

memorandum



**Whitlock & Weinberger
Transportation, Inc.**

490 Mendocino Avenue
Suite 201
Santa Rosa, CA 95401

voice (707) 542-9500
fax (707) 542-9590

website www.w-trans.com
email zmatley@w-trans.com

Date: February 14, 2013
To: **Mr. Steve Marshall** From: Zack Matley
City of Novato Project: NOV911

Subject: San Marin Interchange Evaluation – Preliminary Findings

Following is a summary of the analysis W-Trans has conducted thus far for the San Marin Drive interchange. We have broadly evaluated operation under a near-term condition as well as under buildout of the current General Plan. The land use assumptions for both scenarios are based on projections collaboratively updated by the City and W-Trans, which were finalized on February 13, 2013. The near-term analysis includes traffic associated with major vacancies in existing developments surrounding the interchange area, as well traffic associated with projects that have received entitlements from the City but are not yet generating traffic. The buildout scenario includes this near-term traffic in addition to traffic associated with undeveloped/underutilized parcels throughout the City of Novato and surrounding County of Marin.

Existing Operation

The interchange-area intersections are currently operating acceptably at LOS C or better during both the AM and PM peak hours, with queues contained within available storage.

Near-Term Operation

Traffic associated with occupation of currently-vacant uses and entitled projects would add approximately 550 AM peak hour and 625 PM peak hour trips to the interchange. The interchange-area intersections are projected to continue operating acceptably at LOS D or better. Vehicle queuing issues would arise, however, on the northbound and eastbound approaches of the Redwood Boulevard/San Marin Drive intersection. Queuing on northbound Redwood Boulevard would extend through the intersection at Rush Creek Place-Escalonia Drive, and queuing on eastbound San Marin Drive would extend through the signal at East Campus Drive.

The adverse queuing projected to occur with near-term operation could be alleviated with the following three improvements.

- Widen eastbound San Marin Drive by approximately five feet in order to create a 100-foot long eastbound right turn lane onto Redwood Boulevard. Existing on-street parking in this area would be eliminated.
- Add right turn overlap signal phasing on the northbound and eastbound approaches.
- Implement coordinated signal timing on Atherton Avenue-San Marin Drive between East Campus Drive and the US 101 North Ramps intersections.

With these improvements, the interchange-area intersections are projected to operate acceptably at LOS C or better, with queues remaining within available storage.

General Plan Buildout

Buildout of the General Plan and occupation of currently-vacant buildings is projected to add approximately 4,100 AM peak hour trips and 4,800 PM peak hour trips to the City's roadway network. Of these, approximately 1,650 AM peak hour trips and 1,400 PM peak hour trips would pass through this interchange.

Several interchange-area intersections would operate at unacceptable levels of service and with adverse queuing conditions under General Plan buildout with no improvements.

Conditions with Capital Improvement Projects

The City has already identified in its CIP the following improvements to the interchange area needed to support buildout of the General Plan.

- Widen intersection approaches and railroad overcrossing at Redwood Boulevard/San Marin Drive (project AGP-5). The southbound approach should be modified to include two left turn lanes and one shared through-right turn lane, and the eastbound approach modified to include one left turn lane, three through lanes, and one right turn lane. Modifications to the westbound approach include provision of two left turn lanes, two through lanes and one right turn lane. Right turn overlap signal phasing should be installed for the northbound and westbound approaches. Widen the railroad overcrossing to accommodate the additional westbound lane.
- Modify northbound off-ramp at U.S. 101 Northbound Ramps/Atherton Avenue (project AGP-10). The northbound off-ramp should be modified to include dual left turn lanes and a shared through-right turn lane.
- Create a free right-turn from eastbound San Marin Drive to the southbound on-ramp at U.S. 101 Southbound/San Marin Drive. The eastbound right turn lane should be modified so that it becomes a free movement onto the southbound on-ramp. This modification may also require widening of the on-ramp itself to create two accepting lanes that then merge to one.
- Modify approaches and signal phasing on Redwood Drive north of San Marin Drive. Redwood Drive should be widened to include two southbound lanes between Wood Hollow Drive and San Marin Drive. The widened southbound approach at San Marin Drive should include dual left turn lanes.

With these CIP improvements, the interchange-area intersections would be expected to operate at LOS D or better, with the exception of Atherton Avenue/Binford Road, which would operate unacceptably at LOS F. There would, however, be adverse queuing impacts, including queues extending onto mainline US 101 at both the northbound and southbound offramps.

It is clear that any mitigation scheme developed for the interchange will likely need to include signalization and coordination of the intersection at Atherton Avenue/Binford Road.

Preliminary Assessment of Additional Buildout Improvements

In addition to the interchange-area improvements already included in the CIP, the following improvements would be necessary to support buildout of the General Plan.

- Redwood Drive/San Marin Drive - reconfigure the northbound approach to include dual left turn lanes, a single through lane, and a right turn lane
- Atherton Avenue/Binford Road – signalize the intersection; widen the westbound approach 100 feet in advance of the intersection to accommodate dual through lanes, and widen the southbound approach to include a 75-foot long right turn pocket
- Implement coordinated signal timing along the San Marin Drive-Atherton Avenue corridor between East Campus Drive and the new signal at Binford Road

With these additional improvements, the study area intersections are projected to operate acceptably during the AM and PM peak hours. Queues would be contained on the two US 101 offramps and not extend onto US 101. Queues on City streets would generally be contained within available storage, though at the four closely-spaced intersections between Redwood Boulevard and Binford Road, queues would occasionally spillback through the adjacent signal. Such impacts would be brief, however, typically clearing the next signal cycle and not causing significant delay.

A screenshot of the SYNCHRO network depicting these improvements is enclosed.

Next Steps

Through the use of traffic simulation, it is clear that the improvements described above would function with traffic associated with General Plan buildout, but would result in a system that is essentially at capacity. It is unlikely that the interchange would be able to support additional increases in traffic. For instance, the added traffic associated with projects such as the North Redwood Plan and the former Commons at Mount Burdell would trigger the need for additional improvements beyond those described above.

Based on the work completed thus far, we believe that the next set of improvements would entail major infrastructure upgrades, potentially including one or more new freeway ramps to the north and/or substantial reconfiguration of the existing interchange. We are currently underway with analysis of a diverging diamond interchange (DDI) solution for the existing ramps, which is showing promise for providing at least some increment of additional capacity in a cost-effective manner (in comparison to other options such as new ramps or grade separation of Redwood Boulevard).

Novato General Plan Build-Out Projections - Cumulative Scenario No. 1

Table with columns: PROJECT NAME, LOCATION/DESCRIPTION, APN, ACREAGE, GP LAND USE, DENSITY, PROJECTED DEV., TYPE, TAZ, BUILT SQ. FT., ADDITIONAL, POTENTIAL, RESIDENTIAL, BUILT UNITS, ADDITIONAL, POTENTIAL, COMMERCIAL/INDUSTRIAL, BUILT SQ. FT., ADDITIONAL, POTENTIAL, DA or VTM. The table lists various parcels and their corresponding zoning and potential developments across multiple columns.

Novato General Plan Build-Out Projections - Cumulative Scenario No. 1

PROJECT NAME	LOCATION/DESCRIPTION	Site#	AP#	ACREAGE	LAND USE	GP	DENSITY	PROJECTED DEV.	TYPE	TAZ	RESIDENTIAL		COMMERCIAL/INDUSTRIAL		DA or VTM
											BUILT UNITS	POTENTIAL	BUILT SQ. FT.	POTENTIAL	
Canyon Green (former Novato Hospital site)	Single Family Residential - Hillside Constraint	37	140-341-14	7.37	R1		5	25	SF	194	0	25	0	0	
Old Water Tank Site - Privately Owned	Hillside/Tree Constraints (landlocked parcel)	14a	140-481-01	0.8	R1		5	1	SF	194	0	1	-	-	
Hillside S of Center Rd	501 and 509 Canyon Road - Hillside, Water, & Trees	15a	146-090-17 & 18	28.49	RVL		3	7	SF	194	4	3	7	-	
Hillside S of Center Rd	652, McCloy Road - Hillside/Waterway Constraints	15b	146-090-08	19.59	R1		20	10	SF	194	1	9	10	-	
Eldon Housing	formerly Terraces Assisted Living	16b	140-131-22	2.47	R10		20	61	MF	194	0	61	-	-	
Diablo Affordable Housing Site	formerly Terraces Assisted Living	16b	140-131-23	combined	R10		20	combined		194	0	combined	-	-	
Diablo Affordable Housing Site	formerly Terraces Assisted Living	16b	140-131-24	combined	R10		20	combined		194	0	combined	-	-	
Sutro Ave/Novato Blvd	2349 Novato Boulevard - Waterway & Tree Constraints	3a	132-031-04	4.59	R1		5	6	SF	195	1	5	6	-	
N. Novato Blvd/Sutro Ave	2300 Block of Novato Boulevard - Waterway & Trees	3b	132-031-07	3.71	R1		5	9	SF	195	1	8	9	-	
N. Novato Blvd/Sutro Ave	2311 Novato Boulevard - Waterway & Tree Constraints	3b	132-031-10	1.29	R1		5	2	SF	195	1	2	-	-	
N. Novato Blvd/Sutro Ave	2373 Novato Boulevard - Waterway & Tree Constraints	3c	132-031-11	1.87	R1		5	5	SF	195	1	4	5	-	
N. Novato Blvd/Sutro Ave	870 Sutro Avenue - Waterway & Tree Constraints	3d	132-031-11	2.87	R1		5	4	SF	195	1	4	4	-	
N. Novato Blvd/Sutro Ave	896 Sutro Avenue - Waterway & Tree Constraints	3e	132-031-12	2.00	R1		5	5	SF	195	1	4	5	-	
NUSD Junior High School Site (Undeveloped)	San Marin Dr/San Andreas Dr	4a	124-010-08	21.58	R4		7	100	SF	198	0	100	-	-	
200 San Marin	Medical Offices	4b	124-262-18	0.41	GC		0.4	7144	CO	196			7,144	7,144	
City Parcel	Future neighborhood park	4c	124-010-09	4.43	PL		0.2	-	PK	196			180,000	175,000	355,000
Buck Institute	Per Master Plan	40	125-180-61	81.8	REI		0.2	355,000	OF	197B			-	-	
Buck Institute	new aprn 125-18 and 125-58	40	125-180-67	85.28	REI		0.2	-	OF	197B			-	-	
Buck Institute	Per Master Plan	40	125-180-67		REI		0.2	-	MF	197B	130	130	-	-	
Marin Business Center	Oakview Office - formerly Accountmate	6b	125-202-12	10.6	BPO		0.4	130	MF	197B			24,000	24,000	
San Marin Business Park	Landslide, Hillside, and Tree Constraints	6c	125-202-18 (pm)	39.92	BPO		0.4	272,783	OF	197B			272,783	272,783	
San Marin Business Park (hotel)	Landslide, Hillside, and Tree Constraints	6c	125-202-18 (pm)		BPO		0.4	75,000	HO	197B			75,000	75,000	
San Marin Business Park	San Marin Business Park - 7701 Redwood Boulevard	6d	125-202-13/14	4.5	BPO		0.4	39,204	OF	197B			39,204	39,204	
SMART	North Redwood at Rush Landing								SMT	197B					
Birkenstock	8171 Redwood Blvd.	6f	125-180-45	93.36	LIO		0.4	200,000	OF	197B			172,490	200,000	
PG&E Parcel	8161 Redwood Blvd.	6g	125-180-49	13.56	LIO		0.4	40,000	OF	197B			40,000	40,000	
COUNTY DEVELOPMENT															
St.Vincents/Silvera	Marin Countywide Plan; Max 221 Res. Units	34		1200	PD/AG Enviro			221	SF	174		221			
Ronsheimer Parcel (formerly Leveroni)	County - Outside of Novato SOI (per LAFCO)	22	157-171-14	134.17	AGC3		1 unit/2.9 acres	15	SF	179	0	3			
Bel Marin Keys Unit 5	Coastal Conservancy - Wetland Restoration	28	157-172-38	1600	AGC3		1 unit/2.9 acres	-	OS	180					
Gross Field - Industrial Lands	County of Marin Projections/Land Use	33a		280	IND		0.35	1,176,822	IN	191A			259,189.00	917,633	1,176,822
Blackpoint - Neighborhood Commercial	County of Marin Projections/Land Use				SF2		1 unit/1.5 acres	1,048	SF	191C	781	1,048	153,629.00	43,691	197,320
Blackpoint - Residential Lands	County of Marin Projections/Land Use				NC			197,320	CO	183	277	419	72	194	450
Indian Valley	Area 9 in LAFCO Boundary Study Report				SF3/AGC2		0 unit/2.9 acres	71	SF	183	378	72	194	450	43
Vineyard Road	Area 8 in LAFCO Boundary Study Report							9	SF	195	0	43			

1 Projected development based on recent project proposals, approved project or discussions with owners.

2 Projected development based on maximum General Plan density (no known constraints and existing streets)

3 Projected development based on 50-75% of the gross lot area to account for constraints (slopes, native trees, wetlands, waterways)

4 Projected development per Marin Countywide Plan - 2007

5 Publicly Owned - Open Space/Conservation Land

6 Non-Profit Owned - Open Space/Conservation Land

Type Key	City of Novato	County of Marin
SF - Detached Single Family	595	44
MF - Multi-Family	376	0
AT - Attached Single Family (Townhome or Condominium)	91	0
CO - Commercial (Retail/Personal Services)	242	0
IN - Industrial	932	0
HO - Hotel	36	0
OF - Office	375	0
PK - Parkland	266	748
OS - Open Space	0	918
S - School	214	0
RD - Research and Development (Buck Center)		
CF - Community Facility		
IP - Industrial Park		

retail
 hotel
 industrial park
 multifamily residential
 office
 park
 educational
 single family residential
 warehouse (Gross Field Industrial)
 two Novato SMART stations

Entitled Projects (not yet generating traffic as of October 2012)

PROJECT NAME	LOCATION/DESCRIPTION	Site#	AP#	ACREAGE	GP LAND USE	DENSITY	PROJECTED DEV.	NOTES	TYPE	TAZ	RESIDENTIAL		COMMERCIAL/INDUSTRIAL	
											BUILT UNITS	POTENTIAL	BUILT SQ. FT.	POTENTIAL
Main Gate Plaza at Exchange Triangle	Westbay Builders - Office Condominiums	30-PA5	157-980-05	2.2	CN	0.4	30,550		OF	176	-	-	30,550	
SMART Station South	Future Transit Center	30-PA5	157-980-05	4.1	CF				SMT	176	-	-	-	
Victoria Commons	S. Novato/Redwood Blvd (former Fire Station site)	45	160-991-71	0.6	BPO		10,000		OF	184	-	-	10,000	
Eden Housing on Diablo	Formerly Terraces Assisted Living	16b	140-131-22	2.47	R10	20		61	MF	194	61	25	-	
Canyon Green (former Novato Hospital site)	Single Family Residential - Hillside Constraint	37	140-341-14	7.37	R1	5	25		SF	184	25	25	0	
Sunset Ridge	Hillside W of Sunset Pkwy	25	150-030-01	32.82	R1	1	4		SF	186A	4	4	-	
The Pavilions at Waterfall Terrace	Terminus of Landing Court	19	153-170-56	3.42	BPO	0.4	31,000		OF	188A	-	-	30,525	
Hanna Ranch	east terminus of Rowland Boulevard	24a	153-340-06	18.7	BPO	0.4	42,200		OF	189A	-	-	42,200	
							116		HO	189A	-	-	116	
McPhail's Property	southeast corner of S. R. 37	24b	153-220-19	5.06	BPO	0.4	23,500		CO	189A	-	-	23,500	
In-N-Out	Vintage Oaks (replaces Burger King)						62,000		OF	189A	-	-	62,000	
Oleander Subdivision	End of Oleander Lane						3,750		CO	189A	-	-	3,750	
999 Grant Avenue	20 ksf even split office/retail	18e	153-182-53, 54, 55, 56, 57	14.05	RVL	1	4		SF	189B	4	4	-	
	retail portion						10,000		CO	192A	-	-	10,000	
Novato Theater	820 Grant	41a	153-046-06		CD		10,000		CO	192A	-	-	10,000	
Peets/Restaurant Space	Machin/Cain (current parking lot)	19	153-170-56	3.42	BPO	0.4	18,877		OF	192A	-	-	18,877	
Fourth St Single Family Homes	7320 Redwood						8,268		CO	192A	-	-	8,268	
Atherton Ranch Commercial	1112 Fourth Street						10		SF	193A	-	-	-	
	Master Plan Approved Office/Retail (this line Office)	11	125-600-51/52	3.6	MU	0.4	70,550		OF	193B	10	10	-	
	(this line Retail)								CO	193B	-	-	-	
Marin Business Center	Oakview Office - formerly Accountmate	6b	125-202-12	10.6	BPO	0.4	24,000		OF	197B	-	-	24,000	
SMART Station North	North Redwood at Ruth Landing								SMT	197B	-	-	-	

Vacant or Underutilized Parcels

PROJECT NAME	LOCATION/DESCRIPTION	Site#	AP#	ACREAGE	GP LAND USE	DENSITY	PROJECTED DEV.	NOTES	TYPE	TAZ	RESIDENTIAL		COMMERCIAL/INDUSTRIAL	
											BUILT UNITS	POTENTIAL	BUILT SQ. FT.	POTENTIAL
505 San Marin Drive									OF	197A	-	-	2,300	
Birkenstock (office)									OF	197B	-	-	36,000	
Birkenstock (warehouse)									WH	197B	-	-	135,000	
100 Wood Hollow Drive									OF	197B	-	-	25,060	
Firman's Field									OF	FF	-	-	277,000	
7655/7685 Redwood Boulevard									OF	197B	-	-	7,400	
7599 Redwood Boulevard									OF	193B	-	-	2,300	

Configuration needed to support buildout of current General Plan

