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SLATS MPO Coordinator

**From:** Lee Gibbs, PE, PTOE

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**Subject:** Intersection Control Evaluation (ICE) Study  
WIS 81 (Liberty Avenue) and WIS 213 (Madison Road)  
Beloit, Wisconsin

The following memorandum summarizes the results of an intersection control evaluation (ICE) study for the intersection of WIS 81 and WIS 213 in Beloit, Wisconsin. **Figure 1** illustrates the study area. This memorandum will evaluate potential geometric and/or intersection control strategies to this, as well as the WIS 81 intersections with Garfield Avenue and McKinley Avenue and WIS 213 with McKinley Avenue, to improve mobility and safety in this area.

### Existing Roadway Characteristics

WIS 81 (also known as Liberty Avenue) is an east-west, two-lane principal arterial that serves as a vital east-west route in Beloit. At its unsignalized intersection with WIS 213, a westbound exclusive right-turn lane is provided. At its unsignalized intersections with McKinley Avenue, an eastbound exclusive left-turn lane is provided. No exclusive turn lanes are provide at its unsignalized intersection with Garfield Avenue. On-street parking is prohibited on both sides of WIS 81. Sidewalks are provided on both sides of the roadway and WIS 81 has a posted speed limit of 25 miles per hour.

WIS 213 (also known as Madison Road) is a north-south, two-lane principal arterial that connects northwestern Beloit and rural areas to downtown Beloit. At its unsignalized intersection with WIS 81, no exclusive turn lanes are provided and all movements from WIS 213 are under stop-sign control. At its unsignalized intersection with McKinley Avenue, no exclusive turn lanes are provided on WIS 213. Sidewalks are provided on the east side of the roadway and WIS 213 has a posted speed limit of 25 miles per hour.

McKinley Avenue and Garfield Avenue are north-south, two-lane roadways. McKinley Avenue is classified as a collector while Garfield Avenue is classified as a local street. At their unsignalized intersections with WIS 81 and WIS 213, no exclusive turning lanes are provided on McKinley Avenue and Garfield Avenue and all movements from these roadways are under stop-sign control. Both roadways do not have a posted speed limit; however, by Wisconsin State Statute, they have a speed limit of 25 miles per hour.

Figure 1: Study Area Location



### Traffic Data Collection

Weekday morning (7:00 to 9:00 a.m.) and weekday afternoon (4:00 to 6:00 p.m.) peak hour turning movement counts were collected at the WIS 81 intersections with Garfield Avenue, WIS 213, and McKinley, as well as the WIS 213 intersection with McKinley Avenue on Tuesday, September 10, 2019. From the turning movement counts, the weekday morning peak hour of traffic occurs from 7:30 to 8:30 a.m. while the weekday afternoon peak hour of traffic occurs from 4:00 to 5:00 p.m. The existing peak-hour turning movement counts can be found in the Appendix.

### Crash Data Collection

SRF obtained crash history for the four study intersections from WisDOT. The most recent five years of crash data were collected and evaluated to identify crash trends or commonalities at each location or areawide. The crash data indicated that 18 crashes were located at the WIS 213 and McKinley Avenue intersection, 26 crashes at WIS 81 and WIS 213, 19 crashes at WIS 81 and McKinley Avenue, and 10 crashes at WIS 81 and Garfield Avenue. The following lists crash trends identified from the crash data:

*WIS 213 and McKinley Avenue*

- Of the 18 crashes, 12 were angle crashes, 3 were run-off-road crashes, 1 was a head-on crash, 1 was a rear-end crash, and 1 was a sideswipe crash
- Of the 18 crashes, 3 resulted in minor injuries (B-type injury), 4 resulted in possible injuries (C-type injury), and the remaining 11 resulted in property damage only
- 5 of 18 crashes occurred during inclement weather or roadway conditions (e.g. snow, rain / wet pavement, ice)

*WIS 81 and WIS 213*

- Of the 26 crashes, 10 were angle crashes, 8 were sideswipe crashes, 4 were rear-end crashes, 3 were head-on crashes, and 1 was a run-off-road crash
- Of the 26 crashes, 6 resulted in minor injuries (B-type injury), 7 resulted in possible injuries (C-type injury), and the remaining 13 resulted in property damage only
- 7 of 26 crashes occurred during inclement weather or roadway conditions (e.g. snow, rain / wet pavement, ice)
- 14 of 26 crashes involved a left-turning vehicle from WIS 213 striking an eastbound or westbound vehicle on WIS 81
  - 9 of 10 angle crashes, 4 of 8 sideswipe crashes, and a head-on crash

*WIS 81 and McKinley Avenue*

- Of the 19 crashes, 15 were angle crashes, 2 were run-off-road crashes, and 2 were vehicles striking a bicyclist/pedestrian
- Of the 18 crashes, 1 resulted in serious injuries (A-type injury), 5 resulted in minor injuries (B-type injury), 2 resulted in possible injuries (C-type injury), and the remaining 10 resulted in property damage only
  - The 2 bicyclist/pedestrian crashes resulted in 1 B-type injury and 1 C-type injury
- 10 of 18 crashes involved an eastbound vehicle striking an eastbound or westbound vehicle on WIS 81

*WIS 81 and Garfield Avenue*

- Of the 10 crashes, 3 were angle crashes, 3 were rear-end crashes, 3 were sideswipe crashes, and 1 was a run-off-road crash
- Of the 18 crashes, 3 resulted in minor injuries (B-type injury), 4 resulted in possible injuries (C-type injury), and the remaining 11 resulted in property damage only
- 5 of 18 crashes occurred during inclement weather or roadway conditions (e.g. snow, rain / wet pavement, ice)

## Traffic Projections

Year 2040 traffic forecasts for the study area were developed by the WisDOT Traffic Forecasting Section (TFS). Peak-hour traffic volumes collected by SRF and daily traffic volumes collected by WisDOT, coupled with growth rates developed in the Beloit travel demand model, were used to develop Year 2040 daily and peak-hour traffic forecasts for the study area. Year 2040 forecasted traffic volumes are provided in the Appendix.

## Traffic Operations Analysis

Year 2019 and Year 2040 traffic volumes were inputted into the traffic operations software package, Synchro, to evaluate traffic operations during peak traffic periods. Data was outputted based on the Highway Capacity Manual (HCM) module built into Synchro. **Table 1** and **Table 2** illustrates traffic operations analysis outputs for Year 2019 weekday morning and afternoon conditions, respectively, while **Table 3** and **Table 4** illustrates weekday morning and afternoon operations analysis for Year 2040 conditions.

Table 1: Traffic Operations Summary, Year 2019 Conditions, Weekday Morning Peak Hour

Intersection	Overall		By Approach	Eastbound			Westbound			Northbound			Southbound		
	Delay (s)	LOS		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
WIS 213 & McKinley Avenue	4.3	A	Delay (s)	7.9			7.7			15.9			14.5		
			LOS	A			A			C			B		
			V/C Ratio	0.018			0.004			0.218			0.205		
			95% Queue (ft)	5			0			20			20		
WIS 81 & McKinley Avenue	5.4	A	Delay (s)	7.8	0.0		8.3			18.0			21.5		
			LOS	A	A		A			C			C		
			V/C Ratio	0.013	0		0.003			0.272			0.358		
			95% Queue (ft)	0	0		5			30			40		
WIS 81 & WIS 213	3.4	A	Delay (s)	8.6			0.0			0.0			20.5		
			LOS	A			A			A			C		
			V/C Ratio	0.006			0			0.00			0.45		
			95% Queue (ft)	0			0			0			60		
WIS 81 & Garfield Avenue	1.1	A	Delay (s)	8.7			8.8			28.3			24.5		
			LOS	A			A			D			C		
			V/C Ratio	0.018			0.006			0.103			0.137		
			95% Queue (ft)	5			0			10			15		



Table 2: Traffic Operations Summary, Year 2019 Conditions, Weekday Afternoon Peak Hour

Intersection	Overall		By Approach	Eastbound			Westbound			Northbound			Southbound		
	Delay (s)	LOS		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
WIS 213 & McKinley Avenue	4.4	A	Delay (s)	7.9			7.7			15.9			16.2		
			LOS	A			A			C			C		
			V/C Ratio	0.018			0.009			0.174			0.265		
			95% Queue (ft)	5			0			15			30		
WIS 81 & McKinley Avenue	7.1	A	Delay (s)	7.8	0.0		8.2			18.8			25.5		
			LOS	A	A		A			C			D		
			V/C Ratio	0.014	0		0.026			0.25			0.519		
			95% Queue (ft)	0	0		5			25			75		
WIS 81 & WIS 213	3.5	A	Delay (s)	8.7			0.0			0.0			21.9		
			LOS	A			A			A			C		
			V/C Ratio	0.007			0			0.00			0.476		
			95% Queue (ft)	0			0			0			65		
WIS 81 & Garfield Avenue	1.8	A	Delay (s)	8.6			8.5			27.5			25.6		
			LOS	A			A			D			D		
			V/C Ratio	0.023			0.022			0.126			0.187		
			95% Queue (ft)	5			5			10			20		

Table 3: Traffic Operations Summary, Year 2040 Conditions, Weekday Morning Peak Hour

Intersection	Overall		By Approach	Eastbound			Westbound			Northbound			Southbound		
	Delay (s)	LOS		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
WIS 213 & McKinley Avenue	5.7	A	Delay (s)	7.9			7.8			20.2			17.8		
			LOS	A			A			C			C		
			V/C Ratio	0.02			0.03			0.33			0.29		
			95% Queue (ft)	5			5			35			30		
WIS 81 & McKinley Avenue	7.3	A	Delay (s)	7.9	0.0		8.3			19.4			29.3		
			LOS	A	A		A			C			D		
			V/C Ratio	0.03	0.00		0.03			0.29			0.52		
			95% Queue (ft)	5	0		5			30			70		
WIS 81 & WIS 213	4.5	A	Delay (s)	8.8			0.0			0.0			26.3		
			LOS	A			A			A			D		
			V/C Ratio	0.13			0.00			0.00			0.56		
			95% Queue (ft)	0			0			0			85		
WIS 81 & Garfield Avenue	1.3	A	Delay (s)	8.8			9.0			32.8			26.1		
			LOS	A			A			D			D		
			V/C Ratio	0.02			0.01			0.12			0.17		
			95% Queue (ft)	5			0			10			15		

Table 4: Traffic Operations Summary, Year 2040 Conditions, Weekday Afternoon Peak Hour

Intersection	Overall		By Approach	Eastbound			Westbound			Northbound			Southbound		
	Delay (s)	LOS		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
WIS 213 & McKinley Avenue	5.5	A	Delay (s)	7.9			7.8			18.1			18.9		
			LOS	A			A			C			C		
			V/C Ratio	0.02			0.03			0.24			0.33		
			95% Queue (ft)	5			5			25			35		
WIS 81 & McKinley Avenue	11.6	B	Delay (s)	7.9	0.0		8.2			21.0			40.5		
			LOS	A	A		A			C			E		
			V/C Ratio	0.029	0		0.03			0.29			0.72		
			95% Queue (ft)	0	0		5			30			135		
WIS 81 & WIS 213	4.1	A	Delay (s)	8.9			0.0			0.0			26.5		
			LOS	A			A			A			D		
			V/C Ratio	0.01			0			0.00			0.56		
			95% Queue (ft)	0			0			0			80		
WIS 81 & Garfield Avenue	2.1	A	Delay (s)	8.8			8.7			30.1			29.7		
			LOS	A			A			D			D		
			V/C Ratio	0.03			0.02			0.17			0.24		
			95% Queue (ft)	5			5			15			25		

From Table 1 and Table 2, all intersections and most traffic movements perform adequately (LOS C or better) during the weekday morning and afternoon peak periods. However, some side-street approaches along Garfield Avenue and McKinley Avenue operate at LOS D during peak periods. This condition is due to infrequent gaps in the WIS 81 and WIS 213 traffic stream not allowing vehicles from the side-street to enter the intersection. This is not an uncommon situation, especially when arterials such as WIS 81 and WIS 213 intersect minor roadways under side-street stop-sign control. These conditions continue in Year 2040 (Table 3 and 4), which is anticipated given the increase in traffic volumes with no geometric or operational changes. In addition, the WIS 213 approach at WIS 81 is also anticipated to operate at LOS D during Year 2040 peak periods.

## Improvement Analysis

From the operations analysis, several traffic movements were noted having operational deficiencies currently, and in the future. In addition, the distance between intersections in the study area (ranging from 80 to 180 feet) may create driver expectancy issues due to their proximity to each other and may limit improvements that can be performed. Therefore, several intersection control alternatives were developed to improve safety and mobility while promoting access management in this area. These alternatives are described below:

- No geometric improvements to the study area (i.e. “No-Build” alternative)
- Realign the WIS 81 and WIS 213 intersection to the west, opposite McKinley Avenue, and upgrade the intersection control to a traffic signal (Option 1). WIS 213 would turn south at McKinley Avenue and use the existing roadway from McKinley Avenue to WIS 81. The north leg of McKinley Avenue at WIS 213 would be shifted to intersect WIS 213 at a right angle. Exclusive turn lanes would be provided. Access to the private alley between Garfield Avenue and McKinley Avenue would be restricted to right-in, right-out access. The westernmost WIS 81 access drive and southernmost Garfield Avenue access drive to the gas station in the northwest quadrant of WIS 81 and Garfield Avenue would be eliminated to improve access management by removing access drives close to intersections.
- Realign the WIS 81 east leg and WIS 213 north leg to make those movements the “major” movements of the WIS 81 and WIS 213 intersection (Option 2). The west leg of WIS 81 would intersect the realigned roadway in the triangular “green space” at a right angle and the intersection would be under traffic signal control. The north leg of McKinley Avenue at WIS 213 and the south leg of McKinley Avenue at WIS 81 would be realigned to intersect their respective roadways at right angles. The WIS 81 and Garfield Avenue intersection would be restricted to right-in, right-out access. The existing right-in, right-out access for Family Video along WIS 81 would be eliminated. It is likely that the gas station on the north side of WIS 81 would be acquired to provide proper roadway design of WIS 81 and extend the private alley east to intersect Garfield Avenue (the current alignment would have the private alley in the physical intersection of WIS 81 and WIS 213). Exclusive turn lanes would be provided.

- Convert the WIS 81 and WIS 213 intersection to a three-legged, single-lane roundabout (Option 3). The roundabout would be positioned in the triangular “green space” to minimize right of way needs. The north leg of McKinley Avenue at WIS 213 and the south leg of McKinley Avenue at WIS 81 would be realigned to intersect their respective roadways at right angles. The existing right-in, right-out access for Family Video along WIS 81 would be eliminated. It is likely that the gas station on the north side of WIS 81 would be acquired to provide proper roadway design of the roundabout and extend the private alley east to intersect Garfield Avenue (the current alignment would have the private alley in the physical intersection of WIS 81 and WIS 213). The WIS 81 and Garfield Avenue intersection would be restricted to right-in, right-out access. Exclusive turn lanes would be provided.

The following tables outline traffic operations analysis for the WIS 81 and WIS 213 study area intersections. Table 5 and Table 6 illustrate Option 1 traffic operations analysis results for Year 2040 weekday morning and afternoon peak hours, respectively. Table 7 and Table 8 illustrate Option 2 traffic operations analysis results for Year 2040 weekday morning and afternoon peak hours, respectively. Table 9 and Table 10 illustrate Option 3 traffic operations analysis results for Year 2040 weekday morning and afternoon peak hours, respectively.

Table 5: Traffic Operations Summary, Option 1, Year 2040 Conditions, Weekday Morning Peak Hour

Intersection	Overall		By Approach	Eastbound			Westbound			Northbound			Southbound		
	Delay (s)	LOS		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
WIS 213 & McKinley Avenue	2.5	A	Delay (s)	8.2			0.0						15.5		
			LOS	A			A						C		
			V/C Ratio	0.02			0						0.25		
			95% Queue (ft)	5			0						25		
WIS 81 & WIS 213 (McKinley Avenue)	8.9	A	Delay (s)	8.1	7.9	10.4	6.9	0.0	9.9			11.3	9.7		
			LOS	A	A	B	A	A	A			B	A		
			V/C Ratio	0.08	0.53	0.16	0.34	0	0.19			0.43	0.17		
			95% Queue (ft)	15	125	25	75	0	35			100	25		
WIS 81 & Garfield Avenue	1.3	A	Delay (s)	8.8	0.0	9.0			32.8			26.1			
			LOS	A	A	A			D			D			
			V/C Ratio	0.019	0	0.01			0.12			0.171			
			95% Queue (ft)	5	0	0			10			15			

Table 6: Traffic Operations Summary, Option 1, Year 2040 Conditions, Weekday Afternoon Peak Hour

Intersection	Overall		By Approach	Eastbound			Westbound			Northbound			Southbound		
	Delay (s)	LOS		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
WIS 213 & McKinley Avenue	2.9	A	Delay (s)	8.1			0.0						15.8		
			LOS	A			A						C		
			V/C Ratio	0.02			0						0.28		
			95% Queue (ft)	5			0						30		
WIS 81 & WIS 213 (McKinley Avenue)	8.8	A	Delay (s)	8.1	7.8	10.3	6.9	0.0	9.8			11.0	10.0		
			LOS	A	A	B	A	A	A			B	B		
			V/C Ratio	0.07	0.51	0.16	0.34	0	0.2			0.41	0.28		
			95% Queue (ft)	15	125	25	75	0	35			95	45		
WIS 81 & Garfield Avenue	1.3	A	Delay (s)	8.8	0.0	8.7			30.1			29.7			
			LOS	A	A	A			D			D			
			V/C Ratio	0.03	0	0.02			0.17			0.24			
			95% Queue (ft)	5	0	5			15			25			

Table 7: Traffic Operations Summary, Option 2, Year 2040 Conditions, Weekday Morning Peak Hour

Intersection	Overall		By Approach	Eastbound			Westbound			Northbound			Southbound		
	Delay (s)	LOS		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
WIS 213 & McKinley Avenue	2.8	A	Delay (s)	8.2			0.0			15.8					
			LOS	A			A			C					
			V/C Ratio	0.02			0.00			0.29					
			95% Queue (ft)	5			0			25					
WIS 81 & McKinley Avenue	2.3	A	Delay (s)	0.0			11.1			0.0					
			LOS	A			B			A					
			V/C Ratio	0.00			0.16			0.00					
			95% Queue (ft)	0			15			0.0					
WIS 81 & WIS 213	11.4	B	Delay (s)	14.8	12.9	8.5	6.0	13.4	13.9						
			LOS	B	B	A	A	B	B						
			V/C Ratio	0.53	0.21	0.51	0.33	0.28	0.72						
			95% Queue (ft)	105	35	105	85	50	130						
WIS 81 & Garfield Avenue	0.2	A	Delay (s)	0.0			0.0			14.3			12.7		
			LOS	A			A			B			B		
			V/C Ratio	0.0			0.0			0.02			0.04		
			95% Queue (ft)	0.0			0.0			0			5		

Table 8: Traffic Operations Summary, Option 2, Year 2040 Conditions, Weekday Afternoon Peak Hour

Intersection	Overall		By Approach	Eastbound			Westbound			Northbound			Southbound		
	Delay (s)	LOS		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
WIS 213 & McKinley Avenue	3.5	A	Delay (s)	8.1			0.0			16.9					
			LOS	A			A			C					
			V/C Ratio	0.03			0.00			0.35					
			95% Queue (ft)	5			0			30					
WIS 81 & McKinley Avenue	2.0	A	Delay (s)	0.0			11.9			0.0					
			LOS	A			B			A					
			V/C Ratio	0.00			0.17			0.00					
			95% Queue (ft)	0			15			0.0					
WIS 81 & WIS 213	11.4	B	Delay (s)	14.9	13.8	8.5	5.9	13.6	16.9						
			LOS	B	B	A	A	B	B						
			V/C Ratio	0.52	0.33	0.54	0.34	0.27	0.70						
			95% Queue (ft)	105	55	120	95	50	130						
WIS 81 & Garfield Avenue	0.3	A	Delay (s)	0.0			0.0			12.9			12.4		
			LOS	A			A			B			B		
			V/C Ratio	0.0			0.0			0.03			0.03		
			95% Queue (ft)	0.0			0.0			5			5		

Table 9: Traffic Operations Summary, Option 3, Year 2040 Conditions, Weekday Morning Peak Hour

Intersection	Overall		By Approach	Eastbound			Westbound			Northbound			Southbound		
	Delay (s)	LOS		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
WIS 213 & McKinley Avenue	2.9	A	Delay (s)	8.2			0.0			16.2					
			LOS	A			A			C					
			V/C Ratio	0.02			0.00			0.29					
			95% Queue (ft)	5			0			30					
WIS 81 & McKinley Avenue	1.5	A	Delay (s)	0.0			12.9			0.0					
			LOS	A			B			A					
			V/C Ratio	0.00			0.20			0.00					
			95% Queue (ft)	0			20			0					
WIS 81 & WIS 213	9.8	A	Delay (s)	8.2			10.4			10.2					
			LOS	A			B			B					
			V/C Ratio	0.37			0.56			0.53					
			95% Queue (ft)	45			90			80					
WIS 81 & Garfield Avenue	0.3	A	Delay (s)	0.0			0.0			14.5			12.7		
			LOS	A			A			B			B		
			V/C Ratio	0.00			0.00			0.03			0.04		
			95% Queue (ft)	0			0			5			5		



Table 10: Traffic Operations Summary, Option 3, Year 2040 Conditions, Weekday Afternoon Peak Hour

Intersection	Overall		By Approach	Eastbound			Westbound			Northbound			Southbound			
	Delay (s)	LOS		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT	
WIS 213 & McKinley Avenue	3.8	A	Delay (s)	8.1				0.0							17.7	
			LOS	A				A							C	
			V/C Ratio	0.03				0.00								0.36
			95% Queue (ft)	5				0								40
WIS 81 & McKinley Avenue	1.5	A	Delay (s)	0.0						13.5					0.0	
			LOS	A						B					A	
			V/C Ratio	0.00						0.21						0.00
			95% Queue (ft)	0						20.0						0.0
WIS 81 & WIS 213	6.4	A	Delay (s)		6.1		2.9				6.8					
			LOS		A		A				A					
			V/C Ratio		0.34		0.00				0.33					
			95% Queue (ft)		40		0				40					
WIS 81 & Garfield Avenue	0.3	A	Delay (s)		0.0			0.0				13.2			12.4	
			LOS		A			A				B			B	
			V/C Ratio		0.00			0.00				0.03				0.03
			95% Queue (ft)		0			0				5				5

The results of the improvement analysis for WIS 81 and WIS 213 indicate that most intersections for all evaluated improvement options are anticipated to operate adequately (LOS C or better) during peak traffic periods. The only exception to this is the intersection of WIS 81 and Garfield Avenue during Option 1. However, as previously stated, this is not an uncommon situation, especially when arterials such as WIS 81 intersect minor roadways under side-street stop-sign control. It should be noted that the WIS 81 and Garfield Avenue intersection maintained full traffic access for Option 1 while the intersection was restricted to right-in, right-out for Option 2 and Option 3. For Option 1, the intersection spacing along WIS 81 was adequate for Garfield Avenue to maintain full access; Option 2 and Option 3 shifts the main WIS 81 and WIS 213 intersection slightly further away from Garfield Avenue. For mobility, safety, and access management reasons, it was assumed that Garfield Avenue would be restricted to right-in, right-out.

To implement each improvement option, roadway improvements and right of way acquisition would be necessary. Option 1 would require the least amount of roadway widening or right of way as many existing roadways would be utilized. Option 2 and Option 3 would require much of the triangular “green space” in the center of the study area to be replaced with the shifted WIS 81 and WIS 213 intersection.

Another consideration of the options is an existing fire station located in the southwest quadrant of WIS 81 and McKinley Avenue. Option 1 allows exiting fire trucks direct access to the WIS 81 or WIS 213 corridors via the proposed signal at WIS 81 and McKinley Avenue. For Option 2 and Option 3, fire trucks must turn right on WIS 81 from McKinley Avenue and travel through another intersection to travel on WIS 213.

It is recommended that consideration be given to investigate the feasibility and constructability of implementing Option 1 (realignment of WIS 213 to McKinley Avenue) for the study area. This option reduces the number of intersections surrounding the triangular open space from three to two, eliminates the skewed WIS 81 and WIS 213 intersection, and realigns the skewed WIS 213 and McKinley Avenue intersection. Improvements at the new WIS 81 and WIS 213 can mainly be accommodated within the existing curb lines along WIS 81 (the provision of the westbound right-turn lane would likely extend beyond the north curb line, depending on the turning radius for trucks).

Option 2 and Option 3 can both operate adequately during Year 2040 peak-hour condition; however, each improvement option requires more significant right of way to implement with the same operational results as Option 1. In addition, these options would encourage restricting the WIS 81 and Garfield Avenue intersection to right-in, right-out only due to the proximity of Garfield to the “central” intersection. Option 2 and Option 3 also do not provide direct access to the WIS 213 or east WIS 81 corridor for emergency vehicles as Option 1 does (a fire station is currently located in the southwest quadrant of the WIS 81 and McKinley Avenue intersection).

## Conclusions / Recommendations

An intersection control evaluation (ICE) study was performed for the WIS 81 and WIS 213 intersection and its surrounding area to evaluate potential intersection control improvements to maximize safety and mobility in the study area. The following summarizes this analysis:

- Traffic operations currently, and will continue to, operate adequately at the study intersections. Side-street traffic operations from McKinley Avenue and Garfield Avenue currently experience operational deficiencies and will continue to do so as peak-hour traffic volumes increase.
- All three evaluated options improve traffic operations and traffic safety in the study area.
  - The intersection of WIS 81 and Garfield Avenue could remain a full access intersection for Option 1 or could be restricted to right-in, right-out access (as for Option 2 and Option 3).
- It is recommended that consideration be given to investigate the feasibility and constructability of implementing Option 1 (realignment of WIS 213 to McKinley Avenue) for the study area.
  - This option reduces the number of intersections surrounding the triangular open space from three to two, eliminates the skewed WIS 81 and WIS 213 intersection, and realigns the skewed WIS 213 and McKinley Avenue intersection.
  - Improvements at the new WIS 81 and WIS 213 can mainly be accommodated within the existing curb lines along WIS 81.
  - Option 2 and Option 3 requires more significant right of way to implement with the same operational results as Option 1.
  - Option 2 and Option 3 would encourage restricting the WIS 81 and Garfield Avenue intersection to right-in, right-out only.

- Option 2 and Option 3 also do not provide direct access to the WIS 213 or east WIS 81 corridor for emergency vehicles (a fire station is currently located in the southwest quadrant of the WIS 81 and McKinley Avenue intersection).

## APPENDIX





To: [DOT ICE Review](#)  
From: Lee Gibbs, PE, PTOE, SRF Consulting Group  
Date: [Click here to enter a date.](#)  
RE: Project ID #  
Traffic Impact Analysis (TIA)  
WIS 81 (Liberty Avenue) and WIS 213 (Madison Road)  
City of Beloit, Rock County  
Southwest Region

## **Project Description:**

WIS 81 and WIS 213 are two-lane principal arterials on the west side of Beloit. Their intersection is a side-street stop-control at a significant skew (45 degrees). McKinley Avenue and Garfield Avenue are north-south roadways that intersects WIS 81 100 to 150 feet from the WIS 213 intersection. WIS 81, WIS 213, and McKinley Avenue form a tight triangle of three intersections, spaced 150 to 250 feet from each other.

Objectives of this study are to maximize mobility and safety along this stretch of WIS 81 and WIS 213 and, potentially, improve intersection geometric design as several study area intersections are skewed.

## **Description of Alternatives:**

The following lists alternatives identified and evaluated for the study area:

- No geometric improvements to the study area (i.e. “No-Build” alternative)
- Realign the WIS 81 and WIS 213 intersection to the west, opposite McKinley Avenue, and upgrade the intersection control to a traffic signal (Option 1). WIS 213 would turn south at McKinley Avenue and use the existing roadway from McKinley Avenue to WIS 81. The north leg of McKinley Avenue at WIS 213 would be shifted to intersect WIS 213 at a right angle. Exclusive turn lanes would be provided.
- Realign the WIS 81 east leg and WIS 213 north leg to make those movements the “major” movements of the WIS 81 and WIS 213 intersection (Option 2). The west leg of WIS 81 would intersect the realigned roadway in the triangular “green space” at a right angle and the intersection would be under traffic signal control. The north leg of McKinley Avenue at WIS 213 and the south leg of McKinley Avenue at WIS 81 would be realigned to intersect their respective roadways at right angles. Exclusive turn lanes would be provided.
- Convert the WIS 81 and WIS 213 intersection to a three-legged, single-lane roundabout (Option 3). The roundabout would be positioned in the triangular “green space” to minimize right of way needs. The north leg of McKinley Avenue at WIS 213 and the south leg of McKinley Avenue at WIS 81 would be realigned to intersect their respective roadways at right angles. The WIS 81 and Garfield Avenue intersection would be restricted to right-in, right-out access. Exclusive turn lanes would be provided.



**Safety Considerations:**

Observed Crash History Years: 2015 – 2019: WIS 81 and WIS 213

Crash Type	Fatal	Injury A	Injury B	Injury C	KABC	PDO	Total
Angle	0	0	4	3	7	8	15
Rear-End	0	0	0	2	2	2	4
Run-Off-Road	0	0	0	0	0	1	1
Sideswipe	0	0	2	2	4	2	6
<b>Total</b>	0	0	6	7	13	13	26

(add more rows as needed)

Observed Crash History Years: 2015 – 2019: WIS 81 and McKinley Avenue

Crash Type	Fatal	Injury A	Injury B	Injury C	KABC	PDO	Total
Angle	0	0	2	1	3	10	13
Head-On	0	0	0	0	0	1	1
Rear-End	0	0	0	1	1	0	1
Run-Off-Road	0	0	1	1	2	1	3
Sideswipe	0	0	0	1	1	0	1
<b>Total</b>	0	0	3	4	7	12	19

Observed Crash History Years: 2015 – 2019: WIS 81 and Garfield Avenue

Crash Type	Fatal	Injury A	Injury B	Injury C	KABC	PDO	Total
Angle	0	0	0	1	1	2	3
Rear-End	0	0	0	1	1	2	3
Run-Off-Road	0	0	0	0	0	1	1
Sideswipe	0	0	0	0	0	3	3
<b>Total</b>	0	0	0	2	2	8	10

Observed Crash History Years: 2015 – 2019: WIS 213 and McKinley Avenue

Crash Type	Fatal	Injury A	Injury B	Injury C	KABC	PDO	Total
Angle	0	1	4	1	6	13	19
Other	0	0	1	1	2	2	4
<b>Total</b>	0	1	5	2	8	15	23

Crash Trends: The vast majority of crashes at 3 of the 4 study intersections are angle crashes.

Contributing Factors: Intersection skew at the WIS 81 / WIS 213 and WIS 213 / McKinley Avenue intersections are a likely culprit for many of the angle and sideswipe crashes.

**Operational Considerations:**

Existing Conditions: All intersections operate adequately (LOS C or better) except for the side-street approaches of McKinley Avenue and Garfield Avenue (LOS D). This is due to infrequent gaps in the WIS 81 and WIS 213 traffic stream.

Year 2040 No-Build Conditions: The McKinley Avenue and Garfield Avenue approaches will continue experience operational deficiencies. In addition, the WIS 213 approach at WIS 81 is anticipated to operate at LOS D.



Option 1: All study intersections and movements are anticipated to operate at LOS C or better. The Garfield Avenue movements at WIS 81 are anticipated to operate at LOS D during peak periods; however, this intersection could be restricted to right-in, right-out, if desired.

Option 2: All study intersections and movements are anticipated to operate at LOS C or better. It should be noted that the WIS 81 with Garfield Avenue and McKinley Avenue intersections were restricted to right-in, right-out access only.

Option 3: All study intersections and movements are anticipated to operate at LOS C or better. It should be noted that the WIS 81 with Garfield Avenue and McKinley Avenue intersections were restricted to right-in, right-out access only.

### **Other Considerations:**

An existing fire station is located in the southwest quadrant of the WIS 81 and McKinley Avenue intersection. Option 1 would allow emergency vehicles direct access to the WIS 81 and WIS 213 corridors via traffic signal (with the potential for EVP implementation). Option 2 and Option 3 would require emergency vehicles to negotiate a side-street stop control and either a traffic signal (Option 2) or roundabout (Option 3) to continue their travel along WIS 213 or WIS 81 east.

### **Feasibility of Alternatives:**

All improvement options are anticipated to be constructed within the triangular green space at the center of the study area. All improvements options are anticipated to require right of way acquisition at WIS 213 and McKinley Avenue to eliminate the existing intersection skew. Option 1 would likely require the least amount of right of way and additional pavement required to implement. Option 2 and Option 3 would require significant roadway realignment and intersection construction to implement.

### **Conclusion:**

All improvement options improve Year 2040 peak-hour traffic operations. Option 1

### **Attachments:**

Provide attachments outlined in FDM 11-25-3 Attachment 3.7 as appropriate

# Intersection Traffic Volume Report

## Base Information, Observed (4) Hour and Estimated (24) Hour Volume Summaries

Intersection of: **Garfield Rd and E Liberty Ave**



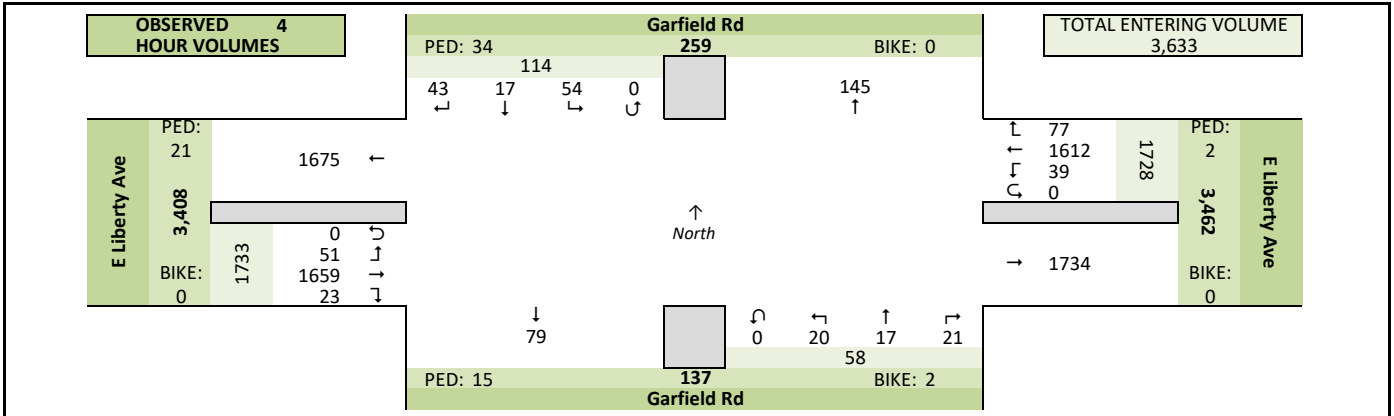
### Site Information

Municipality	City of Beloit
County	Rock
WisDOT Region	SW-M
Traffic Control	Partial Stop Control
Roadway Names	North Direction ↑
North Leg	Garfield Rd
East Leg	E Liberty Ave
South Leg	Garfield Rd
West Leg	E Liberty Ave
Special Considerations	
Schools	In Session
Holidays	None
Special Events	None
Special Pedestrians Observed	
Pre-school children	None
Elementary school age children	None
Visually impaired (white cane/helper dog)	None
Elderly/disabled (except wheelchairs)	None
Wheelchairs/electric scooters	None
Other (describe)	None

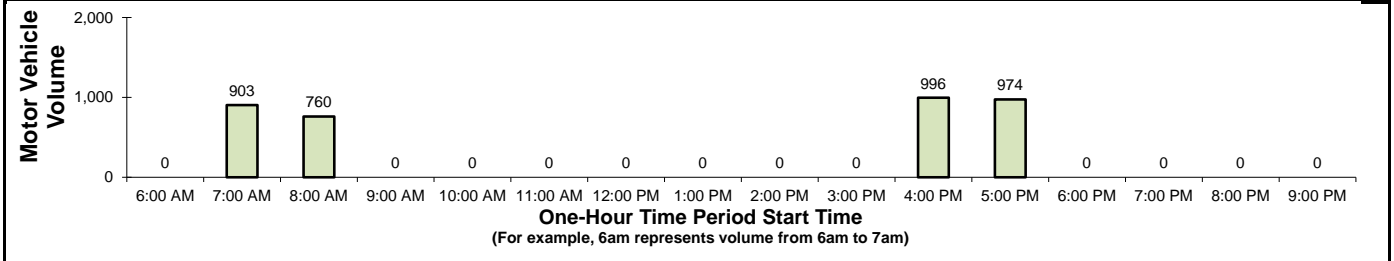
### Count Information

Hrs Counted:	7:00 AM-9:00 AM and 4:00 PM-6:00 PM	
1st Day of Count	Tuesday, September 10, 2019	Weather
AM Peak Period	Tuesday, September 10, 2019	Clear & Dry
Midday Peak Period	Tuesday, September 10, 2019	Clear & Dry
PM Peak Period	Tuesday, September 10, 2019	Clear & Dry
Calculated Peak Hours		
AM	7:30-8:30am	MD
PM	4:45-5:45pm	
Peak Hours Selected for Analysis		
AM	7:30-8:30am	MD
PM	4:00-5:00pm	
Daily/Seasonal Adjustment Group		
Count Expansion Group		
Daily/Seasonal Adjustment Factor	1	Count Expansion Factor
		#N/A
Company Name	SRF Consulting, Inc.	Manual Adj.
		1.000
Observers	AM Peak Period	Matthew Flanagan
	Midday Peak Period	Matthew Flanagan
	PM Peak Period	Matthew Flanagan
Comments		

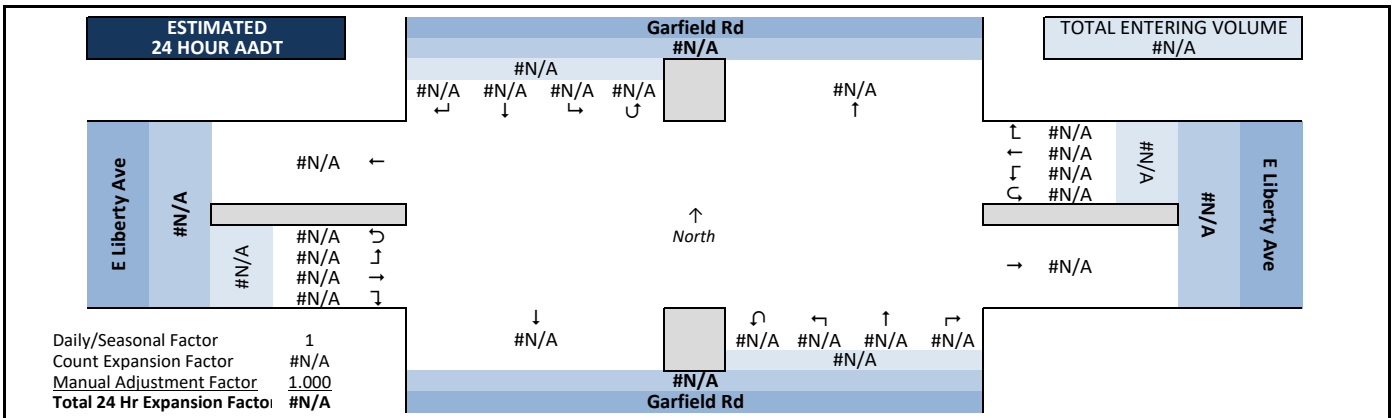
### Observed 4 Hour Volume Summary



### Total Entering Hourly Volume



### Estimated 24 Hour AADT

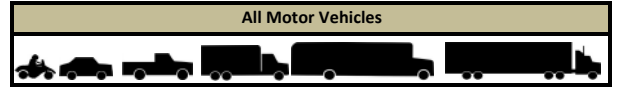




# Intersection Traffic Volume Report

## Peak Hour Volume Summary

### Garfield Rd and E Liberty Ave



#### Peak Hour Volumes, Truck Percentages, and PHFs

Tuesday, September 10, 2019		From North					From East					From South					From West					Totals
		Garfield Rd					E Liberty Ave					Garfield Rd					E Liberty Ave					
AM Peak Hour	Start Time	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
	7:30 AM	1	0	4	0	5	2	121	1	0	124	1	2	3	0	6	1	122	1	0	124	259
	7:45 AM	5	2	1	0	8	3	148	1	0	152	0	2	0	0	2	0	133	6	0	139	301
	8:00 AM	2	2	3	0	7	2	108	0	0	110	1	0	1	0	2	3	141	5	0	149	268
	8:15 AM	4	0	1	0	5	4	67	3	0	74	1	1	0	0	2	1	118	1	0	120	201
	Peak Hour Volume	12	4	9	0	25	11	444	5	0	460	3	5	4	0	12	5	514	13	0	532	1029
	Rounded Hourly Volume	10	5	10	0	25	10	445	5	0	460	5	5	5	0	15	5	515	15	0	535	1035
	% Single Unit Trucks	0.0	0.0	33.3	0.0	12.0	9.1	7.2	20.0	0.0	7.4	100.0	0.0	75.0	0.0	50.0	0.0	7.8	0.0	0.0	7.5	8.1
	% Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	% Trucks (Total)	0.0	0.0	33.3	0.0	12.0	9.1	7.2	20.0	0.0	7.4	100.0	0.0	75.0	0.0	50.0	0.0	7.8	0.0	0.0	7.5	8.1
	Peak Hour Factor (PHF)	0.60	0.50	0.56	0.00	0.78	0.69	0.75	0.42	0.00	0.76	0.75	0.62	0.33	0.00	0.50	0.42	0.91	0.54	0.00	0.89	0.85

N/A		From North					From East					From South					From West					Totals
		Garfield Rd					E Liberty Ave					Garfield Rd					E Liberty Ave					
Midday (MD) Peak Hour	Start Time	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
	12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Peak Hour Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rounded Hourly Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	% Single Unit Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	% Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	% Trucks (Total)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Peak Hour Factor (PHF)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Tuesday, September 10, 2019		From North					From East					From South					From West					Totals
		Garfield Rd					E Liberty Ave					Garfield Rd					E Liberty Ave					
PM Peak Hour	Start Time	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
	4:00 PM	6	1	2	0	9	7	123	3	0	133	3	1	2	0	6	2	131	5	0	138	286
	4:15 PM	2	1	7	0	10	7	120	3	0	130	2	0	1	0	3	4	101	6	0	111	254
	4:30 PM	2	0	5	0	7	5	108	8	0	121	1	0	4	0	5	4	86	4	0	94	227
	4:45 PM	2	0	5	0	7	7	92	4	0	103	1	2	3	0	6	0	109	4	0	113	229
	Peak Hour Volume	12	2	19	0	33	26	443	18	0	487	7	3	10	0	20	10	427	19	0	456	996
	Rounded Hourly Volume	10	0	20	0	30	25	445	20	0	490	5	5	10	0	20	10	425	20	0	455	995
	% Single Unit Trucks	8.3	0.0	0.0	0.0	3.0	0.0	3.6	11.1	0.0	3.7	42.9	0.0	40.0	0.0	35.0	0.0	5.6	0.0	0.0	5.3	5.0
	% Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	% Trucks (Total)	8.3	0.0	0.0	0.0	3.0	0.0	3.6	11.1	0.0	3.7	42.9	0.0	40.0	0.0	35.0	0.0	5.6	0.0	0.0	5.3	5.0
	Peak Hour Factor (PHF)	0.50	0.50	0.68	0.00	0.82	0.93	0.90	0.56	0.00	0.92	0.58	0.37	0.62	0.00	0.83	0.62	0.81	0.79	0.00	0.83	0.87

#### Peak Hour Pedestrian and Bicyclist Volumes

Pedestrians and Bicyclists		Crossing North Approach			Crossing East Approach			Crossing South Approach			Crossing West Approach			Total Ped & Bike Volume
		Garfield Rd			E Liberty Ave			Garfield Rd			E Liberty Ave			
15-Minute Start Time		Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total	
AM	7:30 AM	1	0	1	0	0	0	2	0	2	0	0	0	3
	7:45 AM	1	0	1	0	0	0	0	0	0	0	0	0	1
	8:00 AM	1	0	1	0	0	0	3	0	3	0	0	0	4
	8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	<b>Total</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>
MD	12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
PM	4:00 PM	5	0	5	0	0	0	3	0	3	8	0	8	16
	4:15 PM	12	0	12	0	0	0	0	1	1	3	0	3	16
	4:30 PM	2	0	2	0	0	0	2	0	2	0	0	0	4
	4:45 PM	4	0	4	0	0	0	2	0	2	0	0	0	6
	<b>Total</b>	<b>23</b>	<b>0</b>	<b>23</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>1</b>	<b>8</b>	<b>11</b>	<b>0</b>	<b>11</b>	<b>42</b>

# Intersection Traffic Volume Report

## 15-Minute Motor Vehicle Data

### Garfield Rd and E Liberty Ave



#### 15-Minute Motor Vehicle Data

15-Minute Time Period Start Time	From North					From East					From South					From West					15-Min Totals	Hourly Sum	PHF			
	Garfield Rd					E Liberty Ave					Garfield Rd					E Liberty Ave										
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total						
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7:00 AM	0	0	1	0	1	2	73	2	0	77	0	2	1	0	3	2	63	0	0	0	0	65	146	903	0.75	
7:15 AM	1	1	5	0	7	3	83	0	0	86	1	0	0	0	1	0	102	1	0	103	197	1025	0.85			
7:30 AM	1	0	4	0	5	2	121	1	0	124	1	2	3	0	6	1	122	1	0	124	259	1029	0.85			
7:45 AM	5	2	1	0	8	3	148	1	0	152	0	2	0	0	2	0	133	6	0	139	301	925	0.77			
8:00 AM	2	2	3	0	7	2	108	0	0	110	1	0	1	0	2	3	141	5	0	149	268	760	0.71			
8:15 AM	4	0	1	0	5	4	67	3	0	74	1	1	0	0	2	1	118	1	0	120	201					
8:30 AM	3	1	0	0	4	5	64	1	0	70	0	0	0	0	0	0	80	1	0	81	155					
8:45 AM	1	0	5	0	6	5	61	1	0	67	0	1	1	0	2	1	59	1	0	61	136					
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
4:00 PM	6	1	2	0	9	7	123	3	0	133	3	1	2	0	6	2	131	5	0	138	286	996	0.87			
4:15 PM	2	1	7	0	10	7	120	3	0	130	2	0	1	0	3	4	101	6	0	111	254	979	0.91			
4:30 PM	2	0	5	0	7	5	108	8	0	121	1	0	4	0	5	4	86	4	0	94	227	986	0.92			
4:45 PM	2	0	5	0	7	7	92	4	0	103	1	2	3	0	6	0	109	4	0	113	229	1001	0.93			
5:00 PM	3	2	3	0	8	8	126	5	0	139	3	3	2	0	8	3	108	3	0	114	269	974	0.91			
5:15 PM	3	3	3	0	9	6	122	3	0	131	1	1	0	0	2	2	106	11	0	119	261					
5:30 PM	5	3	7	0	15	4	104	2	0	110	5	2	2	0	9	0	107	1	0	108	242					
5:45 PM	3	1	2	0	6	7	92	2	0	101	1	0	0	0	1	0	93	1	0	94	202					
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
<b>Totals</b>	<b>43</b>	<b>17</b>	<b>54</b>	<b>0</b>	<b>114</b>	<b>77</b>	<b>1612</b>	<b>39</b>	<b>0</b>	<b>1728</b>	<b>21</b>	<b>17</b>	<b>20</b>	<b>0</b>	<b>58</b>	<b>23</b>	<b>1659</b>	<b>51</b>	<b>0</b>	<b>1733</b>	<b>3633</b>					

#### Peak Hour All Vehicle Volume Summary

Hourly Time Period Start Time	From North					From East					From South					From West					Total Hourly Volume	PHF	
	Garfield Rd					E Liberty Ave					Garfield Rd					E Liberty Ave							
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total			
AM 7:30 AM	12	4	9	0	25	11	444	5	0	460	3	5	4	0	12	5	514	13	0	532	1029	0.85	
MD 12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
PM 4:00 PM	12	2	19	0	33	26	443	18	0	487	7	3	10	0	20	10	427	19	0	456	996	0.87	

# Intersection Traffic Volume Report



## Base Information, Observed (4) Hour and Estimated (24) Hour Volume Summaries

Intersection of: **McKinley Ave and E Liberty Ave**

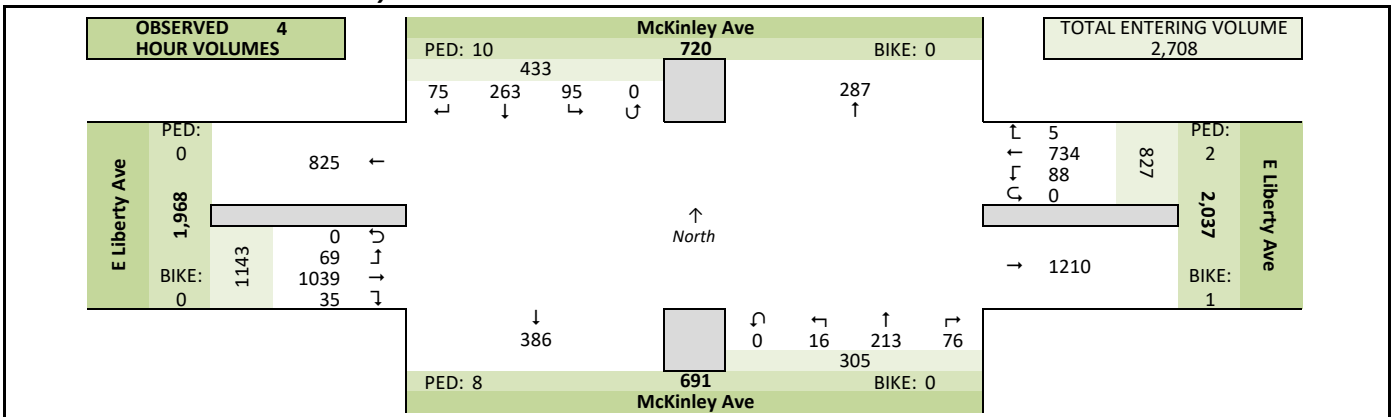
### Site Information

Municipality	City of Beloit	
County	Rock	WisDOT Region
Traffic Control	Partial Stop Control	
Roadway Names	North Direction	
North Leg	McKinley Ave	
East Leg	E Liberty Ave	
South Leg	McKinley Ave	
West Leg	E Liberty Ave	
Special Considerations		
Schools	In Session	
Holidays	None	
Special Events	None	
Special Pedestrians Observed		
	Pre-school children	None
	Elementary school age children	None
	Visually impaired (white cane/helper dog)	None
	Elderly/disabled (except wheelchairs)	None
	Wheelchairs/electric scooters	None
Other (describe)	None	None

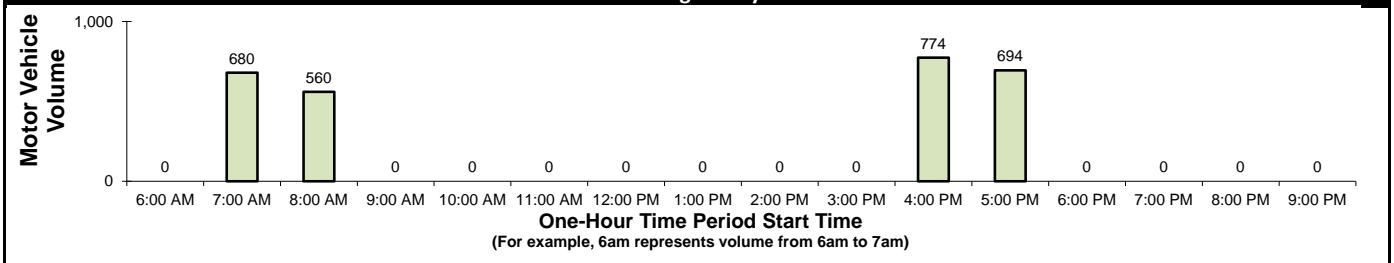
### Count Information

Hrs Counted:	7:00 AM-9:00 AM and 4:00 PM-6:00 PM	
1st Day of Count	Tuesday, September 10, 2019	Weather
AM Peak Period	Tuesday, September 10, 2019	Clear & Dry
Midday Peak Period	Tuesday, September 10, 2019	Clear & Dry
PM Peak Period	Tuesday, September 10, 2019	Clear & Dry
Calculated Peak Hours		
	AM 7:15-8:15am	MD
	PM 4:00-5:00pm	
Peak Hours Selected for Analysis		
	AM 7:30-8:30am	MD
	PM 4:00-5:00pm	
Daily/Seasonal Adjustment Group		
Count Expansion Group		
Daily/Seasonal Adjustment Factor	1	Count Expansion Factor
		#N/A
Company Name	SRF Consulting, Inc.	Manual Adj.
		1.000
Observers	AM Peak Period	Matthew Flanagan
	Midday Peak Period	Matthew Flanagan
	PM Peak Period	Matthew Flanagan
Comments		

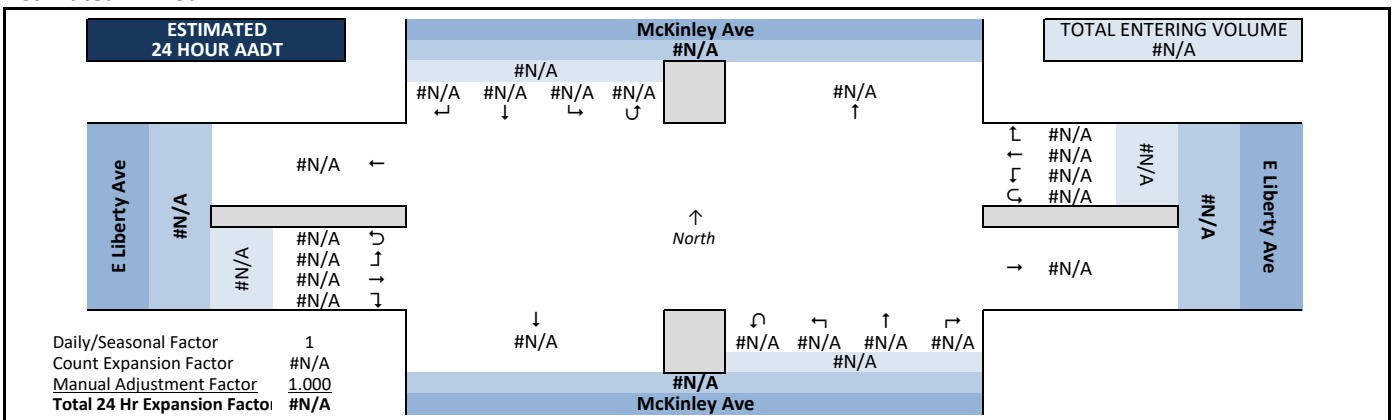
### Observed 4 Hour Volume Summary



### Total Entering Hourly Volume



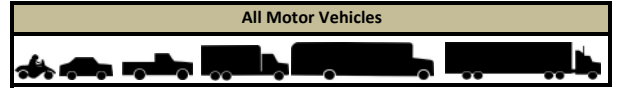
### Estimated 24 Hour AADT



# Intersection Traffic Volume Report

## Peak Hour Volume Summary

### McKinley Ave and E Liberty Ave



#### Peak Hour Volumes, Truck Percentages, and PHFs

Tuesday, September 10, 2019		From North					From East					From South					From West					Totals
AM Peak Hour		McKinley Ave					E Liberty Ave					McKinley Ave					E Liberty Ave					
Start Time	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total		
7:30 AM	4	9	4	0	17	1	50	13	0	64	6	20	2	0	28	1	85	7	0	93	202	
7:45 AM	5	24	6	0	35	1	69	9	0	79	9	15	0	0	24	1	82	2	0	85	223	
8:00 AM	7	15	10	0	32	0	51	5	0	56	5	11	1	0	17	3	98	4	0	105	210	
8:15 AM	2	6	10	0	18	0	36	1	0	37	6	13	1	0	20	3	57	3	0	63	138	
Peak Hour Volume	18	54	30	0	102	2	206	28	0	236	26	59	4	0	89	8	322	16	0	346	773	
Rounded Hourly Volume	20	55	30	0	105	0	205	30	0	235	25	60	5	0	90	10	320	15	0	345	775	
% Single Unit Trucks	5.6	0.0	10.0	0.0	3.9	0.0	12.1	0.0	0.0	10.6	11.5	1.7	0.0	0.0	4.5	12.5	7.8	0.0	0.0	7.5	7.6	
% Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
% Trucks (Total)	5.6	0.0	10.0	0.0	3.9	0.0	12.1	0.0	0.0	10.6	11.5	1.7	0.0	0.0	4.5	12.5	7.8	0.0	0.0	7.5	7.6	
Peak Hour Factor (PHF)	0.64	0.56	0.75	0.00	0.73	0.50	0.75	0.54	0.00	0.75	0.72	0.74	0.50	0.00	0.79	0.67	0.82	0.57	0.00	0.82	0.87	

N/A		From North					From East					From South					From West					Totals
Midday (MD) Peak Hour		McKinley Ave					E Liberty Ave					McKinley Ave					E Liberty Ave					
Start Time	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total		
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Peak Hour Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Rounded Hourly Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
% Single Unit Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
% Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
% Trucks (Total)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Peak Hour Factor (PHF)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Tuesday, September 10, 2019		From North					From East					From South					From West					Totals
PM Peak Hour		McKinley Ave					E Liberty Ave					McKinley Ave					E Liberty Ave					
Start Time	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total		
4:00 PM	7	20	14	0	41	0	60	4	0	64	8	13	3	0	24	3	104	3	0	110	239	
4:15 PM	10	24	5	0	39	1	59	10	0	70	3	5	1	0	9	4	71	2	0	77	195	
4:30 PM	5	26	3	0	34	0	45	4	0	49	6	13	1	0	20	1	59	6	0	66	169	
4:45 PM	7	25	5	0	37	0	42	5	0	47	4	11	3	0	18	2	61	6	0	69	171	
Peak Hour Volume	29	95	27	0	151	1	206	23	0	230	21	42	8	0	71	10	295	17	0	322	774	
Rounded Hourly Volume	30	95	25	0	150	0	205	25	0	230	20	40	10	0	70	10	295	15	0	320	770	
% Single Unit Trucks	6.9	2.1	3.7	0.0	3.3	0.0	5.8	0.0	0.0	5.2	9.5	0.0	37.5	0.0	7.0	0.0	4.7	5.9	0.0	4.7	4.8	
% Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
% Trucks (Total)	6.9	2.1	3.7	0.0	3.3	0.0	5.8	0.0	0.0	5.2	9.5	0.0	37.5	0.0	7.0	0.0	4.7	5.9	0.0	4.7	4.8	
Peak Hour Factor (PHF)	0.72	0.91	0.48	0.00	0.92	0.25	0.86	0.57	0.00	0.82	0.66	0.81	0.67	0.00	0.74	0.62	0.71	0.71	0.00	0.73	0.81	

#### Peak Hour Pedestrian and Bicyclist Volumes

Pedestrians and Bicyclists	Crossing North Approach			Crossing East Approach			Crossing South Approach			Crossing West Approach			Total Ped & Bike Volume
	McKinley Ave			E Liberty Ave			McKinley Ave			E Liberty Ave			
	Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total	
15-Minute Start Time													
7:30 AM	2	0	2	0	0	0	0	0	0	0	0	0	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	
8:15 AM	2	0	2	0	0	0	0	0	0	0	0	2	
Total	4	0	4	0	0	0	0	0	0	0	0	4	
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	0	0	0	0	0	0	0	0	0	0	0	
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	
4:15 PM	1	0	1	1	1	2	1	0	1	0	0	4	
4:30 PM	0	0	0	0	0	0	1	0	1	0	0	1	
4:45 PM	0	0	0	0	0	0	2	0	2	0	0	2	
Total	1	0	1	1	1	2	4	0	4	0	0	7	

# Intersection Traffic Volume Report

## 15-Minute Motor Vehicle Data

### McKinley Ave and E Liberty Ave



#### 15-Minute Motor Vehicle Data

15-Minute Time Period	From North					From East					From South					From West					15-Min Totals	Hourly Sum	PHF			
	McKinley Ave					E Liberty Ave					McKinley Ave					E Liberty Ave										
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total						
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7:00 AM	3	2	2	0	7	0	31	3	0	34	5	19	0	0	24	3	45	4	0	52	117		680	0.76		
7:15 AM	2	10	3	0	15	1	26	0	0	27	4	22	0	0	26	1	58	11	0	70	138		773	0.87		
7:30 AM	4	9	4	0	17	1	50	13	0	64	6	20	2	0	28	1	85	7	0	93	202		773	0.87		
7:45 AM	5	24	6	0	35	1	69	9	0	79	9	15	0	0	24	1	82	2	0	85	223		680	0.76		
8:00 AM	7	15	10	0	32	0	51	5	0	56	5	11	1	0	17	3	98	4	0	105	210		560	0.67		
8:15 AM	2	6	10	0	18	0	36	1	0	37	6	13	1	0	20	3	57	3	0	63	138					
8:30 AM	2	9	7	0	18	0	33	1	0	34	0	6	0	0	6	0	48	3	0	51	109					
8:45 AM	3	6	1	0	10	0	33	0	0	33	2	8	0	0	10	2	45	3	0	50	103					
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
4:00 PM	7	20	14	0	41	0	60	4	0	64	8	13	3	0	24	3	104	3	0	110	239		774	0.81		
4:15 PM	10	24	5	0	39	1	59	10	0	70	3	5	1	0	9	4	71	2	0	77	195		714	0.92		
4:30 PM	5	26	3	0	34	0	45	4	0	49	6	13	1	0	20	1	59	6	0	66	169		692	0.97		
4:45 PM	7	25	5	0	37	0	42	5	0	47	4	11	3	0	18	2	61	6	0	69	171		701	0.98		
5:00 PM	8	24	7	0	39	1	44	9	0	54	3	17	1	0	21	4	58	3	0	65	179		694	0.97		
5:15 PM	5	21	9	0	35	0	51	8	0	59	7	11	1	0	19	0	52	8	0	60	173					
5:30 PM	2	21	6	0	29	0	47	9	0	56	4	21	0	0	25	3	63	2	0	68	178					
5:45 PM	3	21	3	0	27	0	57	7	0	64	4	8	2	0	14	4	53	2	0	59	164					
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
<b>Totals</b>	<b>75</b>	<b>263</b>	<b>95</b>	<b>0</b>	<b>433</b>	<b>5</b>	<b>734</b>	<b>88</b>	<b>0</b>	<b>827</b>	<b>76</b>	<b>213</b>	<b>16</b>	<b>0</b>	<b>305</b>	<b>35</b>	<b>1039</b>	<b>69</b>	<b>0</b>	<b>1143</b>	<b>2708</b>					

#### Peak Hour All Vehicle Volume Summary

Hourly Time Period	From North					From East					From South					From West					Total Hourly Volume	PHF	
	McKinley Ave					E Liberty Ave					McKinley Ave					E Liberty Ave							
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total			
AM 7:30 AM	18	54	30	0	102	2	206	28	0	236	26	59	4	0	89	8	322	16	0	346	773	0.87	
MD 12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
PM 4:00 PM	29	95	27	0	151	1	206	23	0	230	21	42	8	0	71	10	295	17	0	322			

# Intersection Traffic Volume Report



## Base Information, Observed (4) Hour and Estimated (24) Hour Volume Summaries

Intersection of: **S Madison Rd and E Liberty Ave**

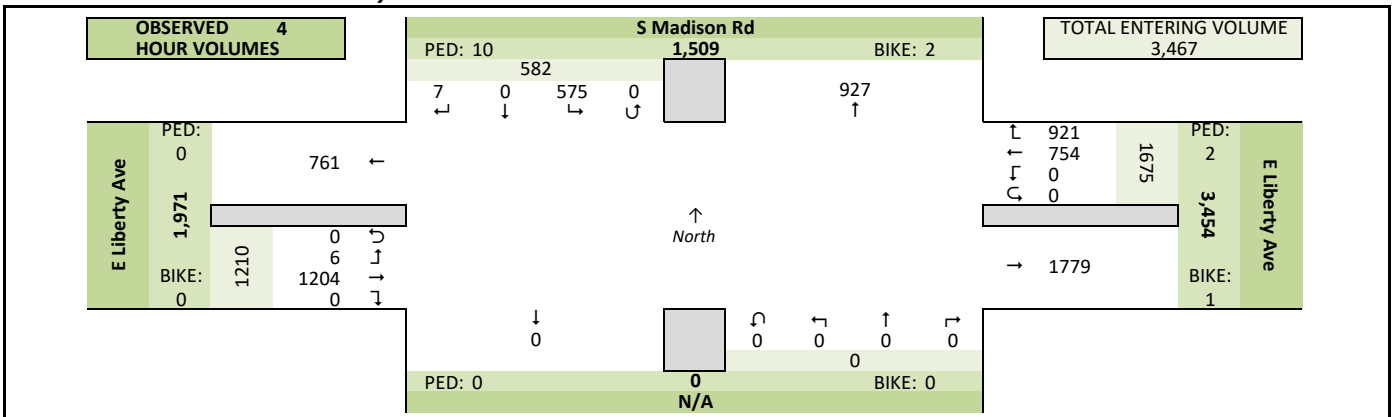
### Site Information

Municipality	City of Beloit
County	Rock
WisDOT Region	SW-M
Traffic Control	Other
Roadway Names	North Direction ↑
North Leg	S Madison Rd
East Leg	E Liberty Ave
South Leg	N/A
West Leg	E Liberty Ave
Special Considerations	
Schools	In Session
Holidays	None
Special Events	None
Special Pedestrians Observed	
Pre-school children	None
Elementary school age children	None
Visually impaired (white cane/helper dog)	None
Elderly/disabled (except wheelchairs)	None
Wheelchairs/electric scooters	None
Other (describe)	None

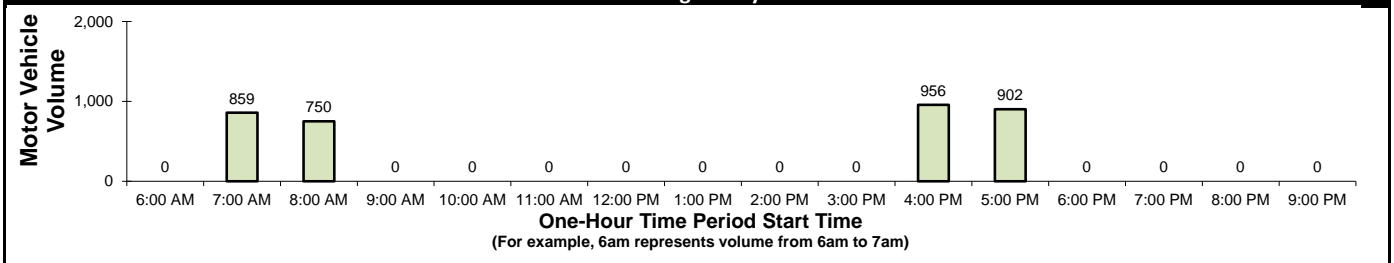
### Count Information

Hrs Counted:	7:00 AM-9:00 AM and 4:00 PM-6:00 PM	
1st Day of Count	Tuesday, September 10, 2019	Weather
AM Peak Period	Tuesday, September 10, 2019	Clear & Dry
Midday Peak Period	Tuesday, September 10, 2019	Clear & Dry
PM Peak Period	Tuesday, September 10, 2019	Clear & Dry
Calculated Peak Hours		
	AM 7:30-8:30am	MD
		PM 4:00-5:00pm
Peak Hours Selected for Analysis		
	AM 7:30-8:30am	MD
		PM 4:00-5:00pm
Daily/Seasonal Adjustment Group		
Count Expansion Group		
Daily/Seasonal Adjustment Factor	1	Count Expansion Factor
		#N/A
Company Name	SRF Consulting, Inc.	Manual Adj.
		1.000
Observers	AM Peak Period	Matthew Flanagan
	Midday Peak Period	Matthew Flanagan
	PM Peak Period	Matthew Flanagan
Comments		

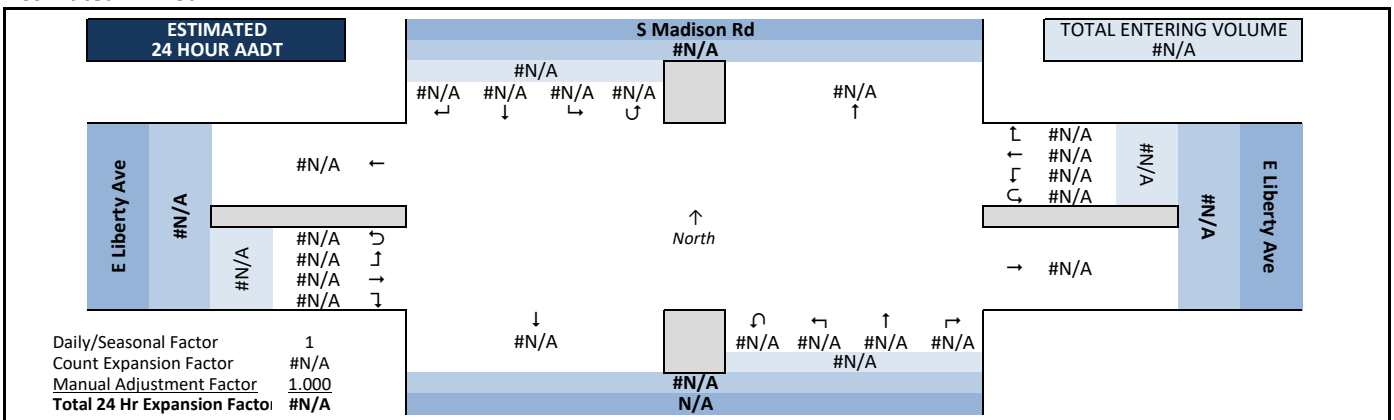
### Observed 4 Hour Volume Summary



### Total Entering Hourly Volume



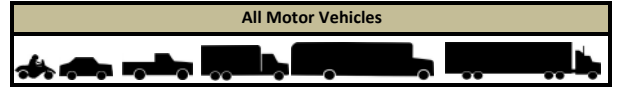
### Estimated 24 Hour AADT



# Intersection Traffic Volume Report

## Peak Hour Volume Summary

### S Madison Rd and E Liberty Ave



#### Peak Hour Volumes, Truck Percentages, and PHFs

Tuesday, September 10, 2019		From North S Madison Rd					From East E Liberty Ave					From South N/A					From West E Liberty Ave					Totals
AM Peak Hour		Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
Start Time																						
7:30 AM		0	0	29	0	29	59	66	0	0	125	0	0	0	0	0	0	0	95	0	95	249
7:45 AM		0	0	35	0	35	83	70	0	0	153	0	0	0	0	0	0	0	97	0	97	285
8:00 AM		1	0	46	0	47	71	40	0	0	111	0	0	0	0	0	0	0	112	1	113	271
8:15 AM		0	0	51	0	51	36	35	0	0	71	0	0	0	0	0	0	0	71	2	73	195
Peak Hour Volume		1	0	161	0	162	249	211	0	0	460	0	0	0	0	0	0	0	375	3	378	1000
Rounded Hourly Volume		0	0	160	0	160	250	210	0	0	460	0	0	0	0	0	0	0	375	5	380	1000
% Single Unit Trucks		0.0	0.0	5.0	0.0	4.9	2.8	13.3	0.0	0.0	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	8.2	7.4
% Heavy Trucks		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
% Trucks (Total)		0.0	0.0	5.0	0.0	4.9	2.8	13.3	0.0	0.0	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3	0.0	8.2	7.4
Peak Hour Factor (PHF)		0.25	0.00	0.79	0.00	0.79	0.75	0.75	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.84	0.37	0.84	0.88

N/A		From North S Madison Rd					From East E Liberty Ave					From South N/A					From West E Liberty Ave					Totals
Midday (MD) Peak Hour		Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
Start Time																						
12:00 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour Volume		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rounded Hourly Volume		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Single Unit Trucks		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
% Heavy Trucks		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
% Trucks (Total)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Peak Hour Factor (PHF)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Tuesday, September 10, 2019		From North S Madison Rd					From East E Liberty Ave					From South N/A					From West E Liberty Ave					Totals
PM Peak Hour		Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
Start Time																						
4:00 PM		0	0	47	0	47	69	62	0	0	131	0	0	0	0	0	0	0	125	1	126	304
4:15 PM		0	0	28	0	28	58	65	0	0	123	0	0	0	0	0	0	0	79	0	79	230
4:30 PM		0	0	33	0	33	75	39	0	0	114	0	0	0	0	0	0	0	68	0	68	215
4:45 PM		2	0	38	0	40	49	48	0	0	97	0	0	0	0	0	0	0	69	1	70	207
Peak Hour Volume		2	0	146	0	148	251	214	0	0	465	0	0	0	0	0	0	0	341	2	343	956
Rounded Hourly Volume		0	0	145	0	145	250	215	0	0	465	0	0	0	0	0	0	0	340	0	340	950
% Single Unit Trucks		0.0	0.0	2.7	0.0	2.7	0.8	8.9	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	5.0	4.4
% Heavy Trucks		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
% Trucks (Total)		0.0	0.0	2.7	0.0	2.7	0.8	8.9	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	5.0	4.4
Peak Hour Factor (PHF)		0.25	0.00	0.78	0.00	0.79	0.84	0.82	0.00	0.00	0.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.50	0.68	0.79

#### Peak Hour Pedestrian and Bicyclist Volumes

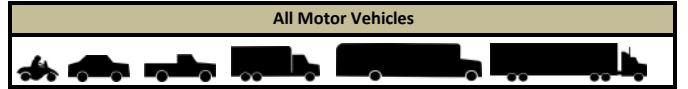
Pedestrians and Bicyclists		Crossing North Approach S Madison Rd			Crossing East Approach E Liberty Ave			Crossing South Approach N/A			Crossing West Approach E Liberty Ave			Total Ped & Bike Volume
15-Minute Start Time		Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total	
AM	7:30 AM	2	0	2	0	0	0	0	0	0	0	0	0	2
	7:45 AM	0	1	1	0	0	0	0	0	0	0	0	0	1
	8:00 AM	1	0	1	0	0	0	0	0	0	0	0	0	1
	8:15 AM	2	0	2	0	0	0	0	0	0	0	0	0	2
	<b>Total</b>	<b>5</b>	<b>1</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>
MD	12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
PM	4:00 PM	0	0	0	1	0	1	0	0	0	0	0	0	1
	4:15 PM	2	0	2	0	0	0	0	0	0	0	0	0	2
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	1	0	1	0	0	0	0	0	0	1
	<b>Total</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>



# Intersection Traffic Volume Report

## 15-Minute Motor Vehicle Data

### S Madison Rd and E Liberty Ave



### 15-Minute Motor Vehicle Data

15-Minute Time Period	From North					From East					From South					From West					15-Min Totals	Hourly Sum	PHF			
	S Madison Rd					E Liberty Ave					N/A					E Liberty Ave										
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total						
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7:00 AM	1	0	18	0	19	30	44	0	0	74	0	0	0	0	0	0	0	52	0	0	52	145	859	0.75		
7:15 AM	0	0	31	0	31	51	33	0	0	84	0	0	0	0	0	0	0	65	0	0	65	180	985	0.86		
7:30 AM	0	0	29	0	29	59	66	0	0	125	0	0	0	0	0	0	0	95	0	0	95	249	1000	0.88		
7:45 AM	0	0	35	0	35	83	70	0	0	153	0	0	0	0	0	0	0	97	0	0	97	285	897	0.79		
8:00 AM	1	0	46	0	47	71	40	0	0	111	0	0	0	0	0	0	0	112	1	0	113	271	750	0.69		
8:15 AM	0	0	51	0	51	36	35	0	0	71	0	0	0	0	0	0	0	71	2	0	73	195				
8:30 AM	1	0	23	0	24	38	29	0	0	67	0	0	0	0	0	0	0	55	0	0	55	146				
8:45 AM	0	0	27	0	27	39	24	0	0	63	0	0	0	0	0	0	0	48	0	0	48	138				
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
4:00 PM	0	0	47	0	47	69	62	0	0	131	0	0	0	0	0	0	0	125	1	0	126	304	956	0.79		
4:15 PM	0	0	28	0	28	58	65	0	0	123	0	0	0	0	0	0	0	79	0	0	79	230	898	0.91		
4:30 PM	0	0	33	0	33	75	39	0	0	114	0	0	0	0	0	0	0	68	0	0	68	215	900	0.91		
4:45 PM	2	0	38	0	40	49	48	0	0	97	0	0	0	0	0	0	0	69	1	0	70	207	911	0.93		
5:00 PM	0	0	47	0	47	76	55	0	0	131	0	0	0	0	0	0	0	68	0	0	68	246	902	0.92		
5:15 PM	2	0	37	0	39	79	46	0	0	125	0	0	0	0	0	0	0	68	0	0	68	232				
5:30 PM	0	0	42	0	42	64	47	0	0	111	0	0	0	0	0	0	0	73	0	0	73	226				
5:45 PM	0	0	43	0	43	44	51	0	0	95	0	0	0	0	0	0	0	59	1	0	60	198				
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Totals	7	0	575	0	582	921	754	0	0	1675	0	0	0	0	0	0	0	1204	6	0	1210	3467				

### Peak Hour All Vehicle Volume Summary

Hourly Time Period	From North					From East					From South					From West					Total Hourly Volume	PHF	
	S Madison Rd					E Liberty Ave					N/A					E Liberty Ave							
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total			
AM 7:30 AM	1	0	161	0	162	249	211	0	0	460	0	0	0	0	0	0	0	375	3	0	378	1000	0.88
MD 12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM 4:00 PM	2	0	146	0	148	251	214	0	0	465	0	0	0	0	0	0	0	341	2	0	343	956	0.79

# Intersection Traffic Volume Report



## Base Information, Observed (4) Hour and Estimated (24) Hour Volume Summaries

Intersection of: **McKinley Ave and S Madison Rd**

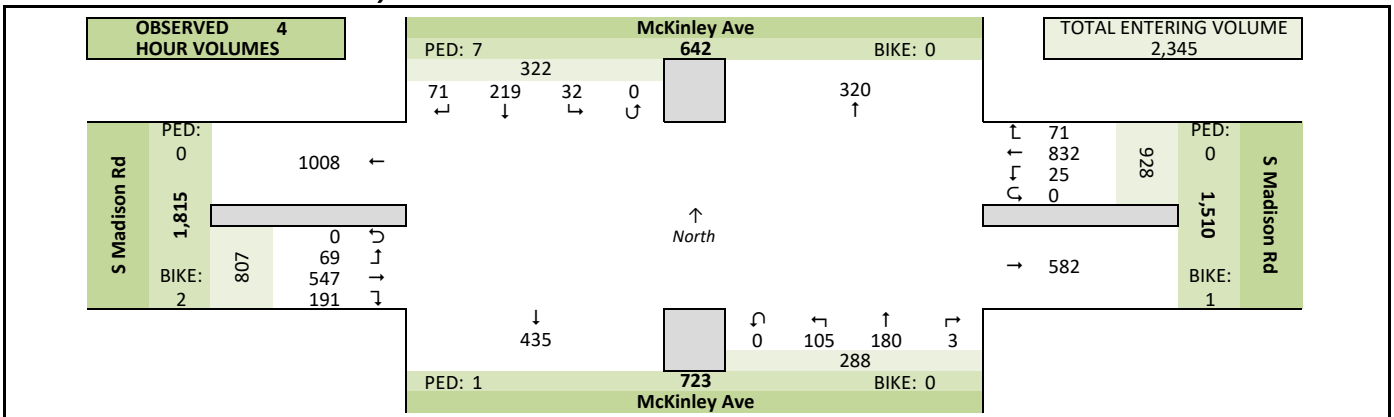
### Site Information

Municipality	City of Beloit
County	Rock
WisDOT Region	SW-M
Traffic Control	Partial Stop Control
Roadway Names	North Direction ↑
North Leg	McKinley Ave
East Leg	S Madison Rd
South Leg	McKinley Ave
West Leg	S Madison Rd
Special Considerations	
Schools	In Session
Holidays	None
Special Events	None
Special Pedestrians Observed	
Pre-school children	None
Elementary school age children	None
Visually impaired (white cane/helper dog)	None
Elderly/disabled (except wheelchairs)	None
Wheelchairs/electric scooters	None
Other (describe)	None

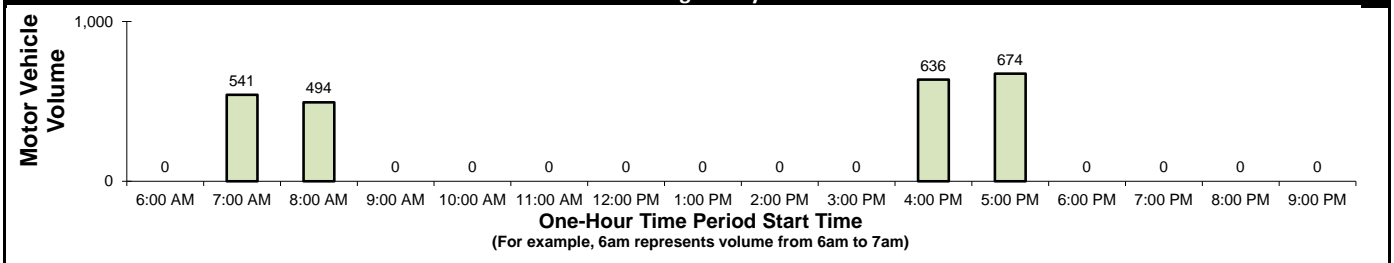
### Count Information

Hrs Counted:	7:00 AM-9:00 AM and 4:00 PM-6:00 PM	
1st Day of Count	Tuesday, September 10, 2019	Weather
AM Peak Period	Tuesday, September 10, 2019	Clear & Dry
Midday Peak Period	Tuesday, September 10, 2019	Clear & Dry
PM Peak Period	Tuesday, September 10, 2019	Clear & Dry
Calculated Peak Hours		
AM	7:15-8:15am	MD
PM	4:45-5:45pm	
Peak Hours Selected for Analysis		
AM	7:30-8:30am	MD
PM	4:00-5:00pm	
Daily/Seasonal Adjustment Group		
Count Expansion Group		
Daily/Seasonal Adjustment Factor	1	Count Expansion Factor
		#N/A
Company Name	SRF Consulting, Inc.	Manual Adj.
		1.000
Observers	AM Peak Period	Matthew Flanagan
	Midday Peak Period	Matthew Flanagan
	PM Peak Period	Matthew Flanagan
Comments		

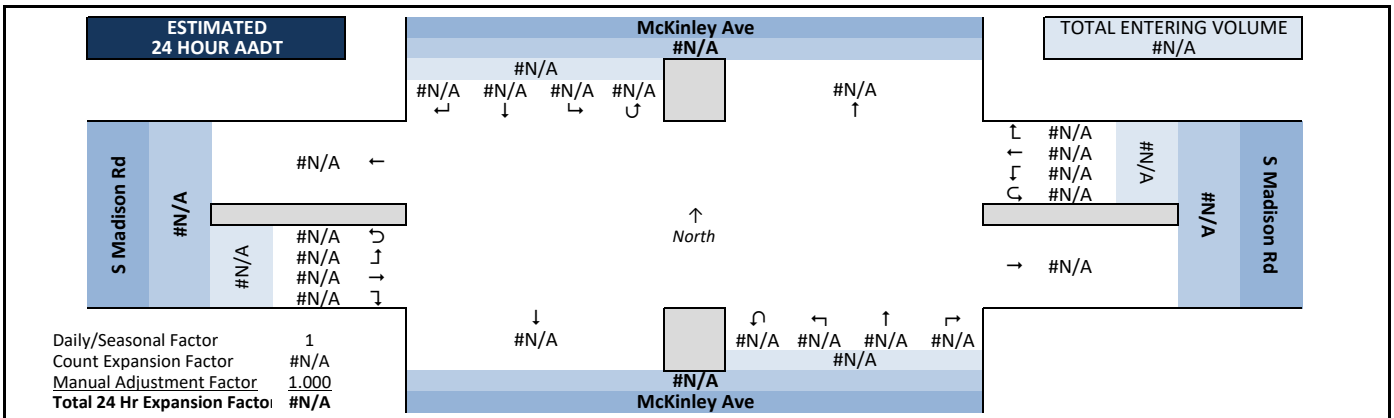
### Observed 4 Hour Volume Summary



### Total Entering Hourly Volume



### Estimated 24 Hour AADT

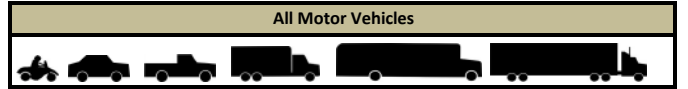




# Intersection Traffic Volume Report

## 15-Minute Motor Vehicle Data

### McKinley Ave and S Madison Rd



### 15-Minute Motor Vehicle Data

15-Minute Time Period	From North					From East					From South					From West					15-Min Totals	Hourly Sum	PHF			
	McKinley Ave					S Madison Rd					McKinley Ave					S Madison Rd										
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total						
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7:00 AM	0	4	1	0	5	6	24	1	0	31	0	19	4	0	23	2	18	3	0	23	82		541	0.75		
7:15 AM	6	8	2	0	16	6	45	0	0	51	0	22	12	0	34	7	29	2	0	38	139		639	0.88		
7:30 AM	3	14	2	0	19	4	55	0	0	59	0	24	4	0	28	3	27	3	0	33	139		632	0.87		
7:45 AM	11	21	4	0	36	7	74	2	0	83	0	14	4	0	18	12	31	1	0	44	181		584	0.81		
8:00 AM	7	13	1	0	21	2	69	1	0	72	0	5	10	0	15	18	46	8	0	72	180		494	0.69		
8:15 AM	3	4	2	0	9	5	32	1	0	38	0	9	7	0	16	13	49	7	0	69	132					
8:30 AM	1	7	0	0	8	2	35	1	0	38	0	7	2	0	9	10	24	2	0	36	91					
8:45 AM	2	6	3	0	11	2	36	1	0	39	0	7	4	0	11	3	24	3	0	30	91					
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
4:00 PM	4	18	0	0	22	2	68	0	0	70	1	7	8	0	16	23	46	7	0	76	184		636	0.86		
4:15 PM	2	25	1	0	28	5	51	2	0	58	1	4	3	0	8	12	26	3	0	41	135		644	0.84		
4:30 PM	5	16	2	0	23	4	66	5	0	75	0	13	6	0	19	13	31	9	0	53	170		691	0.90		
4:45 PM	4	20	0	0	24	6	41	3	0	50	0	13	4	0	17	14	40	2	0	56	147		693	0.90		
5:00 PM	3	22	1	0	26	11	64	1	0	76	0	12	9	0	21	16	46	7	0	69	192		674	0.88		
5:15 PM	8	15	6	0	29	5	71	3	0	79	0	9	11	0	20	17	33	4	0	54	182					
5:30 PM	9	16	3	0	28	3	61	0	0	64	1	10	12	0	23	14	38	5	0	57	172					
5:45 PM	3	10	4	0	17	1	40	4	0	45	0	5	5	0	10	14	39	3	0	56	128					
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
<b>Totals</b>	<b>71</b>	<b>219</b>	<b>32</b>	<b>0</b>	<b>322</b>	<b>71</b>	<b>832</b>	<b>25</b>	<b>0</b>	<b>928</b>	<b>3</b>	<b>180</b>	<b>105</b>	<b>0</b>	<b>288</b>	<b>191</b>	<b>547</b>	<b>69</b>	<b>0</b>	<b>807</b>	<b>2345</b>					

### Peak Hour All Vehicle Volume Summary

Hourly Time Period	From North					From East					From South					From West					Total Hourly Volume	PHF	
	McKinley Ave					S Madison Rd					McKinley Ave					S Madison Rd							
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total			
AM 7:30 AM	24	52	9	0	85	18	230	4	0	252	0	52	25	0	77	46	153	19	0	218	632	0.87	
MD 12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
PM 4:00 PM	15	79	3	0	97	17	226	10	0	253	2	37	21	0	60	62							



**DOCUMENTATION CONVENTION**

NUMBER OF CRASH OCCURRENCES (2015 - 2019)  
 INDIVIDUAL CASE ID (FROM WisDOT DOCUMENTATION)

**CRASH RATE**

**1.11 Crashes**  
 Per One Million  
 Entering Vehicles

Entering Vehicles: 9,900/day

**CRASH FREQUENCY/SEVERITY**

**20 Crashes**

- 0 Fatal Crash (K)
- 0 Incapacitating (A-level)
- 4 Non-Incapacitating (B-level)
- 4 Possible Injury (C-level)
- 12 Property Damage Only

**LEGEND**

- |                   |                     |                       |                  |
|-------------------|---------------------|-----------------------|------------------|
| → Moving Vehicle  | Ⓢ/Ⓨ Stop/Yield Sign | ↗ Angle (Right Angle) | ↔ Head-On        |
| ↔ Backing Vehicle | Ⓣ Tree              | ↖ Angle (Left Turn)   | →+ Rear-End      |
| - - - Pedestrian  | Ⓤ Utility Pole      | ↘ Angle (Right Turn)  | ⤴ Out of Control |
| -B→ Bicyclist     | ⓕ Fixed Object      | ↔ Sideswipe-Same      | →+ Overtake      |
| ▭ Parked Vehicle  | Ⓝ Non-Fixed Object  | ↔ Sideswipe-Opposite  | ○→ Overturn      |



Years: 2015 - 2019

**FIGURE 1**  
**COLLISION DIAGRAM**  
**E LIBERTY AVE / McKINLEY AVE**  
**BELOIT, WISCONSIN**



**DOCUMENTATION CONVENTION**

NUMBER OF CRASH OCCURRENCES (2015 - 2019)  
 INDIVIDUAL CASE ID (FROM WisDOT DOCUMENTATION)

**CRASH RATE**

**1.54 Crashes**  
 Per One Million  
 Entering Vehicles

Entering Vehicles: 6,400/day

**CRASH FREQUENCY/SEVERITY**

**18  
 Crashes**

- 0 Fatal Crash (K)
- 1 Incapacitating (A-level)
- 4 Non-Incapacitating (B-level)
- 2 Possible Injury (C-level)
- 11 Property Damage Only

**LEGEND**

- |                   |                     |                       |                  |
|-------------------|---------------------|-----------------------|------------------|
| → Moving Vehicle  | Ⓢ/Ⓨ Stop/Yield Sign | ↗ Angle (Right Angle) | ↔ Head-On        |
| ↔ Backing Vehicle | Ⓣ Tree              | ↖ Angle (Left Turn)   | ↔ Rear-End       |
| - - - Pedestrian  | Ⓤ Utility Pole      | ↘ Angle (Right Turn)  | ⤴ Out of Control |
| -B→ Bicyclist     | ⓕ Fixed Object      | ↔ Sideswipe-Same      | ↔ Overtake       |
| ▭ Parked Vehicle  | Ⓝ Non-Fixed Object  | ↔ Sideswipe-Opposite  | ⊖ Overtake       |



Years: 2015 - 2019

**FIGURE 1  
 COLLISION DIAGRAM  
 S MADISON RD / MCKINLEY AVE  
 БЕЛОIT, WISCONSIN**





**DOCUMENTATION CONVENTION**

NUMBER OF CRASH OCCURRENCES (2015 - 2019)  
 INDIVIDUAL CASE ID (FROM WisDOT DOCUMENTATION)

**CRASH RATE**

**1.10 Crashes**  
 Per One Million  
 Entering Vehicles

Entering Vehicles: 13,000/day

**CRASH FREQUENCY/SEVERITY**

**26 Crashes**

- 0 Fatal Crash (K)
- 0 Incapacitating (A-level)
- 6 Non-Incapacitating (B-level)
- 7 Possible Injury (C-level)
- 13 Property Damage Only

**LEGEND**

- |                   |                     |                       |                  |
|-------------------|---------------------|-----------------------|------------------|
| → Moving Vehicle  | Ⓢ/Ⓨ Stop/Yield Sign | ↗ Angle (Right Angle) | ↔ Head-On        |
| ↔ Backing Vehicle | Ⓣ Tree              | ↖ Angle (Left Turn)   | → Rear-End       |
| - - - Pedestrian  | Ⓤ Utility Pole      | ↷ Angle (Right Turn)  | ↗ Out of Control |
| -B→ Bicyclist     | ⓕ Fixed Object      | ↔ Sideswipe-Same      | ↗ Overtake       |
| ▭ Parked Vehicle  | Ⓝ Non-Fixed Object  | ↔ Sideswipe-Opposite  | ○→ Overturn      |



Years: 2015 - 2019

**FIGURE 1**  
**COLLISION DIAGRAM**  
**E LIBERTY AVE / S MADISON RD**  
**BELOIT, WISCONSIN**





**DOCUMENTATION CONVENTION**

NUMBER OF CRASH OCCURRENCES (2015 - 2019)  
 INDIVIDUAL CASE ID (FROM WisDOT DOCUMENTATION)

**CRASH RATE**

**0.41 Crashes**  
 Per One Million  
 Entering Vehicles

Entering Vehicles: 13,485/day

**CRASH FREQUENCY/SEVERITY**

**10 Crashes**

- 0 Fatal Crash (K)
- 0 Incapacitating (A-level)
- 0 Non-Incapacitating (B-level)
- 2 Possible Injury (C-level)
- 8 Property Damage Only

**LEGEND**

- |                   |                     |                       |                  |
|-------------------|---------------------|-----------------------|------------------|
| → Moving Vehicle  | Ⓢ/Ⓨ Stop/Yield Sign | ↗ Angle (Right Angle) | ↔ Head-On        |
| ↔ Backing Vehicle | Ⓣ Tree              | ↖ Angle (Left Turn)   | ↔ Rear-End       |
| - - - Pedestrian  | Ⓤ Utility Pole      | ↷ Angle (Right Turn)  | ↗ Out of Control |
| -B➔ Bicyclist     | ⓕ Fixed Object      | ↔ Sideswipe-Same      | ↗ Overtake       |
| ▭ Parked Vehicle  | Ⓝ Non-Fixed Object  | ↔ Sideswipe-Opposite  | ↻ Overturn       |




Years: 2015 - 2019

**FIGURE 1**  
**COLLISION DIAGRAM**  
**E LIBERTY AVE / GARFIELD AVE**  
**BELOIT, WISCONSIN**

WisDOT Bureau of Planning & Economic Development  
 Traffic Forecasting Section  
 Forecast by: Miao Zhang  
 Phone: (608) 266-7995  
 Email: miao.zhang@dot.wi.gov

**Projected AM Design Hour Traffic Volumes**

 Indicates roundabout

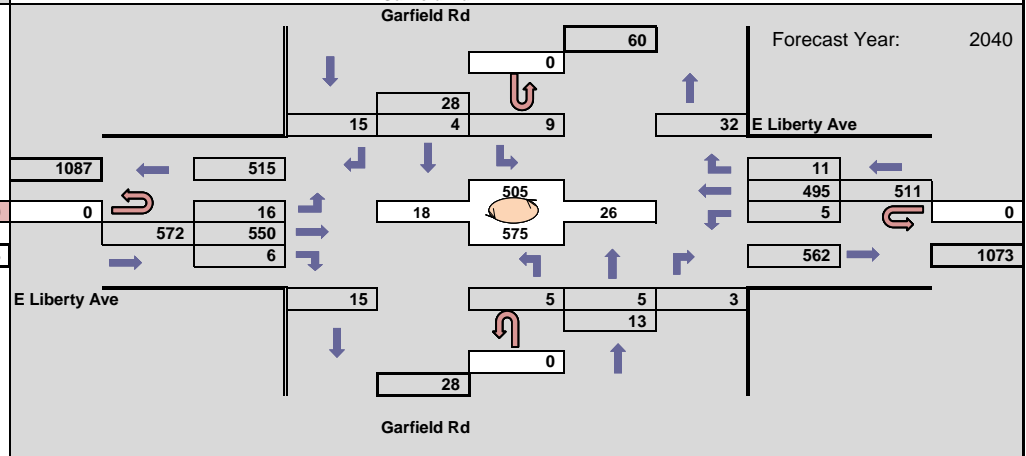
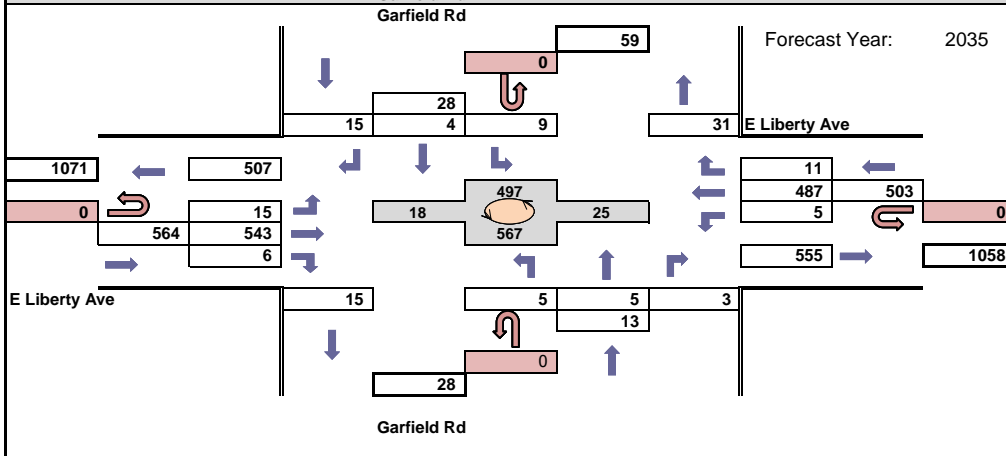
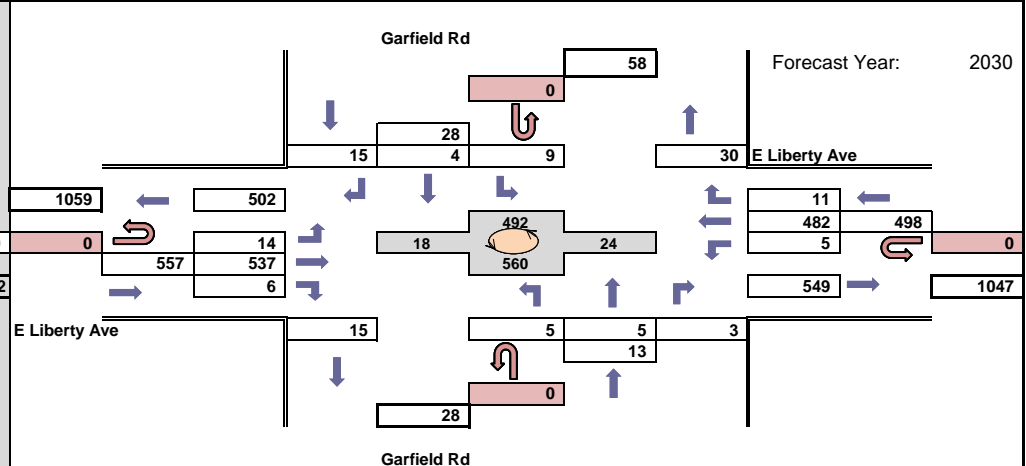
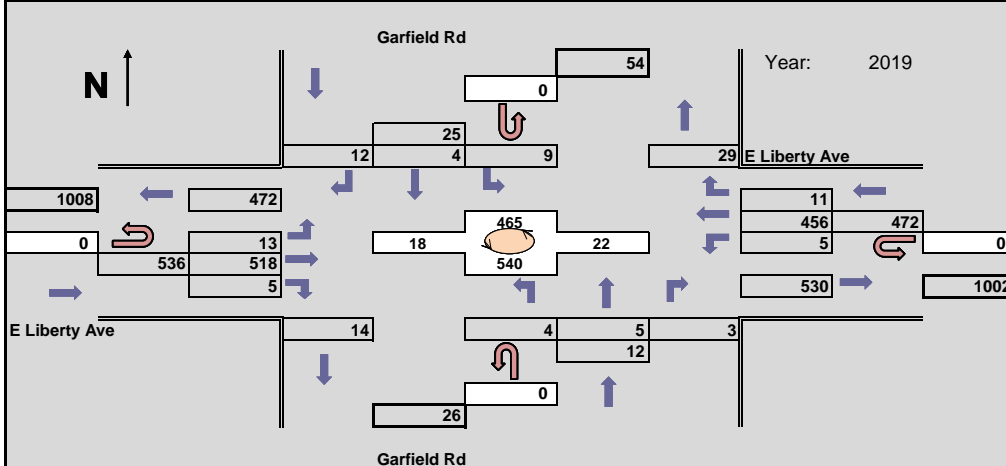
Design Hour: 7:30-8:30am

Forecast Completed: 10/10/2019

**Project Description**


Project ID(s): 6617  
 Route(s): STH 18, STH213  
 Region/COUNTY(IES): SW/Rock  
 Location: Liberty Ave. & Garfield Rd.

Design Hour Turning Movement Data



WisDOT Bureau of Planning & Economic Development  
 Traffic Forecasting Section  
 Forecast by:  
 Phone:  
 Email:

### Projected PM Design Hour Traffic Volumes

 Indicates roundabout

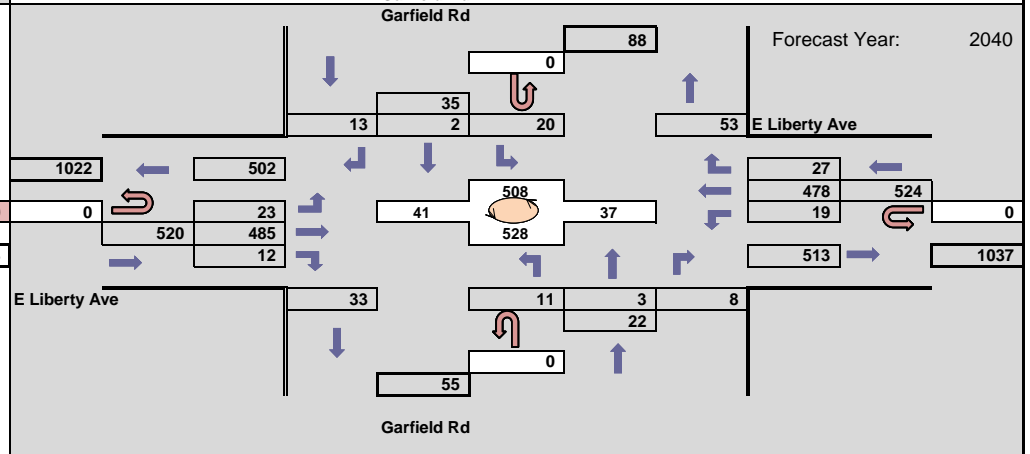
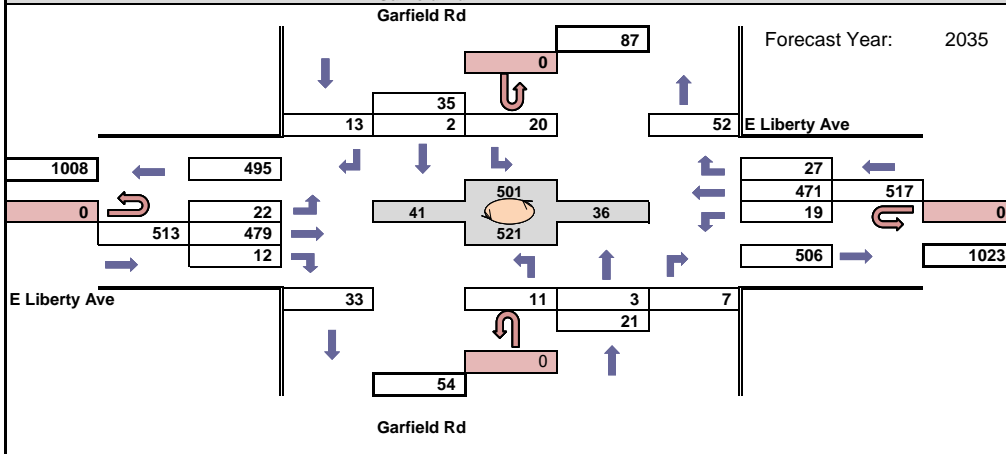
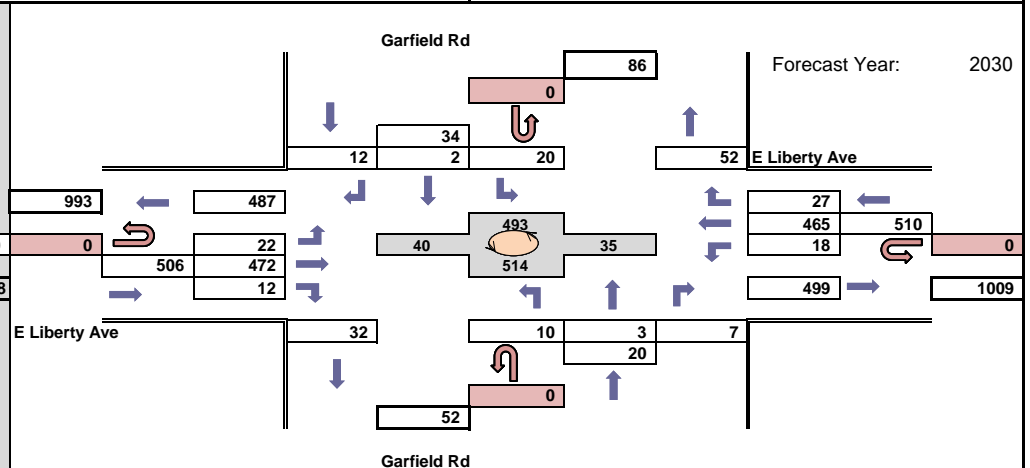
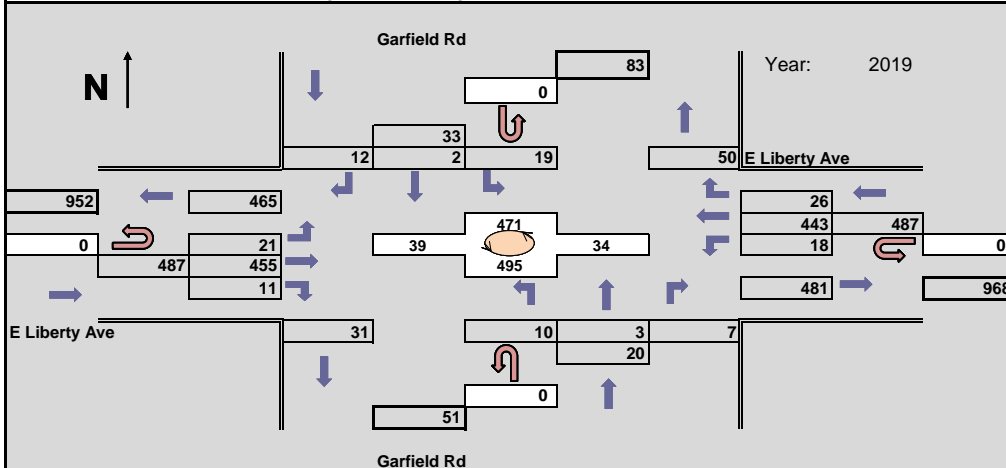
Design Hour: 4:00-5:00pm

Forecast Completed: 10/10/2019

### Project Description


Project ID(s): 6617  
 Route(s): STH 18, STH213  
 Region/COUNTY(IES): SW/Rock  
 Location: Liberty Ave. & Garfield Rd.

### Design Hour Turning Movement Data



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**Projected AM Design Hour Traffic Volumes**

 Indicates roundabout

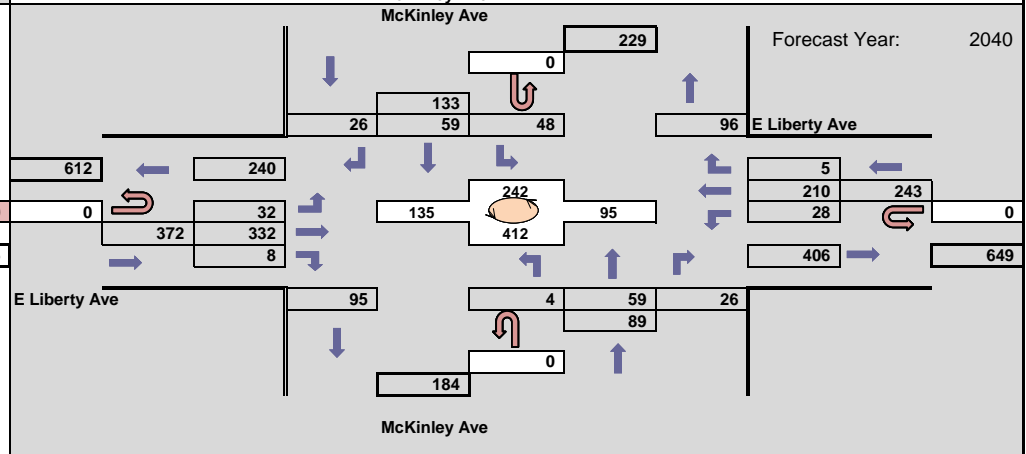
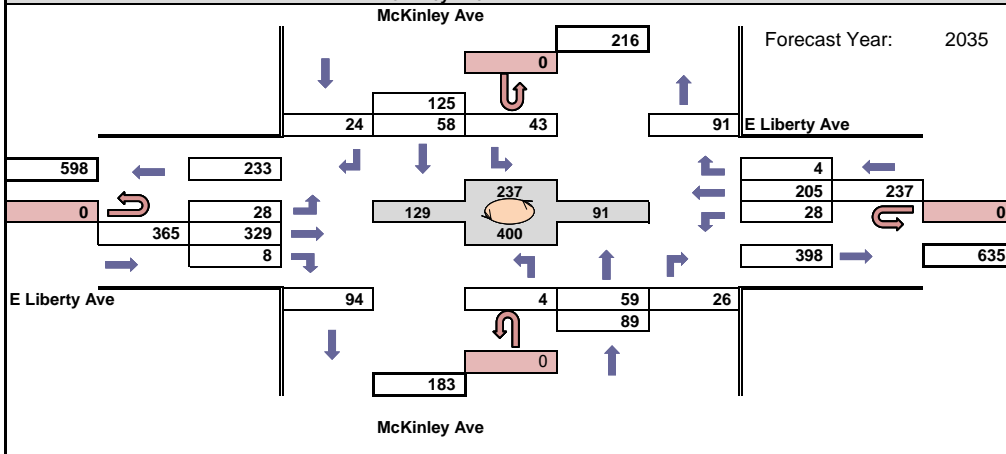
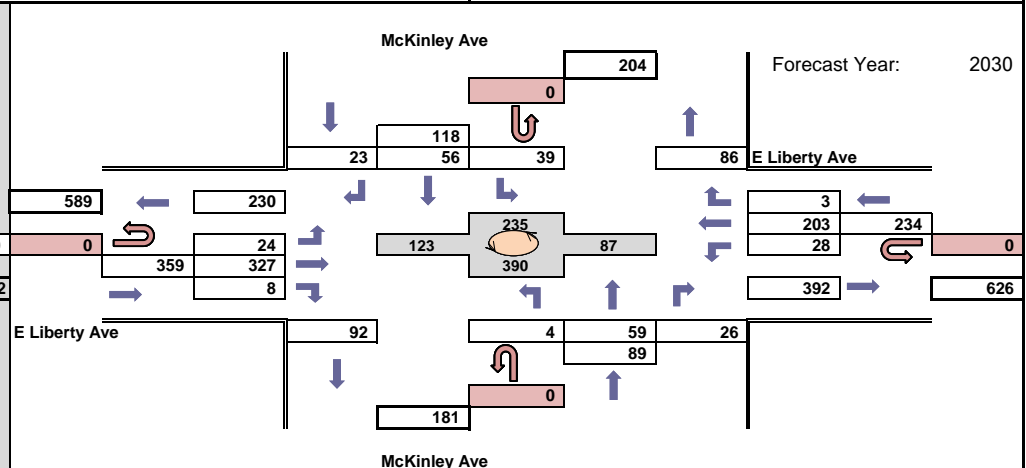
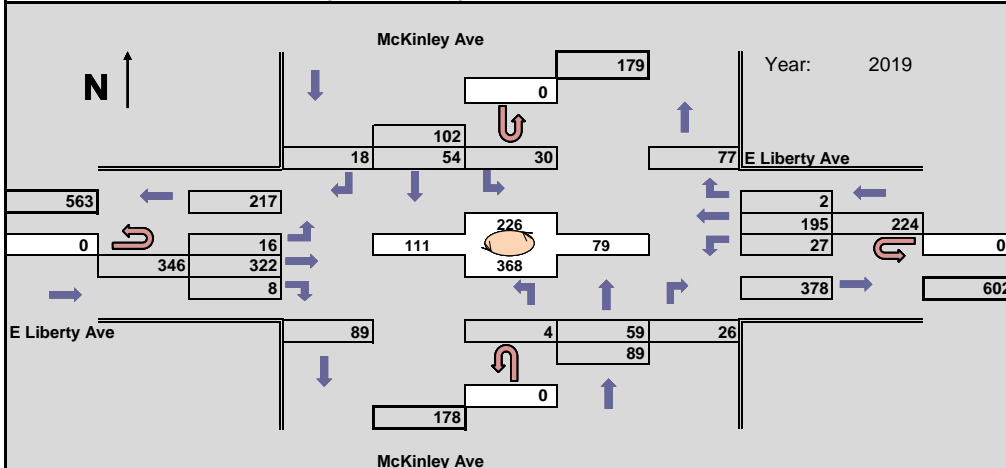
Design Hour: 7:30-8:30am

Forecast Completed: 10/10/2019

**Project Description**

Project ID(s): 6617  
 Route(s): STH 18, STH213  
 Region/COUNTY(IES): SW/Rock  
 Location: Liberty Ave. & McKinley Ave


Design Hour Turning Movement Data





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**Projected AM Design Hour Traffic Volumes**

 Indicates roundabout

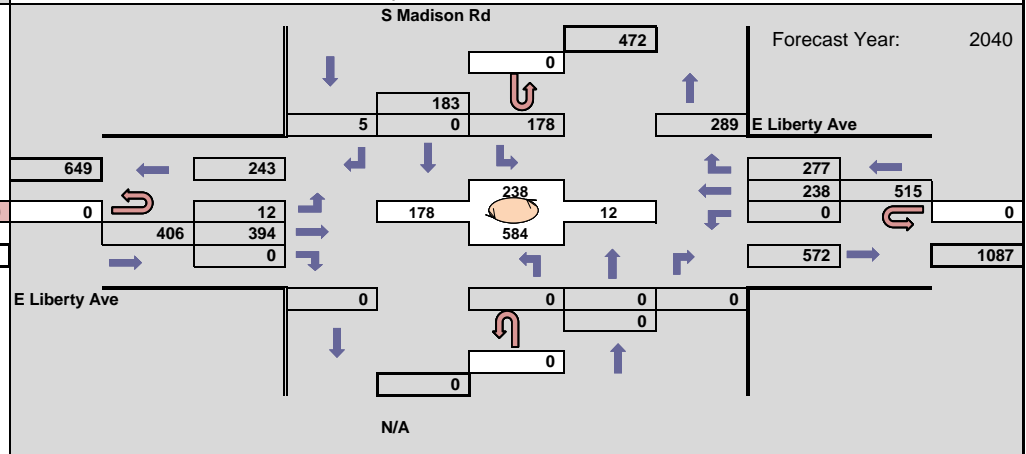
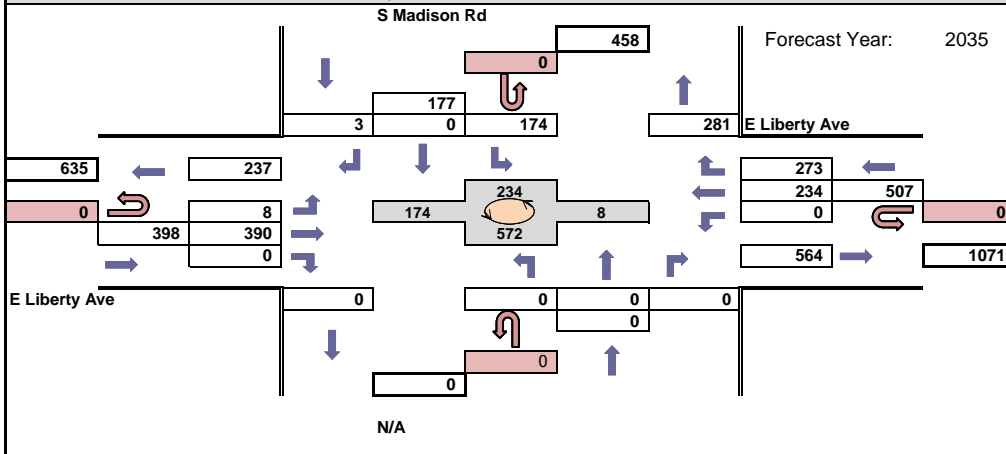
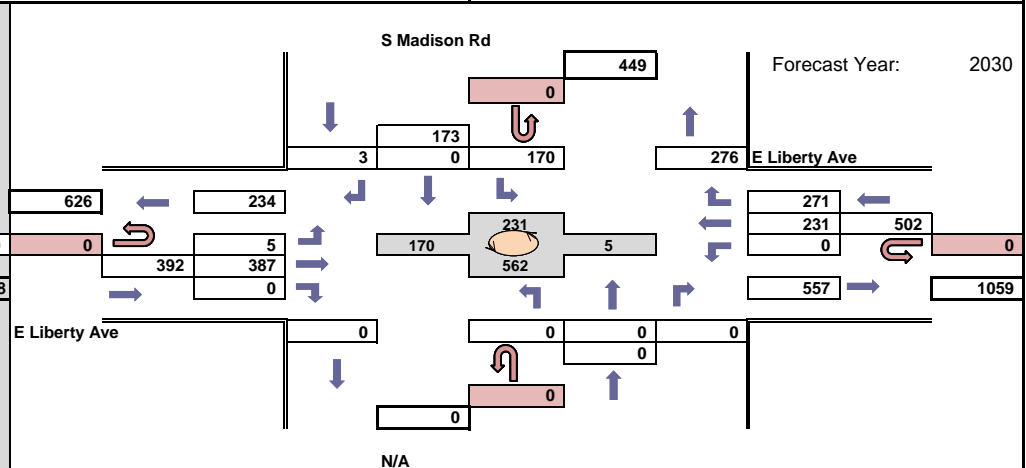
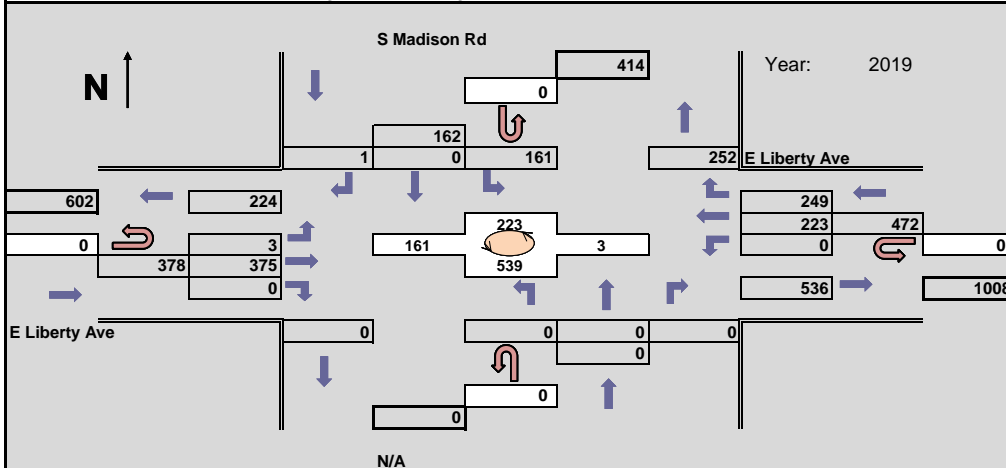
Design Hour: 7:30-8:30am

Forecast Completed: 10/10/2019

**Project Description**


Project ID(s): 6617  
 Route(s): STH 18, STH213  
 Region/COUNTY(IES): SW/Rock  
 Location: Liberty Ave. & Madison Rd

Design Hour Turning Movement Data



WisDOT Bureau of Planning & Economic Development  
 Traffic Forecasting Section  
 Forecast by:  
 Phone:  
 Email:

**Projected PM Design Hour Traffic Volumes**

 Indicates roundabout

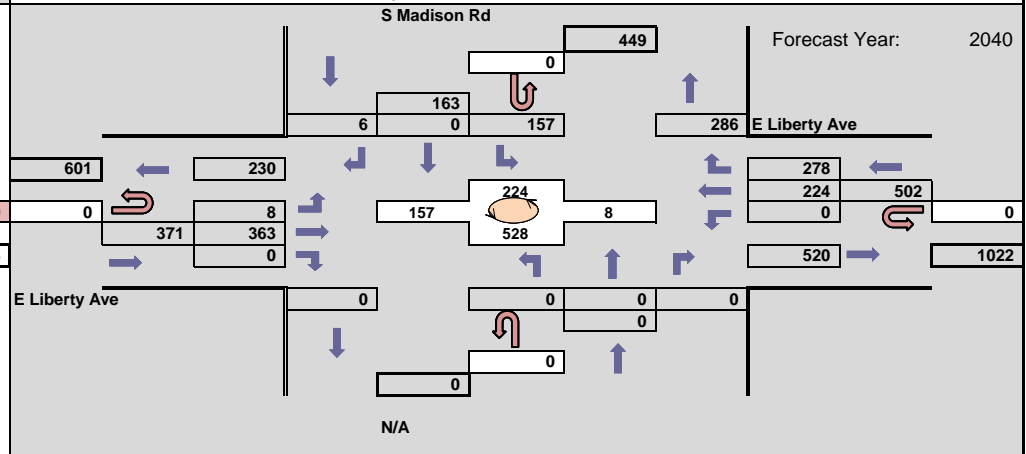
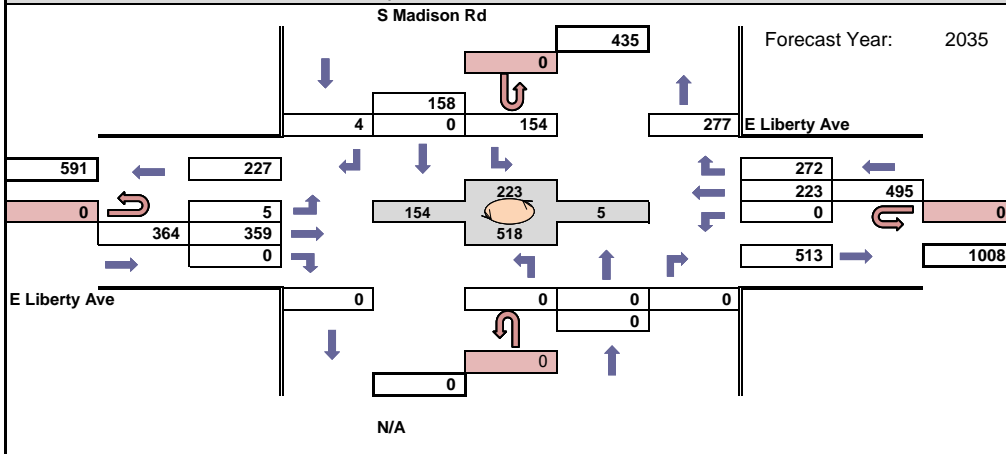
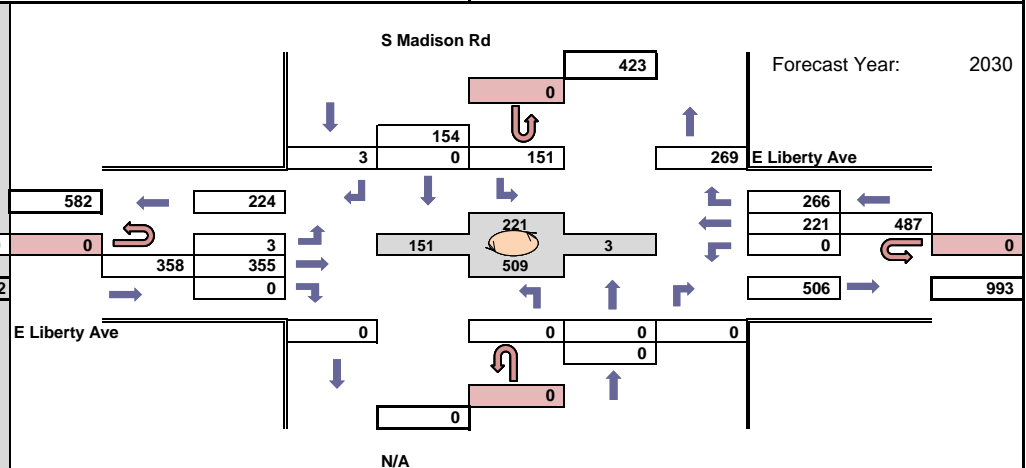
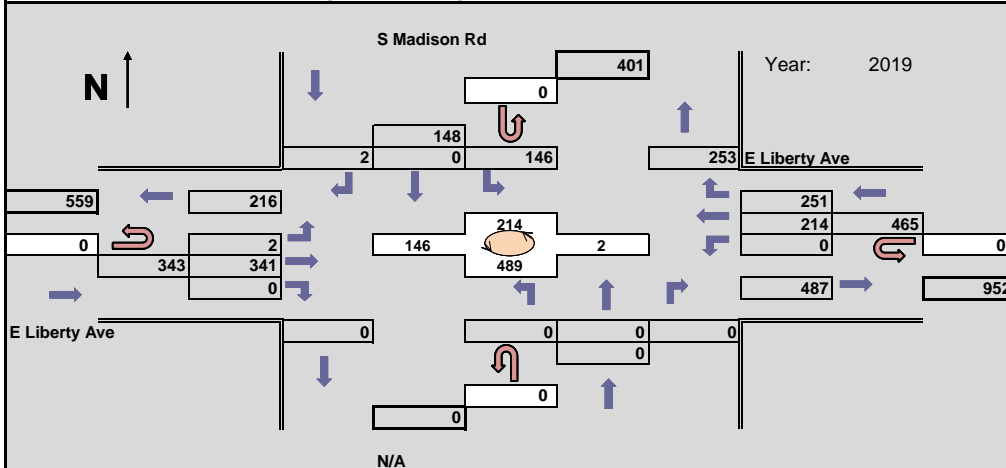
Design Hour: 4:00-5:00pm

Forecast Completed: 10/10/2019

**Project Description**

Project ID(s): 6617  
 Route(s): STH 18, STH213  
 Region/COUNTY(IES): SW/Rock  
 Location: Liberty Ave. & Madison Rd


Design Hour Turning Movement Data





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**Projected AM Design Hour Traffic Volumes**

 Indicates roundabout

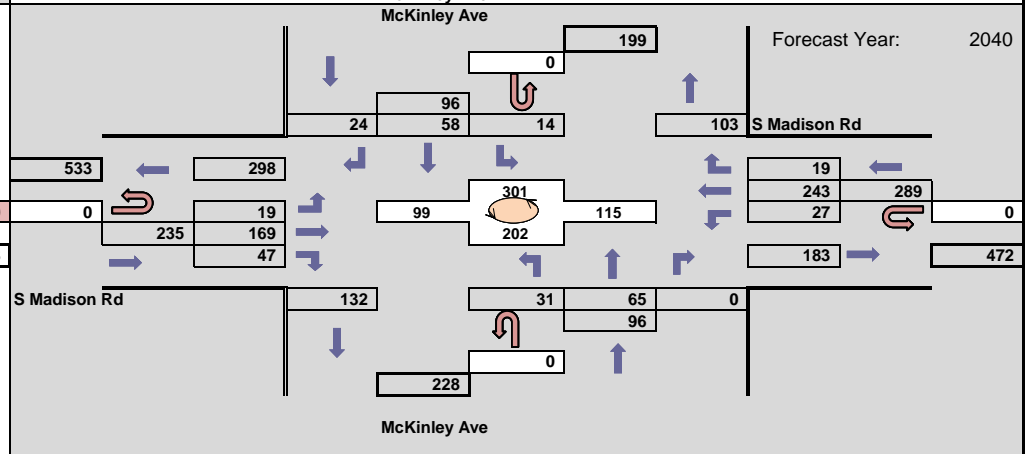
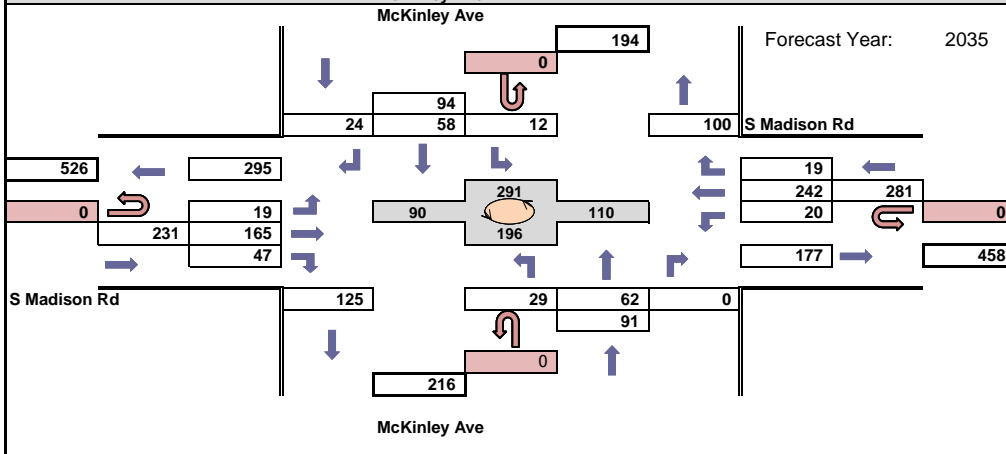
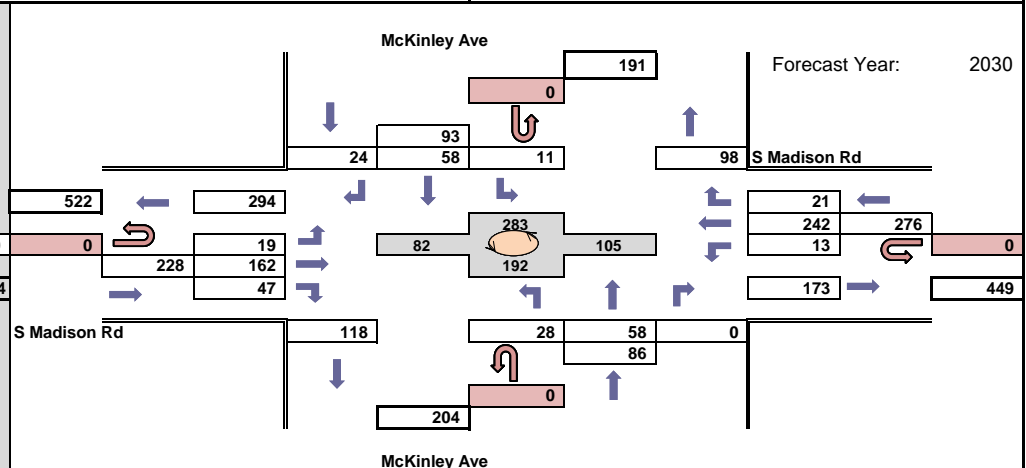
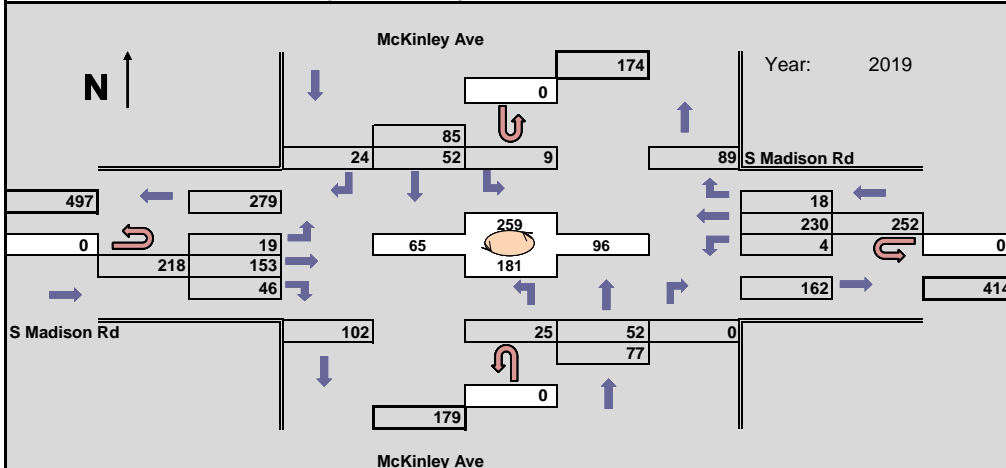
Design Hour: 7:30-8:30am

Forecast Completed: 10/10/2019

**Project Description**


Project ID(s): 6617  
 Route(s): STH 18, STH213  
 Region/COUNTY(IES): SW/Rock  
 Location: Madison Rd & McKinley Ave.

Design Hour Turning Movement Data



WisDOT Bureau of Planning & Economic Development  
 Traffic Forecasting Section  
 Forecast by:  
 Phone:  
 Email:

**Projected PM Design Hour Traffic Volumes**

 Indicates roundabout

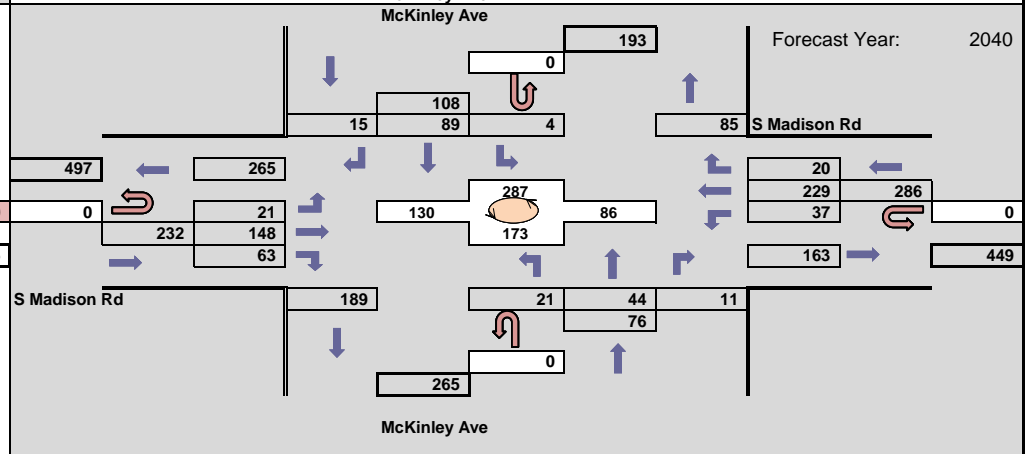
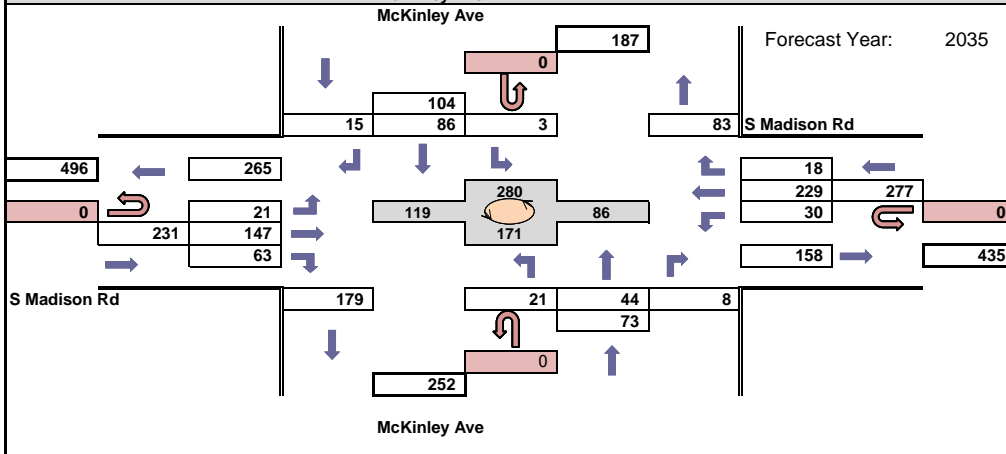
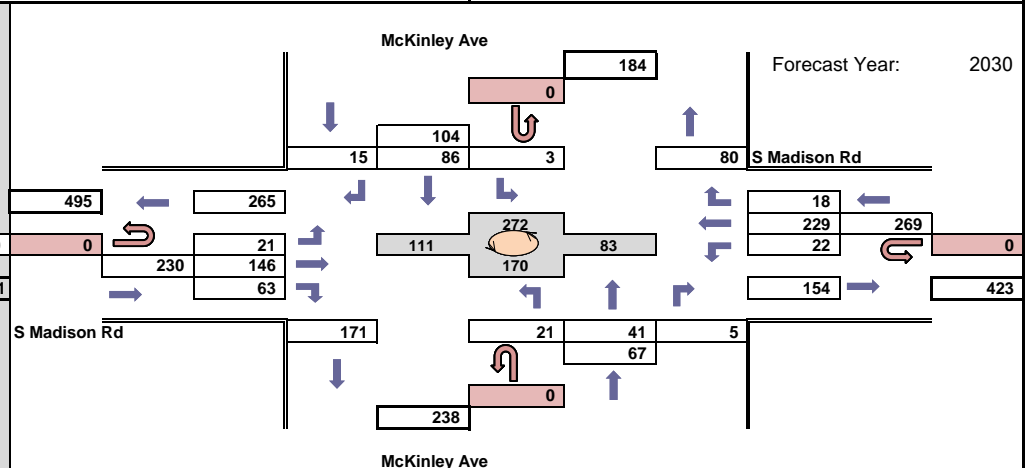
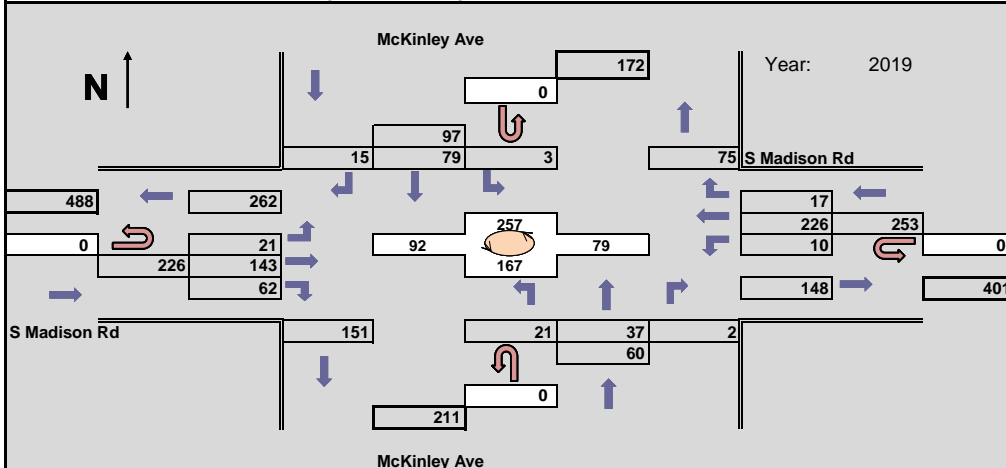
Design Hour: 4:00-5:00pm

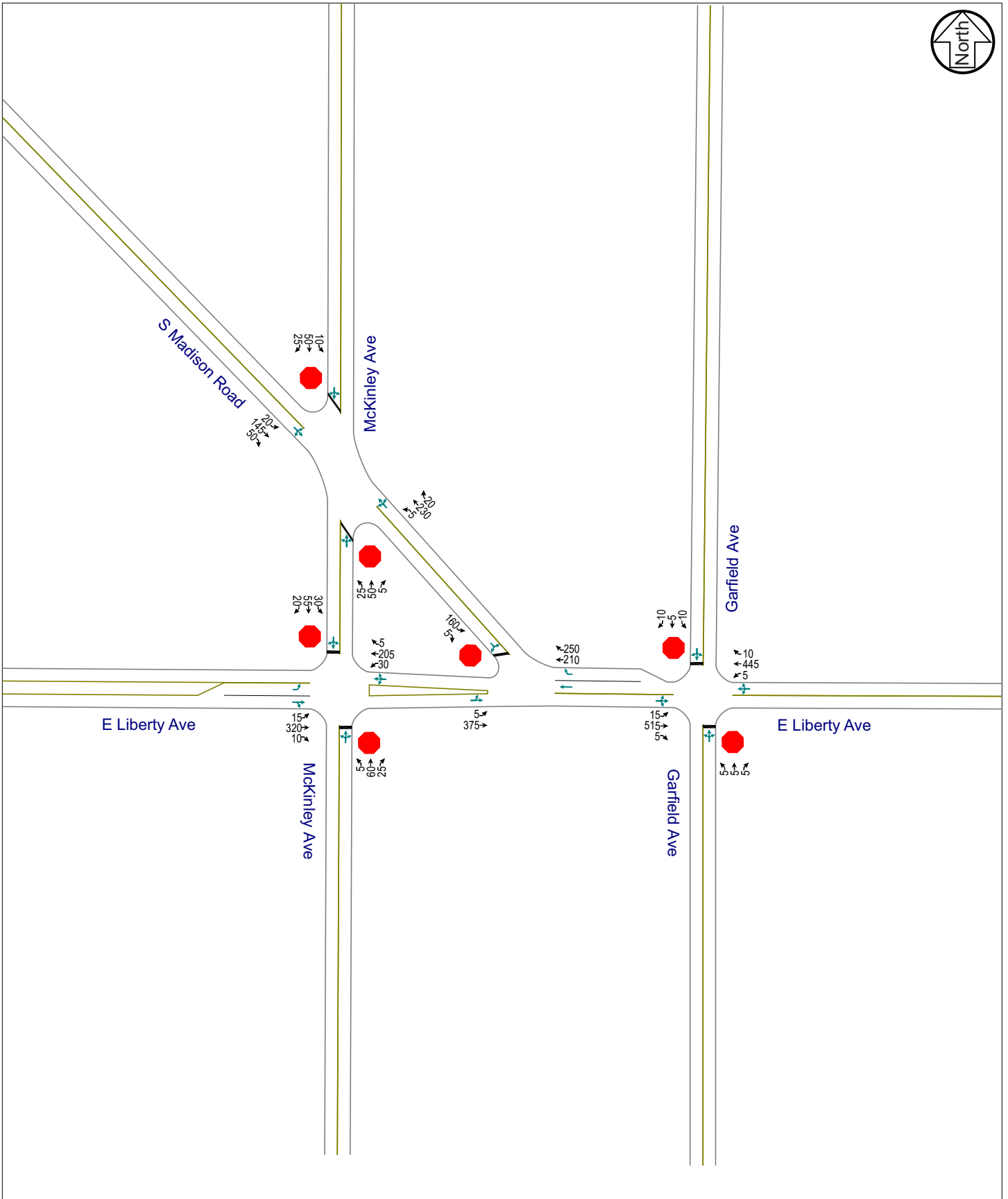
Forecast Completed: 10/10/2019

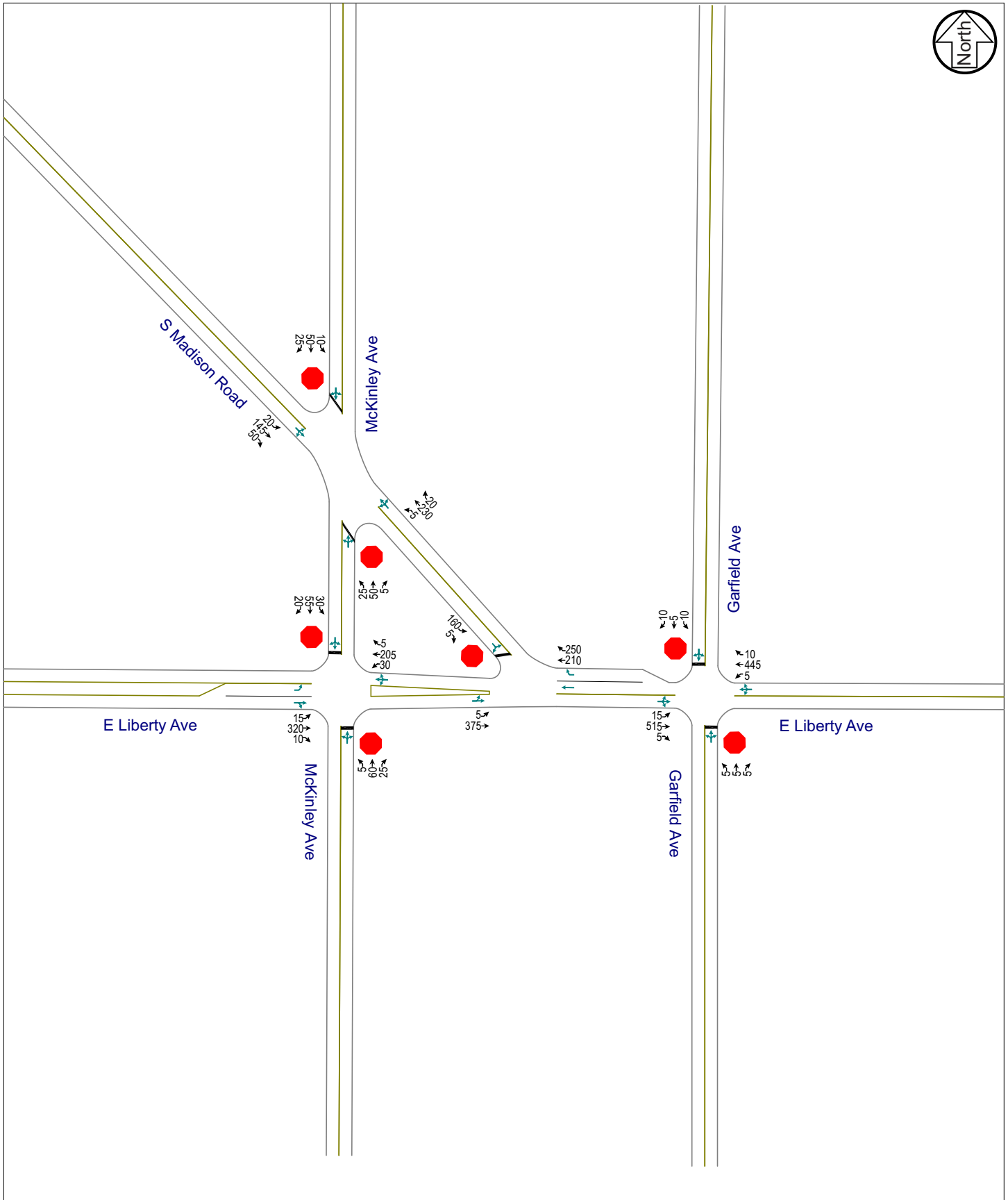
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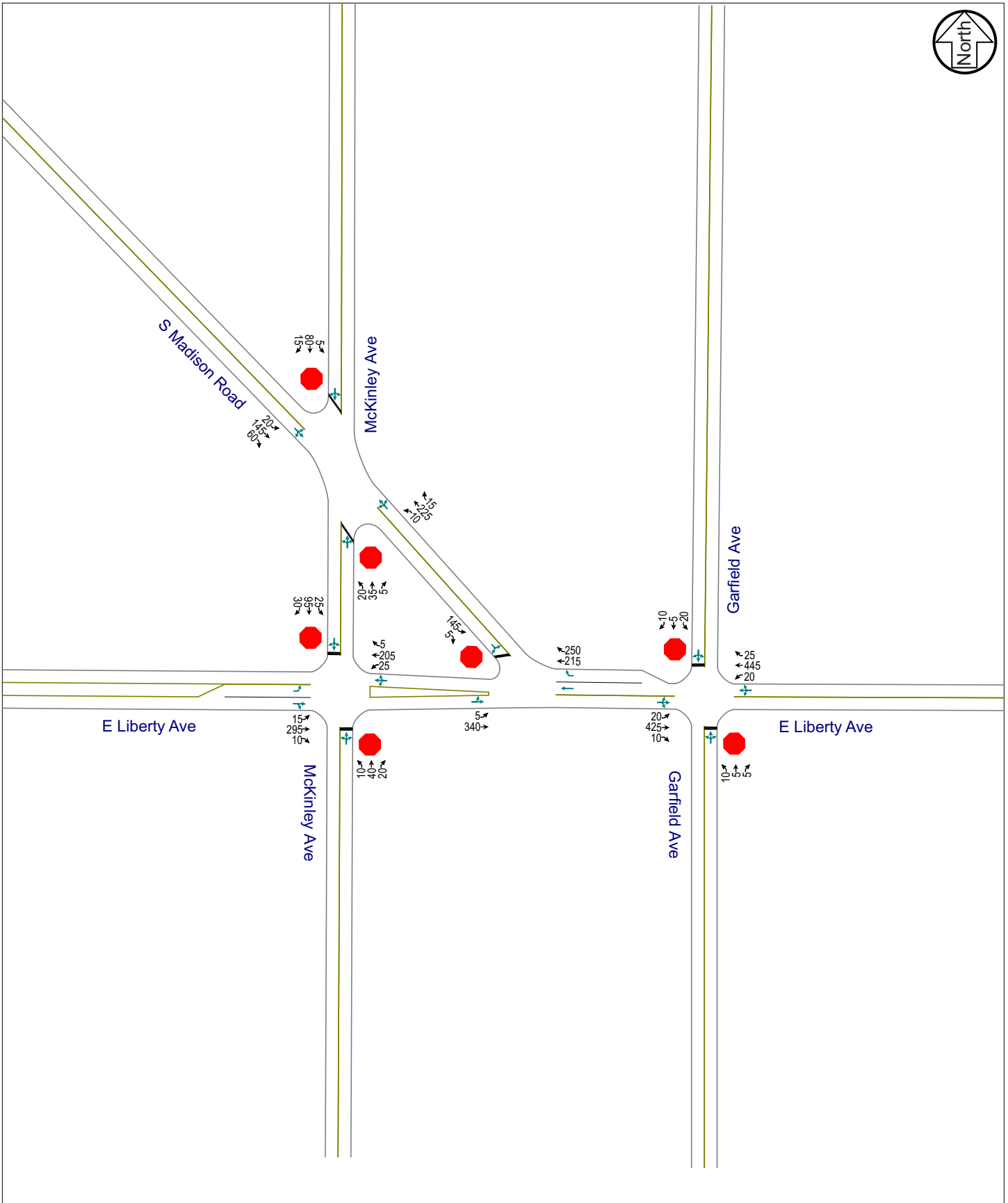
Project ID(s): 6617  
 Route(s): STH 18, STH213  
 Region/COUNTY(IES): SW/Rock  
 Location: Madison Rd & McKinley Ave.

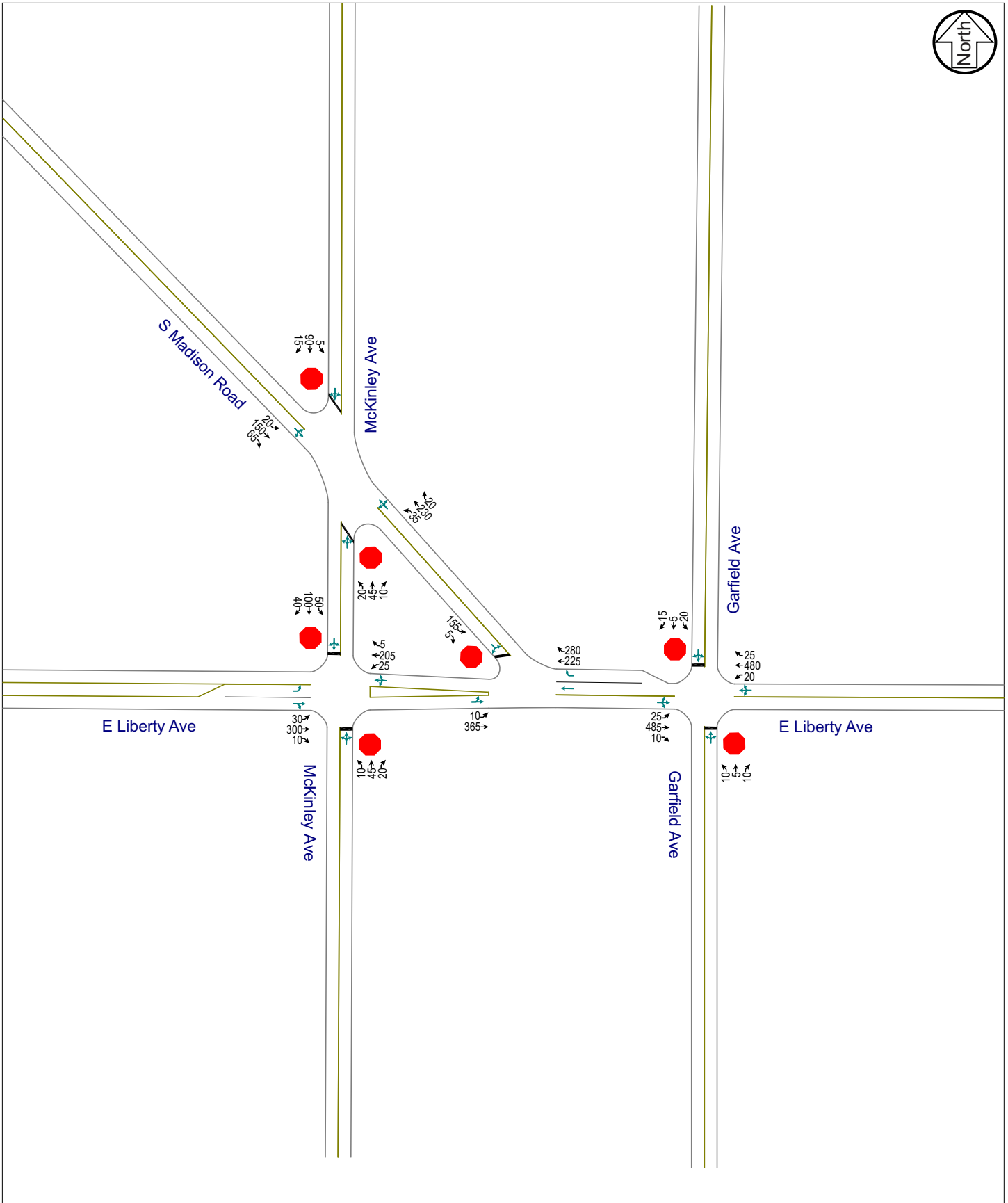
Design Hour Turning Movement Data

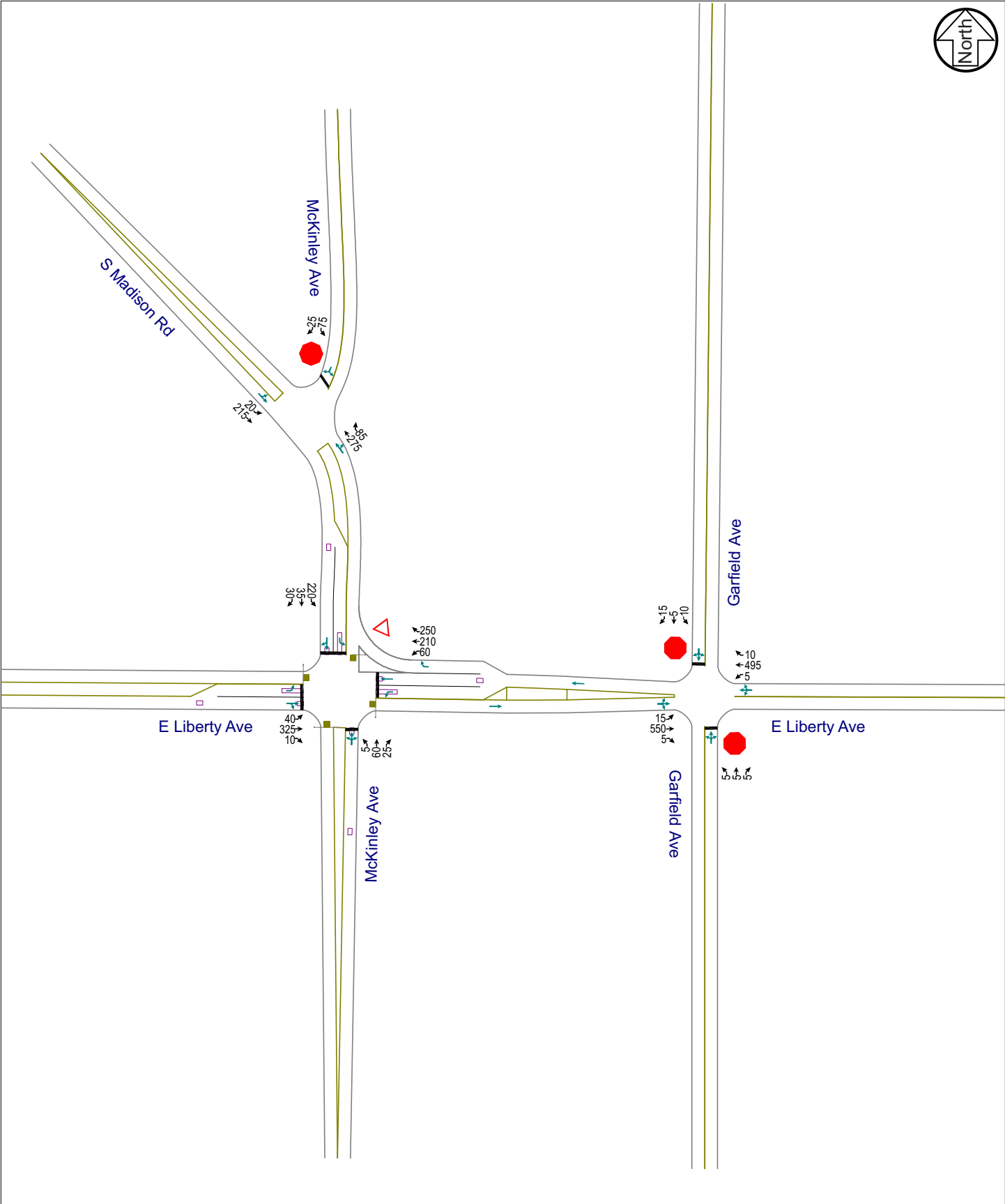


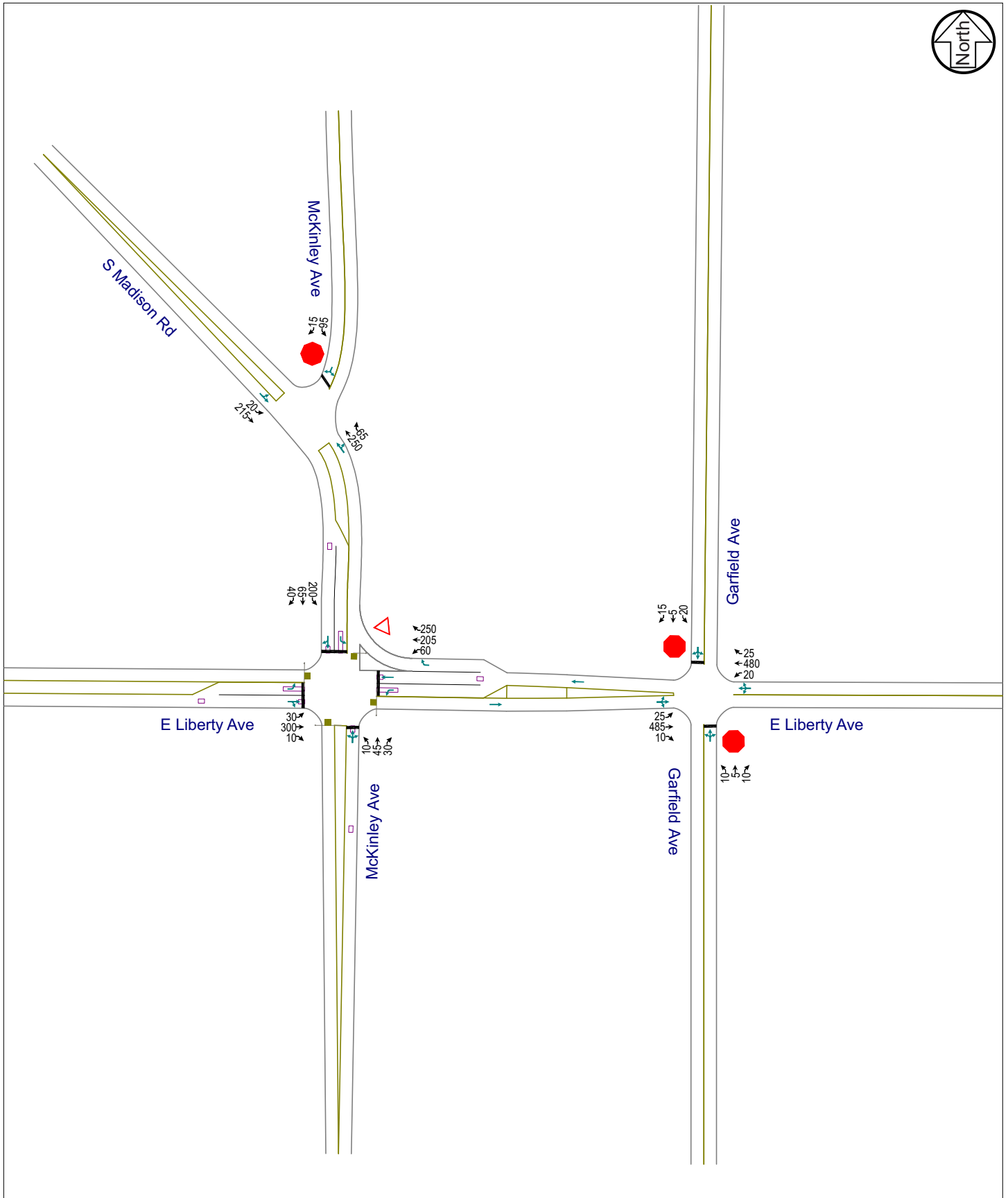




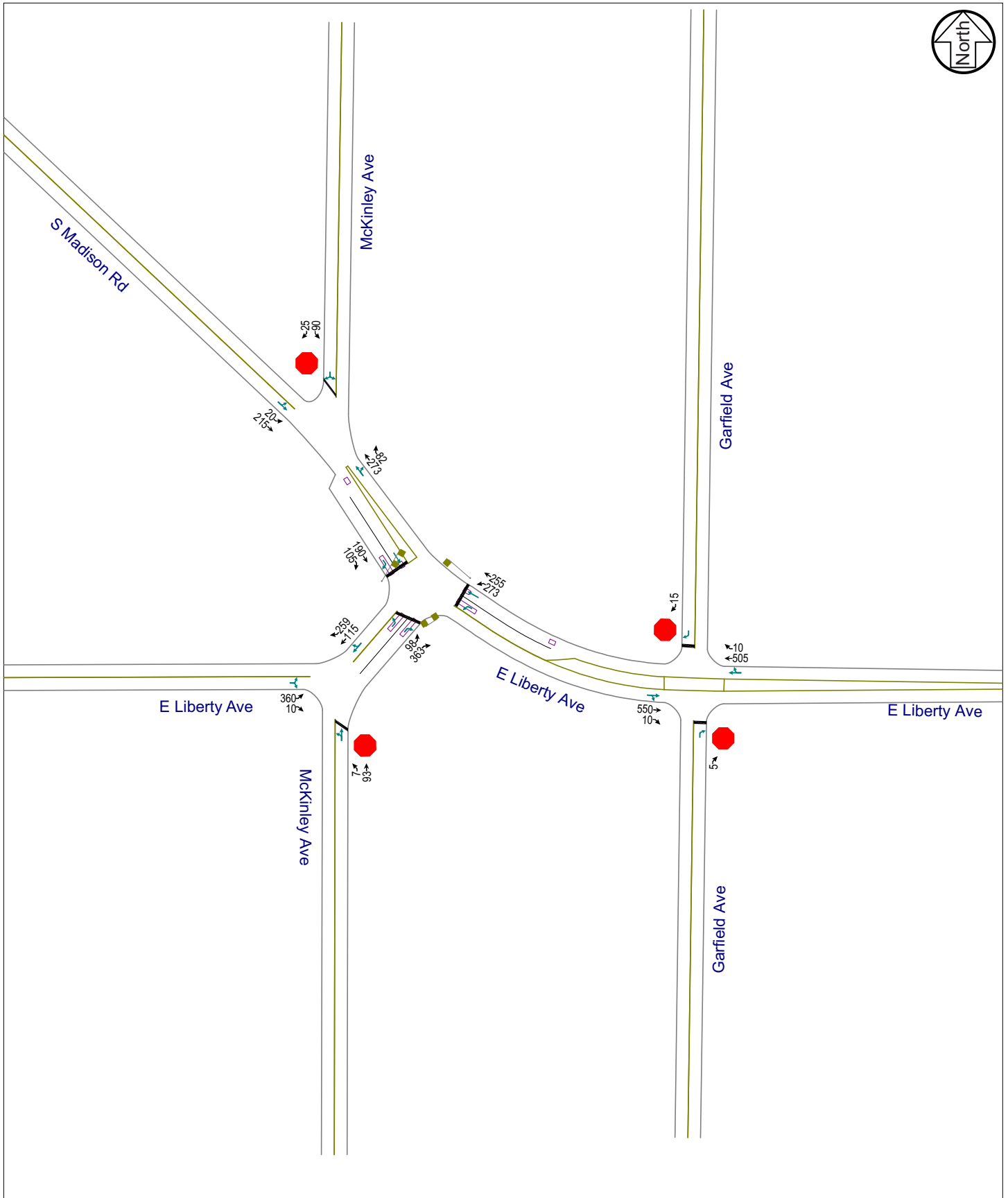


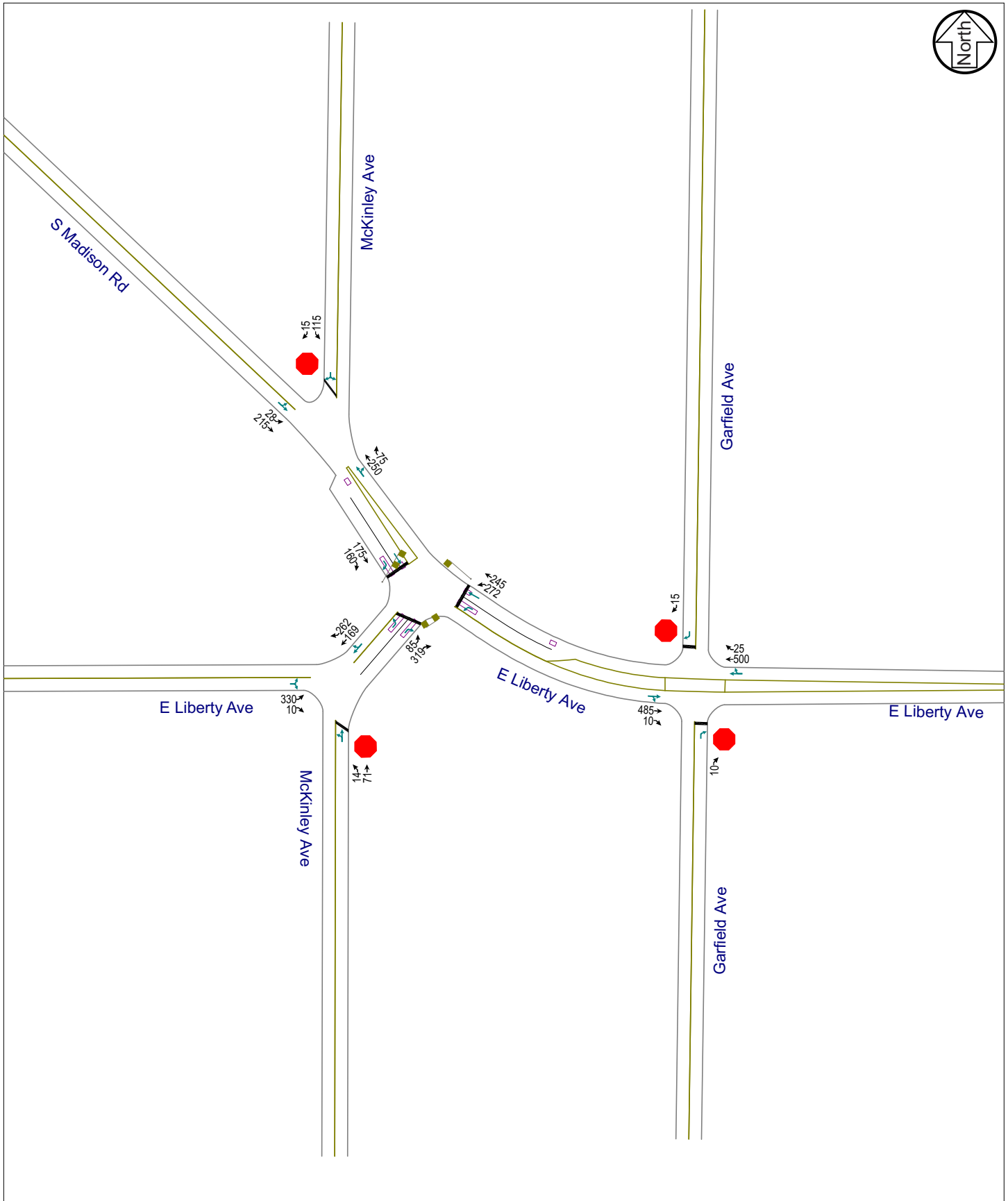


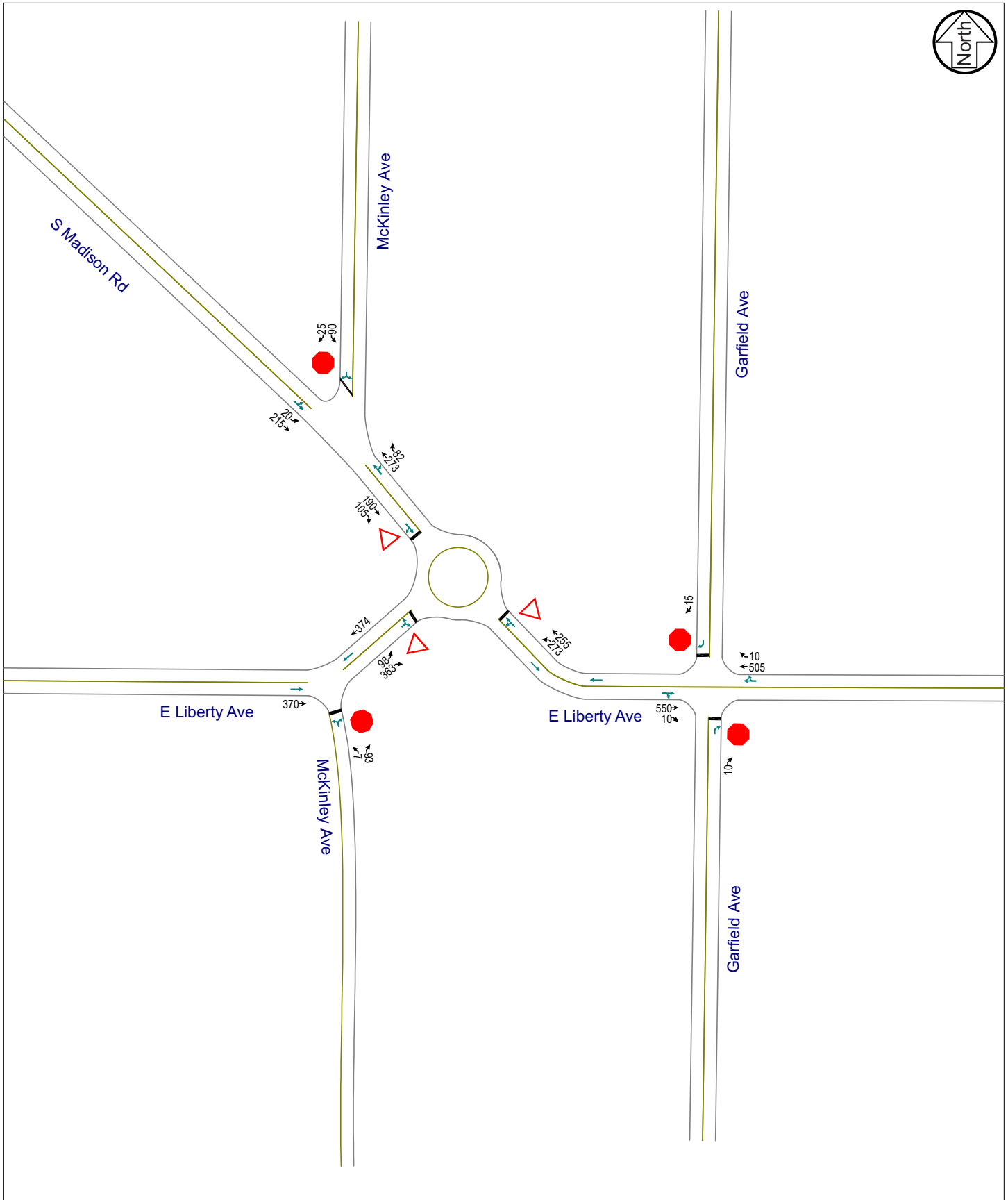


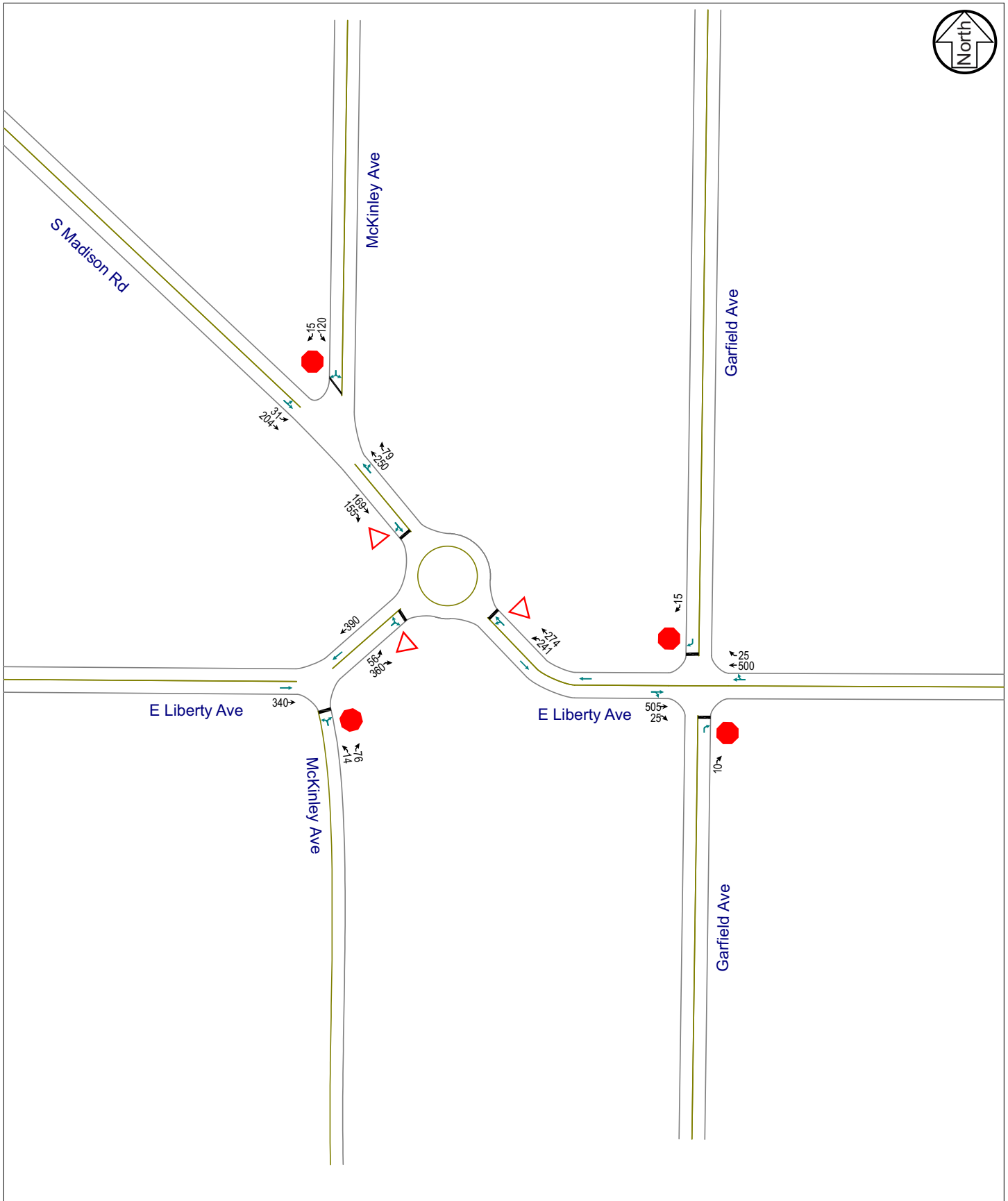














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**Option 1: Shift WIS 213 to McKinley Avenue**

Beloit ICE Study  
City of Beloit

13011  
December 2019

Figure 1





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**Option 2: Make Madison Road "Major" Movement**

Beloit ICE Study  
City of Beloit

Figure 2





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**Option 3: Roundabout at WIS 81 and WIS 213**

Beloit ICE Study  
City of Beloit

**Figure 3**

Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	145	50	5	230	20	25	50	5	10	50	25
Future Vol, veh/h	20	145	50	5	230	20	25	50	5	10	50	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	4	4	4	3	3	3	2	2	2	6	6	6
Mvmt Flow	23	167	57	6	264	23	29	57	6	11	57	29

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	287	0	0	224	0	0	573	541	196	561	558	276
Stage 1	-	-	-	-	-	-	242	242	-	288	288	-
Stage 2	-	-	-	-	-	-	331	299	-	273	270	-
Critical Hdwy	4.14	-	-	4.13	-	-	7.12	6.52	6.22	7.16	6.56	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.16	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.16	5.56	-
Follow-up Hdwy	2.236	-	-	2.227	-	-	3.518	4.018	3.318	3.554	4.054	3.354
Pot Cap-1 Maneuver	1264	-	-	1339	-	-	430	448	845	432	433	753
Stage 1	-	-	-	-	-	-	762	705	-	711	666	-
Stage 2	-	-	-	-	-	-	682	666	-	724	679	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1264	-	-	1339	-	-	363	436	845	378	422	753
Mov Cap-2 Maneuver	-	-	-	-	-	-	363	436	-	378	422	-
Stage 1	-	-	-	-	-	-	746	690	-	696	663	-
Stage 2	-	-	-	-	-	-	596	663	-	645	665	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.7			0.2			15.9			14.5		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	422	1264	-	-	1339	-	-	477
HCM Lane V/C Ratio	0.218	0.018	-	-	0.004	-	-	0.205
HCM Control Delay (s)	15.9	7.9	0	-	7.7	0	-	14.5
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.8	0.1	-	-	0	-	-	0.8



Intersection												
Int Delay, s/veh	5.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	320	10	30	205	5	5	60	25	30	55	20
Future Vol, veh/h	15	320	10	30	205	5	5	60	25	30	55	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	80	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	8	8	8	11	11	11	5	5	5	4	4	4
Mvmt Flow	17	368	11	34	236	6	6	69	29	34	63	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	242	0	0	379	0	0	758	718	374	764	720	239
Stage 1	-	-	-	-	-	-	408	408	-	307	307	-
Stage 2	-	-	-	-	-	-	350	310	-	457	413	-
Critical Hdwy	4.18	-	-	4.21	-	-	7.15	6.55	6.25	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.14	5.54	-
Follow-up Hdwy	2.272	-	-	2.299	-	-	3.545	4.045	3.345	3.536	4.036	3.336
Pot Cap-1 Maneuver	1290	-	-	1132	-	-	320	351	666	318	351	795
Stage 1	-	-	-	-	-	-	614	592	-	699	657	-
Stage 2	-	-	-	-	-	-	660	654	-	580	590	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1290	-	-	1132	-	-	256	334	666	247	334	795
Mov Cap-2 Maneuver	-	-	-	-	-	-	256	334	-	247	334	-
Stage 1	-	-	-	-	-	-	606	584	-	690	634	-
Stage 2	-	-	-	-	-	-	557	631	-	483	582	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	1	18	21.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	380	1290	-	-	1132	-	-	337
HCM Lane V/C Ratio	0.272	0.013	-	-	0.03	-	-	0.358
HCM Control Delay (s)	18	7.8	-	-	8.3	0	-	21.5
HCM Lane LOS	C	A	-	-	A	A	-	C
HCM 95th %tile Q(veh)	1.1	0	-	-	0.1	-	-	1.6

**Intersection**

Int Delay, s/veh 3.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↑	↗	↘	
Traffic Vol, veh/h	5	375	210	250	160	5
Future Vol, veh/h	5	375	210	250	160	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	80	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	8	8	8	8	5	5
Mvmt Flow	6	426	239	284	182	6

**Major/Minor**

	Major1	Major2	Minor2		
Conflicting Flow All	523	0	0	677	239
Stage 1	-	-	-	239	-
Stage 2	-	-	-	438	-
Critical Hdwy	4.18	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	5.45	-
Follow-up Hdwy	2.272	-	-	3.545	3.345
Pot Cap-1 Maneuver	1014	-	-	414	793
Stage 1	-	-	-	794	-
Stage 2	-	-	-	644	-
Platoon blocked, %		-	-		
Mov Cap-1 Maneuver	1014	-	-	411	793
Mov Cap-2 Maneuver	-	-	-	411	-
Stage 1	-	-	-	788	-
Stage 2	-	-	-	644	-

**Approach**

	EB	WB	SB
HCM Control Delay, s	0.1	0	20.5
HCM LOS			C

**Minor Lane/Major Mvmt**

	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1014	-	-	-	417
HCM Lane V/C Ratio	0.006	-	-	-	0.45
HCM Control Delay (s)	8.6	0	-	-	20.5
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	2.3

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	515	5	5	445	10	5	5	5	10	5	10
Future Vol, veh/h	15	515	5	5	445	10	5	5	5	10	5	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	8	8	8	7	7	7	50	50	50	12	12	12
Mvmt Flow	18	606	6	6	524	12	6	6	6	12	6	12

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	536	0	0	612	0	0	1196	1193	609	1193	1190	530
Stage 1	-	-	-	-	-	-	645	645	-	542	542	-
Stage 2	-	-	-	-	-	-	551	548	-	651	648	-
Critical Hdwy	4.18	-	-	4.17	-	-	7.6	7	6.7	7.22	6.62	6.32
Critical Hdwy Stg 1	-	-	-	-	-	-	6.6	6	-	6.22	5.62	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.6	6	-	6.22	5.62	-
Follow-up Hdwy	2.272	-	-	2.263	-	-	3.95	4.45	3.75	3.608	4.108	3.408
Pot Cap-1 Maneuver	1002	-	-	943	-	-	131	152	417	156	180	530
Stage 1	-	-	-	-	-	-	390	401	-	507	504	-
Stage 2	-	-	-	-	-	-	442	447	-	441	451	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1002	-	-	943	-	-	121	147	417	145	174	530
Mov Cap-2 Maneuver	-	-	-	-	-	-	121	147	-	145	174	-
Stage 1	-	-	-	-	-	-	379	390	-	493	499	-
Stage 2	-	-	-	-	-	-	423	443	-	417	439	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.1			28.3			24.5		
HCM LOS							D			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	172	1002	-	-	943	-	-	214
HCM Lane V/C Ratio	0.103	0.018	-	-	0.006	-	-	0.137
HCM Control Delay (s)	28.3	8.7	0	-	8.8	0	-	24.5
HCM Lane LOS	D	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0	-	-	0.5

**Intersection**

Int Delay, s/veh 4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	145	60	10	225	15	20	35	5	5	80	15
Future Vol, veh/h	20	145	60	10	225	15	20	35	5	5	80	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	4	4	4
Mvmt Flow	23	169	70	12	262	17	23	41	6	6	93	17

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	279	0	0	239	0	0	600	553	204	569	580	271
Stage 1	-	-	-	-	-	-	250	250	-	295	295	-
Stage 2	-	-	-	-	-	-	350	303	-	274	285	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.14	5.54	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.536	4.036	3.336
Pot Cap-1 Maneuver	1284	-	-	1328	-	-	413	441	837	430	423	763
Stage 1	-	-	-	-	-	-	754	700	-	709	665	-
Stage 2	-	-	-	-	-	-	666	664	-	728	672	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1284	-	-	1328	-	-	325	427	837	387	409	763
Mov Cap-2 Maneuver	-	-	-	-	-	-	325	427	-	387	409	-
Stage 1	-	-	-	-	-	-	738	685	-	694	658	-
Stage 2	-	-	-	-	-	-	553	657	-	666	658	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.3	15.9	16.2
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	401	1284	-	-	1328	-	-	438
HCM Lane V/C Ratio	0.174	0.018	-	-	0.009	-	-	0.265
HCM Control Delay (s)	15.9	7.9	0	-	7.7	0	-	16.2
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.6	0.1	-	-	0	-	-	1.1

Intersection												
Int Delay, s/veh	7.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	295	10	25	205	5	10	40	20	25	95	30
Future Vol, veh/h	15	295	10	25	205	5	10	40	20	25	95	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	80	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	5	5	5	5	5	5	7	7	7	3	3	3
Mvmt Flow	19	364	12	31	253	6	12	49	25	31	117	37

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	259	0	0	376	0	0	803	729	370	763	732	256
Stage 1	-	-	-	-	-	-	408	408	-	318	318	-
Stage 2	-	-	-	-	-	-	395	321	-	445	414	-
Critical Hdwy	4.15	-	-	4.15	-	-	7.17	6.57	6.27	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.17	5.57	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.17	5.57	-	6.13	5.53	-
Follow-up Hdwy	2.245	-	-	2.245	-	-	3.563	4.063	3.363	3.527	4.027	3.327
Pot Cap-1 Maneuver	1288	-	-	1166	-	-	296	344	665	320	347	780
Stage 1	-	-	-	-	-	-	610	588	-	691	652	-
Stage 2	-	-	-	-	-	-	620	643	-	590	591	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1288	-	-	1166	-	-	198	328	665	263	331	780
Mov Cap-2 Maneuver	-	-	-	-	-	-	198	328	-	263	331	-
Stage 1	-	-	-	-	-	-	601	579	-	681	632	-
Stage 2	-	-	-	-	-	-	466	623	-	512	582	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0.9			18.8			25.5		
HCM LOS							C			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	346	1288	-	-	1166	-	-	357
HCM Lane V/C Ratio	0.25	0.014	-	-	0.026	-	-	0.519
HCM Control Delay (s)	18.8	7.8	-	-	8.2	0	-	25.5
HCM Lane LOS	C	A	-	-	A	A	-	D
HCM 95th %tile Q(veh)	1	0	-	-	0.1	-	-	2.9

**Intersection**

Int Delay, s/veh 3.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↑	↗	↘	
Traffic Vol, veh/h	5	340	215	250	145	5
Future Vol, veh/h	5	340	215	250	145	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	80	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	5	5	5	5	3	3
Mvmt Flow	6	430	272	316	184	6

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	588	0	-	0	714
Stage 1	-	-	-	-	272
Stage 2	-	-	-	-	442
Critical Hdwy	4.15	-	-	-	6.43
Critical Hdwy Stg 1	-	-	-	-	5.43
Critical Hdwy Stg 2	-	-	-	-	5.43
Follow-up Hdwy	2.245	-	-	-	3.527
Pot Cap-1 Maneuver	973	-	-	-	396
Stage 1	-	-	-	-	771
Stage 2	-	-	-	-	646
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	973	-	-	-	393
Mov Cap-2 Maneuver	-	-	-	-	393
Stage 1	-	-	-	-	765
Stage 2	-	-	-	-	646

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	21.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	973	-	-	-	399
HCM Lane V/C Ratio	0.007	-	-	-	0.476
HCM Control Delay (s)	8.7	0	-	-	21.9
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	2.5

Intersection												
Int Delay, s/veh	1.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	425	10	20	445	25	10	5	5	20	5	10
Future Vol, veh/h	20	425	10	20	445	25	10	5	5	20	5	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	5	5	5	4	4	4	35	35	35	3	3	3
Mvmt Flow	23	489	11	23	511	29	11	6	6	23	6	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	540	0	0	500	0	0	1121	1127	495	1119	1118	526
Stage 1	-	-	-	-	-	-	541	541	-	572	572	-
Stage 2	-	-	-	-	-	-	580	586	-	547	546	-
Critical Hdwy	4.15	-	-	4.14	-	-	7.45	6.85	6.55	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.45	5.85	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.45	5.85	-	6.13	5.53	-
Follow-up Hdwy	2.245	-	-	2.236	-	-	3.815	4.315	3.615	3.527	4.027	3.327
Pot Cap-1 Maneuver	1013	-	-	1054	-	-	158	178	513	183	206	550
Stage 1	-	-	-	-	-	-	470	471	-	503	503	-
Stage 2	-	-	-	-	-	-	447	448	-	519	516	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1013	-	-	1054	-	-	144	167	513	168	193	550
Mov Cap-2 Maneuver	-	-	-	-	-	-	144	167	-	168	193	-
Stage 1	-	-	-	-	-	-	455	456	-	487	487	-
Stage 2	-	-	-	-	-	-	419	434	-	491	500	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0.3			27.5			25.6		
HCM LOS							D			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	183	1013	-	-	1054	-	-	215
HCM Lane V/C Ratio	0.126	0.023	-	-	0.022	-	-	0.187
HCM Control Delay (s)	27.5	8.6	0	-	8.5	0	-	25.6
HCM Lane LOS	D	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0.1	-	-	0.7

Intersection												
Int Delay, s/veh	5.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	170	45	30	245	20	30	65	5	15	60	25
Future Vol, veh/h	20	170	45	30	245	20	30	65	5	15	60	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	4	4	4	3	3	3	2	2	2	6	6	6
Mvmt Flow	23	195	52	34	282	23	34	75	6	17	69	29

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	305	0	0	247	0	0	678	640	221	670	655	294
Stage 1	-	-	-	-	-	-	267	267	-	362	362	-
Stage 2	-	-	-	-	-	-	411	373	-	308	293	-
Critical Hdwy	4.14	-	-	4.13	-	-	7.12	6.52	6.22	7.16	6.56	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.16	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.16	5.56	-
Follow-up Hdwy	2.236	-	-	2.227	-	-	3.518	4.018	3.318	3.554	4.054	3.354
Pot Cap-1 Maneuver	1244	-	-	1313	-	-	366	393	819	365	381	736
Stage 1	-	-	-	-	-	-	738	688	-	648	618	-
Stage 2	-	-	-	-	-	-	618	618	-	694	663	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1244	-	-	1313	-	-	288	373	819	295	361	736
Mov Cap-2 Maneuver	-	-	-	-	-	-	288	373	-	295	361	-
Stage 1	-	-	-	-	-	-	722	673	-	634	599	-
Stage 2	-	-	-	-	-	-	509	599	-	599	648	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.7			0.8			20.2			17.7		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	351	1244	-	-	1313	-	-	398
HCM Lane V/C Ratio	0.327	0.018	-	-	0.026	-	-	0.289
HCM Control Delay (s)	20.2	7.9	0	-	7.8	0	-	17.7
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1.4	0.1	-	-	0.1	-	-	1.2



Intersection												
Int Delay, s/veh	7.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	330	10	30	210	5	5	60	25	50	60	25
Future Vol, veh/h	30	330	10	30	210	5	5	60	25	50	60	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	80	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	8	8	8	11	11	11	5	5	5	4	4	4
Mvmt Flow	34	379	11	34	241	6	6	69	29	57	69	29

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	247	0	0	390	0	0	814	768	385	814	770	244
Stage 1	-	-	-	-	-	-	453	453	-	312	312	-
Stage 2	-	-	-	-	-	-	361	315	-	502	458	-
Critical Hdwy	4.18	-	-	4.21	-	-	7.15	6.55	6.25	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.14	5.54	-
Follow-up Hdwy	2.272	-	-	2.299	-	-	3.545	4.045	3.345	3.536	4.036	3.336
Pot Cap-1 Maneuver	1285	-	-	1121	-	-	293	328	656	294	329	790
Stage 1	-	-	-	-	-	-	581	565	-	694	654	-
Stage 2	-	-	-	-	-	-	651	650	-	548	564	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1285	-	-	1121	-	-	223	308	656	222	309	790
Mov Cap-2 Maneuver	-	-	-	-	-	-	223	308	-	222	309	-
Stage 1	-	-	-	-	-	-	566	550	-	676	631	-
Stage 2	-	-	-	-	-	-	539	627	-	446	549	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	1	19.4	29.3
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	352	1285	-	-	1121	-	-	299
HCM Lane V/C Ratio	0.294	0.027	-	-	0.031	-	-	0.519
HCM Control Delay (s)	19.4	7.9	-	-	8.3	0	-	29.3
HCM Lane LOS	C	A	-	-	A	A	-	D
HCM 95th %tile Q(veh)	1.2	0.1	-	-	0.1	-	-	2.8

Intersection						
Int Delay, s/veh	4.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↑	↗	↘	
Traffic Vol, veh/h	10	395	240	275	180	5
Future Vol, veh/h	10	395	240	275	180	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	80	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	80	88	88	88	88	88
Heavy Vehicles, %	8	8	8	8	5	5
Mvmt Flow	13	449	273	313	205	6

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	586	0	-	0	748
Stage 1	-	-	-	-	273
Stage 2	-	-	-	-	475
Critical Hdwy	4.18	-	-	-	6.45
Critical Hdwy Stg 1	-	-	-	-	5.45
Critical Hdwy Stg 2	-	-	-	-	5.45
Follow-up Hdwy	2.272	-	-	-	3.545
Pot Cap-1 Maneuver	960	-	-	-	376
Stage 1	-	-	-	-	766
Stage 2	-	-	-	-	619
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	960	-	-	-	369
Mov Cap-2 Maneuver	-	-	-	-	369
Stage 1	-	-	-	-	752
Stage 2	-	-	-	-	619

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	26.3
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	960	-	-	-	374
HCM Lane V/C Ratio	0.013	-	-	-	0.562
HCM Control Delay (s)	8.8	0	-	-	26.3
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	3.3

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	550	5	5	495	10	5	5	5	10	5	15
Future Vol, veh/h	15	550	5	5	495	10	5	5	5	10	5	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	8	8	8	7	7	7	50	50	50	12	12	12
Mvmt Flow	18	647	6	6	582	12	6	6	6	12	6	18

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	594	0	0	653	0	0	1298	1292	650	1292	1289	588
Stage 1	-	-	-	-	-	-	686	686	-	600	600	-
Stage 2	-	-	-	-	-	-	612	606	-	692	689	-
Critical Hdwy	4.18	-	-	4.17	-	-	7.6	7	6.7	7.22	6.62	6.32
Critical Hdwy Stg 1	-	-	-	-	-	-	6.6	6	-	6.22	5.62	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.6	6	-	6.22	5.62	-
Follow-up Hdwy	2.272	-	-	2.263	-	-	3.95	4.45	3.75	3.608	4.108	3.408
Pot Cap-1 Maneuver	953	-	-	910	-	-	110	131	394	133	156	491
Stage 1	-	-	-	-	-	-	369	382	-	471	474	-
Stage 2	-	-	-	-	-	-	407	419	-	419	432	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	953	-	-	910	-	-	100	126	394	122	150	491
Mov Cap-2 Maneuver	-	-	-	-	-	-	100	126	-	122	150	-
Stage 1	-	-	-	-	-	-	358	371	-	457	469	-
Stage 2	-	-	-	-	-	-	384	415	-	394	419	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.1			32.8			26.1		
HCM LOS							D			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	147	953	-	-	910	-	-	206
HCM Lane V/C Ratio	0.12	0.019	-	-	0.006	-	-	0.171
HCM Control Delay (s)	32.8	8.8	0	-	9	0	-	26.1
HCM Lane LOS	D	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0	-	-	0.6

**Intersection**

Int Delay, s/veh 5.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	20	150	65	35	230	20	20	45	10	5	90	15
Future Vol, veh/h	20	150	65	35	230	20	20	45	10	5	90	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	4	4	4
Mvmt Flow	23	174	76	41	267	23	23	52	12	6	105	17

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	290	0	0	250
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1272	-	-	1316
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1272	-	-	1316
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	1	18.1	18.9
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	362	1272	-	-	1316	-	-	385
HCM Lane V/C Ratio	0.241	0.018	-	-	0.031	-	-	0.332
HCM Control Delay (s)	18.1	7.9	0	-	7.8	0	-	18.9
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.9	0.1	-	-	0.1	-	-	1.4

Intersection												
Int Delay, s/veh	11.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	300	10	25	205	5	10	45	20	50	100	40
Future Vol, veh/h	30	300	10	25	205	5	10	45	20	50	100	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	80	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	5	5	5	5	5	5	7	7	7	3	3	3
Mvmt Flow	37	370	12	31	253	6	12	56	25	62	123	49

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	259	0	0	382	0	0	854	771	376	809	774	256
Stage 1	-	-	-	-	-	-	450	450	-	318	318	-
Stage 2	-	-	-	-	-	-	404	321	-	491	456	-
Critical Hdwy	4.15	-	-	4.15	-	-	7.17	6.57	6.27	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.17	5.57	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.17	5.57	-	6.13	5.53	-
Follow-up Hdwy	2.245	-	-	2.245	-	-	3.563	4.063	3.363	3.527	4.027	3.327
Pot Cap-1 Maneuver	1288	-	-	1160	-	-	273	325	659	298	328	780
Stage 1	-	-	-	-	-	-	579	563	-	691	652	-
Stage 2	-	-	-	-	-	-	613	643	-	557	566	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1288	-	-	1160	-	-	169	306	659	236	309	780
Mov Cap-2 Maneuver	-	-	-	-	-	-	169	306	-	236	309	-
Stage 1	-	-	-	-	-	-	562	547	-	671	632	-
Stage 2	-	-	-	-	-	-	448	623	-	468	550	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.7			0.9			21			40.5		
HCM LOS							C			E		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	317	1288	-	-	1160	-	-	324
HCM Lane V/C Ratio	0.292	0.029	-	-	0.027	-	-	0.724
HCM Control Delay (s)	21	7.9	-	-	8.2	0	-	40.5
HCM Lane LOS	C	A	-	-	A	A	-	E
HCM 95th %tile Q(veh)	1.2	0.1	-	-	0.1	-	-	5.3

**Intersection**

Int Delay, s/veh 4.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↑	↗	↘	
Traffic Vol, veh/h	10	365	225	280	155	5
Future Vol, veh/h	10	365	225	280	155	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	80	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	5	5	5	5	3	3
Mvmt Flow	13	462	285	354	196	6

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	639	0	-	0	773 285
Stage 1	-	-	-	-	285 -
Stage 2	-	-	-	-	488 -
Critical Hdwy	4.15	-	-	-	6.43 6.23
Critical Hdwy Stg 1	-	-	-	-	5.43 -
Critical Hdwy Stg 2	-	-	-	-	5.43 -
Follow-up Hdwy	2.245	-	-	-	3.527 3.327
Pot Cap-1 Maneuver	931	-	-	-	366 752
Stage 1	-	-	-	-	761 -
Stage 2	-	-	-	-	615 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	931	-	-	-	359 752
Mov Cap-2 Maneuver	-	-	-	-	359 -
Stage 1	-	-	-	-	747 -
Stage 2	-	-	-	-	615 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	26.5
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	931	-	-	-	365
HCM Lane V/C Ratio	0.014	-	-	-	0.555
HCM Control Delay (s)	8.9	0	-	-	26.5
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	3.2

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	485	10	20	480	25	10	5	10	20	5	15
Future Vol, veh/h	25	485	10	20	480	25	10	5	10	20	5	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	5	5	5	4	4	4	35	35	35	3	3	3
Mvmt Flow	29	557	11	23	552	29	11	6	11	23	6	17

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	581	0	0	568	0	0	1245	1248	563	1242	1239	567
Stage 1	-	-	-	-	-	-	621	621	-	613	613	-
Stage 2	-	-	-	-	-	-	624	627	-	629	626	-
Critical Hdwy	4.15	-	-	4.14	-	-	7.45	6.85	6.55	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.45	5.85	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.45	5.85	-	6.13	5.53	-
Follow-up Hdwy	2.245	-	-	2.236	-	-	3.815	4.315	3.615	3.527	4.027	3.327
Pot Cap-1 Maneuver	978	-	-	994	-	-	129	150	468	151	175	521
Stage 1	-	-	-	-	-	-	423	431	-	478	482	-
Stage 2	-	-	-	-	-	-	422	428	-	469	475	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	978	-	-	994	-	-	114	139	468	134	162	521
Mov Cap-2 Maneuver	-	-	-	-	-	-	114	139	-	134	162	-
Stage 1	-	-	-	-	-	-	405	412	-	457	466	-
Stage 2	-	-	-	-	-	-	389	413	-	432	455	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0.3			30.1			29.7		
HCM LOS							D			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	172	978	-	-	994	-	-	191
HCM Lane V/C Ratio	0.167	0.029	-	-	0.023	-	-	0.241
HCM Control Delay (s)	30.1	8.8	0	-	8.7	0	-	29.7
HCM Lane LOS	D	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.6	0.1	-	-	0.1	-	-	0.9

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	20	215	275	85	75	25
Future Vol, veh/h	20	215	275	85	75	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	4	4	8	8	6	6
Mvmt Flow	23	247	316	98	86	29

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	414	0	-	0	658 365
Stage 1	-	-	-	-	365 -
Stage 2	-	-	-	-	293 -
Critical Hdwy	4.14	-	-	-	6.46 6.26
Critical Hdwy Stg 1	-	-	-	-	5.46 -
Critical Hdwy Stg 2	-	-	-	-	5.46 -
Follow-up Hdwy	2.236	-	-	-	3.554 3.354
Pot Cap-1 Maneuver	1134	-	-	-	423 671
Stage 1	-	-	-	-	694 -
Stage 2	-	-	-	-	748 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1134	-	-	-	413 671
Mov Cap-2 Maneuver	-	-	-	-	413 -
Stage 1	-	-	-	-	677 -
Stage 2	-	-	-	-	748 -





















Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	15.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1134	-	-	-	457
HCM Lane V/C Ratio	0.02	-	-	-	0.252
HCM Control Delay (s)	8.2	0	-	-	15.5
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	1



HCM 2010 Signalized Intersection Summary  
 20: McKinley Ave & E Liberty Ave

2040 AM Conditions - Option 1  
 E Liberty Ave Region

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	325	10	60	210	250	5	60	25	220	35	30
Future Volume (veh/h)	40	325	10	60	210	250	5	60	25	220	35	30
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1759	1694	1900	1712	1649	1712	1900	1605	1900	1827	1721	1900
Adj Flow Rate, veh/h	46	374	11	69	241	0	6	69	29	253	40	34
Adj No. of Lanes	1	1	0	1	1	1	0	1	0	1	1	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	8	8	8	11	11	11	5	5	5	4	4	4
Cap, veh/h	566	710	21	448	715	631	117	300	119	586	242	206
Arrive On Green	0.43	0.43	0.43	0.43	0.43	0.00	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1071	1638	48	914	1649	1455	29	1066	423	1267	861	731
Grp Volume(v), veh/h	46	0	385	69	241	0	104	0	0	253	0	74
Grp Sat Flow(s),veh/h/ln	1071	0	1686	914	1649	1455	1518	0	0	1267	0	1592
Q Serve(g_s), s	1.0	0.0	5.9	2.1	3.4	0.0	0.0	0.0	0.0	3.6	0.0	1.2
Cycle Q Clear(g_c), s	4.4	0.0	5.9	8.0	3.4	0.0	1.8	0.0	0.0	5.4	0.0	1.2
Prop In Lane	1.00		0.03	1.00		1.00	0.06		0.28	1.00		0.46
Lane Grp Cap(c), veh/h	566	0	731	448	715	631	535	0	0	586	0	448
V/C Ratio(X)	0.08	0.00	0.53	0.15	0.34	0.00	0.19	0.00	0.00	0.43	0.00	0.17
Avail Cap(c_a), veh/h	1325	0	1925	1095	1882	1661	1822	0	0	1677	0	1817
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.1	0.0	7.3	10.2	6.6	0.0	9.7	0.0	0.0	10.8	0.0	9.5
Incr Delay (d2), s/veh	0.1	0.0	0.6	0.2	0.3	0.0	0.2	0.0	0.0	0.5	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.6	0.0	5.0	1.0	2.9	0.0	1.4	0.0	0.0	3.9	0.0	1.0
LnGrp Delay(d),s/veh	8.1	0.0	7.9	10.4	6.9	0.0	9.9	0.0	0.0	11.3	0.0	9.7
LnGrp LOS	A		A	B	A		A			B		A
Approach Vol, veh/h		431			310			104				327
Approach Delay, s/veh		7.9			7.6			9.9				11.0
Approach LOS		A			A			A				B
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		14.8		20.2		14.8		20.2				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		40.0		40.0		40.0		40.0				
Max Q Clear Time (g_c+I1), s		3.8		7.9		7.4		10.0				
Green Ext Time (p_c), s		2.1		5.3		2.1		5.2				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			8.9									
HCM 2010 LOS			A									

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	15	550	5	5	495	10	5	5	5	10	5	15
Future Vol, veh/h	15	550	5	5	495	10	5	5	5	10	5	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	8	8	8	7	7	7	50	50	50	12	12	12
Mvmt Flow	18	647	6	6	582	12	6	6	6	12	6	18

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	594	0	0	653	0	0	1298	1292	650	1292	1289	588
Stage 1	-	-	-	-	-	-	686	686	-	600	600	-
Stage 2	-	-	-	-	-	-	612	606	-	692	689	-
Critical Hdwy	4.18	-	-	4.17	-	-	7.6	7	6.7	7.22	6.62	6.32
Critical Hdwy Stg 1	-	-	-	-	-	-	6.6	6	-	6.22	5.62	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.6	6	-	6.22	5.62	-
Follow-up Hdwy	2.272	-	-	2.263	-	-	3.95	4.45	3.75	3.608	4.108	3.408
Pot Cap-1 Maneuver	953	-	-	910	-	-	110	131	394	133	156	491
Stage 1	-	-	-	-	-	-	369	382	-	471	474	-
Stage 2	-	-	-	-	-	-	407	419	-	419	432	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	953	-	-	910	-	-	100	126	394	122	150	491
Mov Cap-2 Maneuver	-	-	-	-	-	-	100	126	-	122	150	-
Stage 1	-	-	-	-	-	-	358	371	-	457	469	-
Stage 2	-	-	-	-	-	-	384	415	-	394	419	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.1			32.8			26.1		
HCM LOS							D			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	147	953	-	-	910	-	-	206
HCM Lane V/C Ratio	0.12	0.019	-	-	0.006	-	-	0.171
HCM Control Delay (s)	32.8	8.8	0	-	9	0	-	26.1
HCM Lane LOS	D	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0	-	-	0.6

Intersection						
Int Delay, s/veh	2.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	20	215	250	65	95	15
Future Vol, veh/h	20	215	250	65	95	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	4	4
Mvmt Flow	23	250	291	76	110	17





















Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	367	0	-	0	625 329
Stage 1	-	-	-	-	329 -
Stage 2	-	-	-	-	296 -
Critical Hdwy	4.12	-	-	-	6.44 6.24
Critical Hdwy Stg 1	-	-	-	-	5.44 -
Critical Hdwy Stg 2	-	-	-	-	5.44 -
Follow-up Hdwy	2.218	-	-	-	3.536 3.336
Pot Cap-1 Maneuver	1192	-	-	-	445 708
Stage 1	-	-	-	-	725 -
Stage 2	-	-	-	-	750 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1192	-	-	-	435 708
Mov Cap-2 Maneuver	-	-	-	-	435 -
Stage 1	-	-	-	-	709 -
Stage 2	-	-	-	-	750 -

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	15.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1192	-	-	-	459
HCM Lane V/C Ratio	0.02	-	-	-	0.279
HCM Control Delay (s)	8.1	0	-	-	15.8
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	1.1

HCM 2010 Signalized Intersection Summary  
 20: McKinley Ave & E Liberty Ave

2040 PM Conditions - Option 1  
 E Liberty Ave Region

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	300	10	60	205	250	10	45	30	200	65	40
Future Volume (veh/h)	30	300	10	60	205	250	10	45	30	200	65	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1810	1743	1900	1810	1743	1810	1900	1575	1900	1845	1738	1900
Adj Flow Rate, veh/h	37	370	12	74	253	0	12	56	37	247	80	49
Adj No. of Lanes	1	1	0	1	1	1	0	1	0	1	1	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	5	5	5	5	5	5	7	7	7	3	3	3
Cap, veh/h	568	720	23	465	747	659	133	249	146	598	287	176
Arrive On Green	0.43	0.43	0.43	0.43	0.43	0.00	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1090	1679	54	969	1743	1538	65	877	512	1285	1010	619
Grp Volume(v), veh/h	37	0	382	74	253	0	105	0	0	247	0	129
Grp Sat Flow(s),veh/h/ln	1090	0	1733	969	1743	1538	1453	0	0	1285	0	1629
Q Serve(g_s), s	0.8	0.0	5.6	2.1	3.4	0.0	0.0	0.0	0.0	3.2	0.0	2.1
Cycle Q Clear(g_c), s	4.2	0.0	5.6	7.7	3.4	0.0	1.9	0.0	0.0	5.1	0.0	2.1
Prop In Lane	1.00		0.03	1.00		1.00	0.11		0.35	1.00		0.38
Lane Grp Cap(c), veh/h	568	0	743	465	747	659	528	0	0	598	0	463
V/C Ratio(X)	0.07	0.00	0.51	0.16	0.34	0.00	0.20	0.00	0.00	0.41	0.00	0.28
Avail Cap(c_a), veh/h	1352	0	1990	1162	2001	1766	1746	0	0	1708	0	1870
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.1	0.0	7.3	10.1	6.7	0.0	9.6	0.0	0.0	10.6	0.0	9.7
Incr Delay (d2), s/veh	0.0	0.0	0.6	0.2	0.3	0.0	0.2	0.0	0.0	0.5	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	0.5	0.0	5.0	1.0	3.0	0.0	1.4	0.0	0.0	3.7	0.0	1.8
LnGrp Delay(d),s/veh	8.1	0.0	7.8	10.3	6.9	0.0	9.8	0.0	0.0	11.0	0.0	10.0
LnGrp LOS	A		A	B	A		A			B		B
Approach Vol, veh/h		419			327			105			376	
Approach Delay, s/veh		7.9			7.7			9.8			10.7	
Approach LOS		A			A			A			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		14.9		19.9		14.9		19.9				
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0				
Max Green Setting (Gmax), s		40.0		40.0		40.0		40.0				
Max Q Clear Time (g_c+I1), s		3.9		7.6		7.1		9.7				
Green Ext Time (p_c), s		2.5		5.3		2.5		5.2				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			8.8									
HCM 2010 LOS			A									

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	25	485	10	20	480	25	10	5	10	20	5	15
Future Vol, veh/h	25	485	10	20	480	25	10	5	10	20	5	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	5	5	5	4	4	4	35	35	35	3	3	3
Mvmt Flow	29	557	11	23	552	29	11	6	11	23	6	17

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	581	0	0	568	0	0	1245	1248	563	1242	1239	567
Stage 1	-	-	-	-	-	-	621	621	-	613	613	-
Stage 2	-	-	-	-	-	-	624	627	-	629	626	-
Critical Hdwy	4.15	-	-	4.14	-	-	7.45	6.85	6.55	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.45	5.85	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.45	5.85	-	6.13	5.53	-
Follow-up Hdwy	2.245	-	-	2.236	-	-	3.815	4.315	3.615	3.527	4.027	3.327
Pot Cap-1 Maneuver	978	-	-	994	-	-	129	150	468	151	175	521
Stage 1	-	-	-	-	-	-	423	431	-	478	482	-
Stage 2	-	-	-	-	-	-	422	428	-	469	475	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	978	-	-	994	-	-	114	139	468	134	162	521
Mov Cap-2 Maneuver	-	-	-	-	-	-	114	139	-	134	162	-
Stage 1	-	-	-	-	-	-	405	412	-	457	466	-
Stage 2	-	-	-	-	-	-	389	413	-	432	455	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0.3			30.1			29.7		
HCM LOS							D			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	172	978	-	-	994	-	-	191
HCM Lane V/C Ratio	0.167	0.029	-	-	0.023	-	-	0.241
HCM Control Delay (s)	30.1	8.8	0	-	8.7	0	-	29.7
HCM Lane LOS	D	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.6	0.1	-	-	0.1	-	-	0.9

Intersection						
Int Delay, s/veh	2.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	20	215	273	82	90	25
Future Vol, veh/h	20	215	273	82	90	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	4	4	8	8	6	6
Mvmt Flow	23	247	314	94	103	29

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	408	0	-	0	654 361
Stage 1	-	-	-	-	361 -
Stage 2	-	-	-	-	293 -
Critical Hdwy	4.14	-	-	-	6.46 6.26
Critical Hdwy Stg 1	-	-	-	-	5.46 -
Critical Hdwy Stg 2	-	-	-	-	5.46 -
Follow-up Hdwy	2.236	-	-	-	3.554 3.354
Pot Cap-1 Maneuver	1140	-	-	-	425 675
Stage 1	-	-	-	-	696 -
Stage 2	-	-	-	-	748 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1140	-	-	-	415 675
Mov Cap-2 Maneuver	-	-	-	-	415 -
Stage 1	-	-	-	-	680 -
Stage 2	-	-	-	-	748 -

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	15.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1140	-	-	-	453
HCM Lane V/C Ratio	0.02	-	-	-	0.292
HCM Control Delay (s)	8.2	0	-	-	15.8
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.9

Intersection						
Int Delay, s/veh	2.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	360	10	7	93	115	259
Future Vol, veh/h	360	10	7	93	115	259
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	-	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	8	8	5	5	11	11
Mvmt Flow	414	11	8	107	132	298

Major/Minor	Minor2	Major2		
Conflicting Flow All	281	281	-	0
Stage 1	281	281	-	-
Stage 2	0	0	-	-
Critical Hdwy	6.45	6.55	-	-
Critical Hdwy Stg 1	5.45	5.55	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	3.545	4.045	-	-
Pot Cap-1 Maneuver	703	622	-	-
Stage 1	760	673	-	-
Stage 2	-	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	703	0	-	-
Mov Cap-2 Maneuver	703	0	-	-
Stage 1	760	0	-	-
Stage 2	-	0	-	-

Approach	NB	SB
HCM Control Delay, s	11.1	0
HCM LOS	B	

Minor Lane/Major Mvmt	NBLn1	SBT	SBR
Capacity (veh/h)	703	-	-
HCM Lane V/C Ratio	0.164	-	-
HCM Control Delay (s)	11.1	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.5	-	-



	→	↘	↙	←	↖	↗		
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑	↗	↙	↑	↖	↗		
Traffic Volume (veh/h)	190	105	273	255	98	363		
Future Volume (veh/h)	190	105	273	255	98	363		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1694	1712	1712	1657	1759	1759		
Adj Flow Rate, veh/h	216	74	310	290	111	256		
Adj No. of Lanes	1	1	1	1	1	1		
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88		
Percent Heavy Veh, %	8	11	11	8	8	8		
Cap, veh/h	407	350	606	867	397	354		
Arrive On Green	0.24	0.24	0.19	0.52	0.24	0.24		
Sat Flow, veh/h	1694	1455	1630	1657	1675	1495		
Grp Volume(v), veh/h	216	74	310	290	111	256		
Grp Sat Flow(s),veh/h/ln	1694	1455	1630	1657	1675	1495		
Q Serve(g_s), s	4.6	1.7	5.1	4.2	2.3	6.6		
Cycle Q Clear(g_c), s	4.6	1.7	5.1	4.2	2.3	6.6		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	407	350	606	867	397	354		
V/C Ratio(X)	0.53	0.21	0.51	0.33	0.28	0.72		
Avail Cap(c_a), veh/h	977	839	1164	1991	1208	1078		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	13.8	12.7	7.9	5.7	13.0	14.6		
Incr Delay (d2), s/veh	1.0	0.3	0.6	0.2	0.4	2.3		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(95%),veh/ln	4.1	1.3	4.1	3.4	1.9	5.2		
LnGrp Delay(d),s/veh	14.8	12.9	8.5	6.0	13.4	16.9		
LnGrp LOS	B	B	A	A	B	B		
Approach Vol, veh/h	290			600	367			
Approach Delay, s/veh	14.3			7.3	15.8			
Approach LOS	B			A	B			
<b>Timer</b>	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		14.9	11.8	15.0				26.8
Change Period (Y+Rc), s		5.0	4.0	5.0				5.0
Max Green Setting (Gmax), s		30.0	22.0	24.0				50.0
Max Q Clear Time (g_c+I1), s		8.6	7.1	6.6				6.2
Green Ext Time (p_c), s		1.2	0.8	3.2				3.9
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			11.4					
HCM 2010 LOS			B					

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↻			↻				↻			↻
Traffic Vol, veh/h	0	550	10	0	505	10	0	0	5	0	0	15
Future Vol, veh/h	0	550	10	0	505	10	0	0	5	0	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	8	8	8	7	7	7	50	50	50	12	12	12
Mvmt Flow	0	647	12	0	594	12	0	0	6	0	0	18

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	-	0	0	-	-	0	-	-	653	-	-	600
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.7	-	-	6.32
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.75	-	-	3.408
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	392	0	0	483
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	392	-	-	483
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		0		14.3		12.7	
HCM LOS					B		B	

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	392	-	-	-	-	483
HCM Lane V/C Ratio	0.015	-	-	-	-	0.037
HCM Control Delay (s)	14.3	-	-	-	-	12.7
HCM Lane LOS	B	-	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	-	0.1

Intersection						
Int Delay, s/veh	3.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	28	215	250	75	115	15
Future Vol, veh/h	28	215	250	75	115	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	4	4
Mvmt Flow	33	250	291	87	134	17

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	378	0	-	0	651
Stage 1	-	-	-	-	335
Stage 2	-	-	-	-	316
Critical Hdwy	4.12	-	-	-	6.44
Critical Hdwy Stg 1	-	-	-	-	5.44
Critical Hdwy Stg 2	-	-	-	-	5.44
Follow-up Hdwy	2.218	-	-	-	3.536
Pot Cap-1 Maneuver	1180	-	-	-	430
Stage 1	-	-	-	-	720
Stage 2	-	-	-	-	735
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1180	-	-	-	416
Mov Cap-2 Maneuver	-	-	-	-	416
Stage 1	-	-	-	-	697
Stage 2	-	-	-	-	735

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	16.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1180	-	-	-	437
HCM Lane V/C Ratio	0.028	-	-	-	0.346
HCM Control Delay (s)	8.1	0	-	-	16.9
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	1.1

Intersection						
Int Delay, s/veh	2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	330	10	14	71	169	262
Future Vol, veh/h	330	10	14	71	169	262
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Stop	Stop	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	-	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	5	5	7	7	5	5
Mvmt Flow	407	12	17	88	209	323

Major/Minor	Minor2	Major2		
Conflicting Flow All	371	371	-	0
Stage 1	371	371	-	-
Stage 2	0	0	-	-
Critical Hdwy	6.47	6.57	-	-
Critical Hdwy Stg 1	5.47	5.57	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	3.563	4.063	-	-
Pot Cap-1 Maneuver	620	551	-	-
Stage 1	687	611	-	-
Stage 2	-	-	-	-
Platoon blocked, %			-	-
Mov Cap-1 Maneuver	620	0	-	-
Mov Cap-2 Maneuver	620	0	-	-
Stage 1	687	0	-	-
Stage 2	-	0	-	-

Approach	NB	SB
HCM Control Delay, s	11.9	0
HCM LOS	B	

Minor Lane/Major Mvmt	NBLn1	SBT	SBR
Capacity (veh/h)	620	-	-
HCM Lane V/C Ratio	0.169	-	-
HCM Control Delay (s)	11.9	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.5	-	-

	→	↘	↙	←	↖	↗		
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑	↗	↙	↑	↖	↗		
Traffic Volume (veh/h)	175	160	272	245	85	319		
Future Volume (veh/h)	175	160	272	245	85	319		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1777	1845	1810	1705	1810	1810		
Adj Flow Rate, veh/h	222	126	344	310	108	250		
Adj No. of Lanes	1	1	1	1	1	1		
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79		
Percent Heavy Veh, %	3	3	5	5	5	5		
Cap, veh/h	427	377	639	904	402	359		
Arrive On Green	0.24	0.24	0.20	0.53	0.23	0.23		
Sat Flow, veh/h	1777	1568	1723	1705	1723	1538		
Grp Volume(v), veh/h	222	126	344	310	108	250		
Grp Sat Flow(s),veh/h/ln	1777	1568	1723	1705	1723	1538		
Q Serve(g_s), s	4.6	2.8	5.4	4.4	2.2	6.3		
Cycle Q Clear(g_c), s	4.6	2.8	5.4	4.4	2.2	6.3		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	427	377	639	904	402	359		
V/C Ratio(X)	0.52	0.33	0.54	0.34	0.27	0.70		
Avail Cap(c_a), veh/h	1009	891	1200	2017	1223	1092		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	13.9	13.3	7.8	5.7	13.3	14.8		
Incr Delay (d2), s/veh	0.9	0.5	0.7	0.2	0.4	2.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(95%),veh/ln	4.2	2.2	4.7	3.8	1.9	5.2		
LnGrp Delay(d),s/veh	14.9	13.8	8.5	5.9	13.6	16.9		
LnGrp LOS	B	B	A	A	B	B		
Approach Vol, veh/h	348			654	358			
Approach Delay, s/veh	14.5			7.3	15.9			
Approach LOS	B			A	B			
<b>Timer</b>	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		14.9	12.2	15.2				27.4
Change Period (Y+Rc), s		5.0	4.0	5.0				5.0
Max Green Setting (Gmax), s		30.0	22.0	24.0				50.0
Max Q Clear Time (g_c+I1), s		8.3	7.4	6.6				6.4
Green Ext Time (p_c), s		1.2	0.9	3.6				4.3
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			11.4					
HCM 2010 LOS			B					

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↻			↻				↻			↻
Traffic Vol, veh/h	0	485	10	0	500	25	0	0	10	0	0	15
Future Vol, veh/h	0	485	10	0	500	25	0	0	10	0	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	5	5	5	4	4	4	35	35	35	3	3	3
Mvmt Flow	0	557	11	0	575	29	0	0	11	0	0	17

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	-	0	0	-	-	0	-	-	563	-	-	590
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.55	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.615	-	-	3.327
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	468	0	0	506
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	468	-	-	506
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	12.9	12.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	468	-	-	-	-	506
HCM Lane V/C Ratio	0.025	-	-	-	-	0.034
HCM Control Delay (s)	12.9	-	-	-	-	12.4
HCM Lane LOS	B	-	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.1

**Intersection**

Int Delay, s/veh 2.9

**Movement** EBL EBT WBT WBR SBL SBR

Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	20	215	273	82	90	25
Future Vol, veh/h	20	215	273	82	90	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	4	4	8	8	6	6
Mvmt Flow	23	247	314	94	103	29

**Major/Minor** Major1 Major2 Minor2

Conflicting Flow All	408	0	-	0	654	361
Stage 1	-	-	-	-	361	-
Stage 2	-	-	-	-	293	-
Critical Hdwy	4.14	-	-	-	6.46	6.26
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	2.236	-	-	-	3.554	3.354
Pot Cap-1 Maneuver	1140	-	-	-	425	675
Stage 1	-	-	-	-	696	-
Stage 2	-	-	-	-	748	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1140	-	-	-	415	675
Mov Cap-2 Maneuver	-	-	-	-	415	-
Stage 1	-	-	-	-	680	-
Stage 2	-	-	-	-	748	-

**Approach** EB WB SB

HCM Control Delay, s	0.7	0	16.2
HCM LOS			C

**Minor Lane/Major Mvmt** EBL EBT WBT WBR SBLn1

Capacity (veh/h)	1140	-	-	-	453
HCM Lane V/C Ratio	0.02	-	-	-	0.292
HCM Control Delay (s)	8.2	0	-	-	16.2
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	1.2



Intersection						
Int Delay, s/veh	1.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Traffic Vol, veh/h	370	0	0	374	7	93
Future Vol, veh/h	370	0	0	374	7	93
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	8	8	5	5	11	11
Mvmt Flow	425	0	0	430	8	107

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	-	-	855	425
Stage 1	-	-	-	425	-
Stage 2	-	-	-	430	-
Critical Hdwy	-	-	-	6.51	6.31
Critical Hdwy Stg 1	-	-	-	5.51	-
Critical Hdwy Stg 2	-	-	-	5.51	-
Follow-up Hdwy	-	-	-	3.599	3.399
Pot Cap-1 Maneuver	-	0	0	317	610
Stage 1	-	0	0	641	-
Stage 2	-	0	0	637	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	317	610
Mov Cap-2 Maneuver	-	-	-	317	-
Stage 1	-	-	-	641	-
Stage 2	-	-	-	637	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	573	-	-
HCM Lane V/C Ratio	0.201	-	-
HCM Control Delay (s)	12.9	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.7	-	-

# HCS7 Roundabouts Report

General Information				Site Information			
Analyst	Matt Flanagan			Intersection	E Liberty/S Madison		
Agency or Co.	SRF Consulting Group			E/W Street Name	E Liberty Ave		
Date Performed	11/18/2019			N/S Street Name			
Analysis Year	2019			Analysis Time Period (hrs)	0.25		
Time Analyzed	2040 AM - Option 3			Peak Hour Factor	0.88		
Project Description				Jurisdiction			

## Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0
Lane Assignment			TR				LT				LR					
Volume (V), veh/h	0		190	105	0	273	255		0	98		363				
Percent Heavy Vehicles, %	0		8	11	0	11	8		0	8		8				
Flow Rate (v <sub>PCE</sub> ), pc/h	0		233	132	0	344	313		0	120		446				
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1							
Pedestrians Crossing, p/h	0				0				0							

## Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.2000			4.2000			4.2000				
Follow-Up Headway (s)		2.8000			2.8000			2.8000				

## Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v <sub>e</sub> ), pc/h		365.00			657.00			566.00				
Entry Volume veh/h		334.66			599.72			524.07				
Circulating Flow (v <sub>c</sub> ), pc/h		344			120			233			777	
Exiting Flow (v <sub>ex</sub> ), pc/h		679			433			0			476	
Capacity (c <sub>PCE</sub> ), pc/h		983.89			1171.14			1072.61				
Capacity (c), veh/h		902.10			1069.05			993.15				
v/c Ratio (x)		0.37			0.56			0.53				

## Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		8.2			10.4			10.2				
Lane LOS		A			B			B				
95% Queue, veh		1.7			3.6			3.2				
Approach Delay, s/veh	8.2			10.4			10.2					
Approach LOS	A			B			B					
Intersection Delay, s/veh   LOS	9.8						A					

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↻			↻				↻			↻
Traffic Vol, veh/h	0	550	10	0	505	10	0	0	10	0	0	15
Future Vol, veh/h	0	550	10	0	505	10	0	0	10	0	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	8	8	8	7	7	7	50	50	50	12	12	12
Mvmt Flow	0	647	12	0	594	12	0	0	12	0	0	18

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	-	0	0	-	-	0	-	-	653	-	-	600
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.7	-	-	6.32
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.75	-	-	3.408
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	392	0	0	483
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	392	-	-	483
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		0		14.5		12.7	
HCM LOS					B		B	

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	392	-	-	-	-	483
HCM Lane V/C Ratio	0.03	-	-	-	-	0.037
HCM Control Delay (s)	14.5	-	-	-	-	12.7
HCM Lane LOS	B	-	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.1

Intersection						
Int Delay, s/veh	3.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Traffic Vol, veh/h	31	204	250	79	120	15
Future Vol, veh/h	31	204	250	79	120	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	2	4	4
Mvmt Flow	36	237	291	92	140	17

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	383	0	-	0	646 337
Stage 1	-	-	-	-	337 -
Stage 2	-	-	-	-	309 -
Critical Hdwy	4.12	-	-	-	6.44 6.24
Critical Hdwy Stg 1	-	-	-	-	5.44 -
Critical Hdwy Stg 2	-	-	-	-	5.44 -
Follow-up Hdwy	2.218	-	-	-	3.536 3.336
Pot Cap-1 Maneuver	1175	-	-	-	433 701
Stage 1	-	-	-	-	719 -
Stage 2	-	-	-	-	740 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1175	-	-	-	418 701
Mov Cap-2 Maneuver	-	-	-	-	418 -
Stage 1	-	-	-	-	694 -
Stage 2	-	-	-	-	740 -

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	17.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1175	-	-	-	438
HCM Lane V/C Ratio	0.031	-	-	-	0.358
HCM Control Delay (s)	8.2	0	-	-	17.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	1.6

Intersection						
Int Delay, s/veh	1.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Traffic Vol, veh/h	340	0	0	390	14	76
Future Vol, veh/h	340	0	0	390	14	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	5	5	5	5	7	7
Mvmt Flow	420	0	0	481	17	94

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	-	-	-	901 420
Stage 1	-	-	-	-	420 -
Stage 2	-	-	-	-	481 -
Critical Hdwy	-	-	-	-	6.47 6.27
Critical Hdwy Stg 1	-	-	-	-	5.47 -
Critical Hdwy Stg 2	-	-	-	-	5.47 -
Follow-up Hdwy	-	-	-	-	3.563 3.363
Pot Cap-1 Maneuver	-	0	0	-	302 623
Stage 1	-	0	0	-	652 -
Stage 2	-	0	0	-	611 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	302 623
Mov Cap-2 Maneuver	-	-	-	-	302 -
Stage 1	-	-	-	-	652 -
Stage 2	-	-	-	-	611 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	535	-	-
HCM Lane V/C Ratio	0.208	-	-
HCM Control Delay (s)	13.5	-	-
HCM Lane LOS	B	-	-
HCM 95th %tile Q(veh)	0.8	-	-

# HCS7 Roundabouts Report

General Information				Site Information			
Analyst	Matt Flanagan			Intersection	E Liberty/S Madison		
Agency or Co.	SRF Consulting Group			E/W Street Name	E Liberty Ave		
Date Performed	11/18/2019			N/S Street Name			
Analysis Year	2019			Analysis Time Period (hrs)	0.25		
Time Analyzed	2040 PM - Option 3			Peak Hour Factor	0.79		
Project Description				Jurisdiction			

## Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0
Lane Assignment			TR				LT				LR					
Volume (V), veh/h	0		169	155	0	0	0		0	0		274				
Percent Heavy Vehicles, %	5		5	5	5	3	5		3	3		3				
Flow Rate (v <sub>PCE</sub> ), pc/h	0		225	206	0	0	0		0	0		357				
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1							
Pedestrians Crossing, p/h	0				0				0							

## Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.2000			4.2000			4.2000				
Follow-Up Headway (s)		2.8000			2.8000			2.8000				

## Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v <sub>e</sub> ), pc/h		431.00			0.00			357.00				
Entry Volume veh/h		410.48			0.00			346.60				
Circulating Flow (v <sub>c</sub> ), pc/h	0			0			225			0		
Exiting Flow (v <sub>ex</sub> ), pc/h	582			0			0			206		
Capacity (c <sub>PCE</sub> ), pc/h		1285.71			1285.71			1079.30				
Capacity (c), veh/h		1224.49			1230.43			1047.87				
v/c Ratio (x)		0.34			0.00			0.33				

## Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.1			2.9			6.8				
Lane LOS		A			A			A				
95% Queue, veh		1.5			0.0			1.5				
Approach Delay, s/veh	6.1						6.8					
Approach LOS	A						A					
Intersection Delay, s/veh   LOS	6.4						A					

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↻			↻				↻			↻
Traffic Vol, veh/h	0	505	25	0	500	25	0	0	10	0	0	15
Future Vol, veh/h	0	505	25	0	500	25	0	0	10	0	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	5	5	5	4	4	4	35	35	35	3	3	3
Mvmt Flow	0	580	29	0	575	29	0	0	11	0	0	17

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	-	0	0	-	-	0	-	-	595	-	-	590
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.55	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.615	-	-	3.327
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	448	0	0	506
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	448	-	-	506
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	13.2	12.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	448	-	-	-	-	506
HCM Lane V/C Ratio	0.026	-	-	-	-	0.034
HCM Control Delay (s)	13.2	-	-	-	-	12.4
HCM Lane LOS	B	-	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.1