TRAFFIC IMPACT STUDY

For

MANUFACTURING COMPANY

Prepared For:

Airway Heights, WA

Prepared By:

SUNBURST ENGINEERING, P. S.
4310 S. Ball Dr.
Veradale, WA 99037

April, 2013

TRAFFIC IMPACT STUDY

Manufacturing Company at Lawson / McFarlane

Airway Heights, WA

Prepared for:

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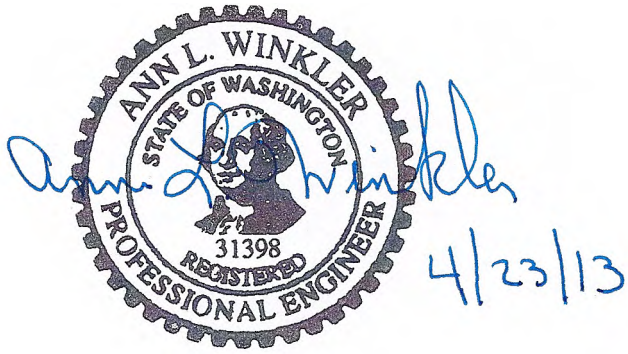
W.O. No. 1309

Prepared by:

Sunburst Engineering, P.S.
4310 South Ball Drive
Veradale, WA 99037
(509) 924-2155

This report has been prepared by the undersigned professional engineer whose seal and signature appears hereon.



Ann L. Winkler, P.E.

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Traffic Impact Study

Lawson Street / McFarlane Avenue Manufacturing Project

Airway Heights, WA

I. EXECUTIVE SUMMARY

A manufacturing company associated with the aerospace industry has shown interest in acquiring approximately 30 acres of vacant land located at the northeast corner of Lawson Street / McFarlane Avenue in Airway Heights. A vicinity map, Figure 1, shows the location of the site in relation to the rest of the city.

The company plans to develop the site in two phases, each accommodating 150,000 square feet of manufacturing area. A site plan has not yet been developed for the site, but all access is expected to Lawson Street due to the presence of a railroad track on the southern edge of the site, which blocks direct access to McFarlane Avenue. The existing zoning allows manufacturing on the site outright.

The level of service (LOS) analysis included in this study analyzed the traffic conditions during the weekday p.m. peak hour at five intersections: US 2 / Craig Road, US 2 / Lawson Street, US 2 / Hayford Road, Craig Road / McFarlane Avenue and Hayford Road / McFarlane Avenue. The analysis includes existing conditions, and future conditions both with and without the traffic from the manufacturing company.

The analysis results for the existing conditions are all intersections meet city standards. The results for future conditions are substantially influenced by the numerous vested projects. At the intersections of US 2 / Craig Road, US 2 / Hayford Road, and Hayford Road / McFarlane Avenue the level of service will fall below acceptable levels. A plan is already in place to make improvements at US 2 / Craig Road. US 2 / Hayford Road was recently improved, and all right-of-way currently available is in use. Acquiring additional right-of-way will be very expensive, and no additional improvements at the intersection itself are planned. The most beneficial improvements would be obtained by developing routes parallel to US 2, allowing traffic alternate routes than through the US 2 / Hayford Road intersections. 21st Avenue has already been identified for this purpose. At Hayford Road / McFarlane Avenue, a northbound left turn lane and a northbound acceleration lane should be constructed if acceptable level of service is to be maintained.

The additional traffic generated by the manufacturing company will require some off-site mitigation including the addition on an eastbound right turn lane on McFarlane Avenue at Hayford Road, plus a contribution toward the improvements at US 2 / Craig Road, using the city-established fee. If a transportation impact fee is established to address the US 2 / Hayford Road intersection, and portions of the manufacturing

company have not vested, payment of the fee may be required at that time. Frontage improvements to city standards may also be required on Lawson Street and/or McFarlane Avenue.

II. INTRODUCTION

The property proposed for this manufacturing company is located in the southern part of Airway Heights, at the northeast corner of Lawson Street / McFarlane Avenue. Figure 1 is a schematic of Airway Heights and locates the proposed site in relation to the rest of Airway Heights. The property is vacant and owned by the City of Airway Heights. The manufacturing company will fully develop the site in two phases, each supporting a 150,000 square foot building. Any driveways serving this site are expected to access Lawson Street. Direct access to McFarlane Avenue is blocked by a railroad track located on the southern edge of the site. At this time no site plan has been developed to more specifically locate the buildings and supporting infrastructure but the 30± acre site is large enough to accommodate 300,000 square feet of manufacturing space and necessary parking lots, drainage facilities and associated infrastructure. The land uses in the surrounding area are light industrial and municipal although there are many vacant parcels as well.

The purpose of this traffic threshold study is to supply the City of Airway Heights with the required traffic information regarding approval of the proposed manufacturing company should this site be chosen. The City of Airway Heights requested this traffic threshold study, and the study area includes five intersections which are most likely to experience level of service changes due to the increased traffic generated by the manufacturing company: US 2 / Craig Road, US 2 / Lawson Street, US 2 / Hayford Road, Craig Road / McFarlane Avenue and Hayford Road / McFarlane Avenue.

III. EXISTING CONDITIONS

Geometrics and Traffic Control

The transportation system serving the site includes a state highway, US 2 located north of the site, and two principal arterials, Craig Road to the west and Hayford Road to the east as well as two minor arterials, McFarlane Avenue and Lawson Street. Various other arterials, collectors and local access streets are also present in the area.

US 2 is a two-way state highway and principal arterial within the City of Airway Heights. It stretches through Spokane County and Washington state. The Washington State Department of Transportation (WSDOT) has also classified it as a highway of statewide significance. The posted speed limit on US 2 is 45 mph at Garfield Street and Hayford Road. Lawson Street is in the heart of Airway Heights, and the speed limit there is 35

mph. It is also 35 at Craig Road, but quickly increases to 55 mph west of there. US 2 links Fairchild Air Force Base with I-90 and the greater Spokane area. It also provides a high speed route to a number of small towns located west of Airway Heights. All major intersections on US 2 are signalized, including Hayford Road, Lawson Street and the entrance to Fairchild.

Hayford Road is a north/south, two-way, five-lane principal arterial north of US 2. A center left turn lane is present on Hayford Road between US 2 and the Spokane Raceway Park. South of US 2, the cross-section of Hayford Road narrows to one lane in each direction, although it retains its principal arterial status. It links Airway Heights with I-90 at the Medical Lake interchange and provides access to the southern side of the airport. The speed limit on Hayford Road is 35 mph in the study area.

Craig Road is a north/south, two-way, two-lane principal arterial within Airway Heights. The speed limit on Craig Road is 35 mph. It extends south of Airway Heights to Hwy 902, providing a connection to Medical Lake and I-90.

Lawson Street is a north/south, two-way, two-lane minor arterial within Airway Heights. The speed limit on Lawson Street is 30 mph. Lawson Street provides one of only two paved streets between 21st Avenue and McFarlane Avenue within the city limits. As such, it provides an important circulation route for the land uses located along McFarlane Avenue.

McFarlane Avenue is a minor arterial between Craig Road and Hayford Road. It is a two-way, two-lane facility serving various cross-streets and providing a good east-west connection to destinations south of Airway Heights. A railroad line is located on the northern border of the McFarlane Avenue right-of-way. This railroad is used by some of the bordering properties to ship goods. All of the land uses along McFarlane Avenue are industrial / municipal in nature. The speed limit on McFarlane Avenue is posted at 35 mph.

Traffic Volumes / Existing Levels of Service

This analysis examined conditions during the weekday p.m. peak hour. Peak hour turning movement counts used for the study came from either the Spokane AIR traffic impact analysis or from the Airway Heights Circulation plan. These volumes are shown on Figure 2, Existing Traffic Volumes. Using the procedures outlined in the Transportation Research Board's 2000 *Highway Capacity Manual (HCM) - Special Report 209* as implemented in the Highway Capacity Software (HCS) version 5.5, levels of service at these intersections were calculated for the existing condition and are

summarized below. More detailed information about these level of service analyses is included in the technical appendix. This analysis provides a baseline to measure future impacts against.

Table 1 - Level of Service Summary for Existing Conditions

INTERSECTION	CONTROL*	DELAY	LOS
US 2 / Craig Road	U	37.1 sec	E
US 2 / Lawson Road	S	13.1 sec	B
US 2 / Hayford Road	S	38.0 sec	D
Craig Road / McFarlane Avenue	U	11.8 sec	B
Hayford Road / McFarlane Avenue	U	15.9 sec	C

* Signalized or Unsignalized (Craig Road stops for US 2 and McFarlane stops for both cross streets)

The level of service at all intersections meet City standards, but the level of service at US 2 / Craig Road is LOS E, the lowest acceptable level of service. Additional traffic is likely to cause this intersection to fall to unacceptable levels of service before too long and this intersection is likely to first experience unacceptable level of service. A plan is already in place to install improvements at this intersection when they become necessary, and money is already being collected to facilitate this plan.

The intersection of US 2 / Hayford Road was recently improved, and these improvements have allowed it to function at acceptable level of service to date. These improvements now occupy the full available right-of-way. No additional improvements are planned at this intersection in the foreseeable future.

Multi-Model Transportation Discussion

Traffic infrastructure in the southern part of Airway Heights is minimal. The streets which are paved are sized for vehicular traffic only with no special provisions for bicycles or pedestrians, although bicycles and pedestrians are allowed on these streets. Many streets are unpaved, but again, pedestrians and bicycles are allowed on them.

A fixed transit route is in operation using US 2 north of the site. This location has half-hour headways during the weekdays and hour headways on weekends and holidays.

The site is served by rail along its southern border, and Spokane International Airport is also nearby.

IV. NO BUILD

Vested Traffic Volumes

Based upon previous discussions with the City of Airway Heights, no ambient growth rate was used for this study.

In part this is due to the extensive number of vested projects in the area. The vested projects used in this study are the same as used in the Spokane AIR study, plus the traffic generated by Spokane AIR itself. Additional information regarding these projects is included in the technical appendix. The traffic generated by these projects is shown on Figure 3.

The traffic volumes in the future including the existing traffic volumes and the additional traffic from the vested projects are shown on Figure 4 and were used to calculate level of service at the study area intersections. Table 2 summarized the level of service analysis for this scenario.

Table 2 - Level of Service Summary for Future Conditions

INTERSECTION	CONTROL*	DELAY	LOS
US 2 / Craig Road	U	Over Capacity	F
US 2 / Lawson Road	S	23.5 sec	C
US 2 / Hayford Road	S	165.4 sec	F
Craig Road / McFarlane Avenue	U	32.2 sec	D
Hayford Road / McFarlane Avenue	U	118.6 sec	F

* Signalized or Unsignalized (McFarlane stops for cross street)

The additional traffic from the vested projects adversely impacts the levels of service at the intersections of US 2 / Craig Road, US 2 / Hayford Road and Hayford Road / McFarlane Avenue which will no longer meet City standards. US 2 / Lawson Street will experience enough additional delay to fall from LOS B to LOS C but continues to meet City standards. Craig Road / McFarlane Avenue will also experience additional delay and fall from LOS B to LOS D. Both LOS C and LOS D are acceptable levels of service.

US 2 / Craig Road should be signalized and an eastbound right turn lane constructed. With these changes / improvements, the intersection will function at LOS D with 44.7 seconds of delay.

Hayford Road / McFarlane Avenue is also functioning below acceptable levels of service. To address this situation, a northbound left turn lane, and eastbound to northbound left turn acceleration lane should be constructed. With these improvements in place, the intersection would function at LOS D with 29.2 seconds of delay.

US 2 / Hayford Road, as described previously, has reached the maximum improvements allowed within the existing right-of-way. Plans are underway to provide alternate routes on the north side of US 2. Similar plans have been proposed on the south side, namely extending 21st Avenue east to Flint Road. It is clear this plan needs to be implemented soon. It may be beneficial to have Spokane Regional Transportation Council (SRTC) model the impacts of this route on US 2 volumes in order to better determine the benefits of this route development.

V. BUILD

Trip Generation

Trip generation rates and volumes for the manufacturing company are based on information published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual, 9th Edition*. This manual is a nationally recognized resource for determining trip generation characteristics for manufacturing facilities and many other land uses. Manufacturing (Land Use Category 120) represents the trip making characteristics of this manufacturing company. Estimates of weekday trip generation rates and volumes for the a.m. peak hour, p.m. peak hour and on a daily basis are summarized in Table 3.

Table 3 - Trip Generation Characteristics of the Manufacturing Facility

KSF*	A.M. Peak Hour			P.M. Peak Hour			ADT**
	Vol @ 0.73 Trips per KSF	Directional Distribution		Vol @ 0.73 Trips per KSF	Directional Distribution		Vol @ 3.82 Trips per KSF
		78% In	22% Out		36% In	64% Out	
150	110	86	24	110	40	70	573
300	219	171	48	219	79	140	1,146

* KSF - Thousand Square Feet
** ADT - Average Daily Traffic

Trip Assignment and Trip Distribution

Distribution of traffic from this manufacturing facility was based on likely routes to and from the site, existing geometric characteristics of the transportation system, road surfacing, ease of route and other factors. Overall distribution for the manufacturing facility is expected to be 20% south using Craig Road, 40% south using Hayford Road, 5% northwest using Lawson Street to US 2 and 35% to the northeast using Lawson Street to US 2 and then to Hayford Road. This is shown pictorially on Figure 5. Trips associated with the site using any forms of alternative transportation to the automobile / truck are expected to be minimal.

The traffic volumes from the manufacturing company using these assignment and distribution parameters are shown on Figure 6 for Phase 1 and Figure 8 for complete build out of the site.

Traffic Volumes with Phase 1 of Project

The traffic volumes anticipated with the completion of Phase 1 including the traffic volumes shown on Figure 4 and Figure 6 are shown on Figure 7. Level of service analyses were conducted for this level of development and the results are shown on Table 4.

Table 4 - Level of Service Summary with Phase 1 of Manufacturing Company

INTERSECTION	CONTROL*	DELAY	LOS
US 2 / Craig Road**	S	45.1 sec	D
US 2 / Lawson Road	S	23.7 sec	C
US 2 / Hayford Road	S	166.3 sec	F
Craig Road / McFarlane Avenue	U	37.0 sec	E
Hayford Road / McFarlane Avenue**	U	31.9 sec	D

* Signalized or Unsignalized (McFarlane stops for cross street)
** Intersection level of service includes mitigation proposed following Table 2

At Hayford Road / McFarlane Avenue, if the left turning treatment described after Table 2 is not implemented, the intersection will fall further into level of service F to 152.4 seconds of delay. Without the left turning treatment described after Table 2, but with a dedicated eastbound right turn lane, the intersection, although still functioning at LOS F, will have 90.2 seconds of delay, less than that shown on Table 2. Therefore, this constitutes full mitigation either with the mitigation necessary due to the vested project or without it.

With the left turning treatment described above and the eastbound right turn lane, the intersection will function at LOS C with 24.2 seconds of delay.

Traffic Volumes with Project Completed

Figure 9 shows the traffic volumes included in the area which include the full development of the manufacturing company. It includes the traffic volumes displayed on Figure 4 added with the volumes shown on Figure 8. The level of service analysis results for full development of the manufacturing company as summarized on Table 5. Table 5 includes the improvements proposed following Table 2, and the eastbound right turn lane proposed following Table 4.

Table 5 - Level of Service Summary with Completion of Manufacturing Company

INTERSECTION	CONTROL*	DELAY	LOS
US 2 / Craig Road	S	45.3 sec	D
US 2 / Lawson Road	S	23.8 sec	C
US 2 / Hayford Road	S	167.3 sec	F
Craig Road / McFarlane Avenue	U	43.3 sec	E
Hayford Road / McFarlane Avenue	U	24.0 sec	C

* Signalized or Unsignalized (McFarlane stops for cross street)

The additional traffic generated by the expansion of the manufacturing company has almost no effect on delay and level of service at Hayford Road / McFarlane Avenue, and the right turn lane continues to provide adequate mitigation. If the right turn lane is in place, but the left turning treatment has not been completed, the intersection will function at LOS F with 90.5 seconds of delay, less than the 118.6 seconds calculated on Table 2, and still providing adequate mitigation.

VI. CONCLUSIONS / RECOMMENDATIONS

Based upon the analysis, field observations, assumptions, methodologies and results which are provided in the body of this document, it is concluded that the impacts to the overall area transportation system from allowing the manufacturing company to locate at Lawson Road / McFarlane Avenue require the construction of an eastbound right turn lane on McFarlane Avenue at Hayford Road with the approval of phase 1. In addition to this direct mitigation improvement, the manufacturing company should contribute to the improvement at US 2 / Craig Road. Finally, if a fee is established to address the needs at US 2 / Hayford Road, any unvested portions of this manufacturing company should contribute to that fee also. These conclusions were reached and are documented within the body of this report.

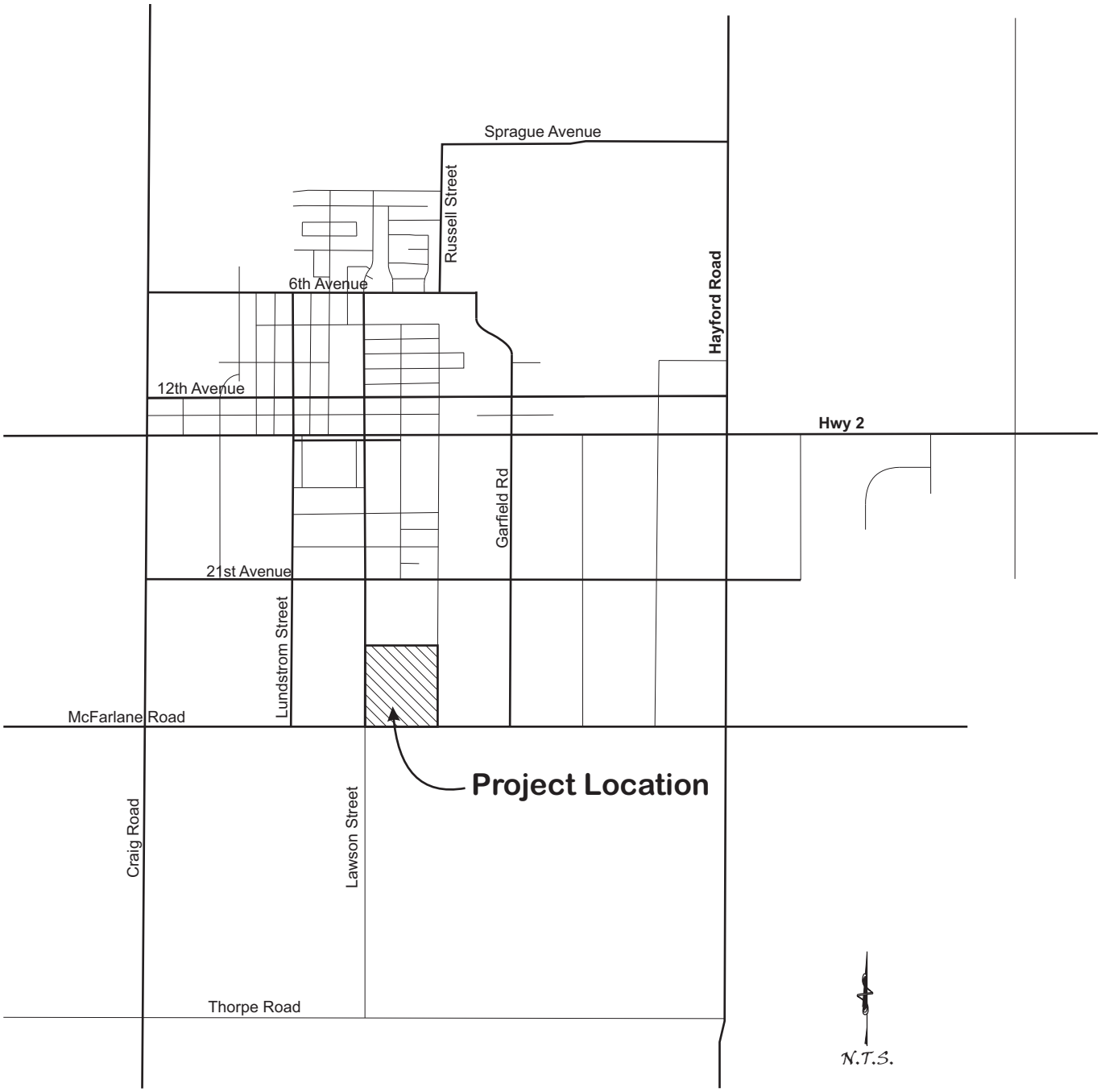
Additional conclusions were also reached, which are not directly related to the presence of the manufacturing company. These findings should be considered by city personnel for inclusion in any future infrastructure improvements.

- US 2 / Craig Road is getting close to requiring improvements. The fee structure in place to fund this improvement should continue to fund this improvement.

- A similar fee structure should be considered to address the needs of US 2 / Hayford Road.

TECHNICAL APPENDIX

TRAFFIC FIGURES



SUNBURST ENGINEERING
4310 S Ball Dr
Veradale, WA 99037
(509) 924-2155
(509) 228-9440 (Fax)
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Traffic Study

Figure 1
Vicinity Map

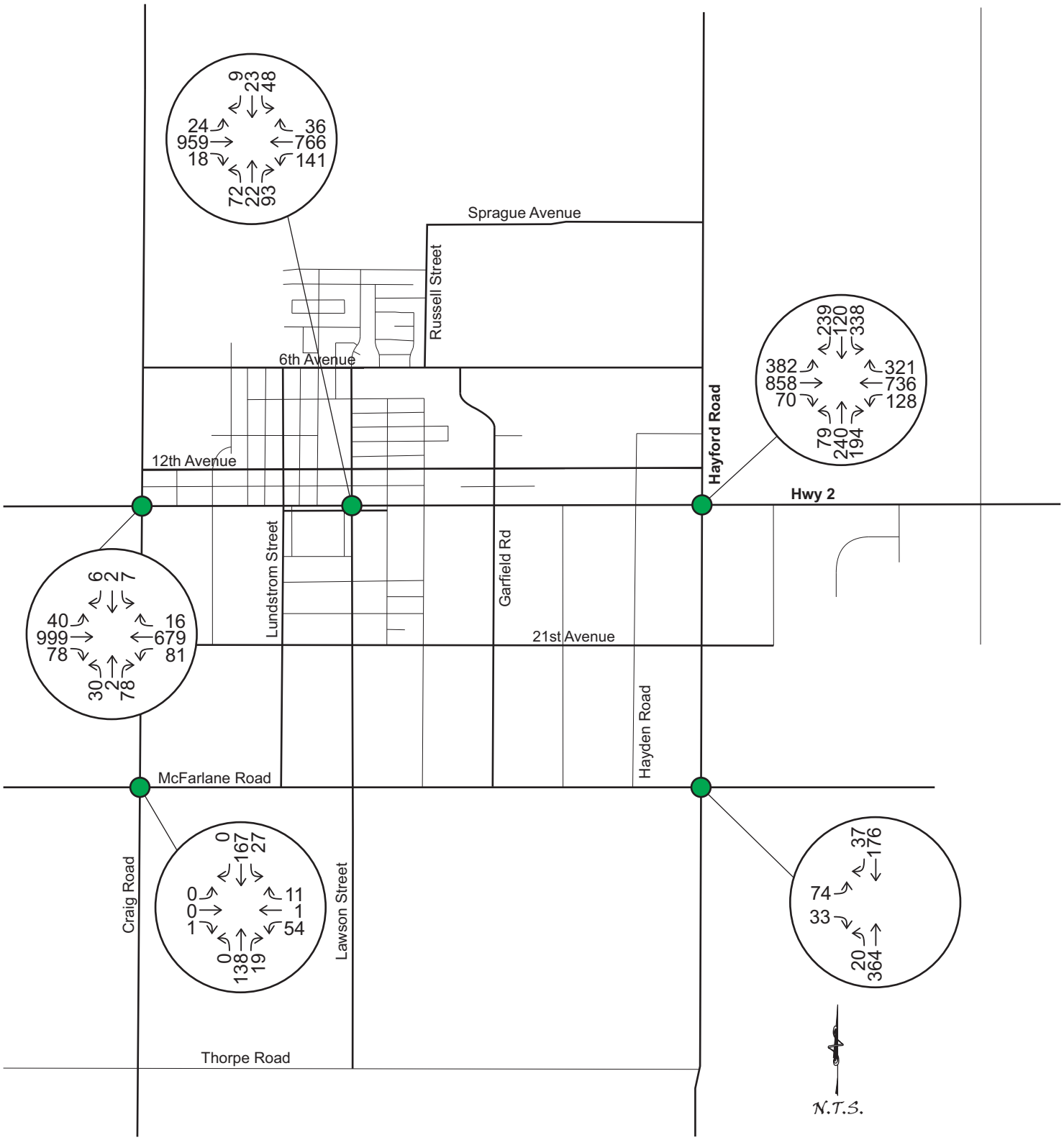

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Figure 2

Existing
P.M. Peak Hour
Traffic Volumes

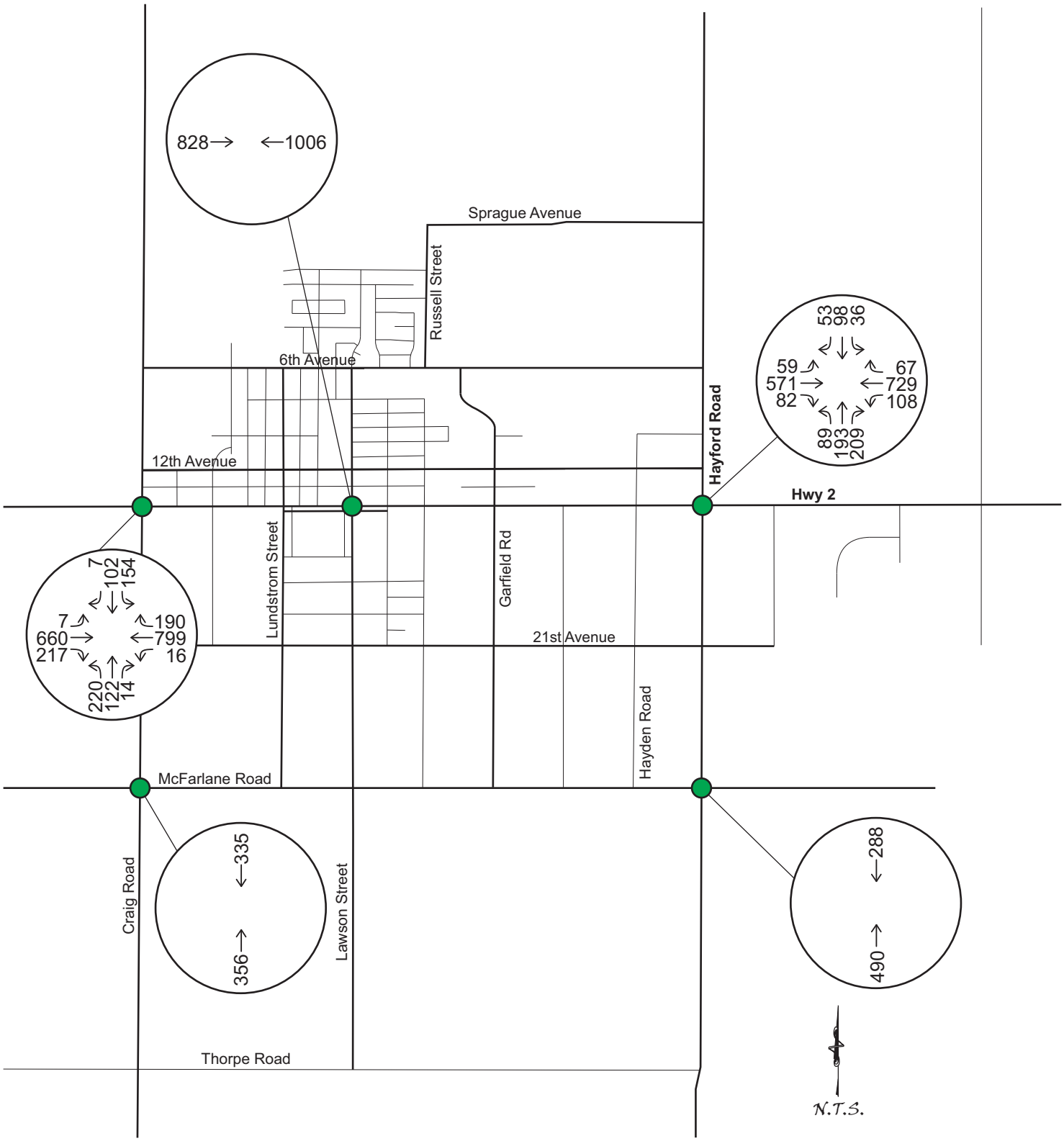

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Figure 3

Vested Projects
P.M. Peak Hour
Traffic Volumes

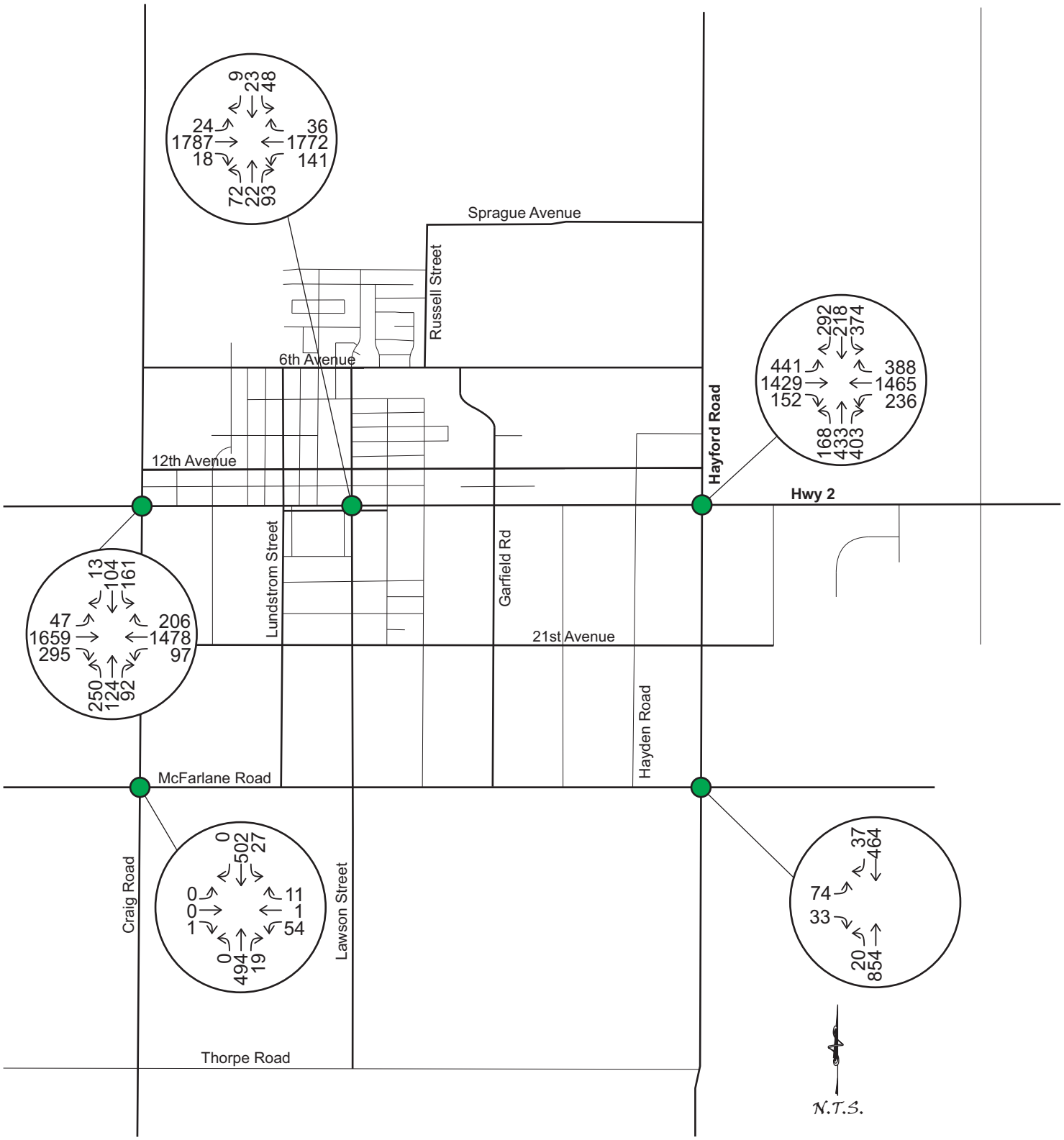

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Figure 4

Future
P.M. Peak Hour
Traffic Volumes

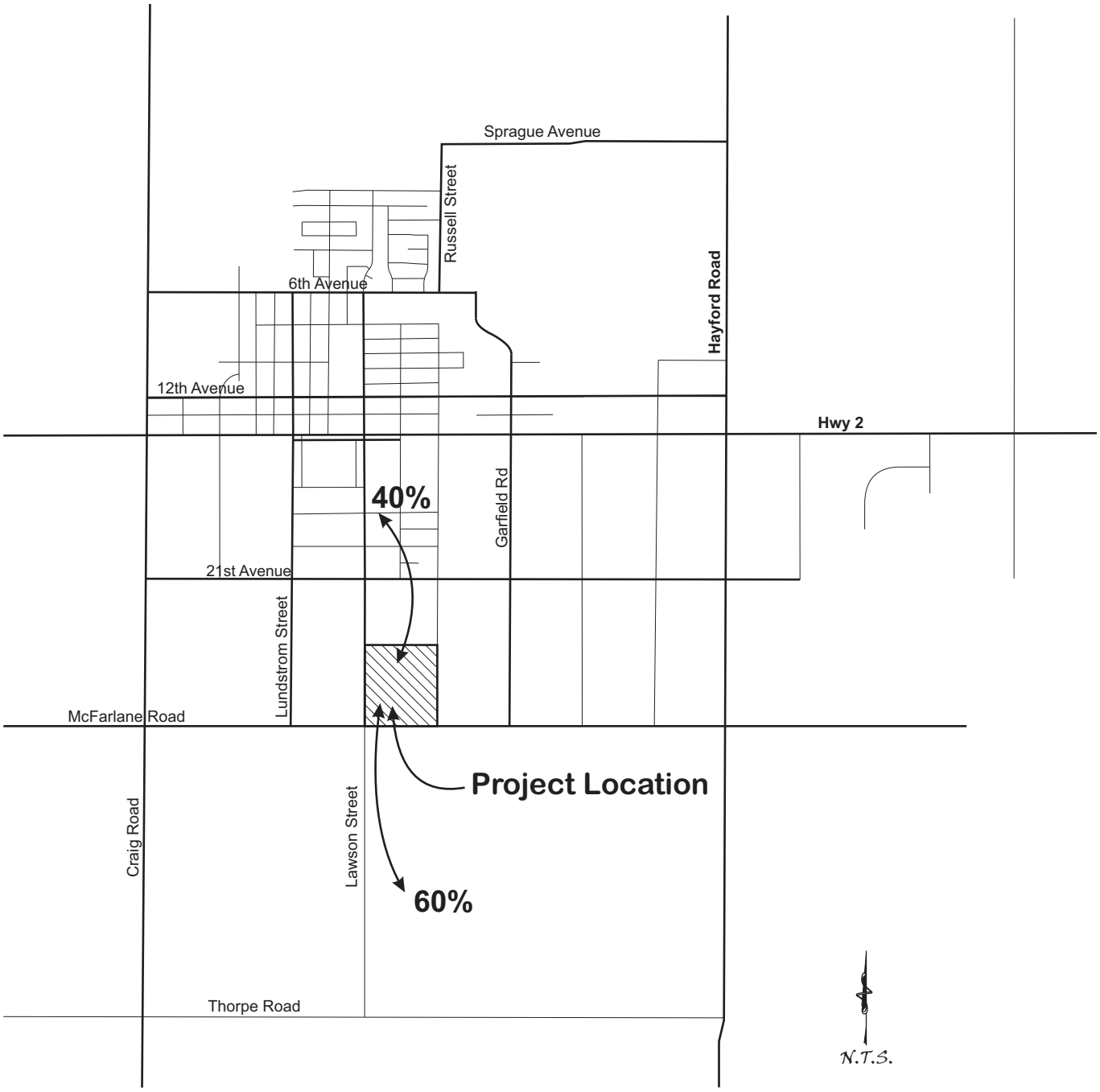

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Figure 5
Distribution Map

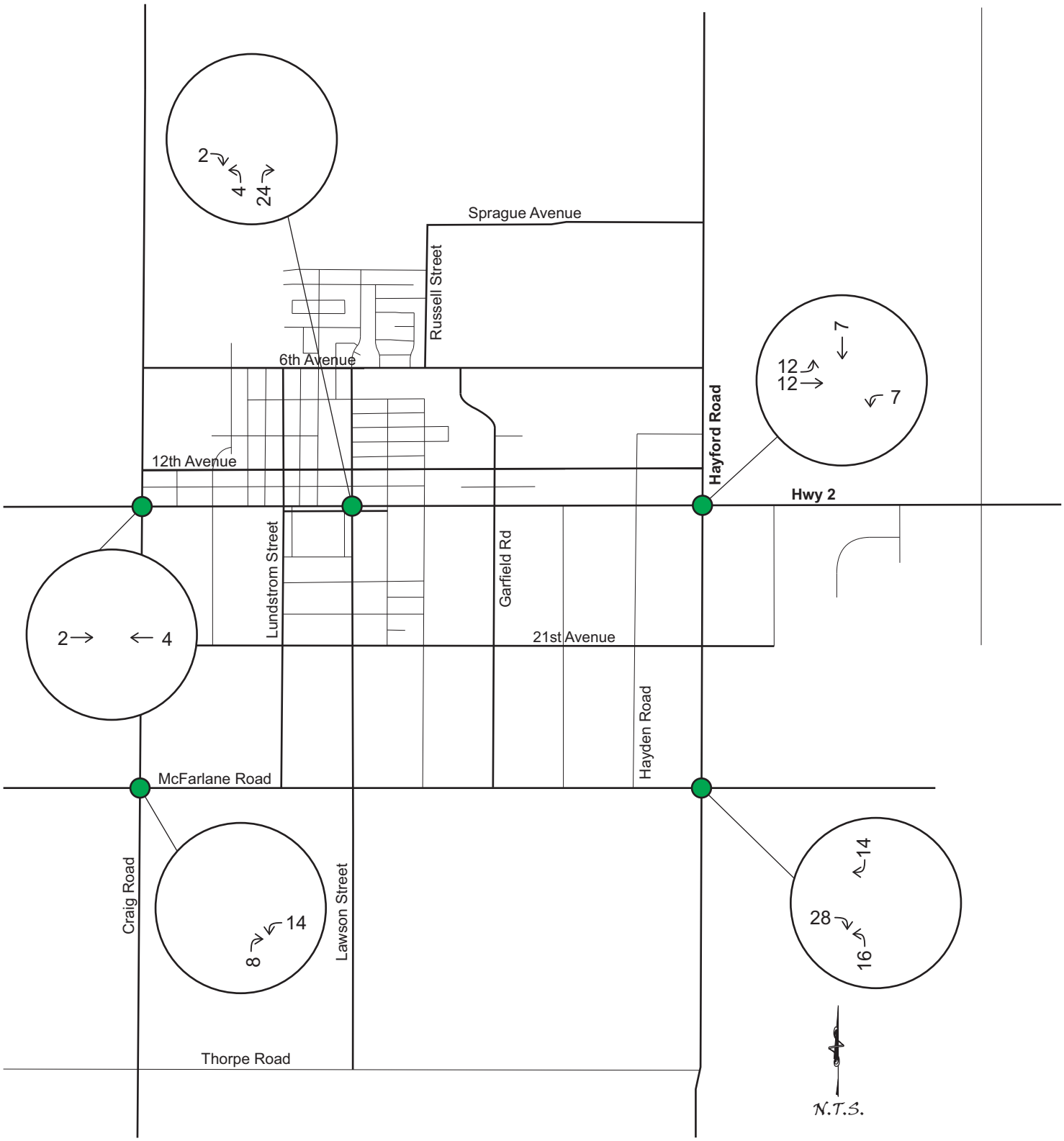

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Figure 6

Phase 1
Site Generated
P.M. Peak Hour
Traffic Volumes

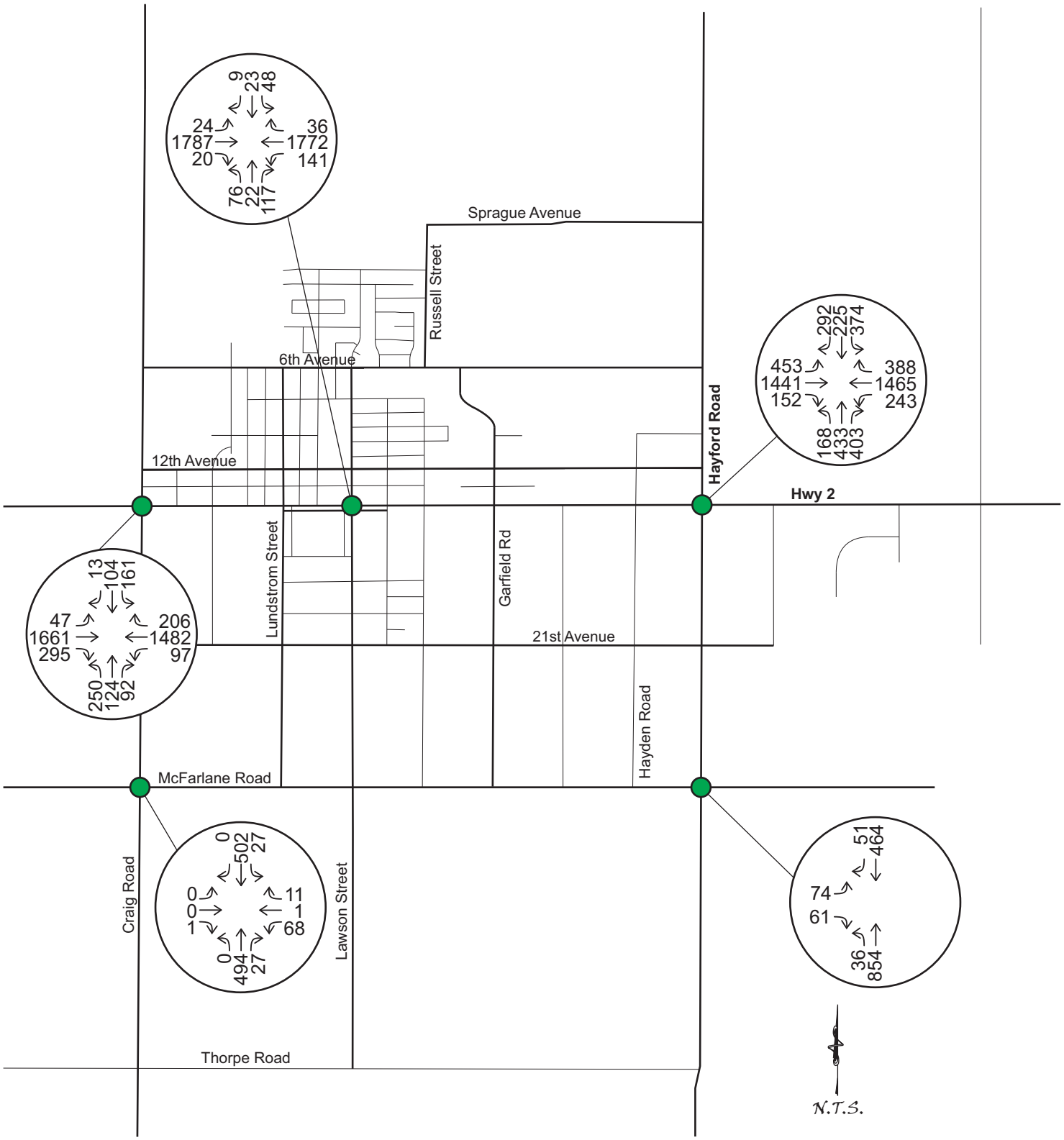

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Figure 7

Future P.M. Peak Hour Traffic Volumes with Phase 1 of Project

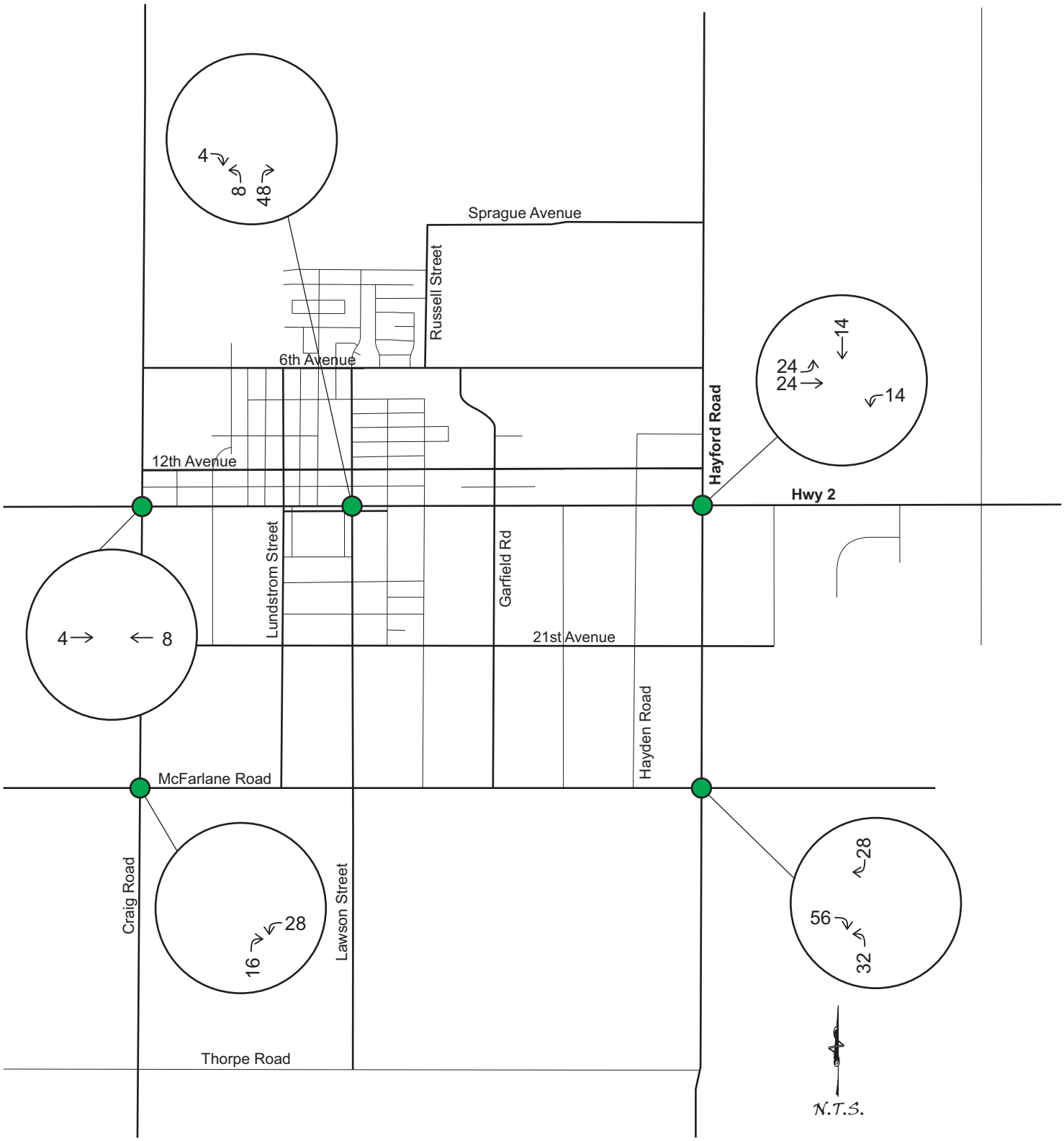

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Figure 8

Site Generated P.M. Peak Hour Traffic Volumes

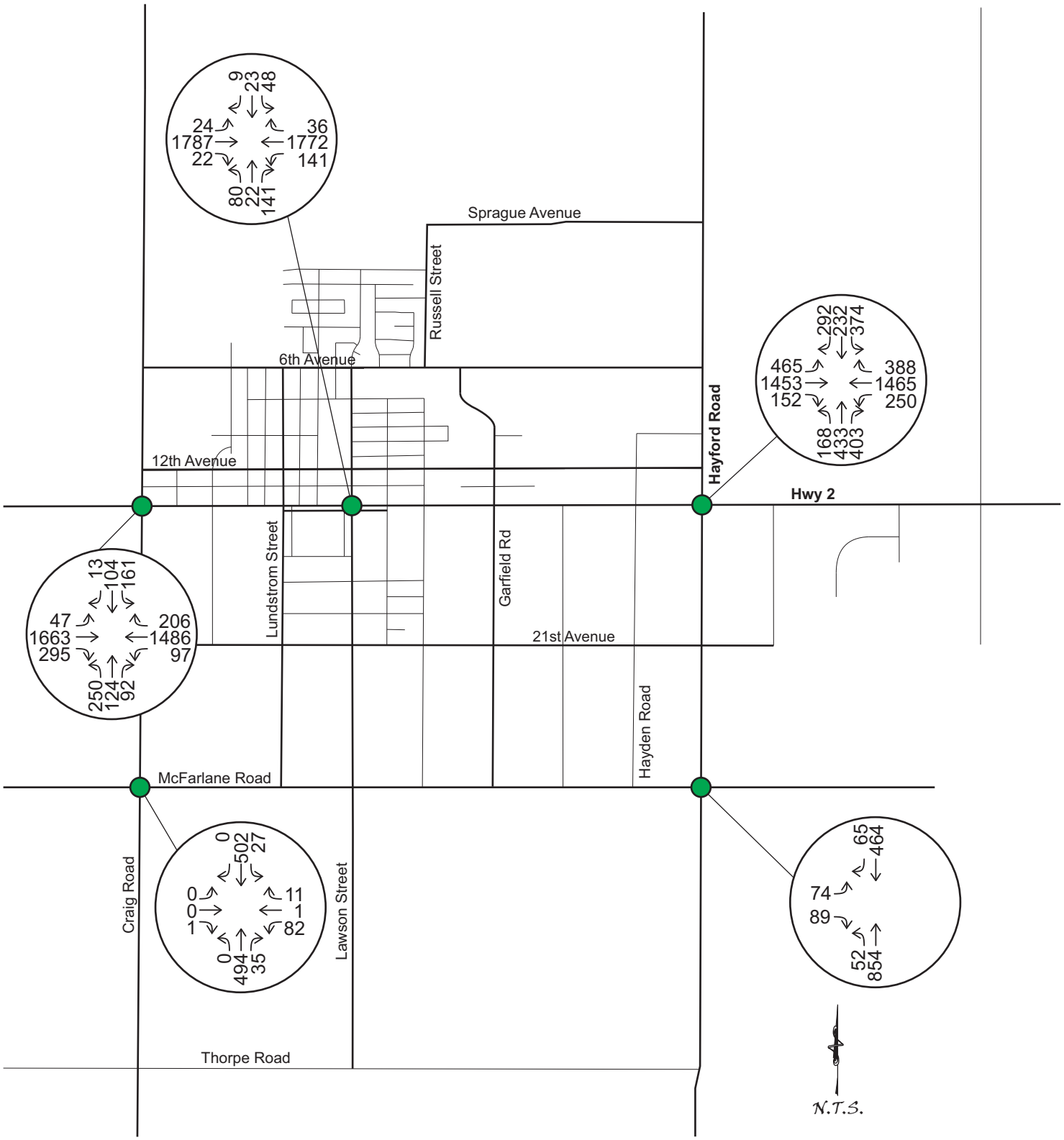

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Figure 9

Future P.M. Peak Hour Traffic Volumes with Project

SUPPLEMENTAL ANALYSIS

Supplemental Analysis -
Manufacturing Company with Existing Development Only

An additional supplemental analysis was requested as a part of this report. This analysis examines the mitigation necessary for the development of manufacturing company without any of the traffic generated by the unbuilt but vested projects. Many of these projects have been approved for ten or more years without any movement forward.

To determine the level of service for this analysis, the traffic volumes to be used were established. These include the existing traffic volumes shown on Figure 3 plus the traffic volumes associated with the manufacturing company shown on Figure 8. When combined, these volumes are shown pictorially on Figure 1A, which directly follows this analysis. Note that no ambient increase in traffic volumes was included in this report due to the number of vested projects.

Using the traffic volumes shown on Figure 1A, the level of service at the study area intersections are shown on Table 1A as follows.

Table 1A - Level of Service Summary for Existing Conditions

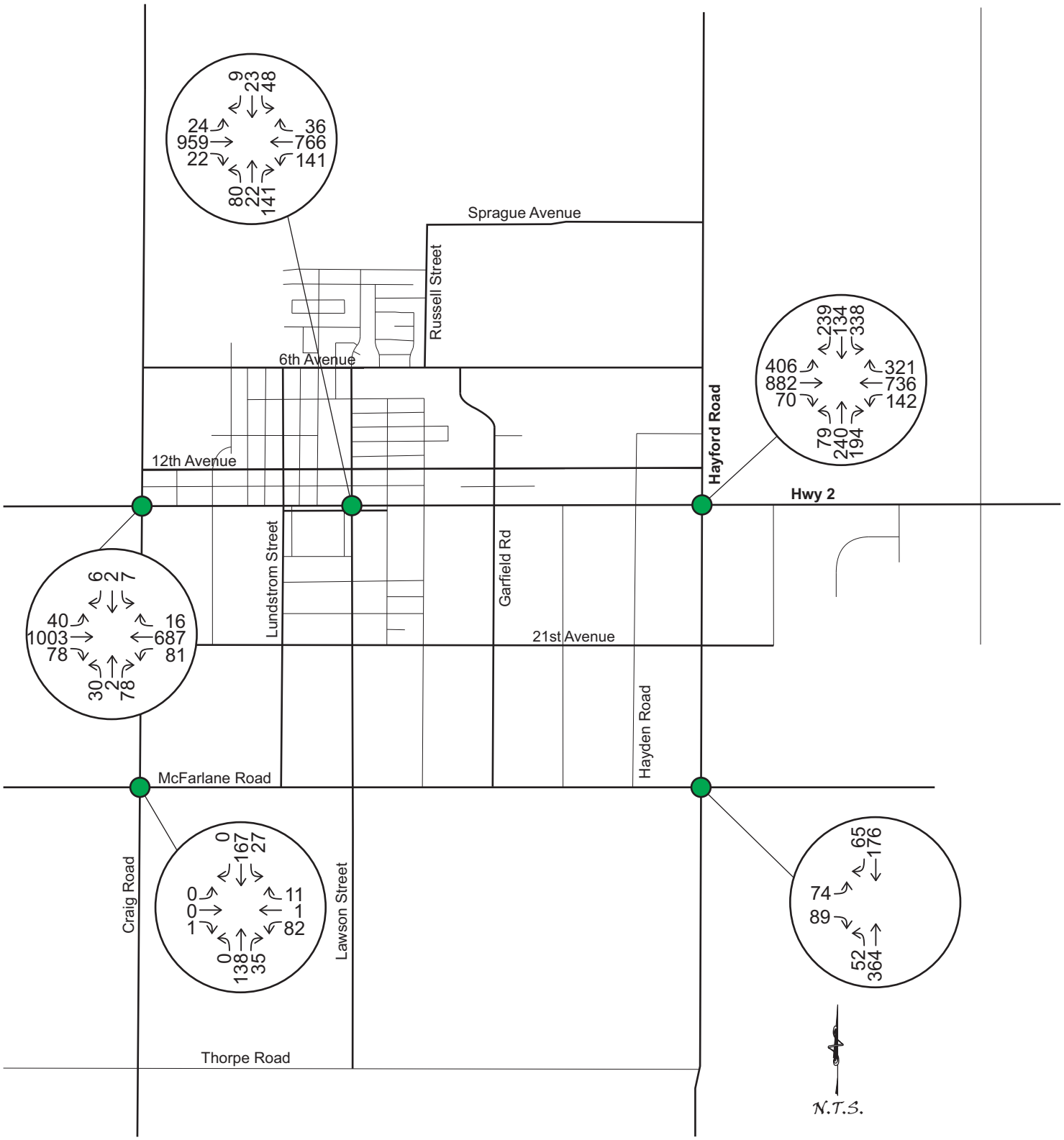
INTERSECTION	CONTROL*	DELAY	LOS
US 2 / Craig Road	U	37.4 sec	E
US 2 / Lawson Road	S	13.6 sec	B
US 2 / Hayford Road	S	38.3 sec	D
Craig Road / McFarlane Avenue	U	12.5 sec	B
Hayford Road / McFarlane Avenue	U	17.5 sec	C

* Signalized or Unsignalized (Craig Road stops for US 2 and McFarlane stops for both cross streets)

Table 1A assumes the existing geometric configure remains in place, and the intersections are operating under the existing traffic control.

Unsignalized intersections must work at LOS E or better, while signalized intersections must work at LOS D or better. <u>All of the intersections in the study area meet this criteria, so no off-site mitigation is shown as necessary in this analysis</u>.

Attached to this supplemental analysis are Figure 1A, and the level of service calculations sheets.



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(509) 228-9440 (Fax)
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Traffic Study

Figure 1A

P.M. Peak Hour Traffic Volumes With Project (No Vested Traffic)

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*ALW*	Intersection	*US 2 / Craig Rd*
Agency/Co.	*Sunburst Engineering*	Jurisdiction	*WSDOT*
Date Performed	*3/13/13*	Analysis Year	*Future w/ Project - no vested*
Analysis Time Period	*PM Peak Hour*		

Project Description *Industrial @ Lawson / McFarlane*

East/West Street: *US 2* North/South Street: *Craig Rd*

Intersection Orientation: *East-West* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*40*	*1003*	*78*	*81*	*687*	*16*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*44*	*1114*	*86*	*90*	*763*	*17*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Two Way Left Turn Lane*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*0*	*1*	*2*	*0*
Configuration	*L*	*T*	*TR*	*L*	*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*30*	*2*	*78*	*7*	*2*	*6*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*33*	*2*	*86*	*7*	*2*	*6*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*		*LTR*			*LTR*	
v (veh/h)	*44*	*90*		*121*			*15*	
C (m) (veh/h)	*846*	*589*		*246*			*126*	
v/c	*0.05*	*0.15*		*0.49*			*0.12*	
95% queue length	*0.16*	*0.54*		*2.50*			*0.39*	
Control Delay (s/veh)	*9.5*	*12.2*		*33.0*			*37.4*	
LOS	*A*	*B*		*D*			*E*	
Approach Delay (s/veh)	--	--	*33.0*			*37.4*		
Approach LOS	--	--	*D*			*E*		

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SHORT REPORT

General Information		Site Information	
Analyst	*ALW*	Intersection	*SR 2 / Lawson*
Agency or Co.	*Sunburst Engineering*	Area Type	*All other areas*
Date Performed	*3/13/13*	Jurisdiction	*WSDOT / Airway Heights*
Time Period	*PM Peak Hour*	Analysis Year	*Future w/ Project - no vested*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	1	0	1	1	0	1	1
Lane Group	L	TR		L	T	R		LT	R		LT	R
Volume (vph)	24	959	22	141	766	36	80	22	141	48	23	9
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Extension of Effective Green	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Arrival Type	3	4		3	4	3		3	3		3	3
Unit Extension	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0
Ped/Bike/RTOR Volume	0	0	0	0	0	0	0	0	20	0	0	0
Lane Width	12.0	12.0		12.0	12.0	12.0		12.0	12.0		12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0	0		0	0		0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	Thru & RT	03	04	NS Perm	06	07	08
Timing	G = 8.0	G = 40.0	G = 0.0	G = 0.0	G = 12.0	G = 0.0	G = 0.0	G = 0.0
	Y = 5.5	Y = 5	Y = 0	Y = 0	Y = 4.5	Y = 0	Y = 0	Y = 0

Duration of Analysis (hrs) = *0.25* Cycle Length C = *75.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	24	1001		144	782	37		104	123		72	9
Lane Group Capacity	193	1923		193	1930	861		220	258		225	258
v/c Ratio	0.12	0.52		0.75	0.41	0.04		0.47	0.48		0.32	0.03
Green Ratio	0.11	0.53		0.11	0.53	0.53		0.16	0.16		0.16	0.16
Uniform Delay d_1	30.3	11.3		32.5	10.4	8.4		28.6	28.6		27.9	26.6
Delay Factor k	0.11	0.13		0.30	0.11	0.11		0.11	0.11		0.11	0.11
Incremental Delay d_2	0.3	0.3		14.7	0.1	0.0		1.6	1.4		0.8	0.1
PF Factor	1.000	0.712		1.000	0.712	1.000		1.000	1.000		1.000	1.000
Control Delay	30.6	8.3		47.2	7.6	8.4		30.2	30.0		28.7	26.7
Lane Group LOS	C	A		D	A	A		C	C		C	C
Approach Delay	8.8			13.5			30.1			28.5		
Approach LOS	A			B			C			C		
Intersection Delay	13.6			Intersection LOS						B		

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SHORT REPORT

General Information		Site Information	
Analyst	*ALW*	Intersection	*US 2 / Hayford Rd*
Agency or Co.	*Sunburst Engineering*	Area Type	*All other areas*
Date Performed	*3/13/13*	Jurisdiction	*WSDOT*
Time Period	*PM Peak Hour*	Analysis Year	*Future w/ Project w/o vested*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2	2	0	1	2	1	1	2	0	1	2	0
Lane Group	L	TR		L	T	R	L	TR		L	TR	
Volume (vph)	406	882	70	142	736	321	79	240	194	338	134	239
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3	3	3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width	12.0	12.0		12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0	0	0	0		0	0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	Thru & RT	03	04	Excl. Left	SB Only	Thru & RT	08
Timing	G = 15.0	G = 30.0	G = 0.0	G = 0.0	G = 8.0	G = 10.0	G = 13.0	G = 0.0
	Y = 5	Y = 5	Y = 0	Y = 0	Y = 0	Y = 0	Y = 4	Y = 0

Duration of Analysis (hrs) = *0.25* Cycle Length C = *90.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	419	981		146	759	331	81	447		348	384	
Lane Group Capacity	584	1193		301	1206	538	160	488		361	836	
v/c Ratio	0.72	0.82		0.49	0.63	0.62	0.51	0.92		0.96	0.46	
Green Ratio	0.17	0.33		0.17	0.33	0.33	0.09	0.14		0.20	0.26	
Uniform Delay d_1	35.5	27.6		34.0	25.3	25.2	39.1	38.0		35.7	28.3	
Delay Factor k	0.28	0.36		0.11	0.21	0.20	0.11	0.43		0.47	0.11	
Incremental Delay d_2	4.2	4.8		1.2	1.1	2.1	2.6	22.1		37.8	0.4	
PF Factor	1.000	1.000		1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Control Delay	39.7	32.3		35.2	26.4	27.3	41.7	60.0		73.5	28.7	
Lane Group LOS	D	C		D	C	C	D	E		E	C	
Approach Delay	34.5			27.7			57.2			50.0		
Approach LOS	C			C			E			D		
Intersection Delay	38.3			Intersection LOS						D		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*ALW*	Intersection	*Craig Rd / McFarlane Rd*
Agency/Co.	*Sunburst Engineering*	Jurisdiction	*Airway Heights, WA*
Date Performed	*3/13/13*	Analysis Year	*Future w/ Project - no vested*
Analysis Time Period	*PM Peak Hour*		

Project Description

East/West Street: *McFarlane Rd* | North/South Street: *Craig Rd*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*138*	*35*	*27*	*167*	*0*
Peak-Hour Factor, PHF	*0.94*	*0.94*	*0.94*	*0.94*	*0.94*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*0*	*146*	*37*	*28*	*177*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*0*	*1*	*82*	*1*	*11*
Peak-Hour Factor, PHF	*0.94*	*0.94*	*0.94*	*0.94*	*0.94*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*1*	*87*	*1*	*11*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*0*	*28*		*99*			*1*	
C (m) (veh/h)	*1411*	*1404*		*580*			*871*	
v/c	*0.00*	*0.02*		*0.17*			*0.00*	
95% queue length	*0.00*	*0.06*		*0.61*			*0.00*	
Control Delay (s/veh)	*7.6*	*7.6*		*12.5*			*9.1*	
LOS	*A*	*A*		*B*			*A*	
Approach Delay (s/veh)	--	--	*12.5*			*9.1*		
Approach LOS	--	--	*B*			*A*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*ALW*	Intersection	*Hayford Rd / McFarlane Rd*
Agency/Co.	*Sunburst Engineering*	Jurisdiction	*Airway Heights, WA*
Date Performed	*3/13/13*	Analysis Year	*Future w/ Project - no vested*
Analysis Time Period	*PM Peak Hour*		

Project Description *Lawson / McFarlane Industrial Project*

East/West Street: *McFarlane Rd* | North/South Street: *Hayford Rd*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*52*	*364*			*176*	*65*
Peak-Hour Factor, PHF	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*
Hourly Flow Rate, HFR (veh/h)	*61*	*433*	*0*	*0*	*209*	*77*
Percent Heavy Vehicles	*10*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*74*		*89*			
Peak-Hour Factor, PHF	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*
Hourly Flow Rate, HFR (veh/h)	*88*	*0*	*105*	*0*	*0*	*0*
Percent Heavy Vehicles	*8*	*0*	*6*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*61*						*193*	
C (m) (veh/h)	*1232*						*479*	
v/c	*0.05*						*0.40*	
95% queue length	*0.16*						*1.92*	
Control Delay (s/veh)	*8.1*						*17.5*	
LOS	*A*						*C*	
Approach Delay (s/veh)	--	--	*17.5*					
Approach LOS	--	--	*C*					

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INFORMATION ON VESTED PROJECTS

Spokane AIR

PM Assignment Total

State Route 2/Craig Road

				8		20					
				IN		OUT					
				0	4	4					
				SBR	SBT	SBL					
51	OUT	0	EBL	TEV =			WBR	10	IN	31	
		8	EBT	99			WBT	20			
20	IN	12	EBR				WBL	0	OUT	12	
				NBL	NBT	NBR					
				31	10	0					
				OUT		IN					
				16		41					

State Route 2/Hayford Road

				59		153					
				IN		OUT					
				0	59	0					
				SBR	SBT	SBL					
31	OUT	0	EBL	TEV =			WBR	0	IN	78	
		0	EBT	535			WBT	0			
12	IN	12	EBR				WBL	78	OUT	203	
				NBL	NBT	NBR					
				31	153	203					
				OUT		IN					
				149		386					

State Route 2/Flint Road

				4		10					
				IN		OUT					
				4	0	0					
				SBR	SBT	SBL					
78	OUT	10	EBL	TEV =			WBR	0	IN	55	
		142	EBT	282			WBT	55			
203	IN	51	EBR				WBL	0	OUT	142	
				NBL	NBT	NBR					
				20	0	0					
				OUT		IN					
				51		20					

State Route 2/Spotted Road

				0		0					
				IN		OUT					
				0	0	0					
				SBR	SBT	SBL					
55	OUT	0	EBL	TEV =			WBR	0	IN	55	
		142	EBT	197			WBT	55			
142	IN	0	EBR				WBL	0	OUT	142	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				0		0					

21st Avenue/Hayford Road

				16		41					
				IN		OUT					
				0	16	0					
				SBR	SBT	SBL					
0	OUT	0	EBL	TEV =			WBR	0	IN	0	
		0	EBT	56			WBT	0			
0	IN	0	EBR				WBL	0	OUT	0	
				NBL	NBT	NBR					
				0	41	0					
				OUT		IN					
				16		41					

21st Avenue/Hayford Road

				149		386					
				IN		OUT					
				0	149	0					
				SBR	SBT	SBL					
0	OUT	0	EBL	TEV =			WBR	0	IN	0	
		0	EBT	535			WBT	0			
0	IN	0	EBR				WBL	0	OUT	0	
				NBL	NBT	NBR					
				0	386	0					
				OUT		IN					
				149		386					

21st Avenue/Flint Road

				51		20					
				IN		OUT					
				0	51	0					
				SBR	SBT	SBL					
0	OUT	0	EBL	TEV =			WBR	0	IN	0	
		0	EBT	70			WBT	0			
0	IN	0	EBR				WBL	0	OUT	0	
				NBL	NBT	NBR					
				0	20	0					
				OUT		IN					
				51		20					

21st Avenue/Spotted Road

				0		0					
				IN		OUT					
				0	0	0					
				SBR	SBT	SBL					
0	OUT	0	EBL	TEV =			WBR	0	IN	0	
		0	EBT	0			WBT	0			
0	IN	0	EBR				WBL	0	OUT	0	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				0		0					

Craig Road/Hayford Road

				16		41					
				IN		OUT					
				0	0	16					
				SBR	SBT	SBL					
0	OUT	0	EBL	TEV =			WBR	41	IN	41	
		0	EBT	56			WBT	0			
0	IN	0	EBR				WBL	0	OUT	16	
				NBL	NBT	NBR					
				0	0	0					
				OUT		IN					
				0		0					

McFarlane Road/Hayford Road

				149		386					
				IN		OUT					
				47	102	0					
				SBR	SBT	SBL					
47	OUT	122	EBL	TEV =			WBR	0	IN	0	
		0	EBT	535			WBT	0			
122	IN	0	EBR				WBL	0	OUT	0	
				NBL	NBT	NBR					
				0	264	0					
				OUT		IN					
				102		264					

EXISTING LEVEL OF SERVICE CALCULATIONS

Table 1

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*ALW*	Intersection	*US 2 / Craig Rd*
Agency/Co.	*Sunburst Engineering*	Jurisdiction	*WSDOT*
Date Performed	*3/13/13*	Analysis Year	*Existing*
Analysis Time Period	*PM Peak Hour*		

Project Description *Industrial @ Lawson / McFarlane*

East/West Street: *US 2* North/South Street: *Craig Rd*

Intersection Orientation: *East-West* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*40*	*999*	*78*	*81*	*679*	*16*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*44*	*1110*	*86*	*90*	*754*	*17*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Two Way Left Turn Lane*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*0*	*1*	*2*	*0*
Configuration	*L*	*T*	*TR*	*L*	*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*30*	*2*	*78*	*7*	*2*	*6*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*33*	*2*	*86*	*7*	*2*	*6*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*		*LTR*			*LTR*	
v (veh/h)	*44*	*90*		*121*			*15*	
C (m) (veh/h)	*853*	*591*		*248*			*127*	
v/c	*0.05*	*0.15*		*0.49*			*0.12*	
95% queue length	*0.16*	*0.53*		*2.47*			*0.39*	
Control Delay (s/veh)	*9.4*	*12.2*		*32.6*			*37.1*	
LOS	*A*	*B*		*D*			*E*	
Approach Delay (s/veh)	--	--	*32.6*			*37.1*		
Approach LOS	--	--	*D*			*E*		

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SHORT REPORT

General Information		Site Information	
Analyst	*ALW*	Intersection	*SR 2 / Lawson*
Agency or Co.	*Sunburst Engineering*	Area Type	*All other areas*
Date Performed	*3/13/13*	Jurisdiction	*WSDOT / Airway Heights*
Time Period	*PM Peak Hour*	Analysis Year	*Existing*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	1	0	1	1	0	1	1
Lane Group	L	TR		L	T	R		LT	R		LT	R
Volume (vph)	24	959	18	141	766	36	72	22	93	48	23	9
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Extension of Effective Green	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Arrival Type	3	4		3	4	3		3	3		3	3
Unit Extension	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0
Ped/Bike/RTOR Volume	0	0	0	0	0	0	0	0	20	0	0	0
Lane Width	12.0	12.0		12.0	12.0	12.0		12.0	12.0		12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0	0		0	0		0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	Thru & RT	03	04	NS Perm	06	07	08
Timing	G = 8.0	G = 40.0	G = 0.0	G = 0.0	G = 12.0	G = 0.0	G = 0.0	G = 0.0
	Y = 5.5	Y = 5	Y = 0	Y = 0	Y = 4.5	Y = 0	Y = 0	Y = 0

Duration of Analysis (hrs) = *0.25* Cycle Length C = *75.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	24	997		144	782	37		95	74		72	9
Lane Group Capacity	193	1924		193	1930	861		221	258		227	258
v/c Ratio	0.12	0.52		0.75	0.41	0.04		0.43	0.29		0.32	0.03
Green Ratio	0.11	0.53		0.11	0.53	0.53		0.16	0.16		0.16	0.16
Uniform Delay d_1	30.3	11.3		32.5	10.4	8.4		28.4	27.7		27.9	26.6
Delay Factor k	0.11	0.12		0.30	0.11	0.11		0.11	0.11		0.11	0.11
Incremental Delay d_2	0.3	0.2		14.7	0.1	0.0		1.3	0.6		0.8	0.1
PF Factor	1.000	0.712		1.000	0.712	1.000		1.000	1.000		1.000	1.000
Control Delay	30.6	8.3		47.2	7.6	8.4		29.8	28.3		28.7	26.7
Lane Group LOS	C	A		D	A	A		C	C		C	C
Approach Delay	8.8			13.5			29.1			28.5		
Approach LOS	A			B			C			C		
Intersection Delay	13.1			Intersection LOS						B		

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SHORT REPORT

General Information		Site Information	
Analyst	*ALW*	Intersection	*US 2 / Hayford Rd*
Agency or Co.	*Sunburst Engineering*	Area Type	*All other areas*
Date Performed	*3/13/13*	Jurisdiction	*WSDOT*
Time Period	*PM Peak Hour*	Analysis Year	*Existing*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2	2	0	1	2	1	1	2	0	1	2	0
Lane Group	L	TR		L	T	R	L	TR		L	TR	
Volume (vph)	382	858	70	128	736	321	79	240	194	338	120	239
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3	3	3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width	12.0	12.0		12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0	0	0	0		0	0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	Thru & RT	03	04	Excl. Left	SB Only	Thru & RT	08
Timing	G = 15.0	G = 30.0	G = 0.0	G = 0.0	G = 8.0	G = 10.0	G = 13.0	G = 0.0
	Y = 5	Y = 5	Y = 0	Y = 0	Y = 0	Y = 0	Y = 4	Y = 0

Duration of Analysis (hrs) = *0.25* Cycle Length C = *90.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	394	957		132	759	331	81	447		348	370	
Lane Group Capacity	584	1192		301	1206	538	160	488		361	832	
v/c Ratio	0.67	0.80		0.44	0.63	0.62	0.51	0.92		0.96	0.44	
Green Ratio	0.17	0.33		0.17	0.33	0.33	0.09	0.14		0.20	0.26	
Uniform Delay d_1	35.2	27.3		33.7	25.3	25.2	39.1	38.0		35.7	28.1	
Delay Factor k	0.25	0.35		0.11	0.21	0.20	0.11	0.43		0.47	0.11	
Incremental Delay d_2	3.1	4.1		1.0	1.1	2.1	2.6	22.1		37.8	0.4	
PF Factor	1.000	1.000		1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Control Delay	38.3	31.4		34.7	26.4	27.3	41.7	60.0		73.5	28.5	
Lane Group LOS	D	C		C	C	C	D	E		E	C	
Approach Delay	33.4			27.5			57.2			50.3		
Approach LOS	C			C			E			D		
Intersection Delay	38.0			Intersection LOS						D		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*ALW*	Intersection	*Craig Rd / McFarlane Rd*
Agency/Co.	*Sunburst Engineering*	Jurisdiction	*Airway Heights, WA*
Date Performed	*3/13/13*	Analysis Year	*Existing*
Analysis Time Period	*PM Peak Hour*		

Project Description

East/West Street: *McFarlane Rd*	North/South Street: *Craig Rd*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*138*	*19*	*27*	*167*	*0*
Peak-Hour Factor, PHF	*0.94*	*0.94*	*0.94*	*0.94*	*0.94*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*0*	*146*	*20*	*28*	*177*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*0*	*1*	*54*	*1*	*11*
Peak-Hour Factor, PHF	*0.94*	*0.94*	*0.94*	*0.94*	*0.94*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*1*	*57*	*1*	*11*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*0*	*28*		*69*			*1*	
C (m) (veh/h)	*1411*	*1424*		*598*			*871*	
v/c	*0.00*	*0.02*		*0.12*			*0.00*	
95% queue length	*0.00*	*0.06*		*0.39*			*0.00*	
Control Delay (s/veh)	*7.6*	*7.6*		*11.8*			*9.1*	
LOS	*A*	*A*		*B*			*A*	
Approach Delay (s/veh)	--	--	*11.8*			*9.1*		
Approach LOS	--	--	*B*			*A*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*ALW*	Intersection	*Hayford Rd / McFarlane Rd*
Agency/Co.	*Sunburst Engineering*	Jurisdiction	*Airway Heights, WA*
Date Performed	*3/13/13*	Analysis Year	*Existing*
Analysis Time Period	*PM Peak Hour*		

Project Description *Lawson / McFarlane Industrial Project*

East/West Street: *McFarlane Rd*	North/South Street: *Hayford Rd*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*20*	*364*			*176*	*37*
Peak-Hour Factor, PHF	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*
Hourly Flow Rate, HFR (veh/h)	*23*	*433*	*0*	*0*	*209*	*44*
Percent Heavy Vehicles	*10*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*74*		*33*			
Peak-Hour Factor, PHF	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*
Hourly Flow Rate, HFR (veh/h)	*88*	*0*	*39*	*0*	*0*	*0*
Percent Heavy Vehicles	*8*	*0*	*6*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*23*						*127*	
C (m) (veh/h)	*1267*						*457*	
v/c	*0.02*						*0.28*	
95% queue length	*0.06*						*1.12*	
Control Delay (s/veh)	*7.9*						*15.9*	
LOS	*A*						*C*	
Approach Delay (s/veh)	--	--				*15.9*		
Approach LOS	--	--				*C*		

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FUTURE
LEVEL OF SERVICE
CALCULATIONS

Table 2

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*ALW*	Intersection	*US 2 / Craig Rd*
Agency/Co.	*Sunburst Engineering*	Jurisdiction	*WSDOT*
Date Performed	*3/13/13*	Analysis Year	*Future w/o Project*
Analysis Time Period	*PM Peak Hour*		

Project Description *Industrial @ Lawson / McFarlane*

East/West Street: *US 2* North/South Street: *Craig Rd*

Intersection Orientation: *East-West* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*47*	*1659*	*295*	*97*	*1478*	*206*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*52*	*1843*	*327*	*107*	*1642*	*228*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Two Way Left Turn Lane*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*0*	*1*	*2*	*0*
Configuration	*L*	*T*	*TR*	*L*	*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*250*	*124*	*92*	*161*	*104*	*13*
Peak-Hour Factor, PHF	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*	*0.90*
Hourly Flow Rate, HFR (veh/h)	*277*	*137*	*102*	*178*	*115*	*14*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*		*LTR*			*LTR*	
v (veh/h)	*52*	*107*		*516*			*307*	
C (m) (veh/h)	*326*	*250*		*0*			*0*	
v/c	*0.16*	*0.43*						
95% queue length	*0.56*	*2.02*						
Control Delay (s/veh)	*18.1*	*29.8*						
LOS	*C*	*D*		*F*			*F*	
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

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SHORT REPORT

General Information		Site Information	
Analyst	*ALW*	Intersection	*SR 2 / Lawson*
Agency or Co.	*Sunburst Engineering*	Area Type	*All other areas*
Date Performed	*3/13/13*	Jurisdiction	*WSDOT / Airway Heights*
Time Period	*PM Peak Hour*	Analysis Year	*Future w/o Project*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	1	0	1	1	0	1	1
Lane Group	L	TR		L	T	R		LT	R		LT	R
Volume (vph)	24	1787	18	141	1772	36	72	22	93	48	23	9
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Extension of Effective Green	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Arrival Type	3	4		3	4	3		3	3		3	3
Unit Extension	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0
Ped/Bike/RTOR Volume	0	0	0	0	0	0	0	0	20	0	0	0
Lane Width	12.0	12.0		12.0	12.0	12.0		12.0	12.0		12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0	0		0	0		0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	Thru & RT	03	04	NS Perm	06	07	08
Timing	G = 8.0	G = 40.0	G = 0.0	G = 0.0	G = 12.0	G = 0.0	G = 0.0	G = 0.0
	Y = 5.5	Y = 5	Y = 0	Y = 0	Y = 4.5	Y = 0	Y = 0	Y = 0

Duration of Analysis (hrs) = *0.25* Cycle Length C = *75.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	24	1841		144	1808	37		95	74		72	9
Lane Group Capacity	193	1926		193	1930	861		221	258		227	258
v/c Ratio	0.12	0.96		0.75	0.94	0.04		0.43	0.29		0.32	0.03
Green Ratio	0.11	0.53		0.11	0.53	0.53		0.16	0.16		0.16	0.16
Uniform Delay d_1	30.3	16.7		32.5	16.3	8.4		28.4	27.7		27.9	26.6
Delay Factor k	0.11	0.47		0.30	0.45	0.11		0.11	0.11		0.11	0.11
Incremental Delay d_2	0.3	11.8		14.7	9.4	0.0		1.3	0.6		0.8	0.1
PF Factor	1.000	0.712		1.000	0.712	1.000		1.000	1.000		1.000	1.000
Control Delay	30.6	23.7		47.2	21.0	8.4		29.8	28.3		28.7	26.7
Lane Group LOS	C	C		D	C	A		C	C		C	C
Approach Delay	23.8			22.7			29.1			28.5		
Approach LOS	C			C			C			C		
Intersection Delay	23.5			Intersection LOS						C		

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SHORT REPORT

General Information		Site Information	
Analyst	*ALW*	Intersection	*US 2 / Hayford Rd*
Agency or Co.	*Sunburst Engineering*	Area Type	*All other areas*
Date Performed	*3/13/13*	Jurisdiction	*WSDOT*
Time Period	*PM Peak Hour*	Analysis Year	*Future w/o Project*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2	2	0	1	2	1	1	2	0	1	2	0
Lane Group	L	TR		L	T	R	L	TR		L	TR	
Volume (vph)	441	1429	152	236	1465	388	168	433	403	374	218	292
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3	3	3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width	12.0	12.0		12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0	0	0	0		0	0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	Thru & RT	03	04	Excl. Left	SB Only	Thru & RT	08
Timing	G = 15.0	G = 30.0	G = 0.0	G = 0.0	G = 8.0	G = 10.0	G = 13.0	G = 0.0
	Y = 5	Y = 5	Y = 0	Y = 0	Y = 0	Y = 0	Y = 4	Y = 0

Duration of Analysis (hrs) = *0.25* Cycle Length C = *90.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	455	1630		243	1510	400	173	861		386	526	
Lane Group Capacity	584	1188		301	1206	538	160	485		361	845	
v/c Ratio	0.78	1.37		0.81	1.25	0.74	1.08	1.78		1.07	0.62	
Green Ratio	0.17	0.33		0.17	0.33	0.33	0.09	0.14		0.20	0.26	
Uniform Delay d_1	35.9	30.0		36.1	30.0	26.6	41.0	38.5		36.0	29.7	
Delay Factor k	0.33	0.50		0.35	0.50	0.30	0.50	0.50		0.50	0.21	
Incremental Delay d_2	6.7	172.8		14.9	120.4	5.6	94.5	357.2		67.0	1.4	
PF Factor	1.000	1.000		1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Control Delay	42.6	202.8		51.1	150.4	32.1	135.5	395.7		103.0	31.1	
Lane Group LOS	D	F		D	F	C	F	F		F	C	
Approach Delay	167.9			117.2			352.1			61.5		
Approach LOS	F			F			F			E		
Intersection Delay	165.4			Intersection LOS						F		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*ALW*	Intersection	*Craig Rd / McFarlane Rd*
Agency/Co.	*Sunburst Engineering*	Jurisdiction	*Airway Heights, WA*
Date Performed	*3/13/13*	Analysis Year	*Future w/o Project*
Analysis Time Period	*PM Peak Hour*		

Project Description

East/West Street: *McFarlane Rd*	North/South Street: *Craig Rd*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	0	494	19	27	502	0
Peak-Hour Factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Hourly Flow Rate, HFR (veh/h)	0	525	20	28	534	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LTR			LTR		
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	0	0	1	54	1	11
Peak-Hour Factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Hourly Flow Rate, HFR (veh/h)	0	0	1	57	1	11
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LTR	LTR		LTR			LTR	
v (veh/h)	0	28		69			1	
C (m) (veh/h)	1044	1034		200			550	
v/c	0.00	0.03		0.34			0.00	
95% queue length	0.00	0.08		1.45			0.01	
Control Delay (s/veh)	8.4	8.6		32.2			11.6	
LOS	A	A		D			B	
Approach Delay (s/veh)	--	--	32.2			11.6		
Approach LOS	--	--	D			B		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*ALW*	Intersection	*Hayford Rd / McFarlane Rd*
Agency/Co.	*Sunburst Engineering*	Jurisdiction	*Airway Heights, WA*
Date Performed	*3/13/13*	Analysis Year	*Future w/o Project*
Analysis Time Period	*PM Peak Hour*		

Project Description *Lawson / McFarlane Industrial Project*

East/West Street: *McFarlane Rd* | North/South Street: *Hayford Rd*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*20*	*854*			*464*	*37*
Peak-Hour Factor, PHF	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*
Hourly Flow Rate, HFR (veh/h)	*23*	*1016*	*0*	*0*	*552*	*44*
Percent Heavy Vehicles	*10*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*74*		*33*			
Peak-Hour Factor, PHF	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*
Hourly Flow Rate, HFR (veh/h)	*88*	*0*	*39*	*0*	*0*	*0*
Percent Heavy Vehicles	*8*	*0*	*6*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*23*						*127*	
C (m) (veh/h)	*942*						*138*	
v/c	*0.02*						*0.92*	
95% queue length	*0.08*						*6.25*	
Control Delay (s/veh)	*8.9*						*118.6*	
LOS	*A*						*F*	
Approach Delay (s/veh)	--	--	*118.6*					
Approach LOS	--	--	*F*					

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FUTURE
LEVEL OF SERVICE
CALCULATIONS

Following Table 2

ROUNDABOUT REPORT

General Information		Site Information	
Analyst	*ALW*	Intersection	*US 2 / Craig Rd*
Agency or Co.	*Sunburst Engineering*	E/W Street Name	*US 2*
Date Performed	*3/13/2013*	N/S Street Name	*Craig Rd*
Time Period	*PM Peak*	Analysis Year	*Future w/o Project*
Peak Hour Factor	*0.90*	Project ID	*Industrial @ Lawson / McFarlane*

Project Description:

Volume Adjustment and Site Characteristics

	EB				WB				NB				SB			
	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R	U
Number of Lanes (N)	*0*	*2*	*0*		*0*	*2*	*0*		*0*	*1*	*0*		*0*	*1*	*0*	
Lane Assignment	*LT*		*TR*		*LT*		*TR*				*LTR*				*LTR*	
Conflicting Lanes	*1*				1				2				2			
Volume (V), veh/h	*50*	*1736*	*301*	*0*	*103*	*1530*	*207*	*0*	*252*	*124*	*98*	*0*	*162*	*104*	*13*	*0*
Heavy Veh. Adj. (f_{HV}), %	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
Pedestrians Crossing	*0*				0				0				0			

Critical and Follow-Up Headway Adjustment

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)	*5.1929*	*5.1929*	*5.1929*	*5.1929*	*5.1929*	*5.1929*	*4.2929*	*4.1129*	*5.1929*	*4.2929*	*4.1129*	*5.1929*
Follow-Up Headway (sec)	*3.1858*	*3.1858*	*3.1858*	*3.1858*	*3.1858*	*3.1858*	*3.1858*	*3.1858*	*3.1858*	*3.1858*	*3.1858*	*3.1858*

Flow Computations

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Circulating Flow (V_c), pc/h	*422*			*487*			*2229*			*2157*		
Exiting Flow (V_{ex}), pc/h	*2284*			*2054*			*199*			*237*		
Entry Flow (V_e), pc/h	*961*	*1083*	*344*	*878*	*991*	*237*		*542*			*319*	
Entry Volume veh/h	*933*	*1051*	*334*	*852*	*962*	*230*		*526*			*310*	

Capacity and v/c Ratios

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Capacity (c_{PCE}), pc/h	*741*	*741*		*694*	*694*			*237*			*250*	
Capacity (*c*), veh/h	*719*	*719*		*674*	*674*			*230*			*242*	
v/c Ratio (X)	*1.30*	*1.46*		*1.26*	*1.43*			*2.29*			*1.28*	

Delay and Level of Service

	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh	*163.1*	*232.9*	*0.0*	*151.1*	*219.1*	*0.0*		*626.8*			*194.8*	
Lane LOS	*F*	*F*		*F*	*F*			*F*			*F*	
Lane 95% Queue	*36.4*	*49.5*		*32.2*	*44.2*			*41.8*			*15.8*	
Approach Delay, s/veh	*171.21*			*166.11*			*626.79*			*194.77*		
Approach LOS, s/veh	*F*			*F*			*F*			*F*		
Intersection Delay, s/veh	*216.71*											
Intersection LOS	*F*											

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SHORT REPORT

General Information		Site Information	
Analyst	*ALW*	Intersection	*US 2 / Craig Rd*
Agency or Co.	*Sunburst Engineering*	Area Type	*All other areas*
Date Performed	*3/13/2013*	Jurisdiction	*WSDOT / Airway Heights*
Time Period	*PM Peak*	Analysis Year	*Future w/o Project*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Lane Group	L	T	R	L	TR		L	TR		L	TR	
Volume (vph)	47	1659	295	97	1478	206	250	124	92	161	104	13
% Heavy Vehicles	2	2	2	2	2	2	2	2	2	2	2	2
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3	3	3	4		3	3		3	3	
Unit Extension	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	0	0	30	0	0	20	0	0	9	0	0	3
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0		12.0	12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0		0	0		0	0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	WB Only	Thru & RT	04	Excl. Left	NB Only	Thru & RT	08
Timing	G = 5.0	G = 7.0	G = 44.0	G = 0.0	G = 10.0	G = 4.0	G = 12.0	G = 0.0
	Y = 0	Y = 0	Y = 4	Y = 0	Y = 0	Y = 0	Y = 4	Y = 0

Duration of Analysis (hrs) = *0.25* Cycle Length C = *90.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	52	1843	294	108	1849		278	230		179	127	
Lane Group Capacity	98	1734	774	236	1976		275	311		197	245	
v/c Ratio	0.53	1.06	0.38	0.46	0.94		1.01	0.74		0.91	0.52	
Green Ratio	0.06	0.49	0.49	0.13	0.57		0.16	0.18		0.11	0.13	
Uniform Delay d_1	41.4	23.0	14.4	36.0	18.0		38.0	35.0		39.5	36.3	
Delay Factor k	0.13	0.50	0.11	0.11	0.45		0.50	0.30		0.43	0.12	
Incremental Delay d_2	5.4	40.5	0.3	1.4	9.1		57.1	9.1		39.7	1.9	
PF Factor	1.000	1.000	1.000	1.000	0.649		1.000	1.000		1.000	1.000	
Control Delay	46.8	63.5	14.7	37.4	20.8		95.1	44.1		79.2	38.3	
Lane Group LOS	D	E	B	D	C		F	D		E	D	
Approach Delay	56.6			21.7			72.0			62.2		
Approach LOS	E			C			E			E		
Intersection Delay	44.7			Intersection LOS						D		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*ALW*	Intersection	*Hayford Rd / McFarlane Rd*
Agency/Co.	*Sunburst Engineering*	Jurisdiction	*Airway Heights, WA*
Date Performed	*3/13/13*	Analysis Year	*Future w/o Project - MIT*
Analysis Time Period	*PM Peak Hour*		

Project Description *Lawson / McFarlane Industrial Project*

East/West Street: *McFarlane Rd* | North/South Street: *Hayford Rd*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*20*	*854*			*464*	*37*
Peak-Hour Factor, PHF	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*
Hourly Flow Rate, HFR (veh/h)	*23*	*1016*	*0*	*0*	*552*	*44*
Percent Heavy Vehicles	*10*	--	--	*0*	--	--
Median Type	*Two Way Left Turn Lane*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*0*	*1*	*0*
Configuration	*L*	*T*				*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*74*		*33*			
Peak-Hour Factor, PHF	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*
Hourly Flow Rate, HFR (veh/h)	*88*	*0*	*39*	*0*	*0*	*0*
Percent Heavy Vehicles	*8*	*0*	*6*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*						*LR*	
v (veh/h)	*23*						*127*	
C (m) (veh/h)	*942*						*273*	
v/c	*0.02*						*0.47*	
95% queue length	*0.08*						*2.32*	
Control Delay (s/veh)	*8.9*						*29.2*	
LOS	*A*						*D*	
Approach Delay (s/veh)	--	--				*29.2*		
Approach LOS	--	--				*D*		

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FUTURE
LEVEL OF SERVICE
CALCULATIONS
WITH PHASE 1

Table 4

SHORT REPORT

General Information		Site Information	
Analyst	*ALW*	Intersection	*US 2 / Craig Rd*
Agency or Co.	*Sunburst Engineering*	Area Type	*All other areas*
Date Performed	*3/13/2013*	Jurisdiction	*WSDOT / Airway Heights*
Time Period	*PM Peak*	Analysis Year	*Future w/ Phase 1*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Lane Group	L	T	R	L	TR		L	TR		L	TR	
Volume (vph)	47	1661	295	97	1482	206	250	124	92	161	104	13
% Heavy Vehicles	2	2	2	2	2	2	2	2	2	2	2	2
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3	3	3	4		3	3		3	3	
Unit Extension	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	0	0	30	0	0	20	0	0	9	0	0	3
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0		12.0	12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0		0	0		0	0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	WB Only	Thru & RT	04	Excl. Left	NB Only	Thru & RT	08
Timing	G = 5.0	G = 7.0	G = 44.0	G = 0.0	G = 10.0	G = 4.0	G = 12.0	G = 0.0
	Y = 0	Y = 0	Y = 4	Y = 0	Y = 0	Y = 0	Y = 4	Y = 0

Duration of Analysis (hrs) = *0.25* Cycle Length C = *90.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	52	1846	294	108	1854		278	230		179	127	
Lane Group Capacity	98	1734	774	236	1976		275	311		197	245	
v/c Ratio	0.53	1.06	0.38	0.46	0.94		1.01	0.74		0.91	0.52	
Green Ratio	0.06	0.49	0.49	0.13	0.57		0.16	0.18		0.11	0.13	
Uniform Delay d_1	41.4	23.0	14.4	36.0	18.0		38.0	35.0		39.5	36.3	
Delay Factor k	0.13	0.50	0.11	0.11	0.45		0.50	0.30		0.43	0.12	
Incremental Delay d_2	5.4	41.2	0.3	1.4	9.4		57.1	9.1		39.7	1.9	
PF Factor	1.000	1.000	1.000	1.000	0.649		1.000	1.000		1.000	1.000	
Control Delay	46.8	64.2	14.7	37.4	21.1		95.1	44.1		79.2	38.3	
Lane Group LOS	D	E	B	D	C		F	D		E	D	
Approach Delay	57.1			22.0			72.0			62.2		
Approach LOS	E			C			E			E		
Intersection Delay	45.1			Intersection LOS						D		

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SHORT REPORT

General Information		Site Information	
Analyst	*ALW*	Intersection	*SR 2 / Lawson*
Agency or Co.	*Sunburst Engineering*	Area Type	*All other areas*
Date Performed	*3/13/13*	Jurisdiction	*WSDOT / Airway Heights*
Time Period	*PM Peak Hour*	Analysis Year	*Future w/ Phase 1*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	1	0	1	1	0	1	1
Lane Group	L	TR		L	T	R		LT	R		LT	R
Volume (vph)	24	1787	20	141	1772	36	76	22	117	48	23	9
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Extension of Effective Green	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Arrival Type	3	4		3	4	3		3	3		3	3
Unit Extension	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0
Ped/Bike/RTOR Volume	0	0	0	0	0	0	0	0	20	0	0	0
Lane Width	12.0	12.0		12.0	12.0	12.0		12.0	12.0		12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0	0		0	0		0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	Thru & RT	03	04	NS Perm	06	07	08
Timing	G = 8.0	G = 40.0	G = 0.0	G = 0.0	G = 12.0	G = 0.0	G = 0.0	G = 0.0
	Y = 5.5	Y = 5	Y = 0	Y = 0	Y = 4.5	Y = 0	Y = 0	Y = 0

Duration of Analysis (hrs) = *0.25* Cycle Length C = *75.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	24	1843		144	1808	37		100	99		72	9
Lane Group Capacity	193	1926		193	1930	861		220	258		226	258
v/c Ratio	0.12	0.96		0.75	0.94	0.04		0.45	0.38		0.32	0.03
Green Ratio	0.11	0.53		0.11	0.53	0.53		0.16	0.16		0.16	0.16
Uniform Delay d_1	30.3	16.7		32.5	16.3	8.4		28.5	28.2		27.9	26.6
Delay Factor k	0.11	0.47		0.30	0.45	0.11		0.11	0.11		0.11	0.11
Incremental Delay d_2	0.3	12.0		14.7	9.4	0.0		1.5	1.0		0.8	0.1
PF Factor	1.000	0.712		1.000	0.712	1.000		1.000	1.000		1.000	1.000
Control Delay	30.6	23.8		47.2	21.0	8.4		30.0	29.1		28.7	26.7
Lane Group LOS	C	C		D	C	A		C	C		C	C
Approach Delay	23.9			22.7			29.6			28.5		
Approach LOS	C			C			C			C		
Intersection Delay	23.7			Intersection LOS						C		

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SHORT REPORT

General Information		Site Information	
Analyst	*ALW*	Intersection	*US 2 / Hayford Rd*
Agency or Co.	*Sunburst Engineering*	Area Type	*All other areas*
Date Performed	*3/13/13*	Jurisdiction	*WSDOT*
Time Period	*PM Peak Hour*	Analysis Year	*Future w/ Phase 1*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2	2	0	1	2	1	1	2	0	1	2	0
Lane Group	L	TR		L	T	R	L	TR		L	TR	
Volume (vph)	453	1441	152	243	1465	388	168	433	403	374	225	292
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3	3	3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width	12.0	12.0		12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0	0	0	0		0	0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	Thru & RT	03	04	Excl. Left	SB Only	Thru & RT	08
Timing	G = 15.0	G = 30.0	G = 0.0	G = 0.0	G = 8.0	G = 10.0	G = 13.0	G = 0.0
	Y = 5	Y = 5	Y = 0	Y = 0	Y = 0	Y = 0	Y = 4	Y = 0

Duration of Analysis (hrs) = *0.25* Cycle Length C = *90.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	467	1643		251	1510	400	173	861		386	533	
Lane Group Capacity	584	1189		301	1206	538	160	485		361	846	
v/c Ratio	0.80	1.38		0.83	1.25	0.74	1.08	1.78		1.07	0.63	
Green Ratio	0.17	0.33		0.17	0.33	0.33	0.09	0.14		0.20	0.26	
Uniform Delay d_1	36.1	30.0		36.3	30.0	26.6	41.0	38.5		36.0	29.7	
Delay Factor k	0.34	0.50		0.37	0.50	0.30	0.50	0.50		0.50	0.21	
Incremental Delay d_2	7.8	177.1		17.9	120.4	5.6	94.5	357.2		67.0	1.5	
PF Factor	1.000	1.000		1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Control Delay	43.8	207.1		54.2	150.4	32.1	135.5	395.7		103.0	31.2	
Lane Group LOS	D	F		D	F	C	F	F		F	C	
Approach Delay	171.0			117.4			352.1			61.4		
Approach LOS	F			F			F			E		
Intersection Delay	166.3			Intersection LOS						F		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*ALW*	Intersection	*Craig Rd / McFarlane Rd*
Agency/Co.	*Sunburst Engineering*	Jurisdiction	*Airway Heights, WA*
Date Performed	*3/13/13*	Analysis Year	*Future w/ Phase 1*
Analysis Time Period	*PM Peak Hour*		

Project Description

East/West Street: *McFarlane Rd*	North/South Street: *Craig Rd*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*494*	*27*	*27*	*502*	*0*
Peak-Hour Factor, PHF	*0.94*	*0.94*	*0.94*	*0.94*	*0.94*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*0*	*525*	*28*	*28*	*534*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*0*	*1*	*68*	*1*	*11*
Peak-Hour Factor, PHF	*0.94*	*0.94*	*0.94*	*0.94*	*0.94*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*1*	*72*	*1*	*11*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*0*	*28*		*84*			*1*	
C (m) (veh/h)	*1044*	*1027*		*194*			*550*	
v/c	*0.00*	*0.03*		*0.43*			*0.00*	
95% queue length	*0.00*	*0.08*		*2.00*			*0.01*	
Control Delay (s/veh)	*8.4*	*8.6*		*37.0*			*11.6*	
LOS	*A*	*A*		*E*			*B*	
Approach Delay (s/veh)	--	--	*37.0*			*11.6*		
Approach LOS	--	--	*E*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*ALW*	Intersection	*Hayford Rd / McFarlane Rd*
Agency/Co.	*Sunburst Engineering*	Jurisdiction	*Airway Heights, WA*
Date Performed	*3/13/13*	Analysis Year	*Future w/ Phase 1 - City Mit*
Analysis Time Period	*PM Peak Hour*		

Project Description *Lawson / McFarlane Industrial Project*

East/West Street: *McFarlane Rd* | North/South Street: *Hayford Rd*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*36*	*854*			*464*	*51*
Peak-Hour Factor, PHF	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*
Hourly Flow Rate, HFR (veh/h)	*42*	*1016*	*0*	*0*	*552*	*60*
Percent Heavy Vehicles	*10*	--	--	*0*	--	--
Median Type	*Two Way Left Turn Lane*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*0*	*1*	*0*
Configuration	*L*	*T*				*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*74*		*61*			
Peak-Hour Factor, PHF	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*
Hourly Flow Rate, HFR (veh/h)	*88*	*0*	*72*	*0*	*0*	*0*
Percent Heavy Vehicles	*8*	*0*	*6*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*						*LR*	
v (veh/h)	*42*						*160*	
C (m) (veh/h)	*929*						*289*	
v/c	*0.05*						*0.55*	
95% queue length	*0.14*						*3.12*	
Control Delay (s/veh)	*9.1*						*31.9*	
LOS	*A*						*D*	
Approach Delay (s/veh)	--	--				*31.9*		
Approach LOS	--	--				*D*		

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FUTURE
LEVEL OF SERVICE
CALCULATIONS
WITH PHASE 1

Following Table 4

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*ALW*	Intersection	*Hayford Rd / McFarlane Rd*
Agency/Co.	*Sunburst Engineering*	Jurisdiction	*Airway Heights, WA*
Date Performed	*3/13/13*	Analysis Year	*Future w/ Phase 1*
Analysis Time Period	*PM Peak Hour*		

Project Description *Lawson / McFarlane Industrial Project*

East/West Street: *McFarlane Rd*	North/South Street: *Hayford Rd*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*36*	*854*			*464*	*51*
Peak-Hour Factor, PHF	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*
Hourly Flow Rate, HFR (veh/h)	*42*	*1016*	*0*	*0*	*552*	*60*
Percent Heavy Vehicles	*10*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*74*		*61*			
Peak-Hour Factor, PHF	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*
Hourly Flow Rate, HFR (veh/h)	*88*	*0*	*72*	*0*	*0*	*0*
Percent Heavy Vehicles	*8*	*0*	*6*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*42*						*160*	
C (m) (veh/h)	*929*						*150*	
v/c	*0.05*						*1.07*	
95% queue length	*0.14*						*8.40*	
Control Delay (s/veh)	*9.1*						*152.4*	
LOS	*A*						*F*	
Approach Delay (s/veh)	--	--	*152.4*					
Approach LOS	--	--	*F*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*ALW*	Intersection	*Hayford Rd / McFarlane Rd*
Agency/Co.	*Sunburst Engineering*	Jurisdiction	*Airway Heights, WA*
Date Performed	*3/13/13*	Analysis Year	*Future w/ Phase 1 Project*
Analysis Time Period	*PM Peak Hour*		

Project Description *Lawson / McFarlane Industrial Project*

East/West Street: *McFarlane Rd* | North/South Street: *Hayford Rd*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*36*	*854*			*464*	*51*
Peak-Hour Factor, PHF	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*
Hourly Flow Rate, HFR (veh/h)	*42*	*1016*	*0*	*0*	*552*	*60*
Percent Heavy Vehicles	*10*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*74*		*61*			
Peak-Hour Factor, PHF	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*
Hourly Flow Rate, HFR (veh/h)	*88*	*0*	*72*	*0*	*0*	*0*
Percent Heavy Vehicles	*8*	*0*	*6*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*0*	*1*	*0*	*0*	*0*
Configuration	*L*		*R*			

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*					*L*		*R*
v (veh/h)	*42*					*88*		*72*
C (m) (veh/h)	*929*					*95*		*505*
v/c	*0.05*					*0.93*		*0.14*
95% queue length	*0.14*					*5.32*		*0.49*
Control Delay (s/veh)	*9.1*					*153.1*		*13.3*
LOS	*A*					*F*		*B*
Approach Delay (s/veh)	--	--	*90.2*					
Approach LOS	--	--	*F*					

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FUTURE
LEVEL OF SERVICE
CALCULATIONS
WITH COMPLETE PROJECT

Table 5

SHORT REPORT

General Information		Site Information	
Analyst	*ALW*	Intersection	*US 2 / Craig Rd*
Agency or Co.	*Sunburst Engineering*	Area Type	*All other areas*
Date Performed	*3/13/2013*	Jurisdiction	*WSDOT / Airway Heights*
Time Period	*PM Peak*	Analysis Year	*Future w/ Project*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Lane Group	L	T	R	L	TR		L	TR		L	TR	
Volume (vph)	47	1663	295	97	1486	206	250	124	92	161	104	13
% Heavy Vehicles	2	2	2	2	2	2	2	2	2	2	2	2
PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3	3	3	4		3	3		3	3	
Unit Extension	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	0	0	30	0	0	20	0	0	9	0	0	3
Lane Width	12.0	12.0	12.0	12.0	12.0		12.0	12.0		12.0	12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0		0	0		0	0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	WB Only	Thru & RT	04	Excl. Left	NB Only	Thru & RT	08
Timing	G = 5.0	G = 7.0	G = 44.0	G = 0.0	G = 10.0	G = 4.0	G = 12.0	G = 0.0
	Y = 0	Y = 0	Y = 4	Y = 0	Y = 0	Y = 0	Y = 4	Y = 0

Duration of Analysis (hrs) = *0.25* Cycle Length C = *90.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	52	1848	294	108	1858		278	230		179	127	
Lane Group Capacity	98	1734	774	236	1976		275	311		197	245	
v/c Ratio	0.53	1.07	0.38	0.46	0.94		1.01	0.74		0.91	0.52	
Green Ratio	0.06	0.49	0.49	0.13	0.57		0.16	0.18		0.11	0.13	
Uniform Delay d_1	41.4	23.0	14.4	36.0	18.1		38.0	35.0		39.5	36.3	
Delay Factor k	0.13	0.50	0.11	0.11	0.45		0.50	0.30		0.43	0.12	
Incremental Delay d_2	5.4	41.6	0.3	1.4	9.6		57.1	9.1		39.7	1.9	
PF Factor	1.000	1.000	1.000	1.000	0.649		1.000	1.000		1.000	1.000	
Control Delay	46.8	64.6	14.7	37.4	21.3		95.1	44.1		79.2	38.3	
Lane Group LOS	D	E	B	D	C		F	D		E	D	
Approach Delay	57.5			22.2			72.0			62.2		
Approach LOS	E			C			E			E		
Intersection Delay	45.3			Intersection LOS						D		

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SHORT REPORT

General Information		Site Information	
Analyst	*ALW*	Intersection	*SR 2 / Lawson*
Agency or Co.	*Sunburst Engineering*	Area Type	*All other areas*
Date Performed	*3/13/13*	Jurisdiction	*WSDOT / Airway Heights*
Time Period	*PM Peak Hour*	Analysis Year	*Future w/ Project*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	1	0	1	1	0	1	1
Lane Group	L	TR		L	T	R		LT	R		LT	R
Volume (vph)	24	1787	22	141	1772	36	80	22	141	48	23	9
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Extension of Effective Green	2.0	2.0		2.0	2.0	2.0		2.0	2.0		2.0	2.0
Arrival Type	3	4		3	4	3		3	3		3	3
Unit Extension	3.0	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0
Ped/Bike/RTOR Volume	0	0	0	0	0	0	0	0	20	0	0	0
Lane Width	12.0	12.0		12.0	12.0	12.0		12.0	12.0		12.0	12.0
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0	0		0	0		0	0
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	Thru & RT	03	04	NS Perm	06	07	08
Timing	G = 8.0	G = 40.0	G = 0.0	G = 0.0	G = 12.0	G = 0.0	G = 0.0	G = 0.0
	Y = 5.5	Y = 5	Y = 0	Y = 0	Y = 4.5	Y = 0	Y = 0	Y = 0

Duration of Analysis (hrs) = *0.25* Cycle Length C = *75.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	24	1845		144	1808	37		104	123		72	9
Lane Group Capacity	193	1926		193	1930	861		220	258		225	258
v/c Ratio	0.12	0.96		0.75	0.94	0.04		0.47	0.48		0.32	0.03
Green Ratio	0.11	0.53		0.11	0.53	0.53		0.16	0.16		0.16	0.16
Uniform Delay d_1	30.3	16.7		32.5	16.3	8.4		28.6	28.6		27.9	26.6
Delay Factor k	0.11	0.47		0.30	0.45	0.11		0.11	0.11		0.11	0.11
Incremental Delay d_2	0.3	12.1		14.7	9.4	0.0		1.6	1.4		0.8	0.1
PF Factor	1.000	0.712		1.000	0.712	1.000		1.000	1.000		1.000	1.000
Control Delay	30.6	24.0		47.2	21.0	8.4		30.2	30.0		28.7	26.7
Lane Group LOS	C	C		D	C	A		C	C		C	C
Approach Delay	24.1			22.7			30.1			28.5		
Approach LOS	C			C			C			C		
Intersection Delay	23.8			Intersection LOS						C		

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SHORT REPORT

General Information		Site Information	
Analyst	*ALW*	Intersection	*US 2 / Hayford Rd*
Agency or Co.	*Sunburst Engineering*	Area Type	*All other areas*
Date Performed	*3/13/13*	Jurisdiction	*WSDOT*
Time Period	*PM Peak Hour*	Analysis Year	*Future w/ Project*

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	2	2	0	1	2	1	1	2	0	1	2	0
Lane Group	L	TR		L	T	R	L	TR		L	TR	
Volume (vph)	465	1453	152	250	1465	388	168	433	403	374	232	292
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0	2.0	2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3	3	3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width	12.0	12.0		12.0	12.0	12.0	12.0	12.0		12.0	12.0	
Parking/Grade/Parking	N	0	N	N	0	N	N	0	N	N	0	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0	0	0	0		0	0	
Minimum Pedestrian Time		3.2			3.2			3.2			3.2	

Phasing	Excl. Left	Thru & RT	03	04	Excl. Left	SB Only	Thru & RT	08
Timing	G = 15.0	G = 30.0	G = 0.0	G = 0.0	G = 8.0	G = 10.0	G = 13.0	G = 0.0
	Y = 5	Y = 5	Y = 0	Y = 0	Y = 0	Y = 0	Y = 4	Y = 0

Duration of Analysis (hrs) = *0.25* Cycle Length C = *90.0*

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	479	1655		258	1510	400	173	861		386	540	
Lane Group Capacity	584	1189		301	1206	538	160	485		361	847	
v/c Ratio	0.82	1.39		0.86	1.25	0.74	1.08	1.78		1.07	0.64	
Green Ratio	0.17	0.33		0.17	0.33	0.33	0.09	0.14		0.20	0.26	
Uniform Delay d_1	36.2	30.0		36.5	30.0	26.6	41.0	38.5		36.0	29.8	
Delay Factor k	0.36	0.50		0.39	0.50	0.30	0.50	0.50		0.50	0.22	
Incremental Delay d_2	9.1	181.6		21.0	120.4	5.6	94.5	357.2		67.0	1.6	
PF Factor	1.000	1.000		1.000	1.000	1.000	1.000	1.000		1.000	1.000	
Control Delay	45.3	211.6		57.5	150.4	32.1	135.5	395.7		103.0	31.4	
Lane Group LOS	D	F		E	F	C	F	F		F	C	
Approach Delay	174.3			117.5			352.1			61.2		
Approach LOS	F			F			F			E		
Intersection Delay	167.3			Intersection LOS						F		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*ALW*	Intersection	*Craig Rd / McFarlane Rd*
Agency/Co.	*Sunburst Engineering*	Jurisdiction	*Airway Heights, WA*
Date Performed	*3/13/13*	Analysis Year	*Future w/ Project*
Analysis Time Period	*PM Peak Hour*		

Project Description

East/West Street: *McFarlane Rd*	North/South Street: *Craig Rd*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*0*	*494*	*35*	*27*	*502*	*0*
Peak-Hour Factor, PHF	*0.94*	*0.94*	*0.94*	*0.94*	*0.94*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*0*	*525*	*37*	*28*	*534*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LTR*			*LTR*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*0*	*1*	*82*	*1*	*11*
Peak-Hour Factor, PHF	*0.94*	*0.94*	*0.94*	*0.94*	*0.94*	*0.94*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*1*	*87*	*1*	*11*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LTR*	*LTR*		*LTR*			*LTR*	
v (veh/h)	*0*	*28*		*99*			*1*	
C (m) (veh/h)	*1044*	*1019*		*189*			*550*	
v/c	*0.00*	*0.03*		*0.52*			*0.00*	
95% queue length	*0.00*	*0.08*		*2.67*			*0.01*	
Control Delay (s/veh)	*8.4*	*8.6*		*43.3*			*11.6*	
LOS	*A*	*A*		*E*			*B*	
Approach Delay (s/veh)	--	--	*43.3*			*11.6*		
Approach LOS	--	--	*E*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*ALW*	Intersection	*Hayford Rd / McFarlane Rd*
Agency/Co.	*Sunburst Engineering*	Jurisdiction	*Airway Heights, WA*
Date Performed	*3/13/13*	Analysis Year	*Future w/ Project*
Analysis Time Period	*PM Peak Hour*		

Project Description *Lawson / McFarlane Industrial Project*

East/West Street: *McFarlane Rd* | North/South Street: *Hayford Rd*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*52*	*854*			*464*	*65*
Peak-Hour Factor, PHF	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*
Hourly Flow Rate, HFR (veh/h)	*61*	*1016*	*0*	*0*	*552*	*77*
Percent Heavy Vehicles	*10*	--	--	*0*	--	--
Median Type	*Two Way Left Turn Lane*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*0*	*1*	*0*
Configuration	*L*	*T*				*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*74*		*89*			
Peak-Hour Factor, PHF	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*
Hourly Flow Rate, HFR (veh/h)	*88*	*0*	*105*	*0*	*0*	*0*
Percent Heavy Vehicles	*8*	*0*	*6*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*0*	*1*	*0*	*0*	*0*
Configuration	*L*		*R*			

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*					*L*		*R*
v (veh/h)	*61*					*88*		*105*
C (m) (veh/h)	*916*					*202*		*500*
v/c	*0.07*					*0.44*		*0.21*
95% queue length	*0.21*					*2.03*		*0.78*
Control Delay (s/veh)	*9.2*					*35.9*		*14.1*
LOS	*A*					*E*		*B*
Approach Delay (s/veh)	--	--				*24.0*		
Approach LOS	--	--				*C*		

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FUTURE
LEVEL OF SERVICE
CALCULATIONS
WITH COMPLETE PROJECT

Following Table 5

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*ALW*	Intersection	*Hayford Rd / McFarlane Rd*
Agency/Co.	*Sunburst Engineering*	Jurisdiction	*Airway Heights, WA*
Date Performed	*3/13/13*	Analysis Year	*Future w/ Project*
Analysis Time Period	*PM Peak Hour*		

Project Description *Lawson / McFarlane Industrial Project*

East/West Street: *McFarlane Rd* | North/South Street: *Hayford Rd*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*52*	*854*			*464*	*65*
Peak-Hour Factor, PHF	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*
Hourly Flow Rate, HFR (veh/h)	*61*	*1016*	*0*	*0*	*552*	*77*
Percent Heavy Vehicles	*10*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*74*		*89*			
Peak-Hour Factor, PHF	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*	*0.84*
Hourly Flow Rate, HFR (veh/h)	*88*	*0*	*105*	*0*	*0*	*0*
Percent Heavy Vehicles	*8*	*0*	*6*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*0*	*1*	*0*	*0*	*0*
Configuration	*L*		*R*			

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*					*L*		*R*
v (veh/h)	*61*					*88*		*105*
C (m) (veh/h)	*916*					*88*		*500*
v/c	*0.07*					*1.00*		*0.21*
95% queue length	*0.21*					*5.74*		*0.78*
Control Delay (s/veh)	*9.2*					*181.6*		*14.1*
LOS	*A*					*F*		*B*
Approach Delay (s/veh)	--	--				*90.5*		
Approach LOS	--	--				*F*		

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