft)	282	395	361	464	665	652	517	893	602
Link Distance (ft)	285	285	398	398	750	750		614	614
Upstream Blk Time (%)	1	71	0	18	16	16		49	0
Queuing Penalty (veh)	3	350	0	91	0	0		284	1
Storage Bay Dist (ft)							425		
Storage Blk Time (%)							68	0	
Queuing Penalty (veh)							211	2	


San Ramon Valley Rd
N Driveway
S Driveway
Ellingson Way
San Ramon Valley Rd
Montevideo Dr
Davona Dr
San Ramon Valley Rd
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