



ALDRIDGE TRANSPORTATION CONSULTANTS, LLC

Advanced Transportation Planning and Traffic Engineering

John M.W. Aldridge, P.E.
Colorado Licensed Professional Engineer

1082 Chimney Rock Road
Highlands Ranch, CO 80126
303-703-9112
Mobile: 303-594-4132
Email: john@atceng.com

September 23, 2020

Mr. Rod Jenkins
Jackson/Main Architecture
311 First Avenue South
Seattle, Washington 98104

Re: Traffic Letter
16091 E. Lockheed Dr., Aurora

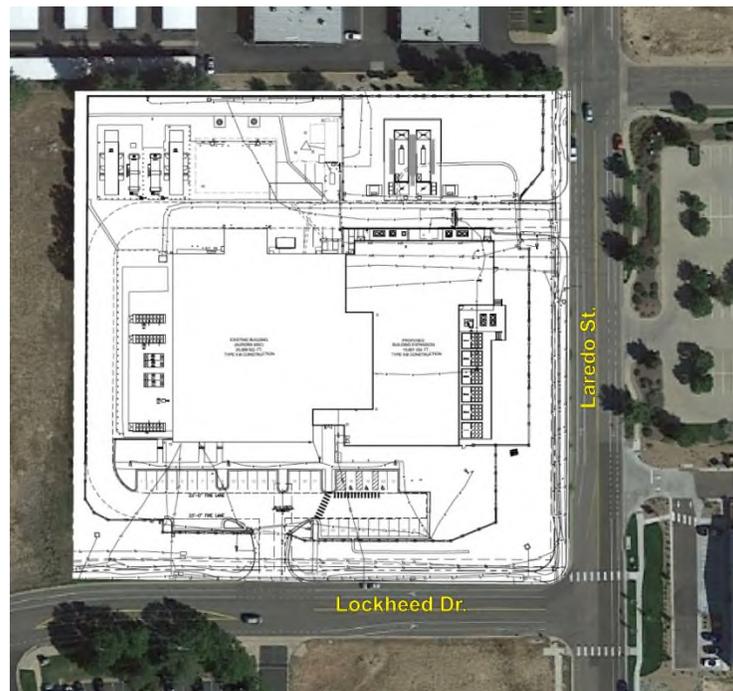
Dear Mr. Jenkins:

This letter provides a trip generation and intersection operational analysis as it pertains to the proposed expansion to the existing Verizon MSC building at 16091 E. Lockheed Dr. in Aurora. The graphic shows the location of the site, site plan, and the adjacent streets and intersections. The proposed building addition is approximately 19,000 square feet in size. Presently there are 8-10 employees at the site. With the addition it is anticipated that only 2 new employees will be added.

EXISTING CONDITIONS

Lockheed Dr. is a 2-Lane Main Street with bike lanes on both sides and parallel parking on the north side. It features a center left turn lane. It currently carries approximately 1,400 ADT and is posted at 25 mph. Laredo St. is also a Main Street with bike lanes and parallel parking on both sides. There is no center turn lane on Laredo St. It carries approximately 1,450 ADT and the posted speed is 25 mph. Note that Laredo St. terminates at a cul-de-sac on the south end.

The intersection is stop sign controlled with stops on eastbound Lockheed Dr. and northbound Laredo St. The southbound right turn and through





movements run freely. IDAX counted the peak hour turning movements on Thursday July 30, 2020. The traffic counts are attached in the appendix.

ACCESS LOCATIONS

Two full-movement access locations are existing and gated. One is on Lockheed Dr. and the other is on Laredo St. No changes to the access locations and type are being proposed with this expansion.

TRIP GENERATION

The Verizon MSC building a switch station that functions as an office building. The trip generation is small with only 8-10 employees and an additional 2 employees with the expansion is too small to be meaningfully evaluated in terms of level of service impacts.

Trip Generation Worksheet								
ITE CODE	LAND USE	UNIT	QUANTITY	ADT	AM		PM	
					IN	OUT	IN	OUT
710	General Office	Employees	12	9.74	0.31	0.06	0.08	0.32
				117	4	1	1	4
Total Trips				117	4	1	1	4

FUTURE CONDITIONS

There are no forecast volumes for the adjacent streets and intersections. In the absence of these, the 2040 volumes are factored assuming a 2 percent increase per annum. That would put the ADT on Lockheed at 2,100 and on Laredo, 2,125.

TRAFFIC OPERATIONS EVALUATION

The present stop sign control is unique with northbound and eastbound stop signs. This is not a configuration analyzable by Synchro. The City suggested making this an all-way stop sign-controlled intersection. There is also the option of removing the northbound stop sign to make it a standard configuration. The Synchro analyses of the all-way and standard stop sign-controlled intersections reports a Level of Service (LOS) A in all configurations with the 1.5 growth factor for the 2040 AM and PM peak hours. The Synchro reports are attached for reference.

FINDINGS and RECOMMENDATIONS

Based on the analysis herein and in my professional opinion, the impact of the proposed expansion is insignificant and cannot be measured meaningfully. The current traffic control configuration functions acceptably however, the northbound stop sign could be removed to make it more standard without experiencing any safety issues. An all-way stop sign-controlled intersection would also operate at LOS A in the 2040 conditions but with questionable benefits as the southbound movement would be unduly delayed.

An all-way stop controlled intersection has no operational benefit but would cause unnecessary delays on the southbound movement. A standard traffic control configuration would be only marginally better than the present control but should be considered when the further development is initiated on the lots to the south of the intersection.



ATC appreciates the opportunity to be of service. Please call if you have any questions. We can be reached at 303-703-9112.

Respectfully submitted,

Aldridge Transportation Consultants, LLC

John M.W. Aldridge, P.E.
Principal



ATC is professional service firm specializing in traffic engineering and transportation planning. ATC's principal, John M.W. Aldridge, is a Colorado licensed professional engineer. In the past 20 years, ATC has prepared over 1,000 traffic impact studies, designed over 100 traffic signals, and has provided expert witness testimony on engineering design and access issues on multi-million-dollar interchange and highway projects in Kansas and Colorado.

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Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	44	8	2	4	5	50
Future Vol, veh/h	44	8	2	4	5	50
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	72	13	3	7	8	82
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.7	7.3	6.9
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	33%	85%	0%
Vol Thru, %	67%	0%	9%
Vol Right, %	0%	15%	91%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	6	52	55
LT Vol	2	44	0
Through Vol	4	0	5
RT Vol	0	8	50
Lane Flow Rate	10	85	90
Geometry Grp	1	1	1
Degree of Util (X)	0.011	0.099	0.088
Departure Headway (Hd)	4.218	4.184	3.543
Convergence, Y/N	Yes	Yes	Yes
Cap	843	858	1003
Service Time	2.273	2.204	1.592
HCM Lane V/C Ratio	0.012	0.099	0.09
HCM Control Delay	7.3	7.7	6.9
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0	0.3	0.3

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Intersection						
Int Delay, s/veh	4.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	44	8	2	4	5	50
Future Vol, veh/h	44	8	2	4	5	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	72	13	3	7	8	82
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	62	49	90	0	-	0
Stage 1	49	-	-	-	-	-
Stage 2	13	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	944	1020	1505	-	-	-
Stage 1	973	-	-	-	-	-
Stage 2	1010	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	942	1020	1505	-	-	-
Mov Cap-2 Maneuver	942	-	-	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	1010	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.1	2.5		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1505	-	953	-	-	
HCM Lane V/C Ratio	0.002	-	0.089	-	-	
HCM Control Delay (s)	7.4	0	9.1	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.3	-	-	

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Intersection

Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	61	0	6	7	3	70
Future Vol, veh/h	61	0	6	7	3	70
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	99	0	10	11	5	114
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8	7.5	7.1
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	46%	100%	0%
Vol Thru, %	54%	0%	4%
Vol Right, %	0%	0%	96%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	13	61	73
LT Vol	6	61	0
Through Vol	7	0	3
RT Vol	0	0	70
Lane Flow Rate	21	99	119
Geometry Grp	1	1	1
Degree of Util (X)	0.025	0.121	0.117
Departure Headway (Hd)	4.292	4.377	3.548
Convergence, Y/N	Yes	Yes	Yes
Cap	824	818	997
Service Time	2.369	2.41	1.618
HCM Lane V/C Ratio	0.025	0.121	0.119
HCM Control Delay	7.5	8	7.1
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.4	0.4

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Intersection

Int Delay, s/veh 4.2

Movement EBL EBR NBL NBT SBT SBRLane Configurations 

Traffic Vol, veh/h 61 0 6 7 3 70

Future Vol, veh/h 61 0 6 7 3 70

Conflicting Peds, #/hr 0 0 0 0 0 0

Sign Control Stop Stop Free Free Free Free

RT Channelized - None - None - None

Storage Length 0 - - - - -

Veh in Median Storage, # 0 - - 0 0 -

Grade, % 0 - - 0 0 -

Peak Hour Factor 92 92 92 92 92 92

Heavy Vehicles, % 2 2 2 2 2 2

Mvmt Flow 99 0 10 11 5 114

Major/Minor Minor2 Major1 Major2

Conflicting Flow All 93 62 119 0 - 0

Stage 1 62 - - - - -

Stage 2 31 - - - - -

Critical Hdwy 6.42 6.22 4.12 - - -

Critical Hdwy Stg 1 5.42 - - - - -

Critical Hdwy Stg 2 5.42 - - - - -

Follow-up Hdwy 3.518 3.318 2.218 - - -

Pot Cap-1 Maneuver 907 1003 1469 - - -

Stage 1 961 - - - - -

Stage 2 992 - - - - -

Platoon blocked, % - - -

Mov Cap-1 Maneuver 901 1003 1469 - - -

Mov Cap-2 Maneuver 901 - - - - -

Stage 1 954 - - - - -

Stage 2 992 - - - - -

Approach EB NB SB

HCM Control Delay, s 9.5 3.4 0

HCM LOS A

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h) 1469 - 901 - -

HCM Lane V/C Ratio 0.007 - 0.11 - -

HCM Control Delay (s) 7.5 0 9.5 - -

HCM Lane LOS A A A - -

HCM 95th %tile Q(veh) 0 - 0.4 - -