



SM ROCHA, LLC

TRAFFIC AND TRANSPORTATION CONSULTANTS

TO: Loren Moreland
Classic Homes

FROM: Brandon Wilson, EIT
Zac Trotter, EIT
SM ROCHA, LLC

DATE: May 31, 2024

SUBJECT: PrairieRidge Filing No.1 Preliminary Plan – Commercial Right-In-Only Access on Vollmer Road

MEMORANDUM

This memorandum is provided to summarize our analysis for consideration of a right-in-only access drive from Vollmer Road, providing access to the commercial portion of the PrairieRidge Filing No. 1 Preliminary Plan, located in El Paso County, Colorado.

Analysis Objective

- Referencing the PrairieRidge Filing No.1 Preliminary Plan Traffic Impact Study¹, re-evaluate site distribution with consideration of the right-in-only commercial access.
- Assess southbound vehicle queue lengths along Vollmer Road approaching Briargate Parkway, to verify if there is potential for vehicles to stack to, or beyond, the proposed right-in-only intersection with Vollmer Road.
- Analyze auxiliary lane requirements along Vollmer Road at the proposed right-in-only access.
- Based on the objectives described above, a determination of access viability will be made.

Site Development Background

Land for the development is vacant and surrounded predominantly by existing or proposed residential land uses.

As described and analyzed within the PrairieRidge Filing No.1 Preliminary Plan Traffic Impact Study, the overall preliminary plan is understood to accommodate a maximum of 450 single-family dwelling units and approximately 4.5 acres of commercial land uses.

¹ PrairieRidge Filing No.1 Preliminary Plan Traffic Impact Study, SM ROCHA, LLC, March 21, 2024.

Access to the commercial area of development is being proposed at the following locations:

- One previously analyzed right-in/right-out access onto the future Briargate Parkway (referred to as Commercial Access per the PrairieRidge Filing No.1 Preliminary Plan Traffic Impact Study).
- One newly proposed right-in-only access from Vollmer Road (referred to as Vollmer Access).

Existing and Committed Surface Transportation Network

As described within the PrairieRidge Filing No.1 Preliminary Plan Traffic Impact Study, Vollmer Road and Briargate Parkway are the primary roadways that will accommodate traffic to and from the proposed development. A brief description of each roadway, based on the County's 2016 Major Transportation Corridors Plan (MTCP)² and the County's Engineering Criteria Manual (ECM)³, as well as the City of Colorado Springs' Major Thoroughfare Plan⁴, is provided below:

Vollmer Road is a north-south, minor arterial roadway having two through lanes (one lane in each direction) with shared turn lanes at the intersections within the study area. Vollmer Road provides a posted speed limit of 45 MPH.

Pursuant to the County's 2040 MTCP Roadway Plan, Vollmer Road is envisioned to be widened from two to four through lanes from Briargate Parkway to Marksheffel Road, and remain as a two-lane roadway north of Briargate Parkway. Recently approved traffic studies^{5,6} for area development on the east side of Vollmer Road have proposed a modification to the MTCP Roadway Plan, recommending the widening of Vollmer Road to four through lanes between Briargate Parkway and Poco Road. The intermediate vision of Vollmer Road would remain as a two-lane roadway north of Poco Road and remain two lanes through the industrial segment south of Dines Boulevard and north of Sterling Ranch Filing 2.

Briargate Parkway is a future east-west, four-lane principal arterial roadway. Briargate Parkway design plans, for the portion east of Vollmer Road to Sterling Ranch Road, are understood to be under County review. The Briargate Parkway extension west of Vollmer Road to Black Forest Road, and ultimately to N Powers Boulevard, will be completed through various future private development or public improvement projects. Briargate Parkway is envisioned to provide a posted speed limit of 45 MPH.

² El Paso County 2016 Major Transportation Corridors Plan Update, Felsburg Holt & Ullevig, December 2016.

³ El Paso County Engineering Criteria Manual, El Paso County, October 2020.

⁴ Major Thoroughfare Plan, City of Colorado Springs, August 2011.

⁵ The Retreat at Timber Ridge Preliminary Plan Transportation Memorandum, LSC Transportation Consultants Inc., June 29, 2018.

⁶ Homestead North Phase 1 Updated Traffic Impact Study, LSC Transportation Consultants Inc., January 11, 2022.

The study intersections along Vollmer Road currently operate under stop-controlled conditions. A stop-controlled intersection is defined as a roadway intersection where vehicle rights-of-way are controlled by one or more “STOP” signs.

Access Spacing - PrairieRidge Filing No.1 Preliminary Plan

The PrairieRidge Filing No.1 Preliminary Plan proposes approximately 630 feet of spacing along Vollmer Road from Briargate Parkway to proposed Vollmer Access (centerline-to-centerline) and approximately 760 feet of spacing along Vollmer Road from Sam Bass Drive to proposed Vollmer Access (centerline-to-centerline).

Access Spacing – El Paso County Engineering Criteria Manual

Pursuant to Section 2.4 of the County’s ECM, access drives shall be designed to accommodate various horizontal and vertical curve objectives, including but not limited to adequate spacing, clear sight distance requirements, and clearances from adjacent intersections.

Review of Table 2-35 of the County’s ECM indicates a minimum access spacing distance of 900 feet is required along Vollmer Road based on entering sight distance requirements for access drives. However, Table 2-35 further states how, if auxiliary lanes are present, the entering posted speed for the deceleration lane and the posted speed at the end of the acceleration lane shall be used. As a result, access spacing requirements for the proposed Vollmer Access may be less than 700 feet.

In comparison of these access spacing requirements to the latest preliminary plan, it is believed that adequate access spacing is being provided along Vollmer Road.

Trip Distribution & Assignment

As referenced in the PrairieRidge Filing No.1 Preliminary Plan Traffic Impact Study, the construction of the commercial development is assumed to occur within the build-out phase of development, to be completed by the end of Year 2040.

The overall directional distribution of site-generated traffic was re-evaluated in reference to the PrairieRidge Filing No.1 Preliminary Plan Traffic Impact Study and with consideration for the newly proposed right-in-only commercial access on Vollmer Road.

Traffic assignment is how generated and distributed vehicle trips are expected to be loaded onto the available roadway network.

Applying updated trip distribution patterns to site-generated traffic for the build-out phase of development, as represented in the PrairieRidge Filing No.1 Preliminary Plan Traffic Impact Study, provides the overall site-generated trip assignments shown in Figure 1.

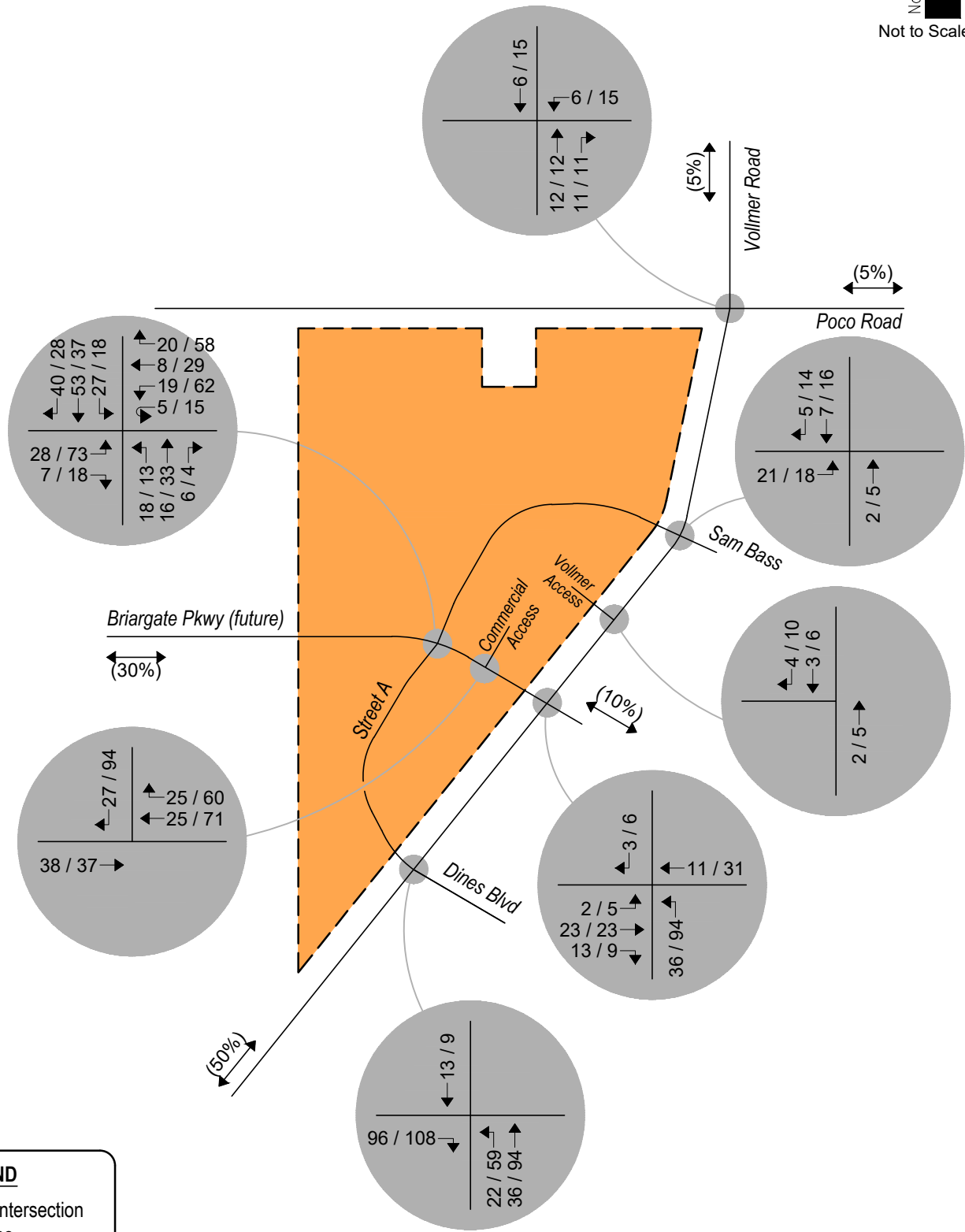


Figure 1
SITE DEVELOPMENT DISTRIBUTION - YEAR 2040
 (%): Overall
SITE-GENERATED TRIPS
 AM / PM Peak Hour



Future Traffic Conditions With Proposed Developments

Total traffic is the traffic projected to be on area roadways with consideration of the proposed development. Total traffic includes background traffic projections for Year 2040 with consideration of site-generated traffic.

Pursuant to area roadway improvement discussions provided in Section III of the PrairieRidge Filing No.1 Preliminary Plan Traffic Impact Study, Year 2040 total traffic conditions assume no additional roadway improvements to accommodate regional transportation demands. Roadway improvements associated with site development are expected to be limited to site access and frontage as required by the governing agency.

Figures 2 and 3 show projected total traffic volumes and intersection geometry for Year 2040, respectively.

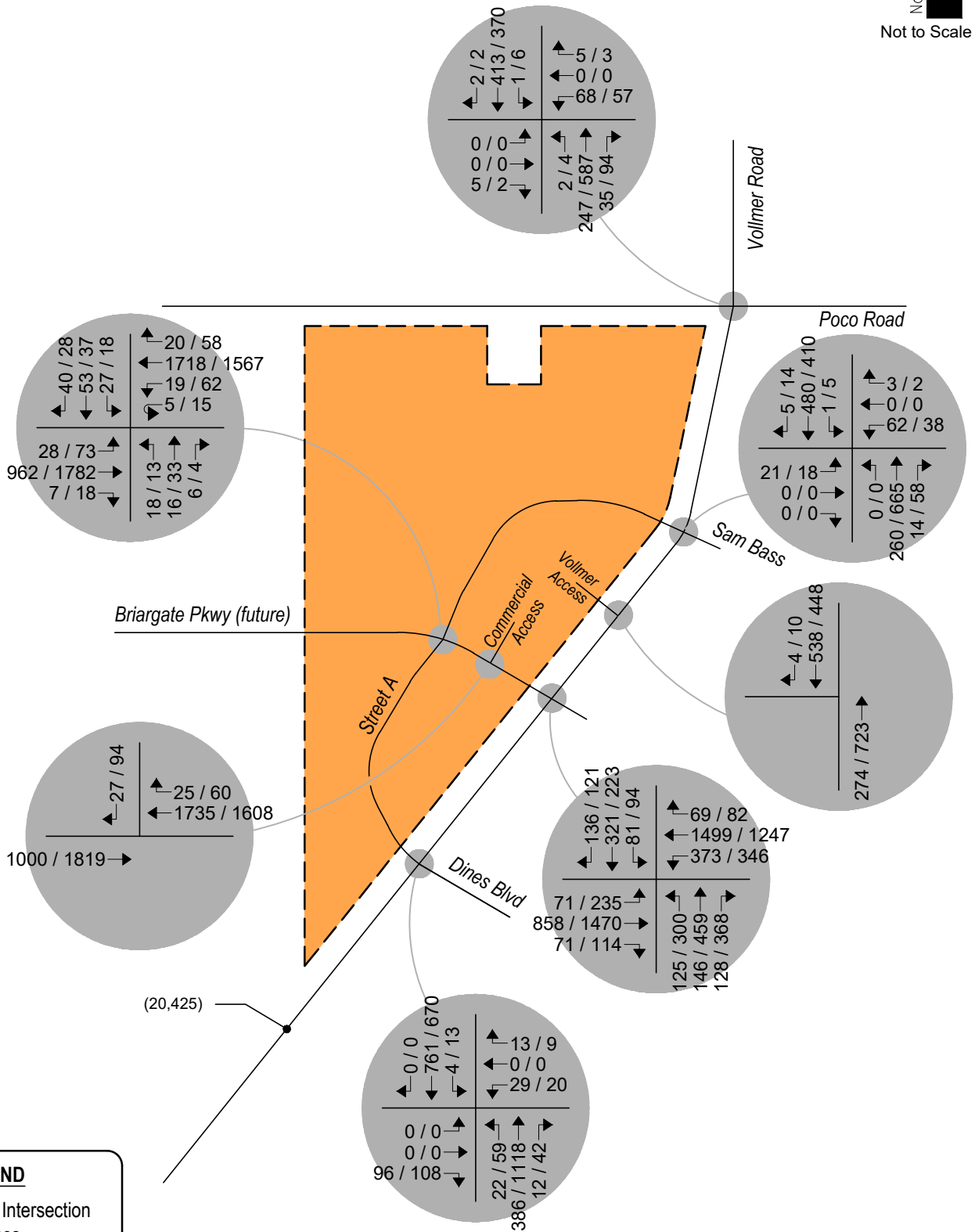


Figure 2
TOTAL TRAFFIC - YEAR 2040
 Volumes
 AM / PM Peak Hour
 (ADT) : Average Daily Traffic



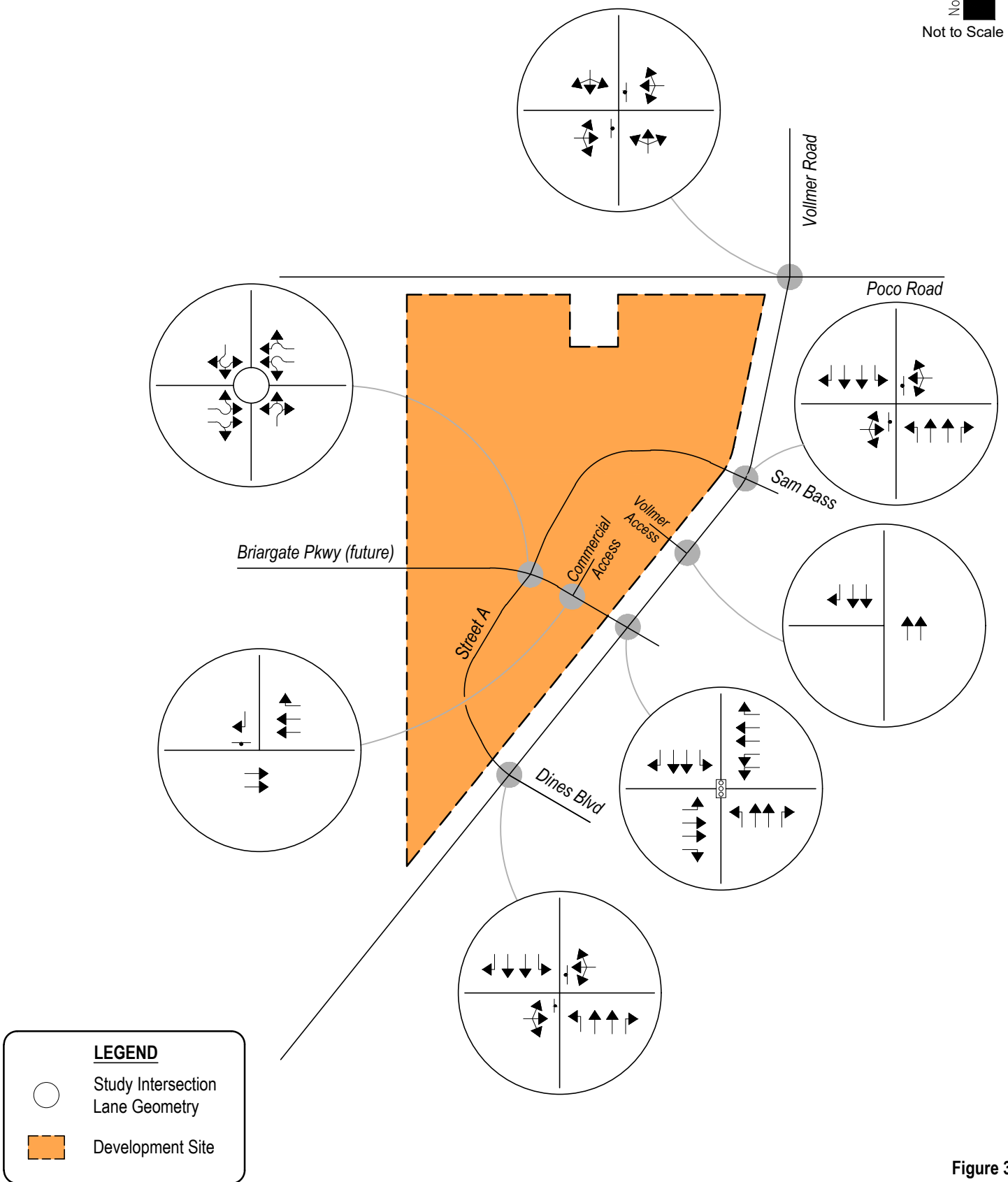


Figure 3
TOTAL TRAFFIC - YEAR 2040
 Intersection Geometry
 AM / PM Peak Hour
 (ADT) : Average Daily Traffic



Auxiliary Lane Analysis

Auxiliary lanes for the site development access are to be based on the County's ECM.

Considering development build-out, an evaluation of auxiliary lane requirements, pursuant to Section 2.3.7.D of the County's, reveals that a southbound right turn deceleration lane along Vollmer Road at the proposed right-in-only Vollmer Access is not required since the development's projected peak hour right turn ingress volume does not exceed the County's threshold of 50 VPH.

However, as discussed previously in this memorandum and pursuant to Table 2-35 of the County's ECM, a southbound right deceleration lane along Vollmer Road at the proposed right-in-only Vollmer Access will be provided.

In further review of Section 2.3.7.D of the County's ECM, acceleration lanes onto minor arterial roadways are generally not required.

Peak Hour Intersection Levels of Service – Total Traffic – Year 2040

The re-analyses and procedures described in this memorandum were performed in accordance with the Highway Capacity Manual (HCM) and are based upon the worst-case conditions that occur during a typical weekday upon build-out of site development and analyzed land uses. Therefore, study intersections are likely to operate with traffic conditions better than those described within this memorandum, which represent the peak hours of weekday operations only.

Upon re-analysis of long-term total traffic conditions, level of service (LOS) results for the intersection of Briargate Parkway and Vollmer Road remain unaffected by the newly proposed Vollmer Access, in comparison to LOS results illustrated within the PrairieRidge Filing No.1 Preliminary Plan Traffic Impact Study (LOS C and D during the morning and afternoon peak traffic hour, respectively).

The newly proposed stop-controlled intersection of Vollmer Road and Vollmer Access is projected to have turning movement operations at LOS B during both the morning and afternoon peak traffic hours.

Queue Length Analysis

Queue lengths for the study intersections were re-analyzed using Year 2040 total traffic conditions. The analysis yields estimate of 95th percentile queue lengths, which only have a five percent probability of being exceeded during the analysis time period. An average vehicle length of 25 feet was assumed. Queue lengths were modeled and are included within the Synchro worksheets in Attachment A.

Table 1 summarizes the 95th percentile queue results in comparison to the projected storage requirements for turn movements within the study area for Year 2040. Table 1 further provides recommended turn lane lengths based on minimum requirements from Section 2.3.7 of the County's ECM and projected 95th percentile queue lengths.

Table 1 – Turn Lane Queues and Storage Requirements – Total Traffic – Year 2040

Intersection	Turn Movement	Existing Turn Lane Length (feet)	AM Peak Hour	PM Peak Hour	Recommended Turn Lane Length (feet)	
			95th Percentile Queue Length (feet)	95th Percentile Queue Length (feet)		
Signalized Intersections						
Briargate Parkway / Vollmer Road	EB	L	-	47'	267'	270'
		T	-	355'	831'	-
		R	-	0'	21'	235'
	WB	L	-	207'	184'	235'
		T	-	612'	712'	-
		R	-	9'	0'	235'
	NB	L	-	141'	297'	300'
		T	-	90'	249'	-
		R	-	45'	252'	255'
	SB	L	-	97'	98'	235'
		T	-	191'	179'	-
		R	-	55'	9'	235'

Note: Turn Lane Length does not include taper length.

Table 1 shows that the maximum southbound queue length along Vollmer Road approaching Briargate Parkway is projected at 191 feet and occurs during the morning peak traffic hour.

Comparison of anticipated 95th percentile queue lengths to the latest preliminary plan continues to indicate that adequate access spacing is being provided along Vollmer Road without negatively impacting the adjacent roadway network.

Analysis Conclusion

This memorandum re-evaluated traffic impacts associated with the proposed PrairieRidge Filing No.1 Preliminary Plan with consideration of a right-in-only access drive from Vollmer Road, associated with the commercial area of development, and determined the proposed access drive's viability.

It is our professional opinion that the proposed right-in-only access onto Vollmer Road is expected to create no negative impact to traffic operations for the surrounding roadway network and study intersections. Re-analysis of site-generated traffic concludes that changes to intersection operations and 95th percentile queue lengths are minor in comparison to those analyzed within the PrairieRidge Filing No.1 Preliminary Plan Traffic Impact Study, and all conclusions presented within the referenced traffic impact study remain valid. As a result, it is our determination that the proposed Vollmer Access functions efficiently and within the County's limits.

We trust that our findings will assist in the planning and approval of the proposed right-in-only Vollmer Access associated with the commercial area of development within the PrairieRidge Filing No.1 Preliminary Plan. Please contact us should further assistance be needed.

Sincerely,

SM ROCHA, LLC

Traffic and Transportation Consultants



Zac Trotter, EIT
Traffic Engineer



Fred Lantz, PE
Traffic Engineer

ATTACHMENT A

Capacity Worksheets

Timings
4: Vollmer Road & Briargate Parkway

Total Traffic Volumes
Year 2040 - AM Peak Hour

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	858	71	373	1499	69	125	146	128	81	321	136
Future Volume (vph)	71	858	71	373	1499	69	125	146	128	81	321	136
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.091			0.950			0.274			0.651		
Satd. Flow (perm)	170	3539	1583	3433	3539	1583	510	3539	1583	1213	3539	1583
Satd. Flow (RTOR)			155			109			155			155
Lane Group Flow (vph)	77	933	77	405	1629	75	136	159	139	88	349	148
Turn Type	pm+pt	NA	Perm	Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2			6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	10.0	57.0	57.0	26.0	73.0	73.0	16.0	26.0	26.0	11.0	21.0	21.0
Total Split (%)	8.3%	47.5%	47.5%	21.7%	60.8%	60.8%	13.3%	21.7%	21.7%	9.2%	17.5%	17.5%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effct Green (s)	47.7	42.5	42.5	17.4	57.7	57.7	29.6	21.6	21.6	20.8	14.5	14.5
Actuated g/C Ratio	0.45	0.40	0.40	0.17	0.55	0.55	0.28	0.21	0.21	0.20	0.14	0.14
v/c Ratio	0.49	0.65	0.10	0.71	0.84	0.08	0.51	0.21	0.31	0.32	0.71	0.42
Control Delay (s/veh)	25.2	27.7	0.2	51.3	25.2	1.0	40.5	40.8	7.2	37.6	55.1	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	25.2	27.7	0.2	51.3	25.2	1.0	40.5	40.8	7.2	37.6	55.1	10.7
LOS	C	C	A	D	C	A	D	D	A	D	E	B
Approach Delay (s/veh)		25.6			29.4			30.0			41.3	
Approach LOS		C			C			C			D	
Queue Length 50th (ft)	20	275	0	148	507	0	79	53	0	50	131	0
Queue Length 95th (ft)	47	355	0	207	612	9	141	90	45	97	191	55
Internal Link Dist (ft)		412			884			915			549	
Turn Bay Length (ft)	375		250	375		250	500		250	250		
Base Capacity (vph)	156	1825	891	715	2387	1103	281	747	456	272	561	381
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.51	0.09	0.57	0.68	0.07	0.48	0.21	0.30	0.32	0.62	0.39

Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 105.3												
Natural Cycle: 75												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.84												

Timings
 4: Vollmer Road & Briargate Parkway

Total Traffic Volumes
 Year 2040 - AM Peak Hour

























Intersection Signal Delay (s/veh): 30.1	Intersection LOS: C
Intersection Capacity Utilization 78.1%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 4: Vollmer Road & Briargate Parkway



Timings
4: Vollmer Road & Briargate Parkway

Total Traffic Volumes
Year 2040 - PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	235	1470	114	346	1247	82	300	459	368	94	223	121
Future Volume (vph)	235	1470	114	346	1247	82	300	459	368	94	223	121
Satd. Flow (prot)	1770	3539	1583	3433	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.076			0.084			0.286			0.469		
Satd. Flow (perm)	142	3539	1583	304	3539	1583	533	3539	1583	874	3539	1583
Satd. Flow (RTOR)			155			200			238			200
Lane Group Flow (vph)	255	1598	124	376	1355	89	326	499	400	102	242	132
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Detector Phase	5	2	2	1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	23.0	58.0	58.0	16.0	51.0	51.0	32.0	30.0	30.0	16.0	14.0	14.0
Total Split (%)	19.2%	48.3%	48.3%	13.3%	42.5%	42.5%	26.7%	25.0%	25.0%	13.3%	11.7%	11.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	Max	Max	Max	Max	Min	Min	Max	Min	Min
Act Effct Green (s)	68.0	53.0	53.0	58.8	47.8	47.8	41.0	25.0	25.0	20.0	9.0	9.0
Actuated g/C Ratio	0.57	0.44	0.44	0.49	0.40	0.40	0.34	0.21	0.21	0.17	0.08	0.08
v/c Ratio	0.85	1.02	0.15	0.86	0.96	0.11	0.70	0.67	0.77	0.44	0.91	0.43
Control Delay (s/veh)	55.6	62.1	1.9	48.6	52.2	0.3	41.4	49.0	28.9	36.4	92.1	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	55.6	62.1	1.9	48.6	52.2	0.3	41.4	49.0	28.9	36.4	92.1	5.5
LOS	E	E	A	D	D	A	D	D	C	D	F	A
Approach Delay (s/veh)		57.5			49.0			40.5			56.2	
Approach LOS		E			D			D			E	
Queue Length 50th (ft)	140	~692	0	99	545	0	203	188	121	55	100	0
Queue Length 95th (ft)	#267	#831	21	#184	#712	0	297	249	#252	98	#179	9
Internal Link Dist (ft)		412			884			915			549	
Turn Bay Length (ft)	375		250	375		250	500		250	250		
Base Capacity (vph)	325	1563	785	436	1410	751	460	737	518	227	265	303
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	1.02	0.16	0.86	0.96	0.12	0.71	0.68	0.77	0.45	0.91	0.44

Intersection Summary









Cycle Length: 120
 Actuated Cycle Length: 120
 Natural Cycle: 90
 Control Type: Semi Act-Uncoord
 Maximum v/c Ratio: 1.02

Timings
 4: Vollmer Road & Briargate Parkway

Total Traffic Volumes
 Year 2040 - PM Peak Hour

Intersection Signal Delay (s/veh): 50.8	Intersection LOS: D
Intersection Capacity Utilization 90.0%	ICU Level of Service E
Analysis Period (min) 15	
~ 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.	

Splits and Phases: 4: Vollmer Road & Briargate Parkway

 Ø1 16 s	 Ø2 58 s	 Ø3 32 s	 Ø4 14 s
 Ø5 23 s	 Ø6 51 s	 Ø7 16 s	 Ø8 30 s