

CITY OF SAN RAFAEL, CALIFORNIA
DEPARTMENT OF PUBLIC WORKS

MEMORANDUM

TO: Steve Stafford
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FROM: Lauren Davini
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SUBJECT: Traffic Analysis for the Proposed Project at 1007, 1010, 1020, and 1030 Northgate Drive

DATE: October 18, 2018

FILE NO.:

Introduction

The proposed project consists of demolishing the existing gas station/UPS store at 1005 Northgate Drive and building 106 condominiums and 30 senior attached housing units at 1007, 1010, 1020, and 1030 Northgate Drive.

Setting

This section describes the existing transportation infrastructure within the vicinity of the proposed project site, including roadway, transit, bicycle, and pedestrian facilities.

Regional Facilities

US 101 is a major north-south regional route serving the West Coast. US 101 extends North from San Francisco through Marin and Sonoma Counties and continues into Oregon and Washington State. South of San Francisco, US 101 Extends through San Jose and the central California Coast into Southern California. In the vicinity of the project site, US 101 is generally a six-lane facility with a High Occupancy Vehicle (HOV) lane in each direction. Average daily traffic on US 101 at Manuel T Freitas Parkway is approximately 183,000 vehicles.

Local Facilities

Manuel T Freitas Parkway is a four-lane minor arterial divided by a raised center median.

Northgate Drive, which provides direct access to the project site, is a two- to four-lane divided collector south of Freitas Parkway with turn pockets at various locations.

Civic Center Drive is a two-lane minor arterial that provides access between the Northgate area and the Civic Center.

Redwood Highway is a two-lane minor arterial that serves as a frontage road to US 101 north of Freitas Parkway.

Study Intersections

The four intersections shown below in Table 1 were included in the traffic study. Peak traffic congestion in the region typically occurs during the commute peak periods between 7:00 a.m. and 9:00 a.m. and 4:00 p.m. and 6:00 p.m. The peak hour is defined as the highest one-hour volume counted during each of the two-hour time periods.

Table 1. Study Intersections	
ID	Intersection
590	Freitas Pkwy & 101 NB Ramps
591	Freitas Pkwy & Civic Center Dr
593	Freitas Pkwy & Del Presidio Blvd
594	Freitas Pkwy & Northgate Dr

Pedestrian and Bicycle Facilities

In the vicinity of the project site, there are Class II bike lanes on Las Gallinas Avenue north of Freitas Parkway and a Class I bike path on the perimeter of the Northgate Mall.

There are sidewalks meeting minimum requirements on both sides of Freitas Parkway from Del Presidio extending west. There are marked crosswalks and signalized crossings in the vicinity of the project site, but some lack pedestrian signal heads and/or push buttons.

The [San Rafael Bicycle and Pedestrian Master Plan, 2018 Update](#) calls for a proposed Class I multi-use path and/or a continuous six-foot wide sidewalk on both sides of Freitas Parkway from Monticello Road to Del Presidio Boulevard.

Transit

Golden Gate Transit operates bus service in Marin County, providing both local service within Marin County and regional service connecting Marin County to San Francisco and Richmond. Golden Gate Transit Routes 44, 54, 54C, 58, and 70 have a stop in the southbound direction at the Terra Linda-Highway 101 bus pad adjacent to the project site and in the northbound direction at the US 101 off-ramp to Freitas Parkway. Routes 44, 54, and 58 provide weekday service between San Francisco and Novato and North San Rafael during the morning and evening peak periods. Route 70 provides service between Novato and San Francisco with stops at the Terra Linda bus pads throughout the day in both directions, with 30 minute to one hour headways.

Marin Transit Route 49 provides service between Novato and San Rafael seven days per week with one-hour headways. There are bus stops in both directions on Freitas Parkway near Northgate Drive.

Sonoma-Marin Area Rail Transit (SMART) began passenger rail service in August 2017 and provides service along approximately 50 miles of the existing Northwestern Pacific (“NWP”) rail corridor from Santa Rosa in Sonoma County to San Rafael in Marin County, with the extension to Larkspur under construction. The closest station to the project site is at the Civic Center, approximately a one-mile walk.

Analysis Methodology

Intersection operating conditions are assessed through an evaluation of peak hour Levels of Service (LOS). The LOS methodology qualitatively characterizes traffic conditions through a measurement of overall congestion. There are six levels of operation or “grades,” ranging from LOS A to LOS F. LOS A represents free-flowing traffic conditions, where motorists are affected little by other motorists, and the level of comfort and convenience to the motorist is high. LOS F is characterized by congested conditions, where motorists usually experience discomfort, inconvenience, and long delays and have little, if any, freedom to choose speeds or lanes of travel. Table 2 shows the Level of Service criteria for signalized and unsignalized intersections.

Table 2. LOS Criteria for Signalized and Unsignalized Intersections

LOS	Description	Total Delay (seconds/vehicle)	
		Signalized Intersections	Unsignalized Intersections
A	Little or no delay	≤ 10.0	≤ 10.0
B	Short traffic delay	>10.0 and ≤ 20.0	>10.0 and ≤ 15.0
C	Average delay	>20.0 and ≤ 35.0	>15.0 and ≤ 25.0
D	Long delay	>35.0 and ≤ 55.0	>25.0 and ≤ 35.0
E	Very long delay	> 55.0 and ≤ 80.0	> 35.0 and ≤ 50.0
F	Extreme delay	> 80.0	> 50.0

Source: Highway Capacity Manual, Transportation Research Board, 2000.

For all study intersections (signalized and unsignalized), traffic conditions were evaluated using Synchro software and the 2000 Highway Capacity Manual (HCM) operations methodology. The delays presented in this document represent average delays for all vehicles entering a given intersection.

The Synchro and SimTraffic 10 software package was used to analyze the operating conditions and LOS at the study intersections.

Level of Service Standards

The Circulation Element of the City of San Rafael General Plan 2020 establishes policies and standards for traffic levels of service. The LOS standard that applies to the study intersections would be that signalized intersections must maintain a LOS D during the peak hours of operation. One exception is the intersection of Merrydale Overcrossing at Civic Center Drive, which must maintain LOS E standard.

The General Plan 2020 Draft EIR states the following standards for unsignalized intersections:

- If an unsignalized intersection with baseline traffic volumes is operating at an acceptable LOS (LOS A, B, C, D, or E) and deteriorates to an unacceptable operation (LOS F), this impact is significant. *It should be noted that LOS is evaluated for intersections overall, and not by any single approach or movement.*
- If an unsignalized intersection with baseline traffic volumes is already operating at LOS F and there is an increase in the delay of five seconds or more, this impact is significant.

For signalized intersections, the following standards are used:

- If a signalized intersection with baseline traffic volumes is operating at an acceptable LOS and deteriorates to an unacceptable operation (LOS E or F), this impact is significant.
- If a signalized intersection with baseline traffic volumes is at an unacceptable LOS or already operating at LOS F and there is an increase in the delay of five seconds or more, this impact is significant.

Trip Generation

The anticipated trip generation for the proposed project was estimated using standard rates published by the Institute of Transportation Engineers (ITE) in Trip Generation Manual, 9th Edition, 2012 for “Residential Condominiums/Townhouse” (ITE LU #230) and “Senior Adult Housing-Attached” (ITE LU #252). Application of these rates indicates the proposed project would be expected to generate 719 new daily trips, including 53 trips during the a.m. peak hour and 62 trips during the p.m. peak hour.

The site is currently occupied by a gas station and UPS store, so the trip generation of the existing uses were considered. Counts were obtained at both driveways during both the morning and evening peak periods for three consecutive days of October 27 to 29, 2015. The average of the counts for the three days indicates that the existing uses currently generate an average of 53 trips during the morning peak hour and 128 trips during the evening peak hour. The driveway counts do not differentiate trips between the UPS store and gas station, so it was estimated that 10 percent of trips during the a.m. peak hour and 12 percent of trips during the p.m. peak hour were to and from the UPS store based on trip generation rates in the Manual. Applying this split results in 115 daily trips, including 6 trips during the a.m. peak hour and 16 trips during the p.m. peak hour for the UPS store and 1,030 daily trips, including 47 trips during the a.m. peak hour and 128 trips during the p.m. peak hour for the gas station. These actual counts are comparable to the trip generation of a gas station with eight fueling positions using the ITE standard rates. Because counts were not obtained for all 24 hours for the three days of data collection, the ITE Trip Generation Manual was used to estimate daily trips.

Gas stations typically draw some of their traffic from passing volumes. Often, a gas station is situated on a main street and would attract pass-by trips, diverted trips, or both. An example of a pass-by trip is if someone is on their way to the freeway from their home, and they make a right turn into a gas station off the main road, fuel up, and then make a right turn out of the gas station and continue onto the freeway. An example of a diverted trip is if someone is on their way to the freeway, turns down a side street, purchases coffee at the convenience store off the side street, and then makes their way back to the main street to get to the freeway. All the gas stations in the Northgate area require motorists to turn off Freitas Parkway to access the fueling stations and convenience stores. Because of the proximity of these gas stations to US 101 and also because they are the only gas stations in the neighborhood, a 75 percent pass-by/diverted trip credit should be applied to the existing gas station.

The expected trip generation potential for the proposed project is shown below in Table 3. Deductions were taken for trips made to and from the existing use at the site, which will cease with the construction of the project. Based on counts of existing trips to the gas station site, and with deductions applied for pass-by/diverted trips, the project would be expected to result in 347 new trips per day, including 36 trips during the morning peak hour, and 18 trips during evening peak hour.

Table 3. Trip Generation

Land Use	Qty	Daily Trips	AM Peak Hour				PM Peak Hour			
			Rate	Trips	In	Out	Rate	Trips	In	Out
Existing (Actual)										
Gas/Service Station	-8 vfp	-1,145	n/a	-53	-28	-25	n/a	-128	-63	-65
UPS Store (est)		-115		-6	-3	-3		-16	-8	-8
Gas Station (est)		-1030		-47	-25	-22		-112	-55	-57
Pass-by	75%	773		36	19	17		84	41	43
Primary		-257		-11	-6	-5		-28	-14	-14
Net Primary Trips		-372		-17	-9	-8		-44	-22	-22
Proposed										
Condominiums	106 du	616	0.44	47	8	39	0.52	55	37	18
Senior Adult Housing – Attached	30 du	103	0.19	6	2	4	0.23	7	4	3
Sub-total Proposed		719		53	10	43		62	41	21
Net Increase (vs. Actual)		347		36	1	35		18	19	-1

Note: vfp = vehicle fueling positions; du = dwelling units

Trip Distribution

Table 4 shows the trip distribution of the project-added trips through the study area.

Table 4. Trip Distribution	
To/From	Percentage
East of project site	55%
West of project site	20%
South of project site	45%

Operational Analysis

Existing and Existing plus Project

Table 5 shows the intersection operation under Existing and Existing plus Project volumes. Field observations were completed during the a.m. peak period on Wednesday September 5, 2018 and during the p.m. peak period on Thursday September 13, 2018 to verify the traffic model with real-world conditions.

Table 5. Existing and Existing plus Project Peak Hour Intersection Levels of Service

ID	Intersection	AM				PM			
		Delay	LOS	+ Project		Delay	LOS	+ Project	
				Delay	LOS			Delay	LOS
590	Freitas & 101 NB Ramps*	10.9	B	9.4	A	14.7	B	14.9	B
591	Freitas & Civic Center*	10.1	B	9.7	B	15.3	B	16.0	B
593	Freitas & Del Presidio	11.9	B	11.9	B	28.9	C	28.9	C
594	Freitas & Northgate	18.3	B	19.6	B	22.4	C	22.1	C

Note: * indicates intersection is Unsignalized and was analyzed using SimTraffic

Italics represent minor movement delay at a side-street STOP controlled intersection

The intersections are all operating acceptably, according to the standards set forth in the General Plan. The intersections of Freitas and 101 Northbound Ramps and Freitas and Civic Center Drive have known issues, specifically with the southbound left-turn from Freitas onto Civic Center Drive-Redwood Highway. It is important to note that *overall*, the intersections operate at LOS B or better under Existing conditions during both peak hours, both with and without project-added traffic. With the addition of project-generated traffic, the intersections are expected to continue operating acceptably.

Baseline and Baseline plus Project

Table 6 shows the Baseline and Baseline plus Project LOS. The Baseline scenario is Existing volumes plus traffic generated by other approved projects in the area which are expected to be constructed in the near-term. It is expected that these projects would be

completed or be closed to completion upon the development of the proposed project analyzed in this study.

Table 6. Baseline and Baseline plus Project Peak Hour Intersection Levels of Service

ID	Intersection	AM				PM			
		Delay	LOS	+ Project		Delay	LOS	+ Project	
				Delay	LOS			Delay	LOS
590	Freitas & 101 NB Ramps*	22.8	C	26.6	D	22.9	C	27.2	D
591	Freitas & Civic Center*	23.8	C	27.3	C	25.1	D	22.0	C
593	Freitas & Del Presidio	12.5	B	12.5	B	34.0	C	34.0	C
594	Freitas & Northgate	27.5	C	28.3	C	23.6	C	23.6	C

Note: * indicates intersection is Unsignalized and was analyzed using SimTraffic

Values in **Bold** indicate unacceptable operation

Italics represent minor movement delay at a side-street STOP controlled intersection

Under Baseline conditions, the intersections are expected to operate acceptably overall at LOS D or better. While the unsignalized intersections show a difference of as much as 4.3 seconds increase in delay with project-added trips, the LOS under plus Project conditions is still considered acceptable at LOS D.

Cumulative and Cumulative plus Project

Cumulative Conditions are defined as traffic conditions set forth by the City of San Rafael General Plan 2020, which focuses on achievable goals that could be implemented by 2020. Some of the achievable goals included in the Cumulative analysis are: optimized signal timing, signalizing the Freitas interchange, and increasing capacity with additional lanes or turn pockets. Because of these improvements, some delays are expected to decrease at certain intersections compared to Existing and Baseline scenarios.

Cumulative Conditions traffic volumes are existing traffic volumes plus Baseline Conditions traffic volumes plus other approved projects that have not been constructed and were not considered as part of the Baseline Conditions entitled projects. These additional projects are part of the City of San Rafael traffic model which models General Plan 2020 expected volumes. Because the 136 residential units were not accounted for in General Plan 2020, they were added to Cumulative volumes to show the project impacts at the study intersections. Table 7 shows the LOS for the study intersections under Cumulative and Cumulative plus Project conditions.

Table 7. Cumulative and Cumulative plus Project Peak Hour Intersection Levels of Service

ID	Intersection	AM				PM			
		Delay	LOS	+ Project		Delay	LOS	+ Project	
				Delay	LOS			Delay	LOS

590	Freitas & 101 NB Ramps*	18.3	C	12.8	C	25.5	D	28.5	D
	Signalized	24.3	C	24.3	C	7.3	A	7.4	A
591	Freitas & Civic Center*	17.5	C	22.2	C	27.3	D	26.2	D
	Signalized	36.0	C	36.0	D	18.6	B	18.6	B
593	Freitas & Del Presidio	11.6	B	11.7	B	37.3	D	37.3	D
594	Freitas & Northgate	17.1	B	17.8	B	23.4	C	24.1	C

Note: * indicates intersection is Unsignalized and was analyzed using SimTraffic

Values in **Bold** indicate unacceptable operation

Italics represent minor movement delay at a side-street STOP controlled intersection

Shaded cells indicate a future signalized intersection

The intersections are all operating acceptably, according to the standards set forth in the General Plan. With the addition of project-generated traffic, the intersections are expected to continue operating acceptably.

Site Access

Northgate Drive will provide access to the proposed project via four different driveways. The existing driveway on Northgate Drive closest to Freitas Parkway will remain and provide access to the Ground Level residential parking. Another driveway will be added to the west side of Northgate Drive, approximately 120 feet north of the first driveway. Two other driveways are proposed on the east side of Northgate Drive. Due to the proximity of the first driveway to Freitas Parkway, “KEEP CLEAR” markings should be striped on Northgate Drive.

Project Impacts

Vehicular Circulation

While the channelized right-turns are good for vehicle circulation, they are not ideal for pedestrian circulation. The intersection of Freitas Parkway/Northgate Drive should be redesigned to eliminate the pork chop islands and tighten the curb radii on the north leg of the intersection. The intersection was modeled without the channelized right-turn lanes and operation was found to be LOS C or better under all scenarios. This should be done in conjunction with added pedestrian crossing features, as discussed in the pedestrian and bicycle impacts below.

Parking

A total of 520 parking spaces will be provided with the project and is intended for both the project use as well as the existing hotel use. This number of spaces does not meet the City parking requirement but is adequate when State Density Bonus parking rates are applied.

Pedestrian and Bicycle Impacts

A Class I path or a six-foot wide sidewalk is proposed on the north side of Freitas Parkway, and the project should provide the right-of-way or help build a wider path along its frontage.

The intersection of Freitas Parkway/Northgate Drive is lacking pedestrian heads and push buttons for the crossing on the north leg. The project should contribute to the installation of pedestrian facilities at that location.

Transit Impacts

The existing bus stops are within walking distance of the project site and are adequate, but the routes between the bus stops and the project site could be improved. Constructing a path or wider sidewalk along the project frontage, as mentioned above and consistent with the Bicycle and Pedestrian Master Plan, would improve access for pedestrians and bicyclists that may include transit users.

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