

Appendix A

Traffic Analysis Data



US-23 Improvements

US-23/M-14 to Silver Lake Road

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Appendix A-1

RITIS Outputs

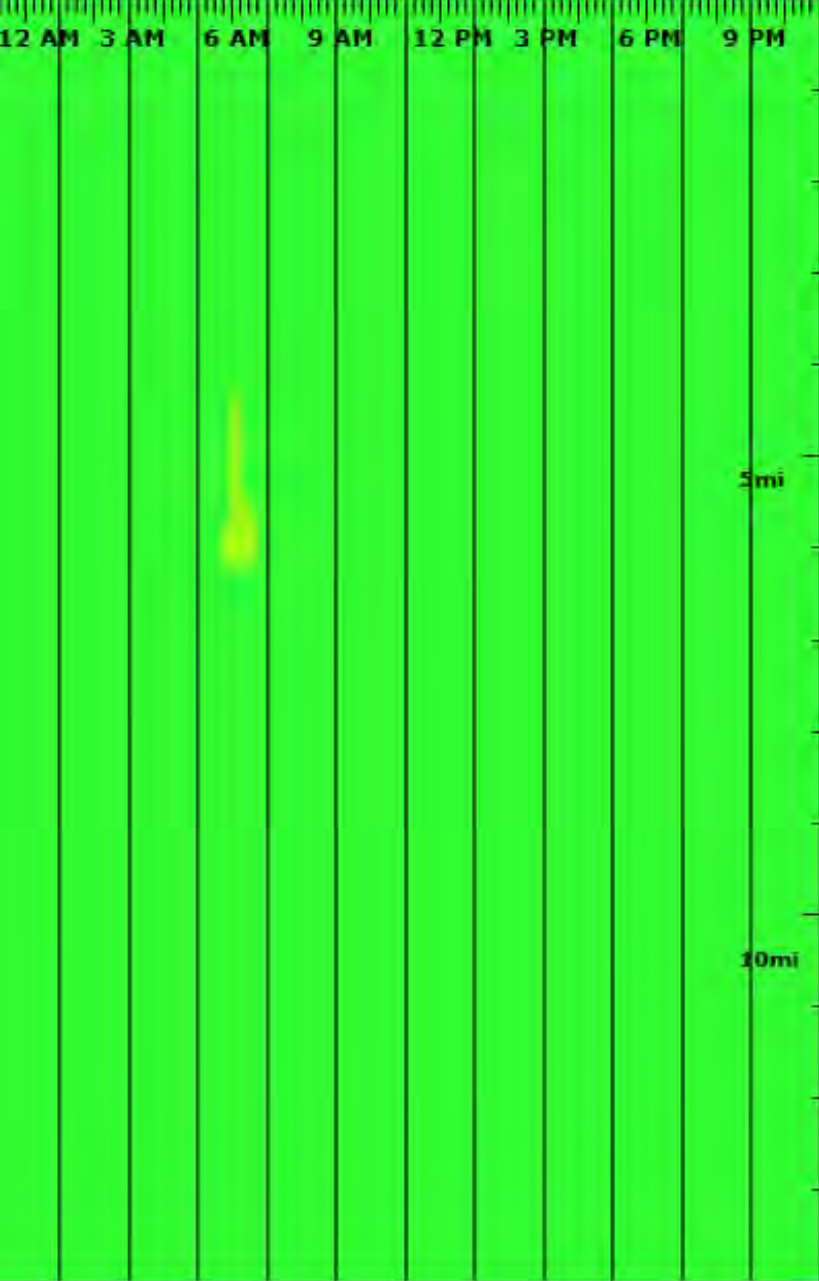
Speed on US-23 between M-14/Exit 41 and Silver Lake Rd/Exit 55

Averaged by 1 hour for August 2014 (every weekday)



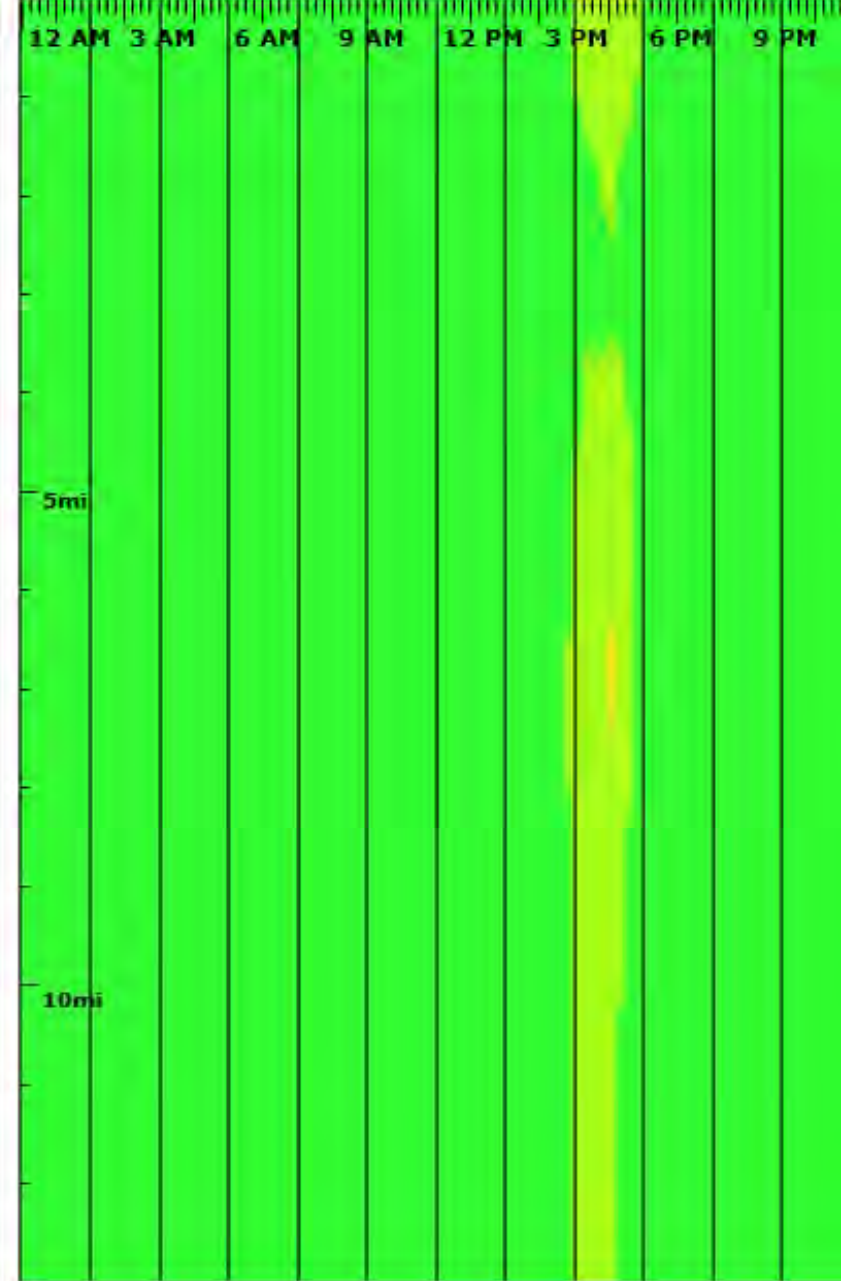
Southbound

August 2014 (every weekday)



Northbound

August 2014 (every weekday)



SILVER LAKE RD/EXIT 55

M-36/EXIT 54

8 MILE RD/EXIT 53

6 MILE RD/EXIT 50

NORTH TERRITORIAL R...

M-14/EXIT 41

The raw measured speed.



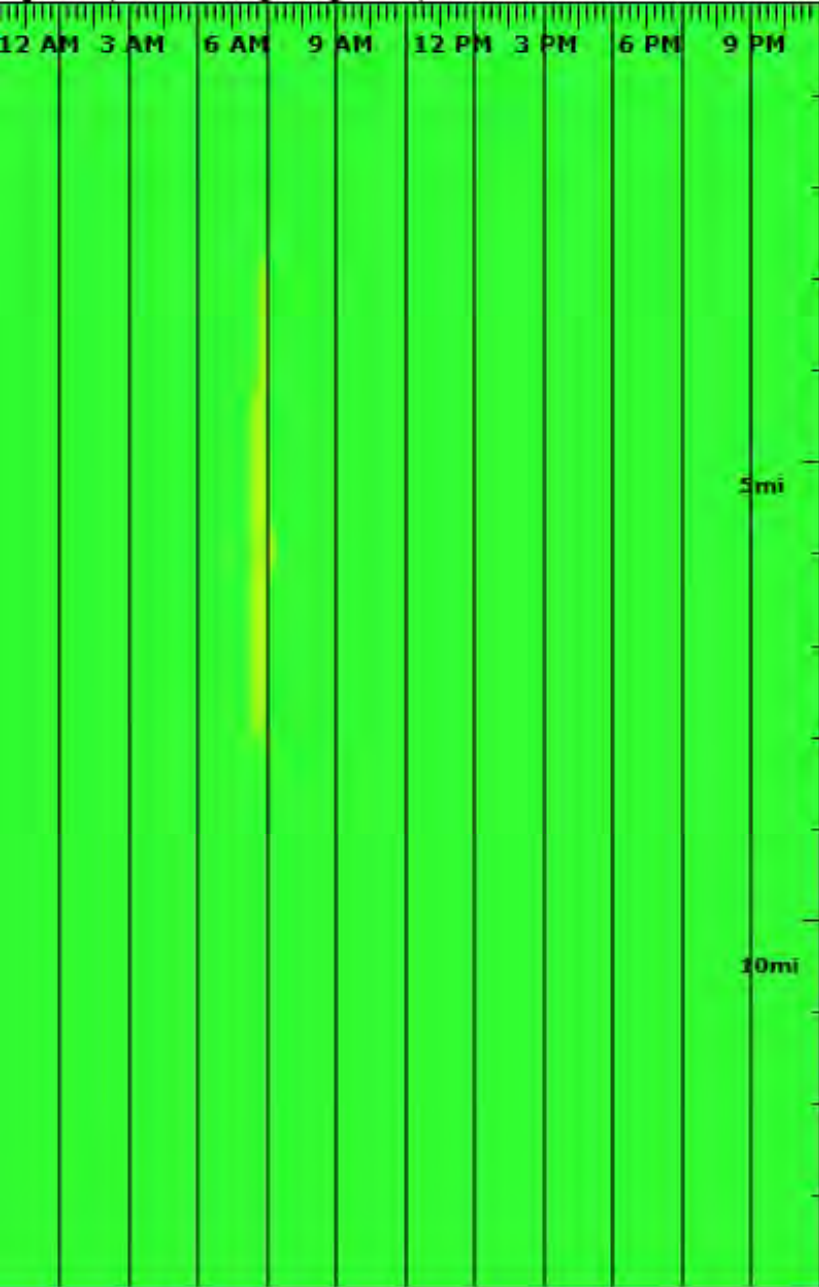
Speed on US-23 between M-14/Exit 41 and Silver Lake Rd/Exit 55

Averaged by 15 minutes for August 04, 2014 through August 08, 2014



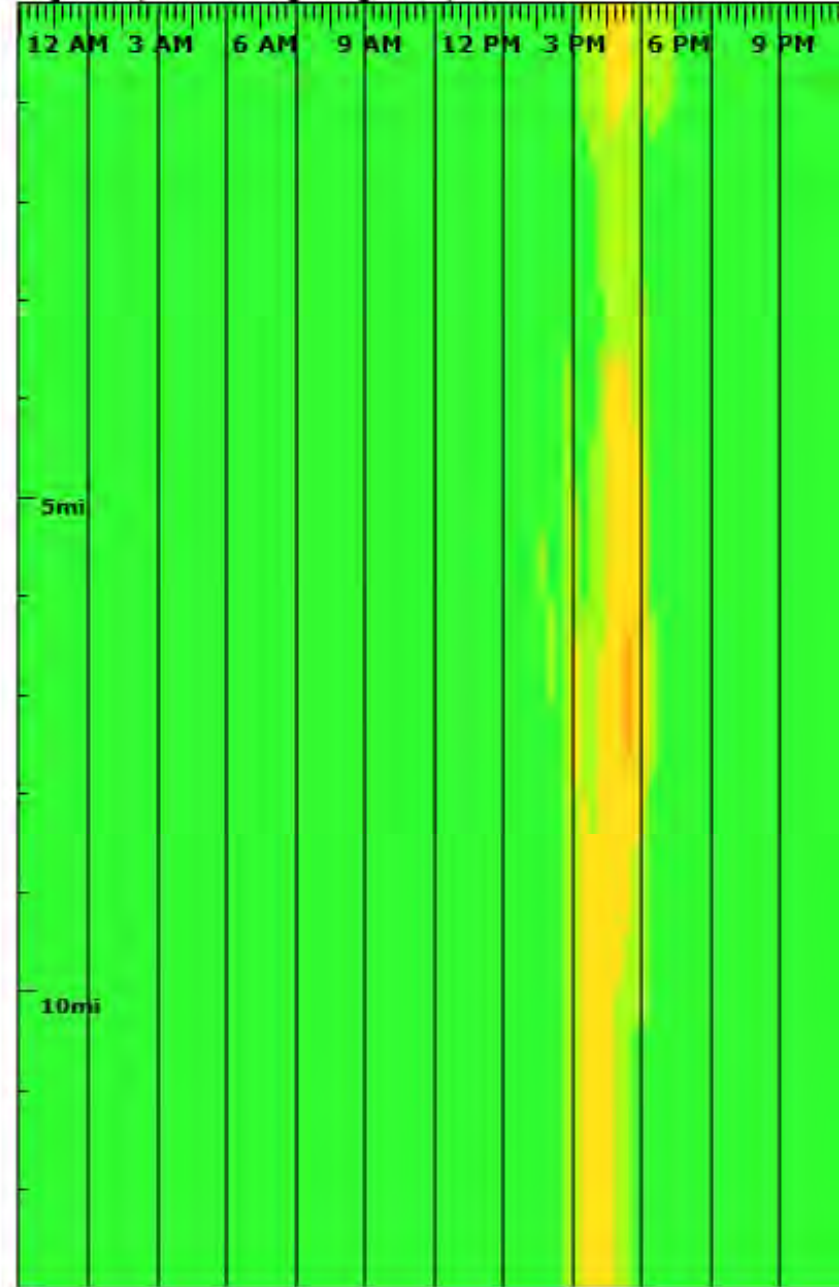
Southbound

August 04, 2014 through August 08, 2014



Northbound

August 04, 2014 through August 08, 2014



SILVER LAKE RD/EXIT 55

M-36/EXIT 54

8 MILE RD/EXIT 53

6 MILE RD/EXIT 50

NORTH TERRITORIAL R...

M-14/EXIT 41

5mi

10mi

5mi

10mi

The raw measured speed.



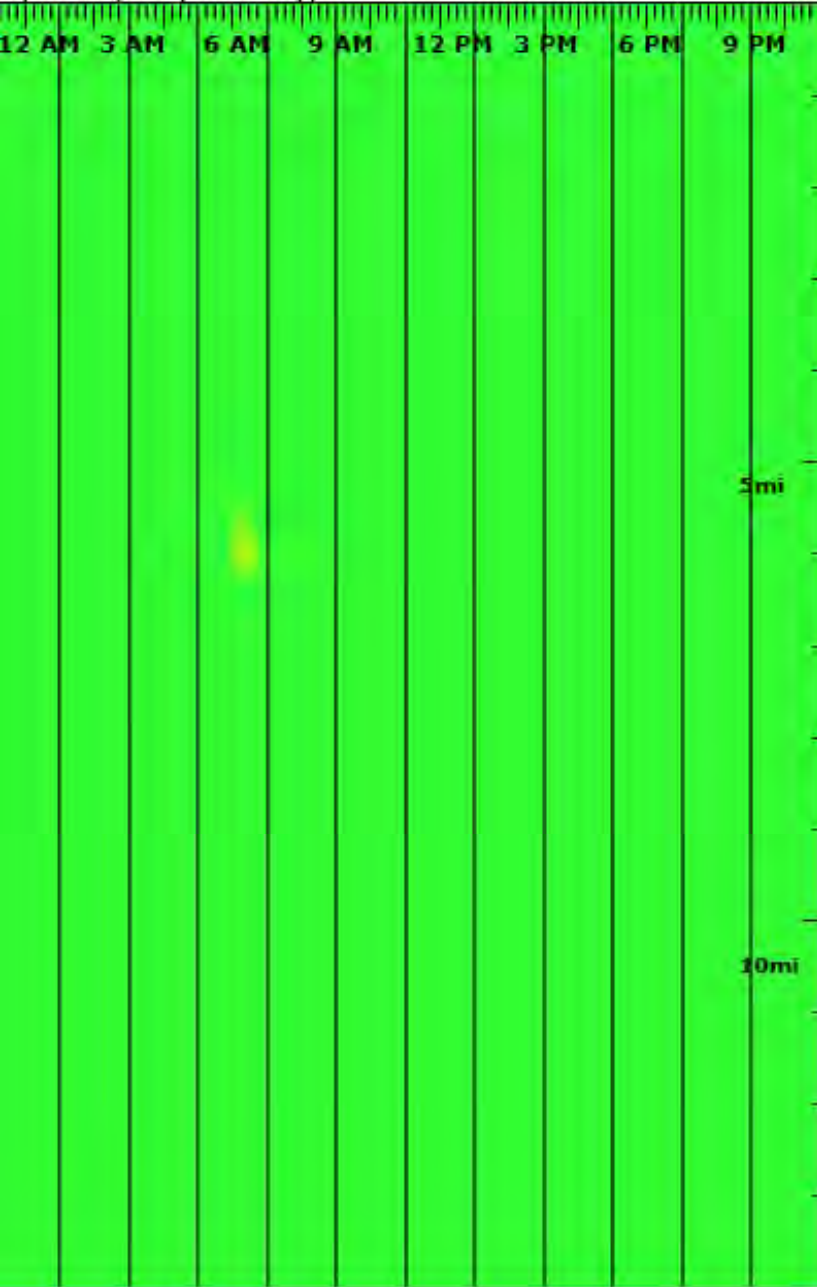
Speed on US-23 between M-14/Exit 41 and Silver Lake Rd/Exit 55

Averaged by 1 hour for July 2014 (every weekday)



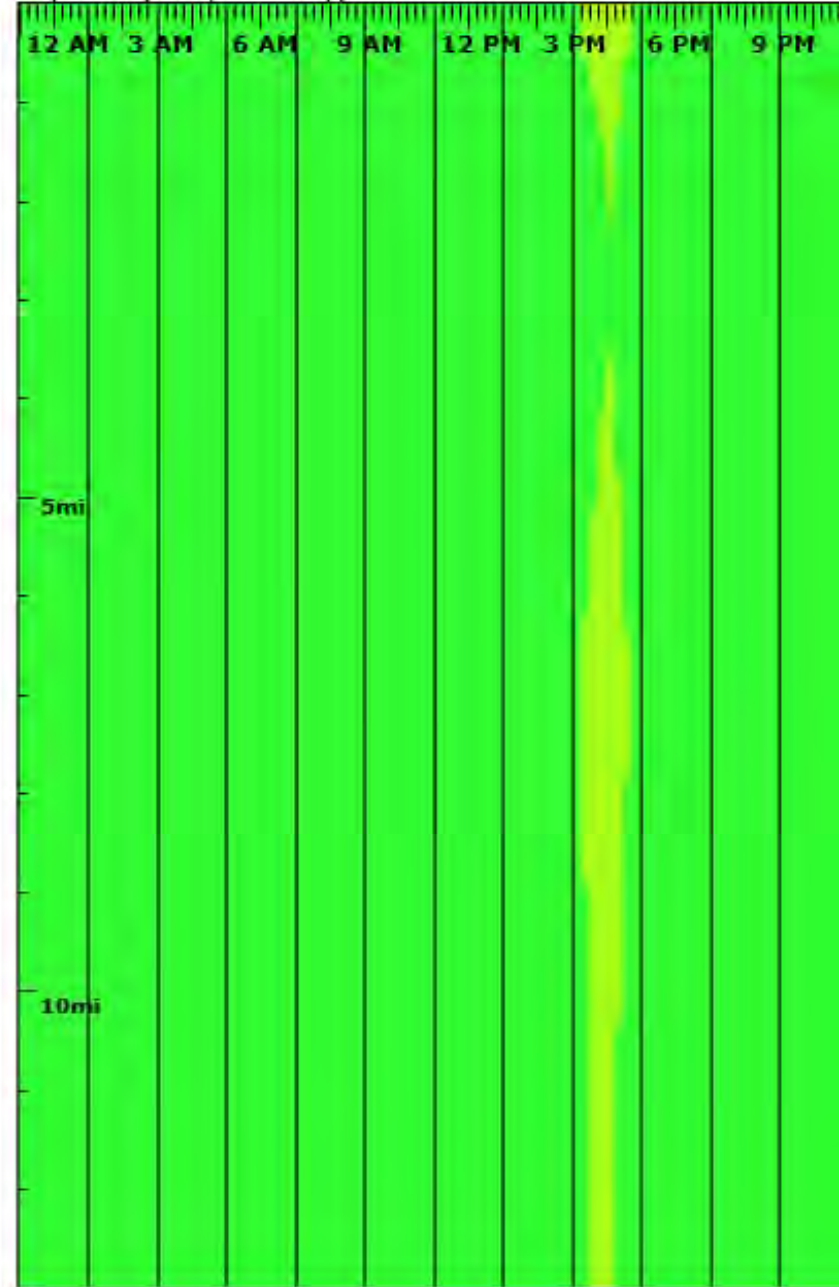
Southbound

July 2014 (every weekday)



Northbound

July 2014 (every weekday)



SILVER LAKE RD/EXIT 55

M-36/EXIT 54

8 MILE RD/EXIT 53

6 MILE RD/EXIT 50

NORTH TERRITORIAL R...

M-14/EXIT 41

5mi

10mi

5mi

10mi

The raw measured speed.



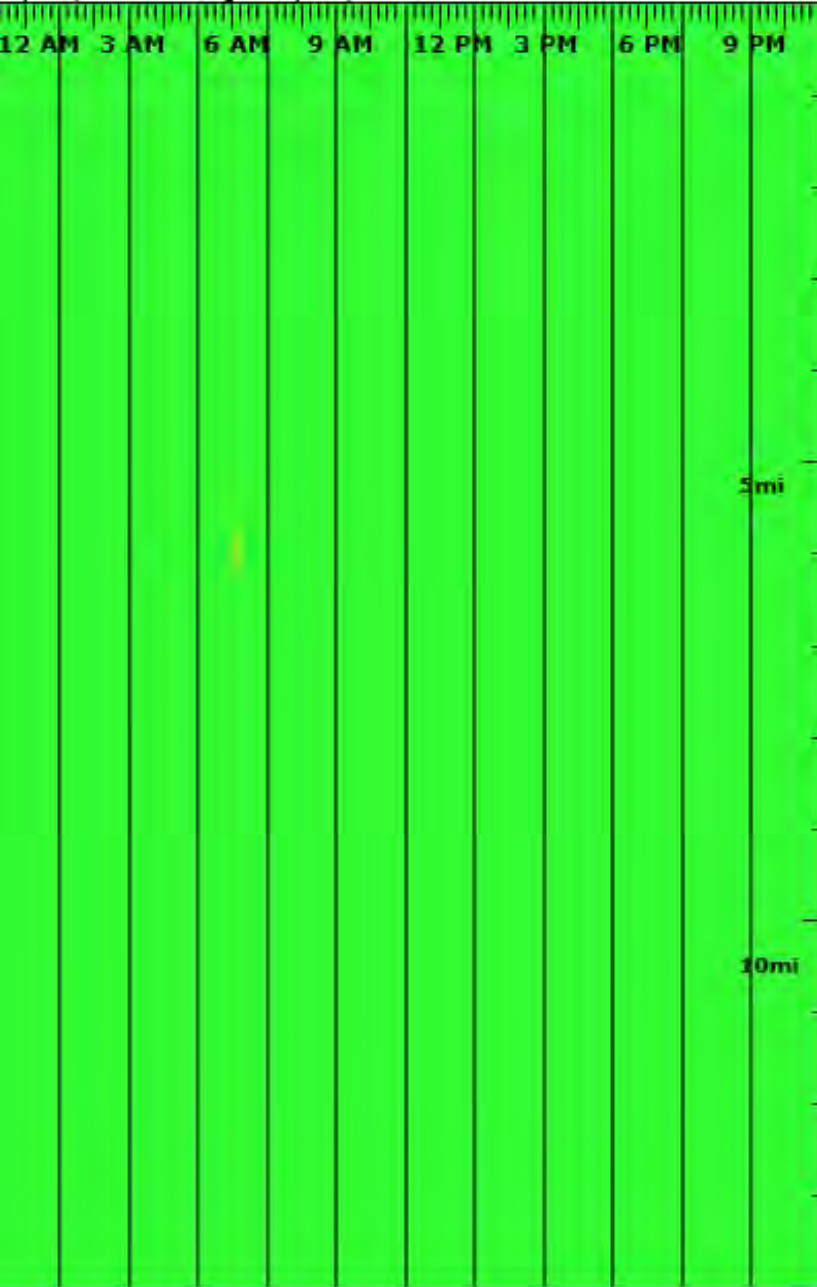
Speed on US-23 between M-14/Exit 41 and Silver Lake Rd/Exit 55

Averaged by 1 hour for July 14, 2014 through July 18, 2014



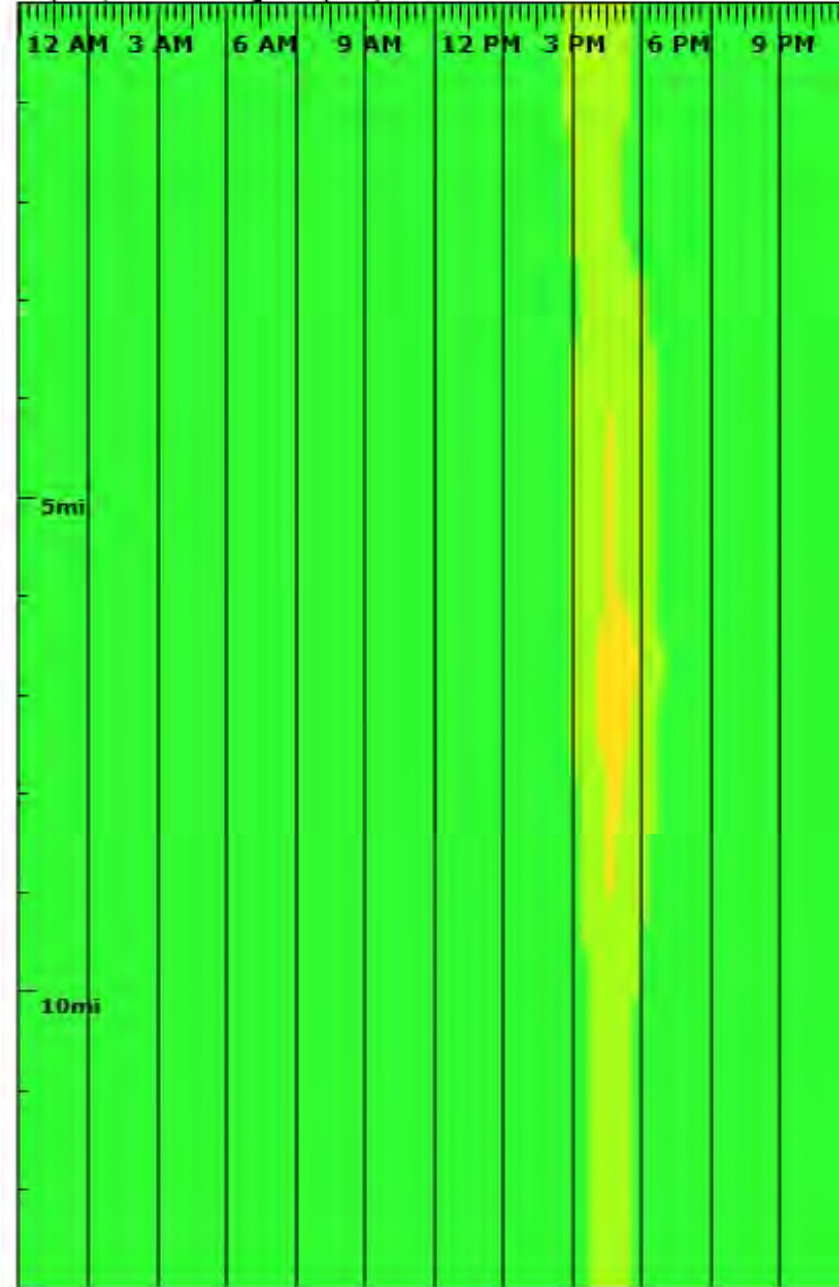
Southbound

July 14, 2014 through July 18, 2014



Northbound

July 14, 2014 through July 18, 2014



SILVER LAKE RD/EXIT 55

M-36/EXIT 54

8 MILE RD/EXIT 53

6 MILE RD/EXIT 50

NORTH TERRITORIAL R...

M-14/EXIT 41

The raw measured speed.



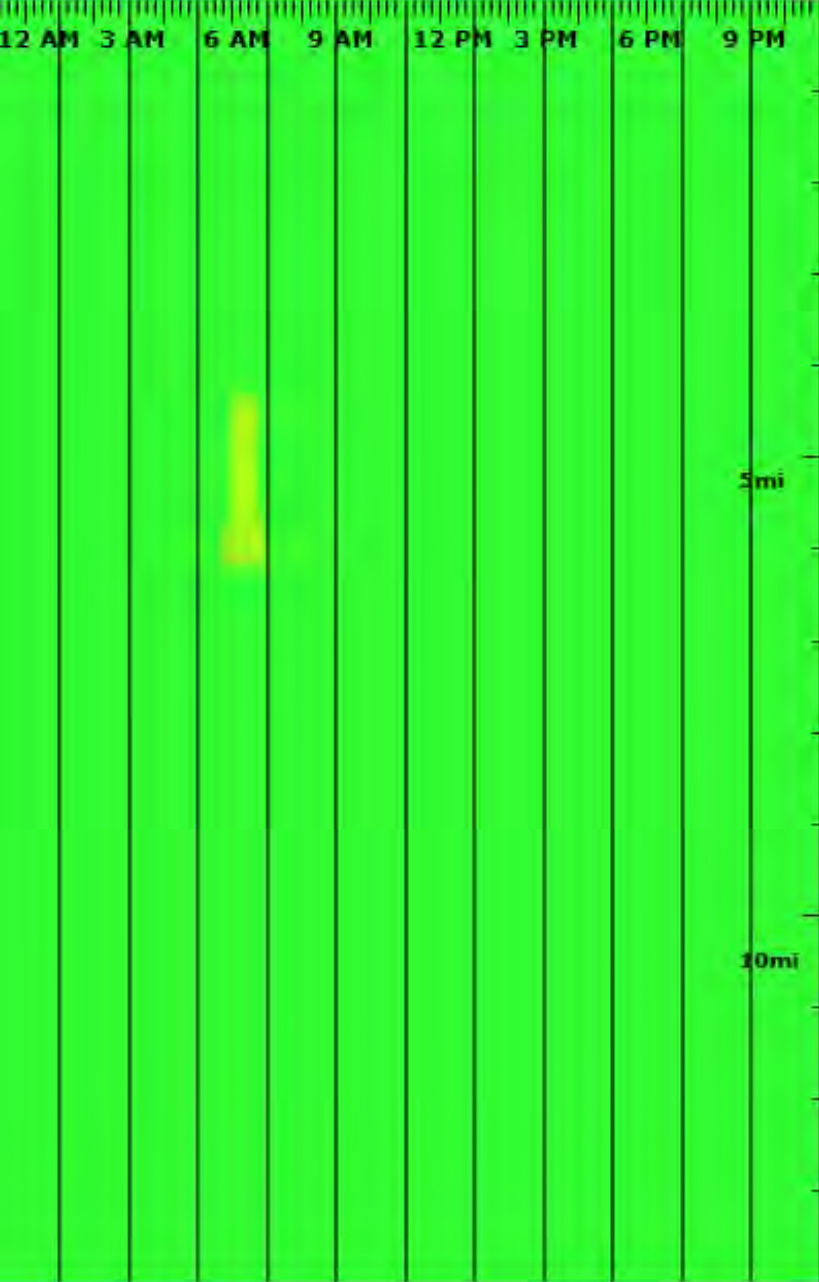
Speed on US-23 between M-14/Exit 41 and Silver Lake Rd/Exit 55

Averaged by 1 hour for April 2014 (every weekday)



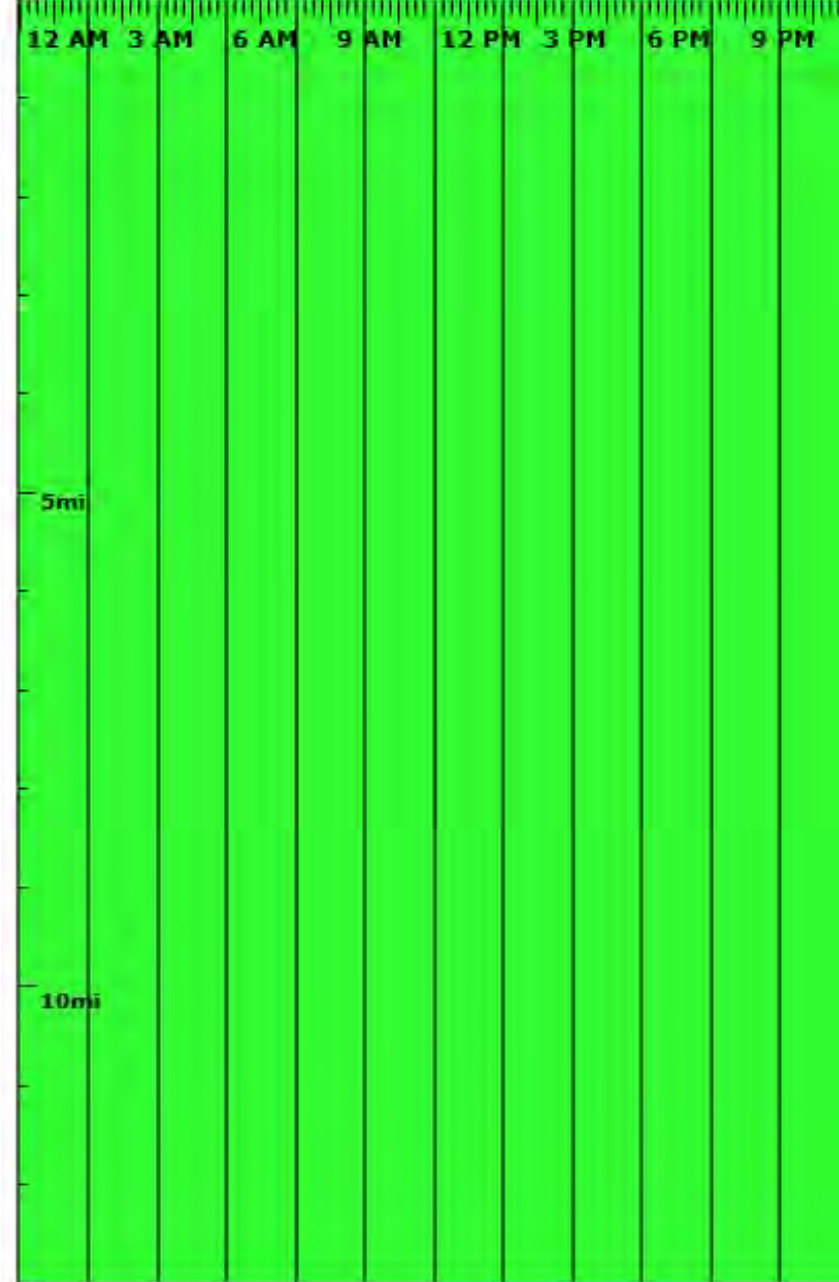
Southbound

April 2014 (every weekday)



Northbound

April 2014 (every weekday)



SILVER LAKE RD/EXIT 55

M-36/EXIT 54

8 MILE RD/EXIT 53

6 MILE RD/EXIT 50

NORTH TERRITORIAL R...

M-14/EXIT 41

The raw measured speed.

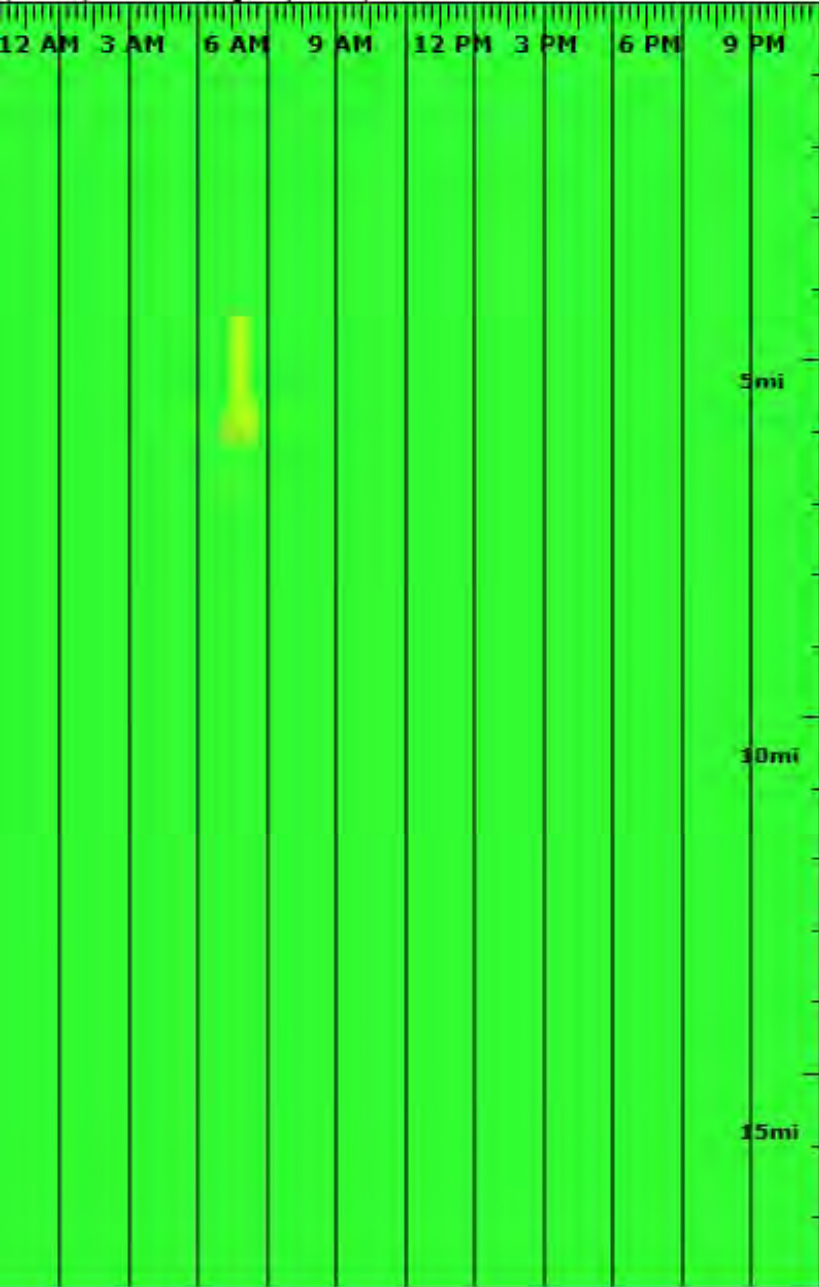


Speed on US-23 between Plymouth Rd/Exit 41 and Silver Lake Rd/Exit 55

Averaged by 1 hour for April 14, 2014 through April 18, 2014

Southbound

April 14, 2014 through April 18, 2014



SILVER LAKE RD/EXIT 55

M-36/EXIT 54

8 MILE RD/EXIT 53

6 MILE RD/EXIT 50

NORTH TERRITORIAL R...

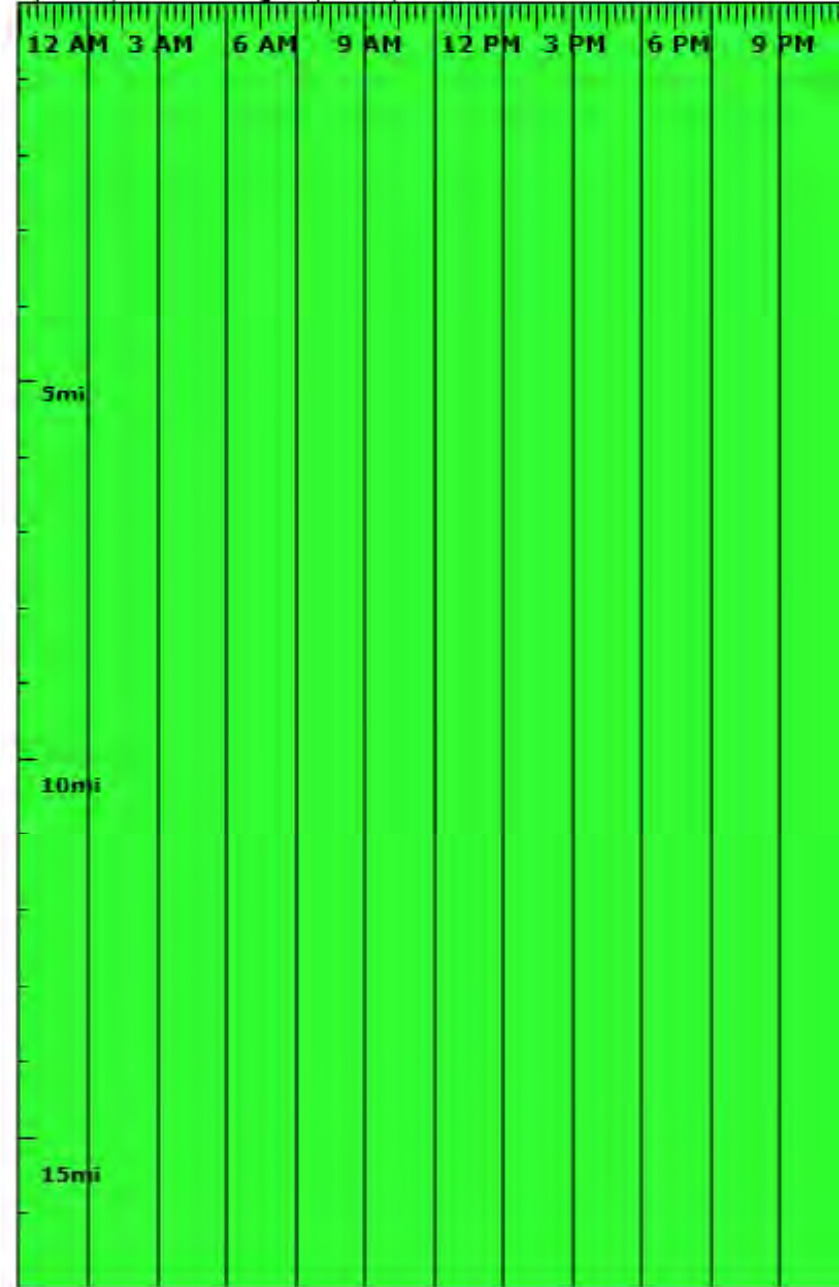
M-14/EXIT 41

M-14/EXIT 42

PLYMOUTH RD/EXIT 41

Northbound

April 14, 2014 through April 18, 2014



The raw measured speed.



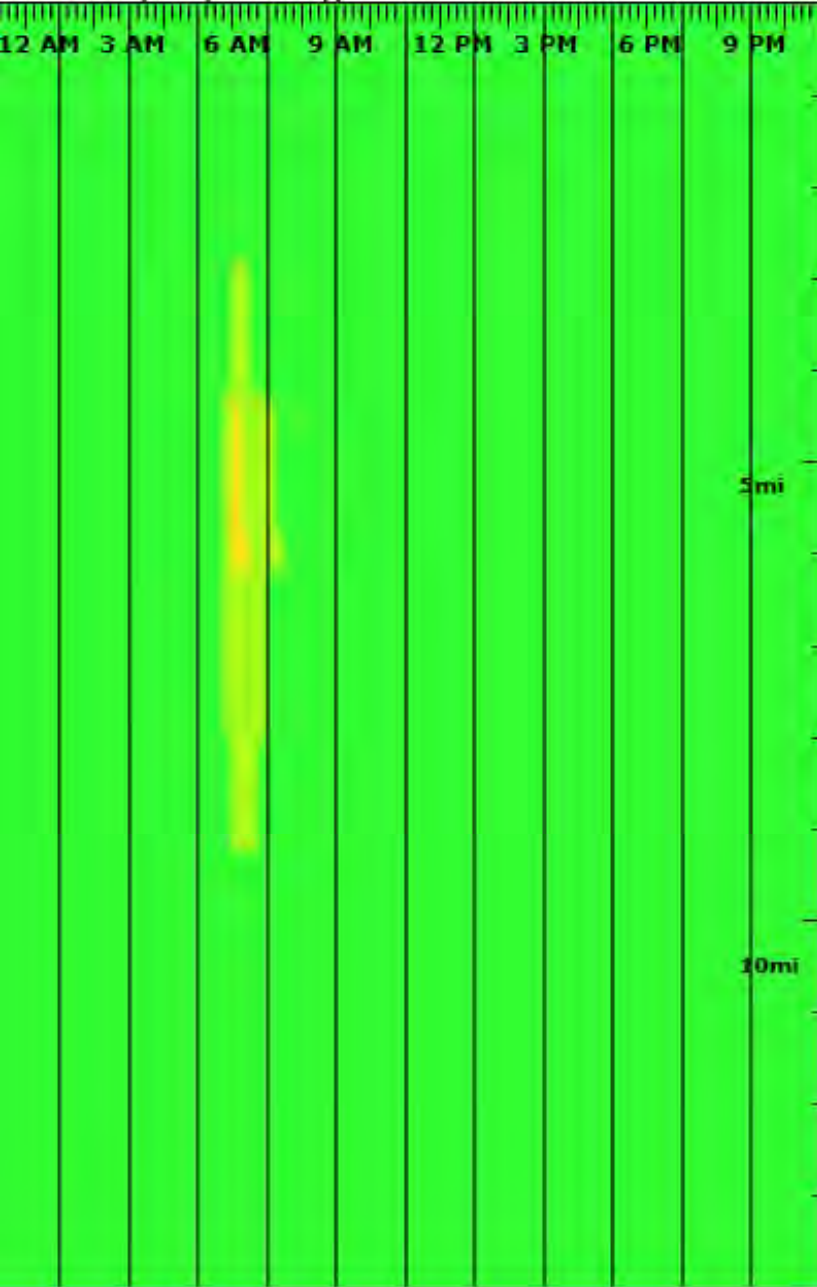
Speed on US-23 between M-14/Exit 41 and Silver Lake Rd/Exit 55

Averaged by 1 hour for March 2014 (every weekday)



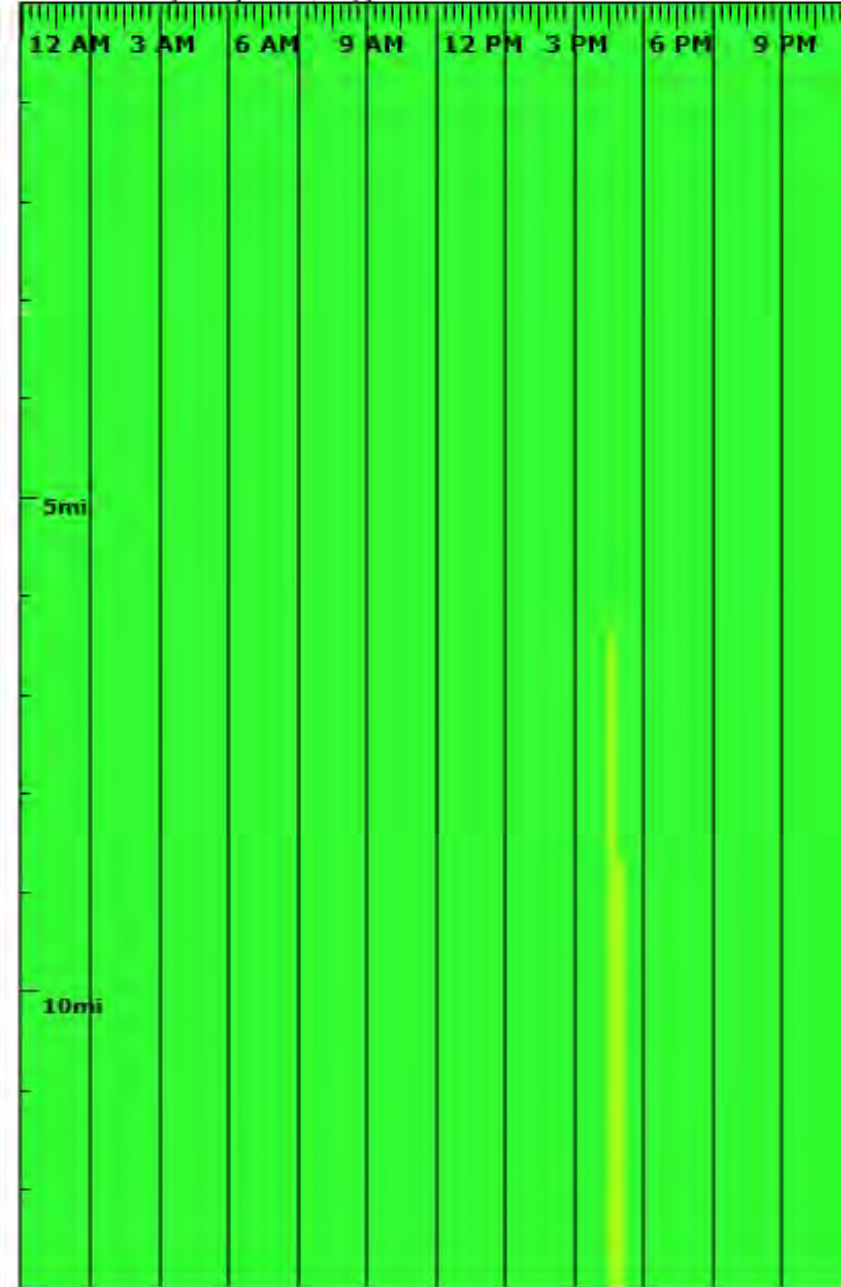
Southbound

March 2014 (every weekday)



Northbound

March 2014 (every weekday)



SILVER LAKE RD/EXIT 55

M-36/EXIT 54

8 MILE RD/EXIT 53

6 MILE RD/EXIT 50

NORTH TERRITORIAL R...

M-14/EXIT 41

5mi

10mi

5mi

10mi

The raw measured speed.



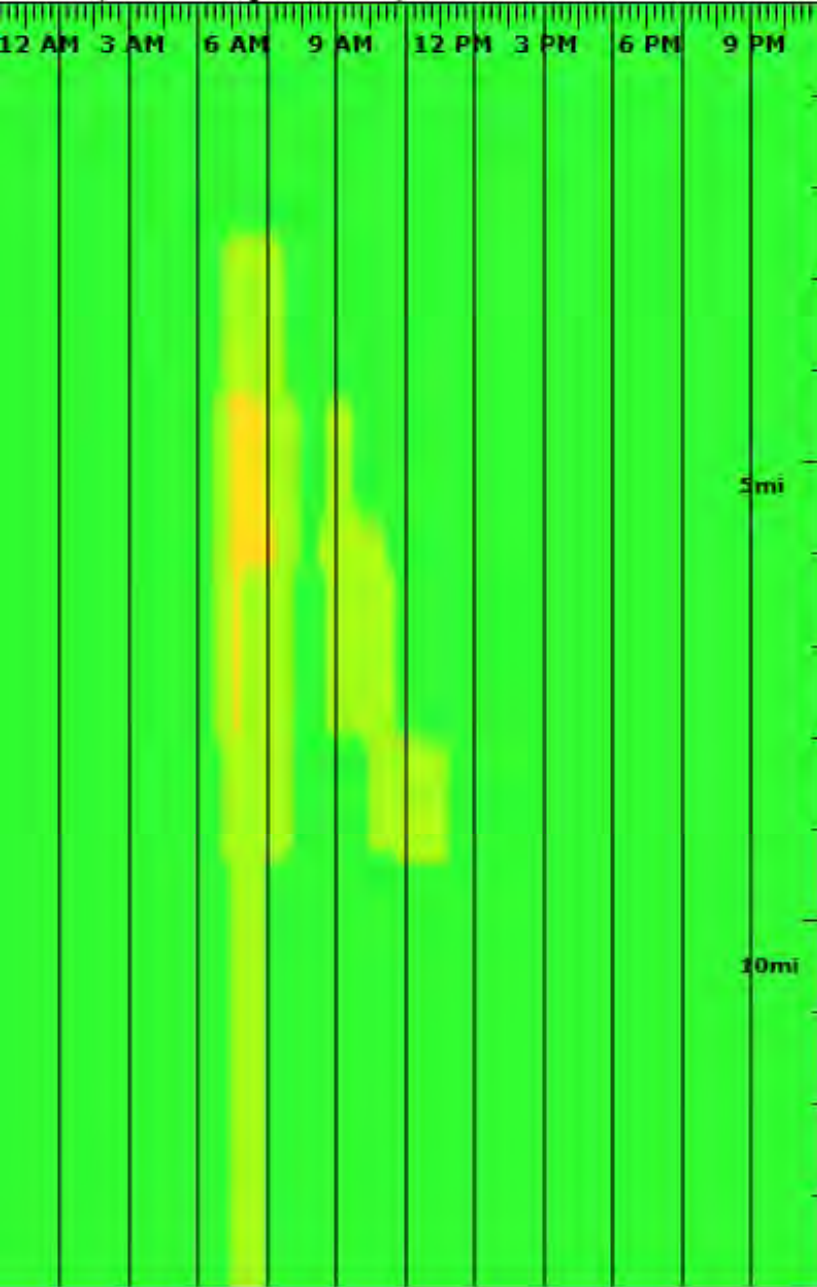
Speed on US-23 between M-14/Exit 41 and Silver Lake Rd/Exit 55

Averaged by 1 hour for March 10, 2014 through March 14, 2014



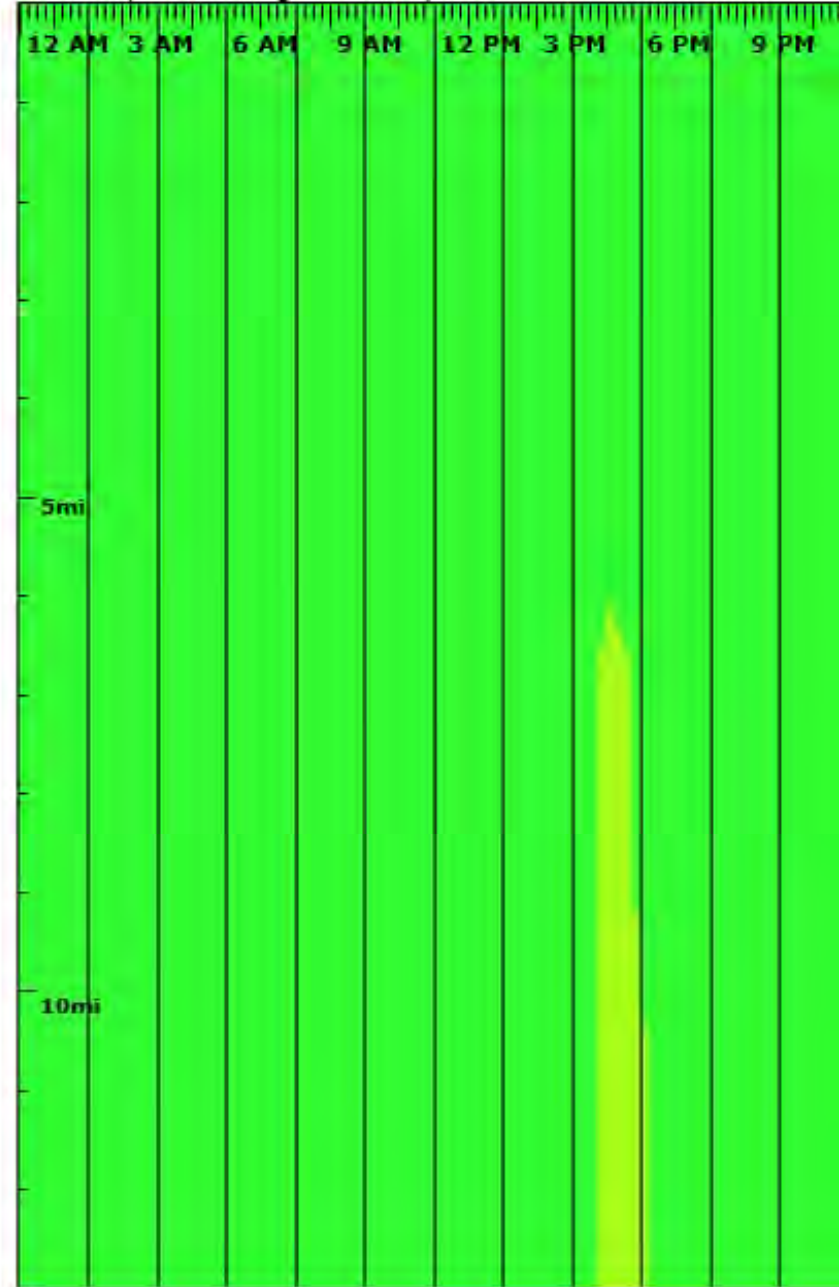
Southbound

March 10, 2014 through March 14, 2014



Northbound

March 10, 2014 through March 14, 2014



SILVER LAKE RD/EXIT 55

M-36/EXIT 54

8 MILE RD/EXIT 53

6 MILE RD/EXIT 50

NORTH TERRITORIAL R...

M-14/EXIT 41

The raw measured speed.



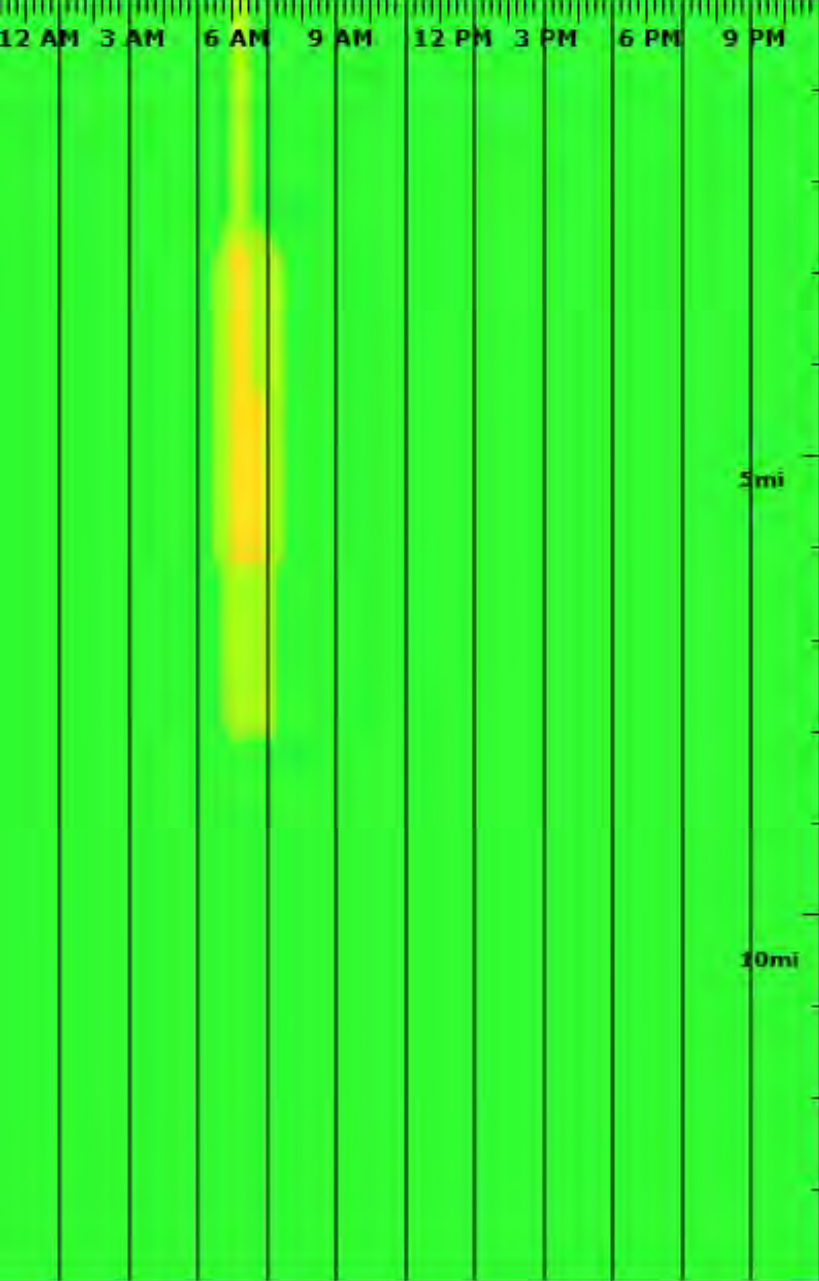
Speed on US-23 between M-14/Exit 41 and Silver Lake Rd/Exit 55

Averaged by 1 hour for September 2014 (every weekday)



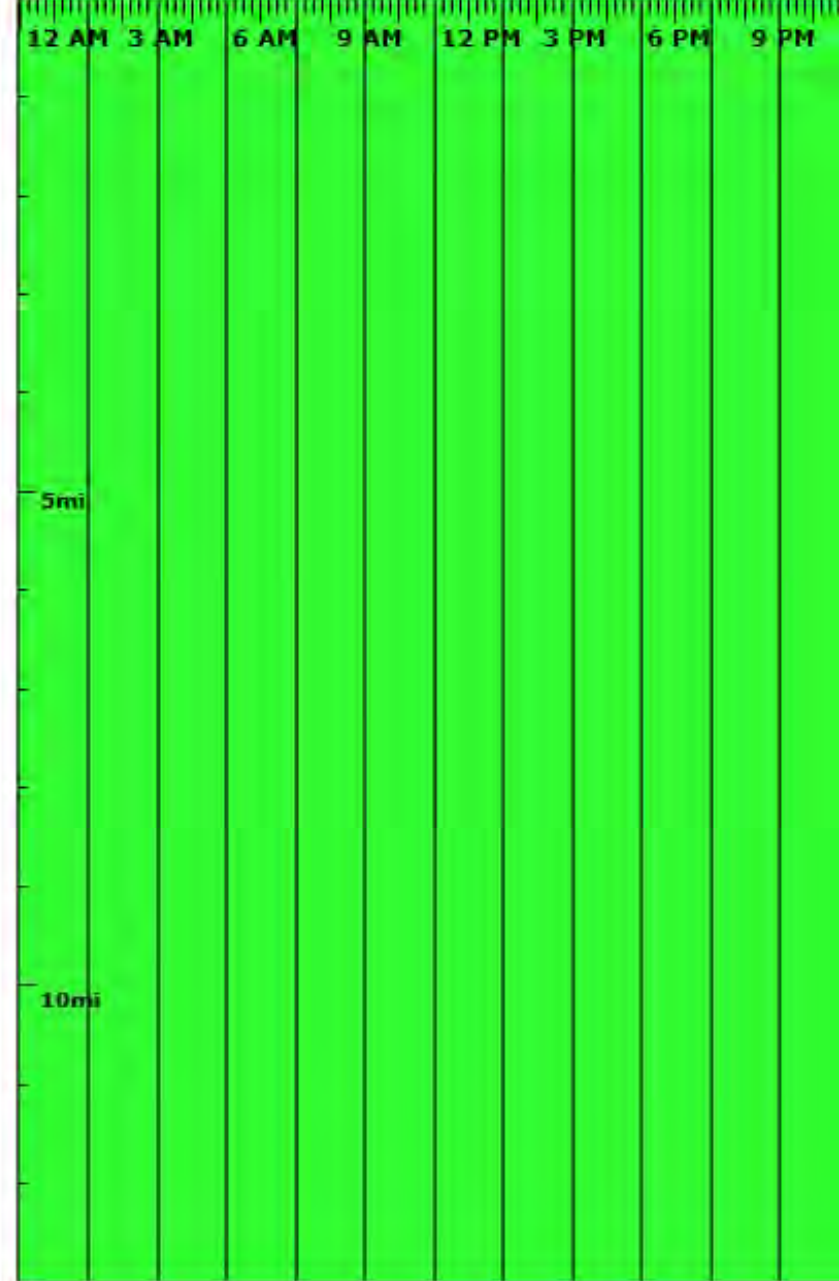
Southbound

September 2014 (every weekday)



Northbound

September 2014 (every weekday)



The raw measured speed.



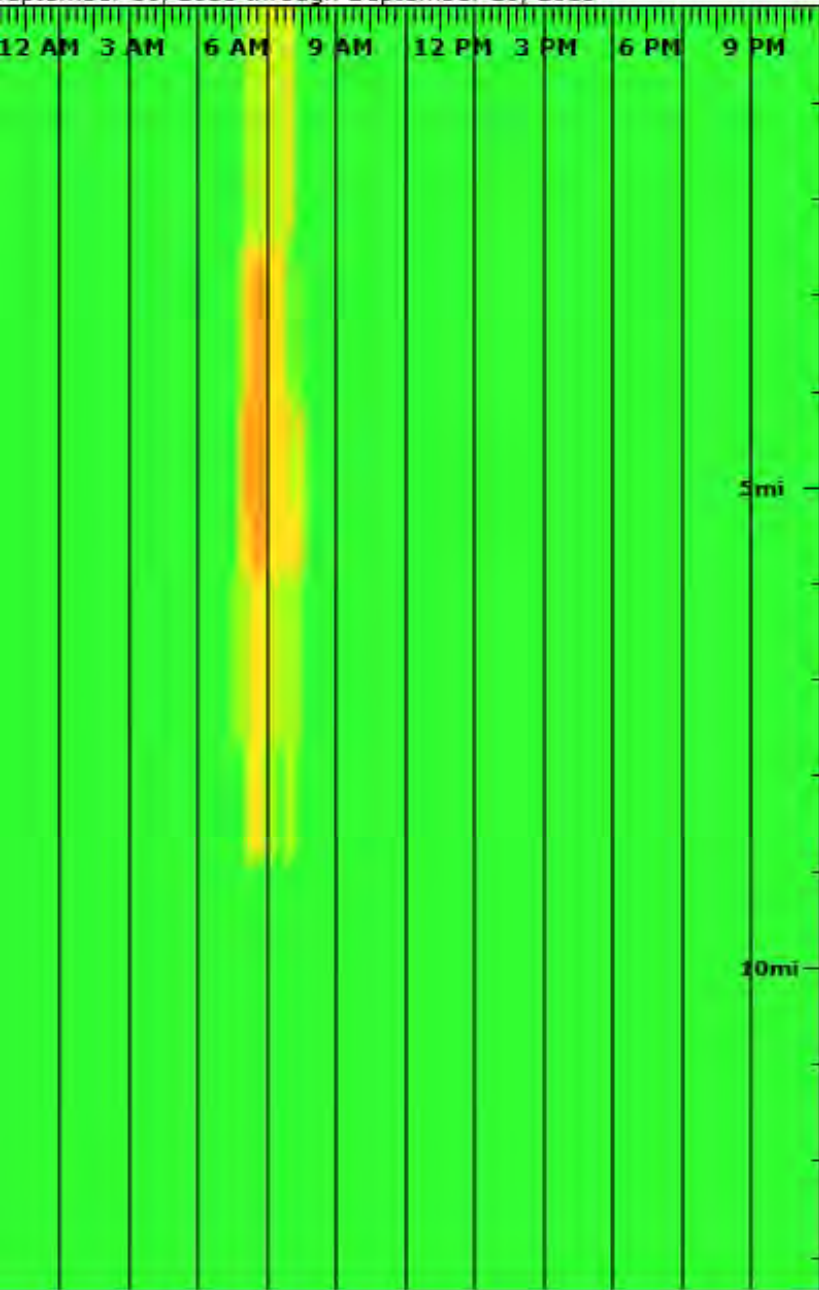
Speed on US-23 between Silver Lake Rd/Exit 55 and M-14/Exit 41

Averaged by 10 minutes for September 16, 2013 through September 20, 2013



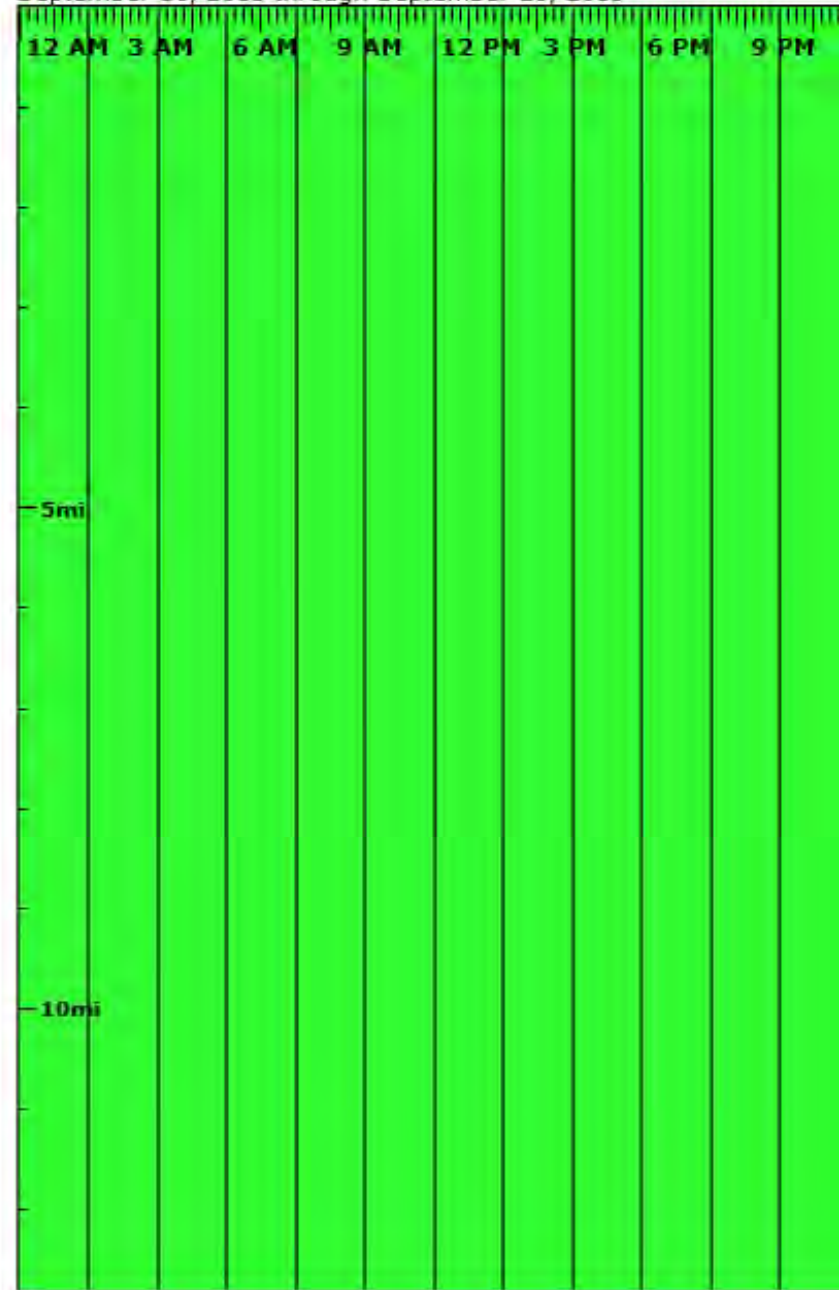
Southbound

September 16, 2013 through September 20, 2013



Northbound

September 16, 2013 through September 20, 2013



The raw measured speed.



Appendix A-2

Crash Report

Crash Analysis

Mainline US-23

Crash data on mainline US-23 from Silver Lake Road to just north of the west US-23/M-14 interchange was collected for a three year period from January 1, 2009 through December 31, 2010 and from January 1, 2013 through December 31, 2013. The years of 2011 and 2012 were omitted from the data since construction was taking place along the US-23 corridor. During the three year period, there were 845 crashes, with 17% of the crashes occurring during icy conditions, 16% during wet conditions and 31% during dark hours. There were two fatalities and 223 injuries (13 A type) over the three year period. Review of the fatal crashes revealed one occurred when a tire from a northbound vehicle struck a southbound vehicle and the other fatal occurred on Southbound US-23 when a semi-truck had a tire blow out and lost control and collided with another vehicle pushing it into the guardrail. Both fatalities occurred in 2013.

The predominant crash types consisted of 339 (40%) rear-end straight, 216 (26%) fixed-object, 105 (12%) Side-swipe same, 65 (8%) animal, 41 (5%) overturn type crashes. The remainder were of various collision types. Review of the rear-end crashes revealed that the majority were due to slowing or stopped traffic during the AM peak for Southbound US-23 and during the PM peak for Northbound US-23. Approximately 46% of the fixed object crashes occurred during snowy/icy conditions. The sideswipe crashes were mostly due to improper lane usage, merging, avoiding other vehicles and driver distraction. Figure 1-4 provides a graphical representation of the crash data.

The preferred alternative will provide for the following mitigation measures that should reduce the severity and frequency of crashes:

Freeway Crash Countermeasures

A variety of countermeasures were incorporated into the proposed projects which will decrease the potential for traffic crashes for the entire study area. These countermeasures include:

1. Making operational improvements to reduce freeway congestion and other unexpected traffic backups.
2. Improving the enforcement area such as wider shoulders or providing crash investigation sites to provide the needed storage for disabled vehicles. This will consequently alleviate the potential congestion due to incidents.
3. Lengthening of acceleration lanes at ramps to increase ramp-freeway merge capacity and reduce conflicts on mainline US-23.
4. Improve drainage and increase surface friction.

US-23 Ramps and Interchange Areas:

Crash data for the US-23 interchange ramps was collected for the same three year period from January 1, 2009 through December 31, 2010 and from January 1, 2013 through December 31, 2013. For the three year period, there were a total of 10 crashes on the US-23/Silver Lake Road interchange ramps, 12 crashes on the M-36 at US-23 interchange ramps, 8 crashes on the US-23 at 8 mile Road ramps, 1 crash on the US-23 and Barker Road ramps, 7 crashes on the US-23 and 6 Mile ramps and 11 crashes on the US-23 at North Territorial ramps. There were no fatalities during the three year period.

The predominant crash pattern on the ramps and the interchange areas was rear-end crashes due to slowing or stopped traffic during the peak periods. There were also clusters of fixed object type crashes within the ramp areas and crashes associated with merging traffic at the US-23 entrance ramps and the west US-23/M-14 interchange. The US-23 at North Territorial ramp terminals experienced a cluster of rear-end type crashes.

Ramp Crash Countermeasures

Various countermeasures were incorporated into the proposed projects which will decrease the potential for traffic crashes for the entire study area. These countermeasures include:

1. Increased storage for off-ramp approaches
2. Lengthening of acceleration lanes at some ramps to increase ramp-freeway merge capacity and reduce conflicts on mainline US-23.
3. Improved signing and attenuation for all ramp movements which require a significant decrease in speed in order to navigate the ramp.
4. Improve drainage and increase surface friction.

Local Roadways:

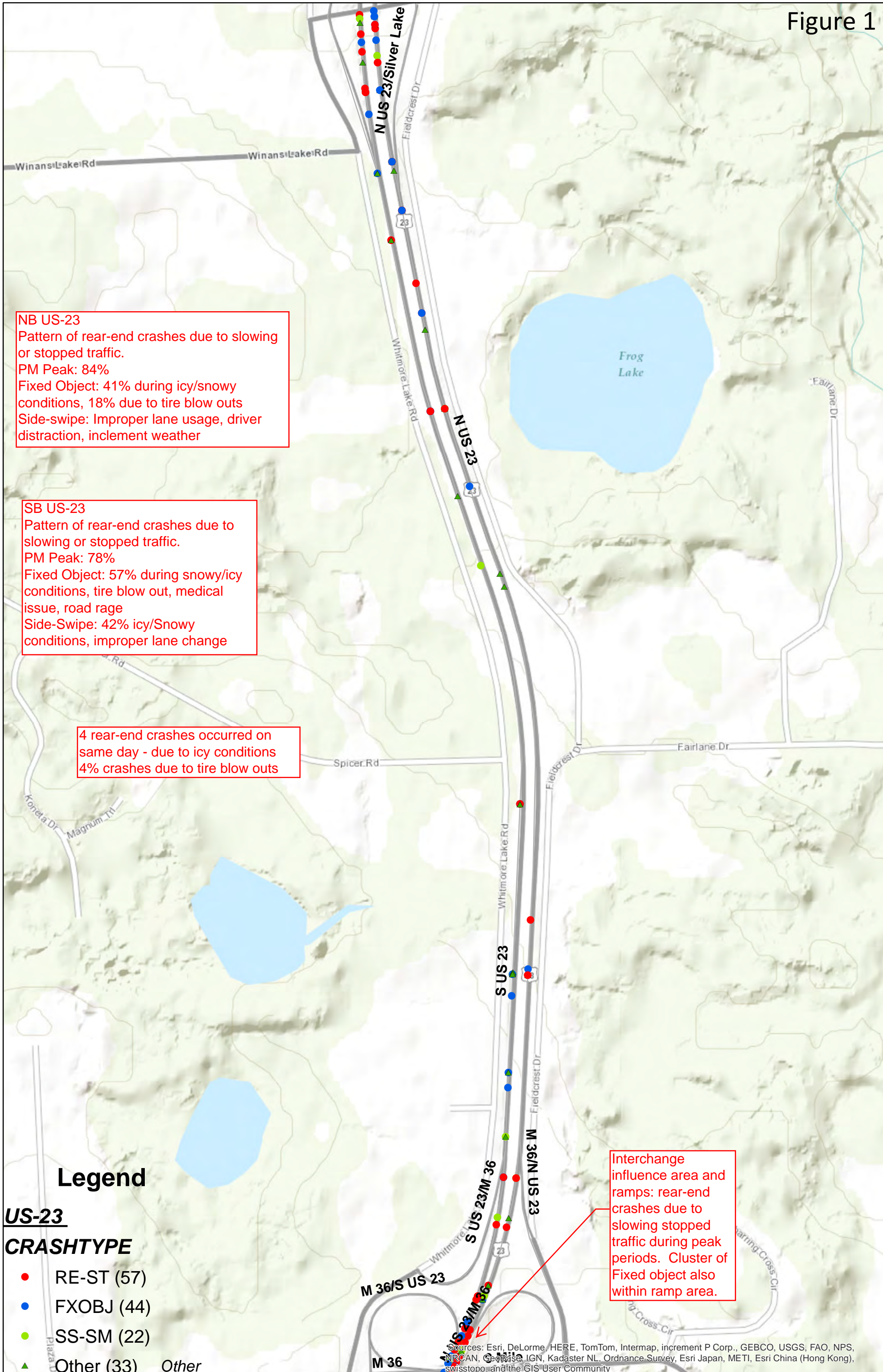
Crash data for the local roadways over US-23 was collected for the same three year period from January 1, 2009 through December 31, 2010 and from January 1, 2013 through December 31, 2013. There were a total of 13 crashes on 8 Mile Road between Whitmore Lake Road and the NB US-23 interchange ramps. The predominant crash type consisted of rear-ends due to motorists not being able to stop in time. There were a total of 14 crashes on North Territorial Road between the US-23 interchange ramps. The predominant crash types consisted of rear-end and head-on left-turn crashes. There were a total of four crashes on 6 Mile Road between the US-23 interchange ramps. There were no fatalities during the three year period.

Ramp Terminal Intersection Countermeasures:

Various countermeasures were incorporated into the proposed projects which will decrease the potential for traffic crashes for the entire study area. These countermeasures include:

1. Optimized traffic signal timing.
2. Improve the operation and potentially reduce crashes with the construction of roundabouts at two interchanges.
3. Increase the sight distance over the bridge with the construction of roundabouts at 8 Mile Road and North Territorial and total bridge replacements.
4. Improve lane definition through pavement markings.

Figure 1



NB US-23
 Pattern of rear-end crashes due to slowing or stopped traffic.
 PM Peak: 84%
 Fixed Object: 41% during icy/snowy conditions, 18% due to tire blow outs
 Side-swipe: Improper lane usage, driver distraction, inclement weather

SB US-23
 Pattern of rear-end crashes due to slowing or stopped traffic.
 PM Peak: 78%
 Fixed Object: 57% during snowy/icy conditions, tire blow out, medical issue, road rage
 Side-Swipe: 42% icy/Snowy conditions, improper lane change

4 rear-end crashes occurred on same day - due to icy conditions
 4% crashes due to tire blow outs

Interchange influence area and ramps: rear-end crashes due to slowing stopped traffic during peak periods. Cluster of Fixed object also within ramp area.

Legend

- US-23**
- CRASHTYPE**
- RE-ST (57)
 - FXOBJ (44)
 - SS-SM (22)
 - ▲ Other (33) *Other*

Sources: Esri, DeLorme, HERE, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, Geobase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, and the GIS User Community

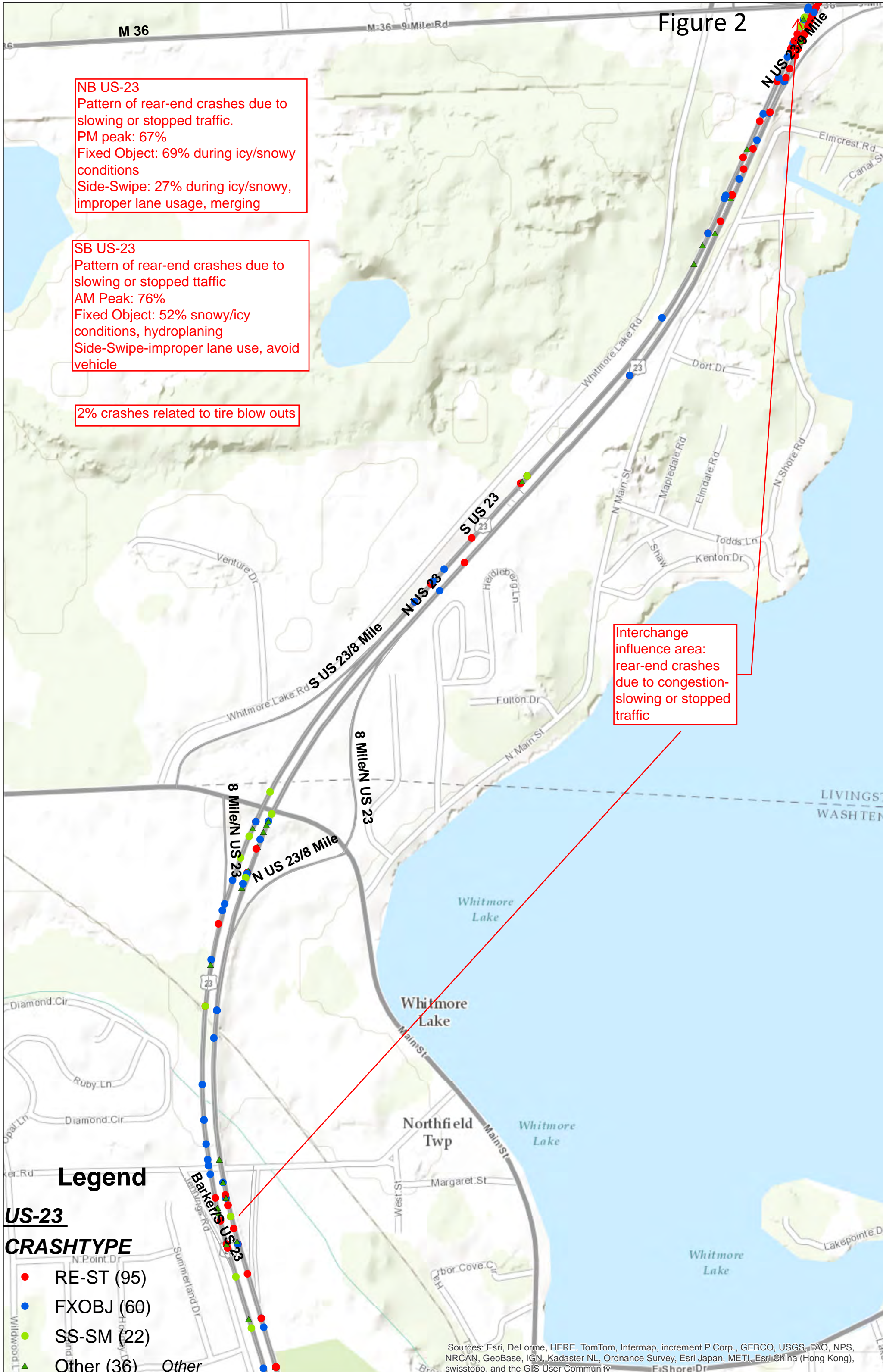
Figure 2

NB US-23
 Pattern of rear-end crashes due to slowing or stopped traffic.
 PM peak: 67%
 Fixed Object: 69% during icy/snowy conditions
 Side-Swipe: 27% during icy/snowy, improper lane usage, merging

SB US-23
 Pattern of rear-end crashes due to slowing or stopped traffic
 AM Peak: 76%
 Fixed Object: 52% snowy/icy conditions, hydroplaning
 Side-Swipe-improper lane use, avoid vehicle

2% crashes related to tire blow outs

Interchange influence area:
 rear-end crashes due to congestion-slowing or stopped traffic



Legend

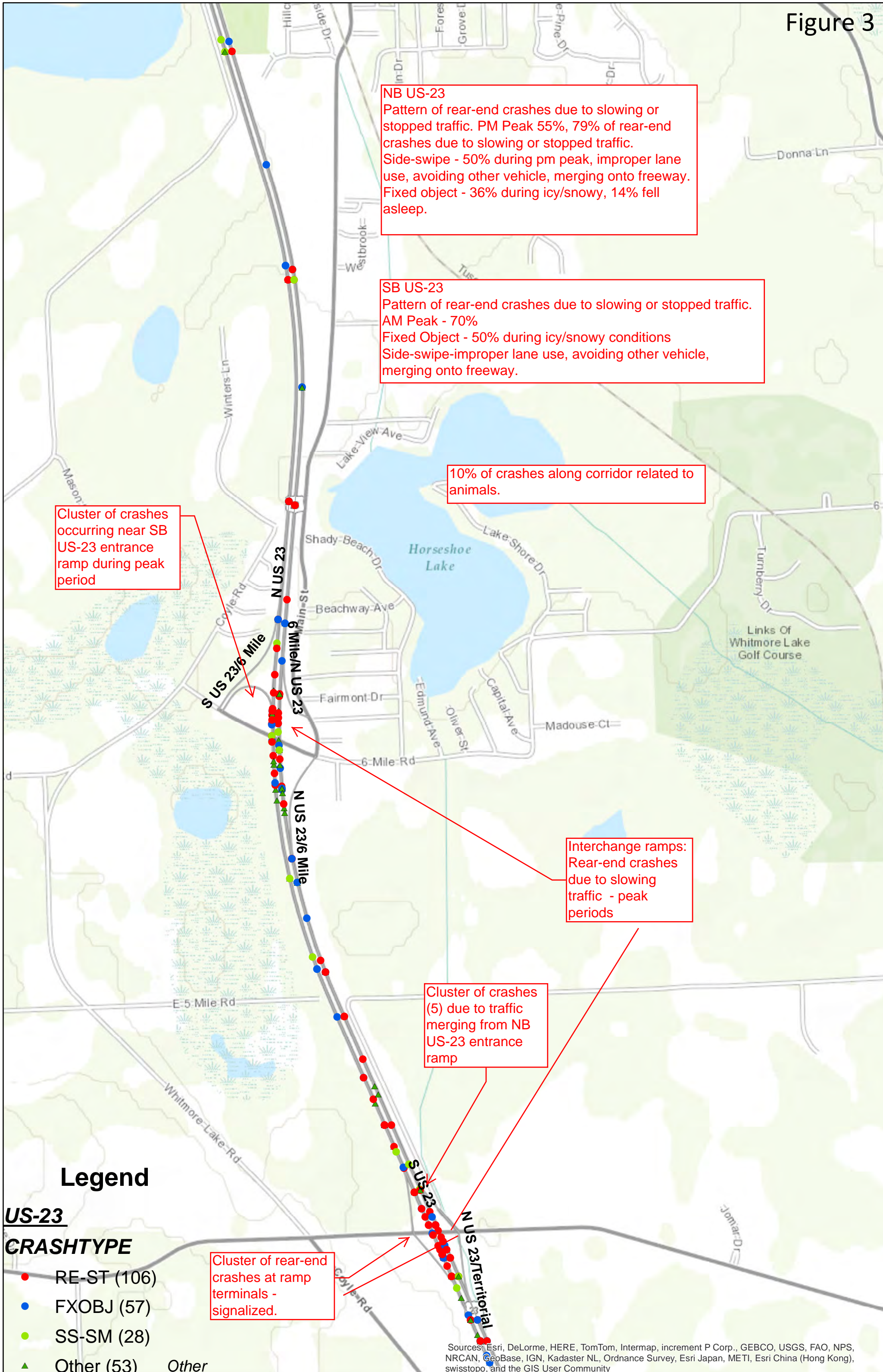
US-23

CRASHTYPE

- RE-ST (95)
- FXOBJ (60)
- SS-SM (22)
- ▲ Other (36)

Sources: Esri, DeLorme, HERE, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

Figure 3



NB US-23
 Pattern of rear-end crashes due to slowing or stopped traffic. PM Peak 55%, 79% of rear-end crashes due to slowing or stopped traffic.
 Side-swipe - 50% during pm peak, improper lane use, avoiding other vehicle, merging onto freeway.
 Fixed object - 36% during icy/snowy, 14% fell asleep.

SB US-23
 Pattern of rear-end crashes due to slowing or stopped traffic. AM Peak - 70%
 Fixed Object - 50% during icy/snowy conditions
 Side-swipe-improper lane use, avoiding other vehicle, merging onto freeway.

10% of crashes along corridor related to animals.

Cluster of crashes occurring near SB US-23 entrance ramp during peak period

Interchange ramps: Rear-end crashes due to slowing traffic - peak periods

Cluster of crashes (5) due to traffic merging from NB US-23 entrance ramp

Cluster of rear-end crashes at ramp terminals - signaled.

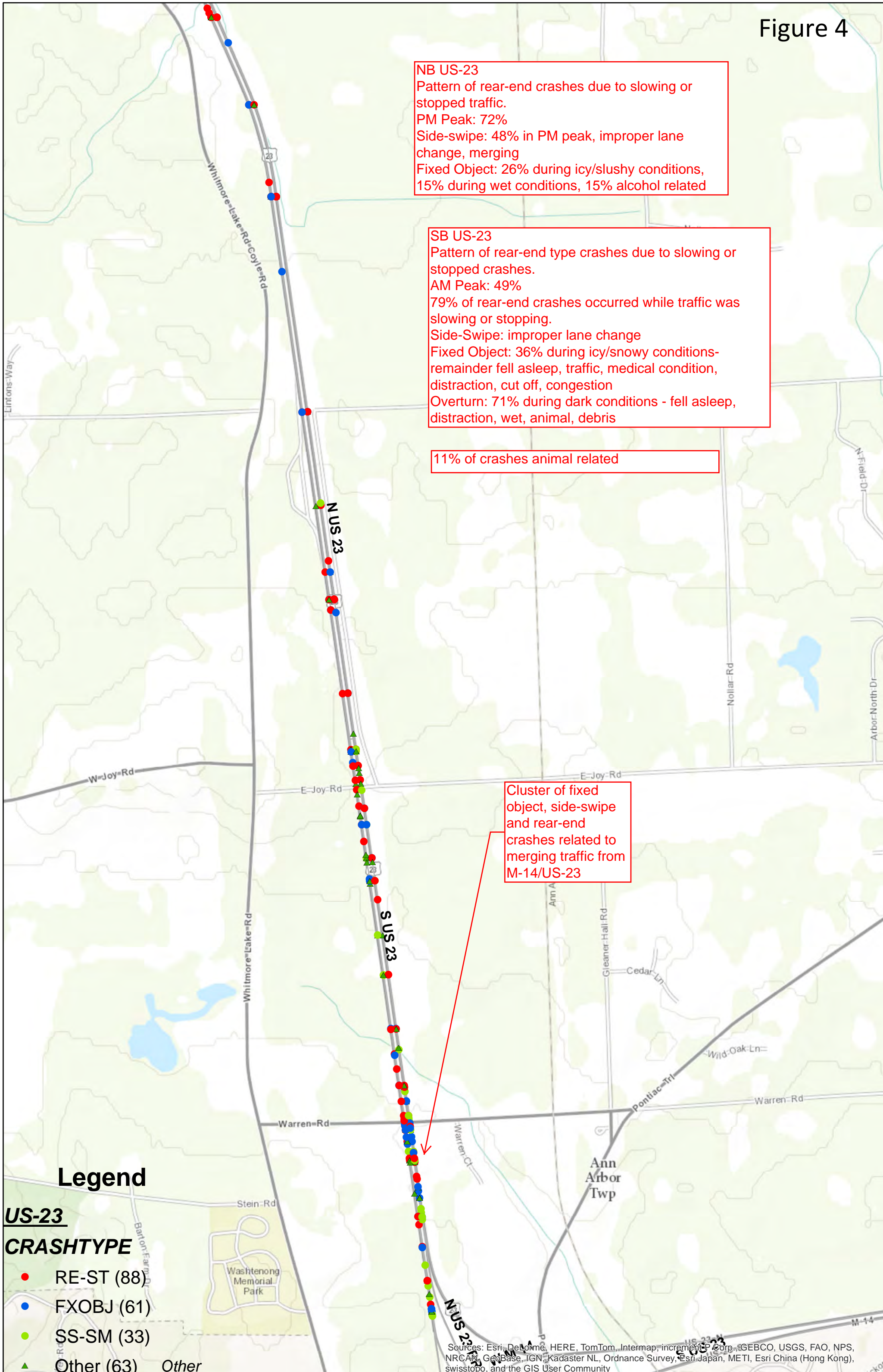
Legend

US-23 CRASHTYPE

- RE-ST (106)
- FXOBJ (57)
- SS-SM (28)
- ▲ Other (53) *Other*

Sources: Esri, DeLorme, HERE, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

Figure 4



NB US-23
 Pattern of rear-end crashes due to slowing or stopped traffic.
 PM Peak: 72%
 Side-swipe: 48% in PM peak, improper lane change, merging
 Fixed Object: 26% during icy/slushy conditions, 15% during wet conditions, 15% alcohol related

SB US-23
 Pattern of rear-end type crashes due to slowing or stopped crashes.
 AM Peak: 49%
 79% of rear-end crashes occurred while traffic was slowing or stopping.
 Side-Swipe: improper lane change
 Fixed Object: 36% during icy/snowy conditions-remainder fell asleep, traffic, medical condition, distraction, cut off, congestion
 Overturn: 71% during dark conditions - fell asleep, distraction, wet, animal, debris

11% of crashes animal related

Cluster of fixed object, side-swipe and rear-end crashes related to merging traffic from M-14/US-23

Legend

- US-23**
CRASHTYPE
- RE-ST (88)
 - FXOBJ (61)
 - SS-SM (33)
 - ▲ Other (63) *Other*

Sources: Esri, DeLorme, HERE, TomTom, Intermap, incrementP Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

Crash Summary
Main Line
US-23

Michigan Department of Transportation

CRASH SUMMARY REPORT

Summary Produced from 1/1/2009 to 12/31/2010

Physical Road Name	Physical Reference Number	BMP	EMP	State Route Name	Direction	Ramp	County
US-23	931510	0.000	2.847	US-23	N	NA	Livingston
US-23	932002	0.000	2.847	US-23	S	NA	Livingston
US-23	1431003	0.752	8.052	US-23	N	NA	Washtenaw
US-23	1431105	0.475	8.028	US-23	S	NA	Washtenaw

Crash Type	Count	Rate	%age
Total	608	130.74	100
Miscellaneous 1 Vehicle	26	5.59	4.28
Overturn	35	7.52	5.76
Hit Train	0	0.00	0
Hit Parked Vehicle	0	0.00	0
Backing	1	0.21	0.16
Parking	0	0.00	0
Pedestrian	1	0.21	0.16
Fixed Object	175	37.63	28.78
Other Object	11	2.36	1.81
Animal	45	9.67	7.4
Bicycle	0	0.00	0
Head-On	1	0.21	0.16
Angle Straight	14	3.01	2.3
Rear-End Straight	229	49.24	37.66
Angle Turn	0	0.00	0
Side Swipe Same	70	15.05	11.51
Rear-End Left Turn	0	0.00	0
Rear-End Right Turn	0	0.00	0
Other Drive	0	0.00	0
Angle Drive	0	0.00	0
Rear-End Drive	0	0.00	0
Side-Swipe Opposite	0	0.00	0
Head-On Left-Turn	0	0.00	0
Dual Left Turn	0	0.00	0
Dual Right Turn	0	0.00	0
Miscellaneous Multiple Vehic	0	0.00	0
Angle Right Turn	0	0.00	0

Crash Type	Rate	Count	%age
ICY	26.23	122	20.07
DARK	43.65	203	33.39
WET	20.42	95	15.63
FATAL	0.00	0	0.00
INJURY	28.59	133	21.88

Severity	Count	Rate
Fatalities:	0	0
Injuries A:	10	2.15
Injuries B:	42	9.03
Injuries C:	119	25.58
Injuries:	171	

Disclaimers: Crash information is conditioned upon your agreement to comply with the requirements of federal law.. MDOT provides access to this information with the understanding that it will be used strictly for scientific research purposes and/or for governmental purposes by governmental units. MDOT authorizes no other use of this privileged information. MDOT does not waive any privilege based on this limited release of information.

Michigan Department of Transportation

CRASH SUMMARY REPORT

Summary Produced from 1/1/2013 to 12/31/2013

Physical Road Name	Physical Reference Number	BMP	EMP	State Route Name	Direction	Ramp	County
US-23	931510	0.000	2.847	US-23	N	NA	Livingston
US-23	932002	0.000	2.847	US-23	S	NA	Livingston
US-23	1431003	0.752	8.052	US-23	N	NA	Washtenaw
US-23	1431105	0.475	8.028	US-23	S	NA	Washtenaw

Crash Type	Count	Rate	%age
Total	237		100
Miscellaneous 1 Vehicle	16		6.75
Overturn	6		2.53
Hit Train	0		0
Hit Parked Vehicle	0		0
Backing	1		0.42
Parking	0		0
Pedestrian	0		0
Fixed Object	41		17.3
Other Object	7		2.95
Animal	20		8.44
Bicycle	0		0
Head-On	0		0
Angle Straight	0		0
Rear-End Straight	110		46.41
Angle Turn	0		0
Side Swipe Same	35		14.77
Rear-End Left Turn	0		0
Rear-End Right Turn	1		0.42
Other Drive	0		0
Angle Drive	0		0
Rear-End Drive	0		0
Side-Swipe Opposite	0		0
Head-On Left-Turn	0		0
Dual Left Turn	0		0
Dual Right Turn	0		0
Miscellaneous Multiple Vehic	0		0
Angle Right Turn	0		0

Crash Type	Rate	Count	%age
ICY		23	9.70
DARK		63	26.58
WET		37	15.61
FATAL		2	0.84
INJURY		41	17.30

Severity	Count	Rate
Fatalities:	2	
Injuries A:	3	
Injuries B:	4	
Injuries C:	45	
Injuries:	52	

Disclaimers: Crash information is conditioned upon your agreement to comply with the requirements of federal law.. MDOT provides access to this information with the understanding that it will be used strictly for scientific research purposes and/or for governmental purposes by governmental units. MDOT authorizes no other use of this privileged information. MDOT does not waive any privilege based on this limited release of information.

Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2009 to 12/31/2010

PR:1431003 BMP:0.752 EMP:8.052

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATI ON	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDO	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	47013	1.119	932002	1.119	terchang	other freeway	ANIML	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Sat	2353	06/12/2010	7629737	0	0	0	Y	0	0	No
ivers	47013	1.247	931510	1.247	terchang	other freeway	ANIML	North	Side; Passenger	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Other	Dry	Sun	0300	02/08/2009	7258912	0	0	0	Y	0	0	No
ivers	47013	1.438	932002	1.438	terchang	other freeway	ANIML	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	0020	07/11/2009	7359100	0	0	0	Y	0	0	No
ivers	81075	1.56	1431105	0.493	terchang	ramp	ANIML	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Sun	1400	09/26/2010	7764977	0	0	0	Y	0	0	No
ivers	47013	1.64	932002	1.64	Mid-block	other freeway	ANIML	South	Side; Driver Si	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	0750	11/02/2009	7453678	0	0	0	Y	0	0	No
ivers	81075	1.874	1431105	0.807	terchang	other freeway	ANIML	South	Uncoded Errors	Change Lanes	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Thu	2220	11/19/2009	7462091	0	0	0	Y	0	0	No
ivers	81075	1.957	1431105	0.89	terchang	other freeway	ANIML	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Thu	0800	04/02/2009	7286507	0	0	0	Y	0	0	No
ivers	81075	1.963	1431105	0.896	terchang	other freeway	ANIML	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	0816	05/29/2009	7337847	0	0	1	N	1	0	No
ivers	81075	1.972	1431003	0.847	terchang	other freeway	ANIML	North	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	2100	11/15/2010	7806674	0	0	0	Y	0	0	No
ivers	81075	2.039	1431003	0.914	terchang	other freeway	ANIML	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	2049	05/28/2010	7625949	0	0	0	Y	0	0	No
ivers	81075	2.044	1431105	0.977	Mid-block	other freeway	ANIML	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Wed	0350	10/14/2009	7435028	0	0	0	Y	0	0	No
ivers	47013	2.597	931510	2.597	terchang	other freeway	ANIML	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Wet	Wed	1925	02/03/2010	7548852	0	0	0	Y	0	0	No
ivers	81075	2.644	1431003	1.519	Mid-block	straight, unrel	ANIML	North	Side; Driver Si	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	2355	05/08/2010	7614303	0	0	0	Y	0	0	No
ivers	47013	2.838	931510	2.838	terchang	other freeway	ANIML	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Wet	Sat	0359	10/24/2009	7438282	0	0	0	Y	0	0	No
ivers	81075	2.839	1431003	1.714	Mid-block	other freeway	ANIML	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	2015	09/26/2009	7417913	0	0	0	Y	0	0	No
ivers	81075	2.879	1431105	1.812	Mid-block	other freeway	ANIML	Unknown	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	2330	11/01/2010	7797687	0	0	0	Y	0	0	No
ivers	81075	2.881	1431105	1.814	Mid-block	other freeway	ANIML	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	0050	11/15/2010	7805110	0	0	0	Y	0	0	No
ivers	81075	3.052	1431105	1.985	Mid-block	other freeway	ANIML	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Tue	0205	11/03/2009	7443666	0	0	0	Y	0	0	No
ivers	81075	3.052	1431105	1.985	Mid-block	other freeway	ANIML	South	Side; Driver Si	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sun	1345	11/08/2009	7463071	0	0	0	Y	0	0	No

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2009 to 12/31/2010

PR:1431003 BMP:0.752 EMP:8.052

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATI ON	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	81075	3.612	1431003	2.487	Mid-block	other freeway	ANIML	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Sun	2140	03/14/2010	7578615	0	0	0	Y	0	0	No
ivers	81075	4.039	1431003	2.914	Mid-block	other freeway	ANIML	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Sat	0650	06/13/2009	7339658	0	0	0	Y	0	0	No
ivers	81075	4.531	1431105	3.464	Mid-block	other freeway	ANIML	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	0330	06/26/2010	7643197	0	0	0	Y	0	0	No
ivers	81075	4.531	1431105	3.464	Mid-block	other freeway	ANIML	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Tue	0009	10/27/2009	7437615	0	0	0	Y	0	0	No
ivers	81075	5.331	1431105	4.264	Interchang	other freeway	ANIML	South	Under Carriage	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Tue	1908	11/17/2009	7462099	0	0	0	Y	0	0	No
ivers	81075	5.331	1431105	4.264	Interchang	straight, unrel	ANIML	South	Side; Passenger	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	1545	05/22/2009	7319251	0	0	0	Y	0	0	No
ivers	81075	5.362	1431003	4.237	Interchang	other freeway	ANIML	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Fog / Smoke	Dry	Sat	0413	11/13/2010	7812483	0	0	0	Y	0	0	No
ivers	81075	5.626	1431105	4.559	Interchang	other freeway	ANIML	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sun	0529	05/30/2010	7629672	0	0	0	Y	0	0	No
ivers	81075	5.781	1431105	4.714	Interchang	other freeway	ANIML	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear		Sun	0240	05/31/2009	7333741	0	0	0	Y	0	0	No
ivers	81075	5.781	1431105	4.714	Interchang	other freeway	ANIML	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Sun	0717	06/13/2010	7643758	0	0	0	Y	0	0	No
ivers	81075	5.831	1431105	4.764	Interchang	other freeway	ANIML	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sun	0145	10/17/2010	7786064	0	0	0	Y	0	0	No
ivers	81075	6.214	1431003	5.089	Mid-block	other freeway	ANIML	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Other	Other	Sun	2230	10/25/2009	7442801	0	0	0	Y	0	0	No
ivers	81075	6.341	1431105	5.274	Mid-block	other freeway	ANIML	South	Front Center	Avoiding Object	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	0152	06/06/2009	7337828	0	0	1	N	1	0	No
ivers	81075	6.412	1431003	5.287	Interchang	straight, unrel	ANIML	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sun	0400	05/03/2009	7306525	0	0	0	Y	0	0	No
ivers	81075	6.531	1431105	5.464	Interchang	other freeway	ANIML	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Tue	0245	11/02/2010	7797688	0	0	0	Y	0	0	No
ivers	81075	6.572	1431003	5.447	Interchang	other freeway	ANIML	North	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Thu	2150	11/05/2009	7457525	0	0	0	Y	0	0	No
ivers	81075	6.741	1431105	5.674	Interchang	other freeway	ANIML	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	1300	05/22/2009	7319250	0	0	0	Y	0	0	No
ivers	81075	6.741	1431105	5.674	Interchang	other freeway	ANIML	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	0620	10/09/2010	7774692	0	0	0	Y	0	0	No
ivers	81075	6.841	1431105	5.774	Interchang	other freeway	ANIML	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sun	2135	05/23/2010	7621021	0	0	0	Y	0	0	No

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PR:1431003 BMP:0.752 EMP:8.052

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOC ATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
Ivers	81075	6.891	1431105	5.824	Interchang	other freeway	ANIML	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Wed	0150	07/22/2009	7382867	0	0	0	Y	0	0	No
Ivers	81075	7.141	1431105	6.074	Mid-block	other freeway	ANIML	South	Rear Corner;	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	0310	05/22/2009	7333740	0	0	0	Y	0	0	No
Ivers	81075	8.111	1431105	7.044	Mid-block	other freeway	ANIML	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Mon	0020	06/08/2009	7333742	0	0	0	Y	0	0	No
Ivers	81075	8.442	1431003	7.317	Interchang	other freeway	ANIML	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Mon	0823	10/25/2010	7800213	0	0	0	Y	0	0	No
Ivers	81075	8.561	1431105	7.494	Interchang	straight, unrel	ANIML	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	1650	06/12/2010	7636237	0	0	0	Y	0	0	No
Ivers	81075	9.027	1431105	7.96	Interchang	other freeway	ANIML	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Fri	2258	03/06/2009	7277926	0	0	0	Y	0	0	No
Ivers	81075	9.117	1431003	7.992	Interchang	other freeway	ANIML	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Thu	0136	05/07/2009	7324366	0	0	0	Y	0	0	No
Ivers	47013	0.463	932002	0.463	Mid-block	other freeway	AN-ST	South	Front Center	Going Straight	South	Front Center	Going Straight	Snow /	Snowy	Mon	1036	02/22/2010	7559296	0	1	1	N	2	0	No
Ivers	47013	1.638	932002	1.638	Mid-block	other freeway	AN-ST	South	Multiple Areas	Going Straight	South	Front Corner; P	Going Straight	Cloudy	Dry	Fri	1755	11/27/2009	7471515	0	0	0	Y	0	0	No
Ivers	81075	1.642	1431105	0.575	Interchang	other freeway	AN-ST	South	Rear Corner;	Change Lanes	South	Front Corner; P	Going Straight	Cloudy	Dry	Thu	0715	01/22/2009	7233639	0	0	0	Y	0	0	No
Ivers	81075	2.125	1431003	1	Mid-block	ransition area	AN-ST	North	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Parked	Clear	Dry	Sat	0315	07/24/2010	7677360	0	0	0	Y	0	0	No
Ivers	81075	2.394	1431003	1.269	Mid-block	other freeway	AN-ST	North	Uncoded Errors	Going Straight	North	Side; Driver Si	Going Straight	leet/H	Slushy	Sun	2324	04/05/2009	7296640	0	0	0	Y	0	0	No
Ivers	81075	3.052	1431105	1.985	Mid-block	Median Crossing	AN-ST	West	Rear Corner;	Leave Road	South	Front Corner; D	Slowing Stopped	Snow /	Wet	Sun	1549	12/27/2009	7519422	0	0	1	N	1	0	No
Ivers	81075	3.089	1431003	1.964	Mid-block	straight, unrel	AN-ST	South	Front Corner; P	Going Straight	South	Front Center	Going Straight	Snow /	Snowy	Wed	1030	01/28/2009	7239938	0	0	0	Y	0	0	No
Ivers	81075	3.181	1431003	2.056	Mid-block	other freeway	AN-ST	North	Front Corner; D	Avoid Vehicle	North	Rear Corner; Dr	Going Straight	Cloudy	Dry	Mon	1745	01/19/2009	7243736	0	0	0	Y	0	0	No
Ivers	81075	5.031	1431105	3.964	Mid-block	other freeway	AN-ST	South	Side; Passenger	Going Straight	South	Front Center	Going Straight	Snow /	Snowy	Tue	0915	02/09/2010	7555985	0	0	0	Y	0	0	No
Ivers	81075	5.474	1431105	4.407	Interchang	other freeway	AN-ST	South	Side; Driver Si	Going Straight	South	Front Center	Going Straight	leet/H	Icy	Tue	2034	01/06/2009	7231431	0	0	1	N	1	0	No
Ivers	81075	5.712	1431003	4.587	Interchang	other freeway	AN-ST	West	Front Corner; D	Change Lanes	North	Front Center	Going Straight	Cloudy	Dry	Sat	1122	11/13/2010	7814949	0	0	0	Y	0	0	No
Ivers	81075	6.591	1431105	5.524	Interchang	other freeway	AN-ST	South	Multiple Areas	Change Lanes	South	Front Corner; P	Going Straight	Clear	Dry	Tue	0712	06/23/2009	7344094	0	0	0	Y	0	0	No

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ivers	81075	6.614	1431003	5.489	terchang	other freeway	AN-ST	North	Rear Center	Going Straight	North	Side; Passenger	Going Straight	Snow /	Slushy	Fri	1136	01/30/2009	7252919	0	0	0	Y	0	0	No
ivers	81075	8.516	1431105	7.449	terchang	straight, unrel	AN-ST	North	Front Corner; D	Change Lanes	North	Front Corner; P	Pedestrian doin	Cloudy	Dry	Mon	1535	05/11/2009	7324259	0	0	0	Y	0	0	No
ivers	81075	3.057	1431105	1.99	Mid-block	other	BCKNG	South	Rear Corner;	Backing	South	Rear Center	Backing	Rain	Wet	Thu	1040	09/02/2010	7688400	0	0	0	Y	0	0	No
ivers	47013	0.269	932002	0.269	terchang	other freeway	FXOBJ	South	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	1535	01/22/2010	7548841	0	0	0	Y	0	0	No
ivers	47013	0.288	931510	0.288	terchang	other freeway	FXOBJ	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Wet	Mon	1000	12/21/2009	7516140	0	0	0	Y	0	0	No
ivers	47013	0.302	932002	0.302	terchang	other freeway	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Wet	Thu	1320	01/07/2010	7533219	0	0	0	Y	0	0	No
ivers	47013	0.322	932002	0.322	terchang	other freeway	FXOBJ	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Icy	Sun	0830	01/11/2009	7223683	0	0	0	Y	0	0	No
ivers	47013	0.472	932002	0.472	Mid-block	other freeway	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Icy	Mon	0559	01/04/2010	7519094	0	0	0	Y	0	0	No
ivers	47013	0.633	931510	0.633	Mid-block	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Icy	Sun	1139	01/18/2009	7237367	0	1	0	N	1	0	No
ivers	47013	0.722	932002	0.722	Mid-block	other freeway	FXOBJ	South	Under Carriage	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sat	1530	02/21/2009	7258900	0	0	0	Y	0	0	No
ivers	47013	0.838	932002	0.838	Mid-block	other freeway	FXOBJ	South	Front Corner; P	Change Lanes	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Thu	2030	04/29/2010	7604934	0	0	0	Y	0	0	No
ivers	47013	0.888	932002	0.888	Mid-block	other freeway	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Fri	1933	05/21/2010	7616912	0	0	0	Y	0	0	No
ivers	47013	0.904	931510	0.904	terchang	other freeway	FXOBJ	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Icy	Sat	1046	12/26/2009	7510637	0	0	0	Y	0	0	No
ivers	47013	0.955	931510	0.955	terchang	other freeway	FXOBJ	North	Side; Passenger	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Wet	Fri	1130	12/10/2010	7856160	0	0	0	Y	0	0	No
ivers	47013	0.991	931510	0.991	terchang	other freeway	FXOBJ	North	Front Corner; D	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	0855	07/06/2009	7354419	0	0	0	Y	0	0	No
ivers	47013	1.033	931510	1.033	terchang	other freeway	FXOBJ	North	Front Center	Slowing Stopped	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Icy	Mon	1005	01/04/2010	7533221	0	0	0	Y	0	0	No
ivers	47013	1.033	931510	1.033	terchang	other freeway	FXOBJ	North	Rear Corner;	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Icy	Tue	2050	01/06/2009	7223311	0	0	0	Y	0	0	No
ivers	47013	1.043	932002	1.043	terchang	other freeway	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sun	1026	12/06/2009	7487607	0	0	0	Y	0	0	No
ivers	47013	1.088	932002	1.088	terchang	other freeway	FXOBJ	South	Side; Passenger	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Mon	0938	11/22/2010	7804827	0	0	0	Y	0	0	No

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Iverson	47013	1.091	932002	1.091	Interchange	other freeway	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Fri	0533	11/27/2009	7471523	0	0	1	N	1	0	No
Iverson	47013	1.105	931510	1.105	Interchange	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Icy	Mon	1005	01/04/2010	7533224	0	0	0	Y	0	0	No
Iverson	47013	1.119	932002	1.119	Interchange		FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Fri	2146	02/26/2010	7574542	0	0	0	Y	0	0	No
Iverson	47013	1.124	931510	1.124	Interchange	other freeway	FXOBJ	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	2011	09/18/2009	7408616	0	0	0	Y	0	0	No
Iverson	47013	1.13	931510	1.13	Interchange	other freeway	FXOBJ	North	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Mon	0850	01/04/2010	7519100	0	0	0	Y	0	0	No
Iverson	47013	1.132	932002	1.132	Interchange	other freeway	FXOBJ	South	Side; Driver Si	Slowing Stopped	Unknown	Uncoded Errors	Uncoded Error	Snow /	Icy	Mon	0609	01/04/2010	7518824	0	0	0	Y	0	0	No
Iverson	47013	1.134	932002	1.134	Interchange	other freeway	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Mon	2344	01/26/2009	7244221	0	1	1	N	2	0	No
Iverson	47013	1.135	932002	1.135	Interchange	other freeway	FXOBJ	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	0137	02/01/2010	7550048	0	0	0	Y	0	0	No
Iverson	47013	1.139	931510	1.139	Interchange	other freeway	FXOBJ	South	Front Center	Starting up on	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Wet	Fri	1950	07/23/2010	7665309	0	1	0	N	1	0	No
Iverson	47013	1.147	932002	1.147	Interchange	other freeway	FXOBJ	South	Front Corner; P	Enter Road	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Icy	Thu	0700	01/21/2010	7562029	0	0	0	Y	0	0	No
Iverson	47013	1.152	931510	1.152	Interchange	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Mon	1000	01/04/2010	7519099	0	0	0	Y	0	0	No
Iverson	47013	1.152	931510	1.152	Interchange	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Mon	1015	01/04/2010	7519104	0	0	0	Y	0	0	No
Iverson	47013	1.157	932002	1.157	Interchange	other freeway	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Icy	Sun	1200	01/18/2009	7237366	0	0	0	Y	0	0	No
Iverson	47013	1.185	932002	1.185	Interchange	other freeway	FXOBJ	South	Front Corner; D	Change Lanes	Unknown	Uncoded Errors	Uncoded Error	Rain	Icy	Wed	0155	01/07/2009	7223687	0	0	0	Y	0	0	No
Iverson	47013	1.2	932002	1.2	Interchange	other freeway	FXOBJ	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Icy	Sun	0700	12/13/2009	7500268	0	0	0	Y	0	0	No
Iverson	47013	1.204	932002	1.204	Interchange	other freeway	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	2215	09/12/2009	7406370	0	0	1	N	1	0	No
Iverson	47013	1.388	932002	1.388	Interchange	other freeway	FXOBJ	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sat	1158	02/21/2009	7264311	0	0	0	Y	0	0	No
Iverson	47013	1.388	932002	1.388	Interchange	other freeway	FXOBJ	South	Side; Driver Si	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sat	1358	02/21/2009	7273303	0	0	0	Y	0	0	No
Iverson	47013	1.498	932002	1.498	Interchange	other freeway	FXOBJ	South	Rear Corner;	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Icy	Sun	1200	01/18/2009	7237362	0	0	0	Y	0	0	No

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2009 to 12/31/2010

PR:1431003 BMP:0.752 EMP:8.052

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATI ON	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	47013	1.517	932002	1.517	terchang	other freeway	FXOBJ	South	Rear Corner;	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Icy	Sun	1200	01/18/2009	7237361	0	0	0	Y	0	0	No
ivers	81075	1.552	1431105	0.485	terchang	other freeway	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Sun	1448	04/25/2010	7600028	0	0	0	Y	0	0	No
ivers	81075	1.561	1431105	0.494	terchang	other freeway	FXOBJ	South	Front Center	Avoid Vehicle	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Wed	0208	05/12/2010	7609667	0	0	0	Y	0	0	Yes
ivers	81075	1.561	1431105	0.494	terchang	other freeway	FXOBJ	South	Side; Passenger	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Icy	Fri	0625	11/27/2009	7466234	0	0	1	N	1	0	No
ivers	81075	1.568	1431105	0.501	terchang	other freeway	FXOBJ	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Wet	Mon	1917	01/04/2010	7513368	0	0	0	Y	0	0	No
ivers	47013	1.611	932002	1.611	Mid-block	other freeway	FXOBJ	South	Side; Passenger	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Icy	Sun	0600	01/11/2009	7223695	0	0	0	Y	0	0	No
ivers	47013	1.638	932002	1.638	Mid-block	other freeway	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Thu	1950	03/12/2009	7284891	0	0	2	N	2	0	No
ivers	81075	1.731	1431105	0.664	terchang	other freeway	FXOBJ	South	Side; Passenger	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Sat	0001	06/20/2009	7338482	0	0	0	Y	0	0	No
ivers	81075	1.813	1431105	0.746	terchang	other freeway	FXOBJ	South	Front Center	Avoiding Object	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sun	0015	12/05/2010	7815727	0	0	0	Y	0	0	No
ivers	81075	1.894	1431003	0.769	terchang	other freeway	FXOBJ	North	Rear Corner;	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Wet	Mon	2355	01/11/2010	7524845	0	0	0	Y	0	0	No
ivers	81075	1.944	1431003	0.819	terchang	transitio area	FXOBJ	North	Rear Corner;	Slowing Stopped	Unknown	Uncoded Errors	Uncoded Error	Clear	Slushy	Wed	2130	01/28/2009	7243982	0	0	0	Y	0	0	No
ivers	81075	1.974	1431003	0.849	terchang	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Thu	1210	07/15/2010	7659226	0	0	0	Y	0	0	No
ivers	81075	2.006	1431105	0.939	Mid-block	straight, unrel	FXOBJ	South	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sun	0700	07/12/2009	7366114	0	1	0	N	1	0	No
ivers	81075	2.025	1431105	0.958	Mid-block	other freeway	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Sun	2330	02/28/2010	7562579	0	0	0	Y	0	0	No
ivers	81075	2.044	1431105	0.977	Mid-block	transitio area	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sat	0945	01/10/2009	7233067	0	0	0	Y	0	0	No
ivers	81075	2.055	1431105	0.988	Mid-block	other freeway	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	1025	11/06/2009	7456299	0	1	0	N	1	0	No
ivers	81075	2.059	1431105	0.992	Mid-block	other freeway	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Fri	2330	06/19/2009	7344012	0	0	0	Y	0	0	No
ivers	81075	2.064	1431003	0.939	Mid-block	other freeway	FXOBJ	North	Rear Corner;	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Sat	0455	06/20/2009	7366277	0	0	0	Y	0	0	Yes
ivers	81075	2.094	1431003	0.969	Mid-block	straight, unrel	FXOBJ	North	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Sat	0800	07/11/2009	7357880	0	0	0	Y	0	0	No

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Michigan Department of Transportation
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PR:1431003 BMP:0.752 EMP:8.052

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOC ATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	ALCHOL INVOL
ivers	81075	2.106	1431003	0.981	Mid-block	transition area	FXOBJ	North	Side; Passenger	Enter Road	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Wed	2120	11/11/2009	7450452	1	0	0	N	1	0	No
ivers	81075	2.14	1431003	1.015	Intersection	straight, unrel	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Icy	Fri	0940	01/08/2010	7518571	0	0	0	Y	0	0	No
ivers	81075	2.143	1431003	1.018	Mid-block	other freeway	FXOBJ	North	Other Unknown	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Icy	Thu	0318	01/15/2009	7226326	0	0	1	N	1	0	No
ivers	81075	2.145	1431003	1.02	Mid-block	transition area	FXOBJ	North	Front Center	Change Lanes	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	2115	02/13/2009	7265412	0	0	1	N	1	0	No
ivers	81075	2.163	1431105	1.096	Mid-block	other freeway	FXOBJ	South	Under Carriage	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Wed	0230	12/09/2009	7498266	0	0	0	Y	0	0	No
ivers	81075	2.201	1431003	1.076	Mid-block	other freeway	FXOBJ	North	Side; Passenger	Avoid Vehicle	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	1507	07/03/2009	7353116	0	0	1	N	1	0	No
ivers	81075	2.243	1431105	1.176	Mid-block	other freeway	FXOBJ	South	Front Corner; P	Avoid Vehicle	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Tue	2038	06/01/2010	7624917	0	0	0	Y	0	0	No
ivers	47013	2.247	931510	2.247	Mid-block	other freeway	FXOBJ	North	Front Corner; P	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	1311	04/05/2010	7604958	0	0	0	Y	0	0	No
ivers	47013	2.347	932002	2.347	Mid-block	other freeway	FXOBJ	South	Side; Driver Si	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Clear	Wet	Wed	1030	12/16/2009	7500262	0	0	0	Y	0	0	No
ivers	47013	2.347	932002	2.347	Mid-block	other freeway	FXOBJ	North	Multiple Areas	Change Lanes	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Mon	0925	01/04/2010	7519101	0	0	0	Y	0	0	No
ivers	47013	2.347	931510	2.347	Mid-block	other freeway	FXOBJ	North	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Tue	2050	04/06/2010	7604957	0	0	0	Y	0	0	Yes
ivers	47013	2.347	931510	2.347	Mid-block	other freeway	FXOBJ	North	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Tue	2242	02/09/2010	7550049	0	0	0	Y	0	0	No
ivers	47013	2.347	932002	2.347	Mid-block	other freeway	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Snowy	Sun	1006	01/18/2009	7237365	0	0	0	Y	0	0	No
ivers	47013	2.468	931510	2.468	Interchang	other freeway	FXOBJ	North	Side; Passenger	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Icy	Thu	0224	02/19/2009	7258905	0	0	0	Y	0	0	No
ivers	47013	2.597	931510	2.597	Interchang	other freeway	FXOBJ	North	Rear Corner;	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Snowy	Fri	1515	01/08/2010	7554807	0	0	0	Y	0	0	No
ivers	81075	2.713	1431105	1.646	Mid-block	straight, unrel	FXOBJ	South	Multiple Areas	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Clear	Wet	Fri	0710	05/14/2010	7614125	0	0	0	Y	0	0	No
ivers	47013	2.72	932002	2.72	Interchang	other freeway	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Wet	Wed	0917	02/03/2010	7548846	0	0	0	Y	0	0	No
ivers	47013	2.747	931510	2.747	Interchang	other freeway	FXOBJ	North	Rear Corner;	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Icy	Tue	2315	01/06/2009	7223688	0	0	0	Y	0	0	No
ivers	47013	2.747	931510	2.747	Interchang	other freeway	FXOBJ	North	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Icy	Sun	0955	01/11/2009	7223684	0	0	0	Y	0	0	No

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Interchange
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 Non-Traffic

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ivers	47013	2.747	931510	2.747	terchang	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Severe Wind	Icy	Mon	0630	12/13/2010	7856167	0	0	0	Y	0	0	No
ivers	47013	2.809	931510	2.809	terchang	other freeway	FXOBJ	North	Rear Corner;	Leave Road	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Sat	2110	07/31/2010	7667228	0	3	0	N	3	0	No
ivers	47013	2.838	931510	2.838	terchang	other freeway	FXOBJ	North	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Thu	1250	11/26/2009	7471526	0	0	0	Y	0	0	No
ivers	47013	2.838	931510	2.838	terchang	other freeway	FXOBJ	North	Rear Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Tue	2033	10/06/2009	7418043	0	0	0	Y	0	0	No
ivers	47013	2.845	931510	2.845	terchang	other freeway	FXOBJ	North	Side; Passenger	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Wed	1535	10/21/2009	7433494	0	0	0	Y	0	0	No
ivers	81075	2.851	1431003	1.725	Mid-block	other freeway	FXOBJ	North	Uncoded Errors	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	0525	08/09/2010	7677329	0	0	0	Y	0	0	No
ivers	81075	2.857	1431105	1.79	Mid-block	other freeway	FXOBJ	South	Front Center	Avoid Vehicle	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Sat	0020	06/20/2009	7341186	0	0	1	N	1	0	No
ivers	81075	2.939	1431003	1.814	Mid-block	other freeway	FXOBJ	North	Rear Corner;	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Slushy	Sun	0935	12/12/2010	7838246	0	0	0	Y	0	0	No
ivers	81075	3.023	1431105	1.956	Mid-block	other freeway	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Tue	0322	03/10/2009	7274402	0	1	0	N	1	0	No
ivers	81075	3.052	1431105	1.985	Mid-block	straight, unrel	FXOBJ	South	Multiple Areas	Avoid Vehicle	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	1120	08/02/2010	7673168	0	0	0	Y	0	0	No
ivers	81075	3.289	1431003	2.164	Mid-block	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Icy	Thu	0818	02/25/2010	7566136	0	0	0	Y	0	0	No
ivers	81075	3.43	1431105	2.363	terchang	other freeway	FXOBJ	South	Rear Corner;	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Thu	0102	05/27/2010	7621931	0	0	0	Y	0	0	No
ivers	81075	3.457	1431105	2.39	terchang	other freeway	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Tue	0127	11/16/2010	7814948	0	0	0	Y	0	0	No
ivers	81075	3.503	1431003	2.378	Mid-block	straight, unrel	FXOBJ	South	Side; Driver Si	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Thu	1630	06/25/2009	7347727	0	0	0	Y	0	0	No
ivers	81075	3.539	1431003	2.414	Mid-block	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear		Sun	2056	06/20/2010	7649923	0	1	0	N	1	0	Yes
ivers	81075	3.612	1431003	2.487	Mid-block	other freeway	FXOBJ	North	Front Corner; D	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Thu	1745	06/04/2009	7331271	0	0	1	N	1	0	No
ivers	81075	3.957	1431105	2.89	terchang	straight, unrel	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sat	1454	01/10/2009	7225042	0	0	1	N	1	0	No
ivers	81075	4.039	1431003	2.914	Mid-block	other freeway	FXOBJ	North	Front Corner; D	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Fri	1605	03/27/2009	7286524	0	0	0	Y	0	0	No
ivers	81075	4.331	1431105	3.264	Mid-block	other freeway	FXOBJ	South	Rear Corner;	Slowing Stopped	Unknown	Uncoded Errors	Uncoded Error	leet/H	Icy	Thu	0158	12/30/2010	7862602	0	0	0	Y	0	0	No

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ivers	81075	4.531	1431105	3.464	Mid-block	other freeway	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Wet	Wed	0917	02/17/2010	7553974	0	0	1	N	1	0	No
ivers	81075	4.531	1431105	3.464	Mid-block	other freeway	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Tue	1151	02/09/2010	7546511	0	0	0	Y	0	0	No
ivers	81075	4.531	1431105	3.464	Mid-block	other freeway	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	0508	10/24/2009	7446656	0	0	0	Y	0	0	No
ivers	81075	4.531	1431105	3.464	Mid-block	other freeway	FXOBJ	South	Uncoded Errors	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	1455	06/06/2009	7333931	1	0	0	N	1	0	No
ivers	81075	4.612	1431003	3.487	Mid-block	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Slushy	Thu	0112	02/25/2010	7562450	0	0	0	Y	0	0	No
ivers	81075	4.781	1431105	3.714	Mid-block	other freeway	FXOBJ	South	Front Center	Change Lanes	Unknown	Uncoded Errors	Uncoded Error	Clear	Wet	Thu	1704	01/22/2009	7263998	0	0	0	Y	0	0	No
ivers	81075	4.781	1431105	3.714	Mid-block	other freeway	FXOBJ	South	Rear Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Icy	Tue	1030	02/09/2010	7549714	0	0	1	N	1	0	No
ivers	81075	5.031	1431105	3.964	Mid-block	other freeway	FXOBJ	South	Side; Driver Si	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Icy	Tue	1840	02/09/2010	7549610	0	0	1	N	1	0	No
ivers	81075	5.039	1431003	3.914	Mid-block	other freeway	FXOBJ	North	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Sat	0504	09/26/2009	7419417	0	0	0	Y	0	0	Yes
ivers	81075	5.112	1431003	3.987	Mid-block	other freeway	FXOBJ	South	Side; Passenger	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	0919	11/13/2009	7462723	0	1	1	N	2	0	No
ivers	81075	5.247	1431105	4.18	terchang	other freeway	FXOBJ	South	Rear Corner;	Change Lanes	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Thu	0725	09/09/2010	7762537	0	0	1	N	1	0	No
ivers	81075	5.281	1431105	4.214	terchang	other freeway	FXOBJ	South	Front Center	Avoid Vehicle	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Wed	2221	07/28/2010	7667750	0	0	1	N	1	0	No
ivers	81075	5.342	1431105	4.275	terchang	other freeway	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Mon	1229	02/22/2010	7561744	0	0	0	Y	0	0	No
ivers	81075	5.362	1431003	4.237	terchang	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Slushy	Mon	1226	02/22/2010	7559941	0	0	0	Y	0	0	No
ivers	81075	5.362	1431003	4.237	terchang	other freeway	FXOBJ	North	Rear Corner;	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Wed	2001	04/22/2009	7303775	0	0	0	Y	0	0	No
ivers	81075	5.412	1431003	4.287	terchang	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Sat	0300	01/24/2009	7244098	0	1	0	N	1	0	Yes
ivers	81075	5.474	1431105	4.407	terchang	other freeway	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Tue	2130	02/09/2010	7549686	0	0	1	N	1	0	No
ivers	81075	5.474	1431105	4.407	terchang	other freeway	FXOBJ	South	Front Center	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Rain	Icy	Tue	2035	01/06/2009	7229112	0	0	0	Y	0	0	No
ivers	81075	5.481	1431105	4.414	terchang	straight, unrel	FXOBJ	South	Rear Corner;	Change Lanes	Unknown	Uncoded Errors	Uncoded Error	Snow /	Slushy	Wed	1015	02/10/2010	7549696	0	0	0	Y	0	0	No

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2009 to 12/31/2010

PR:1431003 BMP:0.752 EMP:8.052

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEATHER	SURFACE CONDITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	81075	5.481	1431105	4.414	terchang	straight, unrel	FXOBJ	North	Rear Corner;	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Wed	1720	07/29/2009	7373803	0	0	0	Y	0	0	No
ivers	81075	5.512	1431003	4.387	terchang	other freeway	FXOBJ	North	Uncoded Errors	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	0030	07/31/2009	7379850	0	1	3	N	4	0	No
ivers	81075	5.531	1431105	4.463	terchang	other freeway	FXOBJ	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	1133	11/06/2009	7454662	0	0	0	Y	0	0	No
ivers	81075	5.584	1431003	4.459	terchang	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sat	1340	01/10/2009	7225039	0	0	1	N	1	0	No
ivers	81075	5.588	1431105	4.521	terchang	straight, unrel	FXOBJ	North	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Mon	0958	12/20/2010	7848161	0	0	1	N	1	0	No
ivers	81075	5.651	1431003	4.525	terchang	other freeway	FXOBJ	North	Front Center	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Fri	1810	07/17/2009	7373931	0	0	0	Y	0	0	No
ivers	81075	5.683	1431105	4.616	terchang	other freeway	FXOBJ	South	Front Center	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Wed	0903	11/18/2009	7466282	0	0	1	N	1	0	No
ivers	81075	5.781	1431105	4.714	terchang	other freeway	FXOBJ	South	Multiple Areas	Change Lanes	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Wed	0700	03/11/2009	7278090	0	0	0	Y	0	0	No
ivers	81075	5.891	1431105	4.824	Mid-block	other freeway	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Wed	0837	02/10/2010	7546514	0	0	1	N	1	0	No
ivers	81075	6.031	1431105	4.964	Mid-block	other freeway	FXOBJ	South	Front Center	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Wet	Fri	1809	12/17/2010	7847095	0	0	1	N	1	0	No
ivers	81075	6.141	1431105	5.074	Mid-block	other freeway	FXOBJ	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Wed	1935	07/28/2010	7675568	0	0	0	Y	0	0	No
ivers	81075	6.214	1431003	5.089	Mid-block	other freeway	FXOBJ	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	1529	06/18/2010	7646545	0	0	0	Y	0	0	No
ivers	81075	6.414	1431003	5.289	terchang	other freeway	FXOBJ	North	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Sat	0234	08/29/2009	7393802	0	0	0	Y	0	0	No
ivers	81075	6.464	1431003	5.339	terchang	other freeway	FXOBJ	North	Front Corner; D	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Fri	2313	06/19/2009	7344082	0	0	0	Y	0	0	No
ivers	81075	6.546	1431105	5.479	terchang	other freeway	FXOBJ	South	Front Corner; D	Slowing Stopped	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Thu	1417	07/09/2009	7382868	0	0	0	Y	0	0	Yes
ivers	81075	6.612	1431003	5.487	terchang	other freeway	FXOBJ	South	Rear Corner;	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sat	1839	01/10/2009	7221102	0	0	0	Y	0	0	No
ivers	81075	6.635	1431105	5.568	terchang	other freeway	FXOBJ	South	Rear Corner;	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Tue	0330	07/20/2010	7665466	0	0	0	Y	0	0	No
ivers	81075	6.657	1431003	5.532	terchang	other freeway	FXOBJ	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Fri	1430	01/09/2009	7238902	0	0	0	Y	0	0	No
ivers	81075	6.669	1431105	5.602	terchang	other freeway	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sat	1000	02/14/2009	7252251	0	0	0	Y	0	0	No

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2009 to 12/31/2010

PR:1431003 BMP:0.752 EMP:8.052

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOC ATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	81075	6.698	1431105	5.631	terchang	straight, unrel	FXOBJ	North	Front Center	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Snow /	Slushy	Mon	0900	01/04/2010	7513370	0	0	0	Y	0	0	No
ivers	81075	6.698	1431105	5.631	terchang	other freeway	FXOBJ	South	Front Center	Slowing Stopped	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Thu	2054	01/07/2010	7528301	0	0	0	Y	0	0	No
ivers	81075	6.705	1431003	5.58	terchang	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	1520	01/30/2010	7540554	0	0	0	Y	0	0	No
ivers	81075	6.752	1431003	5.627	terchang	other freeway	FXOBJ	North	Front Corner; D	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Clear	Snowy	Tue	2139	01/13/2009	7229114	0	0	0	Y	0	0	No
ivers	81075	6.884	1431003	5.759	terchang	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Thu	0147	12/24/2009	7506356	0	1	0	N	1	0	No
ivers	81075	6.891	1431105	5.824	terchang	other freeway	FXOBJ	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Thu	2038	06/17/2010	7643759	0	0	1	N	1	0	No
ivers	81075	6.891	1431105	5.824	terchang	other freeway	FXOBJ	South	Side; Driver Si	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sat	0950	01/10/2009	7225038	0	0	0	Y	0	0	No
ivers	81075	6.964	1431003	5.839	terchang	straight, unrel	FXOBJ	South	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	1645	08/16/2010	7685562	0	0	1	N	1	0	No
ivers	81075	6.964	1431003	5.839	terchang	other freeway	FXOBJ	North	Rear Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Slushy	Mon	1240	02/22/2010	7559942	0	0	0	Y	0	0	No
ivers	81075	7.141	1431105	6.074	Mid-block	other freeway	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Mon	0123	02/22/2010	7558456	0	0	0	Y	0	0	No
ivers	81075	7.214	1431003	6.089	Mid-block	transitior area	FXOBJ	North	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Tue	1230	08/31/2010	7691296	0	1	0	N	1	0	No
ivers	81075	7.464	1431003	6.339	Mid-block	other freeway	FXOBJ	North	Side; Driver Si	Change Lanes	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Tue	2235	08/25/2009	7390644	0	0	1	N	1	0	No
ivers	81075	7.641	1431105	6.574	Mid-block	transitior area	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Mon	0745	11/22/2010	7818802	0	0	0	Y	0	0	No
ivers	81075	7.641	1431105	6.574	Mid-block	other freeway	FXOBJ	South	Front Center	Overtake Passing	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Fri	1024	02/12/2010	7547893	0	1	0	N	1	0	No
ivers	81075	7.714	1431003	6.589	Mid-block	other freeway	FXOBJ	North	Uncoded Errors	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	1550	08/27/2010	7700454	0	1	0	N	1	0	No
ivers	81075	7.942	1431003	6.817	Mid-block	straight, unrel	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sat	1245	01/10/2009	7225041	0	0	0	Y	0	0	No
ivers	81075	8.214	1431003	7.089	Mid-block	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Mon	0138	02/22/2010	7559939	0	0	0	Y	0	0	No
ivers	81075	8.361	1431105	7.294	terchang	other freeway	FXOBJ	South	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Icy	Mon	0618	01/04/2010	7519423	0	0	1	N	1	0	No
ivers	81075	8.492	1431003	7.367	terchang	other freeway	FXOBJ	North	Front Center	Unknown	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Wed	0423	10/20/2010	7792122	0	0	1	N	1	0	No

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2009 to 12/31/2010

PR:1431003 BMP:0.752 EMP:8.052

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOC ATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	81075	8.503	1431003	7.378	terchang	other freeway	FXOBJ	North	Side; Driver Si	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Mon	0737	02/22/2010	7559940	0	0	0	Y	0	0	No
ivers	81075	8.516	1431105	7.449	terchang	other freeway	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Mon	1001	02/22/2010	7559937	0	0	0	Y	0	0	No
ivers	81075	8.597	1431003	7.472	terchang	other freeway	FXOBJ	North	Front Center	Unknown	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	0445	01/16/2010	7527590	0	0	0	Y	0	0	No
ivers	81075	8.602	1431105	7.535	terchang	other freeway	FXOBJ	South	Side; Passenger	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	1230	05/30/2009	7339654	0	0	0	Y	0	0	No
ivers	81075	8.613	1431105	7.546	terchang	other freeway	FXOBJ	South	Side; Passenger	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	2346	04/10/2010	7592005	0	0	0	Y	0	0	No
ivers	81075	8.613	1431105	7.546	terchang	other freeway	FXOBJ	South	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Mon	2334	11/22/2010	7830201	0	0	0	Y	0	0	No
ivers	81075	8.62	1431105	7.553	terchang	other freeway	FXOBJ	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sat	1245	01/17/2009	7244094	0	0	0	Y	0	0	No
ivers	81075	8.639	1431105	7.572	terchang	other freeway	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Wed	1325	01/14/2009	7229116	0	0	0	Y	0	0	No
ivers	81075	8.654	1431003	7.529	terchang	other freeway	FXOBJ	North	Multiple Areas	Avoiding Object	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Tue	1250	05/05/2009	7333932	0	0	0	Y	0	0	No
ivers	81075	8.673	1431003	7.548	terchang	other freeway	FXOBJ	North	Rear Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Sat	0108	05/16/2009	7323976	0	0	0	Y	0	0	No
ivers	81075	8.711	1431105	7.644	Mid-block	other freeway	FXOBJ	South	Rear Corner;	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Icy	Fri	0800	01/16/2009	7227679	0	0	0	Y	0	0	No
ivers	81075	8.847	1431003	7.722	terchang	other freeway	FXOBJ	North	Rear Corner;	Slowing Stopped	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sun	1300	12/12/2010	7840916	0	0	0	Y	0	0	No
ivers	81075	8.861	1431105	7.794	terchang	other freeway	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Tue	1025	02/09/2010	7547892	0	0	0	Y	0	0	No
ivers	81075	8.881	1431003	7.756	terchang	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Snowy	Sat	1440	01/17/2009	7244095	0	0	0	Y	0	0	No
ivers	81075	8.881	1431003	7.756	terchang	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Icy	Wed	1145	01/14/2009	7229117	0	0	0	Y	0	0	No
ivers	81075	8.881	1431003	7.756	terchang	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Icy	Wed	1150	01/14/2009	7229118	1	0	0	N	1	0	No
ivers	81075	8.922	1431105	7.855	terchang	other freeway	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	0323	04/30/2010	7610221	0	0	0	Y	0	0	No
ivers	81075	8.93	1431105	7.863	terchang	other freeway	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Mon	0355	04/06/2009	7310274	0	0	0	Y	0	0	No
ivers	81075	8.96	1431105	7.893	terchang	other freeway	FXOBJ	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	0930	04/23/2010	7600027	0	0	0	Y	0	0	No

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Interchange
 Intersection
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 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATI ON	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	81075	9.036	1431003	7.911	terchang	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sat	1420	01/17/2009	7244097	0	0	0	Y	0	0	No
ivers	81075	9.036	1431003	7.911	terchang	other freeway	FXOBJ	North	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Icy	Mon	0549	01/04/2010	7519425	0	0	0	Y	0	0	No
ivers	81075	9.036	1431105	7.969	terchang	straight, unrel	FXOBJ	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Tue	1610	05/25/2010	7624906	0	0	0	Y	0	0	No
ivers	81075	9.036	1431003	7.911	terchang	other freeway	FXOBJ	North	Rear Corner;	Change Lanes	Unknown	Uncoded Errors	Uncoded Error	Snow /	Icy	Thu	0050	02/19/2009	7263242	0	0	0	Y	0	0	No
ivers	81075	9.049	1431003	7.924	terchang	other freeway	FXOBJ	North	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sat	0250	01/31/2009	7239615	0	0	0	Y	0	0	Yes
ivers	81075	9.093	1431003	7.968	terchang	other freeway	FXOBJ	North	Uncoded Errors	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sat	0934	02/14/2009	7264001	0	0	1	N	1	0	No
ivers	81075	9.117	1431003	7.992	terchang	other freeway	FXOBJ	North	Rear Corner;	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Icy	Tue	2150	01/06/2009	7225040	0	0	0	Y	0	0	No
ivers	81075	8.422	1431105	7.355	terchang	other freeway	HD-ON	North	Front Corner; D	Going Straight	South	Front Corner; D	Going Straight	Snow /	Snowy	Tue	2248	12/08/2009	7489533	0	0	0	Y	0	0	No
ivers	47013	1.033	931510	1.033	terchang	other freeway	SC-MLT	North	None	Going Straight	North	Front Center	Going Straight	Clear	Dry	Wed	1321	09/01/2010	7687654	0	1	0	N	1	0	No
ivers	81075	2.013	1431105	0.946	Mid-block	straight, unrel	SC-MLT	North	Front Center	Going Straight	North	Rear Center	Going Straight			Wed	1400	09/23/2009	7406043	0	0	0	Y	0	0	Yes
ivers	81075	2.344	1431003	1.219	Mid-block	other freeway	SC-MLT	North	None	Going Straight	North	Front Center	Going Straight	Clear	Dry	Thu	1650	03/18/2010	7583210	0	0	0	Y	0	0	No
ivers	47013	2.347	931510	2.347	Mid-block	other freeway	SC-MLT	North	Under Carriage	Going Straight	North	None	Going Straight	Snow /	Icy	Wed	1246	01/14/2009	7231845	0	0	0	Y	0	0	No
ivers	47013	2.747	931510	2.747	terchang	other freeway	SC-MLT	North	Other Unknown	Going Straight	North	Front Center	Going Straight	Cloudy	Dry	Mon	1315	04/13/2009	7302409	0	0	0	Y	0	0	No
ivers	47013	2.784	932002	2.784	terchang	other freeway	SC-MLT	South	Front Corner; D	Going Straight	South	Side; Driver Si	Going Straight	Snow /	Slushy	Mon	1020	01/11/2010	7537771	0	0	0	Y	0	0	No
ivers	81075	3.134	1431003	2.009	Mid-block	other freeway	SC-MLT	North	None	Going Straight	North	Front Corner; D	Going Straight	Clear	Dry	Sun	1715	03/22/2009	7286515	0	0	0	Y	0	0	No
ivers	81075	3.457	1431105	2.39	terchang		SC-MLT	South	None	Going Straight	South	Rear Center	Going Straight	Clear	Dry	Thu	2339	05/07/2009	7324367	0	0	1	N	1	0	No
ivers	81075	4.531	1431105	3.464	Mid-block	other freeway	SC-MLT	South	Front Corner; P	Going Straight	South	Side; Driver Si	Slowing Stopped	Clear	Dry	Sat	1049	11/20/2010	7830199	0	0	0	Y	0	0	No
ivers	81075	5.512	1431003	4.387	terchang	other freeway	SC-MLT	North	None	Going Straight	North	Under Carriage	Going Straight	Clear	Dry	Wed	1810	06/09/2010	7636247	0	0	0	Y	0	0	No
ivers	81075	6.562	1431003	5.437	terchang	other freeway	SC-MLT	North	None	Going Straight	North	Front Corner; P	Going Straight	Rain	Wet	Thu	1253	09/02/2010	7697651	0	0	1	N	1	0	No

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2009 to 12/31/2010

PR:1431003 BMP:0.752 EMP:8.052

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATI ON	CRASH TYPE	DIREC TION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIREC TION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	81075	6.695	1431003	5.57	terchang	other freeway	SC-MLT	North	Side; Driver Si	Going Straight	North	Front Corner; P	Going Straight	Clear	Dry	Sun	1915	10/31/2010	7792469	0	0	0	Y	0	0	No
ivers	81075	8.442	1431003	7.317	terchang	other freeway	SC-MLT	North	Front Center	Slowing Stopped	North	Front Center	Slowing Stopped	Cloudy	Wet	Sat	1602	09/18/2010	7767211	0	0	0	Y	0	0	No
ivers	81075	8.881	1431003	7.756	terchang	other freeway	SC-MLT	South	Front Center	Going Straight	North	Front Center	Going Straight	Snow /	Icy	Mon	0805	12/13/2010	7842693	0	0	0	Y	0	0	No
ivers	81075	9.112	1431003	7.987	terchang	other freeway	SC-MLT	North	None	Going Straight	North	Front Corner; P	Going Straight	Cloudy	Dry	Wed	1325	12/22/2010	7835430	0	0	0	Y	0	0	No
ivers	47013	0.822	932002	0.822	Mid-block	other freeway	SC-SNG	South	None	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Tue	1130	09/07/2010	7699019	0	0	0	Y	0	0	No
ivers	47013	1.638	932002	1.638	Mid-block	other freeway	SC-SNG	South	Other Unknown	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	1441	06/28/2010	7642094	0	0	0	Y	0	0	No
ivers	81075	2.201	1431003	1.076	Mid-block	other freeway	SC-SNG	North	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	0800	11/29/2010	7812134	0	0	0	Y	0	0	No
ivers	47013	2.647	931510	2.647	terchang	other freeway	SC-SNG	North	Other Unknown	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Icy	Mon	0217	12/13/2010	7832566	0	0	0	Y	0	0	No
ivers	47013	2.844	932002	2.844	terchang	other freeway	SC-SNG	South	Under Carriage	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Tue	1110	02/09/2010	7550050	0	0	0	Y	0	0	No
ivers	81075	2.938	1431105	1.871	Mid-block	other freeway	SC-SNG	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	0630	07/13/2009	7354860	0	0	0	Y	0	0	No
ivers	81075	3.039	1431003	1.914	tersectio	straight, unrel	SC-SNG	South	Other Unknown	Uncoded Error	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Thu	1215	04/08/2010	7591387	0	0	0	Y	0	0	No
ivers	81075	4.612	1431003	3.487	Mid-block	other freeway	SC-SNG	North	Other Unknown	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Wed	2345	09/29/2010	7764974	0	0	0	Y	0	0	Yes
ivers	81075	6.664	1431003	5.539	terchang	ramp	SC-SNG	South	Side; Driver Si	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Sat	0815	07/24/2010	7667725	0	0	1	N	1	0	No
ivers	81075	8.701	1431003	7.576	terchang	other freeway	SC-SNG	North	Rear Corner;	Change Lanes	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sat	1120	01/17/2009	7244093	0	0	0	Y	0	0	No
ivers	81075	9.103	1431003	7.978	terchang	ramp	SC-SNG	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	1157	11/13/2009	7462080	0	0	0	Y	0	0	No
ivers	47013	0.472	932002	0.472	Mid-block	other freeway	O-OBJ	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Sat	1342	07/04/2009	7354415	0	0	0	Y	0	0	No
ivers	47013	0.949	932002	0.949	Mid-block	other freeway	O-OBJ	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Wet	Fri	0937	12/10/2010	7861037	0	0	0	Y	0	0	No
ivers	47013	1.138	931510	1.138	terchang	other freeway	O-OBJ	North	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Snowy	Tue	1335	01/05/2010	7642779	0	0	0	Y	0	0	No
ivers	47013	1.517	932002	1.517	terchang	other freeway	O-OBJ	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Thu	1827	12/09/2010	8053129	0	0	0	Y	0	0	No

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2009 to 12/31/2010

PR:1431003 BMP:0.752 EMP:8.052

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATI ON	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	47013	2.238	932002	2.238	Mid-block	other freeway	O-OBJ	South	Rear Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sun	0109	01/18/2009	7237368	0	0	0	Y	0	0	No
ivers	81075	2.563	1431105	1.496	Mid-block	other freeway	O-OBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Wed	1920	10/14/2009	7435271	0	0	0	Y	0	0	No
ivers	47013	2.747	931510	2.747	terchang	other freeway	O-OBJ	North	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Tue	1400	08/25/2009	7394198	0	0	0	Y	0	0	No
ivers	81075	5.574	1431003	4.449	terchang	other freeway	O-OBJ	North	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Mon	1603	08/17/2009	7387381	0	0	2	N	2	0	No
ivers	81075	5.952	1431003	4.827	tersectio	within intersec	O-OBJ	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Debris	Mon	0640	07/26/2010	7673516	0	0	0	Y	0	0	No
ivers	81075	6.508	1431105	5.441	terchang	other freeway	O-OBJ	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	0315	05/28/2010	7629671	0	0	0	Y	0	0	No
ivers	81075	8.554	1431105	7.487	terchang	other freeway	O-OBJ	South	Other Unknown	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Sun	1230	06/07/2009	7337824	0	0	0	Y	0	0	No
ivers	47013	0.797	932002	0.797	Mid-block	other freeway	OTURN	South	Uncoded Errors	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Tue	1337	04/13/2010	7606039	0	0	0	Y	0	0	No
ivers	47013	0.833	931510	0.833	Mid-block	other freeway	OTURN	North	Uncoded Errors	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Wet	Fri	2135	10/23/2009	7438291	2	0	0	N	2	0	No
ivers	47013	0.888	932002	0.888	Mid-block	other freeway	OTURN	South	Uncoded Errors	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Sat	1505	09/11/2010	7696283	0	1	0	N	1	0	No
ivers	47013	1.159	931510	1.159	terchang	ramp	OTURN	North	Side; Passenger	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Sat	1120	04/25/2009	7304978	1	0	0	N	1	0	No
ivers	47013	1.333	931510	1.333	terchang	other freeway	OTURN	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Fri	1212	11/19/2010	7803220	0	0	0	Y	0	0	No
ivers	81075	1.561	1431105	0.494	terchang	transition area	OTURN	South	Uncoded Errors	Avoiding Object	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	2008	01/16/2010	7527714	0	0	1	N	1	0	No
ivers	81075	1.607	1431105	0.54	terchang	other freeway	OTURN	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Sat	2257	11/13/2010	7797113	0	0	0	Y	0	0	No
ivers	47013	1.633	931510	1.633	Mid-block	other freeway	OTURN	North	Multiple Areas	Avoiding Object	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	1130	03/30/2009	7297026	0	0	0	Y	0	0	No
ivers	47013	1.638	932002	1.638	Mid-block	other freeway	OTURN	South	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Thu	1518	02/04/2010	7552959	0	0	0	Y	0	0	No
ivers	47013	2.116	931510	2.116	Mid-block	other freeway	OTURN	North	Uncoded Errors	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Icy	Sun	0700	01/04/2009	7223672	0	0	1	N	1	0	Yes
ivers	47013	2.133	931510	2.133	Mid-block	other freeway	OTURN	North	Uncoded Errors	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Icy	Thu	0218	02/19/2009	7264307	0	1	0	N	1	0	No
ivers	81075	2.239	1431003	1.114	Mid-block	other freeway	OTURN	North	Uncoded Errors	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Wed	1720	09/30/2009	7417682	0	0	0	Y	0	0	No

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Michigan Department of Transportation
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From 1/1/2009 to 12/31/2010

PR:1431003 BMP:0.752 EMP:8.052

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATI ON	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	47013	2.347	931510	2.347	Mid-block	other freeway	OTURN	North	Uncoded Errors	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Icy	Sun	0700	01/04/2009	7264308	0	0	1	N	1	0	No
ivers	47013	2.447	931510	2.447	terchang	other freeway	OTURN	North	Side; Passenger	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Wet	Tue	1330	02/17/2009	7258911	0	1	0	N	1	0	No
ivers	47013	2.647	932002	2.647	terchang	straight, unrel	OTURN	South	Uncoded Errors	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Snowy	Wed	1235	01/14/2009	7231847	0	0	1	N	1	0	No
ivers	47013	2.833	932002	2.833	terchang	other freeway	OTURN	South	Uncoded Errors	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Icy	Fri	2224	02/26/2010	7565787	0	0	1	N	1	0	No
ivers	47013	2.842	932002	2.842	terchang	other freeway	OTURN	South	Uncoded Errors	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Icy	Wed	0932	12/01/2010	7812177	0	0	0	Y	0	0	No
ivers	81075	2.881	1431105	1.814	Mid-block	other freeway	OTURN	South	Uncoded Errors	Unknown	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Mon	0125	11/02/2009	7450708	0	4	0	N	4	0	No
ivers	81075	2.965	1431105	1.898	Mid-block	other freeway	OTURN	South	Uncoded Errors	Slowing Stopped	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Wet	Fri	0842	01/08/2010	7522441	0	0	0	Y	0	0	No
ivers	81075	3.057	1431105	1.99	Mid-block	other freeway	OTURN	South	Uncoded Errors	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	1215	10/22/2010	7787386	0	0	1	N	1	0	No
ivers	81075	3.134	1431003	2.009	Mid-block	other freeway	OTURN	North	Uncoded Errors	Slowing Stopped	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Thu	1534	09/03/2009	7409989	0	0	1	N	1	0	No
ivers	81075	5.031	1431105	3.964	Mid-block	other freeway	OTURN	South	Uncoded Errors	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Thu	0030	09/16/2010	7706586	0	1	0	N	1	0	No
ivers	81075	5.031	1431105	3.964	Mid-block	other freeway	OTURN	South	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Sat	2315	11/13/2010	7797114	0	0	1	N	1	0	No
ivers	81075	5.781	1431105	4.714	terchang	other freeway	OTURN	South	Multiple Areas	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	1002	03/13/2009	7278093	0	0	1	N	1	0	No
ivers	81075	5.933	1431003	4.808	Mid-block	other freeway	OTURN	North	Uncoded Errors	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Mon	1145	11/02/2009	7456184	0	2	0	N	2	0	No
ivers	81075	6.214	1431003	5.089	Mid-block	other freeway	OTURN	North	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sun	2300	10/10/2010	7774687	0	0	0	Y	0	0	No
ivers	81075	6.584	1431105	5.517	terchang	other freeway	OTURN	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sun	0801	08/16/2009	7387380	1	0	0	N	1	0	No
ivers	81075	6.614	1431003	5.489	terchang	other freeway	OTURN	North	Side; Driver Si	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Mon	1459	01/12/2009	7222566	0	1	0	N	1	0	No
ivers	81075	6.691	1431105	5.624	terchang	straight, unrel	OTURN	North	Multiple Areas	Avoid Vehicle	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Tue	1235	10/13/2009	7430906	0	0	0	Y	0	0	No
ivers	81075	7.464	1431003	6.339	Mid-block	other freeway	OTURN	North	Side; Driver Si	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Icy	Tue	0000	01/27/2009	7243737	0	0	1	N	1	0	No
ivers	81075	8.192	1431003	7.067	Mid-block	other freeway	OTURN	North	Uncoded Errors	Avoiding Object	Unknown	Uncoded Errors	Uncoded Error	Clear	Wet	Mon	0726	04/05/2010	7590084	0	0	1	N	1	0	No

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REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOC ATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
Iverson	81075	8.516	1431105	7.449	Interchange	other freeway	OTURN	South	Multiple Areas	Avoid Vehicle	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Tue	1700	08/24/2010	7688403	0	0	1	N	1	0	No
Iverson	81075	8.654	1431003	7.529	Interchange	other freeway	OTURN	North	Uncoded Errors	Slowing Stopped	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Fri	1333	10/09/2009	7428102	0	0	0	Y	0	0	No
Iverson	81075	8.855	1431105	7.788	Interchange	ramp	OTURN	South	Side; Driver Si	Enter Road	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	2209	11/21/2009	7495938	0	1	0	N	1	0	Yes
Iverson	81075	9.084	1431003	7.959	Interchange	other freeway	OTURN	North	Multiple Areas	Slowing Stopped	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Sat	2242	03/13/2010	7575309	0	1	1	N	2	0	Yes
Iverson	47013	2.828	931510	2.828	Interchange	other freeway	PED	North	None	Going Straight	Unknown	None	Pedestrian not	Clear	Dry	Sun	1615	10/10/2010	7767787	0	0	1	N	1	0	No
Iverson	47013	0.269	932002	0.269	Interchange	other freeway	RE-ST	South	Multiple Areas	Going Straight	South	Multiple Areas	Going Straight	Clear	Dry	Tue	1030	03/03/2009	7273297	0	0	1	N	1	0	No
Iverson	47013	0.333	931510	0.333	Interchange	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Cloudy	Dry	Fri	1634	01/22/2010	7537772	0	0	0	Y	0	0	No
Iverson	47013	0.372	932002	0.372	Interchange	other freeway	RE-ST	South	Front Corner; P	Going Straight	South	Rear Corner; Dr	Slowing Stopped	Cloudy	Dry	Fri	2200	01/22/2010	7544310	0	0	0	Y	0	0	No
Iverson	47013	0.46	932002	0.46	Mid-block	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Wed	0745	05/26/2010	7617754	0	0	0	Y	0	0	No
Iverson	47013	0.472	932002	0.472	Mid-block	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Corner; Dr	Slowing Stopped	Clear	Dry	Mon	0746	01/26/2009	7255668	0	0	5	N	5	0	No
Iverson	47013	0.633	931510	0.633	Mid-block	other freeway	RE-ST	North	Rear Center	Slowing Stopped	North	Front Center	Going Straight	Clear	Dry	Sun	1800	10/10/2010	7770086	0	0	0	Y	0	0	No
Iverson	47013	0.633	931510	0.633	Mid-block	other freeway	RE-ST	North	Front Corner; P	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1720	07/31/2009	7375552	0	1	0	N	1	0	No
Iverson	47013	0.838	932002	0.838	Mid-block	other freeway	RE-ST	South	None	Slowing Stopped	South	Rear Corner; Dr	Stopped on Road	Cloudy	Wet	Tue	0800	06/02/2009	7339803	0	0	0	Y	0	0	No
Iverson	47013	0.883	931510	0.883	Mid-block	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Cloudy	Dry	Sat	1545	10/17/2009	7433503	0	0	0	Y	0	0	No
Iverson	47013	0.883	931510	0.883	Mid-block	other freeway	RE-ST	North	Rear Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Clear	Dry	Mon	1715	03/23/2009	7284890	0	0	0	Y	0	0	No
Iverson	47013	0.883	931510	0.883	Mid-block	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1732	04/17/2009	7301350	0	0	0	Y	0	0	No
Iverson	47013	0.883	931510	0.883	Mid-block	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1615	02/19/2010	7559294	0	0	0	Y	0	0	No
Iverson	47013	0.883	931510	0.883	Mid-block	other freeway	RE-ST	North	Front Corner; P	Slowing Stopped	North	Rear Center	Slowing Stopped	Clear	Dry	Thu	1900	07/16/2009	7363044	0	0	1	N	1	0	No
Iverson	47013	0.883	931510	0.883	Mid-block	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Tue	1633	04/21/2009	7301348	0	0	0	Y	0	0	No

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2009 to 12/31/2010

PR:1431003 BMP:0.752 EMP:8.052

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOC ATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	ALCHOL INVOL
ivers	47013	0.938	932002	0.938	Mid-block	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Stopped on Road	Rain	Wet	Fri	0740	06/19/2009	7347081	0	0	0	Y	0	0	No
ivers	47013	0.944	931510	0.944	Interchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Corner; Dr	Going Straight	Cloudy	Dry	Tue	0830	01/26/2010	7537767	0	0	0	Y	0	0	No
ivers	47013	0.993	931510	0.993	Interchang	other freeway	RE-ST	North	Front Corner; D	Going Straight	North	Rear Center	Slowing Stopped	Cloudy	Wet	Sat	1720	09/26/2009	7435537	0	0	1	N	1	0	No
ivers	47013	1.033	931510	1.033	Interchang	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Snow /	Icy	Mon	1005	01/04/2010	7533220	0	0	0	Y	0	0	No
ivers	47013	1.038	932002	1.038	Interchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Clear	Dry	Thu	0800	09/30/2010	7711681	0	0	0	Y	0	0	No
ivers	47013	1.038	931510	1.038	Interchang	other freeway	RE-ST	North	Rear Corner; P	Going Straight	North	Rear Corner; P	Slowing Stopped	Clear	Dry	Fri	1711	10/08/2010	7764594	0	0	0	Y	0	0	No
ivers	47013	1.038	932002	1.038	Interchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Multiple Areas	Stopped on Road	Clear	Dry	Wed	0720	06/03/2009	7333073	0	0	1	N	1	0	No
ivers	47013	1.043	932002	1.043	Interchang	other freeway	RE-ST	South	Front Corner; P	Slowing Stopped	South	Rear Corner; Dr	Slowing Stopped	Clear	Dry	Sat	1348	10/09/2010	7769683	0	0	0	Y	0	0	No
ivers	47013	1.067	931510	1.067	Interchang	other freeway	RE-ST	North	Rear Center	Going Straight	North	Rear Center	Going Straight	Clear	Dry	Mon	1710	02/08/2010	7551375	0	0	0	Y	0	0	No
ivers	47013	1.067	931510	1.067	Interchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Multiple Areas	Going Straight	Clear	Dry	Fri	1757	04/30/2010	7604953	0	0	1	N	1	0	No
ivers	47013	1.076	931510	1.076	Interchang	other freeway	RE-ST	North	Front Corner; P	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1724	09/03/2010	7689842	0	0	0	Y	0	0	No
ivers	47013	1.076	931510	1.076	Interchang	other freeway	RE-ST	North	Rear Center	Slowing Stopped	North	Front Center	Slowing Stopped	Clear	Dry	Fri	1620	10/15/2010	7770740	0	0	0	Y	0	0	No
ivers	47013	1.076	931510	1.076	Interchang	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Clear	Dry	Sat	1720	11/06/2010	7790427	0	0	0	Y	0	0	No
ivers	47013	1.081	932002	1.081	Interchang	other freeway	RE-ST	South	Rear Center	Change Lanes	South	Front Center	Going Straight	Clear	Dry	Tue	0715	11/02/2010	7785765	0	0	0	Y	0	0	No
ivers	47013	1.081	932002	1.081	Interchang	other freeway	RE-ST	South	Rear Center	Going Straight	South	Front Center	Going Straight	Clear	Dry	Sat	1908	10/23/2010	7777710	0	0	1	N	1	0	No
ivers	47013	1.082	932002	1.082	Interchang	other freeway	RE-ST	South	Front Corner; D	Going Straight	South	Rear Corner; P	Slowing Stopped	Clear	Dry	Tue	0830	05/25/2010	7617751	0	0	0	Y	0	0	No
ivers	47013	1.086	931510	1.086	Interchang	other freeway	RE-ST	North	Rear Center	Slowing Stopped	North	Front Center	Going Straight	Clear	Dry	Fri	1728	07/16/2010	7655953	0	0	0	Y	0	0	No
ivers	47013	1.091	932002	1.091	Interchang	other freeway	RE-ST	South	Front Corner; P	Going Straight	South	Multiple Areas	Stopped on Road	Clear	Dry	Tue	0835	09/01/2009	7402866	0	0	0	Y	0	0	No
ivers	47013	1.091	932002	1.091	Interchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Stopped on Road	Clear	Dry	Wed	0750	04/29/2009	7310929	0	0	0	Y	0	0	No

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ivers	47013	1.095	931510	1.095	terchang	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Front Corner; P	Slowing Stopped	Clear	Dry	Fri	1615	10/01/2010	7711683	0	0	0	Y	0	0	No
ivers	47013	1.095	931510	1.095	terchang	other freeway	RE-ST	North	Rear Center	Slowing Stopped	North	Front Center	Going Straight	Clear	Dry	Wed	1730	05/19/2010	7616910	0	0	0	Y	0	0	No
ivers	47013	1.095	931510	1.095	terchang	other freeway	RE-ST	North	Rear Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1720	07/24/2009	7375547	0	0	0	Y	0	0	No
ivers	47013	1.095	931510	1.095	terchang	other freeway	RE-ST	North	Front Corner; D	Going Straight	North	Rear Corner;	Slowing Stopped	Clear	Dry	Fri	1725	09/24/2010	7711679	0	0	0	Y	0	0	No
ivers	47013	1.105	931510	1.105	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1824	04/30/2010	7604954	0	0	0	Y	0	0	No
ivers	47013	1.11	932002	1.11	terchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Multiple Areas	Stopped on Road	Clear	Dry	Mon	0715	04/27/2009	7310928	0	0	1	N	1	0	No
ivers	47013	1.114	931510	1.114	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1709	07/09/2010	7649437	0	0	0	Y	0	0	No
ivers	47013	1.114	931510	1.114	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Sun	1510	07/19/2009	7368877	0	0	1	N	1	0	No
ivers	47013	1.114	931510	1.114	terchang	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1700	03/26/2010	7581653	0	0	0	Y	0	0	No
ivers	47013	1.114	931510	1.114	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Stopped on Road	Rain	Wet	Fri	2000	05/21/2010	7614897	1	0	0	N	1	0	No
ivers	47013	1.119	931510	1.119	terchang	other freeway	RE-ST	North	Rear Corner;	Slowing Stopped	North	Front Center	Slowing Stopped	Clear	Dry	Fri	1710	07/31/2009	7375548	0	0	0	Y	0	0	No
ivers	47013	1.119	931510	1.119	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	2011	09/18/2009	7406357	0	0	1	N	1	0	No
ivers	47013	1.119	931510	1.119	terchang	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Cloudy	Dry	Tue	1725	02/17/2009	7258915	0	0	0	Y	0	0	No
ivers	47013	1.124	931510	1.124	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1642	09/04/2009	7402872	0	0	0	Y	0	0	No
ivers	47013	1.124	931510	1.124	terchang	other freeway	RE-ST	North	Rear Corner;	Slowing Stopped	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	2011	09/18/2009	7408617	0	0	2	N	2	0	No
ivers	47013	1.137	931510	1.137	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1730	10/29/2010	7783033	0	0	0	Y	0	0	No
ivers	47013	1.137	931510	1.137	terchang	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Front Center	Slowing Stopped	Clear	Dry	Fri	1525	08/07/2009	7382925	0	1	0	N	1	0	No
ivers	47013	1.145	931510	1.145	terchang	other freeway	RE-ST	North	Multiple Areas	Slowing Stopped	North	Rear Center	Slowing Stopped	Clear	Dry	Sat	1528	09/19/2009	7406367	0	1	0	N	1	0	No
ivers	47013	1.152	931510	1.152	terchang	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Front Center	Slowing Stopped	Clear	Dry	Fri	1416	07/02/2010	7649436	0	0	0	Y	0	0	No

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ivers	47013	1.166	932002	1.166	terchang	other freeway	RE-ST	South	Rear Center	In prior crash	South	Front Center	Avoiding the veh	Rain	Icy	Wed	0549	01/07/2009	7223692	0	0	0	Y	0	0	No
ivers	47013	1.176	932002	1.176	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Rain	Icy	Wed	0549	01/07/2009	7225180	0	0	0	Y	0	0	No
ivers	47013	1.18	931510	1.18	terchang	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Snow /	Snowy	Wed	1601	02/24/2010	7565783	0	0	0	Y	0	0	No
ivers	47013	1.188	931510	1.188	terchang	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Multiple Areas	Slowing Stopped	Clear	Dry	Fri	1243	07/02/2010	7646135	0	0	0	Y	0	0	No
ivers	47013	1.195	932002	1.195	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Rain	Wet	Thu	0841	09/16/2010	7700943	0	0	0	Y	0	0	No
ivers	47013	1.233	932002	1.233	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Rain	Icy	Wed	0600	01/07/2009	7223677	0	0	0	Y	0	0	No
ivers	47013	1.238	932002	1.238	terchang	other freeway	RE-ST	South	Front Corner; P	Slowing Stopped	South	Rear Corner; Dr	Slowing Stopped	Cloudy	Dry	Sun	1222	10/24/2010	7777711	0	0	0	Y	0	0	No
ivers	47013	1.238	932002	1.238	terchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Clear	Dry	Wed	1105	10/20/2010	7773354	0	0	2	N	2	0	No
ivers	47013	1.238	932002	1.238	terchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Cloudy	Dry	Thu	0734	11/11/2010	7793435	0	0	0	Y	0	0	No
ivers	47013	1.238	932002	1.238	terchang	other freeway	RE-ST	South	Front Corner; D	Slowing Stopped	South	Rear Corner; Dr	Slowing Stopped	Rain	Icy	Wed	0549	01/07/2009	7223690	0	0	0	Y	0	0	No
ivers	47013	1.383	931510	1.383	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Tue	1720	02/17/2009	7258899	0	0	0	Y	0	0	No
ivers	47013	1.383	931510	1.383	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Other Unknown	Slowing Stopped	Clear	Dry	Thu	1550	02/04/2010	7551376	0	0	0	Y	0	0	No
ivers	47013	1.388	932002	1.388	terchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Clear	Dry	Wed	0743	06/03/2009	7333070	0	0	0	Y	0	0	No
ivers	81075	1.58	1431105	0.513	terchang	straight, unrel	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Thu	0920	10/07/2010	7772775	0	0	1	N	1	0	No
ivers	47013	1.633	931510	1.633	Mid-block	other freeway	RE-ST	North	Front Center	Change Lanes	North	Rear Center	Going Straight	Cloudy	Dry	Fri	1545	01/08/2010	7562988	0	0	0	Y	0	0	No
ivers	47013	1.633	931510	1.633	Mid-block	other freeway	RE-ST	North	Front Corner; P	Going Straight	North	Rear Corner; Dr	Slowing Stopped	Clear	Dry	Fri	1555	07/23/2010	7665310	0	0	0	Y	0	0	No
ivers	81075	1.642	1431105	0.575	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	None	Slowing Stopped	Rain	Wet	Sun	1845	11/29/2009	7476909	0	0	0	Y	0	0	No
ivers	81075	1.642	1431105	0.575	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Rain	Wet	Sun	1835	11/29/2009	7473606	0	0	0	Y	0	0	No
ivers	81075	1.642	1431105	0.575	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Multiple Areas	Going Straight	Rain	Wet	Sun	1835	11/29/2009	7476908	0	0	0	Y	0	0	No

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ivers	81075	1.733	1431105	0.666	terchang	straight, unrel	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Rain	Wet	Sat	1100	09/18/2010	7706610	0	0	0	Y	0	0	No
ivers	81075	1.813	1431105	0.746	terchang	other freeway	RE-ST	South	Front Corner; D	Going Straight	South	Rear Center	Slowing Stopped	Cloudy	Dry	Fri	1630	01/29/2010	7543919	0	0	0	Y	0	0	No
ivers	81075	2.002	1431003	0.877	terchang	transitor area	RE-ST	North	Front Corner; D	Slowing Stopped	North	Rear Center	Slowing Stopped	Cloudy	Dry	Mon	1405	10/12/2009	7426188	0	0	0	Y	0	0	No
ivers	81075	2.013	1431105	0.946	Mid-block	straight, unrel	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1600	07/24/2009	7373800	0	0	0	Y	0	0	No
ivers	81075	2.039	1431003	0.914	terchang	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Stopped on Road	Clear	Dry	Fri	1554	10/22/2010	7781676	0	0	0	Y	0	0	No
ivers	81075	2.043	1431105	0.976	Mid-block	other freeway	RE-ST	South	Front Corner; P	Going Straight	South	Rear Center	Slowing Stopped	Snow /	Icy	Thu	0830	01/15/2009	7230415	0	0	0	Y	0	0	No
ivers	81075	2.044	1431003	0.919	terchang	transitor area	RE-ST	North	Front Center	Going Straight	North	Rear Center	Change Lanes	Cloudy	Dry	Fri	1818	11/06/2009	7462082	0	0	0	Y	0	0	No
ivers	81075	2.049	1431003	0.924	Mid-block	transitor area	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Clear	Dry	Tue	1546	03/30/2010	7583178	0	0	0	Y	0	0	No
ivers	81075	2.064	1431003	0.939	Mid-block	transitor area	RE-ST	North	Rear Center	Going Straight	North	Multiple Areas	Slowing Stopped	Rain	Wet	Thu	1815	10/15/2009	7444501	0	0	0	Y	0	0	No
ivers	81075	2.069	1431105	1.002	tersectio	straight, unrel	RE-ST	North	Front Corner; D	Going Straight	North	Rear Corner; D	Slowing Stopped	Cloudy	Dry	Sat	1255	06/12/2010	7636236	0	0	0	Y	0	0	No
ivers	81075	2.072	1431105	1.005	Mid-block	other freeway	RE-ST	South	Other Unknown	U-turn	South	Front Corner; D	Going Straight	Clear	Dry	Tue	1935	09/01/2009	7406040	0	0	0	Y	0	0	No
ivers	81075	2.12	1431105	1.053	Mid-block	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Stopped on Road	Cloudy	Dry	Wed	0830	11/10/2010	7797117	0	0	0	Y	0	0	No
ivers	81075	2.163	1431105	1.096	Mid-block	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Tue	0735	07/27/2010	7667100	0	0	2	N	2	0	No
ivers	81075	2.163	1431105	1.096	Mid-block	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Cloudy	Dry	Wed	0629	05/06/2009	7308160	0	0	0	Y	0	0	No
ivers	81075	2.239	1431003	1.114	Mid-block	transitor area	RE-ST	North	Front Center	Going Straight	North	Multiple Areas	Going Straight	Cloudy	Dry	Tue	1600	11/23/2010	7820524	0	0	1	N	1	0	No
ivers	81075	2.247	1431105	1.18	Mid-block	other freeway	RE-ST	South	Front Corner; P	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Fri	1600	09/17/2010	7706578	0	0	1	N	1	0	No
ivers	81075	2.313	1431105	1.246	Mid-block	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Clear	Dry	Tue	1526	12/28/2010	7840115	0	0	2	N	2	0	No
ivers	47013	2.347	932002	2.347	Mid-block	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Going Straight	Clear	Dry	Mon	0739	04/27/2009	7304982	0	0	0	Y	0	0	No
ivers	47013	2.347	931510	2.347	Mid-block	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Cloudy	Dry	Wed	1551	11/24/2010	7807990	0	0	0	Y	0	0	No

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2009 to 12/31/2010

PR:1431003 BMP:0.752 EMP:8.052

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOC ATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	47013	2.347	932002	2.347	Mid-block	other freeway	RE-ST	South	Front Corner; P	Going Straight	South	Rear Corner; Dr	Going Straight	Clear	Dry	Tue	2258	08/31/2010	7689839	0	0	0	Y	0	0	No
ivers	81075	2.394	1431003	1.269	Mid-block	other freeway	RE-ST	North	Front Corner; P	Going Straight	North	Rear Corner; Dr	Slowing Stopped	Clear	Dry	Wed	1826	07/21/2010	7668377	0	0	0	Y	0	0	No
ivers	81075	2.539	1431003	1.414	Mid-block	other freeway	RE-ST	North	Front Corner; P	Slowing Stopped	North	Rear Corner; Dr	Slowing Stopped	Clear	Dry	Fri	1915	01/22/2010	7534064	0	0	0	Y	0	0	No
ivers	81075	2.539	1431003	1.414	Mid-block	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1554	03/05/2010	7570421	0	0	0	Y	0	0	No
ivers	47013	2.597	931510	2.597	Interchang	other freeway	RE-ST	North	Front Corner; P	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1621	07/09/2010	7649434	0	0	0	Y	0	0	No
ivers	47013	2.597	931510	2.597	Interchang	other freeway	RE-ST	North	Front Corner; D	Going Straight	North	Rear Corner; D	Slowing Stopped	Clear	Dry	Mon	1650	06/21/2010	7639556	0	0	0	Y	0	0	No
ivers	47013	2.597	931510	2.597	Interchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Front Center	Slowing Stopped	Clear	Dry	Fri	1535	07/30/2010	7667227	0	0	0	Y	0	0	No
ivers	81075	2.739	1431003	1.614	Mid-block	ramp	RE-ST	North	Front Corner; D	Going Straight	North	Rear Corner; D	Slowing Stopped	Clear	Dry	Fri	1531	03/06/2009	7278037	0	0	0	Y	0	0	No
ivers	47013	2.747	932002	2.747	Interchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Tue	0900	03/30/2010	7591666	0	0	0	Y	0	0	No
ivers	47013	2.747	932002	2.747	Interchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Multiple Areas	Stopped on Road	Clear	Dry	Sat	1255	10/09/2010	7765756	0	0	0	Y	0	0	No
ivers	81075	2.789	1431003	1.664	Mid-block	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Clear	Dry	Thu	1720	07/30/2009	7374208	0	0	1	N	1	0	No
ivers	47013	2.797	932002	2.797	Interchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Rain	Wet	Mon	1007	11/22/2010	7804829	0	0	0	Y	0	0	No
ivers	81075	2.813	1431105	1.746	Mid-block	other freeway	RE-ST	South	Front Corner; D	Going Straight	South	Rear Center	Slowing Stopped	Rain	Wet	Sat	1130	08/08/2009	7382594	0	0	0	Y	0	0	No
ivers	47013	2.843	932002	2.843	Interchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Cloudy	Wet	Sun	1150	01/11/2009	7223685	0	0	0	Y	0	0	No
ivers	81075	2.851	1431003	1.725	Mid-block	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Clear	Dry	Tue	1717	10/05/2010	7762033	0	0	2	N	2	0	No
ivers	81075	2.857	1431105	1.79	Mid-block	other freeway	RE-ST	South	Side; Passenger	Avoiding the veh	South	Front Center	Going Straight	Cloudy	Dry	Thu	0840	10/15/2009	7432678	0	0	1	N	1	0	No
ivers	81075	2.907	1431105	1.84	Mid-block	straight, unrel	RE-ST	North	Multiple Areas	Going Straight	North	Multiple Areas	Slowing Stopped	Clear	Dry	Thu	1630	01/14/2010	7534091	0	0	0	Y	0	0	No
ivers	81075	2.951	1431105	1.884	Mid-block	other freeway	RE-ST	South	Front Center	Going Straight	South	Multiple Areas	Going Straight	Clear	Dry	Sun	1800	11/28/2010	7827195	0	0	3	N	3	0	No
ivers	81075	2.982	1431003	1.857	Mid-block	straight, unrel	RE-ST	South	Front Center	Going Straight	South	Rear Center	In prior crash	Clear	Dry	Fri	0730	08/07/2009	7379021	0	0	0	Y	0	0	No

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PR:1431003 BMP:0.752 EMP:8.052

Interchange
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 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATI ON	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	81075	3.014	1431105	1.947	Mid-block	straight, unrel	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Wed	0815	11/17/2010	7805178	0	0	1	N	1	0	No
ivers	81075	3.014	1431105	1.947	Mid-block	other freeway	RE-ST	South	Front Center	Going Straight	South	Front Center	Slowing Stopped	Cloudy	Dry	Tue	0845	11/30/2010	7823527	0	0	0	Y	0	0	No
ivers	81075	3.058	1431003	1.933	Intersectio	straight, unrel	RE-ST	North	Rear Center	Going Straight	North	Multiple Areas	Slowing Stopped	Clear	Dry	Thu	1515	05/21/2009	7325598	0	0	0	Y	0	0	No
ivers	81075	3.096	1431003	1.971	Mid-block	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Corner; Dr	Slowing Stopped	Clear	Dry	Thu	1700	07/09/2009	7357979	0	0	0	Y	0	0	No
ivers	81075	3.207	1431105	2.14	Mid-block	other freeway	RE-ST	South	Front Center	Going Straight	South	Multiple Areas	Slowing Stopped	Rain	Wet	Fri	1720	08/28/2009	7398343	0	0	0	Y	0	0	No
ivers	81075	3.289	1431003	2.164	Mid-block	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1725	06/12/2009	7345109	0	0	0	Y	0	0	No
ivers	81075	3.43	1431105	2.363	Interchang	other freeway	RE-ST	South	Front Corner; D	Change Lanes	South	Rear Corner;	Slowing Stopped	Clear	Dry	Thu	0734	01/14/2010	7528947	0	0	0	Y	0	0	No
ivers	81075	3.457	1431105	2.39	Interchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Rain	Wet	Fri	0805	10/30/2009	7446657	0	0	0	Y	0	0	No
ivers	81075	3.457	1431105	2.39	Interchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Thu	0900	06/03/2010	7631963	0	0	0	Y	0	0	No
ivers	81075	3.531	1431105	2.464	Interchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Stopped on Road	Cloudy	Wet	Wed	0724	05/12/2010	7619925	0	2	0	N	2	0	No
ivers	81075	3.539	1431003	2.414	Mid-block	straight, unrel	RE-ST	South	Front Center	Going Straight	South	Multiple Areas	Slowing Stopped	Cloudy	Dry	Wed	0735	11/04/2009	7451877	0	0	0	Y	0	0	No
ivers	81075	3.789	1431003	2.664	Mid-block	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Clear	Dry	Thu	1645	05/07/2009	7324369	0	0	0	Y	0	0	No
ivers	81075	4.531	1431105	3.464	Mid-block	straight, unrel	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Cloudy	Dry	Thu	0500	08/27/2009	7393801	0	0	0	Y	0	0	No
ivers	81075	4.569	1431105	3.502	Mid-block	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Rain	Wet	Sat	1146	08/08/2009	7382119	0	0	0	Y	0	0	No
ivers	81075	4.612	1431003	3.487	Mid-block	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Going Straight	Rain	Wet	Fri	1815	07/23/2010	7672758	0	0	0	Y	0	0	No
ivers	81075	4.612	1431003	3.487	Mid-block	other freeway	RE-ST	North	Rear Center	Going Straight	North	Front Center	Going Straight	Clear	Dry	Fri	2020	03/13/2009	7278038	0	0	1	N	1	0	Yes
ivers	81075	4.781	1431105	3.714	Mid-block	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Thu	0843	07/01/2010	7650806	0	0	2	N	2	0	No
ivers	81075	4.862	1431003	3.737	Mid-block	other freeway	RE-ST	North	Rear Center	Enter Road	North	Front Center	Avoiding the veh	Clear	Dry	Fri	2030	03/13/2009	7286240	0	0	0	Y	0	0	No
ivers	81075	5.031	1431105	3.964	Mid-block	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Uncoded Errors	Slowing Stopped	Clear	Dry	Tue	0740	07/06/2010	7650809	0	0	0	Y	0	0	No

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REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATI ON	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	81075	5.031	1431105	3.964	Mid-block	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Cloudy	Dry	Mon	0735	03/02/2009	7278089	0	0	2	N	2	0	No
ivers	81075	5.031	1431105	3.964	Mid-block	other freeway	RE-ST	South	Front Center	Starting up on	South	Rear Center	Slowing Stopped	Fog / Smoke	Dry	Wed	0823	09/09/2009	7406740	0	0	0	Y	0	0	No
ivers	81075	5.031	1431105	3.964	Mid-block	other freeway	RE-ST	South	Front Corner; P	Change Lanes	South	Rear Corner; Dr	Going Straight	Clear	Dry	Mon	1015	11/15/2010	7797116	0	0	0	Y	0	0	No
ivers	81075	5.112	1431003	3.987	Mid-block	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Going Straight	Clear	Dry	Wed	1812	09/01/2010	7694070	0	0	0	Y	0	0	No
ivers	81075	5.112	1431003	3.987	Mid-block	other freeway	RE-ST	North	Rear Center	Slowing Stopped	North	Front Center	Going Straight	Snow /	Icy	Wed	0800	12/08/2010	7838944	0	0	0	Y	0	0	No
ivers	81075	5.112	1431003	3.987	Mid-block	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Going Straight	Clear	Dry	Fri	1755	06/18/2010	7643760	0	0	0	Y	0	0	No
ivers	81075	5.281	1431105	4.214	Interchang	straight, unrel	RE-ST	South	Front Center	Going Straight	South	Multiple Areas	Slowing Stopped	Cloudy		Thu	0710	10/21/2010	7788114	0	0	0	Y	0	0	No
ivers	81075	5.281	1431105	4.214	Interchang	straight, unrel	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Thu	0800	08/26/2010	7691337	0	0	0	Y	0	0	No
ivers	81075	5.331	1431105	4.264	Interchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Mon	0740	10/05/2009	7417563	0	0	0	Y	0	0	No
ivers	81075	5.412	1431003	4.287	Interchang	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1402	06/25/2010	7646543	0	0	0	Y	0	0	No
ivers	81075	5.431	1431105	4.364	Interchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Rain	Wet	Fri	0845	06/19/2009	7338495	0	0	0	Y	0	0	No
ivers	81075	5.431	1431105	4.364	Interchang	other freeway	RE-ST	South	Front Center	Change Lanes	South	Front Center	Slowing Stopped	Cloudy	Wet	Fri	0815	01/15/2010	7517110	0	0	0	Y	0	0	No
ivers	81075	5.431	1431105	4.364	Interchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Cloudy	Wet	Mon	0840	01/12/2009	7222562	0	0	0	Y	0	0	No
ivers	81075	5.455	1431105	4.388	Interchang	straight, unrel	RE-ST	South	Front Center	Going Straight	South	Multiple Areas	Slowing Stopped	Cloudy	Icy	Wed	0715	01/13/2010	7525963	0	0	0	Y	0	0	No
ivers	81075	5.474	1431105	4.407	Interchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Wed	0750	12/08/2010	7823531	0	0	0	Y	0	0	No
ivers	81075	5.474	1431105	4.407	Interchang	other freeway	RE-ST	South	Front Corner; P	Slowing Stopped	South	Rear Corner;	Stopped on Road	Cloudy	Wet	Sat	1658	05/08/2010	7619924	0	0	0	Y	0	0	No
ivers	81075	5.481	1431105	4.414	Interchang	straight, unrel	RE-ST	South	Front Center	Going Straight	South	Multiple Areas	Slowing Stopped	Cloudy	Dry	Mon	0715	12/07/2009	7493780	0	0	0	Y	0	0	No
ivers	81075	5.481	1431105	4.414	Interchang	straight, unrel	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Cloudy	Wet	Tue	0830	01/19/2010	7534092	0	0	0	Y	0	0	No
ivers	81075	5.481	1431105	4.414	Interchang	straight, unrel	RE-ST	North	Front Corner; P	Going Straight	North	Rear Corner; Dr	Going Straight	Clear	Dry	Mon	1445	04/12/2010	7590567	0	0	0	Y	0	0	No

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ivers	81075	5.493	1431105	4.426	terchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Rain	Wet	Sat	1203	08/08/2009	7381224	0	0	0	Y	0	0	No
ivers	81075	5.502	1431105	4.435	terchang	other freeway	RE-ST	South	Uncoded Errors	Going Straight	South	Uncoded Errors	Going Straight	Clear	Dry	Thu	0815	08/26/2010	7691289	0	0	0	Y	0	0	No
ivers	81075	5.512	1431003	4.387	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Cloudy	Dry	Thu	1755	02/11/2010	7549685	0	0	0	Y	0	0	No
ivers	81075	5.527	1431105	4.46	terchang	straight, unrel	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Cloudy	Dry	Wed	0800	07/01/2009	7353139	0	0	0	Y	0	0	No
ivers	81075	5.55	1431105	4.483	terchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Stopped on Road	Clear	Dry	Sat	1100	10/17/2009	7432721	0	0	0	Y	0	0	No
ivers	81075	5.55	1431105	4.483	terchang	other freeway	RE-ST	South	Front Corner; P	Slowing Stopped	South	Rear Corner; Dr	Stopped on Road	Rain	Wet	Fri	1929	05/07/2010	7612159	0	0	0	Y	0	0	No
ivers	81075	5.555	1431003	4.43	terchang	other freeway	RE-ST	North	Front Corner; D	Going Straight	North	Rear Corner;	Slowing Stopped	Clear	Dry	Wed	1721	07/21/2010	7666311	0	0	0	Y	0	0	No
ivers	81075	5.555	1431003	4.43	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Sat	1610	09/19/2009	7404643	0	0	1	N	1	0	No
ivers	81075	5.555	1431003	4.43	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Wed	1630	06/23/2010	7640050	0	0	0	Y	0	0	No
ivers	81075	5.574	1431003	4.449	terchang	straight, unrel	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Cloudy	Icy	Wed	0730	01/13/2010	7523029	0	0	0	Y	0	0	No
ivers	81075	5.574	1431003	4.449	terchang	straight, unrel	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Cloudy	Icy	Wed	0730	01/13/2010	7524462	0	0	0	Y	0	0	No
ivers	81075	5.588	1431105	4.521	terchang	straight, unrel	RE-ST	South	Front Center	Slowing Stopped	South	Front Center	Slowing Stopped	Cloudy	Dry	Sat	1124	09/25/2010	7764098	0	0	0	Y	0	0	No
ivers	81075	5.618	1431003	4.493	terchang	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Side; Driver Si	Slowing Stopped	Clear	Dry	Mon	1550	09/20/2010	7705683	0	2	2	N	4	0	No
ivers	81075	5.626	1431105	4.559	terchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Rain	Wet	Tue	0832	09/29/2009	7416130	0	0	1	N	1	0	No
ivers	81075	5.626	1431105	4.559	terchang	other freeway	RE-ST	South	Front Corner; P	Going Straight	South	None	Unknown	Clear	Dry	Sat	1111	10/09/2010	7788777	0	0	0	Y	0	0	No
ivers	81075	5.631	1431003	4.506	terchang	straight, unrel	RE-ST	South	Front Center	Going Straight	South	Multiple Areas	Slowing Stopped	Clear	Dry	Tue	0810	03/16/2010	7576436	0	0	0	Y	0	0	No
ivers	81075	5.631	1431003	4.506	terchang	straight, unrel	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Cloudy	Wet	Sat	1120	09/18/2010	7706611	0	0	0	Y	0	0	No
ivers	81075	5.662	1431003	4.537	terchang	straight, unrel	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Tue	0755	01/20/2009	7231096	0	0	0	Y	0	0	No
ivers	81075	5.712	1431003	4.587	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1440	07/02/2010	7652072	0	0	2	N	2	0	No

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Ivers	81075	5.781	1431105	4.714	Interchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Cloudy	Wet	Wed	0740	01/06/2010	7518575	0	0	0	Y	0	0	No
Ivers	81075	5.781	1431105	4.714	Interchang	other freeway	RE-ST	South	Front Center	Change Lanes	South	Rear Corner;	Slowing Stopped	Clear	Icy	Mon	0725	02/23/2009	7264000	0	0	0	Y	0	0	No
Ivers	81075	5.841	1431105	4.774	Interchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Front Center	Slowing Stopped	Rain	Wet	Tue	0836	04/13/2010	7596736	0	0	1	N	1	0	No
Ivers	81075	5.862	1431003	4.737	Interchang	other freeway	RE-ST	North	Front Corner; P	Going Straight	North	Rear Corner;	Slowing Stopped	Cloudy	Dry	Tue	1650	04/21/2009	7310713	0	0	0	Y	0	0	No
Ivers	81075	5.891	1431105	4.824	Mid-block	straight, unrel	RE-ST	South	Front Corner; D	Going Straight	South	Rear Corner;	Going Straight	Rain	Icy	Tue	2040	01/06/2009	7229113	0	0	0	Y	0	0	No
Ivers	81075	6.014	1431003	4.889	Mid-block	other freeway	RE-ST	North	Rear Center	Stopped on Road	North	Multiple Areas	Stopped on Road	Clear	Dry	Mon	1725	11/29/2010	7815730	0	0	1	N	1	0	No
Ivers	81075	6.214	1431003	5.089	Mid-block	other freeway	RE-ST	North	Rear Center	Slowing Stopped	North	Front Center	Going Straight	Clear	Dry	Wed	1800	12/22/2010	7838759	0	0	0	Y	0	0	No
Ivers	81075	6.241	1431003	5.116	Mid-block	other freeway	RE-ST	North	Front Corner; D	Slowing Stopped	North	Front Corner; D	Slowing Stopped	Clear	Dry	Tue	1452	08/31/2010	7694072	0	0	1	N	1	0	No
Ivers	81075	6.464	1431003	5.339	Interchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1830	07/09/2010	7654466	0	0	0	Y	0	0	No
Ivers	81075	6.464	1431003	5.339	Interchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Stopped on Road	Cloudy	Dry	Fri	1850	01/22/2010	7534072	0	0	1	N	1	0	No
Ivers	81075	6.541	1431105	5.474	Interchang	other freeway	RE-ST	South	Front Center	Avoiding the veh	South	Rear Corner; Dr	Slowing Stopped	Clear	Dry	Wed	0740	01/20/2010	7528919	0	0	0	Y	0	0	No
Ivers	81075	6.541	1431105	5.474	Interchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Corner; Dr	Slowing Stopped	Clear	Dry	Wed	0650	08/05/2009	7377735	0	0	0	Y	0	0	No
Ivers	81075	6.565	1431105	5.498	Interchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Cloudy	Wet	Mon	0807	04/26/2010	7600020	0	0	0	Y	0	0	No
Ivers	81075	6.581	1431003	5.456	Interchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Corner;	Slowing Stopped	Clear	Dry	Wed	1756	09/16/2009	7408989	0	0	0	Y	0	0	No
Ivers	81075	6.619	1431003	5.494	Interchang	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Stopped on Road	Clear	Dry	Wed	1752	09/02/2009	7406739	0	0	0	Y	0	0	No
Ivers	81075	6.632	1431105	5.565	Interchang	straight, unrel	RE-ST	South	Rear Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Clear	Dry	Sat	1255	10/09/2010	7776776	0	0	0	Y	0	0	No
Ivers	81075	6.645	1431105	5.578	Interchang	ramp	RE-ST	South	Front Corner; P	Slowing Stopped	South	Rear Corner; Dr	Stopped on Road	Cloudy	Wet	Sat	1344	02/07/2009	7263997	0	0	0	Y	0	0	No
Ivers	81075	6.671	1431105	5.603	Interchang	straight, unrel	RE-ST	South	Front Center	Going Straight	South	Multiple Areas	Slowing Stopped	Cloudy	Wet	Wed	0850	04/22/2009	7304736	0	0	0	Y	0	0	No
Ivers	81075	6.676	1431003	5.551	Interchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Stopped on Road	Clear	Dry	Fri	1839	07/02/2010	7653572	0	0	0	Y	0	0	No

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2009 to 12/31/2010
 PR:1431003 BMP:0.752 EMP:8.052

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATI ON	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	81075	6.688	1431105	5.621	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Wed	1102	11/18/2009	7462084	0	0	0	Y	0	0	No
ivers	81075	6.698	1431105	5.631	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Corner;	Slowing Stopped	Clear	Dry	Wed	0800	04/15/2009	7310721	0	0	0	Y	0	0	No
ivers	81075	6.702	1431105	5.635	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Wed	1003	11/18/2009	7462083	0	0	0	Y	0	0	No
ivers	81075	6.736	1431105	5.669	terchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Stopped on Road	Clear	Dry	Thu	0722	05/27/2010	7621932	0	1	0	N	1	0	No
ivers	81075	6.752	1431003	5.627	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Mon	1740	05/10/2010	7609654	0	0	1	N	1	0	No
ivers	81075	6.752	1431003	5.627	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Going Straight	Clear	Dry	Thu	1636	11/12/2009	7470657	0	0	0	Y	0	0	No
ivers	81075	6.752	1431003	5.627	terchang	other freeway	RE-ST	North	Rear Corner;	Slowing Stopped	North	Front Corner; D	Slowing Stopped	Clear	Dry	Thu	1800	06/17/2010	7640032	0	0	0	Y	0	0	No
ivers	81075	6.764	1431003	5.639	terchang	straight, unrel	RE-ST	South	Front Center	Going Straight	Unknown	Rear Center	Slowing Stopped	Clear	Dry	Fri	0900	08/07/2009	7385806	0	0	0	Y	0	0	No
ivers	81075	6.774	1431105	5.707	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Rain	Wet	Tue	0812	03/10/2009	7278020	0	0	0	Y	0	0	No
ivers	81075	6.809	1431003	5.684	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Going Straight	Clear	Dry	Wed	1655	09/16/2009	7411106	0	0	0	Y	0	0	No
ivers	81075	6.809	1431003	5.684	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Thu	1735	04/23/2009	7310719	0	0	1	N	1	0	No
ivers	81075	6.814	1431003	5.689	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Cloudy	Dry	Wed	1700	10/14/2009	7425903	0	0	1	N	1	0	No
ivers	81075	6.814	1431003	5.689	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1439	10/08/2010	7763609	0	0	0	Y	0	0	No
ivers	81075	6.831	1431105	5.763	terchang	other freeway	RE-ST	South	Rear Center	Going Straight	South	Front Center	Going Straight	Clear	Dry	Tue	0837	11/03/2009	7449980	0	0	0	Y	0	0	No
ivers	81075	6.891	1431105	5.824	terchang	straight, unrel	RE-ST	North	Front Corner; P	Going Straight	North	Rear Corner; Dr	Slowing Stopped	Clear	Dry	Mon	1650	08/16/2010	7685563	0	0	0	Y	0	0	No
ivers	81075	7.141	1431105	6.074	Mid-block	straight, unrel	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Rain	Wet	Tue	0840	04/28/2009	7304737	0	0	0	Y	0	0	No
ivers	81075	7.214	1431003	6.089	Mid-block	straight, unrel	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Cloudy	Dry	Wed	0900	12/15/2010	7838933	0	0	1	N	1	0	No
ivers	81075	7.214	1431003	6.089	Mid-block	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1620	06/12/2009	7339657	0	0	0	Y	0	0	No
ivers	81075	7.214	1431003	6.089	Mid-block	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Clear	Dry	Tue	1808	03/16/2010	7578612	0	0	0	Y	0	0	No

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ivers	81075	7.214	1431003	6.089	Mid-block	other freeway	RE-ST	North	Front Corner; D	Going Straight	North	Rear Corner;	Going Straight	Clear	Dry	Wed	1046	10/13/2010	7782357	0	0	0	Y	0	0	No
ivers	81075	7.611	1431105	6.544	Mid-block	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Clear	Dry	Mon	0724	03/16/2009	7278039	0	0	0	Y	0	0	No
ivers	81075	7.611	1431105	6.544	Mid-block	other freeway	RE-ST	South	Front Corner; P	Slowing Stopped	South	Rear Corner; Dr	Slowing Stopped	Clear	Dry	Mon	0724	03/16/2009	7280480	0	0	0	Y	0	0	No
ivers	81075	7.692	1431003	6.567	Mid-block	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Cloudy	Wet	Thu	1507	07/08/2010	7654451	1	0	0	N	1	0	No
ivers	81075	7.714	1431003	6.589	Mid-block	straight, unrel	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Tue	0830	11/09/2010	7797681	0	0	0	Y	0	0	No
ivers	81075	8.192	1431003	7.067	Mid-block	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Going Straight	Clear	Dry	Fri	0310	07/24/2009	7382873	0	1	1	N	2	0	Yes
ivers	81075	8.442	1431003	7.317	terchang	straight, unrel	RE-ST	South	Front Corner; P	Going Straight	South	Rear Corner; Dr	Slowing Stopped	Rain	Wet	Fri	1350	07/23/2010	7667722	0	0	0	Y	0	0	No
ivers	81075	8.442	1431003	7.317	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Sun	1015	06/21/2009	7355177	0	0	0	Y	0	0	No
ivers	81075	8.442	1431003	7.317	terchang	other freeway	RE-ST	North	Front Corner; D	Going Straight	North	Front Corner; P	Avoiding the veh	Clear	Dry	Tue	0153	08/25/2009	7392888	0	0	0	Y	0	0	No
ivers	81075	8.442	1431003	7.317	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	None	Going Straight	Cloudy	Wet	Thu	0800	02/26/2009	7288111	0	0	0	Y	0	0	No
ivers	81075	8.503	1431003	7.378	terchang	transition area	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Cloudy	Dry	Fri	1620	08/20/2010	7685556	0	0	0	Y	0	0	No
ivers	81075	8.511	1431105	7.444	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Cloudy	Dry	Mon	0720	11/02/2009	7438805	0	0	0	Y	0	0	No
ivers	81075	8.516	1431105	7.449	terchang	other freeway	RE-ST	South	Front Corner; P	Slowing Stopped	South	Rear Center	Slowing Stopped	Clear	Dry	Tue	0844	11/03/2009	7454661	0	0	0	Y	0	0	No
ivers	81075	8.516	1431105	7.449	terchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Cloudy	Dry	Thu	0756	05/20/2010	7617339	0	0	0	Y	0	0	No
ivers	81075	8.559	1431003	7.434	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Tue	1806	11/24/2009	7470659	0	0	0	Y	0	0	No
ivers	81075	8.573	1431105	7.506	terchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Clear	Dry	Tue	0841	06/16/2009	7345110	0	0	0	Y	0	0	No
ivers	81075	8.597	1431003	7.472	terchang	other freeway	RE-ST	North	Front Corner; D	Slowing Stopped	North	Rear Corner;	Slowing Stopped	Clear	Dry	Fri	1945	01/22/2010	7534065	0	0	0	Y	0	0	No
ivers	81075	8.597	1431003	7.472	terchang	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1709	11/06/2009	7457526	0	0	0	Y	0	0	No
ivers	81075	8.631	1431003	7.506	terchang	other freeway	RE-ST	North	Rear Center	Slowing Stopped	North	Front Center	Slowing Stopped	Cloudy	Dry	Fri	1545	07/23/2010	7667742	0	0	0	Y	0	0	No

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ivers	81075	8.645	1431003	7.52	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Going Straight	Clear	Dry	Wed	1812	08/25/2010	7692405	0	0	0	Y	0	0	No
ivers	81075	8.645	1431003	7.52	terchang	other freeway	RE-ST	North	Front Corner; P	Slowing Stopped	North	Rear Corner; Dr	Slowing Stopped	Cloudy	Dry	Thu	1709	07/15/2010	7659043	0	0	0	Y	0	0	No
ivers	81075	8.658	1431003	7.533	terchang	other freeway	RE-ST	North	Front Center	Change Lanes	North	Front Corner; D	Slowing Stopped	Snow /	Snowy	Wed	0813	02/10/2010	7546512	0	0	0	Y	0	0	No
ivers	81075	8.881	1431003	7.756	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Rain	Wet	Tue	1735	04/14/2009	7296644	0	0	0	Y	0	0	No
ivers	81075	8.905	1431105	7.838	terchang	ramp	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Wed	1655	08/04/2010	7677344	0	0	0	Y	0	0	No
ivers	81075	9.081	1431003	7.956	terchang	straight, unrel	RE-ST	South	Front Center	Going Straight	South	Rear Center	Turning Right	Clear	Dry	Mon	0800	01/05/2009	7248325	0	0	0	Y	0	0	No
ivers	47013	0.472	932002	0.472	Mid-block	other freeway	SS-SM	South	Front Center	Going Straight	South	Rear Corner; D	Slowing Stopped	Clear	Dry	Tue	0814	03/30/2010	7591669	0	0	3	N	3	0	No
ivers	47013	0.883	931510	0.883	Mid-block	other freeway	SS-SM	North	Side; Driver Si	Going Straight	North	Side; Passenger	Going Straight	Cloudy	Wet	Thu	2110	07/15/2010	7654928	0	0	0	Y	0	0	No
ivers	47013	0.888	932002	0.888	Mid-block	other freeway	SS-SM	South	Side; Passenger	Enter Road	South	Side; Driver Si	Going Straight	Clear	Dry	Sat	1820	01/09/2010	7559290	0	0	0	Y	0	0	No
ivers	47013	1.076	931510	1.076	terchang	other freeway	SS-SM	North	Front Corner; P	Change Lanes	North	Side; Driver Si	Slowing Stopped	Clear	Dry	Fri	1807	08/13/2010	7675973	0	0	0	Y	0	0	No
ivers	47013	1.104	931510	1.104	terchang	other freeway	SS-SM	North	Front Corner; D	Going Straight	North	Side; Driver Si	Going Straight	Snow /	Icy	Mon	0759	12/13/2010	7856168	0	0	0	Y	0	0	No
ivers	47013	1.11	932002	1.11	terchang	other freeway	SS-SM	South	Front Corner; P	Going Straight	South	Rear Corner; Dr	Change Lanes	Clear	Snowy	Wed	1535	01/28/2009	7246749	0	0	0	Y	0	0	No
ivers	47013	1.119	932002	1.119	terchang	other freeway	SS-SM	South	Front Center	Enter Road	South	Front Center	Going Straight	Clear	Icy	Fri	0921	01/16/2009	7231834	0	0	0	Y	0	0	No
ivers	47013	1.149	932002	1.149	terchang	ramp	SS-SM	South	Side; Driver Si	Change Lanes	South	Side; Passenger	Going Straight	Clear	Dry	Tue	1806	06/29/2010	7642095	0	0	0	Y	0	0	No
ivers	47013	1.166	932002	1.166	terchang	other freeway	SS-SM	South	Front Corner; D	Enter Road	South	Side; Passenger	Going Straight	Clear	Icy	Fri	0703	01/16/2009	7231833	1	0	0	N	1	0	No
ivers	47013	1.233	931510	1.233	terchang	other freeway	SS-SM	North	Multiple Areas	Slowing Stopped	North	None	Going Straight	Clear	Icy	Mon	1255	12/13/2010	7856178	0	0	0	Y	0	0	No
ivers	47013	1.233	932002	1.233	terchang	other freeway	SS-SM	South	Rear Center	Going Straight	South	Side; Driver Si	Going Straight	Snow /	Snowy	Wed	1941	02/24/2010	7565785	0	0	0	Y	0	0	No
ivers	47013	1.233	931510	1.233	terchang	other freeway	SS-SM	North	Side; Driver Si	Slowing Stopped	North	None	Unknown	Clear	Icy	Mon	1300	12/13/2010	7856175	0	0	0	Y	0	0	No
ivers	47013	1.338	932002	1.338	terchang	other freeway	SS-SM	South	Front Corner; D	Going Straight	South	Front Corner; D	Going Straight	Rain	Icy	Wed	0549	01/07/2009	7223689	0	0	0	Y	0	0	No

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ivers	47013	1.383	931510	1.383	terchang	other freeway	SS-SM	North	Front Corner; P	Going Straight	North	Rear Corner; Dr	Change Lanes	Clear	Dry	Tue	1455	03/24/2009	7284620	0	0	0	Y	0	0	No
ivers	47013	1.438	932002	1.438	terchang	straight, unrel	SS-SM	South	Front Corner; P	Change Lanes	South	Front Corner; D	Going Straight	Clear	Dry	Sat	1415	03/06/2010	7582646	0	0	1	N	1	0	No
ivers	81075	1.552	1431105	0.485	terchang	straight, unrel	SS-SM	South	Side; Driver Si	Change Lanes	South	Side; Passenger	Going Straight	Clear	Dry	Fri	0450	09/04/2009	7402278	0	0	0	Y	0	0	No
ivers	81075	1.599	1431105	0.532	terchang	transition area	SS-SM	South	Front Corner; D	Going Straight	South	Side; Passenger	Going Straight	Clear	Dry	Wed	0945	04/28/2010	7598981	0	0	0	Y	0	0	No
ivers	81075	1.629	1431105	0.562	terchang	other freeway	SS-SM	South	Front Corner; P	Change Lanes	South	Side; Driver Si	Going Straight	Clear	Dry	Mon	1230	11/08/2010	7798917	0	0	0	Y	0	0	No
ivers	47013	1.638	932002	1.638	Mid-block	other freeway	SS-SM	South	Rear Center	Going Straight	South	Side; Driver Si	Going Straight	Rain	Icy	Thu	0205	12/30/2010	7842996	0	0	0	Y	0	0	No
ivers	47013	1.638	932002	1.638	Mid-block	other freeway	SS-SM	South	Front Corner; P	Overtake Passing	South	Front Corner; D	Slowing Stopped	Cloudy	Wet	Tue	1400	01/05/2010	7533226	0	0	0	Y	0	0	No
ivers	47013	1.638	932002	1.638	Mid-block	other freeway	SS-SM	South	Side; Driver Si	Change Lanes	South	Side; Passenger	Going Straight	Clear	Dry	Wed	0954	07/21/2010	7682681	0	0	0	Y	0	0	No
ivers	81075	1.683	1431105	0.616	terchang	other freeway	SS-SM	South	Uncoded Errors	Change Lanes	South	Side; Passenger	Avoid Vehicle			Mon	1415	06/28/2010	7654448	0	1	0	N	1	0	No
ivers	47013	1.847	932002	1.847	Mid-block	other freeway	SS-SM	South	Side; Driver Si	Change Lanes	South	Side; Passenger	Going Straight	Cloudy	Wet	Tue	0750	09/22/2009	7415335	0	0	0	Y	0	0	No
ivers	81075	1.887	1431003	0.762	terchang	transition area	SS-SM	North	Side; Passenger	Going Straight	North	Side; Driver Si	Going Straight	Clear	Dry	Fri	1600	10/01/2010	7776741	0	0	0	Y	0	0	No
ivers	81075	1.894	1431003	0.769	terchang	other freeway	SS-SM	North	Front Corner; P	Change Lanes	North	Rear Corner; Dr	Avoid Vehicle	Cloudy	Wet	Mon	0506	01/18/2010	7527570	0	0	0	Y	0	0	No
ivers	81075	1.906	1431003	0.781	terchang	other freeway	SS-SM	North	Front Corner; P	Change Lanes	North	Rear Corner; Dr	Going Straight	Clear	Dry	Wed	1700	09/01/2010	7693545	0	0	0	Y	0	0	No
ivers	81075	1.915	1431003	0.79	terchang	other freeway	SS-SM	North	Rear Corner; P	Change Lanes	North	Front Corner; D	Avoid Vehicle	Clear	Dry	Fri	1835	10/15/2010	7781655	0	0	0	Y	0	0	No
ivers	81075	1.987	1431105	0.92	Mid-block	ramp	SS-SM	South	Front Corner; D	Change Lanes	South	Front Corner; P	Going Straight	Clear	Dry	Mon	1545	11/23/2009	7475175	0	0	0	Y	0	0	No
ivers	81075	2.068	1431003	0.943	Mid-block	transition area	SS-SM	North	Front Corner; D	Slowing Stopped	North	Side; Passenger	Slowing Stopped	Rain	Wet	Fri	1531	10/23/2009	7439727	0	0	0	Y	0	0	No
ivers	47013	2.147	932002	2.147	Mid-block	other freeway	SS-SM	South	Side; Passenger	Going Straight	South	Side; Driver Si	Going Straight	Clear	Dry	Wed	0543	11/24/2010	7807988	0	0	0	Y	0	0	No
ivers	81075	2.151	1431003	1.025	Mid-block	other freeway	SS-SM	North	Front Corner; P	Going Straight	North	Rear Corner; Dr	Going Straight	Clear	Dry	Tue	1614	07/27/2010	7677357	0	0	0	Y	0	0	No
ivers	81075	2.163	1431003	1.038	Mid-block	other freeway	SS-SM	North	Front Center	Going Straight	North	Front Corner; D	Going Straight	Clear	Dry	Thu	1900	08/12/2010	7681102	0	0	0	Y	0	0	No

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2009 to 12/31/2010

PR:1431003 BMP:0.752 EMP:8.052

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATI ON	CRASH TYPE	DIREC TION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIREC TION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	ALCHOL INVOL
ivers	81075	2.227	1431003	1.102	Mid-block	other freeway	SS-SM	North	Other Unknown	Going Straight	North	Side; Driver Si	Going Straight	Clear	Dry	Tue	0811	06/23/2009	7344095	0	0	0	Y	0	0	No
ivers	81075	2.339	1431003	1.214	Mid-block	other freeway	SS-SM	South	Side; Driver Si	Going Straight	South	Side; Passenger	Going Straight	Cloudy	Dry	Tue	0800	10/19/2010	7782624	0	0	0	Y	0	0	No
ivers	47013	2.347	931510	2.347	Mid-block	other freeway	SS-SM	North	Uncoded Errors	Going Straight	North	None	Unknown	Clear	Dry	Sun	0127	11/07/2010	7790429	0	0	0	Y	0	0	Yes
ivers	47013	2.347	931510	2.347	Mid-block	other freeway	SS-SM	North	Other Unknown	Change Lanes	North	Front Corner; P	Going Straight	Clear	Dry	Thu	1122	04/16/2009	7301343	0	0	0	Y	0	0	No
ivers	47013	2.347	931510	2.347	Mid-block	other freeway	SS-SM	North	Side; Driver Si	Change Lanes	North	Front Center	Slowing Stopped	Snow /	Icy	Wed	1246	01/14/2009	7234072	0	0	1	N	1	0	No
ivers	47013	2.658	931510	2.658	Interchang	other freeway	SS-SM	North	Front Corner; P	Going Straight	North	Side; Passenger	Going Straight	Clear	Icy	Mon	0940	12/13/2010	7856169	0	0	0	Y	0	0	No
ivers	81075	2.768	1431105	1.701	Mid-block	transition area	SS-SM	South	Side; Passenger	Going Straight	South	Side; Driver Si	Going Straight	Cloudy	Dry	Thu	1000	09/09/2010	7701496	0	0	0	Y	0	0	No
ivers	81075	2.789	1431003	1.664	Mid-block	other freeway	SS-SM	North	Side; Passenger	Going Straight	North	Side; Driver Si	Going Straight	Clear	Icy	Sun	0215	01/11/2009	7221100	0	0	0	Y	0	0	No
ivers	47013	2.838	932002	2.838	Interchang	other freeway	SS-SM	South	Side; Driver Si	Going Straight	South	Front Corner; P	Going Straight	Snow /	Snowy	Sat	1053	12/26/2009	7516147	0	0	0	Y	0	0	No
ivers	81075	3.031	1431003	1.905	Intersectio		SS-SM	South	Side; Driver Si	Change Lanes	South	Side; Passenger	Going Straight	Clear	Dry	Wed	0630	03/24/2010	7583189	0	0	0	Y	0	0	No
ivers	81075	3.134	1431003	2.009	Mid-block	other freeway	SS-SM	North	Front Center	Going Straight	North	Side; Driver Si	Slowing Stopped	Clear	Dry	Thu	1551	09/03/2009	7409988	0	0	0	Y	0	0	No
ivers	81075	3.139	1431003	2.014	Mid-block	other freeway	SS-SM	North	Front Corner; P	Leave Road	North	Front Corner; D	Going Straight	Clear	Dry	Fri	1552	10/22/2010	7777664	0	0	0	Y	0	0	No
ivers	81075	3.289	1431003	2.164	Mid-block	other freeway	SS-SM	North	Front Corner; P	Going Straight	North	Side; Driver Si	Going Straight	Snow /	Slushy	Mon	1047	02/22/2010	7559938	0	0	0	Y	0	0	No
ivers	81075	4.531	1431105	3.464	Mid-block	other freeway	SS-SM	South	Side; Driver Si	Going Straight	South	Side; Passenger	Overtake Passing	Rain	Wet	Fri	1656	10/23/2009	7438007	0	0	0	Y	0	0	No
ivers	81075	5.281	1431105	4.214	Interchang	other freeway	SS-SM	South	Multiple Areas	Change Lanes	South	Side; Passenger	Going Straight	Cloudy	Dry	Sat	1502	05/02/2009	7325655	0	0	0	Y	0	0	No
ivers	81075	5.362	1431003	4.237	Interchang	other freeway	SS-SM	North	Front Center	Going Straight	North	Rear Corner;	Going Straight	Clear	Dry	Thu	1527	09/03/2009	7400741	0	0	0	Y	0	0	No
ivers	81075	5.404	1431105	4.337	Interchang	ramp	SS-SM	South	Front Corner; D	Change Lanes	South	Rear Corner;	Going Straight	Clear	Dry	Wed	1800	08/05/2009	7396251	0	0	0	Y	0	0	No
ivers	81075	5.527	1431105	4.46	Interchang	straight, unrel	SS-SM	South	Front Corner; D	Change Lanes	South	Side; Passenger	Going Straight	Cloudy	Dry	Wed	0910	11/04/2009	7450468	0	0	0	Y	0	0	No
ivers	81075	5.712	1431003	4.587	Interchang	other freeway	SS-SM	North	Rear Corner;	Change Lanes	North	Side; Passenger	Going Straight	Clear	Dry	Sat	1310	04/03/2010	7703150	0	0	0	Y	0	0	No

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PR:1431003 BMP:0.752 EMP:8.052

Interchange
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 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOC ATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	81075	5.714	1431003	4.589	terchang	other freeway	SS-SM	North	Rear Corner;	Change Lanes	North	Front Corner; P	Going Straight	Clear	Dry	Tue	1816	05/19/2009	7337858	0	0	0	Y	0	0	No
ivers	81075	5.771	1431003	4.646	terchang	ramp	SS-SM	North	Front Corner; D	Change Lanes	North	Side; Passenger	Going Straight	Cloudy	Dry	Sun	1430	11/14/2010	7805127	0	0	0	Y	0	0	No
ivers	81075	6.632	1431105	5.565	terchang	other freeway	SS-SM	South	Rear Corner;	Going Straight	South	Front Corner; D	Going Straight	Clear	Icy	Wed	2052	02/24/2010	7566138	0	0	0	Y	0	0	No
ivers	81075	6.695	1431003	5.57	terchang	other freeway	SS-SM	North	Side; Passenger	Change Lanes	North	Side; Driver Si	Going Straight	Cloudy	Dry	Thu	0635	02/05/2009	7263999	0	0	0	Y	0	0	No
ivers	81075	6.705	1431003	5.58	terchang	other freeway	SS-SM	North	Front Corner; P	Going Straight	North	Rear Corner; Dr	Going Straight	Clear	Dry	Thu	1720	03/05/2009	7274072	0	0	0	Y	0	0	No
ivers	81075	6.809	1431003	5.684	terchang	other freeway	SS-SM	North	Side; Driver Si	Enter Road	North	Front Corner; P	Slowing Stopped	Clear	Dry	Fri	1822	06/25/2010	7644942	0	0	0	Y	0	0	No
ivers	81075	6.841	1431105	5.774	terchang	other freeway	SS-SM	South	Rear Corner;	Overtake Passing	South	Front Corner; P	Going Straight	Clear	Dry	Sun	1813	06/14/2009	7355402	0	0	1	N	1	0	Yes
ivers	81075	7.141	1431105	6.074	Mid-block	other freeway	SS-SM	South	Side; Passenger	Going Straight	South	Side; Driver Si	Going Straight	Severe Wind	Dry	Wed	1500	03/11/2009	7280489	0	0	0	Y	0	0	No
ivers	81075	7.214	1431003	6.089	Mid-block	other freeway	SS-SM	North	Front Corner; P	Slowing Stopped	North	Side; Driver Si	Slowing Stopped	Clear	Dry	Thu	1514	07/16/2009	7382876	0	0	0	Y	0	0	No
ivers	81075	7.692	1431003	6.567	Mid-block	other freeway	SS-SM	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Cloudy	Dry	Thu	1545	11/18/2010	7810342	0	0	0	Y	0	0	No
ivers	81075	7.714	1431003	6.589	Mid-block	other freeway	SS-SM	North	Front Corner; D	Going Straight	North	None	Change Lanes	Clear	Dry	Wed	1742	10/21/2009	7446191	0	0	0	Y	0	0	No
ivers	81075	8.138	1431105	7.071	Mid-block	other freeway	SS-SM	South	Side; Driver Si	Unknown	South	Side; Passenger	Going Straight	Cloudy	Dry	Mon	1243	03/15/2010	7578616	0	0	0	Y	0	0	No
ivers	81075	8.475	1431105	7.408	terchang	ramp	SS-SM	South	Side; Driver Si	Enter Road	South	Rear Corner;	Going Straight	Clear	Dry	Sat	1406	01/03/2009	7228766	0	0	0	Y	0	0	No
ivers	81075	8.654	1431003	7.529	terchang	other freeway	SS-SM	North	Front Corner; P	Going Straight	North	Side; Passenger	Change Lanes	Cloudy	Wet	Sun	2230	04/26/2009	7304733	0	0	2	N	2	0	No
ivers	81075	8.805	1431105	7.738	terchang	other freeway	SS-SM	South	Side; Passenger	Going Straight	South	Other Unknown	Going Straight	Clear	Wet	Thu	0915	01/08/2009	7231432	0	0	0	Y	0	0	No
ivers	81075	8.989	1431105	7.922	terchang	other freeway	SS-SM	South	Side; Driver Si	Change Lanes	South	Front Center	Avoid Vehicle	Cloudy	Dry	Fri	1535	11/26/2010	7812132	0	0	0	Y	0	0	No
ivers	81075	9.017	1431105	7.95	terchang	other freeway	SS-SM	South	Front Corner; D	Going Straight	South	Front Corner; P	Going Straight	Rain	Wet	Wed	1945	07/01/2009	7356349	0	0	0	Y	0	0	No
ivers	81075	9.036	1431003	7.911	terchang	other freeway	SS-SM	North	Front Corner; D	Going Straight	North	Rear Corner; Dr	Going Straight	Clear	Dry	Wed	2228	09/09/2009	7402333	0	0	1	N	1	0	No
ivers	81075	9.127	1431003	8.002	terchang	straight, unrel	SS-SM	South	Rear Corner;	Change Lanes	South	Front Corner; D	Enter Road	Snow /	Snowy	Wed	0715	01/27/2010	7543918	0	0	0	Y	0	0	No

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Michigan Department of Transportation
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PR:1431003 BMP:0.752 EMP:8.052

Interchange
 Intersection
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 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCA TION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	47013	1.033	931510	1.033	terchang	other freeway	ANIML	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Tue	0115	11/12/2013	8773447	0	0	0	Y	0	0	No
ivers	47013	1.847	932002	1.847	Mid-block	other freeway	ANIML	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Thu	0940	11/14/2013	8775843	0	0	1	N	1	0	No
ivers	81075	1.944	1431003	0.819	terchang	other freeway	ANIML	North	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	1640	07/22/2013	8680667	0	0	0	Y	0	0	No
ivers	81075	1.944	1431003	0.819	terchang	other freeway	ANIML	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	0330	10/19/2013	8752395	0	0	0	Y	0	0	No
ivers	47013	2.563	932002	2.563	terchang	other freeway	ANIML	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sun	0451	11/03/2013	8773443	0	0	0	Y	0	0	No
ivers	81075	2.707	1431105	1.64	Mid-block	other freeway	ANIML	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Tue	0219	10/29/2013	8758978	0	0	0	Y	0	0	No
ivers	81075	2.757	1431105	1.69	Mid-block	other freeway	ANIML	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	1937	10/28/2013	8758951	0	0	0	Y	0	0	No
ivers	81075	2.777	1431105	1.71	Mid-block	other freeway	ANIML	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	0014	11/04/2013	8763200	0	0	0	Y	0	0	No
ivers	81075	3.048	1431003	1.923	Mid-block	other freeway	ANIML	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Wed	0130	11/06/2013	8769876	0	0	0	Y	0	0	No
ivers	81075	3.077	1431003	1.952	Mid-block	other freeway	ANIML	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sun	0205	10/27/2013	8772332	0	0	0	Y	0	0	No
ivers	81075	3.134	1431003	2.009	Mid-block	other freeway	ANIML	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Sat	0111	11/02/2013	8781243	0	0	0	Y	0	0	No
ivers	81075	3.289	1431003	2.164	Mid-block	other freeway	ANIML	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Tue	2230	10/22/2013	8752360	0	0	0	Y	0	0	No
ivers	81075	3.707	1431105	2.64	terchang	other freeway	ANIML	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	1555	05/25/2013	8640384	0	0	0	Y	0	0	No
ivers	81075	5.295	1431105	4.228	terchang	other freeway	ANIML	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Sat	2345	10/19/2013	8747392	0	0	0	Y	0	0	No
ivers	81075	5.33	1431105	4.263	terchang	other freeway	ANIML	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Sat	1545	06/08/2013	8650990	0	0	0	Y	0	0	No
ivers	81075	6.112	1431003	4.987	Mid-block	other freeway	ANIML	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	0500	04/06/2013	8606348	0	0	0	Y	0	0	No
ivers	81075	6.604	1431003	5.479	terchang	other freeway	ANIML	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sun	1923	10/13/2013	8740560	0	0	0	Y	0	0	No
ivers	81075	7.611	1431105	6.544	Mid-block	other freeway	ANIML	West	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Mon	0033	06/10/2013	8650976	0	0	0	Y	0	0	No
ivers	81075	8.361	1431105	7.294	terchang	other freeway	ANIML	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	0230	11/09/2013	8776792	0	0	0	Y	0	0	No

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ivers	81075	8.673	1431003	7.548	terchang	other freeway	ANIML	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Fri	0341	09/13/2013	8728778	0	0	0	Y	0	0	No
ivers	81075	8.61	1431003	7.475	terchang	rest area	BCKNG	North	Rear Corner;	Backing	Unknown	Rear Corner; Dr	Parked	Clear	Dry	Mon	1300	06/03/2013	8650986	0	0	0	Y	0	0	No
ivers	47013	0.884	932002	0.884	Mid-block	other freeway	FXOBJ	South	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Icy	Sun	1840	02/03/2013	8553527	0	0	0	Y	0	0	No
ivers	47013	0.996	932002	0.996	terchang	other freeway	FXOBJ	South	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Mon	2106	08/12/2013	8702467	0	0	0	Y	0	0	No
ivers	47013	1.07	932002	1.07	terchang	other freeway	FXOBJ	South	Rear Corner;	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Sat	1300	07/27/2013	8693963	0	0	0	Y	0	0	No
ivers	47013	1.119	931510	1.119	terchang	other freeway	FXOBJ	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Thu	1626	11/07/2013	8768560	0	0	0	Y	0	0	No
ivers	47013	1.144	931510	1.144	terchang	other freeway	FXOBJ	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Tue	1748	07/23/2013	8686194	0	0	0	Y	0	0	No
ivers	47013	1.228	931510	1.228	terchang	other freeway	FXOBJ	North	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Tue	1128	04/30/2013	8624887	0	0	0	Y	0	0	No
ivers	81075	1.567	1431105	0.5	terchang	other freeway	FXOBJ	South	Side; Passenger	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	0830	11/29/2013	8792420	0	0	0	Y	0	0	No
ivers	47013	1.638	932002	1.638	Mid-block	other freeway	FXOBJ	South	Side; Passenger	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Tue	1530	07/02/2013	8671558	0	0	0	Y	0	0	No
ivers	47013	1.641	931510	1.641	Mid-block	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	2014	01/14/2013	8534672	0	0	0	Y	0	0	No
ivers	47013	1.847	932002	1.847	Mid-block	other freeway	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Wed	0925	05/15/2013	8632229	0	0	1	N	1	0	No
ivers	81075	1.894	1431003	0.769	terchang	other freeway	FXOBJ	North	Front Center	Leave Road	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Tue	2130	04/30/2013	8634074	0	0	1	N	1	0	No
ivers	81075	1.963	1431003	0.838	terchang	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Icy	Fri	0710	02/08/2013	8565736	0	0	0	Y	0	0	No
ivers	81075	2.044	1431003	0.919	terchang	other freeway	FXOBJ	North	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Wet	Tue	1230	12/31/2013	8827901	0	0	0	Y	0	0	No
ivers	81075	2.129	1431003	1.004	Mid-block	ransition area	FXOBJ	North	Multiple Areas	Avoid Vehicle	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Fri	1835	10/04/2013	8734930	0	0	0	Y	0	0	No
ivers	81075	2.163	1431105	1.096	Mid-block	other freeway	FXOBJ	South	Front Corner; D	Unknown	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Wed	2225	11/13/2013	8774352	0	0	0	Y	0	0	No
ivers	81075	2.202	1431003	1.077	Mid-block	ransition area	FXOBJ	North	Rear Corner;	Change Lanes	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Tue	1505	12/03/2013	8795996	0	0	0	Y	0	0	No
ivers	81075	2.314	1431105	1.247	Mid-block	other freeway	FXOBJ	South	Rear Corner;	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sat	1000	12/14/2013	8805954	0	0	0	Y	0	0	No

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2013 to 12/31/2013

PR:1431003 BMP:0.752 EMP:8.052

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOC ATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	81075	2.395	1431003	1.27	Mid-block	transition area	FXOBJ	North	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Mon	1400	07/01/2013	8668316	0	0	1	N	1	0	No
ivers	47013	2.647	932002	2.647	Interchang	other freeway	FXOBJ	South	Side; Passenger	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Wet	Thu	0540	12/05/2013	8797279	0	0	0	Y	0	0	No
ivers	47013	2.658	931510	2.658	Interchang	other freeway	FXOBJ	North	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Sat	1450	12/21/2013	8817741	0	0	0	Y	0	0	No
ivers	81075	2.707	1431105	1.64	Mid-block	transition area	FXOBJ	South	Rear Corner;	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Wet	Thu	0757	12/12/2013	8803350	0	0	0	Y	0	0	No
ivers	81075	2.707	1431105	1.64	Mid-block	transition area	FXOBJ	South	Under Carriage	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Icy	Tue	1613	02/26/2013	8618164	0	0	0	Y	0	0	No
ivers	47013	2.809	932002	2.809	Interchang	other freeway	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	1505	08/17/2013	8716756	0	0	1	N	1	0	No
ivers	47013	2.828	931510	2.828	Interchang	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Mon	2200	02/18/2013	8579306	0	0	0	Y	0	0	No
ivers	81075	2.982	1431003	1.857	Mid-block	other freeway	FXOBJ	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sun	0300	05/05/2013	8624446	0	0	0	Y	0	0	Yes
ivers	81075	5.031	1431105	3.964	Mid-block	other freeway	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	0845	02/23/2013	8572085	0	0	0	Y	0	0	No
ivers	81075	5.231	1431105	4.164	Mid-block	other freeway	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Tue	1059	08/20/2013	8713251	0	0	0	Y	0	0	No
ivers	81075	5.281	1431105	4.214	Interchang	transition area	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Tue	1720	02/26/2013	8618165	0	0	0	Y	0	0	No
ivers	81075	5.362	1431003	4.237	Interchang	other freeway	FXOBJ	North	Side; Passenger	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Thu	1712	06/06/2013	8758966	0	0	0	Y	0	0	No
ivers	81075	5.531	1431105	4.464	Interchang	other freeway	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	leet/H	Icy	Wed	0530	02/27/2013	8576003	0	0	0	Y	0	0	No
ivers	81075	5.631	1431003	4.506	Interchang	other freeway	FXOBJ	North	Rear Corner;	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	1612	07/22/2013	8680645	0	0	0	Y	0	0	No
ivers	81075	6.141	1431105	5.074	Mid-block	other freeway	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sat	1613	12/14/2013	8822797	0	0	0	Y	0	0	No
ivers	81075	6.335	1431003	5.21	Interchang	other freeway	FXOBJ	North	Uncoded Errors	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	1148	01/19/2013	8557994	0	0	1	N	1	0	No
ivers	81075	6.614	1431003	5.489	Interchang	other freeway	FXOBJ	North	Front Corner; P	Change Lanes	Unknown	Uncoded Errors	Uncoded Error	Clear	Wet	Fri	0530	12/27/2013	8844442	0	0	0	Y	0	0	No
ivers	81075	6.695	1431003	5.57	Interchang	other freeway	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Other	Other	Fri	0530	12/27/2013	8827919	0	0	0	Y	0	0	No
ivers	81075	6.964	1431003	5.839	Interchang	other freeway	FXOBJ	North	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sat	0915	12/14/2013	8822799	0	0	0	Y	0	0	No

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CRASH REPORT (One Line Listing)

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 PR:1431003 BMP:0.752 EMP:8.052

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATI ON	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	81075	7.141	1431105	6.074	Mid-block	other freeway	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Wet	Fri	1000	02/08/2013	8569619	0	0	0	Y	0	0	No
ivers	81075	7.464	1431003	6.339	Mid-block	other freeway	FXOBJ	North	Rear Corner;	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Thu	0212	01/24/2013	8559598	0	0	0	Y	0	0	No
ivers	81075	8.668	1431105	7.601	Mid-block	other freeway	FXOBJ	South	Other Unknown	Slowing Stopped	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	1649	07/22/2013	8685764	0	0	0	Y	0	0	No
ivers	81075	8.668	1431105	7.601	Mid-block	other freeway	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sat	2254	12/14/2013	8827171	0	0	0	Y	0	0	No
ivers	81075	9.051	1431003	7.926	Interchang	curved road, un	FXOBJ	North	Rear Corner;	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Wed	0911	12/11/2013	8869619	0	0	0	Y	0	0	No
ivers	81075	2.457	1431105	1.39	Mid-block	other freeway	SC-MLT	North	None	Going Straight	South	Uncoded Errors	Going Straight	Cloudy	Dry	Thu	1700	12/26/2013	8844386	0	0	0	N	0	1	No
ivers	81075	2.7	1431105	1.633	Mid-block	other freeway	SC-MLT	South	Front Center	Going Straight	South	None	Going Straight	Cloudy	Dry	Mon	1800	12/09/2013	8862252	0	0	0	Y	0	0	No
ivers	47013	2.752	932002	2.752	Interchang	other freeway	SC-MLT	South	Front Corner; P	Going Straight	South	Multiple Areas	Going Straight	Snow /	Snowy	Thu	0820	12/26/2013	8819055	0	0	0	Y	0	0	No
ivers	81075	2.768	1431105	1.701	Mid-block	other freeway	SC-MLT	South	Front Center	Going Straight	South	Side; Passenger	Going Straight	Snow /	Snowy	Tue	1809	02/26/2013	88618160	0	0	2	N	2	0	No
ivers	81075	5.231	1431105	4.164	Mid-block	other freeway	SC-MLT	South	Multiple Areas	Going Straight	East	Uncoded Errors	Parked	Cloudy	Slushy	Fri	1040	01/25/2013	8545456	0	0	1	N	1	0	No
ivers	81075	6.814	1431003	5.689	Interchang	straight, unrel	SC-MLT	South	Front Center	Avoid Vehicle	South	Front Corner; D	Going Straight	Clear	Dry	Mon	1052	02/18/2013	8569661	0	0	0	Y	0	0	No
ivers	47013	1.228	931510	1.228	Interchang	other freeway	SC-SNG	North	None	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sun	1217	10/20/2013	88754659	0	0	0	Y	0	0	No
ivers	81075	2.125	1431003	1	Mid-block	other freeway	SC-SNG	North	Side; Passenger	Avoid Vehicle	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Wed	1815	04/03/2013	88606237	0	0	0	Y	0	0	No
ivers	47013	2.658	931510	2.658	Interchang	other freeway	SC-SNG	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Mon	0733	07/08/2013	88673562	0	0	0	Y	0	0	No
ivers	81075	4.862	1431003	3.737	Mid-block	other freeway	SC-SNG	North	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Sun	1310	11/17/2013	88782754	0	0	0	Y	0	0	No
ivers	81075	5.381	1431105	4.314	Interchang	other freeway	SC-SNG	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Fri	1040	01/25/2013	8550856	0	0	1	N	1	0	No
ivers	81075	5.731	1431105	4.664	Interchang	other freeway	SC-SNG	South	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Slushy	Fri	1015	01/25/2013	88545455	0	0	0	Y	0	0	No
ivers	81075	6.695	1431003	5.57	Interchang	other freeway	SC-SNG	North	Rear Corner;	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sat	0430	03/16/2013	88589748	0	0	0	Y	0	0	No
ivers	81075	8.111	1431105	7.044	Mid-block	other freeway	SC-SNG	South	None	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	1404	08/10/2013	88708515	0	0	0	Y	0	0	No

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Ivers	81075	9.031	1431003	7.906	Interchang	other freeway	SC-SNG	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Thu	0024	06/13/2013	8655774	0	0	0	Y	0	0	No
Ivers	81075	9.053	1431003	7.928	Interchang	transition area	SC-SNG	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Wed	1108	12/11/2013	8803348	0	0	0	Y	0	0	No
Ivers	47013	0.879	931510	0.879	Mid-block	other freeway	O-OBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Tue	1208	08/06/2013	8692193	0	0	0	Y	0	0	No
Ivers	47013	1.086	931510	1.086	Interchang	other freeway	O-OBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Wed	1019	04/17/2013	88613431	0	1	1	N	2	0	No
Ivers	81075	1.894	1431003	0.769	Interchang	other freeway	O-OBJ	North	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Wed	1740	01/23/2013	8555629	0	0	0	Y	0	0	No
Ivers	81075	2.244	1431003	1.119	Mid-block	other freeway	O-OBJ	North	Under Carriage	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Fri	1300	03/01/2013	8584076	0	0	0	Y	0	0	No
Ivers	81075	5.281	1431105	4.214	Interchang	other freeway	O-OBJ	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Tue	1830	10/08/2013	8737067	0	0	0	Y	0	0	No
Ivers	81075	5.431	1431105	4.364	Interchang	other freeway	O-OBJ	South	Uncoded Errors	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Tue	1830	03/12/2013	8593241	0	0	0	Y	0	0	No
Ivers	81075	8.673	1431003	7.548	Interchang	other freeway	O-OBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Wet	Fri	0544	02/22/2013	8586965	0	0	0	Y	0	0	No
Ivers	81075	1.963	1431105	0.896	Interchang	other freeway	OTURN	South	Uncoded Errors	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Thu	1700	06/27/2013	8664574	0	0	0	Y	0	0	No
Ivers	81075	3.138	1431003	2.013	Mid-block	other freeway	OTURN	North	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	1020	04/05/2013	8610458	0	0	1	N	1	0	No
Ivers	81075	5.233	1431003	4.108	Mid-block	other freeway	OTURN	North	Uncoded Errors	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Sat	0419	10/05/2013	8753558	0	0	0	Y	0	0	No
Ivers	81075	6.778	1431003	5.653	Interchang	other freeway	OTURN	North	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sun	0805	10/13/2013	8744322	0	0	1	N	1	0	No
Ivers	81075	6.964	1431003	5.839	Interchang	other freeway	OTURN	North	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Tue	1630	07/09/2013	88674689	0	1	0	N	1	0	No
Ivers	81075	8.615	1431105	7.548	Interchang	other freeway	OTURN	South	Other Unknown	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Mon	1511	09/09/2013	8718956	0	0	0	Y	0	0	No
Ivers	81075	6.716	1431003	5.591	Interchang	other intersect	RE-RT	North	Front Center	Turning Right	North	Rear Center	Stopped on Road	Clear	Dry	Fri	1041	11/08/2013	8786104	0	0	0	Y	0	0	No
Ivers	47013	0.298	932002	0.298	Interchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Cloudy	Dry	Tue	0750	07/23/2013	88680654	0	0	0	Y	0	0	No
Ivers	47013	0.849	931510	0.849	Mid-block	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1846	09/13/2013	8719575	0	0	1	N	1	0	No
Ivers	47013	0.917	931510	0.917	Interchang	other freeway	RE-ST	North	Front Corner; D	Going Straight	North	Rear Corner;	Stopped on Road	Clear	Dry	Fri	1755	05/17/2013	88636709	0	0	0	Y	0	0	No

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Iverson	47013	0.986	932002	0.986	Mid-block	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Rain	Wet	Wed	0821	04/10/2013	8608621	0	0	0	Y	0	0	No
Iverson	47013	1.05	931510	1.05	Interchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Thu	0814	01/10/2013	8533036	0	0	2	N	2	0	No
Iverson	47013	1.081	932002	1.081	Interchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Clear	Dry	Thu	0725	03/14/2013	8588407	0	0	0	Y	0	0	No
Iverson	47013	1.081	932002	1.081	Interchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Stopped on Road	Clear	Dry	Thu	0800	03/14/2013	8588408	0	0	0	Y	0	0	No
Iverson	47013	1.095	931510	1.095	Interchang	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1615	09/13/2013	8721278	0	0	1	N	1	0	No
Iverson	47013	1.095	931510	1.095	Interchang	other freeway	RE-ST	North	Front Corner; D	Slowing Stopped	North	Rear Corner;	Slowing Stopped	Clear	Dry	Fri	1540	06/28/2013	8668485	0	0	0	Y	0	0	No
Iverson	47013	1.096	931510	1.096	Interchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Front Center	Going Straight	Cloudy	Dry	Fri	1600	11/22/2013	8785033	0	0	0	Y	0	0	No
Iverson	47013	1.1	932002	1.1	Interchang	other freeway	RE-ST	South	None	Going Straight	South	Front Center	Going Straight	Clear	Dry	Sun	1814	07/21/2013	8687833	0	0	0	Y	0	0	No
Iverson	47013	1.105	931510	1.105	Interchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1651	08/09/2013	8702461	0	1	0	N	1	0	No
Iverson	47013	1.109	931510	1.109	Interchang	other freeway	RE-ST	North	Rear Center	Slowing Stopped	North	Rear Center	Going Straight	Clear	Dry	Wed	1540	01/09/2013	8533041	0	0	0	Y	0	0	No
Iverson	47013	1.114	931510	1.114	Interchang	other freeway	RE-ST	North	None	Unknown	North	None	Unknown	Clear	Dry	Wed	1602	11/27/2013	8795140	0	0	0	Y	0	0	No
Iverson	47013	1.119	932002	1.119	Interchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Cloudy	Dry	Mon	0830	10/28/2013	8758333	0	0	0	Y	0	0	No
Iverson	47013	1.119	931510	1.119	Interchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1735	09/27/2013	8730029	0	0	0	Y	0	0	No
Iverson	47013	1.129	931510	1.129	Interchang	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Stopped on Road	Clear	Dry	Fri	1646	11/08/2013	8774671	0	0	2	N	2	0	No
Iverson	47013	1.13	931510	1.13	Interchang	other freeway	RE-ST	North	Front Corner; D	Going Straight	North	Rear Corner;	Slowing Stopped	Clear	Dry	Fri	1727	07/12/2013	8675121	0	0	0	Y	0	0	No
Iverson	47013	1.138	931510	1.138	Interchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1516	08/30/2013	8709283	0	0	0	Y	0	0	No
Iverson	47013	1.152	931510	1.152	Interchang	other freeway	RE-ST	North	Rear Center	Slowing Stopped	North	Front Center	Slowing Stopped	Clear	Dry	Fri	1835	11/01/2013	8773445	0	0	0	Y	0	0	No
Iverson	47013	1.171	931510	1.171	Interchang	other freeway	RE-ST	North	Rear Center	Slowing Stopped	North	Other Unknown	Slowing Stopped	Clear	Dry	Wed	1538	07/03/2013	8668482	0	0	0	Y	0	0	No
Iverson	47013	1.171	931510	1.171	Interchang	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Stopped on Road	Cloudy	Dry	Fri	1907	06/28/2013	8665289	0	0	0	Y	0	0	No

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2013 to 12/31/2013

PR:1431003 BMP:0.752 EMP:8.052

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATI ON	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	47013	1.171	931510	1.171	terchang	other freeway	RE-ST	North	Rear Center	Slowing Stopped	North	Front Center	Slowing Stopped	Clear	Dry	Thu	1759	03/28/2013	8601705	0	0	0	Y	0	0	No
ivers	47013	1.247	931510	1.247	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Rain	Wet	Thu	1738	05/30/2013	8644217	0	0	0	Y	0	0	No
ivers	47013	1.322	931510	1.322	terchang	other freeway	RE-ST	North	Front Corner; P	Slowing Stopped	North	Rear Corner;	Slowing Stopped	Clear	Dry	Fri	1355	09/27/2013	8730022	0	0	0	Y	0	0	No
ivers	47013	1.329	932002	1.329	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Rain	Wet	Mon	1326	03/11/2013	8586309	0	0	0	Y	0	0	No
ivers	47013	1.701	931510	1.701	Mid-block	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Stopped on Road	Clear	Dry	Thu	1713	07/18/2013	8686188	0	0	0	Y	0	0	No
ivers	81075	1.792	1431105	0.725	terchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	None	Slowing Stopped	Clear	Dry	Wed	1327	11/27/2013	8798861	0	0	0	Y	0	0	No
ivers	47013	1.847	932002	1.847	Mid-block	other freeway	RE-ST	South	Front Corner; D	Slowing Stopped	South	Rear Center	Stopped on Road	Cloudy	Dry	Thu	0715	10/24/2013	8757200	0	0	0	Y	0	0	No
ivers	47013	1.847	932002	1.847	Mid-block	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Thu	0745	09/19/2013	8724225	0	0	1	N	1	0	No
ivers	47013	1.847	932002	1.847	Mid-block	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Thu	0725	01/17/2013	8537244	0	0	1	N	1	0	No
ivers	81075	1.963	1431105	0.896	terchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Change Lanes	Clear	Dry	Fri	1340	09/13/2013	8718932	1	0	0	N	1	0	No
ivers	81075	1.968	1431105	0.901	terchang	other freeway	RE-ST	South	Rear Corner;	Going Straight	South	Multiple Areas	Going Straight	Clear	Dry	Mon	1150	06/24/2013	8662303	0	1	0	N	1	0	No
ivers	81075	1.995	1431003	0.87	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Tue	1501	10/15/2013	8747398	0	0	0	Y	0	0	No
ivers	81075	2.082	1431105	1.015	Mid-block	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Cloudy	Dry	Fri	0735	12/13/2013	8805927	0	0	0	Y	0	0	No
ivers	81075	2.134	1431003	1.009	tersectio	straight, unrel	RE-ST	North	Rear Corner;	Slowing Stopped	North	Front Center	Going Straight	Clear	Dry	Fri	1800	03/29/2013	8600749	0	0	0	Y	0	0	No
ivers	81075	2.163	1431003	1.038	Mid-block	ransition area	RE-ST	North	Front Center	Slowing Stopped	North	None	Slowing Stopped	Clear	Dry	Wed	1745	06/19/2013	8660025	0	0	0	Y	0	0	No
ivers	81075	2.207	1431105	1.14	Mid-block	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Clear	Dry	Thu	0945	07/25/2013	8695923	0	0	0	Y	0	0	No
ivers	81075	2.244	1431003	1.119	Mid-block	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Clear	Dry	Tue	1650	09/10/2013	8718955	0	0	0	Y	0	0	No
ivers	47013	2.468	931510	2.468	terchang	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Stopped on Road	Clear	Dry	Fri	2015	10/11/2013	8741244	0	0	1	N	1	0	No
ivers	47013	2.506	931510	2.506	terchang	other freeway	RE-ST	North	Front Corner; P	Slowing Stopped	North	Multiple Areas	Slowing Stopped	Clear	Dry	Fri	1658	11/22/2013	8785037	0	0	0	Y	0	0	No

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Michigan Department of Transportation
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From 1/1/2013 to 12/31/2013
 PR:1431003 BMP:0.752 EMP:8.052

Interchange
 Intersection
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 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOC ATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	47013	2.563	932002	2.563	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Cloudy	Wet	Mon	0828	07/08/2013	8686181	0	0	0	Y	0	0	No
ivers	47013	2.563	932002	2.563	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Mon	0806	05/06/2013	8625785	1	0	1	N	2	0	No
ivers	47013	2.658	931510	2.658	terchang	other freeway	RE-ST	North	None	Unknown	North	Front Center	Going Straight	Cloudy	Dry	Fri	1736	07/19/2013	8686192	0	0	0	Y	0	0	No
ivers	47013	2.658	931510	2.658	terchang	other freeway	RE-ST	North	Front Corner; D	Going Straight	North	None	Unknown	Cloudy	Dry	Fri	0752	12/13/2013	8809233	0	0	0	Y	0	0	No
ivers	47013	2.752	932002	2.752	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	None	Slowing Stopped	Clear	Dry	Tue	0806	10/08/2013	8741242	0	0	0	Y	0	0	No
ivers	47013	2.781	931510	2.781	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Cloudy	Dry	Fri	1644	02/15/2013	8565203	0	0	0	Y	0	0	No
ivers	47013	2.781	931510	2.781	terchang	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1639	05/24/2013	8639114	0	0	0	Y	0	0	No
ivers	47013	2.819	932002	2.819	terchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Going Straight	Rain	Wet	Tue	0810	04/16/2013	8612753	0	0	0	Y	0	0	No
ivers	47013	2.823	931510	2.823	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Multiple Areas	Slowing Stopped	Clear	Dry	Fri	1605	09/27/2013	8730026	0	0	0	Y	0	0	No
ivers	47013	2.828	931510	2.828	terchang	other freeway	RE-ST	North	Rear Center	Slowing Stopped	North	Front Center	Going Straight	Rain	Wet	Thu	1716	05/30/2013	8644213	0	0	0	Y	0	0	No
ivers	81075	2.976	1431105	1.909	Mid-block	other freeway	RE-ST	South	Front Center	Going Straight	South	Front Center	Going Straight	Snow /	Snowy	Sat	1309	12/14/2013	8827168	0	0	0	Y	0	0	No
ivers	81075	3.052	1431105	1.985	Mid-block	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Snow /	Snowy	Sat	1340	12/14/2013	8827169	0	0	0	Y	0	0	No
ivers	81075	3.057	1431105	1.99	Mid-block	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Clear	Dry	Tue	0800	09/10/2013	8718954	0	0	1	N	1	0	No
ivers	81075	3.096	1431003	1.971	Mid-block	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1847	09/06/2013	8717360	0	0	0	Y	0	0	Yes
ivers	81075	3.139	1431003	2.014	Mid-block	other freeway	RE-ST	North	Rear Center	Slowing Stopped	North	Front Corner; D	Going Straight	Clear	Dry	Thu	1345	03/14/2013	8593232	0	0	1	N	1	0	No
ivers	81075	3.538	1431003	2.413	Mid-block	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Going Straight	Clear	Dry	Fri	1750	11/08/2013	8775439	0	0	0	Y	0	0	No
ivers	81075	3.539	1431003	2.414	Mid-block	other freeway	RE-ST	North	Rear Center	Stopped on Road	North	Front Center	Going Straight	Clear	Dry	Fri	1644	07/12/2013	8674683	0	0	0	Y	0	0	No
ivers	81075	3.539	1431003	2.414	Mid-block	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Stopped on Road	Clear	Dry	Fri	1600	07/26/2013	8686727	0	0	0	Y	0	0	No
ivers	81075	3.641	1431003	2.516	Mid-block	other freeway	RE-ST	South	Front Corner; D	Slowing Stopped	South	Rear Corner; D	Stopped on Road	Cloudy	Dry	Tue	0700	09/03/2013	8711368	0	0	0	Y	0	0	No

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 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOC ATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	81075	3.957	1431105	2.89	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Front Center	Stopped on Road	Clear	Dry	Tue	1505	10/15/2013	8743014	0	0	0	Y	0	0	No
ivers	81075	4.039	1431003	2.914	Mid-block	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Stopped on Road	Clear	Dry	Fri	1817	09/27/2013	8729307	0	0	0	Y	0	0	No
ivers	81075	4.531	1431105	3.464	Mid-block	other freeway	RE-ST	South	Rear Center	Stopped on Road	South	Rear Center	Stopped on Road	Cloudy	Dry	Mon	0650	11/25/2013	8788020	0	0	0	Y	0	0	No
ivers	81075	4.531	1431105	3.464	Mid-block	other freeway	RE-ST	South	Front Center	Going Straight	South	Front Center	Going Straight	Cloudy	Dry	Tue	0656	12/10/2013	8803367	0	0	2	N	2	0	No
ivers	81075	4.612	1431003	3.487	Mid-block	other freeway	RE-ST	North	Rear Center	Going Straight	North	Front Center	Going Straight	Cloudy	Dry	Fri	1500	02/01/2013	8554337	0	0	0	Y	0	0	No
ivers	81075	4.612	1431003	3.487	Mid-block	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1930	03/01/2013	8579992	0	0	3	N	3	0	No
ivers	81075	4.612	1431003	3.487	Mid-block	other freeway	RE-ST	North	Rear Center	Slowing Stopped	Unknown	Uncoded Errors	Going Straight	Clear	Dry	Fri	1700	03/22/2013	8600748	0	0	0	Y	0	0	No
ivers	81075	5.031	1431105	3.964	Mid-block	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Cloudy	Dry	Mon	0715	01/07/2013	8526463	0	0	1	N	1	0	No
ivers	81075	5.031	1431105	3.964	Mid-block	other freeway	RE-ST	South	Front Corner; P	Going Straight	South	Rear Corner; Dr	Slowing Stopped	Clear	Dry	Fri	0728	11/15/2013	8776797	0	0	0	Y	0	0	No
ivers	81075	5.031	1431105	3.964	Mid-block	transition area	RE-ST	South	Front Center	Going Straight	South	Rear Center	Going Straight	Clear	Dry	Fri	0715	10/18/2013	8756211	0	0	0	Y	0	0	No
ivers	81075	5.044	1431105	3.977	Mid-block	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Going Straight	Clear	Dry	Mon	0700	06/17/2013	8660014	0	0	0	Y	0	0	No
ivers	81075	5.058	1431105	3.991	Mid-block	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Cloudy	Wet	Wed	0805	12/18/2013	8827172	0	0	0	Y	0	0	No
ivers	81075	5.112	1431003	3.987	Mid-block	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Cloudy	Dry	Fri	1603	08/02/2013	8701250	0	0	0	Y	0	0	No
ivers	81075	5.331	1431105	4.264	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Stopped on Road	Cloudy	Dry	Tue	0755	08/06/2013	8695937	0	0	0	Y	0	0	No
ivers	81075	5.362	1431003	4.237	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Thu	1745	11/14/2013	8776791	0	0	0	Y	0	0	No
ivers	81075	5.555	1431003	4.43	terchang	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Stopped on Road	Cloudy	Dry	Wed	1657	12/18/2013	8828810	0	0	2	N	2	0	No
ivers	81075	5.569	1431105	4.502	terchang	transition area	RE-ST	South	Front Corner; D	Going Straight	South	Rear Center	Slowing Stopped	Cloudy	Dry	Mon	0805	12/02/2013	8792398	0	0	0	Y	0	0	No
ivers	81075	5.593	1431003	4.468	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Multiple Areas	Stopped on Road	Clear	Dry	Fri	1700	10/18/2013	8747410	0	0	0	Y	0	0	No
ivers	81075	5.593	1431003	4.468	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Going Straight	Cloudy	Dry	Wed	1550	07/03/2013	8668294	0	0	1	N	1	0	No

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REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATI ON	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	81075	5.603	1431003	4.478	terchang	other freeway	RE-ST	North	None	Going Straight	North	Rear Center	Stopped on Road	Cloudy	Dry	Tue	1845	07/23/2013	8681583	0	0	0	Y	0	0	No
ivers	81075	5.626	1431105	4.559	terchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Front Center	Stopped on Road	Cloudy	Wet	Mon	0903	12/09/2013	8818161	0	0	0	Y	0	0	No
ivers	81075	5.626	1431105	4.559	terchang	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Center	Slowing Stopped	Rain	Wet	Wed	0840	11/06/2013	8776813	0	0	0	Y	0	0	No
ivers	81075	5.631	1431003	4.506	terchang	other freeway	RE-ST	North	Rear Center	Slowing Stopped	North	Front Center	Slowing Stopped	Clear	Dry	Fri	1430	07/19/2013	8683131	0	0	0	Y	0	0	No
ivers	81075	5.681	1431105	4.614	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Thu	0838	06/20/2013	8673151	0	0	0	Y	0	0	No
ivers	81075	5.731	1431105	4.664	terchang	sale/weig sta	RE-ST	South	Rear Corner;	Stopped on Road	South	Front Center	Going Straight	Clear	Dry	Fri	1135	06/14/2013	8676483	0	0	0	Y	0	0	No
ivers	81075	5.781	1431105	4.714	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Mon	0704	04/15/2013	8621681	0	0	0	Y	0	0	No
ivers	81075	6.112	1431003	4.987	Mid-block	other freeway	RE-ST	North	Rear Center	Going Straight	North	Front Center	Going Straight	Cloudy	Dry	Mon	0636	02/18/2013	8569641	0	0	0	Y	0	0	No
ivers	81075	6.112	1431003	4.987	Mid-block	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Going Straight	Cloudy	Dry	Fri	1630	06/28/2013	8668318	0	0	0	Y	0	0	No
ivers	81075	6.214	1431003	5.089	Mid-block	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Stopped on Road	Rain	Wet	Mon	1400	03/11/2013	8585195	0	0	0	Y	0	0	No
ivers	81075	6.464	1431003	5.339	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Clear	Dry	Wed	1750	02/13/2013	8583571	0	0	0	Y	0	0	No
ivers	81075	6.603	1431105	5.536	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Rain	Wet	Mon	1725	03/11/2013	8585199	0	0	0	Y	0	0	No
ivers	81075	6.612	1431003	5.487	terchang	other freeway	RE-ST	North	Front Corner; P	Slowing Stopped	Unknown	Uncoded Errors	Stopped on Road	Clear	Dry	Tue	0001	09/03/2013	8710498	0	0	0	Y	0	0	No
ivers	81075	6.679	1431105	5.612	terchang	other freeway	RE-ST	South	Front Corner; D	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Mon	0649	09/23/2013	8738679	0	0	0	Y	0	0	No
ivers	81075	6.698	1431105	5.631	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Side; Driver Si	Going Straight	Snow /	Snowy	Sat	1431	12/14/2013	8827170	0	0	0	Y	0	0	No
ivers	81075	6.698	1431105	5.631	terchang	other freeway	RE-ST	South	Front Corner; D	Going Straight	South	Rear Corner;	Slowing Stopped	Cloudy	Dry	Tue	0651	03/05/2013	8598908	0	0	0	Y	0	0	No
ivers	81075	6.705	1431003	5.58	terchang	other freeway	RE-ST	North	Rear Center	Stopped on Road	North	Front Center	Going Straight	Cloudy	Dry	Fri	1730	11/15/2013	8778080	0	0	2	N	2	0	No
ivers	81075	6.774	1431003	5.649	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Change Lanes	Cloudy	Dry	Thu	0900	05/16/2013	8660018	0	0	0	Y	0	0	No
ivers	81075	6.814	1431003	5.689	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	None	Slowing Stopped	Clear	Dry	Fri	1740	08/09/2013	8695928	0	0	0	Y	0	0	No

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 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATI ON	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	81075	7.014	1431003	5.889	terchang	other freeway	RE-ST	North	Front Center	Stopped on Road	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1822	08/30/2013	8709764	0	0	2	N	2	0	No
ivers	81075	7.141	1431105	6.074	Mid-block	other freeway	RE-ST	South	Front Center	Slowing Stopped	South	Rear Corner;	Slowing Stopped	Clear	Dry	Thu	0855	07/25/2013	8695922	0	0	0	Y	0	0	No
ivers	81075	7.141	1431105	6.074	Mid-block	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Mon	0845	04/08/2013	8607169	0	0	0	Y	0	0	No
ivers	81075	7.141	1431105	6.074	Mid-block	other freeway	RE-ST	South	Rear Center	Stopped on Road	South	Front Center	Going Straight	Clear	Dry	Thu	0815	06/20/2013	8660021	0	0	0	Y	0	0	No
ivers	81075	7.214	1431003	6.089	Mid-block	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Going Straight	Clear	Dry	Fri	2225	03/22/2013	8599076	1	0	0	N	1	0	No
ivers	81075	8.442	1431003	7.317	terchang	other freeway	RE-ST	North	Front Corner; P	Avoiding the veh	North	Rear Corner; Dr	Avoiding the veh	Cloudy	Dry	Fri	1900	11/01/2013	8763199	0	0	0	Y	0	0	No
ivers	81075	8.442	1431003	7.317	terchang	other freeway	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Clear	Dry	Fri	1530	06/21/2013	8660058	0	0	0	Y	0	0	No
ivers	81075	8.545	1431105	7.478	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Cloudy	Wet	Thu	0900	03/07/2013	8593216	0	0	0	Y	0	0	No
ivers	81075	8.616	1431003	7.491	terchang	other freeway	RE-ST	North	Front Center	Going Straight	North	Rear Center	Slowing Stopped	Cloudy	Dry	Tue	1403	01/08/2013	8544562	0	0	0	Y	0	0	No
ivers	81075	8.805	1431105	7.738	terchang	other freeway	RE-ST	South	Front Center	Going Straight	South	Rear Center	Slowing Stopped	Clear	Dry	Thu	0941	05/16/2013	8646400	0	0	1	N	1	0	No
ivers	81075	9.036	1431105	7.969	terchang	other freeway	RE-ST	South	Front Corner; D	Slowing Stopped	South	Rear Corner;	Slowing Stopped	Clear	Dry	Tue	0829	10/22/2013	8776339	0	0	0	Y	0	0	No
ivers	81075	9.05	1431003	7.925	terchang	other freeway	RE-ST	North	Rear Center	Stopped on Road	North	Front Center	Going Straight	Cloudy	Wet	Fri	1640	06/28/2013	8681588	0	0	0	Y	0	0	No
ivers	47013	1.095	931510	1.095	terchang	other freeway	SS-SM	North	Front Corner; P	Slowing Stopped	North	Rear Corner; Dr	Slowing Stopped	Clear	Dry	Fri	1540	06/28/2013	8667682	0	0	1	N	1	0	No
ivers	47013	1.114	931510	1.114	terchang	other freeway	SS-SM	North	Side; Driver Si	Slowing Stopped	North	Side; Passenger	Avoiding the veh	Clear	Dry	Fri	1458	07/26/2013	8686198	0	0	0	Y	0	0	No
ivers	47013	1.122	932002	1.122	terchang	other freeway	SS-SM	South	Front Corner; P	Going Straight	South	Rear Corner; Dr	Change Lanes	Clear	Dry	Sat	2112	09/21/2013	8737319	0	0	0	Y	0	0	No
ivers	47013	1.152	931510	1.152	terchang	other freeway	SS-SM	North	Side; Passenger	Change Lanes	North	Side; Driver Si	Going Straight	Cloudy	Dry	Fri	0755	06/07/2013	8650552	0	0	0	Y	0	0	No
ivers	47013	1.161	931510	1.161	terchang	other freeway	SS-SM	North	Front Corner; P	Going Straight	North	Rear Corner; Dr	Going Straight	Clear	Dry	Wed	1426	07/03/2013	8668483	0	0	1	N	1	0	No
ivers	47013	1.176	932002	1.176	terchang	other freeway	SS-SM	South	Side; Driver Si	Going Straight	South	Side; Passenger	Going Straight	Clear	Dry	Sat	1005	07/20/2013	8686193	0	0	0	Y	0	0	No
ivers	81075	1.548	1431105	0.481	terchang	ramp	SS-SM	South	Rear Corner;	Going Straight	South	Front Corner; D	Change Lanes	Clear	Dry	Tue	1045	04/02/2013	8606248	0	0	0	Y	0	0	No

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2013 to 12/31/2013

PR:1431003 BMP:0.752 EMP:8.052

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOC ATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	81075	1.894	1431003	0.769	terchang	other freeway	SS-SM	North	Side; Driver Si	Change Lanes	North	Side; Passenger	Going Straight	Clear	Dry	Tue	1845	09/24/2013	8726860	0	0	0	Y	0	0	No
ivers	81075	1.894	1431003	0.769	terchang	other freeway	SS-SM	North	Multiple Areas	Overtake Passing	North	Side; Driver Si	Going Straight	Clear	Dry	Sun	1144	08/04/2013	8695925	0	0	0	Y	0	0	No
ivers	81075	2.044	1431003	0.919	terchang	other freeway	SS-SM	North	Front Corner; D	Slowing Stopped	North	Side; Passenger	Slowing Stopped	Clear	Dry	Thu	1527	10/10/2013	8738981	0	0	0	Y	0	0	No
ivers	81075	2.125	1431003	1.031	Mid-block	other freeway	SS-SM	North	Side; Passenger	Going Straight	North	Other Unknown	Going Straight	Rain	Wet	Wed	2100	07/31/2013	8691851	0	0	0	Y	0	0	No
ivers	81075	2.156	1431003	1.031	Mid-block	other freeway	SS-SM	North	Front Corner; P	Going Straight	North	Rear Corner; Dr	Going Straight	Rain	Wet	Mon	1040	10/21/2013	8752354	0	0	0	Y	0	0	No
ivers	81075	2.457	1431105	1.39	Mid-block	other freeway	SS-SM	South	Front Center	Going Straight	South	Uncoded Errors	Change Lanes	Cloudy	Dry	Tue	1450	10/15/2013	8743023	0	0	1	N	1	0	No
ivers	81075	2.457	1431105	1.39	Mid-block	other freeway	SS-SM	South	Front Center	Going Straight	South	Side; Passenger	Going Straight	Clear	Dry	Tue	0850	01/15/2013	8536988	0	0	0	Y	0	0	No
ivers	81075	2.457	1431105	1.39	Mid-block	other freeway	SS-SM	South	Multiple Areas	Going Straight	South	Front Center	Going Straight	Cloudy	Icy	Tue	1000	02/19/2013	8600750	0	0	1	N	1	0	No
ivers	81075	2.563	1431105	1.496	Mid-block	other freeway	SS-SM	South	Other Unknown	Going Straight	South	Front Corner; P	Going Straight	Clear	Dry	Tue	1100	06/04/2013	8655793	0	0	0	Y	0	0	No
ivers	47013	2.79	931510	2.79	terchang	other freeway	SS-SM	North	Front Corner; D	Change Lanes	North	Rear Corner; D	Going Straight	Clear	Dry	Fri	1834	11/08/2013	8772020	0	0	0	Y	0	0	No
ivers	81075	2.939	1431003	1.814	Mid-block	other freeway	SS-SM	North	Front Center	Slowing Stopped	North	Side; Passenger	Slowing Stopped	Cloudy	Dry	Mon	1628	08/26/2013	8711363	0	0	0	Y	0	0	No
ivers	81075	3.795	1431003	2.67	Mid-block	transitor area	SS-SM	North	Multiple Areas	Change Lanes	North	Multiple Areas	Going Straight	Clear	Dry	Wed	1700	06/19/2013	8660028	0	0	0	Y	0	0	No
ivers	81075	5.281	1431105	4.214	terchang	transitor area	SS-SM	South	Front Corner; P	Going Straight	South	Front Corner; D	Going Straight	Clear	Dry	Wed	0830	11/13/2013	8782758	0	0	0	Y	0	0	No
ivers	81075	5.431	1431105	4.364	terchang	other freeway	SS-SM	South	Front Corner; P	Going Straight	South	Rear Corner; Dr	Change Lanes	Clear	Dry	Sat	1630	08/17/2013	8705526	0	0	0	Y	0	0	No
ivers	81075	5.512	1431003	4.387	terchang	other freeway	SS-SM	North	Multiple Areas	Slowing Stopped	North	Front Center	Slowing Stopped	Cloudy	Wet	Fri	1150	11/22/2013	8788004	0	0	1	N	1	0	No
ivers	81075	5.72	1431105	4.653	terchang	other freeway	SS-SM	South	Rear Corner; D	Change Lanes	South	Front Corner; D	Going Straight	Clear	Dry	Sat	1421	08/03/2013	8701251	0	0	1	N	1	0	No
ivers	81075	6.168	1431105	5.101	Mid-block	other freeway	SS-SM	South	Front Corner; D	Going Straight	South	Front Corner; P	Going Straight	Snow /	Snowy	Sat	1625	12/14/2013	8822796	0	0	0	Y	0	0	No
ivers	81075	6.341	1431105	5.274	Mid-block	other freeway	SS-SM	South	Side; Passenger	Going Straight	South	Side; Driver Si	Going Straight	Rain	Icy	Tue	1600	02/26/2013	8579981	0	0	0	Y	0	0	No
ivers	81075	6.414	1431003	5.289	terchang	other freeway	SS-SM	North	Front Corner; P	Going Straight	North	Rear Corner; D	Going Straight	Clear	Dry	Sat	2023	09/21/2013	8723659	0	0	0	Y	0	0	No

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2013 to 12/31/2013

PR:1431003 BMP:0.752 EMP:8.052

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATI ON	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	81075	6.614	1431003	5.489	terchang	other freeway	SS-SM	North	Side; Driver Si	Going Straight	North	Rear Corner;	Change Lanes	Cloudy	Dry	Wed	1520	03/27/2013	8598331	0	0	0	Y	0	0	No
ivers	81075	6.645	1431105	5.578	terchang	other freeway	SS-SM	South	Rear Corner;	Slowing Stopped	South	Other Unknown	Starting up on	Cloudy	Wet	Mon	1740	03/11/2013	8587247	0	0	0	Y	0	0	No
ivers	81075	6.733	1431003	5.608	terchang	other freeway	SS-SM	North	Front Corner; D	Going Straight	North	Front Center	Change Lanes	Clear	Dry	Wed	1700	11/06/2013	8776822	0	0	0	Y	0	0	No
ivers	81075	8.111	1431105	7.044	Mid-block	other freeway	SS-SM	South	None	Change Lanes	South	Side; Driver Si	Going Straight	Clear	Dry	Fri	0514	06/21/2013	8664572	0	0	0	Y	0	0	No
ivers	81075	8.411	1431105	7.344	terchang	other freeway	SS-SM	South	Side; Driver Si	Going Straight	South	Uncoded Errors	Going Straight	Rain	Wet	Mon	1259	03/11/2013	8589747	0	0	0	N	0	1	No
ivers	81075	8.631	1431003	7.506	terchang	other freeway	SS-SM	North	Front Center	Stopped on Road	Unknown	Uncoded Errors	Going Straight	Clear	Dry	Wed	0800	08/14/2013	8697706	0	0	0	Y	0	0	No
ivers	81075	9.044	1431003	7.919	terchang	transitor area	SS-SM	North	Rear Corner;	Going Straight	North	Rear Corner; Dr	Going Straight	Clear	Dry	Wed	1200	11/13/2013	8782748	0	0	0	Y	0	0	No
ivers	81075	9.046	1431003	7.921	terchang	transitor area	SS-SM	North	Front Center	In prior crash	North	Rear Corner; Dr	Going Straight	Snow /	Snowy	Wed	1137	12/11/2013	8803347	0	0	0	Y	0	0	No
ivers	81075	9.076	1431105	8.009	Mid-block	other freeway	SS-SM	South	Front Corner; P	Going Straight	South	Front Corner; P	Going Straight	Cloudy	Dry	Sun	2246	07/07/2013	8671544	0	0	0	Y	0	0	No

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Crash Summary
US-23 Ramps

Michigan Department of Transportation

CRASH SUMMARY REPORT

Summary Produced from 1/1/2009 to 12/31/2010

Physical Road Name	Physical Reference Number	BMP	EMP	State Route Name	Direction	Ramp	County
N US 23/6 Mile RAM	1431705	0.000	0.229		0	NA	Washtenaw
6 Mile/N US 23 RAM	1431707	0.000	0.184		0	NA	Washtenaw
6 Mile/S US 23 RAM	1431807	0.000	0.176		0	NA	Washtenaw
S US 23/6 Mile RAM	1431808	0.000	0.248		0	NA	Washtenaw

Crash Type	Count	Rate	%age
Total	4		100
Miscellaneous 1 Vehicle	1		25
Overturn	0		0
Hit Train	0		0
Hit Parked Vehicle	0		0
Backing	0		0
Parking	0		0
Pedestrian	0		0
Fixed Object	2		50
Other Object	0		0
Animal	0		0
Bicycle	0		0
Head-On	0		0
Angle Straight	1		25
Rear-End Straight	0		0
Angle Turn	0		0
Side Swipe Same	0		0
Rear-End Left Turn	0		0
Rear-End Right Turn	0		0
Other Drive	0		0
Angle Drive	0		0
Rear-End Drive	0		0
Side-Swipe Opposite	0		0
Head-On Left-Turn	0		0
Dual Left Turn	0		0
Dual Right Turn	0		0
Miscellaneous Multiple Vehic	0		0
Angle Right Turn	0		0

Crash Type	Rate	Count	%age
ICY		1	25.00
DARK		1	25.00
WET		0	0.00
FATAL		0	0.00
INJURY		1	25.00

Severity	Count	Rate
Fatalities:	0	
Injuries A:	0	
Injuries B:	0	
Injuries C:	1	
Injuries:	1	

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CRASH SUMMARY REPORT

Summary Produced from 1/1/2013 to 12/31/2013

Physical Road Name	Physical Reference Number	BMP	EMP	State Route Name	Direction	Ramp	County
N US 23/6 Mile RAM	1431705	0.000	0.229		0	NA	Washtenaw
6 Mile/N US 23 RAM	1431707	0.000	0.184		0	NA	Washtenaw
6 Mile/S US 23 RAM	1431807	0.000	0.176		0	NA	Washtenaw
S US 23/6 Mile RAM	1431808	0.000	0.248		0	NA	Washtenaw

Crash Type	Count	Rate	%age
Total	3		100
Miscellaneous 1 Vehicle	0		0
Overturn	0		0
Hit Train	0		0
Hit Parked Vehicle	0		0
Backing	0		0
Parking	0		0
Pedestrian	0		0
Fixed Object	2		66.67
Other Object	0		0
Animal	0		0
Bicycle	0		0
Head-On	1		33.33
Angle Straight	0		0
Rear-End Straight	0		0
Angle Turn	0		0
Side Swipe Same	0		0
Rear-End Left Turn	0		0
Rear-End Right Turn	0		0
Other Drive	0		0
Angle Drive	0		0
Rear-End Drive	0		0
Side-Swipe Opposite	0		0
Head-On Left-Turn	0		0
Dual Left Turn	0		0
Dual Right Turn	0		0
Miscellaneous Multiple Vehic	0		0
Angle Right Turn	0		0

Crash Type	Rate	Count	%age
ICY		0	0.00
DARK		1	33.33
WET		1	33.33
FATAL		0	0.00
INJURY		1	33.33

Severity	Count	Rate
Fatalities:	0	
Injuries A:	0	
Injuries B:	0	
Injuries C:	1	
Injuries:	1	

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Interchange
 Intersection
 Mid-Block
 Non-Traffic

Michigan Department of Transportation CRASH REPORT (One Line Listing)

From 1/1/2009 to 12/31/2010

PR:1431808 BMP:0.000 EMP:0.248

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEATHER	SURFACE CONDITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	81075	6.686	1431705	0.22	terchang	ramp	AN-ST	North	Front Corner; D	Going Straight	East	Front Corner; P	Going Straight	Cloudy	Dry	Wed	1555	08/26/2009	7390645	0	0	0	Y	0	0	No
ivers	81075	6.676	1431705	0.21	terchang	ramp	FXOBJ	North	Other Unknown	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	0112	02/01/2010	7543456	0	0	0	Y	0	0	Yes
ivers	81075	6.843	1431807	0.162	terchang	ramp	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Wed	1445	01/14/2009	7229119	0	0	0	Y	0	0	No
ivers		6.908	1431808	0.248	terchang	ramp	SC-SNG	South	Other Unknown	Leave Road	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sun	1814	06/14/2009	7355178	0	0	1	N	1	0	Yes

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2013 to 12/31/2013

PR:1431808 BMP:0.000 EMP:0.248

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEATHER	SURFACE CONDITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	81075	6.908	1431808	0.246	terchang	ramp	FXOBJ	South	Other Unknown	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Thu	1342	11/28/2013	8792417	0	0	1	N	1	0	No
ivers	81075	6.908	1431808	0.21	terchang	ramp	FXOBJ	South	Front Center	Avoiding Object	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Thu	0601	11/14/2013	8774345	0	0	0	Y	0	0	No
ivers	81075	7.091	1431707	0.165	terchang	ramp	HD-ON	South	Front Center	Going Straight	North	Rear Corner; Dr	Going Straight	Rain	Wet	Mon	1420	03/11/2013	8585194	0	0	0	Y	0	0	No

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Michigan Department of Transportation

CRASH SUMMARY REPORT

Summary Produced from 1/1/2009 to 12/31/2010

Physical Road Name	Physical Reference Number	BMP	EMP	State Route Name	Direction	Ramp	County
8 Mile/N US 23 RAM	931602	0.000	0.297		0	NA	Livingston
S US 23/8 Mile RAM	932003	0.000	0.332		0	NA	Livingston
N US 23/8 Mile RAM	1431801	0.000	0.199		0	NA	Washtenaw
8 Mile/N US 23 RAM	1431810	0.000	0.146		0	NA	Washtenaw

Crash Type	Count	Rate	%age
Total	4		100
Miscellaneous 1 Vehicle	0		0
Overturn	1		25
Hit Train	0		0
Hit Parked Vehicle	0		0
Backing	0		0
Parking	0		0
Pedestrian	0		0
Fixed Object	1		25
Other Object	0		0
Animal	0		0
Bicycle	0		0
Head-On	0		0
Angle Straight	0		0
Rear-End Straight	2		50
Angle Turn	0		0
Side Swipe Same	0		0
Rear-End Left Turn	0		0
Rear-End Right Turn	0		0
Other Drive	0		0
Angle Drive	0		0
Rear-End Drive	0		0
Side-Swipe Opposite	0		0
Head-On Left-Turn	0		0
Dual Left Turn	0		0
Dual Right Turn	0		0
Miscellaneous Multiple Vehic	0		0
Angle Right Turn	0		0

Crash Type	Rate	Count	%age
ICY		0	0.00
DARK		1	25.00
WET		2	50.00
FATAL		0	0.00
INJURY		2	50.00

Severity	Count	Rate
Fatalities:	0	
Injuries A:	0	
Injuries B:	2	
Injuries C:	0	
Injuries:	2	

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CRASH SUMMARY REPORT

Summary Produced from 1/1/2013 to 12/31/2013

Physical Road Name	Physical Reference Number	BMP	EMP	State Route Name	Direction	Ramp	County
8 Mile/N US 23 RAM	931602	0.000	0.297		0	NA	Livingston
S US 23/8 Mile RAM	932003	0.000	0.332		0	NA	Livingston
N US 23/8 Mile RAM	1431801	0.000	0.199		0	NA	Washtenaw
8 Mile/N US 23 RAM	1431810	0.000	0.146		0	NA	Washtenaw

Crash Type	Count	Rate	%age
Total	4		100
Miscellaneous 1 Vehicle	0		0
Overturn	0		0
Hit Train	0		0
Hit Parked Vehicle	0		0
Backing	0		0
Parking	0		0
Pedestrian	0		0
Fixed Object	3		75
Other Object	0		0
Animal	0		0
Bicycle	0		0
Head-On	0		0
Angle Straight	0		0
Rear-End Straight	1		25
Angle Turn	0		0
Side Swipe Same	0		0
Rear-End Left Turn	0		0
Rear-End Right Turn	0		0
Other Drive	0		0
Angle Drive	0		0
Rear-End Drive	0		0
Side-Swipe Opposite	0		0
Head-On Left-Turn	0		0
Dual Left Turn	0		0
Dual Right Turn	0		0
Miscellaneous Multiple Vehic	0		0
Angle Right Turn	0		0

Crash Type	Rate	Count	%age
ICY		1	25.00
DARK		0	0.00
WET		1	25.00
FATAL		0	0.00
INJURY		0	0.00

Severity	Count	Rate
Fatalities:	0	
Injuries A:	0	
Injuries B:	0	
Injuries C:	0	
Injuries:	0	

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2009 to 12/31/2010

PR:1431810 BMP:0.000 EMP:0.146

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEATHER	SURFACE CONDITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	P	D	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	81075	9.008	1431810	0.095	terchang	ramp	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Rain	Wet	Fri	1006	08/28/2009	7400739	0	0	0	Y	0	0	No	
ivers		0.222	932003	0.332	Mid-block	ramp	OTURN	South	Uncoded Errors	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	1726	07/03/2010	7644536	0	1	0	N	1	0	No	
ivers		0.238	931602	0.297	terchang	ramp	RE-ST	North	Rear Corner;	Slowing Stopped	North	Front Corner; P	Leave Road	Cloudy	Dry	Fri	1638	12/10/2010	7856159	0	0	0	Y	0	0	No	
ivers	47013	0.245	932003	0.023	terchang	ramp	RE-ST	South	Uncoded Errors	Going Straight	South	Side; Driver Si	Parked	Clear	Wet	Mon	2020	12/21/2009	7501817	0	1	0	N	1	0	No	

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2013 to 12/31/2013
 PR:1431810 BMP:0.000 EMP:0.146

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEATHER	SURFACE CONDITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers		0.222	932003	0.332	Mid-block	ramp	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Fog / Smoke	Wet	Wed	0720	02/27/2013	8579304	0	0	0	Y	0	0	No
ivers	81075	8.954	1431801	0.194	terchang	ramp	FXOBJ	South	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Thu	1024	12/26/2013	8827855	0	0	0	Y	0	0	No
ivers	81075	9.125	1431801	0.171	terchang	ramp	FXOBJ	North	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Other	Other	Thu	0600	05/23/2013	8643725	0	0	0	Y	0	0	No
ivers	81075	8.951	1431810	0.038	terchang	ramp	RE-ST	South	Rear Center	Stopped on Road	South	Front Center	Going Straight	Cloudy	Dry	Mon	0730	09/16/2013	8721833	0	0	0	Y	0	0	No

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Michigan Department of Transportation

CRASH SUMMARY REPORT

Summary Produced from 1/1/2013 to 12/31/2013

Physical Road Name	Physical Reference Number	BMP	EMP	State Route Name	Direction	Ramp	County
N US 23/Barker RA	1431708	0.000	0.139		0	NA	Washtenaw
Jennings Rd	1431809	0.000	0.148		0	NA	Washtenaw

Crash Type	Count	Rate	%age
Total	1		100
Miscellaneous 1 Vehicle	0		0
Overturn	0		0
Hit Train	0		0
Hit Parked Vehicle	0		0
Backing	0		0
Parking	0		0
Pedestrian	0		0
Fixed Object	0		0
Other Object	0		0
Animal	0		0
Bicycle	0		0
Head-On	0		0
Angle Straight	0		0
Rear-End Straight	1		100
Angle Turn	0		0
Side Swipe Same	0		0
Rear-End Left Turn	0		0
Rear-End Right Turn	0		0
Other Drive	0		0
Angle Drive	0		0
Rear-End Drive	0		0
Side-Swipe Opposite	0		0
Head-On Left-Turn	0		0
Dual Left Turn	0		0
Dual Right Turn	0		0
Miscellaneous Multiple Vehic	0		0
Angle Right Turn	0		0

Crash Type	Rate	Count	%age
ICY		0	0.00
DARK		0	0.00
WET		0	0.00
FATAL		0	0.00
INJURY		0	0.00

Severity	Count	Rate
Fatalities:	0	
Injuries A:	0	
Injuries B:	0	
Injuries C:	0	
Injuries:	0	

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2013 to 12/31/2013

PR:1431809 BMP:0.000 EMP:0.148

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCA TION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	ALCHOL INVOL
ivers	81075	8.682	1431708	0.133	terchang	ramp	RE-ST	South	Side; Driver Si	Change Lanes	South	Side; Passenger	Going Straight	Cloudy	Dry	Sun	1335	07/07/2013	8674693	0	0	0	Y	0	0	No

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CRASH SUMMARY REPORT

Summary Produced from 1/1/2009 to 12/31/2010

Physical Road Name	Physical Reference Number	BMP	EMP	State Route Name	Direction	Ramp	County
N US 23/9 Mile RA	931603	0.000	0.211		0	NA	Livingston
N US 23/M 36 RAM	931605	0.000	0.273		0	NA	Livingston
W M 36/S US 23 RA	932004	0.000	0.293		0	NA	Livingston
S US 23/M 36 RAM	932005	0.000	0.228		0	NA	Livingston

Crash Type	Count	Rate	%age
Total	6		100
Miscellaneous 1 Vehicle	0		0
Overturn	1		16.67
Hit Train	0		0
Hit Parked Vehicle	0		0
Backing	0		0
Parking	0		0
Pedestrian	0		0
Fixed Object	4		66.67
Other Object	0		0
Animal	0		0
Bicycle	0		0
Head-On	0		0
Angle Straight	0		0
Rear-End Straight	1		16.67
Angle Turn	0		0
Side Swipe Same	0		0
Rear-End Left Turn	0		0
Rear-End Right Turn	0		0
Other Drive	0		0
Angle Drive	0		0
Rear-End Drive	0		0
Side-Swipe Opposite	0		0
Head-On Left-Turn	0		0
Dual Left Turn	0		0
Dual Right Turn	0		0
Miscellaneous Multiple Vehic	0		0
Angle Right Turn	0		0

Crash Type	Rate	Count	%age
ICY		0	0.00
DARK		2	33.33
WET		2	33.33
FATAL		0	0.00
INJURY		4	66.67

Severity	Count	Rate
Fatalities:	0	
Injuries A:	1	
Injuries B:	2	
Injuries C:	2	
Injuries:	5	

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CRASH SUMMARY REPORT

Summary Produced from 1/1/2013 to 12/31/2013

Physical Road Name	Physical Reference Number	BMP	EMP	State Route Name	Direction	Ramp	County
N US 23/9 Mile RA	931603	0.000	0.211		0	NA	Livingston
N US 23/M 36 RAM	931605	0.000	0.273		0	NA	Livingston
W M 36/S US 23 RA	932004	0.000	0.293		0	NA	Livingston
S US 23/M 36 RAM	932005	0.000	0.228		0	NA	Livingston

Crash Type	Count	Rate	%age
Total	6		100
Miscellaneous 1 Vehicle	1		16.67
Overturn	0		0
Hit Train	0		0
Hit Parked Vehicle	0		0
Backing	0		0
Parking	0		0
Pedestrian	0		0
Fixed Object	2		33.33
Other Object	0		0
Animal	0		0
Bicycle	0		0
Head-On	0		0
Angle Straight	0		0
Rear-End Straight	2		33.33
Angle Turn	0		0
Side Swipe Same	1		16.67
Rear-End Left Turn	0		0
Rear-End Right Turn	0		0
Other Drive	0		0
Angle Drive	0		0
Rear-End Drive	0		0
Side-Swipe Opposite	0		0
Head-On Left-Turn	0		0
Dual Left Turn	0		0
Dual Right Turn	0		0
Miscellaneous Multiple Vehic	0		0
Angle Right Turn	0		0

Crash Type	Rate	Count	%age
ICY		0	0.00
DARK		3	50.00
WET		1	16.67
FATAL		0	0.00
INJURY		1	16.67

Severity	Count	Rate
Fatalities:	0	
Injuries A:	0	
Injuries B:	0	
Injuries C:	1	
Injuries:	1	

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2009 to 12/31/2010
 PR:932005 BMP:0.000 EMP:0.228

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEATHER	SURFACE CONDITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	47013	1.012	931603		Interchang	ramp	FXOBJ	North	Side; Driver Si	Slowing Stopped	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Wet	Mon	1221	11/22/2010	7804830	0	0	0	Y	0	0	No
ivers	47013	1.157	931605		Interchang	ramp	FXOBJ	North	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Wet	Tue	1530	09/28/2010	7707605	0	0	1	N	1	0	No
ivers	47013	1.229	932004	0.076	Interchang	ramp	FXOBJ	South	Uncoded Errors	Enter Road	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sun	0145	10/11/2009	7440415	0	2	0	N	2	0	Yes
ivers	47013	1.241	931605	0.084	Interchang	ramp	FXOBJ	North	Side; Passenger	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sat	0535	02/07/2009	7258907	0	0	1	N	1	0	No
ivers	47013	1.437	932004	0.284	Interchang	ramp	OTURN	South	Uncoded Errors	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Thu	0809	01/21/2010	7537769	1	0	0	N	1	0	No
ivers	47013	1.643	932005	0.223	Interchang	ramp	RE-ST	West	Front Center	Starting up on	West	Rear Center	Slowing Stopped	Clear	Dry	Sun	1309	08/09/2009	7381725	0	0	0	Y	0	0	No

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2013 to 12/31/2013

PR:932005 BMP:0.000 EMP:0.228

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEATHER	SURFACE CONDITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	47013	1.42	932005		Interchang	ramp	FXOBJ	South	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	0325	03/08/2013	8585430	0	0	0	Y	0	0	No
ivers	47013	1.42	932005		Interchang	ramp	FXOBJ	South	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Other	Dry	Tue	0100	04/30/2013	8623411	0	0	0	Y	0	0	No
ivers	47013	1.167	931605	0.01	Interchang	other freeway	SC-SNG	East	Side; Driver Si	Turning Right	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Sun	0825	08/18/2013	8702472	0	0	1	N	1	0	No
ivers		1.42	932005	0.228	Interchang	ramp	RE-ST	South	Front Corner; P	Slowing Stopped	South	Rear Corner; Dr	Stopped on Road	Clear	Dry	Sat	1732	09/28/2013	8730031	0	0	0	Y	0	0	No
ivers		1.42	932005	0.228	Interchang	ramp	RE-ST	West	Front Center	Slowing Stopped	West	Rear Center	Stopped on Road	Clear	Dry	Thu	0754	07/18/2013	8686186	0	0	0	Y	0	0	No
ivers	47013	1.153	932004	0.082	Interchang	ramp	SS-SM	South	None	Unknown	South	Multiple Areas	Change Lanes	Cloudy	Wet	Tue	0610	12/17/2013	8810762	0	0	0	Y	0	0	No

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CRASH SUMMARY REPORT

Summary Produced from 1/1/2009 to 12/31/2010

Physical Road Name	Physical Reference Number	BMP	EMP	State Route Name	Direction	Ramp	County
N US 23/Territorial F	1431702	0.000	0.170		0	NA	Washtenaw
Territorial/N US 23 F	1431704	0.000	0.161		0	NA	Washtenaw
Territorial/S US 23 F	1431805	0.000	0.140		0	NA	Washtenaw
S US 23/Territorial F	1431806	0.000	0.138		0	NA	Washtenaw

Crash Type	Count	Rate	%age
Total	10		100
Miscellaneous 1 Vehicle	1		10
Overturn	0		0
Hit Train	0		0
Hit Parked Vehicle	0		0
Backing	0		0
Parking	0		0
Pedestrian	0		0
Fixed Object	5		50
Other Object	0		0
Animal	0		0
Bicycle	0		0
Head-On	0		0
Angle Straight	2		20
Rear-End Straight	1		10
Angle Turn	0		0
Side Swipe Same	1		10
Rear-End Left Turn	0		0
Rear-End Right Turn	0		0
Other Drive	0		0
Angle Drive	0		0
Rear-End Drive	0		0
Side-Swipe Opposite	0		0
Head-On Left-Turn	0		0
Dual Left Turn	0		0
Dual Right Turn	0		0
Miscellaneous Multiple Vehic	0		0
Angle Right Turn	0		0

Crash Type	Rate	Count	%age
ICY		3	30.00
DARK		4	40.00
WET		1	10.00
FATAL		0	0.00
INJURY		1	10.00

Severity	Count	Rate
Fatalities:	0	
Injuries A:	0	
Injuries B:	0	
Injuries C:	1	
Injuries:	1	

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CRASH SUMMARY REPORT

Summary Produced from 1/1/2013 to 12/31/2013

Physical Road Name	Physical Reference Number	BMP	EMP	State Route Name	Direction	Ramp	County
N US 23/Territorial F	1431702	0.000	0.170		0	NA	Washtenaw
Territorial/N US 23 F	1431704	0.000	0.161		0	NA	Washtenaw
Territorial/S US 23 F	1431805	0.000	0.140		0	NA	Washtenaw
S US 23/Territorial F	1431806	0.000	0.138		0	NA	Washtenaw

Crash Type	Count	Rate	%age
Total	1		100
Miscellaneous 1 Vehicle	0		0
Overturn	0		0
Hit Train	0		0
Hit Parked Vehicle	0		0
Backing	0		0
Parking	0		0
Pedestrian	0		0
Fixed Object	0		0
Other Object	0		0
Animal	0		0
Bicycle	0		0
Head-On	0		0
Angle Straight	0		0
Rear-End Straight	0		0
Angle Turn	0		0
Side Swipe Same	1		100
Rear-End Left Turn	0		0
Rear-End Right Turn	0		0
Other Drive	0		0
Angle Drive	0		0
Rear-End Drive	0		0
Side-Swipe Opposite	0		0
Head-On Left-Turn	0		0
Dual Left Turn	0		0
Dual Right Turn	0		0
Miscellaneous Multiple Vehic	0		0
Angle Right Turn	0		0

Crash Type	Rate	Count	%age
ICY		0	0.00
DARK		0	0.00
WET		0	0.00
FATAL		0	0.00
INJURY		0	0.00

Severity	Count	Rate
Fatalities:	0	
Injuries A:	0	
Injuries B:	0	
Injuries C:	0	
Injuries:	0	

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2009 to 12/31/2010
 PR:1431806 BMP:0.000 EMP:0.138

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOC A TION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers		5.432	1431702	0.17	tersectio	within intersec	AN-ST	North	Front Center	Slowing Stopped	West	Front Corner; D	Stopped on Road	Clear	Dry	Fri	0016	07/24/2009	7382871	0	0	0	Y	0	0	Yes
ivers	81075	5.548	1431805	0.138	terchang	ramp	AN-ST	South	Front Corner; D	Going Straight	South	Rear Corner;	Going Straight	Clear	Dry	Sun	1510	03/01/2009	7272668	0	0	0	Y	0	0	No
ivers	81075	5.451	1431702	0.019	terchang	ramp	FXOBJ	North	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Wet	Wed	0057	06/16/2010	7642407	0	0	0	Y	0	0	Yes
ivers	81075	5.574	1431702	0.142	terchang	ramp	FXOBJ	North	Rear Center	Avoiding the veh	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	1452	10/11/2010	7781356	0	0	0	Y	0	0	No
ivers	81075	5.583	1431702	0.151	terchang	ramp	FXOBJ	North	Front Corner; P	Slowing Stopped	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Snowy	Sun	0340	01/11/2009	7224684	0	0	0	Y	0	0	No
ivers	81075	5.583	1431702	0.151	terchang	ramp	FXOBJ	North	Front Center	Slowing Stopped	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Tue	1315	02/09/2010	7549723	0	0	0	Y	0	0	No
ivers	81075	5.791	1431704	0.038	terchang	ramp	FXOBJ	South	Front Center	Slowing Stopped	Unknown	Uncoded Errors	Uncoded Error	Snow /	Snowy	Sun	0140	12/27/2009	7502397	0	0	0	Y	0	0	No
ivers	81075	5.807	1431806	0.128	terchang		SC-MLT	South	Front Center	Going Straight	South	Rear Center	Going Straight	Clear	Dry	Sat	1215	10/16/2010	7818835	0	0	0	Y	0	0	No
ivers	81075	5.593	1431702	0.161	terchang	ramp	RE-ST	North	Rear Center	Slowing Stopped	North	Front Center	Slowing Stopped	Clear	Dry	Mon	1630	07/20/2009	7382874	0	0	1	N	1	0	No
ivers	81075	5.752	1431704		terchang	ramp	SS-SM	North	Rear Corner;	Going Straight	North	Front Corner; P	Going Straight	Clear	Dry	Tue	1430	03/09/2010	7574377	0	0	0	Y	0	0	No

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2013 to 12/31/2013

PR:1431806 BMP:0.000 EMP:0.138

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCA TION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	ALCHOL INVOL
ivers	81075	5.493	1431805	0.083	terchang	ransition area	SS-SM	South	Front Corner; P	Going Straight	South	Rear Corner; Dr	Going Straight	Snow /	Slushy	Fri	1413	02/22/2013	8586968	0	0	0	Y	0	0	No

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Michigan Department of Transportation

CRASH SUMMARY REPORT

Summary Produced from 1/1/2009 to 12/31/2010

Physical Road Name	Physical Reference Number	BMP	EMP	State Route Name	Direction	Ramp	County
N US 23/Silver Lake	931607	0.000	0.242		0	NA	Livingston
Silver Lake/N US 23	931609	0.000	0.188		0	NA	Livingston
Silver Lake/S US 23	932006	0.000	0.202		0	NA	Livingston
S US 23/Silver Lake	932007	0.000	0.202		0	NA	Livingston

Crash Type	Count	Rate	%age
Total	6		100
Miscellaneous 1 Vehicle	0		0
Overturn	1		16.67
Hit Train	0		0
Hit Parked Vehicle	0		0
Backing	0		0
Parking	0		0
Pedestrian	0		0
Fixed Object	1		16.67
Other Object	0		0
Animal	0		0
Bicycle	0		0
Head-On	0		0
Angle Straight	1		16.67
Rear-End Straight	2		33.33
Angle Turn	0		0
Side Swipe Same	1		16.67
Rear-End Left Turn	0		0
Rear-End Right Turn	0		0
Other Drive	0		0
Angle Drive	0		0
Rear-End Drive	0		0
Side-Swipe Opposite	0		0
Head-On Left-Turn	0		0
Dual Left Turn	0		0
Dual Right Turn	0		0
Miscellaneous Multiple Vehic	0		0
Angle Right Turn	0		0

Crash Type	Rate	Count	%age
ICY		4	66.67
DARK		1	16.67
WET		0	0.00
FATAL		0	0.00
INJURY		4	66.67

Severity	Count	Rate
Fatalities:	0	
Injuries A:	0	
Injuries B:	3	
Injuries C:	2	
Injuries:	5	

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Michigan Department of Transportation

CRASH SUMMARY REPORT

Summary Produced from 1/1/2013 to 12/31/2013

Physical Road Name	Physical Reference Number	BMP	EMP	State Route Name	Direction	Ramp	County
N US 23/Silver Lake	931607	0.000	0.242		0	NA	Livingston
Silver Lake/N US 23	931609	0.000	0.188		0	NA	Livingston
Silver Lake/S US 23	932006	0.000	0.202		0	NA	Livingston
S US 23/Silver Lake	932007	0.000	0.202		0	NA	Livingston

Crash Type	Count	Rate	%age
Total	4		100
Miscellaneous 1 Vehicle	0		0
Overturn	0		0
Hit Train	0		0
Hit Parked Vehicle	0		0
Backing	0		0
Parking	0		0
Pedestrian	0		0
Fixed Object	1		25
Other Object	0		0
Animal	0		0
Bicycle	0		0
Head-On	0		0
Angle Straight	0		0
Rear-End Straight	2		50
Angle Turn	0		0
Side Swipe Same	1		25
Rear-End Left Turn	0		0
Rear-End Right Turn	0		0
Other Drive	0		0
Angle Drive	0		0
Rear-End Drive	0		0
Side-Swipe Opposite	0		0
Head-On Left-Turn	0		0
Dual Left Turn	0		0
Dual Right Turn	0		0
Miscellaneous Multiple Vehic	0		0
Angle Right Turn	0		0

Crash Type	Rate	Count	%age
ICY		1	25.00
DARK		0	0.00
WET		0	0.00
FATAL		0	0.00
INJURY		1	25.00

Severity	Count	Rate
Fatalities:	0	
Injuries A:	0	
Injuries B:	0	
Injuries C:	1	
Injuries:	1	

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2009 to 12/31/2010

PR:932007 BMP:0.000 EMP:0.202

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEATHER	SURFACE CONDITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	47013	3.036	931609		Interchang	ramp	AN-ST	North	Front Corner; D	Starting up on	East	Front Corner; P	Going Straight	Cloudy	Dry	Tue	1300	07/20/2010	7658094	0	2	0	N	2	0	No
ivers	47013	3.093	931609	0.057	Interchang	ramp	FXOBJ	North	Front Corner; P	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Snowy	Thu	0852	01/08/2009	7223675	0	0	0	Y	0	0	No
ivers	47013	2.844	932006	0.197	Interchang	ramp	OTURN	North	Uncoded Errors	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Icy	Thu	0805	02/19/2009	7258921	0	0	1	N	1	0	No
ivers	47013	2.853	931607	0.237	Interchang	ramp	RE-ST	North	Front Center	Going Straight	North	Rear Center	Stopped on Road	Cloudy	Dry	Wed	1450	11/25/2009	7471525	0	0	1	N	1	0	No
ivers	47013	2.853	931607	0.237	Interchang	ramp	RE-ST	North	Front Center	Slowing Stopped	North	Rear Center	Slowing Stopped	Snow /	Snowy	Tue	0650	01/13/2009	7231843	0	0	0	Y	0	0	No
ivers		2.616	931607	0.242	Mid-block	ramp	SS-SM	North	Front Corner; P	Going Straight	North	Front Corner; D	Going Straight	Snow /	Snowy	Wed	0832	12/22/2010	7836283	0	1	0	N	1	0	No

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2013 to 12/31/2013

PR:932007 BMP:0.000 EMP:0.202

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEATHER	SURFACE CONDITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers	47013	3.036	931609		Interchang	ramp	FXOBJ	North	Front Center	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Mon	0742	05/13/2013	8635605	0	0	1	N	1	0	No
ivers		2.616	931607	0.242	Mid-block	ramp	RE-ST	North	Front Corner; D	Going Straight	North	Rear Corner;	Stopped on Road	Clear	Dry	Fri	1834	09/13/2013	8719574	0	0	0	Y	0	0	No
ivers		3.038	932007	0.202	Mid-block	ramp	RE-ST	South	Front Center	Starting up on	South	Rear Center	Slowing Stopped	Clear	Dry	Wed	1432	06/26/2013	8665288	0	0	0	Y	0	0	No
ivers	47013	3.036	931609		Interchang	ramp	SS-SM	North	Front Corner; P	Going Straight	North	None	Unknown	Snow /	Snowy	Sat	0729	03/16/2013	8591524	0	0	0	Y	0	0	No

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Crash Summary
Local Roads
6 Mile
8 Mile
North Territorial

Michigan Department of Transportation

CRASH SUMMARY REPORT

Summary Produced from 1/1/2009 to 12/31/2010

Physical Road Name	Physical Reference Number	BMP	EMP	State Route Name	Direction	Ramp	County
6 Mile Rd	1431706	0.098	0.327		0	NA	Washtenaw

Crash Type	Count	Rate	%age
Total	4		100
Miscellaneous 1 Vehicle	0		0
Overturn	0		0
Hit Train	0		0
Hit Parked Vehicle	0		0
Backing	0		0
Parking	0		0
Pedestrian	0		0
Fixed Object	0		0
Other Object	0		0
Animal	0		0
Bicycle	0		0
Head-On	0		0
Angle Straight	0		0
Rear-End Straight	2		50
Angle Turn	2		50
Side Swipe Same	0		0
Rear-End Left Turn	0		0
Rear-End Right Turn	0		0
Other Drive	0		0
Angle Drive	0		0
Rear-End Drive	0		0
Side-Swipe Opposite	0		0
Head-On Left-Turn	0		0
Dual Left Turn	0		0
Dual Right Turn	0		0
Miscellaneous Multiple Vehic	0		0
Angle Right Turn	0		0

Crash Type	Rate	Count	%age
ICY		0	0.00
DARK		0	0.00
WET		0	0.00
FATAL		0	0.00
INJURY		0	0.00

Severity	Count	Rate
Fatalities:	0	
Injuries A:	0	
Injuries B:	0	
Injuries C:	0	
Injuries:	0	

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2009 to 12/31/2010

PR:1431706 BMP:0.098 EMP:0.327

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATI ON	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEATHER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers		6.466	1431706	0.327	tersectio	within intersec	AN-TN	South	Front Corner; P	Turning Left	East	Rear Corner; Dr	Going Straight	Clear	Dry	Thu	1720	05/21/2009	7333934	0	0	0	Y	0	0	No
ivers		6.466	1431706	0.327	tersectio	within intersec	AN-TN	South	Front Center	Turning Left	West	Front Corner; P	Going Straight	Clear	Dry	Mon	1725	07/06/2009	7382865	0	0	0	Y	0	0	No
ivers		6.466	1431706	0.308	tersectio	straight, unrel	RE-ST	West	Front Center	Slowing Stopped	West	Rear Center	Slowing Stopped	Clear	Dry	Tue	0815	06/23/2009	7355405	0	0	0	Y	0	0	No
ivers		6.466	1431706	0.323	tersectio	straight, unrel	RE-ST	West	Front Center	Going Straight	West	Rear Center	Stopped on Road	Clear	Dry	Tue	0810	06/23/2009	7355404	0	0	0	Y	0	0	No

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Michigan Department of Transportation

CRASH SUMMARY REPORT

Summary Produced from 1/1/2009 to 12/31/2010

Physical Road Name	Physical Reference Number	BMP	EMP	State Route Name	Direction	Ramp	County
Eight Mile Rd	942008	1.068	1.314		0	NA	Washtenaw

Crash Type	Count	Rate	%age
Total	10		100
Miscellaneous 1 Vehicle	0		0
Overturn	0		0
Hit Train	0		0
Hit Parked Vehicle	0		0
Backing	0		0
Parking	0		0
Pedestrian	0		0
Fixed Object	1		10
Other Object	0		0
Animal	1		10
Bicycle	0		0
Head-On	0		0
Angle Straight	0		0
Rear-End Straight	4		40
Angle Turn	1		10
Side Swipe Same	3		30
Rear-End Left Turn	0		0
Rear-End Right Turn	0		0
Other Drive	0		0
Angle Drive	0		0
Rear-End Drive	0		0
Side-Swipe Opposite	0		0
Head-On Left-Turn	0		0
Dual Left Turn	0		0
Dual Right Turn	0		0
Miscellaneous Multiple Vehic	0		0
Angle Right Turn	0		0

Crash Type	Rate	Count	%age
ICY		0	0.00
DARK		1	10.00
WET		1	10.00
FATAL		0	0.00
INJURY		1	10.00

Severity	Count	Rate
Fatalities:	0	
Injuries A:	0	
Injuries B:	0	
Injuries C:	1	
Injuries:	1	

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2009 to 12/31/2010

PR:942008 BMP:1.068 EMP:1.314

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOC ATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	ALCHOL INVOL
ivers		0.222	942008	1.103	terchang	straight, unrel	ANIML	East	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Fri	2022	11/27/2009	7477763	0	0	0	Y	0	0	No
ivers		0.238	942008	1.295	terchang	curved road, un	AN-TN	West	Side; Driver Si	Turning Left	East	Front Corner; D	Stopped on Road	Cloudy	Dry	Tue	1305	02/10/2009	7264003	0	0	0	Y	0	0	No
ivers		0.222	942008	1.092	terchang	ramp	FXOBJ	West	Other Unknown	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Tue	1005	10/12/2010	7769686	0	0	0	Y	0	0	No
ivers		0	942008	1.276	terchang	straight, unrel	RE-ST	East	Front Center	Going Straight	East	Rear Center	Stopped on Road	Cloudy	Dry	Thu	1524	05/07/2009	7324365	0	0	0	Y	0	0	No
ivers		0.222	942008	1.074	terchang	straight, unrel	RE-ST	West	Front Center	Slowing Stopped	West	Rear Center	Stopped on Road	Clear	Dry	Tue	1327	07/14/2009	7382875	0	0	1	N	1	0	No
ivers		0.222	942008	1.075	terchang	straight, unrel	RE-ST	West	Front Center	Slowing Stopped	West	Rear Center	Stopped on Road	Clear	Dry	Mon	1626	05/18/2009	7324525	0	0	0	Y	0	0	No
ivers		0.222	942008	1.092	terchang	straight, unrel	RE-ST	West	Front Corner; P	Going Straight	West	Rear Center	Slowing Stopped	Cloudy	Wet	Fri	1556	10/02/2009	7418037	0	0	0	Y	0	0	No
ivers		0.222	942008	1.101	terchang	straight, unrel	SS-SM	East	Side; Driver Si	Going Straight	East	Side; Passenger	Turning Left	Clear	Dry	Fri	1313	07/09/2010	7656740	0	0	0	Y	0	0	No
ivers		0.222	942008	1.096	terchang	ramp	SS-SM	South	Side; Driver Si	Enter Road	South	Side; Passenger	Going Straight	Cloudy	Dry	Wed	0900	12/15/2010	7848116	0	0	0	Y	0	0	No
ivers		0.222	942008	1.093	terchang	within intersec	SS-SM	East	Front Corner; D	Going Straight	East	Front Corner; P	Going Straight	Other	Other	Wed	1955	11/10/2010	7817511	0	0	0	Y	0	0	No

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Michigan Department of Transportation

CRASH SUMMARY REPORT

Summary Produced from 1/1/2013 to 12/31/2013

Physical Road Name	Physical Reference Number	BMP	EMP	State Route Name	Direction	Ramp	County
Eight Mile Rd	942008	1.068	1.314		0	NA	Washtenaw

Crash Type	Count	Rate	%age
Total	3		100
Miscellaneous 1 Vehicle	0		0
Overturn	0		0
Hit Train	0		0
Hit Parked Vehicle	0		0
Backing	0		0
Parking	0		0
Pedestrian	0		0
Fixed Object	1		33.33
Other Object	0		0
Animal	0		0
Bicycle	0		0
Head-On	0		0
Angle Straight	0		0
Rear-End Straight	2		66.67
Angle Turn	0		0
Side Swipe Same	0		0
Rear-End Left Turn	0		0
Rear-End Right Turn	0		0
Other Drive	0		0
Angle Drive	0		0
Rear-End Drive	0		0
Side-Swipe Opposite	0		0
Head-On Left-Turn	0		0
Dual Left Turn	0		0
Dual Right Turn	0		0
Miscellaneous Multiple Vehic	0		0
Angle Right Turn	0		0

Crash Type	Rate	Count	%age
ICY		0	0.00
DARK		0	0.00
WET		0	0.00
FATAL		0	0.00
INJURY		0	0.00

Severity	Count	Rate
Fatalities:	0	
Injuries A:	0	
Injuries B:	0	
Injuries C:	0	
Injuries:	0	

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2013 to 12/31/2013

PR:942008 BMP:1.068 EMP:1.314

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEATHER	SURFACE CONDITION	DAY	HOUR	DATE	CRASH ID NUMBER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	TOTAL ALCHOL INVOL
ivers		0.238	942008	1.293	terchang	straight, unrel	FXOBJ	East	Multiple Areas	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Clear	Dry	Thu	1404	01/24/2013	8559599	0	0	0	Y	0	0	No
ivers		0.222	942008	1.09	terchang	other intersect	RE-ST	Unknown	Front Center	Going Straight	Unknown	Rear Center	Stopped on Road	Cloudy	Dry	Sat	1526	02/23/2013	8586967	0	0	0	Y	0	0	No
ivers		8.913	942008	1.151	terchang	other intersect	RE-ST	West	Front Center	Going Straight	West	Rear Center	Stopped on Road	Clear	Dry	Fri	1629	09/06/2013	8728779	0	0	0	Y	0	0	No

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Michigan Department of Transportation

CRASH SUMMARY REPORT

Summary Produced from 1/1/2009 to 12/31/2010

Physical Road Name	Physical Reference Number	BMP	EMP	State Route Name	Direction	Ramp	County
North Territorial Rd	1426409	17.126	17.222		0	NA	Washtenaw

Crash Type	Count	Rate	%age
Total	8		100
Miscellaneous 1 Vehicle	0		0
Overturn	0		0
Hit Train	0		0
Hit Parked Vehicle	0		0
Backing	0		0
Parking	0		0
Pedestrian	0		0
Fixed Object	0		0
Other Object	0		0
Animal	0		0
Bicycle	0		0
Head-On	0		0
Angle Straight	1		12.5
Rear-End Straight	4		50
Angle Turn	0		0
Side Swipe Same	0		0
Rear-End Left Turn	0		0
Rear-End Right Turn	0		0
Other Drive	0		0
Angle Drive	0		0
Rear-End Drive	0		0
Side-Swipe Opposite	0		0
Head-On Left-Turn	3		37.5
Dual Left Turn	0		0
Dual Right Turn	0		0
Miscellaneous Multiple Vehic	0		0
Angle Right Turn	0		0

Crash Type	Rate	Count	%age
ICY		0	0.00
DARK		1	12.50
WET		2	25.00
FATAL		0	0.00
INJURY		4	50.00

Severity	Count	Rate
Fatalities:	0	
Injuries A:	2	
Injuries B:	0	
Injuries C:	4	
Injuries:	6	

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2009 to 12/31/2010
 PR:1426409 BMP:17.126 EMP:17.222

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCA TION	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEA THER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	ALCHOL INVOL
ivers		5.432	1426409	7.222	terchang	within intersec	AN-ST	East	Side; Passenger	Going Straight	North	Front Center	Going Straight	Clear	Dry	Wed	1844	04/28/2010	7603629	0	0	0	Y	0	0	No
ivers		5.432	1426409	7.222	terchang	within intersec	HD-LT	West	Front Corner; D	Turning Left	East	Front Center	Going Straight	Cloudy	Dry	Thu	1455	10/15/2009	7432724	0	0	0	Y	0	0	No
ivers		5.432	1426409	7.219	terchang	within intersec	HD-LT	East	Front Corner; P	Turning Left	West	Front Center	Going Straight	Rain	Wet	Wed	0745	02/11/2009	7265907	1	0	1	N	2	0	No
ivers		5.432	1426409	7.221	terchang	within intersec	HD-LT	West	Front Corner; P	Turning Left	West	Front Corner; D	Turning Right	Clear	Dry	Wed	1658	05/13/2009	7324368	0	0	0	Y	0	0	No
ivers		0	1426409	7.162	terchang	other intersect	RE-ST	East	Front Center	Going Straight	East	Rear Center	Stopped on Road	Clear	Dry	Mon	0758	11/08/2010	7808378	0	0	1	N	1	0	No
ivers		5.411	1426409	7.145	terchang	ramp	RE-ST	East	Front Center	Slowing Stopped	East	Rear Center	Slowing Stopped	Clear	Dry	Sat	1117	10/16/2010	7786063	0	0	1	N	1	0	No
ivers		5.411	1426409	7.142	terchang	straight, unrel	RE-ST	West	Front Center	Going Straight	West	Rear Center	Slowing Stopped	Clear	Dry	Tue	1903	07/20/2010	7666310	0	0	0	Y	0	0	No
ivers		5.411	1426409	7.128	terchang	other intersect	RE-ST	West	Front Center	Going Straight	West	Rear Center	Stopped on Road	Rain	Wet	Thu	1607	06/25/2009	7355406	1	0	1	N	2	0	No

Disclaimers: Crash information is conditioned upon your agreement to comply with the requirements of federal law.. MDOT provides access to this information with the understanding that it will be used strictly for scientific research purposes and/or for governmental purposes by governmental units. MDOT authorizes no other use of this privileged information. MDOT does not waive any privilege based on this limited release of information.

Michigan Department of Transportation

CRASH SUMMARY REPORT

Summary Produced from 1/1/2013 to 12/31/2013

Physical Road Name	Physical Reference Number	BMP	EMP	State Route Name	Direction	Ramp	County
North Territorial Rd	1426409	17.126	17.222		0	NA	Washtenaw

Crash Type	Count	Rate	%age
Total	6		100
Miscellaneous 1 Vehicle	0		0
Overturn	0		0
Hit Train	0		0
Hit Parked Vehicle	0		0
Backing	0		0
Parking	0		0
Pedestrian	0		0
Fixed Object	0		0
Other Object	0		0
Animal	1		16.67
Bicycle	0		0
Head-On	0		0
Angle Straight	0		0
Rear-End Straight	3		50
Angle Turn	0		0
Side Swipe Same	1		16.67
Rear-End Left Turn	0		0
Rear-End Right Turn	0		0
Other Drive	0		0
Angle Drive	0		0
Rear-End Drive	0		0
Side-Swipe Opposite	0		0
Head-On Left-Turn	1		16.67
Dual Left Turn	0		0
Dual Right Turn	0		0
Miscellaneous Multiple Vehic	0		0
Angle Right Turn	0		0

Crash Type	Rate	Count	%age
ICY		0	0.00
DARK		1	16.67
WET		1	16.67
FATAL		0	0.00
INJURY		2	33.33

Severity	Count	Rate
Fatalities:	0	
Injuries A:	0	
Injuries B:	0	
Injuries C:	2	
Injuries:	2	

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Michigan Department of Transportation
CRASH REPORT (One Line Listing)

From 1/1/2013 to 12/31/2013

PR:1426409 BMP:17.126 EMP:17.222

Interchange
 Intersection
 Mid-Block
 Non-Traffic

REG ION	CS NUM	CS MP	PR NUM	PR MP	AREA	LOCATI ON	CRASH TYPE	DIRECTION OF VEHICLE1	IMPACT OF VEHICLE1	INTENT OF VEHICLE1	DIRECTION OF VEHICLE2	IMPACT OF VEHICLE2	INTENT OF VEHICLE2	WEATHER	SURFACE COND ITION	DAY	HOUR	DATE	CRASH ID NUMER	A	B	C	PDOT	TOTAL INJ	TOTAL FATAL	ALCHOL INVOL
ivers		5.41	1426409	7.146	terchang	straight, unrel	ANIML	West	Front Corner; D	Going Straight	Unknown	Uncoded Errors	Uncoded Error	Cloudy	Dry	Wed	1258	11/27/2013	8805257	0	0	0	Y	0	0	No
ivers		01	1426409	7.169	terchang	straight, unrel	HD-LT	West	Rear Corner;	Turning Left	East	Front Corner; P	Going Straight	Clear	Dry	Thu	1958	07/18/2013	8689304	0	0	1	N	1	0	No
ivers			1426409	7.162	terchang	straight, unrel	RE-ST	East	Front Center	Slowing Stopped	East	Rear Center	Slowing Stopped	Cloudy	Dry	Wed	1645	10/23/2013	8769197	0	0	0	Y	0	0	No
ivers		5.41	1426409	7.146	terchang	straight, unrel	RE-ST	West	Front Center	Going Straight	West	Rear Center	Stopped on Road	Clear	Dry	Thu	0846	03/14/2013	8603867	0	0	1	N	1	0	No
ivers		5.41	1426409	7.127	terchang	other intersect	RE-ST	West	Front Center	Slowing Stopped	West	Rear Center	Stopped on Road	Cloudy	Wet	Wed	1741	05/22/2013	8650740	0	0	0	Y	0	0	No
ivers			1426409	7.165	terchang	other intersect	SS-SM	East	Front Corner; D	Overtake Passing	East	Front Corner; P	Turning Right	Cloudy	Dry	Fri	0731	10/25/2013	8770906	0	0	0	Y	0	0	No

Disclaimers: Crash information is conditioned upon your agreement to comply with the requirements of federal law.. MDOT provides access to this information with the understanding that it will be used strictly for scientific research purposes and/or for governmental purposes by governmental units. MDOT authorizes no other use of this privileged information. MDOT does not waive any privilege based on this limited release of information.

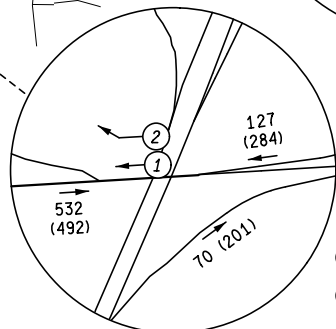
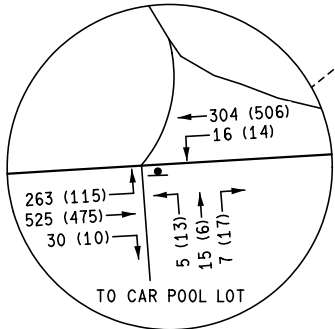
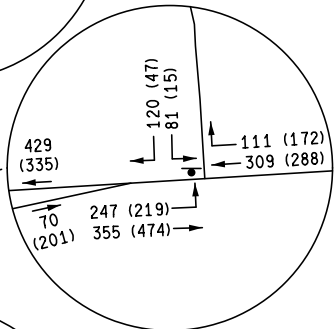
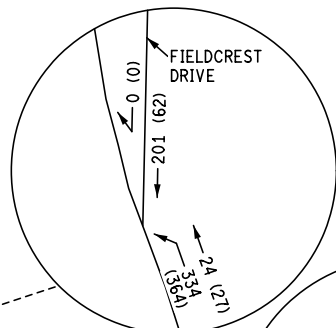
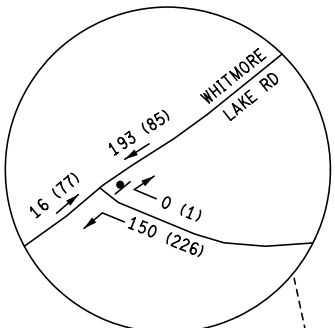
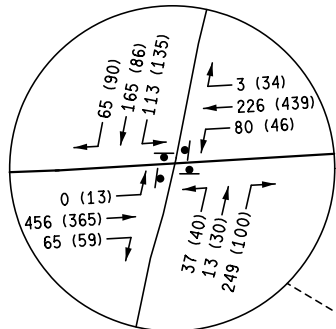
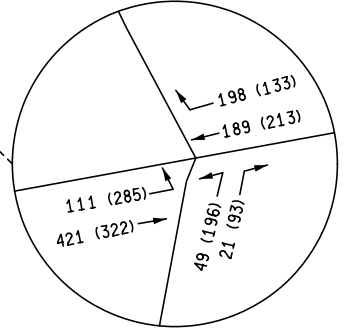
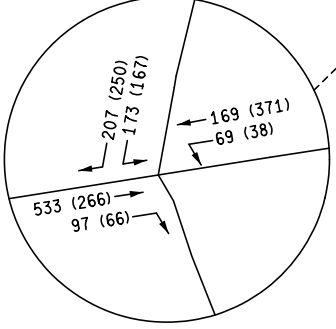
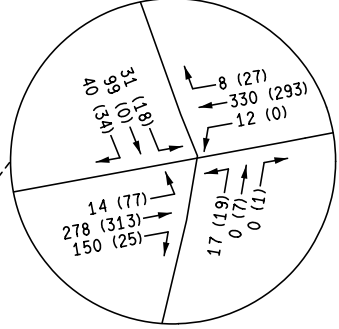
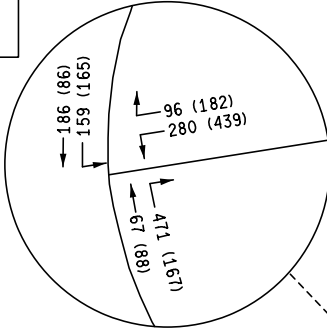
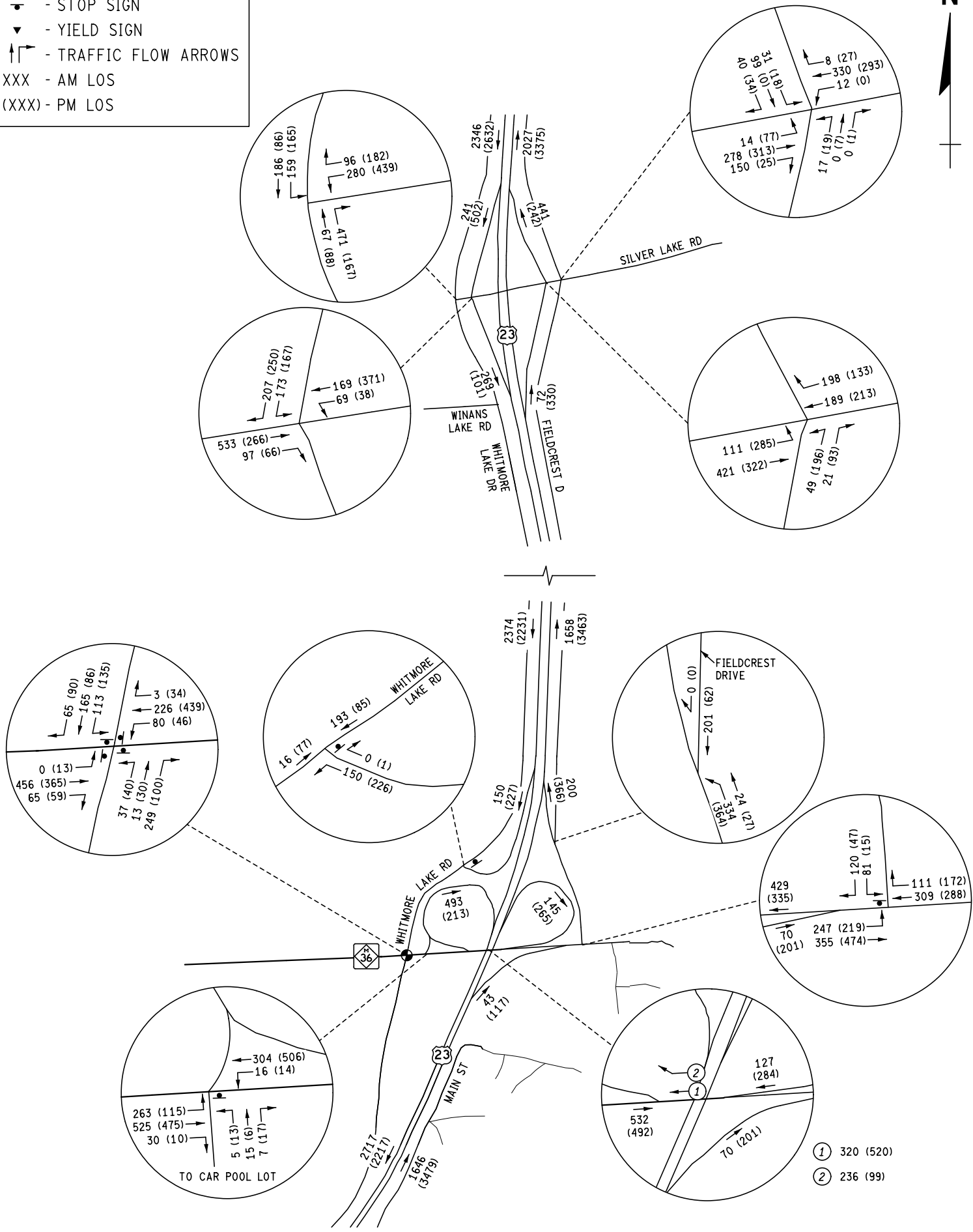
Appendix A-3

Traffic Volumes

2015 Existing

Figure 1a

- - SIGNAL
- ⊥ - STOP SIGN
- ▼ - YIELD SIGN
- ↑↔ - TRAFFIC FLOW ARROWS
- XXX - AM LOS
- (XXX) - PM LOS



- ① 320 (520)
- ② 236 (99)

Figure 1b



- - SIGNAL
- ⊥ - STOP SIGN
- ▼ - YIELD SIGN
- ↑↔ - TRAFFIC FLOW ARROWS
- XXX - AM LOS
- (XXX) - PM LOS

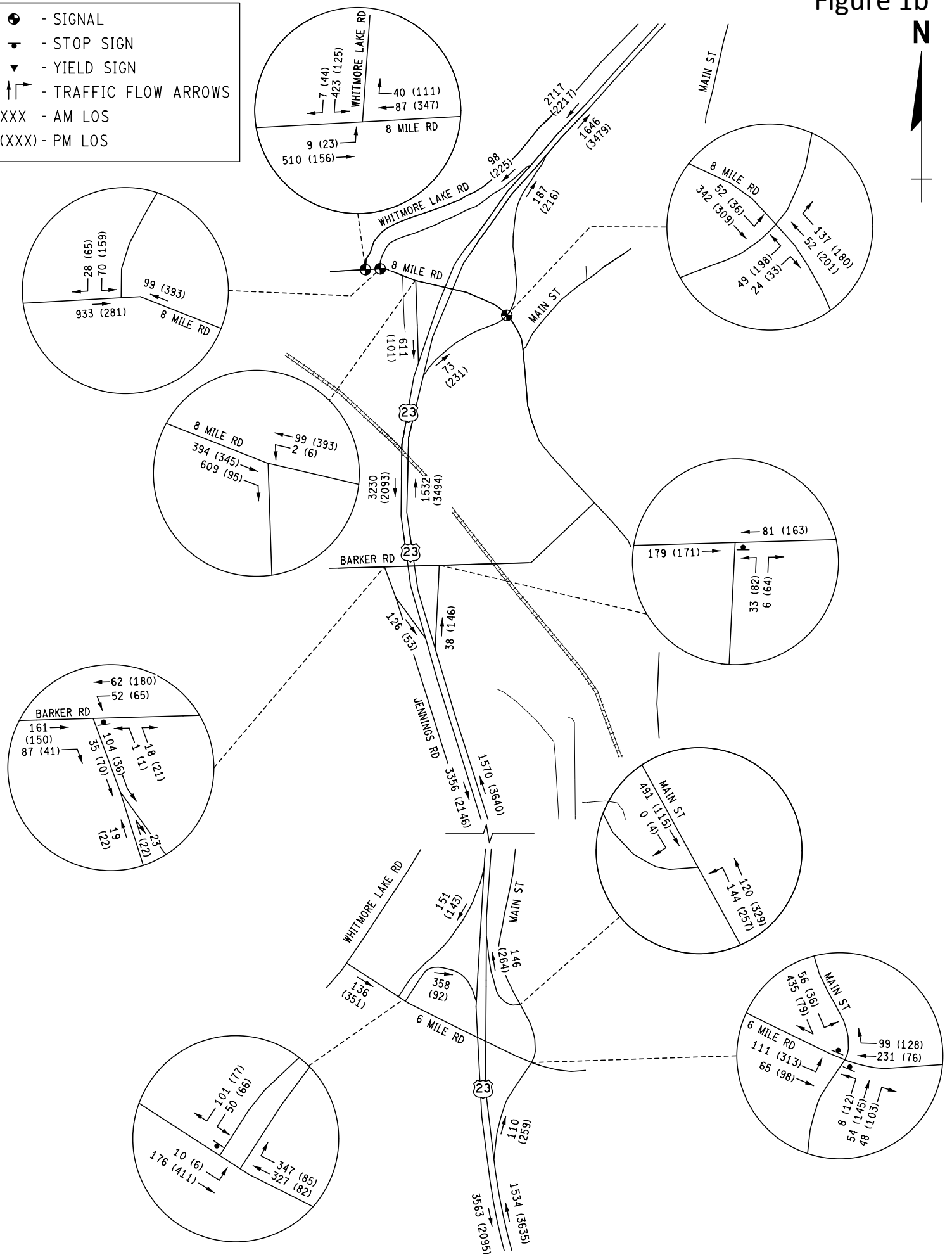


Figure 1c

N

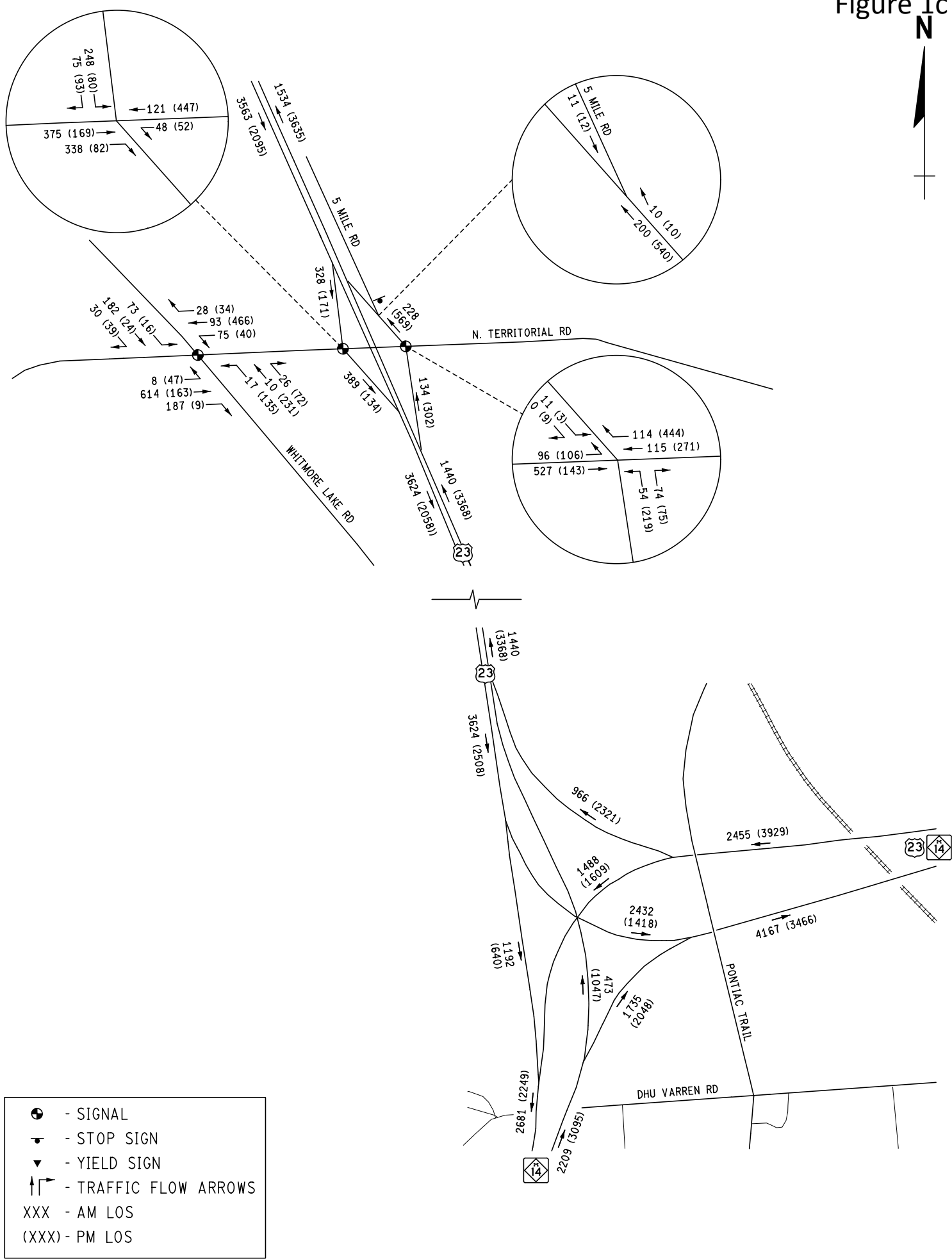
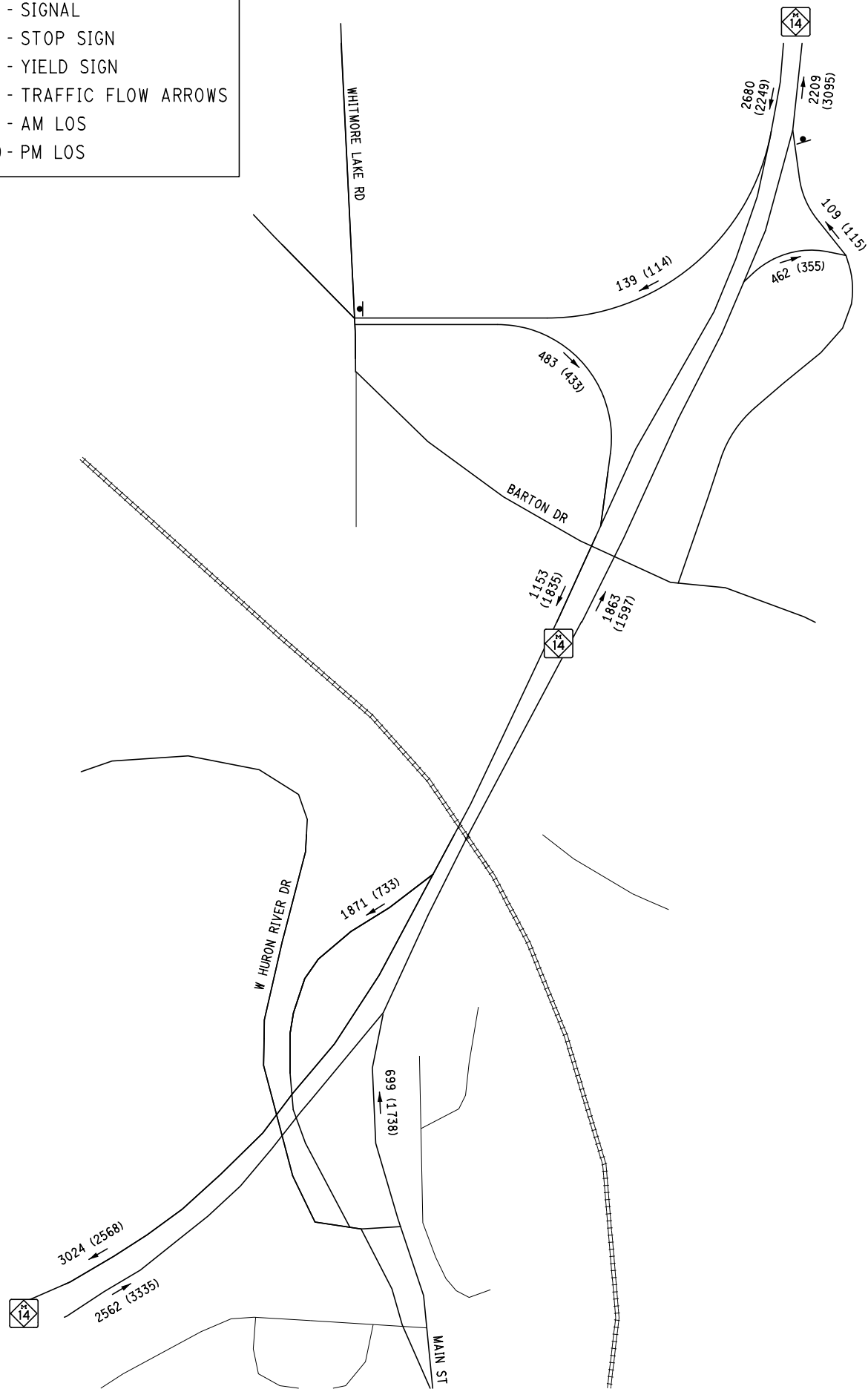


Figure 1d

N

- - SIGNAL
- ⊥ - STOP SIGN
- ▼ - YIELD SIGN
- ↑ - TRAFFIC FLOW ARROWS
- XXX - AM LOS
- (XXX) - PM LOS



2040 No Build

Figure 2a



- - SIGNAL
- ⊥ - STOP SIGN
- ▼ - YIELD SIGN
- ↑↔ - TRAFFIC FLOW ARROWS
- XXX - AM LOS
- (XXX) - PM LOS

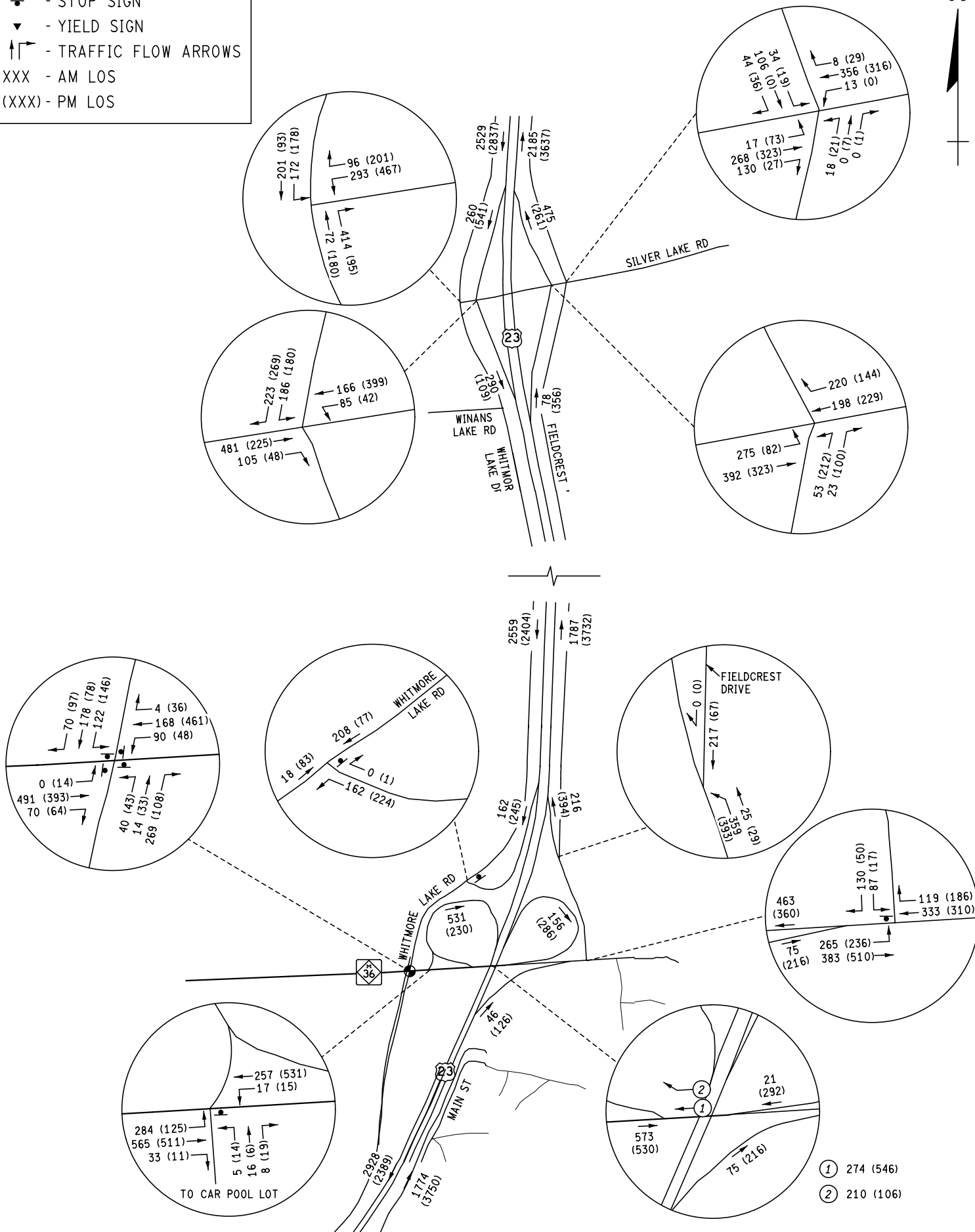


Figure 2b



- - SIGNAL
- ⊥ - STOP SIGN
- ▼ - YIELD SIGN
- ↑↔ - TRAFFIC FLOW ARROWS
- XXX - AM LOS
- (XXX) - PM LOS

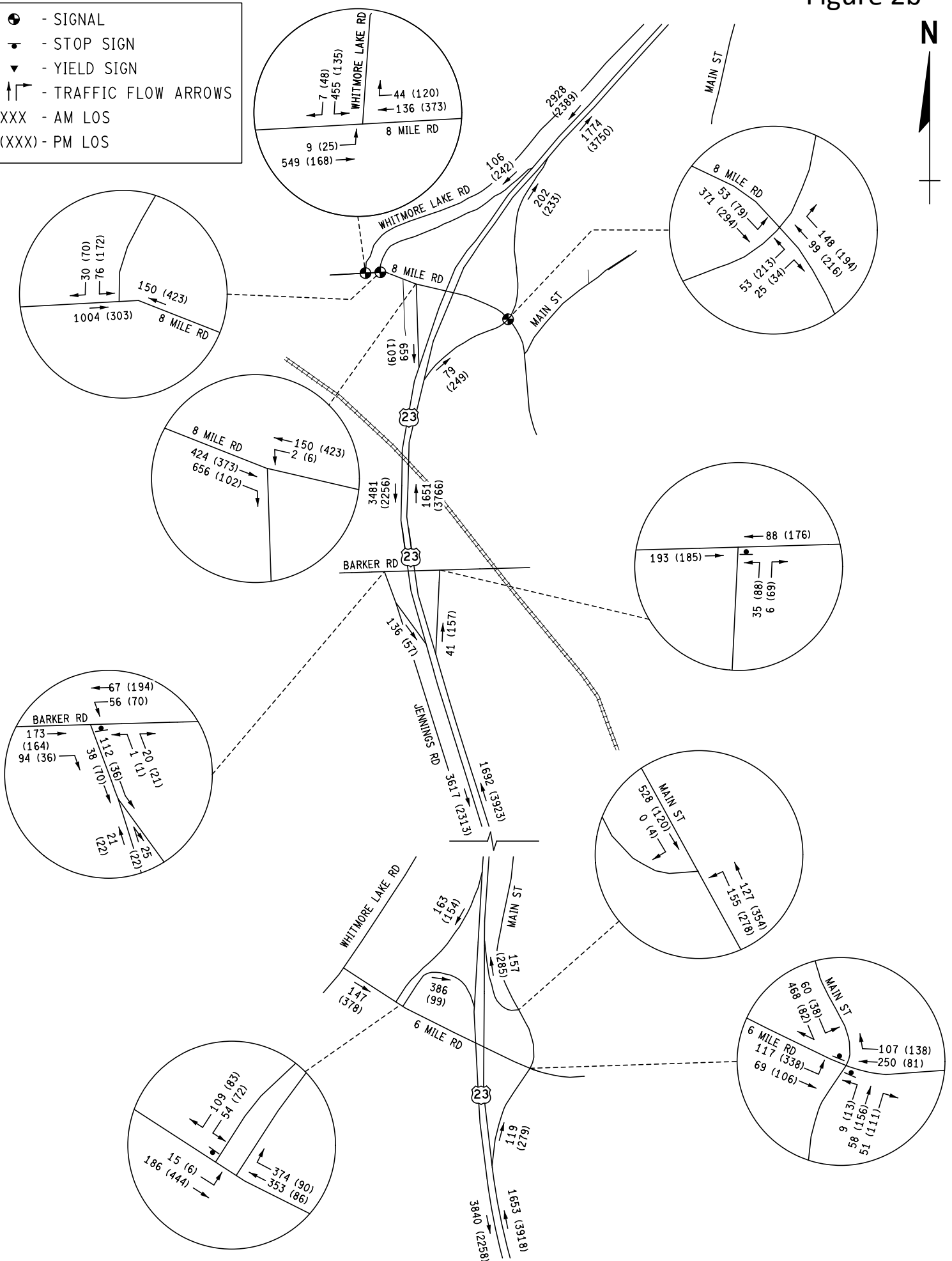
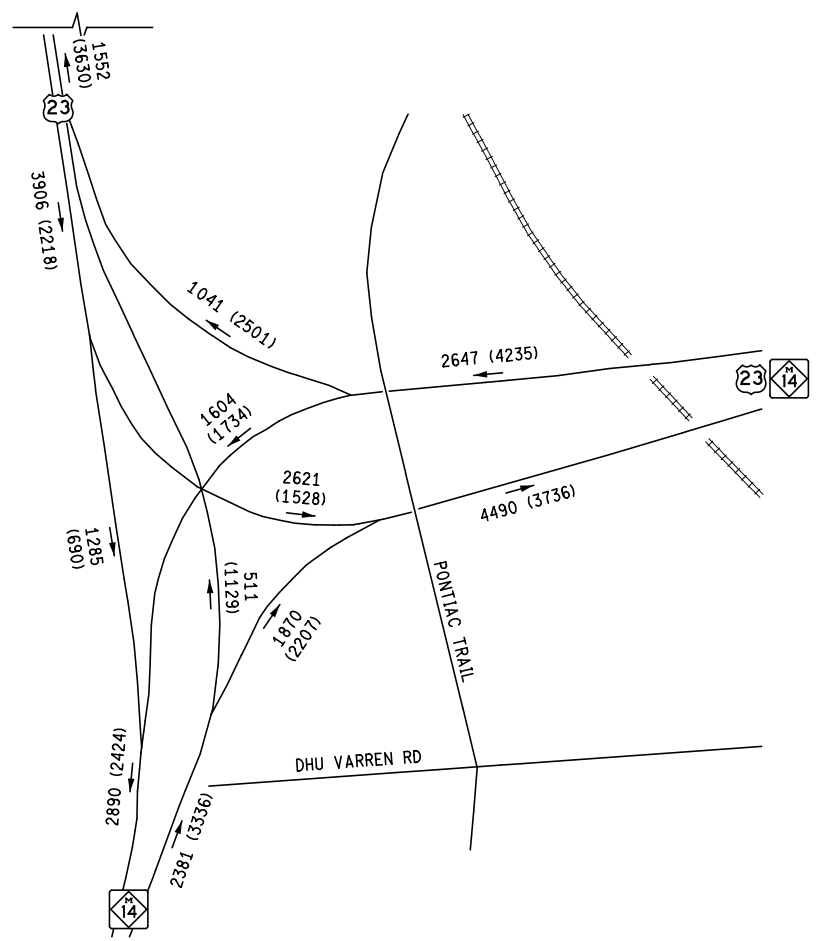
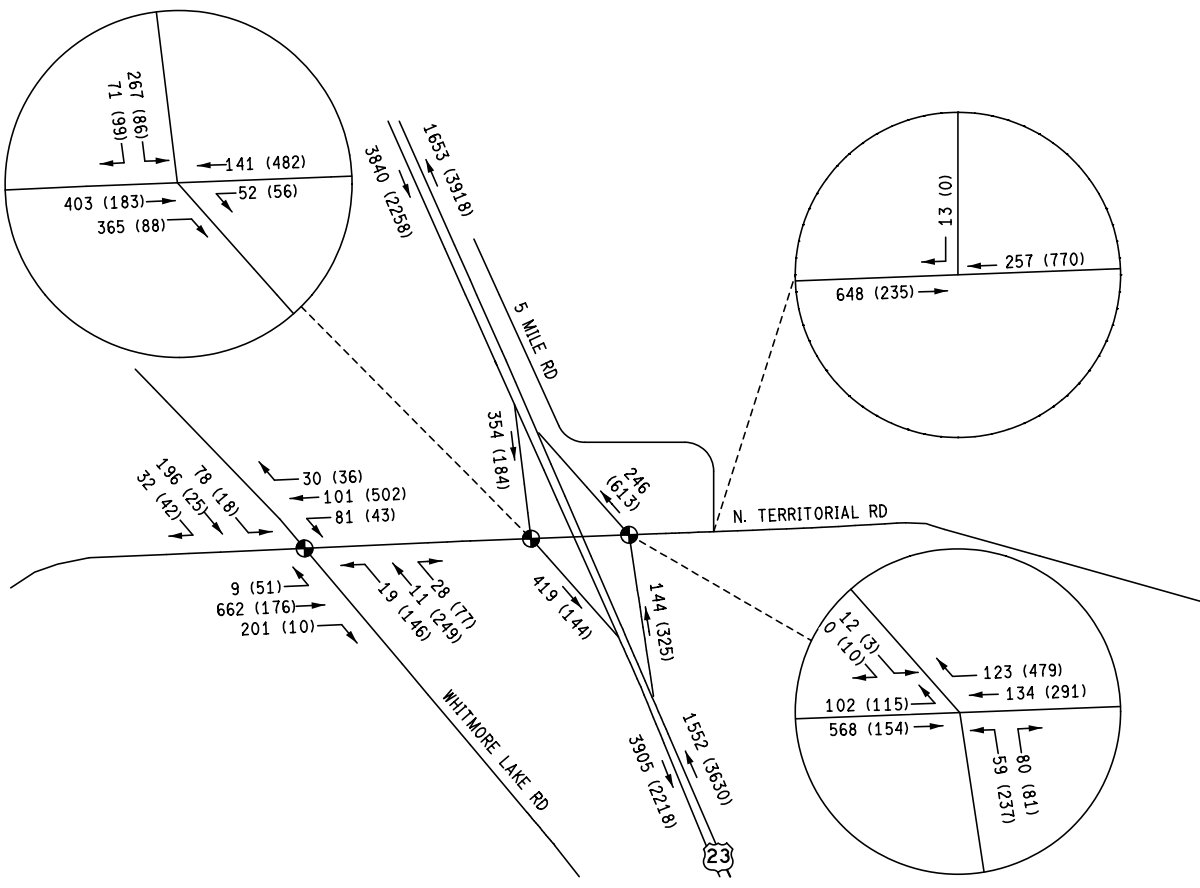


Figure 2c

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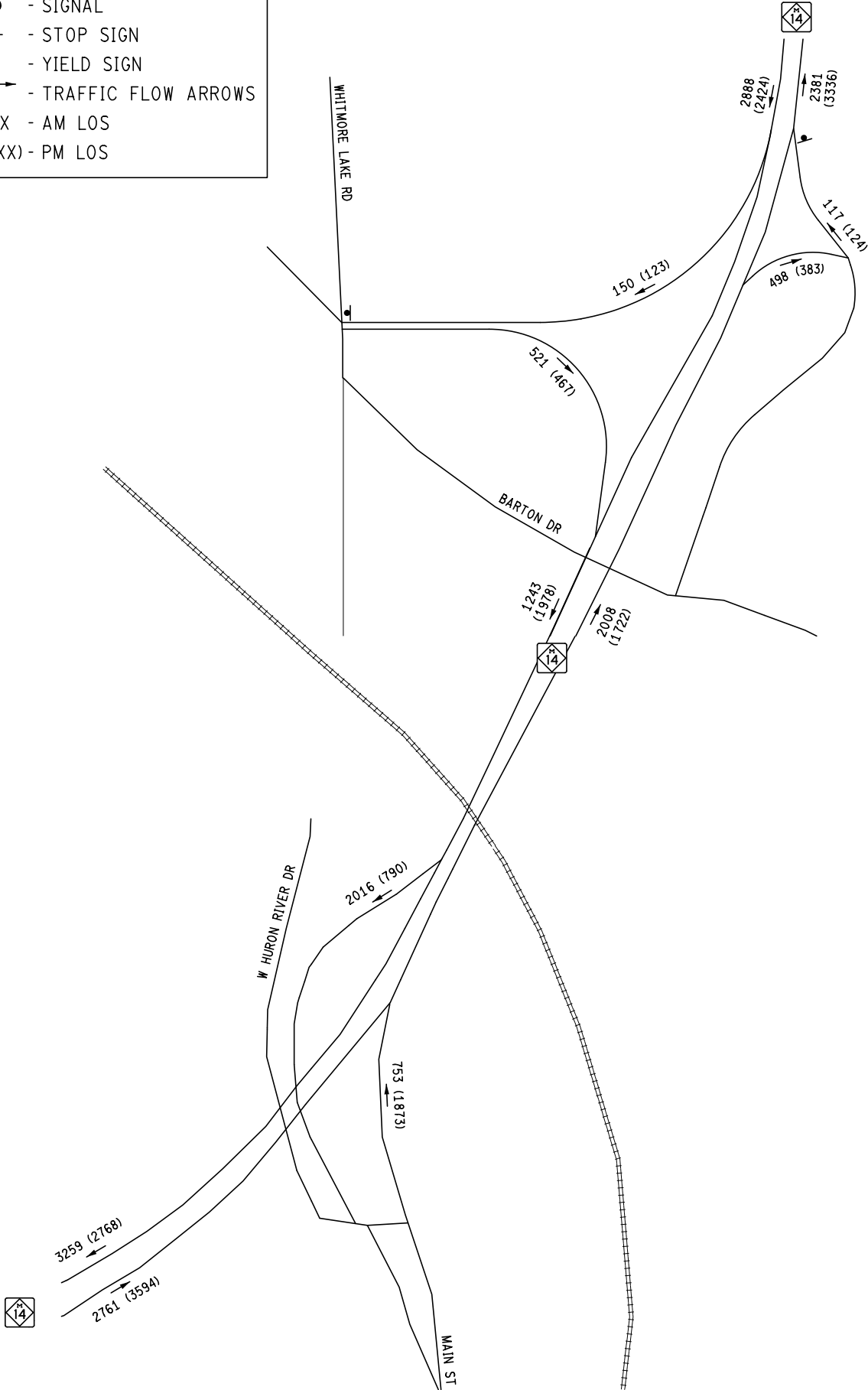


- - SIGNAL
- ⊥ - STOP SIGN
- ▼ - YIELD SIGN
- ↑ - TRAFFIC FLOW ARROWS
- XXX - AM LOS
- (XXX) - PM LOS

Figure 2d



- - SIGNAL
- ⊥ - STOP SIGN
- ▼ - YIELD SIGN
- ↑ - TRAFFIC FLOW ARROWS
- XXX - AM LOS
- (XXX) - PM LOS

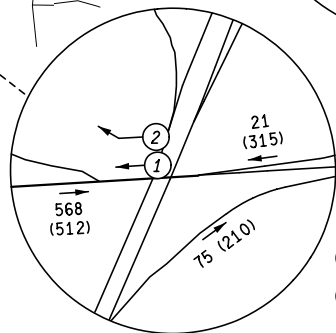
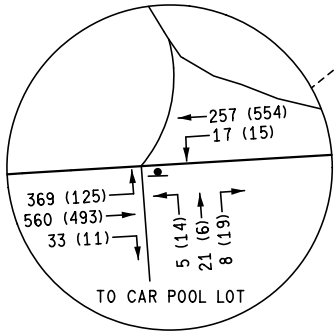
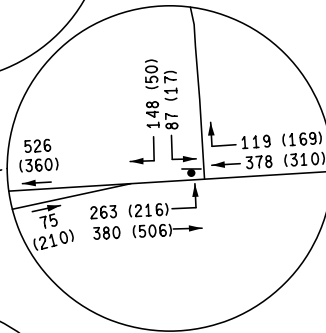
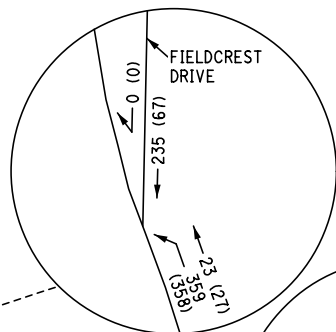
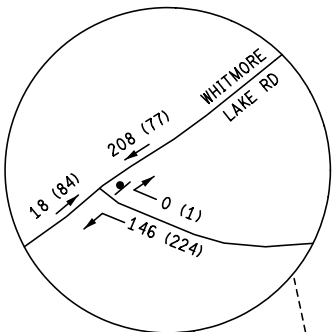
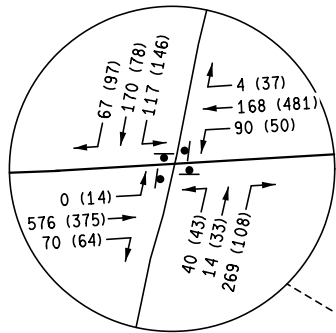
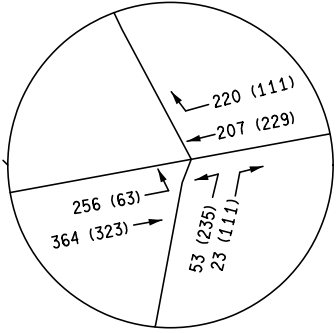
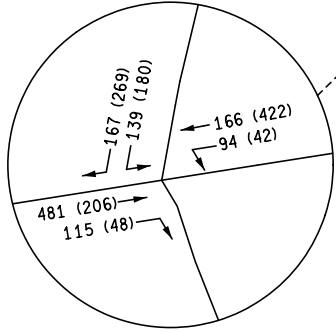
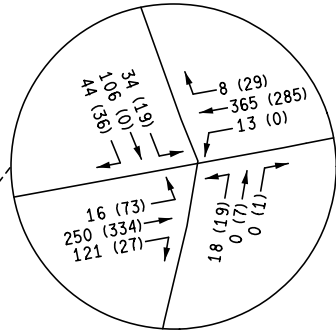
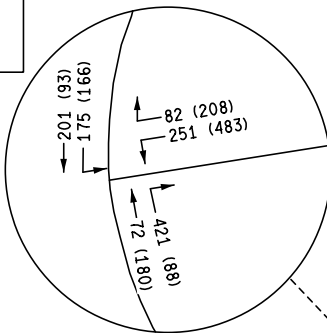
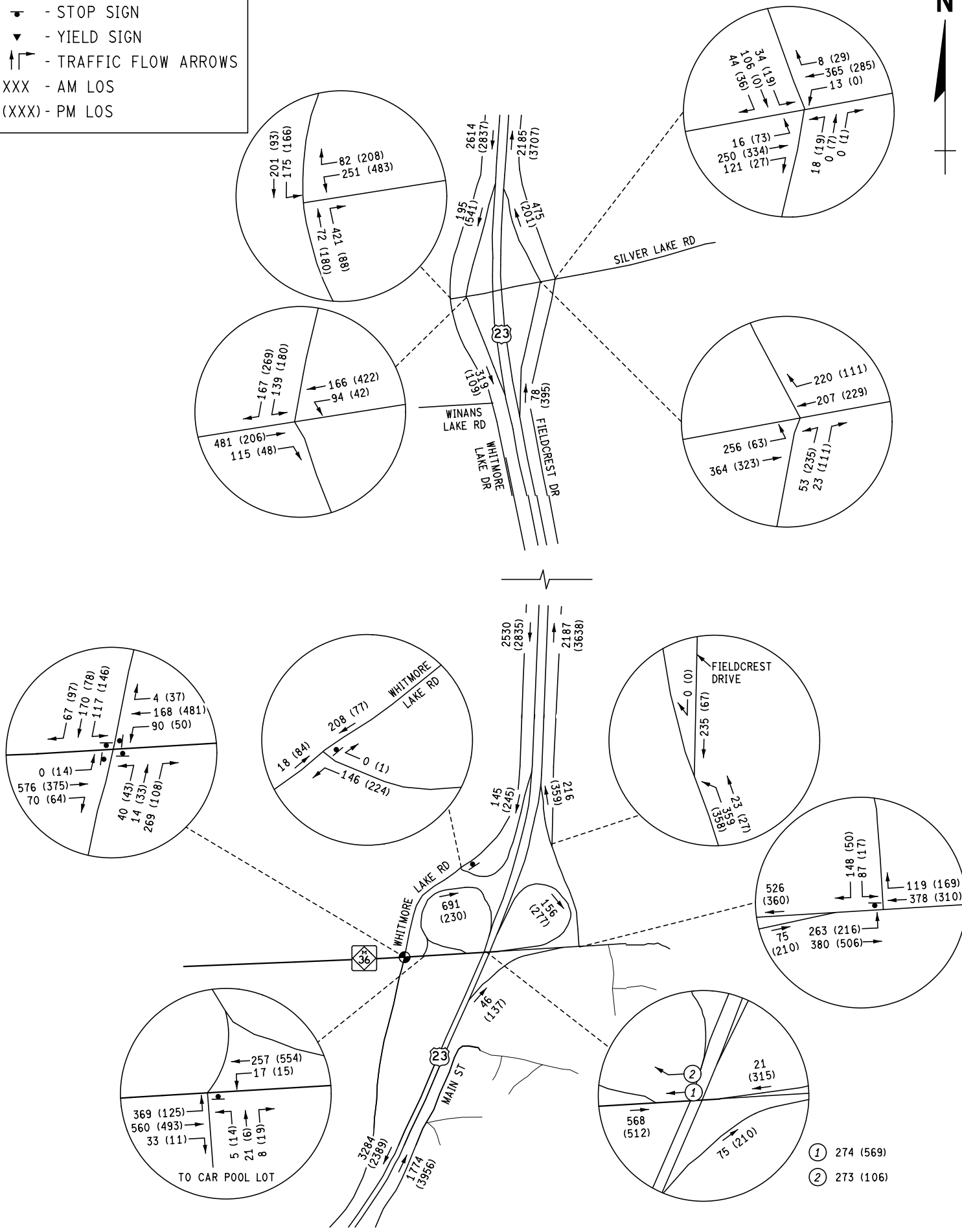


2040 ATM

Figure 3a



- - SIGNAL
- ⊥ - STOP SIGN
- ▼ - YIELD SIGN
- ↑↔ - TRAFFIC FLOW ARROWS
- XXX - AM LOS
- (XXX) - PM LOS



- ① 274 (569)
- ② 273 (106)

Figure 3b



- - SIGNAL
- ⊥ - STOP SIGN
- ▼ - YIELD SIGN
- ↑↔ - TRAFFIC FLOW ARROWS
- XXX - AM LOS
- (XXX) - PM LOS

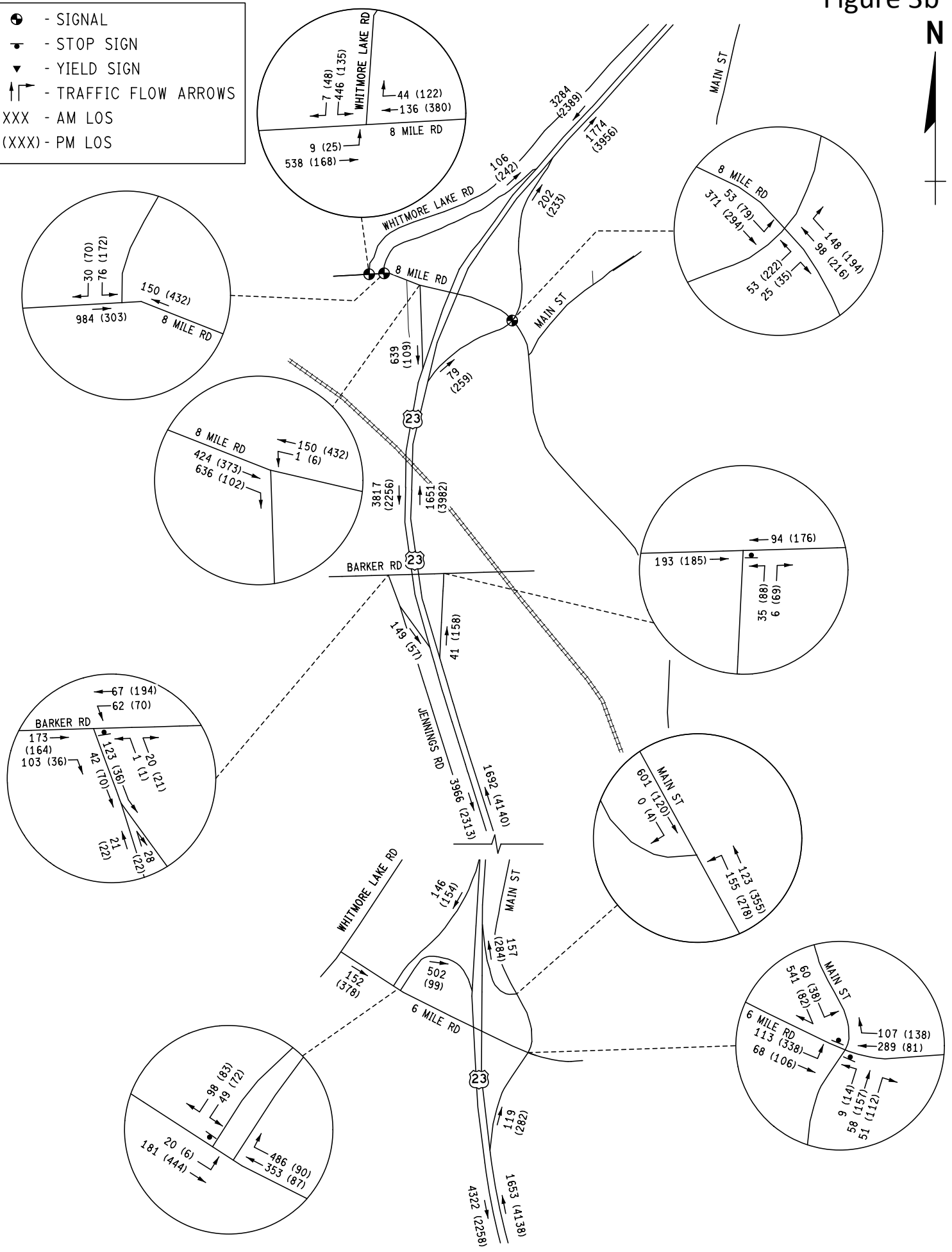
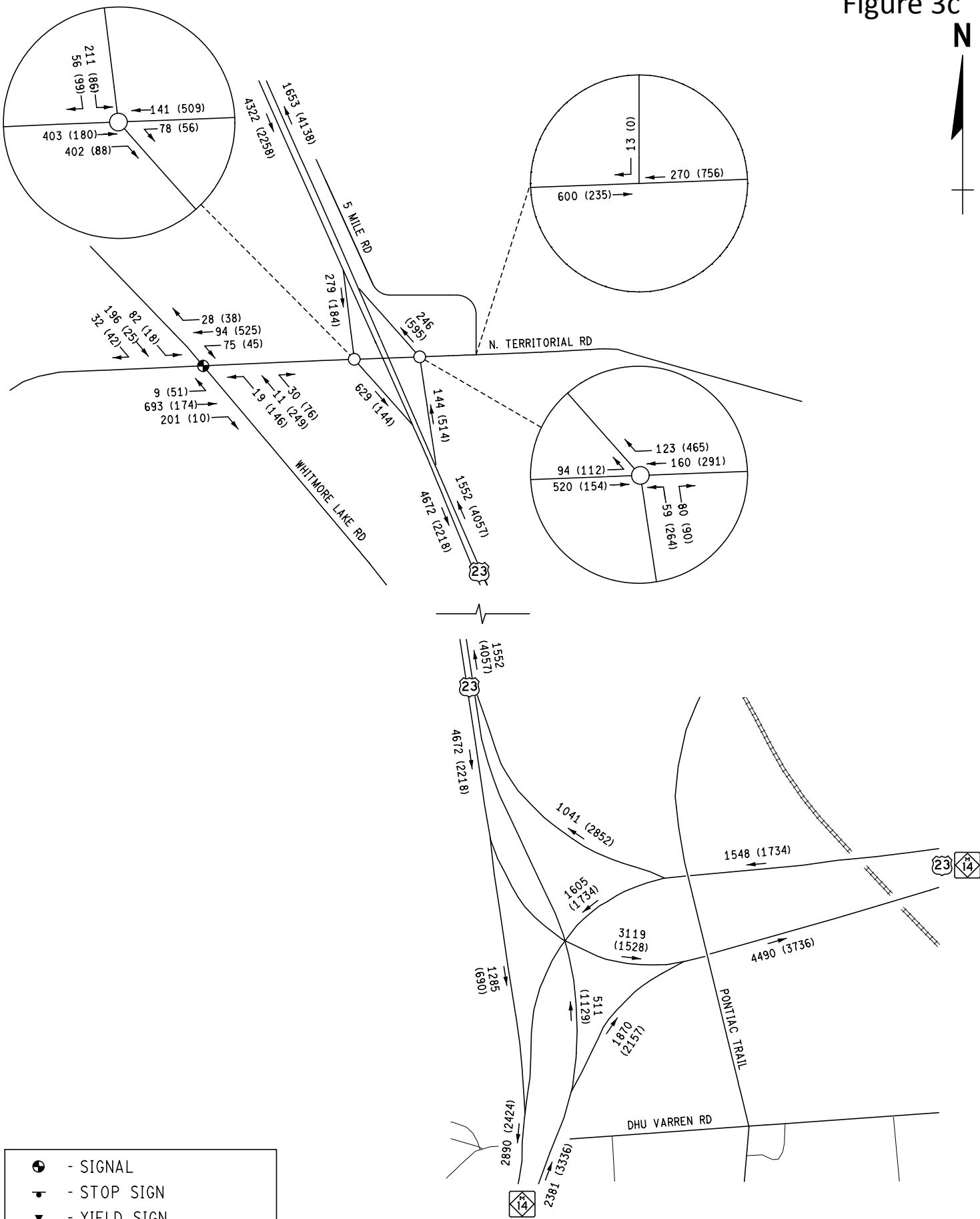


Figure 3c

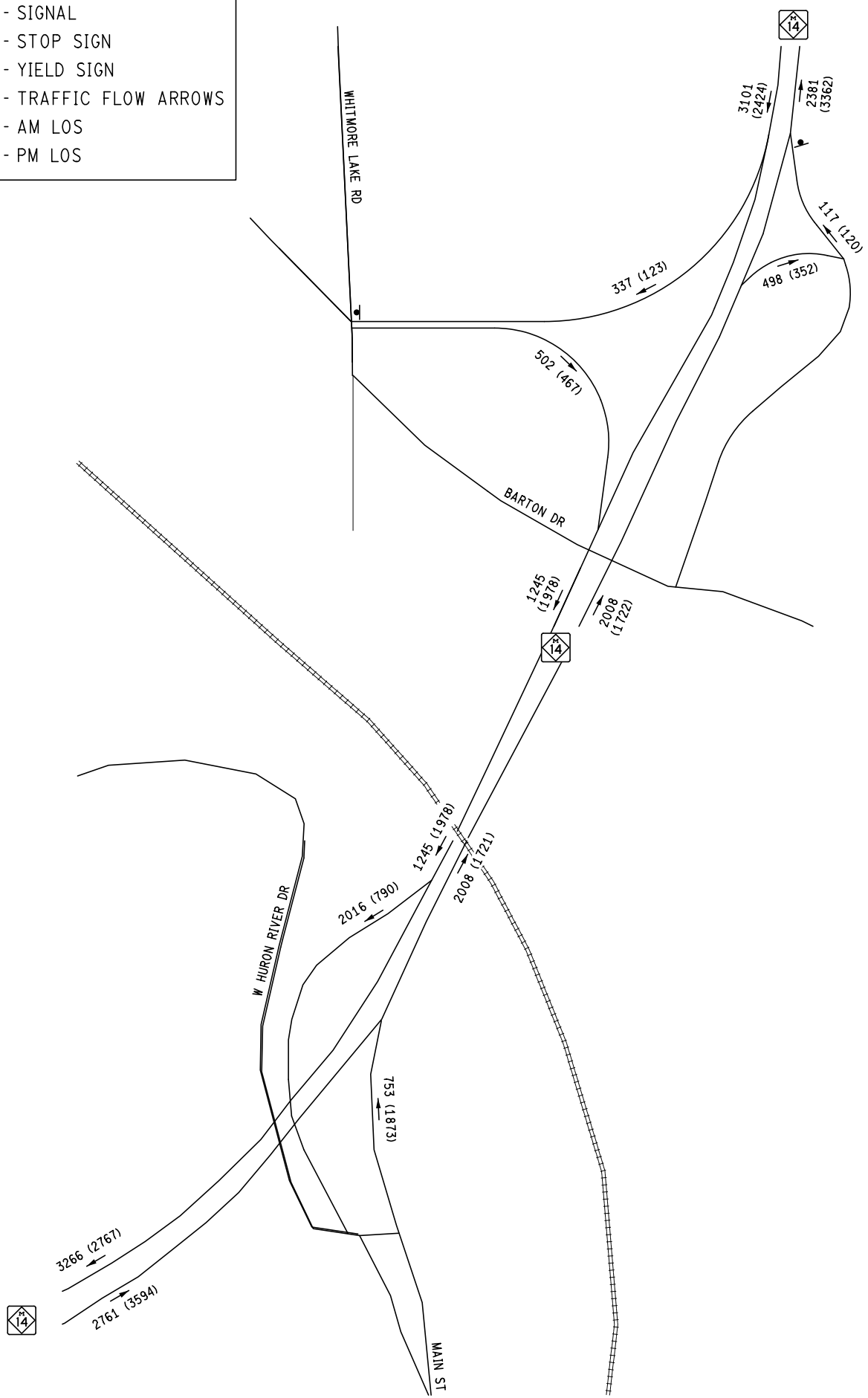


- - SIGNAL
- ⊥ - STOP SIGN
- ▼ - YIELD SIGN
- ↑ - TRAFFIC FLOW ARROWS
- XXX - AM LOS
- (XXX) - PM LOS

Figure 3d



- - SIGNAL
- ⊥ - STOP SIGN
- ▼ - YIELD SIGN
- ↑ - TRAFFIC FLOW ARROWS
- XXX - AM LOS
- (XXX) - PM LOS



2040 HOV

Figure 4a

N

- - SIGNAL
- ⊥ - STOP SIGN
- ▼ - YIELD SIGN
- ↑↔ - TRAFFIC FLOW ARROWS
- XXX - AM LOS
- (XXX) - PM LOS

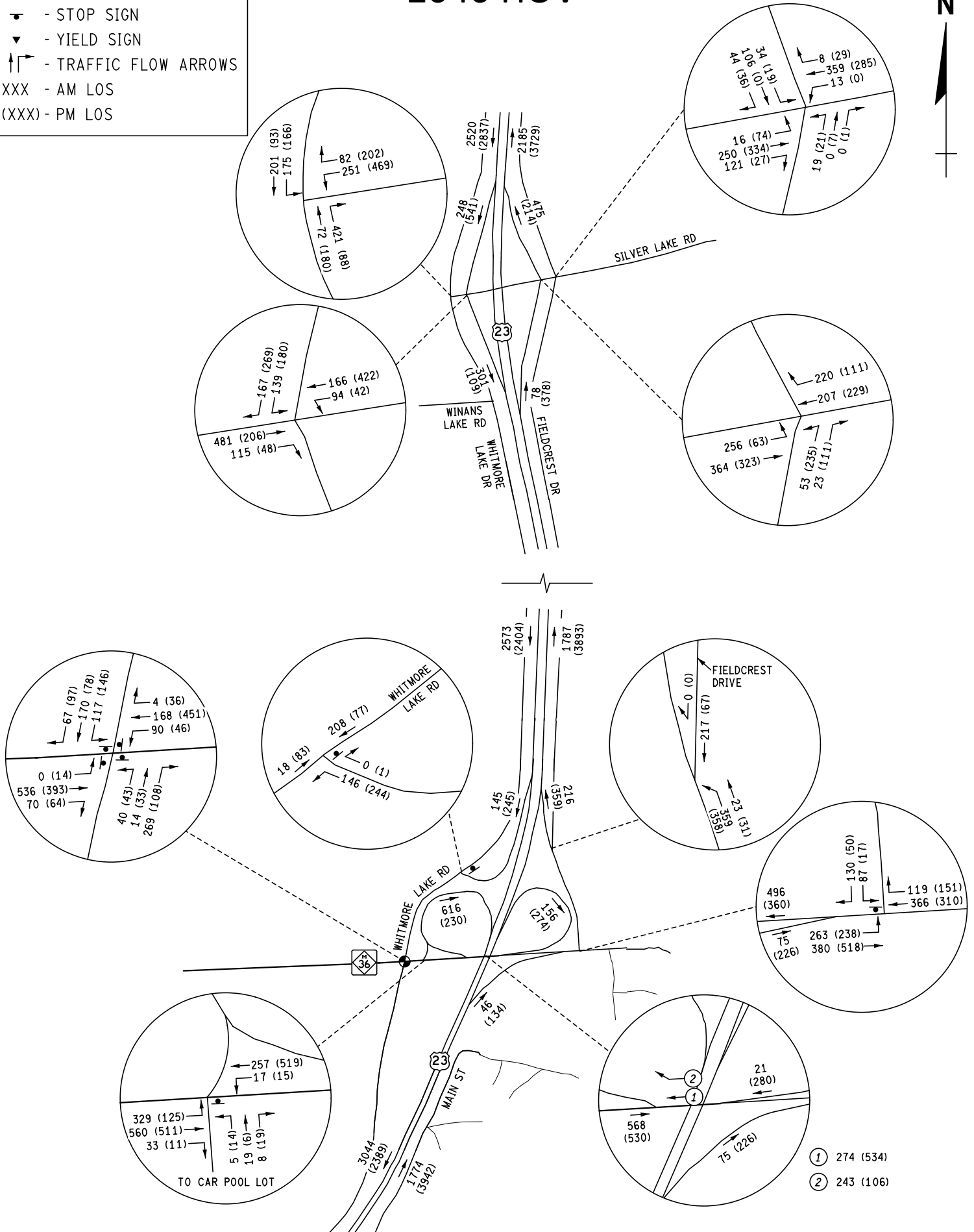


Figure 4b



- - SIGNAL
- ⊥ - STOP SIGN
- ▼ - YIELD SIGN
- ↑↔ - TRAFFIC FLOW ARROWS
- XXX - AM LOS
- (XXX) - PM LOS

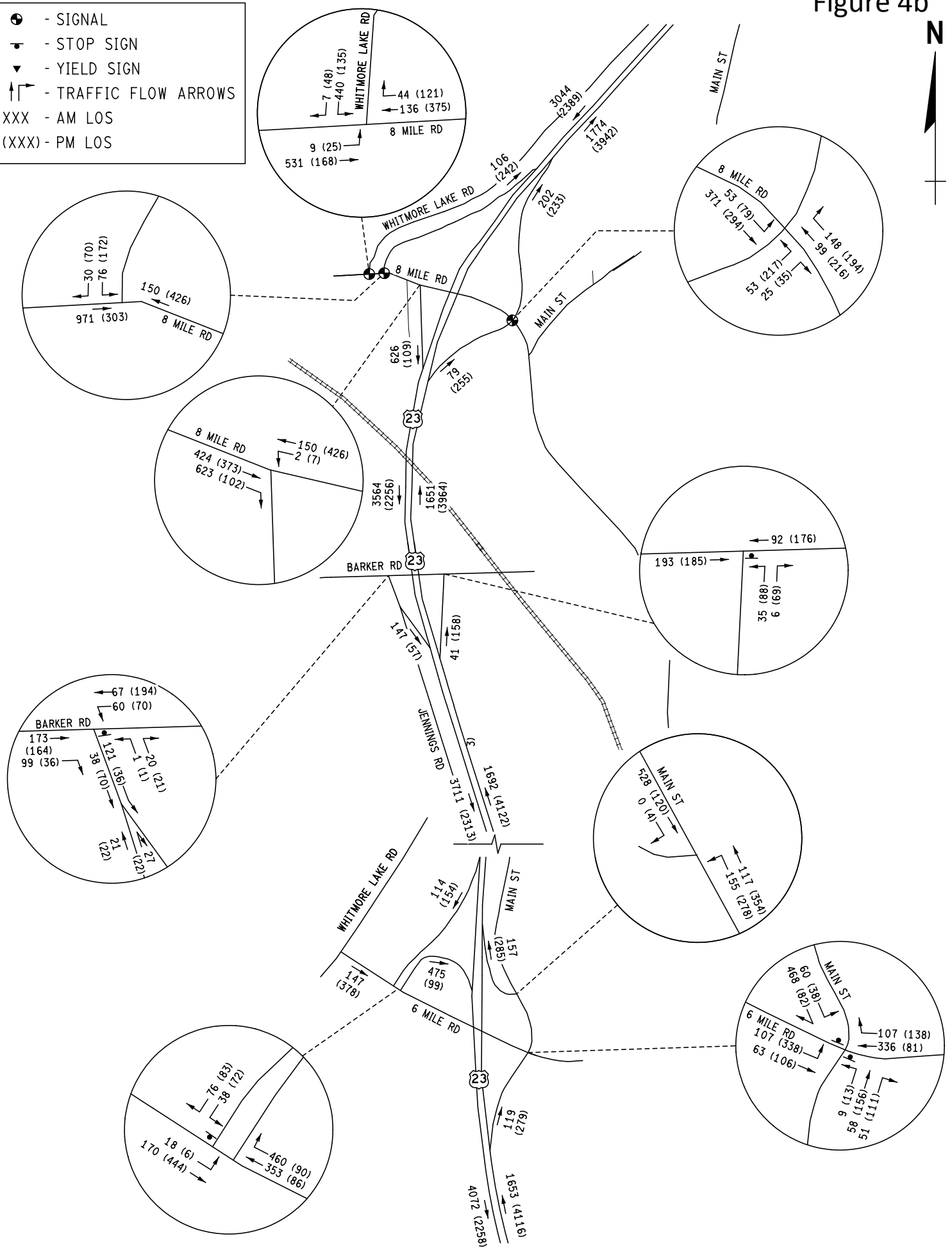
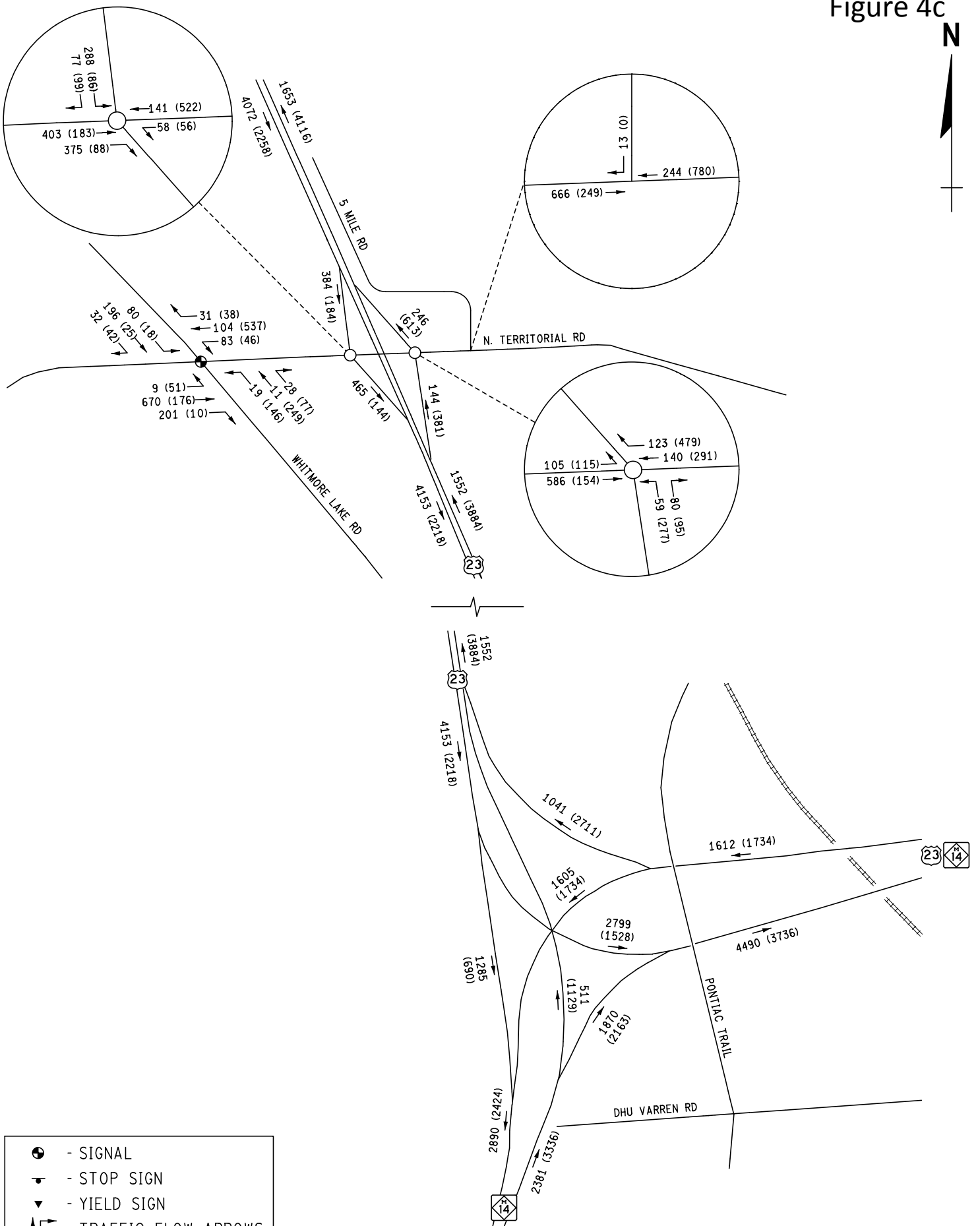


Figure 4c

N

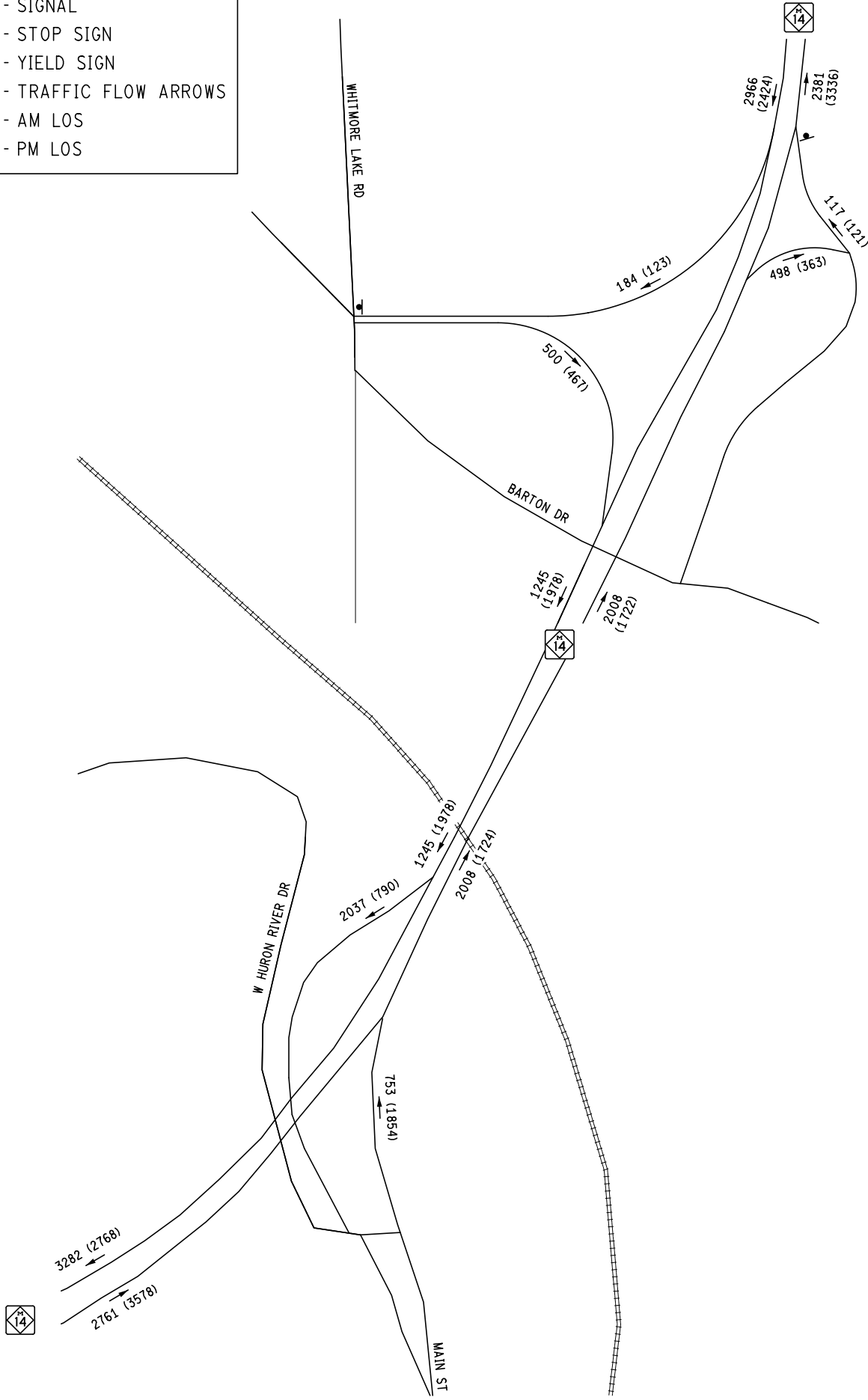


- - SIGNAL
- ⊥ - STOP SIGN
- ▼ - YIELD SIGN
- ↑ - TRAFFIC FLOW ARROWS
- XXX - AM LOS
- (XXX) - PM LOS

Figure 4d

N

- - SIGNAL
- ⊥ - STOP SIGN
- ▼ - YIELD SIGN
- ↑ - TRAFFIC FLOW ARROWS
- XXX - AM LOS
- (XXX) - PM LOS



Appendix A-4

Freeway Analysis

VISSIM

VISSIM files are available upon request. Contact the Michigan Department of Transportation.

Highway Capacity Software
Ramp Analysis

SB US-23 2015 AM Existing

Type	Ramp Name	Density	Speed	LOS
diverge	Exit to Silver Lake	24.8	49.1	C
merge	Entrance from Silver Lake	29.7	50	D
diverge	Exit to 9 mile	26.7	49.2	C
merge	Entrance from 9 Mile	25.4	50	C
diverge	Exit to 8 Mile	28.1	49.3	D
merge	Entrance from 8 Mile	28.3	50	D
merge	Entrance from Barker	23.5	50	C
diverge	Exit to 6 Mile	33.2	49.2	D
merge	Entrance from 6 Mile	33.6	49	D
diverge	Exit N Territorial Rd	37.2	49	E
merge	Entrance N Territorial Rd	39.4	47	E
diverge	To WB M14 Ramp E	24.3	59.1	C
merge	From SB US23 Ramp B	36.1	17	F
merge	From SB US23 Ramp D	50.4	-71	F
merge	From EB M14 Ramp F	23.2	62	C
merge	To SBUS23/EBM114	32.5	56	D
merge	NBUS23	25.2	62	C
weave	Bewtween Main/Barton	1.0		F

NB US-23 2015 AM Existing

Type	Ramp Name	Density	Speed	LOS
diverge	To WB M14 Ramp E	24.3	59.1	C
merge	From SB US23 Ramp B	36.1	17	F
merge	From SB US23 Ramp D	50.4	-71	F
merge	From EB M14 Ramp F	23.2	62	C
merge	To SBUS23/EBM114	32.5	56	D
merge	NBUS23	25.2	62	C
weave	Bewtween Main/Barton	1.0		F
diverge	Exit N Territorial Rd	16.2	49.3	B
merge	Entrance N Territorial Rd	17.8	51	B
diverge	Exit to 6 Mile	14.6	49.3	B
merge	Entrance from 6 Mile	17.1	51	B
diverge	Exit to Barker	17.1	49.4	B
diverge	Exit to 8 Mile	14.0	63.3	B
merge	Entrance from 8 Mile	19.4	51	B
diverge	Exit to 9 mile East	17.8	49.4	B
diverge	Exit to 9 mile west	17.8	49.2	B
merge	Entrance from 9 mile	20.7	51	C
diverge	Exit to Silver Lake	17.7	49.3	B
merge	Entrance from Silver Lake	21.7	51	C

SB US-23 2015 PM Existing

Type	Ramp Name	Density	Speed	LOS
diverge	Exit to Silver Lake	25.8	48.8	C
merge	Entrance from Silver Lake	26.6	50.0	C
diverge	Exit to 9 mile	27.4	49.2	C
merge	Entrance from 9 Mile	24.8	50.0	C
diverge	Exit to 8 Mile	23.3	49.1	C
merge	Entrance from 8 Mile	25.0	50	C
merge	Entrance from Barker	32.8	49.0	D
diverge	Exit to 6 Mile	31.2	49.2	D
merge	Entrance from 6 Mile	23.0	51	C
diverge	Exit N Territorial Rd	23.2	49.2	C
merge	Entrance N Territorial Rd	23.8	50.0	C
diverge	To WB M14 Ramp E	39	58.7	E
merge	From SB US23 Ramp B	21.2	61	C
merge	From SB US23 Ramp D	31.4	54	D
merge	From EB M14 Ramp F	35.7	46	E
merge	To SBUS23/EBM114	42.3	33.0	F
merge	NBUS23	49.9	-61.0	F

NB US-23 2015 PM Existing

Type	Ramp Name	Density	Speed	LOS
diverge	To WB M14 Ramp E	39	58.7	E
merge	From SB US23 Ramp B	21.2	61	C
merge	From SB US23 Ramp D	31.4	54	D
merge	From EB M14 Ramp F	35.7	46	E
merge	To SBUS23/EBM114	42.3	33.0	F
merge	NBUS23	49.9	-61.0	F
diverge	Exit N Territorial Rd	34.6	49.0	D
merge	Entrance N Territorial Rd	37.3	47.0	E
diverge	Exit to 6 Mile	36.1	49.1	E
merge	Entrance from 6 Mile	37.3	47.0	E
diverge	Exit to Barker	37.2	49.2	E
diverge	Exit to 8 Mile	38.4	62.8	E
merge	Entrance from 8 Mile	33.6	49.0	D
diverge	Exit to 9 mile East	35.7	49.3	E
diverge	Exit to 9 mile west	33.9	49.1	D
merge	Entrance from 9 mile	36.8	47.0	E
diverge	Exit to Silver Lake	33.7	49.0	D
merge	Entrance from Silver Lake	34.6	48.0	D

SB US-23 2040 AM No Build

Type	Ramp Name	Density	Speed	LOS
diverge	Exit to Silver Lake	24.8	49.1	C
merge	Entrance from Silver Lake	27.3	50.0	C
diverge	Exit to 9 mile	26.7	49.1	C
merge	Entrance from 9 Mile	27.6	50.0	C
diverge	Exit to 8 Mile	30.1	49.3	D
merge	Entrance from 8 Mile	30.2	50	D
merge	Entrance from Barker	35.7	48.0	E
diverge	Exit to 6 Mile	35.7	49.2	E
merge	Entrance from 6 Mile	36.0	48	E
diverge	Exit N Territorial Rd	37.2	49.0	E
merge	Entrance N Territorial Rd	39.7	46.0	E
diverge	To WB M14 Ramp E	26.2	58.8	C
merge	From SB US23 Ramp B	32.1	39	F
merge	From SB US23 Ramp D	47.2	-26	F
merge	From EB M14 Ramp F	25.1	61	C
merge	To SBUS23/EBM114	35.1	52.0	E
merge	NBUS23	27.5	60.0	C

NB US-23 2040 AM No Build

Type	Ramp Name	Density	Speed	LOS
diverge	To WB M14 Ramp E	26.2	58.8	C
merge	From SB US23 Ramp B	32.1	39	F
merge	From SB US23 Ramp D	47.2	-26	F
merge	From EB M14 Ramp F	25.1	61	C
merge	To SBUS23/EBM114	35.1	52.0	E
merge	NBUS23	27.5	60.0	C
diverge	Exit N Territorial Rd	17.3	49.2	B
merge	Entrance N Territorial Rd	18.8	51.0	B
diverge	Exit to 6 Mile	15.7	49.3	B
merge	Entrance from 6 Mile	19.2	51.0	B
diverge	Exit to Barker	18.6	49.4	B
diverge	Exit to 8 Mile	15.3	63.3	B
merge	Entrance from 8 Mile	19.5	51.0	B
diverge	Exit to 9 mile East	19.4	49.4	B
diverge	Exit to 9 mile west	19.4	49.2	B
merge	Entrance from 9 mile	21.6	51.0	C
diverge	Exit to Silver Lake	17.7	49.3	B
merge	Entrance from Silver Lake	22	51.0	C

SB US-23 2040 PM No Build

Type	Ramp Name	Density	Speed	LOS
diverge	Exit to Silver Lake	27.7	48.7	C
merge	Entrance from Silver Lake	23.7	50	C
diverge	Exit to 9 mile	24.7	49.2	C
merge	Entrance from 9 Mile	23.3	51	C
diverge	Exit to 8 Mile	24.9	49.1	C
merge	Entrance from 8 Mile	26.6	50	C
merge	Entrance from Barker	24.4	50	C
diverge	Exit to 6 Mile	23.2	49.2	C
merge	Entrance from 6 Mile	24.6	50	C
diverge	Exit N Territorial Rd	24.7	49.2	C
merge	Entrance N Territorial Rd	25.2	50	C
diverge	To WB M14 Ramp E	42	58.4	F
merge	From SB US23 Ramp B	19.0	62	B
merge	From SB US23 Ramp D	29.7	56	D
merge	From EB M14 Ramp F	39.0	34	F
merge	To SBUS23/EBM114	46.1	13	F
merge	NBUS23	53.2	-128	F

NB US-23 2040 PM No Build

Type	Ramp Name	Density	Speed	LOS
diverge	To WB M14 Ramp E	42	58.4	F
merge	From SB US23 Ramp B	19.0	62	B
merge	From SB US23 Ramp D	29.7	56	D
merge	From EB M14 Ramp F	39.0	34	F
merge	To SBUS23/EBM114	46.1	13	F
merge	NBUS23	53.2	-128	F
diverge	Exit N Territorial Rd	37.1	49	E
merge	Entrance N Territorial Rd	38.2	47	E
diverge	Exit to 6 Mile	37.4	49.1	E
merge	Entrance from 6 Mile	39.9	46	F
diverge	Exit to Barker	39.9	49.2	E
diverge	Exit to 8 Mile	36.3	62.8	E
merge	Entrance from 8 Mile	36.0	48	E
diverge	Exit to 9 mile East	36.1	49.3	E
diverge	Exit to 9 mile west	32.1	49.1	D
merge	Entrance from 9 mile	34.0	49	D
diverge	Exit to Silver Lake	36.3	49	E
merge	Entrance from Silver Lake	37.1	47	E

SB US-23 2040 AM Enhanced

Type	Ramp Name	Density	Speed	LOS
diverge	Exit to Silver Lake	24.8	49.1	C
merge	Entrance from Silver Lake	37.3	50	C
diverge	Exit to 9 mile	26.7	49.1	C
merge	Entrance from 9 Mile	22.6	51	C
diverge	Exit to 8 Mile	30.1	49.3	D
merge	Entrance from 8 Mile	30.2	50	D
merge	Entrance from Barker	31.9	49	D
diverge	Exit to 6 Mile	25.3	49.2	C
merge	Entrance from 6 Mile	36.0	48	E
diverge	Exit N Territorial Rd	37.2	49	E
merge	Entrance N Territorial Rd	39.2	46	E
diverge	To WB M14 Ramp E	26.2	58.8	C
merge	From SB US23 Ramp B	32.1	39	F
merge	From SB US23 Ramp D	47.2	-26	F
merge	From EB M14 Ramp F	22.0	63	C
merge	To SBUS23/EBM114	35.1	52.0	E
merge	NBUS23	27.5	60.0	C

NB US-23 2040 AM Enhanced

Type	Ramp Name	Density	Speed	LOS
diverge	To WB M14 Ramp E	26.2	58.8	C
merge	From SB US23 Ramp B	32.1	39	F
merge	From SB US23 Ramp D	47.2	-26	F
merge	From EB M14 Ramp F	22.0	63	C
merge	To SBUS23/EBM114	35.1	52.0	E
merge	NBUS23	27.5	60.0	C
diverge	Exit N Territorial Rd	17.3	49.2	B
merge	Entrance N Territorial Rd	14.8	51	B
diverge	Exit to 6 Mile	15.7	49.3	B
merge	Entrance from 6 Mile	16.2	51	B
diverge	Exit to Barker	18.6	49.4	B
diverge	Exit to 8 Mile	15.3	63.3	B
merge	Entrance from 8 Mile	16.5	51	B
diverge	Exit to 9 mile East	19.4	49.4	B
diverge	Exit to 9 mile west	19.4	49.2	B
merge	Entrance from 9 mile	18.6	51	B
diverge	Exit to Silver Lake	17.7	49.3	B
merge	Entrance from Silver Lake	22.0	51	C

SB US-23 2040 PM Enhanced

Type	Ramp Name	Density	Speed	LOS
diverge	Exit to Silver Lake	27.7	48.7	C
merge	Entrance from Silver Lake	23.7	50	C
diverge	Exit to 9 mile	24.7	49.2	C
merge	Entrance from 9 Mile	18.3	51	B
diverge	Exit to 8 Mile	24.9	49.1	C
merge	Entrance from 8 Mile	26.6	50	C
merge	Entrance from Barker	20.6	51	C
diverge	Exit to 6 Mile	12.9	49.2	B
merge	Entrance from 6 Mile	24.6	50	C
diverge	Exit N Territorial Rd	24.7	49.2	C
merge	Entrance N Territorial Rd	24.7	50	C
diverge	To WB M14 Ramp E	42	58.4	F
merge	From SB US23 Ramp B	19.0	62	B
merge	From SB US23 Ramp D	29.7	56	D
merge	From EB M14 Ramp F	26.6	61	C
merge	To SBUS23/EBM114	46.1	13	F
merge	NBUS23	53.2	-128	F

NB US-23 2040 PM Enhanced

Type	Ramp Name	Density	Speed	LOS
diverge	To WB M14 Ramp E	42	58.4	F
merge	From SB US23 Ramp B	19.0	62	B
merge	From SB US23 Ramp D	29.7	56	D
merge	From EB M14 Ramp F	26.6	61	C
merge	To SBUS23/EBM114	46.1	13	F
merge	NBUS23	53.2	-128	F
diverge	Exit N Territorial Rd	37.1	49	E
merge	Entrance N Territorial Rd	34.2	48	D
diverge	Exit to 6 Mile	37.4	49.1	E
merge	Entrance from 6 Mile	36.9	46	F
diverge	Exit to Barker	39.9	49.2	E
diverge	Exit to 8 Mile	36.3	62.8	E
merge	Entrance from 8 Mile	33.0	48	D
diverge	Exit to 9 mile East	36.1	49.3	E
diverge	Exit to 9 mile west	32.1	49.1	D
merge	Entrance from 9 mile	31.0	49	D
diverge	Exit to Silver Lake	36.3	49	E
merge	Entrance from Silver Lake	37.1	47	E

Appendix A-5

Intersection Analysis

2015 Existing AM Peak														
Intersection	Eastbound			Westbound			Northbound			Southbound			ICU	
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	AM LOS	AM Delay
Whitmore Lake/Silver Lake Rd	-	-	-	D	-	D	-	E	E	C	C	-	E	31.9
SB Ramp/Silver Lake Rd	-	A	A	A	A	-	-	-	-	E	-	E	C	12.8
NB Ramp/Silver Lake Rd	A	A	-	-	A	A	F	-	F	-	-	-	D	7.3
Fieldcrest/Silver Lake Rd	A	A	A	A	A	A	D	-	-	D	D	D	A	6.0
Whitmore Lake/M-36	-	F	B	E	E	E	D	D	D	E	E	E	E	71.1
SB Off-Ramp/M-36	-	A	-	-	A	-	B	-	B	-	-	-	A	4.6
Park and Ride/SB On Ramp M-36	A	A	A	A	A	-	E	E	E	-	-	-	D	4.8
NB Ramp/M-36	-	A	-	-	A	-	B	-	B	-	-	-	A	0.0
Fieldcrest/M-36	A	A	-	A	-	A	-	-	-	F	-	F	B	11.3
Whitmore Lake/8 Mile Rd	-	F	-	-	A	C	-	-	-	D	-	B	E/ICU - C	66.9
SB Off Ramp/8 Mile Rd	-	A	-	-	C	-	-	-	-	D	-	B	C/ICU - B	10.8
SB On Ramp/8 Mile Rd	-	A	A	A	A	-	-	-	-	-	-	-	B	0.0
NB Ramp/8 Mile Rd	-	B	-	-	A	-	B	-	B	-	-	-	A/ICU - B	10.7
SB Ramp/Barker Rd	-	A	A	A	A	-	A	-	A	-	-	-	A	1.6
NB Ramp/Barker Rd	-	A	-	-	A	-	B	-	B	-	-	-	A	1.3
SB Ramp/6 Mile Rd	-	A	-	-	A	-	-	-	-	B	-	B	A	2.9
NB Ramp/6 Mile Rd	A	A	-	-	A	A	E	B	B	C	-	C	B	10.9
Whitmore Lake/N. Territorial Rd	D	F	-	D	B	-	D	B	-	D	D	-	F/ICU - D	80.6
SB Ramp/N. Territorial Rd	-	C	-	-	A	-	-	-	-	B	-	A	B/ICU - C	17.2
NB Ramp/N. Territorial Rd	-	B	-	-	A	-	B	A	-	-	B	-	B/ICU - C	14.0

2015 Existing PM Peak														
Intersection	Eastbound			Westbound			Northbound			Southbound			ICU	
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	PM LOS	PM Delay
Whitmore Lake/Silver Lake Rd	-	-	-	F	-	F	-	B	B	C	C	-	D	46.3
SB Ramp/Silver Lake Rd	-	A	A	A	A	-	-	-	-	C	-	C	B	8.7
NB Ramp/Silver Lake Rd	A	A	-	-	A	A	F	-	F	-	-	-	B	22.4
Fieldcrest/Silver Lake Rd	A	A	A	-	A	A	C	C	C	B	-	B	A	2.7
Whitmore Lake/M-36	E	E	B	F	F	F	C	C	C	D	D	D	E	68.6
SB Off-Ramp/M-36	-	A	-	-	A	-	B	-	B	-	-	-	A	6.6
Park and Ride/SB On Ramp M-36	A	A	A	A	A	-	D	D	D	-	-	-	C	2.7
NB Ramp/M-36	-	A	-	-	A	-	-	-	C	-	-	-	A	0.0
Fieldcrest/M-36	A	A	-	-	A	A	-	-	-	C	-	C	B	2.9
Whitmore Lake/8 Mile Rd	-	C	-	-	A	B	-	-	-	D	-	B	B/ICU - A	14.5
SB Off Ramp/8 Mile Rd	-	A	-	-	C	-	-	-	-	D	-	B	B/ICU - A	19.7
SB On Ramp/8 Mile Rd	-	A	A	A	A	-	-	-	-	-	-	-	A	0.1
NB Ramp/8 Mile Rd	-	B	-	-	A	-	B	-	A	-	-	-	B/ICU - C	12.4
SB Ramp/Barker Rd	-	A	A	A	A	-	A	-	A	-	-	-	A	1.7
NB Ramp/Barker Rd	-	A	-	-	A	-	B	-	B	-	-	-	A	3.5
SB Ramp/6 Mile Rd	-	A	-	-	A	-	-	-	-	B	-	A	A	2.6
NB Ramp/6 Mile Rd	A	A	-	-	A	A	D	F	F	F	-	F	C	41.8
Whitmore Lake/N. Territorial Rd	D	C	-	D	D	-	D	D	-	D	B	-	D/ICU - C	36.7
SB Ramp/N. Territorial Rd	-	A	-	-	B	-	-	-	-	B	-	A	B	10.1
NB Ramp/N. Territorial Rd	-	D	-	-	B	-	B	A	-	-	A	-	C/ICU - E	23.1

2040 No Build AM Peak														
Intersection	Eastbound			Westbound			Northbound			Southbound			ICU	
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	AM LOS	AM Delay
Whitmore Lake/Silver Lake Rd	-	-	-	D	-	D	-	D	D	D	D	-	D	29.1
SB Ramp/Silver Lake Rd	-	A	A	A	A	-	-	-	-	E	E	E	C	15.1
NB Ramp/Silver Lake Rd	A	A	-	-	A	A	F	-	F	-	-	-	D	7.4
Fieldcrest/Silver Lake Rd	A	A	A	A	A	A	D	-	-	D	D	D	A	7.0
Whitmore Lake/M-36	-	F	B	D	D	D	E	E	E	F	F	F	F	85.9
SB Off-Ramp/M-36	-	A	-	-	A	-	B	-	B	-	-	-	A	4.7
Park and Ride/SB On Ramp M-36	A	A	A	A	A	-	F	F	F	-	-	-	D	4.5
NB Ramp/M-36	-	A	-	-	A	-	-	-	B	-	-	-	A	0.0
Fieldcrest/M-36	A	A	-	-	A	A	-	-	-	F	-	F	C	18.5
Whitmore Lake/8 Mile Rd	-	F	-	-	A	C	-	-	-	D	-	B	D/ICU - F	91.7
SB Off Ramp/8 Mile Rd	-	A	-	-	C	-	-	-	-	D	-	B	C/ICU - B	13.8
SB On Ramp/8 Mile Rd	-	A	A	A	A	-	-	-	-	-	-	-	C	0.0
NB Ramp/8 Mile Rd	-	B	-	-	A	-	B	-	A	-	-	-	A/ICU - B	11.1
SB Ramp/Barker Rd	-	A	A	A	A	-	A	-	A	-	-	-	A	1.6
NB Ramp/Barker Rd	-	A	-	-	A	-	B	-	B	-	-	-	A	1.3
SB Ramp/6 Mile Rd	-	A	-	-	A	-	-	-	-	B	-	B	A	3.0
NB Ramp/6 Mile Rd	A	A	-	-	A	A	F	C	C	C	-	C	B	12.6
Whitmore Lake/N. Territorial Rd	D	F	-	D	B	-	D	B	-	D	D	-	F/ICU - E	108.3
SB Ramp/N. Territorial Rd	-	C	-	-	B	-	-	-	-	B	-	B	C/ICU - D	22.5
NB Ramp/N. Territorial Rd	-	C	-	-	A	-	B	A	-	-	B	-	B/ICU - C	16.9

2040 No Build PM Peak														
Intersection	Eastbound			Westbound			Northbound			Southbound			ICU	
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	PM LOS	PM Delay
Whitmore Lake/Silver Lake Rd	-	-	-	F	-	F	-	C	C	C	C	-	D	68.0
SB Ramp/Silver Lake Rd	-	A	A	A	A	-	-	-	-	C	-	C	B	9.9
NB Ramp/Silver Lake Rd	A	A	-	-	A	A	F	-	F	-	-	-	C	23.5
Fieldcrest/Silver Lake Rd	A	A	A	-	A	A	C	C	C	B	-	B	A	2.7
Whitmore Lake/M-36	F	F	B	F	F	F	C	C	C	E	E	E	F	94.1
SB Off-Ramp/M-36	-	A	-	-	A	-	B	-	B	-	-	-	A	7.0
Park and Ride/SB On Ramp M-36	A	A	A	A	A	-	D	D	D	-	-	-	D	2.8
NB Ramp/M-36	-	A	-	-	A	-	-	-	C	-	-	-	A	0.0
Fieldcrest/M-36	A	A	-	-	A	A	-	-	-	C	-	C	B	3.2
Whitmore Lake/8 Mile Rd	-	C	-	-	A	B	-	-	-	D	-	B	B/ICU - A	14.9
SB Off Ramp/8 Mile Rd	-	A	-	-	C	-	-	-	-	D	-	A	C/ICU -A	21.2
SB On Ramp/8 Mile Rd	-	A	A	A	A	-	-	-	-	-	-	-	A	0.1
NB Ramp/8 Mile Rd	-	B	-	-	B	-	B	-	B	-	-	-	B/ICU - C	13.5
SB Ramp/Barker Rd	-	A	A	A	A	-	A	-	A	-	-	-	A	1.8
NB Ramp/Barker Rd	-	A	-	-	A	-	B	-	B	-	-	-	A	3.6
SB Ramp/6 Mile Rd	-	A	-	-	A	-	-	-	-	B	-	A	A	2.7
NB Ramp/6 Mile Rd	A	A	-	-	A	A	D	F	F	F	-	F	C	#
Whitmore Lake/N. Territorial Rd	D	C	-	D	D	-	D	D	-	D	B	-	D/ICU - C	39.2
SB Ramp/N. Territorial Rd	-	A	-	-	B	-	-	-	-	B	-	B	B	12.1
NB Ramp/N. Territorial Rd	-	F	-	-	C	-	C	A	-	-	A	-	E/ICU - F	56.1

2040 TSM AM Peak														
Intersection	Eastbound			Westbound			Northbound			Southbound			ICU	
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	AM LOS	AM Delay
Whitmore Lake/Silver Lake Rd	-	-	-	D	-	D	-	D	D	D	D	-	D	29.1
SB Ramp/Silver Lake Rd	-	A	A	A	A	-	-	-	-	E	E	E	C	15.1
NB Ramp/Silver Lake Rd	A	A	-	-	A	A	F	-	F	-	-	-	D	7.4
Fieldcrest/Silver Lake Rd	A	A	A	A	A	A	D	-	-	D	D	D	A	7.0
Whitmore Lake/M-36	-	F	B	D	D	D	E	E	E	F	F	F	F	85.9
SB Off-Ramp/M-36	-	A	-	-	A	-	B	-	B	-	-	-	A	4.7
Park and Ride/SB On Ramp M-36	A	A	A	A	A	-	F	F	F	-	-	-	D	4.5
NB Ramp/M-36	-	A	-	-	A	-	-	-	B	-	-	-	A	0
Fieldcrest/M-36	A	A	-	-	A	A	-	-	-	F	-	F	C	18.5
Whitmore Lake/8 Mile Rd	-	D	-	-	A	C	-	-	-	E	-	B	D/ICU - D	47.3
SB Off Ramp/8 Mile Rd	-	A	-	-	C	-	-	-	-	E	-	C	B/ICU - C	12.8
SB On Ramp/8 Mile Rd	-	A	A	A	A	-	-	-	-	-	-	-	A	0.0
NB Ramp/8 Mile Rd	-	B	-	-	A	-	B	-	A	-	-	-	A/ICU - A	9.7
SB Ramp/Barker Rd	-	A	A	A	A	-	A	-	A	-	-	-	A	1.6
NB Ramp/Barker Rd	-	A	-	-	A	-	B	-	B	-	-	-	A	1.3
SB Ramp/6 Mile Rd	-	A	-	-	A	-	-	-	-	B	-	B	A	3.0
NB Ramp/6 Mile Rd	B	B	-	-	C	C	B	B	B	B	-	D	B	23.8
Whitmore Lake/N. Territorial Rd	D	F	-	D	B	-	D	B	-	D	D	-	F/ICU - E	118.4
SB Ramp/N. Territorial Rd	A												C/ICU - D	32.3
NB Ramp/N. Territorial Rd	A												B/ICU - C	13.3

* For North Territorial - TSM optimized signal with ATM volumes.

2040 TSM PM Peak															
Intersection	Eastbound			Westbound			Northbound			Southbound			ICU		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	PM LOS	PM Delay	
Whitmore Lake/Silver Lake Rd	-	-	-	F	-	F	-	C	C	C	C	-	D	68.0	
SB Ramp/Silver Lake Rd	-	A	A	A	A	-	-	-	-	C	-	C	B	9.9	
NB Ramp/Silver Lake Rd	A	A	-	-	A	A	F	-	F	-	-	-	C	23.5	
Fieldcrest/Silver Lake Rd	A	A	A	-	A	A	C	C	C	B	-	B	A	2.7	
Whitmore Lake/M-36	F	F	B	F	F	F	C	C	C	E	E	E	F	94.1	
SB Off-Ramp/M-36	-	A	-	-	A	-	B	-	B	-	-	-	A	7.0	
Park and Ride/SB On Ramp M-36	A	A	A	A	A	-	D	D	D	-	-	-	D	2.8	
NB Ramp/M-36	-	A	-	-	A	-	-	-	C	-	-	-	A	0.0	
Fieldcrest/M-36	A	A	-	-	A	A	-	-	-	C	-	C	B	3.2	
Whitmore Lake/8 Mile Rd	-	C	-	-	A	C	-	-	-	D	-	A	B/ICU - A	15.2	
SB Off Ramp/8 Mile Rd	-	A	-	-	C	-	-	-	-	D	-	B	C/ICU - A	22.5	
SB On Ramp/8 Mile Rd	-	A	A	A	A	-	-	-	-	-	-	-	A	0.1	
NB Ramp/8 Mile Rd	-	B	-	-	B	-	B	-	A	-	-	-	B/ICU - C	13.5	
SB Ramp/Barker Rd	-	A	A	A	A	-	A	-	A	-	-	-	A	1.8	
NB Ramp/Barker Rd	-	A	-	-	A	-	B	-	B	-	-	-	A	3.6	
SB Ramp/6 Mile Rd	-	A	-	-	A	-	-	-	-	B	-	A	A	2.7	
NB Ramp/6 Mile Rd	D	D	-	-	B	B	A	C	C	B	-	A	C	19.8	
Whitmore Lake/N. Territorial Rd	D	C	-	D	D	-	D	D	-	D	B	-	D/ICU - C	40.3	
SB Ramp/N. Territorial Rd	A												B	12.7	
NB Ramp/N. Territorial Rd	A												D/ICU - F	43.5	

* For North Territorial - TSM optimized signal with ATM volumes.

2040 ATM AM Peak														
Intersection	Eastbound			Westbound			Northbound			Southbound			ICU	
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	AM LOS	AM Delay
Whitmore Lake/Silver Lake Rd	-	-	-	C	-	C	-	D	D	C	C	-	D	24.3
SB Ramp/Silver Lake Rd	-	A	A	A	A	-	-	-	-	D	-	D	B	8.9
NB Ramp/Silver Lake Rd	A	A	-	-	A	A	F	-	F	-	-	-	C	6.5
Fieldcrest/Silver Lake Rd	A	A	A	A	A	A	D	-	-	D	D	D	A	6.8
Whitmore Lake/M-36	-	F	B	D	D	D	E	E	E	E	E	E	F	119.2
SB Off-Ramp/M-36	-	A	-	-	A	-	B	-	-	-	-	-	A	4.4
Park and Ride/SB On Ramp M-36	A	A	A	A	A	-	F	F	F	-	-	-	D	7.6
NB Ramp/M-36	-	A	-	-	A	-	-	-	B	-	-	-	A	0.0
Fieldcrest/M-36	A	A	-	-	A	A	-	-	-	F	-	F	C	25.0
Whitmore Lake/8 Mile Rd	-	E	-	-	A	C	-	-	-	D	-	B	D/ICU - D	52.4
SB Off Ramp/8 Mile Rd	-	A	-	-	C	-	-	-	-	D-	-	B	B/ICU - C	11.5
SB On Ramp/8 Mile Rd	-	A	A	A	A	-	-	-	-	-	-	-	C	0.0
NB Ramp/8 Mile Rd	-	B	-	-	A	-	B	-	A	-	-	-	B/ICU - A	11.1
SB Ramp/Barker Rd	-	A	A	A	A	-	A	-	A	-	-	-	A	1.7
NB Ramp/Barker Rd	-	A	-	-	A	-	B	-	B	-	-	-	A	1.3
SB Ramp/6 Mile Rd	-	A	-	-	A	-	-	-	-	B	-	B	A	2.7
NB Ramp/6 Mile Rd	B	B	-	-	C	C	B	B	B	B	-	D	B	23.5
Whitmore Lake/N. Territorial Rd	B	E	-	C	B	-	C	C	-	C	D	-	D/ICU - E	54.9
SB Ramp/N. Territorial Rd **	A											A	-	
NB Ramp/N. Territorial Rd **	A											A	-	

** Rodel analysis used to evaluate roundabout options at the SB and NB ramp terminal.

2040 ATM PM Peak																
Intersection	Eastbound			Westbound			Northbound			Southbound			ICU			
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	PM LOS	PM Delay		
Whitmore Lake/Silver Lake Rd	-	-	-	F	-	F	-	C	C	C	C	-	D	74.7		
SB Ramp/Silver Lake Rd	-	A	A	A	A	-	-	-	-	D	-	D	B	10.1		
NB Ramp/Silver Lake Rd	A	A	-	-	A	A	F	-	F	-	-	-	B	25.3		
Fieldcrest/Silver Lake Rd	A	A	A	-	A	A	C	C	C	B	-	B	A	2.7		
Whitmore Lake/M-36	F	F	B	F	F	F	C	C	C	D	D	D	F	97.9		
SB Off-Ramp/M-36	-	A	-	-	A	-	B	-	B	-	-	-	A	7.0		
Park and Ride/SB On Ramp M-36	A	A	A	A	A	-	D	D	D	-	-	-	D	3.0		
NB Ramp/M-36	-	A	-	-	A	-	-	-	C	-	-	-	A	0.0		
Fieldcrest/M-36	A	A	-	-	A	A	-	-	-	C	-	C	B	2.9		
Whitmore Lake/8 Mile Rd	-	C	-	-	A	C	-	-	-	D	-	A	B/ICU - A	15.2		
SB Off Ramp/8 Mile Rd	-	A	-	-	C	-	-	-	-	D	-	B	C/ICU - A	23.0		
SB On Ramp/8 Mile Rd	-	A	A	A	A	-	-	-	-	-	-	-	A	0.1		
NB Ramp/8 Mile Rd	-	B	-	-	B	-	B	-	A	-	-	-	B/ICU - C	13.6		
SB Ramp/Barker Rd	-	A	A	A	A	-	A	-	A	-	-	-	A	1.8		
NB Ramp/Barker Rd	-	A	-	-	A	-	B	-	B	-	-	-	A	3.6		
SB Ramp/6 Mile Rd	-	A	-	-	A	-	-	-	-	B	-	B	A	3.0		
NB Ramp/6 Mile Rd	D	D	-	-	B	B	A	C	C	B	-	A	C	20.0		
Whitmore Lake/N. Territorial Rd	B	C	-	B	C	-	C	D	-	C	C	-	C	31.2		
SB Ramp/N. Territorial Rd **	A												A	-		
NB Ramp/N. Territorial Rd **	A												C	-		

** Rodel analysis used to evaluate roundabout options at the SB and NB ramp terminal.

2040 HOV AM Peak														
Intersection	Eastbound			Westbound			Northbound			Southbound			ICU	
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	AM LOS	AM Delay
Whitmore Lake/Silver Lake Rd	-	-	-	D	-	D	-	D	D	C	C	-	D	28.4
SB Ramp/Silver Lake Rd	-	A	A	A	A	-	-	-	-	E	-	E	C	14.2
NB Ramp/Silver Lake Rd	A	A	-	-	A	A	F	-	F	-	-	-	C	7.3
Fieldcrest/Silver Lake Rd	A	A	A	A	A	A	D	-	-	D	D	D	A	7.0
Whitmore Lake/M-36	-	F	B	D	D	D	E	E	E	E	E	E	F	100.3
SB Off-Ramp/M-36	-	A	-	-	A	-	B	-	B	-	-	-	A	4.4
Park and Ride/SB On Ramp M-36	A	A	A	A	A	-	F	F	F	-	-	-	D	6.4
NB Ramp/M-36	-	A	-	-	A	-	-	-	B	-	-	-	A	0.0
Fieldcrest/M-36	A	A	-	-	A	A	-	-	-	F	-	F	C	21.0
Whitmore Lake/8 Mile Rd	-	E	-	-	A	C	-	-	-	D	-	B	D/ICU - C	49.8
SB Off Ramp/8 Mile Rd	-	A	-	-	C	-	-	-	-	D	-	B	B/ICU - C	11.1
SB On Ramp/8 Mile Rd	-	A	A	A	A	-	-	-	-	-	-	-	C	0.0
NB Ramp/8 Mile Rd	-	B	-	-	A	-	B	-	A	-	-	-	B/ICU - A	11.1
SB Ramp/Barker Rd	-	A	A	A	A	-	A	-	A	-	-	-	A	1.7
NB Ramp/Barker Rd	-	A	-	-	A	-	B	-	B	-	-	-	A	1.3
SB Ramp/6 Mile Rd	-	A	-	-	A	-	-	-	-	B	-	B	A	2.2
NB Ramp/6 Mile Rd	B	B	-	-	E	E	B	B	B	B	-	E	C	32.7
Whitmore Lake/N. Territorial Rd	B	E	-	D	B	-	C	C	-	C	D	-	D/ICU - E	48.5
SB Ramp/N. Territorial Rd **	A											B	-	
NB Ramp/N. Territorial Rd **	A											B	-	

** Rodel analysis used to evaluate roundabout options at the SB and NB ramp terminal.

2040 HOV PM Peak														
Intersection	Eastbound			Westbound			Northbound			Southbound			ICU	
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	PM LOS	PM Delay
Whitmore Lake/Silver Lake Rd	-	-	-	F	-	F	-	C	C	C	C	-	D	67.3
SB Ramp/Silver Lake Rd	-	A	A	A	A	-	-	-	-	C	-	C	B	9.8
NB Ramp/Silver Lake Rd	A	A	-	-	A	A	F	-	F	-	-	-	B	19.0
Fieldcrest/Silver Lake Rd	A	A	A	-	A	A	C	C	C	B	-	B	A	2.7
Whitmore Lake/M-36	F	F	B	F	F	F	C	C	C	E	E	E	F	89.2
SB Off-Ramp/M-36	-	A	-	-	A	-	B	-	B	-	-	-	A	7.0
Park and Ride/SB On Ramp M-36	A	A	A	A	A	-	D	D	D	-	-	-	D	3.0
NB Ramp/M-36	-	A	-	-	A	-	-	-	C	-	-	-	A	0.0
Fieldcrest/M-36	A	A	-	-	A	A	-	-	-	C	-	C	B	3.2
Whitmore Lake/8 Mile Rd	-	C	-	-	A	C	-	-	-	D	-	B	B/ICU - A	15.3
SB Off Ramp/8 Mile Rd	-	A	-	-	C	-	-	-	-	D	-	B	C/ICU - A	21.5
SB On Ramp/8 Mile Rd	-	A	A	A	A	-	-	-	-	-	-	-	A	0.1
NB Ramp/8 Mile Rd	-	B	-	-	B	-	B	-	A	-	-	-	B/ICU - C	13.6
SB Ramp/Barker Rd	-	A	A	A	A	-	A	-	A	-	-	-	A	1.8
NB Ramp/Barker Rd	-	A	-	-	A	-	B	-	B	-	-	-	A	3.6
SB Ramp/6 Mile Rd	-	A	-	-	A	-	-	-	-	B	-	A	A	2.7
NB Ramp/6 Mile Rd	D	D	-	-	B	B	A	C	C	B	-	A	C	19.8
Whitmore Lake/N. Territorial Rd	C	C	-	B	C	-	C	D	-	B	C	-	C	31.5
SB Ramp/N. Territorial Rd **	A											A	-	
NB Ramp/N. Territorial Rd **	A											C	-	

** Rodel analysis used to evaluate roundabout options at the SB and NB ramp terminal.

Synchro Reports

Silver Lake
2015 Existing AM

HCM Unsignalized Intersection Capacity Analysis
 1: Silver Lake Road & Whitmore Lake Rd

9/17/2014



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	280	96	67	471	159	186
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	304	104	73	512	173	202
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	409	585	375			
Volume Left (vph)	304	0	173			
Volume Right (vph)	104	512	0			
Hadj (s)	0.03	-0.49	0.13			
Departure Headway (s)	6.6	5.6	6.5			
Degree Utilization, x	0.75	0.92	0.68			
Capacity (veh/h)	533	625	526			
Control Delay (s)	26.7	41.6	22.4			
Approach Delay (s)	26.7	41.6	22.4			
Approach LOS	D	E	C			
Intersection Summary						
Delay			31.9			
HCM Level of Service			D			
Intersection Capacity Utilization			82.6%	ICU Level of Service	E	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2: Silver Lake Rd & Fieldcrest Drive

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	14	278	150	12	330	8	17	0	0	31	99	40
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	302	163	13	359	9	18	0	0	34	108	43
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	367			465			901	808	384	803	885	363
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	367			465			901	808	384	803	885	363
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			89	100	100	89	61	94
cM capacity (veh/h)	1191			1096			166	307	664	296	277	682

















Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	480	380	18	185
Volume Left	15	13	18	34
Volume Right	163	9	0	43
cSH	1191	1096	166	326
Volume to Capacity	0.01	0.01	0.11	0.57
Queue Length 95th (ft)	1	1	9	82
Control Delay (s)	0.4	0.4	29.3	29.5
Lane LOS	A	A	D	D
Approach Delay (s)	0.4	0.4	29.3	29.5
Approach LOS			D	D

Intersection Summary			
Average Delay		6.0	
Intersection Capacity Utilization	45.1%		ICU Level of Service
Analysis Period (min)	15		A

HCM Unsignalized Intersection Capacity Analysis

3: Silver Lake Road & US23 Off Ramp

9/17/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	533	97	69	169	0	0	0	0	173	0	207
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	579	105	75	184	0	0	0	0	188	0	225
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												6
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	184			685			1078	966	632	966	1018	184
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	184			685			1078	966	632	966	1018	184
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			92			100	100	100	14	100	74
cM capacity (veh/h)	1391			909			136	234	480	219	218	859
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total	685	259	413									
Volume Left	0	75	188									
Volume Right	105	0	225									
cSH	1700	909	482									
Volume to Capacity	0.40	0.08	0.86									
Queue Length 95th (ft)	0	7	222									
Control Delay (s)	0.0	3.3	40.0									
Lane LOS		A	E									
Approach Delay (s)	0.0	3.3	40.0									
Approach LOS			E									
Intersection Summary												
Average Delay			12.8									
Intersection Capacity Utilization			66.2%		ICU Level of Service					C		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

6: Silver Lake Road &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↗		↖		↗			
Volume (veh/h)	285	421	0	0	189	198	49	0	21	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	310	458	0	0	205	215	53	0	23	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									2			
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	421			458			1390	1498	458	1402	1390	313
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	421			458			1390	1498	458	1402	1390	313
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	73			100			44	100	96	100	100	100
cM capacity (veh/h)	1138			1103			95	89	603	89	104	727

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	767	421	76
Volume Left	310	0	53
Volume Right	0	215	23
cSH	1138	1700	135
Volume to Capacity	0.27	0.25	0.56
Queue Length 95th (ft)	28	0	70
Control Delay (s)	5.8	0.0	62.0
Lane LOS	A		F
Approach Delay (s)	5.8	0.0	62.0
Approach LOS			F

Intersection Summary		
Average Delay		7.3
Intersection Capacity Utilization	73.3%	ICU Level of Service
Analysis Period (min)		15
		D

Silver Lake
2015 Existing PM

HCM Unsignalized Intersection Capacity Analysis
 1: Silver Lake Road & Whitmore Lake Rd

9/17/2014



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	439	182	88	167	165	86
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	477	198	96	182	179	93
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	675	277	273			
Volume Left (vph)	477	0	179			
Volume Right (vph)	198	182	0			
Hadj (s)	0.00	-0.36	0.17			
Departure Headway (s)	5.6	6.0	6.5			
Degree Utilization, x	1.05	0.46	0.49			
Capacity (veh/h)	634	588	543			
Control Delay (s)	71.8	14.1	15.6			
Approach Delay (s)	71.8	14.1	15.6			
Approach LOS	F	B	C			
Intersection Summary						
Delay			46.3			
HCM Level of Service			E			
Intersection Capacity Utilization			74.0%	ICU Level of Service	D	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2: Silver Lake Rd & Fieldcrest Drive

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	77	313	25	0	293	27	19	7	1	18	0	34
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	84	340	27	0	318	29	21	8	1	20	0	37
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	348			367			891	869	354	859	868	333
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	348			367			891	869	354	859	868	333
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			100			91	97	100	92	100	95
cM capacity (veh/h)	1211			1191			236	270	690	256	270	709

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	451	348	29	57
Volume Left	84	0	21	20
Volume Right	27	29	1	37
cSH	1211	1191	250	439
Volume to Capacity	0.07	0.00	0.12	0.13
Queue Length 95th (ft)	6	0	10	11
Control Delay (s)	2.1	0.0	21.3	14.4
Lane LOS	A		C	B
Approach Delay (s)	2.1	0.0	21.3	14.4
Approach LOS			C	B

Intersection Summary			
Average Delay		2.7	
Intersection Capacity Utilization		52.6%	ICU Level of Service
Analysis Period (min)		15	A

HCM Unsignalized Intersection Capacity Analysis

3: Silver Lake Road & US23 Off Ramp

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↻			↻						↻	↻
Volume (veh/h)	0	266	66	38	371	0	0	0	0	167	0	250
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	289	72	41	403	0	0	0	0	182	0	272
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												6
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	403			361			947	811	325	811	847	403
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	403			361			947	811	325	811	847	403
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			100	100	100	37	100	58
cM capacity (veh/h)	1155			1198			136	303	716	290	289	647

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	361	445	453
Volume Left	0	41	182
Volume Right	72	0	272
cSH	1700	1198	725
Volume to Capacity	0.21	0.03	0.63
Queue Length 95th (ft)	0	3	111
Control Delay (s)	0.0	1.1	23.2
Lane LOS		A	C
Approach Delay (s)	0.0	1.1	23.2
Approach LOS			C

Intersection Summary		
Average Delay		8.7
Intersection Capacity Utilization	58.9%	ICU Level of Service
Analysis Period (min)		15
		B

HCM Unsignalized Intersection Capacity Analysis

6: Silver Lake Road &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕		↕			
Volume (veh/h)	111	322	0	0	213	133	196	0	93	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	121	350	0	0	232	145	213	0	101	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									2			
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	376			350			895	967	350	946	895	304
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	376			350			895	967	350	946	895	304
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	90			100			12	100	85	100	100	100
cM capacity (veh/h)	1182			1209			241	228	693	190	251	736

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	471	376	314
Volume Left	121	0	213
Volume Right	0	145	101
cSH	1182	1700	325
Volume to Capacity	0.10	0.22	0.97
Queue Length 95th (ft)	9	0	255
Control Delay (s)	3.0	0.0	78.2
Lane LOS	A		F
Approach Delay (s)	3.0	0.0	78.2
Approach LOS			F

Intersection Summary		
Average Delay		22.4
Intersection Capacity Utilization	63.3%	ICU Level of Service
Analysis Period (min)		15
		B

Silver Lake
2040 No Build AM

HCM Unsignalized Intersection Capacity Analysis
 1: Silver Lake Road & Whitmore Lake Rd

9/17/2014



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	293	96	72	414	172	201
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	318	104	78	450	187	218

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total (vph)	423	528	405
Volume Left (vph)	318	0	187
Volume Right (vph)	104	450	0
Hadj (s)	0.04	-0.48	0.13
Departure Headway (s)	6.6	5.8	6.5
Degree Utilization, x	0.77	0.85	0.73
Capacity (veh/h)	526	612	531
Control Delay (s)	28.3	32.5	25.4
Approach Delay (s)	28.3	32.5	25.4
Approach LOS	D	D	D

Intersection Summary			
Delay		29.1	
HCM Level of Service		D	
Intersection Capacity Utilization		81.5%	ICU Level of Service
Analysis Period (min)		15	D

HCM Unsignalized Intersection Capacity Analysis

2: Silver Lake Rd & Fieldcrest Drive

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	17	268	130	13	356	8	18	0	0	34	106	44
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	291	141	14	387	9	20	0	0	37	115	48
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	396			433			924	823	362	818	889	391
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	396			433			924	823	362	818	889	391
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			87	100	100	87	58	93
cM capacity (veh/h)	1163			1127			153	300	683	288	274	657

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	451	410	20	200
Volume Left	18	14	20	37
Volume Right	141	9	0	48
cSH	1163	1127	153	322
Volume to Capacity	0.02	0.01	0.13	0.62
Queue Length 95th (ft)	1	1	11	98
Control Delay (s)	0.5	0.4	32.0	32.9
Lane LOS	A	A	D	D
Approach Delay (s)	0.5	0.4	32.0	32.9
Approach LOS			D	D

Intersection Summary			
Average Delay		7.0	
Intersection Capacity Utilization	45.3%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

3: Silver Lake Road & US23 Off Ramp

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗			↖						↖	↗
Volume (veh/h)	0	481	105	85	166	0	0	0	0	186	0	223
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	523	114	92	180	0	0	0	0	202	0	242
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												6
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	180			637			1066	945	580	945	1002	180
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	180			637			1066	945	580	945	1002	180
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			90			100	100	100	10	100	72
cM capacity (veh/h)	1395			947			133	236	514	224	219	862

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	637	273	445
Volume Left	0	92	202
Volume Right	114	0	242
cSH	1700	947	492
Volume to Capacity	0.37	0.10	0.90
Queue Length 95th (ft)	0	8	257
Control Delay (s)	0.0	3.8	43.7
Lane LOS		A	E
Approach Delay (s)	0.0	3.8	43.7
Approach LOS			E

Intersection Summary		
Average Delay		15.1
Intersection Capacity Utilization	65.4%	ICU Level of Service C
Analysis Period (min)		15

HCM Unsignalized Intersection Capacity Analysis

6: Silver Lake Road &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔		↔			
Volume (veh/h)	275	392	0	0	198	220	53	0	23	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	299	426	0	0	215	239	58	0	25	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									2			
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	454			426			1359	1478	426	1371	1359	335
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	454			426			1359	1478	426	1371	1359	335
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	73			100			42	100	96	100	100	100
cM capacity (veh/h)	1106			1133			100	92	628	94	108	707

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	725	454	83
Volume Left	299	0	58
Volume Right	0	239	25
cSH	1106	1700	143
Volume to Capacity	0.27	0.27	0.58
Queue Length 95th (ft)	27	0	74
Control Delay (s)	5.9	0.0	60.5
Lane LOS	A		F
Approach Delay (s)	5.9	0.0	60.5
Approach LOS			F

Intersection Summary		
Average Delay		7.4
Intersection Capacity Utilization	73.1%	ICU Level of Service
Analysis Period (min)		15
		D

Silver Lake
2040 No Build PM

HCM Unsignalized Intersection Capacity Analysis
 1: Silver Lake Road & Whitmore Lake Rd

9/17/2014



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	467	201	180	95	178	93
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	508	218	196	103	193	101
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	726	299	295			
Volume Left (vph)	508	0	193			
Volume Right (vph)	218	103	0			
Hadj (s)	-0.01	-0.17	0.17			
Departure Headway (s)	5.7	6.3	6.6			
Degree Utilization, x	1.16	0.52	0.54			
Capacity (veh/h)	619	567	538			
Control Delay (s)	110.2	15.8	17.0			
Approach Delay (s)	110.2	15.8	17.0			
Approach LOS	F	C	C			
Intersection Summary						
Delay			68.0			
HCM Level of Service			F			
Intersection Capacity Utilization			78.2%	ICU Level of Service	D	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2: Silver Lake Rd & Fieldcrest Drive

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	73	323	27	0	316	29	21	7	1	19	0	36
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	79	351	29	0	343	32	23	8	1	21	0	39
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	375			380			923	899	366	889	898	359
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	375			380			923	899	366	889	898	359
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			100			90	97	100	92	100	94
cM capacity (veh/h)	1183			1178			224	260	679	245	260	685

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	460	375	32	60
Volume Left	79	0	23	21
Volume Right	29	32	1	39
cSH	1183	1178	237	422
Volume to Capacity	0.07	0.00	0.13	0.14
Queue Length 95th (ft)	5	0	11	12
Control Delay (s)	2.0	0.0	22.5	14.9
Lane LOS	A		C	B
Approach Delay (s)	2.0	0.0	22.5	14.9
Approach LOS			C	B

Intersection Summary			
Average Delay		2.7	
Intersection Capacity Utilization		54.4%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

3: Silver Lake Road & US23 Off Ramp

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↻			↻						↻	↻
Volume (veh/h)	0	225	48	42	399	0	0	0	0	180	0	269
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	245	52	46	434	0	0	0	0	196	0	292
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												6
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	434			297			942	796	271	796	822	434
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	434			297			942	796	271	796	822	434
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			100	100	100	34	100	53
cM capacity (veh/h)	1126			1265			125	308	768	297	298	622
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total	297	479	488									
Volume Left	0	46	196									
Volume Right	52	0	292									
cSH	1700	1265	740									
Volume to Capacity	0.17	0.04	0.66									
Queue Length 95th (ft)	0	3	125									
Control Delay (s)	0.0	1.1	24.6									
Lane LOS		A	C									
Approach Delay (s)	0.0	1.1	24.6									
Approach LOS			C									
Intersection Summary												
Average Delay			9.9									
Intersection Capacity Utilization			58.1%		ICU Level of Service					B		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

6: Silver Lake Road &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↗		↖		↗			
Volume (veh/h)	82	323	0	0	229	144	212	0	100	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	89	351	0	0	249	157	230	0	109	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									2			
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	405			351			857	935	351	911	857	327
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	405			351			857	935	351	911	857	327
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			100			12	100	84	100	100	100
cM capacity (veh/h)	1153			1208			261	245	692	202	272	714

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	440	405	339
Volume Left	89	0	230
Volume Right	0	157	109
cSH	1153	1700	346
Volume to Capacity	0.08	0.24	0.98
Queue Length 95th (ft)	6	0	272
Control Delay (s)	2.3	0.0	79.1
Lane LOS	A		F
Approach Delay (s)	2.3	0.0	79.1
Approach LOS			F

Intersection Summary		
Average Delay		23.5
Intersection Capacity Utilization	64.1%	ICU Level of Service C
Analysis Period (min)		15

Silver Lake
2040 ATM AM

HCM Unsignalized Intersection Capacity Analysis
 1: Silver Lake Road & Whitmore Lake Rd

9/17/2014



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	251	82	72	421	175	201
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	273	89	78	458	190	218
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	362	536	409			
Volume Left (vph)	273	0	190			
Volume Right (vph)	89	458	0			
Hadj (s)	0.04	-0.48	0.13			
Departure Headway (s)	6.5	5.5	6.2			
Degree Utilization, x	0.65	0.81	0.70			
Capacity (veh/h)	522	643	556			
Control Delay (s)	20.8	27.9	22.7			
Approach Delay (s)	20.8	27.9	22.7			
Approach LOS	C	D	C			
Intersection Summary						
Delay			24.3			
HCM Level of Service			C			
Intersection Capacity Utilization			78.9%	ICU Level of Service	D	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2: Silver Lake Rd & Fieldcrest Drive

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	16	250	121	13	365	8	18	0	0	34	106	44
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	272	132	14	397	9	20	0	0	37	115	48
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	405			403			907	806	338	802	867	401
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	405			403			907	806	338	802	867	401
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			88	100	100	88	59	93
cM capacity (veh/h)	1153			1155			159	307	705	296	283	649

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	421	420	20	200
Volume Left	17	14	20	37
Volume Right	132	9	0	48
cSH	1153	1155	159	330
Volume to Capacity	0.02	0.01	0.12	0.61
Queue Length 95th (ft)	1	1	10	94
Control Delay (s)	0.5	0.4	30.8	31.3
Lane LOS	A	A	D	D
Approach Delay (s)	0.5	0.4	30.8	31.3
Approach LOS			D	D

Intersection Summary			
Average Delay		6.8	
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis

3: Silver Lake Road & US23 Off Ramp

9/17/2014



















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗			↖						↘	↙
Volume (veh/h)	0	481	115	94	166	0	0	0	0	139	0	167
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	523	125	102	180	0	0	0	0	151	0	182
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												6
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	180			648			1061	970	585	970	1033	180
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	180			648			1061	970	585	970	1033	180
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			89			100	100	100	29	100	79
cM capacity (veh/h)	1395			938			146	226	511	213	207	862
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total	648	283	333									
Volume Left	0	102	151									
Volume Right	125	0	182									
cSH	1700	938	469									
Volume to Capacity	0.38	0.11	0.71									
Queue Length 95th (ft)	0	9	138									
Control Delay (s)	0.0	4.1	30.5									
Lane LOS		A	D									
Approach Delay (s)	0.0	4.1	30.5									
Approach LOS			D									
Intersection Summary												
Average Delay			8.9									
Intersection Capacity Utilization			63.9%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

6: Silver Lake Road &

9/17/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	256	364	0	0	207	220	53	0	23	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	278	396	0	0	225	239	58	0	25	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									2			
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	464			396			1297	1416	396	1309	1297	345
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	464			396			1297	1416	396	1309	1297	345
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	75			100			48	100	96	100	100	100
cM capacity (veh/h)	1097			1163			112	102	654	105	121	698
Direction, Lane #	EB 1	WB 1	NB 1									
Volume Total	674	464	83									
Volume Left	278	0	58									
Volume Right	0	239	25									
cSH	1097	1700	160									
Volume to Capacity	0.25	0.27	0.52									
Queue Length 95th (ft)	25	0	63									
Control Delay (s)	5.7	0.0	50.2									
Lane LOS	A		F									
Approach Delay (s)	5.7	0.0	50.2									
Approach LOS			F									
Intersection Summary												
Average Delay			6.5									
Intersection Capacity Utilization			71.0%			ICU Level of Service			C			
Analysis Period (min)			15									

Silver Lake
2040 ATM PM

HCM Unsignalized Intersection Capacity Analysis
 1: Silver Lake Road & Whitmore Lake Rd

9/17/2014



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	483	208	180	88	166	93
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	525	226	196	96	180	101
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	751	291	282			
Volume Left (vph)	525	0	180			
Volume Right (vph)	226	96	0			
Hadj (s)	-0.01	-0.16	0.16			
Departure Headway (s)	5.7	6.2	6.5			
Degree Utilization, x	1.19	0.50	0.51			
Capacity (veh/h)	629	569	540			
Control Delay (s)	119.6	15.4	16.2			
Approach Delay (s)	119.6	15.4	16.2			
Approach LOS	F	C	C			
Intersection Summary						
Delay			74.7			
HCM Level of Service			F			
Intersection Capacity Utilization			78.4%	ICU Level of Service	D	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

2: Silver Lake Rd & Fieldcrest Drive

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	73	334	27	0	285	29	19	7	1	19	0	36
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	79	363	29	0	310	32	21	8	1	21	0	39
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	341			392			901	878	378	867	877	326
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	341			392			901	878	378	867	877	326
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			100			91	97	100	92	100	95
cM capacity (veh/h)	1218			1166			233	268	669	254	268	716

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	472	341	29	60
Volume Left	79	0	21	21
Volume Right	29	32	1	39
cSH	1218	1166	247	439
Volume to Capacity	0.07	0.00	0.12	0.14
Queue Length 95th (ft)	5	0	10	12
Control Delay (s)	1.9	0.0	21.5	14.5
Lane LOS	A		C	B
Approach Delay (s)	1.9	0.0	21.5	14.5
Approach LOS			C	B

Intersection Summary			
Average Delay		2.7	
Intersection Capacity Utilization		53.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

3: Silver Lake Road & US23 Off Ramp

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↻			↻						↻	↻
Volume (veh/h)	0	206	48	42	422	0	0	0	0	180	0	269
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	224	52	46	459	0	0	0	0	196	0	292
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												6
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	459			276			946	800	250	800	826	459
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	459			276			946	800	250	800	826	459
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			100	100	100	34	100	51
cM capacity (veh/h)	1102			1287			121	307	789	295	296	602

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	276	504	488
Volume Left	0	46	196
Volume Right	52	0	292
cSH	1700	1287	736
Volume to Capacity	0.16	0.04	0.66
Queue Length 95th (ft)	0	3	127
Control Delay (s)	0.0	1.1	25.2
Lane LOS		A	D
Approach Delay (s)	0.0	1.1	25.2
Approach LOS			D

Intersection Summary		
Average Delay		10.1
Intersection Capacity Utilization	58.3%	ICU Level of Service
Analysis Period (min)	15	B

HCM Unsignalized Intersection Capacity Analysis

6: Silver Lake Road &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↗		↖		↗			
Volume (veh/h)	63	323	0	0	229	111	235	0	111	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	68	351	0	0	249	121	255	0	121	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									2			
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	370			351			797	858	351	858	797	309
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	370			351			797	858	351	858	797	309
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			12	100	83	100	100	100
cM capacity (veh/h)	1189			1208			291	278	692	219	301	731

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	420	370	376
Volume Left	68	0	255
Volume Right	0	121	121
cSH	1189	1700	381
Volume to Capacity	0.06	0.22	0.99
Queue Length 95th (ft)	5	0	289
Control Delay (s)	1.8	0.0	76.3
Lane LOS	A		F
Approach Delay (s)	1.8	0.0	76.3
Approach LOS			F

Intersection Summary			
Average Delay		25.3	
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)		15	

Silver Lake
2040 ATM-HOVAM

HCM Unsignalized Intersection Capacity Analysis
 1: Silver Lake Road & Whitmore Lake Rd

9/17/2014



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	286	94	72	418	172	201
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	311	102	78	454	187	218
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	413	533	405			
Volume Left (vph)	311	0	187			
Volume Right (vph)	102	454	0			
Hadj (s)	0.04	-0.48	0.13			
Departure Headway (s)	6.6	5.7	6.5			
Degree Utilization, x	0.75	0.85	0.73			
Capacity (veh/h)	525	617	534			
Control Delay (s)	26.9	32.2	24.9			
Approach Delay (s)	26.9	32.2	24.9			
Approach LOS	D	D	C			
Intersection Summary						
Delay			28.4			
HCM Level of Service			D			
Intersection Capacity Utilization			81.3%	ICU Level of Service	D	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 2: Silver Lake Rd & Fieldcrest Drive

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	17	263	128	13	359	8	18	0	0	34	106	44
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	286	139	14	390	9	20	0	0	37	115	48
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	399			425			921	820	355	815	885	395
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	399			425			921	820	355	815	885	395
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			87	100	100	87	58	93
cM capacity (veh/h)	1160			1134			154	301	689	290	276	655
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	443	413	20	200								
Volume Left	18	14	20	37								
Volume Right	139	9	0	48								
cSH	1160	1134	154	324								
Volume to Capacity	0.02	0.01	0.13	0.62								
Queue Length 95th (ft)	1	1	11	97								
Control Delay (s)	0.5	0.4	31.8	32.6								
Lane LOS	A	A	D	D								
Approach Delay (s)	0.5	0.4	31.8	32.6								
Approach LOS			D	D								
Intersection Summary												
Average Delay			7.0									
Intersection Capacity Utilization			45.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

3: Silver Lake Road & US23 Off Ramp

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↻			↻						↻	↻	
Volume (veh/h)	0	481	109	88	166	0	0	0	0	179	0	214	
Sign Control		Free			Free			Stop			Stop		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	0	523	118	96	180	0	0	0	0	195	0	233	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)												6	
Median type	None				None								
Median storage (veh)													
Upstream signal (ft)													
pX, platoon unblocked													
vC, conflicting volume	180			641				1070	954	582	954	1013	180
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	180			641				1070	954	582	954	1013	180
tC, single (s)	4.1			4.1				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)													
tF (s)	2.2			2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			90				100	100	100	12	100	73
cM capacity (veh/h)	1395			943				134	233	513	220	215	862
Direction, Lane #	EB 1	WB 1	SB 1										
Volume Total	641	276	427										
Volume Left	0	96	195										
Volume Right	118	0	233										
cSH	1700	943	483										
Volume to Capacity	0.38	0.10	0.88										
Queue Length 95th (ft)	0	8	241										
Control Delay (s)	0.0	3.9	42.3										
Lane LOS		A	E										
Approach Delay (s)	0.0	3.9	42.3										
Approach LOS			E										
Intersection Summary													
Average Delay			14.2										
Intersection Capacity Utilization			65.5%	ICU Level of Service								C	
Analysis Period (min)			15										

HCM Unsignalized Intersection Capacity Analysis

6: Silver Lake Road &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↗		↖		↗			
Volume (veh/h)	275	385	0	0	201	220	53	0	23	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	299	418	0	0	218	239	58	0	25	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									2			
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	458			418			1354	1474	418	1367	1354	338
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	458			418			1354	1474	418	1367	1354	338
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	73			100			43	100	96	100	100	100
cM capacity (veh/h)	1103			1141			100	92	635	94	109	704

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	717	458	83
Volume Left	299	0	58
Volume Right	0	239	25
cSH	1103	1700	144
Volume to Capacity	0.27	0.27	0.57
Queue Length 95th (ft)	28	0	73
Control Delay (s)	5.9	0.0	59.9
Lane LOS	A		F
Approach Delay (s)	5.9	0.0	59.9
Approach LOS			F

Intersection Summary		
Average Delay		7.3
Intersection Capacity Utilization	72.9%	ICU Level of Service C
Analysis Period (min)		15

Silver Lake
2040 ATM - HOV PM

HCM Unsignalized Intersection Capacity Analysis

1: Silver Lake Road & Whitmore Lake Rd

9/17/2014



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Volume (vph)	469	202	180	90	168	93
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	510	220	196	98	183	101
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	729	293	284			
Volume Left (vph)	510	0	183			
Volume Right (vph)	220	98	0			
Hadj (s)	-0.01	-0.17	0.16			
Departure Headway (s)	5.7	6.2	6.6			
Degree Utilization, x	1.15	0.51	0.52			
Capacity (veh/h)	626	568	539			
Control Delay (s)	108.0	15.5	16.3			
Approach Delay (s)	108.0	15.5	16.3			
Approach LOS	F	C	C			
Intersection Summary						
Delay			67.3			
HCM Level of Service			F			
Intersection Capacity Utilization			77.5%	ICU Level of Service	D	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis
 2: Silver Lake Rd & Fieldcrest Drive

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	74	328	27	0	290	29	21	7	1	19	0	36
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	80	357	29	0	315	32	23	8	1	21	0	39
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	347			386			902	879	371	868	878	331
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	347			386			902	879	371	868	878	331
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			100			90	97	100	92	100	94
cM capacity (veh/h)	1212			1173			232	267	675	253	268	711

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	466	347	32	60
Volume Left	80	0	23	21
Volume Right	29	32	1	39
cSH	1212	1173	245	437
Volume to Capacity	0.07	0.00	0.13	0.14
Queue Length 95th (ft)	5	0	11	12
Control Delay (s)	2.0	0.0	21.8	14.5
Lane LOS	A		C	B
Approach Delay (s)	2.0	0.0	21.8	14.5
Approach LOS			C	B

Intersection Summary			
Average Delay		2.7	
Intersection Capacity Utilization	53.3%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

3: Silver Lake Road & US23 Off Ramp

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗			↖						↖	↗
Volume (veh/h)	0	210	48	42	402	0	0	0	0	180	0	269
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	228	52	46	437	0	0	0	0	196	0	292
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												6
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	437			280			929	783	254	783	809	437
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	437			280			929	783	254	783	809	437
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			100	100	100	35	100	53
cM capacity (veh/h)	1123			1282			127	314	784	303	303	620
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total	280	483	488									
Volume Left	0	46	196									
Volume Right	52	0	292									
cSH	1700	1282	756									
Volume to Capacity	0.16	0.04	0.65									
Queue Length 95th (ft)	0	3	120									
Control Delay (s)	0.0	1.1	24.0									
Lane LOS		A	C									
Approach Delay (s)	0.0	1.1	24.0									
Approach LOS			C									
Intersection Summary												
Average Delay			9.8									
Intersection Capacity Utilization			57.4%		ICU Level of Service					B		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

6: Silver Lake Road &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕		↕			
Volume (veh/h)	67	323	0	0	229	118	215	0	106	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	73	351	0	0	249	128	234	0	115	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									2			
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	377			351			810	874	351	867	810	313
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	377			351			810	874	351	867	810	313
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			18	100	83	100	100	100
cM capacity (veh/h)	1181			1208			284	270	692	217	295	727



















Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	424	377	349
Volume Left	73	0	234
Volume Right	0	128	115
cSH	1181	1700	382
Volume to Capacity	0.06	0.22	0.91
Queue Length 95th (ft)	5	0	239
Control Delay (s)	1.9	0.0	60.3
Lane LOS	A		F
Approach Delay (s)	1.9	0.0	60.3
Approach LOS			F

Intersection Summary		
Average Delay		19.0
Intersection Capacity Utilization	61.9%	ICU Level of Service
Analysis Period (min)		15
		B

M-36/9 Mile
2015 Existing AM

HCM Unsignalized Intersection Capacity Analysis
 16: M36 & Whitmore Lake Road

















9/17/2014

															
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Lane Configurations															
Sign Control		Stop			Stop			Stop			Stop				
Volume (vph)	0	491	70	90	168	4	40	14	269	122	178	70			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Hourly flow rate (vph)	0	534	76	98	183	4	43	15	292	133	193	76			
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1										
Volume Total (vph)	534	76	285	351	402										
Volume Left (vph)	0	0	98	43	133										
Volume Right (vph)	0	76	4	292	76										
Hadj (s)	0.03	-0.67	0.09	-0.44	-0.01										
Departure Headway (s)	8.8	8.1	9.1	8.2	8.4										
Degree Utilization, x	1.31	0.17	0.72	0.80	0.93										
Capacity (veh/h)	410	439	379	416	402										
Control Delay (s)	178.6	11.5	32.3	37.1	57.7										
Approach Delay (s)	157.8		32.3	37.1	57.7										
Approach LOS	F		D	E	F										
Intersection Summary															
Delay			85.9												
HCM Level of Service			F												
Intersection Capacity Utilization			92.8%					ICU Level of Service			F				
Analysis Period (min)			15												

HCM Unsignalized Intersection Capacity Analysis

17: M36 &

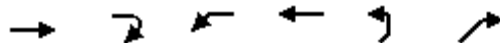
9/17/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	284	565	33	17	257	210	5	16	8	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	309	614	36	18	279	228	5	17	9	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	279			650			1566	1566	632	1583	1584	279
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	279			650			1566	1566	632	1583	1584	279
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	76			98			93	79	98	100	100	100
cM capacity (veh/h)	1283			936			73	83	480	59	81	759
Direction, Lane #	EB 1	WB 1	WB 2	NB 1								
Volume Total	959	298	228	32								
Volume Left	309	18	0	5								
Volume Right	36	0	228	9								
cSH	1283	936	1700	104								
Volume to Capacity	0.24	0.02	0.13	0.30								
Queue Length 95th (ft)	24	2	0	29								
Control Delay (s)	5.1	0.8	0.0	54.0								
Lane LOS	A	A		F								
Approach Delay (s)	5.1	0.4		54.0								
Approach LOS				F								
Intersection Summary												
Average Delay			4.5									
Intersection Capacity Utilization			75.2%		ICU Level of Service				D			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

21: M36 & NB23 Off Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑			↑		↑
Volume (veh/h)	573	0	0	463	0	75
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	623	0	0	503	0	82
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			623		1126	623
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			623		1126	623
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	83
cM capacity (veh/h)			958		227	486

Direction, Lane #	EB 1	WB 1	NE 1
Volume Total	623	503	82
Volume Left	0	0	0
Volume Right	0	0	82
cSH	1700	1700	486
Volume to Capacity	0.37	0.30	0.17
Queue Length 95th (ft)	0	0	15
Control Delay (s)	0.0	0.0	13.9
Lane LOS			B
Approach Delay (s)	0.0	0.0	13.9
Approach LOS			B

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		41.5%	ICU Level of Service
Analysis Period (min)		15	A

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis

25: M36 & Fieldcrest Dr

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↔		↕↕	
Volume (veh/h)	265	383	333	119	87	130
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	288	416	362	129	95	141
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	491				1211	427
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	491				1211	427
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	73				26	75
cM capacity (veh/h)	1068				128	576

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	427	278	491	236
Volume Left	288	0	0	95
Volume Right	0	0	129	141
cSH	1068	1700	1700	239
Volume to Capacity	0.27	0.16	0.29	0.99
Queue Length 95th (ft)	27	0	0	230
Control Delay (s)	7.4	0.0	0.0	98.6
Lane LOS	A			F
Approach Delay (s)	4.5		0.0	98.6
Approach LOS				F

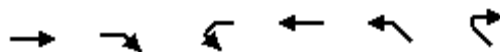
Intersection Summary			
Average Delay		18.5	
Intersection Capacity Utilization		65.9%	ICU Level of Service C
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis

36: Whitmore Lake Road & US23 Off Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑			↑	↘	
Volume (veh/h)	18	0	0	208	162	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	0	0	226	176	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			20		246	20
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			20		246	20
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		76	100
cM capacity (veh/h)			1597		743	1058



















Direction, Lane #	EB 1	WB 1	NW 1
Volume Total	20	226	176
Volume Left	0	0	176
Volume Right	0	0	0
cSH	1700	1700	743
Volume to Capacity	0.01	0.13	0.24
Queue Length 95th (ft)	0	0	23
Control Delay (s)	0.0	0.0	11.3
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.3
Approach LOS			B

Intersection Summary			
Average Delay		4.7	
Intersection Capacity Utilization	26.6%		ICU Level of Service A
Analysis Period (min)		15	

M-36/9 Mile
2015 Existing PM

HCM Unsignalized Intersection Capacity Analysis
 16: M36 & Whitmore Lake Road

















9/17/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	14	393	64	48	461	36	43	33	108	146	78	97
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	427	70	52	501	39	47	36	117	159	85	105
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total (vph)	442	70	592	200	349							
Volume Left (vph)	15	0	52	47	159							
Volume Right (vph)	0	70	39	117	105							
Hadj (s)	0.05	-0.67	0.01	-0.27	-0.06							
Departure Headway (s)	8.2	7.4	8.0	8.7	8.1							
Degree Utilization, x	1.00	0.14	1.32	0.48	0.79							
Capacity (veh/h)	438	477	464	391	434							
Control Delay (s)	71.2	10.5	180.8	19.6	35.2							
Approach Delay (s)	63.0		180.8	19.6	35.2							
Approach LOS	F		F	C	E							
Intersection Summary												
Delay			94.1									
HCM Level of Service			F									
Intersection Capacity Utilization			92.7%	ICU Level of Service	F							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

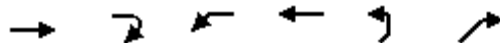
17: M36 &

9/17/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	125	511	11	15	531	106	14	6	19	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	136	555	12	16	577	115	15	7	21	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	577			567			1443	1443	561	1467	1449	577
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	577			567			1443	1443	561	1467	1449	577
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	86			98			84	94	96	100	100	100
cM capacity (veh/h)	996			1005			97	112	527	86	111	516
Direction, Lane #	EB 1	WB 1	WB 2	NB 1								
Volume Total	703	593	115	42								
Volume Left	136	16	0	15								
Volume Right	12	0	115	21								
cSH	996	1005	1700	167								
Volume to Capacity	0.14	0.02	0.07	0.25								
Queue Length 95th (ft)	12	1	0	24								
Control Delay (s)	3.3	0.4	0.0	33.7								
Lane LOS	A	A		D								
Approach Delay (s)	3.3	0.4		33.7								
Approach LOS				D								
Intersection Summary												
Average Delay			2.8									
Intersection Capacity Utilization			76.6%		ICU Level of Service				D			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 21: M36 & NB23 Off Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑			↑		↑
Volume (veh/h)	530	0	0	360	0	216
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	576	0	0	391	0	235
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			576		967	576
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			576		967	576
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	55
cM capacity (veh/h)			997		282	517

Direction, Lane #	EB 1	WB 1	NE 1
Volume Total	576	391	235
Volume Left	0	0	0
Volume Right	0	0	235
cSH	1700	1700	517
Volume to Capacity	0.34	0.23	0.45
Queue Length 95th (ft)	0	0	59
Control Delay (s)	0.0	0.0	17.6
Lane LOS			C
Approach Delay (s)	0.0	0.0	17.6
Approach LOS			C

Intersection Summary			
Average Delay		3.4	
Intersection Capacity Utilization		47.9%	ICU Level of Service A
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis

25: M36 & Fieldcrest Dr

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↔		↕↕	
Volume (veh/h)	236	510	310	186	17	50
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	257	554	337	202	18	54
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	539				1228	438
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	539				1228	438
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	75				86	90
cM capacity (veh/h)	1025				128	566

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	441	370	539	73
Volume Left	257	0	0	18
Volume Right	0	0	202	54
cSH	1025	1700	1700	303
Volume to Capacity	0.25	0.22	0.32	0.24
Queue Length 95th (ft)	25	0	0	23
Control Delay (s)	6.8	0.0	0.0	20.6
Lane LOS	A			C
Approach Delay (s)	3.7		0.0	20.6
Approach LOS				C

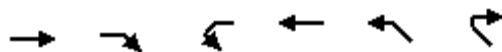
Intersection Summary			
Average Delay		3.2	
Intersection Capacity Utilization		62.6%	ICU Level of Service B
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis

36: Whitmore Lake Road & US23 Off Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑			↑	↘	
Volume (veh/h)	83	0	0	77	244	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	90	0	0	84	265	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			90		174	90
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			90		174	90
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		67	100
cM capacity (veh/h)			1505		816	968



















Direction, Lane #	EB 1	WB 1	NW 1
Volume Total	90	84	266
Volume Left	0	0	265
Volume Right	0	0	1
cSH	1700	1700	817
Volume to Capacity	0.05	0.05	0.33
Queue Length 95th (ft)	0	0	36
Control Delay (s)	0.0	0.0	11.5
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.5
Approach LOS			B

Intersection Summary			
Average Delay		7.0	
Intersection Capacity Utilization	24.6%		ICU Level of Service A
Analysis Period (min)		15	

M-36/9 Mile
2040 No Build AM

HCM Unsignalized Intersection Capacity Analysis
 16: M36 & Whitmore Lake Road

9/17/2014

															
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Lane Configurations															
Sign Control		Stop			Stop			Stop			Stop				
Volume (vph)	0	491	70	90	168	4	40	14	269	122	178	70			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Hourly flow rate (vph)	0	534	76	98	183	4	43	15	292	133	193	76			
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1										
Volume Total (vph)	534	76	285	351	402										
Volume Left (vph)	0	0	98	43	133										
Volume Right (vph)	0	76	4	292	76										
Hadj (s)	0.03	-0.67	0.09	-0.44	-0.01										
Departure Headway (s)	8.8	8.1	9.1	8.2	8.4										
Degree Utilization, x	1.31	0.17	0.72	0.80	0.93										
Capacity (veh/h)	410	439	379	416	402										
Control Delay (s)	178.6	11.5	32.3	37.1	57.7										
Approach Delay (s)	157.8		32.3	37.1	57.7										
Approach LOS	F		D	E	F										
Intersection Summary															
Delay			85.9												
HCM Level of Service			F												
Intersection Capacity Utilization			92.8%					ICU Level of Service			F				
Analysis Period (min)			15												

HCM Unsignalized Intersection Capacity Analysis

17: M36 &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕		↕				
Volume (veh/h)	284	565	33	17	257	0	5	16	8	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	309	614	36	18	279	0	5	17	9	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	279			650			1566	1566	632	1583	1584	279
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	279			650			1566	1566	632	1583	1584	279
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	76			98			93	79	98	100	100	100
cM capacity (veh/h)	1283			936			73	83	480	59	81	759

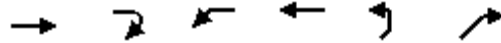
Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	959	298	0	32
Volume Left	309	18	0	5
Volume Right	36	0	0	9
cSH	1283	936	1700	104
Volume to Capacity	0.24	0.02	0.00	0.30
Queue Length 95th (ft)	24	2	0	29
Control Delay (s)	5.1	0.8	0.0	54.0
Lane LOS	A	A		F
Approach Delay (s)	5.1	0.8		54.0
Approach LOS				F

Intersection Summary			
Average Delay		5.3	
Intersection Capacity Utilization		75.2%	ICU Level of Service D
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis
 21: M36 & NB23 Off Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑			↑		↑
Volume (veh/h)	573	0	0	463	0	75
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	623	0	0	503	0	82
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			623		1126	623
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			623		1126	623
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	83
cM capacity (veh/h)			958		227	486

Direction, Lane #	EB 1	WB 1	NE 1
Volume Total	623	503	82
Volume Left	0	0	0
Volume Right	0	0	82
cSH	1700	1700	486
Volume to Capacity	0.37	0.30	0.17
Queue Length 95th (ft)	0	0	15
Control Delay (s)	0.0	0.0	13.9
Lane LOS			B
Approach Delay (s)	0.0	0.0	13.9
Approach LOS			B

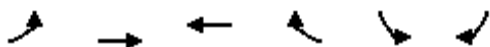
Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		41.5%	ICU Level of Service A
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis

25: M36 & Fieldcrest Dr

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↔		↕↕	
Volume (veh/h)	265	383	333	119	87	130
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	288	416	362	129	95	141
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	491				1211	427
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	491				1211	427
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	73				26	75
cM capacity (veh/h)	1068				128	576

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	427	278	491	236
Volume Left	288	0	0	95
Volume Right	0	0	129	141
cSH	1068	1700	1700	239
Volume to Capacity	0.27	0.16	0.29	0.99
Queue Length 95th (ft)	27	0	0	230
Control Delay (s)	7.4	0.0	0.0	98.6
Lane LOS	A			F
Approach Delay (s)	4.5		0.0	98.6
Approach LOS				F

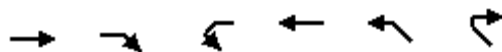
Intersection Summary			
Average Delay		18.5	
Intersection Capacity Utilization		65.9%	ICU Level of Service C
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis

36: Whitmore Lake Road & US23 Off Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑			↑	↘	
Volume (veh/h)	18	0	0	208	162	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	0	0	226	176	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			20		246	20
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			20		246	20
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		76	100
cM capacity (veh/h)			1597		743	1058



















Direction, Lane #	EB 1	WB 1	NW 1
Volume Total	20	226	176
Volume Left	0	0	176
Volume Right	0	0	0
cSH	1700	1700	743
Volume to Capacity	0.01	0.13	0.24
Queue Length 95th (ft)	0	0	23
Control Delay (s)	0.0	0.0	11.3
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.3
Approach LOS			B

Intersection Summary			
Average Delay		4.7	
Intersection Capacity Utilization	26.6%		ICU Level of Service A
Analysis Period (min)		15	

M-36/9 Mile
2040 No Build PM

HCM Unsignalized Intersection Capacity Analysis
 16: M36 & Whitmore Lake Road

















9/17/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	14	393	64	48	461	36	43	33	108	146	78	97
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	427	70	52	501	39	47	36	117	159	85	105
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total (vph)	442	70	592	200	349							
Volume Left (vph)	15	0	52	47	159							
Volume Right (vph)	0	70	39	117	105							
Hadj (s)	0.05	-0.67	0.01	-0.27	-0.06							
Departure Headway (s)	8.2	7.4	8.0	8.7	8.1							
Degree Utilization, x	1.00	0.14	1.32	0.48	0.79							
Capacity (veh/h)	438	477	464	391	434							
Control Delay (s)	71.2	10.5	180.8	19.6	35.2							
Approach Delay (s)	63.0		180.8	19.6	35.2							
Approach LOS	F		F	C	E							
Intersection Summary												
Delay			94.1									
HCM Level of Service			F									
Intersection Capacity Utilization			92.7%	ICU Level of Service	F							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

17: M36 &

9/17/2014

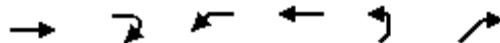
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	125	511	11	15	531	0	14	6	19	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	136	555	12	16	577	0	15	7	21	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	577			567			1443	1443	561	1467	1449	577
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	577			567			1443	1443	561	1467	1449	577
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	86			98			84	94	96	100	100	100
cM capacity (veh/h)	996			1005			97	112	527	86	111	516
Direction, Lane #	EB 1	WB 1	WB 2	NB 1								
Volume Total	703	593	0	42								
Volume Left	136	16	0	15								
Volume Right	12	0	0	21								
cSH	996	1005	1700	167								
Volume to Capacity	0.14	0.02	0.00	0.25								
Queue Length 95th (ft)	12	1	0	24								
Control Delay (s)	3.3	0.4	0.0	33.7								
Lane LOS	A	A		D								
Approach Delay (s)	3.3	0.4		33.7								
Approach LOS				D								
Intersection Summary												
Average Delay			3.0									
Intersection Capacity Utilization			76.6%		ICU Level of Service				D			
Analysis Period (min)			15									

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis

21: M36 & NB23 Off Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑			↑		↑
Volume (veh/h)	530	0	0	360	0	216
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	576	0	0	391	0	235
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			576		967	576
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			576		967	576
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	55
cM capacity (veh/h)			997		282	517

Direction, Lane #	EB 1	WB 1	NE 1
Volume Total	576	391	235
Volume Left	0	0	0
Volume Right	0	0	235
cSH	1700	1700	517
Volume to Capacity	0.34	0.23	0.45
Queue Length 95th (ft)	0	0	59
Control Delay (s)	0.0	0.0	17.6
Lane LOS			C
Approach Delay (s)	0.0	0.0	17.6
Approach LOS			C

Intersection Summary			
Average Delay		3.4	
Intersection Capacity Utilization		47.9%	ICU Level of Service A
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis

25: M36 & Fieldcrest Dr

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↔		↕↕	
Volume (veh/h)	236	510	310	186	17	50
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	257	554	337	202	18	54
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	539				1228	438
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	539				1228	438
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	75				86	90
cM capacity (veh/h)	1025				128	566

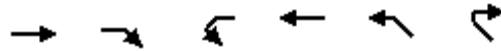
Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	441	370	539	73
Volume Left	257	0	0	18
Volume Right	0	0	202	54
cSH	1025	1700	1700	303
Volume to Capacity	0.25	0.22	0.32	0.24
Queue Length 95th (ft)	25	0	0	23
Control Delay (s)	6.8	0.0	0.0	20.6
Lane LOS	A			C
Approach Delay (s)	3.7		0.0	20.6
Approach LOS				C

Intersection Summary			
Average Delay		3.2	
Intersection Capacity Utilization		62.6%	ICU Level of Service B
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis
 36: Whitmore Lake Road & US23 Off Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑			↑	↘	
Volume (veh/h)	83	0	0	77	244	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	90	0	0	84	265	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			90		174	90
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			90		174	90
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		67	100
cM capacity (veh/h)			1505		816	968



















Direction, Lane #	EB 1	WB 1	NW 1
Volume Total	90	84	266
Volume Left	0	0	265
Volume Right	0	0	1
cSH	1700	1700	817
Volume to Capacity	0.05	0.05	0.33
Queue Length 95th (ft)	0	0	36
Control Delay (s)	0.0	0.0	11.5
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.5
Approach LOS			B

Intersection Summary			
Average Delay		7.0	
Intersection Capacity Utilization		24.6%	ICU Level of Service A
Analysis Period (min)		15	

M-36/9 Mile
2040 ATM AM

HCM Unsignalized Intersection Capacity Analysis
 16: M36 & Whitmore Lake Road

















9/17/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	576	70	90	168	4	40	14	269	117	170	67
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	626	76	98	183	4	43	15	292	127	185	73
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total (vph)	626	76	285	351	385							
Volume Left (vph)	0	0	98	43	127							
Volume Right (vph)	0	76	4	292	73							
Hadj (s)	0.03	-0.67	0.09	-0.44	-0.01							
Departure Headway (s)	8.7	7.9	9.0	8.1	8.3							
Degree Utilization, x	1.51	0.17	0.71	0.79	0.89							
Capacity (veh/h)	416	447	372	421	423							
Control Delay (s)	262.5	11.3	31.0	35.4	49.1							
Approach Delay (s)	235.2		31.0	35.4	49.1							
Approach LOS	F		D	E	E							
Intersection Summary												
Delay			119.2									
HCM Level of Service			F									
Intersection Capacity Utilization			95.5%	ICU Level of Service	F							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

17: M36 &

9/17/2014

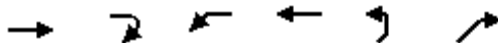
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	369	560	33	17	257	0	5	21	8	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	401	609	36	18	279	0	5	23	9	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	279			645			1745	1745	627	1765	1763	279
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	279			645			1745	1745	627	1765	1763	279
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	69			98			89	61	98	100	100	100
cM capacity (veh/h)	1283			941			51	58	484	34	57	759
Direction, Lane #	EB 1	WB 1	WB 2	NB 1								
Volume Total	1046	298	0	37								
Volume Left	401	18	0	5								
Volume Right	36	0	0	9								
cSH	1283	941	1700	71								
Volume to Capacity	0.31	0.02	0.00	0.52								
Queue Length 95th (ft)	34	2	0	54								
Control Delay (s)	6.3	0.7	0.0	100.4								
Lane LOS	A	A		F								
Approach Delay (s)	6.3	0.7		100.4								
Approach LOS				F								
Intersection Summary												
Average Delay			7.6									
Intersection Capacity Utilization			79.7%		ICU Level of Service				D			
Analysis Period (min)			15									

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis

21: M36 & NB23 Off Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑			↑		↑
Volume (veh/h)	568	0	0	526	0	75
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	617	0	0	572	0	82
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			617		1189	617
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			617		1189	617
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	83
cM capacity (veh/h)			963		208	490

Direction, Lane #	EB 1	WB 1	NE 1
Volume Total	617	572	82
Volume Left	0	0	0
Volume Right	0	0	82
cSH	1700	1700	490
Volume to Capacity	0.36	0.34	0.17
Queue Length 95th (ft)	0	0	15
Control Delay (s)	0.0	0.0	13.8
Lane LOS			B
Approach Delay (s)	0.0	0.0	13.8
Approach LOS			B

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		41.2%	ICU Level of Service A
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis

25: M36 & Fieldcrest Dr

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↔		↕↕	
Volume (veh/h)	263	380	378	119	87	148
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	286	413	411	129	95	161
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	540				1254	476
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	540				1254	476
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	72				20	70
cM capacity (veh/h)	1024				118	536

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	424	275	540	255
Volume Left	286	0	0	95
Volume Right	0	0	129	161
cSH	1024	1700	1700	232
Volume to Capacity	0.28	0.16	0.32	1.10
Queue Length 95th (ft)	29	0	0	284
Control Delay (s)	7.6	0.0	0.0	133.7
Lane LOS	A			F
Approach Delay (s)	4.6		0.0	133.7
Approach LOS				F

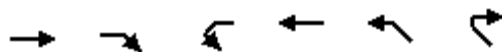
Intersection Summary			
Average Delay		25.0	
Intersection Capacity Utilization		69.2%	ICU Level of Service C
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis

36: Whitmore Lake Road & US23 Off Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑			↑	↔	
Volume (veh/h)	18	0	0	208	146	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	0	0	226	159	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			20		246	20
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			20		246	20
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		79	100
cM capacity (veh/h)			1597		743	1058



















Direction, Lane #	EB 1	WB 1	NW 1
Volume Total	20	226	159
Volume Left	0	0	159
Volume Right	0	0	0
cSH	1700	1700	743
Volume to Capacity	0.01	0.13	0.21
Queue Length 95th (ft)	0	0	20
Control Delay (s)	0.0	0.0	11.2
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.2
Approach LOS			B

Intersection Summary			
Average Delay		4.4	
Intersection Capacity Utilization	25.7%		ICU Level of Service A
Analysis Period (min)		15	

M-36/9 Mile
2040 ATM PM

HCM Unsignalized Intersection Capacity Analysis
 16: M36 & Whitmore Lake Road

















9/17/2014

															
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Lane Configurations															
Sign Control		Stop			Stop			Stop			Stop				
Volume (vph)	14	375	64	50	481	37	43	33	108	146	78	97			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Hourly flow rate (vph)	15	408	70	54	523	40	47	36	117	159	85	105			
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1										
Volume Total (vph)	423	70	617	200	349										
Volume Left (vph)	15	0	54	47	159										
Volume Right (vph)	0	70	40	117	105										
Hadj (s)	0.05	-0.67	0.01	-0.27	-0.06										
Departure Headway (s)	8.1	7.4	7.9	8.6	8.0										
Degree Utilization, x	0.95	0.14	1.35	0.48	0.78										
Capacity (veh/h)	423	476	464	391	427										
Control Delay (s)	59.7	10.4	195.5	19.2	34.1										
Approach Delay (s)	52.7		195.5	19.2	34.1										
Approach LOS	F		F	C	D										
Intersection Summary															
Delay			97.9												
HCM Level of Service			F												
Intersection Capacity Utilization			93.0%					ICU Level of Service			F				
Analysis Period (min)			15												

HCM Unsignalized Intersection Capacity Analysis

17: M36 &

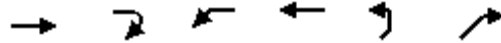
9/17/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	125	493	11	15	554	0	14	6	19	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	136	536	12	16	602	0	15	7	21	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	602			548			1448	1448	542	1472	1454	602
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	602			548			1448	1448	542	1472	1454	602
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	86			98			84	94	96	100	100	100
cM capacity (veh/h)	975			1022			96	111	540	85	110	499
Direction, Lane #	EB 1	WB 1	WB 2	NB 1								
Volume Total	684	618	0	42								
Volume Left	136	16	0	15								
Volume Right	12	0	0	21								
cSH	975	1022	1700	166								
Volume to Capacity	0.14	0.02	0.00	0.26								
Queue Length 95th (ft)	12	1	0	24								
Control Delay (s)	3.4	0.4	0.0	33.9								
Lane LOS	A	A		D								
Approach Delay (s)	3.4	0.4		33.9								
Approach LOS				D								
Intersection Summary												
Average Delay				3.0								
Intersection Capacity Utilization				76.8%			ICU Level of Service			D		
Analysis Period (min)				15								

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis
 21: M36 & NB23 Off Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑			↑		↗
Volume (veh/h)	512	0	0	360	0	210
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	557	0	0	391	0	228
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			557		948	557
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			557		948	557
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	57
cM capacity (veh/h)			1014		289	530

Direction, Lane #	EB 1	WB 1	NE 1
Volume Total	557	391	228
Volume Left	0	0	0
Volume Right	0	0	228
cSH	1700	1700	530
Volume to Capacity	0.33	0.23	0.43
Queue Length 95th (ft)	0	0	54
Control Delay (s)	0.0	0.0	16.8
Lane LOS			C
Approach Delay (s)	0.0	0.0	16.8
Approach LOS			C

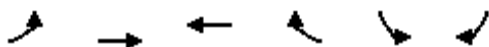
Intersection Summary			
Average Delay		3.3	
Intersection Capacity Utilization	46.6%		ICU Level of Service A
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis

25: M36 & Fieldcrest Dr

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↔		↕↕	
Volume (veh/h)	216	506	310	169	17	50
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	235	550	337	184	18	54
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	521				1173	429
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	521				1173	429
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	77				87	91
cM capacity (veh/h)	1042				143	574

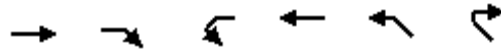
Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	418	367	521	73
Volume Left	235	0	0	18
Volume Right	0	0	184	54
cSH	1042	1700	1700	326
Volume to Capacity	0.23	0.22	0.31	0.22
Queue Length 95th (ft)	22	0	0	21
Control Delay (s)	6.4	0.0	0.0	19.2
Lane LOS	A			C
Approach Delay (s)	3.4		0.0	19.2
Approach LOS				C

Intersection Summary			
Average Delay		2.9	
Intersection Capacity Utilization		60.9%	ICU Level of Service B
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis
 36: Whitmore Lake Road & US23 Off Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑			↑	↘	
Volume (veh/h)	84	0	0	77	244	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	91	0	0	84	265	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			91		175	91
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			91		175	91
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		67	100
cM capacity (veh/h)			1504		815	966


















Direction, Lane #	EB 1	WB 1	NW 1
Volume Total	91	84	266
Volume Left	0	0	265
Volume Right	0	0	1
cSH	1700	1700	815
Volume to Capacity	0.05	0.05	0.33
Queue Length 95th (ft)	0	0	36
Control Delay (s)	0.0	0.0	11.5
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.5
Approach LOS			B

Intersection Summary			
Average Delay		7.0	
Intersection Capacity Utilization		24.7%	ICU Level of Service A
Analysis Period (min)		15	

M-36/9 Mile
2040 ATM - HOV AM

HCM Unsignalized Intersection Capacity Analysis
 16: M36 & Whitmore Lake Road

















9/17/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	536	70	90	168	4	40	14	269	117	170	67
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	583	76	98	183	4	43	15	292	127	185	73
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total (vph)	583	76	285	351	385							
Volume Left (vph)	0	0	98	43	127							
Volume Right (vph)	0	76	4	292	73							
Hadj (s)	0.03	-0.67	0.09	-0.44	-0.01							
Departure Headway (s)	8.7	7.9	9.0	8.1	8.3							
Degree Utilization, x	1.40	0.17	0.71	0.79	0.89							
Capacity (veh/h)	423	447	372	421	423							
Control Delay (s)	218.5	11.3	31.0	35.4	49.2							
Approach Delay (s)	194.6		31.0	35.4	49.2							
Approach LOS	F		D	E	E							
Intersection Summary												
Delay			100.3									
HCM Level of Service			F									
Intersection Capacity Utilization			93.4%	ICU Level of Service	F							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

17: M36 &

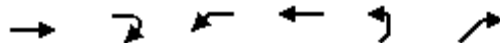
9/17/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	329	560	33	17	257	0	5	19	8	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	358	609	36	18	279	0	5	21	9	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	279			645			1658	1658	627	1677	1676	279
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	279			645			1658	1658	627	1677	1676	279
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	72			98			91	70	98	100	100	100
cM capacity (veh/h)	1283			941			60	69	484	45	67	759
Direction, Lane #	EB 1	WB 1	WB 2	NB 1								
Volume Total	1002	298	0	35								
Volume Left	358	18	0	5								
Volume Right	36	0	0	9								
cSH	1283	941	1700	85								
Volume to Capacity	0.28	0.02	0.00	0.41								
Queue Length 95th (ft)	29	2	0	41								
Control Delay (s)	5.7	0.7	0.0	73.5								
Lane LOS	A	A		F								
Approach Delay (s)	5.7	0.7		73.5								
Approach LOS				F								
Intersection Summary												
Average Delay			6.4									
Intersection Capacity Utilization			77.5%		ICU Level of Service				D			
Analysis Period (min)			15									

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis
 21: M36 & NB23 Off Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑			↑		↑
Volume (veh/h)	568	0	0	496	0	75
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	617	0	0	539	0	82
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			617		1157	617
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			617		1157	617
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	83
cM capacity (veh/h)			963		217	490

Direction, Lane #	EB 1	WB 1	NE 1
Volume Total	617	539	82
Volume Left	0	0	0
Volume Right	0	0	82
cSH	1700	1700	490
Volume to Capacity	0.36	0.32	0.17
Queue Length 95th (ft)	0	0	15
Control Delay (s)	0.0	0.0	13.8
Lane LOS			B
Approach Delay (s)	0.0	0.0	13.8
Approach LOS			B

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		41.2%	ICU Level of Service A
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis

25: M36 & Fieldcrest Dr

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↔		↕↕	
Volume (veh/h)	263	380	366	119	87	130
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	286	413	398	129	95	141
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	527				1241	462
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	527				1241	462
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	72				22	74
cM capacity (veh/h)	1036				121	546

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	424	275	527	236
Volume Left	286	0	0	95
Volume Right	0	0	129	141
cSH	1036	1700	1700	227
Volume to Capacity	0.28	0.16	0.31	1.04
Queue Length 95th (ft)	28	0	0	250
Control Delay (s)	7.6	0.0	0.0	116.6
Lane LOS	A			F
Approach Delay (s)	4.6		0.0	116.6
Approach LOS				F

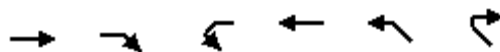
Intersection Summary			
Average Delay		21.0	
Intersection Capacity Utilization		67.5%	ICU Level of Service C
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis

36: Whitmore Lake Road & US23 Off Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑			↑	↘	
Volume (veh/h)	18	0	0	208	146	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	0	0	226	159	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			20		246	20
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			20		246	20
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		79	100
cM capacity (veh/h)			1597		743	1058



















Direction, Lane #	EB 1	WB 1	NW 1
Volume Total	20	226	159
Volume Left	0	0	159
Volume Right	0	0	0
cSH	1700	1700	743
Volume to Capacity	0.01	0.13	0.21
Queue Length 95th (ft)	0	0	20
Control Delay (s)	0.0	0.0	11.2
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.2
Approach LOS			B

Intersection Summary			
Average Delay		4.4	
Intersection Capacity Utilization	25.7%		ICU Level of Service A
Analysis Period (min)		15	

M-36/9 Mile
2040 ATM-HOV PM

HCM Unsignalized Intersection Capacity Analysis
 16: M36 & Whitmore Lake Road

















9/17/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	14	393	64	46	451	36	43	33	108	146	78	97
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	427	70	50	490	39	47	36	117	159	85	105
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1							
Volume Total (vph)	442	70	579	200	349							
Volume Left (vph)	15	0	50	47	159							
Volume Right (vph)	0	70	39	117	105							
Hadj (s)	0.05	-0.67	0.01	-0.27	-0.06							
Departure Headway (s)	8.2	7.4	8.0	8.7	8.1							
Degree Utilization, x	1.00	0.14	1.29	0.48	0.79							
Capacity (veh/h)	438	477	464	391	434							
Control Delay (s)	71.2	10.5	169.0	19.6	35.2							
Approach Delay (s)	62.9		169.0	19.6	35.2							
Approach LOS	F		F	C	E							
Intersection Summary												
Delay			89.2									
HCM Level of Service			F									
Intersection Capacity Utilization			92.1%		ICU Level of Service	F						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

17: M36 &

9/17/2014

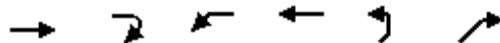
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	125	511	11	15	519	0	14	6	19	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	136	555	12	16	564	0	15	7	21	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	564			567			1430	1430	561	1454	1436	564
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	564			567			1430	1430	561	1454	1436	564
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	87			98			85	94	96	100	100	100
cM capacity (veh/h)	1007			1005			99	115	527	88	114	525
Direction, Lane #	EB 1	WB 1	WB 2	NB 1								
Volume Total	703	580	0	42								
Volume Left	136	16	0	15								
Volume Right	12	0	0	21								
cSH	1007	1005	1700	170								
Volume to Capacity	0.13	0.02	0.00	0.25								
Queue Length 95th (ft)	12	1	0	23								
Control Delay (s)	3.3	0.4	0.0	33.0								
Lane LOS	A	A		D								
Approach Delay (s)	3.3	0.4		33.0								
Approach LOS				D								
Intersection Summary												
Average Delay			3.0									
Intersection Capacity Utilization			76.0%		ICU Level of Service				D			
Analysis Period (min)			15									

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis

21: M36 & NB23 Off Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations	↑			↑		↑
Volume (veh/h)	530	0	0	360	0	226
Sign Control	Free			Free	Yield	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	576	0	0	391	0	246
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			576		967	576
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			576		967	576
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	52
cM capacity (veh/h)			997		282	517

Direction, Lane #	EB 1	WB 1	NE 1
Volume Total	576	391	246
Volume Left	0	0	0
Volume Right	0	0	246
cSH	1700	1700	517
Volume to Capacity	0.34	0.23	0.48
Queue Length 95th (ft)	0	0	63
Control Delay (s)	0.0	0.0	18.1
Lane LOS			C
Approach Delay (s)	0.0	0.0	18.1
Approach LOS			C

Intersection Summary			
Average Delay		3.7	
Intersection Capacity Utilization		48.6%	ICU Level of Service A
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis

25: M36 & Fieldcrest Dr

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	238	518	310	151	17	50
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	259	563	337	164	18	54
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	501				1218	419
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	501				1218	419
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	76				86	91
cM capacity (veh/h)	1059				131	583

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	446	375	501	73
Volume Left	259	0	0	18
Volume Right	0	0	164	54
cSH	1059	1700	1700	310
Volume to Capacity	0.24	0.22	0.29	0.23
Queue Length 95th (ft)	24	0	0	22
Control Delay (s)	6.6	0.0	0.0	20.1
Lane LOS	A			C
Approach Delay (s)	3.6		0.0	20.1
Approach LOS				C

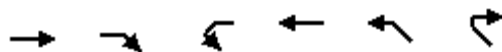
Intersection Summary			
Average Delay		3.2	
Intersection Capacity Utilization		60.8%	ICU Level of Service B
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis

36: Whitmore Lake Road & US23 Off Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑			↑	↔	
Volume (veh/h)	83	0	0	77	244	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	90	0	0	84	265	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			90		174	90
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			90		174	90
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %						
cM capacity (veh/h)						
1505						
816						
968						

Direction, Lane #	EB 1	WB 1	NW 1
Volume Total	90	84	266
Volume Left	0	0	265
Volume Right	0	0	1
cSH	1700	1700	817
Volume to Capacity	0.05	0.05	0.33
Queue Length 95th (ft)	0	0	36
Control Delay (s)	0.0	0.0	11.5
Lane LOS	B		
Approach Delay (s)	0.0	0.0	11.5
Approach LOS	B		

Intersection Summary			
Average Delay			7.0
Intersection Capacity Utilization	24.6%	ICU Level of Service	A
Analysis Period (min)			15

8 Mile
2015 Existing AM

HCM Signalized Intersection Capacity Analysis

32: 8 mile rd &

9/17/2014

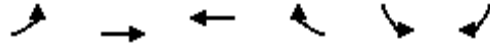


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕		↕			
Volume (vph)	52	342	0	0	52	137	49	0	24	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	12	16	12	12	12
Total Lost time (s)		6.0			6.0		6.0		6.0			
Lane Util. Factor		1.00			1.00		1.00		1.00			
Frt		1.00			0.90		1.00		0.85			
Flt Protected		0.99			1.00		0.95		1.00			
Satd. Flow (prot)		1850			1681		2006		1794			
Flt Permitted		0.93			1.00		0.95		1.00			
Satd. Flow (perm)		1739			1681		2006		1794			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	57	372	0	0	57	149	53	0	26	0	0	0
RTOR Reduction (vph)	0	0	0	0	77	0	0	0	18	0	0	0
Lane Group Flow (vph)	0	429	0	0	129	0	53	0	8	0	0	0
Turn Type	Perm					custom		custom				
Protected Phases		1			1							
Permitted Phases	1						2		2			
Actuated Green, G (s)		30.0			30.0		20.0		20.0			
Effective Green, g (s)		30.0			30.0		20.0		20.0			
Actuated g/C Ratio		0.48			0.48		0.32		0.32			
Clearance Time (s)		6.0			6.0		6.0		6.0			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		841			813		647		579			
v/s Ratio Prot					0.08							
v/s Ratio Perm		c0.25					c0.03		0.00			
v/c Ratio		0.51			0.16		0.08		0.01			
Uniform Delay, d1		11.0			8.9		14.6		14.3			
Progression Factor		1.00			1.00		1.00		1.00			
Incremental Delay, d2		2.2			0.4		0.2		0.0			
Delay (s)		13.2			9.4		14.9		14.3			
Level of Service		B			A		B		B			
Approach Delay (s)		13.2			9.4		14.7				0.0	
Approach LOS		B			A		B				A	
Intersection Summary												
HCM Average Control Delay			12.2			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.34									
Actuated Cycle Length (s)			62.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			48.7%			ICU Level of Service			A			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 37: 8 Mile Rd & US23 Off Ramp

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↘
Volume (vph)	0	933	99	0	70	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		5.6	10.6		10.0	10.0
Lane Util. Factor		1.00	1.00		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1863	1863		2006	1583
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1863	1863		2006	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1014	108	0	76	30
RTOR Reduction (vph)	0	0	0	0	0	27
Lane Group Flow (vph)	0	1014	108	0	76	3
Turn Type						Perm
Protected Phases		6 3	1		2	
Permitted Phases						2
Actuated Green, G (s)		78.0	30.1		9.6	9.6
Effective Green, g (s)		72.5	30.1		9.6	9.6
Actuated g/C Ratio		0.70	0.29		0.09	0.09
Clearance Time (s)			10.6		10.0	10.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)		1309	543		187	147
v/s Ratio Prot		c0.54	0.06		c0.04	
v/s Ratio Perm						0.00
v/c Ratio		0.77	0.20		0.41	0.02
Uniform Delay, d1		10.0	27.5		44.1	42.5
Progression Factor		0.30	1.00		1.00	1.00
Incremental Delay, d2		1.3	0.8		1.4	0.1
Delay (s)		4.3	28.3		45.6	42.6
Level of Service		A	C		D	D
Approach Delay (s)		4.3	28.3		44.7	
Approach LOS		A	C		D	

Intersection Summary			
HCM Average Control Delay	9.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	103.2	Sum of lost time (s)	21.2
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

39: 8 Mile Rd & Whitmore Lake Rd

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↑	↗	↖	↗
Volume (vph)	9	510	87	40	423	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		10.6	5.6	5.6	5.5	5.5
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1861	1863	1583	1770	1583
Flt Permitted		0.99	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1851	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	554	95	43	460	8
RTOR Reduction (vph)	0	0	0	37	0	3
Lane Group Flow (vph)	0	564	95	6	460	5
Turn Type	Perm			custom		Perm
Protected Phases		1	5 1		3	
Permitted Phases	1			5		3
Actuated Green, G (s)		30.1	54.7	14.0	37.4	37.4
Effective Green, g (s)		30.1	44.1	14.0	37.4	37.4
Actuated g/C Ratio		0.29	0.43	0.14	0.36	0.36
Clearance Time (s)		10.6		5.6	5.5	5.5
Vehicle Extension (s)		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		540	796	215	641	574
v/s Ratio Prot			c0.05		c0.26	
v/s Ratio Perm		c0.30		0.00		0.00
v/c Ratio		1.04	0.12	0.03	0.72	0.01
Uniform Delay, d1		36.5	17.8	38.7	28.3	21.0
Progression Factor		1.00	0.15	1.74	1.00	1.00
Incremental Delay, d2		50.8	0.1	0.1	3.8	0.0
Delay (s)		87.4	2.7	67.4	32.2	21.0
Level of Service		F	A	E	C	C
Approach Delay (s)		87.4	22.8		32.0	
Approach LOS		F	C		C	

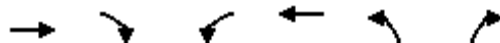
Intersection Summary

HCM Average Control Delay	57.6	HCM Level of Service	E
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	103.2	Sum of lost time (s)	21.7
Intersection Capacity Utilization	70.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

41: 8 mile rd &

9/17/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔		
Volume (veh/h)	394	609	2	99	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	428	662	2	108	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	301			867		
pX, platoon unblocked			0.31		0.31	0.31
vC, conflicting volume			1090		871	759
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			190		0	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			433		318	339

Direction, Lane #	EB 1	WB 1
Volume Total	1090	110
Volume Left	0	2
Volume Right	662	0
cSH	1700	433
Volume to Capacity	0.64	0.01
Queue Length 95th (ft)	0	0
Control Delay (s)	0.0	0.3
Lane LOS		A
Approach Delay (s)	0.0	0.3
Approach LOS		

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		

8 Mile
2015 Existing PM

HCM Signalized Intersection Capacity Analysis

32: 8 mile rd &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↗		↖		↗			
Volume (vph)	36	309	0	0	201	180	198	0	33	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	12	16	12	12	12
Total Lost time (s)		6.0			6.0		6.0		6.0			
Lane Util. Factor		1.00			1.00		1.00		1.00			
Frt		1.00			0.94		1.00		0.85			
Flt Protected		0.99			1.00		0.95		1.00			
Satd. Flow (prot)		1853			1744		2006		1794			
Flt Permitted		0.93			1.00		0.95		1.00			
Satd. Flow (perm)		1730			1744		2006		1794			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	336	0	0	218	196	215	0	36	0	0	0
RTOR Reduction (vph)	0	0	0	0	52	0	0	0	24	0	0	0
Lane Group Flow (vph)	0	375	0	0	362	0	215	0	12	0	0	0
Turn Type	Perm						custom		custom			
Protected Phases		1			1							
Permitted Phases	1						2		2			
Actuated Green, G (s)		30.0			30.0		20.0		20.0			
Effective Green, g (s)		30.0			30.0		20.0		20.0			
Actuated g/C Ratio		0.48			0.48		0.32		0.32			
Clearance Time (s)		6.0			6.0		6.0		6.0			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		837			844		647		579			
v/s Ratio Prot					0.21							
v/s Ratio Perm		c0.22					c0.11		0.01			
v/c Ratio		0.45			0.43		0.33		0.02			
Uniform Delay, d1		10.5			10.4		15.9		14.3			
Progression Factor		1.00			1.00		1.00		1.00			
Incremental Delay, d2		1.7			1.6		1.4		0.1			
Delay (s)		12.3			12.0		17.3		14.4			
Level of Service		B			B		B		B			
Approach Delay (s)		12.3			12.0			16.9			0.0	
Approach LOS		B			B			B			A	

Intersection Summary

HCM Average Control Delay	13.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	62.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

37: 8 Mile Rd & US23 Off Ramp

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↘
Volume (vph)	0	281	393	0	159	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		5.6	10.6		10.0	10.0
Lane Util. Factor		1.00	1.00		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1863	1863		2006	1583
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1863	1863		2006	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	305	427	0	173	71
RTOR Reduction (vph)	0	0	0	0	0	60
Lane Group Flow (vph)	0	305	427	0	173	11
Turn Type						Perm
Protected Phases		6 3	1		2	
Permitted Phases						2
Actuated Green, G (s)		52.4	30.2		12.6	12.6
Effective Green, g (s)		46.9	30.2		12.6	12.6
Actuated g/C Ratio		0.58	0.37		0.16	0.16
Clearance Time (s)			10.6		10.0	10.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)		1084	698		314	247
v/s Ratio Prot		c0.16	c0.23		c0.09	
v/s Ratio Perm						0.01
v/c Ratio		0.28	0.61		0.55	0.04
Uniform Delay, d1		8.4	20.4		31.4	28.9
Progression Factor		0.01	1.00		1.00	1.00
Incremental Delay, d2		0.1	4.0		2.1	0.1
Delay (s)		0.2	24.4		33.5	29.0
Level of Service		A	C		C	C
Approach Delay (s)		0.2	24.4		32.2	
Approach LOS		A	C		C	

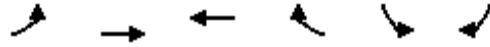
Intersection Summary

HCM Average Control Delay	18.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	80.6	Sum of lost time (s)	26.2
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 39: 8 Mile Rd & Whitmore Lake Rd

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕	↕	↕	↕
Volume (vph)	23	156	347	111	125	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		10.6	5.6	5.6	5.5	5.5
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		0.99	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1851	1863	1583	1770	1583
Flt Permitted		0.91	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1688	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	170	377	121	136	48
RTOR Reduction (vph)	0	0	0	95	0	41
Lane Group Flow (vph)	0	195	377	26	136	7
Turn Type	Perm			custom		Perm
Protected Phases		1	5 1		3	
Permitted Phases	1			5		3
Actuated Green, G (s)		30.2	57.8	17.0	11.7	11.7
Effective Green, g (s)		30.2	47.2	17.0	11.7	11.7
Actuated g/C Ratio		0.37	0.59	0.21	0.15	0.15
Clearance Time (s)		10.6		5.6	5.5	5.5
Vehicle Extension (s)		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		632	1091	334	257	230
v/s Ratio Prot			c0.20		c0.08	
v/s Ratio Perm		0.12		0.02		0.00
v/c Ratio		0.31	0.35	0.08	0.53	0.03
Uniform Delay, d1		17.8	8.7	25.5	31.9	29.6
Progression Factor		1.00	0.09	2.93	1.00	1.00
Incremental Delay, d2		1.3	0.2	0.1	2.0	0.1
Delay (s)		19.1	0.9	74.9	33.9	29.6
Level of Service		B	A	E	C	C
Approach Delay (s)		19.1	18.9		32.8	
Approach LOS		B	B		C	

Intersection Summary			
HCM Average Control Delay	21.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	80.6	Sum of lost time (s)	16.7
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

41: 8 mile rd &

9/17/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔		
Volume (veh/h)	345	95	6	393	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	375	103	7	427	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	301			867		
pX, platoon unblocked			0.92		0.94	0.92
vC, conflicting volume			478		867	427
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			388		715	331
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			1075		372	652

Direction, Lane #	EB 1	WB 1
Volume Total	478	434
Volume Left	0	7
Volume Right	103	0
cSH	1700	1075
Volume to Capacity	0.28	0.01
Queue Length 95th (ft)	0	0
Control Delay (s)	0.0	0.2
Lane LOS		A
Approach Delay (s)	0.0	0.2
Approach LOS		

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization	28.8%		ICU Level of Service A
Analysis Period (min)		15	

8 Mile
2040 No Build AM

HCM Signalized Intersection Capacity Analysis

32: 8 mile rd &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↗		↖		↗			
Volume (vph)	53	371	0	0	99	148	53	0	25	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	12	16	12	12	12
Total Lost time (s)		6.0			6.0		6.0		6.0			
Lane Util. Factor		1.00			1.00		1.00		1.00			
Frt		1.00			0.92		1.00		0.85			
Flt Protected		0.99			1.00		0.95		1.00			
Satd. Flow (prot)		1851			1712		2006		1794			
Flt Permitted		0.93			1.00		0.95		1.00			
Satd. Flow (perm)		1727			1712		2006		1794			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	403	0	0	108	161	58	0	27	0	0	0
RTOR Reduction (vph)	0	0	0	0	83	0	0	0	18	0	0	0
Lane Group Flow (vph)	0	461	0	0	186	0	58	0	9	0	0	0
Turn Type	Perm						custom		custom			
Protected Phases		1			1							
Permitted Phases	1						2		2			
Actuated Green, G (s)		30.0			30.0		20.0		20.0			
Effective Green, g (s)		30.0			30.0		20.0		20.0			
Actuated g/C Ratio		0.48			0.48		0.32		0.32			
Clearance Time (s)		6.0			6.0		6.0		6.0			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		836			828		647		579			
v/s Ratio Prot					0.11							
v/s Ratio Perm		c0.27					c0.03		0.00			
v/c Ratio		0.55			0.22		0.09		0.02			
Uniform Delay, d1		11.3			9.3		14.6		14.3			
Progression Factor		1.00			1.00		1.00		1.00			
Incremental Delay, d2		2.6			0.6		0.3		0.0			
Delay (s)		13.9			9.9		14.9		14.3			
Level of Service		B			A		B		B			
Approach Delay (s)		13.9			9.9		14.7				0.0	
Approach LOS		B			A		B				A	

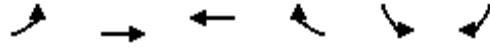
Intersection Summary

HCM Average Control Delay	12.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	62.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 37: 8 Mile Rd & US23 Off Ramp

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↘
Volume (vph)	0	1004	150	0	76	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		5.6	10.6		10.0	10.0
Lane Util. Factor		1.00	1.00		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1863	1863		2006	1583
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1863	1863		2006	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1091	163	0	83	33
RTOR Reduction (vph)	0	0	0	0	0	30
Lane Group Flow (vph)	0	1091	163	0	83	3
Turn Type						Perm
Protected Phases		6 3	1		2	
Permitted Phases						2
Actuated Green, G (s)		80.5	30.0		10.0	10.0
Effective Green, g (s)		75.0	30.0		10.0	10.0
Actuated g/C Ratio		0.71	0.28		0.09	0.09
Clearance Time (s)			10.6		10.0	10.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)		1317	527		189	149
v/s Ratio Prot		c0.59	0.09		c0.04	
v/s Ratio Perm						0.00
v/c Ratio		0.83	0.31		0.44	0.02
Uniform Delay, d1		11.0	29.9		45.4	43.6
Progression Factor		0.43	1.00		1.00	1.00
Incremental Delay, d2		1.3	1.5		1.6	0.1
Delay (s)		6.1	31.4		47.0	43.7
Level of Service		A	C		D	D
Approach Delay (s)		6.1	31.4		46.1	
Approach LOS		A	C		D	

Intersection Summary

HCM Average Control Delay	12.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	106.1	Sum of lost time (s)	21.2
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

39: 8 Mile Rd & Whitmore Lake Rd

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕	↗	↖	↖
Volume (vph)	9	549	136	44	455	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		10.6	5.6	5.6	5.5	5.5
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1861	1863	1583	1770	1583
Flt Permitted		0.99	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1850	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	597	148	48	495	8
RTOR Reduction (vph)	0	0	0	41	0	3
Lane Group Flow (vph)	0	607	148	7	495	5
Turn Type	Perm			custom		Perm
Protected Phases		1	5 1		3	
Permitted Phases	1			5		3
Actuated Green, G (s)		30.0	55.0	14.4	40.0	40.0
Effective Green, g (s)		30.0	44.4	14.4	40.0	40.0
Actuated g/C Ratio		0.28	0.42	0.14	0.38	0.38
Clearance Time (s)		10.6		5.6	5.5	5.5
Vehicle Extension (s)		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		523	780	215	667	597
v/s Ratio Prot			c0.08		c0.28	
v/s Ratio Perm		c0.33		0.00		0.00
v/c Ratio		1.16	0.19	0.03	0.74	0.01
Uniform Delay, d1		38.0	19.5	39.8	28.6	20.7
Progression Factor		1.00	0.11	1.86	1.00	1.00
Incremental Delay, d2		91.8	0.1	0.1	4.5	0.0
Delay (s)		129.9	2.4	74.3	33.0	20.7
Level of Service		F	A	E	C	C
Approach Delay (s)		129.9	20.0		32.8	
Approach LOS		F	B		C	

Intersection Summary

HCM Average Control Delay	76.0	HCM Level of Service	E
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	106.1	Sum of lost time (s)	21.7
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

41: 8 mile rd &

9/17/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔		
Volume (veh/h)	424	656	2	150	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	461	713	2	163	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	301			867		
pX, platoon unblocked			0.31		0.31	0.31
vC, conflicting volume			1174		985	817
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			436		0	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			344		312	333

Direction, Lane #	EB 1	WB 1
Volume Total	1174	165
Volume Left	0	2
Volume Right	713	0
cSH	1700	344
Volume to Capacity	0.69	0.01
Queue Length 95th (ft)	0	0
Control Delay (s)	0.0	0.3
Lane LOS		A
Approach Delay (s)	0.0	0.3
Approach LOS		

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		

8 Mile
2040 No Build PM

HCM Signalized Intersection Capacity Analysis

32: 8 mile rd &

9/17/2014



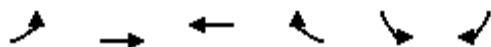
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↗		↖		↗			
Volume (vph)	79	294	0	0	216	194	213	0	34	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	12	16	12	12	12
Total Lost time (s)		6.0			6.0		6.0		6.0			
Lane Util. Factor		1.00			1.00		1.00		1.00			
Frt		1.00			0.94		1.00		0.85			
Flt Protected		0.99			1.00		0.95		1.00			
Satd. Flow (prot)		1843			1744		2006		1794			
Flt Permitted		0.81			1.00		0.95		1.00			
Satd. Flow (perm)		1512			1744		2006		1794			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	86	320	0	0	235	211	232	0	37	0	0	0
RTOR Reduction (vph)	0	0	0	0	52	0	0	0	25	0	0	0
Lane Group Flow (vph)	0	406	0	0	394	0	232	0	12	0	0	0
Turn Type	Perm						custom		custom			
Protected Phases		1			1							
Permitted Phases	1						2		2			
Actuated Green, G (s)		30.0			30.0		20.0		20.0			
Effective Green, g (s)		30.0			30.0		20.0		20.0			
Actuated g/C Ratio		0.48			0.48		0.32		0.32			
Clearance Time (s)		6.0			6.0		6.0		6.0			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		732			844		647		579			
v/s Ratio Prot					0.23							
v/s Ratio Perm		c0.27					c0.12		0.01			
v/c Ratio		0.55			0.47		0.36		0.02			
Uniform Delay, d1		11.3			10.7		16.1		14.3			
Progression Factor		1.00			1.00		1.00		1.00			
Incremental Delay, d2		3.0			1.9		1.5		0.1			
Delay (s)		14.3			12.5		17.6		14.4			
Level of Service		B			B		B		B			
Approach Delay (s)		14.3			12.5			17.2			0.0	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM Average Control Delay			14.3			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			62.0			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			68.2%			ICU Level of Service						C
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

37: 8 Mile Rd & US23 Off Ramp

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↗
Volume (vph)	0	303	423	0	172	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		5.6	10.6		10.0	10.0
Lane Util. Factor		1.00	1.00		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1863	1863		2006	1583
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1863	1863		2006	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	329	460	0	187	76
RTOR Reduction (vph)	0	0	0	0	0	64
Lane Group Flow (vph)	0	329	460	0	187	12
Turn Type						Perm
Protected Phases		6 3	1		2	
Permitted Phases						2
Actuated Green, G (s)		53.2	30.2		13.3	13.3
Effective Green, g (s)		47.7	30.2		13.3	13.3
Actuated g/C Ratio		0.58	0.37		0.16	0.16
Clearance Time (s)			10.6		10.0	10.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)		1082	685		325	256
v/s Ratio Prot		c0.18	c0.25		c0.09	
v/s Ratio Perm						0.01
v/c Ratio		0.30	0.67		0.58	0.05
Uniform Delay, d1		8.8	21.8		31.8	29.1
Progression Factor		0.01	1.00		1.00	1.00
Incremental Delay, d2		0.2	5.2		2.5	0.1
Delay (s)		0.2	27.0		34.3	29.1
Level of Service		A	C		C	C
Approach Delay (s)		0.2	27.0		32.8	
Approach LOS		A	C		C	

Intersection Summary

HCM Average Control Delay	20.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	82.1	Sum of lost time (s)	26.2
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 39: 8 Mile Rd & Whitmore Lake Rd

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕	↕	↕	↕
Volume (vph)	25	168	373	120	135	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		10.6	5.6	5.6	5.5	5.5
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		0.99	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1851	1863	1583	1770	1583
Flt Permitted		0.90	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1675	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	183	405	130	147	52
RTOR Reduction (vph)	0	0	0	102	0	44
Lane Group Flow (vph)	0	210	405	28	147	8
Turn Type	Perm			custom		Perm
Protected Phases		1	5 1		3	
Permitted Phases	1			5		3
Actuated Green, G (s)		30.2	58.5	17.7	12.5	12.5
Effective Green, g (s)		30.2	47.9	17.7	12.5	12.5
Actuated g/C Ratio		0.37	0.58	0.22	0.15	0.15
Clearance Time (s)		10.6		5.6	5.5	5.5
Vehicle Extension (s)		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		616	1087	341	269	241
v/s Ratio Prot			c0.22		c0.08	
v/s Ratio Perm		0.13		0.02		0.01
v/c Ratio		0.34	0.37	0.08	0.55	0.03
Uniform Delay, d1		18.8	9.1	25.7	32.2	29.6
Progression Factor		1.00	0.08	2.96	1.00	1.00
Incremental Delay, d2		1.5	0.2	0.1	2.3	0.1
Delay (s)		20.3	0.9	76.1	34.4	29.7
Level of Service		C	A	E	C	C
Approach Delay (s)		20.3	19.2		33.2	
Approach LOS		C	B		C	

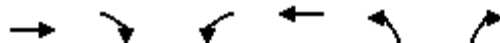
Intersection Summary

HCM Average Control Delay	22.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	82.1	Sum of lost time (s)	16.7
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

41: 8 mile rd &

9/17/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔		
Volume (veh/h)	373	102	6	423	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	405	111	7	460	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)	301			867		
pX, platoon unblocked			0.91		0.94	0.91
vC, conflicting volume			516		934	461
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			419		753	358
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			1037		352	625

Direction, Lane #	EB 1	WB 1
Volume Total	516	466
Volume Left	0	7
Volume Right	111	0
cSH	1700	1037
Volume to Capacity	0.30	0.01
Queue Length 95th (ft)	0	0
Control Delay (s)	0.0	0.2
Lane LOS		A
Approach Delay (s)	0.0	0.2
Approach LOS		

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization	30.4%	ICU Level of Service	A
Analysis Period (min)	15		

8 Mile
2040 ATM AM

HCM Signalized Intersection Capacity Analysis

32: 8 mile rd &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↗		↖		↗			
Volume (vph)	53	371	0	0	98	148	53	0	25	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	12	16	12	12	12
Total Lost time (s)		6.0			6.0		6.0		6.0			
Lane Util. Factor		1.00			1.00		1.00		1.00			
Frt		1.00			0.92		1.00		0.85			
Flt Protected		0.99			1.00		0.95		1.00			
Satd. Flow (prot)		1851			1712		2006		1794			
Flt Permitted		0.93			1.00		0.95		1.00			
Satd. Flow (perm)		1727			1712		2006		1794			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	403	0	0	107	161	58	0	27	0	0	0
RTOR Reduction (vph)	0	0	0	0	83	0	0	0	18	0	0	0
Lane Group Flow (vph)	0	461	0	0	185	0	58	0	9	0	0	0
Turn Type	Perm						custom		custom			
Protected Phases		1			1							
Permitted Phases	1						2		2			
Actuated Green, G (s)		30.0			30.0		20.0		20.0			
Effective Green, g (s)		30.0			30.0		20.0		20.0			
Actuated g/C Ratio		0.48			0.48		0.32		0.32			
Clearance Time (s)		6.0			6.0		6.0		6.0			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		836			828		647		579			
v/s Ratio Prot					0.11							
v/s Ratio Perm		c0.27					c0.03		0.00			
v/c Ratio		0.55			0.22		0.09		0.02			
Uniform Delay, d1		11.3			9.3		14.6		14.3			
Progression Factor		1.00			1.00		1.00		1.00			
Incremental Delay, d2		2.6			0.6		0.3		0.0			
Delay (s)		13.9			9.9		14.9		14.3			
Level of Service		B			A		B		B			
Approach Delay (s)		13.9			9.9		14.7				0.0	
Approach LOS		B			A		B				A	

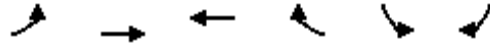
Intersection Summary

HCM Average Control Delay	12.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	62.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 37: 8 Mile Rd & US23 Off Ramp

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↗
Volume (vph)	0	984	150	0	76	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		5.6	10.6		10.0	10.0
Lane Util. Factor		1.00	1.00		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1863	1863		2006	1583
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1863	1863		2006	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1070	163	0	83	33
RTOR Reduction (vph)	0	0	0	0	0	30
Lane Group Flow (vph)	0	1070	163	0	83	3
Turn Type						Perm
Protected Phases		6 3	1		2	
Permitted Phases						2
Actuated Green, G (s)		73.2	32.5		8.9	8.9
Effective Green, g (s)		67.7	32.5		8.9	8.9
Actuated g/C Ratio		0.69	0.33		0.09	0.09
Clearance Time (s)			10.6		10.0	10.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)		1291	620		183	144
v/s Ratio Prot		c0.57	0.09		c0.04	
v/s Ratio Perm						0.00
v/c Ratio		0.83	0.26		0.45	0.02
Uniform Delay, d1		10.8	23.8		42.1	40.4
Progression Factor		0.15	1.00		1.00	1.00
Incremental Delay, d2		1.8	1.0		1.8	0.1
Delay (s)		3.4	24.9		43.9	40.5
Level of Service		A	C		D	D
Approach Delay (s)		3.4	24.9		42.9	
Approach LOS		A	C		D	

Intersection Summary

HCM Average Control Delay	9.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	97.7	Sum of lost time (s)	21.2
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

39: 8 Mile Rd & Whitmore Lake Rd

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕	↗	↖	↗
Volume (vph)	9	538	136	44	446	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		10.6	5.6	5.6	5.5	5.5
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1861	1863	1583	1770	1583
Flt Permitted		0.99	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1851	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	585	148	48	485	8
RTOR Reduction (vph)	0	0	0	41	0	5
Lane Group Flow (vph)	0	595	148	7	485	3
Turn Type	Perm			custom		Perm
Protected Phases		1	5		3	
Permitted Phases	1			5		3
Actuated Green, G (s)		32.5	56.4	13.3	30.2	30.2
Effective Green, g (s)		32.5	45.8	13.3	30.2	30.2
Actuated g/C Ratio		0.33	0.47	0.14	0.31	0.31
Clearance Time (s)		10.6		5.6	5.5	5.5
Vehicle Extension (s)		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		616	873	215	547	489
v/s Ratio Prot			c0.08		c0.27	
v/s Ratio Perm		c0.32		0.00		0.00
v/c Ratio		0.97	0.17	0.03	0.89	0.01
Uniform Delay, d1		32.1	15.0	36.6	32.1	23.4
Progression Factor		1.00	0.11	1.95	1.00	1.00
Incremental Delay, d2		28.8	0.1	0.1	15.9	0.0
Delay (s)		60.8	1.7	71.6	48.0	23.4
Level of Service		E	A	E	D	C
Approach Delay (s)		60.8	18.8		47.6	
Approach LOS		E	B		D	

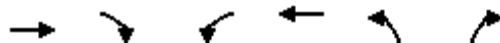
Intersection Summary

HCM Average Control Delay	49.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	97.7	Sum of lost time (s)	21.7
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

41: 8 mile rd &

9/17/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←		
Volume (veh/h)	424	636	1	150	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	461	691	1	163	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)	301			867		
pX, platoon unblocked			0.32		0.32	0.32
vC, conflicting volume			1152		972	807
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			420		0	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			367		329	350

Direction, Lane #	EB 1	WB 1
Volume Total	1152	164
Volume Left	0	1
Volume Right	691	0
cSH	1700	367
Volume to Capacity	0.68	0.00
Queue Length 95th (ft)	0	0
Control Delay (s)	0.0	0.1
Lane LOS		A
Approach Delay (s)	0.0	0.1
Approach LOS		

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		

8 Mile Road
2040 No Build TSM

HCM Signalized Intersection Capacity Analysis

32: 8 mile rd &

9/18/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↗		↖		↗			
Volume (vph)	53	371	0	0	99	148	53	0	25	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	12	16	12	12	12
Total Lost time (s)		6.0			6.0		6.0		6.0			
Lane Util. Factor		1.00			1.00		1.00		1.00			
Frt		1.00			0.92		1.00		0.85			
Flt Protected		0.99			1.00		0.95		1.00			
Satd. Flow (prot)		1851			1712		2006		1794			
Flt Permitted		0.93			1.00		0.95		1.00			
Satd. Flow (perm)		1727			1712		2006		1794			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	403	0	0	108	161	58	0	27	0	0	0
RTOR Reduction (vph)	0	0	0	0	84	0	0	0	19	0	0	0
Lane Group Flow (vph)	0	461	0	0	185	0	58	0	8	0	0	0
Turn Type	Perm						custom		custom			
Protected Phases		1			1							
Permitted Phases	1						2		2			
Actuated Green, G (s)		24.0			24.0		14.0		14.0			
Effective Green, g (s)		24.0			24.0		14.0		14.0			
Actuated g/C Ratio		0.48			0.48		0.28		0.28			
Clearance Time (s)		6.0			6.0		6.0		6.0			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		829			822		562		502			
v/s Ratio Prot					0.11							
v/s Ratio Perm		c0.27					c0.03		0.00			
v/c Ratio		0.56			0.23		0.10		0.02			
Uniform Delay, d1		9.2			7.6		13.3		13.0			
Progression Factor		1.00			1.00		1.00		1.00			
Incremental Delay, d2		2.7			0.6		0.4		0.1			
Delay (s)		11.9			8.2		13.7		13.1			
Level of Service		B			A		B		B			
Approach Delay (s)		11.9			8.2		13.5				0.0	
Approach LOS		B			A		B				A	

Intersection Summary

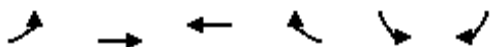
HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

37: 8 Mile Rd & US23 Off Ramp

9/18/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↘
Volume (vph)	0	1004	150	0	76	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		5.6	10.6		10.0	10.0
Lane Util. Factor		1.00	1.00		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1863	1863		2006	1583
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1863	1863		2006	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1091	163	0	83	33
RTOR Reduction (vph)	0	0	0	0	0	31
Lane Group Flow (vph)	0	1091	163	0	83	2
Turn Type						Perm
Protected Phases		6 3	1		2	
Permitted Phases						2
Actuated Green, G (s)		68.9	31.4		5.0	5.0
Effective Green, g (s)		63.4	31.4		5.0	5.0
Actuated g/C Ratio		0.71	0.35		0.06	0.06
Clearance Time (s)			10.6		10.0	10.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)		1320	654		112	88
v/s Ratio Prot		c0.59	0.09		c0.04	
v/s Ratio Perm						0.00
v/c Ratio		0.83	0.25		0.74	0.02
Uniform Delay, d1		9.2	20.7		41.6	39.9
Progression Factor		0.11	1.00		1.00	1.00
Incremental Delay, d2		1.7	0.9		22.9	0.1
Delay (s)		2.7	21.6		64.5	40.0
Level of Service		A	C		E	D
Approach Delay (s)		2.7	21.6		57.6	
Approach LOS		A	C		E	

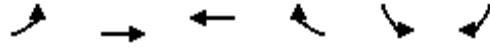
Intersection Summary

HCM Average Control Delay	9.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	89.5	Sum of lost time (s)	21.2
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 39: 8 Mile Rd & Whitmore Lake Rd

9/18/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕	↗	↖	↗
Volume (vph)	9	549	136	44	455	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		10.6	5.6	5.6	5.5	5.5
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1861	1863	1583	1770	1583
Flt Permitted		0.99	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1851	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	597	148	48	495	8
RTOR Reduction (vph)	0	0	0	43	0	5
Lane Group Flow (vph)	0	607	148	5	495	3
Turn Type	Perm			custom		Perm
Protected Phases		1	5		3	
Permitted Phases	1			5		3
Actuated Green, G (s)		31.4	51.4	9.4	27.0	27.0
Effective Green, g (s)		31.4	40.8	9.4	27.0	27.0
Actuated g/C Ratio		0.35	0.46	0.11	0.30	0.30
Clearance Time (s)		10.6		5.6	5.5	5.5
Vehicle Extension (s)		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		649	849	166	534	478
v/s Ratio Prot			c0.08		c0.28	
v/s Ratio Perm		c0.33		0.00		0.00
v/c Ratio		0.94	0.17	0.03	0.93	0.01
Uniform Delay, d1		28.1	14.4	36.0	30.3	21.9
Progression Factor		1.00	0.11	1.81	1.00	1.00
Incremental Delay, d2		22.6	0.1	0.1	22.2	0.0
Delay (s)		50.6	1.7	65.3	52.5	21.9
Level of Service		D	A	E	D	C
Approach Delay (s)		50.6	17.2		52.1	
Approach LOS		D	B		D	

Intersection Summary

HCM Average Control Delay	46.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	89.5	Sum of lost time (s)	21.7
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

41: 8 mile rd &

9/18/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔		
Volume (veh/h)	424	656	2	150	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	461	713	2	163	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	301			867		
pX, platoon unblocked			0.31		0.31	0.31
vC, conflicting volume			1174		985	817
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			440		0	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			345		313	334

Direction, Lane #	EB 1	WB 1
Volume Total	1174	165
Volume Left	0	2
Volume Right	713	0
cSH	1700	345
Volume to Capacity	0.69	0.01
Queue Length 95th (ft)	0	0
Control Delay (s)	0.0	0.3
Lane LOS		A
Approach Delay (s)	0.0	0.3
Approach LOS		

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis

32: 8 mile rd &

9/18/2014



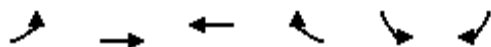
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↗		↖		↗			
Volume (vph)	79	294	0	0	216	194	213	0	34	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	12	16	12	12	12
Total Lost time (s)		6.0			6.0		6.0		6.0			
Lane Util. Factor		1.00			1.00		1.00		1.00			
Frt		1.00			0.94		1.00		0.85			
Flt Protected		0.99			1.00		0.95		1.00			
Satd. Flow (prot)		1843			1744		2006		1794			
Flt Permitted		0.81			1.00		0.95		1.00			
Satd. Flow (perm)		1512			1744		2006		1794			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	86	320	0	0	235	211	232	0	37	0	0	0
RTOR Reduction (vph)	0	0	0	0	52	0	0	0	25	0	0	0
Lane Group Flow (vph)	0	406	0	0	394	0	232	0	12	0	0	0
Turn Type	Perm						custom		custom			
Protected Phases		1			1							
Permitted Phases	1						2		2			
Actuated Green, G (s)		30.0			30.0		20.0		20.0			
Effective Green, g (s)		30.0			30.0		20.0		20.0			
Actuated g/C Ratio		0.48			0.48		0.32		0.32			
Clearance Time (s)		6.0			6.0		6.0		6.0			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		732			844		647		579			
v/s Ratio Prot					0.23							
v/s Ratio Perm		c0.27					c0.12		0.01			
v/c Ratio		0.55			0.47		0.36		0.02			
Uniform Delay, d1		11.3			10.7		16.1		14.3			
Progression Factor		1.00			1.00		1.00		1.00			
Incremental Delay, d2		3.0			1.9		1.5		0.1			
Delay (s)		14.3			12.5		17.6		14.4			
Level of Service		B			B		B		B			
Approach Delay (s)		14.3			12.5		17.2				0.0	
Approach LOS		B			B		B				A	
Intersection Summary												
HCM Average Control Delay			14.3			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			62.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			68.2%			ICU Level of Service			C			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

37: 8 Mile Rd & US23 Off Ramp

9/18/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↗
Volume (vph)	0	303	423	0	172	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		5.6	10.6		10.0	10.0
Lane Util. Factor		1.00	1.00		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1863	1863		2006	1583
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1863	1863		2006	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	329	460	0	187	76
RTOR Reduction (vph)	0	0	0	0	0	65
Lane Group Flow (vph)	0	329	460	0	187	11
Turn Type						Perm
Protected Phases		6 3	1		2	
Permitted Phases						2
Actuated Green, G (s)		46.8	24.5		10.8	10.8
Effective Green, g (s)		41.3	24.5		10.8	10.8
Actuated g/C Ratio		0.56	0.33		0.15	0.15
Clearance Time (s)			10.6		10.0	10.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)		1051	624		296	234
v/s Ratio Prot		c0.18	c0.25		c0.09	
v/s Ratio Perm						0.01
v/c Ratio		0.31	0.74		0.63	0.05
Uniform Delay, d1		8.4	21.5		29.3	26.8
Progression Factor		0.01	1.00		1.00	1.00
Incremental Delay, d2		0.2	7.6		4.4	0.1
Delay (s)		0.2	29.1		33.7	26.9
Level of Service		A	C		C	C
Approach Delay (s)		0.2	29.1		31.7	
Approach LOS		A	C		C	

Intersection Summary

HCM Average Control Delay	20.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	73.2	Sum of lost time (s)	26.2
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

39: 8 Mile Rd & Whitmore Lake Rd

9/18/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕	↕	↕	↕
Volume (vph)	25	168	373	120	135	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		10.6	5.6	5.6	5.5	5.5
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		0.99	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1851	1863	1583	1770	1583
Flt Permitted		0.85	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1585	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	183	405	130	147	52
RTOR Reduction (vph)	0	0	0	103	0	44
Lane Group Flow (vph)	0	210	405	27	147	8
Turn Type	Perm			custom		Perm
Protected Phases		1	5 1		3	
Permitted Phases	1			5		3
Actuated Green, G (s)		24.5	50.3	15.2	11.8	11.8
Effective Green, g (s)		24.5	39.7	15.2	11.8	11.8
Actuated g/C Ratio		0.33	0.54	0.21	0.16	0.16
Clearance Time (s)		10.6		5.6	5.5	5.5
Vehicle Extension (s)		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		530	1010	329	285	255
v/s Ratio Prot			c0.22		c0.08	
v/s Ratio Perm		0.13		0.02		0.01
v/c Ratio		0.40	0.40	0.08	0.52	0.03
Uniform Delay, d1		18.7	9.8	23.4	28.1	25.9
Progression Factor		1.00	0.08	2.61	1.00	1.00
Incremental Delay, d2		2.2	0.2	0.1	1.6	0.1
Delay (s)		20.9	1.0	61.0	29.7	25.9
Level of Service		C	A	E	C	C
Approach Delay (s)		20.9	15.6		28.7	
Approach LOS		C	B		C	

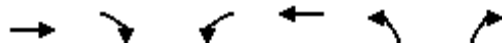
Intersection Summary

HCM Average Control Delay	19.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	73.2	Sum of lost time (s)	16.7
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

41: 8 mile rd &

9/18/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔		
Volume (veh/h)	373	102	6	423	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	405	111	7	460	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)	301			867		
pX, platoon unblocked			0.91		0.94	0.91
vC, conflicting volume			516		934	461
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			415		751	353
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			1037		352	626

Direction, Lane #	EB 1	WB 1
Volume Total	516	466
Volume Left	0	7
Volume Right	111	0
cSH	1700	1037
Volume to Capacity	0.30	0.01
Queue Length 95th (ft)	0	0
Control Delay (s)	0.0	0.2
Lane LOS		A
Approach Delay (s)	0.0	0.2
Approach LOS		

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization	30.4%	ICU Level of Service	A
Analysis Period (min)	15		

8 Mile
2040 ATM PM

HCM Signalized Intersection Capacity Analysis

32: 8 mile rd &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕		↕			
Volume (vph)	79	294	0	0	216	194	222	0	35	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	12	16	12	12	12
Total Lost time (s)		6.0			6.0		6.0		6.0			
Lane Util. Factor		1.00			1.00		1.00		1.00			
Frt		1.00			0.94		1.00		0.85			
Flt Protected		0.99			1.00		0.95		1.00			
Satd. Flow (prot)		1843			1744		2006		1794			
Flt Permitted		0.81			1.00		0.95		1.00			
Satd. Flow (perm)		1512			1744		2006		1794			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	86	320	0	0	235	211	241	0	38	0	0	0
RTOR Reduction (vph)	0	0	0	0	52	0	0	0	26	0	0	0
Lane Group Flow (vph)	0	406	0	0	394	0	241	0	12	0	0	0
Turn Type	Perm						custom		custom			
Protected Phases		1			1							
Permitted Phases	1						2		2			
Actuated Green, G (s)		30.0			30.0		20.0		20.0			
Effective Green, g (s)		30.0			30.0		20.0		20.0			
Actuated g/C Ratio		0.48			0.48		0.32		0.32			
Clearance Time (s)		6.0			6.0		6.0		6.0			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		732			844		647		579			
v/s Ratio Prot					0.23							
v/s Ratio Perm		c0.27					c0.12		0.01			
v/c Ratio		0.55			0.47		0.37		0.02			
Uniform Delay, d1		11.3			10.7		16.2		14.3			
Progression Factor		1.00			1.00		1.00		1.00			
Incremental Delay, d2		3.0			1.9		1.6		0.1			
Delay (s)		14.3			12.5		17.8		14.4			
Level of Service		B			B		B		B			
Approach Delay (s)		14.3			12.5			17.3			0.0	
Approach LOS		B			B			B			A	

Intersection Summary

HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	62.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

37: 8 Mile Rd & US23 Off Ramp

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↗
Volume (vph)	0	303	432	0	172	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		5.6	10.6		10.0	10.0
Lane Util. Factor		1.00	1.00		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1863	1863		2006	1583
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1863	1863		2006	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	329	470	0	187	76
RTOR Reduction (vph)	0	0	0	0	0	65
Lane Group Flow (vph)	0	329	470	0	187	11
Turn Type						Perm
Protected Phases		6 3	1		2	
Permitted Phases						2
Actuated Green, G (s)		46.8	24.5		10.8	10.8
Effective Green, g (s)		41.3	24.5		10.8	10.8
Actuated g/C Ratio		0.56	0.33		0.15	0.15
Clearance Time (s)			10.6		10.0	10.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)		1051	624		296	234
v/s Ratio Prot		c0.18	c0.25		c0.09	
v/s Ratio Perm						0.01
v/c Ratio		0.31	0.75		0.63	0.05
Uniform Delay, d1		8.4	21.7		29.3	26.8
Progression Factor		0.01	1.00		1.00	1.00
Incremental Delay, d2		0.2	8.2		4.4	0.1
Delay (s)		0.2	29.9		33.7	26.9
Level of Service		A	C		C	C
Approach Delay (s)		0.2	29.9		31.7	
Approach LOS		A	C		C	

Intersection Summary

HCM Average Control Delay	21.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	73.2	Sum of lost time (s)	26.2
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

39: 8 Mile Rd & Whitmore Lake Rd

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↑	↗	↖	↗
Volume (vph)	25	168	380	122	135	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		10.6	5.6	5.6	5.5	5.5
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		0.99	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1851	1863	1583	1770	1583
Flt Permitted		0.84	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1566	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	183	413	133	147	52
RTOR Reduction (vph)	0	0	0	105	0	44
Lane Group Flow (vph)	0	210	413	28	147	8
Turn Type	Perm			custom		Perm
Protected Phases		1	5 1		3	
Permitted Phases	1			5		3
Actuated Green, G (s)		24.5	50.3	15.2	11.8	11.8
Effective Green, g (s)		24.5	39.7	15.2	11.8	11.8
Actuated g/C Ratio		0.33	0.54	0.21	0.16	0.16
Clearance Time (s)		10.6		5.6	5.5	5.5
Vehicle Extension (s)		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		524	1010	329	285	255
v/s Ratio Prot			c0.22		c0.08	
v/s Ratio Perm		0.13		0.02		0.01
v/c Ratio		0.40	0.41	0.08	0.52	0.03
Uniform Delay, d1		18.7	9.9	23.4	28.1	25.9
Progression Factor		1.00	0.08	2.63	1.00	1.00
Incremental Delay, d2		2.3	0.2	0.1	1.6	0.1
Delay (s)		21.0	1.0	61.5	29.7	25.9
Level of Service		C	A	E	C	C
Approach Delay (s)		21.0	15.7		28.7	
Approach LOS		C	B		C	

Intersection Summary

HCM Average Control Delay	19.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	73.2	Sum of lost time (s)	16.7
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

41: 8 mile rd &

9/17/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔		
Volume (veh/h)	373	102	6	432	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	405	111	7	470	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)	301			867		
pX, platoon unblocked			0.91		0.94	0.91
vC, conflicting volume			516		943	461
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			415		748	353
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			1037		355	626

Direction, Lane #	EB 1	WB 1
Volume Total	516	476
Volume Left	0	7
Volume Right	111	0
cSH	1700	1037
Volume to Capacity	0.30	0.01
Queue Length 95th (ft)	0	0
Control Delay (s)	0.0	0.2
Lane LOS		A
Approach Delay (s)	0.0	0.2
Approach LOS		

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization	30.9%	ICU Level of Service	A
Analysis Period (min)	15		

8 Mile
2040 ATM-HOV AM

HCM Signalized Intersection Capacity Analysis

32: 8 mile rd &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↗		↖		↗			
Volume (vph)	53	371	0	0	99	148	53	0	25	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	12	16	12	12	12
Total Lost time (s)		6.0			6.0		6.0		6.0			
Lane Util. Factor		1.00			1.00		1.00		1.00			
Frt		1.00			0.92		1.00		0.85			
Flt Protected		0.99			1.00		0.95		1.00			
Satd. Flow (prot)		1851			1712		2006		1794			
Flt Permitted		0.93			1.00		0.95		1.00			
Satd. Flow (perm)		1727			1712		2006		1794			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	403	0	0	108	161	58	0	27	0	0	0
RTOR Reduction (vph)	0	0	0	0	83	0	0	0	18	0	0	0
Lane Group Flow (vph)	0	461	0	0	186	0	58	0	9	0	0	0
Turn Type	Perm						custom		custom			
Protected Phases		1			1							
Permitted Phases	1						2		2			
Actuated Green, G (s)		30.0			30.0		20.0		20.0			
Effective Green, g (s)		30.0			30.0		20.0		20.0			
Actuated g/C Ratio		0.48			0.48		0.32		0.32			
Clearance Time (s)		6.0			6.0		6.0		6.0			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		836			828		647		579			
v/s Ratio Prot					0.11							
v/s Ratio Perm		c0.27					c0.03		0.00			
v/c Ratio		0.55			0.22		0.09		0.02			
Uniform Delay, d1		11.3			9.3		14.6		14.3			
Progression Factor		1.00			1.00		1.00		1.00			
Incremental Delay, d2		2.6			0.6		0.3		0.0			
Delay (s)		13.9			9.9		14.9		14.3			
Level of Service		B			A		B		B			
Approach Delay (s)		13.9			9.9		14.7				0.0	
Approach LOS		B			A		B				A	

Intersection Summary

HCM Average Control Delay	12.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	62.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

37: 8 Mile Rd & US23 Off Ramp

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↗
Volume (vph)	0	971	150	0	76	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		5.6	10.6		10.0	10.0
Lane Util. Factor		1.00	1.00		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1863	1863		2006	1583
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1863	1863		2006	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1055	163	0	83	33
RTOR Reduction (vph)	0	0	0	0	0	30
Lane Group Flow (vph)	0	1055	163	0	83	3
Turn Type						Perm
Protected Phases		6 3	1		2	
Permitted Phases						2
Actuated Green, G (s)		73.1	32.5		8.9	8.9
Effective Green, g (s)		67.6	32.5		8.9	8.9
Actuated g/C Ratio		0.69	0.33		0.09	0.09
Clearance Time (s)			10.6		10.0	10.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)		1290	620		183	144
v/s Ratio Prot		c0.57	0.09		c0.04	
v/s Ratio Perm						0.00
v/c Ratio		0.82	0.26		0.45	0.02
Uniform Delay, d1		10.6	23.8		42.0	40.4
Progression Factor		0.13	1.00		1.00	1.00
Incremental Delay, d2		1.8	1.0		1.8	0.1
Delay (s)		3.1	24.8		43.8	40.4
Level of Service		A	C		D	D
Approach Delay (s)		3.1	24.8		42.9	
Approach LOS		A	C		D	

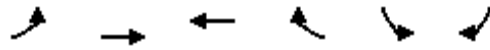
Intersection Summary

HCM Average Control Delay	9.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	97.6	Sum of lost time (s)	21.2
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
 39: 8 Mile Rd & Whitmore Lake Rd

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↑	↗	↖	↗
Volume (vph)	9	531	136	44	440	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		10.6	5.6	5.6	5.5	5.5
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1861	1863	1583	1770	1583
Flt Permitted		0.99	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1850	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	577	148	48	478	8
RTOR Reduction (vph)	0	0	0	41	0	5
Lane Group Flow (vph)	0	587	148	7	478	3
Turn Type	Perm		custom		Perm	
Protected Phases		1	5 1		3	
Permitted Phases	1			5		3
Actuated Green, G (s)		32.5	56.4	13.3	30.1	30.1
Effective Green, g (s)		32.5	45.8	13.3	30.1	30.1
Actuated g/C Ratio		0.33	0.47	0.14	0.31	0.31
Clearance Time (s)		10.6		5.6	5.5	5.5
Vehicle Extension (s)		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		616	874	216	546	488
v/s Ratio Prot			c0.08		c0.27	
v/s Ratio Perm		c0.32		0.00		0.00
v/c Ratio		0.95	0.17	0.03	0.88	0.01
Uniform Delay, d1		31.8	14.9	36.6	32.0	23.4
Progression Factor		1.00	0.11	1.95	1.00	1.00
Incremental Delay, d2		26.4	0.1	0.1	14.6	0.0
Delay (s)		58.2	1.7	71.5	46.5	23.4
Level of Service		E	A	E	D	C
Approach Delay (s)		58.2	18.8		46.2	
Approach LOS		E	B		D	

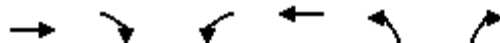
Intersection Summary

HCM Average Control Delay	47.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	97.6	Sum of lost time (s)	21.7
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

41: 8 mile rd &

9/17/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←		
Volume (veh/h)	424	623	2	150	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	461	677	2	163	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)	301			867		
pX, platoon unblocked			0.32		0.32	0.32
vC, conflicting volume			1138		967	799
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			378		0	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			381		328	350

Direction, Lane #	EB 1	WB 1
Volume Total	1138	165
Volume Left	0	2
Volume Right	677	0
cSH	1700	381
Volume to Capacity	0.67	0.01
Queue Length 95th (ft)	0	0
Control Delay (s)	0.0	0.3
Lane LOS		A
Approach Delay (s)	0.0	0.3
Approach LOS		

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		

8 Mile
2040 ATM-HOV PM

HCM Signalized Intersection Capacity Analysis

32: 8 mile rd &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖			↗		↖		↗			
Volume (vph)	79	294	0	0	216	194	217	0	35	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	12	16	12	12	12
Total Lost time (s)		6.0			6.0		6.0		6.0			
Lane Util. Factor		1.00			1.00		1.00		1.00			
Frt		1.00			0.94		1.00		0.85			
Flt Protected		0.99			1.00		0.95		1.00			
Satd. Flow (prot)		1843			1744		2006		1794			
Flt Permitted		0.81			1.00		0.95		1.00			
Satd. Flow (perm)		1512			1744		2006		1794			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	86	320	0	0	235	211	236	0	38	0	0	0
RTOR Reduction (vph)	0	0	0	0	52	0	0	0	26	0	0	0
Lane Group Flow (vph)	0	406	0	0	394	0	236	0	12	0	0	0
Turn Type	Perm						custom		custom			
Protected Phases		1			1							
Permitted Phases	1						2		2			
Actuated Green, G (s)		30.0			30.0		20.0		20.0			
Effective Green, g (s)		30.0			30.0		20.0		20.0			
Actuated g/C Ratio		0.48			0.48		0.32		0.32			
Clearance Time (s)		6.0			6.0		6.0		6.0			
Vehicle Extension (s)		3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)		732			844		647		579			
v/s Ratio Prot					0.23							
v/s Ratio Perm		c0.27					c0.12		0.01			
v/c Ratio		0.55			0.47		0.36		0.02			
Uniform Delay, d1		11.3			10.7		16.1		14.3			
Progression Factor		1.00			1.00		1.00		1.00			
Incremental Delay, d2		3.0			1.9		1.6		0.1			
Delay (s)		14.3			12.5		17.7		14.4			
Level of Service		B			B		B		B			
Approach Delay (s)		14.3			12.5			17.3			0.0	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM Average Control Delay			14.3			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			62.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			68.4%			ICU Level of Service			C			
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

37: 8 Mile Rd & US23 Off Ramp

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↗
Volume (vph)	0	303	426	0	172	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	16	12
Total Lost time (s)		5.6	10.6		10.0	10.0
Lane Util. Factor		1.00	1.00		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		1863	1863		2006	1583
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		1863	1863		2006	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	329	463	0	187	76
RTOR Reduction (vph)	0	0	0	0	0	66
Lane Group Flow (vph)	0	329	463	0	187	10
Turn Type						Perm
Protected Phases		6 3	1		2	
Permitted Phases						2
Actuated Green, G (s)		49.5	27.5		10.4	10.4
Effective Green, g (s)		44.0	27.5		10.4	10.4
Actuated g/C Ratio		0.58	0.36		0.14	0.14
Clearance Time (s)			10.6		10.0	10.0
Vehicle Extension (s)			3.0		3.0	3.0
Lane Grp Cap (vph)		1086	679		276	218
v/s Ratio Prot		c0.18	c0.25		c0.09	
v/s Ratio Perm						0.01
v/c Ratio		0.30	0.68		0.68	0.05
Uniform Delay, d1		8.0	20.3		31.0	28.3
Progression Factor		0.01	1.00		1.00	1.00
Incremental Delay, d2		0.1	5.5		6.5	0.1
Delay (s)		0.2	25.8		37.4	28.3
Level of Service		A	C		D	C
Approach Delay (s)		0.2	25.8		34.8	
Approach LOS		A	C		C	

Intersection Summary

HCM Average Control Delay	20.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	75.5	Sum of lost time (s)	26.2
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

39: 8 Mile Rd & Whitmore Lake Rd

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕	↗	↖	↗
Volume (vph)	25	168	375	121	135	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		10.6	5.6	5.6	5.5	5.5
Lane Util. Factor		1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		0.99	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1851	1863	1583	1770	1583
Flt Permitted		0.90	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1670	1863	1583	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	183	408	132	147	52
RTOR Reduction (vph)	0	0	0	106	0	44
Lane Group Flow (vph)	0	210	408	26	147	8
Turn Type	Perm			custom		Perm
Protected Phases		1	5 1		3	
Permitted Phases	1			5		3
Actuated Green, G (s)		27.5	52.9	14.8	11.5	11.5
Effective Green, g (s)		27.5	42.3	14.8	11.5	11.5
Actuated g/C Ratio		0.36	0.56	0.20	0.15	0.15
Clearance Time (s)		10.6		5.6	5.5	5.5
Vehicle Extension (s)		3.0		3.0	3.0	3.0
Lane Grp Cap (vph)		608	1044	310	270	241
v/s Ratio Prot			c0.22		c0.08	
v/s Ratio Perm		0.13		0.02		0.01
v/c Ratio		0.35	0.39	0.08	0.54	0.03
Uniform Delay, d1		17.5	9.3	24.8	29.6	27.3
Progression Factor		1.00	0.08	2.65	1.00	1.00
Incremental Delay, d2		1.6	0.2	0.1	2.2	0.1
Delay (s)		19.0	1.0	65.9	31.8	27.3
Level of Service		B	A	E	C	C
Approach Delay (s)		19.0	16.8		30.6	
Approach LOS		B	B		C	

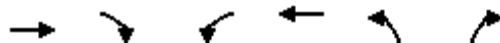
Intersection Summary

HCM Average Control Delay	20.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	75.5	Sum of lost time (s)	16.7
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis

41: 8 mile rd &

9/17/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔		
Volume (veh/h)	373	102	7	426	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	405	111	8	463	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	301			867		
pX, platoon unblocked			0.91		0.94	0.91
vC, conflicting volume			516		939	461
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			419		754	358
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			1037		353	624

Direction, Lane #	EB 1	WB 1
Volume Total	516	471
Volume Left	0	8
Volume Right	111	0
cSH	1700	1037
Volume to Capacity	0.30	0.01
Queue Length 95th (ft)	0	1
Control Delay (s)	0.0	0.2
Lane LOS		A
Approach Delay (s)	0.0	0.2
Approach LOS		

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization	31.4%		ICU Level of Service A
Analysis Period (min)	15		

Barker Road
2015 Existing AM

HCM Unsignalized Intersection Capacity Analysis

3: Barker Rd & Off Ramp

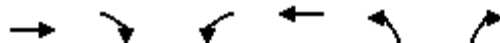
9/17/2014

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	↗
Volume (veh/h)	179	0	0	81	33	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	195	0	0	88	36	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			195		283	195
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			195		283	195
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		95	99
cM capacity (veh/h)			1379		707	847
Direction, Lane #						
	EB 1	WB 1	NB 1			
Volume Total	195	88	42			
Volume Left	0	0	36			
Volume Right	0	0	7			
cSH	1700	1700	726			
Volume to Capacity	0.11	0.05	0.06			
Queue Length 95th (ft)	0	0	5			
Control Delay (s)	0.0	0.0	10.3			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.3			
Approach LOS			B			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			19.4%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Barker Rd & On Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	161	87	52	62	1	18
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	175	95	57	67	1	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			270		403	222
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			270		403	222
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		100	98
cM capacity (veh/h)			1294		577	817
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	270	124	21			
Volume Left	0	57	1			
Volume Right	95	0	20			
cSH	1700	1294	800			
Volume to Capacity	0.16	0.04	0.03			
Queue Length 95th (ft)	0	3	2			
Control Delay (s)	0.0	3.8	9.6			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.8	9.6			
Approach LOS			A			
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			33.3%	ICU Level of Service	A	
Analysis Period (min)			15			

Intersection Sign configuration not allowed in HCM analysis.

Barker Road
2015 Existing PM

HCM Unsignalized Intersection Capacity Analysis

3: Barker Rd & Off Ramp

9/17/2014

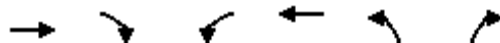


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Volume (veh/h)	171	0	0	163	82	64
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	186	0	0	177	89	70
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			186		363	186
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			186		363	186
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		86	92
cM capacity (veh/h)			1389		636	856
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	186	177	159			
Volume Left	0	0	89			
Volume Right	0	0	70			
cSH	1700	1700	717			
Volume to Capacity	0.11	0.10	0.22			
Queue Length 95th (ft)	0	0	21			
Control Delay (s)	0.0	0.0	11.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			24.1%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Barker Rd & On Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↘
Volume (veh/h)	150	41	65	180	1	21
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	163	45	71	196	1	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			208		522	185
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			208		522	185
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		100	97
cM capacity (veh/h)			1363		488	857

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	208	266	24
Volume Left	0	71	1
Volume Right	45	0	23
cSH	1700	1363	828
Volume to Capacity	0.12	0.05	0.03
Queue Length 95th (ft)	0	4	2
Control Delay (s)	0.0	2.4	9.5
Lane LOS		A	A
Approach Delay (s)	0.0	2.4	9.5
Approach LOS			A

Intersection Summary			
Average Delay		1.7	
Intersection Capacity Utilization		36.8%	ICU Level of Service
Analysis Period (min)		15	A

Intersection Sign configuration not allowed in HCM analysis.

Barker Road
2040 No Build AM

HCM Unsignalized Intersection Capacity Analysis

3: Barker Rd & Off Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Volume (veh/h)	193	0	0	88	35	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	210	0	0	96	38	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			210		305	210
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			210		305	210
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	99
cM capacity (veh/h)			1361		687	830

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	210	96	45
Volume Left	0	0	38
Volume Right	0	0	7
cSH	1700	1700	704
Volume to Capacity	0.12	0.06	0.06
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.0	0.0	10.5
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.5
Approach LOS			B

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization	20.2%	ICU Level of Service	A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

5: Barker Rd & On Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↔	↔
Volume (veh/h)	173	94	56	67	1	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	188	102	61	73	1	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			290		434	239
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			290		434	239
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		100	97
cM capacity (veh/h)			1272		552	800
Direction, Lane #						
	EB 1	WB 1	NB 1			
Volume Total	290	134	23			
Volume Left	0	61	1			
Volume Right	102	0	22			
cSH	1700	1272	783			
Volume to Capacity	0.17	0.05	0.03			
Queue Length 95th (ft)	0	4	2			
Control Delay (s)	0.0	3.8	9.7			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.8	9.7			
Approach LOS			A			
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			34.8%	ICU Level of Service		A
Analysis Period (min)			15			

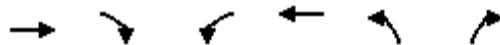
Intersection Sign configuration not allowed in HCM analysis.

Barker Road
2040 No Build PM

HCM Unsignalized Intersection Capacity Analysis

3: Barker Rd & Off Ramp

9/17/2014

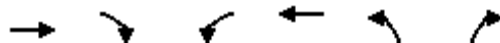


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Volume (veh/h)	185	0	0	176	88	69
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	201	0	0	191	96	75
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			201		392	201
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			201		392	201
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		84	91
cM capacity (veh/h)			1371		612	840
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	201	191	171			
Volume Left	0	0	96			
Volume Right	0	0	75			
cSH	1700	1700	695			
Volume to Capacity	0.12	0.11	0.25			
Queue Length 95th (ft)	0	0	24			
Control Delay (s)	0.0	0.0	11.9			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.9			
Approach LOS			B			
Intersection Summary						
Average Delay			3.6			
Intersection Capacity Utilization			25.5%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Barker Rd & On Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Volume (veh/h)	164	36	70	194	1	21
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	178	39	76	211	1	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			217		561	198
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			217		561	198
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		100	97
cM capacity (veh/h)			1352		461	843

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	217	287	24
Volume Left	0	76	1
Volume Right	39	0	23
cSH	1700	1352	813
Volume to Capacity	0.13	0.06	0.03
Queue Length 95th (ft)	0	4	2
Control Delay (s)	0.0	2.4	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	2.4	9.6
Approach LOS			A

Intersection Summary			
Average Delay		1.8	
Intersection Capacity Utilization		38.2%	ICU Level of Service
Analysis Period (min)		15	A

Intersection Sign configuration not allowed in HCM analysis.

Barker Road
2040 ATM AM

HCM Unsignalized Intersection Capacity Analysis

3: Barker Rd & Off Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Volume (veh/h)	193	0	0	94	35	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	210	0	0	102	38	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			210		312	210
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			210		312	210
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	99
cM capacity (veh/h)			1361		681	830

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	210	102	45
Volume Left	0	0	38
Volume Right	0	0	7
cSH	1700	1700	699
Volume to Capacity	0.12	0.06	0.06
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.0	0.0	10.5
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.5
Approach LOS			B

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization	20.2%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

5: Barker Rd & On Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	173	103	62	67	1	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	188	112	67	73	1	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			300	452		244
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			300	452		244
tC, single (s)			4.1	6.4		6.2
tC, 2 stage (s)						
tF (s)			2.2	3.5		3.3
p0 queue free %			95	100		97
cM capacity (veh/h)			1261	535		795
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	300	140	23			
Volume Left	0	67	1			
Volume Right	112	0	22			
cSH	1700	1261	777			
Volume to Capacity	0.18	0.05	0.03			
Queue Length 95th (ft)	0	4	2			
Control Delay (s)	0.0	4.1	9.8			
Lane LOS			A		A	
Approach Delay (s)	0.0	4.1	9.8			
Approach LOS			A			
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			35.7%	ICU Level of Service		A
Analysis Period (min)			15			

Intersection Sign configuration not allowed in HCM analysis.

Barker Road
2040 ATM PM

HCM Unsignalized Intersection Capacity Analysis

3: Barker Rd & Off Ramp

9/17/2014

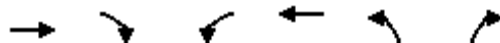


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Volume (veh/h)	185	0	0	176	88	69
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	201	0	0	191	96	75
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			201		392	201
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			201		392	201
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		84	91
cM capacity (veh/h)			1371		612	840
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	201	191	171			
Volume Left	0	0	96			
Volume Right	0	0	75			
cSH	1700	1700	695			
Volume to Capacity	0.12	0.11	0.25			
Queue Length 95th (ft)	0	0	24			
Control Delay (s)	0.0	0.0	11.9			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.9			
Approach LOS			B			
Intersection Summary						
Average Delay			3.6			
Intersection Capacity Utilization			25.5%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Barker Rd & On Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	
Volume (veh/h)	164	36	70	194	1	21
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	178	39	76	211	1	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			217		561	198
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			217		561	198
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		100	97
cM capacity (veh/h)			1352		461	843

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	217	287	24
Volume Left	0	76	1
Volume Right	39	0	23
cSH	1700	1352	813
Volume to Capacity	0.13	0.06	0.03
Queue Length 95th (ft)	0	4	2
Control Delay (s)	0.0	2.4	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	2.4	9.6
Approach LOS			A

Intersection Summary			
Average Delay		1.8	
Intersection Capacity Utilization		38.2%	ICU Level of Service
Analysis Period (min)		15	A

Intersection Sign configuration not allowed in HCM analysis.

Barker Road
2040 ATM-HOV AM

HCM Unsignalized Intersection Capacity Analysis

3: Barker Rd & Off Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Volume (veh/h)	193	0	0	92	35	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	210	0	0	100	38	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			210		310	210
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			210		310	210
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		94	99
cM capacity (veh/h)			1361		683	830

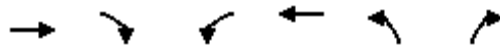
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	210	100	45
Volume Left	0	0	38
Volume Right	0	0	7
cSH	1700	1700	701
Volume to Capacity	0.12	0.06	0.06
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.0	0.0	10.5
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.5
Approach LOS			B

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization	20.2%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis

5: Barker Rd & On Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↔	
Volume (veh/h)	173	99	60	67	1	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	188	108	65	73	1	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			296		445	242
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			296		445	242
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		100	97
cM capacity (veh/h)			1266		541	797

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	296	138	23
Volume Left	0	65	1
Volume Right	108	0	22
cSH	1700	1266	779
Volume to Capacity	0.17	0.05	0.03
Queue Length 95th (ft)	0	4	2
Control Delay (s)	0.0	4.0	9.8
Lane LOS		A	A
Approach Delay (s)	0.0	4.0	9.8
Approach LOS			A

Intersection Summary			
Average Delay		1.7	
Intersection Capacity Utilization		35.3%	ICU Level of Service
Analysis Period (min)		15	A

Intersection Sign configuration not allowed in HCM analysis.

Barker Road
2040 ATM-HOV PM

HCM Unsignalized Intersection Capacity Analysis

3: Barker Rd & Off Ramp

9/17/2014

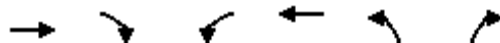


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↘	
Volume (veh/h)	185	0	0	176	88	69
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	201	0	0	191	96	75
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			201		392	201
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			201		392	201
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		84	91
cM capacity (veh/h)			1371		612	840
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	201	191	171			
Volume Left	0	0	96			
Volume Right	0	0	75			
cSH	1700	1700	695			
Volume to Capacity	0.12	0.11	0.25			
Queue Length 95th (ft)	0	0	24			
Control Delay (s)	0.0	0.0	11.9			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	11.9			
Approach LOS			B			
Intersection Summary						
Average Delay			3.6			
Intersection Capacity Utilization			25.5%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

5: Barker Rd & On Ramp

9/17/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Volume (veh/h)	164	36	70	194	1	21
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	178	39	76	211	1	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			217		561	198
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			217		561	198
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		100	97
cM capacity (veh/h)			1352		461	843

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	217	287	24
Volume Left	0	76	1
Volume Right	39	0	23
cSH	1700	1352	813
Volume to Capacity	0.13	0.06	0.03
Queue Length 95th (ft)	0	4	2
Control Delay (s)	0.0	2.4	9.6
Lane LOS		A	A
Approach Delay (s)	0.0	2.4	9.6
Approach LOS			A

Intersection Summary			
Average Delay		1.8	
Intersection Capacity Utilization		38.2%	ICU Level of Service A
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

6 Mile Road
2015 Existing AM

HCM Unsignalized Intersection Capacity Analysis

11: 6 Mile & Off Ramp

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↘
Volume (veh/h)	0	136	327	0	50	101
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	148	355	0	54	110
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	355				503	355
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	355				503	355
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				90	84
cM capacity (veh/h)	1203				528	689

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	148	355	54	110
Volume Left	0	0	54	0
Volume Right	0	0	0	110
cSH	1700	1700	528	689
Volume to Capacity	0.09	0.21	0.10	0.16
Queue Length 95th (ft)	0	0	9	14
Control Delay (s)	0.0	0.0	12.6	11.2
Lane LOS			B	B
Approach Delay (s)	0.0	0.0	11.7	
Approach LOS			B	



















Intersection Summary			
Average Delay		2.9	
Intersection Capacity Utilization		30.1%	ICU Level of Service
Analysis Period (min)		15	A

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis

15: 6 Mile & On Ramp

9/17/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	111	65	0	0	231	99	8	54	48	56	0	435
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	121	71	0	0	251	108	9	59	52	61	0	473
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												7
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	359			71			853	671	71	698	617	305
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	359			71			853	671	71	698	617	305
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	90			100			91	83	95	77	100	36
cM capacity (veh/h)	1200			1530			92	340	992	270	365	735
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total	191	359	9	111	534							
Volume Left	121	0	9	0	61							
Volume Right	0	108	0	52	473							
cSH	1200	1700	92	492	830							
Volume to Capacity	0.10	0.21	0.09	0.23	0.64							
Queue Length 95th (ft)	8	0	8	21	120							
Control Delay (s)	5.6	0.0	48.3	14.4	18.7							
Lane LOS	A		E	B	C							
Approach Delay (s)	5.6	0.0	16.9		18.7							
Approach LOS			C		C							
Intersection Summary												
Average Delay			10.9									
Intersection Capacity Utilization			58.5%		ICU Level of Service				B			
Analysis Period (min)			15									

Intersection Sign configuration not allowed in HCM analysis.

6 Mile Road
2015 Existing PM

HCM Unsignalized Intersection Capacity Analysis

11: 6 Mile & Off Ramp

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↗
Volume (veh/h)	0	351	82	0	66	77
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	382	89	0	72	84
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	89				471	89
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	89				471	89
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				87	91
cM capacity (veh/h)	1506				551	969

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	382	89	72	84
Volume Left	0	0	72	0
Volume Right	0	0	0	84
cSH	1700	1700	551	969
Volume to Capacity	0.22	0.05	0.13	0.09
Queue Length 95th (ft)	0	0	11	7
Control Delay (s)	0.0	0.0	12.5	9.1
Lane LOS			B	A
Approach Delay (s)	0.0	0.0	10.7	
Approach LOS			B	



















Intersection Summary			
Average Delay		2.6	
Intersection Capacity Utilization		28.8%	ICU Level of Service
Analysis Period (min)		15	A

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis

15: 6 Mile & On Ramp

9/17/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	313	98	0	0	76	128	12	145	103	36	0	79
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	340	107	0	0	83	139	13	158	112	39	0	86
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												7
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	222			107			982	1009	107	1130	939	152
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	222			107			982	1009	107	1130	939	152
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	75			100			92	12	88	0	100	90
cM capacity (veh/h)	1347			1484			166	180	948	34	197	894
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total	447	222	13	270	125							
Volume Left	340	0	13	0	39							
Volume Right	0	139	0	112	86							
cSH	1347	1700	166	271	108							
Volume to Capacity	0.25	0.13	0.08	1.00	1.16							
Queue Length 95th (ft)	25	0	6	250	200							
Control Delay (s)	7.1	0.0	28.5	94.5	127.6							
Lane LOS	A		D	F	F							
Approach Delay (s)	7.1	0.0	91.5		127.6							
Approach LOS			F		F							
Intersection Summary												
Average Delay			41.8									
Intersection Capacity Utilization			64.9%		ICU Level of Service				C			
Analysis Period (min)			15									

Intersection Sign configuration not allowed in HCM analysis.

6 Mile Road
2040 No Build AM

HCM Unsignalized Intersection Capacity Analysis

11: 6 Mile & Off Ramp

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↘
Volume (veh/h)	0	147	353	0	54	109
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	160	384	0	59	118
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	384				543	384
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	384				543	384
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				88	82
cM capacity (veh/h)	1175				500	664

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	160	384	59	118
Volume Left	0	0	59	0
Volume Right	0	0	0	118
cSH	1700	1700	500	664
Volume to Capacity	0.09	0.23	0.12	0.18
Queue Length 95th (ft)	0	0	10	16
Control Delay (s)	0.0	0.0	13.1	11.6
Lane LOS			B	B
Approach Delay (s)	0.0	0.0	12.1	
Approach LOS			B	



















Intersection Summary			
Average Delay		3.0	
Intersection Capacity Utilization		32.0%	ICU Level of Service A
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis

15: 6 Mile & On Ramp

9/17/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	117	69	0	0	250	107	9	58	51	60	0	468
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	127	75	0	0	272	116	10	63	55	65	0	509
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												7
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	388			75			914	717	75	746	659	330
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	388			75			914	717	75	746	659	330
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	89			100			85	80	94	73	100	29
cM capacity (veh/h)	1170			1524			66	317	986	242	342	712
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total	202	388	10	118	574							
Volume Left	127	0	10	0	65							
Volume Right	0	116	0	55	509							
cSH	1170	1700	66	464	803							
Volume to Capacity	0.11	0.23	0.15	0.26	0.71							
Queue Length 95th (ft)	9	0	12	25	155							
Control Delay (s)	5.7	0.0	68.4	15.4	22.1							
Lane LOS	A		F	C	C							
Approach Delay (s)	5.7	0.0	19.4		22.1							
Approach LOS			C		C							
Intersection Summary												
Average Delay			12.6									
Intersection Capacity Utilization			62.0%		ICU Level of Service				B			
Analysis Period (min)			15									

Intersection Sign configuration not allowed in HCM analysis.

6 Mile Road
2040 No Build PM

HCM Unsignalized Intersection Capacity Analysis

11: 6 Mile & Off Ramp

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	↓
Volume (veh/h)	0	378	86	0	72	83
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	411	93	0	78	90
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	93				504	93
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	93				504	93
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				85	91
cM capacity (veh/h)	1501				527	964

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	411	93	78	90
Volume Left	0	0	78	0
Volume Right	0	0	0	90
cSH	1700	1700	527	964
Volume to Capacity	0.24	0.05	0.15	0.09
Queue Length 95th (ft)	0	0	13	8
Control Delay (s)	0.0	0.0	13.0	9.1
Lane LOS			B	A
Approach Delay (s)	0.0	0.0	10.9	
Approach LOS			B	



















Intersection Summary			
Average Delay		2.7	
Intersection Capacity Utilization		30.6%	ICU Level of Service A
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis

15: 6 Mile & On Ramp

9/17/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	338	106	0	0	81	138	13	156	111	38	0	82
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	367	115	0	0	88	150	14	170	121	41	0	89
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												7
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	238			115			1058	1088	115	1218	1013	163
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	238			115			1058	1088	115	1218	1013	163
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	72			100			90	0	87	0	100	90
cM capacity (veh/h)	1329			1474			143	156	937	0	173	882
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total	483	238	14	290	130							
Volume Left	367	0	14	0	41							
Volume Right	0	150	0	121	89							
cSH	1329	1700	143	239	0							
Volume to Capacity	0.28	0.14	0.10	1.22	Err							
Queue Length 95th (ft)	28	0	8	353	Err							
Control Delay (s)	7.3	0.0	32.9	171.4	Err							
Lane LOS	A		D	F	F							
Approach Delay (s)	7.3	0.0	165.0		Err							
Approach LOS			F		F							
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			68.7%		ICU Level of Service				C			
Analysis Period (min)			15									

Intersection Sign configuration not allowed in HCM analysis.

6 Mile Road
2040 TSM AM

HCM Unsignalized Intersection Capacity Analysis

11: 6 Mile & Off Ramp

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↘
Volume (veh/h)	0	147	353	0	54	109
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	160	384	0	59	118
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	384				543	384
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	384				543	384
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				88	82
cM capacity (veh/h)	1175				500	664



















Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	160	384	59	118
Volume Left	0	0	59	0
Volume Right	0	0	0	118
cSH	1700	1700	500	664
Volume to Capacity	0.09	0.23	0.12	0.18
Queue Length 95th (ft)	0	0	10	16
Control Delay (s)	0.0	0.0	13.1	11.6
Lane LOS			B	B
Approach Delay (s)	0.0	0.0	12.1	
Approach LOS			B	

Intersection Summary			
Average Delay		3.0	
Intersection Capacity Utilization		32.0%	ICU Level of Service A
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis
 15: 6 Mile & On Ramp

9/17/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	117	69	0	0	250	107	9	58	51	60	0	468
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	127	75	0	0	272	116	10	63	55	65	0	509
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	202	388	10	118	65	509						
Volume Left (vph)	127	0	10	0	65	0						
Volume Right (vph)	0	116	0	55	0	509						
Hadj (s)	0.16	-0.15	0.53	-0.29	0.53	-0.67						
Departure Headway (s)	7.0	6.3	8.2	7.3	7.3	6.1						
Degree Utilization, x	0.39	0.68	0.02	0.24	0.13	0.86						
Capacity (veh/h)	465	545	399	441	474	579						
Control Delay (s)	14.5	21.4	10.2	11.5	10.2	34.2						
Approach Delay (s)	14.5	21.4	11.4		31.4							
Approach LOS	B	C	B		D							
Intersection Summary												
Delay			23.8									
HCM Level of Service			C									
Intersection Capacity Utilization			62.0%		ICU Level of Service		B					
Analysis Period (min)			15									

Intersection Sign configuration not allowed in HCM analysis.

6 Mile Road
2040 TSM PM

HCM Unsignalized Intersection Capacity Analysis

11: 6 Mile & Off Ramp

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	↓
Volume (veh/h)	0	378	86	0	72	83
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	411	93	0	78	90
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	93				504	93
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	93				504	93
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				85	91
cM capacity (veh/h)	1501				527	964



















Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	411	93	78	90
Volume Left	0	0	78	0
Volume Right	0	0	0	90
cSH	1700	1700	527	964
Volume to Capacity	0.24	0.05	0.15	0.09
Queue Length 95th (ft)	0	0	13	8
Control Delay (s)	0.0	0.0	13.0	9.1
Lane LOS			B	A
Approach Delay (s)	0.0	0.0	10.9	
Approach LOS			B	

Intersection Summary			
Average Delay		2.7	
Intersection Capacity Utilization		30.6%	ICU Level of Service
Analysis Period (min)		15	A

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis
 15: 6 Mile & On Ramp

9/17/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	338	106	0	0	81	138	13	156	111	38	0	82
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	367	115	0	0	88	150	14	170	121	41	0	89
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	483	238	14	290	41	89						
Volume Left (vph)	367	0	14	0	41	0						
Volume Right (vph)	0	150	0	121	0	89						
Hadj (s)	0.19	-0.34	0.53	-0.26	0.53	-0.67						
Departure Headway (s)	6.0	6.0	7.5	6.7	8.0	6.8						
Degree Utilization, x	0.80	0.39	0.03	0.54	0.09	0.17						
Capacity (veh/h)	588	545	446	494	407	476						
Control Delay (s)	28.5	12.8	9.6	16.2	10.6	9.9						
Approach Delay (s)	28.5	12.8	15.9		10.1							
Approach LOS	D	B	C		B							
Intersection Summary												
Delay			19.8									
HCM Level of Service			C									
Intersection Capacity Utilization			68.7%				ICU Level of Service	C				
Analysis Period (min)			15									

Intersection Sign configuration not allowed in HCM analysis.

6 Mile Road
2040 ATM AM

HCM Unsignalized Intersection Capacity Analysis

11: 6 Mile & Off Ramp

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↘
Volume (veh/h)	0	147	353	0	49	98
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	160	384	0	53	107
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	384				543	384
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	384				543	384
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				89	84
cM capacity (veh/h)	1175				500	664



















Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	160	384	53	107
Volume Left	0	0	53	0
Volume Right	0	0	0	107
cSH	1700	1700	500	664
Volume to Capacity	0.09	0.23	0.11	0.16
Queue Length 95th (ft)	0	0	9	14
Control Delay (s)	0.0	0.0	13.0	11.5
Lane LOS			B	B
Approach Delay (s)	0.0	0.0	12.0	
Approach LOS			B	

Intersection Summary			
Average Delay		2.7	
Intersection Capacity Utilization		31.3%	ICU Level of Service A
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis
 15: 6 Mile & On Ramp

9/17/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	113	68	0	0	250	107	9	58	51	60	0	468
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	123	74	0	0	272	116	10	63	55	65	0	509
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	197	388	10	118	65	509						
Volume Left (vph)	123	0	10	0	65	0						
Volume Right (vph)	0	116	0	55	0	509						
Hadj (s)	0.16	-0.15	0.53	-0.29	0.53	-0.67						
Departure Headway (s)	7.0	6.2	8.2	7.3	7.3	6.1						
Degree Utilization, x	0.38	0.67	0.02	0.24	0.13	0.86						
Capacity (veh/h)	464	538	401	443	475	582						
Control Delay (s)	14.3	21.2	10.1	11.4	10.2	33.6						
Approach Delay (s)	14.3	21.2	11.3		30.9							
Approach LOS	B	C	B		D							
Intersection Summary												
Delay			23.5									
HCM Level of Service			C									
Intersection Capacity Utilization			62.0%		ICU Level of Service	B						
Analysis Period (min)			15									

Intersection Sign configuration not allowed in HCM analysis.

6 Mile Road
2040 ATM PM

HCM Unsignalized Intersection Capacity Analysis

11: 6 Mile & Off Ramp

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	
Volume (veh/h)	0	378	87	0	72	83
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	411	95	0	78	90
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	95				505	95
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	95				505	95
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				85	91
cM capacity (veh/h)	1499				527	962

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	411	95	168
Volume Left	0	0	78
Volume Right	0	0	90
cSH	1700	1700	695
Volume to Capacity	0.24	0.06	0.24
Queue Length 95th (ft)	0	0	24
Control Delay (s)	0.0	0.0	11.8
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.8
Approach LOS			B

Intersection Summary			
Average Delay		3.0	
Intersection Capacity Utilization		35.6%	ICU Level of Service A
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis
 15: 6 Mile & On Ramp

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔		↔
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	338	106	0	0	81	138	14	157	112	38	0	82
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	367	115	0	0	88	150	15	171	122	41	0	89
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	483	238	15	292	41	89						
Volume Left (vph)	367	0	15	0	41	0						
Volume Right (vph)	0	150	0	122	0	89						
Hadj (s)	0.19	-0.34	0.53	-0.26	0.53	-0.67						
Departure Headway (s)	6.0	6.0	7.5	6.7	8.0	6.8						
Degree Utilization, x	0.80	0.39	0.03	0.55	0.09	0.17						
Capacity (veh/h)	587	543	446	494	408	475						
Control Delay (s)	28.7	12.8	9.6	16.3	10.6	9.9						
Approach Delay (s)	28.7	12.8	16.0		10.1							
Approach LOS	D	B	C		B							
Intersection Summary												
Delay			20.0									
HCM Level of Service			C									
Intersection Capacity Utilization			68.8%		ICU Level of Service		C					
Analysis Period (min)			15									

Intersection Sign configuration not allowed in HCM analysis.

6 Mile Road
2040 ATM-HOV AM

HCM Unsignalized Intersection Capacity Analysis

11: 6 Mile & Off Ramp

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↗
Volume (veh/h)	0	150	353	0	38	76
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	163	384	0	41	83
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	384				547	384
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	384				547	384
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				92	88
cM capacity (veh/h)	1175				498	664



















Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	163	384	41	83
Volume Left	0	0	41	0
Volume Right	0	0	0	83
cSH	1700	1700	498	664
Volume to Capacity	0.10	0.23	0.08	0.12
Queue Length 95th (ft)	0	0	7	11
Control Delay (s)	0.0	0.0	12.9	11.2
Lane LOS			B	B
Approach Delay (s)	0.0	0.0	11.8	
Approach LOS			B	

Intersection Summary			
Average Delay		2.2	
Intersection Capacity Utilization		30.0%	ICU Level of Service A
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis
 15: 6 Mile & On Ramp

9/17/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	107	63	0	0	336	107	9	58	51	60	0	468
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	116	68	0	0	365	116	10	63	55	65	0	509
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	185	482	10	118	65	509						
Volume Left (vph)	116	0	10	0	65	0						
Volume Right (vph)	0	116	0	55	0	509						
Hadj (s)	0.16	-0.11	0.53	-0.29	0.53	-0.67						
Departure Headway (s)	7.4	6.4	8.7	7.8	7.7	6.4						
Degree Utilization, x	0.38	0.86	0.02	0.26	0.14	0.91						
Capacity (veh/h)	444	482	390	430	455	551						
Control Delay (s)	15.0	36.7	10.7	12.3	10.7	43.3						
Approach Delay (s)	15.0	36.7	12.2		39.6							
Approach LOS	B	E	B		E							
Intersection Summary												
Delay			32.7									
HCM Level of Service			D									
Intersection Capacity Utilization			66.5%		ICU Level of Service	C						
Analysis Period (min)			15									

Intersection Sign configuration not allowed in HCM analysis.

6 Mile Road
2040 ATM-HOV PM

HCM Unsignalized Intersection Capacity Analysis

11: 6 Mile & Off Ramp

9/17/2014



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	↓
Volume (veh/h)	0	378	86	0	72	83
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	411	93	0	78	90
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	93				504	93
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	93				504	93
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				85	91
cM capacity (veh/h)	1501				527	964



















Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	411	93	78	90
Volume Left	0	0	78	0
Volume Right	0	0	0	90
cSH	1700	1700	527	964
Volume to Capacity	0.24	0.05	0.15	0.09
Queue Length 95th (ft)	0	0	13	8
Control Delay (s)	0.0	0.0	13.0	9.1
Lane LOS			B	A
Approach Delay (s)	0.0	0.0	10.9	
Approach LOS			B	

Intersection Summary			
Average Delay		2.7	
Intersection Capacity Utilization		30.6%	ICU Level of Service A
Analysis Period (min)		15	

Intersection Sign configuration not allowed in HCM analysis.

HCM Unsignalized Intersection Capacity Analysis
 15: 6 Mile & On Ramp

9/17/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	338	106	0	0	81	138	13	156	111	38	0	82
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	367	115	0	0	88	150	14	170	121	41	0	89
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total (vph)	483	238	14	290	41	89						
Volume Left (vph)	367	0	14	0	41	0						
Volume Right (vph)	0	150	0	121	0	89						
Hadj (s)	0.19	-0.34	0.53	-0.26	0.53	-0.67						
Departure Headway (s)	6.0	6.0	7.5	6.7	8.0	6.8						
Degree Utilization, x	0.80	0.39	0.03	0.54	0.09	0.17						
Capacity (veh/h)	588	545	446	494	407	476						
Control Delay (s)	28.5	12.8	9.6	16.2	10.6	9.9						
Approach Delay (s)	28.5	12.8	15.9		10.1							
Approach LOS	D	B	C		B							
Intersection Summary												
Delay			19.8									
HCM Level of Service			C									
Intersection Capacity Utilization			68.7%				ICU Level of Service	C				
Analysis Period (min)			15									

Intersection Sign configuration not allowed in HCM analysis.

North Territorial Road
2015 Existing AM

HCM Signalized Intersection Capacity Analysis

22: N. Territorial &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Volume (vph)	96	527	0	0	115	114	54	0	74	11	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	16	12	12	12	12
Total Lost time (s)		5.5			5.5		5.2	5.2			5.2	
Lane Util. Factor		1.00			1.00		1.00	1.00			1.00	
Frt		1.00			0.93		1.00	0.85			1.00	
Flt Protected		0.99			1.00		0.95	1.00			0.95	
Satd. Flow (prot)		1849			1738		2006	1794			1770	
Flt Permitted		0.90			1.00		0.75	1.00			0.70	
Satd. Flow (perm)		1685			1738		1583	1794			1313	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	104	573	0	0	125	124	59	0	80	12	0	0
RTOR Reduction (vph)	0	0	0	0	63	0	0	56	0	0	0	0
Lane Group Flow (vph)	0	677	0	0	186	0	59	24	0	0	12	0
Turn Type	Perm							Perm		Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		24.5			24.5		14.8	14.8			14.8	
Effective Green, g (s)		24.5			24.5		14.8	14.8			14.8	
Actuated g/C Ratio		0.49			0.49		0.30	0.30			0.30	
Clearance Time (s)		5.5			5.5		5.2	5.2			5.2	
Lane Grp Cap (vph)		826			852		469	531			389	
v/s Ratio Prot					0.11			0.01				
v/s Ratio Perm		c0.40					c0.04				0.01	
v/c Ratio		0.82			0.22		0.13	0.04			0.03	
Uniform Delay, d1		10.9			7.3		12.9	12.6			12.5	
Progression Factor		0.94			1.00		1.00	1.00			1.00	
Incremental Delay, d2		6.5			0.6		0.6	0.2			0.1	
Delay (s)		16.7			7.9		13.4	12.7			12.7	
Level of Service		B			A		B	B			B	
Approach Delay (s)		16.7			7.9			13.0			12.7	
Approach LOS		B			A			B			B	

Intersection Summary

HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

24: N. Territorial & Off Ramp

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↻			↻		↻		↻		
Volume (vph)	0	375	338	48	121	0	248	0	75	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	16	16	12	12
Total Lost time (s)		5.5			5.5		5.2		5.2		
Lane Util. Factor		1.00			1.00		1.00		1.00		
Frt		0.94			1.00		1.00		0.85		
Flt Protected		1.00			0.99		0.95		1.00		
Satd. Flow (prot)		1744			1837		2006		1794		
Flt Permitted		1.00			0.55		0.95		1.00		
Satd. Flow (perm)		1744			1026		2006		1794		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	408	367	52	132	0	270	0	82	0	0
RTOR Reduction (vph)	0	65	0	0	0	0	0	0	58	0	0
Lane Group Flow (vph)	0	710	0	0	184	0	270	0	24	0	0
Turn Type				Perm			custom		custom		
Protected Phases		4			8						
Permitted Phases				8			6		6		
Actuated Green, G (s)		24.5			24.5		14.8		14.8		
Effective Green, g (s)		24.5			24.5		14.8		14.8		
Actuated g/C Ratio		0.49			0.49		0.30		0.30		
Clearance Time (s)		5.5			5.5		5.2		5.2		
Lane Grp Cap (vph)		855			503		594		531		
v/s Ratio Prot		c0.41									
v/s Ratio Perm					0.18		c0.13		0.01		
v/c Ratio		0.83			0.37		0.45		0.05		
Uniform Delay, d1		11.0			7.9		14.3		12.6		
Progression Factor		1.00			0.93		1.00		1.00		
Incremental Delay, d2		9.2			2.0		2.5		0.2		
Delay (s)		20.2			9.4		16.8		12.7		
Level of Service		C			A		B		B		
Approach Delay (s)		20.2			9.4			15.9		0.0	
Approach LOS		C			A			B		A	

Intersection Summary

HCM Average Control Delay	17.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

27: N. Territorial &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Volume (vph)	8	614	187	75	93	28	17	10	26	73	182	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8		6.8	6.8		6.8	6.8		6.8	6.8	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	0.97		1.00	0.89		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1798		1770	1799		1770	1662		1770	1823	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1798		1770	1799		1770	1662		1770	1823	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	667	203	82	101	30	18	11	28	79	198	33
RTOR Reduction (vph)	0	7	0	0	6	0	0	24	0	0	6	0
Lane Group Flow (vph)	9	863	0	82	125	0	18	15	0	79	225	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	1.0	40.7		7.2	46.9		2.2	13.5		9.1	20.4	
Effective Green, g (s)	1.0	40.7		7.2	46.9		2.2	13.5		9.1	20.4	
Actuated g/C Ratio	0.01	0.42		0.07	0.48		0.02	0.14		0.09	0.21	
Clearance Time (s)	6.8	6.8		6.8	6.8		6.8	6.8		6.8	6.8	
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	6.0		2.0	6.0	
Lane Grp Cap (vph)	18	749		130	864		40	230		165	381	
v/s Ratio Prot	0.01	c0.48		c0.05	c0.07		0.01	0.01		c0.04	c0.12	
v/s Ratio Perm												
v/c Ratio	0.50	1.15		0.63	0.14		0.45	0.06		0.48	0.59	
Uniform Delay, d1	48.1	28.5		44.0	14.2		47.2	36.6		42.0	34.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.7	83.4		7.1	0.2		2.9	0.3		0.8	4.5	
Delay (s)	55.8	111.9		51.1	14.4		50.1	36.9		42.8	39.4	
Level of Service	E	F		D	B		D	D		D	D	
Approach Delay (s)		111.4			28.5			41.1			40.3	
Approach LOS		F			C			D			D	

Intersection Summary

HCM Average Control Delay	81.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	97.7	Sum of lost time (s)	34.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

North Territorial Road
2015 Existing PM

HCM Signalized Intersection Capacity Analysis

22: N. Territorial &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Volume (vph)	106	143	0	0	271	444	219	0	75	3	0	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	16	12	12	12	12
Total Lost time (s)		5.5			5.5		5.2	5.2			5.2	
Lane Util. Factor		1.00			1.00		1.00	1.00			1.00	
Frt		1.00			0.92		1.00	0.85			0.90	
Flt Protected		0.98			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		1824			1707		2006	1794			1650	
Flt Permitted		0.32			1.00		0.75	1.00			0.95	
Satd. Flow (perm)		602			1707		1581	1794			1590	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	115	155	0	0	295	483	238	0	82	3	0	10
RTOR Reduction (vph)	0	0	0	0	118	0	0	58	0	0	7	0
Lane Group Flow (vph)	0	270	0	0	660	0	238	24	0	0	6	0
Turn Type	Perm						Perm		Perm			
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		24.5			24.5		14.8	14.8			14.8	
Effective Green, g (s)		24.5			24.5		14.8	14.8			14.8	
Actuated g/C Ratio		0.49			0.49		0.30	0.30			0.30	
Clearance Time (s)		5.5			5.5		5.2	5.2			5.2	
Lane Grp Cap (vph)		295			836		468	531			471	
v/s Ratio Prot					0.39			0.01				
v/s Ratio Perm		c0.45					c0.15				0.00	
v/c Ratio		0.92			0.79		0.51	0.05			0.01	
Uniform Delay, d1		11.8			10.6		14.6	12.6			12.4	
Progression Factor		0.90			1.00		1.00	1.00			1.00	
Incremental Delay, d2		34.1			7.5		3.9	0.2			0.0	
Delay (s)		44.7			18.1		18.5	12.7			12.5	
Level of Service		D			B		B	B			B	
Approach Delay (s)		44.7			18.1			17.0			12.5	
Approach LOS		D			B			B			B	

Intersection Summary

HCM Average Control Delay	23.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	87.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

24: N. Territorial & Off Ramp

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↻			↻		↻		↻		
Volume (vph)	0	169	82	52	447	0	80	0	93	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	16	16	12	12
Total Lost time (s)		5.5			5.5		5.2		5.2		
Lane Util. Factor		1.00			1.00		1.00		1.00		
Frt		0.96			1.00		1.00		0.85		
Flt Protected		1.00			0.99		0.95		1.00		
Satd. Flow (prot)		1781			1853		2006		1794		
Flt Permitted		1.00			0.94		0.95		1.00		
Satd. Flow (perm)		1781			1751		2006		1794		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	184	89	57	486	0	87	0	101	0	0
RTOR Reduction (vph)	0	35	0	0	0	0	0	0	71	0	0
Lane Group Flow (vph)	0	238	0	0	543	0	87	0	30	0	0
Turn Type				Perm			custom		custom		
Protected Phases		4			8						
Permitted Phases				8			6		6		
Actuated Green, G (s)		24.5			24.5		14.8		14.8		
Effective Green, g (s)		24.5			24.5		14.8		14.8		
Actuated g/C Ratio		0.49			0.49		0.30		0.30		
Clearance Time (s)		5.5			5.5		5.2		5.2		
Lane Grp Cap (vph)		873			858		594		531		
v/s Ratio Prot		0.13									
v/s Ratio Perm					c0.31		c0.04		0.02		
v/c Ratio		0.27			0.63		0.15		0.06		
Uniform Delay, d1		7.5			9.4		13.0		12.6		
Progression Factor		1.00			1.03		1.00		1.00		
Incremental Delay, d2		0.8			2.6		0.5		0.2		
Delay (s)		8.3			12.3		13.5		12.8		
Level of Service		A			B		B		B		
Approach Delay (s)		8.3			12.3			13.1		0.0	
Approach LOS		A			B			B		A	

Intersection Summary

HCM Average Control Delay	11.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	57.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

27: N. Territorial &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗	↘		↗	↘		↗	↘		↗	↘	
Volume (vph)	47	163	9	40	466	34	135	231	72	16	24	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8		6.8	6.8		6.8	6.8		6.8	6.8	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.96		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1848		1770	1844		1770	1797		1770	1690	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1848		1770	1844		1770	1797		1770	1690	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	51	177	10	43	507	37	147	251	78	17	26	42
RTOR Reduction (vph)	0	1	0	0	2	0	0	9	0	0	36	0
Lane Group Flow (vph)	51	186	0	43	542	0	147	320	0	17	32	0
Turn Type	Prot		Prot		Prot		Prot		Prot			
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	6.2	39.8		4.5	38.1		14.0	26.6		2.4	15.0	
Effective Green, g (s)	6.2	39.8		4.5	38.1		14.0	26.6		2.4	15.0	
Actuated g/C Ratio	0.06	0.40		0.04	0.38		0.14	0.26		0.02	0.15	
Clearance Time (s)	6.8	6.8		6.8	6.8		6.8	6.8		6.8	6.8	
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	6.0		2.0	6.0	
Lane Grp Cap (vph)	109	732		79	699		247	476		42	252	
v/s Ratio Prot	c0.03	0.10		0.02	c0.29		c0.08	c0.18		0.01	0.02	
v/s Ratio Perm												
v/c Ratio	0.47	0.25		0.54	0.78		0.60	0.67		0.40	0.13	
Uniform Delay, d1	45.6	20.4		47.0	27.4		40.6	33.1		48.3	37.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	0.5		4.1	6.8		2.6	5.7		2.3	0.6	
Delay (s)	46.7	20.9		51.1	34.2		43.1	38.8		50.7	37.7	
Level of Service	D	C		D	C		D	D		D	D	
Approach Delay (s)		26.4			35.5			40.1			40.3	
Approach LOS		C			D			D			D	

Intersection Summary

HCM Average Control Delay	35.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.5	Sum of lost time (s)	27.2
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

North Territorial Road
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HCM Signalized Intersection Capacity Analysis

22: N. Territorial &

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Volume (vph)	102	568	0	0	134	123	59	0	80	12	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	16	12	12	12	12
Total Lost time (s)		5.5			5.5		5.2	5.2			5.2	
Lane Util. Factor		1.00			1.00		1.00	1.00			1.00	
Frt		1.00			0.94		1.00	0.85			1.00	
Flt Protected		0.99			1.00		0.95	1.00			0.95	
Satd. Flow (prot)		1849			1742		2006	1794			1770	
Flt Permitted		0.90			1.00		0.75	1.00			0.70	
Satd. Flow (perm)		1671			1742		1581	1794			1305	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	111	617	0	0	146	134	64	0	87	13	0	0
RTOR Reduction (vph)	0	0	0	0	66	0	0	61	0	0	0	0
Lane Group Flow (vph)	0	728	0	0	214	0	64	26	0	0	13	0
Turn Type	Perm						Perm		Perm			
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		24.5			24.5		14.8	14.8			14.8	
Effective Green, g (s)		24.5			24.5		14.8	14.8			14.8	
Actuated g/C Ratio		0.49			0.49		0.30	0.30			0.30	
Clearance Time (s)		5.5			5.5		5.2	5.2			5.2	
Lane Grp Cap (vph)		819			854		468	531			386	
v/s Ratio Prot					0.12			0.01				
v/s Ratio Perm		c0.44					c0.04				0.01	
v/c Ratio		0.89			0.25		0.14	0.05			0.03	
Uniform Delay, d1		11.5			7.4		12.9	12.6			12.5	
Progression Factor		0.96			1.00		1.00	1.00			1.00	
Incremental Delay, d2		9.6			0.7		0.6	0.2			0.2	
Delay (s)		20.6			8.1		13.5	12.7			12.7	
Level of Service		C			A		B	B			B	
Approach Delay (s)		20.6			8.1		13.1				12.7	
Approach LOS		C			A		B				B	

Intersection Summary

HCM Average Control Delay	16.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

24: N. Territorial & Off Ramp

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↻			↻		↻		↻		
Volume (vph)	0	403	365	52	141	0	267	0	71	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	16	16	12	12
Total Lost time (s)		5.5			5.5		5.2		5.2		
Lane Util. Factor		1.00			1.00		1.00		1.00		
Frt		0.94			1.00		1.00		0.85		
Flt Protected		1.00			0.99		0.95		1.00		
Satd. Flow (prot)		1743			1838		2006		1794		
Flt Permitted		1.00			0.45		0.95		1.00		
Satd. Flow (perm)		1743			847		2006		1794		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	438	397	57	153	0	290	0	77	0	0
RTOR Reduction (vph)	0	65	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	770	0	0	210	0	290	0	77	0	0
Turn Type				Perm			custom		custom		
Protected Phases		4			8						
Permitted Phases				8			6		6		
Actuated Green, G (s)		24.5			24.5		14.8		14.8		
Effective Green, g (s)		24.5			24.5		14.8		14.8		
Actuated g/C Ratio		0.49			0.49		0.30		0.30		
Clearance Time (s)		5.5			5.5		5.2		5.2		
Lane Grp Cap (vph)		854			415		594		531		
v/s Ratio Prot		c0.44									
v/s Ratio Perm					0.25		c0.14		0.04		
v/c Ratio		0.90			0.51		0.49		0.15		
Uniform Delay, d1		11.6			8.6		14.5		12.9		
Progression Factor		1.00			0.92		1.00		1.00		
Incremental Delay, d2		14.5			4.3		2.9		0.6		
Delay (s)		26.2			12.2		17.3		13.5		
Level of Service		C			B		B		B		
Approach Delay (s)		26.2			12.2			16.5		0.0	
Approach LOS		C			B			B		A	

Intersection Summary

HCM Average Control Delay	21.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

27: N. Territorial & Whitmore Lake

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	662	201	81	101	30	19	11	28	78	196	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8		6.8	6.8		6.8	6.8		6.8	6.8	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.97		1.00	0.89		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1798		1770	1798		1770	1663		1770	1823	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1798		1770	1798		1770	1663		1770	1823	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	720	218	88	110	33	21	12	30	85	213	35
RTOR Reduction (vph)	0	7	0	0	6	0	0	26	0	0	5	0
Lane Group Flow (vph)	10	931	0	88	137	0	21	16	0	85	243	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	1.0	40.7		7.6	47.3		2.3	14.3		9.6	21.6	
Effective Green, g (s)	1.0	40.7		7.6	47.3		2.3	14.3		9.6	21.6	
Actuated g/C Ratio	0.01	0.41		0.08	0.48		0.02	0.14		0.10	0.22	
Clearance Time (s)	6.8	6.8		6.8	6.8		6.8	6.8		6.8	6.8	
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	6.0		2.0	6.0	
Lane Grp Cap (vph)	18	736		135	856		41	239		171	396	
v/s Ratio Prot	0.01	c0.52		c0.05	c0.08		0.01	0.01		c0.05	c0.13	
v/s Ratio Perm												
v/c Ratio	0.56	1.26		0.65	0.16		0.51	0.07		0.50	0.61	
Uniform Delay, d1	49.0	29.4		44.6	14.8		48.0	36.8		42.6	35.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	19.4	129.9		8.3	0.2		4.4	0.3		0.8	4.9	
Delay (s)	68.4	159.2		52.9	15.0		52.4	37.1		43.4	40.0	
Level of Service	E	F		D	B		D	D		D	D	
Approach Delay (s)		158.3			29.5			42.2			40.9	
Approach LOS		F			C			D			D	

Intersection Summary

HCM Average Control Delay	109.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	99.4	Sum of lost time (s)	34.0
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

North Territorial Road
2040 No Build PM

HCM Signalized Intersection Capacity Analysis

22: N. Territorial &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔			↔	
Volume (vph)	115	154	0	0	291	479	237	0	81	3	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	16	12	12	8	12
Total Lost time (s)		5.5			5.5		5.2	5.2			5.2	
Lane Util. Factor		1.00			1.00		1.00	1.00			1.00	
Frt		1.00			0.92		1.00	0.85			0.89	
Flt Protected		0.98			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		1824			1706		2006	1794			1428	
Flt Permitted		0.24			1.00		0.75	1.00			0.95	
Satd. Flow (perm)		441			1706		1580	1794			1377	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	167	0	0	316	521	258	0	88	3	0	11
RTOR Reduction (vph)	0	0	0	0	119	0	0	62	0	0	8	0
Lane Group Flow (vph)	0	292	0	0	718	0	258	26	0	0	6	0
Turn Type	Perm						Perm		Perm			
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		24.5			24.5		14.8	14.8			14.8	
Effective Green, g (s)		24.5			24.5		14.8	14.8			14.8	
Actuated g/C Ratio		0.49			0.49		0.30	0.30			0.30	
Clearance Time (s)		5.5			5.5		5.2	5.2			5.2	
Lane Grp Cap (vph)		216			836		468	531			408	
v/s Ratio Prot					0.42			0.01				
v/s Ratio Perm		c0.66					c0.16				0.00	
v/c Ratio		1.35			0.86		0.55	0.05			0.02	
Uniform Delay, d1		12.8			11.2		14.8	12.6			12.4	
Progression Factor		0.89			1.00		1.00	1.00			1.00	
Incremental Delay, d2		185.1			11.2		4.6	0.2			0.1	
Delay (s)		196.5			22.4		19.4	12.7			12.5	
Level of Service		F			C		B	B			B	
Approach Delay (s)		196.5			22.4			17.7			12.5	
Approach LOS		F			C			B			B	

Intersection Summary

HCM Average Control Delay	55.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 24: N. Territorial & Off Ramp

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↻			↻		↻		↻		
Volume (vph)	0	183	88	56	482	0	86	0	99	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	16	16	12	12
Total Lost time (s)		5.5			5.5		5.2		5.2		
Lane Util. Factor		1.00			1.00		1.00		1.00		
Frt		0.96			1.00		1.00		0.85		
Flt Protected		1.00			0.99		0.95		1.00		
Satd. Flow (prot)		1781			1853		2006		1794		
Flt Permitted		1.00			0.94		0.95		1.00		
Satd. Flow (perm)		1781			1744		2006		1794		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	199	96	61	524	0	93	0	108	0	0
RTOR Reduction (vph)	0	35	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	260	0	0	585	0	93	0	108	0	0
Turn Type				Perm			custom		custom		
Protected Phases		4			8						
Permitted Phases				8			6		6		
Actuated Green, G (s)		24.5			24.5		14.8		14.8		
Effective Green, g (s)		24.5			24.5		14.8		14.8		
Actuated g/C Ratio		0.49			0.49		0.30		0.30		
Clearance Time (s)		5.5			5.5		5.2		5.2		
Lane Grp Cap (vph)		873			855		594		531		
v/s Ratio Prot		0.15									
v/s Ratio Perm					c0.34		0.05		c0.06		
v/c Ratio		0.30			0.68		0.16		0.20		
Uniform Delay, d1		7.6			9.8		13.0		13.2		
Progression Factor		1.00			1.03		1.00		1.00		
Incremental Delay, d2		0.9			3.0		0.6		0.9		
Delay (s)		8.5			13.1		13.6		14.0		
Level of Service		A			B		B		B		
Approach Delay (s)		8.5			13.1			13.8		0.0	
Approach LOS		A			B			B		A	

Intersection Summary		
HCM Average Control Delay	12.0	HCM Level of Service B
HCM Volume to Capacity ratio	0.50	
Actuated Cycle Length (s)	50.0	Sum of lost time (s) 10.7
Intersection Capacity Utilization	60.7%	ICU Level of Service B
Analysis Period (min)	15	
c Critical Lane Group		

HCM Signalized Intersection Capacity Analysis

27: N. Territorial &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	51	176	10	43	502	36	146	249	77	18	25	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8		6.8	6.8		6.8	6.8		6.8	6.8	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.96		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1848		1770	1844		1770	1797		1770	1687	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1848		1770	1844		1770	1797		1770	1687	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	191	11	47	546	39	159	271	84	20	27	46
RTOR Reduction (vph)	0	1	0	0	2	0	0	9	0	0	39	0
Lane Group Flow (vph)	55	201	0	47	583	0	159	346	0	20	34	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	6.4	39.8		4.6	38.0		14.7	27.8		2.5	15.6	
Effective Green, g (s)	6.4	39.8		4.6	38.0		14.7	27.8		2.5	15.6	
Actuated g/C Ratio	0.06	0.39		0.05	0.37		0.14	0.27		0.02	0.15	
Clearance Time (s)	6.8	6.8		6.8	6.8		6.8	6.8		6.8	6.8	
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	6.0		2.0	6.0	
Lane Grp Cap (vph)	111	722		80	688		255	490		43	258	
v/s Ratio Prot	c0.03	0.11		0.03	c0.32		c0.09	c0.19		0.01	0.02	
v/s Ratio Perm												
v/c Ratio	0.50	0.28		0.59	0.85		0.62	0.71		0.47	0.13	
Uniform Delay, d1	46.2	21.2		47.7	29.3		41.0	33.4		49.0	37.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	0.6		6.9	10.9		3.4	6.7		2.9	0.7	
Delay (s)	47.5	21.8		54.6	40.2		44.4	40.1		51.9	38.0	
Level of Service	D	C		D	D		D	D		D	D	
Approach Delay (s)		27.3			41.3			41.4			41.0	
Approach LOS		C			D			D			D	

Intersection Summary

HCM Average Control Delay	38.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	101.9	Sum of lost time (s)	27.2
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

North Territorial Road
2040 ATM AM

HCM Signalized Intersection Capacity Analysis

22: N. Territorial &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Volume (vph)	94	520	0	0	160	123	59	0	80	12	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	16	12	12	12	12
Total Lost time (s)		5.5			5.5		5.2	5.2			5.2	
Lane Util. Factor		1.00			1.00		1.00	1.00			1.00	
Frt		1.00			0.94		1.00	0.85			1.00	
Flt Protected		0.99			1.00		0.95	1.00			0.95	
Satd. Flow (prot)		1849			1753		2006	1794			1770	
Flt Permitted		0.89			1.00		0.75	1.00			0.70	
Satd. Flow (perm)		1665			1753		1581	1794			1305	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	102	565	0	0	174	134	64	0	87	13	0	0
RTOR Reduction (vph)	0	0	0	0	56	0	0	61	0	0	0	0
Lane Group Flow (vph)	0	667	0	0	252	0	64	26	0	0	13	0
Turn Type	Perm						Perm		Perm			
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		24.5			24.5		14.8	14.8			14.8	
Effective Green, g (s)		24.5			24.5		14.8	14.8			14.8	
Actuated g/C Ratio		0.49			0.49		0.30	0.30			0.30	
Clearance Time (s)		5.5			5.5		5.2	5.2			5.2	
Lane Grp Cap (vph)		816			859		468	531			386	
v/s Ratio Prot					0.14			0.01				
v/s Ratio Perm		c0.40					c0.04				0.01	
v/c Ratio		0.82			0.29		0.14	0.05			0.03	
Uniform Delay, d1		10.8			7.6		12.9	12.6			12.5	
Progression Factor		0.94			1.00		1.00	1.00			1.00	
Incremental Delay, d2		5.9			0.9		0.6	0.2			0.2	
Delay (s)		16.0			8.5		13.5	12.7			12.7	
Level of Service		B			A		B	B			B	
Approach Delay (s)		16.0			8.5		13.1				12.7	
Approach LOS		B			A		B				B	

Intersection Summary

HCM Average Control Delay	13.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
 24: N. Territorial & Off Ramp

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↻			↻		↻		↻		
Volume (vph)	0	403	402	78	141	0	211	0	56	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	16	16	12	12
Total Lost time (s)		5.5			5.5		5.2		5.2		
Lane Util. Factor		1.00			1.00		1.00		1.00		
Frt		0.93			1.00		1.00		0.85		
Flt Protected		1.00			0.98		0.95		1.00		
Satd. Flow (prot)		1737			1830		2006		1794		
Flt Permitted		1.00			0.29		0.95		1.00		
Satd. Flow (perm)		1737			544		2006		1794		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	438	437	85	153	0	229	0	61	0	0
RTOR Reduction (vph)	0	72	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	803	0	0	238	0	229	0	61	0	0
Turn Type				Perm			custom		custom		
Protected Phases		4			8						
Permitted Phases				8			6		6		
Actuated Green, G (s)		24.5			24.5		14.8		14.8		
Effective Green, g (s)		24.5			24.5		14.8		14.8		
Actuated g/C Ratio		0.49			0.49		0.30		0.30		
Clearance Time (s)		5.5			5.5		5.2		5.2		
Lane Grp Cap (vph)		851			267		594		531		
v/s Ratio Prot		c0.46									
v/s Ratio Perm					0.44		c0.11		0.03		
v/c Ratio		0.94			0.89		0.39		0.11		
Uniform Delay, d1		12.1			11.5		14.0		12.8		
Progression Factor		1.00			0.88		1.00		1.00		
Incremental Delay, d2		19.9			32.4		1.9		0.4		
Delay (s)		32.0			42.5		15.9		13.3		
Level of Service		C			D		B		B		
Approach Delay (s)		32.0			42.5		15.3		0.0		
Approach LOS		C			D		B		A		

Intersection Summary

HCM Average Control Delay	30.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

27: N. Territorial & Whitmore Lake

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	693	201	75	94	28	19	11	30	82	196	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8		6.8	6.8		6.8	6.8		6.8	6.8	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.97		1.00	0.89		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1800		1770	1799		1770	1658		1770	1823	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1800		1770	1799		1770	1658		1770	1823	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	753	218	82	102	30	21	12	33	89	213	35
RTOR Reduction (vph)	0	6	0	0	6	0	0	28	0	0	5	0
Lane Group Flow (vph)	10	965	0	82	126	0	21	17	0	89	243	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	1.0	40.8		7.3	47.1		2.3	13.8		9.7	21.2	
Effective Green, g (s)	1.0	40.8		7.3	47.1		2.3	13.8		9.7	21.2	
Actuated g/C Ratio	0.01	0.41		0.07	0.48		0.02	0.14		0.10	0.21	
Clearance Time (s)	6.8	6.8		6.8	6.8		6.8	6.8		6.8	6.8	
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	6.0		2.0	6.0	
Lane Grp Cap (vph)	18	743		131	858		41	232		174	391	
v/s Ratio Prot	0.01	c0.54		c0.05	c0.07		0.01	0.01		c0.05	c0.13	
v/s Ratio Perm												
v/c Ratio	0.56	1.30		0.63	0.15		0.51	0.07		0.51	0.62	
Uniform Delay, d1	48.7	29.0		44.4	14.5		47.7	36.9		42.3	35.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	19.4	144.0		6.6	0.2		4.4	0.4		1.1	5.2	
Delay (s)	68.1	173.0		51.0	14.8		52.1	37.3		43.4	40.4	
Level of Service	E	F		D	B		D	D		D	D	
Approach Delay (s)		171.9			28.6			42.0			41.1	
Approach LOS		F			C			D			D	

Intersection Summary

HCM Average Control Delay	119.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	98.8	Sum of lost time (s)	34.0
Intersection Capacity Utilization	85.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

North Territorial Road
2040 ATM PM

HCM Signalized Intersection Capacity Analysis

22: N. Territorial &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔			↔	
Volume (vph)	112	154	0	0	291	465	264	0	90	3	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	16	12	12	8	12
Total Lost time (s)		5.5			5.5		5.2	5.2			5.2	
Lane Util. Factor		1.00			1.00		1.00	1.00			1.00	
Frt		1.00			0.92		1.00	0.85			0.89	
Flt Protected		0.98			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		1824			1708		2006	1794			1428	
Flt Permitted		0.26			1.00		0.75	1.00			0.95	
Satd. Flow (perm)		488			1708		1580	1794			1376	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	122	167	0	0	316	505	287	0	98	3	0	11
RTOR Reduction (vph)	0	0	0	0	115	0	0	69	0	0	8	0
Lane Group Flow (vph)	0	289	0	0	706	0	287	29	0	0	6	0
Turn Type	Perm						Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		24.5			24.5		14.8	14.8			14.8	
Effective Green, g (s)		24.5			24.5		14.8	14.8			14.8	
Actuated g/C Ratio		0.49			0.49		0.30	0.30			0.30	
Clearance Time (s)		5.5			5.5		5.2	5.2			5.2	
Lane Grp Cap (vph)		239			837		468	531			407	
v/s Ratio Prot					0.41			0.02				
v/s Ratio Perm		c0.59					c0.18				0.00	
v/c Ratio		1.21			0.84		0.61	0.05			0.02	
Uniform Delay, d1		12.8			11.1		15.1	12.6			12.4	
Progression Factor		0.90			1.00		1.00	1.00			1.00	
Incremental Delay, d2		125.9			10.1		5.9	0.2			0.1	
Delay (s)		137.4			21.2		21.0	12.8			12.5	
Level of Service		F			C		C	B			B	
Approach Delay (s)		137.4			21.2			18.9			12.5	
Approach LOS		F			C			B			B	

Intersection Summary

HCM Average Control Delay	42.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	92.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

24: N. Territorial & Off Ramp

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↻			↻		↻		↻		
Volume (vph)	0	180	88	56	509	0	86	0	99	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	16	16	12	12
Total Lost time (s)		5.5			5.5		5.2		5.2		
Lane Util. Factor		1.00			1.00		1.00		1.00		
Frt		0.96			1.00		1.00		0.85		
Flt Protected		1.00			1.00		0.95		1.00		
Satd. Flow (prot)		1780			1854		2006		1794		
Flt Permitted		1.00			0.94		0.95		1.00		
Satd. Flow (perm)		1780			1750		2006		1794		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	196	96	61	553	0	93	0	108	0	0
RTOR Reduction (vph)	0	35	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	257	0	0	614	0	93	0	108	0	0
Turn Type				Perm			custom		custom		
Protected Phases		4			8						
Permitted Phases				8			6		6		
Actuated Green, G (s)		24.5			24.5		14.8		14.8		
Effective Green, g (s)		24.5			24.5		14.8		14.8		
Actuated g/C Ratio		0.49			0.49		0.30		0.30		
Clearance Time (s)		5.5			5.5		5.2		5.2		
Lane Grp Cap (vph)		872			858		594		531		
v/s Ratio Prot		0.14									
v/s Ratio Perm					c0.35		0.05		c0.06		
v/c Ratio		0.29			0.72		0.16		0.20		
Uniform Delay, d1		7.6			10.0		13.0		13.2		
Progression Factor		1.00			1.03		1.00		1.00		
Incremental Delay, d2		0.9			3.4		0.6		0.9		
Delay (s)		8.5			13.7		13.6		14.0		
Level of Service		A			B		B		B		
Approach Delay (s)		8.5			13.7			13.8		0.0	
Approach LOS		A			B			B		A	

Intersection Summary

HCM Average Control Delay	12.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

27: N. Territorial &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	51	174	10	45	525	38	146	249	76	18	25	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8		6.8	6.8		6.8	6.8		6.8	6.8	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.96		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1847		1770	1844		1770	1797		1770	1687	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1847		1770	1844		1770	1797		1770	1687	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	189	11	49	571	41	159	271	83	20	27	46
RTOR Reduction (vph)	0	1	0	0	2	0	0	9	0	0	39	0
Lane Group Flow (vph)	55	199	0	49	610	0	159	345	0	20	34	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	6.4	39.7		4.7	38.0		14.6	27.6		2.5	15.5	
Effective Green, g (s)	6.4	39.7		4.7	38.0		14.6	27.6		2.5	15.5	
Actuated g/C Ratio	0.06	0.39		0.05	0.37		0.14	0.27		0.02	0.15	
Clearance Time (s)	6.8	6.8		6.8	6.8		6.8	6.8		6.8	6.8	
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	6.0		2.0	6.0	
Lane Grp Cap (vph)	111	721		82	689		254	488		44	257	
v/s Ratio Prot	c0.03	0.11		0.03	c0.33		c0.09	c0.19		0.01	0.02	
v/s Ratio Perm												
v/c Ratio	0.50	0.28		0.60	0.89		0.63	0.71		0.45	0.13	
Uniform Delay, d1	46.1	21.2		47.6	29.8		41.0	33.4		48.9	37.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.3	0.6		7.6	14.5		3.4	6.8		2.7	0.7	
Delay (s)	47.4	21.8		55.1	44.3		44.4	40.2		51.6	37.9	
Level of Service	D	C		E	D		D	D		D	D	
Approach Delay (s)		27.3			45.1			41.5			40.9	
Approach LOS		C			D			D			D	

Intersection Summary

HCM Average Control Delay	40.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	101.7	Sum of lost time (s)	27.2
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

North Territorial Road
2040 ATM - HOV AM

HCM Signalized Intersection Capacity Analysis

22: N. Territorial &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Volume (vph)	105	586	0	0	140	123	59	0	80	12	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	16	12	12	12	12
Total Lost time (s)		5.5			5.5		5.2	5.2			5.2	
Lane Util. Factor		1.00			1.00		1.00	1.00			1.00	
Frt		1.00			0.94		1.00	0.85			1.00	
Flt Protected		0.99			1.00		0.95	1.00			0.95	
Satd. Flow (prot)		1849			1745		2006	1794			1770	
Flt Permitted		0.90			1.00		0.75	1.00			0.70	
Satd. Flow (perm)		1669			1745		1581	1794			1305	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	114	637	0	0	152	134	64	0	87	13	0	0
RTOR Reduction (vph)	0	0	0	0	63	0	0	61	0	0	0	0
Lane Group Flow (vph)	0	751	0	0	223	0	64	26	0	0	13	0
Turn Type	Perm						Perm		Perm			
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		24.5			24.5		14.8	14.8			14.8	
Effective Green, g (s)		24.5			24.5		14.8	14.8			14.8	
Actuated g/C Ratio		0.49			0.49		0.30	0.30			0.30	
Clearance Time (s)		5.5			5.5		5.2	5.2			5.2	
Lane Grp Cap (vph)		818			855		468	531			386	
v/s Ratio Prot					0.13			0.01				
v/s Ratio Perm		c0.45					c0.04				0.01	
v/c Ratio		0.92			0.26		0.14	0.05			0.03	
Uniform Delay, d1		11.8			7.5		12.9	12.6			12.5	
Progression Factor		0.97			1.00		1.00	1.00			1.00	
Incremental Delay, d2		11.8			0.7		0.6	0.2			0.2	
Delay (s)		23.3			8.2		13.5	12.7			12.7	
Level of Service		C			A		B	B			B	
Approach Delay (s)		23.3			8.2		13.1				12.7	
Approach LOS		C			A		B				B	

Intersection Summary

HCM Average Control Delay	18.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

24: N. Territorial & Off Ramp

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↻			↻		↻		↻		
Volume (vph)	0	403	375	58	141	0	288	0	77	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	16	16	12	12
Total Lost time (s)		5.5			5.5		5.2		5.2		
Lane Util. Factor		1.00			1.00		1.00		1.00		
Frt		0.93			1.00		1.00		0.85		
Flt Protected		1.00			0.99		0.95		1.00		
Satd. Flow (prot)		1741			1836		2006		1794		
Flt Permitted		1.00			0.41		0.95		1.00		
Satd. Flow (perm)		1741			767		2006		1794		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	438	408	63	153	0	313	0	84	0	0
RTOR Reduction (vph)	0	67	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	779	0	0	216	0	313	0	84	0	0
Turn Type				Perm			custom		custom		
Protected Phases		4			8						
Permitted Phases				8			6		6		
Actuated Green, G (s)		24.5			24.5		14.8		14.8		
Effective Green, g (s)		24.5			24.5		14.8		14.8		
Actuated g/C Ratio		0.49			0.49		0.30		0.30		
Clearance Time (s)		5.5			5.5		5.2		5.2		
Lane Grp Cap (vph)		853			376		594		531		
v/s Ratio Prot		c0.45									
v/s Ratio Perm					0.28		c0.16		0.05		
v/c Ratio		0.91			0.57		0.53		0.16		
Uniform Delay, d1		11.8			9.0		14.7		13.0		
Progression Factor		1.00			0.90		1.00		1.00		
Incremental Delay, d2		15.8			6.1		3.3		0.6		
Delay (s)		27.5			14.3		18.0		13.6		
Level of Service		C			B		B		B		
Approach Delay (s)		27.5			14.3			17.1		0.0	
Approach LOS		C			B			B		A	

Intersection Summary

HCM Average Control Delay	22.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

27: N. Territorial & Whitmore Lake

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Volume (vph)	9	670	201	83	104	31	19	11	28	80	196	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8		6.8	6.8		6.8	6.8		6.8	6.8	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.97		1.00	0.89		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1798		1770	1798		1770	1663		1770	1823	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1798		1770	1798		1770	1663		1770	1823	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	728	218	90	113	34	21	12	30	87	213	35
RTOR Reduction (vph)	0	7	0	0	6	0	0	26	0	0	5	0
Lane Group Flow (vph)	10	939	0	90	141	0	21	16	0	87	243	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	1.0	40.7		7.7	47.4		2.3	14.2		9.7	21.6	
Effective Green, g (s)	1.0	40.7		7.7	47.4		2.3	14.2		9.7	21.6	
Actuated g/C Ratio	0.01	0.41		0.08	0.48		0.02	0.14		0.10	0.22	
Clearance Time (s)	6.8	6.8		6.8	6.8		6.8	6.8		6.8	6.8	
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	6.0		2.0	6.0	
Lane Grp Cap (vph)	18	735		137	857		41	237		173	396	
v/s Ratio Prot	0.01	c0.52		c0.05	c0.08		0.01	0.01		c0.05	c0.13	
v/s Ratio Perm												
v/c Ratio	0.56	1.28		0.66	0.16		0.51	0.07		0.50	0.61	
Uniform Delay, d1	49.0	29.4		44.6	14.8		48.0	36.9		42.6	35.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	19.4	135.3		8.4	0.3		4.4	0.3		0.8	4.9	
Delay (s)	68.4	164.7		53.0	15.1		52.5	37.3		43.5	40.1	
Level of Service	E	F		D	B		D	D		D	D	
Approach Delay (s)		163.6			29.5			42.3			40.9	
Approach LOS		F			C			D			D	

Intersection Summary

HCM Average Control Delay	113.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	99.5	Sum of lost time (s)	34.0
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

North Territorial Road
2040 ATM-HOV PM

HCM Signalized Intersection Capacity Analysis

22: N. Territorial &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔			↔	
Volume (vph)	115	154	0	0	291	479	277	0	95	3	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	16	12	12	8	12
Total Lost time (s)		5.5			5.5		5.2	5.2			5.2	
Lane Util. Factor		1.00			1.00		1.00	1.00			1.00	
Frt		1.00			0.92		1.00	0.85			0.89	
Flt Protected		0.98			1.00		0.95	1.00			0.99	
Satd. Flow (prot)		1824			1706		2006	1794			1428	
Flt Permitted		0.24			1.00		0.75	1.00			0.95	
Satd. Flow (perm)		441			1706		1580	1794			1375	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	167	0	0	316	521	301	0	103	3	0	11
RTOR Reduction (vph)	0	0	0	0	119	0	0	73	0	0	8	0
Lane Group Flow (vph)	0	292	0	0	718	0	301	30	0	0	6	0
Turn Type	Perm						Perm		Perm			
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		
Actuated Green, G (s)		24.5			24.5		14.8	14.8			14.8	
Effective Green, g (s)		24.5			24.5		14.8	14.8			14.8	
Actuated g/C Ratio		0.49			0.49		0.30	0.30			0.30	
Clearance Time (s)		5.5			5.5		5.2	5.2			5.2	
Lane Grp Cap (vph)		216			836		468	531			407	
v/s Ratio Prot					0.42			0.02				
v/s Ratio Perm		c0.66					c0.19				0.00	
v/c Ratio		1.35			0.86		0.64	0.06			0.02	
Uniform Delay, d1		12.8			11.2		15.3	12.6			12.4	
Progression Factor		0.89			1.00		1.00	1.00			1.00	
Incremental Delay, d2		185.1			11.2		6.7	0.2			0.1	
Delay (s)		196.5			22.4		22.0	12.8			12.5	
Level of Service		F			C		C	B			B	
Approach Delay (s)		196.5			22.4			19.6			12.5	
Approach LOS		F			C			B			B	

Intersection Summary

HCM Average Control Delay	54.4	HCM Level of Service	D
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	94.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

24: N. Territorial & Off Ramp

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations		↶			↷		↶		↷		
Volume (vph)	0	183	88	56	522	0	86	0	99	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	16	16	16	12	12
Total Lost time (s)		5.5			5.5		5.2		5.2		
Lane Util. Factor		1.00			1.00		1.00		1.00		
Frt		0.96			1.00		1.00		0.85		
Flt Protected		1.00			1.00		0.95		1.00		
Satd. Flow (prot)		1781			1854		2006		1794		
Flt Permitted		1.00			0.94		0.95		1.00		
Satd. Flow (perm)		1781			1752		2006		1794		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	199	96	61	567	0	93	0	108	0	0
RTOR Reduction (vph)	0	35	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	260	0	0	628	0	93	0	108	0	0
Turn Type				Perm			custom		custom		
Protected Phases		4			8						
Permitted Phases				8			6		6		
Actuated Green, G (s)		24.5			24.5		14.8		14.8		
Effective Green, g (s)		24.5			24.5		14.8		14.8		
Actuated g/C Ratio		0.49			0.49		0.30		0.30		
Clearance Time (s)		5.5			5.5		5.2		5.2		
Lane Grp Cap (vph)		873			858		594		531		
v/s Ratio Prot		0.15									
v/s Ratio Perm					c0.36		0.05		c0.06		
v/c Ratio		0.30			0.73		0.16		0.20		
Uniform Delay, d1		7.6			10.1		13.0		13.2		
Progression Factor		1.00			1.04		1.00		1.00		
Incremental Delay, d2		0.9			3.6		0.6		0.9		
Delay (s)		8.5			14.2		13.6		14.0		
Level of Service		A			B		B		B		
Approach Delay (s)		8.5			14.2			13.8		0.0	
Approach LOS		A			B			B		A	

Intersection Summary

HCM Average Control Delay	12.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

27: N. Territorial &

9/17/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	51	176	10	46	537	38	146	249	77	18	25	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.8	6.8		6.8	6.8		6.8	6.8		6.8	6.8	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.96		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1848		1770	1844		1770	1797		1770	1687	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1848		1770	1844		1770	1797		1770	1687	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	191	11	50	584	41	159	271	84	20	27	46
RTOR Reduction (vph)	0	1	0	0	2	0	0	9	0	0	39	0
Lane Group Flow (vph)	55	201	0	50	623	0	159	346	0	20	34	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	6.4	36.8		6.2	36.6		14.6	27.6		2.5	15.5	
Effective Green, g (s)	6.4	36.8		6.2	36.6		14.6	27.6		2.5	15.5	
Actuated g/C Ratio	0.06	0.37		0.06	0.36		0.15	0.28		0.02	0.15	
Clearance Time (s)	6.8	6.8		6.8	6.8		6.8	6.8		6.8	6.8	
Vehicle Extension (s)	2.0	6.0		2.0	6.0		2.0	6.0		2.0	6.0	
Lane Grp Cap (vph)	113	678		109	673		258	494		44	261	
v/s Ratio Prot	c0.03	0.11		0.03	c0.34		c0.09	c0.19		0.01	0.02	
v/s Ratio Perm												
v/c Ratio	0.49	0.30		0.46	0.93		0.62	0.70		0.45	0.13	
Uniform Delay, d1	45.4	22.6		45.4	30.5		40.2	32.6		48.2	36.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	0.7		1.1	19.9		3.1	6.5		2.7	0.6	
Delay (s)	46.6	23.2		46.5	50.5		43.3	39.2		50.9	37.2	
Level of Service	D	C		D	D		D	D		D	D	
Approach Delay (s)		28.2			50.2			40.4			40.2	
Approach LOS		C			D			D			D	

Intersection Summary

HCM Average Control Delay	42.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.3	Sum of lost time (s)	27.2
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Ramp Meter
Synchro Reports

6 Mile Road and SB On Ramp
AM Peak

HCM Signalized Intersection Capacity Analysis

8: Ramp Meter &

9/18/2014



Movement	WBL	NBL	NBR	NER
Lane Configurations			↗	↘
Volume (vph)	0	0	0	389
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)				2.0
Lane Util. Factor				1.00
Flt				0.86
Flt Protected				1.00
Satd. Flow (prot)				1611
Flt Permitted				1.00
Satd. Flow (perm)				1611
Peak-hour factor, PHF	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	423
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	0	0	423
Turn Type			custom	
Protected Phases			6	4
Permitted Phases				
Actuated Green, G (s)				1.0
Effective Green, g (s)				1.0
Actuated g/C Ratio				0.09
Clearance Time (s)				2.0
Vehicle Extension (s)				0.2
Lane Grp Cap (vph)				145
v/s Ratio Prot				c0.26
v/s Ratio Perm				
v/c Ratio				2.92
Uniform Delay, d1				5.0
Progression Factor				1.00
Incremental Delay, d2				881.3
Delay (s)				886.3
Level of Service				F
Approach Delay (s)	0.0	0.0		886.3
Approach LOS	A	A		F

Intersection Summary			
HCM Average Control Delay		886.3	HCM Level of Service F
HCM Volume to Capacity ratio		1.46	
Actuated Cycle Length (s)		11.1	Sum of lost time (s) 10.1
Intersection Capacity Utilization		34.1%	ICU Level of Service A
Analysis Period (min)		15	
c Critical Lane Group			

8 Mile Road and SB On Ramp
AM Peak

HCM Signalized Intersection Capacity Analysis

11: Ramp Meter &

9/18/2014



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑	↑	
Volume (vph)	0	0	0	0	658	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)					2.0	
Lane Util. Factor					1.00	
Frt					1.00	
Flt Protected					1.00	
Satd. Flow (prot)					1863	
Flt Permitted					1.00	
Satd. Flow (perm)					1863	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	715	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	715	0
Turn Type	custom					
Protected Phases	6					
Permitted Phases	4					
Actuated Green, G (s)	3.0					
Effective Green, g (s)	3.0					
Actuated g/C Ratio	0.29					
Clearance Time (s)	2.0					
Vehicle Extension (s)	0.2					
Lane Grp Cap (vph)	548					
v/s Ratio Prot	c0.38					
v/s Ratio Perm						
v/c Ratio	1.30					
Uniform Delay, d1	3.6					
Progression Factor	1.00					
Incremental Delay, d2	150.0					
Delay (s)	153.6					
Level of Service	F					
Approach Delay (s)	0.0			0.0	153.6	
Approach LOS	A			A	F	

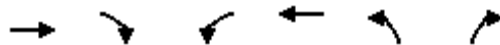
Intersection Summary			
HCM Average Control Delay	153.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	10.2	Sum of lost time (s)	7.2
Intersection Capacity Utilization	38.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

M36 SB On Ramp
AM Peak

HCM Signalized Intersection Capacity Analysis

7: Ramp Meter &

9/18/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑					↗
Volume (vph)	510	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.0					
Lane Util. Factor	1.00					
Frt	1.00					
Flt Protected	1.00					
Satd. Flow (prot)	1863					
Flt Permitted	1.00					
Satd. Flow (perm)	1863					
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	554	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	554	0	0	0	0	0
Turn Type						custom
Protected Phases	2					4
Permitted Phases						
Actuated Green, G (s)	1.0					
Effective Green, g (s)	1.0					
Actuated g/C Ratio	0.10					
Clearance Time (s)	2.0					
Vehicle Extension (s)	0.2					
Lane Grp Cap (vph)	181					
v/s Ratio Prot	c0.30					
v/s Ratio Perm						
v/c Ratio	3.06					
Uniform Delay, d1	4.7					
Progression Factor	1.00					
Incremental Delay, d2	941.9					
Delay (s)	946.5					
Level of Service	F					
Approach Delay (s)	946.5			0.0	0.0	
Approach LOS	F			A	A	









Intersection Summary			
HCM Average Control Delay	946.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.53		
Actuated Cycle Length (s)	10.3	Sum of lost time (s)	9.3
Intersection Capacity Utilization	30.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

M36 NB On Ramp
PM Peak

HCM Signalized Intersection Capacity Analysis

27: Ramp Meter &

9/18/2014

						
Movement	SBL	SBR	NWL	NWR	NEL	NER
Lane Configurations						
Volume (vph)	0	0	0	393	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				2.0		
Lane Util. Factor				1.00		
Frt				0.86		
Flt Protected				1.00		
Satd. Flow (prot)				1611		
Flt Permitted				1.00		
Satd. Flow (perm)				1611		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	427	0	0
RTOR Reduction (vph)	0	0	0	389	0	0
Lane Group Flow (vph)	0	0	0	38	0	0
Turn Type				custom		
Protected Phases				2	4	
Permitted Phases						
Actuated Green, G (s)				1.0		
Effective Green, g (s)				1.0		
Actuated g/C Ratio				0.09		
Clearance Time (s)				2.0		
Vehicle Extension (s)				0.2		
Lane Grp Cap (vph)				144		
v/s Ratio Prot				c0.02		
v/s Ratio Perm						
v/c Ratio				0.26		
Uniform Delay, d1				4.8		
Progression Factor				1.00		
Incremental Delay, d2				0.4		
Delay (s)				5.1		
Level of Service				A		
Approach Delay (s)	0.0		5.1		0.0	
Approach LOS	A		A		A	
Intersection Summary						
HCM Average Control Delay			5.1		HCM Level of Service	A
HCM Volume to Capacity ratio			0.13			
Actuated Cycle Length (s)			11.2		Sum of lost time (s)	10.2
Intersection Capacity Utilization			27.7%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

Rodel Reports

US-23 Active Traffic Management Assessment

US-23/8 Mile Road Roundabout Analysis Output

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	NB Entrance Ramp	0	0	16.00	1	17.00	1	85.00	66.00	30.00
2	EB 8 Mile Road	90	0	12.00	1	15.00	1	85.00	66.00	30.00
3	Nb Exit Ramp	180	0	16.00	1	17.00	1	85.00	66.00	30.00
4	WB 8 Mile Road	270	0	12.00	1	15.00	1	85.00	66.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	NB Entrance Ramp	140.00	19.00	1	17.00	1	16.00	1
2	EB 8 Mile Road	140.00	19.00	1	15.00	1	12.00	1
3	Nb Exit Ramp	140.00	19.00	1	17.00	1	12.00	1
4	WB 8 Mile Road	140.00	19.00	1	15.00	1	12.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	NB Entrance Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
2	EB 8 Mile Road	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0
3	Nb Exit Ramp	0	1.000	0	1.000	20.00	2390	0	12.00	1792	0
4	WB 8 Mile Road	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0

Operational Results

2040 AM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)				Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass	Entry	Bypass	Entry	Bypass
1	NB Entrance Ramp	None	0		0		201	0		0.0000
2	EB 8 Mile Road	None	424		0		152	1096		0.3961
3	Nb Exit Ramp	None	78		424		0	1103		0.0726
4	WB 8 Mile Road	None	247		106		396	1042		0.2427

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	NB Entrance Ramp	None	0.00		0.00	0.00		A		A
2	EB 8 Mile Road	None	4.96		4.96	1.82		A		A
3	Nb Exit Ramp	None	3.32		3.32	0.22		A		A
4	WB 8 Mile Road	None	4.24		4.24	0.90		A		A

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	NB Entrance Ramp	0	0	16.00	1	17.00	1	85.00	66.00	30.00
2	EB 8 Mile Road	90	0	12.00	1	15.00	1	85.00	66.00	30.00
3	Nb Exit Ramp	180	0	16.00	1	17.00	1	85.00	66.00	30.00
4	WB 8 Mile Road	270	0	12.00	1	15.00	1	85.00	66.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	NB Entrance Ramp	140.00	19.00	1	17.00	1	16.00	1
2	EB 8 Mile Road	140.00	19.00	1	15.00	1	12.00	1
3	Nb Exit Ramp	140.00	19.00	1	17.00	1	12.00	1
4	WB 8 Mile Road	140.00	19.00	1	15.00	1	12.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	NB Entrance Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
2	EB 8 Mile Road	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0
3	Nb Exit Ramp	0	1.000	0	1.000	20.00	2390	0	12.00	1792	0
4	WB 8 Mile Road	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0

Operational Results

2040 PM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)				Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass	Entry	Bypass	Entry	Bypass
1	NB Entrance Ramp	None	0		0		273	0		0.0000
2	EB 8 Mile Road	None	373		0		429	1096		0.3482
3	Nb Exit Ramp	None	247		373		0	1131		0.2240
4	WB 8 Mile Road	None	410		292		328	946		0.4467

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	NB Entrance Ramp	None	0.00		0.00	0.00		A		A
2	EB 8 Mile Road	None	4.62		4.62	1.49		A		A
3	Nb Exit Ramp	None	3.83		3.83	0.82		A		A
4	WB 8 Mile Road	None	6.23		6.23	2.30		A		A

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	SB Exit Ramp	0	0	16.00	1	17.00	1	85.00	66.00	30.00
2	EB 8 Mile Road	90	0	12.00	1	15.00	1	85.00	66.00	30.00
3	SB Entrance Ramp	180	0	16.00	1	17.00	1	85.00	66.00	30.00
4	WB Exit Ramp	270	0	12.00	1	15.00	1	85.00	66.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	SB Exit Ramp	140.00	18.00	1	17.00	1	16.00	1
2	EB 8 Mile Road	140.00	18.00	1	15.00	1	12.00	1
3	SB Entrance Ramp	140.00	18.00	1	17.00	1	16.00	1
4	WB Exit Ramp	140.00	18.00	1	15.00	1	12.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	SB Exit Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
2	EB 8 Mile Road	0	1.000	0	1.000	24.00	3584	0	12.00	1792	0
3	SB Entrance Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
4	WB Exit Ramp	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0

Operational Results

2040 AM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	SB Exit Ramp	None	106		152		0	1256		0.0862	
2	EB 8 Mile Road	Yield	348	656	78	78	180	1056	1177	0.3376	0.5737
3	SB Entrance Ramp	None	0		0		658	0		0.0000	
4	WB Exit Ramp	None	152		0		424	1096		0.1416	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	SB Exit Ramp	None	2.95		2.95	0.26		A		A
2	EB 8 Mile Road	Yield	4.73	7.05	6.24	1.43	4.22	A	A	A
3	SB Entrance Ramp	None	0.00		0.00	0.00		A		A
4	WB Exit Ramp	None	3.59		3.59	0.46		A		A

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	SB Exit Ramp	0	0	16.00	1	17.00	1	85.00	66.00	30.00
2	EB 8 Mile Road	90	0	12.00	1	15.00	1	85.00	66.00	30.00
3	SB Entrance Ramp	180	0	16.00	1	17.00	1	85.00	66.00	30.00
4	WB Exit Ramp	270	0	12.00	1	15.00	1	85.00	66.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	SB Exit Ramp	140.00	18.00	1	17.00	1	16.00	1
2	EB 8 Mile Road	140.00	18.00	1	15.00	1	12.00	1
3	SB Entrance Ramp	140.00	18.00	1	17.00	1	16.00	1
4	WB Exit Ramp	140.00	18.00	1	15.00	1	12.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	SB Exit Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
2	EB 8 Mile Road	0	1.000	0	1.000	24.00	3584	0	12.00	1792	0
3	SB Entrance Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
4	WB Exit Ramp	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0

Operational Results

2040 PM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	SB Exit Ramp	None	242		429		0	1124		0.2213	
2	EB 8 Mile Road	Yield	201	102	178	178	493	1025	1134	0.2009	0.0920
3	SB Entrance Ramp	None	0		0		108	0		0.0000	
4	WB Exit Ramp	None	429		0		373	1117		0.3931	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	SB Exit Ramp	None	3.89		3.89	0.82		A		A
2	EB 8 Mile Road	Yield	4.15	3.47	3.92	0.72	0.30	A	A	A
3	SB Entrance Ramp	None	0.00		0.00	0.00		A		A
4	WB Exit Ramp	None	4.92		4.92	1.83		A		A

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	Whitmore Lake Rd	0	0	12.00	1	15.00	1	85.00	66.00	30.00
2	EB 8 Mile Road	90	0	12.00	1	15.00	1	85.00	66.00	30.00
3	WB 8 Mile Road	270	0	12.00	1	15.00	1	85.00	66.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Whitmore Lake Rd	140.00	18.00	1	14.00	1	12.00	1
2	EB 8 Mile Road	140.00	18.00	1	14.00	1	12.00	1
3	WB 8 Mile Road	140.00	18.00	1	14.00	1	12.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	Whitmore Lake Rd	0	1.000	0	1.000	12.00	1792	0	12.00	1792	0
2	EB 8 Mile Road	0	1.000	0	1.000	12.00	1792	0	12.00	1792	0
3	WB 8 Mile Road	0	1.000	0	1.000	12.00	1792	0	12.00	1792	0

Operational Results

2040 AM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Whitmore Lake Rd	None	462		136		53	1026		0.4626	
2	EB 8 Mile Road	None	558		455		143	863		0.6760	
3	WB 8 Mile Road	None	180		9		1004	1091		0.1684	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Whitmore Lake Rd	None	5.89		5.89	2.42		A		A
2	EB 8 Mile Road	None	10.98		10.98	6.02		B		B
3	WB 8 Mile Road	None	3.71		3.71	0.56		A		A

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	Whitmore Lake Rd	0	0	12.00	1	15.00	1	85.00	66.00	30.00
2	EB 8 Mile Road	90	0	12.00	1	15.00	1	85.00	66.00	30.00
3	WB 8 Mile Road	270	0	12.00	1	15.00	1	85.00	66.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Whitmore Lake Rd	140.00	18.00	1	14.00	1	12.00	1
2	EB 8 Mile Road	140.00	18.00	1	14.00	1	12.00	1
3	WB 8 Mile Road	140.00	18.00	1	14.00	1	12.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	Whitmore Lake Rd	0	1.000	0	1.000	12.00	1792	0	12.00	1792	0
2	EB 8 Mile Road	0	1.000	0	1.000	12.00	1792	0	12.00	1792	0
3	WB 8 Mile Road	0	1.000	0	1.000	12.00	1792	0	12.00	1792	0

Operational Results

2040 PM Peak - 60 minutes

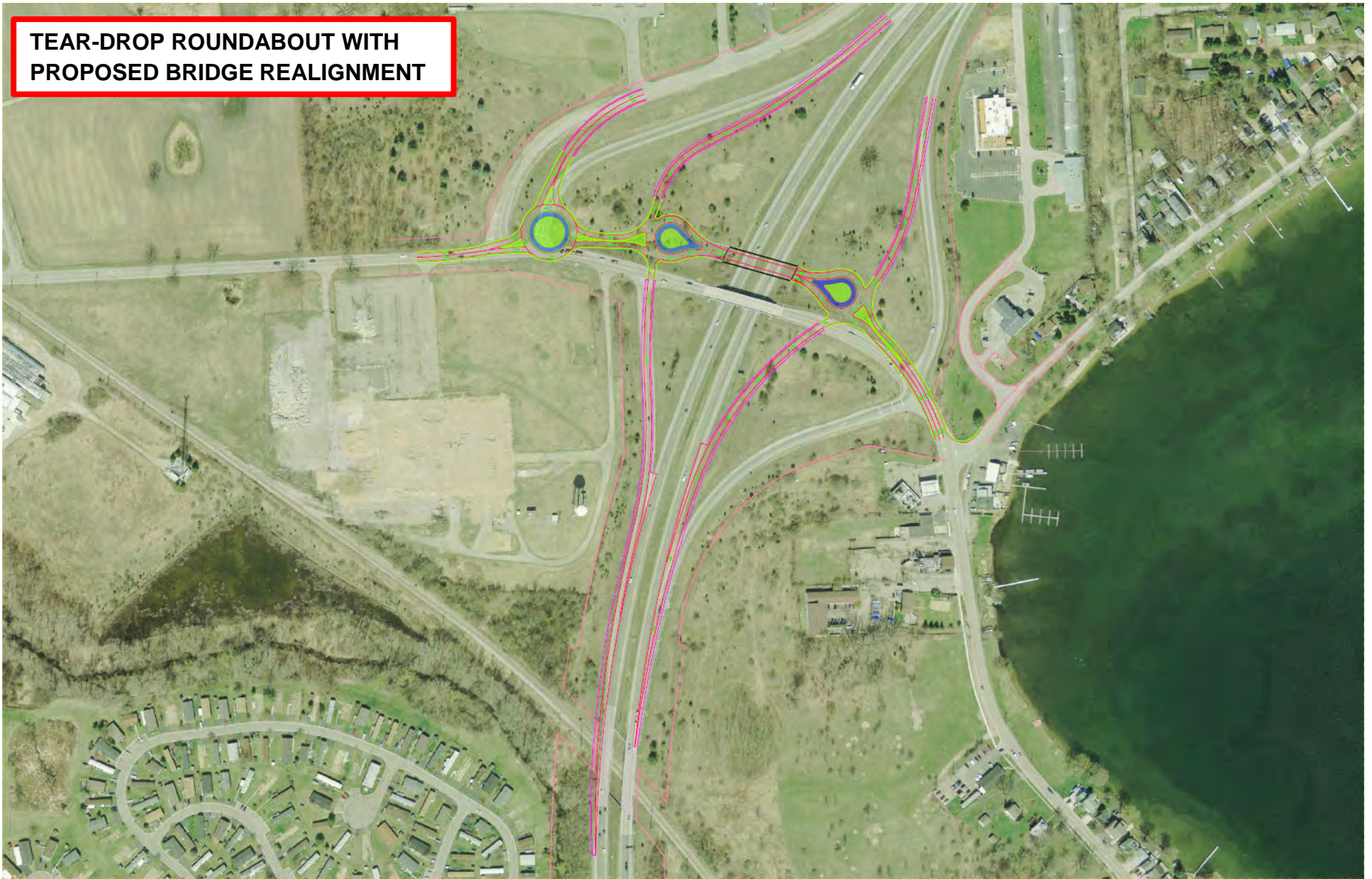
Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)				Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass	Entry	Bypass	Entry	Bypass
1	Whitmore Lake Rd	None	183		373		145	905		0.2081
2	EB 8 Mile Road	None	193		135		421	1027		0.1924
3	WB 8 Mile Road	None	493		25		303	1083		0.4668

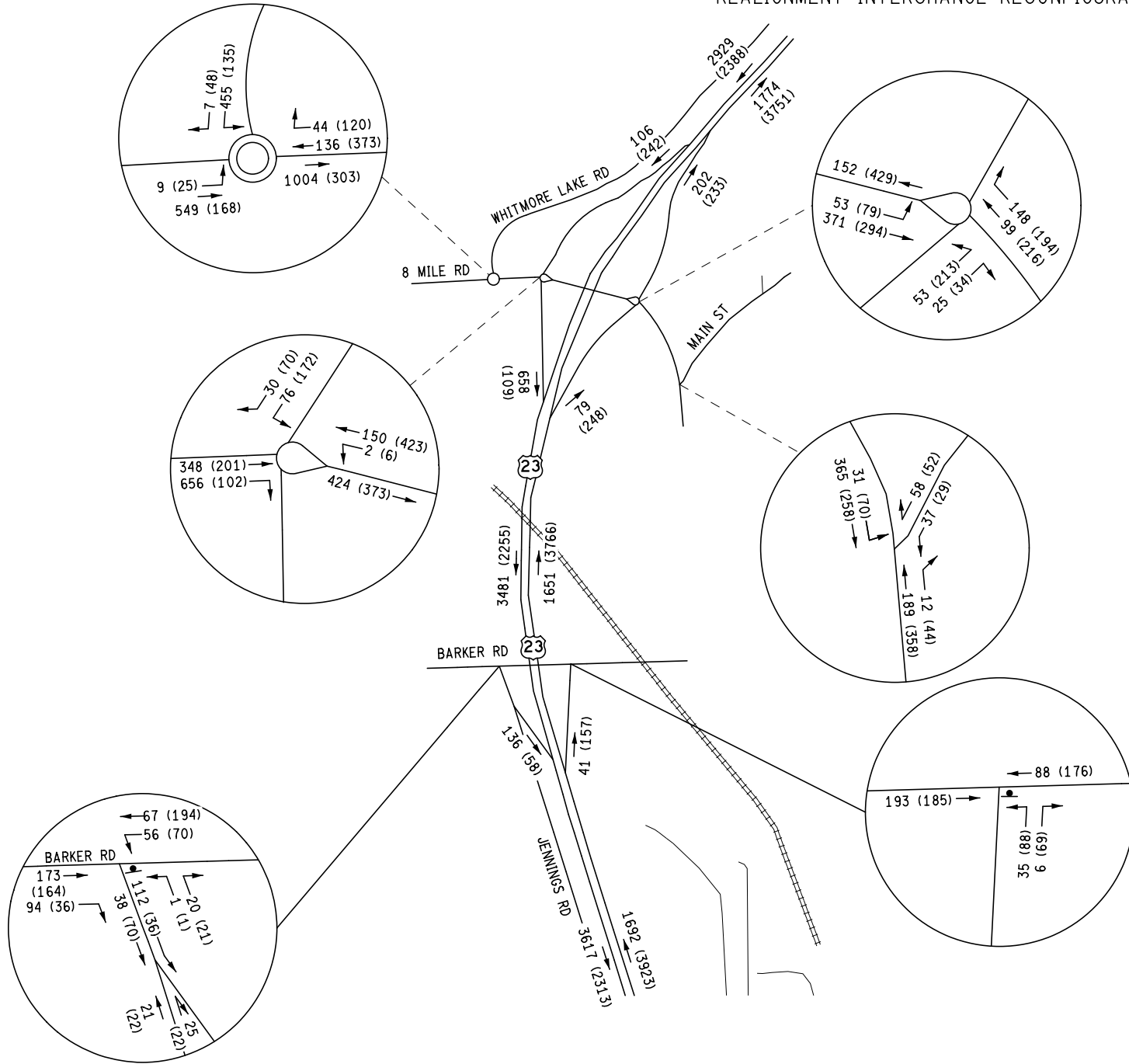
Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Whitmore Lake Rd	None	4.69		4.69	0.75		A		A
2	EB 8 Mile Road	None	4.05		4.05	0.67		A		A
3	WB 8 Mile Road	None	5.61		5.61	2.44		A		A

**TEAR-DROP ROUNDABOUT WITH
PROPOSED BRIDGE REALIGNMENT**



FUTURE (2040) PEAK-HOUR VOLUMES
 WITH TEAR DROP/CIRCLE COMBO & PROP BRIDGE
 REALIGNMENT INTERCHANGE RECONFIGURATION



DATE: September 4, 2014

TO: Stephanie Palmer
University Region

FROM: Rosemary Edwards
Geometric Operations Unit

SUBJECT: Active Traffic Management Team
US-23/North Territorial Road Roundabout Option Analysis,
81075

Purpose:

US-23 at North Territorial Road is located in the corridor being considered for a Full Shoulder Running, from US-23/M-14 interchange to Silver Lake Road. To provide capacity and design configuration information for the northbound and southbound ramp terminals a roundabout analysis was conducted for this interchange.

Proposed and Enhanced Options:

The volumes at the ramp terminals for the Proposed Option and the Enhanced Option are the same. The Enhanced Option involves low cost operational improvements such as ramp extensions.

Single lane tear drop shaped roundabouts are proposed at each ramp terminal. Bypass lanes will be required from N. Territorial Road onto both the northbound and southbound entrance ramps. 5 Mile Road is proposed to be separated from the NB US-23 entrance ramp. The new intersection of 5 Mile Road is projected to be east of the interchange. Volumes from 5 Mile Road were excluded from the interchange analysis; distribution information was not provided. The number of vehicles from 5 Mile Road that would enter the interchange area is negligible to the overall input into the roundabout.

Active Traffic Management (ATM) and High Occupancy Vehicle (HOV) Lane Options:

The single lane roundabout configuration did not change with the Active Traffic Management or High Occupancy Vehicle Lane options. Bypass lanes from N. Territorial Road onto both the northbound and southbound entrance ramps will also still be required.

Capacity:

"

'P q'Dwrf and Enhanced Options:

P D'Tco r "Vgto kpcn'Tqwpf cdqw

Peak Hour	Delay (s)	LOS
2015 AM	5.75	A
2015 PM	4.85	A
2040 AM	6.28	A
2040 PM	5.19	A

SB Ramp Terminal Roundabout

Peak Hour	Delay (s)	LOS
2015 AM	3.31	A
2015 PM	4.40	A
2040 AM	3.49	A
2040 PM	4.64	A

Active Traffic Management (ATM)

NB Ramp Terminal Roundabout

Peak Hour	Delay (s)	LOS
2040 AM	5.54	A
2040 PM	5.08	A

SB Ramp Terminal Roundabout

Peak Hour	Delay (s)	LOS
2040 AM	3.26	A
2040 PM	4.64	A

High Occupancy Vehicle (HOV) Lane

NB Ramp Terminal Roundabout

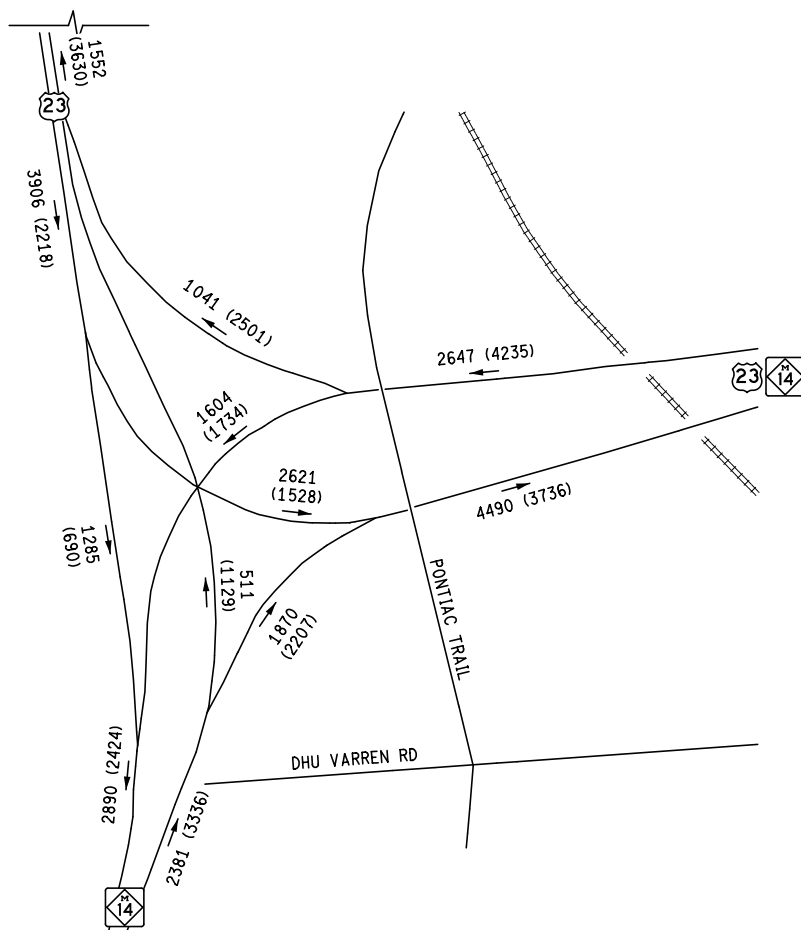
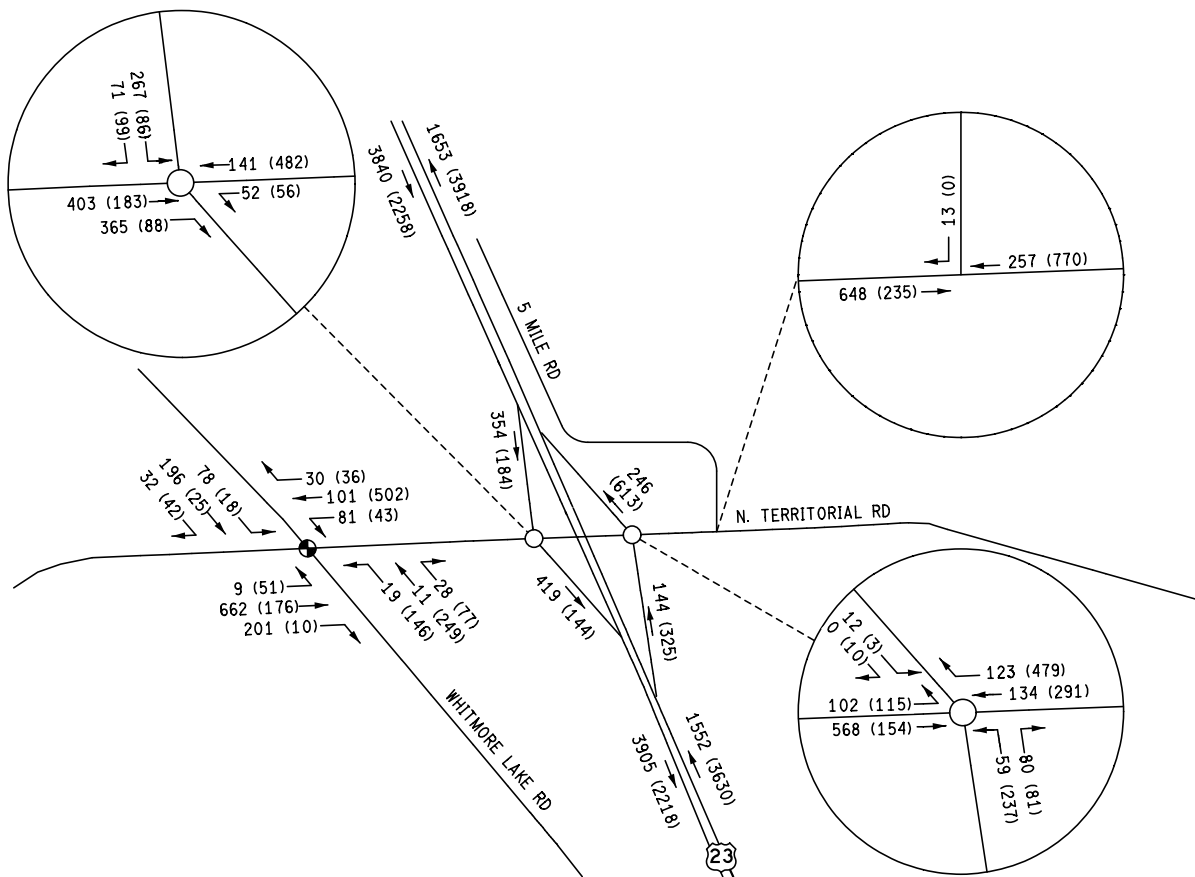
Peak Hour	Delay (s)	LOS
2040 AM	6.45	A
2040 PM	5.21	A

SB Ramp Terminal Roundabout

Peak Hour	Delay (s)	LOS
2040 AM	3.50	A
2040 PM	4.85	A

The 85% Confidence Levels for each option passed with acceptable levels of service and delay.

Rosemary Edwards
Geometric Operations Unit



- - SIGNAL
- ⊥ - STOP SIGN
- ▼ - YIELD SIGN
- ↑ - TRAFFIC FLOW ARROWS
- XXX - AM LOS
- (XXX) - PM LOS

US-23 Active Traffic Management Assessment

US-23/North Territorial Road Roundabout Analysis Output

US-23/North Territorial Road Roundabout Analysis Output

No Build
and
TSM Options

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	NB On	0	0	16.00	1	16.00	1	85.00	60.00	25.00
2	EB N Territorial	90	0	12.00	1	15.50	1	85.00	100.00	40.00
3	NB US-23 Off Ramp	180	0	16.00	1	16.00	1	85.00	82.00	25.00
4	WB N Territorial	270	0	12.00	1	15.50	1	85.00	100.00	40.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	NB On	130.00	20.00	1	16.00	1	16.00	1
2	EB N Territorial	130.00	20.00	1	15.50	1	12.00	1
3	NB US-23 Off Ramp	130.00	20.00	1	16.00	1	16.00	1
4	WB N Territorial	130.00	20.00	1	15.50	1	12.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	NB On	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
2	EB N Territorial	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0
3	NB US-23 Off Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
4	WB N Territorial	0	1.000	0	1.000	20.00	2987	0	12.00	1792	0

Operational Results

2015 PM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	NB On	None	0		0		550	0		0.0000	
2	EB N Territorial	None	239		0		528	1118		0.2183	
3	NB US-23 Off Ramp	None	294		239		0	1289		0.2334	
4	WB N Territorial	Yield	309	444	325	325	208	949	1064	0.3351	0.4301

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	NB On	None	0.00		0.00	0.00		A		A
2	EB N Territorial	None	3.93		3.93	0.80		A		A
3	NB US-23 Off Ramp	None	3.48		3.48	0.88		A		A
4	WB N Territorial	Yield	5.40	5.88	5.68	1.48	2.36	A	A	A

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	NB On	0	0	16.00	1	16.00	1	85.00	60.00	25.00
2	EB N Territorial	90	0	12.00	1	15.50	1	85.00	100.00	40.00
3	NB US-23 Off Ramp	180	0	16.00	1	16.00	1	85.00	82.00	25.00
4	WB N Territorial	270	0	12.00	1	15.50	1	85.00	100.00	40.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	NB On	130.00	20.00	1	16.00	1	16.00	1
2	EB N Territorial	130.00	20.00	1	15.50	1	12.00	1
3	NB US-23 Off Ramp	130.00	20.00	1	16.00	1	16.00	1
4	WB N Territorial	130.00	20.00	1	15.50	1	12.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	NB On	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
2	EB N Territorial	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0
3	NB US-23 Off Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
4	WB N Territorial	0	1.000	0	1.000	20.00	2987	0	12.00	1792	0

Operational Results

2015 AM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	NB On	None	0		0		210	0		0.0000	
2	EB N Territorial	None	628		0		181	1118		0.5776	
3	NB US-23 Off Ramp	None	128		628		0	1057		0.1249	
4	WB N Territorial	Yield	127	114	150	150	606	1040	1162	0.1249	0.1003

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	NB On	None	0.00		0.00	0.00		A		A
2	EB N Territorial	None	6.98		6.98	3.95		A		A
3	NB US-23 Off Ramp	None	3.75		3.75	0.42		A		A
4	WB N Territorial	Yield	3.79	3.42	3.62	0.41	0.33	A	A	A

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	SB US-23 Off Ramp	0	0	16.00	1	16.00	1	85.00	66.00	25.00
2	EB N Territorial	90	0	12.00	1	15.50	1	85.00	100.00	40.00
3	SB US-23 On Ramp	180	0	16.00	1	16.00	1	85.00	60.00	25.00
4	WB N Territorial	270	0	12.00	1	15.50	1	85.00	100.00	40.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	SB US-23 Off Ramp	130.00	20.00	1	16.00	1	16.00	1
2	EB N Territorial	130.00	20.00	1	15.50	1	12.00	1
3	SB US-23 On Ramp	130.00	20.00	1	16.00	1	16.00	1
4	WB N Territorial	130.00	20.00	1	15.50	1	12.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	SB US-23 Off Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
2	EB N Territorial	0	1.000	0	1.000	20.00	2987	0	12.00	1792	0
3	SB US-23 On Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
4	WB N Territorial	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0

Operational Results

2040 PM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	SB US-23 Off Ramp	None	184		538		0	1100		0.1721	
2	EB N Territorial	Free	178	88	142	0	580	1044	1288	0.1744	0.0692
3	SB US-23 On Ramp	None	0		0		144	0		0.0000	
4	WB N Territorial	None	538		0		264	1118		0.4936	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	SB US-23 Off Ramp	None	3.80		3.80	0.61		A		A
2	EB N Territorial	Free	3.99	0.00	2.67	0.61	0.00	A	A	A
3	SB US-23 On Ramp	None	0.00		0.00	0.00		A		A
4	WB N Territorial	None	5.90		5.90	2.81		A		A

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	SB US-23 Off Ramp	0	0	16.00	1	16.00	1	85.00	66.00	25.00
2	EB N Territorial	90	0	12.00	1	15.50	1	85.00	100.00	40.00
3	SB US-23 On Ramp	180	0	16.00	1	16.00	1	85.00	60.00	25.00
4	WB N Territorial	270	0	12.00	1	15.50	1	85.00	100.00	40.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	SB US-23 Off Ramp	130.00	20.00	1	16.00	1	16.00	1
2	EB N Territorial	130.00	20.00	1	15.50	1	12.00	1
3	SB US-23 On Ramp	130.00	20.00	1	16.00	1	16.00	1
4	WB N Territorial	130.00	20.00	1	15.50	1	12.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	SB US-23 Off Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
2	EB N Territorial	0	1.000	0	1.000	20.00	2987	0	12.00	1792	0
3	SB US-23 On Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
4	WB N Territorial	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0

Operational Results

2040 AM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	SB US-23 Off Ramp	None	351		193		0	1304		0.2753	
2	EB N Territorial	Free	410	365	317	0	227	954	1288	0.4435	0.2869
3	SB US-23 On Ramp	None	0		0		417	0		0.0000	
4	WB N Territorial	None	193		0		675	1118		0.1762	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	SB US-23 Off Ramp	None	3.63		3.63	1.10		A		A
2	EB N Territorial	Free	6.36	0.00	3.36	2.36	0.00	A	A	A
3	SB US-23 On Ramp	None	0.00		0.00	0.00		A		A
4	WB N Territorial	None	3.74		3.74	0.61		A		A

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	SB Off Ramp	0	0	16.00	1	16.00	1	85.00	66.00	25.00
2	EB N Territorial	90	0	12.00	1	15.50	1	85.00	100.00	40.00
3	SB On Ramp	180	0	16.00	1	16.00	1	85.00	60.00	25.00
4	WB N Territorial	270	0	12.00	1	15.50	1	85.00	100.00	40.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	SB Off Ramp	130.00	20.00	1	16.00	1	16.00	1
2	EB N Territorial	130.00	20.00	1	15.50	1	12.00	1
3	SB On Ramp	130.00	20.00	1	16.00	1	16.00	1
4	WB N Territorial	130.00	20.00	1	15.50	1	12.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	SB Off Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
2	EB N Territorial	0	1.000	0	1.000	20.00	2987	0	12.00	1792	0
3	SB On Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
4	WB N Territorial	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0

Operational Results

2015 PM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	SB Off Ramp	None	171		499		0	1123		0.1565	
2	EB N Territorial	Free	165	82	132	0	538	1050	1288	0.1608	0.0645
3	SB On Ramp	None	0		0		134	0		0.0000	
4	WB N Territorial	None	499		0		245	1118		0.4575	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	SB Off Ramp	None	3.65		3.65	0.55		A		A
2	EB N Territorial	Free	3.91	0.00	2.61	0.55	0.00	A	A	A
3	SB On Ramp	None	0.00		0.00	0.00		A		A
4	WB N Territorial	None	5.54		5.54	2.43		A		A

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	SB Off Ramp	0	0	16.00	1	16.00	1	85.00	66.00	25.00
2	EB N Territorial	90	0	12.00	1	15.50	1	85.00	100.00	40.00
3	SB On Ramp	180	0	16.00	1	16.00	1	85.00	60.00	25.00
4	WB N Territorial	270	0	12.00	1	15.50	1	85.00	100.00	40.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	SB Off Ramp	130.00	20.00	1	16.00	1	16.00	1
2	EB N Territorial	130.00	20.00	1	15.50	1	12.00	1
3	SB On Ramp	130.00	20.00	1	16.00	1	16.00	1
4	WB N Territorial	130.00	20.00	1	15.50	1	12.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	SB Off Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
2	EB N Territorial	0	1.000	0	1.000	20.00	2987	0	12.00	1792	0
3	SB On Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
4	WB N Territorial	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0

Operational Results

2015 AM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	SB Off Ramp	None	326		179		0	1313		0.2540	
2	EB N Territorial	Free	380	338	294	0	211	966	1288	0.4054	0.2657
3	SB On Ramp	None	0		0		386	0		0.0000	
4	WB N Territorial	None	179		0		626	1118		0.1634	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	SB Off Ramp	None	3.51		3.51	0.99		A		A
2	EB N Territorial	Free	5.90	0.00	3.12	2.01	0.00	A	A	A
3	SB On Ramp	None	0.00		0.00	0.00		A		A
4	WB N Territorial	None	3.68		3.68	0.56		A		A

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	NB On	0	0	16.00	1	16.00	1	85.00	60.00	25.00
2	EB N Territorial	90	0	12.00	1	15.50	1	85.00	100.00	40.00
3	NB US-23 Off Ramp	180	0	16.00	1	16.00	1	85.00	82.00	25.00
4	WB N Territorial	270	0	12.00	1	15.50	1	85.00	100.00	40.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	NB On	130.00	20.00	1	16.00	1	16.00	1
2	EB N Territorial	130.00	20.00	1	15.50	1	12.00	1
3	NB US-23 Off Ramp	130.00	20.00	1	16.00	1	16.00	1
4	WB N Territorial	130.00	20.00	1	15.50	1	12.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	NB On	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
2	EB N Territorial	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0
3	NB US-23 Off Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
4	WB N Territorial	0	1.000	0	1.000	20.00	2987	0	12.00	1792	0

Operational Results

2040 PM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	NB On	None	0		0		601	0		0.0000	
2	EB N Territorial	None	258		0		570	1118		0.2357	
3	NB US-23 Off Ramp	None	326		258		0	1278		0.2613	
4	WB N Territorial	Yield	333	479	359	359	225	932	1045	0.3685	0.4733

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	NB On	None	0.00		0.00	0.00		A		A
2	EB N Territorial	None	4.01		4.01	0.88		A		A
3	NB US-23 Off Ramp	None	3.64		3.64	1.03		A		A
4	WB N Territorial	Yield	5.78	6.47	6.19	1.72	2.84	A	A	A

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	NB On	0	0	16.00	1	16.00	1	85.00	60.00	25.00
2	EB N Territorial	90	0	12.00	1	15.50	1	85.00	100.00	40.00
3	NB US-23 Off Ramp	180	0	16.00	1	16.00	1	85.00	82.00	25.00
4	WB N Territorial	270	0	12.00	1	15.50	1	85.00	100.00	40.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	NB On	130.00	20.00	1	16.00	1	16.00	1
2	EB N Territorial	130.00	20.00	1	15.50	1	12.00	1
3	NB US-23 Off Ramp	130.00	20.00	1	16.00	1	16.00	1
4	WB N Territorial	130.00	20.00	1	15.50	1	12.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	NB On	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
2	EB N Territorial	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0
3	NB US-23 Off Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
4	WB N Territorial	0	1.000	0	1.000	20.00	2987	0	12.00	1792	0

Operational Results

2040 AM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	NB On	None	0		0		227	0		0.0000	
2	EB N Territorial	None	678		0		196	1118		0.6246	
3	NB US-23 Off Ramp	None	139		678		0	1027		0.1398	
4	WB N Territorial	Yield	137	123	163	163	654	1034	1154	0.1357	0.1089

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	NB On	None	0.00		0.00	0.00		A		A
2	EB N Territorial	None	7.77		7.77	4.81		A		A
3	NB US-23 Off Ramp	None	3.93		3.93	0.48		A		A
4	WB N Territorial	Yield	3.86	3.47	3.68	0.45	0.36	A	A	A

US-23/North Territorial Road Roundabout Analysis Output

Active Traffic Management (ATM)

and

High Occupancy Vehicle (HOV) Lane Options

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	NB On	0	0	16.00	1	16.00	1	85.00	60.00	25.00
2	EB N Territorial	90	0	12.00	1	15.50	1	85.00	100.00	40.00
3	NB US-23 Off Ramp	180	0	16.00	1	16.00	1	85.00	82.00	25.00
4	WB N Territorial	270	0	12.00	1	15.50	1	85.00	100.00	40.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	NB On	130.00	20.00	1	16.00	1	16.00	1
2	EB N Territorial	130.00	20.00	1	15.50	1	12.00	1
3	NB US-23 Off Ramp	130.00	20.00	1	16.00	1	16.00	1
4	WB N Territorial	130.00	20.00	1	15.50	1	12.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	NB On	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
2	EB N Territorial	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0
3	NB US-23 Off Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
4	WB N Territorial	0	1.000	0	1.000	20.00	2987	0	12.00	1792	0

Operational Results

2040 AM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	NB On	None	0		0		217	0		0.0000	
2	EB N Territorial	None	614		0		219	1118		0.5644	
3	NB US-23 Off Ramp	None	139		614		0	1065		0.1346	
4	WB N Territorial	Yield	160	123	153	153	600	1039	1160	0.1576	0.1084

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	NB On	None	0.00		0.00	0.00		A		A
2	EB N Territorial	None	6.78		6.78	3.74		A		A
3	NB US-23 Off Ramp	None	3.76		3.76	0.46		A		A
4	WB N Territorial	Yield	3.94	3.46	3.73	0.54	0.36	A	A	A

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	SB US-23 Off Ramp	0	0	16.00	1	16.00	1	85.00	66.00	25.00
2	EB N Territorial	90	0	12.00	1	15.50	1	85.00	100.00	40.00
3	SB US-23 On Ramp	180	0	16.00	1	16.00	1	85.00	60.00	25.00
4	WB N Territorial	270	0	12.00	1	15.50	1	85.00	100.00	40.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	SB US-23 Off Ramp	130.00	20.00	1	16.00	1	16.00	1
2	EB N Territorial	130.00	20.00	1	15.50	1	12.00	1
3	SB US-23 On Ramp	130.00	20.00	1	16.00	1	16.00	1
4	WB N Territorial	130.00	20.00	1	15.50	1	12.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	SB US-23 Off Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
2	EB N Territorial	0	1.000	0	1.000	20.00	2987	0	12.00	1792	0
3	SB US-23 On Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
4	WB N Territorial	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0

Operational Results

2040 PM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	SB US-23 Off Ramp	None	185		565		0	1084		0.1758	
2	EB N Territorial	Free	180	88	142	0	608	1044	1288	0.1764	0.0692
3	SB US-23 On Ramp	None	0		0		144	0		0.0000	
4	WB N Territorial	None	565		0		266	1118		0.5187	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	SB US-23 Off Ramp	None	3.87		3.87	0.63		A		A
2	EB N Territorial	Free	4.00	0.00	2.69	0.62	0.00	A	A	A
3	SB US-23 On Ramp	None	0.00		0.00	0.00		A		A
4	WB N Territorial	None	6.19		6.19	3.11		A		A

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	SB US-23 Off Ramp	0	0	16.00	1	16.00	1	85.00	66.00	25.00
2	EB N Territorial	90	0	12.00	1	15.50	1	85.00	100.00	40.00
3	SB US-23 On Ramp	180	0	16.00	1	16.00	1	85.00	60.00	25.00
4	WB N Territorial	270	0	12.00	1	15.50	1	85.00	100.00	40.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	SB US-23 Off Ramp	130.00	20.00	1	16.00	1	16.00	1
2	EB N Territorial	130.00	20.00	1	15.50	1	12.00	1
3	SB US-23 On Ramp	130.00	20.00	1	16.00	1	16.00	1
4	WB N Territorial	130.00	20.00	1	15.50	1	12.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	SB US-23 Off Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
2	EB N Territorial	0	1.000	0	1.000	20.00	2987	0	12.00	1792	0
3	SB US-23 On Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
4	WB N Territorial	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0

Operational Results

2040 AM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)				Capacity (veh/hr)				
			Arrival Flow		Opposing Flow		Capacity		Average VCR		
			Entry	Bypass	Entry	Bypass	Entry	Bypass	Entry	Bypass	
1	SB US-23 Off Ramp	None	267		219		0	1289		0.2119	
2	EB N Territorial	Free	403	402	289	0	197	968	1288	0.4290	0.3160
3	SB US-23 On Ramp	None	0		0		480	0		0.0000	
4	WB N Territorial	None	219		0		614	1118		0.2000	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	SB US-23 Off Ramp	None	3.39		3.39	0.78		A		A
2	EB N Territorial	Free	6.11	0.00	3.06	2.21	0.00	A	A	A
3	SB US-23 On Ramp	None	0.00		0.00	0.00		A		A
4	WB N Territorial	None	3.84		3.84	0.71		A		A

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	NB On	0	0	16.00	1	16.00	1	85.00	60.00	25.00
2	EB N Territorial	90	0	12.00	1	15.50	1	85.00	100.00	40.00
3	NB US-23 Off Ramp	180	0	16.00	1	16.00	1	85.00	82.00	25.00
4	WB N Territorial	270	0	12.00	1	15.50	1	85.00	100.00	40.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	NB On	130.00	20.00	1	16.00	1	16.00	1
2	EB N Territorial	130.00	20.00	1	15.50	1	12.00	1
3	NB US-23 Off Ramp	130.00	20.00	1	16.00	1	16.00	1
4	WB N Territorial	130.00	20.00	1	15.50	1	12.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	NB On	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
2	EB N Territorial	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0
3	NB US-23 Off Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
4	WB N Territorial	0	1.000	0	1.000	20.00	2987	0	12.00	1792	0

Operational Results

2040 PM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	NB On	None	0		0		577	0		0.0000	
2	EB N Territorial	None	266		0		555	1118		0.2431	
3	NB US-23 Off Ramp	None	354		266		0	1273		0.2849	
4	WB N Territorial	Yield	291	465	376	376	244	923	1035	0.3250	0.4638

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	NB On	None	0.00		0.00	0.00		A		A
2	EB N Territorial	None	4.05		4.05	0.92		A		A
3	NB US-23 Off Ramp	None	3.77		3.77	1.16		A		A
4	WB N Territorial	Yield	5.48	6.42	6.06	1.42	2.73	A	A	A

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	NB On	0	0	16.00	1	16.00	1	85.00	60.00	25.00
2	EB N Territorial	90	0	12.00	1	15.50	1	85.00	100.00	40.00
3	NB US-23 Off Ramp	180	0	16.00	1	16.00	1	85.00	82.00	25.00
4	WB N Territorial	270	0	12.00	1	15.50	1	85.00	100.00	40.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	NB On	130.00	20.00	1	16.00	1	16.00	1
2	EB N Territorial	130.00	20.00	1	15.50	1	12.00	1
3	NB US-23 Off Ramp	130.00	20.00	1	16.00	1	16.00	1
4	WB N Territorial	130.00	20.00	1	15.50	1	12.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	NB On	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
2	EB N Territorial	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0
3	NB US-23 Off Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
4	WB N Territorial	0	1.000	0	1.000	20.00	2987	0	12.00	1792	0

Operational Results

2040 AM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	NB On	None	0		0		228	0		0.0000	
2	EB N Territorial	None	691		0		199	1118		0.6369	
3	NB US-23 Off Ramp	None	139		691		0	1019		0.1410	
4	WB N Territorial	Yield	140	123	164	164	666	1033	1154	0.1387	0.1090

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	NB On	None	0.00		0.00	0.00		A		A
2	EB N Territorial	None	8.00		8.00	5.07		A		A
3	NB US-23 Off Ramp	None	3.97		3.97	0.49		A		A
4	WB N Territorial	Yield	3.88	3.48	3.69	0.46	0.36	A	A	A

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	SB US-23 Off Ramp	0	0	16.00	1	16.00	1	85.00	66.00	25.00
2	EB N Territorial	90	0	12.00	1	15.50	1	85.00	100.00	40.00
3	SB US-23 On Ramp	180	0	16.00	1	16.00	1	85.00	60.00	25.00
4	WB N Territorial	270	0	12.00	1	15.50	1	85.00	100.00	40.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	SB US-23 Off Ramp	130.00	20.00	1	16.00	1	16.00	1
2	EB N Territorial	130.00	20.00	1	15.50	1	12.00	1
3	SB US-23 On Ramp	130.00	20.00	1	16.00	1	16.00	1
4	WB N Territorial	130.00	20.00	1	15.50	1	12.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	SB US-23 Off Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
2	EB N Territorial	0	1.000	0	1.000	20.00	2987	0	12.00	1792	0
3	SB US-23 On Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
4	WB N Territorial	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0

Operational Results

2040 PM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	SB US-23 Off Ramp	None	185		565		0	1084		0.1758	
2	EB N Territorial	Free	180	88	142	0	608	1044	1288	0.1764	0.0692
3	SB US-23 On Ramp	None	0		0		144	0		0.0000	
4	WB N Territorial	None	565		0		266	1118		0.5187	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	SB US-23 Off Ramp	None	3.87		3.87	0.63		A		A
2	EB N Territorial	Free	4.00	0.00	2.69	0.62	0.00	A	A	A
3	SB US-23 On Ramp	None	0.00		0.00	0.00		A		A
4	WB N Territorial	None	6.19		6.19	3.11		A		A

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	SB US-23 Off Ramp	0	0	16.00	1	16.00	1	85.00	66.00	25.00
2	EB N Territorial	90	0	12.00	1	15.50	1	85.00	100.00	40.00
3	SB US-23 On Ramp	180	0	16.00	1	16.00	1	85.00	60.00	25.00
4	WB N Territorial	270	0	12.00	1	15.50	1	85.00	100.00	40.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	SB US-23 Off Ramp	130.00	20.00	1	16.00	1	16.00	1
2	EB N Territorial	130.00	20.00	1	15.50	1	12.00	1
3	SB US-23 On Ramp	130.00	20.00	1	16.00	1	16.00	1
4	WB N Territorial	130.00	20.00	1	15.50	1	12.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	SB US-23 Off Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
2	EB N Territorial	0	1.000	0	1.000	20.00	2987	0	12.00	1792	0
3	SB US-23 On Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
4	WB N Territorial	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0

Operational Results

2040 AM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	SB US-23 Off Ramp	None	365		199		0	1301		0.2872	
2	EB N Territorial	Free	403	375	346	0	218	939	1288	0.4433	0.2948
3	SB US-23 On Ramp	None	0		0		433	0		0.0000	
4	WB N Territorial	None	199		0		691	1118		0.1817	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	SB US-23 Off Ramp	None	3.69		3.69	1.17		A		A
2	EB N Territorial	Free	6.46	0.00	3.35	2.36	0.00	A	A	A
3	SB US-23 On Ramp	None	0.00		0.00	0.00		A		A
4	WB N Territorial	None	3.76		3.76	0.63		A		A

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	NB On	0	0	16.00	1	16.00	1	85.00	60.00	25.00
2	EB N Territorial	90	0	12.00	1	15.50	1	85.00	100.00	40.00
3	NB US-23 Off Ramp	180	0	16.00	1	16.00	1	85.00	82.00	25.00
4	WB N Territorial	270	0	12.00	1	15.50	1	85.00	100.00	40.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	NB On	130.00	20.00	1	16.00	1	16.00	1
2	EB N Territorial	130.00	20.00	1	15.50	1	12.00	1
3	NB US-23 Off Ramp	130.00	20.00	1	16.00	1	16.00	1
4	WB N Territorial	130.00	20.00	1	15.50	1	12.00	1

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	NB On	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
2	EB N Territorial	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0
3	NB US-23 Off Ramp	0	1.000	0	1.000	20.00	2390	0	16.00	2390	0
4	WB N Territorial	0	1.000	0	1.000	20.00	2987	0	12.00	1792	0

Operational Results

2040 PM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	NB On	None	0		0		594	0		0.0000	
2	EB N Territorial	None	269		0		568	1118		0.2458	
3	NB US-23 Off Ramp	None	372		269		0	1271		0.2999	
4	WB N Territorial	Yield	291	479	392	392	249	915	1026	0.3281	0.4824

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	NB On	None	0.00		0.00	0.00		A		A
2	EB N Territorial	None	4.06		4.06	0.93		A		A
3	NB US-23 Off Ramp	None	3.85		3.85	1.25		A		A
4	WB N Territorial	Yield	5.56	6.71	6.27	1.44	2.96	A	A	A

Appendix A-6

Traffic Forecasting

DATE: January 8, 2015

TO: US-23 ATM File

FROM: Stephanie Palmer
Traffic, Safety and Operations Engineer
University Region
4701 W. Michigan Ave
Jackson MI 49240

SUBJECT: Traffic Forecasting
US-23 Environmental Assessment Traffic Analysis

This memo addresses the following methodologies for the traffic forecasting:

- Existing Traffic Volumes and Data Collection
- Background Growth Rate
- Assumptions for Travel Demand Forecasting Models

Existing Traffic Volumes

Traffic volumes were collected in November 2012, January 2013, and February and of May 2014. All volumes were seasonally adjusted using MDOT's memorandum "2013 Day of Week (DOW) Factors for Annual Average Daily Traffic (ADT) Calculation". Since the traffic volumes were not all collected on the same day, minor vehicle balancing was necessary throughout the study area.

The peak hours for US-23 were from 7:00 to 8:00 AM and from 5:00 to 6:00 PM. In order to analyze the worst case scenario at the ramp terminal intersections, the highest collected AM and PM peak hours were analyzed, even if they differed from the mainline peak period. The ramp terminal intersection peak period varied between 7:00 to 8:15 AM and 3:30 to 6:15 PM. For this reason, the peak hour for the freeway does not necessarily correspond with the peak hour for interchange terminals.

Background Growth Rate

In order to determine the growth rate for the study area, the regional travel demand forecasting models generated by the Southeast Michigan Council of Governments (SEMCOG), Washtenaw Area Transportation Study (WATS) and historical projection from MDOT's Permanent Traffic Recorder (PTR) locations (approximately 1/2 mile south of Barker Road) were considered.

MDOT compared the historic traffic regression with both the SEMCOG and WATS models and for one location within the project area which is shown in the table below.

Table 1: Growth Rate Comparison

		Do Nothing 2015 - 2040		Historical Counts 11 year regression; PTR & short counts	Historical Counts 18 year regression; PTR & Sufficiency
		SEMCOG	WATS		
NB US-23	6 Mile Rd. to Barker Rd.	0.28%	0.67%	-0.27%	0.62%
SB US-23	6 Mile Rd. to Barker Rd.	0.29%	0.66%	-0.60%	

The table below shows the 2015 base year volumes in both the SEMCOG and WATS models as compared to the PTR traffic count. The model volumes are very similar to each other in this location. However, when comparing the volumes to the actual data collected at MDOT's PTR, it is approximately 25% higher than what is actually being experienced on the roadway.

Table 2: Model Volumes versus PTR Volumes

		2015 est. volumes		2013 PTR Volumes
		SEMCOG	WATS	
NB US-23	6 Mile Rd. to Barker Rd.	41162	39725	32137
SB US- 23	6 Mile Rd. to Barker Rd.	41884	41938	31849

Based on the analysis of all of this information and discussions between MDOT, WATS, and SEMCOG, an annual growth rate of 0.3 percent was established. This 0.3 percent annual growth rate was applied to all the existing traffic counts within the study area to arrive at the 2015 and 2040 No-Build traffic volumes.

Travel Demand Forecasting for Alternatives

The following alternatives were analyzed in the US-23 Environmental Assessment traffic analysis:

- No-Build
- Transportation System Management
- Ramp Metering
- Active Traffic Management (ATM) with dynamic shoulder use (for general purpose)
- ATM with dynamic shoulder use for high occupancy vehicle only (ATM-HOV)

It was determined that the No-Build, TSM, and Ramp Metering alternatives would not impact the traffic volumes over the No-Build alternative, so the No-Build volumes were used to analyze

these alternatives. However, after discussion between MDOT, WATS, and SEMCOG, it was decided that the ATM and ATM-HOV alternatives should be modeled using both the SEMCOG and WATS travel demand forecasting models to estimate any changes in traffic patterns or traffic growth due to these alternatives.

In order to add the median shoulder use for the directional peak hours into the 2040 WATS and SEMCOG model, the capacity of the shoulder being used as a temporary traffic lane needed to be determined. Therefore, MDOT investigated data from similar dynamic shoulders in other states as well as information collected from the Highway Capacity Manual (HCM) and the MDOT Traffic and Safety Note. It should be noted that at the time of this study, there was no official guidance on the capacity for dynamic shoulder use and the information collected from other states is preliminary.

Below are the findings of the dynamic shoulder capacity investigation:

- In Minnesota, I-35W has a measured capacity of about 1,700 vehicles per hour (vph) for its median dynamic shoulder. This dynamic shoulder on I-35W varies from an 11-foot lane with a 2-foot shy distance to a 12-foot lane with a 3-foot shy distance. The US-23 ATM alternatives assume a paved 11-foot lane with a 2-foot shy distance.
- In Virginia, I-66 has a shoulder capacity of approximately 2,000 vph. The I-66 dynamic shoulder is an outside shoulder lane.
- In Washington, US-2 has a shoulder capacity of 1,400 vph. This is a relatively narrow structure with essentially no shy to the barrier on the outside of the shoulder lane.
- In Massachusetts, I-93 in Massachusetts has a capacity of about 1,400 vph.
- The SEMCOG travel demand forecasting model uses 2,100 vph per lane for the capacity of the existing US-23 freeway lanes.
- HCM Chapter 11 (flow curves on page 11-3) for a normal freeway lane, assuming a free flow speed of 55 to 60 mph, the ideal hourly capacity would be 2,250 to 2,300 vehicles per hour (which is higher than we are currently using for US-23).
- Chapter 35 for the HCM gives some critical flow rates for HOV lanes and they recommend 1,500 vph for an HOV lane (this is a critical flow rate and not a capacity value)
- Comparing the dynamic shoulder to a work zone and using MDOT's work zone capacity methodology (attached), an estimated capacity between 1,500-1,600 vph is assumed (depending on if the shoulder is considered to be restricted on one or both sides).
- The MDOT proposed upgraded shoulder for US-23 will have a minimum of 13 feet to the face of the barrier (11-foot lane with a 2-foot shy distance).

Based on the information above, and discussion between MDOT, WATS and SEMCOG, it was agreed that a shoulder capacity of 1,700 vph should be used in the model. This value was only used in the travel demand forecasting modeling in order to predict the changes in traffic patterns. It should be noted that the actual traffic simulation and capacity analysis that was performed for the alternatives used the actual shoulder characteristics to model the traffic flow.

Once the shoulder capacity was determined, the SEMCOG and WATS models were modified to include the use of the median shoulder for travel during the AM and PM peak periods (attached).

The model output was reviewed by MDOT, WATS, and SEMCOG and compared to the No-Build model to determine the traffic pattern shifts. SEMCOG and MDOT staff separately spent time assessing the differences between the SEMCOG and WATS model outputs. Both felt that the WATS model had a good assignment of volumes; however, there were three primary discrepancies between the two models:

1. The counts at the external stations in the WATS model were high. The WATS model used pre-recession volumes so the existing model year had 42,000 vehicles with 51,000 vehicles in the future year. The SEMCOG model numbers were post-recession volumes with 35,000 vehicles in the existing year and 38,000 in the future year. SEMCOG's numbers were closer to the actual volumes that are currently being realized on US-23.
2. The growth rate for the numbers in the WATS model is 0.75% per year. SEMCOG's model growth rate is 0.25% per year. SEMCOG's model growth rate is closer to the agreed upon growth rate of 0.30% per year.
3. Also, the higher volumes at the external station on the northern end of the corridor in the WATS model is causing more traffic to divert off of US-23 as it moves south.

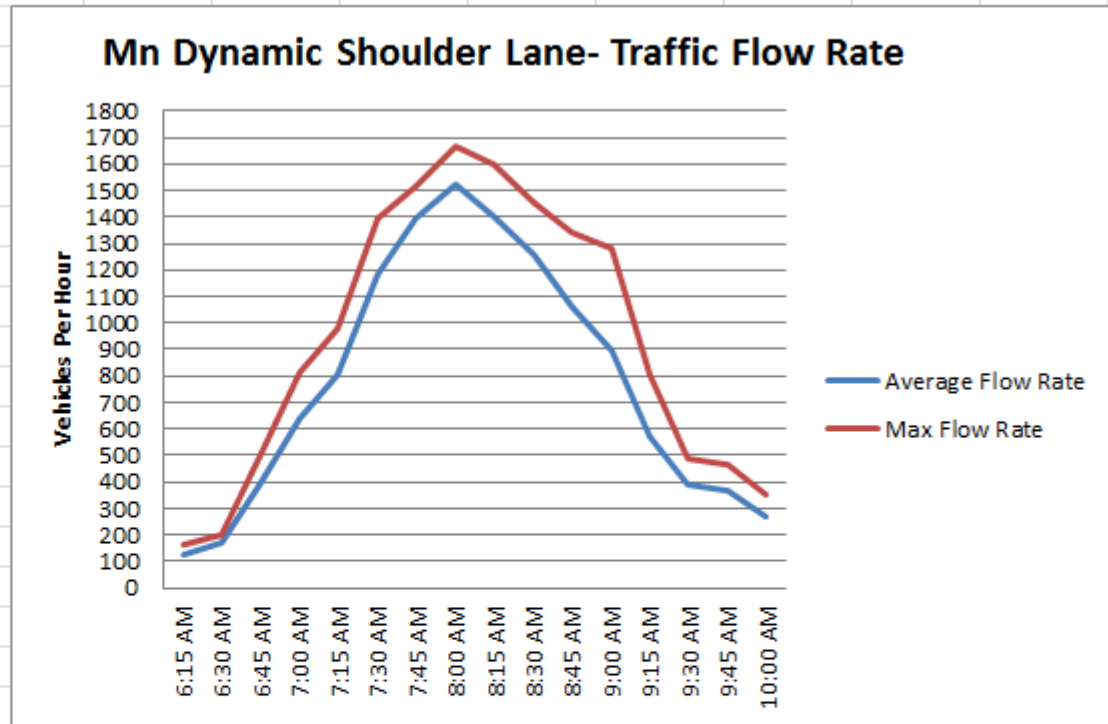
Although the WATS model was very helpful in cross checking the SEMCOG model volumes, it was agreed that the diversion percentages/rates in the SEMCOG model should be used to add the additional trips along the mainline and at the ramps.

Attachments:

Minnesota's I-35 Traffic Flow Measurements
MDOT's Work Zone Capacity Methodology
WATS and SEMCOG Model output

Typical Hourly Flow Rates in Peak Period

MN Dynamic Shoulder lane		
Time	Average Flow Rate	Max Flow Rate
6:15 AM	124	160
6:30 AM	173	200
6:45 AM	392	496
7:00 AM	638	812
7:15 AM	805	976
7:30 AM	1186	1396
7:45 AM	1394	1516
8:00 AM	1519	1668
8:15 AM	1404	1596
8:30 AM	1257	1456
8:45 AM	1062	1340
9:00 AM	895	1280
9:15 AM	570	808
9:30 AM	389	492
9:45 AM	368	464
10:00 AM	266	356



October 2013 Data for Mid Point location of Dynamic Shoulder lane In Minneapolis MN

Obtained from Nick Thompson, Parsons Brinkerhoff

TRAFFIC AND SAFETY NOTE 901B

SUBJECT: Guidelines for Maintaining Traffic Capacity

PURPOSE: To Provide Guidance in Determining the Appropriate Maintaining Traffic Scheme

COORDINATING UNIT: Geometric Design Unit

INFORMATION: The following charts are provided to assist with determining an appropriate maintaining traffic scheme.

Values below are generalizations of the Charts I through IV on the following pages. For greater accuracy at specific locations, the use of the appropriate chart is recommended. For more information on work zone management see the Work Zone Safety and Mobility Manual.

Maximum Hourly Capacity Values For Construction Areas

HIGHWAY FACILITY	UNITS	Level of Service "C"	Level of Service "D"	Level of Service "E"
Rural two-lanes, two-way	Veh/hr	1330*	1610*	1900*
Rural Multi-lane	Veh/hr/lane	1100	1500	1900
Urban Freeway	Veh/hr/lane	1440	1670	1900
Urban	Vehicle/hour of green/lane			1650

*Total volume for both directions

Average Adjustment Factors

LANE WIDTH		SIDE CLEARANCE	
12 foot lane	1.00	Unrestricted	1.00
11 foot lane	0.95	Restricted One Side	0.90
10 foot lane	0.90	Restricted Both Sides	0.84

CHART I – MAXIMUM HOURLY VOLUMES FOR SIGNALIZED FLOW

Lane Characteristics			No Turns		50% Turns*		100% Turns* or Right-turn lane		U-turn Crossover
Lane Width (ft)			12	10	12	10	12	10	N/A
Green Time	40%	Unrestricted	620	550	560	500	520	450	530
		Restricted	580	510	520	460	480	420	490
	50%	Unrestricted	850	750	770	680	710	620	670
		Restricted	800	700	730	640	670	590	630
	60%	Unrestricted	1040	910	940	830	870	760	810
		Restricted	970	850	880	780	810	710	760

Assumptions:

- a) Level of Service E
- b) 5% trucks
- c) Level Terrain
- d) Urban Area

*Assumes no left turns through opposing traffic from lane being analyzed. Left turns with opposing traffic merit special consideration. If there is no opposing traffic, then left turns are treated as right turns. For example: No opposing traffic – 30% rights & 20% lefts – Use Table Values for 50% turns.

CHART II – MAXIMUM HOURLY VOLUMES FOR URBAN FREEWAYS

Characteristics of the Facility	Lane Width (ft)	Level of Service "A"	Level of Service "B"	Level of Service "C"	Level of Service "D"	Level of Service "E"	Level of Service "D"	Level of Service "E"
Operating Speed (Assume a 10 mph reduction in speed in the work zone)		≥ 60 mph	≥ 55 mph	≥ 50 mph	≥ 40 mph	≥ 30-35 mph	≥ 40 mph	≥ 30-35 mph
v/c		≤ 0.43	≤ 0.63	≤ 0.76	≤ 0.82	≤ 1.00	≤ 0.41	≤ 1.00
Average Highway Speed		70 mph					50 mph	
Unrestricted	12	820	1200	1440	1560	1900	780	1900
	10	740	1100	1310	1420	1730	710	1730
Restricted One Side	12	770	1130	1360	1460	1790	730	1790
	10	690	1020	1230	1320	1610	660	1610
Restricted Both Side	12	740	1090	1310	1420	1730	710	1730
	10	660	970	1170	1260	1540	630	1540

Assumptions:

- a) 5% trucks
- b) Level terrain
- c) Uninterrupted flow

CHART III – MAXIMUM HOURLY VOLUMES FOR MULTILANE & DIVIDED HIGHWAY UNINTERRUPTED FLOW (RURAL)

Characteristics of the Facility	Lane Width (ft)	Level of Service "A"	Level of Service "B"	Level of Service "C"	Level of Service "D"	Level of Service "E"	Level of Service "D"	Level of Service "E"
Operating Speed (Assume a 10 mph reduction in speed in the work zone)		≥ 60 mph	≥ 55 mph	≥ 50 mph	≥ 40 mph	≥ 30-35 mph	≥ 40 mph	≥ 30-35 mph
v/c		≤ 0.35	≤ 0.50	≤ 0.58	≤ 0.69	≤ 1.00	≤ 0.35	≤ 1.00
Average Highway Speed		70 mph					50 mph	
Unrestricted	12	670	950	1100	1310	1900	670	1900
	10	610	860	1000	1190	1730	610	1730
Restricted One Side	12	600	850	990	1180	1710	600	1710
	10	550	780	900	1080	1560	550	1560
Restricted Both Side	12	540	770	890	1060	1540	540	1540
	10	490	700	820	970	1410	490	1410

Assumptions:

- a) 5% trucks
- b) Level terrain

CHART IV – MAXIMUM HOURLY VOLUMES FOR TWO-LANE RURAL HIGHWAYS

Characteristics of the Facility	Lane Width (ft)	Level of Service "A"	Level of Service "B"	Level of Service "C"	Level of Service "D"	Level of Service "E"
Operating Speed (Assume a 10 mph reduction in speed in the work zone)		≥ 60 mph	≥ 50 mph	≥ 40 mph	≥ 35 mph	≥ 30 mph
v/c		≤ 0.20	≤ 0.45	≤ 0.70	≤ 0.85	≤ 1.00
Average Highway Speed		70 mph				
Unrestricted	12	380	860	1330	1620	1900
	10	290	680	1060	1290	1520
Restricted One Side	12	320	730	1140	1410	1670
	10	250	560	900	1130	1350
Restricted Both Side	12	260	600	960	1200	1440
	10	200	460	760	970	1180

CHART IV – continued for lower average highways speeds

Characteristics of the Facility	Lane Width (ft)	Level of Service "C"	Level of Service "D"	Level of Service "E"	Level of Service "D"	Level of Service "E"
Operating Speed (Assume a 10 mph reduction in speed in the work zone)		≥ 40	≥ 35	30	≥ 35	30
v/c		≤ 0.56	≤ 0.75	≤ 1.00	≤ 0.58	≤ 1.00
Average Highway Speed		50 mph			40 mph	
Unrestricted	12	1060	1430	1900	1100	1900
	10	850	1140	1520	880	1520
Restricted One Side	12	920	1240	1670	950	1670
	10	720	1000	1350	750	1350
Restricted Both Side	12	770	1050	1440	790	1440
	10	610	860	1180	630	1180

Assumptions:

- a) 5% trucks
- b) Level terrain
- c) Uninterrupted flow

NORTHBOUND		2040 No Build Scenario			
		SEMCOG		WATS	
Corridor	Location	Daily	PM	Daily	PM
NB US-23	North Territorial to 6 Mile	45,111	14,156	43,639	12,427
NB US-23	M-14 to North Territorial	43,362	13,148	43,676	11,511

2040 Full 3rd Lane			
SEMCOG		WATS	
Daily	PM	Daily	PM
46319	15234	48,533	15,977
45032	14654	49,944	15,492

Difference - (3 full lanes -no build)							
SEMCOG				WATS			
Daily		PM		Daily		PM	
1,208	2.68%	1,078	7.62%	4,894	11.21%	3,550	28.57%
1,670	3.85%	1,506	11.45%	6,268	14.35%	3,981	34.58%

SOUTHBOUND		2040 No Build Scenario			
		SEMCOG		WATS	
Corridor	Location	Daily	AM	Daily	AM
SB US-23	North Territorial to 6 Mile	45,701	10,393	45,916	8,533
SB US-23	M-14 to North Territorial	44,567	9,689	46,004	7,801

2040 Full 3rd Lane			
SEMCOG		WATS	
Daily	AM	Daily	AM
45,032	11,785	50,566	10,898
46,928	11,554	52,188	10,405

Difference - (3 full lanes -no build)							
SEMCOG				WATS			
Daily		AM		Daily		AM	
1,670	3.85%	1,392	13.39%	4,650	10.13%	2,365	27.72%
2,361	5.30%	1,865	19.25%	6,184	13.44%	2,604	33.38%

NORTHBOUND		2040 No Build Scenario			
		SEMCOG		WATS	
Corridor	Location	Daily	PM	Daily	PM
NB US-23	North Territorial to 6 Mile	45,111	14,156	43,639	12,427
NB US-23	M-14 to North Territorial	43,362	13,148	43,676	11,511

2040 ATM			
SEMCOG		WATS	
Daily	PM	Daily	PM
45,997	15,017	47,484	15,069
44,606	14,375	48,547	14,400

Difference - (ATM - no build)							
SEMCOG				WATS			
Daily		PM		Daily		PM	
886	1.96%	861	6.08%	3,845	8.81%	2,642	21.26%
1,244	2.87%	1,227	9.33%	4,871	11.15%	2,889	25.10%

SOUTHBOUND		2040 No Build Scenario			
		SEMCOG		WATS	
Corridor	Location	Daily	AM	Daily	AM
SB US-23	North Territorial to 6 Mile	45,701	10,393	45,916	8,533
SB US-23	M-14 to North Territorial	44,567	9,689	46,004	7,801

2040 ATM			
SEMCOG		WATS	
Daily	AM	Daily	AM
46,992	11,652	49,677	10,239
46,323	11,422	51,032	9,723

Difference - (ATM - no build)							
SEMCOG				WATS			
Daily		AM		Daily		AM	
1,291	2.82%	1,259	12.11%	3,761	8.19%	1,706	19.99%
1,756	3.94%	1,733	17.89%	5,028	10.93%	1,922	24.64%

NORTHBOUND		2040 No Build Scenario			
		SEMCOG		WATS	
Corridor	Location	Daily	PM	Daily	PM
NB US-23	North Territorial to 6 Mile	45,111	14,156	43,639	12,427
NB US-23	M-14 to North Territorial	43,362	13,148	43,676	11,511

2040 ATM HOV			
SEMCOG		WATS	
Daily	PM	Daily	PM
45724	14757	n/a	
44073	13849	n/a	

Difference - (ATM HOV - no build)							
SEMCOG				WATS			
Daily		PM		Daily		PM	
613	1.36%	601	4.25%	n/a			
711	1.64%	701	5.33%	n/a			

SOUTHBOUND		2040 No Build Scenario			
		SEMCOG		WATS	
Corridor	Location	Daily	AM	Daily	AM
SB US-23	North Territorial to 6 Mile	45,701	10,393	45,916	8,533
SB US-23	M-14 to North Territorial	44,567	9,689	46,004	7,801

2040 ATM HOV			
SEMCOG		WATS	
Daily	AM	Daily	AM
46271	10939	n/a	
45059	10185	n/a	

Difference - (ATM HOV - no build)							
SEMCOG				WATS			
Daily		AM		Daily		AM	
570	1.25%	546	5.25%	n/a			
492	1.10%	496	5.12%	n/a			