
Memorandum

The City of Traverse City
Engineering Department



TO: Mark Watson, TCLP Field Supervisor
CC: Marty Colburn, City Manager
Tim Arends, TCLP Executive Director
Mark Jones, Streets Superintendent
Timothy J. Lodge, P.E., City Engineer
FROM: Jessica Carpenter, E.I.T., Engineering Technician
DATE: Monday, November 27, 2017
SUBJECT: Traffic Signal at Parsons and Airport Access

The City Engineering Department was asked by City Staff to review the signal timing of the traffic signal at the intersection of Parsons Rd and Airport Access Rd following a resident request to the Transportation Committee. This memo is to formalize City Engineering's initial findings with regard to the traffic patterns at the intersection and proposed signal timing changes.

The data was gathered using a Jamar Traffic Counter which collected traffic data using a tube that is placed on the road and connected to the device. This information was then analyzed and the data compiled into a report using TraxPro. The report shows how many vehicles traveled over the tube during one hour intervals as indicated by the report and is shown graphically for clarification.

The collected data was then used to complete a Traffic Control Signal Warrant (MUTCD 2009, Chapter 4C) to determine if the signal should remain in place and/or when the existing traffic signal should be operating in "flash" mode. Only one of the nine warrants was met, therefore, the existing signal is warranted but alternatives should be explored. Review of the traffic volumes indicated that between the hours of 6:00pm and 7:00am the existing signal can operate in "flash" mode since, between these hours, none of the warrants are met.

Encl.

Traffic Control Signal Warrant for Parsons Rd and Airport Access Rd

Traffic Control Order No. 420



**Traffic Control Signal for
Parsons Rd and Airport Access Rd
City Engineering Department
November 2017**

Referenced Reports and Memorandums

1. 2009 Edition Chapter 4C. Traffic Control Signal Needs Studies

Warrant for Traffic Control Signal Installation

Warrant 1: 8-hour Vehicular Volume

This warrant is **satisfied** because the traffic volume on Parsons Rd exceeds 600 vehicles per hour for any eight hours of an average day and the traffic volume for Airport Access Rd exceeds 200 vehicles per hour for any eight hours of an average day.

Warrant 2: 4-hour Vehicular Volume

This warrant is **not satisfied** because the volumes per hour for Parsons Rd and Airport Access Rd do not fall above the appropriate curve in Figure 4C-1 for each of any four hours of an average day.

Warrant 3: Peak Hour

This warrant is **not satisfied** because the volumes per hour through the intersection do not fall above the appropriate curve in Figure 4C-3 during the peak travel hour of an average day.

Warrant 4: Pedestrian Volume

This warrant is **not satisfied** because the pedestrian volume crossing Parsons Rd falls below the appropriate curve in Figure 4C-5 for each of any four hours of an average day as well as the appropriate curve in Figure 4C-7 for the peak pedestrian hour. Also, there are more than 60 gaps per hour during the peak travel hour.

Warrant 5: School Crossing

This warrant is **not applicable** to this intersection.



Warrant 6: Coordinated Signal System

This warrant is **not satisfied** because a Traffic Control Signal is not needed to maintain proper platooning of vehicles.

Warrant 7: Crash Experience

This warrant is **not satisfied** because there have been less than five accidents at this intersection in the past 12 months that could have been prevented by the installation of a traffic signal.

Warrant 8: Roadway Network

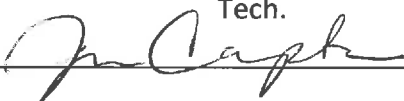
This warrant is **not applicable** because the intersection of Parsons Rd and Airport Access Rd is not the intersection of two major roads. However, the total entering volume of vehicles at the intersection of Parsons Rd and Airport Access Rd is more than 1000 vehicles per hour during the peak hour of an average day. Also, the five-year projected traffic volumes meet Warrants 1 and 2.

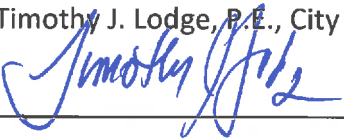
Warrant 9: Intersection Near a Grade Crossing

This warrant is only to be considered if no other warrants are met and therefore is **not applicable**. However, the south leg of the intersection of Parsons Rd and Airport Access Rd has a railroad crossing less than 130 feet from the intersection with peak hour volumes that fall above the appropriate curve.

Additional Notes

There is currently a signal installed at this intersection. Based on this signal warrant analysis, only one of the 9 warrants, Warrant 1, has been met. Therefore the existing signal is warranted, but alternatives should be explored. Review of the traffic volumes indicates that between the hours of 6:00 pm and 7:00 am the existing signal can operate in "flash" mode since, between these hours, none of the warrants are met.

Prepared By:
Jessica L. Carpenter, EIT, Engineering
Tech.


Reviewed By:
Timothy J. Lodge, P.E., City Engineer




**2017 Signal Warrant--Parsons and Airport Access
Intersection Data**

Area of Concern	KEY
**Estimates and Projected Data are found by using a 2% per year growth rate	

Warrant 1: 8-hour Vehicular Volume

Main Road	Minor Road	Vehicles per Hour on Major Street	Vehicles per Hour on Minor Street	Meets Condition A	Meets Condition B	Meets Condition A and B Combination	Major/Minor Street Volume Estimated** from:
Parsons	Airport Access	609	206 yes	no	no	no	2017/2016

Table 4C-1. Warrant 1, Eight-Hour Vehicular Volume

Number of lanes for moving traffic on each approach		Condition A--Minimum Vehicular Volume						Condition B--Interruption of Continuous Traffic					
		Vehicles per hour on major street (total of both approaches)			Vehicles per hour on minor-street approach (one direction only)			Vehicles per hour on higher-volume minor-street approach (one direction only)					
		80% ^b			80% ^b			80% ^b					
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d
1	1	500	400	350	280	150	120	105	84	75	60	53	42
2 or more	1	600	480	420	336	150	120	105	84	75	60	53	42
2 or more	2 or more	600	480	420	336	200	160	140	112	100	80	70	56
1	2 or more	500	400	350	280	200	160	140	112	100	80	70	56
Condition B--Interruption of Continuous Traffic													
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)						Vehicles per hour on higher-volume minor-street approach (one direction only)					
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d
1	1	750	600	525	420	75	60	53	42	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56	100	80	70	56

^a Basic minimum hourly volume
^b Used for combination of Conditions A and B after adequate trial of other remedial measures
^c May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
^d May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 40 mph or in an isolated community with a

Warrant 2: 4-hour Vehicular Volume

Main Road	Minor Road	Falls Above Curve
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Parsons Airport Access no

Table for Figure 4C-1

One lane and one lane	Two or more lanes and one lane	Two or more lanes and one lane	Two or more lanes and two or more lanes	Two or more lanes and one lane
VPH on the major street (Total of both approaches)	VPH on the minor street (Higher volume approach)	VPH on the major street (Total of both approaches)	VPH on the minor street (Higher volume approach)	VPH on the major street (Total of both approaches)
1400	80	1400	80 or 115*	1400
1300	80	1300	90 or 115*	1300
1200	80	1200	100 or 115*	1200
1100	80	1100	120	1100
1000	100	1000	150	1000
900	120	900	175	900
800	150	800	200	800
700	180	700	250	700
600	220	600	290	600
500	260	500	340	500
400	310	400	390	400
				Not available

Warrant 3: Peak Hour

Main Road	Minor Road	Total Current Entering Volume of Peak Hour	Peak Hour Falls Above 4C-3 Curve	Meets Criteria
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Parsons

Airport Access

1179 no

no

Table for Figure 4C-3

One lane and one lane	Two or more lanes and one lane	Two or more lanes and two or more lanes	Two or more lanes and two or more lanes	Two or more lanes and two or more lanes
VPH on the major street (Total of both approaches)	VPH on the minor street (Higher volume approach)	VPH on the major street (Total of both approaches)	VPH on the minor street (Higher volume approach)	VPH on the major street (Total of both approaches)
1800	100	1800	100 or 150*	1800
1700	100	1700	100 or 150*	1700
1600	100	1600	120 or 150*	1600
1500	100	1500	145 or 150*	1500
1400	120	1400	155	1400
1300	130	1300	190	1300
1200	150	1200	220	1200
1100	175	1100	250	1100
1000	200	1000	285	1000
900	245	900	325	900
800	285	800	360	800
700	325	700	420	700
600	360	600	460	600
500	420	500	Not available	500
				Not available

* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Warrant 4: Pedestrian Volume

Main Road	Minor Road	Pedestrians Per Hour Falls Above 4C-5 Curve	Fewer than 60 Gaps per Hour	Meets Criteria
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Parsons Airport Access no no no

Table for Figure 4C-5

VPH on the major street (Total of both approaches)	PPH for the total of all pedestrians crossing the major street
1400	107*
1300	107*
1200	107*
1100	107*
1000	125
900	150
800	200
700	225
600	300
500	350
400	400

* Note: 107 pph applies as the lower

Warrant 5: School Crossing

Main Road	Minor Road	Applicable	Meets Criteria
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Parsons Airport Access no n/a

Warrant 6: Coordinated Signal System

Main Road	Minor Road	Traffic Control Signals Needed for a Progressive Operation
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Parsons Airport Access no

Warrant 7: Crash Experience

Main Road	Minor Road	Correctable Crashes in Past 12 Months	Meets Conditions A, B, & C
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Parsons Airport Access 0 no

Warrant 8: Roadway Network

Main Road	Minor Road	5-Year Projected** Major Street Volume	5-Year Projected** Minor Street Volume	5-Year Projected** Total Entering Volume of Peak Hour	Projected Volumes Meet Warrant 1	Projected Volumes Meet Warrant 2	Projected Volumes Meet Warrant 3
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Parsons Airport Access 993 309 1302 yes yes no

Warrant 8: Roadway Network

Main Road	Minor Road	Applicable	Meets Criteria
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Parsons Airport Access no n/a

Warrant 9: Intersection Near a Grade Crossing

Main Road	Minor Road	Applicable	Peak Hour Volume Crossing Tracks	Adjustment Factor	Adjusted Volume	Falls Above Appropriate Curve
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Parsons Airport Access yes 97 0.67 64.99 yes

Airport Access Rd
 Count#51
SOUTH OF PARSONS

Site Code: 000000000000
 Station ID:

Latitude: 0' 0.0000 South

Start Time	Mon 17-Jul-17	Tue 18-Jul-17	Wed 19-Jul-17	Thu 20-Jul-17	Fri 21-Jul-17	Average Day	Sat 22-Jul-17	Sun 23-Jul-17	Week Average
12:00 AM	*	3	*	*	*	3	*	*	3
01:00	*	6	*	*	*	6	*	*	6
02:00	*	1	*	*	*	1	*	*	1
03:00	*	0	*	*	*	0	*	*	0
04:00	*	8	*	*	*	8	*	*	8
05:00	*	27	*	*	*	27	*	*	27
06:00	*	46	*	*	*	46	*	*	46
07:00	*	94	*	*	*	94	*	*	94
08:00	*	78	*	*	*	78	*	*	78
09:00	*	67	*	*	*	67	*	*	67
10:00	*	87	*	*	*	87	*	*	87
11:00	*	92	*	*	*	92	*	*	92
12:00 PM	*	97	*	*	*	97	*	*	97
01:00	*	76	*	*	*	76	*	*	76
02:00	*	66	*	*	*	66	*	*	66
03:00	*	68	*	*	*	68	*	*	68
04:00	*	84	*	*	*	84	*	*	84
05:00	*	57	*	*	*	57	*	*	57
06:00	*	24	*	*	*	24	*	*	24
07:00	*	23	*	*	*	23	*	*	23
08:00	*	15	*	*	*	15	*	*	15
09:00	*	6	*	*	*	6	*	*	6
10:00	*	9	*	*	*	9	*	*	9
11:00	*	11	*	*	*	11	*	*	11
Day Total	373	748	0	0	0	1050	0	0	1050
% Avg. WKDay	35.5%	71.2%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	
% Avg. Week	35.5%	71.2%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak Vol.	-	07:00 94	-	-	-	07:00 94	-	-	07:00 94
PM Peak Vol.	16:00 84	12:00 97	-	-	-	12:00 97	-	-	12:00 97

Airport Access Rd
Just North of Parsons Rd
Count #51

Page 1
Site Code: 000000000000
Station ID:

Latitude: 0° 0.0000 South

Start Time	Mon 09-May-16	Tue 10-May-16	Wed 11-May-16	Thu 12-May-16	Fri 13-May-16	Average Day	Sat 14-May-16	Sun 15-May-16	Week Average
12:00 AM	*	*	*	10	*	10	*	*	10
01:00	*	*	*	3	*	3	*	*	3
02:00	*	*	*	4	*	4	*	*	4
03:00	*	*	*	5	*	5	*	*	5
04:00	*	*	*	9	*	9	*	*	9
05:00	*	*	*	31	*	31	*	*	31
06:00	*	*	*	103	*	103	*	*	103
07:00	*	*	*	285	*	285	*	*	285
08:00	*	*	*	261	*	261	*	*	261
09:00	*	*	*	246	*	246	*	*	246
10:00	*	*	*	206	*	206	*	*	206
11:00	*	*	298	*	*	298	*	*	298
12:00 PM	*	*	280	*	*	280	*	*	280
01:00	*	*	268	*	*	268	*	*	268
02:00	*	*	304	*	*	304	*	*	304
03:00	*	*	337	*	*	337	*	*	337
04:00	*	*	340	*	*	340	*	*	340
05:00	*	*	282	*	*	282	*	*	282
06:00	*	*	121	*	*	121	*	*	121
07:00	*	*	82	*	*	82	*	*	82
08:00	*	*	67	*	*	67	*	*	67
09:00	*	*	36	*	*	36	*	*	36
10:00	*	*	24	*	*	24	*	*	24
11:00	*	*	12	*	*	12	*	*	12
Day Total	0	0	2451	1163	0	3614	0	0	3614
% Avg. WKDay	0.0%	0.0%	67.8%	32.2%	0.0%	100.0%	0.0%	0.0%	
% Avg. Week	0.0%	0.0%	67.8%	32.2%	0.0%	100.0%	0.0%	0.0%	
AM Peak Vol.	-	-	11:00 298	07:00 285	-	11:00 298	-	-	11:00 298
PM Peak Vol.	-	-	16:00 340	-	-	16:00 340	-	-	16:00 340

Parson Rd
 Btw Airport Access Rd and Avenue B
 Count#50

Site Code: 000000000000
 Station ID:

Latitude: 0' 0.0000 South

Start Time	Mon 31-Jul-17	Tue 01-Aug-17	Wed 02-Aug-17	Thu 03-Aug-17	Fri 04-Aug-17	Average Day	Sat 05-Aug-17	Sun 06-Aug-17	Week Average
12:00 AM	*	28	32	*	*	30	*	*	30
01:00	*	14	16	*	*	15	*	*	15
02:00	*	7	15	*	*	11	*	*	11
03:00	*	21	13	*	*	17	*	*	17
04:00	*	27	16	*	*	22	*	*	22
05:00	*	122	128	*	*	125	*	*	125
06:00	*	193	207	*	*	200	*	*	200
07:00	*	500	512	*	*	506	*	*	506
08:00	*	643	*	*	*	643	*	*	643
09:00	*	612	*	*	*	612	*	*	612
10:00	*	609	*	*	*	609	*	*	609
11:00	657	690	*	*	*	674	*	*	674
12:00 PM	904	894	*	*	*	899	*	*	899
01:00	731	720	*	*	*	726	*	*	726
02:00	652	688	*	*	*	670	*	*	670
03:00	733	786	*	*	*	760	*	*	760
04:00	781	833	*	*	*	807	*	*	807
05:00	809	843	*	*	*	826	*	*	826
06:00	391	432	*	*	*	412	*	*	412
07:00	285	297	*	*	*	291	*	*	291
08:00	205	213	*	*	*	209	*	*	209
09:00	169	165	*	*	*	167	*	*	167
10:00	78	98	*	*	*	88	*	*	88
11:00	43	51	*	*	*	47	*	*	47
Day Total	6438	9486	939	0	0	9366	0	0	9366
% Avg. WKDay	68.7%	101.3%	10.0%	0.0%	0.0%				
% Avg. Week	68.7%	101.3%	10.0%	0.0%	0.0%	100.0%	0.0%	0.0%	
AM Peak Vol.	11:00 657	11:00 690	07:00 512	-	-	11:00 674	-	-	11:00 674
PM Peak Vol.	12:00 904	12:00 894	-	-	-	12:00 899	-	-	12:00 899

The City of Traverse City

GOVERNMENTAL CENTER
400 Boardman Avenue
P.O. Box 592
Traverse City, Michigan
49685-0592



TRAFFIC CONTROL ORDER NO: 420

DATE: 6/13/00

A traffic light signal shall be placed at the following intersection and shall be used primarily during high volume hours and shall be switched to "flasher" operations at times when the need for intersection control is reduced:

Traffic light at the intersection of Parsons Road and Airport Access is a semi-actuated signal. This traffic signal is dwell green on Parsons Road and is fully actuated by traffic approaching on Airport Access Road. At times when the "flash" mode is activated, eastbound and westbound Parsons Road shall observe the "caution" amber light, and northbound and southbound Airport Access shall be required to stop on red.

A handwritten signature in cursive script, reading "Richard I. Lewis", is written over a horizontal line.

Richard I. Lewis
City Manager

Confirmed by the City Commission: 6-19-00