

TRAFFIC IMPACT ANALYSIS

Grandview Commons Town Center
City of Madison
Dane County, WI

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INTRODUCTION

The proposed Grandview Commons Town Center Development is a mixed-use development on the far eastside of the City of Madison in Dane County, WI. It includes a grocery store and a public library as well as mixed commercial, office and residential. This project is located on the north side of Cottage Grove Road between North Star Drive and McLean Drive in the Grandview Commons Development in the Sprecher neighborhood. It consists of approximately 15 acres on what is currently mostly vacant land but also includes the former Doric Lodge Site. Also included as part of this study is a combined commercial/office/residential building on the northwest corner of the intersection of North Star Drive & Jupiter Drive/Sharpsburg Drive and eighteen single family homes just east of the proposed Town Center.

The purpose of this study is to determine the impact of this proposed development on the existing street system. As requested by the City of Madison Traffic Engineering Division, individual intersections evaluated include:

- Cottage Grove Road and North Star Drive
- Cottage Grove Road and McLean Drive
- Cottage Grove Road and the proposed development access points
- North Star Drive, Sharpsburg Drive and Jupiter Drive
- Sharpsburg Drive, Gemini Drive and the proposed development access
- Sharpsburg Drive and McLean Drive

The objective of this report is to analyze the existing and future roadway operations and make recommendations for geometric or traffic control improvements to help ensure the safe and efficient movement of traffic at the above named intersections, as well as evaluating the pedestrian, bicycle and transit accommodations in the area. Analyses of the street system were completed for the PM peak hour for existing conditions (2011), full build out (2017), and full build out plus fifteen years (2032). In addition to individual intersection evaluations, the roadway network was evaluated as a whole with particular attention paid to the interaction between intersections along Cottage Grove Road.

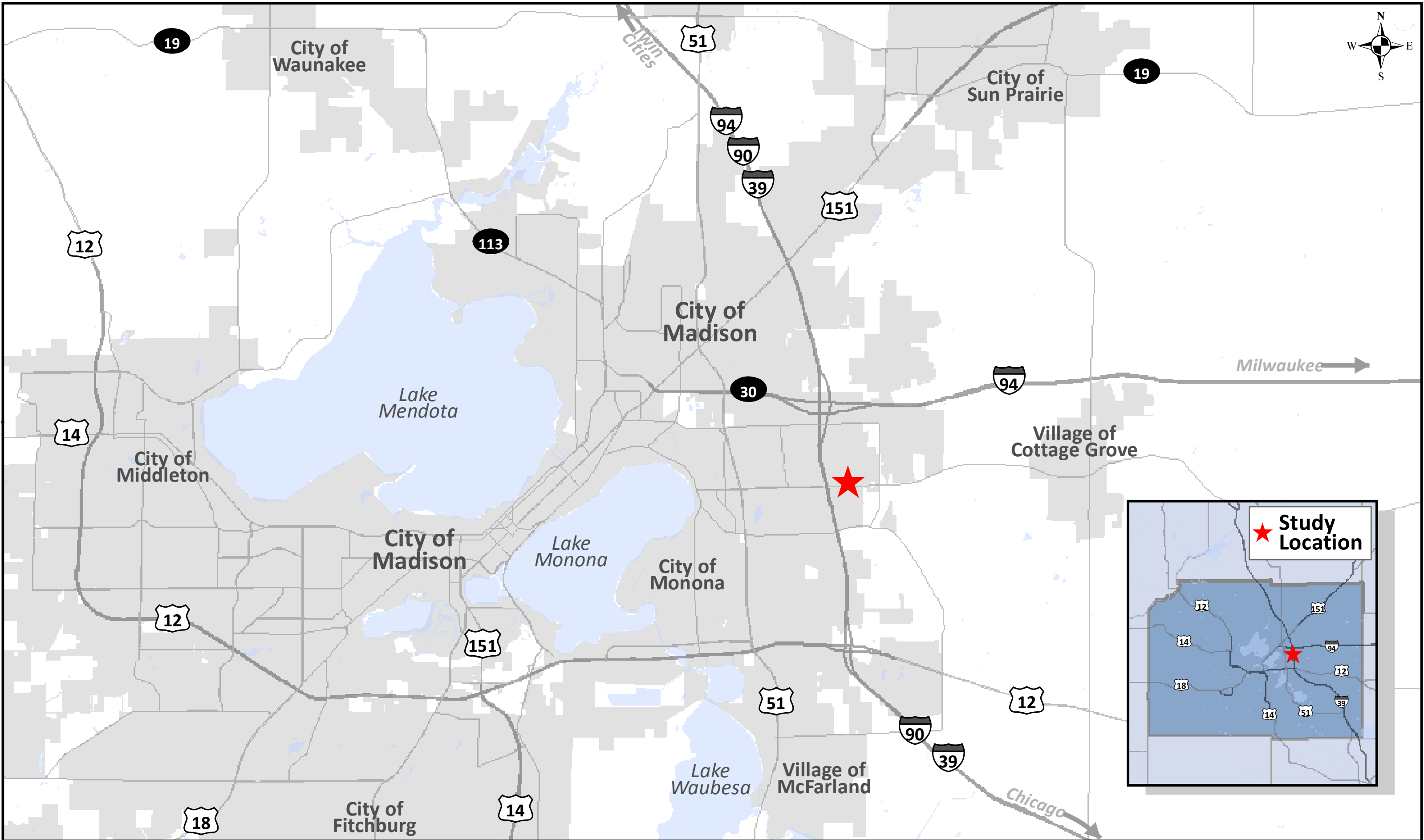
PROPOSED DEVELOPMENT

The Grandview Commons Town Center proposed development includes a 58,000 square foot (SF) Grocery Store, a 24,000 SF two-story public library and approximately 27,500 additional SF of specialty retail/small restaurants in six other buildings ranging in size from 2,500 to 9,000 first floor square feet. A combination of office and residential is proposed for the second floors of some buildings with up to seventy residential units or 8,500 square feet of office space possibly included. An additional 15,000 SF of commercial/office and 45 residential units is planned in a building to the northwest (building E-1) and 18 single family homes are planned to the east. This project is planned to be developed over five years with the grocery store anticipated to open in 2012, the Library budgeted for 2014 and the remaining parcels expected to follow based on market demand. For purposes of this study, full development was assumed by 2017. A site location map of the proposed development is included as Exhibit 1 and a Concept Plan is included as Exhibit 2.

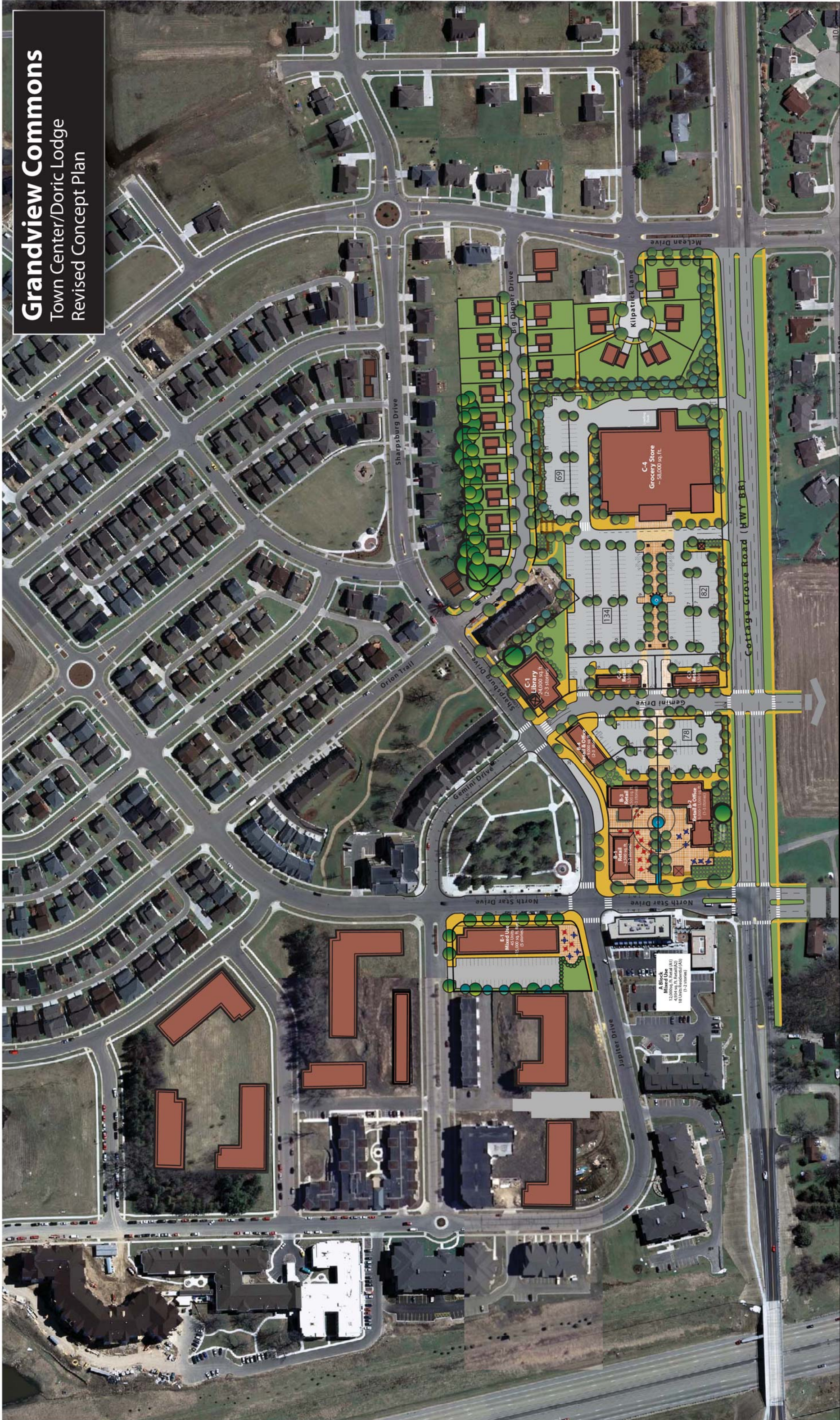
Land uses surrounding the proposed Town Center include the Grandview Commons residential development to the north and east, the Richmond Hill Residential Development and the Schoenstatt Sisters of Mary Property to the south, and Grandview Commons mixed use properties to the west. The Richmond Hill area is fully developed; however, the Grandview Commons area is not fully developed at this time. Currently there are no plans for a change in use of the Schoenstatt Sisters property to the south.

There are four access points proposed for the Town Center including three access points onto Cottage Grove Road and one access point as an extension of Gemini Drive at its intersection with Sharpsburg Drive. All three proposed access points on Cottage Grove Road, including one intended specifically for truck traffic, allow right turns in and out of the development as well as left turns into the development, but left turns out of the development would only be allowed at the west access. This access is intended to be a public street which extends from Sharpsburg Drive as an extension of Gemini Drive to Cottage Grove Road. A full median break which will allow for all turning movements on and off the extension of Gemini Drive is proposed at the intersection with Cottage Grove Road.

Access to Building E-1 will be on Gemini Drive west of North Star Drive. The single family homes will be constructed on a newly proposed connection of Big Dipper Drive between Sharpsburg Drive and McLean Drive and on Kilpatrick Lane, which is proposed to be a cul-de-sac east of McLean Drive.



Grandview Commons
Town Center/Doric Lodge
Revised Concept Plan



EXISTING CONDITIONS

Cottage Grove Road

Cottage Grove Road (CTH AB) is a primary arterial street connecting the City of Madison west of Interstate Highway 39/90 with development in Madison east of the interstate and the Village of Cottage Grove. It currently has a variable cross section with two to four lanes of travel. West of Interstate 39/90, it is a four lane divided urban roadway narrowing to two lanes at the bridge over the interstate. East of the interstate, it has a rural cross section with one travel lane in each direction and turn lanes approaching each intersection. There is intermittent sidewalk on both sides of Cottage Grove Road between the interstate and Sprecher Road, the first arterial street east of the interstate. The intersection of Sprecher Road and Cottage Grove Road is controlled by a traffic signal and is approximately 4,200 feet east of the interstate bridge. The City of Madison plans to widen Cottage Grove Road to four lanes in 2015 between the current four lane segment west of the Interstate and Sprecher Road. Expansion of the bridge over the interstate to four lanes is planned to be included as part of this proposed reconstruction. A preliminary cross section obtained from the City of Madison for this project includes an eighteen foot center median, two eleven foot travel lanes and a bicycle lane in each direction, and sidewalk on both sides of Cottage Grove Road. A ten foot multi-use path is shown on the City's preliminary cross section as a possible alternative to sidewalk on the north side of Cottage Grove Road. Sidewalk is currently planned for the north side of Cottage Grove Road as part of the Town Center Development.

North Star Drive, Sharpsburg Drive and McLean Drive

All three of these roadways are classified as collector streets. North Star Drive is a 46 foot wide roadway while Sharpsburg Drive and McLean Road are both 36 feet wide. North Star Drive currently extends from Cottage Grove Road to the north for over one-half mile to north of Dominion Drive. Plans are for North Star Drive to continue north and eventually connect to Milwaukee Street. An extension of North Star Drive south of Cottage Grove Road is also considered a possibility if and when the property south of Cottage Grove Road develops, resulting in a possible future four legged intersection with Cottage Grove Road.

Sharpsburg Drive is an east – west residential collector street and extends from the western edge of the neighborhood as Jupiter Drive becoming Sharpsburg Drive at the intersection with North Star Drive. It then extends to the eastern edge of Grandview Commons intersecting with Sprecher Road approximately three quarter mile east of North Star Drive. From Sprecher Road it continues into the adjacent neighborhood as Wyalusing Drive.

McLean Drive is a north – south residential collector street serving the Richmond Hill residential development to the south as well as the Grandview Commons neighborhood. It extends approximately one half mile to the north from Cottage Grove Road and ends in a tee intersection with North Star Drive.

PROJECTED TRAFFIC

Background Traffic

Existing hourly counts for Cottage Grove Road, Sharpsburg Drive, McLean Drive and North Star Drive were obtained from the City of Madison. In addition, KL Engineering conducted peak hour turning movement traffic counts at the Cottage Grove Road intersections with North Star Drive and McLean Drive and the North Star Drive intersection with Sharpsburg Drive/Jupiter Drive and McLean Drive. Growth rate factors were discussed with the City of Madison and it was determined that a growth rate factor between two and four percent would be appropriate. Four percent is higher than for most locations but seemed realistic here through 2017 because Grandview Commons is not yet completed. Therefore a four percent growth rate was used to project traffic to 2017. After 2017, a two percent growth factor was used. This reflects more complete development in the area and results in the projections being more consistent with Madison MPO projections to 2035. Copies of these counts and projections are included in Appendix A.

Trip Generation

Trip generation rates were determined by using average trip generation rates obtained from the Institute of Transportation Engineers (ITE) report, Trip Generation, 8th Edition, published by the Institute of Transportation Engineers (ITE) in 2008. This publication is based on more than 4,800 trip generation studies submitted to the Institute by public agencies, developers, consulting firms, and associations. A trip is defined as a single or one-directional movement, with either the origin or destination of the trip being from the proposed development. The trip generation categories from the ITE Trip Generation Manual considered for this project were: Land Use 210, Single-Family Detached Housing; Land Use 220, Apartment; Land Use 590, Library; Land Use 710, General Office Building; Land Use 814, Specialty Retail Center; Land Use 850, Supermarket; Land Use 932, High-Turnover (Sit-Down) Restaurant; Land Use 933, Fast-Food Restaurant without Drive-Through Window; and Land Use 936, Coffee/Donut Shop without Drive-Through Window.

Trip generation rates for the individual uses were determined based on the ITE rates and combined based on location. Some of the traffic for the new development will be making multiple stops in the development and some trips will be internal to the development and will not require the use of the street system. Therefore, the total trips were reduced by 10% to 20%, based on use, to reflect these multiple-use and internal trips.

In addition, some of the trips to the retail areas will be “pass-by trips” which are defined by the ITE Handbook “as intermediate stops on the way from an origin to a primary trip destination without a route diversion. Pass-By trips are attracted from traffic passing the site on an adjacent street or roadway that offers direct access to the generator. Pass-by trips are not diverted from another roadway.” These pass-by trips will not be new trips to the surrounding streets, but they were included as new trips at the development access points. A pass-by rate of 30% was assumed for the coffee/donut shop, 20% for the Supermarket, Restaurants and Specialty Retail Center, and 10% for the Library with no pass-by rate assumed for the single family homes, apartments or offices. Both the

multi-use reduction and the pass-by adjustments are consistent with ITE standards and are as discussed and agreed upon with the City of Madison Traffic Engineering staff.

Reduction for Multi-Modal Transportation Uses

In addition to the above reductions, a 10% reduction was taken for multi-modal uses. Grandview Commons has been planned as a “new traditional neighborhood” and is being implemented as a “mixed-use walkable neighborhood.” The Town Center was conceived as a center for neighborhood activities and the smaller retail uses are planned to be tailored to neighborhood uses. Currently, with the exception of Cottage Grove Road, there are sidewalks along all streets in the area and the proposed project is planned to be pedestrian friendly with a main sidewalk traversing the parking lot and a pedestrian plaza at the west end near the proposed specialty retail uses. Sidewalk on Cottage Grove Road will be completed as part of this project or the reconstruction project. Bicycle lanes on both sides of Cottage Grove Road are planned as part of the Cottage Grove Road reconstruction scheduled for 2015. The neighborhood roadways in the area are bicycle friendly. The combination of these factors and the City of Madison’s stated goals of increased use of alternative modes of transportation indicate that a 10% reduction for multi-modal uses is reasonable and these reductions were agreed upon with the City of Madison Traffic Engineering staff.

A summary of the trip generation for this development, for an average daily weekday, PM peak hour, and AM peak hour; including the reduction for combined trips, pass-by trips, and multi-modal trips is included on the following pages. Because traffic was distributed to the street system differently for the different development areas, the Town Center, Building E-1, and the single family homes are categorized on the trip generation sheet.

After the above reductions are applied, the proposed development is anticipated to generate a total of 8,705 trips on an average weekday with 870 of these trips in the PM peak hour and 509 in the AM peak hour. Approximately 1,566 of the daily trips are anticipated to be “pass-by” trips and approximately 7,139 are anticipated to be “new” trips. One hundred fifty of the PM peak hour trips are anticipated to be “pass-by” trips and approximately 720 of the PM peak hour trips are anticipated to be “new” trips. In the AM peak hour, approximately 96 of the trips are anticipated to be “pass-by” trips and approximately 412 are anticipated to be new trips.

GRANDVIEW COMMONS
TRIP GENERATION SUMMARY
AVERAGE DAILY TRAFFIC

Buildings B and C Block																	
Building Number	Land Use	Independent Variable	Ind. Variable Full Build Out 2017	Rate	Number of Trips	Multi-Use Alt. Mode Reduction	Total Trips After Reductions	Split Entering/Exiting %	Split Exiting %	No. Entering	No. Exiting	Pass-By Reduction %	Pass-By Trips	Pass-By Entering	Pass-By Exiting	New Trips Entering	New Trips Exiting
B-1	814	Specialty Retail Center	1,000SF	2.5	44.32	111	20%	10%	80	50%	40	20%	16	8	8	32	32
B-2	814	Specialty Retail Center	1,000SF	9	44.32	399	20%	10%	287	50%	144	20%	57	29	29	115	115
B-2	710	General Office Building	1,000SF	4	11.01	44	20%	10%	32	50%	16	0%	0	0	0	16	16
B-3	936	Coffee/Donut Shop without Drive-Through Window	1,000SF	1	818.58	819	20%	10%	589	50%	295	30%	177	88	88	206	206
B-3	932	High-Turnover (Sit-Down) Restaurant	1000SF	3.5	127.15	445	20%	10%	320	50%	160	20%	64	32	32	128	128
B-3	220	Apartment	Dwelling Units	20	6.65	133	10%	10%	108	50%	54	0%	0	0	0	54	54
B-4	814	Specialty Retail Center	1,000SF	4.5	44.32	199	20%	10%	144	50%	72	20%	29	14	14	57	57
B-4	220	Apartment	Dwelling Units	20	6.65	133	10%	10%	108	50%	54	0%	0	0	0	54	54
C-1	590	Library	1,000SF	24	56.24	1350	20%	10%	972	50%	486	10%	97	49	49	437	437
C-2	933	Fast-Food Restaurant without Drive-Through Window	1,000SF	3.5	250.00	875	20%	10%	630	50%	315	20%	126	63	63	252	252
C-3	814	Specialty Retail Center	1,000SF	3.5	44.32	155	20%	10%	112	50%	56	20%	22	11	11	45	45
C-4	850	Supermarket	1,000SF	58	102.24	5930	20%	10%	4270	50%	2135	20%	854	427	427	1708	1708
SUBTOTAL						10,593			7,651		3,825		1,442	721	721	3,104	3,104
TOTAL NEW TRIPS (Town Center)																	6,208

Building E-1 (Northwest corner of North Star Drive and Jupiter Drive)

Building Number	Land Use	Ind. Variable	Ind. Variable Full Build Out 2017	Rate	Number of Trips	Multi-Use Alt. Mode Reduction	Total Trips After Reduction	Split Entering/Exiting %	Split Exiting %	No. Entering	No. Exiting	Pass-By Reduction %	Pass-By Trips	Pass-By Entering/Exiting	New Trips Entering/Exiting
E-1	814	Specialty Retail Center	1,000 SF	5	44.32	222	20%	10%	160	50%	80	20%	32	16	64
E-1	710	General Office Building	1,000 SF	5	11.01	55	20%	10%	40	50%	20	0%	0	0	20
E-1	932	High-Turnover (Sit-Down) Restaurant	1000 SF	5	127.15	636	20%	10%	458	50%	229	20%	92	46	183
E-1	220	Apartment	Dwelling Units	45	6.65	299	10%	10%	242	50%	121	0%	0	0	121
SUBTOTAL										450	450		123	62	388
TOTAL NEW TRIPS (Building E-1)														62	776

Single Family Homes (Big Dipper Drive & Kilpatrick Lane)

Building Number	Land Use	Ind. Variable	Ind. Variable Full Build Out 2017	Rate	Number of Trips	Multi-Use Alt. Mode Reduction	Total Trips After Reduction	Split Entering/Exiting %	Split Exiting %	No. Entering	No. Exiting	Pass-By Reduction %	Pass-By Trips	Pass-By Entering/Exiting	New Trips Entering/Exiting
N/A	210	Single-Family Detached Housing	Dwelling Units	18	9.57	172	10%	10%	155	50%	78	0%	0	0	78
TOTAL NEW TRIPS (Single Family Homes)														0	155

Total Trips
All Buildings and Uses
Average Daily Traffic

Total Trips After Reductions	No. Entering	No. Exiting	Pass-By Reduction No.	Pass-By Entering	Pass-By Exiting	New Trips Non	Pass-by Entering	Non Pass-by Exiting
8,705	4,352	4,352		783	783		3,570	3,570
TOTAL NEW TRIPS								
							7,139	

GRANDVIEW COMMONS
TRIP GENERATION SUMMARY
AM PEAK HOUR

Buildings B and C Block																		
Building Number	Land Use	Ind. Variable Full Build Out 2017	Rate	Number of Trips	Multi-Use Reduction	Alt. Mode Reduction	Total Trips After Reductions	Split Entering/Exiting %	Split Exiting %	No. Entering	No. Exiting	Pass-By Reduction %	Pass-By Trips	Pass-By Entering	Pass-By Exiting	New Trips Entering	New Trips Exiting	
B-1	931	Specialty Retail Center	2.5	1.03	3	20%	10%	2	61%	39%	1	1	20%	0	0	1	2	
B-2	814	Specialty Retail Center	9	1.03	9	20%	10%	7	61%	39%	4	3	20%	1	1	3	2	
B-2	710	General Office Building	4	1.55	6	20%	10%	4	88%	12%	4	1	0%	0	0	4	1	
B-3	936	Coffee/Donut Shop without Drive-Through Window	1	117.23	117	20%	10%	84	51%	49%	43	41	30%	25	13	30	29	
B-3	932	High-Turnover (Sit-Down) Restaurant	3.5	11.52	40	20%	10%	29	52%	48%	15	14	20%	6	3	12	11	
B-3	220	Apartment	20	0.51	10	10%	10%	8	20%	80%	2	7	0%	0	0	2	7	
B-4	814	Specialty Retail Center	4.5	1.03	5	20%	10%	3	61%	39%	2	1	20%	1	0	2	1	
B-4	220	Apartment	20	0.51	10	10%	10%	8	20%	80%	2	7	0%	0	0	2	7	
C-1	590	Library	24	1.04	25	20%	10%	18	71%	29%	13	5	10%	2	1	12	4	
C-2	933	Fast-Food Restaurant without Drive-Through Window	3.5	43.87	154	20%	10%	111	60%	40%	66	44	20%	22	11	55	33	
C-3	814	Specialty Retail Center	3.5	1.03	4	20%	10%	3	61%	39%	2	1	20%	1	0	1	1	
C-4	850	Supermarket	58	3.59	208	20%	10%	150	61%	39%	91	58	20%	30	15	76	43	
SUBTOTAL					591			427		245	183		88	44	44	201	139	
TOTAL NEW TRIPS (AM Peak Hour)																	339	

Building E-1 (Northwest corner of North Star Drive and Jupiter Drive					
Building Number	Land Use	Independent Variable	Ind. Variable Full Build Out 2017	Rate	
E-1	814	Specialty Retail Center	1,000 SF	5	1.03
E-1	710	General Office Building	1,000 SF	5	1.55
E-1	932	High-Turnover (Sit-Down) Restaurant	1,000 SF	5	11.52
E-1	220	Apartment	Dwelling Units	45	0.51
					SUBTOTAL

Single Family Homes (Big Dipper Drive & Kilpatrick Lane)																
Building Number	Land Use	Ind. Variable	Ind. Variable Full Build Out	Rate	Number of Trips	Multi-Use Reduction	Alt. Mode Reduction	Total Trips After Reductions	Split Entering/Exiting %	Split Exiting %	No. Entering	No. Exiting	Pass-By Reduction %	Pass-By Trips	Pass-By Entering/Exiting	New Trips Entering/Exiting
N/A	210	Single-Family Detached Housing	Dwelling Units	18	0.75	14	10%	12	25%	75%	3	9	0%	0	0	3
TOTAL NEW TRIPS (Single Family Homes)															12	

Total Trips
All Buildings and Uses
AM Peak Hour

Total Trips After Reductions	No. Entering	No. Exiting	Pass-By Reduction No.	Pass-By Entering	Pass-By Exiting	New Trips Entering	New Trips Exiting
509	280	229	97	48	48	232	180
TOTAL NEW TRIPS							
						412	

**GRANDVIEW COMMONS
TRIP GENERATION SUMMARY
PM PEAK HOUR**

Buildings B and C Block																
Building Number	Land Use Code	Land Use	Ind. Variable Full Build Out 2017	Number of Trips	Multi-Use Alt. Mode Reduction	Total Trips After Reductions	Split Entering/ %	Split Exiting %	No. Entering	No. Exiting	Pass-By Trips	Pass-By Entering	Pass-By Exiting	New Trips Entering	New Trips Exiting	
B-1	814	Specialty Retail Center	2.5	19	20%	13	44%	56%	6	8	3	1	1	5	6	
B-2	814	Specialty Retail Center	9	24	20%	18	44%	56%	8	10	4	2	2	6	8	
B-2	710	General Office Building	4	6	20%	4	17%	83%	1	4	0	0	0	1	4	
B-3	936	Coffee/Donut Shop without Drive-Through Window	1	41	20%	29	50%	50%	15	15	9	4	4	10	10	
B-3	932	High-Turnover (Sit-Down) Restaurant	3.5	11,15	20%	28	59%	41%	17	12	6	3	3	14	9	
B-3	220	Apartment	20	12	10%	10	65%	35%	7	4	0	0	0	7	4	
B-4	814	Specialty Retail Center	4.5	12	20%	9	44%	56%	4	5	2	1	1	3	4	
B-4	220	Apartment	20	12	10%	10	65%	35%	7	4	0	0	0	7	4	
C-1	590	Library	24	175	20%	126	48%	52%	61	66	13	6	6	54	59	
C-2	933	Fast-Food Restaurant without Drive-Through Window	3.5	92	20%	66	51%	49%	34	32	13	7	7	27	26	
C-3	814	Specialty Retail Center	3.5	9	20%	7	44%	56%	3	4	1	1	1	2	3	
C-4	850	Supermarket	58	609	20%	438	51%	49%	224	215	88	44	44	180	171	
			SUBTOTAL	1,051		759			383	376	137	69	69	315	307	
TOTAL NEW TRIPS (PM Peak Hour)														622		
Pass-By Trips														137		

Building E-1 (Northwest corner of North Star Drive and Jupiter Drive)																		
Building Number	Land Use	Ind. Variable Full Build Out	Independent Variable	Rate	Number of Trips	Multi-Use Alt. Mode Reduction	Total Trips After Reductions	Split Entering/ %	Split Exiting %	No. Entering	No. Exiting	Pass-By Reduction %	Pass-By Trips	Pass-By Entering	Pass-By Exiting	New Trips Entering	New Trips Exiting	
E-1	814		1,000 SF	5	7.49	37	10%	27	61%	39%	16	11	20%	5	3	14	8	
E-1	710		1,000 SF	5	1.49	7	20%	5	88%	12%	5	1	0%	0	0	5	1	
E-1	932		1,000 SF	5	11.15	5.6	20%	40	52%	48%	21	19	20%	8	4	17	15	
E-1	220		Dwelling Units	45	0.62	28	10%	23	20%	80%	5	18	0%	0	0	5	18	
				SUBTOTAL		129		95		47	49		13	7	7	40	42	
																	82	
																TOTAL NEW TRIPS (Building E-1)		82

Single Family Homes (Big Dipper Drive & Kilpatrick Lane)																		
Building Use	Land Use	Ind. Variable	Ind. Variable Full Build Out	Rate	Number of Trips	Multi-Use Alt. Mode Reduction	Total Trips After Reductions	Split Entering/Exiting %	Split Exiting %	No. Entering	No. Exiting	Pass-By Reduction %	Pass-By Trips	Pass-By Entering	Pass-By Exiting	New Trips Entering	New Trips Exiting	
N/A	210	Single-Family Detached Housing	Dwelling Units	18	1.01	18	10%	16	63%	37%	10	6	0%	0	0	0	10	6
TOTAL NEW TRIPS (Single Family Homes)																16		

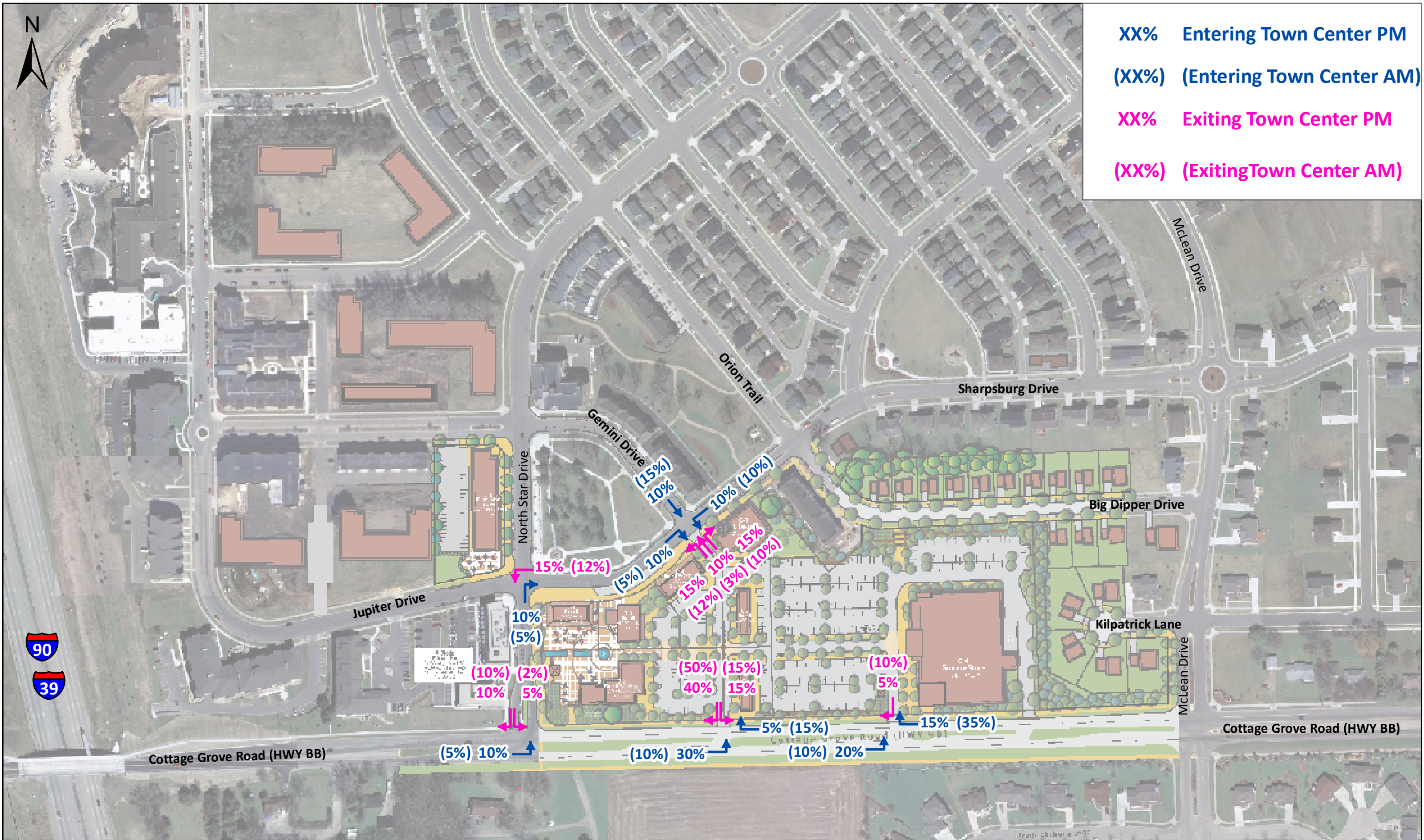
Total Trips			No.	No.		Pass-By	Pass-By		New
After			Entering	Exiting		Trips	Entering	Exiting	Trips
Reductions			440	430		151	75	75	365
870									355
			TOTAL NEW TRIPS						720

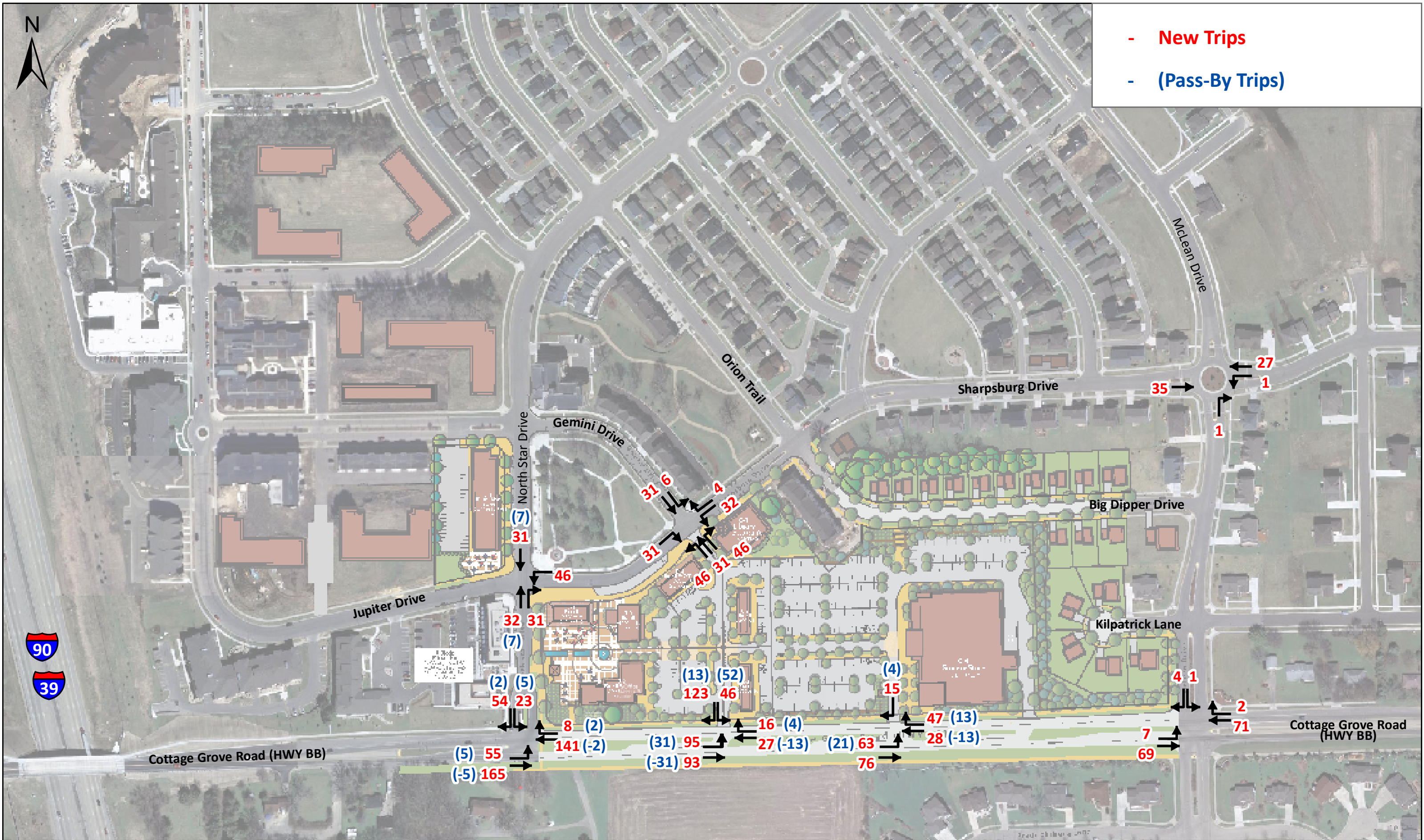
Development Access and Trip Distribution

Access to the proposed Grandview Commons Town Center/Doric Lodge development will be provided by three access points along Cottage Grove Road as well as an access point which will be constructed as the south leg of the Sharpsburg Drive – Gemini Drive intersection.

All three proposed access points along Cottage Grove Road would accommodate right turns in and out of the development as well as left turns into the development. The west median break is proposed to be a full median break with access to a public street into the development and is proposed to connect to Gemini Drive at its intersection with Sharpsburg Drive on the north end of the project. Further east, a partial median break is proposed which would access the front of the grocery store. The eastern most access point is primarily intended to serve trucks servicing the grocery store. A fourth access point is proposed for the intersection of Sharpsburg Drive and Gemini Drive intersection.

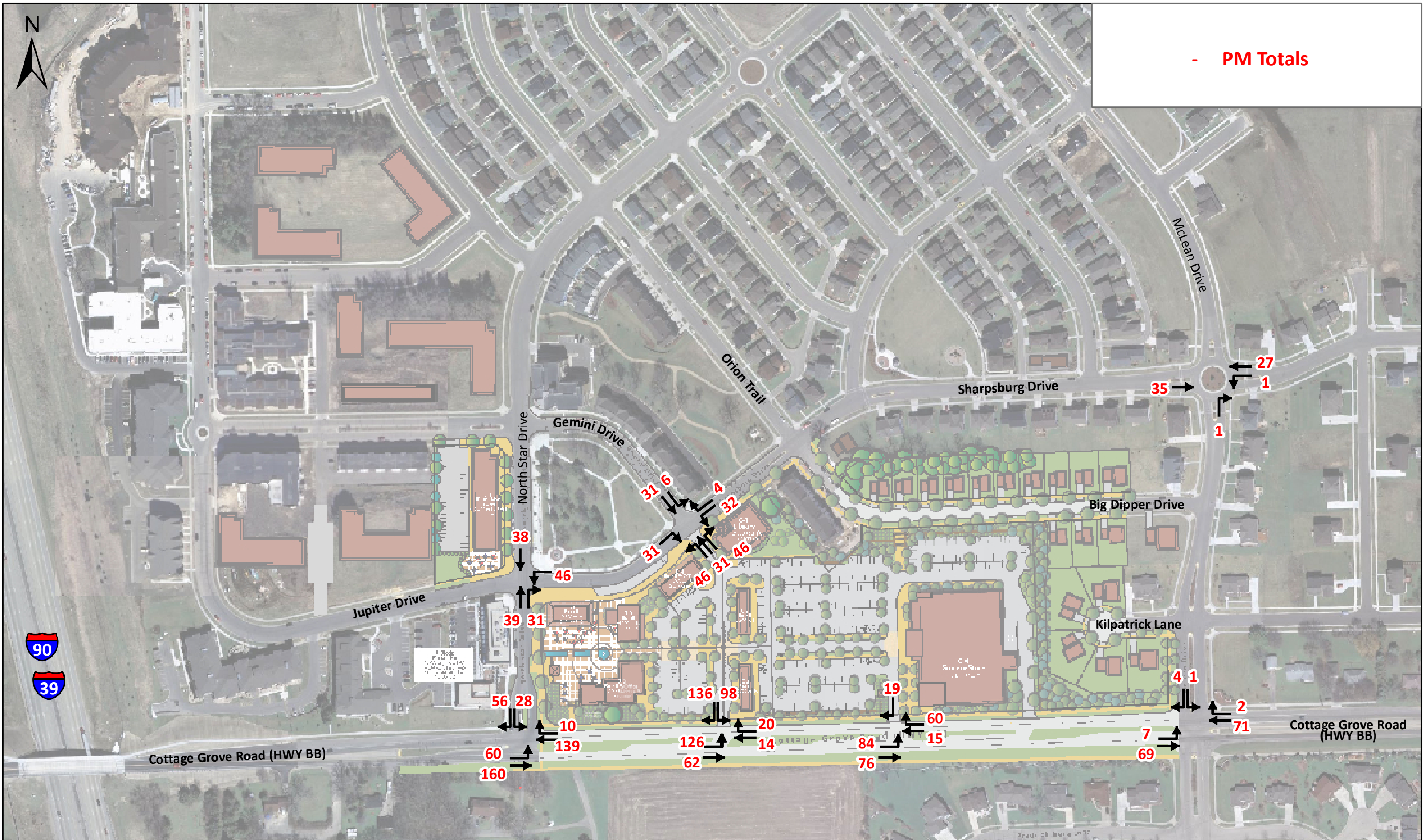
Based on street system geometrics, existing travel patterns, and engineering judgment, trips were assigned to the proposed access points and the existing roadway system. Exhibit 3 summarizes trip distribution percentages during both peak hours. Exhibit 4 breaks down the PM peak hour trips by new trips and pass-by trips and Exhibit 5 summarizes total trips during the PM peak hour for: background traffic in 2017; total traffic, including development traffic, in 2017; and total traffic, including development traffic, in 2032. Trip distribution percentages were reviewed and adjusted based on discussions with the developer and City staff.

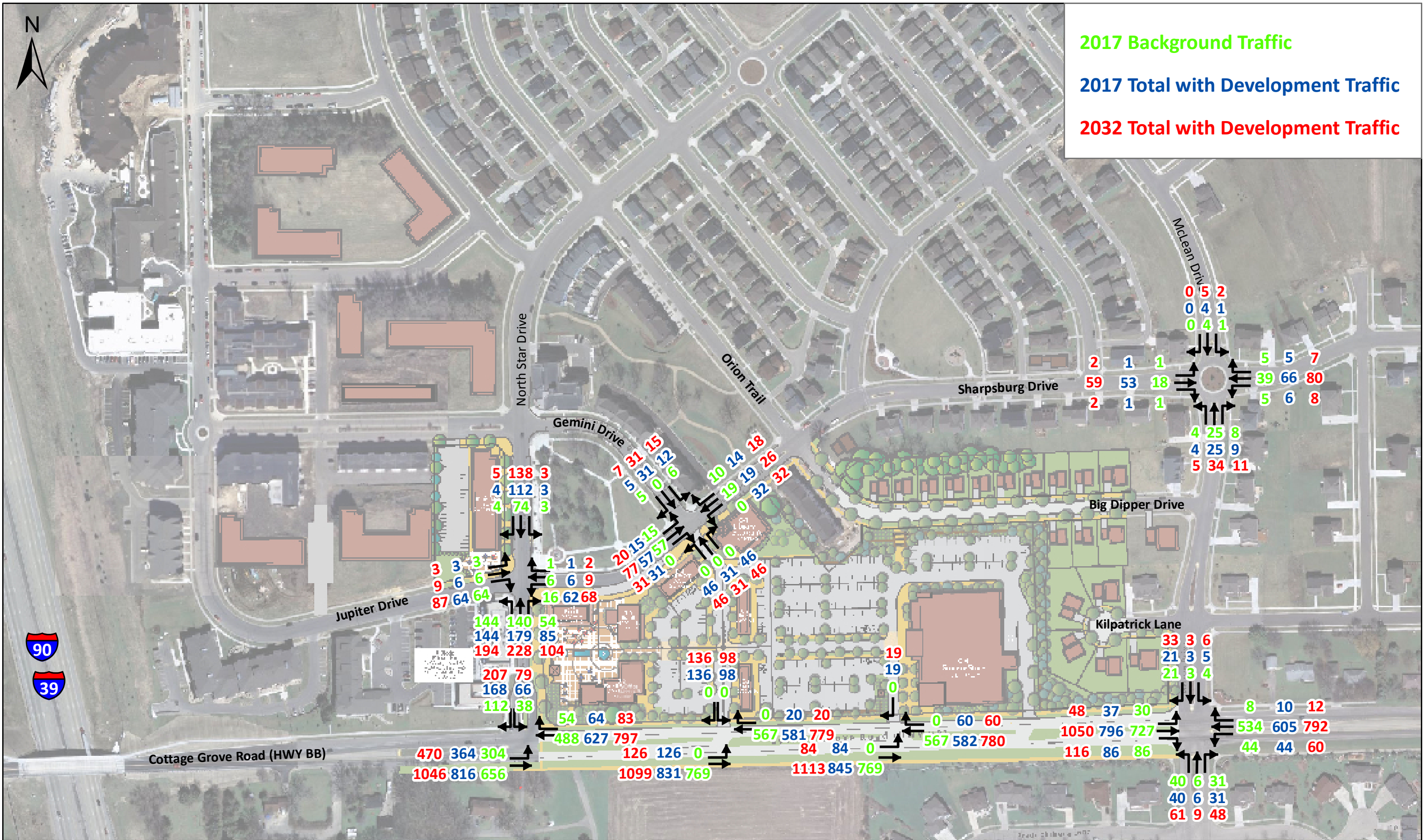




- New Trips
- (Pass-By Trips)







TRAFFIC AND IMPROVEMENT ANALYSES

Capacity analyses were completed for the PM peak hour for the proposed intersections of Cottage Grove Road and North Star Drive, Cottage Grove Road and McLean Drive and Cottage Grove Road with the two main proposed access points. The intersections of North Star Drive with Sharpsburg Drive/Jupiter Drive, Sharpsburg Drive with Gemini Drive/proposed development access, and Sharpsburg Drive and McLean Drive were also evaluated. The PM peak hour was analyzed because it has higher background and development traffic than occurs during the AM peak hour. All analyses were completed using Synchro traffic analysis software. Synchro is based on the methodologies from the Highway Capacity Manual and results in a level of service (LOS) and average delay for intersections as well as for individual approaches and traffic movements. A description of levels of service is provided in Appendix B. In addition, average travel speed and queuing results were determined from Sim Traffic software results. Sim Traffic is a microscopic simulation model that models each vehicle in the network individually (randomly assigning a driver type and a vehicle type to every vehicle as it enters the network). This methodology can provide more accurate speed and queuing results than macroscopic models (Synchro) by factoring in the interactions between adjacent intersections and is therefore better suited to model multiple intersections along a corridor. Synchro and Sim Traffic analyses are included in Appendix C for existing traffic, Appendix D for 2017 projected traffic and existing geometrics, Appendix E for 2017 projected traffic and proposed geometrics, and Appendix F for 2032 projected traffic. A summary of the results of the analyses follows.

Cottage Grove Road and North Star Drive Intersection

The intersection of Cottage Grove Road and North Star Drive is located approximately 900 feet east of the bridge over Interstate Highway 39/90 and is currently a tee intersection which is controlled by a stop sign on the North Star Drive approach. Cottage Grove Road has one through lane in each direction as well as a left turn lane for eastbound traffic and a right turn lane for westbound traffic intending to turn north onto North Star Drive. A single family home private access is on the south side of this intersection. The North Star Drive approach is a one lane roadway which widens at the intersection to provide separate left and right turn lanes and a short center median approximately 80 feet in length. This intersection has been evaluated by the City of Madison Traffic Engineering Department for the installation of traffic signals and plans are to install traffic signals at this location in the next year or two. Additionally, if and when the Schoenstatt property is developed, preliminary plans are to create an access point to the south resulting in a four-legged intersection.

This intersection was analyzed for:

- existing traffic and conditions
- in 2017 with projected traffic, including development traffic; and existing geometrics and stop control
- in 2017 with projected traffic, including development traffic; and existing geometrics and traffic signal
- in 2017 with projected traffic, including development traffic; and proposed geometrics and traffic signal
- in 2032 with projected traffic, including development traffic and an anticipated south approach; and proposed geometrics and traffic signal

Because this intersection may be expanded to the south if and when the property to the south becomes available for development, traffic volumes comparable to the volumes that currently exist on the south leg of the McLean Drive – Cottage Grove intersection were assumed for the 2032 analyses.

The summaries of these analyses are shown in the following table. The analyses show that the southbound approach to this intersection would be anticipated to operate at level of service (LOS) F with full development in 2017 if planned improvements, including the installation of a traffic signal, are not constructed before then. With a traffic signal, the intersection and all of its approaches, including a fourth leg from the south, would be anticipated to operate at or above LOS C through 2032.

The queuing analysis for this intersection shows that the 95th% eastbound left turn queue during the PM peak hour is 220 feet so the eastbound left turn lane on Cottage Grove Road at this intersection should be constructed with a minimum length of 250 feet and a preferred length of 300 feet.

**COTTAGE GROVE ROAD AND NORTH STAR DRIVE
WEEKDAY PM PEAK HOUR**

Intersection	Traffic Control	Eastbound	Westbound	Northbound	Southbound
2011 Existing Traffic Existing Geometrics and Traffic Control	Two-way Stop Control Intersection LOS N/A	Left LOS A 9 sec delay	N/A	N/A	Approach LOS C 16 sec delay
2017 Traffic with development Existing Geometrics and Traffic Control	Two-way Stop Control Intersection LOS N/A	Left LOS B 12 sec delay	N/A	N/A	Approach LOS F 174 sec delay
2017 Traffic with development Existing Geometrics	Traffic Signal Intersection LOS B 17 sec delay	Approach LOS B 13 sec delay Thru LOS C 22 sec delay Right LOS A 9 sec delay	Approach LOS C 25 sec delay Thru/Left LOS C 25 sec delay Right LOS C 20sec delay	Approach LOS C 24 sec delay	Approach LOS B 14 sec delay Left LOS C 28 delay Right A LOS 9 sec delay
2017 Traffic with development Proposed Geometrics Traffic Signal	Traffic Signal Intersection LOS A 10 sec delay	Approach LOS A 7 sec delay Left LOS B 11 sec delay Thru LOS A 5 sec delay	Approach LOS B 15 sec delay Thru/Left LOS B 16 sec delay Right LOS A 5 sec delay	Approach LOS B 17 sec delay	Approach LOS B 10 sec delay Left LOS B 20 sec delay Right LOS A 7 sec delay
2032 Traffic with development Proposed Geometrics	Traffic Signal Intersection LOS B 17 sec delay	Approach LOS B 13 sec delay Thru LOS C 28 sec delay Right LOS A 7 sec delay	Approach LOS C 24 sec delay Left LOS C 26 sec delay Thru LOS A 9 sec delay	Approach LOS C 25 sec delay (assumed volumes from future development)	Approach LOS B 12 sec delay Thru/Left LOS C 24 sec delay Right LOS A 7 sec delay

Cottage Grove Road and development access points

There are three development access points proposed for the development onto Cottage Grove Road, two for general traffic and one intended to serve mostly delivery trucks servicing the grocery store.

The westernmost access is proposed to be a new public street extending from Cottage Grove Road to the north and connecting to Gemini Drive at its intersection with Sharpsburg Drive. This access is proposed to be an entry as well as a two lane exit and is located on Cottage Grove Road approximately 450 feet east of its intersection with North Star Drive. Approximately 400 feet further east is a proposed partial access which would access the front of the proposed grocery store. Right turns would be allowed into and out of this access, but left turns would only be allowed in, not out of the development.

The easternmost access point is proposed to primarily provide truck access to the rear of the grocery store and would serve an estimated 10 to 15 trucks per day. This is proposed to be a partial median break allowing trucks to turn into the driveway at the rear of the store. This access was not specifically evaluated because of the overall very low volume of traffic, specifically during the peak hours. It is located approximately 300 feet east of the center access and approximately 400 feet west of the McLean Drive intersection.

Summaries of the analyses for the two primary Cottage Grove Road access intersections follow. They show that the west full access point (the extension of Gemini Drive) would be anticipated to operate at LOS E during the PM peak hour in 2017 if the planned improvements on Cottage Grove Road are not completed prior to full development. With the planned four lane improvements on Cottage Grove Road, the southbound left turn exiting the new development would be anticipated to operate at LOS D in 2017 and LOS E in 2032 during the PM peak hour. However, if a traffic signal is installed at McLean Road, gaps created by the traffic signal should lessen the delay and improve the LOS for these vehicles.

Traffic turning right to exit the development from both access points is anticipated to operate at LOS B or better during the PM peak hour through 2032. Traffic turning left from Cottage Grove Road into the development is also anticipated to operate at LOS B or better during the PM peak hour through 2032.

Queuing analyses for these intersections indicate that with anticipated traffic on Cottage Grove Road during the PM peak hour in 2032, both eastbound left turn lanes on Cottage Grove Road are anticipated to experience 95% queues approaching 100 feet. Therefore, left turn lanes at all three Cottage Grove Road access points should be constructed at a minimum length of 150 feet.

COTTAGE GROVE ROAD AND EXTENSION OF GEMINI DRIVE WEEKDAY PM PEAK HOUR

Intersection	Traffic Control	Eastbound	Westbound	Northbound	Southbound
2011 Existing Traffic Existing Geometrics and Traffic Control	N/A	N/A	N/A	N/A	N/A
2017 Traffic with development Existing Geometrics	Two-way Stop Control	Left LOS A 10 sec delay	N/A	N/A	Approach LOS E 39 sec delay Left LOS F 71 delay Right LOS C 16 sec delay
2017 Traffic with development Proposed Geometrics	Two-way Stop Control	Left LOS A 10 sec delay	N/A	N/A	Approach LOS C 18 sec delay Left LOS D 27 delay Right LOS B 12 sec delay
2032 Traffic with development Proposed Geometrics	Two-way Stop Control	Left LOS B 11 sec delay	N/A	N/A	Approach LOS C 24 sec delay Left LOS E 38 sec delay Right LOS B 14 sec delay

COTTAGE GROVE ROAD AND EAST DEVELOPMENT ACCESS WEEKDAY PM PEAK HOUR

Intersection	Traffic Control	Eastbound	Westbound	Northbound	Southbound
2011 Existing Traffic Existing Geometrics and Traffic Control	N/A	N/A	N/A	N/A	N/A
2017 Traffic with development Existing Geometrics	Two-way Stop Control	Left LOS A 10 sec delay	N/A	N/A	Right LOS B 13 sec delay
2017 Traffic with development Proposed Geometrics	Two-way Stop Control	Left LOS A 10 sec delay	N/A	N/A	Right LOS B 11 sec delay
2032 Traffic with development Proposed Geometrics	Two-way Stop Control	Left LOS B 11 sec delay	N/A	N/A	Right LOS B 12 sec delay

Cottage Grove Road and McLean Drive Intersection

This intersection is located approximately 1,550 feet east of the North Star Drive intersection and 1,800 feet west of the Sprecher Road intersection with Cottage Grove Road. Existing traffic control consists of stop signs on the McLean Drive approaches. There are single travel lanes with left and right turn lanes in each direction on Cottage Grove Road. The McLean Drive approach from the south has two undesignated approach lanes and the north approach, although lanes are not marked, is 26 feet wide and can easily accommodate two lanes. The City of Madison has evaluated this location for a traffic signal and it currently does not meet warrants. However, the City does plan for the installation of a traffic signal at this intersection when warrants are met.

This intersection was analyzed for:

- existing traffic and conditions
- in 2017 with projected traffic, including development traffic; and existing geometrics and stop control
- in 2017 with 2017 base traffic (development traffic not included), proposed geometrics and stop control
- in 2017 with projected traffic, including development traffic; and proposed geometrics and stop control
- in 2032 with 2032 base traffic (development traffic not included), proposed geometrics and stop control
- in 2032 with projected traffic, including development traffic; and proposed geometrics and stop control
- in 2032 with projected traffic, including development traffic; and proposed geometrics and a traffic signal

The Highway Capacity analyses for this intersection, which were confirmed by field delay studies, show that the northbound approach currently operates at level of service (LOS) C during the PM peak hour. This would be expected to drop to LOS D by 2017 with full development if planned improvements are not completed for Cottage Grove Road. With planned improvements and development traffic, the level of service for the northbound approach is anticipated to be LOS C in 2017 and LOS F in 2032. This compares to an anticipated level of service C in 2017 and LOS E in 2032 without additional development traffic. Therefore, the installation of a traffic signal will likely be warranted as traffic on Cottage Grove Road increases. This is consistent with City of Madison plans for future traffic signals. A traffic signal at this location would not only improve the level of service for the McLean Drive approaches to this intersection, it would also serve to create gaps in traffic at the proposed development access points. A traffic signal here would also create an easier crossing for bicyclists and pedestrians traveling between Richmond Hill and other areas south of Cottage Grove Road and the proposed development.

COTTAGE GROVE ROAD AND MCLEAN DRIVE

WEEKDAY PM PEAK HOUR

Intersection	Traffic Control	Eastbound	Westbound	Northbound	Southbound
2011 Existing Traffic Existing Geometrics and Traffic Control	Two-way Stop Control	Left LOS A 8 sec delay	Left LOS A 9 sec delay	Approach LOS C 18 sec delay Left lane LOS C 21 sec delay Right lane LOS B 14 sec delay	Approach LOS B 13 sec delay Left lane LOS C 19 sec delay Right lane LOS B 12 sec delay
2017 Traffic with development Existing Geometrics	Two-way Stop Control	Left LOS A 9 sec delay	Left LOS B 10 sec delay	Approach LOS D 27 sec delay Left lane LOS E 35 sec delay Right lane LOS C 18 sec delay	Approach LOS C 17 sec delay Left lane LOS D 29 sec delay Right lane LOS B 14 sec delay
2017 BaseTraffic (Development traffic not included) Proposed Geometrics	Two-way Stop Control	Left LOS A 9 sec delay	Left LOS B 10 sec delay	Approach LOS C 20 sec delay Left lane LOS D 26 sec delay Right LOS B 13 sec delay	Approach LOS B 13 sec delay Left lane LOS C 21 sec delay Right lane LOS B 11 sec delay
2017 Traffic with development Proposed Geometrics	Two-way Stop Control	Left LOS A 9 sec delay	Left LOS B 10 sec delay	Approach LOS C 23 sec delay Left lane LOS D 30 sec delay Right LOS B 13 sec delay	Approach LOS B 14 sec delay Left lane LOS C 23 sec delay Right lane LOS B 12 sec delay

**COTTAGE GROVE ROAD AND MCLEAN DRIVE
WEEKDAY PM PEAK HOUR (CONTINUED)**

Intersection	Traffic Control	Eastbound	Westbound	Northbound	Southbound
2032 BaseTraffic (Development traffic not included) Proposed Geometrics	Two-way Stop Control	Left LOS A 10 sec delay	Left LOS B 12 sec delay	Approach LOS E 40 sec delay Left lane LOS F 59 sec delay Right LOS C 16 sec delay	Approach LOS C 16 sec delay Left lane LOS D 32 sec delay Right lane LOS B 13 sec delay
2032 Traffic with development Proposed Geometrics	Two-way Stop Control	Left LOS A 10 sec delay	Left LOS B 12 sec delay	Approach LOS F 50 sec delay Left lane LOS F 77 sec delay Right LOS C 17 sec delay	Approach LOS C 17 sec delay Left lane LOS E 37 sec delay Right lane LOS B 13 sec delay
2032 Traffic with development Proposed Geometrics	Traffic Signal Intersection LOS A 7 sec delay	Approach LOS A 6 sec delay Left LOS A 5 sec delay Thru LOS A 5 sec delay	Approach LOS A 6 sec delay Left LOS A 7 sec delay Thru LOS A 6 sec delay	Approach LOS C 22 sec delay	Approach LOS B 14 sec delay

North Star Drive and Sharpsburg Drive/Jupiter Drive Intersection

This intersection is located approximately 350 feet north of the Cottage Grove Road intersection with North Star Drive. Both North Star Drive and Sharpsburg Drive are classified as collector streets. There currently are stop signs on the Sharpsburg Drive approach from the east and the Jupiter Drive approach from the west. All four approaches are one lane approaches with no turn lanes.

All approaches to this intersection currently operate at level of service B or better during the PM peak hour. With annual growth and full development, including Building E-1, the westbound approach is expected to operate at LOS D in 2017 and LOS F in 2032 during the PM peak hour if the existing two-way stop control is maintained. As traffic volumes increase, four-way stop control or the construction of a roundabout should be considered. These options are preferable to additional traffic lanes because of the desire to maintain a pedestrian/bicycle friendly roadway system in this area. An analysis of the intersection with existing geometry and four-way stop control in 2032 results in LOS C for the intersection and LOS C or better on all approaches. The queuing analysis shows that the longest queue with four-way stop control would be on the northbound approach with an anticipated 95th queue of 169 feet. This would not likely result in problems at the Cottage Grove Road traffic signal. However, the ability to add a northbound right turn lane on the North Star Drive approach from the south should be protected as part of the proposed development plan in case backups do become a problem in the future. A future one lane roundabout could also be considered for the future here, however it may not be feasible because of geometric constraints caused by existing facilities, including the retaining wall in the northeast quadrant. Additionally, adequate pedestrian and bicycle facilities would need to be included in the design.

NORTH STAR DRIVE AND SHARPSBURG DRIVE/JUPITER DRIVE WEEKDAY PM PEAK HOUR

Intersection	Traffic Control	Eastbound	Westbound	Northbound	Southbound
2011 Existing Traffic Existing Geometrics and Traffic Control	Two-way Stop Control	Approach LOS A 10 sec delay	Approach LOS B 15 sec delay	Left LOS A 4 sec delay	Left LOS A 1 sec delay
2017 Traffic with development	Two-way Stop Control	Approach LOS B 11 sec delay	Approach LOS D 25 sec delay	Left LOS A 4 sec delay	Left LOS A 1 sec delay
2032 Traffic with development	Two-way Stop Control	Approach LOS B 12 sec delay	Approach LOS F 54 sec delay	Left LOS A 4 sec delay	Left LOS A 1 sec delay
2032 Traffic with development	Four-way Stop Control Intersection LOS C 19 sec delay	Approach LOS A 10 sec delay	Approach LOS B 10 sec delay	Left LOS C 24 sec delay	Left LOS B 10 sec delay

Sharpsburg Drive and Gemini Drive/Gemini Drive Extension Intersection (North access to proposed development)

This intersection is located approximately 400 feet east of the North Star Drive intersection with Sharpsburg Drive. It is currently a tee intersection with a stop sign on the Gemini Drive approach on the north. An extension of Gemini Drive is planned as a new public street to the south. Currently, all three approaches to the intersection are single lane with no turn lanes.

The developer plans a two lane approach from the south for this intersection, therefore it was analyzed as a two-lane approach with a combined left/thru lane and an exclusive right turn lane. The existing one lane geometry was analyzed for the other three approaches. With this geometry and stop control on the Gemini Drive/development access approaches, all approaches to this intersection are anticipated to operate at LOS B or better through 2032.

Queues at this intersection are not expected to exceed 60 feet in any direction.

**SHARPSBURG DRIVE AND GEMINI DRIVE (DEVELOPMENT ACCESS)
WEEKDAY PM PEAK HOUR**

Intersection	Traffic Control	Eastbound	Westbound	Northbound	Southbound
2011 Existing Traffic Existing Geometrics and Traffic Control	Two-way Stop Control	Left LOS A 2 sec delay	N/A	N/A	Approach LOS A 9 sec delay
2017 Traffic with development Proposed Geometrics	Two-way Stop Control	Left LOS A 1 sec delay	Left LOS A 4 sec delay	Approach LOS B 10 sec delay Left/thru LOS B 11 sec delay Right LOS A 9 sec delay	Thru LOS B 11 sec delay
2032 Traffic with development	Two-way Stop Control	Left LOS A 1 sec delay	Left LOS A 4 sec delay	Approach LOS B 11 sec delay Left/thru LOS B 12 sec delay Right LOS A 9 sec delay	Thru LOS B 11 sec delay

Sharpsburg Drive and McLean Drive Intersection

This intersection is located approximately 750 feet north of the Cottage Grove Road intersection with McLean Drive and approximately 1000 feet east of the Gemini Drive intersection with Sharpsburg Drive. It is a small single lane roundabout with yield signs on all four approaches. A Synchro analysis of this intersection results in LOS A on all four approaches through 2032. With traffic growth and development traffic, total traffic using this intersection is not expected to exceed 200 vehicles in the PM peak hour. This is a very manageable traffic volume for an intersection with these characteristics. However, consideration should be given to improving the sight distance at this location both for pedestrians and motorists by keeping the plantings on the outer edge of the traffic circle trimmed below three feet above street level.

SHARPSBURG DRIVE AND MCLEAN DRIVE WEEKDAY PM PEAK HOUR

Intersection	Traffic Control
2011 Existing Traffic Existing Geometrics and Traffic Control	Roundabout Yield Control Intersection LOS A
2017 Traffic with development	Roundabout Yield Control Intersection LOS A
2032 Traffic with development	Roundabout Yield Control Intersection LOS A

PEDESTRIAN, BICYCLE AND MULTI-USE CONSIDERATIONS

Currently the sidewalks on both sides of Cottage Grove Road are discontinuous. The developer has plans to complete the sidewalk along the north side of Cottage Grove Road between North Star Drive and McLean Road as part of the development. The City of Madison plans to complete the rest of the sidewalk east to Sprecher Road along both sides of Cottage Grove Road as part of the planned reconstruction in 2015. The City of Madison is also considering construction of a wider multi-use path for the north side of Cottage Grove Road. If a wider path is installed, in order to improve safety at the development access points, the crossings should be made as visible as possible with enhanced pavement treatments and signing to alert motorists of crossing bicyclists. The planned reconstruction includes bicycle lanes in both directions on Cottage Grove Road east to Sprecher Road and west to connect to existing bicycle lanes on the west side of the interstate. The planned bicycle lanes are consistent with Cottage Grove Road accommodations to the west and will serve as an access route to the proposed development as well as an extension of the Madison bike system.

In addition to the planned sidewalk and bicycle lanes along Cottage Grove Road, the developer has plans for pedestrian and bicycle circulation within the development. Although final plans were not determined at the time of this report, an east-west pedestrian/bicycle connection is planned, either as a standalone or part of a motor vehicle travel way, from the front of the grocery store to and across the proposed extension of Gemini Drive to the western part of the development. Bicycle and pedestrian accommodations will be provided on both sides of the extension of Gemini Drive and will connect to this east-west route. In addition, a north-south connection from Cottage Grove Road to Big Dipper Drive across the front of the store and a pedestrian connection from the Kirkpatrick Lane cul-de-sac to the north side of the grocery store are planned. Because of a grade issue and the need to construct a stairway, the Kirkpatrick Lane sidewalk would not accommodate bicyclists; however they could be directed to the Big Dipper Drive path from either Sharpsburg Drive or McLean Drive with appropriate signing. Extending the Kirkpatrick Lane sidewalk to the Big Dipper Drive sidewalk and completing the ped/bike connection from the Big Dipper Drive connection to the west to Gemini Drive along the north side of the parking lot should also be considered. This would give pedestrians and bicycles coming from the north and east an option to access the smaller commercial areas, including the proposed public library, without using any of the main vehicular access points. It would also provide an alternative route for pedestrians and bicycles coming from the south on McLean Drive who prefer to avoid biking or walking along Cottage Grove Road. The roadways north of the proposed development are neighborhood streets with sidewalks on both sides and adequate roadway width to accommodate bicycles with the projected traffic volumes.

All traffic signals installed in the area should have pedestrian signals as well as highly visible marked crosswalks. Crosswalks should also be marked across Sharpsburg Drive at North Star Drive, Gemini Drive, and Big Dipper Drive as well as across North Star Drive and Gemini Drive at Sharpsburg Drive.

With the exception of school routes, Madison Metro does not currently have transit service in this area. However, consideration should be given to extending public transit into the area as development progresses. Because the extension of Gemini Drive would be a desirable location to serve public facilities, it should be designed and constructed to accommodate future bus traffic and bus stops.

COTTAGE GROVE ROAD RECONSTRUCTION

The planned reconstruction to convert Cottage Grove Road to four lanes and install bicycle lanes is tentatively scheduled for 2014. The grocery store is planned for 2012 with the public library tentatively budgeted in 2014. The remaining parcels are expected to follow based on market demand. The City of Madison has plans to install a traffic signal at the Cottage Grove Road – North Star Drive intersection in 2012. It is recommended that these traffic signals be in operation prior to the opening of the grocery store. The sidewalk on the north side of Cottage Grove Road and the extension of Gemini Drive should be completed as part of the grocery store development in 2012. Additionally, minimum 100 foot left turn and minimum 50 foot right turn lanes should be constructed on Cottage Grove Road approaching the Gemini Drive extension and the grocery store access point prior to the grocery store opening in 2012. Analyses of 2017 traffic with existing geometrics show that these lanes would be adequate to handle Cottage Grove Road traffic through 2017 if the reconstruction of Cottage Grove is delayed; however traffic exiting the development would experience long delays if the reconstruction of Cottage Grove Road is not completed by 2017.

CONCLUSIONS AND RECOMMENDATIONS

The proposed Grandview Commons Town Center Development, on the north side of Cottage Grove Road between North Star Drive and McLean Drive, consists of a 58,000 square foot grocery store, a public library, some other small commercial uses and multi-family and single family residential. The grocery store is expected to open in 2012 with full development planned to be completed by 2017.

The analyses show that with the construction of turn lanes on Cottage Grove Road on the approaches to the extension of Gemini Drive and the grocery store access, and the planned installation of a traffic signal at the North Star Drive intersection; the existing roadway system should be adequate to accommodate additional traffic resulting from the proposed development until Cottage Grove Road is reconstructed to four lanes in 2015. With the planned reconstruction of Cottage Grove Road, the proposed street system is adequate to accommodate additional traffic resulting from the proposed development through 2032. However, in order to best accommodate the traffic anticipated by this development, the following improvements are recommended in addition to the four lane construction on Cottage Grove Road and the addition of a traffic signal at the Cottage Grove Road and North Star Drive intersection:

- Construction of minimum 150 foot left turn lanes at all three accesses on Cottage Grove Road
- Construction of a minimum 250 foot left turn lane on eastbound Cottage Grove Road at North Star Drive
- Construction of a minimum 150 foot left turn lanes on Cottage Grove Road at McLean Drive and the installation of a traffic signal at the Cottage Grove Road and McLean Drive intersection if it becomes warranted.
- Consideration of four-way stop control at the North Star Drive/Jupiter Drive/Sharpsburg Drive intersection as volumes warrant.
- Provisions to allow for the possible future installation of a right turn lane on the northbound approach of North Star Drive at its intersection with Jupiter Drive/Sharpsburg Drive if it becomes necessary.
- Pedestrian/Bicycle connections should be constructed as planned through the development along the extension of Gemini Drive, through the parking lot between the planned pedestrian plaza and the grocery store, in front of the grocery store continuing from Cottage Grove Road to Big Dipper Drive, from Kilpatrick Lane to Big Dipper Drive and also from the Big Dipper Drive connection to the public library along the north side of the parking lot.
- Pedestrian signals and crosswalks should be installed at signalized intersections. Crosswalks should also be marked across Sharpsburg Drive at North Star Drive, Gemini Drive and Big Dipper Drive and across North Star Drive and Gemini Drive at Sharpsburg Drive. A crosswalk should also be marked where the internal pedestrian/bicycle way crosses the extension of Gemini Drive.
- Consideration of extending Madison Metro transit service into the area and providing appropriate accommodations for this service within the development.

The recommendations above are based on traffic analyses completed for the traffic anticipated to be generated by the development. After reductions for internal, mixed

use and multi-modal trips, the proposed development is anticipated to generate approximately 8,705 total trips during an average weekday with approximately 870 of these trips occurring during the PM peak hour and 509 occurring during the AM peak hour. Approximately 7,139 of the daily trips, 720 of the PM peak hour trips, and 412 of the AM peak hour trips are anticipated to be new trips.

These trips were assigned to the existing roadway system using current street system geometrics, existing travel patterns and engineering judgment. The development is proposed to have four access points, three on Cottage Grove Road and one onto Sharpsburg Drive opposite its intersection with Gemini Drive. The west access point on Cottage Grove Road is intended to be a full access with the other two planned to allow for right turns in and out of the development as well as left turns into the development. Left turns out of the development would not be allowed at these two locations.

Analyses of the street system were completed for the PM peak hour and were completed for 2017 and 2032 traffic. In addition to individual intersection evaluations, the roadway network was evaluated as a whole with particular attention paid to the interaction between intersections along Cottage Grove Road.

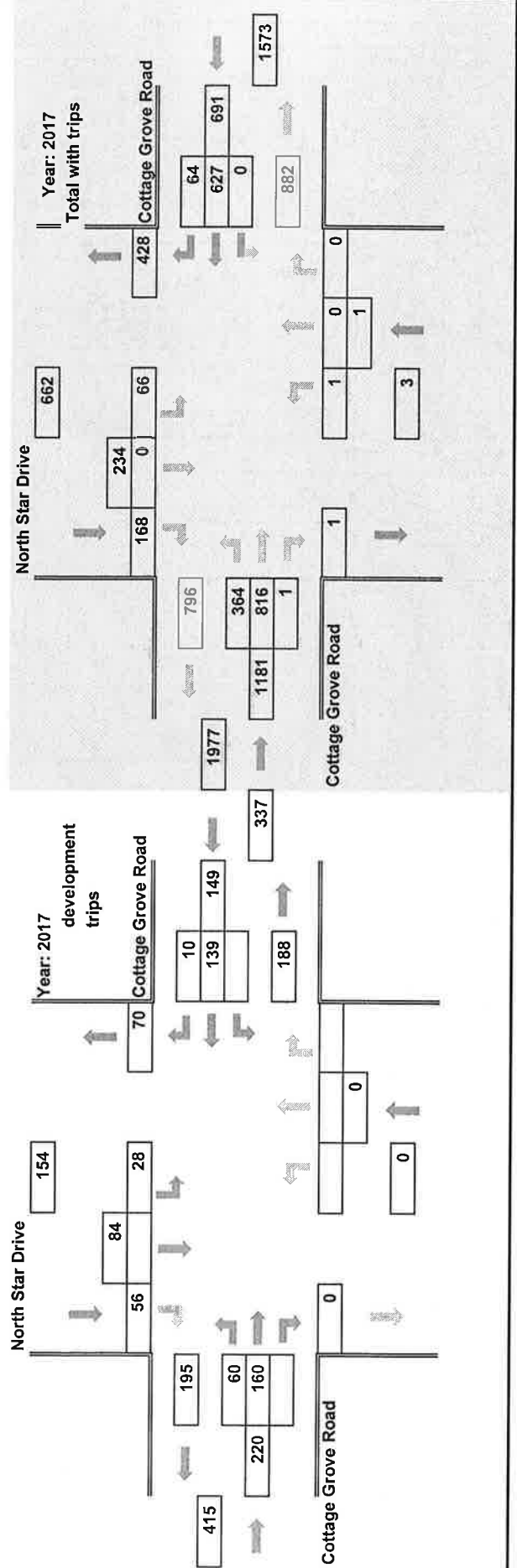
APPENDIX A

Traffic Volumes

Project Description

Grandview Commons Town Center
Location: Cottage Grove Road
Cross Street: North Star Drive
City of Madison, Dane County, WI

Design Hour: 5:00-6:00 PM

Year: 2011
Existing

Year: 2017
development
trips

Year: 2017
Total with trips

2017 Projected PM Design Hour Traffic Volumes With Added Development Trips

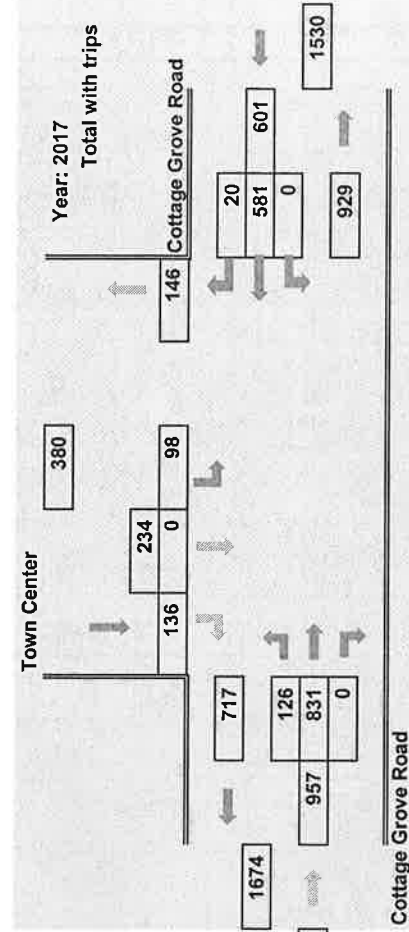
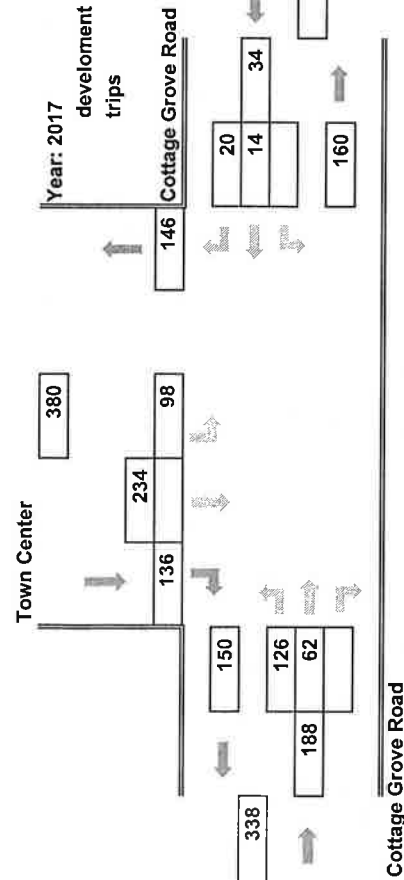
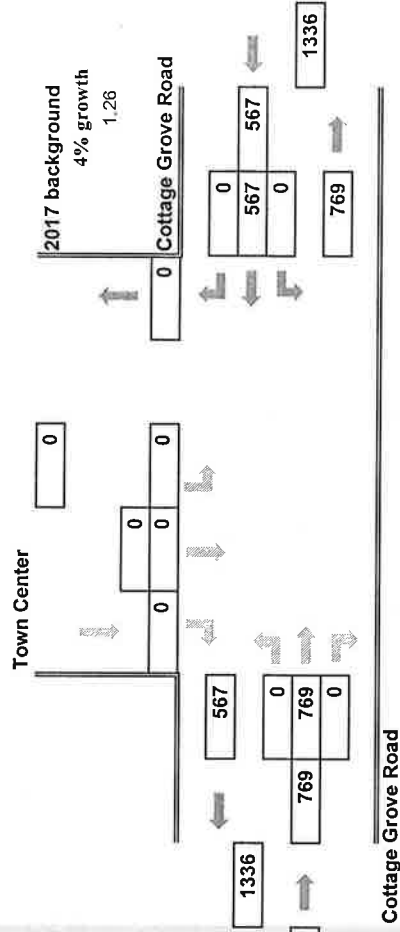
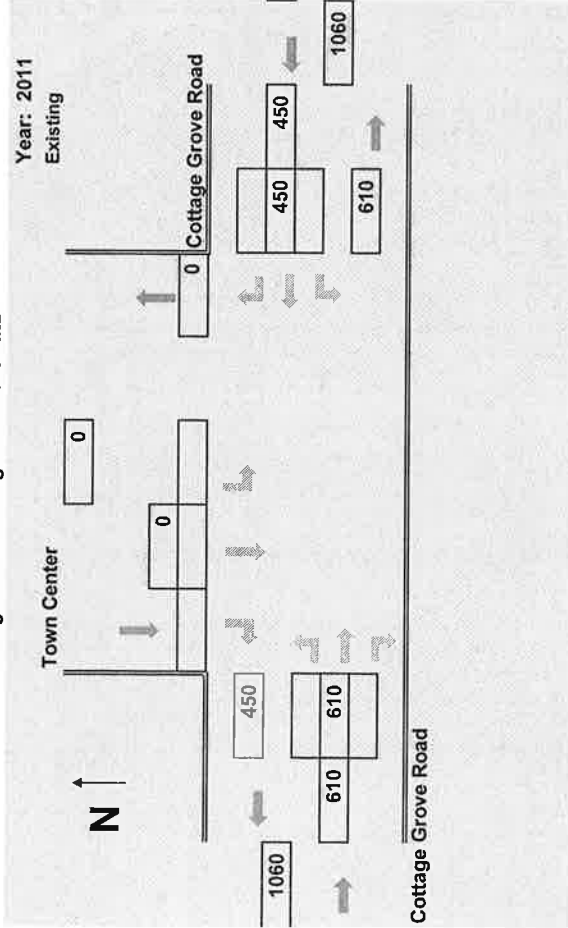
Mary Greuel
KL Engineering

Design Hour: 5:00-6:00 PM

Project Description

Grandview Commons Town Center
Location: Cottage Grove Road
Cross Street: Main Town Center Access
City of Madison, Dane County, WI

Design Hour Turning Movement Data



2017 Projected PM Design Hour Traffic Volumes With Added Development Trips

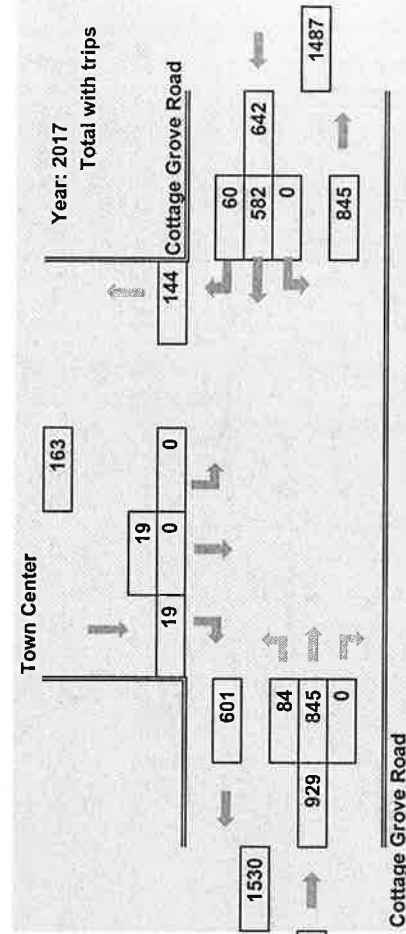
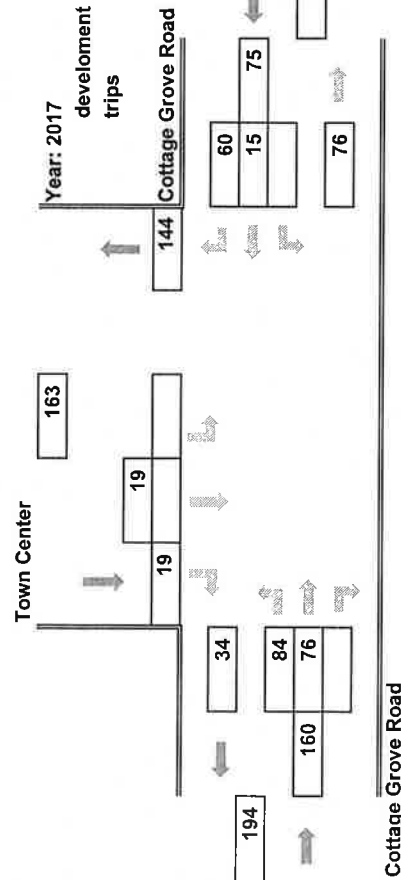
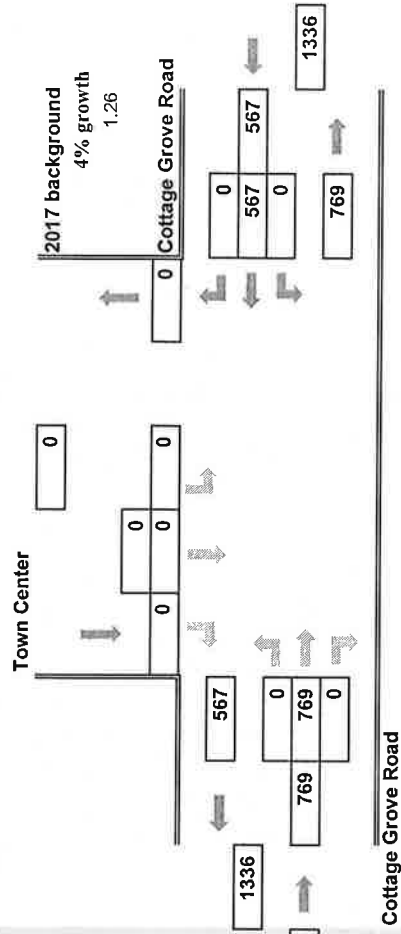
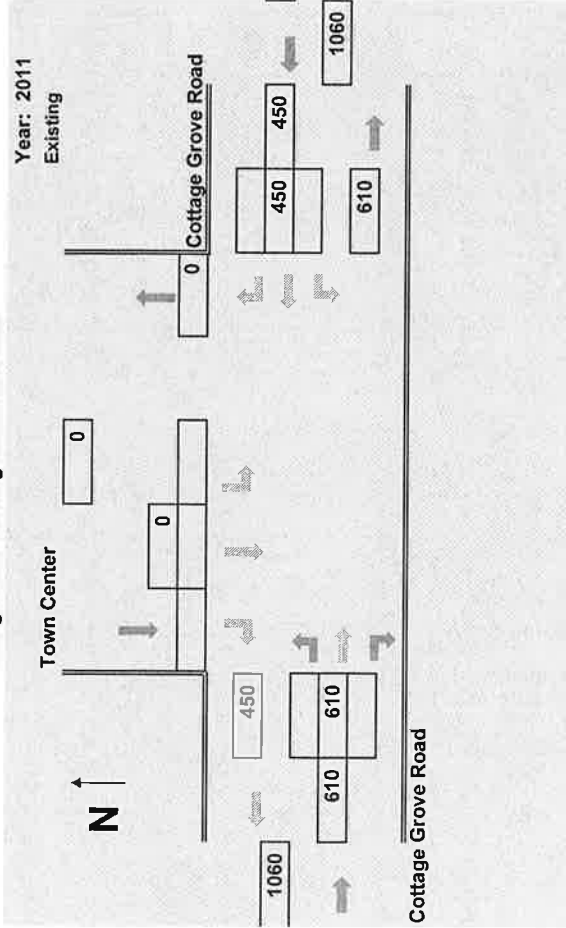
Project Description

Mary Greuel
KL Engineering

Grandview Commons Town Center
Location: Cottage Grove Road
Cross Street: Main Town Center Access
City of Madison, Dane County, WI

Design Hour: 5:00-6:00 PM

Design Hour Turning Movement Data



2017 Projected PM Design Hour Traffic Volumes With Added Development Trips

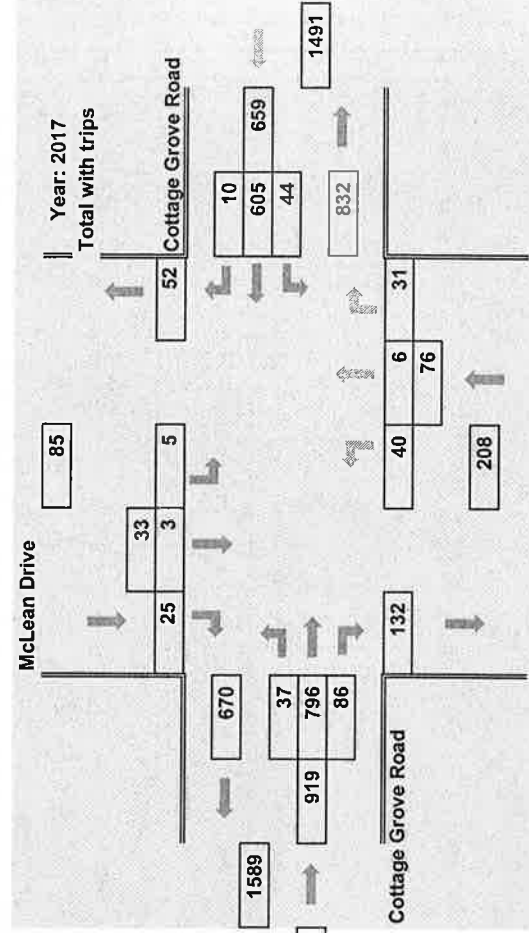
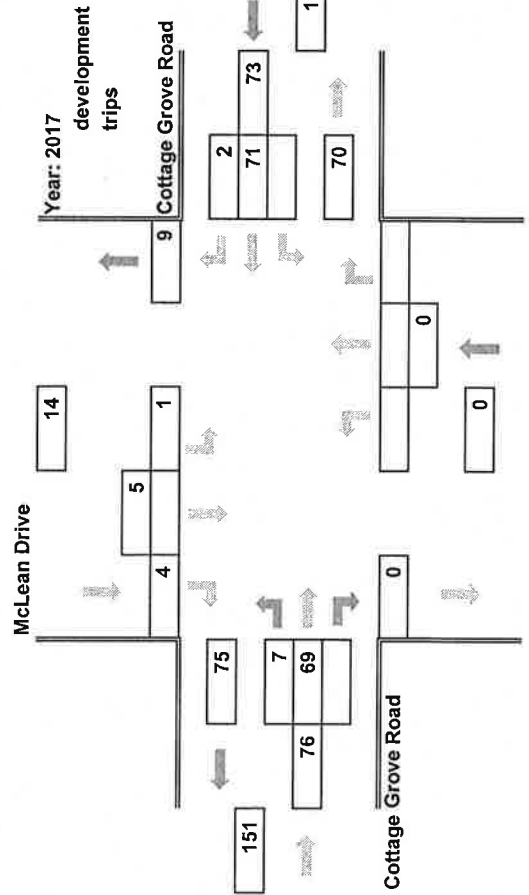
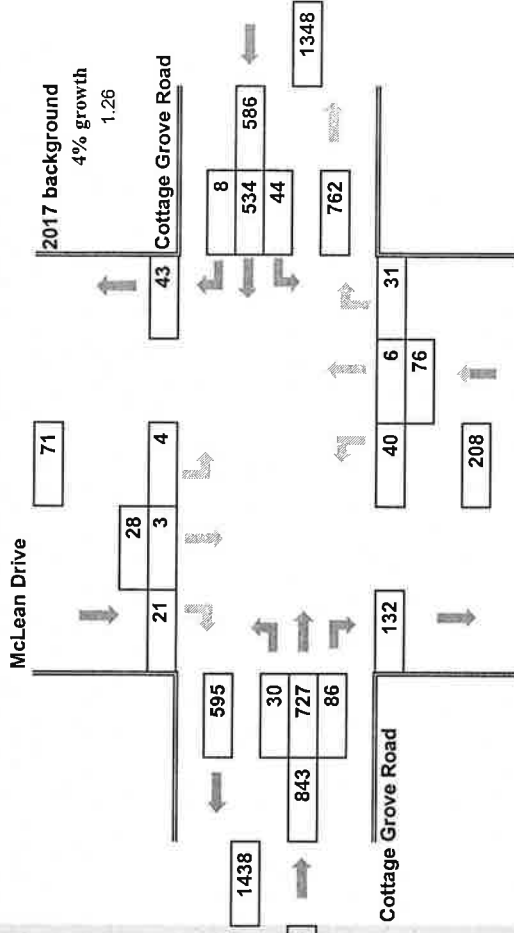
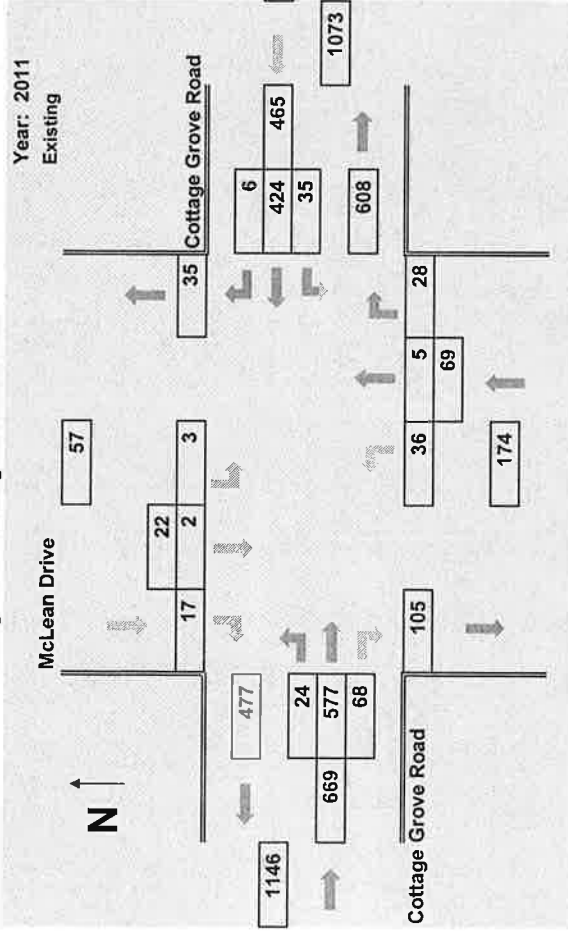
Design Hour: 4:30 - 5:30 PM

Project Description

Grandview Commons Town Center
Location: Cottage Grove Road
Cross Street: McLean Drive
City of Madison, Dane County, WI

Mary Greuel
KL Engineering

Design Hour Turning Movement Data



2017 Projected PM Design Hour Traffic Volumes With Added Development Trips

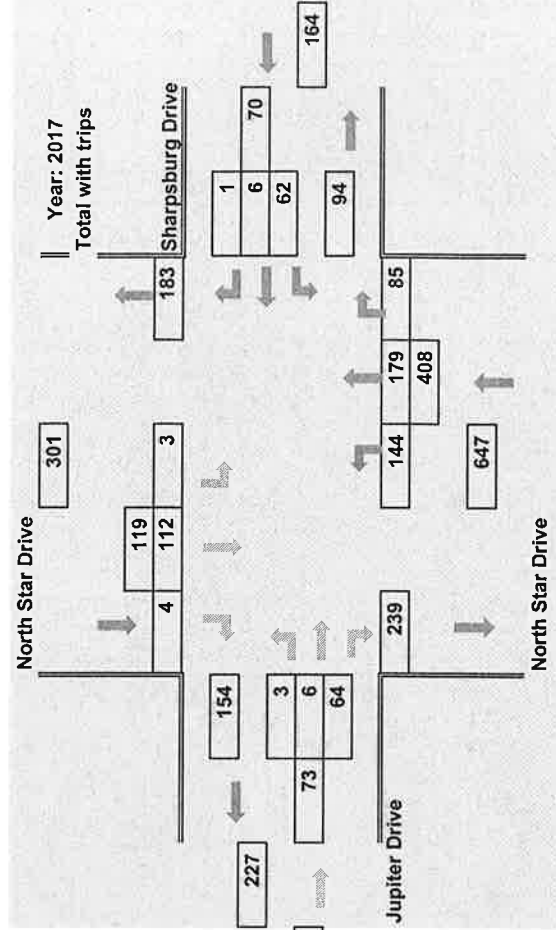
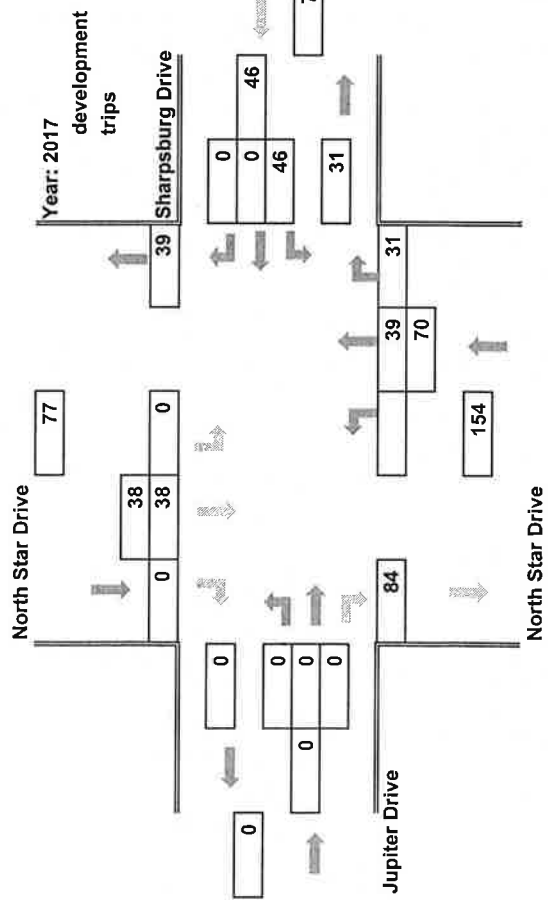
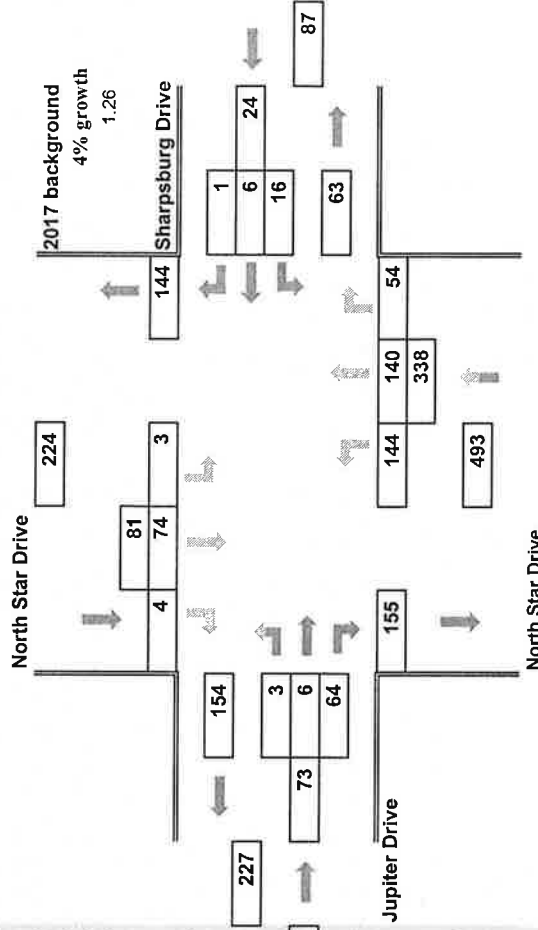
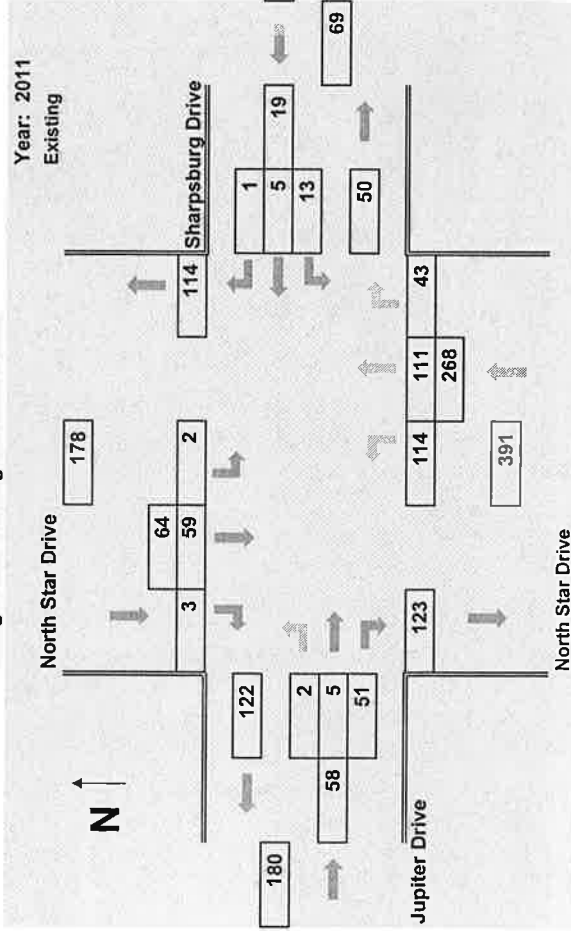
Design Hour: 5:00-6:00 PM

Project Description

Grandview Commons Town Center
Location: North Star Drive
Cross Street: Jupiter Dr. / Sharpsburg Dr.
City of Madison, Dane County, WI

Mary Greuel
KL Engineering

Design Hour Turning Movement Data



2017 Projected PM Design Hour Traffic Volumes With Added Development Trips

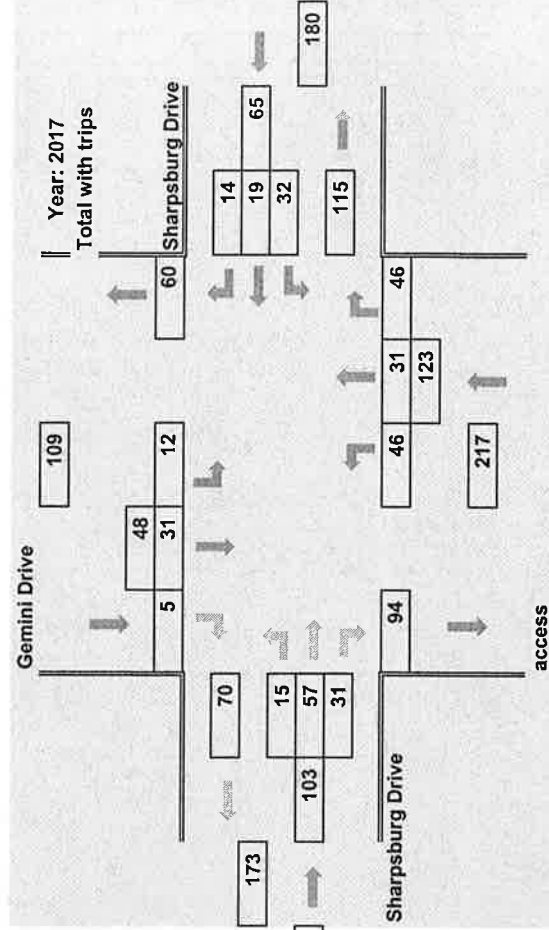
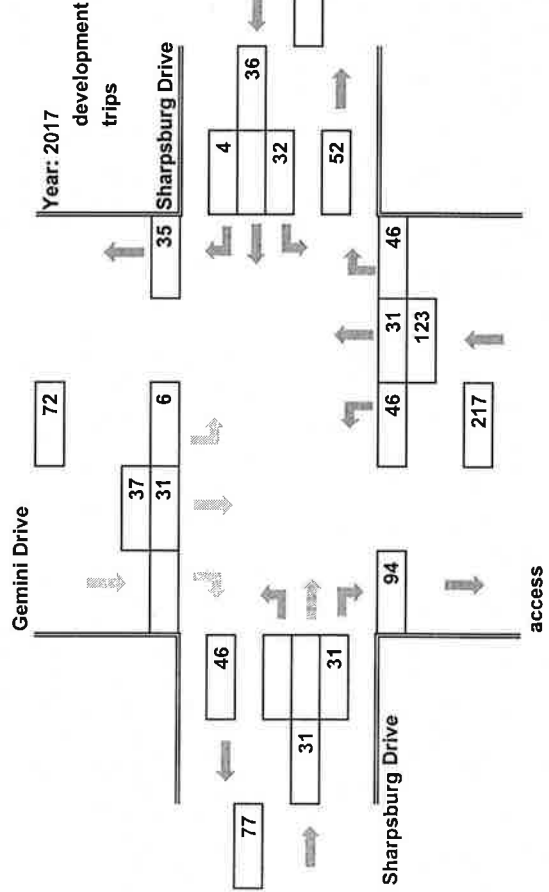
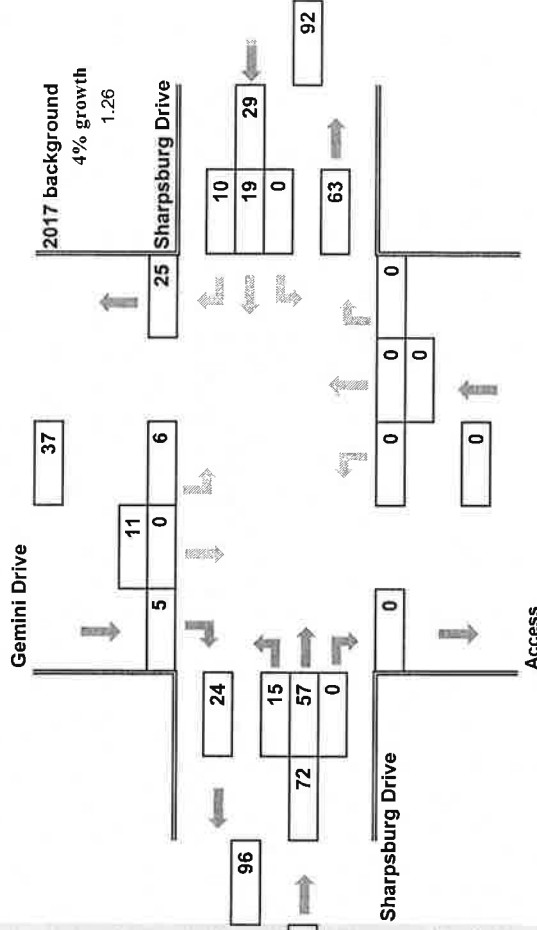
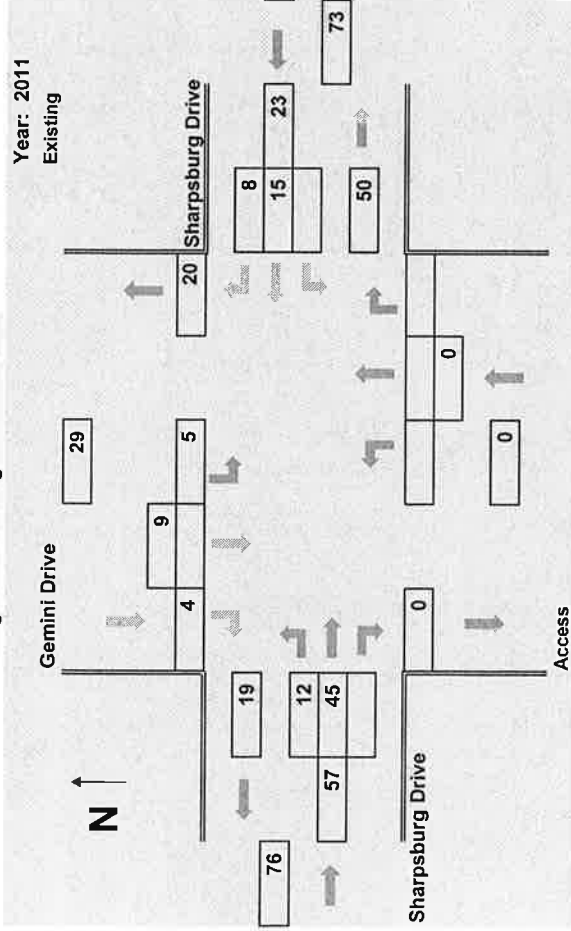
Design Hour: 5:00-6:00 PM

Project Description

Grandview Commons Town Center
Location: Sharpsburg Drive
Cross Street: Gemini Drive/access
City of Madison, Dane County, WI

Mary Greuel
KL Engineering

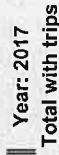
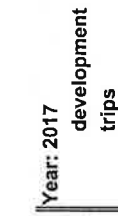
Design Hour Turning Movement Data



Project Description

Grandview Commons Town Center
Location: Sharpsburg Drive
Cross Street: McLean Drive
City of Madison, Dane County, WI

Design Hour: 5:00-6:00 PM

Year: 2011
Existing

Mary Greuel
KL Engineering

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KL Engineering

Year: 2011
Existing

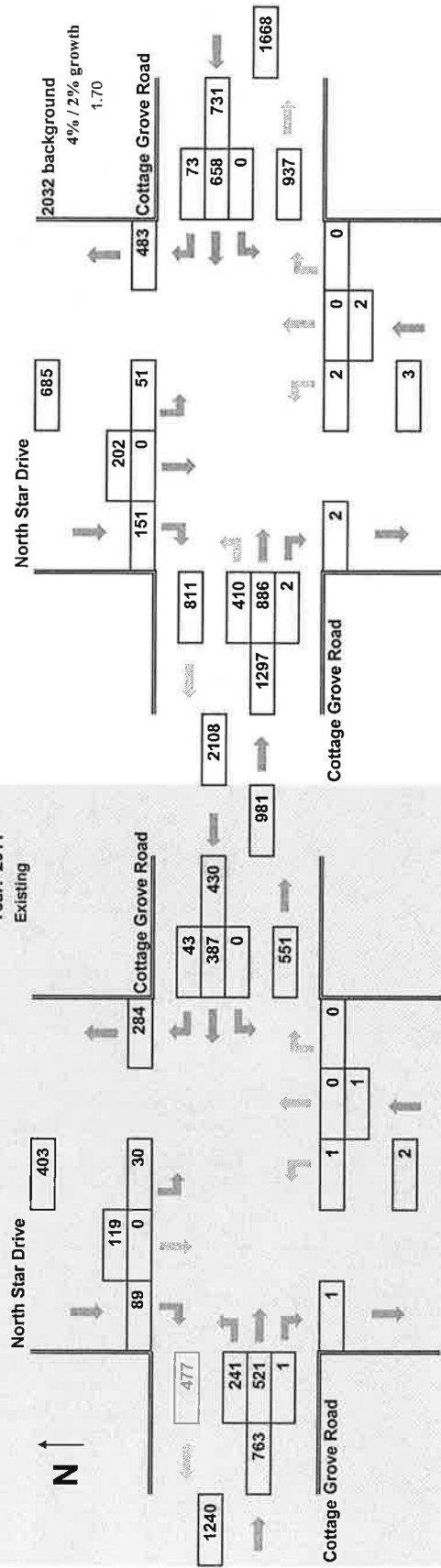


Figure 1 is a schematic diagram of a four-way intersection between North Star Drive and Cottage Grove Road. The diagram illustrates traffic flow and vehicle counts for various movements.

North Star Drive:

- Left Turn:** 154 vehicles.
- Through/Right Turn:** 84 vehicles (left lane) and 56 vehicles (right lane).
- Right Turn:** 28 vehicles.

Cottage Grove Road:

- Left Turn:** 415 vehicles.
- Through/Right Turn:** 195 vehicles (left lane), 60 vehicles (middle lane), and 160 vehicles (right lane).
- Right Turn:** 220 vehicles.

A "development trips" label is located near the top of North Star Drive. A "0" count is shown in the bottom right corner of the diagram.

Year: 2032
Total with trips

Norm Star Drive

Cottage Grove Road

2032

839

207

286

0

79

1006

470

1046

2

1517

2523

553

83

797

0

880

1125

2005

2

0

2

3

Grandview Commons Town Center
Location: Cottage Grove Road
Cross Street: North Star Drive
City of Madison, Dane County, WI

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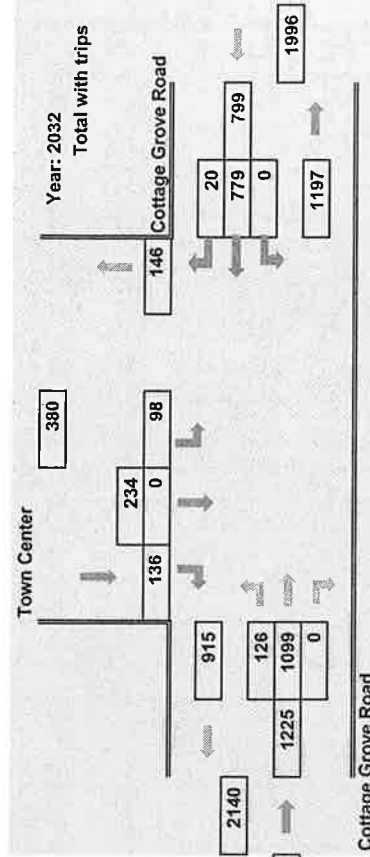
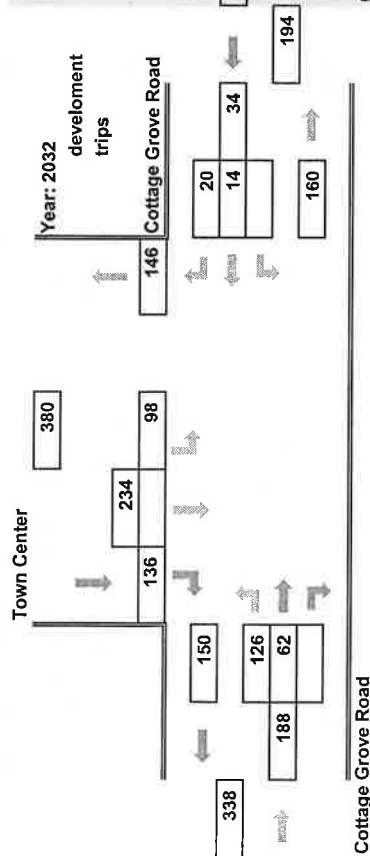
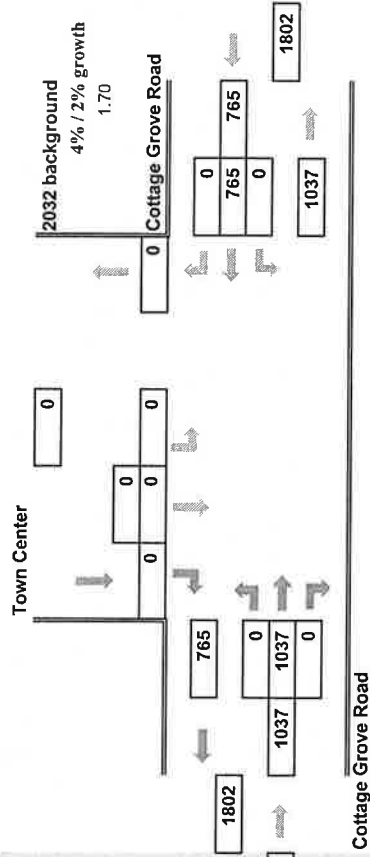
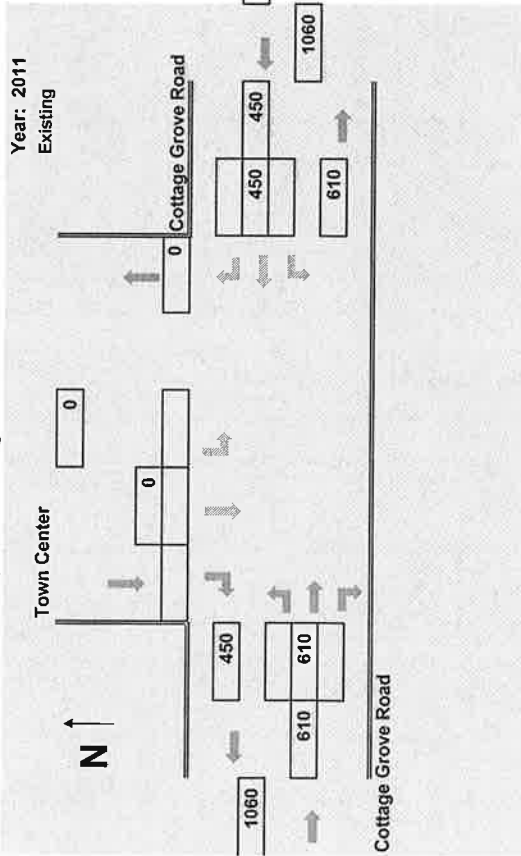
2032 Projected PM Design Hour Traffic Volumes With Added Development Trips

Design Hour: 5:00-6:00 PM

Project Description

Grandview Commons Town Center
Location: Cottage Grove Road
Cross Street: Main Town Center Access
City of Madison, Dane County, WI

Design Hour Turning Movement Data



2032 Projected PM Design Hour Traffic Volumes With Added Development Trips

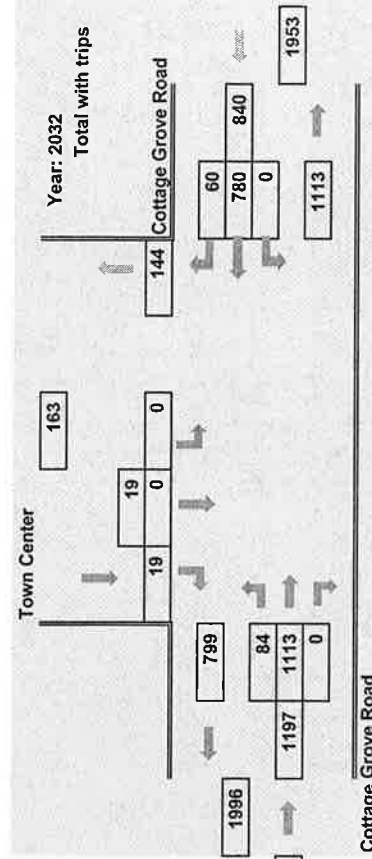
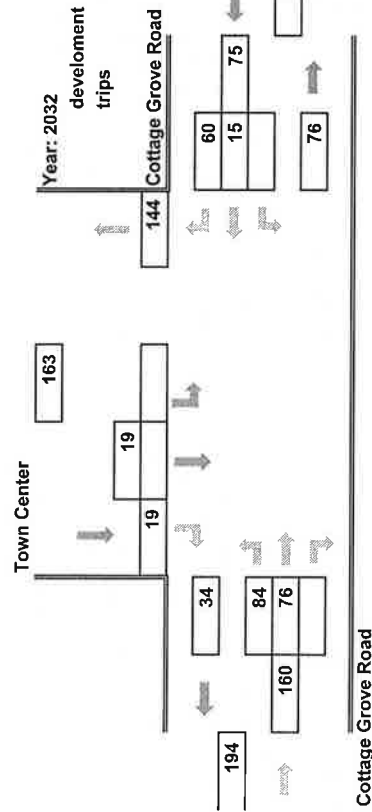
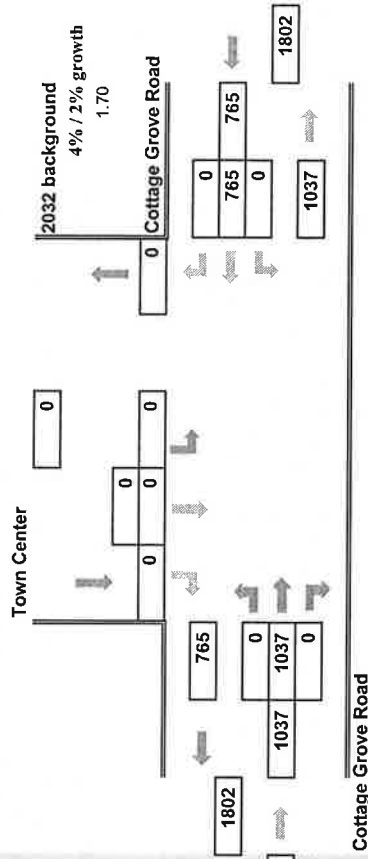
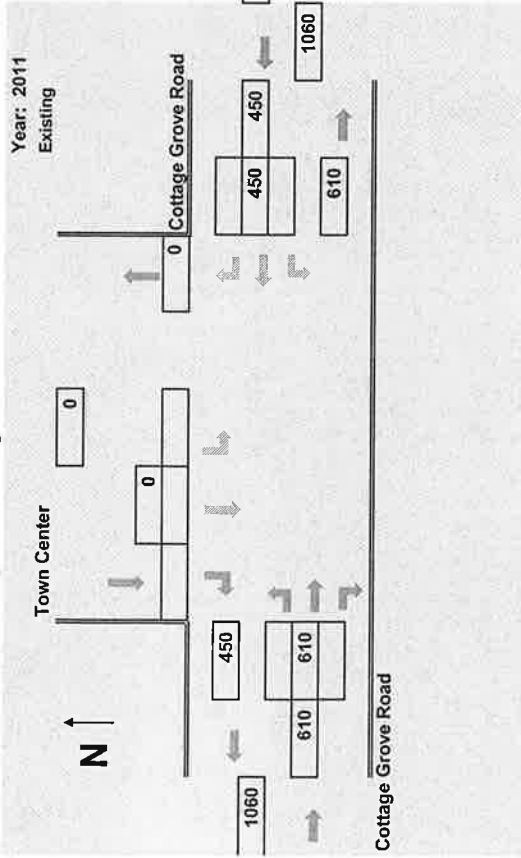
Mary Greuel
KL Engineering

Design Hour: 5:00-8:00 PM

Project Description

Grandview Commons Town Center
Location: Cottage Grove Road
Cross Street: Main Town Center Access
City of Madison, Dane County, WI

Design Hour Turning Movement Data



2032 Projected PM Design Hour Traffic Volumes With Added Development Trips

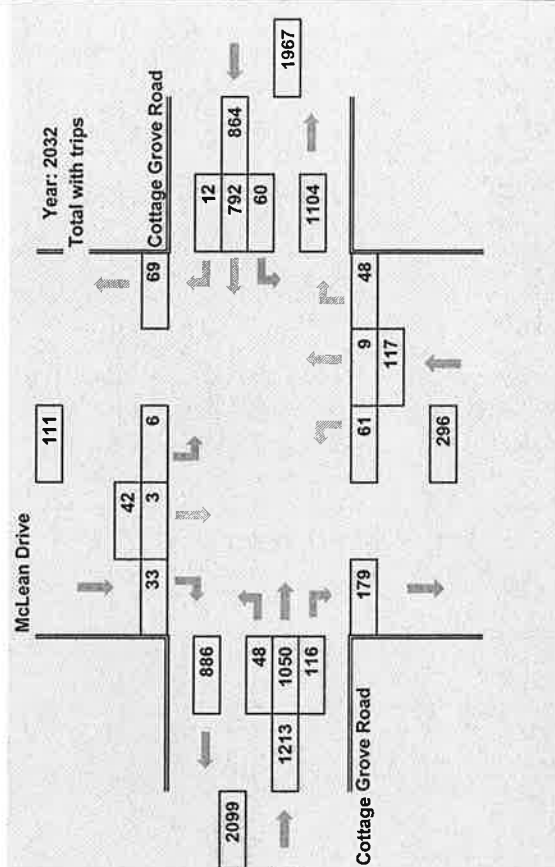
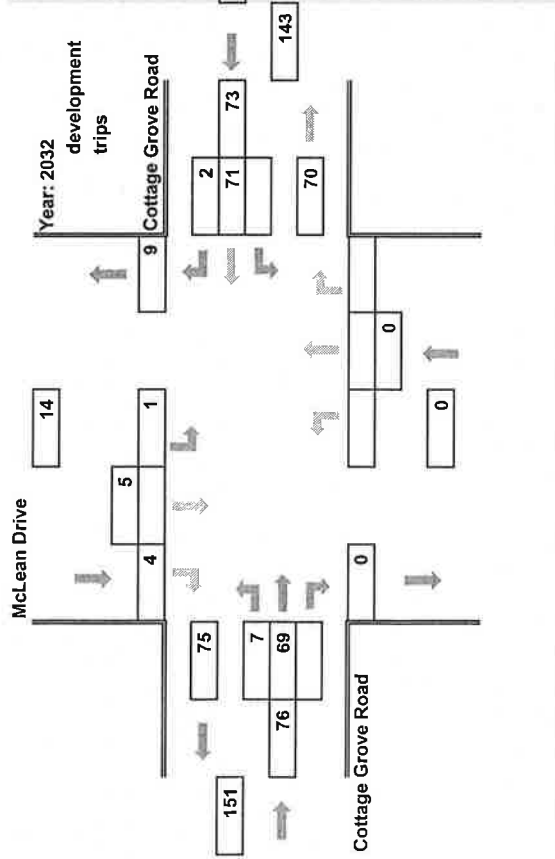
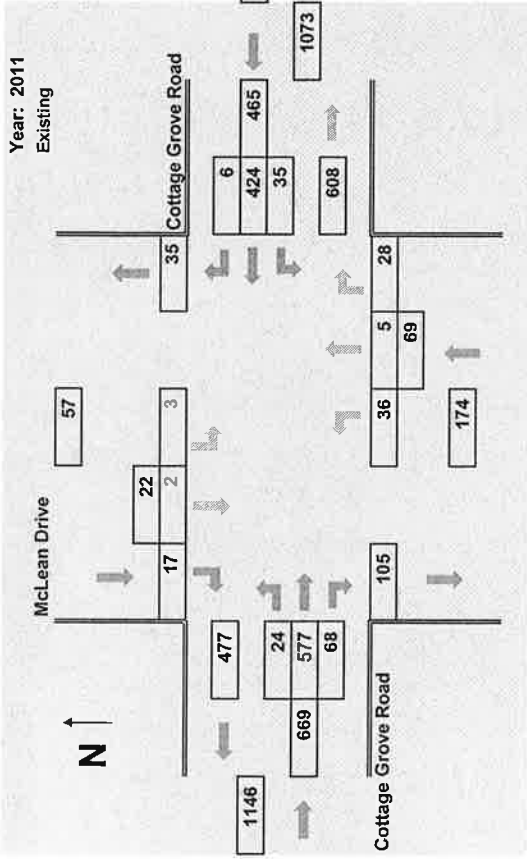
Mary Greul
KL Engineering

Design Hour: 4:30 - 5:30 PM

Project Description

Grandview Commons Town Center
Location: Cottage Grove Road
Cross Street: McLean Drive
City of Madison, Dane County, WI

Design Hour Turning Movement Data



2032 Projected PM Design Hour Traffic Volumes With Added Development Trips

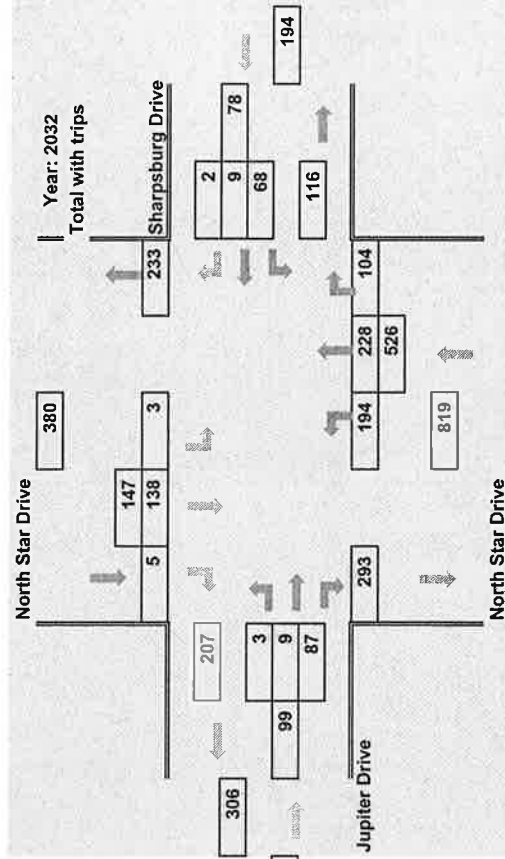
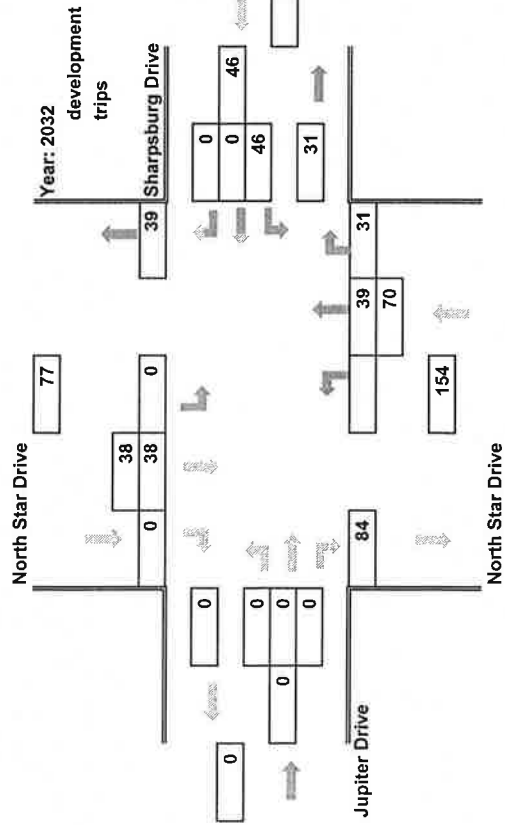
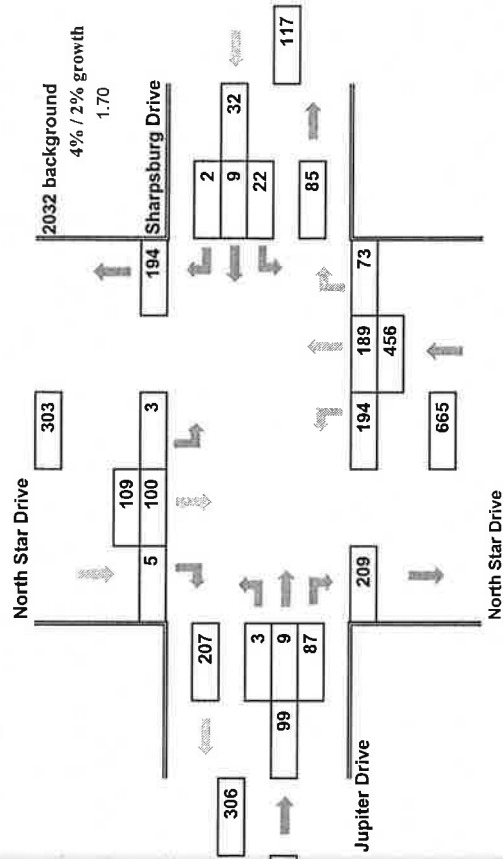
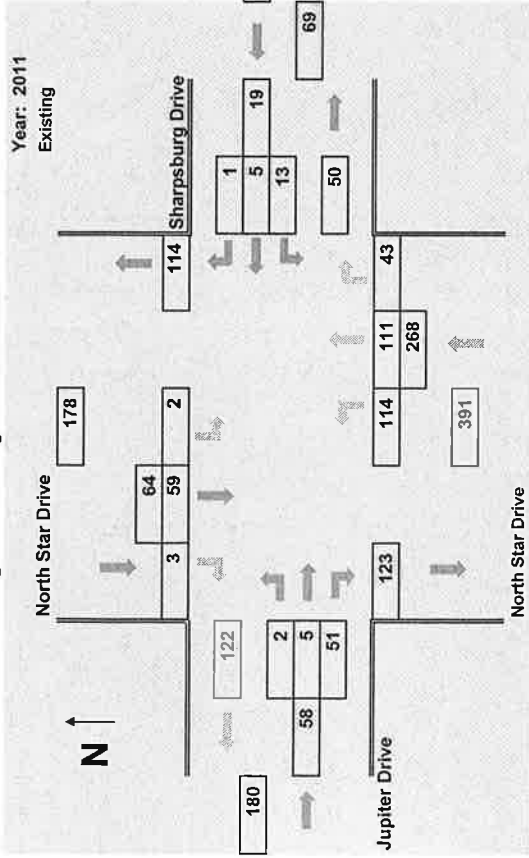
Mary Greuel
KL Engineering

Design Hour: 5:00-6:00 PM

Project Description

Grandview Commons Town Center
Location: North Star Drive
Cross Street: Jupiter Dr. / Sharsburg Dr.
City of Madison, Dane County, WI

Design Hour Turning Movement Data



2032 Projected PM Design Hour Traffic Volumes With Added Development Trips

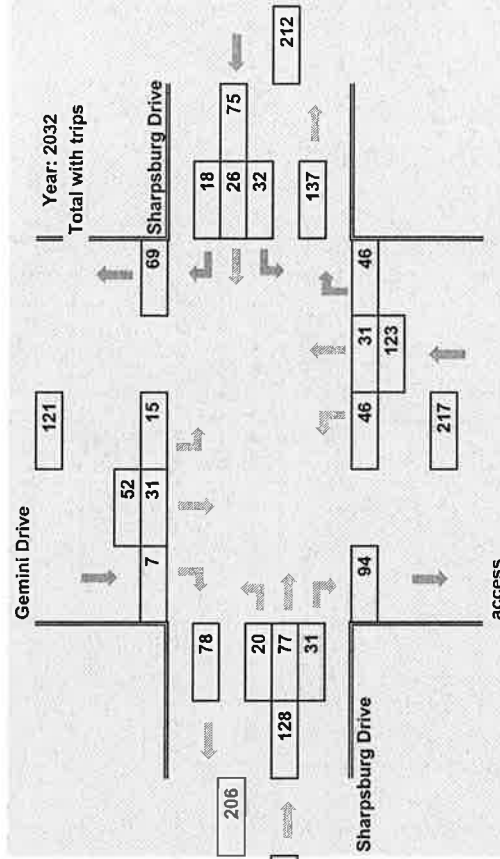
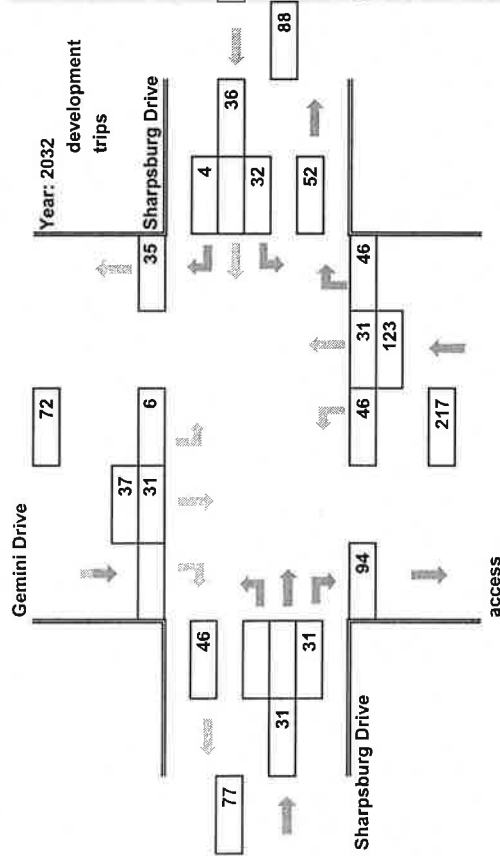
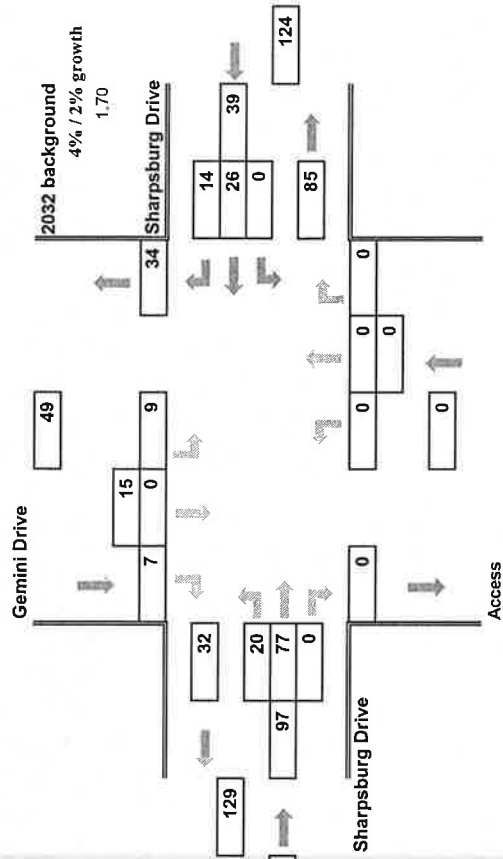
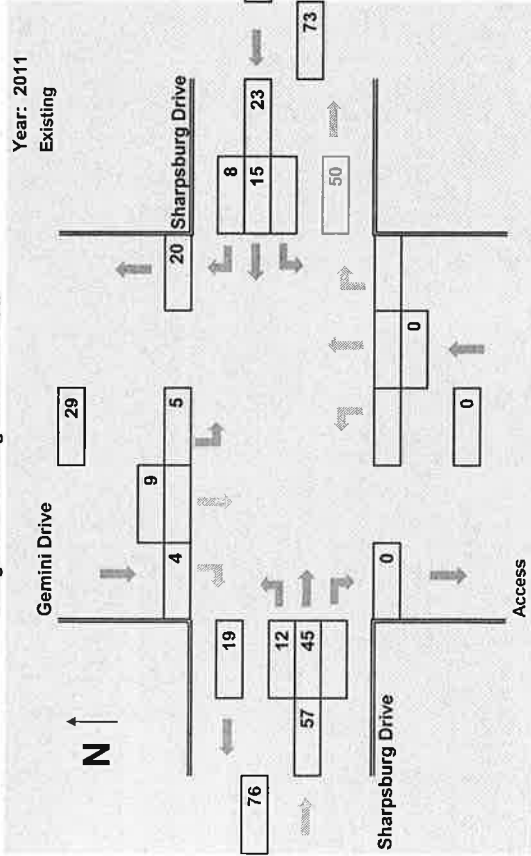
Mary Greuel
KL Engineering

Design Hour: 5:00-6:00 PM

Project Description

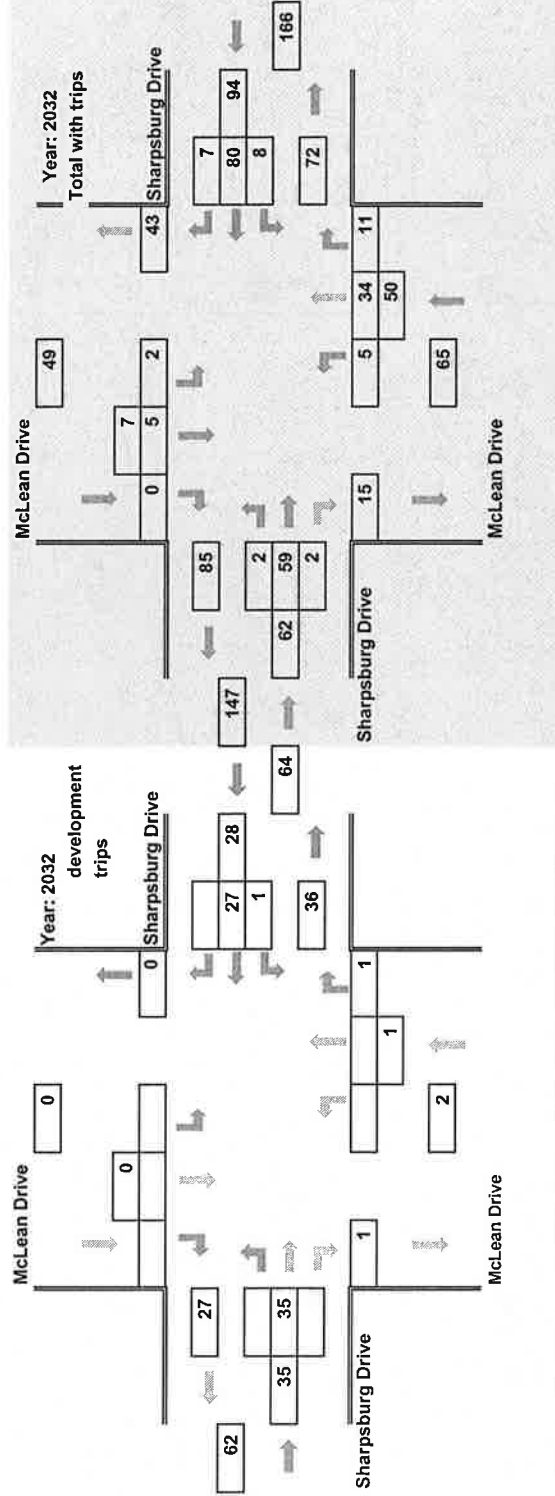
Grandview Commons Town Center
Location: Sharpsburg Drive
Cross Street: Gemini Drive/access
City of Madison, Dane County, WI

Design Hour Turning Movement Data



Project Description
Grandview Commons Town Center Location: Sharnsburg Drive Cross Street: McLean Drive City of Madison, Dane County, WI

Design Hour: 5:00-6:00 PM



KL Engineering, Inc.

5950 Seminole Centre Court, Suite 200
Madison, WI 53711

Cottage Grove Road & North Star Drive
7:00 - 9:00 AM
Madison, Dane County, WI
Grandview Commons Town Center

File Name : am cottage grove rd. & north star dr.
Site Code : 111001AM
Start Date : 10/19/2011
Page No : 1

Groups Printed- Cars - Trucks - Buses - Bicycles

Start Time	North Star Dr. From North					Cottage Grove Road From East					private From South					Cottage Grove Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	63	0	4	0	67	3	149	0	0	152	0	0	0	0	0	0	31	5	0	36	255
07:15 AM	56	0	2	0	58	5	210	0	0	215	0	0	0	0	0	0	49	10	0	59	332
07:30 AM	54	0	3	0	57	5	221	0	0	226	0	0	0	0	0	0	56	27	0	83	366
07:45 AM	63	0	3	0	66	2	212	1	0	215	0	0	1	0	1	0	53	18	0	71	353
Total	236	0	12	0	248	15	792	1	0	808	0	0	1	0	1	0	189	60	0	249	1306
08:00 AM	49	0	3	0	52	5	167	0	0	172	0	0	0	0	0	0	51	17	0	68	292
08:15 AM	47	0	2	0	49	3	98	0	0	101	0	0	0	0	0	0	61	14	0	75	225
08:30 AM	30	0	1	0	31	2	87	0	0	89	0	0	1	1	2	1	56	10	0	67	189
08:45 AM	35	0	1	0	36	9	99	0	0	108	0	0	0	0	0	0	44	22	0	66	210
Total	161	0	7	0	168	19	451	0	0	470	0	0	1	1	2	1	212	63	0	276	916
Grand Total	397	0	19	0	416	34	1243	1	0	1278	0	0	2	1	3	1	401	123	0	525	2222
Apprch %	95.4	0	4.6	0		2.7	97.3	0.1	0		0	0	66.7	33.3		0.2	76.4	23.4	0		
Total %	17.9	0	0.9	0	18.7	1.5	55.9	0	0	57.5	0	0	0.1	0	0.1	0	18	5.5	0	23.6	
Cars	391	0	18	0	409	34	1220	1	0	1255	0	0	2	1	3	1	389	120	0	510	2177
% Cars	98.5	0	94.7	0	98.3	100	98.1	100	0	98.2	0	0	100	100	100	100	97	97.6	0	97.1	98
Trucks	1	0	0	0	1	0	9	0	0	9	0	0	0	0	0	0	5	1	0	6	16
% Trucks	0.3	0	0	0	0.2	0	0.7	0	0	0.7	0	0	0	0	0	0	1.2	0.8	0	1.1	0.7
Buses	3	0	1	0	4	0	13	0	0	13	0	0	0	0	0	0	7	2	0	9	26
% Buses	0.8	0	5.3	0	1	0	1	0	0	1	0	0	0	0	0	0	1.7	1.6	0	1.7	1.2
Bicycles	2	0	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
% Bicycles	0.5	0	0	0	0.5	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0.1

Queues observed

SB RT 11 max 7:45

LT 1 max

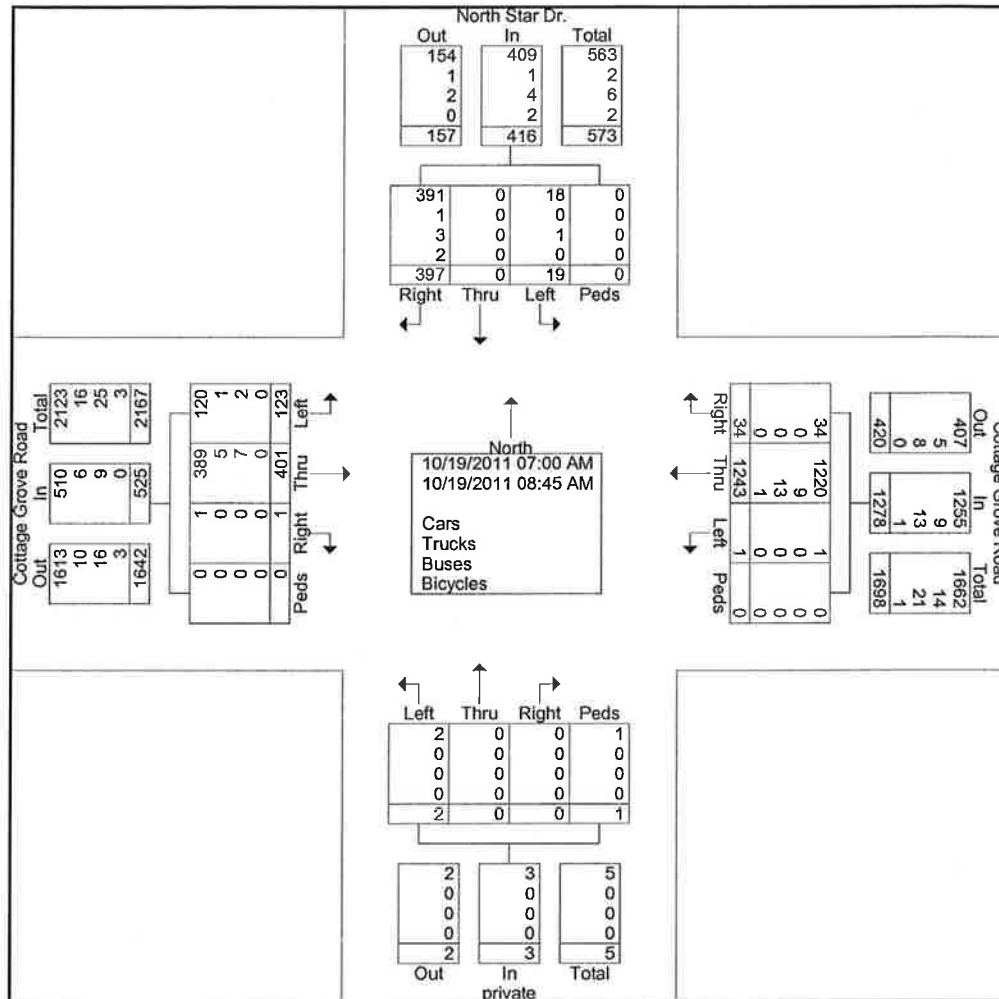
EB LT 3 max

KL Engineering, Inc.

5950 Seminole Centre Court, Suite 200
Madison, WI 53711

Cottage Grove Road & North Star Drive
7:00 - 9:00 AM
Madison, Dane County, WI
Grandview Commons Town Center

File Name : am cottage grove rd. & north star dr.
Site Code : 111001AM
Start Date : 10/19/2011
Page No : 2



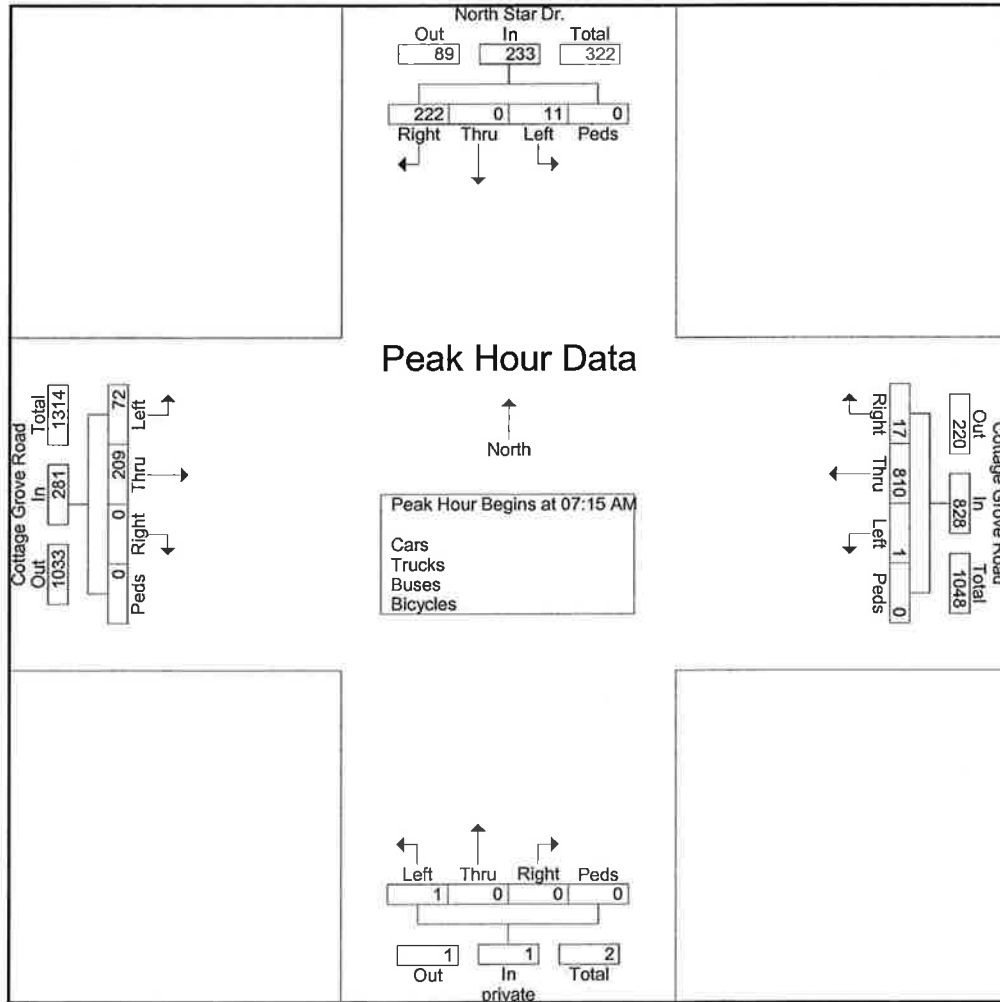
KL Engineering, Inc.

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Madison, WI 53711

Cottage Grove Road & North Star Drive
7:00 - 9:00 AM
Madison, Dane County, WI
Grandview Commons Town Center

File Name : am cottage grove rd. & north star dr.
Site Code : 111001AM
Start Date : 10/19/2011
Page No : 3

	North Star Dr. From North					Cottage Grove Road From East					private From South					Cottage Grove Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	56	0	2	0	58	5	210	0	0	215	0	0	0	0	0	0	49	10	0	59	332
07:30 AM	54	0	3				221			226	0	0	0	0	0	0	56	27		83	366
07:45 AM	63				66	2	212	1					1	0	1	0	53	18	0	71	353
08:00 AM	49	0	3	0	52	5	167	0	0	172	0	0	0	0	0	0	51	17	0	68	292
Total Volume	222	0	11	0	233	17	810	1	0	828	0	0	1	0	1	0	209	72	0	281	1343
% App. Total	95.3	0	4.7	0		2.1	97.8	0.1	0		0	0	100	0		0	74.4	25.6	0		
PHF	.881	.000	.917	.000	.883	.850	.916	.250	.000	.916	.000	.000	.250	.000	.250	.000	.933	.667	.000	.846	.917



KL Engineering, Inc.

5950 Seminole Centre Court, Suite 200
Madison, WI 53711

Cottage Grove Road & North Star Drive
4:00 - 6:00 PM
Madison, Dane County, WI
Grandview Commons Town Center

File Name : PM North Star & Cottage Grove Rd.
Site Code : 111001PM
Start Date : 10/25/2011
Page No : 1

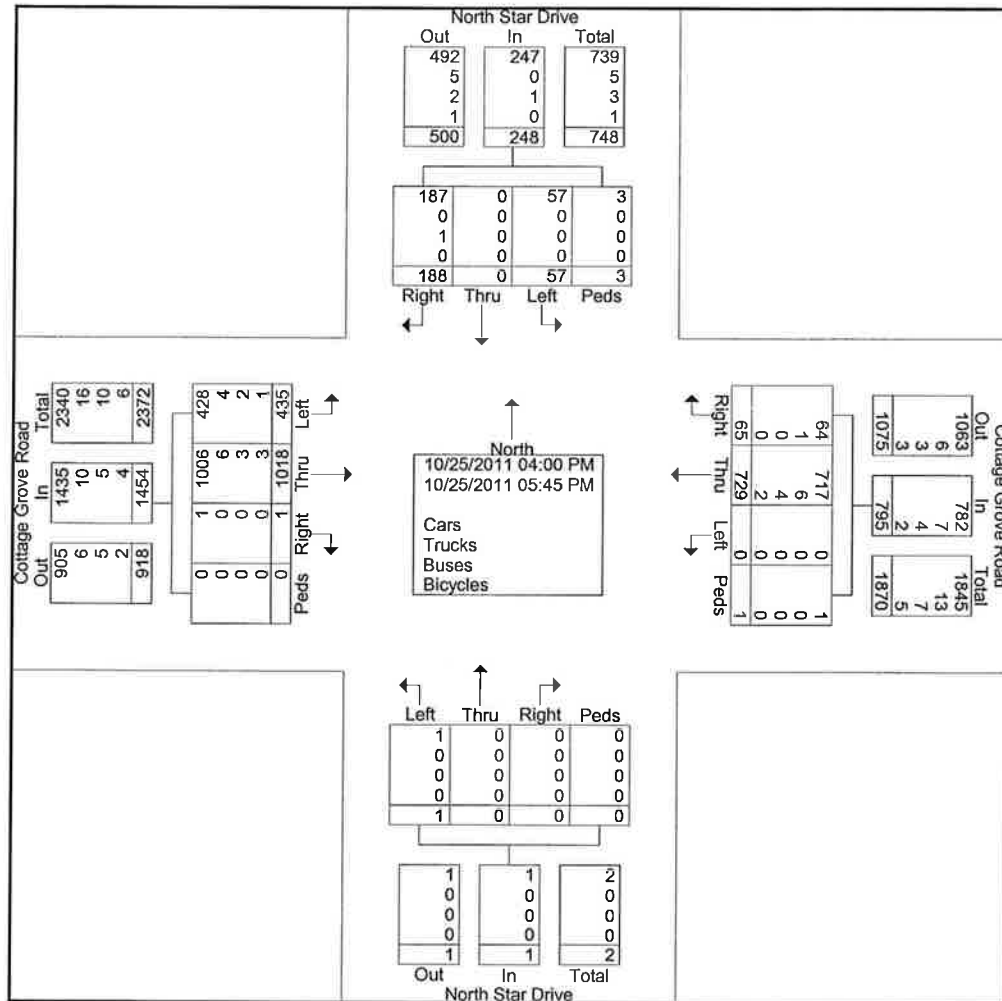
Groups Printed- Cars - Trucks - Buses - Bicycles

Start Time	North Star Drive From North					Cottage Grove Road From East					North Star Drive From South					Cottage Grove Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	18	0	4	1	23	3	82	0	0	85	0	0	0	0	0	0	114	46	0	160	268
04:15 PM	26	0	9	1	36	5	75	0	0	80	0	0	0	0	0	0	123	42	0	165	281
04:30 PM	30	0	5	1	36	4	90	0	0	94	0	0	0	0	0	0	142	53	0	195	325
04:45 PM	25	0	9	0	34	10	95	0	1	106	0	0	0	0	0	0	118	53	0	171	311
Total	99	0	27	3	129	22	342	0	1	365	0	0	0	0	0	0	497	194	0	691	1185
05:00 PM	21	0	8	0	29	8	107	0	0	115	0	0	0	0	0	0	147	39	0	186	330
05:15 PM	18	0	8	0	26	6	95	0	0	101	0	0	0	0	0	1	149	63	0	213	340
05:30 PM	21	0	11	0	32	12	94	0	0	106	0	0	0	0	0	0	115	77	0	192	330
05:45 PM	29	0	3	0	32	17	91	0	0	108	0	0	1	0	1	0	110	62	0	172	313
Total	89	0	30	0	119	43	387	0	0	430	0	0	1	0	1	1	521	241	0	763	1313
Grand Total	188	0	57	3	248	65	729	0	1	795	0	0	1	0	1	1	1018	435	0	1454	2498
Apprch %	75.8	0	23	1.2		8.2	91.7	0	0.1		0	0	100	0		0.1	70	29.9	0		
Total %	7.5	0	2.3	0.1	9.9	2.6	29.2	0	0	31.8	0	0	0	0	0	0	40.8	17.4	0	58.2	
Cars	187	0	57	3	247	64	717	0	1	782	0	0	1	0	1	1	1006	428	0	1435	2465
% Cars	99.5	0	100	100	99.6	98.5	98.4	0	100	98.4	0	0	100	0	100	100	98.8	98.4	0	98.7	98.7
Trucks	0	0	0	0	0	1	6	0	0	7	0	0	0	0	0	0	6	4	0	10	17
% Trucks	0	0	0	0	0	1.5	0.8	0	0	0.9	0	0	0	0	0	0	0.6	0.9	0	0.7	0.7
Buses	1	0	0	0	1	0	4	0	0	4	0	0	0	0	0	0	3	2	0	5	10
% Buses	0.5	0	0	0	0.4	0	0.5	0	0	0.5	0	0	0	0	0	0	0.3	0.5	0	0.3	0.4
Bicycles	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	1	0	4	6
% Bicycles	0	0	0	0	0	0	0.3	0	0	0.3	0	0	0	0	0	0	0.3	0.2	0	0.3	0.2

5950 Seminole Centre Court, Suite 200
Madison, WI 53711

Cottage Grove Road & North Star Drive
4:00 - 6:00 PM
Madison, Dane County, WI
Grandview Commons Town Center

File Name : PM North Star & Cottage Grove Rd.
Site Code : 111001PM
Start Date : 10/25/2011
Page No : 2



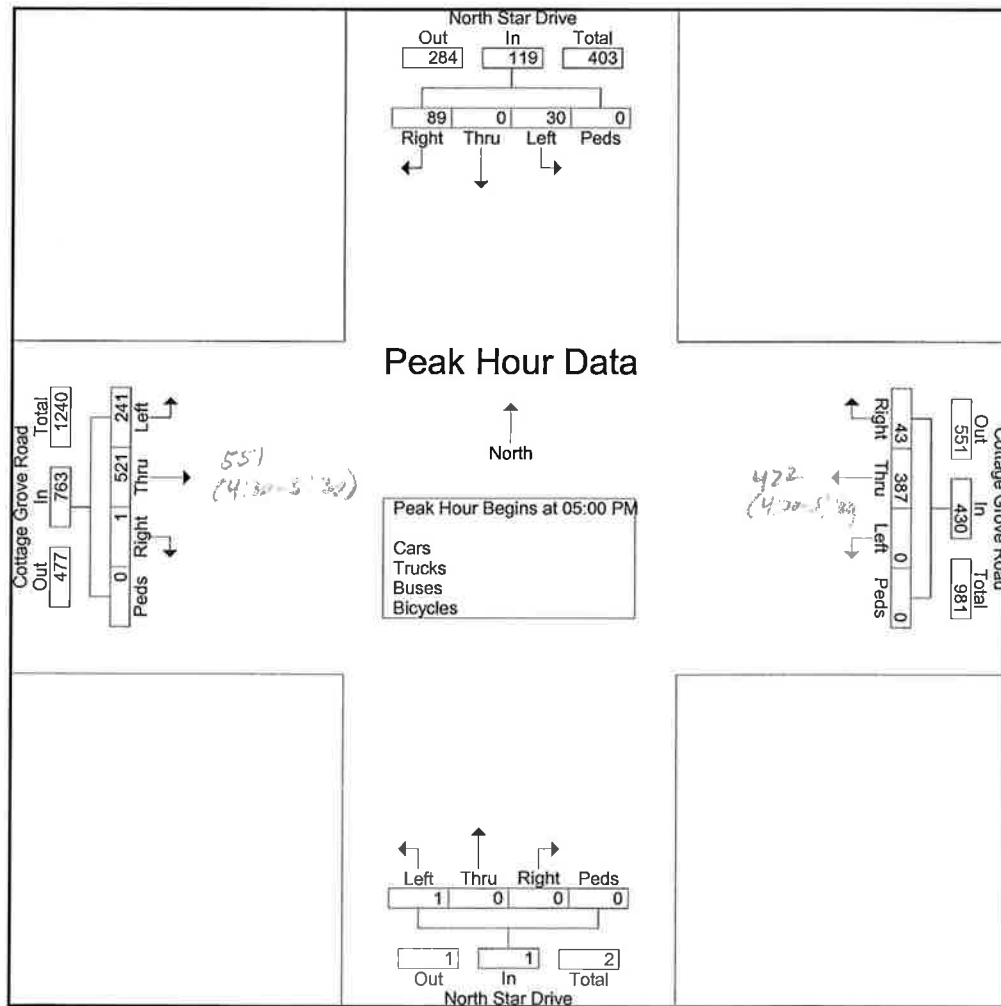
KL Engineering, Inc.

5950 Seminole Centre Court, Suite 200
Madison, WI 53711

Cottage Grove Road & North Star Drive
4:00 - 6:00 PM
Madison, Dane County, WI
Grandview Commons Town Center

File Name : PM North Star & Cottage Grove Rd.
Site Code : 111001PM
Start Date : 10/25/2011
Page No : 3

	North Star Drive From North					Cottage Grove Road From East					North Star Drive From South					Cottage Grove Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	21	0	8	0	29	8	107			115	0	0	0	0	0	0	147	39	0	186	330
05:15 PM	18	0	8	0	26	6	95	0	0	101	0	0	0	0	0	1	149	63	0	213	340
05:30 PM	21	0	11		32	12	94	0	0	106	0	0	0	0	0	0	115	77			
05:45 PM	29	0	3	0	32	17	91	0	0	108	0	0	1	0	1	0	110	62	0	172	313
Total Volume	89	0	30	0	119	43	387	0	0	430	0	0	1	0	1	1	521	241	0	763	1313
% App. Total	74.8	0	25.2	0		10	90	0	0		0	0	100	0		0.1	68.3	31.6	0		
PHF	.767	.000	.682	.000	.930	.632	.904	.000	.000	.935	.000	.000	.250	.000	.250	.250	.874	.782	.000	.896	.965



KL Engineering, Inc.

5950 Seminole Centre Court, Suite 200
Madison, WI 53711

Cottage Grove Road & McLean Drive
7:00 - 9:00 AM
Madison, Dane County, WI
Grandview Commons Town Center

File Name : AM Cottage Grove Rd & McClean Rd
Site Code : 111002AM
Start Date : 10/20/2011
Page No : 1

Groups Printed- Cars - Trucks - Buses - Bicycles

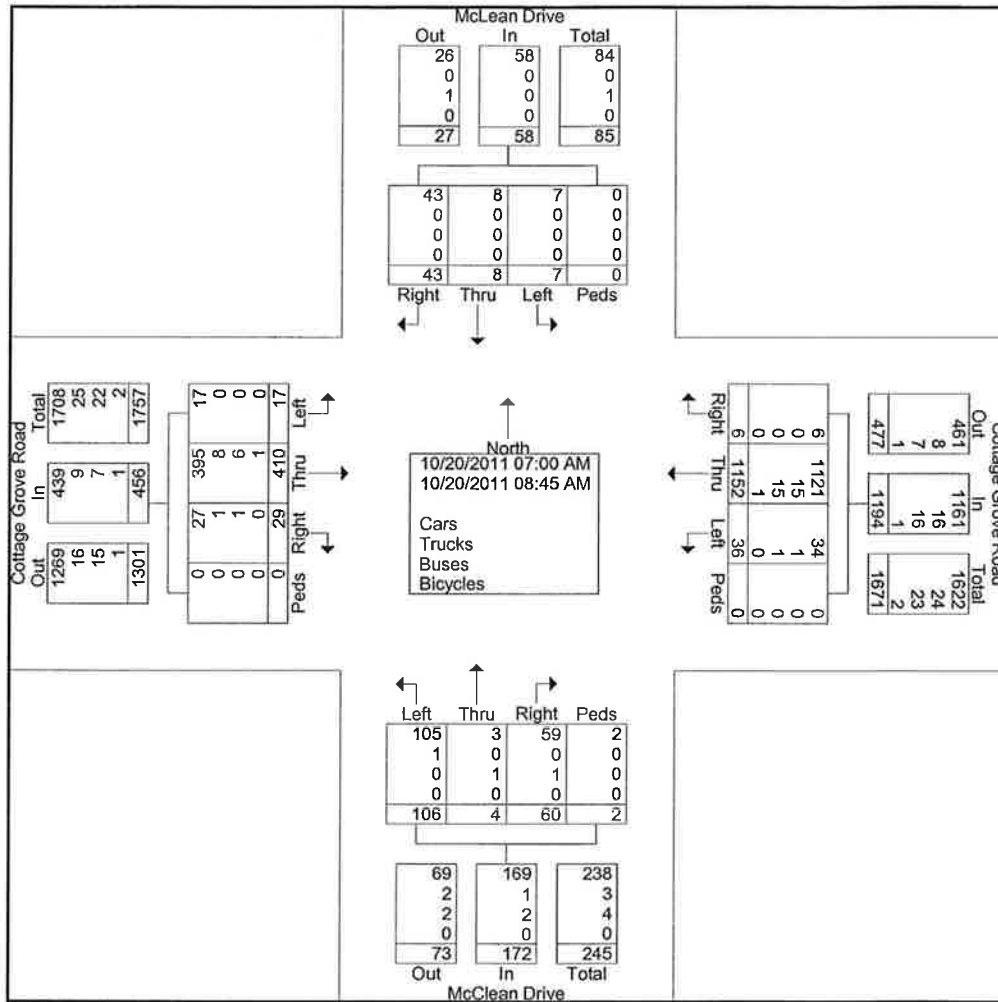
Start Time	McLean Drive From North					Cottage Grove Road From East					McClean Drive From South					Cottage Grove Road From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	13	1	1	0	15	0	142	5	0	147	8	1	15	0	24	2	33	0	0	35	221
07:15 AM	4	1	0	0	5	1	194	2	0	197	7	0	17	1	25	3	47	2	0	52	279
07:30 AM	7	0	2	0	9	1	203	4	0	208	7	1	18	0	26	2	64	1	0	67	310
07:45 AM	3	2	0	0	5	1	196	5	0	202	8	0	14	0	22	4	66	2	0	72	301
Total	27	4	3	0	34	3	735	16	0	754	30	2	64	1	97	11	210	5	0	226	1111
08:00 AM	8	3	2	0	13	1	155	4	0	160	8	0	15	0	23	4	50	1	0	55	251
08:15 AM	4	0	1	0	5	2	94	4	0	100	3	1	10	0	14	7	44	5	0	56	175
08:30 AM	1	0	1	0	2	0	85	1	0	86	7	0	12	1	20	3	52	3	0	58	166
08:45 AM	3	1	0	0	4	0	83	11	0	94	12	1	5	0	18	4	54	3	0	61	177
Total	16	4	4	0	24	3	417	20	0	440	30	2	42	1	75	18	200	12	0	230	769
Grand Total	43	8	7	0	58	6	1152	36	0	1194	60	4	106	2	172	29	410	17	0	456	1880
Apprch %	74.1	13.8	12.1	0		0.5	96.5	3	0		34.9	2.3	61.6	1.2		6.4	89.9	3.7	0		
Total %	2.3	0.4	0.4	0	3.1	0.3	61.3	1.9	0	63.5	3.2	0.2	5.6	0.1	9.1	1.5	21.8	0.9	0	24.3	
Cars	43	8	7	0	58	6	1121	34	0	1161	59	3	105	2	169	27	395	17	0	439	1827
% Cars	100	100	100	0	100	100	97.3	94.4	0	97.2	98.3	75	99.1	100	98.3	93.1	96.3	100	0	96.3	97.2
Trucks	0	0	0	0	0	0	15	1	0	16	0	0	1	0	1	1	8	0	0	9	26
% Trucks	0	0	0	0	0	0	1.3	2.8	0	1.3	0	0	0.9	0	0.6	3.4	2	0	0	2	1.4
Buses	0	0	0	0	0	0	15	1	0	16	1	1	0	0	2	1	6	0	0	7	25
% Buses	0	0	0	0	0	0	1.3	2.8	0	1.3	1.7	25	0	0	1.2	3.4	1.5	0	0	1.5	1.3
Bicycles	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
% Bicycles	0	0	0	0	0	0	0.1	0	0	0.1	0	0	0	0	0	0	0.2	0	0	0.2	0.1

KL Engineering, Inc.

5950 Seminole Centre Court, Suite 200
Madison, WI 53711

Cottage Grove Road & McLean Drive
7:00 - 9:00 AM
Madison, Dane County, WI
Grandview Commons Town Center

File Name : AM Cottage Grove Rd & McClean Rd
Site Code : 111002AM
Start Date : 10/20/2011
Page No : 2



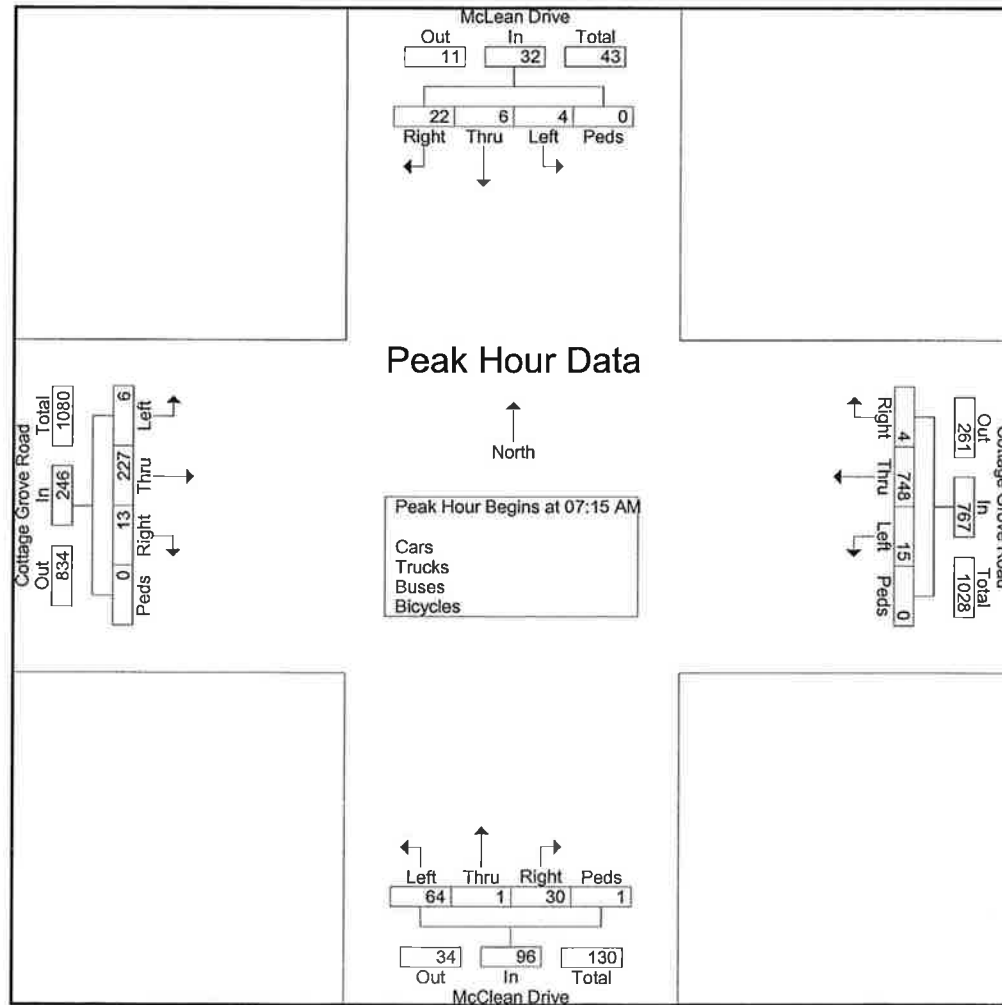
KL Engineering, Inc.

5950 Seminole Centre Court, Suite 200
Madison, WI 53711

Cottage Grove Road & McLean Drive
7:00 - 9:00 AM
Madison, Dane County, WI
Grandview Commons Town Center

File Name : AM Cottage Grove Rd & McClean Rd
Site Code : 111002AM
Start Date : 10/20/2011
Page No : 3

	McLean Drive From North					Cottage Grove Road From East					McClean Drive From South					Cottage Grove Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	4	1	0	0	5	1	194	2	0	197	7	0	17	1				2			
07:30 AM	7	0	2	0	9	1	203	4	0	208	7	1	18	0	26	2	64	1	0	67	310
07:45 AM	3	2	0	0	5	1	196	5			8		15	0	23	4	66	2	0	72	301
08:00 AM	8	3	2	0	13	1	155	4	0	160	8	0	15	0	23	4	50	1	0	55	251
Total Volume	22	6	4	0	32	4	748	15	0	767	30	1	64	1	96	13	227	6	0	246	1141
% App. Total	68.8	18.8	12.5	0		0.5	97.5	2	0		31.2	1	66.7	1		5.3	92.3	2.4	0		
PHF	.688	.500	.500	.000	.615	1.00	.921	.750	.000	.922	.938	.250	.889	.250	.923	.813	.860	.750	.000	.854	.920



KL Engineering, Inc.

5950 Seminole Centre Court, Suite 200
Madison, WI 53711

Cottage Grove Road & McLean Drive
4:00 - 6:00 PM
Madison, Dane County, WI
Grandview Commons Town Center

File Name : PM Cottage Grove Rd - McLean Dr.
Site Code : 111002PM
Start Date : 10/20/2011
Page No : 1

Groups Printed- Cars - Trucks - Buses - Bicycles

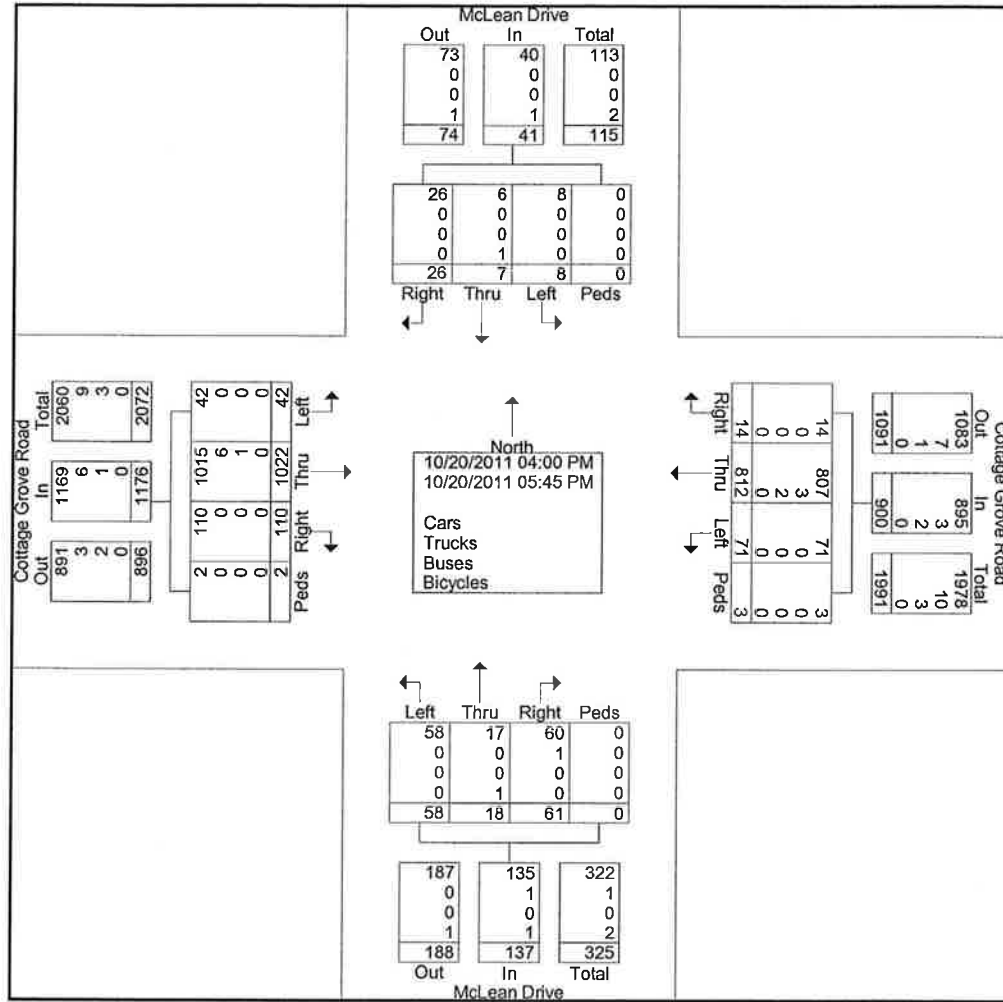
Start Time	McLean Drive From North					Cottage Grove Road From East					McLean Drive From South					Cottage Grove Road From West					int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	1	1	1	0	3	1	90	17	2	110	10	3	3	0	16	9	108	5	1	123	252
04:15 PM	2	2	1	0	5	2	117	4	0	123	6	4	5	0	15	15	126	2	0	143	286
04:30 PM	3	0	0	0	3	1	101	11	1	114	5	1	6	0	12	13	153	5	0	171	300
04:45 PM	7	1	0	0	8	4	107	10	0	121	7	1	11	0	19	19	125	7	0	151	299
Total	13	4	2	0	19	8	415	42	3	468	28	9	25	0	62	56	512	19	1	588	1137
05:00 PM	1	1	1	0	3	1	120	4	0	125	12	0	11	0	23	19	151	6	1	177	328
05:15 PM	6	0	2	0	8	0	96	10	0	106	4	3	8	0	15	17	148	6	0	171	300
05:30 PM	2	2	2	0	6	2	82	8	0	92	9	4	8	0	21	7	110	10	0	127	246
05:45 PM	4	0	1	0	5	3	99	7	0	109	8	2	6	0	16	11	101	1	0	113	243
Total	13	3	6	0	22	6	397	29	0	432	33	9	33	0	75	54	510	23	1	588	1117
Grand Total	26	7	8	0	41	14	812	71	3	900	61	18	58	0	137	110	1022	42	2	1176	2254
Apprch %	63.4	17.1	19.5	0		1.6	90.2	7.9	0.3		44.5	13.1	42.3	0		9.4	86.9	3.6	0.2		
Total %	1.2	0.3	0.4	0	1.8	0.6	36	3.1	0.1	39.9	2.7	0.8	2.6	0	6.1	4.9	45.3	1.9	0.1	52.2	
Cars	26	6	8	0	40	14	807	71	3	895	60	17	58	0	135	110	1015	42	2	1169	2239
% Cars	100	85.7	100	0	97.6	100	99.4	100	100	99.4	98.4	94.4	100	0	98.5	100	99.3	100	100	99.4	99.3
Trucks	0	0	0	0	0	0	3	0	0	3	1	0	0	0	1	0	6	0	0	6	10
% Trucks	0	0	0	0	0	0	0.4	0	0	0.3	1.6	0	0	0	0.7	0	0.6	0	0	0.5	0.4
Buses	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	3
% Buses	0	0	0	0	0	0	0.2	0	0	0.2	0	0	0	0	0	0	0.1	0	0	0.1	0.1
Bicycles	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
% Bicycles	0	14.3	0	0	2.4	0	0	0	0	0	0	5.6	0	0	0.7	0	0	0	0	0	0.1

KL Engineering, Inc.

5950 Seminole Centre Court, Suite 200
Madison, WI 53711

Cottage Grove Road & McLean Drive
4:00 - 6:00 PM
Madison, Dane County, WI
Grandview Commons Town Center

File Name : PM Cottage Grove Rd - McLean Dr.
Site Code : 111002PM
Start Date : 10/20/2011
Page No : 2



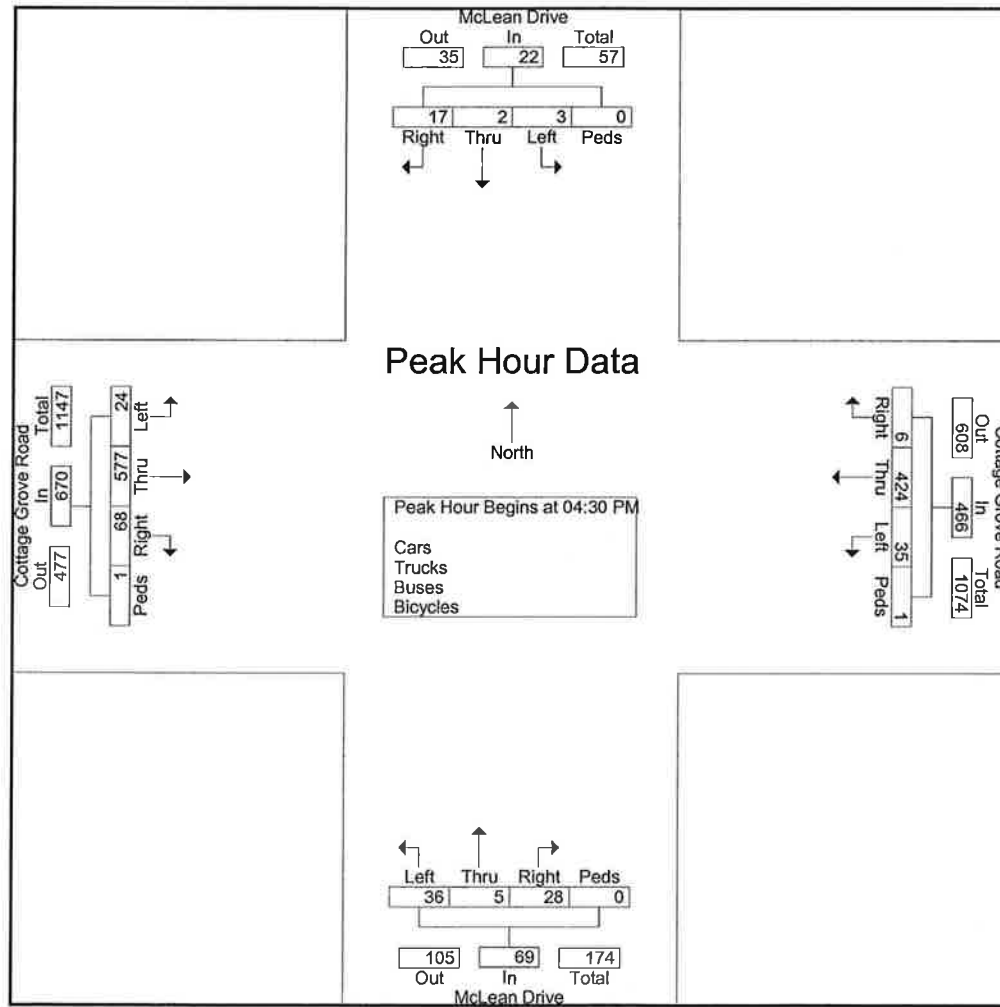
KL Engineering, Inc.

5950 Seminole Centre Court, Suite 200
Madison, WI 53711

Cottage Grove Road & McLean Drive
4:00 - 6:00 PM
Madison, Dane County, WI
Grandview Commons Town Center

File Name : PM Cottage Grove Rd - McLean Dr.
Site Code : 111002PM
Start Date : 10/20/2011
Page No : 3

	McLean Drive From North					Cottage Grove Road From East					McLean Drive From South					Cottage Grove Road From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	3	0	0	0	3	1	101	11	1	114	5	1	6	0	12	13	153	5	0	171	300
04:45 PM	7	1	0	0	8	4	107	10	0	121	7	1	11	0	19	19		7			
05:00 PM	1	1	1	0	3	1	120	4	0	125	12	0	11	0	23	19	151	6	1	177	328
05:15 PM	6	0	2									3									
Total Volume	17	2	3	0	22	6	424	35	1	466	28	5	36	0	69	68	577	24	1	670	1227
% App. Total	77.3	9.1	13.6	0		1.3	91	7.5	0.2		40.6	7.2	52.2	0		10.1	86.1	3.6	0.1		
PHF	.607	.500	.375	.000	.688	.375	.883	.795	.250	.932	.583	.417	.818	.000	.750	.895	.943	.857	.250	.946	.935



5950 Seminole Centre Court, Suite 200
Madison, WI 53711

File Name : North Star & Jupiter AM
Site Code : 111005AM
Start Date : 10/25/2011
Page No : 1

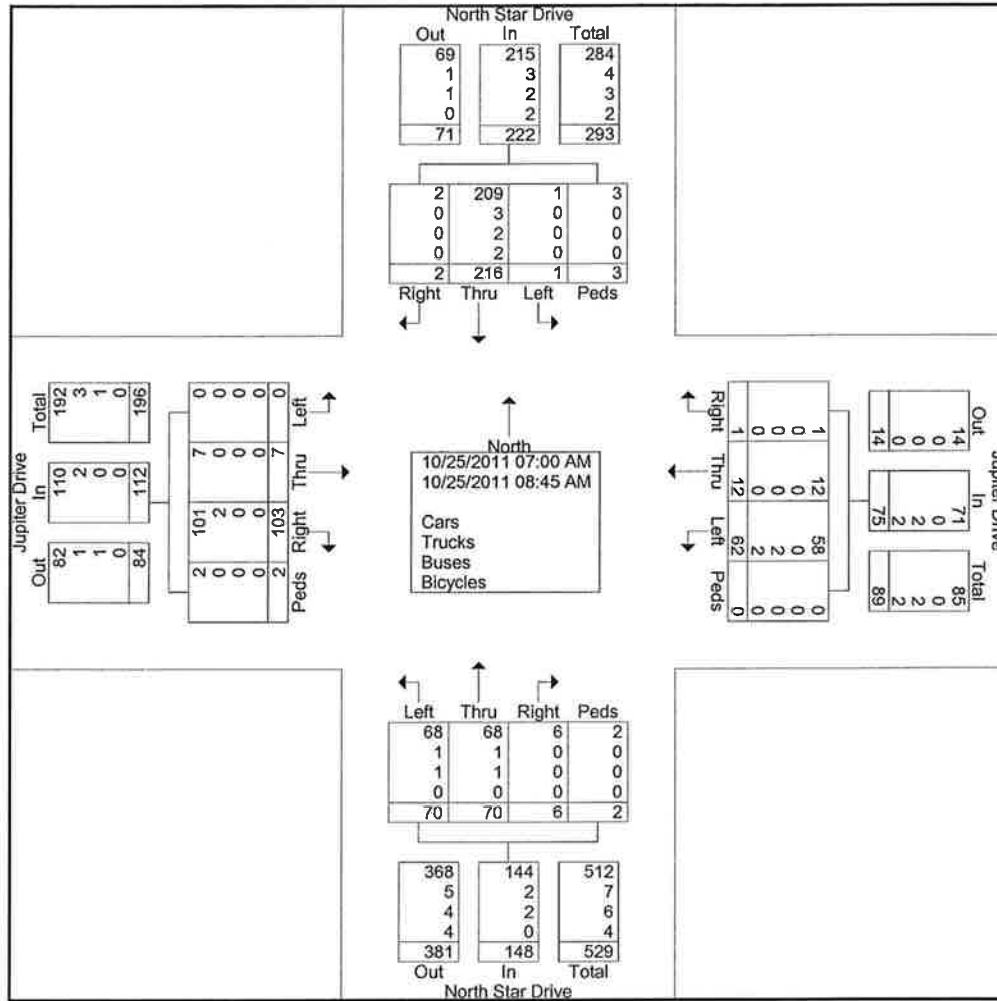
[illegible]

KL Engineering, Inc.

5950 Seminole Centre Court, Suite 200
Madison, WI 53711

North Star Drive & Jupiter Drive
7:00 - 9:00 AM
Madison, Dane County, WI
Grandview Commons Town Center

File Name : North Star & Jupiter AM
Site Code : 111005AM
Start Date : 10/25/2011
Page No : 2



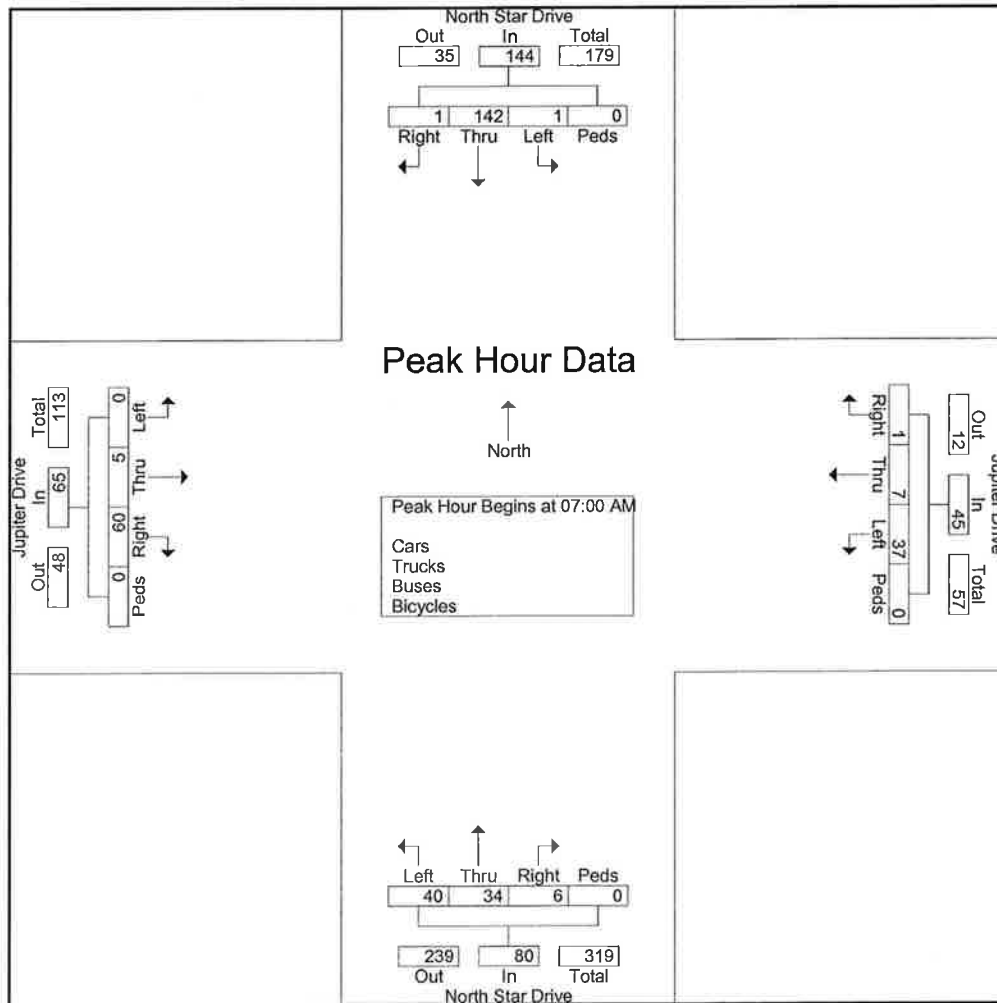
KL Engineering, Inc.

5950 Seminole Centre Court, Suite 200
Madison, WI 53711

North Star Drive & Jupiter Drive
7:00 - 9:00 AM
Madison, Dane County, WI
Grandview Commons Town Center

File Name : North Star & Jupiter AM
Site Code : 111005AM
Start Date : 10/25/2011
Page No : 3

	North Star Drive From North					Jupiter Drive From East					North Star Drive From South					Jupiter Drive From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	36	0	0	36	1	1	13		15	0	6	9	0	15	14	2	0	0	16	82
07:15 AM	1	38	0	0	39	0	2						13	0	22	11	0	0	0	11	84
07:30 AM	0	37	0	0	37	0	2	5	0	7	3					20				22	88
07:45 AM	0	31	1									11									
Total Volume	1	142	1	0	144	1	7	37	0	45	6	34	40	0	80	60	5	0	0	65	334
% App. Total	0.7	98.6	0.7	0		2.2	15.6	82.2	0		7.5	42.5	50	0		92.3	7.7	0	0		
PHF	.250	.934	.250	.000	.923	.250	.875	.712	.000	.750	.500	.773	.769	.000	.909	.750	.625	.000	.000	.739	.949



KL Engineering, Inc.

5950 Seminole Centre Court, Suite 200
Madison, WI 53711

North Star Dr & Sharpsburg/Jupiter Dr
4:00 - 6:00 pm
Madison, Dane County, WI
Grandview Commons Town Center

File Name : PM North Star Jupiter PM
Site Code : 111005PM
Start Date : 10/25/2011
Page No : 1

Groups Printed- Cars - Trucks - Buses - Bicycles

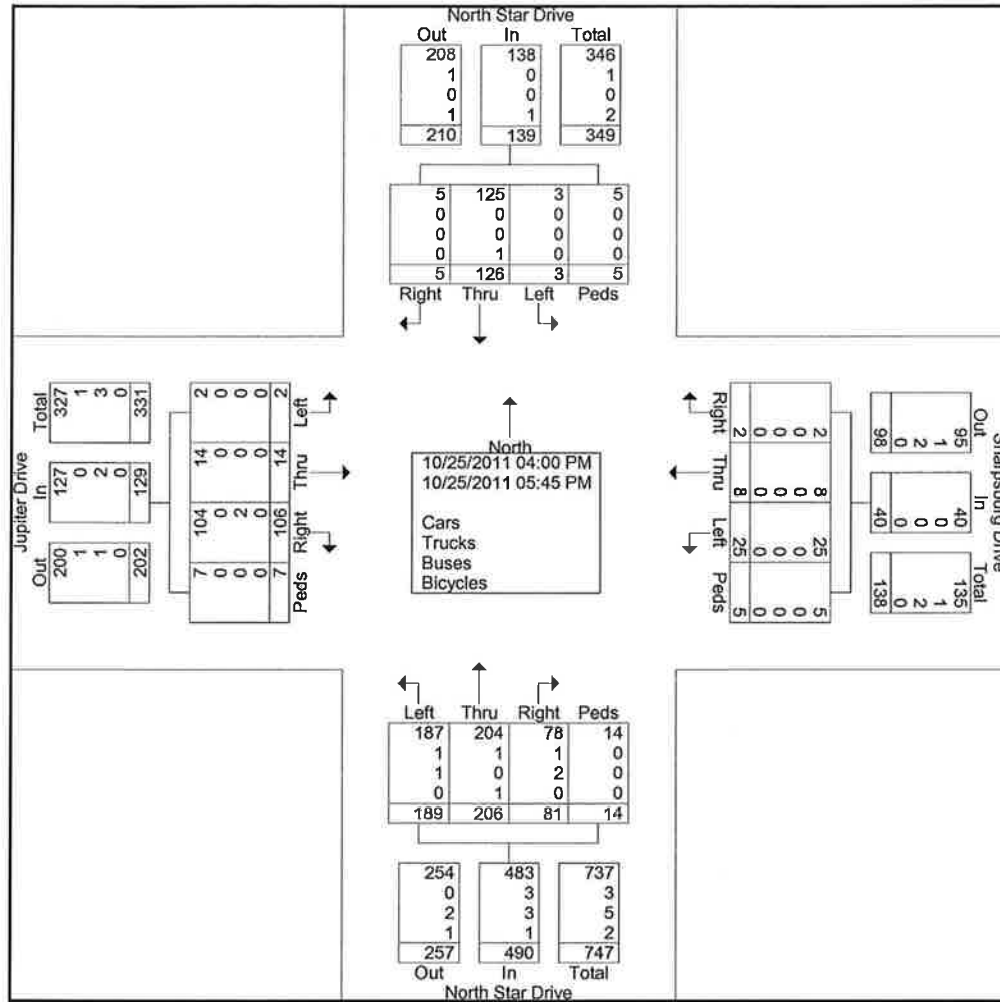
	North Star Drive From North					Sharpsburg Drive From East					North Star Drive From South					Jupiter Drive From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	1	14	0	0	15	0	1	2	1	4	11	16	21	3	51	9	2	0	2	13	83
04:15 PM	1	12	1	1	15	1	0	7	0	8	6	23	17	1	47	16	2	0	1	19	89
04:30 PM	0	24	0	1	25	0	1	1	1	3	11	34	13	0	58	15	3	0	0	18	104
04:45 PM	0	17	0	1	18	0	1	2	1	4	10	22	24	2	58	15	2	0	2	19	99
Total	2	67	1	3	73	1	3	12	3	19	38	95	75	6	214	55	9	0	5	69	375
05:00 PM	1	15	2	0	18	0	2	3	0	5	5	22	23	0	50	15	3	0	0	18	91
05:15 PM	0	13	0	2	15	1	1	2	2	6	10	31	22	2	65	13	0	0	2	15	101
05:30 PM	1	19	0	0	20	0	0	4	0	4	15	35	32	4	86	11	0	0	0	11	121
05:45 PM	1	12	0	0	13	0	2	4	0	6	13	23	37	2	75	12	2	2	0	16	110
Total	3	59	2	2	66	1	5	13	2	21	43	111	114	8	276	51	5	2	2	60	423
Grand Total	5	126	3	5	139	2	8	25	5	40	81	206	189	14	490	106	14	2	7	129	798
Apprch %	3.6	90.6	2.2	3.6		5	20	62.5	12.5		16.5	42	38.6	2.9		82.2	10.9	1.6	5.4		
Total %	0.6	15.8	0.4	0.6	17.4	0.3	1	3.1	0.6	5	10.2	25.8	23.7	1.8	61.4	13.3	1.8	0.3	0.9	16.2	
Cars	5	125	3	5	138	2	8	25	5	40	78	204	187	14	483	104	14	2	7	127	788
% Cars	100	99.2	100	100	99.3	100	100	100	100	100	96.3	99	98.9	100	98.6	98.1	100	100	100	98.4	98.7
Trucks	0	0	0	0	0	0	0	0	0	0	1	1	1	0	3	0	0	0	0	0	3
% Trucks	0	0	0	0	0	0	0	0	0	0	1.2	0.5	0.5	0	0.6	0	0	0	0	0	0.4
Buses	0	0	0	0	0	0	0	0	0	0	2	0	1	0	3	2	0	0	0	2	5
% Buses	0	0	0	0	0	0	0	0	0	0	2.5	0	0.5	0	0.6	1.9	0	0	0	1.6	0.6
Bicycles	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
% Bicycles	0	0.8	0	0	0.7	0	0	0	0	0	0	0.5	0	0	0.2	0	0	0	0	0	0.3

KL Engineering, Inc.

5950 Seminole Centre Court, Suite 200
Madison, WI 53711

North Star Dr & Sharpsburg/Jupiter Dr
4:00 - 6:00 pm
Madison, Dane County, WI
Grandview Commons Town Center

File Name : PM North Star Jupiter PM
Site Code : 111005PM
Start Date : 10/25/2011
Page No : 2



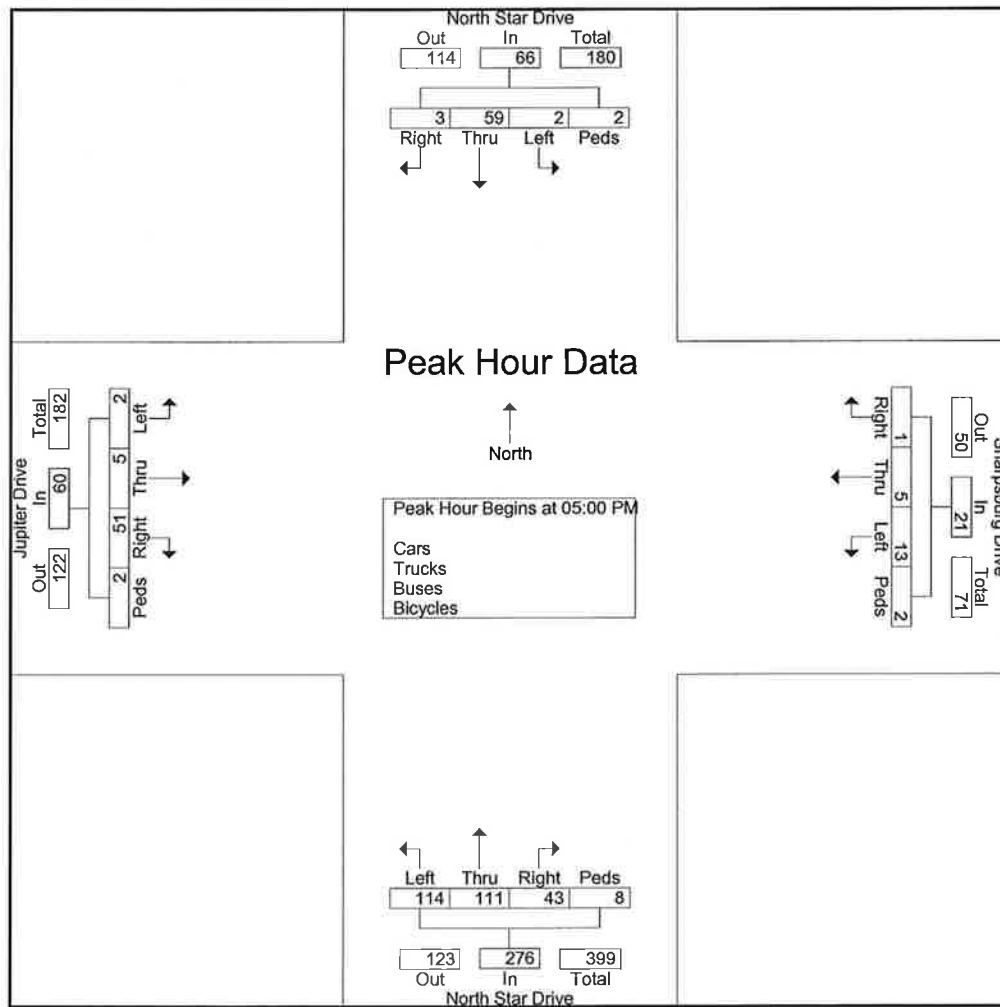
KL Engineering, Inc.

5950 Seminole Centre Court, Suite 200
Madison, WI 53711

North Star Dr & Sharpsburg/Jupiter Dr
4:00 - 6:00 pm
Madison, Dane County, WI
Grandview Commons Town Center

File Name : PM North Star Jupiter PM
Site Code : 111005PM
Start Date : 10/25/2011
Page No : 3

	North Star Drive From North					Sharpsburg Drive From East					North Star Drive From South					Jupiter Drive From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	1		2				2									15	3	0	0	18	91
05:15 PM	0	13	0	2		1	1	2	2	6	10	31	22	2	65	13	0	0	2		
05:30 PM	1	19	0	0	20	0	0	4	0	4	15	35	32	4	86	11	0	0	0	11	121
05:45 PM	1	12	0	0	13	0	2	4	0	6	13	23	37	2	75	12	2	2			
Total Volume	3	59	2	2	66	1	5	13	2	21	43	111	114	8	276	51	5	2	2	60	423
% App. Total	4.5	89.4	3	3		4.8	23.8	61.9	9.5		15.6	40.2	41.3	2.9		85	8.3	3.3	3.3		
PHF	.750	.776	.250	.250	.825	.250	.625	.813	.250	.875	.717	.793	.770	.500	.802	.850	.417	.250	.250	.833	.874



KL Engineering, Inc.

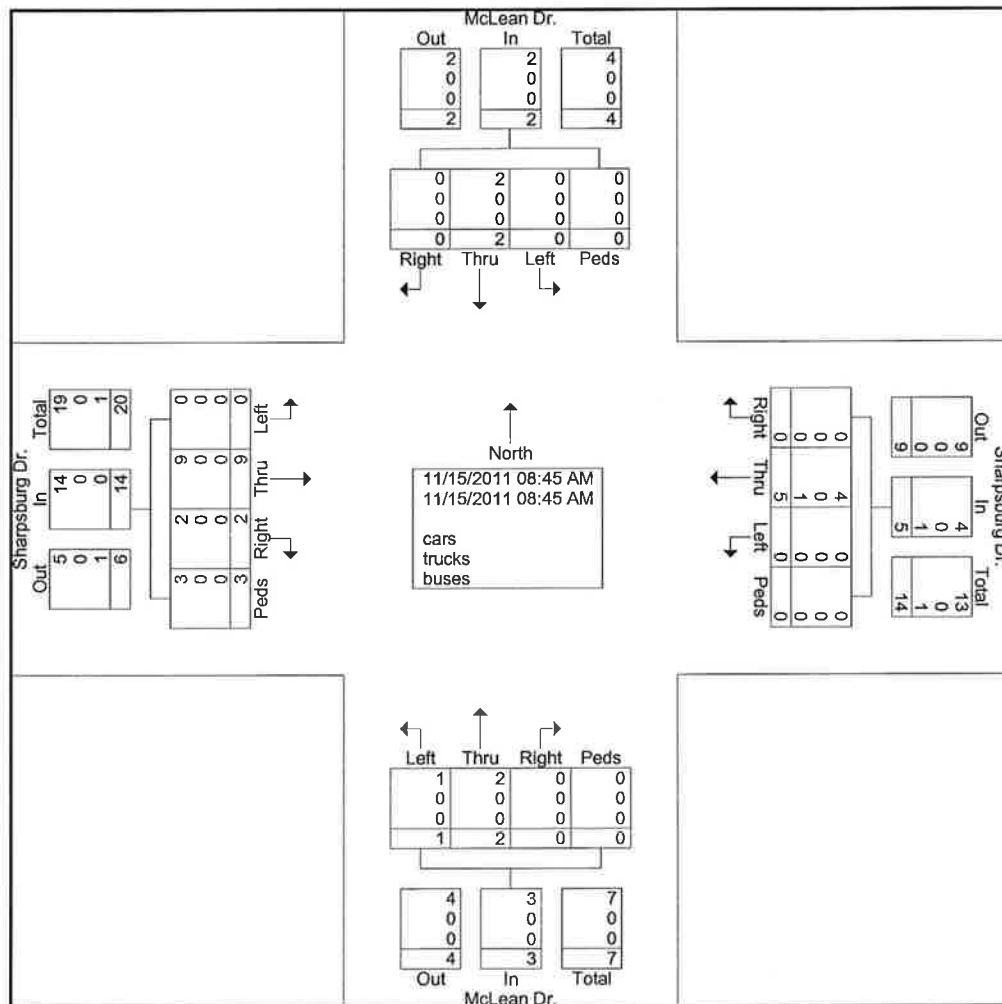
5950 Seminole Centre Court, Suite 200
Madison, WI 53711

McLean Dr and Sharpsburg
7:45 - 8:00 AM
Madison, Dane County, WI
Grandview Commons Town Center

File Name : AM McLean Dr. - Sharpsburg Dr.
Site Code :
Start Date : 11/15/2011
Page No : 1

Groups Printed- cars - trucks - buses

	McLean Dr. From North					Sharpsburg Dr. From East					McLean Dr. From South					Sharpsburg Dr. From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:45 AM	0	2	0	0	2	0	5	0	0	5	0	2	1	0	3	2	9	0	3	14	24
Total	0	2	0	0	2	0	5	0	0	5	0	2	1	0	3	2	9	0	3	14	24
Grand Total	0	2	0	0	2	0	5	0	0	5	0	2	1	0	3	2	9	0	3	14	24
Apprch %	0	100	0	0		0	100	0	0		0	66.7	33.3	0		14.3	64.3	0	21.4		
Total %	0	8.3	0	0	8.3	0	20.8	0	0	20.8	0	8.3	4.2	0	12.5	8.3	37.5	0	12.5	58.3	
cars	0	2	0	0	2	0	4	0	0	4	0	2	1	0	3	2	9	0	3	14	23
% cars	0	100	0	0	100	0	80	0	0	80	0	100	100	0	100	100	100	0	100	100	95.8
trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
buses	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
% buses	0	0	0	0	0	0	20	0	0	20	0	0	0	0	0	0	0	0	0	0	4.2



KL Engineering, Inc.

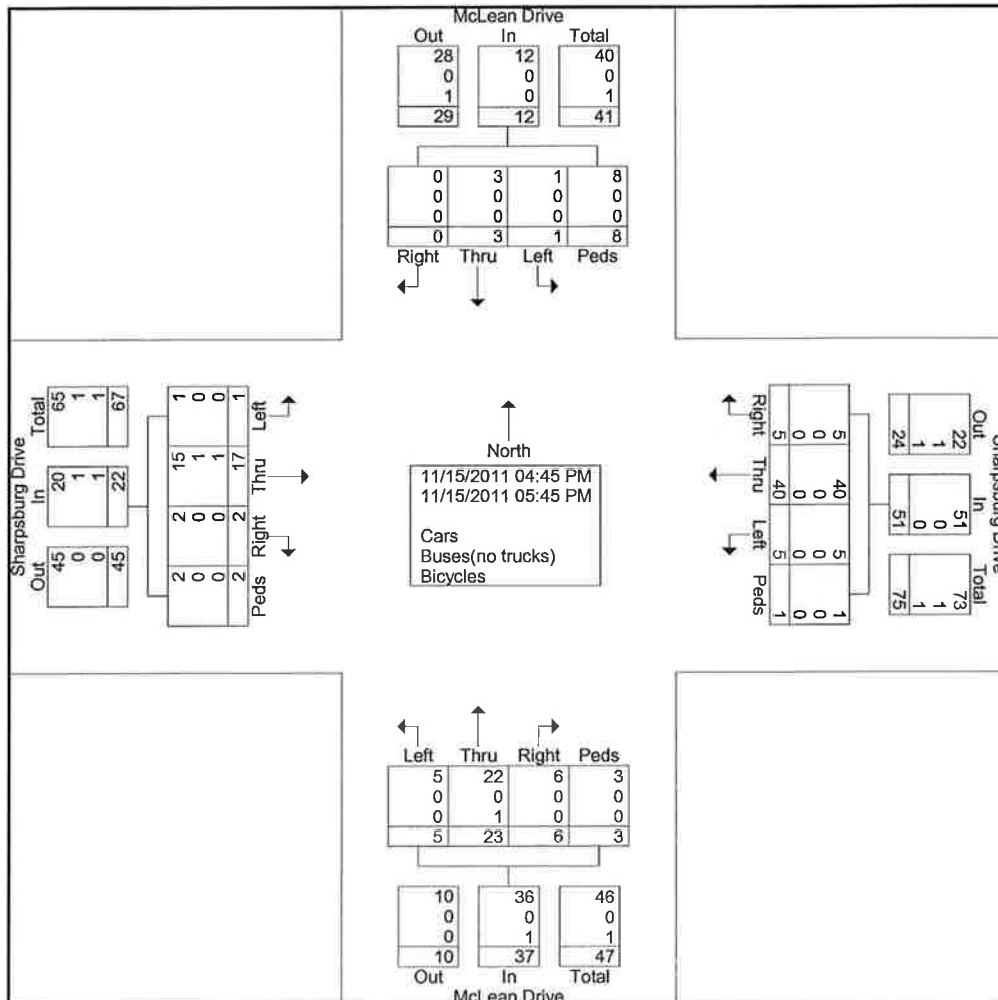
5950 Seminole Centre Court, Suite 200
Madison, WI 53711

McLean Drive & Sharpsburg Drive
PM Peak
Madison, Dane County, WI
Grandview Commons Town Center

File Name : PM McLean Dr. - Sharpsburg Dr.
Site Code : PM
Start Date : 11/15/2011
Page No : 1

Groups Printed- Cars - Buses(no trucks) - Bicycles

Start Time	McLean Drive From North					Sharpsburg Drive From East					McLean Drive From South					Sharpsburg Drive From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:45 PM	0	2	0	0	2	0	10	2	0	12	2	6	2	1	11	0	1	1	0	2	27
Total	0	2	0	0	2	0	10	2	0	12	2	6	2	1	11	0	1	1	0	2	27
05:00 PM	0	0	1	3	4	0	8	1	1	10	1	2	0	0	3	0	6	0	1	7	24
05:15 PM	0	0	0	1	1	2	9	1	0	12	0	8	0	0	8	0	3	0	0	3	24
05:30 PM	0	1	0	4	5	2	4	0	0	6	3	4	1	2	10	1	4	0	1	6	27
05:45 PM	0	0	0	0	0	1	9	1	0	11	0	3	2	0	5	1	3	0	0	4	20
Total	0	1	1	8	10	5	30	3	1	39	4	17	3	2	26	2	16	0	2	20	95
Grand Total	0	3	1	8	12	5	40	5	1	51	6	23	5	3	37	2	17	1	2	22	122
Apprch %	0	25	8.3	66.7		9.8	78.4	9.8	2		16.2	62.2	13.5	8.1		9.1	77.3	4.5	9.1		
Total %	0	2.5	0.8	6.6	9.8	4.1	32.8	4.1	0.8	41.8	4.9	18.9	4.1	2.5	30.3	1.6	13.9	0.8	1.6	18	
Cars	0	3	1	8	12	5	40	5	1	51	6	22	5	3	36	2	15	1	2	20	119
% Cars	0	100	100	100	100	100	100	100	100	100	100	95.7	100	100	97.3	100	88.2	100	100	90.9	97.5
Buses(no trucks)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.9	0	0	4.5	0.8
% Buses(no trucks)	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	2
Bicycles	0	0	0	0	0	0	0	0	0	0	0	4.3	0	0	2.7	0	5.9	0	0	4.5	1.6
% Bicycles	0	0	0	0	0	0	0	0	0	0	0	4.3	0	0	2.7	0	5.9	0	0	4.5	1.6



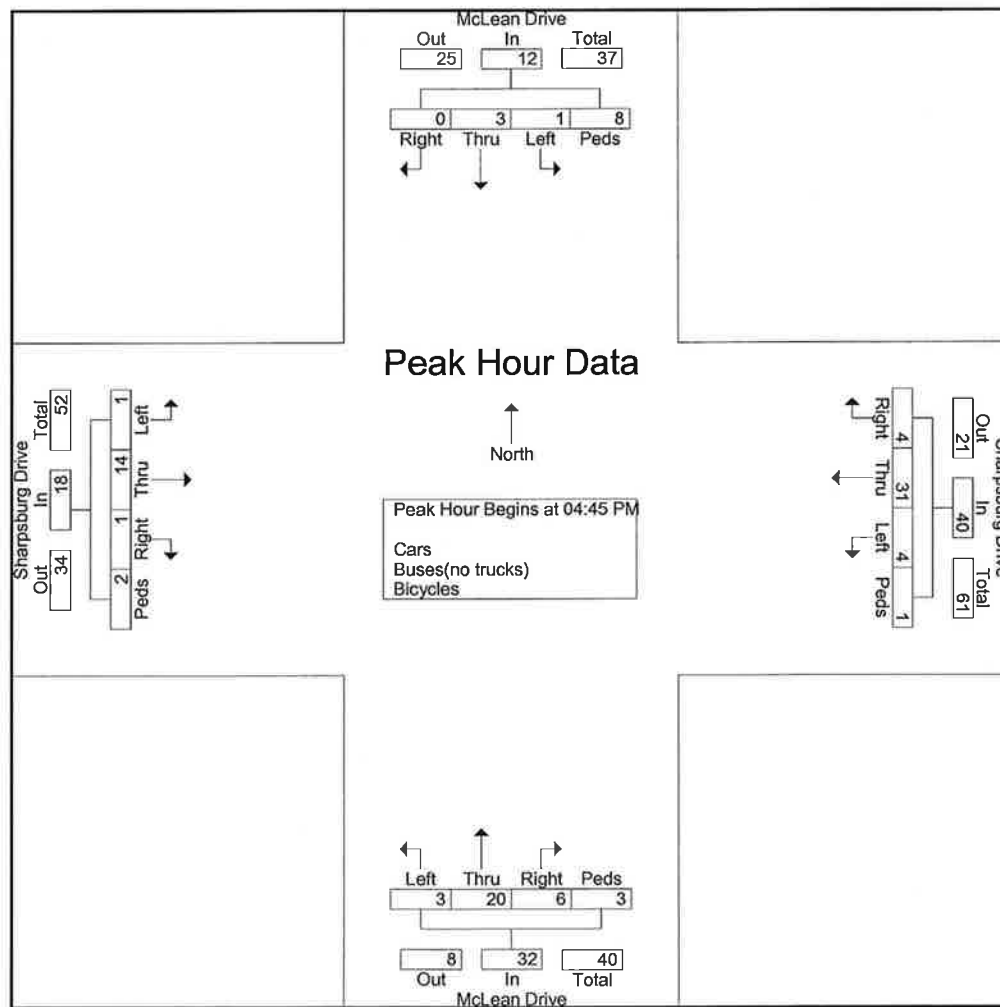
KL Engineering, Inc.

5950 Seminole Centre Court, Suite 200
Madison, WI 53711

McLean Drive & Sharpsburg Drive
PM Peak
Madison, Dane County, WI
Grandview Commons Town Center

File Name : PM McLean Dr. - Sharpsburg Dr.
Site Code : PM
Start Date : 11/15/2011
Page No : 2

	McLean Drive From North					Sharpsburg Drive From East					McLean Drive From South					Sharpsburg Drive From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	2	0	0	2	0	10	2		12	2	6	2	1	11	0	1	1			27
05:00 PM	0	0	1						1	10	1	2	0	0	3	0	6	0	1	7	24
05:15 PM	0	0	0	1	1	2	9	1	0	12	0	8									
05:30 PM	0	1	0	4	5	2	4	0	0	6	3	4	1	2	10	1	4	0	1	6	27
Total Volume	0	3	1	8	12	4	31	4	1	40	6	20	3	3	32	1	14	1	2	18	102
% App. Total	0	25	8.3	66.7		10	77.5	10	2.5		18.8	62.5	9.4	9.4		5.6	77.8	5.6	11.1		
PHF	.000	.375	.250	.500	.600	.500	.775	.500	.250	.833	.500	.625	.375	.375	.727	.250	.583	.250	.500	.643	.944



5500 COTTAGE GROVE RD. [THOMPSON - I/90]
 TRAFFIC ENGINEERING DIVISION
 CITY OF MADISON, WI
 AUTOMATIC TRAFFIC COUNTER RECORD

LOCATION 5500 COTTAGE GROVE RD. [THOMPSON - I/90]

STATION# 4022

DIRECTION combined

REMARKS

START TIME 1000 on 7/28/2010

END TIME 1000 on 7/29/2010

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	TOTAL M-F	AWT	ADT
Date	02-Aug-10	03-Aug-10	28-Jul-10	29-Jul-10	30-Jul-10	31-Jul-10	01-Aug-10	Volume	Volume	Volume
AM 12-1				68				68	68	68
1-2				53				53	53	53
2-3				22				22	22	22
3-4				32				32	32	32
4-5				44				44	44	44
5-6				195				195	195	195
6-7				477				477	477	477
7-8				879				879	879	879
8-9				787				787	787	787
9-10				700				700	700	700
10-11			740					740	740	740
11-12			748					748	748	748
PM 12-1			882					882	882	882
1-2			818					818	818	818
2-3			886					886	886	886
3-4			1049					1049	1049	1049
4-5			1178					1178	1178	1178
5-6			1214					1214	1214	1214
6-7			946					946	946	946
7-8			737					737	737	737
8-9			676					676	676	676
9-10			515					515	515	515
10-11			225					225	225	225
11-12			144					144	144	144
24 HR TOTAL			10758	3257				14015	14015	14015

Factor 0.98

AAWT

Factored Total 13735

LOCATION 5500 COTTAGE GROVE RD. [THOMPSON - I/90]

STATION# 4022

DIRECTION E.B.

REMARKS

START TIME 1000 on 7/28/2010

END TIME 1000 on 7/29/2010

TRAFFIC ENGINEERING DIVISION
CITY OF MADISON, WI
AUTOMATIC TRAFFIC COUNTER RECORD

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	TOTAL M-F	AWT	ADT
Date	02-Aug-10	03-Aug-10	28-Jul-10	29-Jul-10	30-Jul-10	31-Jul-10	01-Aug-10	Volume	Volume	Volume
AM 12-1					35			35	35	35
1-2					31			31	31	31
2-3					16			16	16	16
3-4					13			13	13	13
4-5					10			10	10	10
5-6					58			58	58	58
6-7					120			120	120	120
7-8					221			221	221	221
8-9					252			252	252	252
9-10					306			306	306	306
10-11				343				343	343	343
11-12				365				365	365	365
PM 12-1				456				456	456	456
1-2				391				391	391	391
2-3				477				477	477	477
3-4				570				570	570	570
4-5				719				719	719	719
5-6				707				707	707	707
6-7				500				500	500	500
7-8				401				401	401	401
8-9				377				377	377	377
9-10				334				334	334	334
10-11				143				143	143	143
11-12				94				94	94	94
24 HR TOTAL			5877	1062				6939	6939	6939

Factor 0.98

AAWT

Factored Total 6800

LOCATION 5500 COTTAGE GROVE RD. [THOMPSON - I/90]

STATION# 4022

DIRECTION W.B.

REMARKS

START TIME 1000 on 7/28/2010

END TIME 1000 on 7/29/2010

TRAFFIC ENGINEERING DIVISION

CITY OF MADISON, WI

AUTOMATIC TRAFFIC COUNTER RECORD

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	TOTAL M-F	AWT	ADT
Date	02-Aug-10	03-Aug-10	28-Jul-10	29-Jul-10	30-Jul-10	31-Jul-10	01-Aug-10	Volume	Volume	Volume
AM 12-1				33				33	33	33
1-2				22				22	22	22
2-3				6				6	6	6
3-4				19				19	19	19
4-5				34				34	34	34
5-6				137				137	137	137
6-7				357				357	357	357
7-8				658				658	658	658
8-9				535				535	535	535
9-10				394				394	394	394
10-11			397					397	397	397
11-12			383					383	383	383
PM 12-1			426					426	426	426
1-2			427					427	427	427
2-3			409					409	409	409
3-4			479					479	479	479
4-5			459					459	459	459
5-6			507					507	507	507
6-7			446					446	446	446
7-8			336					336	336	336
8-9			299					299	299	299
9-10			181					181	181	181
10-11			82					82	82	82
11-12			50					50	50	50
24 HR TOTAL			4881	2195				7076	7076	7076

Factor 0.98

AAWT

Factored Total 6934

LOCATION 5900 Cottage Grove Rd [North Star -McLean]

STATION# 402206

DIRECTION NON-DIR

REMARKS

START TIME 1400 on 7/21/2010

END TIME 1400 on 7/22/2010

TRAFFIC ENGINEERING DIVISION

CITY OF MADISON, WI

AUTOMATIC TRAFFIC COUNTER RECORD

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	TOTAL M-F	AWT	ADT
Date	26-Jul-10	27-Jul-10	21-Jul-10	22-Jul-10	23-Jul-10	24-Jul-10	25-Jul-10	Volume	Volume	Volume
AM 12-1					59			59	59	59
1-2					35			35	35	35
2-3					18			18	18	18
3-4					28			28	28	28
4-5					39			39	39	39
5-6					128			128	128	128
6-7					386			386	386	386
7-8					677			677	677	677
8-9					570			570	570	570
9-10					526			526	526	526
10-11					561			561	561	561
11-12					603			603	603	603
PM 12-1					635			635	635	635
1-2					669			669	669	669
2-3					681			681	681	681
3-4					859			859	859	859
4-5					1016			1016	1016	1016
5-6					1088			1088	1088	1088
6-7					780			780	780	780
7-8					581			581	581	581
8-9					578			578	578	578
9-10					442			442	442	442
10-11					227			227	227	227
11-12					102			102	102	102
24 HR TOTAL				4934				11288	11288	11288

Factor 0.98

AAWT

Factored Total 11062

6900

LOCATION 6900 COTTAGE GR. RD. (WEST OF SPRECHER)

STATION# 402202

DIRECTION NON-DIR

REMARKS

START TIME 1300 on 7/21/2010

END TIME 1300 on 7/22/2010

TRAFFIC ENGINEERING DIVISION

CITY OF MADISON, WI

AUTOMATIC TRAFFIC COUNTER RECORD

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	TOTAL M-F	AWT	ADT
Date	26-Jul-10	27-Jul-10	21-Jul-10	22-Jul-10	23-Jul-10	24-Jul-10	25-Jul-10	Volume	Volume	Volume
AM 12-1					51			51	51	51
1-2					27			27	27	27
2-3					14			14	14	14
3-4					26			26	26	26
4-5					35			35	35	35
5-6					130			130	130	130
6-7					353			353	353	353
7-8					589			589	589	589
8-9					514			514	514	514
9-10					500			500	500	500
10-11					531			531	531	531
11-12					543			543	543	543
PM 12-1					546			546	546	546
1-2				620				620	620	620
2-3				610				610	610	610
3-4				779				779	779	779
4-5				887				887	887	887
5-6				943				943	943	943
6-7				660				660	660	660
7-8				491				491	491	491
8-9				490				490	490	490
9-10				351				351	351	351
10-11				175				175	175	175
11-12				85				85	85	85
24 HR TOTAL			6091	3859				9950	9950	9950

Factor 0.98

AAWT

Factored Total 9751

1260

LOCATION ~~6400~~ COTTAGE GR. RD. (EAST OF SPRECHER)

STATION# 402201

DIRECTION NON-DIR

REMARKS

START TIME 1300 on 7/21/2010

END TIME 1300 on 7/22/2010

TRAFFIC ENGINEERING DIVISION

CITY OF MADISON, WI

AUTOMATIC TRAFFIC COUNTER RECORD

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	TOTAL M-F	AWT	ADT
Date	26-Jul-10	27-Jul-10	21-Jul-10	22-Jul-10	23-Jul-10	24-Jul-10	25-Jul-10	Volume	Volume	Volume
AM 12-1					45			45	45	45
1-2					29			29	29	29
2-3					17			17	17	17
3-4					24			24	24	24
4-5					36			36	36	36
5-6					142			142	142	142
6-7					412			412	412	412
7-8					741			741	741	741
8-9					585			585	585	585
9-10					528			528	528	528
10-11					576			576	576	576
11-12					594			594	594	594
PM 12-1					597			597	597	597
1-2				653				653	653	653
2-3				667				667	667	667
3-4				869				869	869	869
4-5				1010				1010	1010	1010
5-6				1087				1087	1087	1087
6-7				725				725	725	725
7-8				529				529	529	529
8-9				561				561	561	561
9-10				394				394	394	394
10-11				190				190	190	190
11-12				109				109	109	109
24 HR TOTAL			6794	4326				11120	11120	11120

Factor 0.98

AAWT

Factored Total 10898

LOCATION 900 North Star Dr [Sharpsburg - Cottage Grove]

STATION# 402205

DIRECTION combined

REMARKS

START TIME 1000 on 7/9/2009

END TIME 1000 on 7/10/2009

TRAFFIC ENGINEERING DIVISION

CITY OF MADISON, WI

AUTOMATIC TRAFFIC COUNTER RECORD

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	TOTAL M-F	AWT	ADT
Date	13-Jul-09	14-Jul-09	15-Jul-09	09-Jul-09	10-Jul-09	11-Jul-09	12-Jul-09	Volume	Volume	Volume
AM 12-1					41			41	41	41
1-2					18			18	18	18
2-3					15			15	15	15
3-4					12			12	12	12
4-5					18			18	18	18
5-6					73			73	73	73
6-7					155			155	155	155
7-8					295			295	295	295
8-9					226			226	226	226
9-10					204			204	204	204
10-11				160				160	160	160
11-12				221				221	221	221
PM 12-1				285				285	285	285
1-2				206				206	206	206
2-3				241				241	241	241
3-4				249				249	249	249
4-5				307				307	307	307
5-6				351				351	351	351
6-7				244				244	244	244
7-8				204				204	204	204
8-9				182				182	182	182
9-10				121				121	121	121
10-11				99				99	99	99
11-12				55				55	55	55
24 HR TOTAL				2925	1057			3982	3982	3982

Factor 0.98

AAWT

Factored Total 3902

LOCATION 900 North Star Dr [Sharpsburg - Cottage Grove]

STATION# 402205

DIRECTION N.B.

REMARKS

START TIME 1000 on 7/9/2009

END TIME 1000 on 7/10/2009

TRAFFIC ENGINEERING DIVISION
CITY OF MADISON, WI
AUTOMATIC TRAFFIC COUNTER RECORD

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	TOTAL M-F	AWT	ADT
Date	13-Jul-09	14-Jul-09	15-Jul-09	09-Jul-09	10-Jul-09	11-Jul-09	12-Jul-09	Volume	Volume	Volume
AM 12-1					23			23	23	23
1-2					13			13	13	13
2-3					6			6	6	6
3-4					5			5	5	5
4-5					6			6	6	6
5-6					26			26	26	26
6-7					37			37	37	37
7-8					75			75	75	75
8-9					67			67	67	67
9-10					62			62	62	62
10-11				70				70	70	70
11-12				87				87	87	87
PM 12-1				114				114	114	114
1-2				90				90	90	90
2-3				93				93	93	93
3-4				119				119	119	119
4-5				145				145	145	145
5-6				185				185	185	185
6-7				110				110	110	110
7-8				102				102	102	102
8-9				99				99	99	99
9-10				67				67	67	67
10-11				40				40	40	40
11-12				36				36	36	36
24 HR TOTAL				1357	320			1677	1677	1677

Factor 0.98

AAWT

Factored Total 1643

LOCATION 900 North Star Dr [Sharpsburg - Cottage Grove]

STATION# 402205

DIRECTION S.B.

REMARKS

START TIME 1000 on 7/9/2009

END TIME 1000 on 7/10/2009

TRAFFIC ENGINEERING DIVISION

CITY OF MADISON, WI

AUTOMATIC TRAFFIC COUNTER RECORD

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	TOTAL M-F	AWT	ADT
Date	13-Jul-09	14-Jul-09	15-Jul-09	08-Jul-09	10-Jul-09	11-Jul-09	12-Jul-09	Volume	Volume	Volume
AM 12-1					18			18	18	18
1-2					5			5	5	5
2-3					9			9	9	9
3-4					7			7	7	7
4-5					12			12	12	12
5-6					47			47	47	47
6-7					118			118	118	118
7-8					- 220	6		220	220	220
8-9					- 159	5		159	159	159
9-10					- 142	8		142	142	142
10-11				90				90	90	90
11-12				134	8			134	134	134
PM 12-1				171	7			171	171	171
1-2				116				116	116	116
2-3				- 148	5			148	148	148
3-4				130	3			130	130	130
4-5				- 162	2			162	162	162
5-6				- 166	1			166	166	166
6-7				134	4			134	134	134
7-8				102				102	102	102
8-9				83				83	83	83
9-10				54				54	54	54
10-11				59				59	59	59
11-12				19				19	19	19
24 HR TOTAL				1568	737			2305	2305	2305

Factor: 0.98

AAWT

Factored Total 2259

LOCATION 900 McLean Dr [Kilpatrick - Cottage Grove]
 STATION# 402204
 DIRECTION combined
 REMARKS
 START TIME 1000 on 7/28/2010
 END TIME 1000 on 7/29/2010

TRAFFIC ENGINEERING DIVISION
 CITY OF MADISON, WI
 AUTOMATIC TRAFFIC COUNTER RECORD

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	TOTAL M-F	AWT	ADT
Date	02-Aug-10	03-Aug-10	28-Jul-10	29-Jul-10	30-Jul-10	31-Jul-10	01-Aug-10	Volume	Volume	Volume
AM 12-1				3				3	3	3
1-2										
2-3										
3-4				2				2	2	2
4-5				1				1	1	1
5-6				14				14	14	14
6-7				22				22	22	22
7-8				35				35	35	35
8-9				31				31	31	31
9-10				26				26	26	26
10-11			25					25	25	25
11-12			25					25	25	25
PM 12-1			48					48	48	48
1-2			26					26	26	26
2-3			20					20	20	20
3-4			41					41	41	41
4-5			48					48	48	48
5-6			71					71	71	71
6-7			47					47	47	47
7-8			24					24	24	24
8-9			26					26	26	26
9-10			25					25	25	25
10-11			11					11	11	11
11-12			14					14	14	14
24 HR TOTAL			451	134				585	585	585

Factor 0.98

AAWT

Factored Total 573

LOCATION 900 McLean Dr [Kilpatrick - Cottage Grove]

STATION# 402204

DIRECTION N.B.

REMARKS

START TIME 1000 on 7/28/2010

END TIME 1000 on 7/29/2010

TRAFFIC ENGINEERING DIVISION

CITY OF MADISON, WI

AUTOMATIC TRAFFIC COUNTER RECORD

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	TOTAL M-F	AWT	ADT
Date	02-Aug-10	03-Aug-10	28-Jul-10	29-Jul-10	30-Jul-10	31-Jul-10	01-Aug-10	Volume	Volume	Volume
AM 12-1				2				2	2	2
1-2										
2-3										
3-4										
4-5										
5-6				2				2	2	2
6-7				3				3	3	3
7-8				4				4	4	4
8-9				7				7	7	7
9-10				13				13	13	13
10-11			11					11	11	11
11-12			15					15	15	15
PM 12-1			21					21	21	21
1-2			12					12	12	12
2-3			11					11	11	11
3-4			25					25	25	25
4-5			30					30	30	30
5-6			39					39	39	39
6-7			25					25	25	25
7-8			17					17	17	17
8-9			14					14	14	14
9-10			16					16	16	16
10-11			8					8	8	8
11-12			12					12	12	12
24 HR TOTAL			256	31				287	287	287

Factor 0.98

AAWT

Factored Total 281

LOCATION 900 McLean Dr (Kilpatrick - Cottage Grove)

STATION# 402204

DIRECTION S.B.

REMARKS

START TIME 1000 on 7/28/2010

END TIME 1000 on 7/29/2010

TRAFFIC ENGINEERING DIVISION
CITY OF MADISON, WI
AUTOMATIC TRAFFIC COUNTER RECORD

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	TOTAL M-F	AWT	ADT
Date	02-Aug-10	03-Aug-10	28-Jul-10	29-Jul-10	30-Jul-10	31-Jul-10	01-Aug-10	Volume	Volume	Volume
AM 12-1				1				1	1	1
1-2										
2-3										
3-4				2				2	2	2
4-5				1				1	1	1
5-6				12				12	12	12
6-7				19				19	19	19
7-8				31				31	31	31
8-9				24				24	24	24
9-10				13				13	13	13
10-11			14					14	14	14
11-12			10					10	10	10
PM 12-1			27					27	27	27
1-2			14					14	14	14
2-3			9					9	9	9
3-4			16					16	16	16
4-5			18					18	18	18
5-6			32					32	32	32
6-7			22					22	22	22
7-8			7					7	7	7
8-9			12					12	12	12
9-10			9					9	9	9
10-11			3					3	3	3
11-12			2					2	2	2
24 HR TOTAL			195	103				298	298	298

Factor 0.98

AAWT

Factored Total 292

LOCATION 1000 McLean Dr [Cottage Grove - Fredricksburg]

STATION# 402203

DIRECTION combined

REMARKS

START TIME 1000 on 7/28/2010

END TIME 1000 on 7/29/2010

TRAFFIC ENGINEERING DIVISION

CITY OF MADISON, WI

AUTOMATIC TRAFFIC COUNTER RECORD

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	TOTAL M-F	AWT	ADT
Date	02-Aug-10	03-Aug-10	28-Jul-10	29-Jul-10	30-Jul-10	31-Jul-10	01-Aug-10	Volume	Volume	Volume
AM 12-1					18			18	18	18
1-2					9			9	9	9
2-3					3			3	3	3
3-4					10			10	10	10
4-5					5			5	5	5
5-6					41			41	41	41
6-7					59			59	59	59
7-8				133				133	133	133
8-9				114				114	114	114
9-10				105				105	105	105
10-11			110					110	110	110
11-12			134					134	134	134
PM 12-1			142					142	142	142
1-2			135					135	135	135
2-3			136					136	136	136
3-4			158					158	158	158
4-5			202					202	202	202
5-6			216					216	216	216
6-7			185					185	185	185
7-8			128					128	128	128
8-9			146					146	146	146
9-10			106					106	106	106
10-11			45					45	45	45
11-12			20					20	20	20
24 HR TOTAL			1863	497				2360	2360	2360

Factor 0.98

AAWT

Factored Total 2313

LOCATION 1000 McLean Dr [Cottage Grove - Fredricksburg]
 STATION# 402203
 DIRECTION N.B.
 REMARKS
 START TIME 1000 on 7/28/2010
 END TIME 1000 on 7/29/2010

TRAFFIC ENGINEERING DIVISION
 CITY OF MADISON, WI
 AUTOMATIC TRAFFIC COUNTER RECORD

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	TOTAL M-F	AWT	ADT
Date	02-Aug-10	03-Aug-10	28-Jul-10	29-Jul-10	30-Jul-10	31-Jul-10	01-Aug-10	Volume	Volume	Volume
AM 12-1					10			10	10	10
1-2					1			1	1	1
2-3					1			1	1	1
3-4					8			8	8	8
4-5					4			4	4	4
5-6					34			34	34	34
6-7					44			44	44	44
7-8					108			108	108	108
8-9					75			75	75	75
9-10					61			61	61	61
10-11				60				60	60	60
11-12				76				76	76	76
PM 12-1				69				69	69	69
1-2				75				75	75	75
2-3				65				65	65	65
3-4				68				68	68	68
4-5				78				78	78	78
5-6				92				92	92	92
6-7				70				70	70	70
7-8				53				53	53	53
8-9				60				60	60	60
9-10				42				42	42	42
10-11				15				15	15	15
11-12				11				11	11	11
24 HR TOTAL			834	346				1180	1180	1180

Factor 0.98

AAWT

Factored Total 1156

LOCATION 1000 McLean Dr [Cottage Grove - Fredricksburg]

STATION# 402203

DIRECTION S.B.

REMARKS

START TIME 1000 on 7/28/2010

END TIME 1000 on 7/29/2010

TRAFFIC ENGINEERING DIVISION

CITY OF MADISON, WI

AUTOMATIC TRAFFIC COUNTER RECORD

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	TOTAL M-F	AWT	ADT
Date	02-Aug-10	03-Aug-10	28-Jul-10	29-Jul-10	30-Jul-10	31-Jul-10	01-Aug-10	Volume	Volume	Volume
AM 12-1				8				8	8	8
1-2				8				8	8	8
2-3				2				2	2	2
3-4				2				2	2	2
4-5				1				1	1	1
5-6				7				7	7	7
6-7				15				15	15	15
7-8				25				25	25	25
8-9				39				39	39	39
9-10				44				44	44	44
10-11			50					50	50	50
11-12			58					58	58	58
PM 12-1			73					73	73	73
1-2			60					60	60	60
2-3			71					71	71	71
3-4			90					90	90	90
4-5			124					124	124	124
5-6			124					124	124	124
6-7			115					115	115	115
7-8			75					75	75	75
8-9			86					86	86	86
9-10			64					64	64	64
10-11			30					30	30	30
11-12			9					9	9	9
24 HR TOTAL			1029	151				1180	1180	1180

Factor 0.98

AAWT

Factored Total 1156

LOCATION 1900 SPRECHER RD 1150 FT NORTH OF COTTAGE GR R

STATION# 397303

DIRECTION combined

REMARKS

START TIME 1300 on 7/21/2010

END TIME 1300 on 7/22/2010

TRAFFIC ENGINEERING DIVISION
CITY OF MADISON, WI
AUTOMATIC TRAFFIC COUNTER RECORD

Day	Monday 26-Jul-10	Tuesday 27-Jul-10	Wednesday 21-Jul-10	Thursday 22-Jul-10	Friday 23-Jul-10	Saturday 24-Jul-10	Sunday 25-Jul-10	TOTAL M-F Volume	AWT Volume	ADT Volume
AM 12-1				37				37	37	37
1-2				35				35	35	35
2-3				21				21	21	21
3-4				24				24	24	24
4-5				45				45	45	45
5-6				118				118	118	118
6-7				352				352	352	352
7-8				622				622	622	622
8-9				473				473	473	473
9-10				481				481	481	481
10-11				334				334	334	334
11-12				453				453	453	453
PM 12-1				482				482	482	482
1-2			500					500	500	500
2-3			516					516	516	516
3-4			655					655	655	655
4-5			920					920	920	920
5-6			962					962	962	962
6-7			580					580	580	580
7-8			458					458	458	458
8-9			394					394	394	394
9-10			289					289	289	289
10-11			150					150	150	150
11-12			83					83	83	83
24 HR TOTAL			5507	3477				8984	8984	8984

Factor 0.98

AAWT

Factored Total 8804

TRAFFIC ENGINEERING DIVISION
CITY OF MADISON, WI
AUTOMATIC TRAFFIC COUNTER RECORD

LOCATION 900 SPRECHER RD 150 FT NORTH OF COTTAGE GR R

STATION# 397303

DIRECTION E.B. (N.B.)

REMARKS

START TIME 1300 on 7/21/2010

END TIME 1300 on 7/22/2010

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	TOTAL M-F	AWT	ADT
Date	26-Jul-10	27-Jul-10	21-Jul-10	22-Jul-10	23-Jul-10	24-Jul-10	25-Jul-10	Volume	Volume	Volume
AM 12-1				21				21	21	21
1-2				21				21	21	21
2-3				10				10	10	10
3-4				10				10	10	10
4-5				18				18	18	18
5-6				42				42	42	42
6-7				163				163	163	163
7-8				275				275	275	275
8-9				211				211	211	211
9-10				185				185	185	185
10-11				169				169	169	169
11-12				243				243	243	243
PM 12-1				248				248	248	248
1-2				243				243	243	243
2-3				251				251	251	251
3-4				343				343	343	343
4-5				497				497	497	497
5-6				530				530	530	530
6-7				290				290	290	290
7-8				234				234	234	234
8-9				209				209	209	209
9-10				134				134	134	134
10-11				69				69	69	69
11-12				40				40	40	40
24 HR TOTAL				2840	1616			4456	4456	4456

Factor 0.98

AAWT

Factored Total 4367

LOCATION 1900 SPRECHER RD 1150 FT NORTH OF COTTAGE GR R

STATION# 397303

DIRECTION W.B. (S.B.)

REMARKS

START TIME 1300 on 7/21/2010

END TIME 1300 on 7/22/2010

TRAFFIC ENGINEERING DIVISION

CITY OF MADISON, WI

AUTOMATIC TRAFFIC COUNTER RECORD

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	TOTAL M-F	AWT	ADT
Date	26-Jul-10	27-Jul-10	21-Jul-10	22-Jul-10	23-Jul-10	24-Jul-10	25-Jul-10	Volume	Volume	Volume
AM 12-1				16				16	16	16
1-2				14				14	14	14
2-3				11				11	11	11
3-4				14				14	14	14
4-5				27				27	27	27
5-6				76				76	76	76
6-7				189				189	189	189
7-8				347				347	347	347
8-9				262				262	262	262
9-10				296				296	296	296
10-11				165				165	165	165
11-12				210				210	210	210
PM 12-1				234				234	234	234
1-2			257					257	257	257
2-3			265					265	265	265
3-4			312					312	312	312
4-5			423					423	423	423
5-6			432					432	432	432
6-7			290					290	290	290
7-8			224					224	224	224
8-9			185					185	185	185
9-10			155					155	155	155
10-11			81					81	81	81
11-12			43					43	43	43
24 HR TOTAL			2667	1861				4528	4528	4528

Factor 0.98

AAWT

Factored Total 4437

LOCATION 1100S SPRECHER RD IS. OF COTTAGE GR RD.1

STATION# 397306

DIRECTION NON-DIR

REMARKS

START TIME 1300 on 7/21/2010

END TIME 1300 on 7/22/2010

TRAFFIC ENGINEERING DIVISION
CITY OF MADISON, WI
AUTOMATIC TRAFFIC COUNTER RECORD

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	TOTAL M-F	AWT	ADT
Date	26-Jul-10	27-Jul-10	21-Jul-10	22-Jul-10	23-Jul-10	24-Jul-10	25-Jul-10	Volume	Volume	Volume
AM 12-1				26				26	26	26
1-2				29				29	29	29
2-3				9				9	9	9
3-4				13				13	13	13
4-5				33				33	33	33
5-6				99				99	99	99
6-7				285				285	285	285
7-8				508				508	508	508
8-9				362				362	362	362
9-10				351				351	351	351
10-11				228				228	228	228
11-12				284				284	284	284
PM 12-1				324				324	324	324
1-2			319					319	319	319
2-3			334					334	334	334
3-4			450					450	450	450
4-5			623					623	623	623
5-6			684					684	684	684
6-7			331					331	331	331
7-8			259					259	259	259
8-9			256					256	256	256
9-10			194					194	194	194
10-11			102					102	102	102
11-12			78					78	78	78
24 HR TOTAL			3630	2551				6181	6181	6181

Factor 0.98

AAWT

Factored Total 6057

LOCATION 6400 Sharpsburg Dr [Malvern Hill - Sprecher]

STATION# 397308

DIRECTION NON-DIR

REMARKS

START TIME 1500 on 7/27/2010

END TIME 1500 on 7/28/2010

TRAFFIC ENGINEERING DIVISION

CITY OF MADISON, WI

AUTOMATIC TRAFFIC COUNTER RECORD

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	TOTAL M-F	AWT	ADT
Date	02-Aug-10	27-Jul-10	28-Jul-10	29-Jul-10	30-Jul-10	31-Jul-10	01-Aug-10	Volume	Volume	Volume
AM 12-1										
1-2										
2-3			2					2	2	2
3-4										
4-5			3					3	3	3
5-6			7					7	7	7
6-7			19					19	19	19
7-8			48					48	48	48
8-9			53					53	53	53
9-10			47					47	47	47
10-11			45					45	45	45
11-12			34					34	34	34
PM 12-1			48					48	48	48
1-2			32					32	32	32
2-3			41					41	41	41
3-4		52						52	52	52
4-5		67						67	67	67
5-6		86						86	86	86
6-7		61						61	61	61
7-8		46						46	46	46
8-9		29						29	29	29
9-10		22						22	22	22
10-11		8						8	8	8
11-12		7						7	7	7
24 HR TOTAL		378	379					757	757	757

Factor 0.98

AAWT

Factored Total 742

Cottage Grove Rd "BB" C.T.H. (East of I 39-90-94)
STATE COUNTS

[illegible]

Wisconsin Department of Transportation

Monthly Volume Calendar

Site Names: 130263, , SW
 County: Dane
 Funct. Class: R Minor Arterial - Other
 Location: CTH BB - EAST OF I-39-90-94

Num Days: 30
 MADT: 8,703
 MAWDT: 9,133
 MAWET: 7,302

January 2009

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2	3
Road					5,435	9,470	7,654
Neg DIR					2,820	4,924	3,938
Pos DIR					2,615	4,546	3,716
	4	5	6	7	8	9	10
	5,708	9,488	9,791		10,048	9,308	8,261
	2,981	4,947	5,020		5,209	4,829	4,347
	2,727	4,541	4,771		4,839	4,479	3,914
	11	12	13	14	15	16	17
	6,732	9,702	9,062	9,320	7,826	9,349	8,120
	3,499	5,005	4,760	4,865	4,056	4,777	4,220
	3,233	4,697	4,302	4,455	3,770	4,572	3,900
	18	19	20	21	22	23	24
	6,683	8,472	9,170	9,774	9,674	10,436	8,054
	3,437	4,365	4,841	5,120	5,039	5,444	4,204
	3,246	4,107	4,329	4,654	4,635	4,992	3,850
	25	26	27	28	29	30	31
	6,688	9,356	9,591	9,277	9,099	10,363	8,665
	3,446	4,900	4,948	4,852	4,768	5,322	4,474
	3,242	4,456	4,643	4,425	4,331	5,041	4,191
MADW	6,453	9,255	9,404	9,457	8,416	9,785	8,151
STD	497	541	345	275	1,867	565	365
DAF	1.35	0.94	0.93	0.92	1.03	0.89	1.07

Wisconsin Department of Transportation

Monthly Hourly Day of Week Summary for January 2009

Site Names: 130263,, SW
 County: Dane
 Funct. Class: R Minor Arterial - Other
 Location: CTH BB - EAST OF I-39-90-94

Seasonal Factor Group: 4
 Daily Factor Group: 4
 Axle Factor Group: 2
 Growth Factor Group: 1

	Sunday			Monday			Tuesday			Wednesday			Thursday			Friday			Saturday		
	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR
0:00	100	41	60	24	10	14	40	16	24	31	12	19	79	37	42	46	16	30	94	35	59
1:00	58	26	33	21	9	12	22	10	12	20	9	11	60	27	33	27	13	15	61	24	37
2:00	55	20	35	15	4	11	22	11	11	13	5	9	40	15	25	21	7	14	48	18	29
3:00	26	11	15	15	8	6	23	14	9	18	10	8	26	14	13	21	13	8	29	13	17
4:00	20	11	9	32	25	7	39	29	10	34	25	9	35	22	13	39	20	19	31	18	13
5:00	38	26	12	125	103	22	149	120	29	136	112	24	122	98	24	119	96	23	51	37	13
6:00	65	49	16	312	242	70	348	268	80	363	283	80	273	207	66	309	241	68	94	67	26
7:00	143	102	41	850	676	175	955	777	177	920	740	179	658	531	128	722	581	141	193	127	66
8:00	275	173	102	594	421	173	602	426	176	574	416	158	468	336	132	541	376	166	362	238	124
9:00	330	215	115	450	271	179	393	246	147	395	242	157	360	218	142	454	267	187	496	302	194
10:00	533	310	223	479	256	224	408	229	179	428	245	183	371	212	160	471	258	213	657	388	269
11:00	528	295	233	523	279	243	513	267	246	463	248	215	454	242	212	541	296	245	734	403	331
12:00	579	297	282	567	293	274	504	254	250	503	254	249	505	258	246	596	295	301	668	348	320
13:00	527	265	262	561	284	278	511	257	255	503	259	244	491	250	241	589	302	287	593	300	293
14:00	477	230	247	594	275	319	537	255	283	559	271	288	508	239	269	613	286	327	548	264	284
15:00	515	251	264	718	315	404	764	319	445	775	315	459	671	306	365	766	333	433	539	250	289
16:00	495	237	258	845	337	508	883	340	543	858	351	507	756	310	446	860	359	500	586	293	292
17:00	477	222	255	857	338	519	895	354	541	929	366	563	773	316	457	896	376	520	585	295	290
18:00	383	173	210	597	260	337	610	268	341	698	308	390	571	253	318	677	321	356	539	266	274
19:00	285	136	149	394	149	245	394	164	230	435	158	277	401	176	226	450	196	253	368	182	186
20:00	231	105	126	298	105	193	315	117	199	336	133	204	311	122	188	347	145	202	270	119	151
21:00	156	70	86	214	79	135	265	83	183	249	99	149	231	88	142	314	114	201	248	102	146
22:00	106	50	56	107	41	66	144	48	96	136	57	79	162	66	96	213	90	123	199	83	116
23:00	57	28	29	65	25	40	69	22	47	77	28	49	90	35	56	153	59	94	158	65	93
MADW	6,453	3,341	3,112	9,255	4,804	4,450	9,404	4,892	4,511	9,457	4,946	4,511	8,416	4,378	4,038	9,785	5,059	4,726	8,151	4,237	3,914
NDAYS	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

Wisconsin Department of Transportation

Monthly Volume Calendar

Site Names: 130263, , SW
 County: Dane
 Funct. Class: R Minor Arterial - Other
 Location: CTH BB - EAST OF I-39-90-94

Num Days: 26
 MADT: 9,246
 MAWDT: 9,651
 MAWET: 7,774

February 2009

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Road	1	2	3	4	5	6	7
Neg DIR	7,220	9,377	-	9,515	9,853	10,594	8,665
Pos DIR	3,746	4,894	-	4,941	5,097	5,505	4,527
	3,474	4,483	-	4,574	4,756	5,089	4,138
	8	9	10	11	12	13	14
	7,160	9,574	9,779	9,891	10,278	11,111	9,099
	3,674	4,996	5,062	5,149	5,356	5,792	4,736
	3,486	4,578	4,717	4,742	4,922	5,319	4,363
	15	16	17	18	19	20	21
	7,245	9,430	9,683	9,504	9,755	10,557	6,968
	3,723	4,871	5,054	4,914	5,023	5,427	3,616
	3,522	4,559	4,629	4,590	4,732	5,130	3,352
	22	23	24	25	26	27	28
	-	9,433	9,542	10,078	9,059	10,009	8,626
	-	4,857	4,947	5,224	4,677	5,168	4,454
	-	4,576	4,595	4,854	4,382	4,841	4,172
MADW	7,208	9,454	9,668	9,747	9,736	10,568	8,340
STD	44	84	119	285	505	450	939
DAF	1.28	0.98	0.96	0.95	0.95	0.87	1.11

Wisconsin Department of Transportation

Monthly Hourly Day of Week Summary for February 2009

Site Names: 130263., SW
 County: Dane
 Funct. Class: R Minor Arterial - Other
 Location: CTH BB - EAST OF I-39-90-94

Seasonal Factor Group: 4
 Daily Factor Group: 4
 Axle Factor Group: 2
 Growth Factor Group: 1

	Sunday			Monday			Tuesday			Wednesday			Thursday			Friday			Saturday		
	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR
0:00	101	41	60	28	14	14	28	9	19	30	11	18	32	11	21	48	18	30	91	35	57
1:00	57	21	36	13	7	6	20	6	14	36	16	20	25	8	17	28	9	19	55	20	35
2:00	54	21	33	13	4	9	17	8	9	14	4	10	20	6	14	21	7	14	38	11	27
3:00	31	12	19	11	7	4	16	8	7	16	9	7	15	8	7	20	11	9	25	11	14
4:00	21	12	9	36	27	9	35	28	7	36	26	10	36	26	10	34	25	9	26	15	11
5:00	32	23	9	135	110	25	138	114	24	141	116	26	137	112	26	124	102	23	49	35	14
6:00	64	47	17	342	264	78	364	274	90	357	281	76	358	275	83	327	250	77	117	82	36
7:00	168	121	47	909	732	177	944	765	179	950	765	186	930	750	180	852	678	174	222	146	76
8:00	318	207	112	567	404	163	562	392	169	565	392	173	597	416	181	590	405	185	374	245	129
9:00	397	252	145	435	259	176	434	265	169	428	264	164	404	239	165	477	291	186	512	311	202
10:00	600	358	242	441	242	199	430	245	184	417	234	183	446	252	194	482	268	214	620	355	265
11:00	585	315	270	479	255	224	518	268	250	522	275	248	546	273	273	574	302	272	702	388	315
12:00	636	332	304	553	279	274	537	273	264	518	272	247	532	271	261	613	309	304	654	348	307
13:00	567	284	282	552	279	273	527	251	276	509	251	258	538	255	283	600	284	316	562	293	270
14:00	543	262	280	569	278	292	583	285	298	546	263	283	548	266	282	622	300	322	549	265	284
15:00	600	279	321	762	307	454	821	333	488	814	328	486	797	327	470	891	379	512	551	250	301
16:00	596	281	315	864	335	529	910	357	553	894	344	550	886	336	550	972	408	564	608	319	289
17:00	541	242	298	895	361	534	927	392	534	903	379	524	930	390	540	1,018	458	560	602	299	303
18:00	406	186	220	667	308	359	639	297	332	710	331	379	677	323	354	727	332	395	570	278	292
19:00	312	140	172	457	181	276	436	176	260	457	183	274	441	190	251	496	212	285	444	219	225
20:00	207	93	114	350	121	230	332	124	208	387	146	241	346	120	226	381	152	229	326	145	181
21:00	220	117	103	219	81	138	262	79	183	269	87	182	275	102	174	310	121	189	251	104	146
22:00	94	45	48	106	35	72	129	47	82	147	54	93	147	55	92	224	94	130	216	90	127
23:00	58	23	37	54	18	37	71	23	48	82	28	53	77	28	49	138	59	79	178	72	106
MADW	7,208	3,714	3,494	9,454	4,905	4,549	9,668	5,021	4,647	9,747	5,057	4,690	9,736	5,038	4,698	10,568	5,473	5,095	8,340	4,333	4,006
NDAYS	3	3	3	4	4	4	4	3	3	4	4	4	4	4	4	4	4	4	4	4	4

Wisconsin Department of Transportation

Monthly Volume Calendar

Site Names: 130263, , SW
 County: Dane
 Funct. Class: R Minor Arterial - Other
 Location: CTH BB - EAST OF I-39-90-94

Num Days: 31
 MADT: 9,511
 MAWDT: 9,966
 MAWET: 7,860

March 2009

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Road	1	2	3	4	5	6	7
Neg DIR	6,927	9,859	9,538	10,049	9,960	11,009	8,297
Pos DIR	3,623	5,090	4,951	5,210	5,161	5,714	4,286
	3,304	4,769	4,587	4,839	4,799	5,295	4,011
	8	9	10	11	12	13	14
	6,286	9,914	9,767	10,073	10,280	11,252	9,072
	3,236	5,149	5,035	5,186	5,309	5,784	4,717
	3,050	4,765	4,732	4,887	4,971	5,468	4,355
	15	16	17	18	19	20	21
	7,735	10,606	10,828	10,462	10,493	11,021	8,956
	4,063	5,534	5,612	5,378	5,432	5,662	4,637
	3,672	5,072	5,216	5,084	5,061	5,359	4,319
	22	23	24	25	26	27	28
	7,555	9,097	8,924	9,527	9,824	10,673	8,470
	3,896	4,662	4,625	4,883	5,045	5,452	4,415
	3,659	4,435	4,299	4,644	4,779	5,221	4,055
	29	30	31				
	6,604	10,047	9,911				
	3,418	5,208	5,162				
	3,186	4,839	4,749				
MADW	7,021	9,905	9,794	10,028	10,139	10,989	8,699
STD	616	540	690	384	304	238	374
DAF	1.35	0.96	0.97	0.95	0.94	0.87	1.09

Wisconsin Department of Transportation

Monthly Hourly Day of Week Summary for March 2009

Site Names: 130263,, SW
 County: Dane
 Funct. Class: R Minor Arterial - Other
 Location: CTH BB - EAST OF I-39-90-94
 Seasonal Factor Group: 4
 Daily Factor Group: 4
 Axle Factor Group: 2
 Growth Factor Group: 1

	Sunday			Monday			Tuesday			Wednesday			Thursday			Friday			Saturday		
	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR
0:00	71	26	45	20	9	11	12	25	10	15	33	13	20	33	13	20	63	22	42		
1:00	50	19	31	15	5	9	11	25	9	16	20	7	13	23	7	16	51	18	32		
2:00	35	18	18	14	8	6	16	17	9	8	14	8	6	19	8	11	32	15	17		
3:00	20	10	11	35	28	7	34	26	8	34	23	11	34	26	10	30	24	12	11		
4:00	29	20	9	113	90	24	118	97	21	100	80	20	108	87	21	102	80	22	42	29	13
5:00	57	39	17	300	236	64	304	236	69	296	231	65	291	225	66	270	207	63	76	55	23
6:00	134	94	41	751	601	150	774	618	153	741	587	154	724	570	153	702	546	156	186	122	64
7:00	269	165	104	665	471	194	670	486	184	687	487	200	681	499	182	700	502	199	359	232	127
8:00	352	222	130	465	294	171	465	292	173	484	311	173	478	301	177	511	311	200	484	301	183
9:00	550	338	212	466	264	202	436	248	188	444	259	185	471	266	205	548	307	241	632	359	274
10:00	566	307	259	509	272	237	494	253	241	526	280	247	543	282	261	619	317	302	724	392	332
11:00	637	339	299	548	280	268	569	290	273	568	293	276	589	276	284	635	312	323	670	352	319
12:00	596	305	292	591	304	287	544	259	285	554	276	278	543	286	259	655	341	314	690	364	326
13:00	527	256	271	605	290	315	575	279	296	609	305	305	590	285	305	661	326	335	612	299	313
14:00	550	273	275	750	317	433	782	328	454	753	309	444	736	324	432	816	352	463	597	289	308
15:00	554	266	288	883	353	530	883	360	524	878	350	528	916	378	538	954	392	563	635	313	322
16:00	546	267	278	906	364	542	931	381	550	945	386	559	977	400	576	963	414	549	624	321	303
17:00	444	209	235	794	366	428	721	320	402	770	351	419	797	368	429	818	391	428	590	298	292
18:00	369	172	197	525	218	308	499	229	271	560	233	327	528	219	310	602	271	331	460	229	231
19:00	274	126	149	423	159	264	378	145	233	436	166	270	427	171	256	432	185	248	330	157	174
20:00	196	84	112	252	98	154	275	102	173	276	105	172	306	121	185	346	136	210	283	119	164
21:00	106	50	55	157	59	98	164	61	104	163	62	101	189	75	114	261	102	159	249	105	145
22:00	55	25	30	76	29	47	77	26	51	91	33	59	103	37	66	184	73	111	173	67	106
23:00	34	15	19	41	14	27	43	15	28	49	14	35	54	18	36	106	40	66	116	47	69
MADW	7,021	3,647	3,374	9,903	5,129	4,776	9,794	5,077	4,717	10,028	5,164	4,864	10,139	5,237	4,903	10,989	5,633	5,336	8,699	4,514	4,185
NDAYS	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

Wisconsin Department of Transportation

Monthly Volume Calendar

Site Names: 130263, , SW
 County: Dane
 Funct. Class: R Minor Arterial - Other
 Location: CTH BB - EAST OF I-39-90-94

Num Days: 30
 MADT: 10,092
 MAWDT: 10,555
 MAWET: 8,229

April 2009

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Road				1	2	3	4
Neg DIR				10,594	10,380	11,826	8,971
Pos DIR				5,486	5,441	6,077	4,605
				5,108	4,939	5,749	4,366
	5	6	7	8	9	10	11
	6,137	9,781	10,021	10,560	10,627	11,709	9,492
	3,142	5,026	5,155	5,451	5,500	6,012	4,941
	2,995	4,755	4,866	5,109	5,127	5,697	4,551
	12	13	14	15	16	17	18
	7,948	9,350	10,690	11,193	11,368	11,948	9,664
	4,143	4,812	5,456	5,821	5,878	6,162	5,001
	3,805	4,538	5,234	5,372	5,490	5,786	4,663
	19	20	21	22	23	24	25
	7,500	10,426	10,174	11,042	11,170	12,377	8,650
	3,910	5,433	5,266	5,682	5,773	6,349	4,445
	3,590	4,993	4,908	5,360	5,397	6,028	4,205
	26	27	28	29	30		
	7,466	10,491	10,809	11,125	10,871		
	3,859	5,518	5,600	5,751	5,663		
	3,607	4,973	5,209	5,374	5,208		
MADW	7,263	10,012	10,424	10,903	10,883	11,965	9,194
STD	782	545	385	302	399	291	467
DAF	1.39	1.01	0.97	0.93	0.93	0.84	1.10

Wisconsin Department of Transportation

Monthly Hourly Day of Week Summary for April 2009

Site Names: 130263, SW
 County: Dane
 Funct. Class: R Minor Arterial - Other
 Location: CTH BB - EAST OF I-39-90-94
 Seasonal Factor Group: 4
 Daily Factor Group: 4
 Axle Factor Group: 2
 Growth Factor Group: 1

	Sunday			Monday			Tuesday			Wednesday			Thursday			Friday			Saturday		
	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR
0:00	53	21	32	21	10	11	23	9	14	20	8	12	27	10	17	32	12	20	57	25	32
1:00	47	19	29	11	5	7	17	7	10	18	6	12	22	7	15	26	10	16	50	21	29
2:00	30	16	14	14	5	5	19	13	6	19	11	8	20	11	9	18	10	9	32	14	18
3:00	16	9	7	39	32	7	40	30	10	37	29	8	37	28	10	32	22	10	25	16	9
4:00	37	26	11	127	103	25	138	112	26	128	104	24	132	109	23	123	98	26	50	33	17
5:00	71	48	23	362	279	83	377	286	91	389	296	93	378	284	92	348	262	86	119	83	37
6:00	206	145	60	861	693	168	964	776	188	962	765	197	968	773	195	951	755	197	243	155	88
7:00	329	206	123	578	386	192	613	418	195	607	412	195	616	423	194	622	405	217	437	275	162
8:00	430	255	175	474	286	188	461	284	178	486	292	194	492	288	204	557	320	237	611	355	256
9:00	603	354	249	479	268	211	455	248	207	520	285	236	495	271	224	579	328	251	722	394	328
10:00	622	301	320	566	292	274	545	270	275	610	298	311	566	303	263	705	353	352	776	424	352
11:00	660	344	316	593	311	282	590	308	304	614	300	314	600	285	314	703	335	371	676	354	322
12:00	578	285	293	637	328	308	599	295	304	614	300	314	600	285	314	703	335	371	676	354	322
13:00	536	264	272	620	297	324	624	300	325	660	313	347	663	325	338	747	359	388	631	308	323
14:00	547	272	276	826	346	480	894	364	530	877	360	517	911	370	541	1,006	406	600	625	302	323
15:00	546	259	287	959	380	579	974	384	590	1,008	411	597	1,027	433	594	996	442	554	625	300	329
16:00	529	269	260	920	359	560	951	382	569	1,002	419	585	1,027	433	594	996	442	554	625	300	329
17:00	427	212	214	674	308	366	725	335	390	789	376	412	769	374	395	808	395	413	560	285	275
18:00	361	169	192	465	193	272	495	209	286	528	219	309	539	237	302	585	257	327	455	228	228
19:00	283	132	151	345	126	219	413	151	263	428	172	256	430	176	254	482	210	272	349	162	187
20:00	171	79	92	219	92	127	262	99	163	280	110	170	289	121	168	327	145	182	284	135	145
21:00	100	44	56	123	57	66	134	51	84	150	62	88	168	69	99	252	102	150	224	93	131
22:00	56	24	31	67	25	42	75	28	47	76	30	46	91	34	57	166	63	103	159	65	94
23:00	31	15	17	35	15	20	38	13	25	41	14	27	44	16	29	95	39	56	94	39	55
MADW	7,263	3,764	3,499	10,012	5,197	4,815	10,424	5,369	5,054	10,903	5,638	5,265	10,883	5,651	5,232	11,965	6,150	5,815	9,194	4,748	4,446
NDAYS	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

Wisconsin Department of Transportation

Monthly Volume Calendar

Site Names: 130263, , SW
 County: Dane
 Funct. Class: R Minor Arterial - Other
 Location: CTH BB - EAST OF I-39-90-94

Num Days: 31
 MADT: 10,881
 MAWDT: 11,211
 MAWET: 9,432

May 2009

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Road Neg DIR Pos DIR						1 12,187 6,205 5,982	2 10,335 5,337 4,998
	3 8,715 4,506 4,209	4 11,274 5,854 5,420	5 11,118 5,745 5,373	6 11,240 5,795 5,445	7 11,913 6,105 5,808	8 12,781 6,507 6,274	9 10,374 5,355 5,019
	10 9,259 4,810 4,449	11 11,048 5,724 5,324	12 11,186 5,780 5,406	13 10,711 5,544 5,167	14 11,528 5,974 5,554	15 12,198 6,280 5,918	16 10,310 5,377 4,933
	17 8,744 4,524 4,220	18 11,227 5,887 5,340	19 11,882 6,175 5,707	20 12,186 6,275 5,911	21 12,127 6,347 5,780	22 12,485 6,473 6,012	23 9,093 4,722 4,371
	24 8,403 4,383 4,020	25 8,145 4,245 3,900	26 11,095 5,693 5,402	27 10,896 5,576 5,320	28 11,794 6,008 5,786	29 12,639 6,462 6,177	30 9,907 5,102 4,805
	31 9,183 4,706 4,477						
MADW	8,861	10,424	11,320	11,258	11,841	12,458	10,004
STD	356	1,522	376	656	250	264	543
DAF	1.23	1.04	0.96	0.97	0.92	0.87	1.09

Wisconsin Department of Transportation

Monthly Hourly Day of Week Summary for May 2009

Site Names: 130263, SW: Seasonal Factor Group: 4
 County: Dane Daily Factor Group: 4
 Funct. Class: R Minor Arterial - Other Axle Factor Group: 2
 Location: CTH BB - EAST OF I-39-90-94 Growth Factor Group: 1

	Sunday			Monday			Tuesday			Wednesday			Thursday			Friday			Saturday		
	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR
0:00	64	28	36	23	9	14	26	13	13	28	10	18	27	12	15	31	13	18	52	22	29
1:00	52	19	33	16	6	10	16	7	9	18	5	14	19	6	14	22	7	15	47	17	30
2:00	30	14	16	14	8	7	16	10	7	20	13	7	20	12	9	21	9	12	26	10	16
3:00	24	12	12	32	25	7	35	27	8	33	26	7	36	27	9	34	25	9	22	15	7
4:00	43	31	13	123	96	27	153	126	27	138	113	25	144	120	24	138	109	29	54	38	16
5:00	90	60	30	327	246	81	429	324	105	423	322	101	413	313	100	394	301	94	126	87	38
6:00	214	144	70	792	620	172	1,010	806	204	1,029	828	202	1,011	803	208	990	779	211	279	182	97
7:00	381	230	151	612	423	190	666	447	219	637	430	207	678	444	235	663	427	236	482	301	180
8:00	504	295	209	566	346	220	503	281	222	528	305	224	528	303	225	607	345	262	640	367	273
9:00	698	402	297	511	282	229	513	286	227	528	291	237	564	314	250	623	334	289	755	420	335
10:00	744	376	368	617	315	302	637	329	308	622	319	303	649	337	312	738	381	357	847	439	408
11:00	770	397	373	650	319	331	640	331	309	617	315	303	673	333	340	757	368	389	790	401	389
12:00	704	351	353	670	335	335	676	330	345	631	316	315	654	325	329	747	354	393	745	370	375
13:00	700	355	345	673	332	342	666	324	342	678	320	358	715	348	367	791	375	416	719	347	372
14:00	660	331	329	644	362	302	602	381	376	657	371	380	1,009	411	599	1,037	437	600	687	355	352
15:00	663	329	335	944	392	552	1,007	390	620	1,010	382	628	1,081	429	652	1,067	450	617	724	370	354
16:00	611	295	316	896	374	521	1,007	406	602	1,054	423	631	1,033	444	589	1,005	438	567	655	315	340
17:00	567	283	285	687	321	356	770	360	411	780	352	428	777	366	411	795	377	417	611	308	304
18:00	478	215	263	527	240	287	551	242	309	525	228	297	581	264	317	622	280	342	498	245	253
19:00	387	182	205	394	170	224	470	209	261	431	189	242	530	233	297	504	213	292	405	194	211
20:00	231	112	119	267	111	156	298	117	181	308	130	178	358	134	224	383	166	216	325	150	175
21:00	125	65	60	123	58	65	149	59	90	149	65	84	176	69	108	235	94	141	229	109	119
22:00	77	38	38	63	26	37	86	31	55	82	30	52	106	38	68	162	63	99	167	77	91
23:00	43	23	20	35	14	21	36	14	22	35	12	23	61	27	34	92	39	53	121	58	64
MADW	8,861	4,586	4,275	10,424	5,428	4,996	11,320	5,848	5,472	11,258	5,798	5,461	11,841	6,109	5,732	12,458	6,385	6,073	10,004	5,179	4,825
NDAYS	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	5	5	5	5	5	5

Wisconsin Department of Transportation

Monthly Volume Calendar

Site Names: 130263, SW
 County: Dane
 Funct. Class: R Minor Arterial - Other
 Location: CTH BB - EAST OF I-39-90-94

Num Days: 30
 MADT: 10,675
 MAWDT: 11,084
 MAWET: 9,187

June 2009

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Road		1	2	3	4	5	6
Neg DIR		11,189	11,119	11,608	12,047	13,550	10,506
Pos DIR		5,803	5,723	5,987	6,188	6,926	5,448
		5,386	5,396	5,621	5,859	6,624	5,058
	7	8	9	10	11	12	13
	8,565	10,701	11,290	11,523	11,910	12,157	9,684
	4,478	5,537	5,877	5,977	6,102	6,189	5,009
	4,087	5,164	5,413	5,546	5,808	5,968	4,675
	14	15	16	17	18	19	20
	8,577	10,492	10,559	10,998	11,061	11,136	10,169
	4,407	5,390	5,469	5,652	5,666	5,692	5,200
	4,170	5,102	5,090	5,346	5,395	5,444	4,969
	21	22	23	24	25	26	27
	8,563	10,309	10,648	11,152	11,084	11,231	8,898
	4,508	5,382	5,465	5,754	5,694	5,809	4,644
	4,055	4,927	5,183	5,398	5,390	5,422	4,254
	28	29	30				
	8,530	10,453	10,692				
	4,455	5,397	5,490				
	4,075	5,056	5,202				
MADW	8,559	10,629	10,862	11,320	11,526	12,019	9,814
STD	20	343	322	292	526	1,120	698
DAF	1.25	1.00	0.98	0.94	0.93	0.89	1.09

Wisconsin Department of Transportation

Monthly Hourly Day of Week Summary for June 2009

Site Names: 130263., SW
 County: Dane
 Funct. Class: R Minor Arterial - Other
 Location: CTH BB - EAST OF I-39-90-94

Seasonal Factor Group: 4
 Daily Factor Group: 4
 Axle Factor Group: 2
 Growth Factor Group: 1

	Sunday			Monday			Tuesday			Wednesday			Thursday			Friday			Saturday		
	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR
0:00	78	45	33	23	12	10	22	10	12	28	12	17	31	13	18	37	15	22	67	32	35
1:00	46	21	26	17	6	11	18	6	12	20	7	13	25	8	17	25	9	17	50	20	30
2:00	24	13	11	16	13	4	17	12	6	20	13	8	18	10	8	25	13	12	35	16	19
3:00	22	14	8	35	29	6	41	32	10	33	26	7	41	31	10	36	27	8	24	18	6
4:00	41	30	11	144	119	25	158	128	30	147	126	21	148	123	25	136	109	27	62	42	21
5:00	96	59	37	378	300	79	393	302	91	422	326	96	417	317	100	376	286	91	154	105	49
6:00	201	136	65	798	630	167	819	642	177	871	681	190	829	645	184	730	557	173	288	187	101
7:00	384	231	153	153	610	406	622	419	203	636	426	210	658	425	233	705	460	245	457	276	181
8:00	467	274	193	544	323	222	510	305	204	542	328	215	572	329	243	640	374	266	671	379	292
9:00	643	362	281	533	294	239	532	294	239	542	302	240	602	330	292	663	338	325	769	404	305
10:00	661	347	315	636	338	298	638	327	311	635	327	308	670	349	320	729	380	349	755	393	362
11:00	731	397	334	675	350	325	699	347	351	718	340	378	701	358	344	790	391	399	769	374	395
12:00	645	326	319	660	329	330	636	328	309	668	346	322	658	334	325	758	374	385	715	381	353
13:00	644	310	334	681	322	359	670	317	353	700	342	357	698	334	363	782	358	424	682	326	356
14:00	635	314	321	821	342	480	789	342	447	868	347	521	879	372	507	921	399	523	646	332	324
15:00	633	313	320	950	376	574	974	391	584	994	388	606	1,016	396	621	1,000	427	574	680	352	339
16:00	606	303	304	916	352	564	994	385	609	1,023	421	602	988	410	578	990	437	553	617	312	305
17:00	523	260	263	687	310	377	692	333	359	710	325	386	740	354	386	708	333	375	603	297	306
18:00	461	230	231	499	221	277	541	236	305	592	281	312	572	250	322	561	256	306	492	231	261
19:00	388	189	200	450	193	258	453	187	266	485	212	274	489	214	275	475	208	266	413	185	228
20:00	274	142	131	276	115	160	331	133	197	336	135	202	369	147	221	376	165	211	341	159	182
21:00	195	87	108	159	67	92	172	74	98	185	75	110	207	89	119	280	113	167	229	108	121
22:00	111	45	69	77	37	41	92	38	54	98	44	54	122	54	68	170	81	89	176	89	86
23:00	53	21	32	43	19	24	48	17	31	49	18	31	57	22	35	107	48	61	123	69	54
MADW	8,559	4,462	4,097	10,629	5,502	5,127	10,862	5,603	5,257	11,320	5,843	5,478	11,526	5,913	5,613	12,019	6,154	5,865	9,814	5,075	4,739
NDAVS	4	4	4	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4

Wisconsin Department of Transportation

Monthly Volume Calendar

Site Names: 130263, , SW
 County: Dane
 Funct. Class: R Minor Arterial - Other
 Location: CTH BB - EAST OF I-39-90-94.

Num Days: 31
 MADT: 9,862
 MAWDT: 10,457
 MAWET: 8,227

July 2009

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Road				1	2	3	4
Neg DIR				11,189	11,206	10,113	7,240
Pos DIR				5,795	5,798	5,269	3,822
				5,394	5,408	4,844	3,418
	5	6	7	8	9	10	11
	7,019	9,926	10,150	10,390	10,759	10,545	9,328
	3,600	5,149	5,237	5,370	5,606	5,496	4,794
	3,419	4,777	4,913	5,020	5,153	5,049	4,534
	12	13	14	15	16	17	18
	8,104	10,291	10,494	10,565	10,810	10,641	8,653
	4,251	5,312	5,448	5,479	5,683	5,550	4,526
	3,853	4,979	5,046	5,086	5,127	5,091	4,127
	19	20	21	22	23	24	25
	7,796	10,289	9,807	10,498	10,526	10,852	9,614
	4,091	5,329	5,086	5,496	5,428	5,651	5,059
	3,705	4,960	4,721	5,002	5,098	5,201	4,555
	26	27	28	29	30	31	
	8,063	9,852	10,248	11,117	10,759	11,618	
	4,234	5,130	5,342	5,779	5,617	6,049	
	3,829	4,722	4,906	5,338	5,142	5,569	
MADW	7,746	10,090	10,175	10,752	10,812	10,754	8,709
STD	503	233	285	372	246	553	1,059
DAF	1.27	0.98	0.97	0.92	0.91	0.92	1.13

Wisconsin Department of Transportation

Monthly Hourly Day of Week Summary for July 2009

Site Names: 130263, SW
 County: Dane
 Funct. Class: R Minor Arterial - Other
 Location: CTH BB - EAST OF I-39-90-94

Seasonal Factor Group: 4
 Daily Factor Group: 4
 Axle Factor Group: 2
 Growth Factor Group: 1

	Sunday			Monday			Tuesday			Wednesday			Thursday			Friday			Saturday		
	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR
0:00	71	30	41	22	9	13	22	11	11	33	12	21	31	12	12	36	12	24	56	24	33
1:00	44	17	27	16	6	9	21	9	12	28	9	19	24	9	15	27	8	18	39	13	26
2:00	25	10	16	10	6	6	18	11	7	24	15	9	19	12	7	23	11	12	22	8	14
3:00	21	10	10	37	28	10	34	27	8	34	25	10	39	30	9	34	26	8	22	12	10
4:00	42	31	11	117	24	117	151	127	24	141	114	28	144	114	50	117	94	23	43	31	14
5:00	91	58	33	377	300	77	370	295	75	385	300	85	380	296	84	539	248	90	135	94	40
6:00	193	130	63	642	494	148	684	532	152	703	543	160	673	517	156	564	417	147	228	148	80
7:00	344	210	134	567	371	197	593	390	203	544	329	215	553	337	216	591	350	241	539	321	218
8:00	439	263	176	573	340	232	521	307	214	544	329	215	553	337	216	591	350	241	539	321	218
9:00	610	362	248	584	328	236	545	311	234	575	321	254	571	310	262	645	353	292	624	342	283
10:00	609	322	287	635	325	310	627	318	309	655	329	324	667	348	319	725	390	335	701	372	329
11:00	631	348	283	674	337	337	638	326	312	669	337	331	674	349	325	713	365	348	670	354	316
12:00	592	297	295	640	330	311	604	308	296	655	343	312	626	320	307	740	378	362	608	310	298
13:00	598	313	284	635	300	335	634	308	326	650	319	331	681	328	353	722	345	377	565	273	290
14:00	569	287	282	730	323	408	730	312	418	760	329	431	768	348	420	746	341	403	575	280	296
15:00	572	289	284	901	357	544	904	374	530	928	380	547	947	392	555	919	412	508	623	332	291
16:00	513	249	264	873	358	516	909	379	531	961	413	547	977	424	553	858	387	470	550	287	262
17:00	502	238	264	629	293	337	636	291	346	709	326	383	682	338	344	671	330	341	556	280	276
18:00	437	203	234	471	213	258	472	206	266	543	251	292	541	239	302	481	233	248	469	235	233
19:00	363	169	194	398	170	228	450	194	236	483	226	257	492	217	275	420	192	228	397	207	190
20:00	242	110	132	259	111	149	308	121	186	355	139	215	347	144	203	334	148	186	314	150	164
21:00	123	52	73	148	68	81	164	69	95	173	74	98	198	80	118	225	101	124	260	94	166
22:00	71	33	44	82	29	53	94	38	56	111	44	67	111	43	68	149	61	87	200	81	119
23:00	42	16	26	42	18	24	48	17	31	51	18	33	62	29	33	101	43	59	122	51	71
MADW	7,746	4,044	3,702	10,090	5,230	4,860	10,175	5,278	4,897	10,752	5,384	5,168	10,812	5,626	5,186	10,754	5,603	5,151	8,709	4,550	4,159
NDAYS	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

Wisconsin Department of Transportation

Monthly Volume Calendar

Site Names: 130263, , SW
 County: Dane
 Funct. Class: R Minor Arterial - Other
 Location: CTH BB - EAST OF I-39-90-94

Num Days: 31
 MADT: 9,794
 MAWDT: 10,479
 MAWET: 7,961

August 2009

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Road							1
Neg DIR							9,237
Pos DIR							4,834
							4,403
	2	3	4	5	6	7	8
	8,165	10,099	10,421	10,489	10,465	10,079	7,517
	4,279	5,308	5,348	5,431	5,383	5,290	3,956
	3,886	4,791	5,073	5,058	5,082	4,789	3,561
	9	10	11	12	13	14	15
	6,496	9,817	10,393	10,465	10,894	10,417	8,079
	3,364	5,107	5,475	5,511	5,606	5,501	4,216
	3,132	4,710	4,918	4,954	5,288	4,916	3,863
	16	17	18	19	20	21	22
	6,558	9,770	10,398	10,799	10,871	10,902	9,045
	3,422	5,115	5,432	5,685	5,700	5,649	4,721
	3,136	4,655	4,966	5,114	5,171	5,253	4,324
	23	24	25	26	27	28	29
	7,944	10,484	10,124	10,930	10,763	11,494	8,674
	4,211	5,416	5,228	5,581	5,570	5,986	4,503
	3,733	5,068	4,896	5,349	5,193	5,508	4,171
	30	31					
	7,897	10,635					
	4,131	5,496					
	3,766	5,139					
MADW	7,412	10,161	10,334	10,671	10,748	10,723	8,510
STD	814	389	141	230	197	615	709
DAF	1.32	0.96	0.95	0.92	0.91	0.91	1.15

Wisconsin Department of Transportation

Monthly Hourly Day of Week Summary for August 2009

Site Names: 130263, , SW
 County: Dane
 Funct. Class: R Minor Arterial - Other
 Location: CTH BB - EAST OF I-39-90-94

Seasonal Factor Group: 4
 Daily Factor Group: 4
 Axle Factor Group: 2
 Growth Factor Group: 1

	Sunday			Monday			Tuesday			Wednesday			Thursday			Friday			Saturday		
	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR
0:00	63	27	36	20	8	12	22	22	8	14	28	11	18	30	17	34	13	21	57	21	36
1:00	48	19	29	19	8	11	26	10	16	16	27	12	15	33	16	18	9	21	43	16	26
2:00	23	9	14	16	12	5	19	13	6	21	12	9	25	15	11	23	14	11	27	12	15
3:00	19	10	9	45	33	12	41	28	28	12	38	25	13	42	31	12	42	27	13	28	11
4:00	39	27	12	148	121	27	154	125	29	145	121	24	147	120	28	137	111	26	55	42	13
5:00	91	55	36	380	284	96	396	294	102	391	293	99	366	276	90	353	261	92	129	89	41
6:00	190	130	60	661	509	153	674	507	167	706	540	166	670	503	167	649	490	159	270	167	103
7:00	345	215	130	543	339	184	583	396	187	583	378	206	592	389	203	590	394	197	418	257	161
8:00	435	265	170	537	324	213	517	304	213	560	331	229	532	312	221	566	341	226	555	322	233
9:00	572	331	241	541	312	229	547	302	243	563	311	254	546	311	235	586	333	254	652	363	239
10:00	634	331	241	541	312	229	547	302	243	563	311	254	546	311	235	586	333	254	652	363	239
11:00	633	326	237	541	312	229	547	302	243	563	311	254	546	311	235	586	333	254	652	363	239
12:00	567	291	276	650	384	317	645	337	308	672	326	297	637	341	296	678	355	323	698	362	336
13:00	563	288	275	648	318	330	638	313	326	638	306	333	636	333	303	689	355	334	603	308	297
14:00	549	279	271	791	350	440	743	327	416	811	365	446	800	355	445	752	337	415	598	292	306
15:00	522	255	266	942	370	572	964	394	571	954	401	553	992	412	581	886	385	501	595	306	289
16:00	519	264	255	865	358	507	924	391	534	930	412	518	939	395	545	908	403	504	555	279	276
17:00	444	219	225	680	329	351	681	327	334	672	321	351	706	330	376	713	348	364	554	279	275
18:00	414	194	221	516	229	287	527	227	300	552	235	317	576	250	327	540	256	283	428	214	214
19:00	315	153	161	401	156	245	430	188	243	444	182	262	470	209	261	421	187	234	351	168	183
20:00	202	98	104	247	103	144	284	114	170	277	116	161	292	121	171	298	131	168	251	115	136
21:00	123	57	67	135	58	77	150	67	83	197	84	113	160	74	86	212	91	120	177	84	93
22:00	64	24	40	71	32	39	97	39	59	113	46	66	105	44	61	154	53	101	135	64	71
23:00	39	16	23	39	17	22	54	22	33	66	29	37	63	25	39	93	39	54	89	44	45
MADW	7,412	3,881	3,531	10,161	5,288	4,872	10,334	5,371	4,963	10,671	5,552	5,119	10,748	5,365	5,184	10,723	5,607	5,117	8,510	4,446	4,064
NDAYS	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

Wisconsin Department of Transportation

Monthly Volume Calendar

Site Names: 130263, , SW
 County: Dane
 Funct. Class: R Minor Arterial - Other
 Location: CTH BB - EAST OF I-39-90-94

Num Days: 30
 MADT: 9,977
 MAWDT: 10,496
 MAWET: 8,176

September 2009

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4	5
Road			11,081	11,000	11,263	11,399	8,352
Neg DIR			5,767	5,705	5,884	5,938	4,433
Pos DIR			5,314	5,295	5,379	5,461	3,919
	6	7	8	9	10	11	12
	7,382	6,745	10,708	10,975	11,255	11,318	8,868
	3,848	3,461	5,552	5,723	5,868	5,900	4,702
	3,534	3,284	5,156	5,252	5,387	5,418	4,166
	13	14	15	16	17	18	19
	7,757	10,336	10,498	11,213	11,156	12,120	9,181
	4,073	5,395	5,463	5,810	5,757	6,344	4,853
	3,684	4,941	5,035	5,403	5,399	5,776	4,328
	20	21	22	23	24	25	26
	7,356	10,284	9,809	10,592	11,195	11,172	9,103
	3,853	5,366	5,066	5,490	5,768	5,763	4,762
	3,503	4,918	4,743	5,102	5,427	5,409	4,341
	27	28	29	30			
	7,407	10,105	10,317	10,807			
	3,922	5,240	5,348	5,583			
	3,485	4,865	4,969	5,224			
MADW	7,476	9,368	10,483	10,917	11,217	11,502	8,876
STD	189	1,751	472	232	51	422	374
DAF	1.33	1.07	0.95	0.91	0.89	0.87	1.12

Wisconsin Department of Transportation

Monthly Hourly Day of Week Summary for September 2009

Site Names: 130263, , SW
 County: Dane
 Funct. Class: R Minor Arterial - Other
 Location: CTH BB - EAST OF I-39-90-94
 Seasonal Factor Group: 4
 Daily Factor Group: 4
 Axle Factor Group: 2
 Growth Factor Group: 1

	Sunday			Monday			Tuesday			Wednesday			Thursday			Friday			Saturday		
	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR
0:00	58	23	35	24	12	12	13	5	8	17	8	9	23	10	14	26	11	16	51	23	28
1:00	46	21	25	18	8	10	19	8	11	16	7	8	19	8	11	23	8	15	39	18	21
2:00	24	10	14	15	10	5	19	12	7	18	11	7	25	15	10	23	13	11	31	12	19
3:00	20	9	11	34	24	10	43	33	10	46	32	14	50	36	14	42	29	12	25	14	11
4:00	34	24	10	123	99	25	155	120	35	159	128	31	142	111	32	149	120	29	50	36	14
5:00	79	52	27	340	256	84	422	320	102	442	334	108	438	332	105	387	295	92	139	95	43
6:00	210	146	64	754	579	176	991	780	211	1,009	797	213	999	788	211	964	758	206	331	234	97
7:00	372	220	152	510	330	180	626	401	226	641	409	232	616	396	220	629	401	228	531	353	178
8:00	484	293	191	450	264	186	471	276	195	487	277	210	507	295	212	516	294	222	644	394	250
9:00	654	384	270	494	273	221	489	270	218	504	278	227	518	294	224	600	330	270	709	391	319
10:00	656	335	321	540	280	260	562	290	272	563	292	271	602	322	280	625	318	308	709	371	338
11:00	615	314	301	552	297	255	568	279	290	592	304	287	597	307	290	681	339	342	657	327	330
12:00	541	278	263	565	293	273	603	310	294	632	315	317	585	291	294	643	317	326	556	291	265
13:00	516	271	245	612	298	314	627	307	320	672	317	356	653	314	339	710	346	364	591	300	291
14:00	588	314	275	804	326	477	897	375	522	897	356	541	930	386	544	975	398	577	630	316	314
15:00	585	286	299	815	346	469	969	405	564	988	409	579	1,069	470	599	982	439	543	624	321	303
16:00	516	248	268	879	366	512	943	398	545	1,000	432	547	1,053	457	597	992	460	532	558	281	277
17:00	475	238	237	656	324	333	710	334	376	803	376	427	784	389	396	760	390	371	544	261	283
18:00	366	174	192	476	198	278	523	206	318	555	237	318	611	243	368	531	246	285	436	207	229
19:00	267	120	147	328	130	198	373	141	231	408	154	254	415	145	270	406	163	243	338	156	182
20:00	167	80	87	195	77	118	240	85	155	237	78	159	315	113	202	354	133	221	265	108	157
21:00	114	49	65	106	46	60	123	51	72	135	54	81	147	53	94	257	89	168	209	92	117
22:00	62	24	38	53	19	34	64	22	42	64	24	41	82	31	51	147	58	90	134	56	78
23:00	30	13	17	30	15	15	32	12	21	34	14	20	39	16	23	84	35	49	79	34	46
MADW	7,476	3,924	3,552	9,368	4,866	4,502	10,483	5,439	5,043	10,917	5,662	5,255	11,217	5,819	5,398	11,502	5,986	5,516	8,876	4,688	4,189
NDAYS	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

Wisconsin Department of Transportation

Monthly Volume Calendar

Site Names: 130263, , SW
 County: Dane
 Funct. Class: R Minor Arterial - Other
 Location: CTH BB - EAST OF I-39-90-94

Num Days: 31
 MADT: 9,845
 MAWDT: 10,375
 MAWET: 8,048

October 2009

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2	3
Road					10,668	11,688	8,564
Neg DIR					5,514	6,042	4,464
Pos DIR					5,154	5,646	4,100
	4	5	6	7	8	9	10
	7,003	10,736	10,005	10,867	10,759	11,989	8,568
	3,652	5,572	5,235	5,581	5,555	6,225	4,465
	3,351	5,164	4,770	5,286	5,204	5,764	4,103
	11	12	13	14	15	16	17
	7,204	9,950	9,957	10,868	10,534	11,557	9,004
	3,741	5,183	5,223	5,609	5,411	5,968	4,749
	3,463	4,767	4,734	5,259	5,123	5,589	4,255
	18	19	20	21	22	23	24
	7,476	10,325	10,340	10,563	10,338	10,769	9,148
	3,895	5,352	5,370	5,513	5,297	5,507	4,771
	3,581	4,973	4,970	5,050	5,041	5,262	4,377
	25	26	27	28	29	30	31
	7,105	9,814	10,491	10,498	9,676	10,590	9,206
	3,746	5,007	5,439	5,512	4,987	5,479	4,899
	3,359	4,807	5,052	4,986	4,689	5,111	4,307
MADW	7,197	10,206	10,198	10,699	10,395	11,219	8,898
STD	203	414	259	196	432	607	312
DAF	1.37	0.96	0.97	0.92	0.95	0.87	1.11

Wisconsin Department of Transportation

Monthly Hourly Day of Week Summary for October 2009

Site Names: 130263., SW
 County: Dane
 Funct. Class: R Minor Arterial - Other
 Location: CTH BB - EAST OF I-39-90-94

Seasonal Factor Group: 4
 Daily Factor Group: 4
 Axle Factor Group: 2
 Growth Factor Group: 1

	Sunday			Monday			Tuesday			Wednesday			Thursday			Friday			Saturday		
	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR
0:00	59	29	31	9	4	5	15	6	10	20	7	13	25	8	17	22	8	13	59	26	33
1:00	46	20	26	14	8	6	15	7	8	16	7	9	19	9	10	25	11	14	47	22	26
2:00	30	12	18	15	10	5	19	12	7	18	13	7	21	13	8	23	12	11	24	12	11
3:00	18	7	11	41	33	8	41	34	7	44	35	9	44	33	11	42	30	12	25	15	10
4:00	32	25	7	150	119	31	145	115	30	161	129	32	156	117	39	140	112	28	53	38	16
5:00	67	47	20	418	323	96	424	324	100	429	326	103	408	310	98	375	285	90	115	83	32
6:00	194	137	57	926	727	200	973	777	195	999	791	208	915	725	190	851	676	174	291	199	92
7:00	357	218	139	619	410	209	617	401	216	613	402	212	611	395	216	599	388	212	476	312	164
8:00	448	268	180	474	278	197	463	269	194	474	276	198	491	289	203	510	292	218	618	373	245
9:00	654	391	264	483	260	223	470	263	207	511	284	227	491	274	217	549	310	239	713	377	336
10:00	668	335	333	557	286	271	532	275	257	602	300	303	572	300	272	624	321	303	702	363	339
11:00	618	313	306	556	287	269	545	273	273	590	304	286	570	297	273	671	332	359	647	332	315
12:00	521	275	246	627	312	316	541	275	266	580	289	291	575	288	288	656	326	330	605	309	296
13:00	519	268	251	648	297	350	612	298	314	634	308	326	622	296	326	709	350	359	618	302	317
14:00	596	307	290	882	361	521	887	346	542	934	372	562	869	347	522	943	383	560	623	301	322
15:00	569	274	295	966	390	576	1,000	415	585	1,001	404	597	969	406	563	1,025	438	587	654	348	306
16:00	514	251	263	896	363	533	927	411	516	979	432	547	972	402	570	1,014	466	549	584	301	382
17:00	447	222	225	737	347	390	716	336	360	764	351	413	725	333	392	779	400	379	586	299	286
18:00	329	138	191	431	170	261	411	173	239	463	193	270	441	168	273	519	229	290	431	203	228
19:00	219	99	120	325	115	210	343	121	222	371	147	224	368	144	225	376	153	223	320	141	180
20:00	149	63	86	203	77	126	278	85	193	240	90	151	273	95	178	392	146	246	273	116	158
21:00	77	33	44	130	60	70	127	47	79	145	53	92	138	59	79	232	83	149	197	89	108
22:00	48	19	29	74	31	43	67	23	44	78	28	49	75	30	45	148	58	90	140	60	79
23:00	22	10	12	28	12	18	33	12	21	35	15	21	44	15	29	94	36	58	97	50	48
MADW	7,197	3,759	3,439	10,206	5,279	4,928	10,198	5,317	4,882	10,699	5,554	5,145	10,395	5,353	5,042	11,319	5,844	5,474	8,898	4,670	4,228
NDAYS	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4

Wisconsin Department of Transportation

Monthly Volume Calendar

Site Names: 130263, , SW
 County: Dane
 Funct. Class: R Minor Arterial - Other
 Location: CTH BB - EAST OF I-39-90-94

Num Days: 29
 MADT: 9,508
 MAWDT: 10,063
 MAWET: 7,953

November 2009

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Road	1	2	3	4	5	6	7
Neg DIR	7,104	10,142	-	10,427	10,412	11,137	9,748
Pos DIR	3,726	5,234	-	5,336	5,397	5,761	5,101
	3,378	4,908	-	5,091	5,015	5,376	4,647
	8	9	10	11	12	13	14
	7,551	10,362	10,318	10,507	10,659	11,432	9,179
	3,904	5,310	5,360	5,411	5,498	5,965	4,745
	3,647	5,052	4,958	5,096	5,161	5,467	4,434
	15	16	17	18	19	20	21
	7,095	10,140	10,063	10,499	10,614	10,992	8,630
	3,700	5,251	5,215	5,400	5,494	5,712	4,502
	3,395	4,889	4,848	5,099	5,120	5,280	4,128
	22	23	24	25	26	27	28
	6,970	9,822	10,629	10,539	5,623	8,029	7,886
	3,576	5,138	5,444	5,419	2,887	4,097	4,096
	3,394	4,684	5,185	5,120	2,736	3,932	3,790
	29	30	-	-	-	-	-
	6,507	10,004	-	-	-	-	-
	3,328	5,197	-	-	-	-	-
	3,179	4,807	-	-	-	-	-
MADW	7,045	10,094	10,337	10,493	9,327	10,398	8,861
STD	373	199	283	47	2,472	1,590	794
DAF	1.35	0.94	0.92	0.91	1.02	0.91	1.07

Wisconsin Department of Transportation

Monthly Hourly Day of Week Summary for November 2009

Site Names: 130263,, SW
 County: Dane
 Funct. Class: R Minor Arterial - Other
 Location: CTH BB - EAST OF I-39-90-94

Seasonal Factor Group: 4
 Daily Factor Group: 4
 Axle Factor Group: 2
 Growth Factor Group: 1

	Sunday			Monday			Tuesday			Wednesday			Thursday			Friday			Saturday		
	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR	Road	Neg DIR	Pos DIR
0:00	94	39	55	26	12	14	29	10	19	39	15	23	59	24	35	47	18	29	92	38	54
1:00	63	26	37	11	5	6	18	7	12	22	8	14	31	9	22	24	8	16	61	25	36
2:00	47	18	29	13	6	7	16	8	8	18	7	12	28	10	19	25	9	16	47	19	28
3:00	24	9	15	15	10	5	17	8	9	18	11	10	21	11	10	23	12	12	28	11	17
4:00	22	9	12	38	29	9	36	27	9	42	33	8	36	27	9	43	31	12	31	21	11
5:00	39	26	14	137	108	28	126	97	29	126	101	24	106	81	25	103	81	22	38	24	13
6:00	73	51	22	351	264	87	339	255	85	335	250	85	275	197	78	277	206	71	99	72	27
7:00	193	137	55	963	769	195	932	778	174	863	680	183	719	562	157	726	567	158	217	143	75
8:00	354	227	127	664	450	214	679	452	226	678	468	210	532	370	162	603	397	207	437	287	149
9:00	460	282	177	494	295	199	496	285	211	482	284	199	440	256	184	500	293	207	594	366	229
10:00	667	405	262	503	280	223	473	272	202	526	295	231	482	279	203	551	300	252	723	397	326
11:00	630	317	313	570	294	277	567	291	276	608	330	279	603	311	292	687	349	337	733	384	349
12:00	638	322	317	571	284	287	575	286	290	624	315	309	569	285	284	692	335	357	688	338	350
13:00	569	281	287	618	312	305	563	288	275	595	291	305	497	244	253	642	316	326	647	362	285
14:00	547	268	278	644	311	335	611	295	316	637	301	337	545	261	284	700	349	351	603	289	313
15:00	527	259	268	857	336	521	918	371	547	858	361	497	789	334	454	849	365	484	590	287	303
16:00	518	260	259	898	360	538	962	398	564	959	385	574	845	366	479	902	401	501	665	338	327
17:00	441	199	242	937	374	563	977	390	587	962	397	566	827	360	468	904	413	491	617	304	313
18:00	361	179	182	623	289	333	647	306	341	707	319	389	631	294	336	620	306	314	548	268	280
19:00	309	122	187	426	154	271	452	191	261	455	180	275	418	182	236	443	197	246	413	200	213
20:00	212	94	117	351	138	213	396	147	249	385	153	232	362	150	211	376	151	225	310	141	168
21:00	133	64	70	198	74	124	254	96	158	290	104	185	280	114	166	291	126	166	285	114	171
22:00	83	37	46	115	44	70	148	55	94	172	70	102	149	58	91	231	94	137	227	110	117
23:00	43	15	27	72	28	44	85	30	55	95	36	59	87	36	51	145	62	83	170	73	98
MADW	7,045	3,647	3,399	10,094	5,226	4,868	10,337	5,340	4,997	10,493	5,392	5,102	9,327	4,819	4,508	10,398	5,384	5,014	8,861	4,611	4,250
NDAYS	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

APPENDIX B

Introduction to Capacity

INTRODUCTION TO CAPACITY

The main objective of a capacity analysis is to estimate the maximum amount of traffic that can be accommodated by a given facility. Traffic facilities generally operate poorly when they are at or near capacity and are not usually designed to do so. Ranges of operating conditions are defined by levels of service. A capacity analysis was conducted for the aforementioned intersections utilizing the methods in the Highway Capacity Manual, Special Report 209, published by the Transportation Research Board and utilizing software developed by the Federal Highway Administration.

Level of Service is a quantitative measure that refers to the overall quality of flow at an intersection ranging from very good, LOS A, to very poor, LOS F. The various levels of service are defined as follows:




















- ◆ LOS A is the highest level of service that can be achieved. Under this condition, intersection approaches appear quite open, turning movements are easily made, and nearly all drivers find freedom of operation. The general level of comfort and convenience provided to the motorist, passenger, or pedestrian is excellent. At signalized intersections, average delays are less than or equal to ten seconds. At unsignalized intersections, average delays are zero to ten seconds.
- ◆ LOS B represents stable operation. The level of comfort and convenience provided is somewhat less than at LOS A, because the presence of others in the traffic stream begins to affect individual behavior. At signalized intersections, average vehicle delays are ten to twenty seconds. At unsignalized intersections, average delays are ten to fifteen seconds.
- ◆ LOS C still represents stable operation, but periodic backups of a few vehicles may develop behind turning vehicles. Most drivers begin to feel restricted, but not severely. The general level of comfort and convenience declines noticeably at this level. At signalized intersections, average vehicle delays are 20 to 35 seconds. At unsignalized intersections, average delays are 15 to 25 seconds.
- ◆ LOS D represents increasing traffic restrictions as the intersection approaches instability. Delays to approaching vehicles may be substantial during short peaks within the peak period, but periodic clearance of long lines occurs, this preventing excessive backups. At signalized intersections, average vehicle delays are 35 to 55 seconds. At unsignalized intersections, average delays are 25 to 35 seconds.
- ◆ LOS E represents operating conditions at or near the capacity level. Comfort and convenience levels are poor, and driver or pedestrian frustration is generally high. At signalized intersections, average vehicle delays are 55 to 80 seconds. At unsignalized intersections, average delays are 35 to 50 seconds.
- LOS F represents jammed conditions where the intersection is over capacity and acceptable gaps for unsignalized intersections in the mainline traffic flow are minimal. It is defined as forced, or breakdown flow. At signalized intersections, average vehicle delays exceed 80 seconds. At unsignalized intersections, average delays exceed 50 seconds.

APPENDIX C
SYNCHRO Capacity Analyses
Existing Conditions
2011 PM Peak Hour

HCM Unsignalized Intersection Capacity Analysis

1: Cottage Grove Road & North Star Drive





















12/21/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	241	521	1	0	387	43	1	0	0	31	0	92
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.93	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	251	543	1	0	403	45	1	0	0	32	0	96
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												4
Median type		Raised			Raised							
Median storage veh		1			1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	448			544			1496	1493	543	1448	1449	403
vC1, stage 1 conf vol							1045	1045		403	403	
vC2, stage 2 conf vol							451	448		1045	1046	
vCu, unblocked vol	448			544			1496	1493	543	1448	1449	403
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	77			100			99	100	100	81	100	85
cM capacity (veh/h)	1112			1025			137	166	540	174	190	647
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	251	544	403	45	1	128						
Volume Left	251	0	0	0	1	32						
Volume Right	0	1	0	45	0	96						
cSH	1112	1700	1025	1700	137	691						
Volume to Capacity	0.23	0.32	0.00	0.03	0.01	0.19						
Queue Length 95th (ft)	22	0	0	0	1	17						
Control Delay (s)	9.2	0.0	0.0	0.0	31.4	16.3						
Lane LOS	A				D	C						
Approach Delay (s)	2.9		0.0		31.4	16.3						
Approach LOS					D	C						
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utilization			61.2%		ICU Level of Service		B					
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

















2: Cottage Grove Road & McLean Drive

12/21/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	24	577	68	35	424	6	36	5	28	3	2	17
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	26	614	72	37	451	6	38	5	30	3	2	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh		1			1							
Upstream signal (ft)					841							
pX, platoon unblocked												
vC, conflicting volume	457			686			1246	1233	650	1223	1263	451
vC1, stage 1 conf vol							701	701		526	526	
vC2, stage 2 conf vol							545	532		697	737	
vCu, unblocked vol	457			686			1246	1233	650	1223	1263	451
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			96			85	98	94	99	99	97
cM capacity (veh/h)	1103			908			263	282	469	250	268	608
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2			
Volume Total	26	686	37	451	6	41	32	4	19			
Volume Left	26	0	37	0	0	38	0	3	0			
Volume Right	0	72	0	0	6	0	30	0	18			
cSH	1103	1700	908	1700	1700	264	445	254	568			
Volume to Capacity	0.02	0.40	0.04	0.27	0.00	0.16	0.07	0.02	0.03			
Queue Length 95th (ft)	2	0	3	0	0	14	6	1	3			
Control Delay (s)	8.3	0.0	9.1	0.0	0.0	21.1	13.7	19.4	11.6			
Lane LOS	A		A			C	B	C	B			
Approach Delay (s)	0.3		0.7			17.9		13.0				
Approach LOS						C		B				
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			49.8%			ICU Level of Service			A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 21: North Star Drive & Jupiter Drive/Sharpsburg Drive

12/15/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	5	51	13	5	1	120	114	50	2	59	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	2	6	59	15	6	1	138	131	57	2	68	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	514	539	70	571	511	160	71			189		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	514	539	70	571	511	160	71			189		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	94	96	99	100	91			100		
cM capacity (veh/h)	433	408	993	373	423	885	1529			1386		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	67	22	326	74								
Volume Left	2	15	138	2								
Volume Right	59	1	57	3								
cSH	850	398	1529	1386								
Volume to Capacity	0.08	0.05	0.09	0.00								
Queue Length 95th (ft)	6	4	7	0								
Control Delay (s)	9.6	14.6	3.7	0.3								
Lane LOS	A	B	A	A								
Approach Delay (s)	9.6	14.6	3.7	0.3								
Approach LOS	A	B										
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization			36.5%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 18: Sharpsburg Drive & Gemini Drive













12/15/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↰		↰	
Volume (veh/h)	12	45	15	8	5	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	49	16	9	5	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	25				96	21
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	25				96	21
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	100
cM capacity (veh/h)	1589				896	1057
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	62	25	10			
Volume Left	13	0	5			
Volume Right	0	9	4			
cSH	1589	1700	961			
Volume to Capacity	0.01	0.01	0.01			
Queue Length 95th (ft)	1	0	1			
Control Delay (s)	1.6	0.0	8.8			
Lane LOS	A		A			
Approach Delay (s)	1.6	0.0	8.8			
Approach LOS			A			
Intersection Summary						
Average Delay			1.9			
Intersection Capacity Utilization			19.7%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis 12: McLean Drive & Sharpsburg Drive

12/15/2011




















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Volume (veh/h)	1	14	1	4	31	4	3	20	6	1	4	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1	15	1	4	33	4	3	21	6	1	4	0
Approach Volume (veh/h)		17			41			31			5	
Crossing Volume (veh/h)		10			26			17			40	
High Capacity (veh/h)		1374			1357			1366			1342	
High v/c (veh/h)		0.01			0.03			0.02			0.00	
Low Capacity (veh/h)		1152			1136			1145			1122	
Low v/c (veh/h)		0.01			0.04			0.03			0.00	
Intersection Summary												
Maximum v/c High			0.03									
Maximum v/c Low			0.04									
Intersection Capacity Utilization		13.3%		ICU Level of Service					A			

APPENDIX D
SYNCHRO Capacity Analyses
2017 PM Peak Hour
Existing Geometrics

HCM Unsignalized Intersection Capacity Analysis

1: Cottage Grove Road & North Star Drive












12/21/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	364	816	1	0	627	64	1	0	0	66	0	168
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	379	850	1	0	653	67	1	0	0	69	0	175
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												4
Median type		Raised			Raised							
Median storage veh		1			1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	720			851			2349	2329	851	2261	2262	653
vC1, stage 1 conf vol							1609	1609		653	653	
vC2, stage 2 conf vol							741	720		1608	1609	
vCu, unblocked vol	720			851			2349	2329	851	2261	2262	653
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	57			100			90	100	100	0	100	63
cM capacity (veh/h)	882			787			10	40	360	63	76	467
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	379	851	653	67	1	244						
Volume Left	379	0	0	0	1	69						
Volume Right	0	1	0	67	0	175						
cSH	882	1700	787	1700	10	204						
Volume to Capacity	0.43	0.50	0.00	0.04	0.10	1.20						
Queue Length 95th (ft)	55	0	0	0	7	310						
Control Delay (s)	12.1	0.0	0.0	0.0	386.4	173.9						
Lane LOS	B				F	F						
Approach Delay (s)	3.7		0.0		386.4	173.9						
Approach LOS					F	F						
Intersection Summary												
Average Delay			21.6									
Intersection Capacity Utilization			89.4%		ICU Level of Service		E					
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis











20: Cottage Grove Road & Extension Gemini

12/21/2011

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	126	831	581	20	98	136
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	137	903	632	22	107	148
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage (veh)		1	1			
Upstream signal (ft)		507				
pX, platoon unblocked					0.73	
vC, conflicting volume	653				1820	642
vC1, stage 1 conf vol					642	
vC2, stage 2 conf vol					1177	
vCu, unblocked vol	653				1938	642
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	85				30	69
cM capacity (veh/h)	934				152	474
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2	
Volume Total	137	903	653	107	148	
Volume Left	137	0	0	107	0	
Volume Right	0	0	22	0	148	
cSH	934	1700	1700	152	474	
Volume to Capacity	0.15	0.53	0.38	0.70	0.31	
Queue Length 95th (ft)	13	0	0	102	33	
Control Delay (s)	9.5	0.0	0.0	71.0	16.0	
Lane LOS	A			F	C	
Approach Delay (s)	1.3		0.0	39.0		
Approach LOS				E		
Intersection Summary						
Average Delay			5.8			
Intersection Capacity Utilization			55.8%	ICU Level of Service		B
Analysis Period (min)			15			




















HCM Unsignalized Intersection Capacity Analysis 25: Cottage Grove Road & east driveway

12/21/2011

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	84	845	582	60	0	19
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	91	918	633	65	0	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh		1	1			
Upstream signal (ft)		857				
pX, platoon unblocked					0.77	
vC, conflicting volume	698				1766	665
vC1, stage 1 conf vol					665	
vC2, stage 2 conf vol					1101	
vCu, unblocked vol	698				1846	665
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	90				100	96
cM capacity (veh/h)	899				176	460
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	91	918	698	21		
Volume Left	91	0	0	0		
Volume Right	0	0	65	21		
cSH	899	1700	1700	460		
Volume to Capacity	0.10	0.54	0.41	0.04		
Queue Length 95th (ft)	8	0	0	4		
Control Delay (s)	9.5	0.0	0.0	13.2		
Lane LOS	A			B		
Approach Delay (s)	0.9		0.0	13.2		
Approach LOS				B		
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			47.8%	ICU Level of Service		A
Analysis Period (min)			15			




















HCM Unsignalized Intersection Capacity Analysis 2: McLean Drive & Cottage Grove Road

12/21/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	37	796	86	44	605	10	40	6	31	5	3	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	39	847	91	47	644	11	43	6	33	5	3	27
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage (veh)		1			1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	654			938			1737	1719	893	1699	1754	644
vC1, stage 1 conf vol							971	971		737	737	
vC2, stage 2 conf vol							765	748		962	1017	
vCu, unblocked vol	654			938			1737	1719	893	1699	1754	644
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			94			74	97	90	96	98	94
cM capacity (veh/h)	933			730			163	189	341	150	174	473
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2			
Volume Total	39	938	47	644	11	46	36	7	28			
Volume Left	39	0	47	0	0	43	0	5	0			
Volume Right	0	91	0	0	11	0	33	0	27			
cSH	933	1700	730	1700	1700	165	318	155	431			
Volume to Capacity	0.04	0.55	0.06	0.38	0.01	0.28	0.11	0.04	0.07			
Queue Length 95th (ft)	3	0	5	0	0	27	10	3	5			
Control Delay (s)	9.0	0.0	10.3	0.0	0.0	35.0	17.8	29.4	13.9			
Lane LOS	A		B			E	C	D	B			
Approach Delay (s)	0.4		0.7			27.4		17.0				
Approach LOS						D		C				
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization			62.7%			ICU Level of Service			B			
Analysis Period (min)			15									

Lanes, Volumes, Timings
1: Cottage Grove Road & North Star Drive

12/21/2011

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	364	816	1	0	627	64	1	0	0	66	0	168
Satd. Flow (prot)	1770	1863	0	0	1863	1583	0	1770	0	0	1770	1583
Flt Permitted	0.155							0.712			0.757	
Satd. Flow (perm)	289	1863	0	0	1863	1583	0	1326	0	0	1410	1583
Satd. Flow (RTOR)						26						175
Lane Group Flow (vph)	379	851	0	0	653	67	0	1	0	0	69	175
Turn Type	pm+pt	NA		Perm	NA	custom	Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		8	8			4		4
Total Split (s)	16.0	52.0		36.0	36.0	23.0	23.0	23.0		23.0	23.0	23.0
Total Lost Time (s)	4.0	5.0			5.0	5.0		5.0			4.0	4.0
Act Effct Green (s)	43.2	42.2			26.0	8.8		8.8			9.8	9.8
Actuated g/C Ratio	0.71	0.69			0.43	0.14		0.14			0.16	0.16
v/c Ratio	0.76	0.66			0.82	0.27		0.01			0.30	0.44
Control Delay	22.3	8.5			25.6	20.3		24.0			28.3	8.5
Queue Delay	0.0	0.0			0.0	0.0		0.0			0.0	0.0
Total Delay	22.3	8.5			25.6	20.3		24.0			28.3	8.5
LOS	C	A			C	C		C			C	A
Approach Delay		12.8			25.1			24.0			14.1	
Approach LOS		B			C			C			B	
Queue Length 50th (ft)	63	131			196	14		0			24	0
Queue Length 95th (ft)	#214	270			#359	47		4			59	47
Internal Link Dist (ft)		550			427			280			311	
Turn Bay Length (ft)	100					75						100
Base Capacity (vph)	498	1447			954	489		394			443	617
Starvation Cap Reductn	0	0			0	0		0			0	0
Spillback Cap Reductn	0	0			0	0		0			0	0
Storage Cap Reductn	0	0			0	0		0			0	0
Reduced v/c Ratio	0.76	0.59			0.68	0.14		0.00			0.16	0.28

Intersection Summary

Cycle Length: 75

Actuated Cycle Length: 61.1

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 17.0

Intersection LOS: B

Intersection Capacity Utilization 95.2%






ICU Level of Service F

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.




















Splits and Phases: 1: Cottage Grove Road & North Star Drive

		
ø1	ø2	ø4
16 s	36 s	23 s
		
ø6		ø8
52 s		23 s

APPENDIX E
SYNCHRO Capacity Analyses
2017 PM Peak Hour
Proposed Geometrics – Cottage Grove Road

Lanes, Volumes, Timings
1: Cottage Grove Rd. & North Star Drive

12/15/2011

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	364	816	1	0	627	64	1	0	0	66	0	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	0		75	0		0	0		100
Storage Lanes	1		0	0		1	0		0	0		1
Taper Length (ft)	100			100			100			100		
Satd. Flow (prot)	1770	3539	0	0	3539	1583	0	1770	0	0	1770	1583
Flt Permitted	0.241							0.712			0.757	
Satd. Flow (perm)	449	3539	0	0	3539	1583	0	1326	0	0	1410	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						67						175
Link Speed (mph)		40			40			25			25	
Link Distance (ft)		630			467			174			391	
Travel Time (s)		10.7			8.0			4.7			10.7	
Lane Group Flow (vph)	379	851	0	0	653	67	0	1	0	0	69	175
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		4
Total Split (s)	16.0	38.0		22.0	22.0	22.0	22.0	22.0		22.0	22.0	22.0
Total Lost Time (s)	4.0	4.0			4.0	4.0		4.0			4.0	4.0
Act Effct Green (s)	28.8	28.8			14.4	14.4		9.0			9.0	9.0
Actuated g/C Ratio	0.63	0.63			0.31	0.31		0.20			0.20	0.20
v/c Ratio	0.65	0.38			0.59	0.12		0.00			0.25	0.39
Control Delay	11.4	4.8			16.0	4.7		17.0			19.8	6.7
Queue Delay	0.0	0.0			0.0	0.0		0.0			0.0	0.0
Total Delay	11.4	4.8			16.0	4.7		17.0			19.8	6.7
LOS	B	A			B	A		B			B	A
Approach Delay		6.8			14.9			17.0			10.4	
Approach LOS		A			B			B			B	
Queue Length 50th (ft)	34	41			72	0		0			16	0
Queue Length 95th (ft)	112	82			131	20		3			46	39
Internal Link Dist (ft)		550			387			94			311	
Turn Bay Length (ft)	100					75						100
Base Capacity (vph)	633	2667			1412	672		529			563	737
Starvation Cap Reductn	0	0			0	0		0			0	0
Spillback Cap Reductn	0	0			0	0		0			0	0
Storage Cap Reductn	0	0			0	0		0			0	0
Reduced v/c Ratio	0.60	0.32			0.46	0.10		0.00			0.12	0.24

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 45.9

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 9.9






Intersection LOS: A

Intersection Capacity Utilization 56.6%

ICU Level of Service B

Analysis Period (min) 15












Splits and Phases: 1: Cottage Grove Rd. & North Star Drive

 <p>ø1</p>	 <p>ø2</p>	 <p>ø4</p>
<p>16 s</p>	<p>22 s</p>	<p>22 s</p>
 <p>ø6</p>		 <p>ø8</p>
<p>38 s</p>		<p>22 s</p>

HCM Unsignalized Intersection Capacity Analysis

27: Cottage Grove Rd. & west driveway

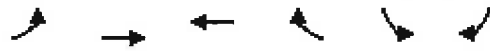
12/21/2011

							
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Volume (veh/h)	126	831	581	20	98	136	
Sign Control		Free	Free		Stop		
Grade		0%	0%		0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	137	903	632	22	107	148	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type		Raised	Raised				
Median storage veh		1	1				
Upstream signal (ft)		467					
pX, platoon unblocked					0.92		
vC, conflicting volume	653				1368	327	
vC1, stage 1 conf vol					642		
vC2, stage 2 conf vol					726		
vCu, unblocked vol	653				1229	327	
tC, single (s)	4.1				6.8	6.9	
tC, 2 stage (s)					5.8		
tF (s)	2.2				3.5	3.3	
p0 queue free %	85				61	78	
cM capacity (veh/h)	929				270	669	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	SB 2
Volume Total	137	452	452	421	232	107	148
Volume Left	137	0	0	0	0	107	0
Volume Right	0	0	0	0	22	0	148
cSH	929	1700	1700	1700	1700	270	669
Volume to Capacity	0.15	0.27	0.27	0.25	0.14	0.39	0.22
Queue Length 95th (ft)	13	0	0	0	0	45	21
Control Delay (s)	9.5	0.0	0.0	0.0	0.0	26.7	11.9
Lane LOS	A					D	B
Approach Delay (s)	1.3			0.0		18.1	
Approach LOS						C	
Intersection Summary							
Average Delay			3.0				
Intersection Capacity Utilization			39.1%		ICU Level of Service		A
Analysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis

23: Cottage Grove Rd./Cottage Grove Road & Store Front

12/21/2011





















Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰	↱↱	↱↱	↱		↱	
Volume (veh/h)	84	845	582	60	0	19	
Sign Control		Free	Free		Stop		
Grade		0%	0%		0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	91	918	633	65	0	21	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type		Raised	Raised				
Median storage veh		1	1				
Upstream signal (ft)		907					
pX, platoon unblocked							
vC, conflicting volume	698				1274	316	
vC1, stage 1 conf vol					633		
vC2, stage 2 conf vol					642		
vCu, unblocked vol	698				1274	316	
tC, single (s)	4.1				6.8	6.9	
tC, 2 stage (s)					5.8		
tF (s)	2.2				3.5	3.3	
p0 queue free %	90				100	97	
cM capacity (veh/h)	894				276	679	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	91	459	459	316	316	65	21
Volume Left	91	0	0	0	0	0	0
Volume Right	0	0	0	0	0	65	21
cSH	894	1700	1700	1700	1700	1700	679
Volume to Capacity	0.10	0.27	0.27	0.19	0.19	0.04	0.03
Queue Length 95th (ft)	8	0	0	0	0	0	2
Control Delay (s)	9.5	0.0	0.0	0.0	0.0	0.0	10.5
Lane LOS	A						B
Approach Delay (s)	0.9			0.0			10.5
Approach LOS							B
Intersection Summary							
Average Delay			0.6				
Intersection Capacity Utilization			27.4%		ICU Level of Service		A
Analysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis

2: McLean Drive & Cottage Grove Road

















12/21/2011

																			
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR							
Lane Configurations																			
Volume (veh/h)	37	796	86	44	605	10	40	6	31	5	3	25							
Sign Control		Free			Free			Stop			Stop								
Grade		0%			0%			0%			0%								
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94							
Hourly flow rate (vph)	39	847	91	47	644	11	43	6	33	5	3	27							
Pedestrians																			
Lane Width (ft)																			
Walking Speed (ft/s)																			
Percent Blockage																			
Right turn flare (veh)																			
Median type	Raised				Raised														
Median storage veh	1				1														
Upstream signal (ft)					841														
pX, platoon unblocked																			
vC, conflicting volume	654					938			1415	1719	469	1281	1760	327					
vC1, stage 1 conf vol							971	971			743	743							
vC2, stage 2 conf vol							444	748			538	1017							
vCu, unblocked vol	654					938			1415	1719	469	1281	1760	327					
tC, single (s)	4.1					4.1			7.5	6.5	6.9	7.5	6.5	6.9					
tC, 2 stage (s)								6.5	5.5			6.5	5.5						
tF (s)	2.2					2.2			3.5	4.0	3.3	3.5	4.0	3.3					
p0 queue free %	96					94			77	97	94	98	98	96					
cM capacity (veh/h)	929					726			187	188	541	215	173	669					
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2									
Volume Total	39	565	374	47	429	225	46	36	7	28									
Volume Left	39	0	0	47	0	0	43	0	5	0									
Volume Right	0	0	91	0	0	11	0	33	0	27									
cSH	929	1700	1700	726	1700	1700	187	464	203	575									
Volume to Capacity	0.04	0.33	0.22	0.06	0.25	0.13	0.25	0.08	0.03	0.05									
Queue Length 95th (ft)	3	0	0	5	0	0	23	6	3	4									
Control Delay (s)	9.0	0.0	0.0	10.3	0.0	0.0	30.4	13.4	23.3	11.6									
Lane LOS	A			B			D	B	C	B									
Approach Delay (s)	0.4				0.7			22.9			13.9								
Approach LOS						C			B										
Intersection Summary																			
Average Delay	1.8																		
Intersection Capacity Utilization	47.0%				ICU Level of Service				A										
Analysis Period (min)	15																		

HCM Unsignalized Intersection Capacity Analysis

21: North Star Drive & Jupiter Drive/Sharpsburg Drive

















12/16/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	6	64	62	6	1	144	179	85	3	112	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	3	7	74	71	7	1	166	206	98	3	129	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								391				
pX, platoon unblocked	0.94	0.94		0.94	0.94	0.94				0.94		
vC, conflicting volume	728	772	131	801	726	255	133			303		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	675	723	131	753	673	169	133			221		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	92	72	98	100	89			100		
cM capacity (veh/h)	308	292	918	251	311	819	1451			1261		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	84	79	469	137								
Volume Left	3	71	166	3								
Volume Right	74	1	98	5								
cSH	730	258	1451	1261								
Volume to Capacity	0.11	0.31	0.11	0.00								
Queue Length 95th (ft)	10	31	10	0								
Control Delay (s)	10.6	25.0	3.5	0.2								
Lane LOS	B	D	A	A								
Approach Delay (s)	10.6	25.0	3.5	0.2								
Approach LOS	B	D										
Intersection Summary												
Average Delay			5.9									
Intersection Capacity Utilization			46.4%				ICU Level of Service			A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis













18: Sharpsburg Drive & Gemini Drive

12/15/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	57	31	32	19	14	46	31	46	12	31	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	62	34	35	21	15	50	34	50	13	34	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	36			96			232	217	79	276	226	28
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	36			96			232	217	79	276	226	28
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			93	95	95	98	95	99
cM capacity (veh/h)	1575			1498			674	658	982	601	651	1047
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total	112	71	84	50	52							
Volume Left	16	35	50	0	13							
Volume Right	34	15	0	50	5							
cSH	1575	1498	667	982	663							
Volume to Capacity	0.01	0.02	0.13	0.05	0.08							
Queue Length 95th (ft)	1	2	11	4	6							
Control Delay (s)	1.1	3.8	11.2	8.9	10.9							
Lane LOS	A	A	B	A	B							
Approach Delay (s)	1.1	3.8	10.3		10.9							
Approach LOS			B		B							
Intersection Summary												
Average Delay			6.3									
Intersection Capacity Utilization			25.3%			ICU Level of Service			A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 12: McLean Drive & Sharpsburg Drive



















12/15/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Volume (veh/h)	1	53	1	6	66	5	3	22	8	1	4	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1	56	1	6	70	5	3	23	9	1	4	0
Approach Volume (veh/h)		59			82			35			5	
Crossing Volume (veh/h)		12			28			59			80	
High Capacity (veh/h)		1372			1355			1323			1301	
High v/c (veh/h)		0.04			0.06			0.03			0.00	
Low Capacity (veh/h)		1150			1134			1105			1085	
Low v/c (veh/h)		0.05			0.07			0.03			0.00	
Intersection Summary												
Maximum v/c High			0.06									
Maximum v/c Low			0.07									
Intersection Capacity Utilization			17.1%			ICU Level of Service				A		

HCM Unsignalized Intersection Capacity Analysis

2: McLean Drive & Cottage Grove Road




















1/5/2012

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	727	86	44	534	8	40	6	31	4	3	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	32	773	91	47	568	9	43	6	33	4	3	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh		1			1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	577			865			1285	1553	432	1153	1595	288
vC1, stage 1 conf vol							883	883		666	666	
vC2, stage 2 conf vol							402	670		487	929	
vCu, unblocked vol	577			865			1285	1553	432	1153	1595	288
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			94			80	97	94	98	98	97
cM capacity (veh/h)	993			774			216	216	571	246	198	708
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2		
Volume Total	32	516	349	47	379	198	46	36	6	24		
Volume Left	32	0	0	47	0	0	43	0	4	0		
Volume Right	0	0	91	0	0	9	0	33	0	22		
cSH	993	1700	1700	774	1700	1700	216	499	231	605		
Volume to Capacity	0.03	0.30	0.21	0.06	0.22	0.12	0.21	0.07	0.03	0.04		
Queue Length 95th (ft)	2	0	0	5	0	0	19	6	2	3		
Control Delay (s)	8.7	0.0	0.0	10.0	0.0	0.0	26.1	12.8	21.0	11.2		
Lane LOS	A			A			D	B	C	B		
Approach Delay (s)	0.3			0.7			20.2		13.1			
Approach LOS							C		B			
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			45.1%			ICU Level of Service			A			
Analysis Period (min)			15									

APPENDIX F
SYNCHRO Capacity Analyses
2032 PM Peak Hour

Lanes, Volumes, Timings
1: Cottage Grove Rd. & North Star Drive

12/19/2011

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	470	1046	2	0	797	83	100	10	50	79	5	207
Satd. Flow (prot)	1770	3539	0	0	3539	1583	0	1731	0	0	1779	1583
Flt Permitted	0.179							0.758			0.667	
Satd. Flow (perm)	333	3539	0	0	3539	1583	0	1353	0	0	1242	1583
Satd. Flow (RTOR)						60		35				216
Lane Group Flow (vph)	490	1092	0	0	830	86	0	166	0	0	87	216
Turn Type	pm+pt	NA		Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	1	6			2			8			4	
Permitted Phases	6			2		2	8			4		4
Total Split (s)	20.0	43.0		23.0	23.0	23.0	22.0	22.0		22.0	22.0	22.0
Total Lost Time (s)	5.0	5.0			5.0	5.0		4.0			4.0	4.0
Act Effct Green (s)	37.0	37.0			17.3	17.3		11.4			11.4	11.4
Actuated g/C Ratio	0.64	0.64			0.30	0.30		0.20			0.20	0.20
v/c Ratio	0.84	0.48			0.78	0.17		0.56			0.35	0.44
Control Delay	28.1	6.6			25.6	8.6		24.5			24.3	6.6
Queue Delay	0.0	0.0			0.0	0.0		0.0			0.0	0.0
Total Delay	28.1	6.6			25.6	8.6		24.5			24.3	6.6
LOS	C	A			C	A		C			C	A
Approach Delay		13.2			24.0			24.5			11.7	
Approach LOS		B			C			C			B	
Queue Length 50th (ft)	100	80			133	6		41			27	0
Queue Length 95th (ft)	#301	159			#250	36		92			61	44
Internal Link Dist (ft)		550			387			94			311	
Turn Bay Length (ft)	100					75						100
Base Capacity (vph)	593	2362			1119	541		452			392	648
Starvation Cap Reductn	0	0			0	0		0			0	0
Spillback Cap Reductn	0	0			0	0		0			0	0
Storage Cap Reductn	0	0			0	0		0			0	0
Reduced v/c Ratio	0.83	0.46			0.74	0.16		0.37			0.22	0.33

Intersection Summary

Cycle Length: 65

Actuated Cycle Length: 57.4

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 17.0

Intersection LOS: B

Intersection Capacity Utilization 78.5%






ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.












Splits and Phases: 1: Cottage Grove Rd. & North Star Drive

		
ø1	ø2	ø4
20 s	23 s	22 s
		
ø6		ø8
43 s		22 s

HCM Unsignalized Intersection Capacity Analysis

27: Cottage Grove Rd. & Gemini extension

12/21/2011

							
Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations							
Volume (veh/h)	126	1099	779	20	98	136	
Sign Control		Free	Free		Stop		
Grade		0%	0%		0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	137	1195	847	22	107	148	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type		Raised	Raised				
Median storage veh)		1	1				
Upstream signal (ft)		467					
pX, platoon unblocked					0.86		
vC, conflicting volume	868				1729	434	
vC1, stage 1 conf vol					858		
vC2, stage 2 conf vol					871		
vCu, unblocked vol	868				1515	434	
tC, single (s)	4.1				6.8	6.9	
tC, 2 stage (s)					5.8		
tF (s)	2.2				3.5	3.3	
p0 queue free %	82				50	74	
cM capacity (veh/h)	771				212	570	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	SB 2
Volume Total	137	597	597	564	304	107	148
Volume Left	137	0	0	0	0	107	0
Volume Right	0	0	0	0	22	0	148
cSH	771	1700	1700	1700	1700	212	570
Volume to Capacity	0.18	0.35	0.35	0.33	0.18	0.50	0.26
Queue Length 95th (ft)	16	0	0	0	0	64	26
Control Delay (s)	10.7	0.0	0.0	0.0	0.0	38.0	13.5
Lane LOS	B					E	B
Approach Delay (s)	1.1			0.0		23.8	
Approach LOS						C	
Intersection Summary							
Average Delay			3.1				
Intersection Capacity Utilization			44.6%		ICU Level of Service		A
Analysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis

23: Cottage Grove Rd./Cottage Grove Road & grocery driveway



















12/21/2011



Movement	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations	↰	↕↕	↕↕	↰		↰	
Volume (veh/h)	84	1113	780	60	0	19	
Sign Control		Free	Free		Stop		
Grade		0%	0%		0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	91	1210	848	65	0	21	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type		Raised	Raised				
Median storage veh		1	1				
Upstream signal (ft)		907					
pX, platoon unblocked					0.91		
vC, conflicting volume	913				1635	424	
vC1, stage 1 conf vol					848		
vC2, stage 2 conf vol					788		
vCu, unblocked vol	913				1497	424	
tC, single (s)	4.1				6.8	6.9	
tC, 2 stage (s)					5.8		
tF (s)	2.2				3.5	3.3	
p0 queue free %	88				100	96	
cM capacity (veh/h)	742				224	579	
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	91	605	605	424	424	65	21
Volume Left	91	0	0	0	0	0	0
Volume Right	0	0	0	0	0	65	21
cSH	742	1700	1700	1700	1700	1700	579
Volume to Capacity	0.12	0.36	0.36	0.25	0.25	0.04	0.04
Queue Length 95th (ft)	10	0	0	0	0	0	3
Control Delay (s)	10.5	0.0	0.0	0.0	0.0	0.0	11.5
Lane LOS	B						B
Approach Delay (s)	0.7			0.0			11.5
Approach LOS							B
Intersection Summary							
Average Delay			0.5				
Intersection Capacity Utilization			34.1%		ICU Level of Service		A
Analysis Period (min)			15				

HCM Unsignalized Intersection Capacity Analysis 2: McLean Drive & Cottage Grove Road



















12/21/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	48	1050	116	60	792	12	61	9	48	6	3	33
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	51	1117	123	64	843	13	65	10	51	6	3	35
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	Raised					Raised						
Median storage veh	1					1						
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	855	1240					1866	2264	620	1693	2319	428
vC1, stage 1 conf vol							1281	1281	977			
vC2, stage 2 conf vol							586	983	716			
vCu, unblocked vol	855	1240					1866	2264	620	1693	2319	428
tC, single (s)	4.1	4.1					7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5	6.5			
tF (s)	2.2	2.2					3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93	89					43	92	88	95	97	94
cM capacity (veh/h)	780	557					114	119	431	129	99	575
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2		
Volume Total	51	745	496	64	562	294	70	56	8	37		
Volume Left	51	0	0	64	0	0	65	0	6	0		
Volume Right	0	0	123	0	0	13	0	51	0	35		
cSH	780	1700	1700	557	1700	1700	114	352	122	475		
Volume to Capacity	0.07	0.44	0.29	0.11	0.33	0.17	0.61	0.16	0.07	0.08		
Queue Length 95th (ft)	5	0	0	10	0	0	76	14	5	6		
Control Delay (s)	9.9	0.0	0.0	12.3	0.0	0.0	76.6	17.2	36.7	13.2		
Lane LOS	A				B			F	C	E	B	
Approach Delay (s)	0.4	0.9					50.2	17.4				
Approach LOS							F	C				
Intersection Summary												
Average Delay	3.5											
Intersection Capacity Utilization	56.1%				ICU Level of Service					B		
Analysis Period (min)	15											

Lanes, Volumes, Timings

2: McLean Drive & Cottage Grove Road

12/21/2011

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	48	1050	116	60	792	12	61	9	48	6	3	33
Satd. Flow (prot)	1770	3486	0	1770	3532	0	0	3240	0	0	3096	0
Flt Permitted	0.331			0.160				0.810			0.909	
Satd. Flow (perm)	617	3486	0	298	3532	0	0	2692	0	0	2834	0
Satd. Flow (RTOR)		17			3			51			35	
Lane Group Flow (vph)	51	1240	0	64	856	0	0	126	0	0	44	0
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			8			4	
Permitted Phases	6			2			8			4		
Total Split (s)	12.0	31.0		22.0	41.0		22.0	22.0		22.0	22.0	
Total Lost Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Act Effct Green (s)	53.6	54.4		53.6	54.4			8.6			8.6	
Actuated g/C Ratio	0.71	0.73		0.71	0.73			0.11			0.11	
v/c Ratio	0.09	0.49		0.17	0.33			0.36			0.12	
Control Delay	5.2	5.3		6.6	6.1			22.1			14.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	5.2	5.3		6.6	6.1			22.1			14.3	
LOS	A	A		A	A			C			B	
Approach Delay		5.3			6.1			22.1			14.3	
Approach LOS		A			A			C			B	
Queue Length 50th (ft)	7	105		10	90			17			2	
Queue Length 95th (ft)	m17	134		26	135			41			16	
Internal Link Dist (ft)		285			1116			366			750	
Turn Bay Length (ft)	125			200								
Base Capacity (vph)	564	2535		566	2565			685			707	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.09	0.49		0.11	0.33			0.18			0.06	

Intersection Summary

Cycle Length: 75

Actuated Cycle Length: 75

Offset: 0 (0%), Referenced to phase 2:WBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.49

Intersection Signal Delay: 6.7

Intersection LOS: A








Intersection Capacity Utilization 59.4%

ICU Level of Service B

Analysis Period (min) 15

















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: McLean Drive & Cottage Grove Road

			
ø2		ø1	ø4
41 s		12 s	22 s
			
ø5	ø6		ø8
22 s	31 s		22 s


















HCM Unsignalized Intersection Capacity Analysis 21: North Star Drive & Jupiter Drive/Sharpsburg Drive

12/15/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	9	87	68	9	2	194	228	104	3	138	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			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
Hourly flow rate (vph)	3	10	100	78	10	2	223	262	120	3	159	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								391				
pX, platoon unblocked	0.87	0.87		0.87	0.87	0.87				0.87		
vC, conflicting volume	944	996	161	1041	939	322	164			382		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	861	921	161	973	855	146	164			215		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	95	89	48	95	100	84			100		
cM capacity (veh/h)	202	198	883	151	216	784	1414			1179		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	114	91	605	168								
Volume Left	3	78	223	3								
Volume Right	100	2	120	6								
cSH	623	159	1414	1179								
Volume to Capacity	0.18	0.57	0.16	0.00								
Queue Length 95th (ft)	17	74	14	0								
Control Delay (s)	12.1	54.0	4.0	0.2								
Lane LOS	B	F	A	A								
Approach Delay (s)	12.1	54.0	4.0	0.2								
Approach LOS	B	F										
Intersection Summary												
Average Delay			8.9									
Intersection Capacity Utilization			57.8%			ICU Level of Service				B		
Analysis Period (min)			15									













HCM Unsignalized Intersection Capacity Analysis 18: Sharpsburg Drive & Gemini Drive

12/15/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	20	77	31	32	26	18	46	31	46	15	31	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	84	34	35	28	20	50	34	50	16	34	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	48			117			276	261	101	318	268	38
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	48			117			276	261	101	318	268	38
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			92	95	95	97	95	99
cM capacity (veh/h)	1559			1471			625	619	955	560	614	1034
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1							
Volume Total	139	83	84	50	58							
Volume Left	22	35	50	0	16							
Volume Right	34	20	0	50	8							
cSH	1559	1471	623	955	630							
Volume to Capacity	0.01	0.02	0.13	0.05	0.09							
Queue Length 95th (ft)	1	2	12	4	8							
Control Delay (s)	1.2	3.3	11.7	9.0	11.3							
Lane LOS	A	A	B	A	B							
Approach Delay (s)	1.2	3.3	10.7		11.3							
Approach LOS			B		B							
Intersection Summary												
Average Delay			6.1									
Intersection Capacity Utilization			25.5%		ICU Level of Service				A			
Analysis Period (min)			15									

















HCM Unsignalized Intersection Capacity Analysis 12: McLean Drive & Sharpsburg Drive

12/15/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Volume (veh/h)	2	59	2	8	80	7	5	34	11	2	5	5
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	2	63	2	9	85	7	5	36	12	2	5	5
Approach Volume (veh/h)		67			101			53			13	
Crossing Volume (veh/h)		16			44			67			99	
High Capacity (veh/h)		1368			1338			1314			1282	
High v/c (veh/h)		0.05			0.08			0.04			0.01	
Low Capacity (veh/h)		1146			1119			1097			1068	
Low v/c (veh/h)		0.06			0.09			0.05			0.01	
Intersection Summary												
Maximum v/c High			0.08									
Maximum v/c Low			0.09									
Intersection Capacity Utilization			18.2%			ICU Level of Service				A		

HCM Unsignalized Intersection Capacity Analysis 21: North Star Drive & Jupiter Drive/Sharpsburg Drive



















12/21/2011

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	3	9	87	68	9	2	194	228	104	3	138	5
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
Hourly flow rate (vph)	3	10	100	78	10	2	223	262	120	3	159	6
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	114	91	605	168								
Volume Left (vph)	3	78	223	3								
Volume Right (vph)	100	2	120	6								
Hadj (s)	-0.49	0.19	-0.01	0.02								
Departure Headway (s)	5.5	6.2	4.8	5.3								
Degree Utilization, x	0.17	0.16	0.80	0.25								
Capacity (veh/h)	585	521	742	628								
Control Delay (s)	9.7	10.4	23.8	10.1								
Approach Delay (s)	9.7	10.4	23.8	10.1								
Approach LOS	A	B	C	B								
Intersection Summary												
Delay			18.6									
HCM Level of Service			C									
Intersection Capacity Utilization			57.8%	ICU Level of Service			B					
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2: McLean Drive & Cottage Grove Road

1/5/2012

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	41	981	116	60	721	10	61	9	48	5	3	29
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	44	1044	123	64	767	11	65	10	51	5	3	31
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh		1			1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	778			1167			1736	2098	584	1565	2154	389
vC1, stage 1 conf vol							1193	1193		900	900	
vC2, stage 2 conf vol							544	905		665	1254	
vCu, unblocked vol	778			1167			1736	2098	584	1565	2154	389
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			89			51	93	89	96	97	95
cM capacity (veh/h)	835			594			132	137	455	149	115	610
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1	SB 2		
Volume Total	44	696	471	64	511	266	70	56	7	32		
Volume Left	44	0	0	64	0	0	65	0	5	0		
Volume Right	0	0	123	0	0	11	0	51	0	31		
cSH	835	1700	1700	594	1700	1700	132	380	139	503		
Volume to Capacity	0.05	0.41	0.28	0.11	0.30	0.16	0.53	0.15	0.05	0.06		
Queue Length 95th (ft)	4	0	0	9	0	0	63	13	4	5		
Control Delay (s)	9.6	0.0	0.0	11.8	0.0	0.0	59.1	16.1	32.2	12.6		
Lane LOS	A			B			F	C	D	B		
Approach Delay (s)	0.3			0.9			39.9		16.1			
Approach LOS							E		C			
Intersection Summary												
Average Delay			3.1									
Intersection Capacity Utilization			54.2%				ICU Level of Service		A			
Analysis Period (min)			15									

Intersection: 1: Cottage Grove Rd. & North Star Drive

Movement	EB	EB	EB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	TR	LT	T	R	LTR	LT	R
Maximum Queue (ft)	199	497	391	298	304	175	178	129	136
Average Queue (ft)	152	128	106	149	167	55	80	48	57
95th Queue (ft)	220	320	244	243	260	144	142	100	109
Link Distance (ft)		591	591	401	401		206	287	
Upstream Blk Time (%)		0	0				0		
Queuing Penalty (veh)		0	0				0		
Storage Bay Dist (ft)	100					75			100
Storage Blk Time (%)	25	2			36	1		1	1
Queuing Penalty (veh)	131	8			30	2		3	1

Intersection: 2: McLean Drive & Cottage Grove Road

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	TR	LT	TR
Maximum Queue (ft)	73	185	222	84	154	186	112	81	33	66
Average Queue (ft)	24	66	93	29	31	55	44	32	5	17
95th Queue (ft)	53	146	174	64	96	126	91	63	22	48
Link Distance (ft)		292	292		1156	1156	394	394	721	721
Upstream Blk Time (%)			0							
Queuing Penalty (veh)			0							
Storage Bay Dist (ft)	125			200						
Storage Blk Time (%)	0	1			0					
Queuing Penalty (veh)	0	0			0					

Intersection: 12: McLean Drive & Sharpsburg Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	6	38	24	6
Average Queue (ft)	0	2	1	0
95th Queue (ft)	5	12	12	4
Link Distance (ft)	759	294	721	164
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 18: Sharpsburg Drive & Gemini Drive

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	LT	R	LTR
Maximum Queue (ft)	18	32	62	58	49
Average Queue (ft)	0	5	31	27	25
95th Queue (ft)	6	24	54	51	50
Link Distance (ft)	352	417	167	167	280
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 21: North Star Drive & Jupiter Drive/Sharpsburg Drive

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	57	51	198	83
Average Queue (ft)	35	29	107	41
95th Queue (ft)	55	47	169	62
Link Distance (ft)	225	352	287	272
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 23: Cottage Grove Rd./Cottage Grove Road & grocery driveway

Movement	EB	WB	SB
Directions Served	L	R	R
Maximum Queue (ft)	94	21	32
Average Queue (ft)	36	1	11
95th Queue (ft)	71	10	30
Link Distance (ft)			158
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	200	100	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 25: Cottage Grove Road & Truck Access

Movement	WB	WB
Directions Served	T	T
Maximum Queue (ft)	10	10
Average Queue (ft)	0	1
95th Queue (ft)	8	10
Link Distance (ft)	292	292
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 27: Cottage Grove Rd. & new public street

Movement	EB	WB	WB	SB	SB
Directions Served	L	T	R	L	R
Maximum Queue (ft)	117	4	9	293	267
Average Queue (ft)	46	0	0	191	104
95th Queue (ft)	86	3	6	343	289
Link Distance (ft)		380		279	279
Upstream Blk Time (%)				29	13
Queuing Penalty (veh)				0	0
Storage Bay Dist (ft)	200		100		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Network Summary

Network wide Queuing Penalty: 176
