FEHR PEERS

FINAL
MEMORANDUM

Date: October 26, 2017

To: Mark Stout and Matt Todd (City of Roseville)

From: Alan Telford (Fehr & Peers)

Subject: Traffic Analysis of NCRSP Parcel 49, Phase 2B

RS17-3548

Fehr & Peers prepared a traffic study in January 2015 titled *'Transportation Impact Study Report for North Central Roseville Specific Plan – Parcel 49'*. That study evaluated the traffic impacts and mitigations for three distinct development phases of NCRSP Parcel 49. Phase 1 was the TopGolf facility that opened in late summer, 2016. Phase 2 consisted of a mixture of restaurant, retail, hotel, and office uses. Phase 3 consisted of the Bayside Covenant Church complex.

In mid-2016 Phase 2 was further divided into Phases 2A and 2B, with Phase 2A consisting of two hotels containing a combined total of 211 rooms, and Phase 2B consisting of the restaurant, retail, and office uses. Fehr & Peers prepared a traffic analysis for Phase 2A and 2B (Technical Memorandum dated July 29, 2016).

The development applicant is now proposing to modify the mix of uses in Phase 2B and separating the office uses into Phase 2C, as shown in Table 1. The new Phase 2B land use mix is referred to herein as the proposed project.

Table 1 – Phase 2 Land Uses

Approved Site Plan (2015)		**Modified Site Plan (2016)**		**Proposed Site Plan (2017)**	
Phase 2		**Phase 2A**		**Phase 2A**	
Hotel (1)	125 rooms	Hotels (2)	211 rooms	Hotels (2)	211 rooms
		Phase 2B		**Phase 2B**	
Restaurants	11,200 sq. ft.	Restaurants	11,200 sq. ft.	Restaurants	10,875 sq. ft.
				Restaurants/ Fast Food	5,800 sq. ft.
Retail	37,800 sq. ft.	Retail	20,200 sq. ft.	Retail	10,575 sq. ft.
				Park & Ride	25 spaces
				Phase 2C	
Office	91,500 sq. ft.	Office	84,000 sq. ft.	Office	84,000 sq. ft.
Park & Ride	25 spaces	Park & Ride	25 spaces		

Source: Fehr & Peers, 2017

Change in Trip Generation

Fehr & Peers has estimated the change in trip generation of Phase 2 for all six time periods that were analyzed in the 2015 transportation study. Table 2 shows the resulting trip generation estimates.

Table 3 compares the trip generation of the proposed uses to the trip generation of the uses as approved in 2015. As shown, the buildout of the proposed project is expected to result in additional trips for all six time periods studied in the 2015 report:

- Weekday AM peak hour - 201 trip increase
- Weekday PM peak hour – 32 trip increase
- Saturday 5:15 to 6:15 PM (church service arrival) – 76 trip increase
- Saturday 7:00 to 8:00 PM (church service departure) – 172 trip increase
- Sunday 10:15 to 11:15 AM (church service arrival) – 96 trip increase
- Sunday 12:00 to 1:00 PM (church service departure) – 247 trip increase

Table 2 – Proposed Phase 2A & 2B & 2C Trip Generation

Project Land Use				Project Trip Generation																	
				Weekday						Saturday						Sunday					
				AM Peak Hour			PM Peak Hour			Before Service			After Service			Before Service			After Service		
				7:30 AM to 8:30 AM			4:30 PM to 5:30 PM			5:15 PM to 6:15 PM			7:00 PM to 8:00 PM			10:15 AM to 11:15 AM			12:00 PM to 1:00 PM		
Phase	Land Use	ITE Quantity	ITE Units	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
2A	Hotel 1	107	rooms	32	28	**60**	38	27	**65**	26	26	**52**	26	26	**52**	17	35	**52**	18	18	**35**
	Hotel 2	104	rooms	32	27	**58**	37	27	**63**	25	25	**50**	25	25	**50**	17	33	**50**	17	17	**34**
2B	Restaurant	10.9	KSF	63	55	**118**	58	49	**107**	67	42	**109**	73	63	**136**	22	27	**49**	63	28	**91**
	Restaurant/ Fast Food	5.8	KSF	134	129	**263**	98	91	**189**	129	125	**254**	144	128	**272**	85	81	**166**	203	219	**422**
	Retail	10.6	KSF	25	15	**40**	64	69	**133**	42	87	**129**	23	25	**48**	50	29	**79**	141	73	**214**
	Park-and-Ride	25	spaces	14	4	**18**	4	12	**16**	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**
2C	Office	84	KSF	146	20	**166**	29	143	**172**	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**
			Gross Trips	9	278	**724**	328	418	**746**	289	305	**594**	291	267	**558**	191	205	**396**	442	355	**797**
			Internal Trips	-18	-11	**-29**	-12	-18	**-30**	-12	-13	**-25**	-12	-11	**-23**	-8	-7	**-15**	-20	-16	**-36**
			Pass-by Trips	-44	-40	**-84**	-89	-84	**-173**	-71	-76	**-147**	-72	-65	**-137**	-47	-41	**-88**	-122	-96	**-218**
			New Trips	**384**	**227**	**611**	**227**	**316**	**543**	**206**	**216**	**422**	**207**	**191**	**398**	**136**	**157**	**293**	**300**	**243**	**543**

Notes:

1. Internal trip reduction is assumed to be 5% of retail, and restaurant trips for all scenarios.
2. Pass-by trip reduction is assumed to be 20% for retail and restaurant in the weekday AM peak hour, and 30% for the Saturday and Sunday scenarios. During the weekday PM peak hour, pass by trip reduction is 43% for restaurant and 34% for retail, as determined using the average percentages in the ITE Trip Generation Handbook, 3rd Edition.
3. Gross trips based on the Trip Generation Manual (Institute of Transportation Engineers, 2012) using the land use categories for hotel (ITE 310), restaurant (ITE 932), retail (ITE 320), and park-and-ride (ITE 90).

Source: Fehr & Peers, 2017

Table 3 – Approved Phase 2 (2015) vs Proposed Phase 2A & 2B & 2C (2017) Trip Generation

Scenario	Weekday						Saturday						Sunday					
	AM Peak Hour			PM Peak Hour			Before Service			After Service			Before Service			After Service		
	7:30 AM to 8:30 AM			4:30 PM to 5:30 PM			5:15 PM to 6:15 PM			7:00 PM to 8:00 PM			10:15 AM to 11:15 AM			12:00 PM to 1:00 PM		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Approved Project (2015) Phase 2	288	122	**410**	200	312	**512**	142	204	**346**	115	111	**226**	101	96	**197**	180	116	**296**
Proposed Project (2017) Phase 2A + 2B + 2C	384	227	**611**	227	316	**543**	206	216	**422**	207	191	**398**	136	157	**293**	300	243	**543**
Proposed Project Change from Approved Project	**+96**	**+105**	**+201**	**+27**	**+4**	**+32**	**+64**	**+12**	**+76**	**+92**	**+80**	**+172**	**+35**	**+61**	**+96**	**+120**	**+127**	**+247**

Source: Fehr & Peers, 2017

Traffic Impacts of Proposed Phase 2B

As discussed earlier, the entire NCRSP Parcel 49 project site is planned to contain a large church complex, which is expected to be built in the last phase of the parcel development. Since the church complex is expected to generate substantial traffic volumes before and after weekend church services, the 2015 study *'Transportation Impact Study Report for North Central Roseville Specific Plan – Parcel 49'* evaluated traffic impacts immediately before and after weekend services, as well as during typical weekday AM and PM peak hour conditions. As such, traffic impacts of proposed Phase 2B are evaluated herein under both weekday and weekend peak hour conditions.

Table 4 shows the traffic impacts of Phase 2B on the key intersections adjacent or close to Parcel 49. The Approved Parcel 49 column assumes buildout and operation of all the approved uses on the site. The Phase 2B column shows the resulting LOS and delay due to the increased traffic generated by Phase 2B. As shown, LOS C or better conditions would be met during all four periods analyzed at the Washington Blvd/Freedom Way and Blue Oaks Blvd/SR 65 NB ramps intersections.

Table 4 - Traffic Impacts of Proposed Phase 2B

Intersection	Peak Hour Period	Approved Parcel 49		With Proposed Phase 2B	
		LOS	Delay	LOS	Delay
Washington Blvd/Freedom Way	Weekday AM	B	17	B	19
	Weekday PM	C	33	C	34
	Saturday PM	C	31	C	35
	Sunday Midday	C	25	C	27
Washington Blvd/Blue Oaks Blvd/SR 65 SB Ramps	Weekday AM	C	34	C	35
	Weekday PM	D	54	D	54
	Saturday PM	E	55	E	59
	Sunday Midday	C	31	C	32
Blue Oaks Blvd/SR 65 NB Ramps	Weekday AM	B	15	B	17
	Weekday PM	C	21	C	22
	Saturday PM	C	25	C	34
	Sunday Midday	B	11	B	11

Notes**:** Weekday AM is the peak one hour period between 7:00 and 9:00AM.
Weekday PM is the peak on hour period between 4:00 and 6:00PM.
Saturday PM is the one hour period before the 6 PM church worship service.
Sunday Midday is the one hour period at the conclusion of the 11 AM service.
Delay is the average seconds of delay per vehicle.

Phase 2B does not result in a change in LOS under any of the four analyzed periods at the Washington Blvd/Blue Oaks Blvd/SR 65 SB ramps intersection. LOS C conditions would be maintained during the weekday AM and Sunday midday peak hours. LOS D would occur during the weekday PM peak hour, and

LOS E would occur during the Saturday PM peak hour. City Council approved the Amoruso Specific Plan in June 2016 and with it, the finding from the associated EIR which approved a change to the acceptable LOS at the Washington Blvd/Blue Oaks Blvd/SR 65 SB ramp intersection from LOS D to LOS E. As such, LOS E at this intersection is acceptable and not considered a significant impact.

Thrive Drive Analysis

Fehr & Peers analyzed traffic operations on Thrive Drive assuming buildout of the proposed project, based on the site plan dated February 17, 2017. As previously discussed, the proposed project is expected to generate more traffic than the 2015 approved project. The increase in traffic will be more pronounced on Thrive Drive, which is the project road that directly services the fast-food restaurants, sit-down restaurant, and retail uses. Table 5 shows the change in traffic volumes expected on Thrive Drive with the proposed project.

The first step in the analysis was to assign project trips to both project driveways on Washington Boulevard (Freedom Way and Thrive Drive) and to the driveways along Thrive Drive. As discussed in the previous section, Phase 2B in the 2017 Plan is expected to generate more traffic than the 2015 Plan. Because the fast-food restaurants and retail buildings are served primarily by Thrive Drive, peak hour traffic volumes on Thrive Drive are the same or higher with the proposed plan as shown in Table 5.

Table 5 – Thrive Drive Traffic Volumes

	Weekday AM Peak Hour		Weekday PM Peak Hour	
	Approved Plan (2015)	Proposed Plan (2017)	Approved Plan (2015)	Proposed Plan (2017)
Right Turn from Washington Blvd to Thrive Dr	36	66	55	72
Right Turn from Thrive Dr to Washington Blvd	87	154	249	249

Source: Fehr & Peers, 2017

Figure 1 shows the projected AM and PM peak hour traffic projections at the driveways along Thrive Drive assuming buildout of the proposed project.

Table 6 presents the resulting peak hour levels of service at the study intersections, and Table 7 presents the average maximum queue lengths during both peak hours. As shown, traffic operations are acceptable during the AM peak hour since all intersections operate at LOS B or better and maximum queue lengths in turn pockets are less than the storage lengths.

Table 6 - Intersection Level of Service – Buildout of Proposed Project			
Intersection	Control	AM Peak Hour	PM Peak Hour
Washington Blvd/Thrive Dr	Side Street Stop	B (WB RT)	D (WB RT)
West Driveway/Thrive Dr	Side Street Stop	A (SB RT)	A (SB RT)
East Driveway/Thrive Dr	Side Street Stop	A (SB LT)	A (NB LT)
Pride Way/Thrive Dr	Side Street Stop	B (NB LT)	A (NB LT)
Note: For side street stop control, LOS is reported for the highest controlled movement. Source: Fehr & Peers, 2017			

Table 7 - Average Maximum Queue Length – Buildout of Proposed Project			
Movement	Storage	AM Peak Hour	PM Peak Hour
Northbound Washington Blvd at Blue Oaks Blvd	425	250	375
Westbound Thrive Drive at Washington Blvd	225	125	300
Eastbound Left Thrive Drive at West Driveway	60	50	50
Eastbound Left Thrive Drive at East Driveway	60	25	25
Northbound Pride Way at Thrive Drive	235	225	150
Note: Queue length is reported in feet. Bold and underline font indicates that the average maximum queue length exceeds the storage. Source: Fehr & Peers, 2017			

During the PM peak hour, the Washington Boulevard/Thrive Drive intersection would operate at LOS D and the other intersections would operate at LOS A. The average maximum queue lengths would exceed storage capacity at the westbound Thrive Drive approach to Washington Boulevard.

Closer inspection of the simulated traffic flows reveal that the northbound traffic queues on Washington Boulevard occasionally extend to Thrive Drive during the PM peak hour, thus making it difficult for motorists to turn right from Thrive Drive onto Washington Boulevard. This right-turning traffic can then back up on Thrive Drive beyond the western driveway that serves the two fast-food restaurants. As a result, the left-turning traffic from Thrive Drive into the western driveway would be blocked occasionally. As shown in Table 7, the maximum queue length of the eastbound left-turn movement into the western driveway is 50 feet, which is within the storage capacity of 60 feet. As such, this left-turn movement is not expected to cause traffic backup to Washington Boulevard. To ensure that this backup does not occur, we recommend increasing the storage length of the eastbound left-turn lane into the western driveway from 60 to 80 feet.

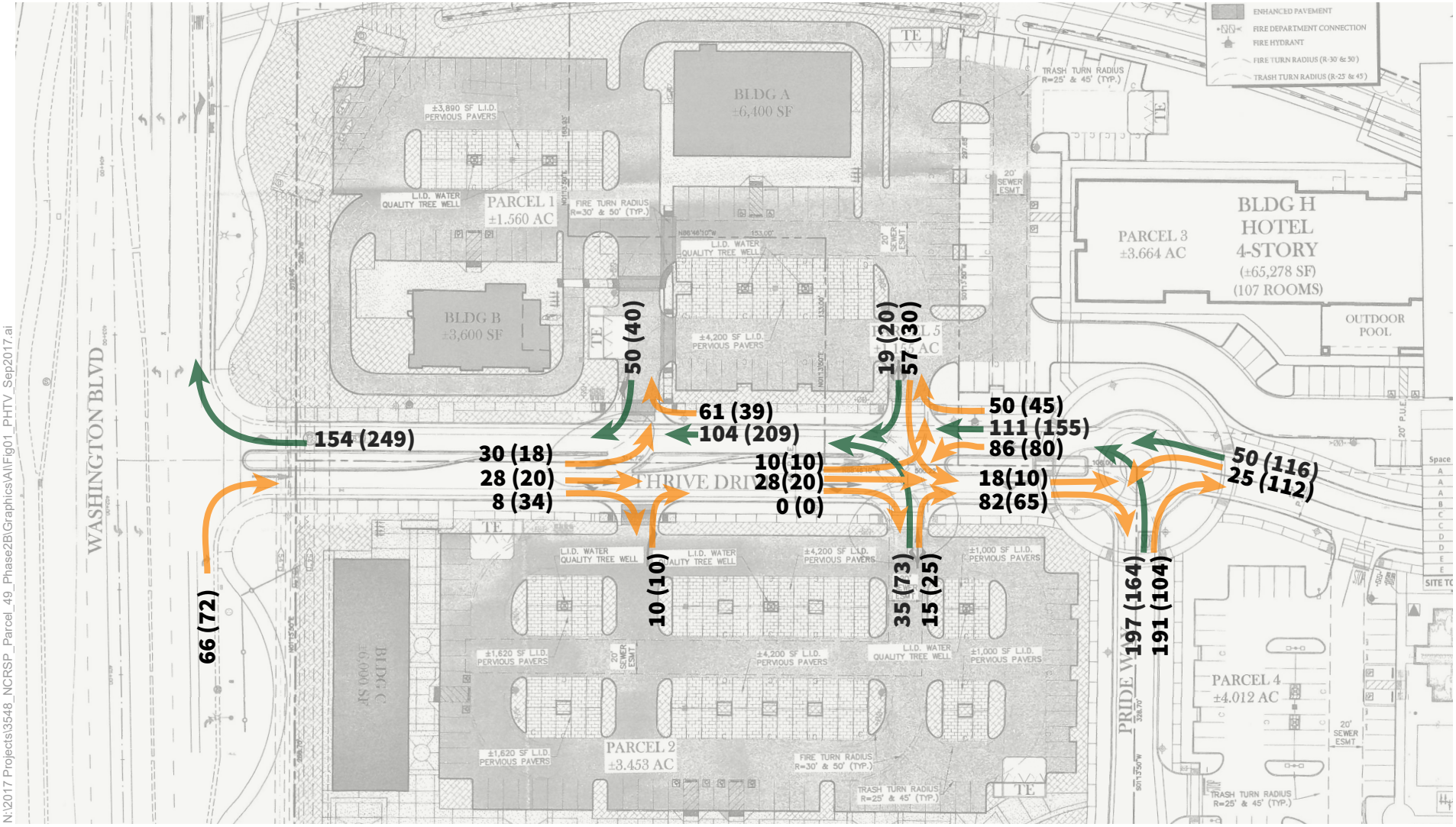

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Image Source: TSD Engineering Inc.

AM(PM) Weekday Peak Hour Volume

Inbound Movement

Outbound Movement

Figure 1

Peak Hour Traffic Volumes
Baseline Plus Buildout Conditions (Weekday)