TRAFFIC IMPACT ANALYSIS

East Broadway Corridor
City of Monona
Dane County, WI

Prepared for:
City of Monona
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June 2011

I certify that this Traffic Impact Analysis has been prepared by me or under my immediate supervision and that I have experience and training in the field of traffic and transportation engineering.

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June 2011

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CHAPTER 1 – INTRODUCTION AND EXECUTIVE SUMMARY

PART A – PURPOSE OF REPORT AND STUDY OBJECTIVES

The City of Monona wishes to plan for orderly development and redevelopment along the East Broadway (CTH BW) corridor. This corridor will be impacted by the opening of two health clinics currently under construction and planned to be completed in the fall of 2011 as well as other anticipated development in Tax Increment District (TID) #6 and Redevelopment Area (RA) #6. The study area encompasses the East Broadway corridor from USH 51 (Stoughton Road) to Monona Drive in the City of Monona, Dane County, Wisconsin. Although the intersection of East Broadway and Stoughton Road was not part of this study, the interaction of this intersection with any changes recommended to the west was considered. East Broadway is a four lane divided urban arterial roadway.

Proposed development along East Broadway includes the two clinics which are currently under construction, a Meriter Health Clinic on the northeast corner of East Broadway and Copps Avenue and a UW Health Clinic on the south side of East Broadway to the west; an expansion of the existing Menards Home Improvement Store on the northwest corner of the intersection of East Broadway and Copps Avenue, a large anticipated commercial/office park development on the south side of East Broadway east of the UW Clinic, (Whitehorse Development), and several redevelopments on both sides of East Broadway in the vicinity of the Edna Taylor Parkway intersection.

The purpose of this study is to determine the impact of this proposed and anticipated development on the intersections in the study area. The objective of this report is to analyze the existing and future roadway operations and make recommendations for geometric or traffic control improvements to accommodate the proposed and anticipated development to help ensure the safe and efficient movement of all modes of transportation at the affected intersections. The analyses were completed for the existing conditions (2011), completion of the clinics and Menards expansion (Fall 2011), full operation of the clinics and anticipated build out of other anticipated development (2016), and full build out of the corridor with geometric changes as anticipated by the USH 51 study (2021).

PART B – EXECUTIVE SUMMARY

A summary of the development and recommended transportation improvements are described below. The details of the complete traffic study follow this summary.

Proposed Development

The 57,000 square foot (SF) Meriter Monona Health Clinic is currently under construction on the northeast corner of East Broadway and Copps Avenue at the east end of the study area. This is the first phase of build out for this clinic with an anticipated expansion to include up to an additional 57,000 square feet prior to 2021. The first phase of this clinic is anticipated to serve approximately 400 patient visits each day upon completion and 600 patient visits each day by 2016. The clinic will have two access points onto Copps Avenue within 500 feet of the East Broadway intersection with Copps Avenue.

Directly across Copps Avenue from the Meriter Clinic is a Menards Home Improvement store and a Denny's Restaurant which also access Copps Avenue in the block between East Broadway and Femrite Drive to the north. The Menards store is planning an approximately 30,000 SF addition in the summer of 2011. Although Copps Avenue traffic can use Femrite Drive to connect to Monona Drive to the west, it is anticipated that most of the traffic generated by these developments will utilize the Copps Avenue-East Broadway intersection to gain access to these facilities.

Also currently under construction and anticipated to be completed by August of 2011 is the UW Health Yahara Family Medical Clinic. This clinic is located on the south side of East Broadway approximately 1000 feet west of the Copps Avenue intersection and it will be served by two existing driveway accesses onto East Broadway. The west access is a full median break with left turn lanes opposite a driveway serving a gas station. This access point will be shared with the existing Broadway Business Park retail center just west of the Clinic and an anticipated future office building just south of the Yahara Clinic. The eastern access will primarily serve the clinic and is also a right in / right out access.

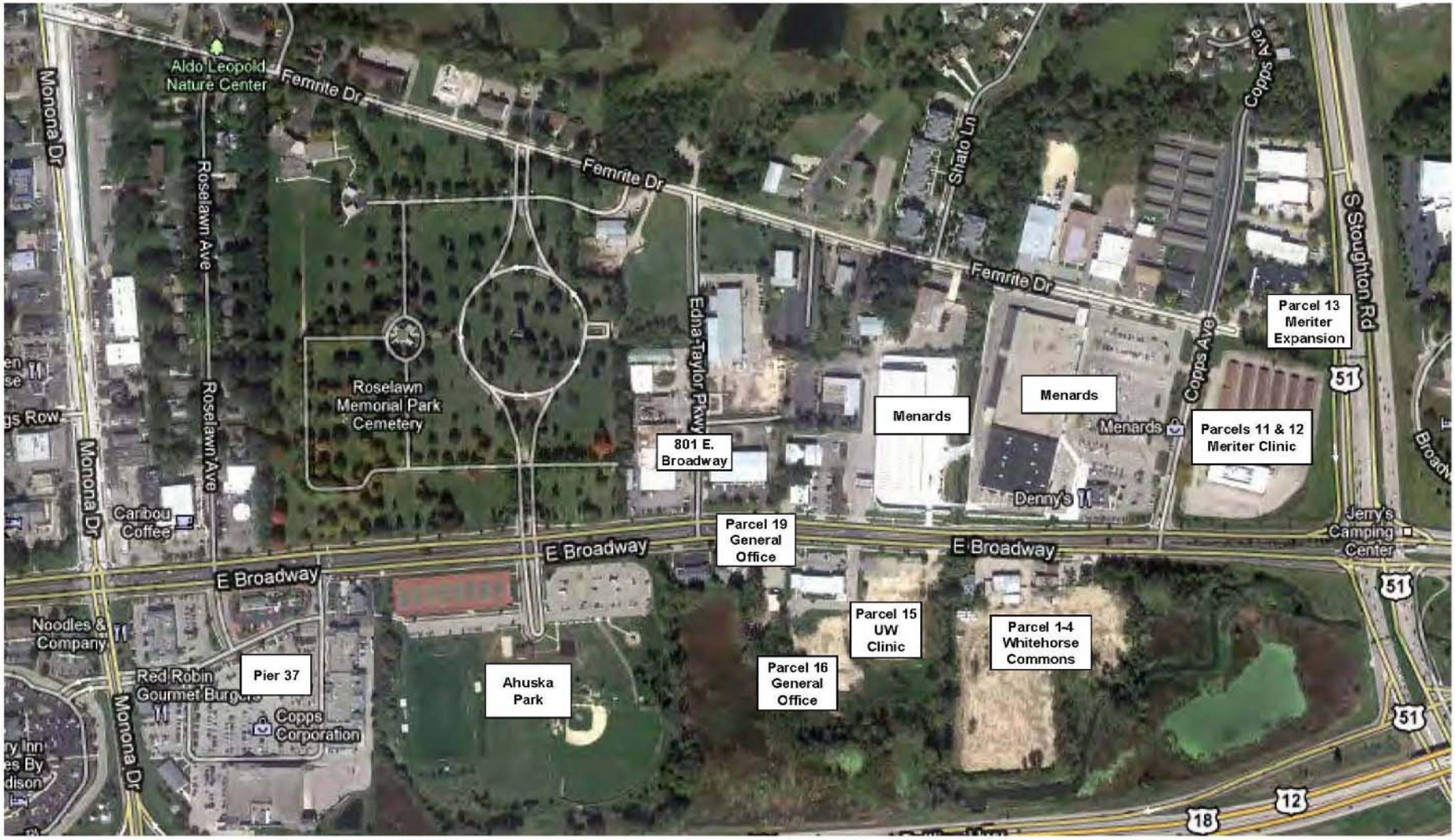
Although no additional new development is currently proposed, an approximately eight acre site, known as the "Whitehorse development", just east of the UW Clinic is anticipated to be developed within the next five years. This parcel includes a floodplain area but there is approximately 110,000 SF of developable land. This land is currently for sale but it is anticipated that a combination of commercial and office uses will be constructed here. A total of 180,000 SF of "office park" was assumed for this location.

There are also two locations that the City of Monona anticipates will "redevelop" in the next five years. These include low volume existing retail just west of the Broadway Business Park on the south side of East Broadway and on the northwest corner of East Broadway and Edna Taylor Parkway. These are anticipated to redevelop into higher volume uses including general office buildings and some specialty retail.

A map of the study area including all proposed and anticipated development discussed above is shown in Exhibit 1-1. Parcel numbers in Exhibit 1-1 correspond to parcel numbers shown in Exhibit 2-2.

Aerial View

East Broadway Traffic Impact Analysis Study – City of Monona



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EAST BROADWAY CORRIDOR STUDY AREA INCLUDING PROPOSED AND ANTICIPATED DEVELOPMENT

EXHIBIT 1-1

Although there are different trip generation results anticipated for each of the three future study time periods, a total of approximately 10,000 trips are expected to be generated by the proposed and anticipated developments on an average weekday by full build out in 2021. Approximately 807 of these trips are anticipated to be during the a.m. peak hour and approximately 1,004 are anticipated to be during the p.m. peak hour. These estimates were taken from estimates published in the Institute of Transportation Engineers (ITE) *Trip Generation, 8th Edition, 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 travel movement with either the origin or destination of the trip being from the proposed development.

The study area for the East Broadway corridor includes the following intersections:

1. East Broadway and Monona Drive
2. East Broadway and Roselawn Avenue/west entrance to Pier 37
3. East Broadway and east access to Pier 37
4. East Broadway and Edna Taylor Parkway
5. East Broadway and the entrance to the UW Health Yahara Clinic
6. East Broadway and the entrance anticipated development east of the UW Health Yahara Clinic (Whitehorse)
7. East Broadway and Copps Avenue

Interaction between the Copps Avenue intersection and the intersection of East Broadway with USH 51 (Stoughton Road) was also evaluated; however, an analysis of the East Broadway – Stoughton Road intersection was not included as part of this study as it is currently being studied as part of the Wisconsin Department of Transportation's (WisDOT) USH 51 study. Current anticipated recommendations from that study were incorporated into the 2021 analyses for this study. These recommendations include essentially closing the East Broadway – USH 51 intersection and providing access to and from USH 51 to East Broadway through a more circuitous route with jug handle type improvements. This will likely have an effect on all traffic on East Broadway as some motorists will choose to use the Monona Drive access to the Beltline Highway rather than the USH 51 access.

Ninety-six hour automatic counts were conducted at two locations on East Broadway in addition to peak hour turning movement counts at the study intersections. Based on these counts and existing and future anticipated traffic volumes, all of the study area intersections were analyzed during the weekday evening peak traffic hours because both existing traffic volumes on East Broadway and trip generation are higher during the evening peak hour than during the morning or Saturday peak hour. Therefore the evening peak hour is considered the critical peak hour. The intersection of Monona Drive and East Broadway was also analyzed during the weekday morning peak hour and the intersection of Copps Avenue and East Broadway was analyzed for both the morning weekday peak hour and the weekend peak hour in addition to the evening peak hour. All of the capacity analyses were completed utilizing Synchro software, which is based on the Highway Capacity Manual, and SimTraffic software.

A summary of the Level of Service of all the intersections in the PM peak hour for existing, fall of 2011, 2016, and 2021 with existing geometrics and traffic control is as shown on the following pages.

Abbreviations are as follows:

- AP = Approach
- LT = Left
- TH= Thru
- RT= Right

Year 2011 Background Traffic Operating Conditions
With Existing Geometrics and Traffic Control
PM Peak Hour

Intersection: East Broadway &	Traffic Control	Inter. LOS	Level of Service per Movement by Approach															
			Eastbound				Westbound				Northbound				Southbound			
			AP	LT	TH	RT	AP	LT	TH	RT	AP	LT	TH	RT	AP	LT	TH	RT
Monona Drive	Traffic Signals	**D**	**D**	C	D	C	**D**	D	D	C	**D**	D	D	-	**D**	D	D	-
Roselawn Ave. – Pier 37 west access	Two-way stop	N/A	**-**	A	-	-	**-**	A	-	-	**B**	C	-	A	**B**	-	-	-
Pier 37 east access	Traffic Signals	**B**	**B**	-	B	-	**A**	A	A	-	**B**	C		A	**-**	-	-	-
Edna Taylor Parkway	One-way stop	N/A	**-**	A	-	-	**-**		-	-		-		-	**B**	-	-	-
Copps Ave.	One-way stop	N/A	**-**	A	-	-	**-**	-	-	-	-	-	-	-	**C**	C	-	-

Fall 2011 Operating Conditions
Existing geometrics and added traffic from clinics and Menard's Addition
PM Peak Hour

Intersection: East Broadway &	Traffic Control	Inter. LOS	Level of Service per Movement by Approach															
			Eastbound				Westbound				Northbound				Southbound			
			AP	LT	TH	RT	AP	LT	TH	RT	AP	LT	TH	RT	AP	LT	TH	RT
Monona Drive	Traffic Signals	**D**	**D**	C	D	C	**D**	D	D	C	**D**	D	E	-	**D**	D	D	-
Roselawn Ave. – Pier 37 west access	Two-way stop	N/A	**-**	A	-	-	**-**	A	-	-	**B**	C	-	A	**B**	-	-	-
Pier 37 east access	Traffic Signals	**B**	**B**	-	B	-	**A**	A	A	-	**B**	C	-	A	**-**	-	-	-
Edna Taylor Parkway	One-way stop	N/A	**-**	A	-	-	**-**	-	-	-	-	-	-	-	**C**	-	-	-
UW Clinic Access	Two-way stop	N/A	**-**	A	-	-	**-**	A	-	-	**C**	C	B	-	**C**	-	-	-
Whitehorse Development	One-way stop	N/A	**-**	-	-	-	**-**	-	-	-	-	-	-	-	**-**	-	-	-
Copps Ave.	One-way stop	N/A	**-**	A	-	-	**-**	-	-	-	-	-	-	-	**C**	C	-	-

Year 2016 Background Traffic Operating Conditions
With Existing Geometrics and Traffic Control
PM Peak Hour

Intersection: East Broadway &	Traffic Control	Inter. LOS	Level of Service per Movement by Approach															
			Eastbound				Westbound				Northbound				Southbound			
			AP	LT	TH	RT	AP	LT	TH	RT	AP	LT	TH	RT	AP	LT	TH	RT
Monona Drive	Traffic Signals	**E**	**E**	D	E	D	**E**	E	D	C	**E**	E	E	-	**E**	E	D	-
Roselawn Ave. – Pier 37 west access	Two-way stop	N/A	**-**	B	-	-	**-**	A	-	-	**B**	C	-	A	**B**	-	-	-
Pier 37 east access	Traffic Signals	**B**	**B**	-	B	-	**A**	A	A	-	**B**	C	-	A	**-**	-	-	-
Edna Taylor Parkway	One-way stop	N/A	**-**	B	-	-	**-**	-	-	-		-		-	**D**	-	-	-
UW Clinic Access	Two-way stop	N/A	**-**	A	-	-	**-**	B	-	-	**D**	E	B	-	**C**	-	-	-
Whitehorse Development	One-way stop	N/A	**-**	-	-	-	**-**	B	-	-	**D**	E	C	-	**-**	-	-	-
Copps Ave.	One-way stop	N/A	**-**	B	-	-	**-**	-	-	-	-	-	-	-	**F**	-	-	-

Year 2021 Operating Conditions
With existing geometrics and added traffic from all developments
PM Peak Hour

Intersection: East Broadway &	Traffic Control	Inter. LOS	Level of Service per Movement by Approach															
			Eastbound				Westbound				Northbound				Southbound			
			AP	LT	TH	RT	AP	LT	TH	RT	AP	LT	TH	RT	AP	LT	TH	RT
Monona Drive	Traffic Signals	**F**	**E**	D	F	E	**F**	F	D	C	**F**	F	F	-	**F**	F	E	-
Roselawn Ave. – Pier 37 west access	Two-way stop	N/A	**-**	B	-	-	**-**	A	-	-	**C**	C	-	B	**C**	-	-	-
Pier 37 east access	Traffic Signals	**B**	**B**	-	B	-	**A**	A	A	-	**C**	D	-	A	**-**	-	-	-
Edna Taylor Parkway	One-way stop	N/A	**-**	B	-	-	**-**		-	-		-		-	**D**	-	-	-
UW Clinic Access	Two-way stop	N/A	**-**	A	-	-	**-**	B	-	-	**D**	F	C	-	**C**	-	-	-
Whitehorse Development	One-way stop	N/A	**-**	-	-	-		B	-	-	**D**	F	C	-	**-**	-	-	-
Copps Ave.	One-way stop	N/A	**-**	F	-	-	**-**	-	-	-	-	-	-	-	**F**	F	-	-

Recommended Improvements

Overall, the existing configuration of the East Broadway corridor is adequate to provide for currently proposed and anticipated development through 2021. Therefore, there are no geometric changes recommended for the corridor as a whole. However, the additional traffic resulting from proposed and anticipated future developments will likely result in unacceptable levels of service and/or unacceptable gaps in traffic for motorists to reasonably enter or cross East Broadway at some intersections.

The following sections address the improvements recommended to accommodate the traffic conditions in the study area.

East Broadway and Monona Drive
East Broadway and Roselawn Avenue/Pier 37 west access
East Broadway and Pier 37 east access

As traffic increases along this corridor as a result of base traffic growth and development, additional capacity will be required for the Monona Drive intersection. During the peak hours, queues for the westbound left turn lane on East Broadway have been observed extending beyond the left turn bay into the through travel lanes. This results in a reduction in capacity for both westbound left turning vehicles which can't always access the turn lane in order to utilize the left turn arrow and for westbound through vehicles because the queue of vehicles intending to turn left sometimes block the left through lane. This will occur more often and to a greater degree as traffic increases with development. In order to extend the westbound left turn lane approaching the Monona Drive intersection, the median at Roselawn Avenue should be partially closed. The partial closing of this median break would not allow for left turns on or off of East Broadway or out of the Pier 37 shopping center but would accommodate left turns off of Roselawn Avenue onto East Broadway. Left turning traffic in and out of the Pier 37 shopping center would likely use the signalized access to the east. Additionally, eastbound traffic desiring to access Roselawn Avenue would be required to U-turn at the east access signalized intersection. A traffic analysis of the east access Pier 37 intersection estimates that this additional traffic will not significantly affect levels of service at this signalized location.

Even with the extended left turn lane, the Monona Drive intersection is anticipated to have capacity concerns if all assumed development is constructed by 2021 and if WisDOT proceeds with the currently considered changes at the USH 51 intersection. Therefore, as the need arises, an additional westbound left turn lane should be constructed from East Broadway onto Monona Drive. This could be done without increasing the total number of lanes approaching this intersection by combining the westbound right turn lane with the right through lane. Additionally, a right turn lane should be constructed for northbound Monona Drive to accommodate increased right turning traffic from the south and the Beltline Highway. If additional capacity is still required, it may also be advisable to construct an exclusive southbound right turn lane to create additional capacity on the southbound approach, and therefore for the intersection as a whole. Extensions of the northbound, southbound and eastbound left turn lanes should be considered, but they will have to be weighed against the physical constraints that exist with adjacent intersections.

East Broadway and Copps Avenue

The current stop sign control on Copps Avenue at this intersection results in a LOS C. However, when the clinic is in full operation by 2016 and with all the other anticipated development on East Broadway, the southbound Copps Avenue left turn is anticipated to operate at LOS F. This intersection currently meets the warrants for the installation of traffic signals under Warrant 2, Four-Hour Vehicular Volume. It also currently meets the standards for Warrant 1B, Interruption of Continuous Traffic, for seven hours each day. Additional traffic from the clinic currently under construction is anticipated to result in this intersection meeting Warrant 1B for the required eight hours to justify the installation of traffic signals or the construction of a roundabout.

To evaluate the effect of a change in traffic control at this intersection, analyses were completed for the Fall of 2011, 2016 and 2021 with a traffic signal and a two lane roundabout. These analyses show that either a roundabout or a traffic signal would result in an acceptable level of service at this intersection and that neither one would be anticipated to adversely affect the USH 51 intersection with Stoughton Road. Although both would operate acceptably at this location, a traffic signal would have the advantage of creating gaps in westbound traffic for the future Whitehorse Development and the UW Clinics access. However, a roundabout would result in less disruption to East Broadway through traffic and would not have the concern of an additional signal so close to the major intersection at East Broadway and Stoughton Road (USH 51). A roundabout would likely require additional right-of-way and an analysis of space requirements and may not be feasible because of the wetlands on the south side of Broadway.

A traffic signal installed at the Copps Avenue intersection would need to be coordinated with the East Broadway and USH 51 (Stoughton Road) traffic signal. If a traffic signal is installed at this location, the westbound right turn lane on East Broadway should be extended to 200 feet. The eastbound left turn lane should also be extended to provide for the most efficient movement of travel at this intersection, however geometric constraints with the left turn lane for the future Whitehorse Development need to be taken into consideration. In addition, parking should be prohibited on both sides of Copps Avenue between East Broadway and Femrite Drive.

East Broadway and Edna Taylor Parkway
East Broadway and UW Clinic
East Broadway and Whitehorse Development

All three of these intersections are anticipated to operate at an acceptable level of service following construction of the clinics in 2011. The Synchro analysis results in an anticipated level of service D on all side street approaches during the p.m. peak hour in both 2016 and 2021 with the left turn at LOS F at the UW Clinic and Whitehorse Development in 2021. If all development is constructed as assumed, there is not anticipated to be enough gaps in traffic to accommodate the traffic exiting the Whitehorse Development in 2021. Alternatives to alleviate this situation would be either the installation of additional traffic signals as warrants are met or the construction of a system of roundabouts. This choice would be dependent on the control installed on Copps Avenue. If an additional traffic signal is installed, the Edna Taylor Parkway intersection would result in the most uniform spacing and therefore best potential for

two-way traffic progression but may not be the best location based on traffic volume. This should be reevaluated when the Whitehorse Development materializes.

Summary of Recommendations noted previously:
2011 Recommendations

- **Monona Drive and Roselawn**
  - Extend the westbound left turn lane from East Broadway onto southbound Monona Drive. This would require restricting access to Roselawn from the west and Pier 37 to and from the east and therefore needs to be weighed against City of Monona access concerns. An alternative would be to construct a modified pork chop island in the median to restrict Pier 37 access but maintain Roselawn access. This could result in a small increase in the length of the westbound Broadway left turn lane but will not result in a significant improvement to operations at the Monona Drive intersection. It will however improve traffic flow between Monona Drive and the signalized Pier 37 access to the east.
- **Pier 37 east access**
  - If access to Roselawn is restricted from the east, the "No U Turn" signs should be removed and a 50 foot left turn lane should be installed for eastbound East Broadway to accommodate U turning traffic at the signalized Pier 37 intersection.
  - In conjunction with access to Pier 37 being restricted at the unsignalized median break, the westbound left turn lane at this location should be extended to 250 feet.
- **Copps Avenue**
  - Traffic signals or the construction of a two-lane roundabout is recommended to accommodate full build-out of the two medical clinics
  - If traffic signals are installed, the westbound right turn lane should be extended to 200 feet and the eastbound left turn lane should be extended to at least 100 feet. A length of 175 feet would be preferred, however it would require the shortening of the existing left turn lane entering any future development on the Whitehorse property.

2021 Recommendations (assuming reconfiguration of the USH 51/Broadway intersection)

- **Monona Drive**
  - Construct a second westbound left turn lane from East Broadway onto southbound Monona Drive (as long as possible).
  - Construct an approximately 150 foot (as long as possible without interfering with the Pier 37 entrance/exit) right turn only lane for northbound Monona Drive onto eastbound East Broadway.
  - Consider construction of right turn only lane for southbound Monona Drive onto westbound East Broadway (as long as possible without interfering with existing driveways).
  - Lengthening of northbound, southbound and eastbound left turn lanes to 300 feet would be desired, but would have to be weighed against needs at adjacent intersections.

Whitehorse Development

- Monitor this location as traffic volumes increase to determine the need for traffic signals or a roundabout

- **Copps Avenue**
  - If the USH 51 and East Broadway intersection is reconstructed with limited access to and from East Broadway onto USH 51 by 2021, a reevaluation should be done to determine if the right and left turn lanes on East Broadway should be extended further to accommodate the projected increase in turns at Copps Avenue resulting from the new route required to access southbound USH 51 from East Broadway.

Additional Recommendations

- Parking should be prohibited on both sides of East Broadway in the study area and on both sides of Copps Avenue between East Broadway and Femrite Drive.
- If transit service is provided, bus pull outs should be incorporated into the site developments or roadway improvements
- Sidewalks should be built as part of all new development in this corridor and pedestrian signals should be included as part of any traffic signal installation. The current bicycle lanes should be maintained.
- A “No Outlet” sign should be installed on the northbound side of Copps Avenue just north of Femrite Drive to address a resident’s concern.
- As development materializes, speed studies should be conducted to determine if a reduction in speed limit is appropriate.

CHAPTER 2 – PROPOSED AND ANTICIPATED DEVELOPMENT

PART A – DEVELOPMENT DESCRIPTIONS AND SITE LOCATION

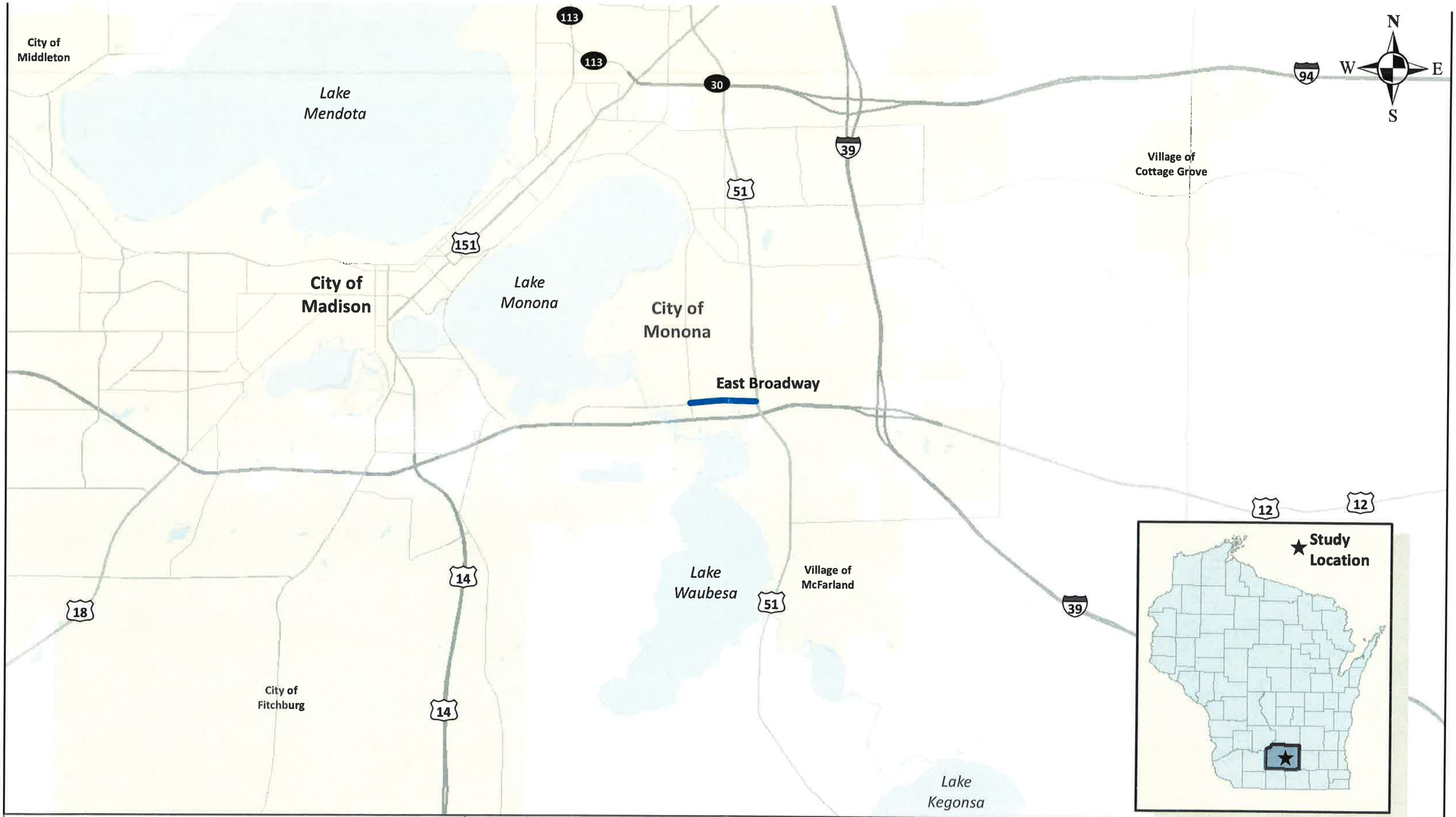
The City of Monona has requested a Traffic Impact Analysis for the East Broadway corridor (CTH BW) from Monona Drive to USH 51 (Stoughton Road). This corridor will be impacted by the construction of two health clinics planned to be completed in the fall of 2011 as well as other anticipated development in Tax Increment District (TID) #6 and Redevelopment Area (RA) #6. The City of Monona is interested in identifying transportation improvements necessary along the East Broadway corridor to provide for the efficient movement of all modes of transportation following full possible future development in this corridor. The study is initially intended to analyze the immediate impact of the two health clinics which are both currently under construction. Meriter Health is currently constructing an approximately 57,000 square foot (SF) clinic on the north side of East Broadway east of Copps Avenue on parcels 11 and 12. A UW Health Family Medicine Clinic (Yahara Clinic) is also under construction on the south side of East Broadway approximately one quarter mile to the west of the Meriter Clinic on parcel 15. The UW Clinic is planned to be smaller than the Meriter Clinic with approximately 40,000 SF. A recently proposed addition to the existing Menards Store at the northwest corner of the intersection of East Broadway and Copps Avenue is also planned to be completed by the fall of 2011.

In addition to the 2011 proposed analyses, the City has requested that all potential future development along the corridor prior to 2021 be included in the study. A site location map of the study area is shown in Exhibit 2-1.

Land Use and Intensity

East Broadway currently has an assortment of commercial uses including retail and office. In addition to the two major definitive medical clinic developments and the Menard's store addition planned to be completed in 2011, there are also several possible developments and "redevelopments" along the East Broadway corridor anticipated to be completed by 2021. The Meriter Clinic currently under construction on Copps Avenue has the potential to expand and double its currently projected size of 57,000 SF (parcels 11-13). In addition, the "Whitehorse" development, on the south side of East Broadway just east of the UW Health Family Medicine Clinic, (parcels 1-4) is anticipated to be developed prior to 2016. A combination of commercial and office is anticipated for this site. There is also some anticipated redevelopment in the area including the possible redevelopment of parcels 16, 19, and 801 East Broadway with office and commercial developments. Because these developments are not proposed, assumptions were made as to the type and size of development which are most likely to be constructed. These assumptions were based on discussions with City of Monona staff and knowledge of the type of development desired for this area as well as typical developments currently existing in the City of Monona.

The TID #6 and Redevelopment Area #6 district site plan boundaries are shown in Exhibit 2-2.



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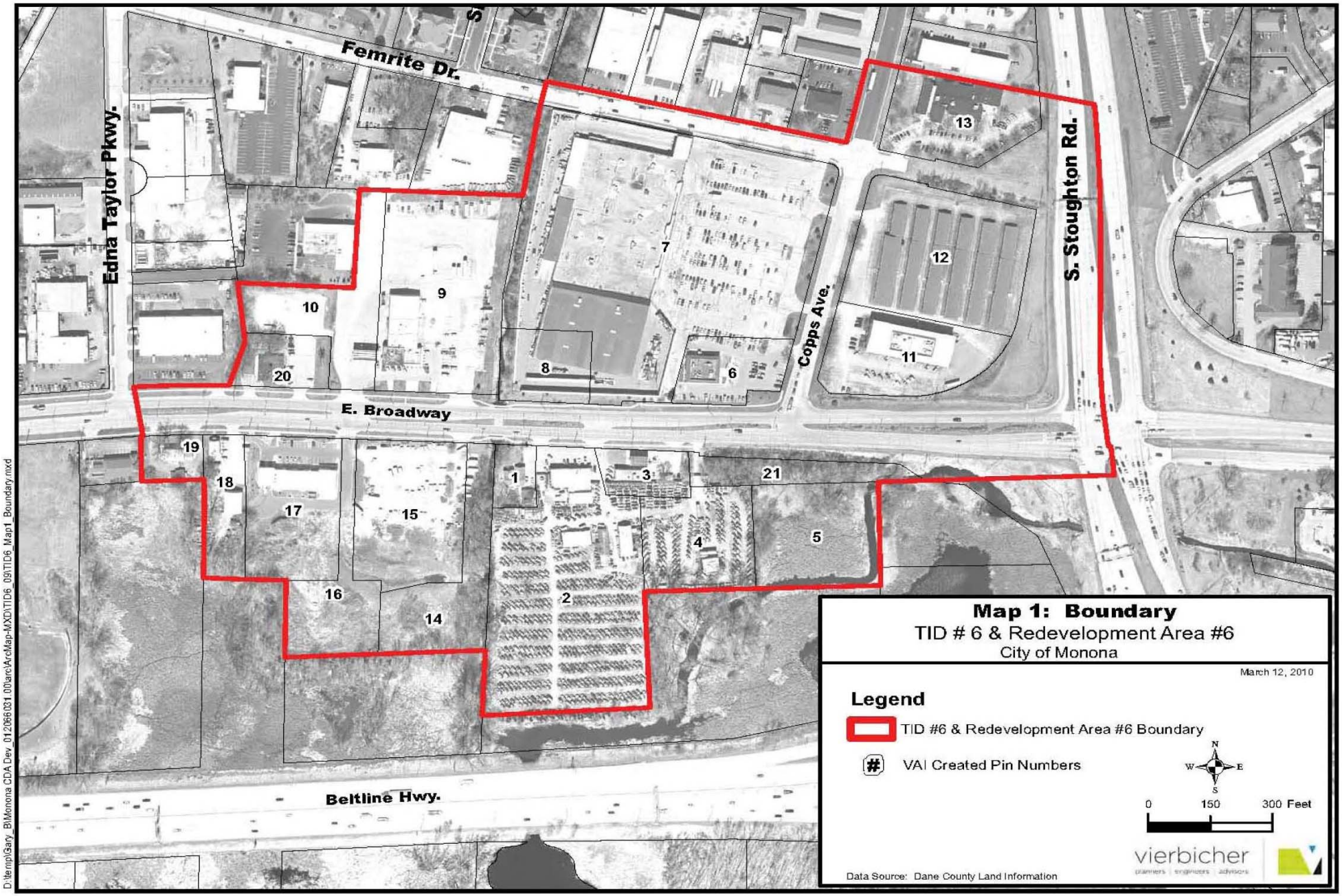
Study Location

Exhibit 2-1



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REDEVELOPMENT AREA

EXHIBIT 2-2

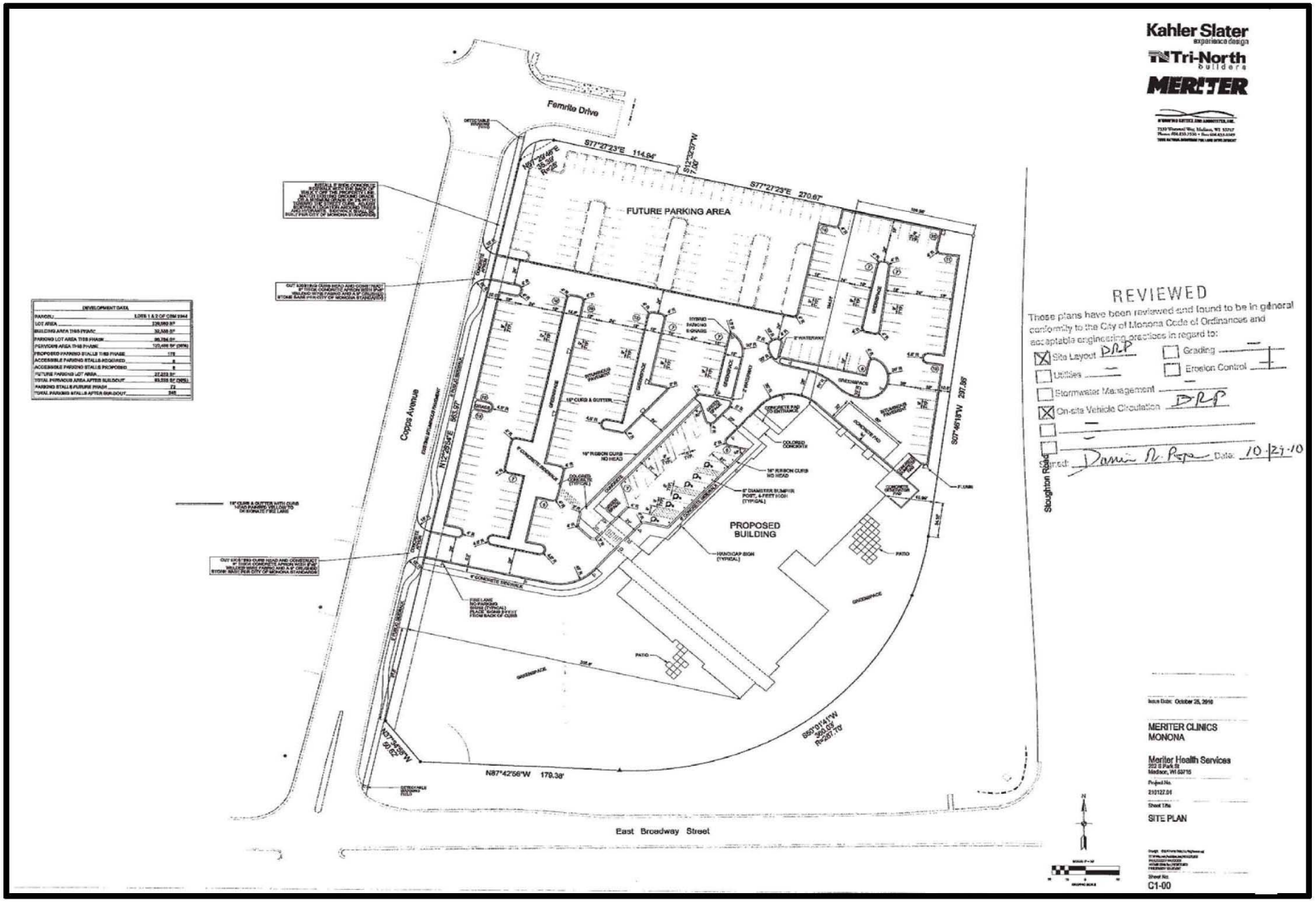
Proposed Site Plans
As shown on the TID and Redevelopment area maps in Exhibit 2-2, the proposed TID district is bordered by USH 51 (Stoughton Road) to the west, the Beltline highway to the south, Edna Taylor Parkway to the west and Femrite Drive to the north. There is also one lot north of Femrite Drive which Meriter Health has tentative plans to expand into and a couple of lots to the west of the TID district which Monona considers likely for redevelopment in the next five years. Exhibit 2-3 shows the proposed site plan for the Meriter Clinic in the northeast corner of the East Broadway and Copps intersection and exhibit 2-4 shows the proposed site plan for the UW Yahara Clinic south of East Broadway.

Development Phasing and Timing
The UW Health Clinic on the south side of East Broadway on parcel 15 and the Meriter Health Clinic on the northwest corner of East Broadway and Copps Avenue (parcels 11 and 12) are both currently under construction and planned to be completed and in partial operation in the fall of 2011. They are anticipated to be in full operation by 2016. The rest of the TID district and area redevelopment are anticipated to be constructed sometime between 2011 and 2016. It is anticipated that Meriter Health may also expand into lot 13 north of Femrite Drive sometime between 2016 and 2021. With the exception of the two clinics, all other development is tentative and assumptions were made as to the nature and size of the developments. These assumptions, in addition to trip generation and trip distribution resulting from these developments, were reviewed by City staff. A summary of the proposed and anticipated development is shown in Exhibit 2-5.

PART B – STUDY AREA
Area of Significant Traffic Impact
The study area for the East Broadway corridor includes the following intersections:

1. East Broadway and Monona Drive
2. East Broadway and Roselawn Avenue\west entrance to Pier 37
3. East Broadway and East Access to Pier 37
4. East Broadway and Edna Taylor Parkway
5. East Broadway and the proposed entrance to the UW Health Yahara Clinic
6. East Broadway and the entrance to the proposed development east of the UW Health Yahara Clinic (Whitehorse)
7. East Broadway and Copps Avenue

Turning movement traffic counts were conducted at Monona Drive, Roselawn Avenue/Pier 37 west entrance, Pier 37 east entrance, Edna Taylor Parkway, and Copps Avenue. Trips were generated for the p.m. peak hour for all of the above intersections, for the a.m. peak hour for the Monona Drive and the Copps Avenue intersections and for the Saturday peak hour for Copps Avenue. These intersections were then analyzed for existing conditions for all peak periods counted. Future conditions were analyzed for all intersections only during the weekday evening peak traffic hour because it was determined that is the heaviest volume traffic period currently and the p.m. peak hour will also have the highest trip generation for new traffic.



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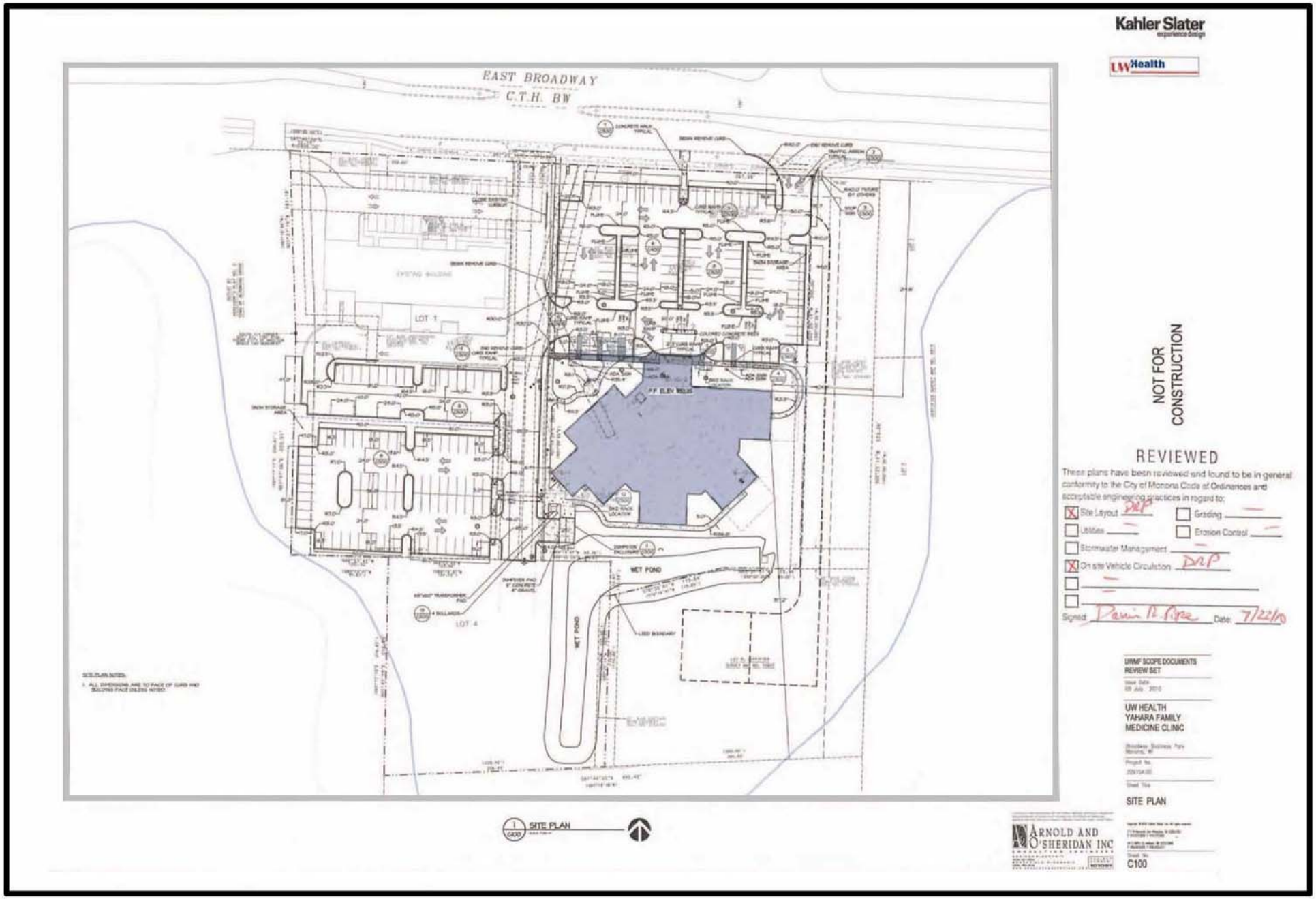
MONONA MERITER CLINIC
SITE PLAN

EXHIBIT 2-3



KL Engineering [A] Better Experience

UW HEALTH YAHARA FAMILY CLINIC SITE PLAN

EXHIBIT 2-4

Exhibit 2-5

City of Monona
East Broadway
Proposed & Assumed Development
TID #6 & Redevelopment Area #6

	Parcel No.	ITE Land Use Code	Land Use	Approximate Size of Parcel	Assumed Building Size	Size suitable for Development determined by	Year
Whitehorse	1-4	750	Office Park	N/A	180,000 SF	Vierbicher estimate 90,000*2 story	2016
Meriter	11-12	720	Medical-Dental Office Building - Meriter	N/A	57,000 SF	Developer	67% in 2011 100% in 2016
Future Meriter	13	720	Medical-Dental Office Building - Meriter	N/A	57,000 SF	Meriter via Vierbicher	2021
Menard's Addition	Menards Parking Lot	862	Home Improvement Store	N/A	33,000 SF	Menards	2011
UW Health	15	720	Medical-Dental Office Building - UW Health	N/A	40,000 SF	Developer	80% in 2011 100% in 2016
Future Office	16	710	General Office	44,000 SF	26,400 SF	30% of parcel 2 story	2016
Currently Fire Place Shop - Future office	19	710	General Office	18,000 SF	9,000 SF	25% of parcel 2 story	2016
Currently	801 E. Broadway Ground Floor	814	Specialty Retail Center	90,000 SF	27,000 SF	30% of parcel	2016
Monona Tire	801 E. Broadway 2nd Floor	710	General Office	90,000 SF	27,000 SF	each story	

PART C – OFF-SITE LAND USE AND DEVELOPMENT

The analysis includes the UW Health and the Meriter Medical Clinics, as well as a possible expansion by the Meriter Clinic; the Menards Store proposed addition, and all other development and redevelopment possibilities anticipated for this corridor prior to 2021. Currently, there are no other specific off-site developments proposed within the study area. Therefore, no additional off-site developments were included in the analyses.

PART D – SITE ACCESSIBILITY

East Broadway is a four lane divided urban roadway in this area. It serves as CTH BW and connects to Femrite Drive on the east end in the City of Madison east of USH 51 (Stoughton Road). The study area runs through the City of Monona from USH 51 (Stoughton Road) to Monona Drive. USH 51 and Monona Drive both have full access interchanges to the Beltline Highway which is an urban freeway approximately 1000 feet to the south serving both local traffic for the urban area and bypass traffic around the Cities of Monona and Madison. West of the study area, East Broadway becomes West Broadway through a commercial section of Monona and Madison and has an additional access to the Beltline Highway at South Towne Drive approximately one and one half mile west of Monona Drive. Access to the proposed and anticipated developments will be provided along East Broadway with access to the Beltline Highway at the above mentioned locations.

CHAPTER 3 – ANALYSIS OF EXISTING CONDITIONS

PART A – ROADWAY AND INTERSECTION CHARACTERISTICS

East Broadway is a four lane divided urban arterial roadway. It provides for local access to a variety of commercial properties along the route as well as serving as a parallel alternative route for the East Beltline Highway. The East Beltline is a limited access urban freeway approximately 1000 feet south of East Broadway. It has full access interchanges with Stoughton Road and Monona Drive at the eastern and western edges of the study area. Traffic on East Broadway is significantly affected by the flow of traffic on the Beltline Highway.

East Broadway currently has median breaks and left turn lanes at all intersections. Madison Metro buses run on East Broadway but do not currently stop. There are marked bicycle lanes in both directions. The posted speed limit is 40 mph.

Monona Drive is a four lane divided urban arterial roadway. It intersects East Broadway at a four legged intersection with left turn lanes in all directions. In addition, there are right turn lanes in both directions on East Broadway. Monona Drive connects East Broadway to the Beltline Highway with a full access approximately 1000 feet to the south and is the main roadway through the City of Monona to the north. It has a posted speed limit of 30 miles per hour and has commercial uses on both sides both north and south of East Broadway. The intersection of East Broadway and Monona Drive is controlled by a fully actuated traffic signal with protected/permitted left turns in all four directions. A full access to Madison's Beltline Highway is approximately 1000 feet south of the Broadway intersection.

Roselawn Avenue is a 32 foot wide urban roadway which connects East Broadway and Femrite Drive approximately 1500 feet to the north. It intersects East Broadway opposite the west entrance/exit to the Pier 37 shopping center approximately 350 feet west of the east access to Pier 37 and 425 feet east of the Monona Drive intersection. It is classified as a local street with no lane markings. It has no posted speed limit but has an implied speed limit of 25 miles per hour because it is a residential street with the exception of some commercial lots just north of East Broadway which have access points on Roselawn Avenue. The west entrance/exit to the Pier 37 shopping center is a divided access with room for right and left turning exiting vehicles to sit side by side. The intersection operates as a four-legged intersection with stop control for Roselawn Avenue and for the Pier 37 entrance/exit. There are left and right turn lanes from the west on East Broadway and a left turn lane from the east on East Broadway.

The east access to Pier 37 is a T intersection access point to the Pier 37 shopping center. There is a two lane exit from Pier 37 and a left turn lane from the east on East Broadway. The intersection of East Broadway and Pier 37 is currently controlled by a fully actuated traffic signal with protected and permitted left turns from East Broadway into Pier 37.

Edna Taylor Parkway is a 32 foot wide urban roadway with no lane markings. It is classified as a local street and has a 25 mile per hour posted speed limit. It is

approximately 1100 feet long and connects East Broadway on its south end to Femrite Drive on its north end. This intersection is stop controlled with a left turn lane from the west on East Broadway approaching Edna Taylor Parkway. There is no intersecting street or access point on the south side of this intersection.

Copps Avenue is an urban roadway that intersects East Broadway at a T intersection. Currently, this intersection is controlled by a stop sign on Copps Avenue. There are two approach lanes on Copps Avenue from the north, a right turn lane and a left turn lane. Copps Avenue intersects Femrite Drive approximately 750 feet north of East Broadway and then continues north with small commercial and warehousing for approximately one block before entering a residential area to the north. Copps Avenue is classified as a collector street between East Broadway and Femrite Drive and as a local street north of Femrite Drive. There is no posted speed limit on Copps Avenue. Three driveways on the west side of Copps Avenue between East Broadway and Femrite Drive serve as the major accesses to a Menards store and as the only access to a Denny's Restaurant. Two proposed driveways on the east side of Copps Avenue will serve as the only access points to the proposed Meriter Health Clinic. There currently is a left turn lane from the west on East Broadway and a right turn lane from the east on East Broadway.

A summary of the existing transportation system is shown in Exhibit 3-1.

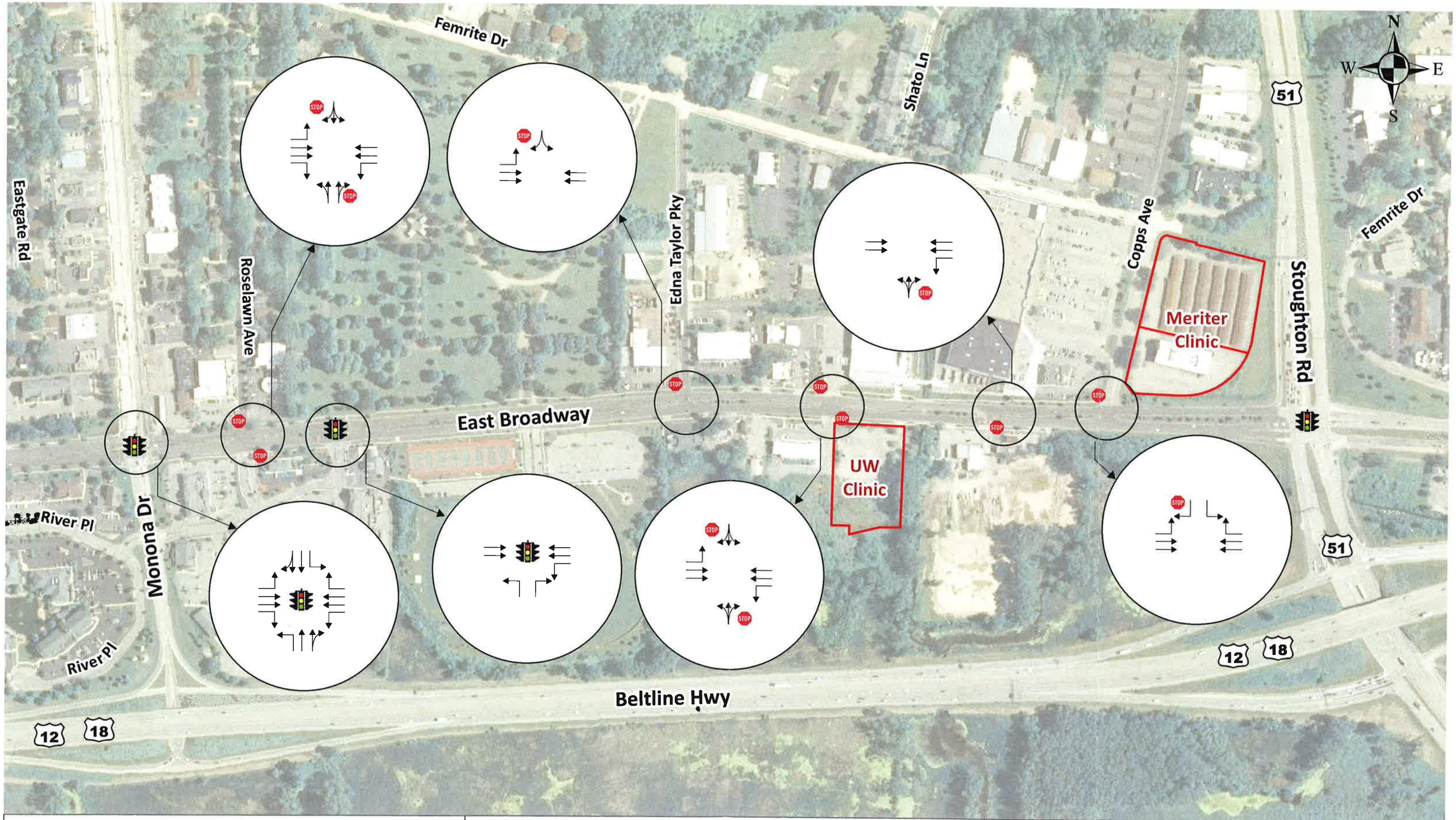
PART B – TRAFFIC VOLUMES

Annual traffic volumes and hourly volumes for East Broadway were obtained from July 2009 and July, 2010 City of Madison traffic counts between Copps Avenue and Roselawn Avenue and a continuous count station maintained by the Wisconsin Department of Transportation (WisDOT) on East Broadway approximately one half mile west of the Monona Drive intersection. In addition, 96 hour hose counts, which included both weekend days, were conducted for KL Engineering in March of 2011. From these counts, the annual average daily traffic (AADT) volume on East Broadway was determined to be approximately 15,600. In February of 2011, KL Engineering completed peak hour turning movement counts from 4-6 p.m. at the Copps Avenue, Edna Taylor Parkway, East access to Pier 37, Roselawn Avenue/west access to Pier 37, and Monona Drive intersections with East Broadway. KL Engineering also completed turning movement counts at the Copps Avenue and Monona Drive intersections with East Broadway from 7:00 – 9:00 a.m., and at the Copps Avenue – East Broadway intersection on a Saturday in March from 11 a.m. to 1 p.m. A 7:15 to 8:15 a.m. count at the Copps Avenue – East Broadway intersection from November of 2010, which was done as part of the ongoing Stoughton Road study, was used to verify and compare count data from February of 2011. In order to complete a traffic signal warrant analysis, additional turning movement counts were conducted at the Copps Avenue – East Broadway intersection in April of 2011. These counts were conducted from 9:00 a.m. – 4:00 p.m. and from 6:00 p.m. to 7:00. This resulted in a combined 12 hour count from 7:00 a.m. to 7:00 p.m.

Based on the above counts and other counts in the area, a 2% annual growth rate factor is considered reasonable for East Broadway and the other roadways in this area. This was agreed upon with the City of Monona. All of the counts referred to above are included in Appendix A.

An evaluation of the hourly volumes and turning movement counts shows the p.m. peak hour on East Broadway is 4:30 to 5:30 p.m. and the a.m. peak hour is 7:15 to 8:15 a.m. The Saturday peak hour at the Copps Avenue intersection was determined to be 11:15 a.m. to 12:15 p.m.

The traffic volumes obtained from the above turning movement counts are referred to as "Year 2011 background traffic." The Year 2011 background traffic volumes used are as shown in Exhibit 3-2.



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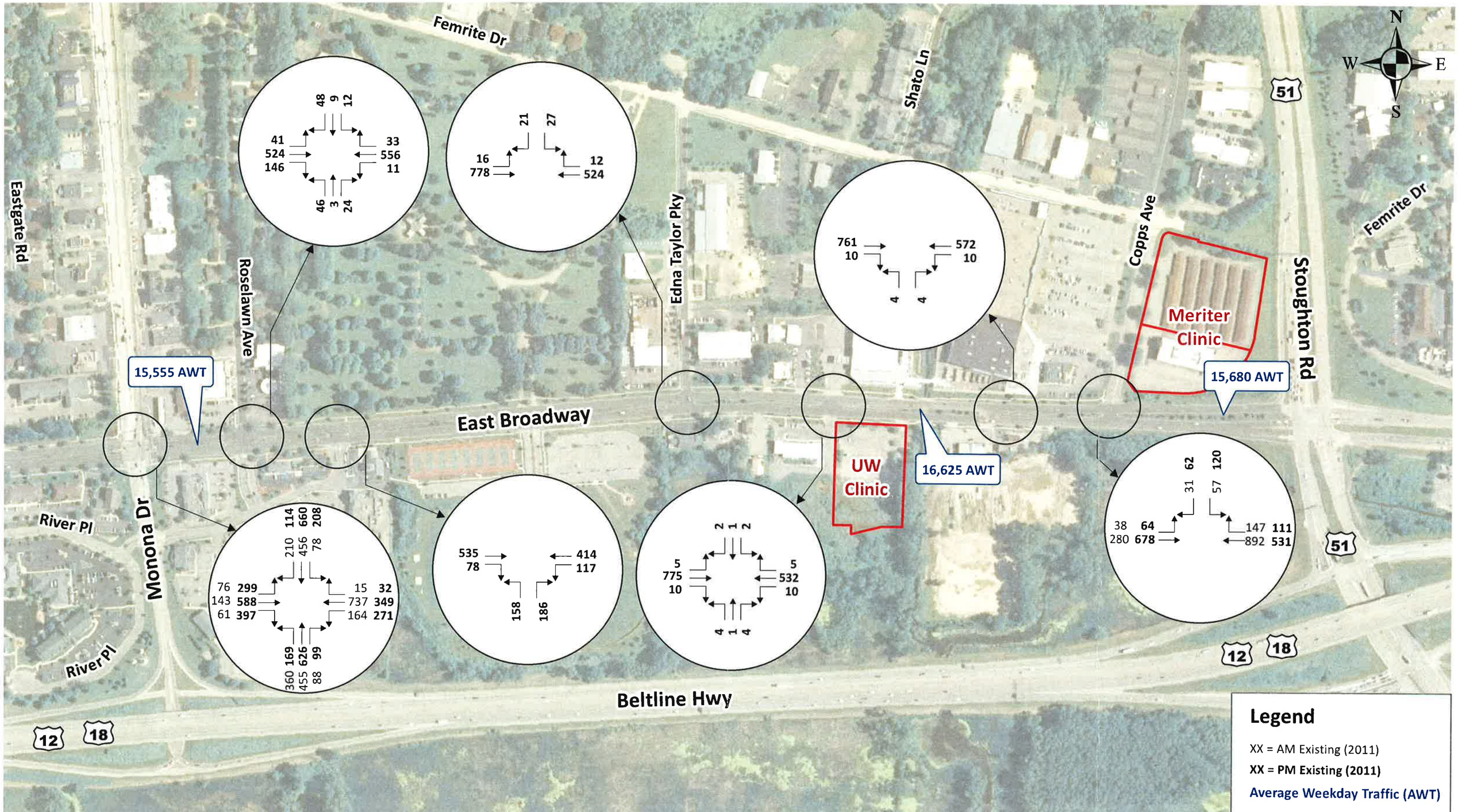
Existing Transportation System

Exhibit 3-1



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2011 Background Traffic

Exhibit 3-2

PART C – CAPACITY/LEVEL OF SERVICE

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, including average delay, level of service and queueing results; was conducted for the aforementioned intersections utilizing the Synchro traffic analysis software suite. Synchro software is based on the methodologies from the Highway Capacity Manual published by the Transportation Research Board. 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.

Year 2011 Background Traffic Operating Conditions

The year 2011 background traffic capacity analyses are based on existing intersection geometrics, traffic control and volumes and are summarized in Exhibits 3-3A (p.m. peak hour), Exhibit 3-3B (a.m. peak hour), and Exhibit 3-3C (Saturday peak hour).

As shown in Exhibit 3-3 A, all approaches at the Roselawn Avenue/Pier 37 west access, the Pier 37 east access, and Edna Taylor Parkway intersections operate at level of service (LOS) C or better during the p.m. peak hour. The Monona Drive intersection currently operates at LOS D with all approaches at LOS D during the p.m. peak hour and at LOS C with the southbound and westbound approaches at LOS D during the a.m. peak hour. Although there is not an overall level of service reported for a stop controlled intersection, the Copps Avenue approach to the Broadway intersection currently operates at LOS C during the a.m., the p.m. and the Saturday peak hour.

Exhibit 3-3A – Capacity/Level of Service Analysis for Existing Transportation System: Background Traffic, Base Year 2011
PM Peak Hour
With Existing Geometrics and Traffic Control

Intersection East Broadway &	Intersection Performance	Eastbound Approach	Westbound Approach	Northbound Approach	Southbound Approach
Monona Drive **Traffic Signals**	**LOS D** **45.2 sec delay**	**LOS D** **40.2 sec delay** **Left** LOS C 31.3 sec delay **Thru** LOS D 53.7 sec delay **Right** LOS C 26.8 sec delay	**LOS D** **39.8 sec delay** **Left** LOS D 36.6 sec delay **Thru** LOS D 43.8 sec delay **Right** LOS C 23.5 sec delay	**LOS D** **51.5 sec delay** **Left** LOS D 40.7 sec delay **Thru/Right** LOS D 51.5 sec delay	**LOS D** **49.8 sec delay** **Left** LOS D 42.7 sec delay **Thru/Right** LOS D 51.7 sec delay
Roselawn Ave. **Stop signs on Roselawn & exit to Pier 37**	**N/A**	**Left** LOS A 8.8 sec delay	**Left** LOS A 8.7 sec delay	**LOS B** **13.9 sec delay** **Left/Thru** LOS C 16.3 sec delay **Thru/Right** LOS A 9.3 sec delay	**LOS B** **12.7 sec delay**
Pier 37 **Traffic Signals**	**LOS B** **11.2 sec delay**	**LOS B** **14.4 sec delay**	**LOS A** **5.9 sec delay** **Left** LOS A 6.5 sec delay **Thru** LOS A 5.7 sec delay	**LOS B** **13.8 sec delay** **Left** LOS C 22.6 sec delay **Right** LOS A 6.3 sec delay	N/A
Edna Taylor Parkway Stop sign on Edna Taylor Pkwy	**N/A**	**Left** LOS A 8.8 sec delay	N/A	N/A	**LOS B** **14.1 sec delay**
Copps Ave. Stop sign on Copps Ave.	**N/A**	**Left** LOS A 9.1 sec delay	N/A	N/A	**LOS C** **16.8 sec delay**

Exhibit 3-3B–Capacity/Level of Service Analysis for Existing Transportation System: Background Traffic, Base Year 2011
AM Peak Hour
With Existing Geometrics and Traffic Control

Intersection East Broadway &	Intersection Performance	Eastbound Approach	Westbound Approach	Northbound Approach	Southbound Approach
Monona Drive **Traffic Signals**	**LOS C** **34.9 sec delay**	**LOS C** **25.0 sec delay** **Left** LOS C 26.8 sec delay **Thru** LOS C 30.9 sec delay **Right** LOS A 9.0 sec delay	**LOS D** **38.1 sec delay** **Left** LOS C 24.5 sec delay **Thru** LOS D 41.5 sec delay **Right** LOS C 20.1 sec delay	**LOS C** **28.8 sec delay** **Left** LOS D 39.6 sec delay **Thru/Right** LOS C 21.6 sec delay	**LOS D** **42.1 sec delay** **Left** LOS B 17.7 sec delay **Thru/Right** LOS D 44.9 sec delay
Copps Ave. Stop sign on Copps Ave.	**N/A**	**Left** LOS B 10.9 sec delay	N/A	N/A	**LOS C** **17.6 sec delay**

Exhibit 3-3C–Capacity/Level of Service Analysis for Existing Transportation System: Background Traffic, Base Year 2011
Saturday Peak Hour
With Existing Geometrics and Traffic Control

Intersection East Broadway &	Intersection Performance	Eastbound Approach	Westbound Approach	Northbound Approach	Southbound Approach
Copps Ave. Stop sign on Copps Ave.	**N/A**	**Left** LOS A 9.2 sec delay	N/A	N/A	**LOS C** **17.4 sec delay**

CHAPTER 4 – PROJECTED TRAFFIC

PART A – BACKGROUND TRAFFIC FORECASTING

Traffic forecast volumes for Year 2016 and 2021 were developed based on the turning movement counts conducted in February of 2011 by KL Engineering using a growth rate of 2%. These forecast volumes represent the Year 2016 and 2021 background traffic volumes.

PART B – SITE TRAFFIC FORECASTING

To address any potential future traffic impacts within the study area, it is necessary to identify the peak hourly volume of traffic generated by the proposed and future assumed developments. The expected traffic volumes generated by the proposed developments are based on the size and type of proposed land uses, and on trip data published in the Institute of Transportation Engineers (ITE) *Trip Generation, 8th Edition, 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 travel movement with either the origin or destination of the trip being from the proposed development.

Trip Generation

Trip generation numbers for the proposed and assumed developments are as shown in Exhibits 4-1 (Fall 2011), 4-2 (2016) and 4-3 (2021). Trips were generated for an average weekday, the a.m. peak hour, p.m. peak hour, and Saturday peak hour.

For the fall of 2011 analyses, the following trip generation categories were utilized for this project: Land Use 720 Medical-Dental Office Building (Meriter and UW clinics which are currently under construction) and Land Use 852 Home Improvement Store (Menards Addition). The projections for the fall of 2011 include approximately 67% operation for the Meriter Clinic on the northeast corner of the intersection of Copps Avenue and East Broadway and approximately 80% operation for the UW Health Clinic on the south side of East Broadway. These percentages are as given by the respective clinics for anticipated completion and occupancy rates.

The 2011 analyses also include some additional trips for the proposed Menards addition which is expected to be completed by the fall of 2011. This addition is expected to be approximately 33,000 square feet. Because this additional square footage is not a new traffic generator but rather an existing traffic generator which will likely have increased traffic due to the addition, a reduction factor of 50% was used in comparison to new development. This resulted in estimated additional trips for the Menards Store of 246 per average weekday.

The two clinics along with the Menards addition, are anticipated to generate a total of approximately 1,514 trips per average weekday or approximately 707 vehicles (one vehicle = two trips; one in and one out). This includes an estimated 182 trips in the a.m. peak hour and an estimated 282 trips in the p.m. peak hour in the fall of 2011.

For the 2016 analyses, in addition to the 2011 uses, the following categories were also used to account for possible future development along the East Broadway corridor: Land Use 750 Office Park, Land Use 710 General Office, and Land Use 814 Specialty Retail Center. These land uses are assumptions based on what type of development the City of Monona foresees in this corridor. Discussions were held with the City Planner, City Administrator, and assistant City Engineer to develop and verify these assumptions. The 2016 proposed and assumed developments are anticipated to generate a total of approximately 7,936 trips per average weekday or approximately 3,968 vehicles. This includes an estimated 676 trips in the a.m. peak hour and an estimated 807 trips in the p.m. peak hour with anticipated development in the corridor by 2016.

In addition to the above, the 2021 analyses includes a possible expansion of the Meriter Health Clinic on the northeast corner of the intersection of Copps Avenue and East Broadway. This addition is anticipated to generate an additional 2059 trips during an average weekday, including 131 trips in the a.m. peak hour and 197 trips in the p.m. peak hour. With these additional trips the total proposed and assumed developments are anticipated to generate a total of approximately 9,995 trips per average weekday or approximately 4,997 vehicles in 2021. This includes an estimated 807 trips in the a.m. peak hour and an estimated 1,004 trips in the p.m. peak hour in 2021.

Mode Split

Currently there are bicycle lanes for both directions of travel on East Broadway and sidewalks on both sides of East Broadway in the developed areas. All new developments will include sidewalks. There currently is a Madison Metro Transit route which runs both directions on East Broadway but does not currently stop along this corridor. Trips generated by the proposed and assumed developments were not adjusted for pedestrian, bicycle or transit; therefore the trip generation rates as stated by ITE, assuming 100% auto usage, were utilized for this study. However, accommodations for facilities for these modes of transportation were considered as part of this study.

Determination of Pass-By and Multi (Linked)-Trip Traffic

With the exception of the reduction in trips for the Menards addition in comparison to a new development, no reductions were taken for pass-by or multi-use trips. The land uses proposed and assumed for this area are not generally considered to be pass-by or multi-use type trips.

Trip Distribution and Assignment

Trip distribution percentages are based on current and future street geometrics, existing traffic patterns and engineering judgment. Exhibits 4-4A (Year 2011 and 2016) and 4-4B (Year 2021) illustrate expected trip distribution percentages for the proposed and assumed developments within the study area for the AM and PM peak hours. These were reviewed with the City of Monona for concurrence. The 2021 trip distribution numbers were assumed based on adjusted traffic patterns based on the reconfiguration and restricted access resulting from the possible reconstruction of the USH 51 – East Broadway intersection as anticipated as part of the USH 51 corridor study prior to 2021.

Traffic generated by the proposed and assumed developments was assigned to the area roadway system based on the directional distributions as shown in Exhibits 4-4A and B. New development trips reflect these directional distributions accordingly and are summarized in Exhibit 4-5A for 2011 and 2016 and 4-5B for 2021. The 2021 trip distribution and adjustments is broken down to account for both new development trips and a projected trip redistribution based on proposed changes at the USH 51 and East Broadway intersection included in the WisDOT ongoing study of the USH 51 corridor. Trips were distributed for the p.m. peak hour.

PART C – TOTAL TRAFFIC

The year 2011 background traffic volumes (Exhibit 3-2) were added to the new development trips to identify Fall 2011 background plus development traffic volumes, shown in Exhibit 4-6.

The year 2016 and 2021 background traffic volumes were added to the new development trips to identify the year 2016 and 2021 total traffic volumes, also shown in Exhibit 4-6.

A summary of the background traffic volumes, annual traffic growth, trip distribution and total traffic for each individual intersection is included in Appendix B.

EXHIBIT 4-1: AVERAGE DAILY TRAFFIC

FALL 2011 ESTIMATED TRIP GENERATION
EAST BROADWAY
CITY OF MONONA

Land Use Code	Land Use	Independent Variable	Ind. Variable at Full Build out 2011	Rate		Per cent Buildout	Total Trips After % Buildout Reduction	Multi-Use Reduction	Total Trips After Multi-Use Reduction	Split Entering/ %	Split Exiting %	No. Entering	No. Exiting
720	Medical-Dental Office Building - Meriter	1,000 SF	57	36.13	2059	67%	1380	0%	1380	50%	50%	690	690
720	Medical-Dental Office Building - UW Clinic	1,000 SF	40	36.13	1445	80%	1156	0%	1156	50%	50%	578	578
862	Home Improvement Store (Menard's Addition)	1,000 SF	33	29.80	983	100%	983	50%	492	50%	50%	246	246
			TOTAL TRIPS						**3028**			**1514**	**1514**

EXHIBIT 4-1: AM & PM PEAK HOUR
FALL 2011 ESTIMATED TRIP GENERATION

EAST BROADWAY
CITY OF MONONA
AM PEAK HOUR

Land Use Code	Land Use	Independent Variable	Ind. Variable at Full Build out 2011	Rate	Number of Trips 2011	Per cent Buildout	Total Trips After % Buildout Reduction	Multi-Use Reduction	Total Trips After Multi-Use Reduction	Split Entering/ %	Split Exiting %	No. Entering	No. Exiting
720	Medical-Dental Office Building - Meriter	1,000 SF	57	2.30	131	67%	88	0%	88	79%	21%	69	18
720	Medical-Dental Office Building - UW Clinic	1,000 SF	40	2.30	92	80%	74	0%	74	79%	21%	58	15
862	Home Improvement Store (Menard's Addition)	1,000 SF	33	1.26	42	100%	42	50%	21	57%	43%	12	9
			TOTALS				**203**		**182**			**139**	**43**

PM PEAK HOUR

Land Use Code	Land Use	Independent Variable	Ind. Variable at Full Build out 2011	Rate	Number of Trips 2011	Per cent Buildout	Total Trips After % Buildout Reduction	Multi-Use Reduction	Total Trips After Multi-Use Reduction	Split Entering/ %	Split Exiting %	No. Entering	No. Exiting
720	Medical-Dental Office Building - Meriter	1,000 SF	57	3.46	197	67%	132	0%	132	27%	73%	36	96
720	Medical-Dental Office Building - UW Clinic	1,000 SF	40	3.46	138	80%	111	0%	111	27%	73%	30	81
862	Home Improvement Store (Menard's Addition)	1,000 SF	33	2.37	78	100%	78	50%	39	48%	52%	19	20
			TOTALS				**321**					**84**	**198**

EXHIBIT 4-1: SATURDAY PEAK HOUR
FALL 2011 ESTIMATED TRIP GENERATION

EAST BROADWAY
CITY OF MONONA

Land Use Code	Land Use	Independent Variable	Ind. Variable at Full Build out 2011	Rate	Number of Trips 2011	Per cent Buildout	Total Trips After % Buildout Reduction	Reduction	Total Trips After Multi-Use Reduction	Split Entering/ %	Split Exiting %	No. Entering	No. Exiting
720	Medical-Dental Office Building - Meriter	1,000 SF	57	3.63	207	67%	139	50%	69	57%	43%	40	30
720	Medical-Dental Office Building - UW Clinic	1,000 SF	40	3.63	145	80%	116	50%	58	57%	43%	33	25
862	Home Improvement Store (Menard's Addition)	1,000 SF	33	4.51	149	100%	149	50%	74	51%	49%	38	36
			TOTALS				**404**		**202**			**111**	**91**

EXHIBIT 4-2: AVERAGE DAILY TRAFFIC

2016 ESTIMATED TRIP GENERATION
EAST BROADWAY
CITY OF MONONA

Parcel No.	Land Use Code	Land Use	Independent Variable	Ind. Variable At Full Build Out 2016	Rate	Number of Trips 2016	Multi-Use Reduction	Total Trips After Multi-Use Reduction	Split Entering/ %	Split Exiting %	No. Entering	No. Exiting
1-4	750	Office Park (Whitehorse Commons)	1,000 SF	180	11.42	2056	0%	2056	50%	50%	1028	1028
11-12	720	Medical-Dental Office Building - Meriter	1,000 SF	57	36.13	2059	0%	2059	50%	50%	1030	1030
15	720	Medical-Dental Office Building - UW Clinic	1,000 SF	40	36.13	1445	0%	1445	50%	50%	723	723
Menards	862	Home Improvement Store (Menard's Addition)	1,000 SF	33	29.80	983	50%	492	50%	50%	246	246
16	710	General Office	1,000 SF	26.4	11.01	291	0%	291	50%	50%	145	145
19	710	General Office	1,000 SF	9	11.01	99	0%	99	50%	50%	50	50
801 E Broadway	814	Specialty Retail Center	1,000 SF	27	44.32	1197	0%	1197	50%	50%	598	598
801 E Broadway	710	General Office	1,000 SF	27	11.01	297	0%	297	50%	50%	149	149
				TOTAL TRIPS				**7936**			**3968**	**3968**

EXHIBIT 4-2: AM PEAK HOUR

2016 ESTIMATED TRIP GENERATION
EAST BROADWAY
CITY OF MONONA

Parcel No.	Land Use Code	Land Use	Independent Variable	Ind. Variable At Full Build Out 2016	Rate	Number of Trips 2016	Multi-Use Reduction	Total Trips After Multi-Use Reduction	Split Entering/ %	Split Exiting %	No. Entering	No. Exiting
1-4	750	Office Park (Whitehorse Commons)	1,000 SF	180	1.71	308	0%	308	89%	11%	274	34
11-12	720	Medical-Dental Office Building - Meriter	1,000 SF	57	2.30	131	0%	131	79%	21%	104	28
15	720	Medical-Dental Office Building - UW Clinic	1,000 SF	40	2.30	92	0%	92	79%	21%	73	19
Menards	862	Home Improvement Store (Menard's Addition)	1,000 SF	33	1.26	42	50%	21	57%	43%	12	9
16	710	General Office	1,000 SF	26.4	1.55	41	0%	41	88%	12%	36	5
19	710	General Office	1,000 SF	9	1.55	14	0%	14	88%	12%	12	2
801 E Broadway	814	Specialty Retail Center*	1,000 SF	27	1.03	28	0%	28	61%	39%	17	11
801 E Broadway	710	General Office	1,000 SF	27	1.55	42	0%	42	88%	12%	37	5
				TOTALS				**676**			**564**	**112**

*Rate is based on AM shopping center

EXHIBIT 4-2: PM PEAK HOUR

2016 ESTIMATED TRIP GENERATION
EAST BROADWAY
CITY OF MONONA

Parcel No.	Land Use Code	Land Use	Independent Variable	Ind. Variable At Full Build Out 2016	Rate	Number of Trips 2016	Reduction	Total Trips After Multi-Use Reduction	Split Entering/ %	Split Exiting %	No. Entering	No. Exiting
1-4	750	Office Park (Whitehorse Commons)	1,000 SF	180	1.48	266	0%	266	14%	86%	37	229
11-12	720	Medical-Dental Office Building - Meriter	1,000 SF	57	3.46	197	0%	197	27%	73%	53	144
15	720	Medical-Dental Office Building - UW Clinic	1,000 SF	40	3.46	138	0%	138	27%	73%	37	101
Menards	862	Home Improvement Store (Menard's Addition)	1,000 SF	33	2.37	78	50%	39	48%	52%	19	20
16	710	General Office	1,000 SF	26.4	1.49	39	0%	39	17%	83%	7	33
19	710	General Office	1,000 SF	9	1.49	13	0%	13	17%	83%	2	11
801 E Broadway	814	Specialty Retail Center	1,000 SF	27	2.71	73	0%	73	44%	56%	32	41
801 E Broadway	710	General Office	1,000 SF	27	1.49	40	0%	40	17%	83%	7	33
				TOTALS				807			195	613

EXHIBIT 4-2: SATURDAY PEAK HOUR

2016 ESTIMATED TRIP GENERATION
EAST BROADWAY
CITY OF MONONA

Parcel No.	Land Use Code	Land Use	Independent Variable	Ind. Variable At Full Build Out 2016	Rate	Number of Trips 2016	Multi-Use Reduction	Total Trips After Multi-Use Reduction	Split Entering/ %	Split Exiting %	No. Entering	No. Exiting
1-4	750	Office Park (Whitehorse Commons)	1,000 SF	180	0.14	25	0%	25	74%	26%	19	7
11-12	720	Medical-Dental Office Building - Meriter	1,000 SF	57	3.63	207	50%	103	57%	43%	59	44
15	720	Medical-Dental Office Building - UW Clinic	1,000 SF	40	3.63	145	50%	73	57%	43%	41	31
Menards	862	Home Improvement Store (Menard's Addition)	1,000 SF	33	4.51	149	50%	74	51%	49%	38	36
16	710	General Office	1,000 SF	26.4	0.41	11	0%	11	54%	46%	6	5
19	710	General Office	1,000 SF	9	0.41	4	0%	4	54%	46%	2	2
801 E Broadway	814	Specialty Retail Center	1,000 SF	27	4.20	113	0%	113	52%	48%	59	54
801 E Broadway	710	General Office	1,000 SF	27	0.41	11	0%	11	54%	46%	6	5
				TOTALS				**415**			**230**	**185**

EXHIBIT 4-3: AVERAGE DAILY TRAFFIC

2021 ESTIMATED TRIP GENERATION
EAST BROADWAY
CITY OF MONONA

Parcel No.	Land Use Code	Land Use	Independent Variable	Ind. Variable At Full Build Out 2021	Rate	Number of Trips 2021	Multi-Use Reduction	Total Trips After Multi-Use Reduction	Split Entering/ %	Split Exiting %	No. Entering	No. Exiting
1-4	750	Office Park	1,000 SF	180	11.42	2056	0%	2056	50%	50%	1028	1028
11-12	720	Medical-Dental Office Building - Meriter	1,000 SF	57	36.13	2059	0%	2059	50%	50%	1030	1030
13	720	Medical-Dental Office Building - Meriter	1,000 SF	57	36.13	2059	0%	2059	50%	50%	1030	1030
15	720	Medical-Dental Office Building - UW Clinic	1,000 SF	40	36.13	1445	0%	1445	50%	50%	723	723
Menard's Lot	862	Home Improvement Store (Menard's Addition)	1,000 SF	33	29.80	983	50%	492	50%	50%	246	246
16	710	General Office	1,000 SF	26.4	11.01	291	0%	291	50%	50%	145	145
19	710	General Office	1,000 SF	9	11.01	99	0%	99	50%	50%	50	50
801 E Broadway	814	Specialty Retail Center	1,000 SF	27	44.32	1197	0%	1197	50%	50%	598	598
801 E Broadway	710	General Office	1,000 SF	27	11.01	297	0%	297	50%	50%	149	149
						0	0%	0				
	TOTAL TRIPS							**9995**			**4997**	**4997**

4/29/2011

EXHIBIT 4-3: AM PEAK HOUR

2021 ESTIMATED TRIP GENERATION
EAST BROADWAY
CITY OF MONONA

Parcel No.	Land Use Code	Land Use	Independent Variable	Ind. Variable At Full Build Out 2021	Rate	Number of Trips 2021	Multi-Use Reduction	Total Trips After Multi-Use Reduction	Split Entering/ %	Split Exiting %	No. Entering	No. Exiting
1-4	750	Office Park	1,000 SF	180	1.71	308	0%	308	89%	11%	274	34
11-12	720	Medical-Dental Office Building - Meriter	1,000 SF	57	2.30	131	0%	131	79%	21%	104	28
13	720	Medical-Dental Office Building - Meriter	1,000 SF	57	2.30	131	0%	131	79%	21%	104	28
15	720	Medical-Dental Office Building - UW Clinic	1,000 SF	40	2.30	92	0%	92	79%	21%	73	19
Menard's Lot	862	Home Improvement Store (Menard's Addition)	1,000 SF	33	1.26	42	50%	21	57%	43%	12	9
16	710	General Office	1,000 SF	26.4	1.55	41	0%	41	88%	12%	36	5
19	710	General Office	1,000 SF	9	1.55	14	0%	14	88%	12%	12	2
801 E Broadway	814	Specialty Retail Center*	1,000 SF	27	1.03	28	0%	28	61%	39%	17	11
801 E Broadway	710	General Office	1,000 SF	27	1.55	42	0%	42	88%	12%	37	5
		TOTALS						**807**			**668**	**140**

*Rate is based on AM shopping center

EXHIBIT 4-3: PM PEAK HOUR

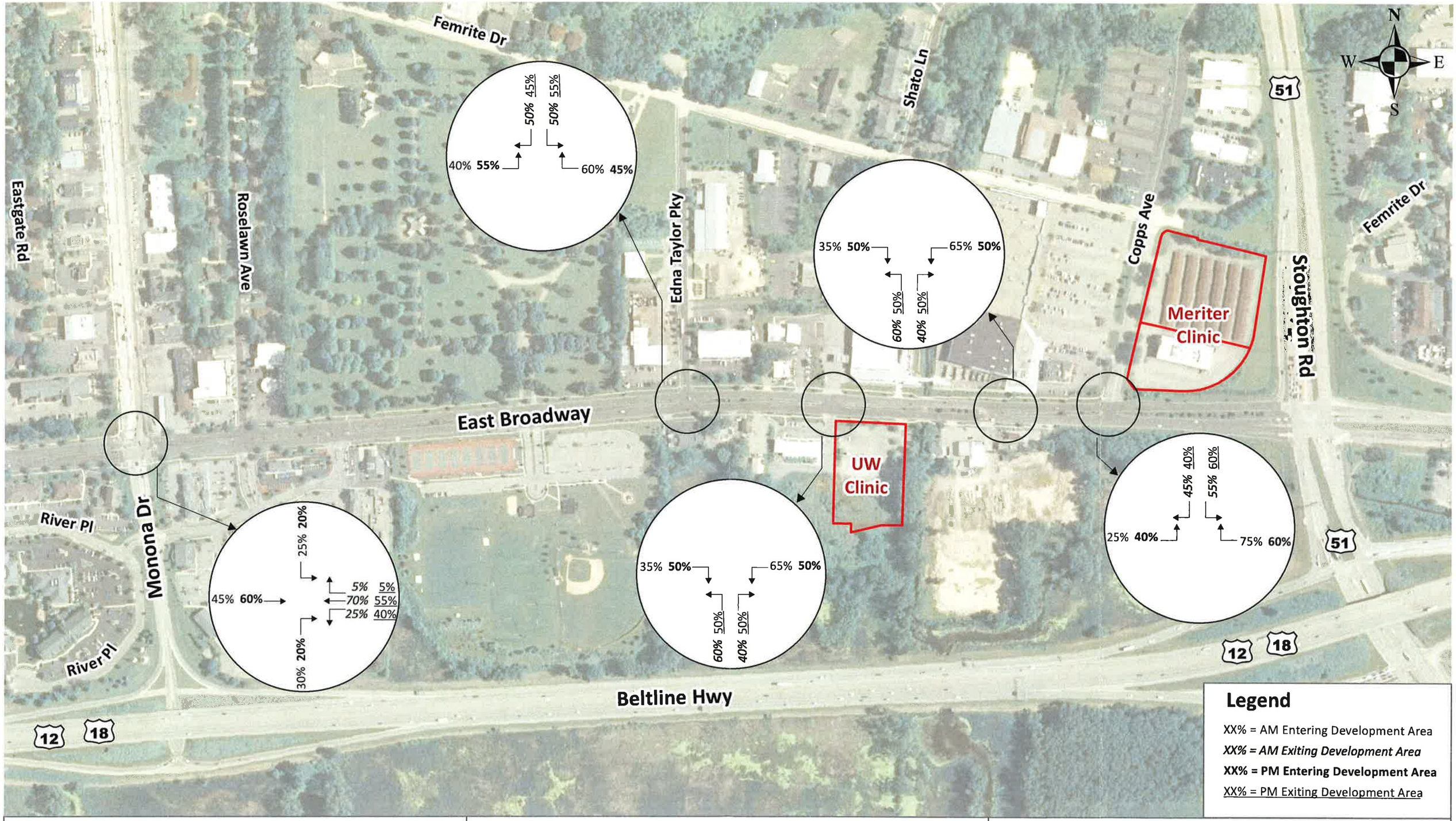
2021 ESTIMATED TRIP GENERATION
EAST BROADWAY
CITY OF MONONA

Parcel No.	Land Use Code	Land Use	Independent Variable	Ind. Variable At Full Build Out 2021	Rate	Number of Trips 2021	Multi-Use Reduction	Total Trips After Multi-Use Reduction	Split Entering/ %	Split Exiting %	No. Entering	No. Exiting
1-4	750	Office Park	1,000 SF	180	1.48	266	0%	266	14%	86%	37	229
11-12	720	Medical-Dental Office Building - Meriter	1,000 SF	57	3.46	197	0%	197	27%	73%	53	144
13	720	Medical-Dental Office Building - Meriter	1,000 SF	57	3.46	197	0%	197	27%	73%	53	144
15	720	Medical-Dental Office Building - UW Clinic	1,000 SF	40	3.46	138	0%	138	27%	73%	37	101
Menard's Lot	862	Home Improvement Store (Menard's Addition)	1,000 SF	33	2.37	78	50%	39	48%	52%	19	20
16	710	General Office	1,000 SF	26.4	1.49	39	0%	39	17%	83%	7	33
19	710	General Office	1,000 SF	9	1.49	13	0%	13	17%	83%	2	11
801 E Broadway	814	Specialty Retail Center	1,000 SF	27	2.71	73	0%	73	44%	56%	32	41
801 E Broadway	710	General Office	1,000 SF	27	1.49	40	0%	40	17%	83%	7	33
	TOTALS							**1004**			**248**	**757**

EXHIBIT 4-3: SATURDAY PEAK HOUR

2021 ESTIMATED TRIP GENERATION
EAST BROADWAY
CITY OF MONONA

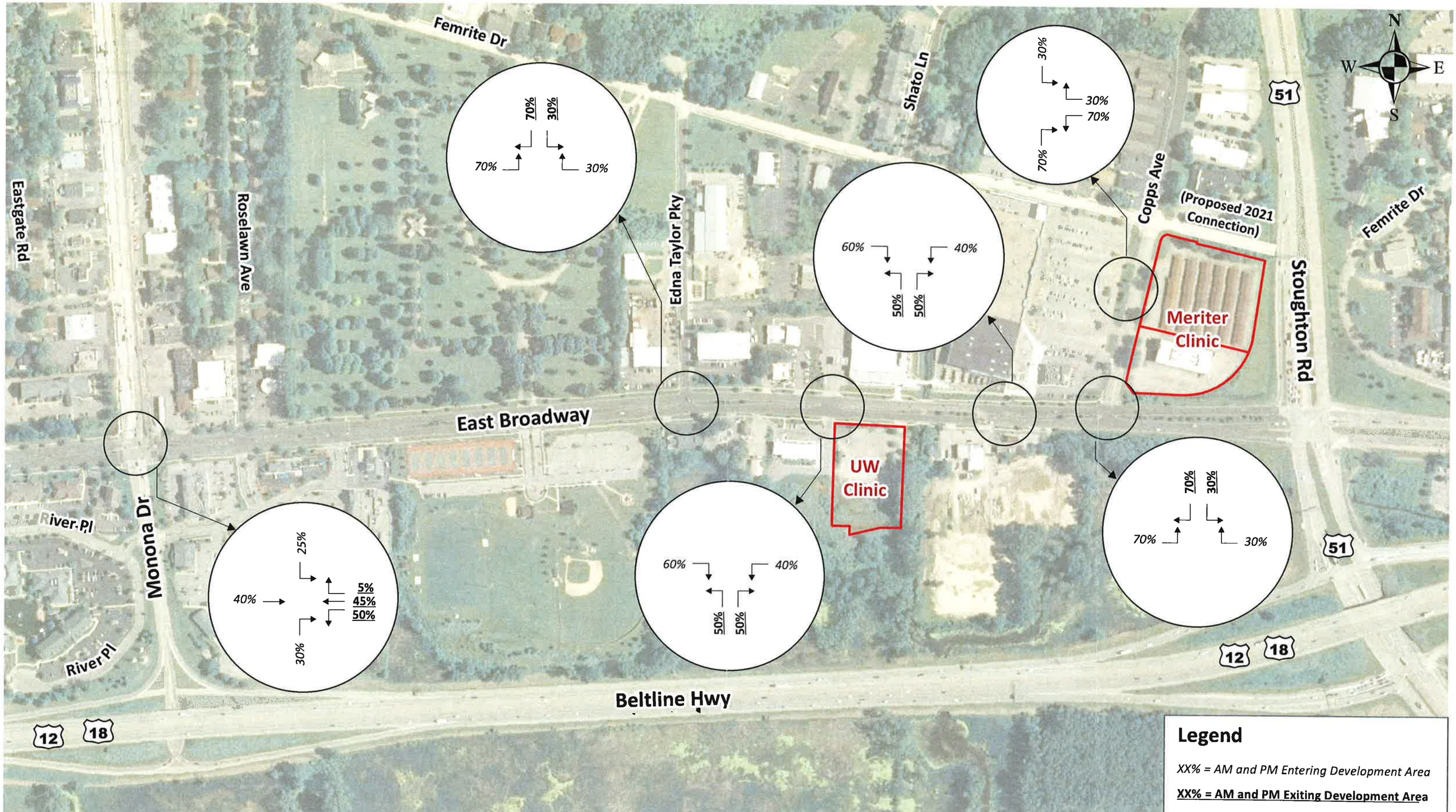
Parcel No.	Land Use Code	Land Use	Independent Variable	Ind. Variable At Full Build Out 2021	Rate	Number of Trips 2021	Reduction	Total Trips After Reduction	Split Entering/ %	Split Exiting %	No. Entering	No. Exiting
1-4	750	Office Park	1,000 SF	180	0.14	25	0%	25	74%	26%	19	7
11-12	720	Medical-Dental Office Building - Meriter	1,000 SF	57	3.63	207	50%	103	57%	43%	59	44
13	720	Medical-Dental Office Building - Meriter	1,000 SF	57	3.63	207	50%	103	57%	43%	59	44
15	720	Medical-Dental Office Building - UW Clinic	1,000 SF	40	3.63	145	50%	73	57%	43%	41	31
Menard's Lot	862	Home Improvement Store (Menard's Addition)	1,000 SF	33	4.51	149	50%	74	51%	49%	38	36
16	710	General Office	1,000 SF	26.4	0.41	11	0%	11	54%	46%	6	5
19	710	General Office	1,000 SF	9	0.41	4	0%	4	54%	46%	2	2
801 E Broadway	814	Specialty Retail Center	1,000 SF	27	4.20	113	0%	113	52%	48%	59	54
801 E Broadway	710	General Office	1,000 SF	27	0.41	11	0%	11	54%	46%	6	5
								0				
	TOTALS							**518**			**289**	**229**



KL Engineering
[A] Better Experience

Trip Distribution
Fall 2011 & 2016

Exhibit 4-4A



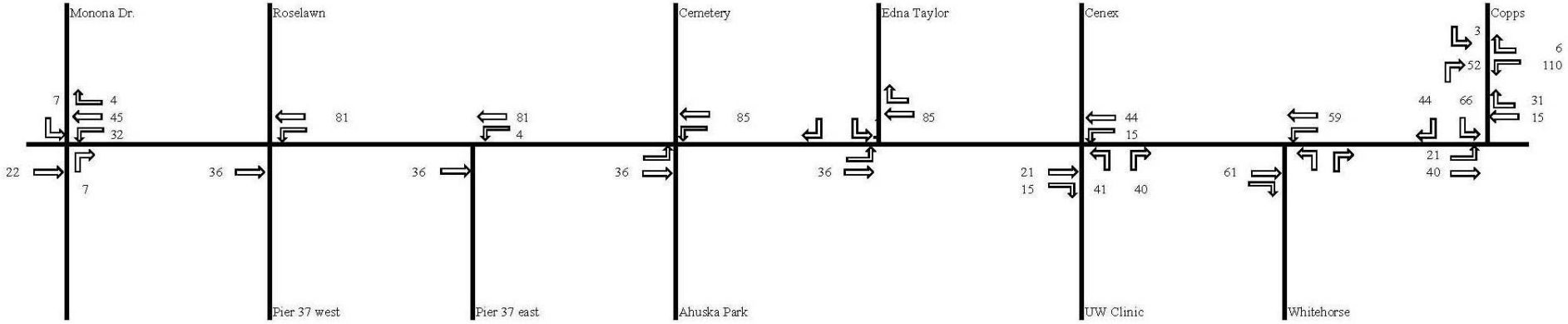
KL Engineering
[A] Better Experience

Trip Distribution
2021

Exhibit 4-4B

EXHIBIT 4-5A

EAST BROADWAY NEW TRIPS FROM DEVELOPMENT
2011 PM PEAK HOUR



2016 PM PEAK HOUR

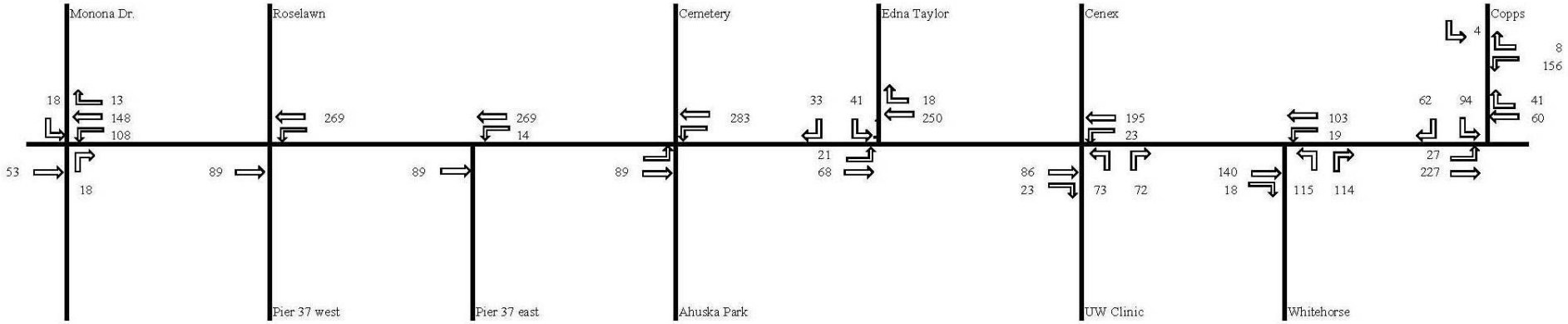
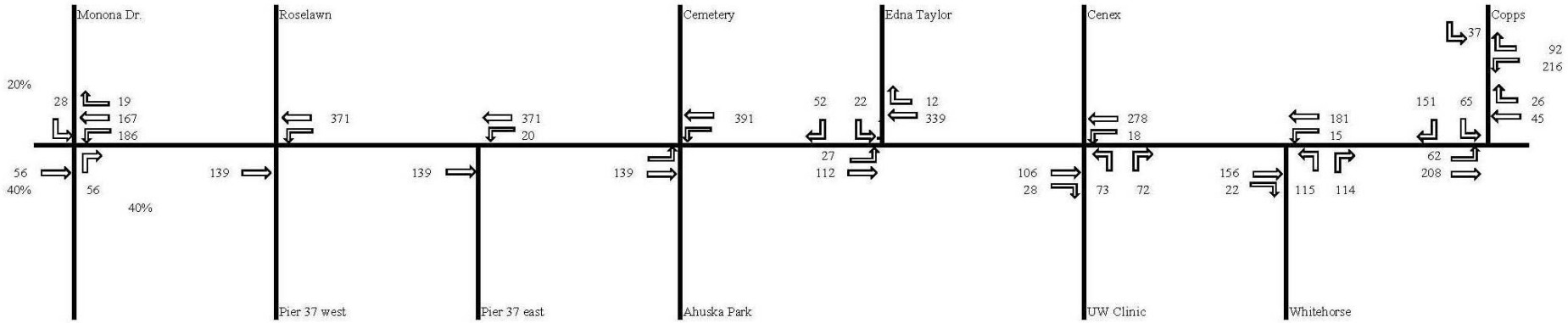
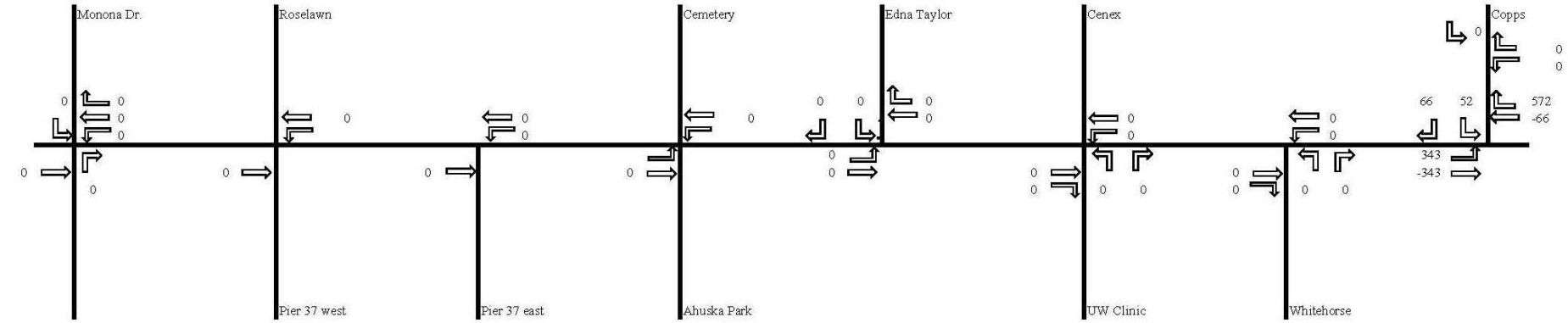


EXHIBIT 4-5B
EAST BROADWAY NEW TRIPS
2021 PM PEAK HOUR

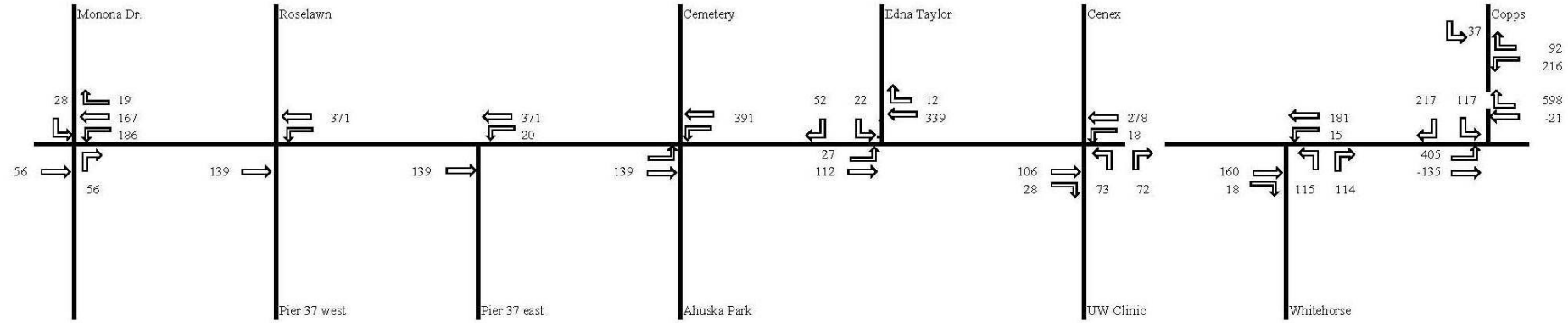
2021 PROJECTED TRIPS FROM NEW DEVELOPMENT

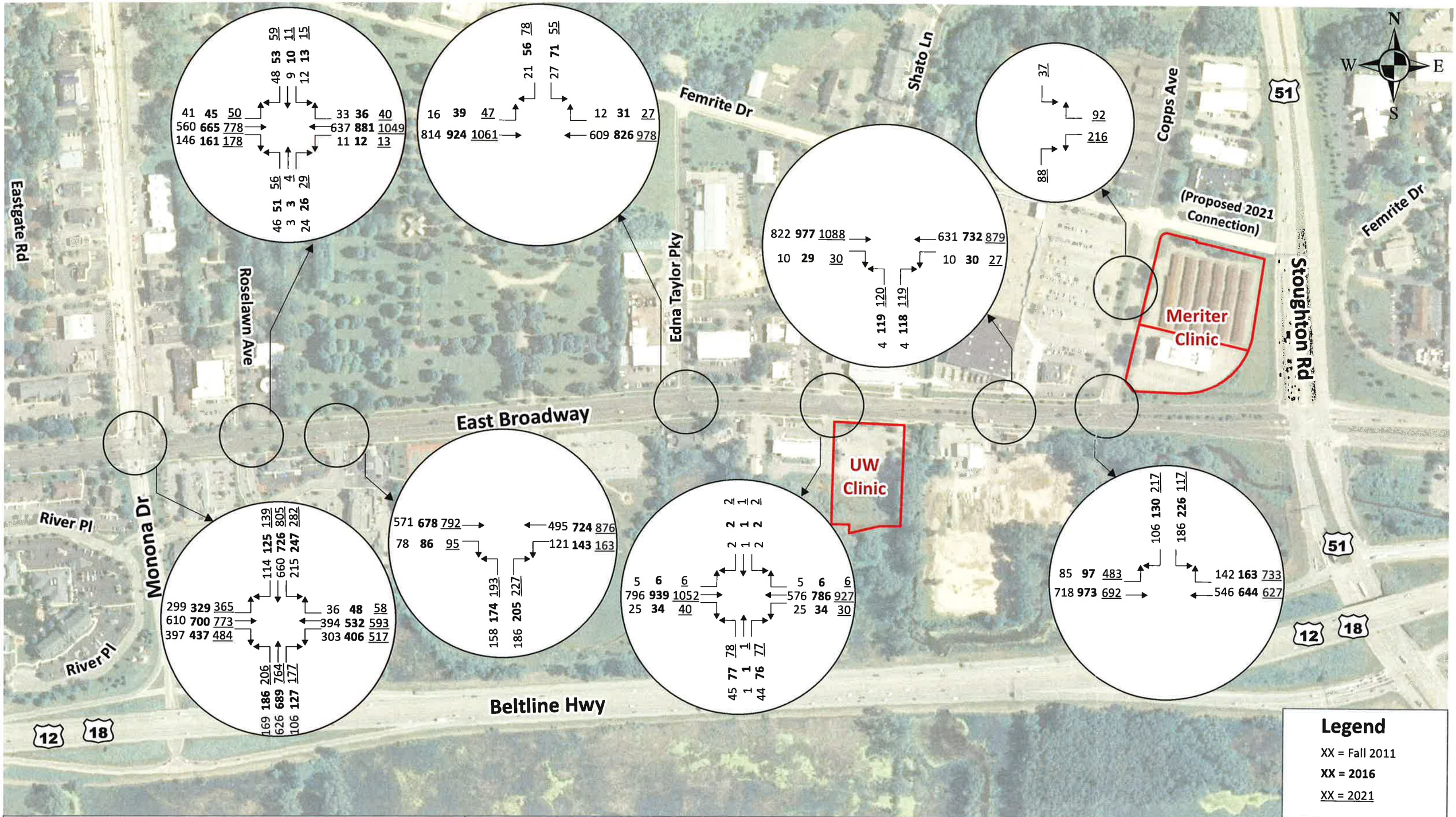


2021 TRAFFIC REDIRECTION FROM 51



2021 TOTAL PM PEAK HOUR TRIP CHANGES





KL Engineering
[A] Better Experience

Projected Total Traffic
PM Peak Fall 2011/2016/2021

Exhibit 4-6

CHAPTER 5 – TRAFFIC AND IMPROVEMENT ANALYSIS

PART A – SITE ACCESS

As shown on the site plan, there are multiple developments along East Broadway included in this study. They will access East Broadway at multiple locations along the corridor.

PART B – CAPACITY/LEVEL OF SERVICE ANALYSIS

All of the capacity analyses are based on the Highway Capacity Manual utilizing Synchro and SimTraffic software.

Base Traffic Plus Development Traffic Operating Conditions

The Fall of 2011 traffic analyses are based on the 2011 counts along with traffic generated by the proposed Meriter Clinic on the northeast corner of the intersection of Copps Avenue and East Broadway, the Menard's addition proposed for the northwest corner of the intersection of Copp's Avenue and East Broadway, and the proposed UW Clinic on the south side of East Broadway to the west. These analyses were completed with existing traffic control and geometrics for all five study intersections during the p.m. peak hour. The p.m. peak hour was chosen for future analyses because it is the critical peak hour currently and will remain the critical peak hour when additional trips are added. This is because in addition to having lower traffic volumes currently in the a.m. peak hour than the p.m. peak hour; trip generation is also lower in the a.m. peak than the p.m. peak hour. Analyses of the study area intersections are summarized below and include analyses of existing conditions as well as for the Fall 2011, 2016, and 2021 traffic including proposed and anticipated development at the study area intersections during the p.m. peak hour. The capacity analysis inputs and outputs for base plus development traffic are included in Appendix D for existing geometrics and traffic control and Appendix E for proposed improvements.

East Broadway and Monona Drive

This intersection is on the west edge of the study area and is controlled by an eight phase traffic signal with two through travel lanes and single left turn lanes on all four approaches. East Broadway also currently has a right turn lane on both approaches. The right lanes on both Monona Drive approaches serve as combined right/through lanes. Currently, this intersection and all four approaches operate at LOS D during the p.m. peak hour. During the a.m. peak hour, this intersection currently operates at LOS C. Both approaches on East Broadway and the southbound approach on Monona Drive operate at LOS D and the northbound approach on Monona Drive operates at LOS C during the a.m. peak hour. Although there are no new developments proposed in the immediate vicinity of this intersection, it will be impacted by vehicles needing to gain access to the developments, specifically from the west via either West Broadway or the Beltline Highway, which has a full interchange on Monona Drive approximately 1000 feet south of this intersection; or from the north on Monona Drive. Therefore, traffic approaching the anticipated developments is likely to increase southbound left turning traffic, eastbound through traffic, and northbound right turning traffic at this

intersection. In addition, traffic leaving the anticipated developments is likely to increase all traffic approaching this intersection from the east.

In the fall of 2011, with the projected traffic increases from the two clinics and the Menards addition, this intersection and all of its approaches are anticipated to continue to operate at LOS D during the p.m. peak hour. In 2016, when base traffic increases and traffic from the remaining developments are added, this intersection and its approaches are anticipated to drop to LOS E during the p.m. peak hour with existing geometrics. Without capacity improvements to this intersection prior to 2021 and with the assumed changes at the USH 51 and Broadway intersection, this intersection is anticipated to operate at LOS F with all approaches at LOS F except for the eastbound approach which is anticipated to operate at LOS E.

To address the capacity and level of service concerns at this intersection in the future, geometric changes will be required. During the peak hours, queues for the westbound left turn lane on East Broadway have been observed extending beyond the left turn bay into the through travel lanes. This results in a reduction in capacity for both westbound left turning vehicles which can't always access the turn lane in order to utilize the left turn arrow and for westbound through vehicles because the queue of vehicles intending to turn left sometimes block the left through lane. This will occur more often and to a greater degree as traffic increases with development. This left turn lane is physically constrained because of the full median break and corresponding eastbound left turn lane at the Roselawn Avenue/Pier 37 west access approximately 400 feet to the east. In order to extend the westbound left turn lane approaching the Monona Drive intersection, the median at Roselawn Avenue would need to at least be partially closed.

Even with the extended left turn lane, the Monona Drive intersection is anticipated to have capacity concerns if all assumed development is constructed by 2021. Therefore, as the need arises, an additional westbound left turn lane should be constructed from East Broadway onto Monona Drive. This could be done without increasing the total number of lanes approaching this intersection by combining the westbound right turn lane with the right through lane. Additionally, prior to 2021, a right turn lane should be constructed for northbound Monona Drive to accommodate increased right turning traffic from the south and the Beltline Highway. . If additional capacity is still needed, it may also be advisable to construct an exclusive southbound right turn lane to create additional capacity on the southbound approach, and therefore for the intersection as a whole.

Capacity/Level of Service Analysis for East Broadway
PM Peak Hour

Intersection East Broadway &	Intersection Performance	Eastbound Approach	Westbound Approach	Northbound Approach	Southbound Approach
Monona Drive **Traffic Signals** **2011 Existing**	**LOS D** **45.2 sec delay**	**LOS D** **40.2 sec delay** **Left** LOS C 31.3 sec delay **Thru** LOS D 53.7 sec delay **Right** LOS C 26.8 sec delay	**LOS D** **39.8 sec delay** **Left** LOS D 36.6 sec delay **Thru** LOS D 43.8 sec delay **Right** LOS C 23.5 sec delay	**LOS D** **51.5 sec delay** **Left** LOS D 40.7 sec delay **Thru/Right** LOS D 51.5 sec delay	**LOS D** **49.8 sec delay** **Left** LOS D 42.7 sec delay **Thru/Right** LOS D 51.7 sec delay
Monona Drive **Traffic Signals** **Fall 2011**	**LOS D** **47.0 sec delay**	**LOS D** **41.4 sec delay** **Left** LOS C 32.4 sec delay **Thru** LOS D 54.5 sec delay **Right** LOS C 28.1 sec delay	**LOS D** **45.6 sec delay** **Left** LOS D 46.3 sec delay **Thru** LOS D 46.9 sec delay **Right** LOS C 25.4 sec delay	**LOS D** **52.6 sec delay** **Left** LOS D 40.3 sec delay **Thru/Right** LOS E 55.5 sec delay	**LOS D** **50.3 sec delay** **Left** LOS D 45.8 sec delay **Thru/Right** LOS D 51.6 sec delay
Monona Drive **Traffic Signals** **2016** **No Geometric Changes**	**LOS E** **56.9 sec delay**	**LOS D** **49.6 sec delay** **Left** LOS D 36.6 sec delay **Thru** LOS E 64.6 sec delay **Right** LOS D 35.4 sec delay	**LOS D** **49.0 sec delay** **Left** LOS E 78.4 sec delay **Thru** LOS C 30.0 sec delay **Right** LOS B 10.4 sec delay	**LOS E** **66.7 sec delay** **Left** LOS D 54.5 sec delay **Thru/Right** LOS E 69.5 sec delay	**LOS E** **64.7 sec delay** **Left** LOS E 77.6 sec delay **Thru/Right** LOS E 61.0 sec delay
Monona Drive **Traffic Signals** **2021** **No Geometric Changes**	**LOS F** **86.6 sec delay**	**LOS E** **76.0 sec delay** **Left** LOS D 52.6 sec delay **Thru** LOS F 89.0 sec delay **Right** LOS E 72.7 sec delay	**LOS F** **100 sec delay** **Left** LOS F 168 sec delay **Thru** LOS D 48.3 sec delay **Right** LOS C 22.7 sec delay	**LOS F** **89.5 sec delay** **Left** LOS F 102 sec delay **Thru/Right** LOS F 86.7 sec delay	**LOS F** **84.5 sec delay** **Left** LOS F 149 sec delay **Thru/Right** LOS E 65.7 sec delay

Intersection East Broadway &	Intersection Performance	Eastbound Approach	Westbound Approach	Northbound Approach	Southbound Approach
Monona Drive **Traffic Signals 2021 With Geometric Changes (2 extended WB LT lanes, NB RT lane)**	**LOS E** **60.3 sec delay**	**LOS D** **55.3 sec delay** **Left** LOS E 78.0 sec delay **Thru** LOS D 53.3 sec delay **Right** LOS D 41.5 sec delay	**LOS E** **71.1 sec delay** **Left** LOS E 78.2 sec delay **Thru** LOS E 65.4 sec delay	**LOS E** **64.0 sec delay** **Left** LOS E 76.3 sec delay **Thru** LOS E 73.8 sec delay **Right** LOS A 7.4 sec delay	**LOS D** **53.0 sec delay** **Left** LOS E 77.2 sec delay **Thru** LOS D 52.6 sec delay **Right** LOS A 6.6 sec delay

East Broadway and Roselawn Avenue/West Access to Pier 37

This intersection is located just over 400 feet east of the Monona Drive intersection and approximately halfway between the Monona Drive intersection and the west access to the Pier 37 shopping center intersection, both of which are signalized intersections. The Roselawn Avenue/access to Pier 37 intersection currently is two-way stop controlled, with Roselawn and the shopping center access stopping for East Broadway. With the two-way stop control, although there is no overall LOS calculated for a stop controlled intersection, all movements at this intersection are currently operating at level of service (LOS) C or better during the p.m. peak hour. Like Monona Drive, there are no new developments proposed in the immediate vicinity of this intersection; however through traffic on East Broadway will be increased at this intersection which will affect both this intersection individually and the interaction between this intersection and the closely spaced adjacent signalized intersections at Monona Drive and the east access to the Pier 37 Shopping Center. Synchro analyses of this intersection with increased background traffic and traffic from the developments result in all movements at the intersection continuing to operate at LOS C or better in 2016 but with the side street approaches dropping to LOS D in 2021. Because of the close spacing and resulting queue backups between this intersection and the signalized intersections of East Broadway and the Monona Drive / Pier 37 east access, this intersection was more closely analyzed with the SimTraffic animation software which more accurately reflects the interaction between signalized and non-signalized intersections. The SimTraffic analyses resulted in a LOS F for the minor street approaches to this intersection by 2016.

As discussed previously, requirements for additional capacity and improved traffic flow at the Monona Drive intersection indicate that the westbound left turn lane should be extended requiring the elimination of the East Broadway left turns lanes at this location. This would require a partial median closure. For safety and efficiency reasons, left turns from East Broadway cannot be allowed without providing for left turn lanes at this intersection.

The partial closing of this median break would require that traffic accessing the Pier 37 shopping center approaching from the east, turn left at the signalized access to the shopping center which is 400 feet further east. Traffic desiring to exit the Pier 37 shopping center to go west would also need to use the east intersection or exit onto Monona Drive. A traffic analysis of the east access Pier 37 intersection estimates that this additional traffic will not significantly affect levels of service at the signalized intersection.

Unfortunately, Roselawn Avenue does not have realistic alternative access points. Specifically, traffic exiting Roselawn does not really have an acceptable alternative to access the eastbound lanes of East Broadway. Therefore, it is recommended that vehicles be allowed to turn left from Roselawn onto East Broadway and that a restricted median opening be constructed to accommodate this movement. Although allowing this movement may result in additional delay to left turning vehicles at Monona Drive, it is the most feasible alternative to ensure vehicle access to eastbound East Broadway from Roselawn Avenue, while providing for safe, efficient movement of traffic on East Broadway.

Traffic attempting to enter Roselawn from the west does have an acceptable route from a traffic management standpoint. They could proceed past the Roselawn Avenue intersection, U-turn at the Pier 37 east access point and come back to Roselawn and turn right. This would require allowing U-turns, currently signed as prohibited, at the signalized Pier 37 intersection. In addition, the construction of a short left turn lane for eastbound traffic at this intersection to provide for safe storage of one U-turning vehicle would be recommended to safely accommodate the vehicles waiting to make this movement. Although this is an acceptable alternative from a traffic management standpoint, the City of Monona has concerns that it is not acceptable access for Roselawn Avenue and the businesses at the Roselawn Avenue – East Broadway intersection. If the City determines that it is necessary to require left turning access onto Roselawn Avenue, the median should be constructed to allow left turns in and out of Roselawn but should still restrict straight across movements and left turns in and out of Pier 37.

The chart below gives the level of service of this intersection if all movements are allowed in the respective years.

Intersection East Broadway &	Intersection Performance	Eastbound Approach	Westbound Approach	Northbound Approach	Southbound Approach
Roselawn Ave./Pier 37 west access **Stop Signs 2011 Existing**	**N/A**	**Left** LOS A 8.8 sec delay	**Left** LOS A 8.7 sec delay	**LOS B** **13.9 sec delay** **Thru/Left** LOS C 16.3 sec delay **Thru/Right** LOS A 9.3 sec delay	**LOS B** **12.7 sec delay**
Roselawn Ave./Pier 37 west access **Stop Signs Fall 2011**	**N/A**	**Left** LOS A 9.1 sec delay	**Left** LOS A 8.8 sec delay	**LOS B** **13.9 sec delay** **Thru/Left** LOS C 16.4 sec delay **Thru/Right** LOS A 9.4 sec delay	**LOS B** **12.9 sec delay**
Roselawn Ave./Pier 37 west access **Stop Signs 2016**	**N/A**	**Left** LOS B 10.0 sec delay	**Left** LOS A 9.0 sec delay	**LOS B** **14.9 sec delay** **Thru/Left** LOS C 17.6 sec delay **Thru/Right** LOS A 9.7 sec delay	**LOS B** **14.4 sec delay**
Roselawn Ave./Pier 37 west access **Stop Signs 2021**	**N/A**	**Left** LOS B 11.2 sec delay	**Left** LOS A 9.6 sec delay	**LOS D*** **32.2 sec delay** **Thru/Left** LOS E 43.2 sec delay **Thru/Right** LOS B 11.6 sec delay	**LOS D*** **28.3 sec delay**

*This Synchro analysis does not consider the backup resulting from the Monona Drive signal. A SimTraffic analysis results in LOS F for northbound and southbound traffic attempting to turn left in 2021.

East Broadway East Access to Pier 37

This T-intersection serves as the main access point for the Pier 37 Shopping Center on the south approach and is currently controlled by a traffic signal with a protected/permitted left turn phase from westbound Broadway to enter the shopping center. There are two through lanes on each approach on East Broadway and a two lane exit from the shopping center. Currently, this intersection and all three approaches operate at LOS B during the p.m. peak hour. With the increase in traffic resulting from the developments, this intersection and all approaches are anticipated to continue to operate at LOS B or better through 2016. Projections in 2021 result in an overall LOS B for this intersection in 2021 with the northbound approach anticipated to operate at LOS D.

This intersection was analyzed in 2016 and 2021 and although not shown in the table below, additional traffic resulting from the partial median closure at the west access to Pier 37 would not affect the level of service at this intersection or any of the approaches. The eastbound U-turn that would be created to accommodate eastbound vehicles attempting to gain access to Roselawn Avenue would be anticipated to operate at LOS B. These analyses are included in Appendix E.

Intersection East Broadway &	Intersection Performance	Eastbound Approach	Westbound Approach	Northbound Approach	Southbound Approach
Pier 37 east access **Traffic Signals 2011 Existing**	**LOS B** **11.2 sec delay**	**LOS B** **14.4 sec delay** **Thru** LOS B 14.4 sec delay	**LOS A** **5.9 sec delay** **Left** LOS A 5.7 sec delay **Thru** LOS A 5.8 sec delay	**LOS B** **13.8 sec delay** **Left** LOS C 22.6 sec delay **Right** LOS A 6.3 sec delay	**N/A**
Pier 37 east access **Traffic Signals Fall 2011**	**LOS B** **11.2 sec delay**	**LOS B** **14.6 sec delay** **Thru** LOS B 14.6 sec delay	**LOS A** **6.0 sec delay** **Left** LOS A 6.6 sec delay **Thru** LOS A 5.8 sec delay	**LOS B** **14.1 sec delay** **Left** LOS C 23.2 sec delay **Right** LOS A 6.4 sec delay	**N/A**
Pier 37 east access **Traffic Signals 2016**	**LOS B** **11.4 sec delay**	**LOS A** **5.0 sec delay** **U-Turn** LOS A 5.1 sec delay **Thru** LOS A 5.0 sec delay	**LOS A** **6.5 sec delay** **Left** LOS A 7.5 sec delay **Thru** LOS A 6.3 sec delay	**Left** LOS E 55.7 sec delay **Right** LOS A 8.1 sec delay	**N/A**

Intersection East Broadway &	Intersection Performance	Eastbound Approach	Westbound Approach	Northbound Approach	Southbound Approach
Pier 37 east access **Traffic Signals 2021**	**LOS B** **11.2 sec delay**	**LOS A** **3.5 sec delay** **U-Turn** LOS A 3.5 sec delay **Thru** LOS A 3.5 sec delay	**LOS A** **7.0 sec delay** **Left** LOS A 8.5 sec delay **Thru** LOS A 6.7 sec delay	**Left** LOS E 60.8 sec delay **Right** LOS A 8.6 sec delay	**N/A**

East Broadway and Edna Taylor Parkway

Currently, this T-intersection is controlled by a stop sign on Edna Taylor Parkway on the north approach. A redevelopment is anticipated on the northwest corner of this intersection that will likely increase traffic turning onto and off of East Broadway from and to Edna Taylor Parkway. Currently the Edna Taylor approach operates at LOS C and it is anticipated to continue to do so in the fall of 2011. In 2016 and 2021, annual growth and the additional trips resulting from development are projected to result in the Edna Taylor approach dropping to LOS D.

Intersection East Broadway &	Intersection Performance	Eastbound Approach	Westbound Approach	Northbound Approach	Southbound Approach
Edna Taylor Parkway **Stop Signs 2011 Existing**	**N/A**	**Left** LOS A 8.8 sec delay	**N/A**	**N/A**	**LOS B** **14.1 sec delay**
Edna Taylor Parkway **Stop Signs Fall 2011**	**N/A**	**Left** LOS A 9.1 sec delay	**N/A**	**N/A**	**LOS C** **15.2 sec delay**
Edna Taylor Parkway **Stop Signs 2016**	**N/A**	**Left** LOS B 10.3 sec delay	**N/A**	**N/A**	**LOS D** **26.7 sec delay**
Edna Taylor Parkway **Stop Signs 2021**	**N/A**	**Left** LOS B 11.3 sec delay	**N/A**	**N/A**	**LOS D** **30.6 sec delay**

East Broadway and UW Health Yahara Clinic Access

This intersection currently exists as a stop controlled intersection with an access to the south serving the Broadway Business Park retail center and an access to the north serving a gas station. There is a full median break on East Broadway with left turn lanes. When completed, the UW Yahara Clinic will share the south access with the existing business park as will a future office building anticipated to be developed just south of the business park. Because of relatively low traffic volumes on the side street approaches, this intersection was not evaluated for existing conditions. In the fall of 2011, with partial occupancy of the UW Yahara Clinic, the northbound approach to this intersection is anticipated to operate at LOS C. With annual traffic growth and full build out of the UW Clinic in 2016, the LOS for the northbound approach (exiting UW Yahara Clinic) is anticipated to drop to LOS D with the northbound left turn at LOS E during the p.m. peak hour. Projected LOS in 2021 is LOS D for the northbound approach with the northbound left turn is anticipated to operate at LOS F.

Intersection East Broadway &	Intersection Performance	Eastbound Approach	Westbound Approach	Northbound Approach	Southbound Approach
UW Clinic **Stop Signs** **2011 Existing**	**N/A**	**Left** LOS A 8.7 sec delay	**Left** LOS A 9.7 sec delay	**LOS C** **15.5 sec delay** **Left** LOS C 19.7 sec delay **Thru/Right** LOS B 11.30 sec delay	**LOS C** **14.9 sec delay**
UW Clinic **Stop Signs** **Fall 2011**	**N/A**	**Left** LOS A 8.8 sec delay	**Left** LOS A 9.9 sec delay	**LOS C** **18.6 sec delay** **Left** LOS C 24.9 sec delay **Thru/Right** LOS B 12.0 sec delay	**LOS C** **16.4 sec delay**
UW Clinic **Stop Signs** **2016**	**N/A**	**Left** LOS A 9.6 sec delay	**Left** LOS B 10.8 sec delay	**LOS D** **28.9 sec delay** **Left** LOS E 43.7 sec delay **Thru/Right** LOS B 13.7 sec delay	**LOS C** **21.2 sec delay**
UW Clinic **Stop Signs** **2021**	**N/A**	**Left** LOS A 9.9 sec delay	**Left** LOS B 11.5 sec delay	**LOS D** **34.3 sec delay** **Left** LOS F 53.4 sec delay **Thru/Right** LOS C 15.0 sec delay	**LOS C** **22.3 sec delay**

East Broadway and Proposed Whitehorse Development

This intersection currently exists as a single driveway exit on the south leg serving a gas station and some small businesses. The "Whitehorse" development has the potential for approximately 180,000 SF of development and will share this driveway access. Because of the low traffic volumes on the existing driveway approach, this intersection was not evaluated for existing or Fall of 2011 traffic. With annual traffic growth and the build out of the assumed development here, the "Whitehorse" approach to this intersection is anticipated to operate at LOS D in the p.m. peak hour in 2016 and 2021. The northbound left turn is projected to operate at LOS F in 2021.

Intersection East Broadway &	Intersection Performance	Eastbound Approach	Westbound Approach	Northbound Approach	Southbound Approach
Whitehorse Development **Stop Signs** **2011 Existing**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Whitehorse Development **Stop Signs** **Fall 2011**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**
Whitehorse Development **Stop Signs** **2016**	**N/A**	**N/A**	**Left** LOS B 11.0 sec delay	**LOS D** **30.0 sec delay** **Left** LOS E 44.6 sec delay **Right** LOS C 15.2 sec delay	**N/A**
Whitehorse Development **Stop Signs** **2021**	**N/A**	**N/A**	**Left** LOS B 11.7 sec delay	**LOS D** **35.0 sec delay** **Left** LOS F 53.2 sec delay **Right** LOS C 16.6 sec delay	**N/A**

East Broadway and Copps Avenue

This intersection is one-way stop controlled with Copps Avenue stopping for East Broadway. The Menards Home Improvement Store and a Denny's Restaurant have their access points onto Copps Avenue as will the new Meriter Monona Health Clinic. This intersection is the primary route for motorists to access these businesses. Concern has been expressed about the difficulties and delays currently experienced by motorists attempting to turn left onto East Broadway from Copps Avenue. This left turn operates at LOS C during the a.m. and p.m. weekday peak hours as well as the Saturday peak hour which was determined to be from 11:15 a.m. - 12:15 p.m. It is anticipated to continue to operate at LOS C in the Fall of 2011 during all three peak hours after the clinic opens. However, when the clinic is in full operation by 2016 and with all the other anticipated development on East Broadway, the southbound Copps Avenue left turn is anticipated to operate at LOS F. This intersection currently meets the warrants for the installation of traffic signals under Warrant 2, Four-Hour Vehicular Volume. It also currently meets the standards for Warrant 1B, Interruption of Continuous Traffic, for seven hours each day. Additional traffic from the clinic currently under construction is anticipated to result in this intersection meeting Warrant 1B for the required eight hours to justify the installation of traffic signals or the construction of a roundabout.

To evaluate the effect of a change in traffic control at this intersection, analyses were completed for the Fall of 2011, 2016 and 2021 with a traffic signal and a roundabout. These analyses show that either a roundabout or a traffic signal would result in an acceptable level of service at this intersection and that neither one would be anticipated to adversely affect the USH 51 intersection with Stoughton Road. Although both would operate acceptably at this location, a traffic signal would have the advantage of creating gaps in westbound traffic for the future Whitehorse Development and the UW Clinics access. However, a roundabout would result in less disruption to East Broadway through traffic and would not have the concern of an additional signal so close to the major intersection at East Broadway and Stoughton Road (USH 51). It would likely require additional right-of-way and an analysis of space requirements and may not be feasible because of the wetlands on the south side of Broadway.

If a traffic signal is installed at this location, the Wisconsin Department of Transportation would require coordination of this signal with the signal at the East Broadway and USH 51 (Stoughton Road) intersection. In addition, the westbound right turn lane on East Broadway should be extended to 200 feet to better accommodate motorists trying to enter this lane when through traffic is stopped for a red light. Consideration should be given to prohibiting parking on both sides of Copps Avenue between East Broadway and Femrite Drive to allow for the efficient operation of traffic near the intersection with East Broadway and the bypassing of vehicles turning left into driveways along Copps Avenue.

If a roundabout is installed, a two-lane roundabout is required. A southbound Copps Avenue to westbound East Broadway right turn bypass lane, although not currently required to adequately accommodate traffic volume, is recommended to make it easier for vehicles, specifically trucks, to navigate this right turn.

If currently considered changes to the East Broadway-USH 51 intersection are constructed, a right turn bypass lane for westbound East Broadway to northbound Copps Avenue is recommended to accommodate the increased right turning traffic. The changes at East Broadway-USH 51 would also result in the southbound right turn bypass lane being recommended in response to increased volume.

Intersection East Broadway &	Intersection Performance	Eastbound Approach	Westbound Approach	Northbound Approach	Southbound Approach
Copps Avenue **Stop Signs** **2011 Existing**	**N/A**	**Left** LOS A 9.1 sec delay	**N/A**	**N/A**	**LOS C** **16.8 sec delay**
Copps Avenue **Stop Sign** **Fall 2011**	**N/A**	**Left** LOS A 9.4 sec delay	**N/A**	**N/A**	**LOS C** **24.0 sec delay**
Copps Avenue **Traffic Signal** **Fall 2011**	**LOS B** **10.6 sec delay**	**LOS A** **5.2 sec delay** **Left** LOS A 5.0 sec delay **Thru** LOS A 5.2 sec delay	**LOS B** **10.6 sec delay** **Thru** LOS B 10.7 sec delay **Right** LOS B 10.2 sec delay	**N/A**	**LOS C** **25.4 sec delay** **Thru** LOS C 26.9 sec delay **Right** LOS C 22.7 sec delay
Copps Avenue **Roundabout** **Fall 2011**	**LOS B** **14.7 sec delay**	**Approach** LOS B 14.4 sec delay	**Approach** LOS B 14.1 sec delay	**N/A**	**Approach** LOS B 14.1 sec delay

Intersection East Broadway &	Intersection Performance	Eastbound Approach	Westbound Approach	Northbound Approach	Southbound Approach
Copps Avenue **Stop Sign** **2016**	**N/A**	**Left** LOS B 10.1 sec delay	**N/A**	**N/A**	**LOS F** **93.7 sec delay**
Copps Avenue **Traffic Signal** **2016**	**LOS B** **10.6 sec delay**	**LOS A** **6.6 sec delay** **Left** LOS A 5.9 sec delay **Thru** LOS A 6.7 sec delay	**LOS A** **9.2 sec delay** **Thru** LOS A 9.3 sec delay **Right** LOS A 9.0 sec delay	**N/A**	**LOS C** **25.4 sec delay** **Thru** LOS C 27.3 sec delay **Right** LOS C 22.2 sec delay
Copps Avenue **Roundabout** **2016**	**LOS B** **15.3 sec delay**	**Approach** LOS B 15.0 sec delay	**Approach** LOS B 14.3 sec delay	**N/A**	**Approach** LOS B 15.2 sec delay

Intersection East Broadway &	Intersection Performance	Eastbound Approach	Westbound Approach	Northbound Approach	Southbound Approach
Copps Avenue **Stop Sign** **2021**	**N/A**	**Left** LOS F 94.3 sec delay	**N/A**	**LOS F** **Maximum** **Delay**	**N/A**
Copps Avenue **Traffic Signal** **2021**	**LOS B** **15.1 sec delay**	**LOS B** **15.8 sec delay** **Left** LOS C 29.1 sec delay **Thru** LOS A 6.6 sec delay	**LOS B** **15.3 sec delay** **Thru** LOS C 20.2 sec delay **Right** LOS B 11.2 sec delay	**N/A**	**LOS B** **11.6 sec delay** **Thru** LOS C 22.7 sec delay **Right** LOS A 5.7 sec delay
Copps Avenue **Roundabout** **Fall 2021**	**LOS B** **16.5 sec delay**	**Approach** LOS B 15.1 sec delay	**Approach** LOS B 17.3 sec delay	**N/A**	**Approach** LOS B 14.9 sec delay

PART C – QUEUING ANALYSIS

Queue lengths were analyzed in conjunction with the intersection capacities. This was done using SimTraffic modeling software because it more accurately models the interaction between intersections than the Synchro software which evaluates individual intersections. Following is a table summarizing the projected queue lengths at all intersections in Fall 2011, 2016, and 2021. The 2011 analysis is with existing traffic control and geometrics and the 2016 and 2021 analyses are for recommended improvements at all intersections except Copps Avenue. At Copps Avenue, queues are given for the existing traffic control and for the alternative options, a traffic signal or roundabout, for all three study years.

The queuing analyses indicate that existing left turn lanes at all of the stop control intersections should be adequate to provide for traffic through 2021. None of the anticipated left turning queues exceed the existing turn lane length at these intersections.

As traffic increases along East Broadway, consideration should be given to increasing some of the left turn lanes at the signalized intersections. At Monona Drive, all four left turn lanes should be lengthened to provide for the most efficient movement of traffic during the p.m. peak hour. Current left turn lanes are all less than 160 feet and analyses show that 300 foot left turn lanes for northbound, southbound and eastbound traffic would result in better operation at this signalized intersection. This would be in addition to the 500 foot westbound left turn lane that would be created with the reconfiguration of the Roselawn Avenue median. It should be noted that lengthening the southbound and eastbound left turn lanes at this intersection would require shortening left turn lanes at adjacent intersections along Monona Drive and West Broadway.

The westbound left turn lane at the east access to Pier 37 should be lengthened to 250 feet prior to 2016, specifically if the median is partially closed at Roselawn. This left turn lane is not physically constrained. Lengthening it would best accommodate the overall increase in traffic along East Broadway as well as the increase in left turning traffic entering Pier 37 at this intersection as a result of the median reconfiguration at Roselawn.

If a traffic signal is installed at the Copps Avenue intersection, the westbound right turn lane should be lengthened to 250 feet to ensure that right turning vehicles are not prohibited from entering the right turn lane by a queue of through vehicles stopped at the red light. This should minimize the possibility that traffic from this intersection queues too close to the USH 51 intersection. Analyses also indicate that the eastbound left turn lane on East Broadway should be lengthened to at least 100 feet from the current 75 feet to accommodate the additional clinic traffic as well as the installation of a traffic signal. A length of 175 feet would be preferred by 2016, but any lengthening of this lane would require the shortening of the existing left turn lane entering any future development on the Whitehorse property. This should be taken into account when the Whitehorse Development is planned.

If the USH 51 and East Broadway intersection is reconstructed with limited access to and from East Broadway onto USH 51 by 2021, a reevaluation should be made at that time. The reevaluation should determine if the right and left turn lanes on East Broadway should be extended further to accommodate the projected increase in turns at Copps Avenue resulting from the new route required to access southbound USH 51 from East Broadway.

PM Peak Hour Queue Length with Planned Development and Proposed Changes including alternatives for Copps Avenue SimTraffic Software Analysis (Rodel Analysis for Copps Avenue Roundabout)

Intersection: East Broadway	Year	Peak Hour	Queue Lengths per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Monona Drive Traffic Signal	2011	PM	287	453	306	240	424	80	212	490	-	254	372	-
	2016	PM	266	444	286	613	906	56	246	869	-	300	540	-
	2021 2 WB LT	PM	275	360	240	821	584	-	228	616	90	298	637	211
Roselawn Avenue Stop signs (with full median)	2011	PM	50	-	18	27	190	-	60	38	-	93	-	-
	2016	PM	42	-	-	20	76	-	67	41	-	79	-	-
	2021	PM	43	445	118	25	402	-	237	-	86	448	-	-
Pier 37 east access Traffic Signal	2011	PM	-	159	-	91	116	-	113	-	71	-	-	-
	2016	PM	31	118	-	154	269	-	168	-	127	-	-	-
	2021	PM	60	73	-	175	270	-	243	-	123	-	-	-
Edna Taylor Parkway Stop sign	2011	PM	25	-	-	-	-	-	-	-	-	65	-	-
	2016	PM	37	-	-	-	-	-	-	-	-	115	-	-
	2021	PM	47	-	-	-	-	-	-	-	-	156	-	-
UW Clinics Stop signs	2011	PM	25	-	-	25	-	-	62	-	57	-	25	-
	2016	PM	25	-	-	31	-	-	74	-	63	-	25	-
	2021	PM	25	-	-	47	-	-	114	-	64	-	25	-
Whitehorse Stop sign	2011	PM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2016	PM	-	-	-	46	-	-	179	-	97	-	-	-
	2021	PM	-	-	-	38	-	-	276	-	161	-	-	-
Copps Avenue Stop Sign	2011	PM	53	-	-	-	-	25	-	-	-	281	-	156
	2016	PM	56	-	-	-	-	25	-	-	-	517	-	195
	2021	PM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Copps Avenue Traffic Signal	2011	PM	66	139	-	-	139	104	-	-	-	180	-	127
	2016	PM	80	169	-	-	131	92	-	-	-	155	-	116
	2021	PM	295	454	-	-	450	215	-	-	-	103	-	76
Copps Avenue Roundabout	2011	PM	50	-	-	50	-	-	-	-	-	50	-	-
	2016	PM	50	-	-	50	-	-	-	-	-	50	-	-
	2021	PM	75	-	-	125	-	-	-	-	-	50	-	-

PART D – PEDESTRIAN, BICYCLE AND MULTI-USE CONSIDERATIONS

There are currently sidewalks on both sides of East Broadway through most of the study area and marked bicycle lanes in both directions on East Broadway.

Madison Metro operates the existing transit system in the Greater Madison area. Currently the City of Monona does not participate in Madison Metro operations. There are two existing bus routes that travel along the East Broadway Corridor from the Dutch Mill Park and Ride Lot to the UW Campus area/Capitol Square, and then on to the West Transfer Point. These are Routes 11 and 12, and they operate during peak hours from 6 am to 9 am and from 3 pm to 7 pm on weekdays. They do not currently make any stops on East Broadway between Stoughton Road and Monona Drive. Madison Metro also operates Route 16, which travels near the East Broadway Corridor, on Monona Drive, and goes west on West Broadway.

The City of Monona operates the Monona Express and the Monona Lift. Monona Express is a contracted commuter service which makes two loops each morning and two loops each afternoon to take riders to the downtown Madison and UW Campus. Monona Lift is a special transportation service for senior citizens or riders with special needs. Monona Express bus routes currently do not operate along East Broadway.

PART E – SPEED CONSIDERATIONS

The speed limit on East Broadway is currently posted at 40 mph. As a result of the urbanization of East Broadway and the planned development with resulting additional traffic and added turning movements, lowering the speed limit could be considered to make it more consistent with speed limits in urbanized areas.

CHAPTER 6 – CONCLUSIONS AND RECOMMENDATIONS

The East Broadway corridor in the City of Monona will be impacted by the opening of two health clinics as well as other anticipated development in TID #6 and RA #6. Proposed development along East Broadway includes the two clinics which are currently under construction, a Meriter Health Clinic on the northeast corner of East Broadway and Copps Avenue and a UW Health Clinic on the south side of East Broadway to the west; an expansion of the existing Menards Home Improvement Store on the northwest corner of the intersection of East Broadway and Copps Avenue, a large anticipated commercial/office park development on the south side of East Broadway east of the UW Clinic, (Whitehorse Development), and several redevelopments on both sides of East Broadway in the vicinity of the Edna Taylor Parkway intersection.

The study area encompasses the East Broadway corridor from USH 51 (Stoughton Road) to Monona Drive. Although the intersection of East Broadway and Stoughton Road was not part of this study, the interaction of this intersection with any changes recommended to the west was considered. East Broadway is a four lane divided urban arterial roadway.

Overall, the existing configuration of the East Broadway corridor is adequate to provide for currently proposed and anticipated development through 2021. Therefore, there are no geometric changes recommended for the corridor as a whole. However, the additional traffic resulting from proposed and anticipated future developments will likely result in unacceptable levels of service and/or unacceptable gaps in traffic for motorists to reasonably enter or cross East Broadway at some intersections.

Following is a summary of recommended improvements to accommodate the safe and efficient movement of traffic in the study area.

East Broadway and Monona Drive
East Broadway and Roselawn Avenue/Pier 37 west access
East Broadway and Pier 37 east access

As traffic increases along this corridor as a result of base traffic growth and development, additional capacity will be required for the Monona Drive intersection. During the peak hours, queues for the westbound left turn lane on East Broadway have been observed extending beyond the left turn bay into the through travel lanes. This results in a reduction in capacity for both westbound left turning vehicles which can't always access the turn lane in order to utilize the left turn arrow and for westbound through vehicles because the queue of vehicles intending to turn left sometimes block the left through lane. This will occur more often and to a greater degree as traffic increases with development. In order to extend the westbound left turn lane approaching the Monona Drive intersection, the median at Roselawn Avenue should be partially closed. The partial closing of this median break would not allow for left turns on or off of East Broadway or out of the Pier 37 shopping center but would accommodate left turns off of Roselawn Avenue onto East Broadway. Left turning traffic in and out of the Pier 37 shopping center would likely use the signalized access to the east. Additionally, eastbound traffic desiring to access Roselawn Avenue would be required

to U-turn at the east access signalized intersection. A traffic analysis of the east access Pier 37 intersection estimates that this additional traffic will not significantly affect levels of service at this location.

Even with the extended left turn lane, the Monona Drive intersection is anticipated to have capacity concerns if all assumed development is constructed by 2021 and WisDOT proceeds with the currently considered changes to the USH 51 intersection. Therefore, as the need arises, an additional westbound left turn lane should be constructed from East Broadway onto Monona Drive. This could be done without increasing the total number of lanes approaching this intersection by combining the westbound right turn lane with the right through lane. Additionally, a right turn lane should be constructed for northbound Monona Drive to accommodate increased right turning traffic from the south and the Beltline Highway. As traffic volumes increase, it may also be advisable to construct an exclusive southbound right turn lane to create additional capacity on the southbound approach, and therefore for the intersection as a whole. Extensions of the northbound, southbound and eastbound left turn lanes should be considered, but they will have to be weighed against the physical constraints that exist with adjacent intersections.

East Broadway and Copps Avenue

The current stop sign control on Copps Avenue at this intersection results in a LOS C. However, when the clinic is in full operation by 2016 and with all the other anticipated development on East Broadway, the southbound Copps Avenue left turn is anticipated to operate at LOS F. This intersection currently meets the warrants for the installation of traffic signals under Warrant 2, Four-Hour Vehicular Volume. It also currently meets the standards for Warrant 1B, Interruption of Continuous Traffic, for seven hours each day. Additional traffic from the clinic currently under construction is anticipated to result in this intersection meeting Warrant 1B for the required eight hours to justify the installation of traffic signals or the construction of a roundabout.

To evaluate the effect of a change in traffic control at this intersection, analyses were completed for the Fall of 2011, 2016 and 2021 with a traffic signal and a two-lane roundabout. These analyses show that either a roundabout or a traffic signal would result in an acceptable level of service at this intersection and that neither one would be anticipated to adversely affect the USH 51 intersection with Stoughton Road. Although both would operate acceptably at this location, a traffic signal would have the advantage of creating gaps in westbound traffic for the future Whitehorse Development and the UW Clinics access. However, a roundabout would result in less disruption to East Broadway through traffic and would not have the concern of an additional signal so close to the major intersection at East Broadway and Stoughton Road (USH 51). A roundabout would likely require additional right-of-way and an analysis of space requirements and may not be feasible because of the wetlands on the south side of Broadway.

If a traffic signal is installed at this location, the westbound right turn lane should be extended to 200 feet and the eastbound left turn lane should be extended to at least 100 feet, and preferably 175 feet. Any left turn lane extension would result in a shorter left turn lane entering the Whitehorse Development and an extension to 175 feet would

result in its elimination. This should be considered before any changes are made and as the Whitehorse development materializes.

In addition to the geometric changes noted above, parking should be prohibited on both sides of Copps Avenue between East Broadway and Femrite Drive to allow for the efficient operation of traffic near the intersection with East Broadway and the bypassing of vehicles turning left into driveways along Copps Avenue.

East Broadway and Edna Taylor Parkway
East Broadway and UW Clinic
East Broadway and Whitehorse Development
All three of these intersections are anticipated to operate at an acceptable level of service following construction of the clinics in 2011. The Synchro analysis results in an anticipated level of service D on all side street approaches during the p.m. peak hour in both 2016 and 2021 with the left turn movements at LOS F at the UW Clinic and Whitehorse Development in 2021. If all development is constructed as assumed, there is not anticipated to be enough gaps in traffic to accommodate the traffic exiting the Whitehorse Development in 2021. Alternatives to alleviate this situation would be either the installation of additional traffic signals as warrants are met or the construction of a system of roundabouts. This choice would be dependent on the control installed on Copps Avenue. If an additional traffic signal is installed, the Edna Taylor Parkway intersection would result in the most uniform spacing and therefore best potential for two-way traffic progression but may not be the best location based on traffic volume. This should be reevaluated when the Whitehorse Development materializes.

Copps Avenue
Parking should be prohibited on both sides of Copps Avenue between East Broadway and Femrite Drive. In addition, a resident concern regarding traffic inadvertently entering the residential area to the north on Copps Avenue following construction of the Meriter Clinic should be addressed by installing a “No Outlet” sign on the northbound side of Copps Avenue just north of Femrite Drive.

Transit
If the City of Monona is to provide services along East Broadway between Stoughton Road and Monona Drive to serve the area businesses, including the two new medical clinics, bus stops should be planned along the corridor. Bus pull outs and shelters could be incorporated into the site developments or roadway improvements. To determine the specific locations for bus stops, planning and scheduling should be coordinated between Madison Metro and the City of Monona, depending on who is providing the service.

Pedestrians and Bicycles
Sidewalks should be built as part of all new development in this corridor and pedestrian signals should be included as part of any traffic signal installation. The current bicycle lanes should be maintained.

Parking
Currently parking is not signed as prohibited in this corridor. Considering the nature of the roadway, parking should be prohibited in the entire study area along East Broadway.

Speed Limit
As development materializes, a reduction in speed limit along East Broadway should be considered to be more consistent with speed limits in developed urban areas. This should only be done after appropriate studies are conducted.

Summary of Recommendations:

2011 Recommendations

- **Monona Drive and Roselawn**
  - Extend the westbound left turn lane from East Broadway onto southbound Monona Drive. This would require restricting access to Roselawn from the west and Pier 37 to and from the east and therefore needs to be weighed against City of Monona access concerns. An alternative would be to construct a modified pork chop island in the median to restrict Pier 37 access but maintain Roselawn access. This could result in a small increase in the length of the westbound Broadway left turn lane but will not result in a significant improvement to operations at the Monona Drive intersection. It will however improve traffic flow between Monona Drive and the signalized Pier 37 access to the east.
- **Pier 37 east access**
  - If access to Roselawn is restricted from the east, the “No U Turn” signs should be removed and a 50 foot left turn lane should be installed for eastbound East Broadway to accommodate U turning traffic at the signalized Pier 37 intersection.
  - In conjunction with access to Pier 37 being restricted at the unsignalized median break, the westbound left turn lane at this location should be extended to 250 feet.
- **Copps Avenue**
  - Traffic signals or the construction of a two-lane roundabout is recommended to accommodate full build-out of the two medical clinics
  - If traffic signals are installed, the westbound right turn lane should be extended to 200 feet and the eastbound left turn lane should be extended to at least 100 feet. A length of 175 feet would be preferred, however it would require the shortening of the existing left turn lane entering any future development on the Whitehorse property.

2021 Recommendations (assuming reconfiguration of the USH 51/Broadway intersection)

- **Monona Drive**
  - Construct a second westbound left turn lane from East Broadway onto southbound Monona Drive (as long as possible).
  - Construct an approximately 150 foot (as long as possible without interfering with the Pier 37 entrance/exit) right turn only lane for northbound Monona Drive onto eastbound East Broadway.
  - Consider construction of right turn only lane for southbound Monona Drive onto westbound East Broadway (as long as possible without interfering with existing driveways).
  - Lengthening of northbound, southbound and eastbound left turn lanes to 300 feet would be desired, but would have to be weighed against needs at adjacent intersections.
- **Whitehorse Development**
  - Monitor this location as traffic volumes increase to determine the need for traffic signals or a roundabout
- **Copps Avenue**
  - If the USH 51 and East Broadway intersection is reconstructed with limited access to and from East Broadway onto USH 51 by 2021, a reevaluation should be done to determine if the right and left turn lanes on East Broadway should be extended further to accommodate the projected increase in turns at Copps Avenue resulting from the new route required to access southbound USH 51 from East Broadway.

Additional Recommendations

- Parking should be prohibited on both sides of East Broadway in the study area and on both sides of Copps Avenue between East Broadway and Femrite Drive.
- If transit service is provided, bus pull outs should be incorporated into the site developments or roadway improvements
- Sidewalks should be built as part of all new development in this corridor and pedestrian signals should be included as part of any traffic signal installation. The current bicycle lanes should be maintained.
- A “No Outlet” sign should be installed on the northbound side of Copps Avenue just north of Femrite Drive to address a resident’s concern.
- As development materializes, speed studies should be conducted to determine if a reduction in speed limit is appropriate.

APPENDIX A
Traffic

Existing Traffic Counts

Monona Dr.
AM

KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53711

East Broadway - Monona Drive
7:00-9:00 AM
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : AM Broadway-Monona
Site Code : 10000709
Start Date : 2/15/2011
Page No : 1

Groups Printed- Cars - Trucks - Bikes

	Monona Drive From North					East Broadway From East					Monona Drive From South					East Broadway 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
07:00 AM	33	87	20	0	140	7	112	36	0	155	23	93	67	1	184	19	33	19	0	71	550
07:15 AM	46	100	16	4	166	3	173	49	0	225	17	91	92	0	200	12	35	17	0	64	655
07:30 AM	69	118	20	0	207	5	219	41	0	265	17	122	77	0	216	17	35	19	0	71	759
07:45 AM	54	145	16	0	215	3	231	42	0	276	29	122	92	0	243	12	36	21	0	69	803
Total	202	450	72	4	728	18	735	168	0	921	86	428	328	1	843	60	139	76	0	275	2767
08:00 AM	41	93	26	0	160	4	114	32	0	150	25	120	99	0	244	20	37	19	0	76	630
08:15 AM	29	104	27	0	160	1	95	36	0	132	30	86	55	0	171	10	37	14	0	61	524
08:30 AM	22	105	22	0	149	5	52	36	0	93	30	91	46	0	167	18	32	13	0	63	472
08:45 AM	27	71	25	0	123	4	65	36	0	105	27	78	46	0	151	13	37	19	0	69	448
Total	119	373	100	0	592	14	326	140	0	480	112	375	246	0	733	61	143	65	0	269	2074
Grand Total	321	823	172	4	1320	32	1061	308	0	1401	198	803	574	1	1576	121	282	141	0	544	4841
Apprch %	24.3	62.3	13	0.3		2.3	75.7	22	0		12.6	51	36.4	0.1		22.2	51.8	25.9	0		
Total %	6.6	17	3.6	0.1	27.3	0.7	21.9	6.4	0	28.9	4.1	16.6	11.9	0	32.6	2.5	5.8	2.9	0	11.2	
Cars	307	812	160	4	1283	27	1032	289	0	1348	190	779	573	1	1543	119	266	130	0	515	4689
% Cars	95.6	98.7	93	100	97.2	84.4	97.3	93.8	0	96.2	96	97	99.8	100	97.9	98.3	94.3	92.2	0	94.7	96.9
Trucks	14	10	12	0	36	5	29	19	0	53	8	24	1	0	33	2	12	11	0	25	147
% Trucks	4.4	1.2	7	0	2.7	15.6	2.7	6.2	0	3.8	4	3	0.2	0	2.1	1.7	4.3	7.8	0	4.6	3
Bikes	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	5
% Bikes	0	0.1	0	0	0.1	0	0	0	0	0	0	0	0	0	0	0	1.4	0	0	0.7	0.1

KL Engineering, Inc.

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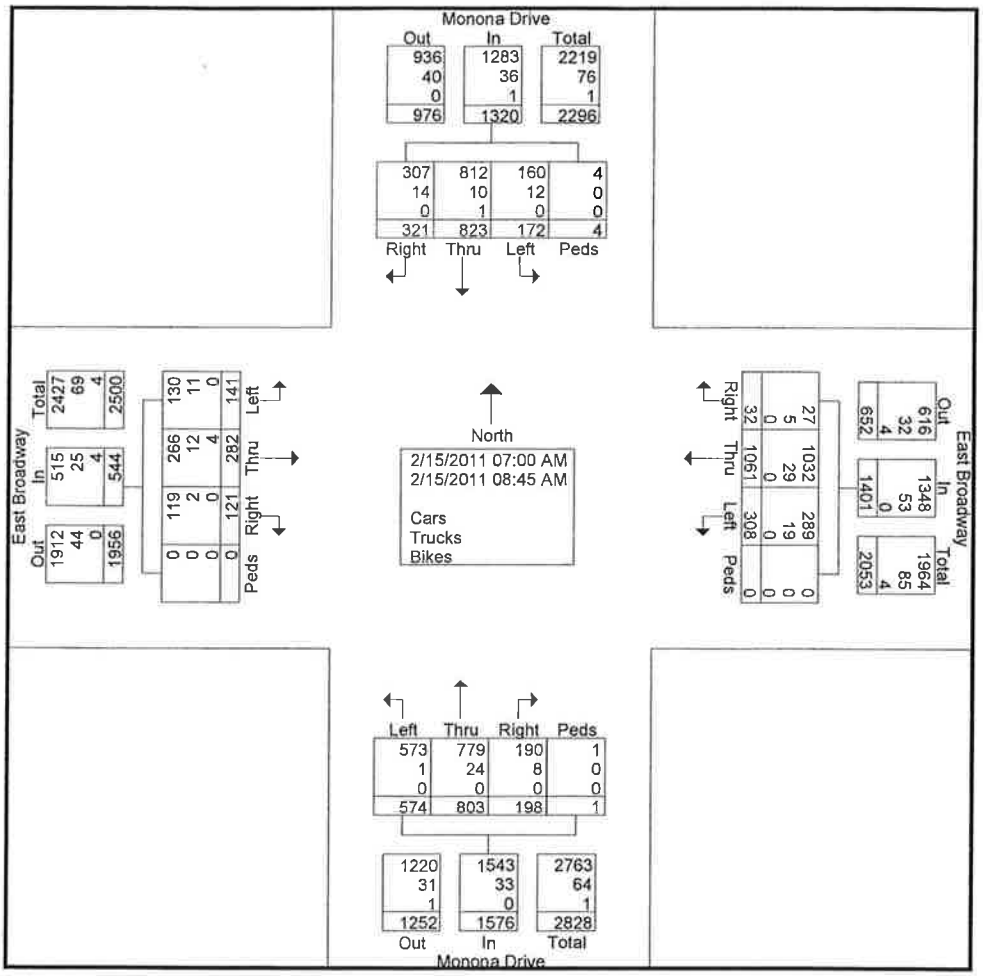

KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53711

East Broadway - Monona Drive
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East Broadway Corridor Study
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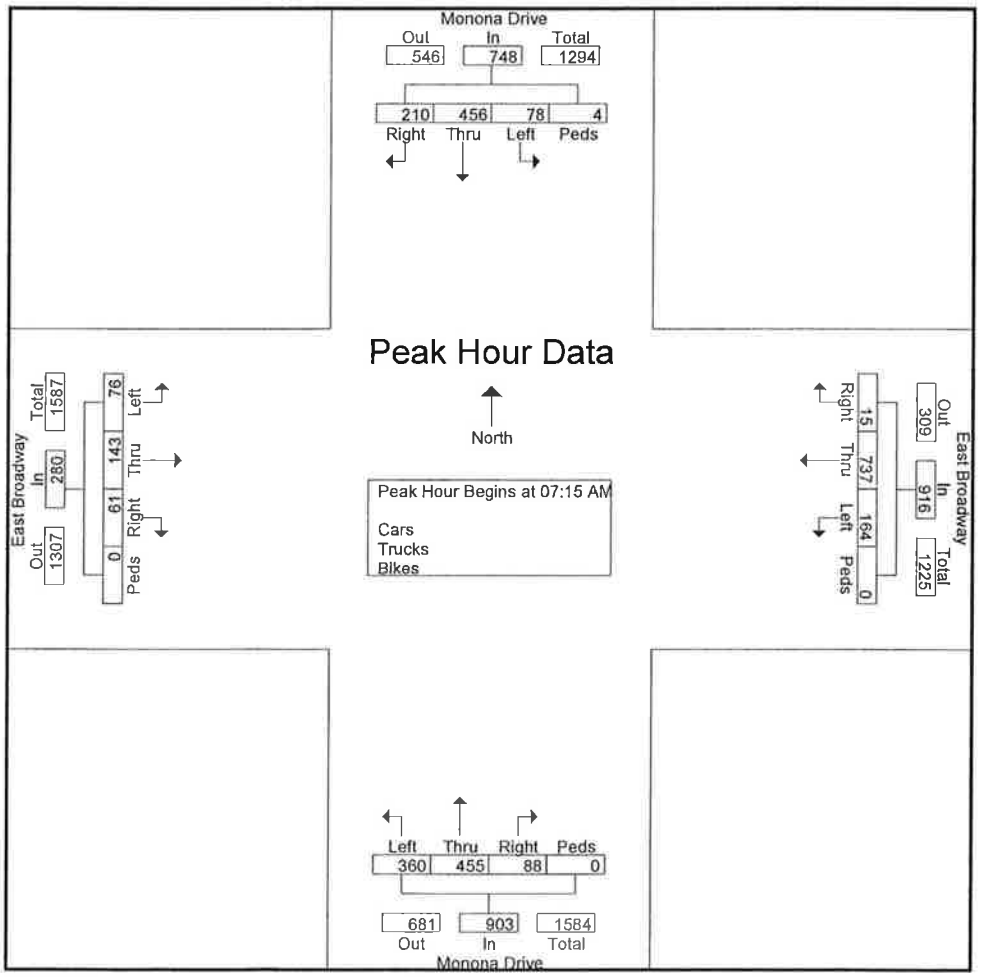
Start Date : 2/15/2011
Page No : 3

	Monona Drive From North					East Broadway From East					Monona Drive From South					East Broadway 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	46	100	16	4	166	3	173	**49**	0	225	17	91	92	0	200	12	35	17	0	64	655
07:30 AM	**69**	118	20	0	207	**5**	219	41	0	265	17	**122**	77	0	216	17	35	19	0	71	759
07:45 AM	54	**145**	16	0	**215**	3	**231**	42	0	**276**	**29**	122	92	0	243	12	36	**21**	0	69	**803**
08:00 AM	41	93	**26**	0	160	4	114	32	0	150	25	120	**99**	0	**244**	**20**	**37**	19	0	**76**	630
Total Volume	210	456	78	4	748	15	737	164	0	916	88	455	360	0	903	61	143	76	0	280	2847
% App. Total	28.1	61	10.4	0.5		1.6	80.5	17.9	0		9.7	50.4	39.9	0		21.8	51.1	27.1	0		
PHF	.761	.786	.750	.250	.870	.750	.798	.837	.000	.830	.759	.932	.909	.000	.925	.763	.966	.905	.000	.921	.886



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5950 Seminole Centre Court
Madison, WI 53711

East Broadway - Monona Drive
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East Broadway Corridor Study
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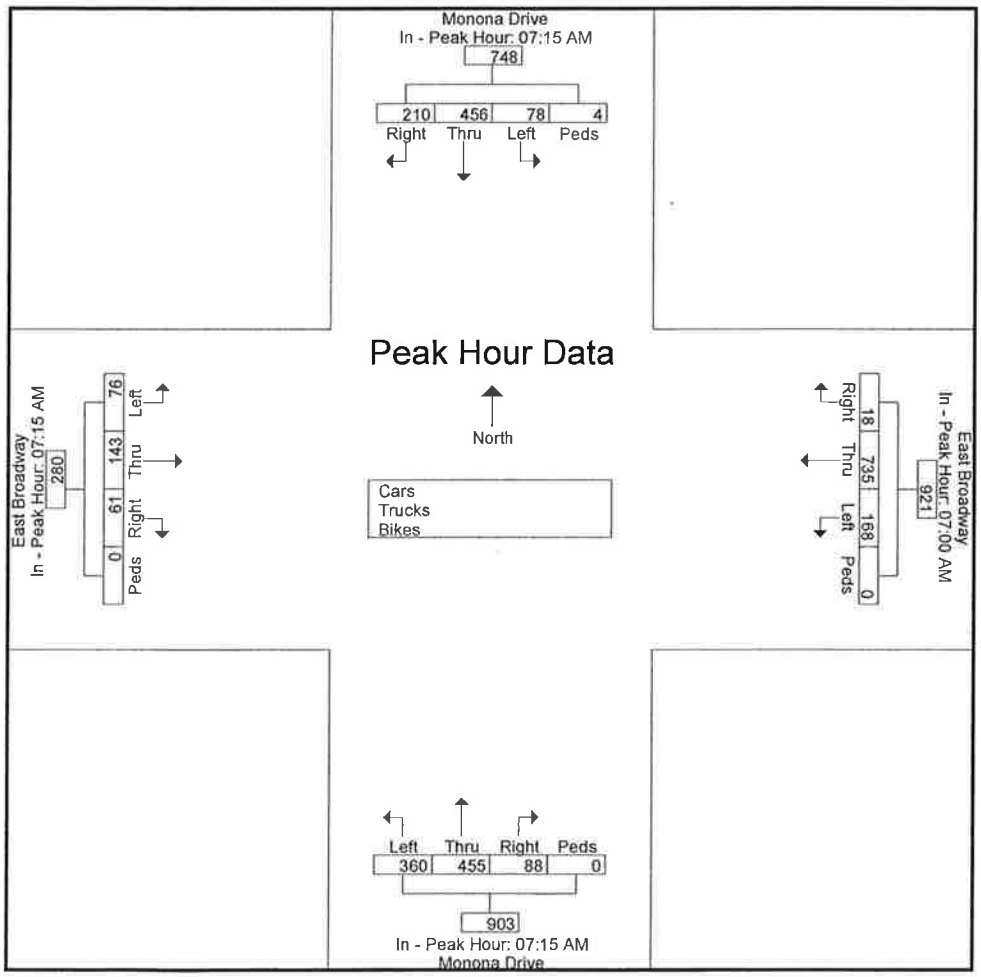
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	07:15 AM					07:00 AM					07:15 AM					07:15 AM					
+0 mins.	46	100	16	4	166	7	112	36	0	155	17	91	92	0	200	12	35	17	0	64	
+15 mins.	**69**	118	20	0	207	3	173	**49**	0	225	17	**122**	77	0	216	17	35	19	0	71	
+30 mins.	54	**145**	16	0	**215**	5	219	41	0	265	**29**	122	92	0	243	12	36	**21**	0	69	
+45 mins.	41	93	**26**	0	160	3	**231**	42	0	**276**	25	120	**99**	0	**244**	**20**	**37**	19	0	**76**	
Total Volume	210	456	78	4	748	18	735	168	0	921	88	455	360	0	903	61	143	76	0	280	
% App. Total	28.1	61	10.4	0.5		2	79.8	18.2	0		9.7	50.4	39.9	0		21.8	51.1	27.1	0		
PHF	.761	.786	.750	.250	.870	.643	.795	.857	.000	.834	.759	.932	.909	.000	.925	.763	.966	.905	.000	.921	



Monona Dr PM

KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53711

East Broadway - Monona Drive
4:00 - 6:00 PM
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : PM Broadway-Monona
Site Code : 10000406
Start Date : 2/15/2011
Page No : 1

Groups Printed- Cars - Trucks - Bikes

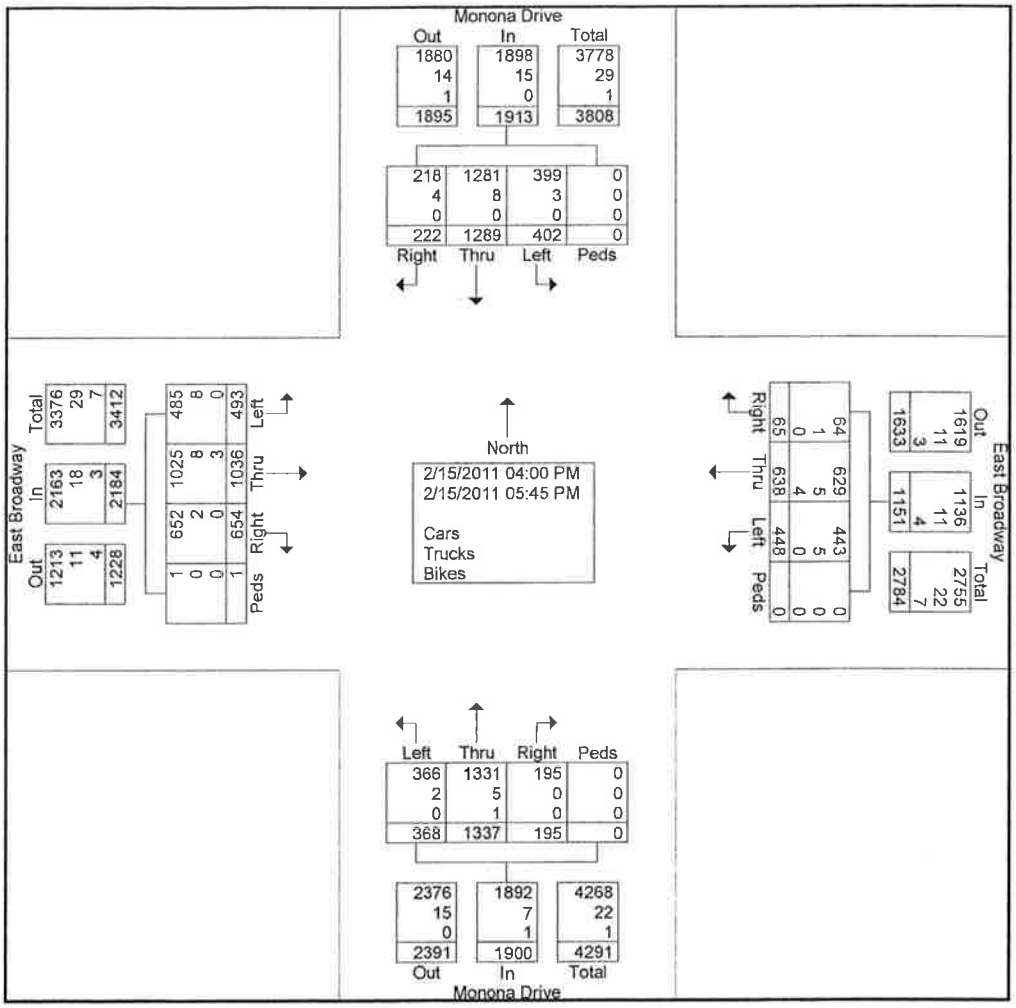
	Monona Drive From North					East Broadway From East					Monona Drive From South					East Broadway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	28	191	60	0	279	3	85	49	0	137	21	185	39	0	245	85	134	64	0	283	944
04:15 PM	26	160	41	0	227	13	74	41	0	128	23	144	71	0	238	85	141	49	0	275	868
04:30 PM	27	140	33	0	200	7	96	61	0	164	24	164	34	0	222	136	157	61	0	354	940
04:45 PM	28	196	48	0	272	11	104	76	0	191	27	159	33	0	219	80	170	83	1	334	1016
Total	109	687	182	0	978	34	359	227	0	620	95	652	177	0	924	386	602	257	1	1246	3768
05:00 PM	29	175	55	0	259	10	81	68	0	159	24	155	43	0	222	106	148	79	0	333	973
05:15 PM	30	149	72	0	251	4	68	66	0	138	24	148	59	0	231	75	113	76	0	264	884
05:30 PM	27	166	50	0	243	9	74	37	0	120	22	181	40	0	243	55	102	45	0	202	808
05:45 PM	27	112	43	0	182	8	56	50	0	114	30	201	49	0	280	32	71	36	0	139	715
Total	113	602	220	0	935	31	279	221	0	531	100	685	191	0	976	268	434	236	0	938	3380
Grand Total	222	1289	402	0	1913	65	638	448	0	1151	195	1337	368	0	1900	654	1036	493	1	2184	7148
Apprch %	11.6	67.4	21	0		5.6	55.4	38.9	0		10.3	70.4	19.4	0		29.9	47.4	22.6	0		
Total %	3.1	18	5.6	0	26.8	0.9	8.9	6.3	0	16.1	2.7	18.7	5.1	0	26.6	9.1	14.5	6.9	0	30.6	
Cars	218	1281	399	0	1898	64	629	443	0	1136	195	1331	366	0	1892	652	1025	485	1	2163	7089
% Cars	98.2	99.4	99.3	0	99.2	98.5	98.6	98.9	0	98.7	100	99.6	99.5	0	99.6	99.7	98.9	98.4	100	99	99.2
Trucks	4	8	3	0	15	1	5	5	0	11	0	5	2	0	7	2	8	8	0	18	51
% Trucks	1.8	0.6	0.7	0	0.8	1.5	0.8	1.1	0	1	0	0.4	0.5	0	0.4	0.3	0.8	1.6	0	0.8	0.7
Bikes	0	0	0	0	0	0	4	0	0	4	0	1	0	0	1	0	3	0	0	3	8
% Bikes	0	0	0	0	0	0	0.6	0	0	0.3	0	0.1	0	0	0.1	0	0.3	0	0	0.1	0.1

KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53711

East Broadway - Monona Drive
4:00 - 6:00 PM
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : PM Broadway-Monona
Site Code : 10000406
Start Date : 2/15/2011
Page No : 2



KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53711

East Broadway - Monona Drive
4:00 - 6:00 PM
East Broadway Corridor Study
City of Monona, Dane County, WI

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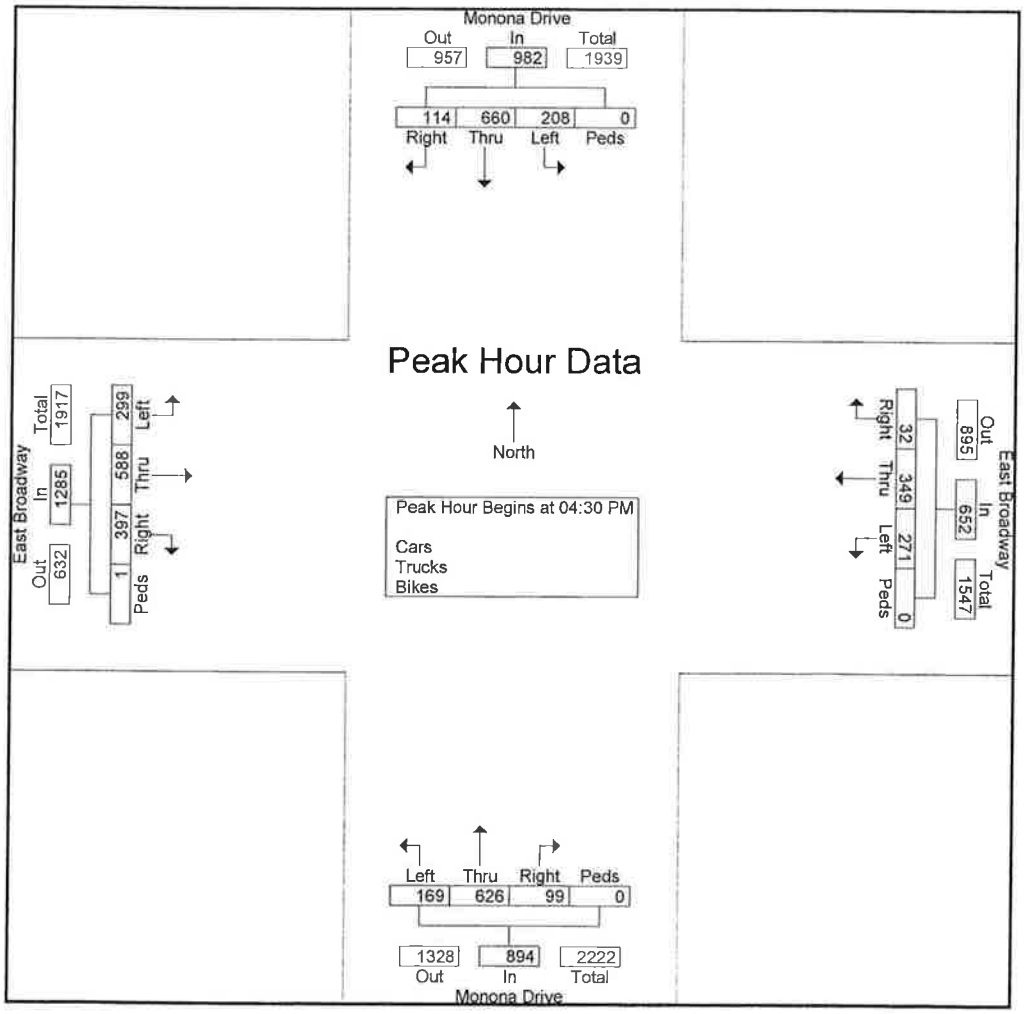
Page No : 3

	Monona Drive From North					East Broadway From East					Monona Drive From South					East Broadway 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	27	140	33	0	200	7	96	61	0	164	24	**164**	34	0	222	**136**	157	61	0	**354**	940
04:45 PM	28	**196**	48	0	**272**	**11**	**104**	**76**	0	**191**	**27**	159	33	0	219	80	**170**	**83**	**1**	334	**1016**
05:00 PM	29	175	55	0	259	10	81	68	0	159	24	155	43	0	222	106	148	79	0	333	973
05:15 PM	**30**	149	**72**	0	251	4	68	66	0	138	24	148	**59**	0	**231**	75	113	76	0	264	884
Total Volume	114	660	208	0	982	32	349	271	0	652	99	626	169	0	894	397	588	299	1	1285	3813
% App. Total	11.6	67.2	21.2	0		4.9	53.5	41.6	0		11.1	70	18.9	0		30.9	45.8	23.3	0.1		
PHF	.950	.842	.722	.000	.903	.727	.839	.891	.000	.853	.917	.954	.716	.000	.968	.730	.865	.901	.250	.907	.938



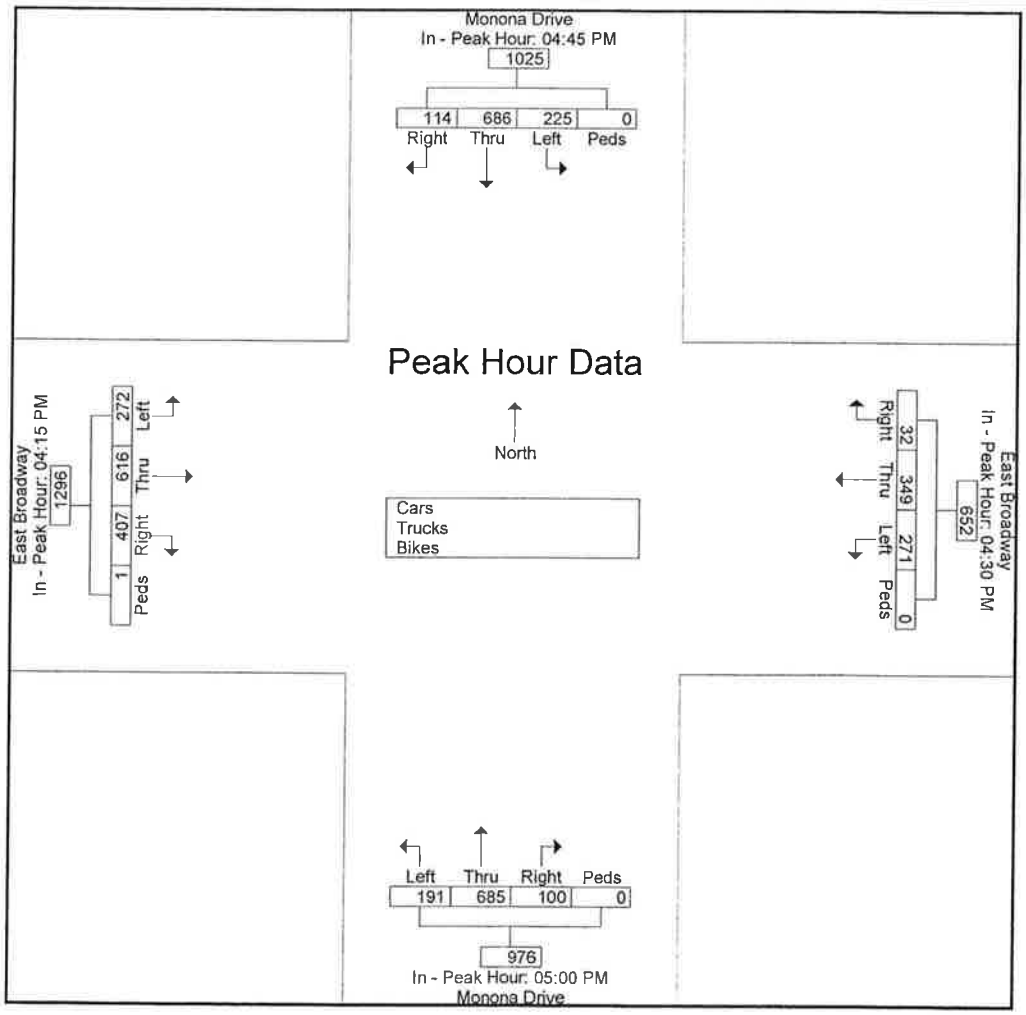
KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53711

East Broadway - Monona Drive
4:00 - 6:00 PM
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : PM Broadway-Monona
Site Code : 10000406
Start Date : 2/15/2011
Page No : 4

	Monona Drive From North					East Broadway From East					Monona Drive From South					East Broadway 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 Each Approach Begins at:																					
	04:45 PM					04:30 PM					05:00 PM					04:15 PM					
+0 mins.	28	**196**	48	0	**272**	7	96	61	0	164	24	155	43	0	222	85	141	49	0	275	
+15 mins.	29	175	55	0	259	**11**	**104**	**76**	0	**191**	24	148	**59**	0	231	**136**	157	61	0	**354**	
+30 mins.	**30**	149	**72**	0	251	10	81	68	0	159	22	181	40	0	243	80	**170**	**83**	**1**	334	
+45 mins.	27	166	50	0	243	4	68	66	0	138	**30**	**201**	49	0	**280**	106	148	79	0	333	
Total Volume	114	686	225	0	1025	32	349	271	0	652	100	685	191	0	976	407	616	272	1	1296	
% App. Total	11.1	66.9	22	0		4.9	53.5	41.6	0		10.2	70.2	19.6	0		31.4	47.5	21	0.1		
PHF	.950	.875	.781	.000	.942	.727	.839	.891	.000	.853	.833	.852	.809	.000	.871	.748	.906	.819	.250	.915	



Roselawn PM

KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53711

East Broadway - Roselawn
4:00 - 6:00 PM
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : PM Broadway-Roselawn
Site Code : 20000406
Start Date : 2/8/2011
Page No : 1

Groups Printed- Cars - Trucks - Bikes

	Roselawn From North					East Broadway From East					Pier 37 From South					East Broadway 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	14	1	2	0	17	4	117	0	0	121	6	2	8	0	16	39	114	12	0	165	319
04:15 PM	17	3	2	0	22	7	128	2	0	137	7	0	11	0	18	35	106	15	0	156	333
04:30 PM	13	0	2	0	15	7	138	3	0	148	4	0	12	0	16	30	142	8	0	180	359
04:45 PM	14	4	5	0	23	9	121	4	0	134	8	0	15	0	23	33	138	14	0	185	365
Total	58	8	11	0	77	27	504	9	0	540	25	2	46	0	73	137	500	49	0	686	1376
05:00 PM	12	4	4	0	20	8	160	4	0	172	8	1	8	0	17	41	132	10	0	183	392
05:15 PM	9	1	1	0	11	9	137	0	0	146	4	2	11	0	17	42	112	9	0	163	337
05:30 PM	10	0	7	0	17	3	105	3	0	111	4	1	15	0	20	26	115	7	0	148	296
05:45 PM	9	3	4	0	16	3	101	3	0	107	5	1	9	0	15	41	81	14	0	136	274
Total	40	8	16	0	64	23	503	10	0	536	21	5	43	0	69	150	440	40	0	630	1299
Grand Total	98	16	27	0	141	50	1007	19	0	1076	46	7	89	0	142	287	940	89	0	1316	2675
Apprch %	69.5	11.3	19.1	0		4.6	93.6	1.8	0		32.4	4.9	62.7	0		21.8	71.4	6.8	0		
Total %	3.7	0.6	1	0	5.3	1.9	37.6	0.7	0	40.2	1.7	0.3	3.3	0	5.3	10.7	35.1	3.3	0	49.2	
Cars	97	16	27	0	140	49	994	19	0	1062	46	7	89	0	142	287	924	88	0	1299	2643
% Cars	99	100	100	0	99.3	98	98.7	100	0	98.7	100	100	100	0	100	100	98.3	98.9	0	98.7	98.8
Trucks	1	0	0	0	1	1	11	0	0	12	0	0	0	0	0	0	14	1	0	15	28
% Trucks	1	0	0	0	0.7	2	1.1	0	0	1.1	0	0	0	0	0	0	1.5	1.1	0	1.1	1
Bikes	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	4
% Bikes	0	0	0	0	0	0	0.2	0	0	0.2	0	0	0	0	0	0	0.2	0	0	0.2	0.1

KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53711

East Broadway - Roselawn
4:00 - 6:00 PM
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : PM Broadway-Roselawn
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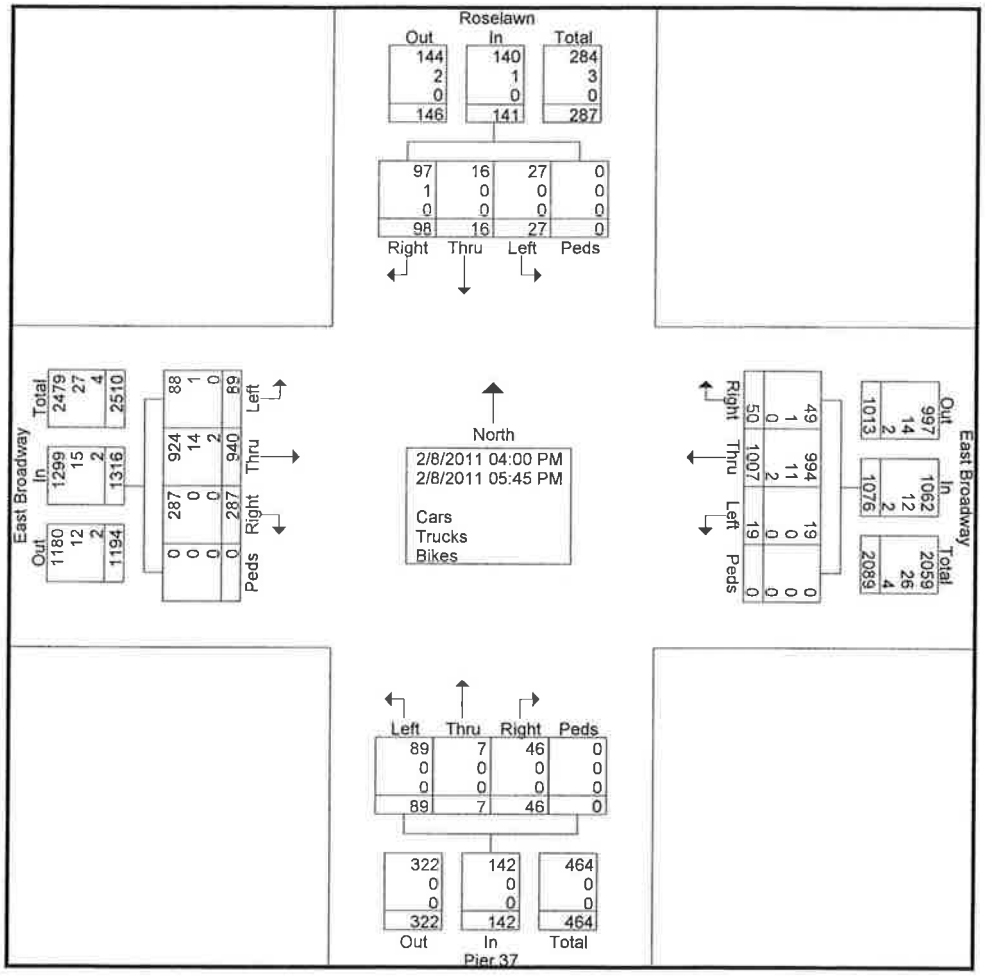
Start Date : 2/8/2011
Page No : 2



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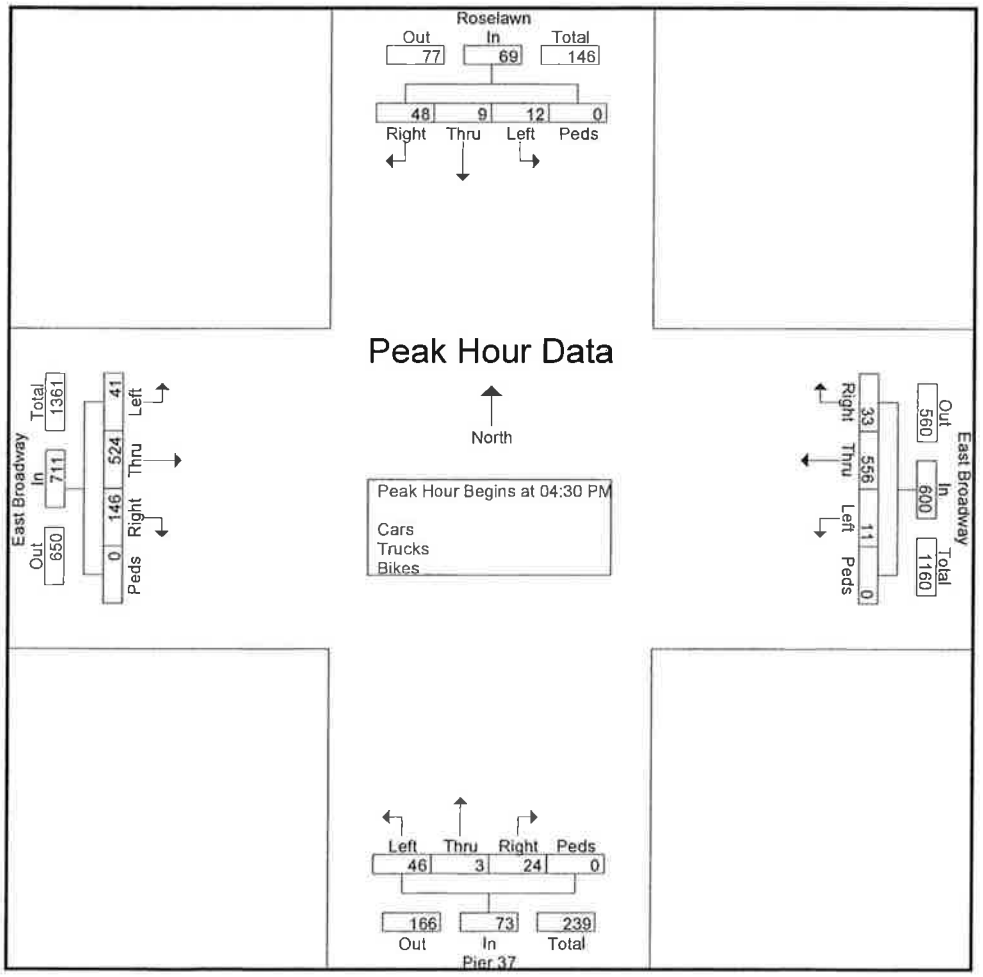
East Broadway - Roselawn
4:00 - 6:00 PM
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : PM Broadway-Roselawn
Site Code : 20000406
Start Date : 2/8/2011
Page No : 3

	Roselawn From North					East Broadway From East					Pier 37 From South					East Broadway 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	13	0	2	0	15	7	138	3	0	148	4	0	12	0	16	30	**142**	8	0	180	359
04:45 PM	**14**	**4**	**5**	0	**23**	**9**	121	4	0	134	**8**	0	**15**	0	**23**	33	138	**14**	0	**185**	365
05:00 PM	12	4	4	0	20	8	**160**	4	0	**172**	8	1	8	0	17	41	132	10	0	183	**392**
05:15 PM	9	1	1	0	11	9	137	0	0	146	4	**2**	11	0	17	**42**	112	9	0	163	337
Total Volume	48	9	12	0	69	33	556	11	0	600	24	3	46	0	73	146	524	41	0	711	1453
% App. Total	69.6	13	17.4	0		5.5	92.7	1.8	0		32.9	4.1	63	0		20.5	73.7	5.8	0		
PHF	.857	.563	.600	.000	.750	.917	.869	.688	.000	.872	.750	.375	.767	.000	.793	.869	.923	.732	.000	.961	.927



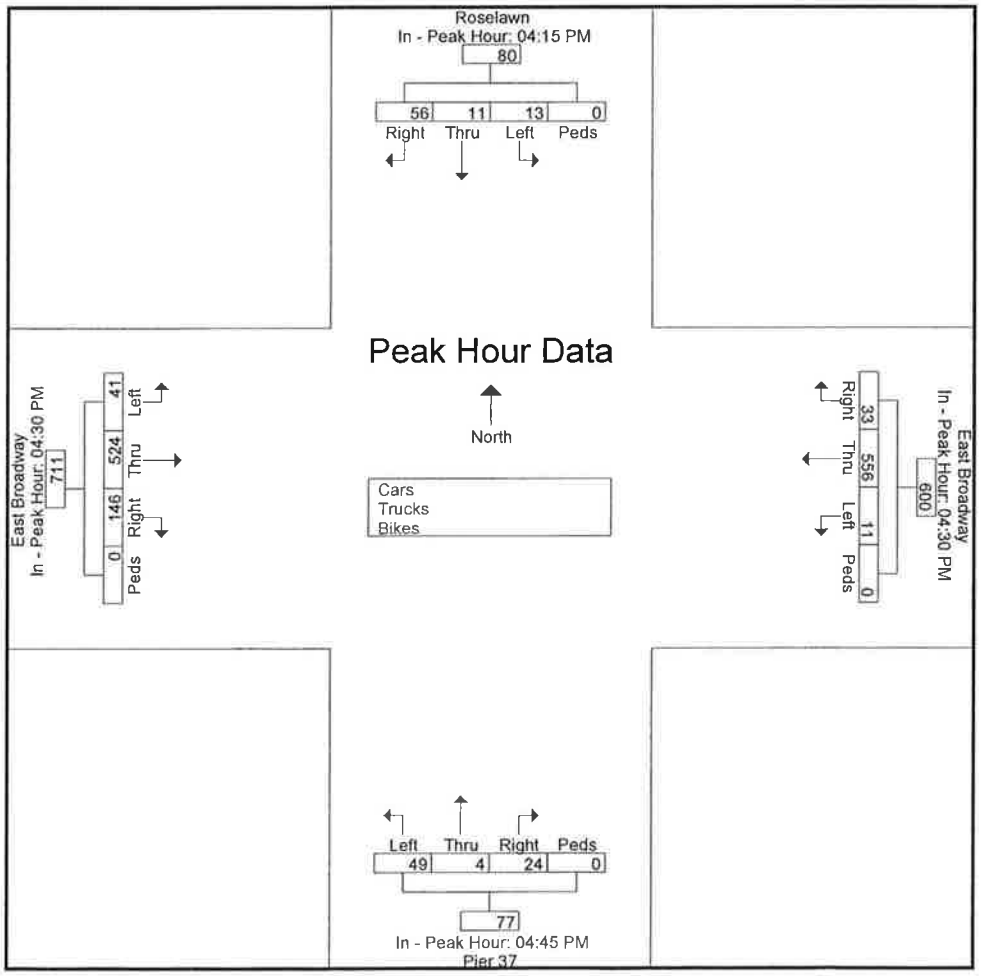
KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53711

East Broadway - Roselawn
4:00 - 6:00 PM
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : PM Broadway-Roselawn
Site Code : 20000406
Start Date : 2/8/2011
Page No : 4

	Roselawn From North					East Broadway From East					Pier 37 From South					East Broadway 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 Each Approach Begins at:																					
	04:15 PM					04:30 PM					04:45 PM					04:30 PM					
+0 mins.	**17**	3	2	0	22	7	138	3	0	148	**8**	0	**15**	0	**23**	30	**142**	8	0	180	
+15 mins.	13	0	2	0	15	**9**	121	4	0	134	8	1	8	0	17	33	138	**14**	0	**185**	
+30 mins.	14	4	**5**	0	**23**	8	**160**	4	0	**172**	4	**2**	11	0	17	41	132	10	0	183	
+45 mins.	12	4	4	0	20	9	137	0	0	146	4	1	15	0	20	**42**	112	9	0	163	
Total Volume	56	11	13	0	80	33	556	11	0	600	24	4	49	0	77	146	524	41	0	711	
% App. Total	70	13.8	16.2	0		5.5	92.7	1.8	0		31.2	5.2	63.6	0		20.5	73.7	5.8	0		
PHF	.824	.688	.650	.000	.870	.917	.869	.688	.000	.872	.750	.500	.817	.000	.837	.869	.923	.732	.000	.961	



Pier 37 PM

KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53711

East Broadwy - Pier 37 east (signalized)
4:00 - 6:00 PM
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : PM Broadway-Pier 37
Site Code : 30000406
Start Date : 2/16/2011
Page No : 1

Groups Printed- Cars - Trucks - Bicycles

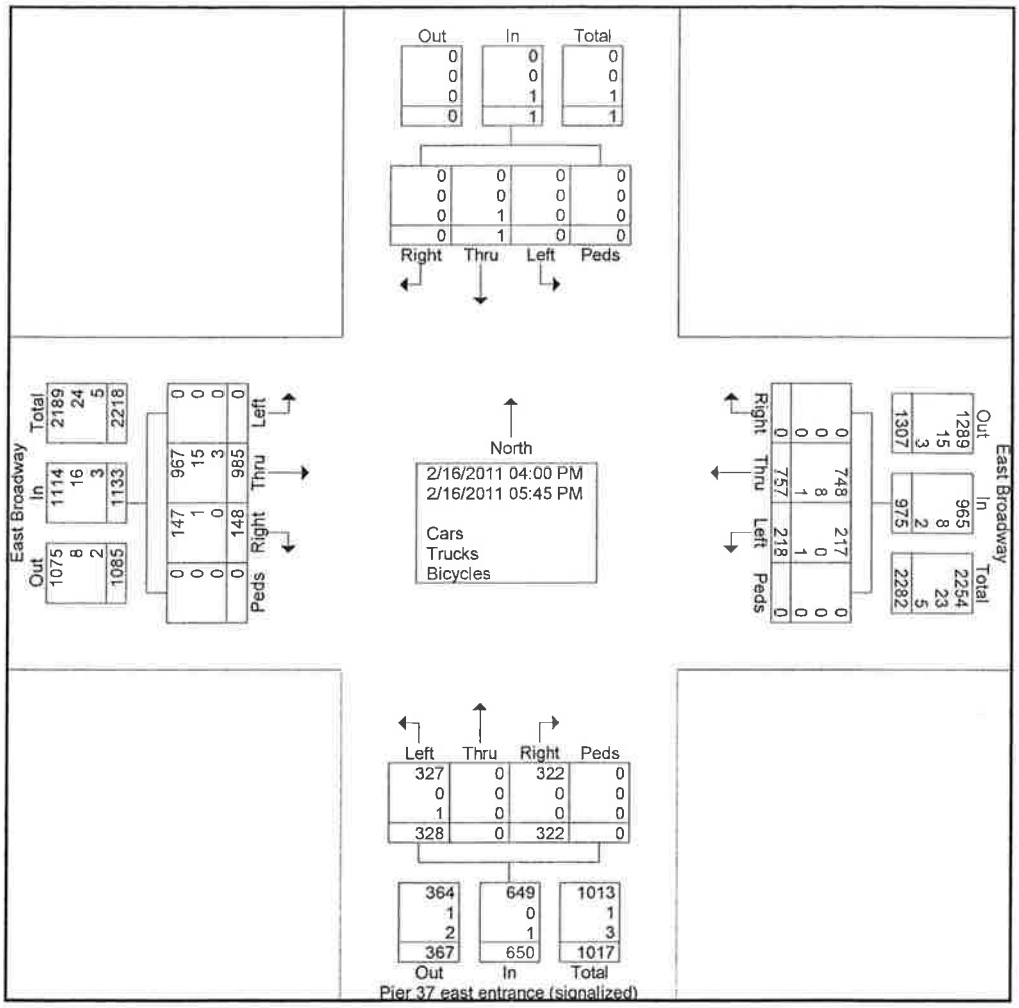
	From North					East Broadway From East					Pier 37 east entrance (signalized) From South					East Broadway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	104	19	0	123	26	0	45	0	71	24	123	0	0	147	341
04:15 PM	0	1	0	0	1	0	95	23	0	118	32	0	40	0	72	16	121	0	0	137	328
04:30 PM	0	0	0	0	0	0	120	25	0	145	51	0	31	0	82	19	142	0	0	161	388
04:45 PM	0	0	0	0	0	0	106	25	0	131	44	0	40	0	84	24	138	0	0	162	377
Total	0	1	0	0	1	0	425	92	0	517	153	0	156	0	309	83	524	0	0	607	1434
05:00 PM	0	0	0	0	0	0	87	34	0	121	46	0	42	0	88	20	112	0	0	132	341
05:15 PM	0	0	0	0	0	0	101	33	0	134	45	0	45	0	90	15	143	0	0	158	382
05:30 PM	0	0	0	0	0	0	91	32	0	123	38	0	46	0	84	17	112	0	0	129	336
05:45 PM	0	0	0	0	0	0	53	27	0	80	40	0	39	0	79	13	94	0	0	107	266
Total	0	0	0	0	0	0	332	126	0	458	169	0	172	0	341	65	461	0	0	526	1325
Grand Total	0	1	0	0	1	0	757	218	0	975	322	0	328	0	650	148	985	0	0	1133	2759
Apprch %	0	100	0	0		0	77.6	22.4	0		49.5	0	50.5	0		13.1	86.9	0	0		
Total %	0	0	0	0	0	0	27.4	7.9	0	35.3	11.7	0	11.9	0	23.6	5.4	35.7	0	0	41.1	
Cars	0	0	0	0	0	0	748	217	0	965	322	0	327	0	649	147	967	0	0	1114	2728
% Cars	0	0	0	0	0	0	98.8	99.5	0	99	100	0	99.7	0	99.8	99.3	98.2	0	0	98.3	98.9
Trucks	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	1	15	0	0	16	24
% Trucks	0	0	0	0	0	0	1.1	0	0	0.8	0	0	0	0	0	0.7	1.5	0	0	1.4	0.9
Bicycles	0	1	0	0	1	0	1	1	0	2	0	0	1	0	1	0	3	0	0	3	7
% Bicycles	0	100	0	0	100	0	0.1	0.5	0	0.2	0	0	0.3	0	0.2	0	0.3	0	0	0.3	0.3

KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53711

East Broadwy - Pier 37 east (signalized)
4:00 - 6:00 PM
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : PM Broadway-Pier 37
Site Code : 30000406
Start Date : 2/16/2011
Page No : 2



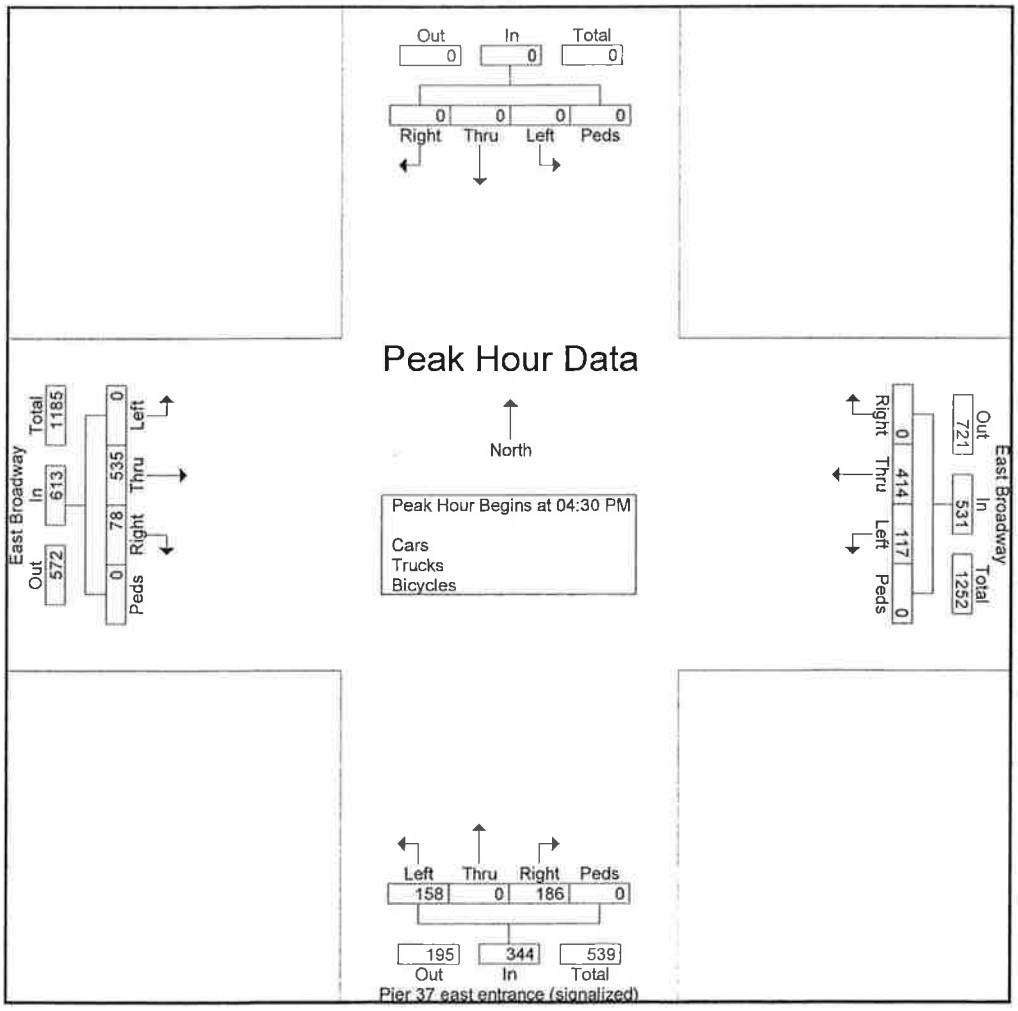
KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53711

East Broadwy - Pier 37 east (signalized)
4:00 - 6:00 PM
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : PM Broadway-Pier 37
Site Code : 30000406
Start Date : 2/16/2011
Page No : 3

	From North					East Broadway From East					Pier 37 east entrance (signalized) From South					East Broadway 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	0	0	0	0	0	0	**120**	25	0	**145**	**51**	0	31	0	82	19	142	0	0	161	**388**
04:45 PM	0	0	0	0	0	0	106	25	0	131	44	0	40	0	84	**24**	138	0	0	**162**	377
05:00 PM	0	0	0	0	0	0	87	**34**	0	121	46	0	42	0	88	20	112	0	0	132	341
05:15 PM	0	0	0	0	0	0	101	33	0	134	45	0	**45**	0	**90**	15	**143**	0	0	158	382
Total Volume	0	0	0	0	0	0	414	117	0	531	186	0	158	0	344	78	535	0	0	613	1488
% App. Total	0	0	0	0		0	78	22	0		54.1	0	45.9	0		12.7	87.3	0	0		
PHF	.000	.000	.000	.000	.000	.000	.863	.860	.000	.916	.912	.000	.878	.000	.956	.813	.935	.000	.000	.946	.959



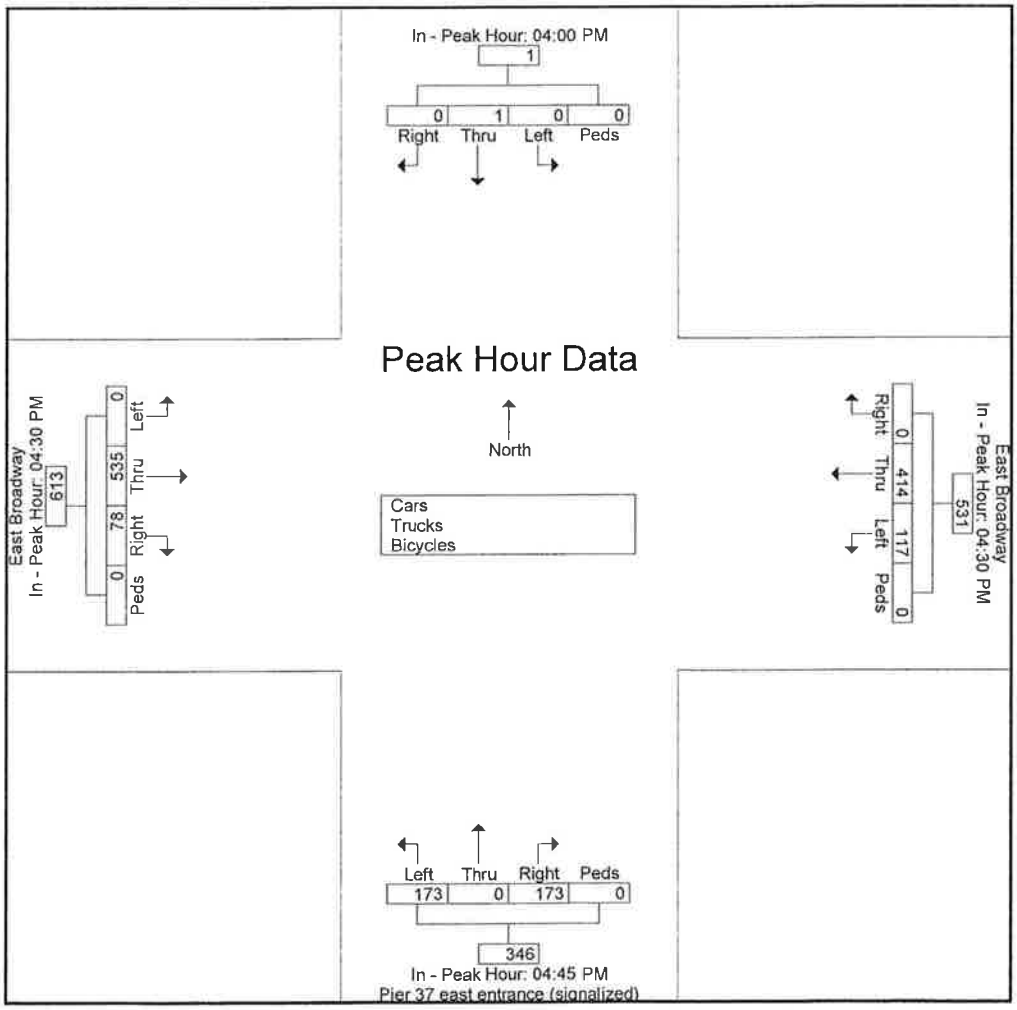
KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53711

East Broadwy - Pier 37 east (signalized)
4:00 - 6:00 PM
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : PM Broadway-Pier 37
Site Code : 30000406
Start Date : 2/16/2011
Page No : 4

	From North					East Broadway From East					Pier 37 east entrance (signalized) From South					East Broadway 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 Each Approach Begins at:																					
	04:00 PM					04:30 PM					04:45 PM					04:30 PM					
+0 mins.	0	0	0	0	0	0	**120**	25	0	**145**	44	0	40	0	84	19	142	0	0	161	
+15 mins.	0	**1**	0	0	**1**	0	106	25	0	131	**46**	0	42	0	88	**24**	138	0	0	**162**	
+30 mins.	0	0	0	0	0	0	87	**34**	0	121	45	0	45	0	**90**	20	112	0	0	132	
+45 mins.	0	0	0	0	0	0	101	33	0	134	38	0	**46**	0	84	15	**143**	0	0	158	
Total Volume	0	1	0	0	1	0	414	117	0	531	173	0	173	0	346	78	535	0	0	613	
% App. Total	0	100	0	0		0	78	22	0		50	0	50	0		12.7	87.3	0	0		
PHF	.000	.250	.000	.000	.250	.000	.863	.860	.000	.916	.940	.000	.940	.000	.961	.813	.935	.000	.000	.946	



Edna Taylor PM

KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53711

East Broadway - Edna Taylor Pkwy
4:00 - 6:00 PM
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : 60000406
Site Code : 60000406
Start Date : 2/24/2011
Page No : 1

Groups Printed- Cars - Trucks

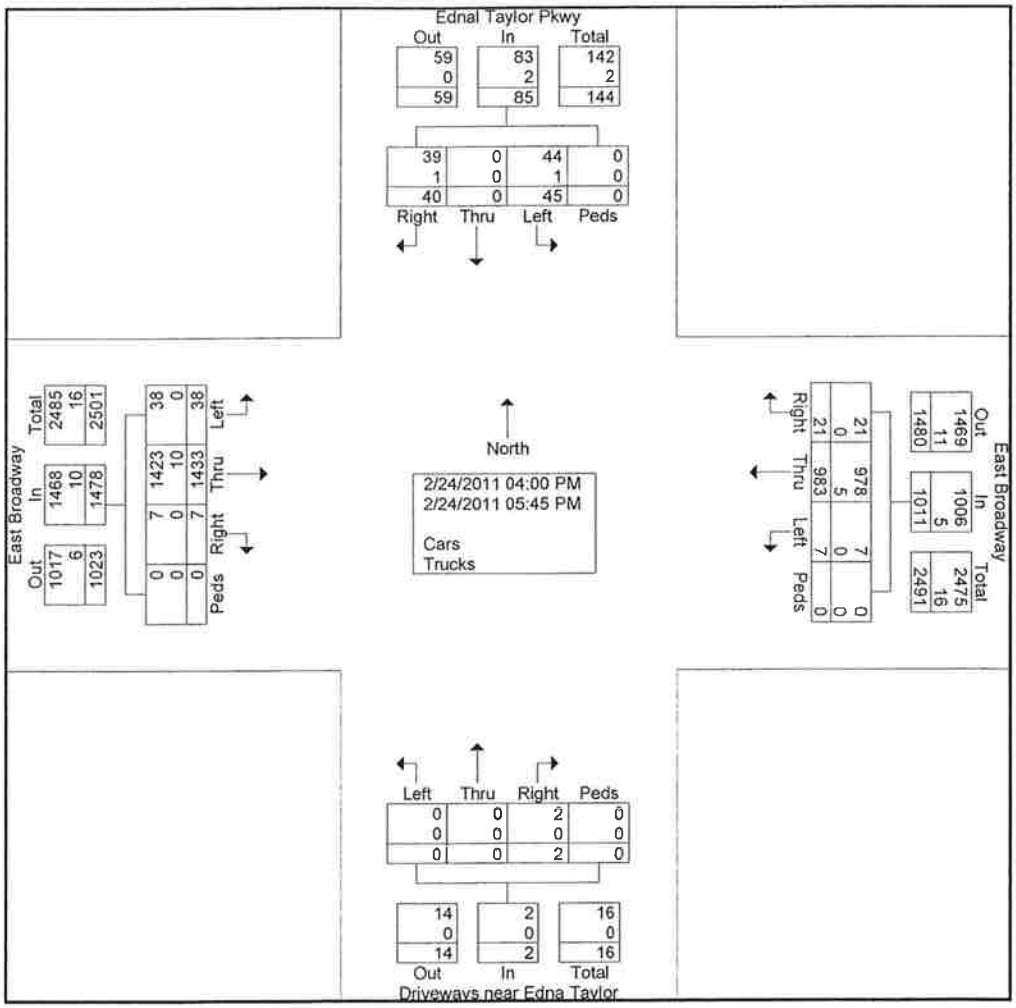
	Ednal Taylor Pkwy From North					East Broadway From East					Driveways near Edna Taylor From South					East Broadway From West					
Start Time	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Int Total
04:00 PM	4	0	4	0	8	2	126	0	0	128	0	0	0	0	0	0	163	7	0	170	306
04:15 PM	6	0	7	0	13	3	113	3	0	119	0	0	0	0	0	3	192	5	0	200	332
04:30 PM	4	0	7	0	11	4	116	1	0	121	0	0	0	0	0	2	180	4	0	186	318
04:45 PM	6	0	8	0	14	3	149	0	0	152	0	0	0	0	0	0	215	4	0	219	385
Total	20	0	26	0	46	12	504	4	0	520	0	0	0	0	0	5	750	20	0	775	1341
05:00 PM	9	0	8	0	17	1	124	1	0	126	1	0	0	0	1	1	196	2	0	199	343
05:15 PM	2	0	4	0	6	4	135	0	0	139	1	0	0	0	1	0	187	6	0	193	339
05:30 PM	4	0	1	0	5	1	108	1	0	110	0	0	0	0	0	1	165	7	0	173	288
05:45 PM	5	0	6	0	11	3	112	1	0	116	0	0	0	0	0	0	135	3	0	138	265
Total	20	0	19	0	39	9	479	3	0	491	2	0	0	0	2	2	683	18	0	703	1235
Grand Total	40	0	45	0	85	21	983	7	0	1011	2	0	0	0	2	7	1433	38	0	1478	2576
Apprch %	47.1	0	52.9	0		2.1	97.2	0.7	0		100	0	0	0		0.5	97	2.6	0		
Total %	1.6	0	1.7	0	3.3	0.8	38.2	0.3	0	39.2	0.1	0	0	0	0.1	0.3	55.6	1.5	0	57.4	
Cars	39	0	44	0	83	21	978	7	0	1006	2	0	0	0	2	7	1423	38	0	1468	2559
% Cars	97.5	0	97.8	0	97.6	100	99.5	100	0	99.5	100	0	0	0	100	100	99.3	100	0	99.3	99.3
Trucks	1	0	1	0	2	0	5	0	0	5	0	0	0	0	0	0	10	0	0	10	17
% Trucks	2.5	0	2.2	0	2.4	0	0.5	0	0	0.5	0	0	0	0	0	0	0.7	0	0	0.7	0.7

KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53711

East Broadway - Edna Taylor Pkwy
4:00 - 6:00 PM
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : 60000406
Site Code : 60000406
Start Date : 2/24/2011
Page No : 2



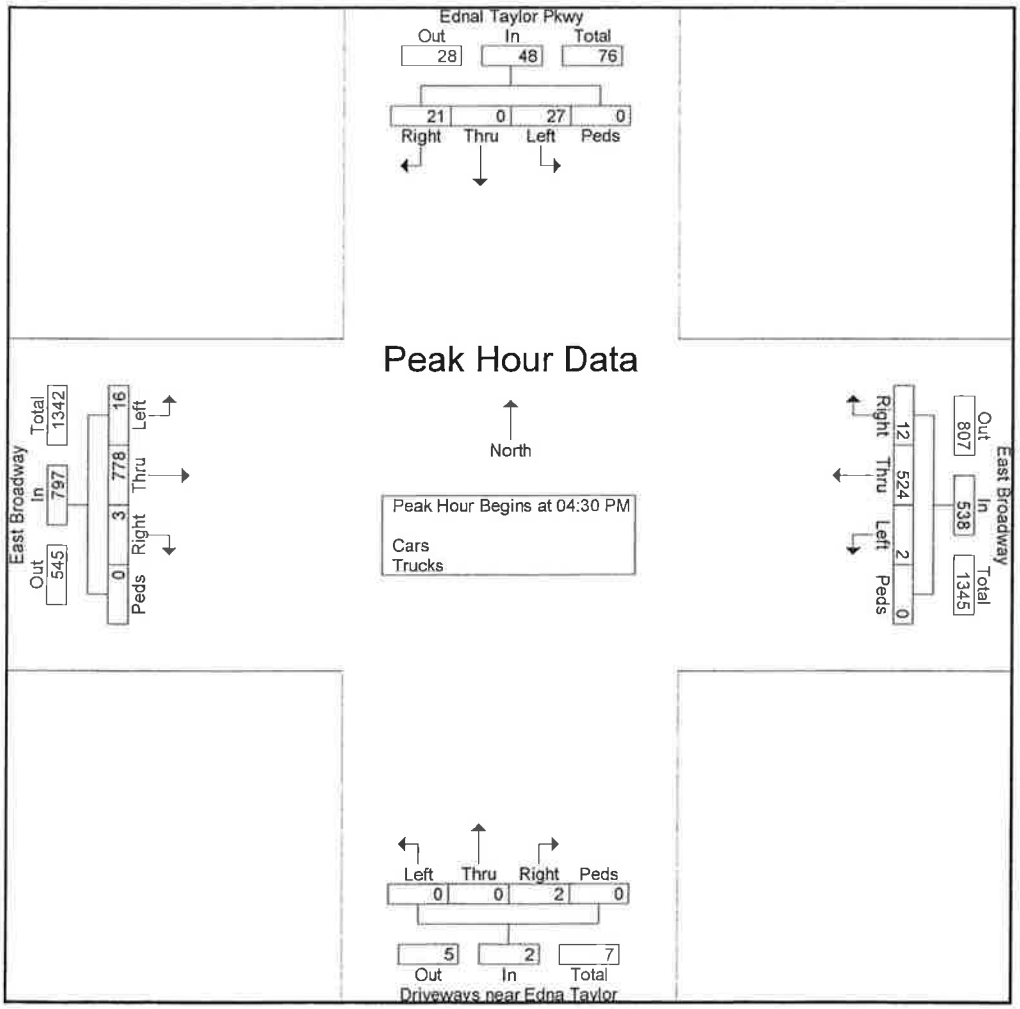
KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53711

East Broadway - Edna Taylor Pkwy
4:00 - 6:00 PM
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : 60000406
Site Code : 60000406
Start Date : 2/24/2011
Page No : 3

	Ednal Taylor Pkwy From North					East Broadway From East					Driveways near Edna Taylor From South					East Broadway 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	4	0	7	0	11	**4**	116	**1**	0	121	0	0	0	0	0	**2**	180	4	0	186	318
04:45 PM	6	0	**8**	0	14	3	**149**	0	0	**152**	0	0	0	0	0	0	**215**	4	0	**219**	**385**
05:00 PM	**9**	0	8	0	**17**	1	124	1	0	126	**1**	0	0	0	**1**	1	196	2	0	199	343
05:15 PM	2	0	4	0	6	4	135	0	0	139	1	0	0	0	1	0	187	**6**	0	193	339
Total Volume	21	0	27	0	48	12	524	2	0	538	2	0	0	0	2	3	778	16	0	797	1385
% App. Total	43.8	0	56.2	0		2.2	97.4	0.4	0		100	0	0	0		0.4	97.6	2	0		
PHF	.583	.000	.844	.000	.706	.750	.879	.500	.000	.885	.500	.000	.000	.000	.500	.375	.905	.667	.000	.910	.899



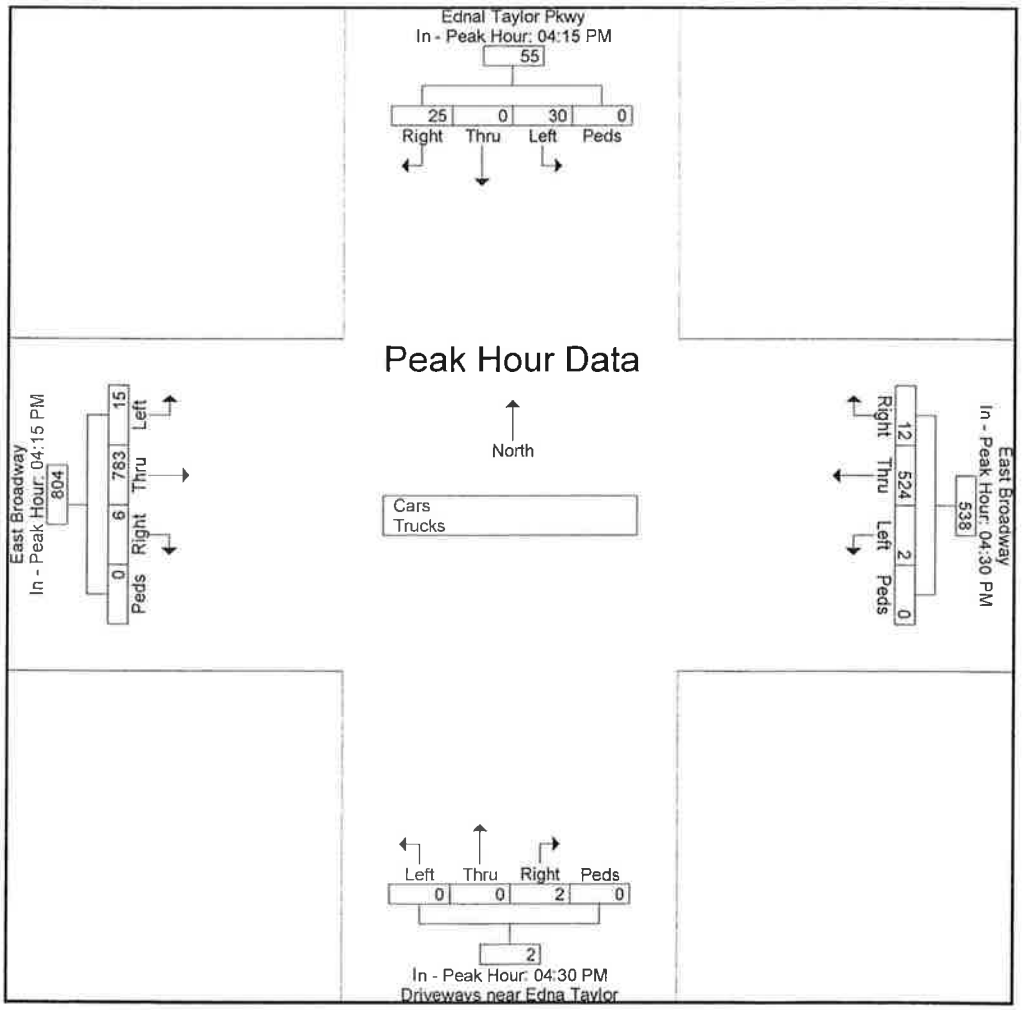
KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53711

.ast Broadway - Edna Taylor Pkwy
4:00 - 6:00 PM
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : 60000406
Site Code : 60000406
Start Date : 2/24/2011
Page No : 4

	Ednal Taylor Pkwy From North					East Broadway From East					Driveways near Edna Taylor From South					East Broadway 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 Each Approach Begins at:																					
	04:15 PM					04:30 PM					04:30 PM					04:15 PM					
+0 mins.	6	0	7	0	13	**4**	116	**1**	0	121	0	0	0	0	0	**3**	192	**5**	0	200	
+15 mins.	4	0	7	0	11	3	**149**	0	0	**152**	0	0	0	0	0	2	180	4	0	186	
+30 mins.	6	**0**	**8**	0	14	1	124	1	0	126	**1**	0	0	0	**1**	0	**215**	4	0	**219**	
+45 mins.	**9**	0	8	0	**17**	4	135	0	0	139	1	0	0	0	1	1	196	2	0	199	
Total Volume	25	0	30	0	55	12	524	2	0	538	2	0	0	0	2	6	783	15	0	804	
% App. Total	45.5	0	54.5	0		2.2	97.4	0.4	0		100	0	0	0		0.7	97.4	1.9	0		
PHF	.694	.000	.938	.000	.809	.750	.879	.500	.000	.885	.500	.000	.000	.000	.500	.500	.910	.750	.000	.918	



Copps 7-7

KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53714

East Broadway - Copps Avenue
7:00 am - 7:00 pm
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : Copps Broadway 7-7
Site Code : 12345678
Start Date : 4/5/2011
Page No : 1

Groups Printed- Cars - Trucks/Buses - Bicycles

	Copps Avenue From North					East Broadway From East					Copps Avenue From South					East Broadway 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
07:00 AM	8	0	12	0	20	19	123	0	0	142	0	0	0	0	0	0	56	4	0	60	222
07:15 AM	10	0	7	0	17	22	204	0	0	226	0	0	0	0	0	0	56	5	0	61	304
07:30 AM	8	0	8	0	16	27	259	0	0	286	0	0	0	0	0	0	63	4	0	67	369
07:45 AM	8	0	17	0	25	38	308	0	0	346	0	0	0	0	0	0	92	7	0	99	470
Total	34	0	44	0	78	106	894	0	0	1000	0	0	0	0	0	0	267	20	0	287	1365
08:00 AM	10	0	13	0	23	30	114	0	0	144	0	0	0	0	0	0	72	9	0	81	248
08:15 AM	12	0	13	0	25	38	125	0	0	163	0	0	0	0	0	0	65	17	0	82	270
08:30 AM	10	0	21	0	31	25	74	0	0	99	0	0	0	0	0	0	55	11	0	66	196
08:45 AM	11	0	30	0	41	26	106	0	0	132	0	0	0	0	0	0	56	16	0	72	245
Total	43	0	77	0	120	119	419	0	0	538	0	0	0	0	0	0	248	53	0	301	959
09:00 AM	15	0	36	0	51	34	88	0	0	122	0	0	0	0	0	0	54	11	0	65	238
09:15 AM	15	0	28	0	43	30	67	0	0	97	0	0	0	0	0	0	66	4	0	70	210
09:30 AM	11	0	27	0	38	36	88	0	0	124	0	0	0	0	0	0	66	14	0	80	242
09:45 AM	8	0	30	0	38	40	79	0	0	119	0	0	0	0	0	0	67	17	0	84	241
Total	49	0	121	0	170	140	322	0	0	462	0	0	0	0	0	0	253	46	0	299	931
10:00 AM	16	0	31	1	48	35	69	0	0	104	0	0	0	0	0	0	53	16	0	69	221
10:15 AM	22	0	41	0	63	35	76	0	0	111	0	0	0	0	0	0	78	15	0	93	267
10:30 AM	16	0	41	2	59	40	93	0	1	134	0	0	0	0	0	0	80	8	0	88	281
10:45 AM	27	0	26	0	53	37	83	0	0	120	0	0	0	0	0	0	82	17	0	99	272
Total	81	0	139	3	223	147	321	0	1	469	0	0	0	0	0	0	293	56	0	349	1041
11:00 AM	20	0	27	0	47	48	83	0	0	131	0	0	0	0	0	0	97	16	0	113	291
11:15 AM	21	0	45	0	66	34	127	0	0	161	0	0	0	0	0	0	82	23	0	105	332
11:30 AM	18	0	31	0	49	43	140	0	0	183	0	0	0	0	0	0	112	12	0	124	356
11:45 AM	28	0	41	0	69	51	150	0	0	201	0	0	0	0	0	0	148	36	0	184	454
Total	87	0	144	0	231	176	500	0	0	676	0	0	0	0	0	0	439	87	0	526	1433
12:00 PM	30	0	44	0	74	43	153	0	0	196	0	0	0	0	0	0	107	20	0	127	397
12:15 PM	16	0	51	0	67	34	128	0	0	162	0	0	0	0	0	0	150	30	1	181	410
12:30 PM	10	0	39	0	49	38	131	0	0	169	0	0	0	0	0	0	155	29	0	184	402
12:45 PM	25	0	43	0	68	39	118	0	0	157	0	0	0	0	0	0	163	15	0	178	403
Total	81	0	177	0	258	154	530	0	0	684	0	0	0	0	0	0	575	94	1	670	1612
01:00 PM	21	0	40	0	61	32	113	0	0	145	0	0	0	0	0	0	132	17	0	149	355
01:15 PM	17	0	31	0	48	50	103	0	0	153	0	0	0	0	0	0	96	17	0	113	314
01:30 PM	23	0	37	1	61	33	84	0	0	117	0	0	0	0	0	0	114	16	0	130	308
01:45 PM	25	0	45	0	70	54	89	0	1	144	0	0	0	0	0	0	103	13	0	116	330
Total	86	0	153	1	240	169	389	0	1	559	0	0	0	0	0	0	445	63	0	508	1307
02:00 PM	17	0	46	0	63	41	83	0	0	124	0	0	0	0	0	0	102	14	0	116	303
02:15 PM	22	0	49	0	71	42	84	0	0	126	0	0	0	0	0	0	95	13	0	108	305
02:30 PM	15	0	46	0	61	29	92	0	0	121	0	0	0	0	0	0	108	20	0	128	310
02:45 PM	10	0	48	0	58	47	90	0	0	137	0	0	0	0	0	0	113	13	0	126	321
Total	64	0	189	0	253	159	349	0	0	508	0	0	0	0	0	0	418	60	0	478	1239
03:00 PM	15	0	57	0	72	35	89	0	0	124	0	0	0	0	0	0	134	11	0	145	341
03:15 PM	19	0	59	0	78	42	91	0	0	133	0	0	0	0	0	0	103	14	0	117	328
03:30 PM	21	0	65	0	86	28	146	0	0	174	0	0	0	0	0	0	152	11	0	163	423
03:45 PM	19	0	53	0	72	21	120	0	0	141	0	0	0	0	0	0	140	18	0	158	371
Total	74	0	234	0	308	126	446	0	0	572	0	0	0	0	0	0	529	54	0	583	1463
04:00 PM	13	0	26	0	39	30	118	2	0	150	0	0	0	0	0	0	166	16	0	182	371
04:15 PM	13	0	22	1	36	24	96	1	0	121	0	0	0	0	0	0	131	15	0	146	303
04:30 PM	10	0	27	0	37	28	138	5	0	171	0	0	0	0	0	0	179	17	0	196	404
04:45 PM	13	0	19	0	32	32	120	1	0	153	0	0	0	0	0	0	180	19	0	199	384
Total	49	0	94	1	144	114	472	9	0	595	0	0	0	0	0	0	656	67	0	723	1462

KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53714

East Broadway - Copps Avenue
7:00 am - 7:00 pm
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : Copps Broadway 7-7
Site Code : 12345678
Start Date : 4/5/2011
Page No : 2

Groups Printed- Cars - Trucks/Buses - Bicycles

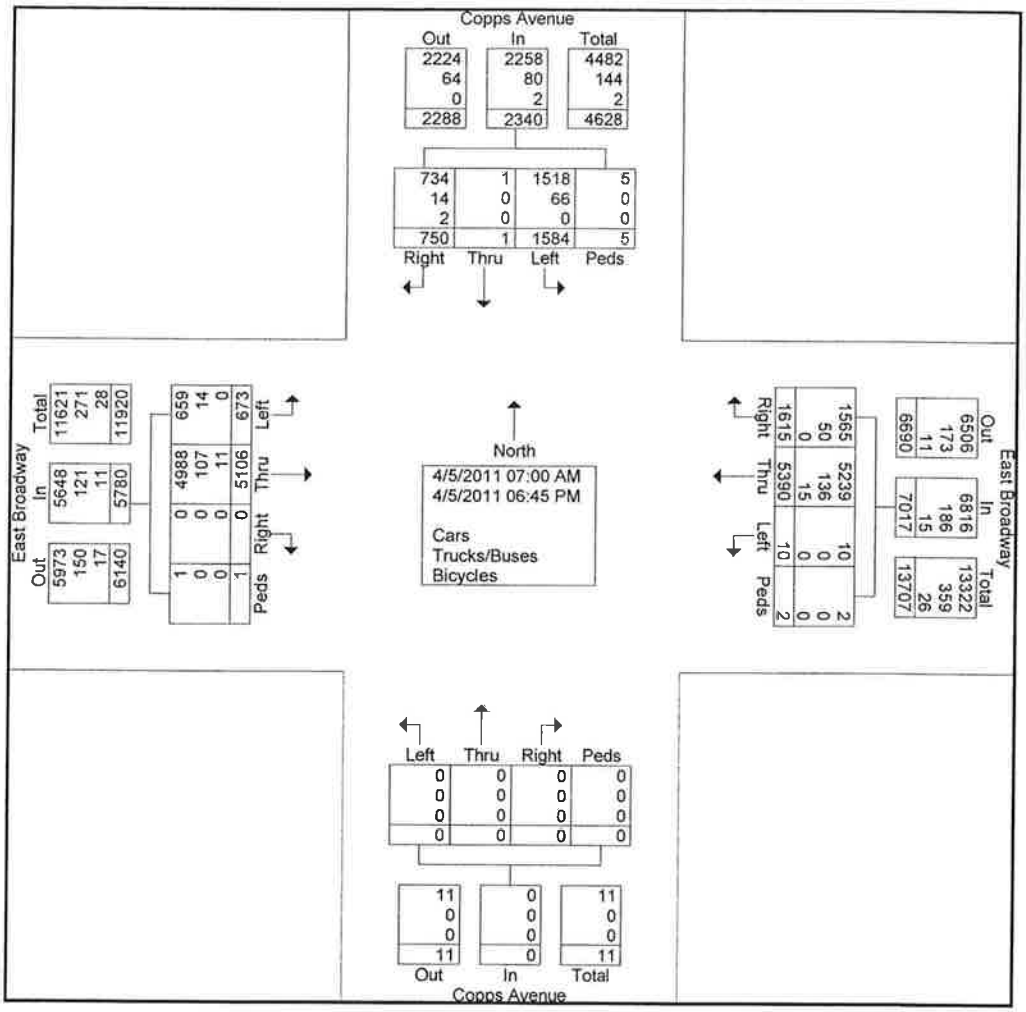
	Copps Avenue From North					East Broadway From East					Copps Avenue From South					East Broadway From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
05:00 PM	21	0	47	0	68	27	143	0	0	170	0	0	0	0	0	0	162	15	0	177	415
05:15 PM	18	1	26	0	45	24	130	0	0	154	0	0	0	0	0	0	157	13	0	170	369
05:30 PM	8	0	25	0	33	25	87	0	0	112	0	0	0	0	0	0	144	8	0	152	297
05:45 PM	10	0	21	0	31	19	72	0	0	91	0	0	0	0	0	0	115	6	0	121	243
Total	57	1	119	0	177	95	432	0	0	527	0	0	0	0	0	0	578	42	0	620	1324
06:00 PM	9	0	27	0	36	19	88	0	0	107	0	0	0	0	0	0	107	7	0	114	257
06:15 PM	13	0	19	0	32	32	86	0	0	118	0	0	0	0	0	0	113	7	0	120	270
06:30 PM	12	0	20	0	32	31	71	0	0	102	0	0	0	0	0	0	101	6	0	107	241
06:45 PM	11	0	27	0	38	28	71	1	0	100	0	0	0	0	0	0	84	11	0	95	233
Total	45	0	93	0	138	110	316	1	0	427	0	0	0	0	0	0	405	31	0	436	1001
Grand Total	750	1	1584	5	2340	1615	5390	10	2	7017	0	0	0	0	0	0	5106	673	1	5780	15137
Apprch %	32.1	0	67.7	0.2		23	76.8	0.1	0		0	0	0	0		0	88.3	11.6	0		
Total %	5	0	10.5	0	15.5	10.7	35.6	0.1	0	46.4	0	0	0	0	0	0	33.7	4.4	0	38.2	
Cars	734	1	1518	5	2258	1565	5239	10	2	6816	0	0	0	0	0	0	4988	659	1	5648	14722
% Cars	97.9	100	95.8	100	96.5	96.9	97.2	100	100	97.1	0	0	0	0	0	0	97.7	97.9	100	97.7	97.3
Trucks/Buses	14	0	66	0	80	50	136	0	0	186	0	0	0	0	0	0	107	14	0	121	387
% Trucks/Buses	1.9	0	4.2	0	3.4	3.1	2.5	0	0	2.7	0	0	0	0	0	0	2.1	2.1	0	2.1	2.6
Bicycles	2	0	0	0	2	0	15	0	0	15	0	0	0	0	0	0	11	0	0	11	28
% Bicycles	0.3	0	0	0	0.1	0	0.3	0	0	0.2	0	0	0	0	0	0	0.2	0	0	0.2	0.2

KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53714

East Broadway - Copps Avenue
7:00 am - 7:00 pm
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : Copps Broadway 7-7
Site Code : 12345678
Start Date : 4/5/2011
Page No : 3



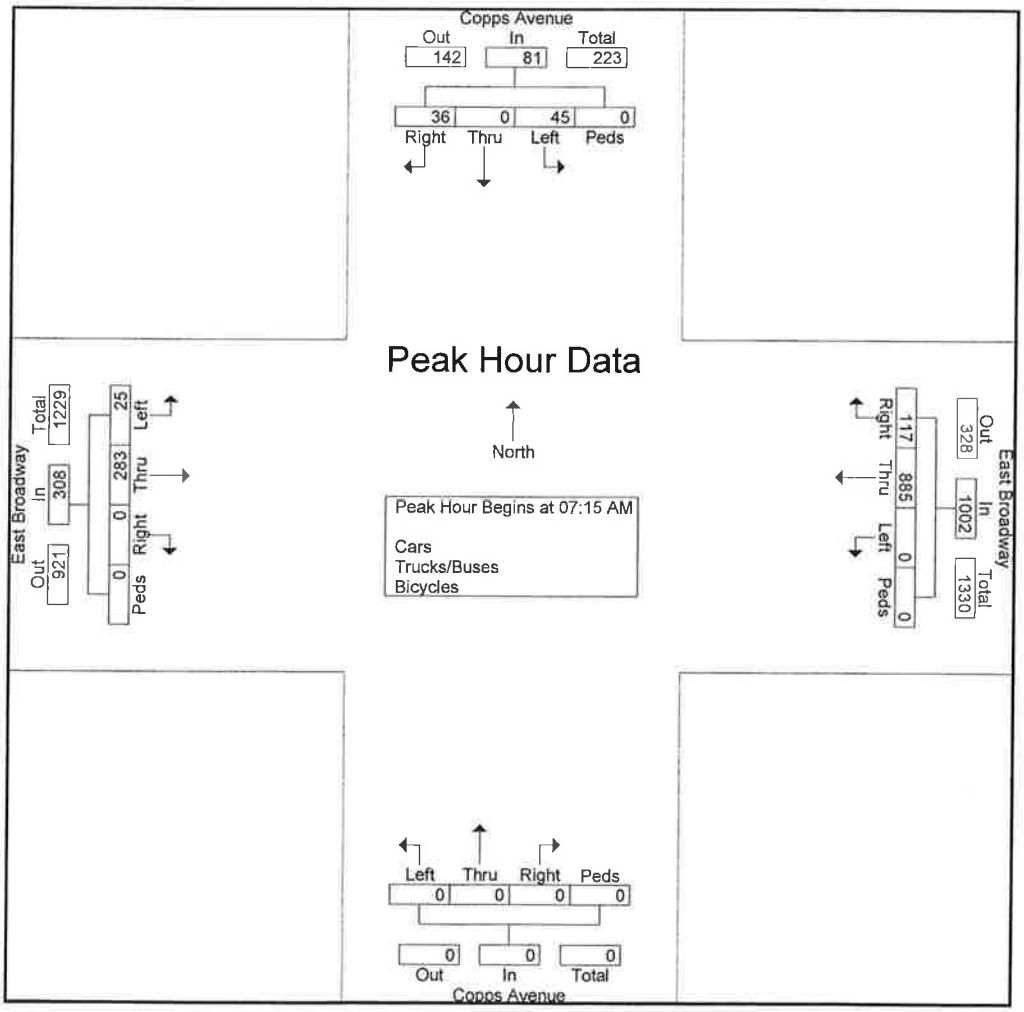
KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53714

East Broadway - Copps Avenue
7:00 am - 7:00 pm
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : Copps Broadway 7-7
Site Code : 12345678
Start Date : 4/5/2011
Page No : 4

	Copps Avenue From North					East Broadway From East					Copps Avenue From South					East Broadway 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 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	**10**	0	7	0	17	22	204	0	0	226	0	0	0	0	0	0	56	5	0	61	304
07:30 AM	8	0	8	0	16	27	259	0	0	286	0	0	0	0	0	0	63	4	0	67	369
07:45 AM	8	0	**17**	0	**25**	**38**	**308**	0	0	**346**	0	0	0	0	0	0	**92**	7	0	**99**	**470**
08:00 AM	10	0	13	0	23	30	114	0	0	144	0	0	0	0	0	0	72	**9**	0	81	248
Total Volume	36	0	45	0	81	117	885	0	0	1002	0	0	0	0	0	0	283	25	0	308	1391
% App. Total	44.4	0	55.6	0		11.7	88.3	0	0		0	0	0	0		0	91.9	8.1	0		
PHF	.900	.000	.662	.000	.810	.770	.718	.000	.000	.724	.000	.000	.000	.000	.000	.000	.769	.694	.000	.778	.740



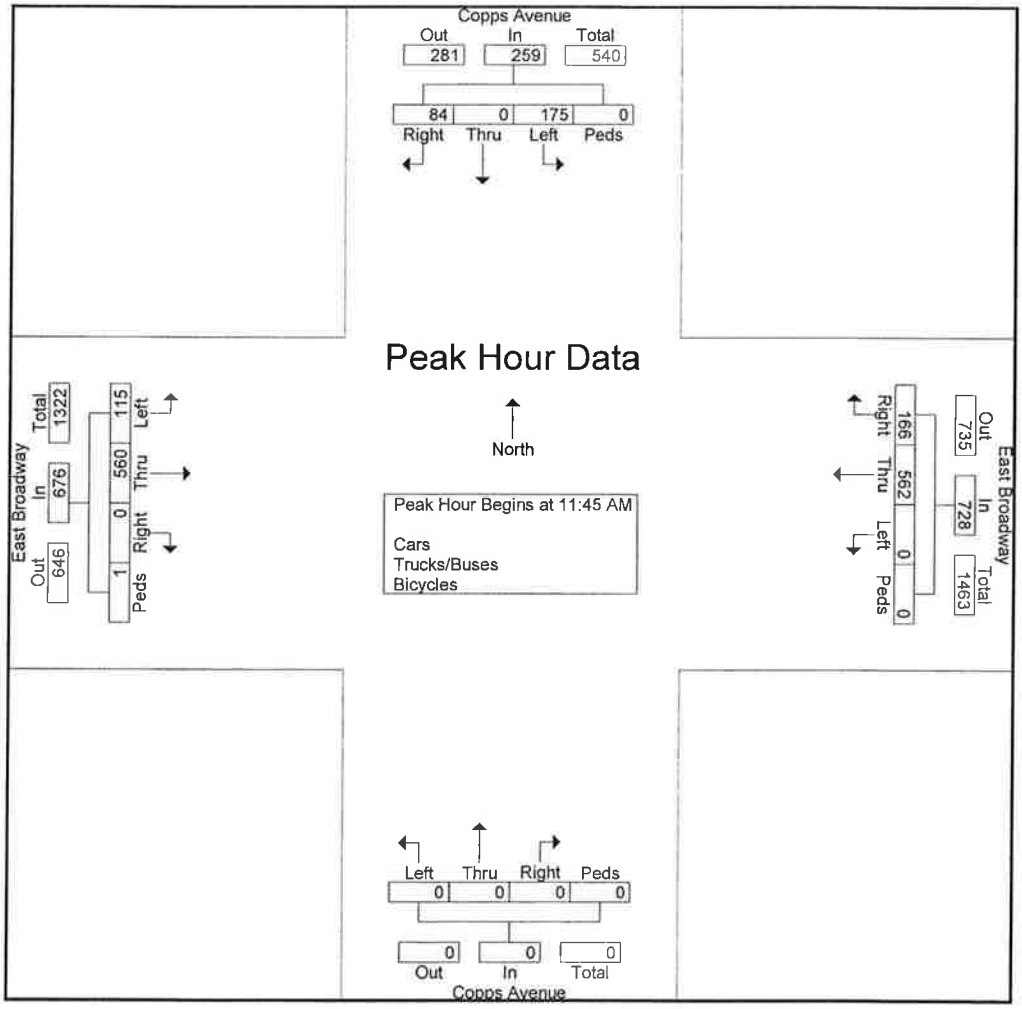
KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53714

East Broadway - Copps Avenue
7:00 am - 7:00 pm
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : Copps Broadway 7-7
Site Code : 12345678
Start Date : 4/5/2011
Page No : 5

	Copps Avenue From North					East Broadway From East					Copps Avenue From South					East Broadway 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 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:45 AM																					
11:45 AM	28	0	41	0	69	**51**	150	0	0	**201**	0	0	0	0	0	0	148	**36**	0	**184**	**454**
12:00 PM	**30**	0	44	0	**74**	43	**153**	0	0	196	0	0	0	0	0	0	107	20	0	127	397
12:15 PM	16	0	**51**	0	67	34	128	0	0	162	0	0	0	0	0	0	150	30	**1**	181	410
12:30 PM	10	0	39	0	49	38	131	0	0	169	0	0	0	0	0	0	**155**	29	0	184	402
Total Volume	84	0	175	0	259	166	562	0	0	728	0	0	0	0	0	0	560	115	1	676	1663
% App. Total	32.4	0	67.6	0		22.8	77.2	0	0		0	0	0	0		0	82.8	17	0.1		
PHF	.700	.000	.858	.000	.875	.814	.918	.000	.000	.905	.000	.000	.000	.000	.000	.000	.903	.799	.250	.918	.916



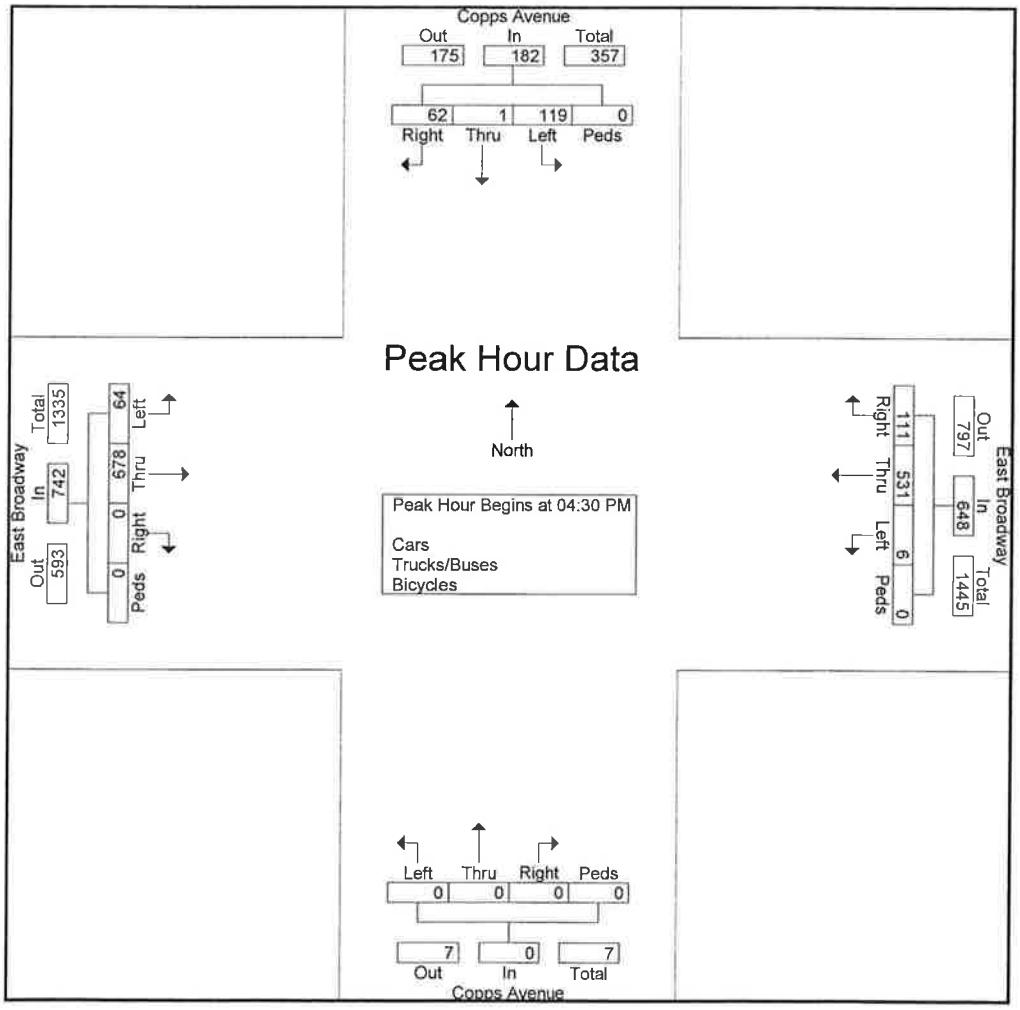
KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53714

East Broadway - Copps Avenue
7:00 am - 7:00 pm
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : Copps Broadway 7-7
Site Code : 12345678
Start Date : 4/5/2011
Page No : 6

	Copps Avenue From North					East Broadway From East					Copps Avenue From South					East Broadway 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 02:00 PM to 06:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	10	0	27	0	37	28	138	**5**	0	**171**	0	0	0	0	0	0	179	17	0	196	404
04:45 PM	13	0	19	0	32	**32**	120	1	0	153	0	0	0	0	0	0	**180**	**19**	0	**199**	384
05:00 PM	**21**	0	**47**	0	**68**	27	**143**	0	0	170	0	0	0	0	0	0	162	15	0	177	**415**
05:15 PM	18	**1**	26	0	45	24	130	0	0	154	0	0	0	0	0	0	157	13	0	170	369
Total Volume	62	1	119	0	182	111	531	6	0	648	0	0	0	0	0	0	678	64	0	742	1572
% App. Total	34.1	0.5	65.4	0		17.1	81.9	0.9	0		0	0	0	0		0	91.4	8.6	0		
PHF	.738	.250	.633	.000	.669	.867	.928	.300	.000	.947	.000	.000	.000	.000	.000	.000	.942	.842	.000	.932	.947



Copps
Saturday 11-1

KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53711

East Broadway-Copps Ave
Saturday 11 AM - 1 PM
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : Sat Broadway-Copps
Site Code : 80001101
Start Date : 3/5/2011
Page No : 1

Groups Printed- Cars - Trucks

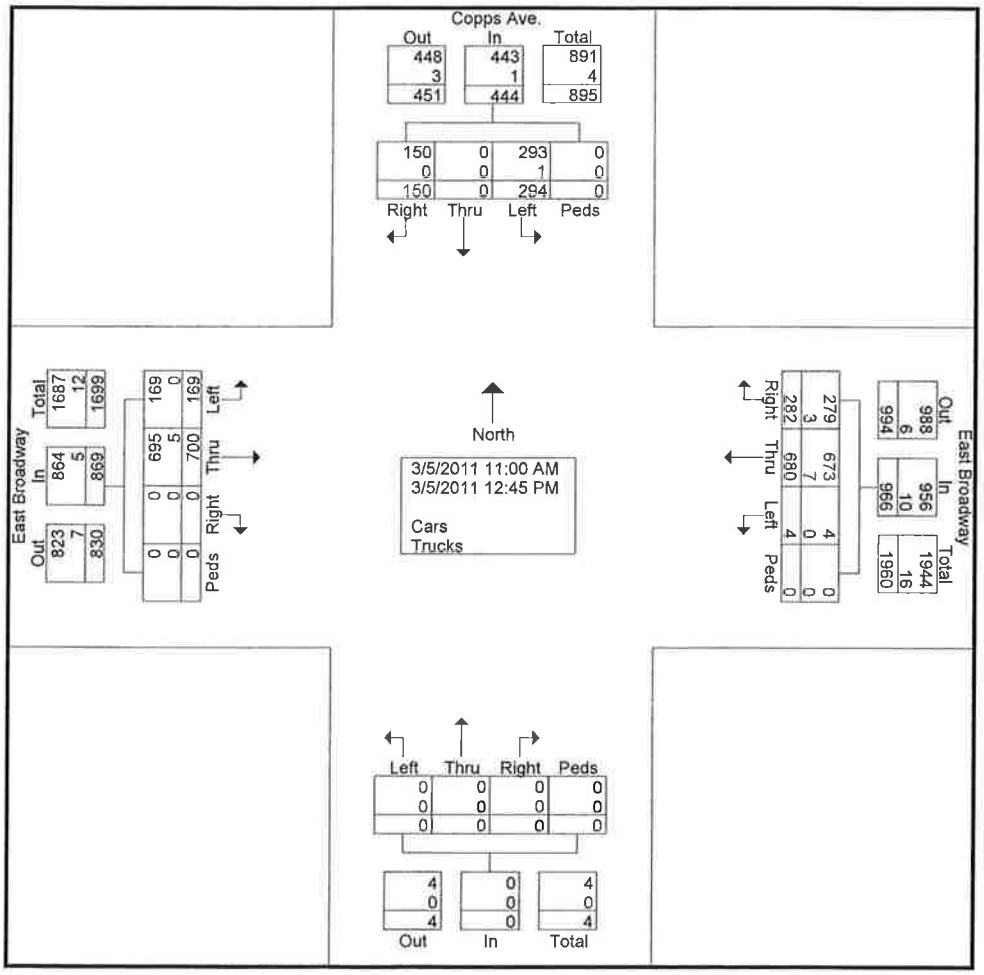
	Copps Ave. From North					East Broadway From East					From South					East Broadway From West					
Start Time	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Right	Thru	Left	Peds	App Total	Int. Total
11:00 AM	18	0	26	0	44	30	78	1	0	109	0	0	0	0	0	0	81	22	0	103	256
11:15 AM	20	0	44	0	64	42	89	0	0	131	0	0	0	0	0	0	80	30	0	110	305
11:30 AM	17	0	35	0	52	36	91	0	0	127	0	0	0	0	0	0	94	16	0	110	289
11:45 AM	26	0	44	0	70	46	106	1	0	153	0	0	0	0	0	0	87	35	0	122	345
Total	81	0	149	0	230	154	364	2	0	520	0	0	0	0	0	0	342	103	0	445	1195
12:00 PM	21	0	33	0	54	37	108	0	0	145	0	0	0	0	0	0	115	27	0	142	341
12:15 PM	21	0	32	0	53	31	84	0	0	115	0	0	0	0	0	0	84	16	0	100	268
12:30 PM	14	0	50	0	64	29	69	1	0	99	0	0	0	0	0	0	94	8	0	102	265
12:45 PM	13	0	30	0	43	31	55	1	0	87	0	0	0	0	0	0	65	15	0	80	210
Total	69	0	145	0	214	128	316	2	0	446	0	0	0	0	0	0	358	66	0	424	1084
Grand Total	150	0	294	0	444	282	680	4	0	966	0	0	0	0	0	0	700	169	0	869	2279
Apprch %	33.8	0	66.2	0		29.2	70.4	0.4	0		0	0	0	0		0	80.6	19.4	0		
Total %	6.6	0	12.9	0	19.5	12.4	29.8	0.2	0	42.4	0	0	0	0	0	0	30.7	7.4	0	38.1	
Cars	150	0	293	0	443	279	673	4	0	956	0	0	0	0	0	0	695	169	0	864	2263
% Cars	100	0	99.7	0	99.8	98.9	99	100	0	99	0	0	0	0	0	0	99.3	100	0	99.4	99.3
Trucks	0	0	1	0	1	3	7	0	0	10	0	0	0	0	0	0	5	0	0	5	16
% Trucks	0	0	0.3	0	0.2	1.1	1	0	0	1	0	0	0	0	0	0	0.7	0	0	0.6	0.7

KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53711

East Broadway-Copps Ave
Saturday 11 AM - 1 PM
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : Sat Broadway-Copps
Site Code : 80001101
Start Date : 3/5/2011
Page No : 2



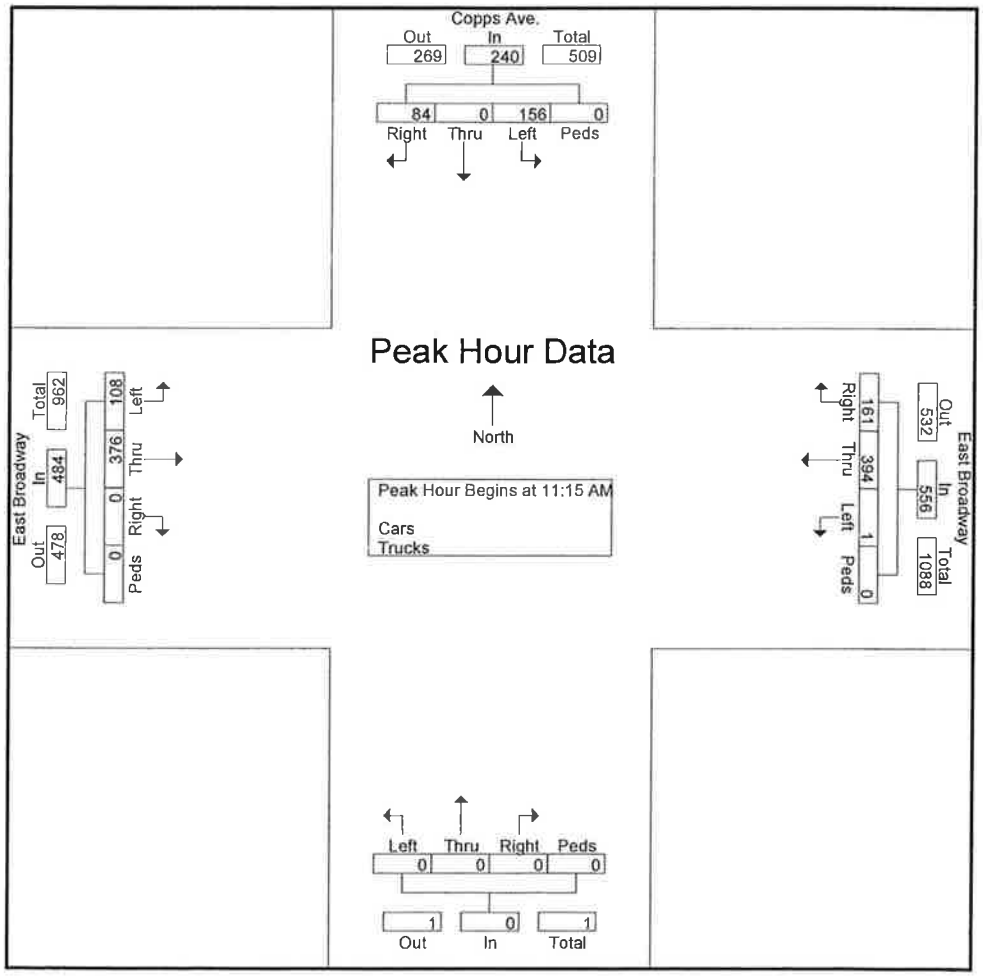
KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53711

East Broadway-Copps Ave
Saturday 11 AM - 1 PM
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : Sat Broadway-Copps
Site Code : 80001101
Start Date : 3/5/2011
Page No : 3

	Copps Ave. From North					East Broadway From East					From South					East Broadway 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 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:15 AM																					
11:15 AM	20	0	**44**	0	64	42	89	0	0	131	0	0	0	0	0	0	80	30	0	110	305
11:30 AM	17	0	35	0	52	36	91	0	0	127	0	0	0	0	0	0	94	16	0	110	289
11:45 AM	**26**	0	**44**	0	**70**	**46**	106	**1**	0	**153**	0	0	0	0	0	0	87	**35**	0	122	**345**
12:00 PM	21	0	33	0	54	37	**108**	0	0	145	0	0	0	0	0	0	**115**	27	0	**142**	341
Total Volume	84	0	156	0	240	161	394	1	0	556	0	0	0	0	0	0	376	108	0	484	1280
% App. Total	35	0	65	0		29	70.9	0.2	0		0	0	0	0		0	77.7	22.3	0		
PHF	.808	.000	.886	.000	.857	.875	.912	.250	.000	.908	.000	.000	.000	.000	.000	.000	.817	.771	.000	.852	.928



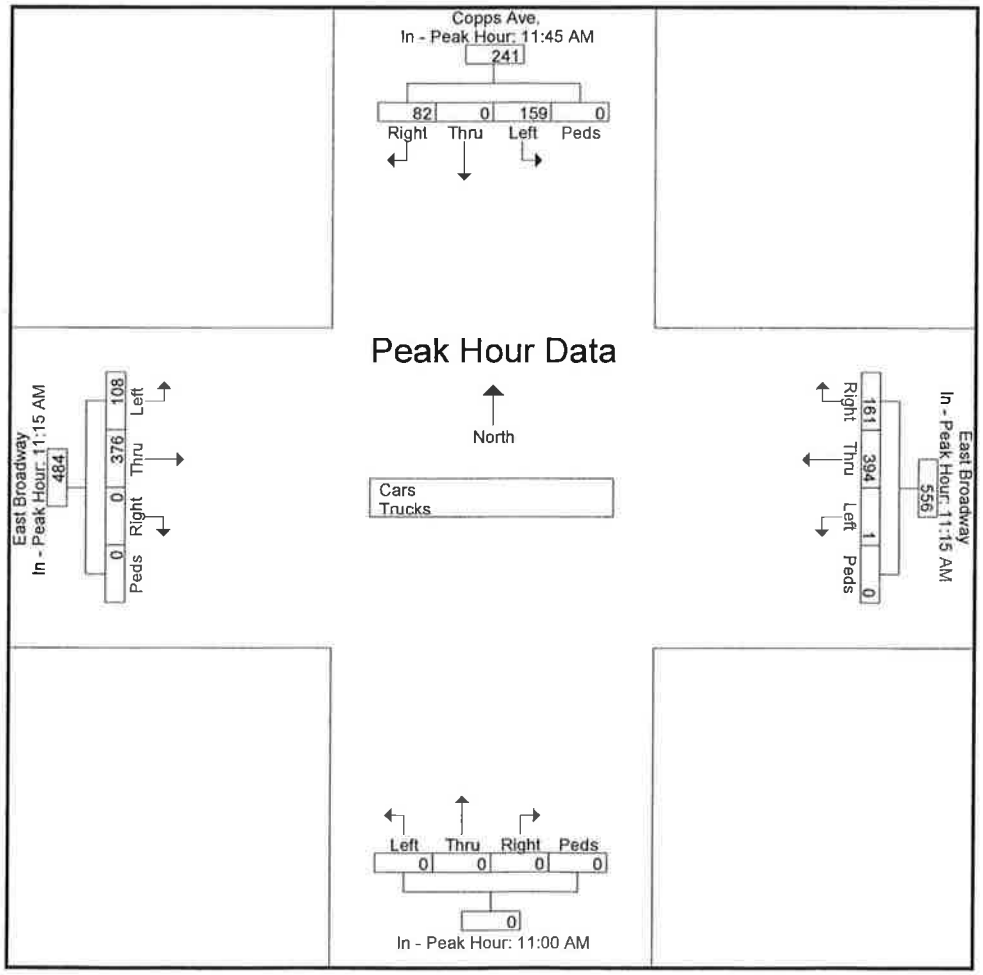
KL Engineering, Inc.

5950 Seminole Centre Court
Madison, WI 53711

East Broadway-Copps Ave
Saturday 11 AM - 1 PM
East Broadway Corridor Study
City of Monona, Dane County, WI

File Name : Sat Broadway-Copps
Site Code : 80001101
Start Date : 3/5/2011
Page No : 4

	Copps Ave. From North					East Broadway From East					From South					East Broadway 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 11:00 AM to 12:45 PM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	11:45 AM					11:15 AM					11:00 AM					11:15 AM					
+0 mins.	26	0	44	0	70	42	89	0	0	131	0	0	0	0	0	0	80	30	0	110	
+15 mins.	21	0	33	0	54	36	91	0	0	127	0	0	0	0	0	0	94	16	0	110	
+30 mins.	21	0	32	0	53	46	106	1	0	153	0	0	0	0	0	0	87	35	0	122	
+45 mins.	14	0	50	0	64	37	108	0	0	145	0	0	0	0	0	0	115	27	0	142	
Total Volume	82	0	159	0	241	161	394	1	0	556	0	0	0	0	0	0	376	108	0	484	
% App. Total	34	0	66	0		29	70.9	0.2	0		0	0	0	0		0	77.7	22.3	0		
PHF	.788	.000	.795	.000	.861	.875	.912	.250	.000	.908	.000	.000	.000	.000	.000	.000	.817	.771	.000	.852	



East Broadway - Copps Ave.
AM

File Name: S:\MAD\1400--1499\1467\001\Traffic Counts\Meriter counts\51 Copps AM.ppd
Start Date: 11/11/2010
Start Time: 7:15:00 AM
Site Code: 00000000
Comment 1: Default Comments
Comment 2: Change These in The Preferences Window
Comment 3: Select File/Preference in the Main Scree
Comment 4: Then Click the Comments Tab

	COPPS Southbound				BW Westbound				COPPS Northbound				BW Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
07:15 AM	6	0	8	0	0	224	37	0	0	0	0	0	7	59	0	0	341
07:30 AM	12	0	7	0	0	272	30	0	0	0	0	0	4	78	0	0	403
07:45 AM	23	0	8	0	0	261	40	0	0	0	0	0	12	80	0	0	424
08:00 AM	16	0	8	0	0	135	40	0	0	0	0	0	15	63	0	0	277
Cars	57	0	31		0	892	147		0	0	0		38	280	0		PHF
Trucks	10	0	7		0	38	11		0	0	0		1	16	0		0.85
Truck %	15%	0.00%	18.42%		0.00%	4.09%	6.96%		0.00%	0.00%	0.00%		2.56%	5.41%	0.00%		
TOTAL	**67**	**0**	**38**		**0**	**930**	**158**		**0**	**0**	**0**		**39**	**296**	**0**		

Hourly Counts
East Broadway
Monona – Roselawn

Traffic Volumes on Broadway between Monona Dr and Roselawn Ave
Monona, WI
Counted Friday, March 11, 2011 to Tuesday March 15, 2011
Axle Factor Used = 2.06 Axles Per Vehicle

Date	Time	Total	WB	EB		Hourly Total
Friday, March 11, 2011	1:00 PM	363	171	192		1374
Friday, March 11, 2011	1:15 PM	344	191	153		1327
Friday, March 11, 2011	1:30 PM	355	180	175		1258
Friday, March 11, 2011	1:45 PM	312	147	165		1268
Friday, March 11, 2011	2:00 PM	316	162	154		1309
Friday, March 11, 2011	2:15 PM	275	135	140		1310
Friday, March 11, 2011	2:30 PM	365	201	164		1357
Friday, March 11, 2011	2:45 PM	353	179	174		1364
Friday, March 11, 2011	3:00 PM	317	156	161		1367
Friday, March 11, 2011	3:15 PM	322	158	164		1378
Friday, March 11, 2011	3:30 PM	372	172	200		1412
Friday, March 11, 2011	3:45 PM	356	181	175		1416
Friday, March 11, 2011	4:00 PM	328	161	167		1389
Friday, March 11, 2011	4:15 PM	356	173	183		1430
Friday, March 11, 2011	4:30 PM	376	178	198	Friday PM Peak	1462
Friday, March 11, 2011	4:45 PM	329	167	162		1415
Friday, March 11, 2011	5:00 PM	369	175	194		1372
Friday, March 11, 2011	5:15 PM	388	181	207		1273
Friday, March 11, 2011	5:30 PM	329	143	186		1112
Friday, March 11, 2011	5:45 PM	286	153	133		998
Friday, March 11, 2011	6:00 PM	270	140	130		910
Friday, March 11, 2011	6:15 PM	227	125	102		837
Friday, March 11, 2011	6:30 PM	215	120	95		781
Friday, March 11, 2011	6:45 PM	198	113	85		734
Friday, March 11, 2011	7:00 PM	197	110	87		688
Friday, March 11, 2011	7:15 PM	171	103	68		619
Friday, March 11, 2011	7:30 PM	168	98	70		576
Friday, March 11, 2011	7:45 PM	152	85	67		535
Friday, March 11, 2011	8:00 PM	128	70	58		489
Friday, March 11, 2011	8:15 PM	128	79	49		469
Friday, March 11, 2011	8:30 PM	127	77	50		433
Friday, March 11, 2011	8:45 PM	106	67	39		374
Friday, March 11, 2011	9:00 PM	108	58	50		326
Friday, March 11, 2011	9:15 PM	92	45	47		318
Friday, March 11, 2011	9:30 PM	68	40	28		311
Friday, March 11, 2011	9:45 PM	58	37	21		306
Friday, March 11, 2011	10:00 PM	100	60	40		306
Friday, March 11, 2011	10:15 PM	85	62	23		249
Friday, March 11, 2011	10:30 PM	63	42	21		208
Friday, March 11, 2011	10:45 PM	58	31	27		182

Friday, March 11, 2011	11:00 PM	43	27	16		164
Friday, March 11, 2011	11:15 PM	44	27	17		159
Friday, March 11, 2011	11:30 PM	37	25	12		151
Friday, March 11, 2011	11:45 PM	40	23	17		139
Saturday, March 12, 2011	12:00 AM	38	22	16		130
Saturday, March 12, 2011	12:15 AM	36	21	15		122
Saturday, March 12, 2011	12:30 AM	25	17	8		114
Saturday, March 12, 2011	12:45 AM	31	21	10		110
Saturday, March 12, 2011	1:00 AM	30	18	12		94
Saturday, March 12, 2011	1:15 AM	28	14	14		79
Saturday, March 12, 2011	1:30 AM	21	17	4		83
Saturday, March 12, 2011	1:45 AM	15	9	6		87
Saturday, March 12, 2011	2:00 AM	15	7	8		85
Saturday, March 12, 2011	2:15 AM	32	15	17		82
Saturday, March 12, 2011	2:30 AM	25	13	12		64
Saturday, March 12, 2011	2:45 AM	13	6	7		45
Saturday, March 12, 2011	3:00 AM	12	6	6		41
Saturday, March 12, 2011	3:15 AM	14	10	4		45
Saturday, March 12, 2011	3:30 AM	6	3	3		38
Saturday, March 12, 2011	3:45 AM	9	4	5		47
Saturday, March 12, 2011	4:00 AM	16	11	5		47
Saturday, March 12, 2011	4:15 AM	7	3	4		38
Saturday, March 12, 2011	4:30 AM	15	10	5		44
Saturday, March 12, 2011	4:45 AM	9	1	8		40
Saturday, March 12, 2011	5:00 AM	7	4	3		49
Saturday, March 12, 2011	5:15 AM	13	8	5		59
Saturday, March 12, 2011	5:30 AM	11	7	4		65
Saturday, March 12, 2011	5:45 AM	18	7	11		92
Saturday, March 12, 2011	6:00 AM	17	11	6		114
Saturday, March 12, 2011	6:15 AM	19	8	11		151
Saturday, March 12, 2011	6:30 AM	38	25	13		191
Saturday, March 12, 2011	6:45 AM	40	17	23		227
Saturday, March 12, 2011	7:00 AM	54	31	23		262
Saturday, March 12, 2011	7:15 AM	59	29	30		301
Saturday, March 12, 2011	7:30 AM	74	49	25		354
Saturday, March 12, 2011	7:45 AM	75	41	34		400
Saturday, March 12, 2011	8:00 AM	93	61	32		493
Saturday, March 12, 2011	8:15 AM	112	69	43		549
Saturday, March 12, 2011	8:30 AM	120	70	50		594
Saturday, March 12, 2011	8:45 AM	168	94	74		652
Saturday, March 12, 2011	9:00 AM	149	85	64		643
Saturday, March 12, 2011	9:15 AM	157	86	71		684
Saturday, March 12, 2011	9:30 AM	178	97	81		711
Saturday, March 12, 2011	9:45 AM	159	83	76		711
Saturday, March 12, 2011	10:00 AM	190	105	85		765
Saturday, March 12, 2011	10:15 AM	184	113	71		809
Saturday, March 12, 2011	10:30 AM	178	95	83		914

Saturday, March 12, 2011	10:45 AM	213	113	100		1013
Saturday, March 12, 2011	11:00 AM	234	120	114		1068
Saturday, March 12, 2011	11:15 AM	289	167	122		1133
Saturday, March 12, 2011	11:30 AM	277	144	133		1148
Saturday, March 12, 2011	11:45 AM	268	133	135		1173
Saturday, March 12, 2011	12:00 PM	299	165	134		1189
Saturday, March 12, 2011	12:15 PM	304	160	144	Saturday Peak	1173
Saturday, March 12, 2011	12:30 PM	302	156	146		1175
Saturday, March 12, 2011	12:45 PM	284	155	129		1177
Saturday, March 12, 2011	1:00 PM	283	155	128		1156
Saturday, March 12, 2011	1:15 PM	306	159	147		1149
Saturday, March 12, 2011	1:30 PM	304	173	131		1090
Saturday, March 12, 2011	1:45 PM	263	138	125		1025
Saturday, March 12, 2011	2:00 PM	276	146	130		990
Saturday, March 12, 2011	2:15 PM	247	134	113		977
Saturday, March 12, 2011	2:30 PM	239	129	110		936
Saturday, March 12, 2011	2:45 PM	228	125	103		945
Saturday, March 12, 2011	3:00 PM	263	147	116		946
Saturday, March 12, 2011	3:15 PM	206	95	111		913
Saturday, March 12, 2011	3:30 PM	248	135	113		922
Saturday, March 12, 2011	3:45 PM	229	122	107		899
Saturday, March 12, 2011	4:00 PM	230	129	101		848
Saturday, March 12, 2011	4:15 PM	215	110	105		801
Saturday, March 12, 2011	4:30 PM	225	127	98		768
Saturday, March 12, 2011	4:45 PM	178	100	78		744
Saturday, March 12, 2011	5:00 PM	183	98	85		740
Saturday, March 12, 2011	5:15 PM	182	101	81		745
Saturday, March 12, 2011	5:30 PM	201	118	83		727
Saturday, March 12, 2011	5:45 PM	174	113	61		698
Saturday, March 12, 2011	6:00 PM	188	123	65		668
Saturday, March 12, 2011	6:15 PM	164	115	49		618
Saturday, March 12, 2011	6:30 PM	172	114	58		573
Saturday, March 12, 2011	6:45 PM	144	95	49		529
Saturday, March 12, 2011	7:00 PM	138	87	51		477
Saturday, March 12, 2011	7:15 PM	119	82	37		451
Saturday, March 12, 2011	7:30 PM	128	92	36		438
Saturday, March 12, 2011	7:45 PM	92	63	29		381
Saturday, March 12, 2011	8:00 PM	112	81	31		371
Saturday, March 12, 2011	8:15 PM	106	72	34		324
Saturday, March 12, 2011	8:30 PM	71	52	19		283
Saturday, March 12, 2011	8:45 PM	82	52	30		279
Saturday, March 12, 2011	9:00 PM	65	46	19		258
Saturday, March 12, 2011	9:15 PM	65	38	27		234
Saturday, March 12, 2011	9:30 PM	67	52	15		228
Saturday, March 12, 2011	9:45 PM	61	43	18		194
Saturday, March 12, 2011	10:00 PM	41	26	15		170
Saturday, March 12, 2011	10:15 PM	59	47	12		167

Saturday, March 12, 2011	10:30 PM	33	22	11		141
Saturday, March 12, 2011	10:45 PM	37	30	7		138
Saturday, March 12, 2011	11:00 PM	38	22	16		123
Saturday, March 12, 2011	11:15 PM	33	21	12		114
Saturday, March 12, 2011	11:30 PM	30	20	10		112
Saturday, March 12, 2011	11:45 PM	22	15	7		120
Sunday, March 13, 2011	12:00 AM	29	17	12		120
Sunday, March 13, 2011	12:15 AM	31	22	9		115
Sunday, March 13, 2011	12:30 AM	38	32	6		101
Sunday, March 13, 2011	12:45 AM	22	12	10		84
Sunday, March 13, 2011	1:00 AM	24	17	7		89
Sunday, March 13, 2011	1:15 AM	17	13	4		86
Sunday, March 13, 2011	1:30 AM	21	13	8		89
Sunday, March 13, 2011	1:45 AM	27	18	9		99
Sunday, March 13, 2011	2:00 AM	Hour "lost" due to start of Daylight Saving Time				
Sunday, March 13, 2011	2:15 AM					
Sunday, March 13, 2011	2:30 AM					
Sunday, March 13, 2011	2:45 AM					
Sunday, March 13, 2011	3:00 AM	21	13	8		89
Sunday, March 13, 2011	3:15 AM	20	14	6		92
Sunday, March 13, 2011	3:30 AM	31	18	13		83
Sunday, March 13, 2011	3:45 AM	17	9	8		63
Sunday, March 13, 2011	4:00 AM	24	11	13		59
Sunday, March 13, 2011	4:15 AM	11	7	4		55
Sunday, March 13, 2011	4:30 AM	11	7	4		52
Sunday, March 13, 2011	4:45 AM	13	11	2		56
Sunday, March 13, 2011	5:00 AM	20	12	8		49
Sunday, March 13, 2011	5:15 AM	8	6	2		40
Sunday, March 13, 2011	5:30 AM	15	9	6		42
Sunday, March 13, 2011	5:45 AM	6	3	3		36
Sunday, March 13, 2011	6:00 AM	11	8	3		43
Sunday, March 13, 2011	6:15 AM	10	8	2		50
Sunday, March 13, 2011	6:30 AM	9	7	2		57
Sunday, March 13, 2011	6:45 AM	13	10	3		72
Sunday, March 13, 2011	7:00 AM	18	12	6		97
Sunday, March 13, 2011	7:15 AM	17	8	9		108
Sunday, March 13, 2011	7:30 AM	24	18	6		131
Sunday, March 13, 2011	7:45 AM	38	17	21		173
Sunday, March 13, 2011	8:00 AM	29	17	12		212
Sunday, March 13, 2011	8:15 AM	40	20	20		254
Sunday, March 13, 2011	8:30 AM	66	40	26		301
Sunday, March 13, 2011	8:45 AM	77	42	35		350
Sunday, March 13, 2011	9:00 AM	71	35	36		399
Sunday, March 13, 2011	9:15 AM	87	38	49		482
Sunday, March 13, 2011	9:30 AM	115	51	64		524
Sunday, March 13, 2011	9:45 AM	126	66	60		551
Sunday, March 13, 2011	10:00 AM	154	84	70		604

Sunday, March 13, 2011	10:15 AM	129	67	62		620
Sunday, March 13, 2011	10:30 AM	142	69	73		687
Sunday, March 13, 2011	10:45 AM	179	93	86		752
Sunday, March 13, 2011	11:00 AM	170	87	83		795
Sunday, March 13, 2011	11:15 AM	196	99	97		867
Sunday, March 13, 2011	11:30 AM	207	107	100		904
Sunday, March 13, 2011	11:45 AM	222	109	113		908
Sunday, March 13, 2011	12:00 PM	242	103	139		924
Sunday, March 13, 2011	12:15 PM	233	109	124		922
Sunday, March 13, 2011	12:30 PM	211	112	99		935
Sunday, March 13, 2011	12:45 PM	238	119	119		979
Sunday, March 13, 2011	1:00 PM	240	133	107		969
Sunday, March 13, 2011	1:15 PM	246	119	127		982
Sunday, March 13, 2011	1:30 PM	255	140	115	Sunday Peak	982
Sunday, March 13, 2011	1:45 PM	228	109	119		956
Sunday, March 13, 2011	2:00 PM	253	137	116		957
Sunday, March 13, 2011	2:15 PM	246	135	111		932
Sunday, March 13, 2011	2:30 PM	229	104	125		916
Sunday, March 13, 2011	2:45 PM	229	116	113		905
Sunday, March 13, 2011	3:00 PM	228	111	117		906
Sunday, March 13, 2011	3:15 PM	230	100	130		913
Sunday, March 13, 2011	3:30 PM	218	128	90		887
Sunday, March 13, 2011	3:45 PM	230	110	120		898
Sunday, March 13, 2011	4:00 PM	235	107	128		872
Sunday, March 13, 2011	4:15 PM	204	107	97		825
Sunday, March 13, 2011	4:30 PM	229	120	109		817
Sunday, March 13, 2011	4:45 PM	204	106	98		739
Sunday, March 13, 2011	5:00 PM	188	109	79		699
Sunday, March 13, 2011	5:15 PM	196	101	95		676
Sunday, March 13, 2011	5:30 PM	151	86	65		632
Sunday, March 13, 2011	5:45 PM	164	85	79		620
Sunday, March 13, 2011	6:00 PM	165	76	89		594
Sunday, March 13, 2011	6:15 PM	152	89	63		559
Sunday, March 13, 2011	6:30 PM	139	82	57		524
Sunday, March 13, 2011	6:45 PM	138	76	62		478
Sunday, March 13, 2011	7:00 PM	130	83	47		451
Sunday, March 13, 2011	7:15 PM	117	74	43		396
Sunday, March 13, 2011	7:30 PM	93	52	41		353
Sunday, March 13, 2011	7:45 PM	111	65	46		324
Sunday, March 13, 2011	8:00 PM	75	46	29		265
Sunday, March 13, 2011	8:15 PM	74	44	30		249
Sunday, March 13, 2011	8:30 PM	64	48	16		234
Sunday, March 13, 2011	8:45 PM	52	33	19		211
Sunday, March 13, 2011	9:00 PM	59	44	15		206
Sunday, March 13, 2011	9:15 PM	59	39	20		177
Sunday, March 13, 2011	9:30 PM	41	28	13		152
Sunday, March 13, 2011	9:45 PM	47	33	14		134

Sunday, March 13, 2011	10:00 PM	30	17	13		123
Sunday, March 13, 2011	10:15 PM	34	23	11		120
Sunday, March 13, 2011	10:30 PM	23	13	10		103
Sunday, March 13, 2011	10:45 PM	36	22	14		114
Sunday, March 13, 2011	11:00 PM	27	18	9		93
Sunday, March 13, 2011	11:15 PM	17	15	2		87
Sunday, March 13, 2011	11:30 PM	34	25	9		83
Sunday, March 13, 2011	11:45 PM	15	13	2		57
Monday, March 14, 2011	12:00 AM	21	12	9		52
Monday, March 14, 2011	12:15 AM	13	7	6		41
Monday, March 14, 2011	12:30 AM	8	7	1		35
Monday, March 14, 2011	12:45 AM	10	8	2		32
Monday, March 14, 2011	1:00 AM	10	7	3		26
Monday, March 14, 2011	1:15 AM	7	5	2		29
Monday, March 14, 2011	1:30 AM	5	2	3		40
Monday, March 14, 2011	1:45 AM	4	4	0		47
Monday, March 14, 2011	2:00 AM	13	7	6		48
Monday, March 14, 2011	2:15 AM	18	11	7		40
Monday, March 14, 2011	2:30 AM	12	7	5		30
Monday, March 14, 2011	2:45 AM	5	2	3		23
Monday, March 14, 2011	3:00 AM	5	3	2		29
Monday, March 14, 2011	3:15 AM	8	6	2		42
Monday, March 14, 2011	3:30 AM	5	2	3		41
Monday, March 14, 2011	3:45 AM	11	7	4		41
Monday, March 14, 2011	4:00 AM	18	13	5		54
Monday, March 14, 2011	4:15 AM	7	5	2		52
Monday, March 14, 2011	4:30 AM	5	1	4		74
Monday, March 14, 2011	4:45 AM	24	14	10		106
Monday, March 14, 2011	5:00 AM	16	10	6		140
Monday, March 14, 2011	5:15 AM	29	19	10		208
Monday, March 14, 2011	5:30 AM	37	30	7		258
Monday, March 14, 2011	5:45 AM	58	47	11		327
Monday, March 14, 2011	6:00 AM	84	67	17		384
Monday, March 14, 2011	6:15 AM	79	60	19		429
Monday, March 14, 2011	6:30 AM	106	82	24		532
Monday, March 14, 2011	6:45 AM	115	90	25		665
Monday, March 14, 2011	7:00 AM	129	99	30		816
Monday, March 14, 2011	7:15 AM	182	155	27		874
Monday, March 14, 2011	7:30 AM	239	185	54	Monday	869
Monday, March 14, 2011	7:45 AM	266	205	61	AM Peak	800
Monday, March 14, 2011	8:00 AM	187	134	53		716
Monday, March 14, 2011	8:15 AM	177	124	53		694
Monday, March 14, 2011	8:30 AM	170	107	63		688
Monday, March 14, 2011	8:45 AM	182	117	65		697
Monday, March 14, 2011	9:00 AM	165	90	75		668
Monday, March 14, 2011	9:15 AM	171	106	65		659
Monday, March 14, 2011	9:30 AM	179	110	69		693

Monday, March 14, 2011	9:45 AM	153	78	75		730
Monday, March 14, 2011	10:00 AM	156	77	79		789
Monday, March 14, 2011	10:15 AM	205	114	91		885
Monday, March 14, 2011	10:30 AM	216	108	108		932
Monday, March 14, 2011	10:45 AM	212	106	106		1048
Monday, March 14, 2011	11:00 AM	252	129	123		1158
Monday, March 14, 2011	11:15 AM	252	133	119		1318
Monday, March 14, 2011	11:30 AM	332	149	183		1418
Monday, March 14, 2011	11:45 AM	322	151	171	Monday Mid-Day Peak	1457
Monday, March 14, 2011	12:00 PM	412	196	216		1438
Monday, March 14, 2011	12:15 PM	352	172	180		1367
Monday, March 14, 2011	12:30 PM	371	193	178		1337
Monday, March 14, 2011	12:45 PM	303	149	154		1225
Monday, March 14, 2011	1:00 PM	341	167	174		1235
Monday, March 14, 2011	1:15 PM	322	159	163		1151
Monday, March 14, 2011	1:30 PM	259	157	102		1084
Monday, March 14, 2011	1:45 PM	313	149	164		1099
Monday, March 14, 2011	2:00 PM	257	128	129		1081
Monday, March 14, 2011	2:15 PM	255	133	122		1098
Monday, March 14, 2011	2:30 PM	274	139	135		1129
Monday, March 14, 2011	2:45 PM	295	146	149		1210
Monday, March 14, 2011	3:00 PM	274	116	158		1256
Monday, March 14, 2011	3:15 PM	286	139	147		1320
Monday, March 14, 2011	3:30 PM	355	150	205		1368
Monday, March 14, 2011	3:45 PM	341	163	178		1368
Monday, March 14, 2011	4:00 PM	338	171	167		1371
Monday, March 14, 2011	4:15 PM	334	133	201		1442
Monday, March 14, 2011	4:30 PM	355	165	190	Monday PM Peak	1444
Monday, March 14, 2011	4:45 PM	344	154	190		1363
Monday, March 14, 2011	5:00 PM	409	201	208		1288
Monday, March 14, 2011	5:15 PM	336	179	157		1160
Monday, March 14, 2011	5:30 PM	274	143	131		1043
Monday, March 14, 2011	5:45 PM	269	143	126		955
Monday, March 14, 2011	6:00 PM	281	142	139		858
Monday, March 14, 2011	6:15 PM	219	109	110		727
Monday, March 14, 2011	6:30 PM	186	97	89		646
Monday, March 14, 2011	6:45 PM	172	98	74		592
Monday, March 14, 2011	7:00 PM	150	82	68		541
Monday, March 14, 2011	7:15 PM	138	83	55		491
Monday, March 14, 2011	7:30 PM	132	80	52		443
Monday, March 14, 2011	7:45 PM	121	75	46		400
Monday, March 14, 2011	8:00 PM	100	58	42		362
Monday, March 14, 2011	8:15 PM	90	54	36		340
Monday, March 14, 2011	8:30 PM	89	51	38		321
Monday, March 14, 2011	8:45 PM	83	38	45		295
Monday, March 14, 2011	9:00 PM	78	49	29		253
Monday, March 14, 2011	9:15 PM	71	50	21		231

Monday, March 14, 2011	9:30 PM	63	47	16		197
Monday, March 14, 2011	9:45 PM	41	26	15		167
Monday, March 14, 2011	10:00 PM	56	40	16		155
Monday, March 14, 2011	10:15 PM	37	22	15		137
Monday, March 14, 2011	10:30 PM	33	16	17		130
Monday, March 14, 2011	10:45 PM	29	21	8		118
Monday, March 14, 2011	11:00 PM	38	24	14		106
Monday, March 14, 2011	11:15 PM	30	22	8		87
Monday, March 14, 2011	11:30 PM	21	17	4		74
Monday, March 14, 2011	11:45 PM	17	12	5		65
Tuesday, March 15, 2011	12:00 AM	19	14	5		58
Tuesday, March 15, 2011	12:15 AM	17	14	3		52
Tuesday, March 15, 2011	12:30 AM	12	9	3		47
Tuesday, March 15, 2011	12:45 AM	10	4	6		42
Tuesday, March 15, 2011	1:00 AM	13	11	2		38
Tuesday, March 15, 2011	1:15 AM	12	7	5		31
Tuesday, March 15, 2011	1:30 AM	7	3	4		34
Tuesday, March 15, 2011	1:45 AM	6	1	5		30
Tuesday, March 15, 2011	2:00 AM	6	5	1		32
Tuesday, March 15, 2011	2:15 AM	15	11	4		31
Tuesday, March 15, 2011	2:30 AM	3	0	3		24
Tuesday, March 15, 2011	2:45 AM	8	6	2		24
Tuesday, March 15, 2011	3:00 AM	5	3	2		30
Tuesday, March 15, 2011	3:15 AM	8	6	2		35
Tuesday, March 15, 2011	3:30 AM	3	1	2		34
Tuesday, March 15, 2011	3:45 AM	14	11	3		39
Tuesday, March 15, 2011	4:00 AM	10	5	5		41
Tuesday, March 15, 2011	4:15 AM	7	6	1		46
Tuesday, March 15, 2011	4:30 AM	8	4	4		75
Tuesday, March 15, 2011	4:45 AM	16	4	12		105
Tuesday, March 15, 2011	5:00 AM	15	11	4		163
Tuesday, March 15, 2011	5:15 AM	36	28	8		228
Tuesday, March 15, 2011	5:30 AM	38	28	10		273
Tuesday, March 15, 2011	5:45 AM	74	62	12		372
Tuesday, March 15, 2011	6:00 AM	80	60	20		430
Tuesday, March 15, 2011	6:15 AM	81	57	24		491
Tuesday, March 15, 2011	6:30 AM	137	111	26		636
Tuesday, March 15, 2011	6:45 AM	132	100	32		766
Tuesday, March 15, 2011	7:00 AM	141	109	32		908
Tuesday, March 15, 2011	7:15 AM	226	183	43		981
Tuesday, March 15, 2011	7:30 AM	267	218	49	Tuesday	932
Tuesday, March 15, 2011	7:45 AM	274	214	60	AM Peak	849
Tuesday, March 15, 2011	8:00 AM	214	156	58		741
Tuesday, March 15, 2011	8:15 AM	177	104	73		708
Tuesday, March 15, 2011	8:30 AM	184	117	67		721
Tuesday, March 15, 2011	8:45 AM	166	100	66		727
Tuesday, March 15, 2011	9:00 AM	181	102	79		745

Tuesday, March 15, 2011	9:15 AM	190	111	79		756
Tuesday, March 15, 2011	9:30 AM	190	108	82		795
Tuesday, March 15, 2011	9:45 AM	184	101	83		809
Tuesday, March 15, 2011	10:00 AM	192	100	92		847
Tuesday, March 15, 2011	10:15 AM	229	128	101		885
Tuesday, March 15, 2011	10:30 AM	204	116	88		938
Tuesday, March 15, 2011	10:45 AM	222	108	114		1034
Tuesday, March 15, 2011	11:00 AM	230	114	116		1171
Tuesday, March 15, 2011	11:15 AM	282	142	140		1258
Tuesday, March 15, 2011	11:30 AM	300	131	169		1333
Tuesday, March 15, 2011	11:45 AM	359	180	179		1409
Tuesday, March 15, 2011	12:00 PM	317	169	148		1388
Tuesday, March 15, 2011	12:15 PM	357	183	174		
Tuesday, March 15, 2011	12:30 PM	376	185	191		
Tuesday, March 15, 2011	12:45 PM	338	175	163		

Totals	52452	28874	23578

Hourly Counts
East Broadway
Copps - Stoughton

Traffic Volumes on Broadway between Copps Ave and Stoughton Rd
Monona, WI
Counted Friday, March 11, 2011 to Tuesday March 15, 2011
Axle Factor Used = 2.06 Axles Per Vehicle

Date	Time	Total	WB	EB		Hourly Total
Friday, March 11, 2011	1:00 PM	373	164	209		1342
Friday, March 11, 2011	1:15 PM	373	161	212		1274
Friday, March 11, 2011	1:30 PM	290	130	160		1162
Friday, March 11, 2011	1:45 PM	306	138	168		1198
Friday, March 11, 2011	2:00 PM	305	135	170		1195
Friday, March 11, 2011	2:15 PM	261	124	137		1190
Friday, March 11, 2011	2:30 PM	326	158	168		1213
Friday, March 11, 2011	2:45 PM	303	146	157		1281
Friday, March 11, 2011	3:00 PM	300	137	163		1285
Friday, March 11, 2011	3:15 PM	284	119	165		1336
Friday, March 11, 2011	3:30 PM	394	173	221		1394
Friday, March 11, 2011	3:45 PM	307	132	175	Friday PM	1374
Friday, March 11, 2011	4:00 PM	351	169	182	Peak	1390
Friday, March 11, 2011	4:15 PM	342	141	201		1386
Friday, March 11, 2011	4:30 PM	374	167	207		1368
Friday, March 11, 2011	4:45 PM	323	144	179		1328
Friday, March 11, 2011	5:00 PM	347	159	188		1288
Friday, March 11, 2011	5:15 PM	324	144	180		1186
Friday, March 11, 2011	5:30 PM	334	142	192		1101
Friday, March 11, 2011	5:45 PM	283	122	161		964
Friday, March 11, 2011	6:00 PM	245	103	142		864
Friday, March 11, 2011	6:15 PM	239	109	130		817
Friday, March 11, 2011	6:30 PM	197	73	124		722
Friday, March 11, 2011	6:45 PM	183	86	97		673
Friday, March 11, 2011	7:00 PM	198	82	116		642
Friday, March 11, 2011	7:15 PM	144	57	87		589
Friday, March 11, 2011	7:30 PM	148	68	80		567
Friday, March 11, 2011	7:45 PM	152	56	96		534
Friday, March 11, 2011	8:00 PM	145	66	79		494
Friday, March 11, 2011	8:15 PM	122	48	74		470
Friday, March 11, 2011	8:30 PM	115	61	54		436
Friday, March 11, 2011	8:45 PM	112	42	70		391
Friday, March 11, 2011	9:00 PM	121	50	71		344
Friday, March 11, 2011	9:15 PM	88	32	56		313
Friday, March 11, 2011	9:30 PM	70	33	37		297
Friday, March 11, 2011	9:45 PM	65	26	39		281
Friday, March 11, 2011	10:00 PM	90	36	54		275
Friday, March 11, 2011	10:15 PM	72	30	42		233
Friday, March 11, 2011	10:30 PM	54	26	28		203
Friday, March 11, 2011	10:45 PM	59	24	35		185

Friday, March 11, 2011	11:00 PM	48	21	27		167
Friday, March 11, 2011	11:15 PM	42	18	24		158
Friday, March 11, 2011	11:30 PM	36	19	17		150
Friday, March 11, 2011	11:45 PM	41	17	24		150
Saturday, March 12, 2011	12:00 AM	39	15	24		144
Saturday, March 12, 2011	12:15 AM	34	14	20		134
Saturday, March 12, 2011	12:30 AM	36	13	23		123
Saturday, March 12, 2011	12:45 AM	35	17	18		109
Saturday, March 12, 2011	1:00 AM	29	17	12		100
Saturday, March 12, 2011	1:15 AM	23	6	17		97
Saturday, March 12, 2011	1:30 AM	22	14	8		106
Saturday, March 12, 2011	1:45 AM	26	10	16		112
Saturday, March 12, 2011	2:00 AM	26	10	16		101
Saturday, March 12, 2011	2:15 AM	32	11	21		90
Saturday, March 12, 2011	2:30 AM	28	10	18		70
Saturday, March 12, 2011	2:45 AM	15	8	7		51
Saturday, March 12, 2011	3:00 AM	15	5	10		53
Saturday, March 12, 2011	3:15 AM	12	4	8		54
Saturday, March 12, 2011	3:30 AM	9	6	3		55
Saturday, March 12, 2011	3:45 AM	17	3	14		59
Saturday, March 12, 2011	4:00 AM	16	7	9		59
Saturday, March 12, 2011	4:15 AM	13	5	8		54
Saturday, March 12, 2011	4:30 AM	13	11	2		50
Saturday, March 12, 2011	4:45 AM	17	13	4		49
Saturday, March 12, 2011	5:00 AM	11	4	7		48
Saturday, March 12, 2011	5:15 AM	9	5	4		54
Saturday, March 12, 2011	5:30 AM	12	10	2		72
Saturday, March 12, 2011	5:45 AM	16	10	6		95
Saturday, March 12, 2011	6:00 AM	17	12	5		128
Saturday, March 12, 2011	6:15 AM	27	19	8		146
Saturday, March 12, 2011	6:30 AM	35	18	17		178
Saturday, March 12, 2011	6:45 AM	49	26	23		228
Saturday, March 12, 2011	7:00 AM	35	20	15		267
Saturday, March 12, 2011	7:15 AM	59	35	24		339
Saturday, March 12, 2011	7:30 AM	85	54	31		400
Saturday, March 12, 2011	7:45 AM	88	58	30		448
Saturday, March 12, 2011	8:00 AM	107	66	41		518
Saturday, March 12, 2011	8:15 AM	120	67	53		579
Saturday, March 12, 2011	8:30 AM	133	76	57		636
Saturday, March 12, 2011	8:45 AM	158	102	56		687
Saturday, March 12, 2011	9:00 AM	168	92	76		750
Saturday, March 12, 2011	9:15 AM	177	102	75		805
Saturday, March 12, 2011	9:30 AM	184	113	71		829
Saturday, March 12, 2011	9:45 AM	221	126	95		874
Saturday, March 12, 2011	10:00 AM	223	134	89		897
Saturday, March 12, 2011	10:15 AM	201	110	91		914
Saturday, March 12, 2011	10:30 AM	229	123	106		957

Saturday, March 12, 2011	10:45 AM	244	128	116		991
Saturday, March 12, 2011	11:00 AM	240	130	110		1013
Saturday, March 12, 2011	11:15 AM	244	126	118		1054
Saturday, March 12, 2011	11:30 AM	263	144	119		1118
Saturday, March 12, 2011	11:45 AM	266	123	143		1143
Saturday, March 12, 2011	12:00 PM	281	142	139		1148
Saturday, March 12, 2011	12:15 PM	308	130	178	Saturday Peak	1176
Saturday, March 12, 2011	12:30 PM	288	120	168		1168
Saturday, March 12, 2011	12:45 PM	271	120	151		1153
Saturday, March 12, 2011	1:00 PM	309	146	163		1123
Saturday, March 12, 2011	1:15 PM	300	140	160		1057
Saturday, March 12, 2011	1:30 PM	273	126	147		1004
Saturday, March 12, 2011	1:45 PM	241	116	125		995
Saturday, March 12, 2011	2:00 PM	243	101	142		963
Saturday, March 12, 2011	2:15 PM	247	107	140		952
Saturday, March 12, 2011	2:30 PM	264	119	145		955
Saturday, March 12, 2011	2:45 PM	209	101	108		906
Saturday, March 12, 2011	3:00 PM	232	105	127		915
Saturday, March 12, 2011	3:15 PM	250	100	150		893
Saturday, March 12, 2011	3:30 PM	215	104	111		862
Saturday, March 12, 2011	3:45 PM	218	102	116		854
Saturday, March 12, 2011	4:00 PM	210	97	113		812
Saturday, March 12, 2011	4:15 PM	219	94	125		826
Saturday, March 12, 2011	4:30 PM	207	90	117		790
Saturday, March 12, 2011	4:45 PM	176	77	99		792
Saturday, March 12, 2011	5:00 PM	224	90	134		787
Saturday, March 12, 2011	5:15 PM	183	74	109		731
Saturday, March 12, 2011	5:30 PM	209	94	115		718
Saturday, March 12, 2011	5:45 PM	171	84	87		691
Saturday, March 12, 2011	6:00 PM	168	81	87		675
Saturday, March 12, 2011	6:15 PM	170	84	86		649
Saturday, March 12, 2011	6:30 PM	182	68	114		603
Saturday, March 12, 2011	6:45 PM	155	63	92		537
Saturday, March 12, 2011	7:00 PM	142	57	85		496
Saturday, March 12, 2011	7:15 PM	124	60	64		461
Saturday, March 12, 2011	7:30 PM	116	49	67		449
Saturday, March 12, 2011	7:45 PM	114	57	57		413
Saturday, March 12, 2011	8:00 PM	107	48	59		408
Saturday, March 12, 2011	8:15 PM	112	53	59		390
Saturday, March 12, 2011	8:30 PM	80	41	39		363
Saturday, March 12, 2011	8:45 PM	109	42	67		347
Saturday, March 12, 2011	9:00 PM	89	39	50		305
Saturday, March 12, 2011	9:15 PM	85	35	50		282
Saturday, March 12, 2011	9:30 PM	64	28	36		254
Saturday, March 12, 2011	9:45 PM	67	32	35		231
Saturday, March 12, 2011	10:00 PM	66	34	32		204
Saturday, March 12, 2011	10:15 PM	57	29	28		179

Saturday, March 12, 2011	10:30 PM	41	19	22		153
Saturday, March 12, 2011	10:45 PM	40	23	17		149
Saturday, March 12, 2011	11:00 PM	41	14	27		143
Saturday, March 12, 2011	11:15 PM	31	12	19		131
Saturday, March 12, 2011	11:30 PM	37	18	19		127
Saturday, March 12, 2011	11:45 PM	34	13	21		117
Sunday, March 13, 2011	12:00 AM	29	16	13		116
Sunday, March 13, 2011	12:15 AM	27	14	13		114
Sunday, March 13, 2011	12:30 AM	27	16	11		102
Sunday, March 13, 2011	12:45 AM	33	14	19		100
Sunday, March 13, 2011	1:00 AM	27	13	14		90
Sunday, March 13, 2011	1:15 AM	15	5	10		87
Sunday, March 13, 2011	1:30 AM	25	11	14		91
Sunday, March 13, 2011	1:45 AM	23	10	13		97
Sunday, March 13, 2011	2:00 AM	Hour "lost" due to start of Daylight Saving Time				
Sunday, March 13, 2011	2:15 AM					
Sunday, March 13, 2011	2:30 AM					
Sunday, March 13, 2011	2:45 AM					
Sunday, March 13, 2011	3:00 AM	24	12	12		100
Sunday, March 13, 2011	3:15 AM	19	12	7		102
Sunday, March 13, 2011	3:30 AM	31	17	14		108
Sunday, March 13, 2011	3:45 AM	26	11	15		88
Sunday, March 13, 2011	4:00 AM	26	7	19		76
Sunday, March 13, 2011	4:15 AM	25	13	12		60
Sunday, March 13, 2011	4:30 AM	11	4	7		42
Sunday, March 13, 2011	4:45 AM	14	8	6		45
Sunday, March 13, 2011	5:00 AM	10	6	4		42
Sunday, March 13, 2011	5:15 AM	7	3	4		41
Sunday, March 13, 2011	5:30 AM	14	5	9		56
Sunday, March 13, 2011	5:45 AM	11	6	5		54
Sunday, March 13, 2011	6:00 AM	9	6	3		55
Sunday, March 13, 2011	6:15 AM	22	15	7		61
Sunday, March 13, 2011	6:30 AM	12	6	6		64
Sunday, March 13, 2011	6:45 AM	12	9	3		86
Sunday, March 13, 2011	7:00 AM	15	9	6		128
Sunday, March 13, 2011	7:15 AM	25	18	7		159
Sunday, March 13, 2011	7:30 AM	34	17	17		189
Sunday, March 13, 2011	7:45 AM	54	27	27		229
Sunday, March 13, 2011	8:00 AM	46	27	19		259
Sunday, March 13, 2011	8:15 AM	55	33	22		278
Sunday, March 13, 2011	8:30 AM	74	43	31		322
Sunday, March 13, 2011	8:45 AM	84	50	34		346
Sunday, March 13, 2011	9:00 AM	65	42	23		402
Sunday, March 13, 2011	9:15 AM	99	53	46		494
Sunday, March 13, 2011	9:30 AM	98	51	47		534
Sunday, March 13, 2011	9:45 AM	140	93	47		593
Sunday, March 13, 2011	10:00 AM	157	99	58		617

Sunday, March 13, 2011	10:15 AM	139	81	58		639
Sunday, March 13, 2011	10:30 AM	157	92	65		704
Sunday, March 13, 2011	10:45 AM	164	81	83		786
Sunday, March 13, 2011	11:00 AM	179	100	79		848
Sunday, March 13, 2011	11:15 AM	204	101	103		911
Sunday, March 13, 2011	11:30 AM	239	124	115		906
Sunday, March 13, 2011	11:45 AM	226	113	113		884
Sunday, March 13, 2011	12:00 PM	242	108	134		877
Sunday, March 13, 2011	12:15 PM	199	100	99		889
Sunday, March 13, 2011	12:30 PM	217	117	100		927
Sunday, March 13, 2011	12:45 PM	219	119	100		939
Sunday, March 13, 2011	1:00 PM	254	119	135	Sunday Peak	954
Sunday, March 13, 2011	1:15 PM	237	110	127		929
Sunday, March 13, 2011	1:30 PM	229	117	112		928
Sunday, March 13, 2011	1:45 PM	234	115	119		949
Sunday, March 13, 2011	2:00 PM	229	117	112		930
Sunday, March 13, 2011	2:15 PM	236	120	116		937
Sunday, March 13, 2011	2:30 PM	250	119	131		924
Sunday, March 13, 2011	2:45 PM	215	94	121		899
Sunday, March 13, 2011	3:00 PM	236	98	138		888
Sunday, March 13, 2011	3:15 PM	223	110	113		875
Sunday, March 13, 2011	3:30 PM	225	109	116		868
Sunday, March 13, 2011	3:45 PM	204	90	114		833
Sunday, March 13, 2011	4:00 PM	223	92	131		823
Sunday, March 13, 2011	4:15 PM	216	80	136		770
Sunday, March 13, 2011	4:30 PM	190	83	107		720
Sunday, March 13, 2011	4:45 PM	194	92	102		683
Sunday, March 13, 2011	5:00 PM	170	89	81		675
Sunday, March 13, 2011	5:15 PM	166	85	81		670
Sunday, March 13, 2011	5:30 PM	153	69	84		655
Sunday, March 13, 2011	5:45 PM	186	85	101		645
Sunday, March 13, 2011	6:00 PM	165	77	88		596
Sunday, March 13, 2011	6:15 PM	151	65	86		558
Sunday, March 13, 2011	6:30 PM	143	66	77		519
Sunday, March 13, 2011	6:45 PM	137	58	79		473
Sunday, March 13, 2011	7:00 PM	127	51	76		431
Sunday, March 13, 2011	7:15 PM	112	50	62		389
Sunday, March 13, 2011	7:30 PM	97	43	54		350
Sunday, March 13, 2011	7:45 PM	95	32	63		326
Sunday, March 13, 2011	8:00 PM	85	29	56		276
Sunday, March 13, 2011	8:15 PM	73	34	39		240
Sunday, March 13, 2011	8:30 PM	73	36	37		210
Sunday, March 13, 2011	8:45 PM	45	17	28		180
Sunday, March 13, 2011	9:00 PM	49	26	23		181
Sunday, March 13, 2011	9:15 PM	43	24	19		173
Sunday, March 13, 2011	9:30 PM	43	19	24		155
Sunday, March 13, 2011	9:45 PM	46	21	25		137

Sunday, March 13, 2011	10:00 PM	41	19	22		117
Sunday, March 13, 2011	10:15 PM	25	13	12		93
Sunday, March 13, 2011	10:30 PM	25	12	13		87
Sunday, March 13, 2011	10:45 PM	26	11	15		79
Sunday, March 13, 2011	11:00 PM	17	5	12		73
Sunday, March 13, 2011	11:15 PM	19	15	4		74
Sunday, March 13, 2011	11:30 PM	17	10	7		74
Sunday, March 13, 2011	11:45 PM	20	15	5		71
Monday, March 14, 2011	12:00 AM	18	9	9		61
Monday, March 14, 2011	12:15 AM	19	4	15		55
Monday, March 14, 2011	12:30 AM	14	4	10		41
Monday, March 14, 2011	12:45 AM	10	6	4		32
Monday, March 14, 2011	1:00 AM	12	6	6		30
Monday, March 14, 2011	1:15 AM	5	2	3		22
Monday, March 14, 2011	1:30 AM	5	1	4		29
Monday, March 14, 2011	1:45 AM	8	2	6		31
Monday, March 14, 2011	2:00 AM	4	3	1		29
Monday, March 14, 2011	2:15 AM	12	5	7		33
Monday, March 14, 2011	2:30 AM	7	4	3		23
Monday, March 14, 2011	2:45 AM	6	2	4		22
Monday, March 14, 2011	3:00 AM	8	3	5		29
Monday, March 14, 2011	3:15 AM	2	2	0		35
Monday, March 14, 2011	3:30 AM	6	1	5		45
Monday, March 14, 2011	3:45 AM	13	8	5		49
Monday, March 14, 2011	4:00 AM	14	8	6		60
Monday, March 14, 2011	4:15 AM	12	8	4		68
Monday, March 14, 2011	4:30 AM	10	6	4		84
Monday, March 14, 2011	4:45 AM	24	20	4		115
Monday, March 14, 2011	5:00 AM	22	17	5		160
Monday, March 14, 2011	5:15 AM	28	17	11		224
Monday, March 14, 2011	5:30 AM	41	30	11		289
Monday, March 14, 2011	5:45 AM	69	60	9		378
Monday, March 14, 2011	6:00 AM	86	62	24		465
Monday, March 14, 2011	6:15 AM	93	69	24		533
Monday, March 14, 2011	6:30 AM	130	83	47		659
Monday, March 14, 2011	6:45 AM	156	108	48		814
Monday, March 14, 2011	7:00 AM	154	108	46		956
Monday, March 14, 2011	7:15 AM	219	160	59		1010
Monday, March 14, 2011	7:30 AM	285	214	71	Monday	997
Monday, March 14, 2011	7:45 AM	298	209	89	AM Peak	888
Monday, March 14, 2011	8:00 AM	208	136	72		773
Monday, March 14, 2011	8:15 AM	206	140	66		735
Monday, March 14, 2011	8:30 AM	176	101	75		708
Monday, March 14, 2011	8:45 AM	183	120	63		722
Monday, March 14, 2011	9:00 AM	170	88	82		728
Monday, March 14, 2011	9:15 AM	179	104	75		756
Monday, March 14, 2011	9:30 AM	190	103	87		763

Monday, March 14, 2011	9:45 AM	189	106	83		782
Monday, March 14, 2011	10:00 AM	198	102	96		822
Monday, March 14, 2011	10:15 AM	186	103	83		880
Monday, March 14, 2011	10:30 AM	209	116	93		947
Monday, March 14, 2011	10:45 AM	229	135	94		1042
Monday, March 14, 2011	11:00 AM	256	122	134		1141
Monday, March 14, 2011	11:15 AM	253	142	111		1239
Monday, March 14, 2011	11:30 AM	304	158	146		1324
Monday, March 14, 2011	11:45 AM	328	186	142	Monday Mid-Day Peak	1396
Monday, March 14, 2011	12:00 PM	354	193	161		1389
Monday, March 14, 2011	12:15 PM	338	162	176		1357
Monday, March 14, 2011	12:30 PM	376	183	193		1329
Monday, March 14, 2011	12:45 PM	321	150	171		1218
Monday, March 14, 2011	1:00 PM	322	161	161		1175
Monday, March 14, 2011	1:15 PM	310	136	174		1148
Monday, March 14, 2011	1:30 PM	265	133	132		1105
Monday, March 14, 2011	1:45 PM	278	128	150		1083
Monday, March 14, 2011	2:00 PM	295	142	153		1074
Monday, March 14, 2011	2:15 PM	267	122	145		1055
Monday, March 14, 2011	2:30 PM	243	134	109		1071
Monday, March 14, 2011	2:45 PM	269	122	147		1195
Monday, March 14, 2011	3:00 PM	276	118	158		1238
Monday, March 14, 2011	3:15 PM	283	130	153		1275
Monday, March 14, 2011	3:30 PM	367	172	195		1317
Monday, March 14, 2011	3:45 PM	312	135	177		1308
Monday, March 14, 2011	4:00 PM	313	134	179		1327
Monday, March 14, 2011	4:15 PM	325	135	190		1408
Monday, March 14, 2011	4:30 PM	358	173	185	Monday PM Peak	1429
Monday, March 14, 2011	4:45 PM	331	143	188		1345
Monday, March 14, 2011	5:00 PM	394	180	214		1262
Monday, March 14, 2011	5:15 PM	346	146	200		1089
Monday, March 14, 2011	5:30 PM	274	118	156		980
Monday, March 14, 2011	5:45 PM	248	113	135		874
Monday, March 14, 2011	6:00 PM	221	90	131		802
Monday, March 14, 2011	6:15 PM	237	100	137		758
Monday, March 14, 2011	6:30 PM	168	84	84		654
Monday, March 14, 2011	6:45 PM	176	85	91		631
Monday, March 14, 2011	7:00 PM	177	77	100		591
Monday, March 14, 2011	7:15 PM	133	56	77		542
Monday, March 14, 2011	7:30 PM	145	66	79		516
Monday, March 14, 2011	7:45 PM	136	62	74		463
Monday, March 14, 2011	8:00 PM	128	50	78		419
Monday, March 14, 2011	8:15 PM	107	52	55		390
Monday, March 14, 2011	8:30 PM	92	36	56		348
Monday, March 14, 2011	8:45 PM	92	34	58		310
Monday, March 14, 2011	9:00 PM	99	41	58		257
Monday, March 14, 2011	9:15 PM	65	31	34		228

Monday, March 14, 2011	9:30 PM	54	22	32		206
Monday, March 14, 2011	9:45 PM	39	19	20		182
Monday, March 14, 2011	10:00 PM	70	29	41		187
Monday, March 14, 2011	10:15 PM	43	14	29		155
Monday, March 14, 2011	10:30 PM	30	7	23		143
Monday, March 14, 2011	10:45 PM	44	24	20		138
Monday, March 14, 2011	11:00 PM	38	18	20		112
Monday, March 14, 2011	11:15 PM	31	14	17		94
Monday, March 14, 2011	11:30 PM	25	13	12		80
Monday, March 14, 2011	11:45 PM	18	9	9		67
Tuesday, March 15, 2011	12:00 AM	20	12	8		61
Tuesday, March 15, 2011	12:15 AM	17	5	12		56
Tuesday, March 15, 2011	12:30 AM	12	5	7		57
Tuesday, March 15, 2011	12:45 AM	12	6	6		56
Tuesday, March 15, 2011	1:00 AM	15	7	8		50
Tuesday, March 15, 2011	1:15 AM	18	7	11		42
Tuesday, March 15, 2011	1:30 AM	11	3	8		31
Tuesday, March 15, 2011	1:45 AM	6	1	5		25
Tuesday, March 15, 2011	2:00 AM	7	1	6		28
Tuesday, March 15, 2011	2:15 AM	7	5	2		26
Tuesday, March 15, 2011	2:30 AM	5	2	3		30
Tuesday, March 15, 2011	2:45 AM	9	4	5		33
Tuesday, March 15, 2011	3:00 AM	5	2	3		35
Tuesday, March 15, 2011	3:15 AM	11	5	6		41
Tuesday, March 15, 2011	3:30 AM	8	6	2		40
Tuesday, March 15, 2011	3:45 AM	11	7	4		47
Tuesday, March 15, 2011	4:00 AM	11	3	8		58
Tuesday, March 15, 2011	4:15 AM	10	9	1		65
Tuesday, March 15, 2011	4:30 AM	15	9	6		91
Tuesday, March 15, 2011	4:45 AM	22	18	4		130
Tuesday, March 15, 2011	5:00 AM	18	12	6		197
Tuesday, March 15, 2011	5:15 AM	36	24	12		258
Tuesday, March 15, 2011	5:30 AM	54	34	20		316
Tuesday, March 15, 2011	5:45 AM	89	74	15		398
Tuesday, March 15, 2011	6:00 AM	79	62	17		486
Tuesday, March 15, 2011	6:15 AM	94	65	29		575
Tuesday, March 15, 2011	6:30 AM	136	105	31		735
Tuesday, March 15, 2011	6:45 AM	177	127	50		921
Tuesday, March 15, 2011	7:00 AM	168	111	57		1068
Tuesday, March 15, 2011	7:15 AM	254	188	66		1159
Tuesday, March 15, 2011	7:30 AM	322	235	87	Tuesday	1094
Tuesday, March 15, 2011	7:45 AM	324	237	87	AM Peak	977
Tuesday, March 15, 2011	8:00 AM	259	165	94		873
Tuesday, March 15, 2011	8:15 AM	189	111	78		831
Tuesday, March 15, 2011	8:30 AM	205	130	75		858
Tuesday, March 15, 2011	8:45 AM	220	130	90		838
Tuesday, March 15, 2011	9:00 AM	217	109	108		815

Tuesday, March 15, 2011	9:15 AM	216	135	81		803
Tuesday, March 15, 2011	9:30 AM	185	97	88		798
Tuesday, March 15, 2011	9:45 AM	197	107	90		831
Tuesday, March 15, 2011	10:00 AM	205	118	87		873
Tuesday, March 15, 2011	10:15 AM	211	112	99		858
Tuesday, March 15, 2011	10:30 AM	218	127	91		906
Tuesday, March 15, 2011	10:45 AM	239	126	113		972
Tuesday, March 15, 2011	11:00 AM	190	107	83		1058
Tuesday, March 15, 2011	11:15 AM	259	147	112		1198
Tuesday, March 15, 2011	11:30 AM	284	157	127		1319
Tuesday, March 15, 2011	11:45 AM	325	171	154		1390
Tuesday, March 15, 2011	12:00 PM	330	181	149		1387
Tuesday, March 15, 2011	12:15 PM	380	203	177		
Tuesday, March 15, 2011	12:30 PM	355	168	187		
Tuesday, March 15, 2011	12:45 PM	322	129	193		

Totals	52973	26396	26577

East Broadway - USH 51 (Stoughton Rd)
2005

Start Date 3/15/2005
Start Time 6:00
Site Code 0

Street Name	HWY51--Southbound				BROADWAY--Westbound				HWY51--Northbound				BROADWAY--Eastbound				15-minute	1-hour	
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	total	total	
6:00 AM	5	136	24	0	32	10	2	0	15	192	71	0	14	11	7	0	519		
6:15 AM	4	192	29	0	32	10	5	0	29	264	85	0	17	6	3	0	676		
6:30 AM	6	282	32	0	64	24	7	0	30	302	171	0	13	15	7	0	953		
6:45 AM	12	350	58	0	65	46	10	1	54	391	222	0	31	24	13	0	1276	3424	
7:00 AM	8	321	85	1	76	35	6	0	52	345	178	0	35	17	17	0	1175	4080	
7:15 AM	12	418	59	0	86	51	13	0	88	451	192	0	32	35	11	0	1448	4852	
7:30 AM	13	381	54	0	79	75	6	0	113	467	158	0	25	25	15	0	1411	5310	
7:45 AM	23	321	66	0	63	63	10	0	104	583	209	0	79	67	20	0	1608	5642	
8:00 AM	23	299	48	0	71	48	9	0	46	440	156	0	55	56	17	0	1268	5735	PHF: 0.89
8:15 AM	14	335	33	0	60	35	10	0	88	384	137	0	36	26	29	0	1187	5474	
8:30 AM	18	286	38	0	69	30	11	0	36	341	110	0	40	17	15	0	1011	5074	
8:45 AM	8	264	36	0	67	28	8	0	35	305	102	0	40	12	30	0	935	4401	
9:00 AM	5	278	66	0	48	24	14	0	35	303	95	0	36	12	19	0	935	4068	
9:15 AM	18	269	44	0	47	17	4	0	28	306	89	0	34	33	22	0	911	3792	
9:30 AM	11	321	42	0	60	26	12	0	37	277	87	0	44	23	20	0	960	3741	
9:45 AM	11	294	53	0	61	15	10	0	32	289	65	0	38	18	27	0	913	3719	
10:00 AM	8	267	47	0	53	25	10	0	28	290	66	0	54	12	29	0	889	3673	
10:15 AM	14	240	41	0	69	18	12	0	23	288	65	0	38	14	32	0	854	3616	
10:30 AM	12	255	38	0	56	25	10	0	30	300	65	0	60	21	19	0	891	3547	
10:45 AM	8	225	50	0	62	26	12	0	37	282	77	0	60	21	28	0	888	3522	
11:00 AM	10	252	48	0	72	29	9	0	24	271	67	0	49	29	25	0	885	3518	
11:15 AM	6	289	47	0	70	42	8	0	38	283	59	0	54	31	33	0	960	3624	
11:30 AM	12	242	25	0	70	49	6	0	43	250	46	0	58	37	31	0	869	3602	
11:45 AM	11	293	41	0	73	42	18	0	47	263	64	0	53	47	28	0	980	3694	
12:00 PM	19	253	43	0	69	56	14	0	35	306	58	0	68	51	30	0	1002	3811	
12:15 PM	19	278	35	0	81	67	15	0	52	251	76	0	77	66	48	1	1065	3916	
12:30 PM	21	260	33	0	80	35	22	0	35	250	72	0	77	67	51	0	1003	4050	
12:45 PM	9	276	39	0	79	38	15	0	29	267	88	0	76	62	49	0	1027	4097	
1:00 PM	17	226	27	0	69	42	14	0	26	238	69	0	86	39	48	0	901	3996	
1:15 PM	12	275	37	0	63	28	18	0	41	271	80	0	64	48	47	0	984	3915	
1:30 PM	21	313	38	0	62	25	16	0	25	250	83	0	74	37	39	0	983	3895	
1:45 PM	13	253	37	0	66	29	16	0	28	265	71	0	72	47	47	0	944	3812	
2:00 PM	15	310	35	0	90	35	23	1	20	269	79	0	61	28	42	0	1007	3918	
2:15 PM	12	272	31	0	75	35	23	1	26	246	73	0	64	24	62	0	943	3877	
2:30 PM	21	297	32	0	78	26	15	0	37	284	66	0	57	32	51	0	996	3890	
2:45 PM	9	365	31	0	78	19	12	0	24	297	68	0	69	19	50	0	1041	3987	
3:00 PM	12	313	26	0	86	23	17	0	29	276	50	0	68	24	53	0	977	3957	
3:15 PM	14	365	34	0	93	26	22	0	39	301	57	0	70	29	56	1	1106	4120	
3:30 PM	16	341	30	0	120	69	20	0	40	314	65	0	82	34	68	0	1199	4323	
3:45 PM	15	368	33	0	121	48	18	0	31	305	71	0	78	44	79	0	1211	4493	
4:00 PM	11	359	25	0	118	46	21	0	57	342	70	0	98	43	64	0	1254	4770	
4:15 PM	13	400	15	0	141	44	17	2	47	321	75	0	81	38	75	0	1267	4931	
4:30 PM	8	399	22	0	149	85	16	0	40	356	74	0	98	40	96	0	1383	5115	
4:45 PM	13	381	17	0	144	77	26	0	36	338	65	0	122	63	81	0	1363	5267	
5:00 PM	18	378	12	0	138	70	15	0	43	309	59	0	95	47	91	0	1275	5288	PHF: 0.96
5:15 PM	10	354	18	0	113	31	15	0	47	321	77	0	83	45	77	0	1191	5212	
5:30 PM	12	300	14	0	123	35	16	0	27	335	66	0	73	39	71	0	1111	4940	
5:45 PM	15	266	14	0	93	32	23	0	38	269	68	0	80	28	63	0	989	4566	

	HWY51--Southbound				BROADWAY--Westbound				HWY51--Northbound				BROADWAY--Eastbound			
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
AM Peak Hour 7:15-8:15 AM	71	1419	227	0	299	237	38	0	351	1941	715	0	191	183	63	0
Seasonal Adjustment * 1.05	**75**	**1490**	**238**	**0**	**314**	**249**	**40**	**0**	**369**	**2038**	**751**	**0**	**201**	**192**	**66**	**0**

* From ATR 130011, 2000, 1 - located on Beltline 1 mile east of Broadway

LOCATION 500E BROADWAY [COPPS-ROSELAWN]
STATION# 4054
DIRECTION combined
REMARKS
START TIME 1100 on 7/26/2010
END TIME 1100 on 7/27/2010

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	28-Jul-10	29-Jul-10	30-Jul-10	31-Jul-10	01-Aug-10	Volume	Volume	Volume
AM 12-1		78						78	78	78
1-2		50						50	50	50
2-3		41						41	41	41
3-4		37						37	37	37
4-5		48						48	48	48
5-6		197						197	197	197
6-7		506						506	506	506
7-8		954	1767					954	954	954
8-9		813						813	813	813
9-10		794						794	794	794
10-11		845						845	845	845
11-12	1162							1162	1162	1162
PM 12-1	1369							1369	1369	1369
1-2	1072							1072	1072	1072
2-3	959							959	959	959
3-4	1131							1131	1131	1131
4-5	1228	2536						1228	1228	1228
5-6	1309							1309	1309	1309
6-7	770							770	770	770
7-8	574							574	574	574
8-9	450							450	450	450
9-10	322							322	322	322
10-11	195							195	195	195
11-12	126							126	126	126
24 HR TOTAL	10667	4363						15030	15030	15030

Factor 0.98

AAWT

Factored Total 14729

LOCATION 500E BROADWAY [COPPS-ROSELAWN]
STATION# 4054
DIRECTION E.B.
REMARKS
START TIME 1100 on 7/26/2010
END TIME 1100 on 7/27/2010

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	28-Jul-10	29-Jul-10	30-Jul-10	31-Jul-10	01-Aug-10	Volume	Volume	Volume
AM 12-1		37						37	37	37
1-2		23						23	23	23
2-3		19						19	19	19
3-4		19						19	19	19
4-5		29						29	29	29
5-6		65						65	65	65
6-7		161						161	161	161
7-8		306	651 37%					306	306	306
8-9		345						345	345	345
9-10		371						371	371	371
10-11		427	+456 = 883					427	427	427
11-12	578							578	578	578
PM 12-1	747							747	747	747
1-2	585							585	585	585
2-3	545							545	545	545
3-4	636							636	636	636
4-5	720	1st Manual 700-800						720	720	720
5-6	796							796	796	796
6-7	452							452	452	452
7-8	298							298	298	298
8-9	271							271	271	271
9-10	178							178	178	178
10-11	117							117	117	117
11-12	55							55	55	55
24 HR TOTAL	5978	1802						7780	7780	7780

Factor 0.98

AAWT

Factored Total 7624

LOCATION 500E BROADWAY [COPPS-ROSELAWN]
STATION# 4054
DIRECTION W.B.
REMARKS
START TIME 1100 on 7/26/2010
END TIME 1100 on 7/27/2010

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	28-Jul-10	29-Jul-10	30-Jul-10	31-Jul-10	01-Aug-10	Volume	Volume	Volume
AM 12-1		41						41	41	41
1-2		27						27	27	27
2-3		22						22	22	22
3-4		18						18	18	18
4-5		19						19	19	19
5-6		132						132	132	132
6-7		345						345	345	345
7-8		648						648	648	648
8-9		468						468	468	468
9-10		423						423	423	423
10-11		418						418	418	418
11-12	584							584	584	584
PM 12-1	622							622	622	622
1-2	487							487	487	487
2-3	414							414	414	414
3-4	495							495	495	495
4-5	508							508	508	508
5-6	513	Manual	550-600					513	513	513
6-7	318							318	318	318
7-8	276							276	276	276
8-9	179							179	179	179
9-10	144							144	144	144
10-11	78							78	78	78
11-12	71							71	71	71
24 HR TOTAL	4689	2561						7250	7250	7250

Factor 0.98

AAWT

Factored Total 7105

LOCATION 500E BROADWAY [COPPS-ROSELAWN]
STATION# 4054
DIRECTION combined
REMARKS
START TIME 1100 on 7/14/2009
END TIME 1100 on 7/15/2009

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	20-Jul-09	14-Jul-09	15-Jul-09	16-Jul-09	17-Jul-09	18-Jul-09	19-Jul-09	Volume	Volume	Volume
AM 12-1			82					82	82	82
1-2			62					62	62	62
2-3			35					35	35	35
3-4			31					31	31	31
4-5			62					62	62	62
5-6			190					190	190	190
6-7			473					473	473	473
7-8			991	1902				991	991	991
8-9			911					911	911	911
9-10			854					854	854	854
10-11			909					909	909	909
11-12		1257						1257	1257	1257
PM 12-1		1748						1748	1748	1748
1-2		1237						1237	1237	1237
2-3		1208						1208	1208	1208
3-4		1232						1232	1232	1232
4-5		1412	7625					1412	1412	1412
5-6		1413						1413	1413	1413
6-7		863						863	863	863
7-8		600						600	600	600
8-9		553						553	553	553
9-10		369						369	369	369
10-11		228						228	228	228
11-12		139						139	139	139
24 HR TOTAL		12259	4600					16859	16859	16859

Factor 0.98

AAWT

Factored Total 16522

LOCATION 500E BROADWAY [COPPS-ROSELAWN]
STATION# 4054
DIRECTION E.B.
REMARKS
START TIME 1100 on 7/14/2009
END TIME 1100 on 7/15/2009

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	20-Jul-09	14-Jul-09	15-Jul-09	16-Jul-09	17-Jul-09	18-Jul-09	19-Jul-09	Volume	Volume	Volume
AM 12-1			45					45	45	45
1-2			36					36	36	36
2-3			16					16	16	16
3-4			18					18	18	18
4-5			39					39	39	39
5-6			68					68	68	68
6-7			149					149	149	149
7-8			380					380	380	380
8-9			410					410	410	410
9-10			417					417	417	417
10-11			467					467	467	467
11-12		627						627	627	627
PM 12-1		1009						1009	1009	1009
1-2		730						730	730	730
2-3		681						681	681	681
3-4		686	Manual – 700-800					686	686	686
4-5		779						779	779	779
5-6		827						827	827	827
6-7		491						491	491	491
7-8		369						369	369	369
8-9		325						325	325	325
9-10		216						216	216	216
10-11		117						117	117	117
11-12		78						78	78	78
24 HR TOTAL		6935	2045					8980	8980	8980

Factor 0.98

AAWT

Factored Total 8800

LOCATION 500E BROADWAY [COPPS-ROSELAWN]
STATION# 4054
DIRECTION W.B.
REMARKS
START TIME 1100 on 7/14/2009
END TIME 1100 on 7/15/2009

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	20-Jul-09	14-Jul-09	15-Jul-09	16-Jul-09	17-Jul-09	18-Jul-09	19-Jul-09	Volume	Volume	Volume
AM 12-1			37					37	37	37
1-2			26					26	26	26
2-3			19					19	19	19
3-4			13					13	13	13
4-5			23					23	23	23
5-6			122					122	122	122
6-7			324					324	324	324
7-8			611					611	611	611
8-9			501					501	501	501
9-10			437					437	437	437
10-11			442					442	442	442
11-12		630						630	630	630
PM 12-1		739						739	739	739
1-2		507						507	507	507
2-3		527						527	527	527
3-4		546						546	546	546
4-5		633	Manual 550-600					633	633	633
5-6		586						586	586	586
6-7		372						372	372	372
7-8		231						231	231	231
8-9		228						228	228	228
9-10		153						153	153	153
10-11		111						111	111	111
11-12		61						61	61	61
24 HR TOTAL		5324	2555					7879	7879	7879

Factor 0.98

AAWT

Factored Total 7721

APPENDIX B
Traffic
Future Traffic Projections

2011 Projected PM Design Hour Traffic Volumes

With Added Trips

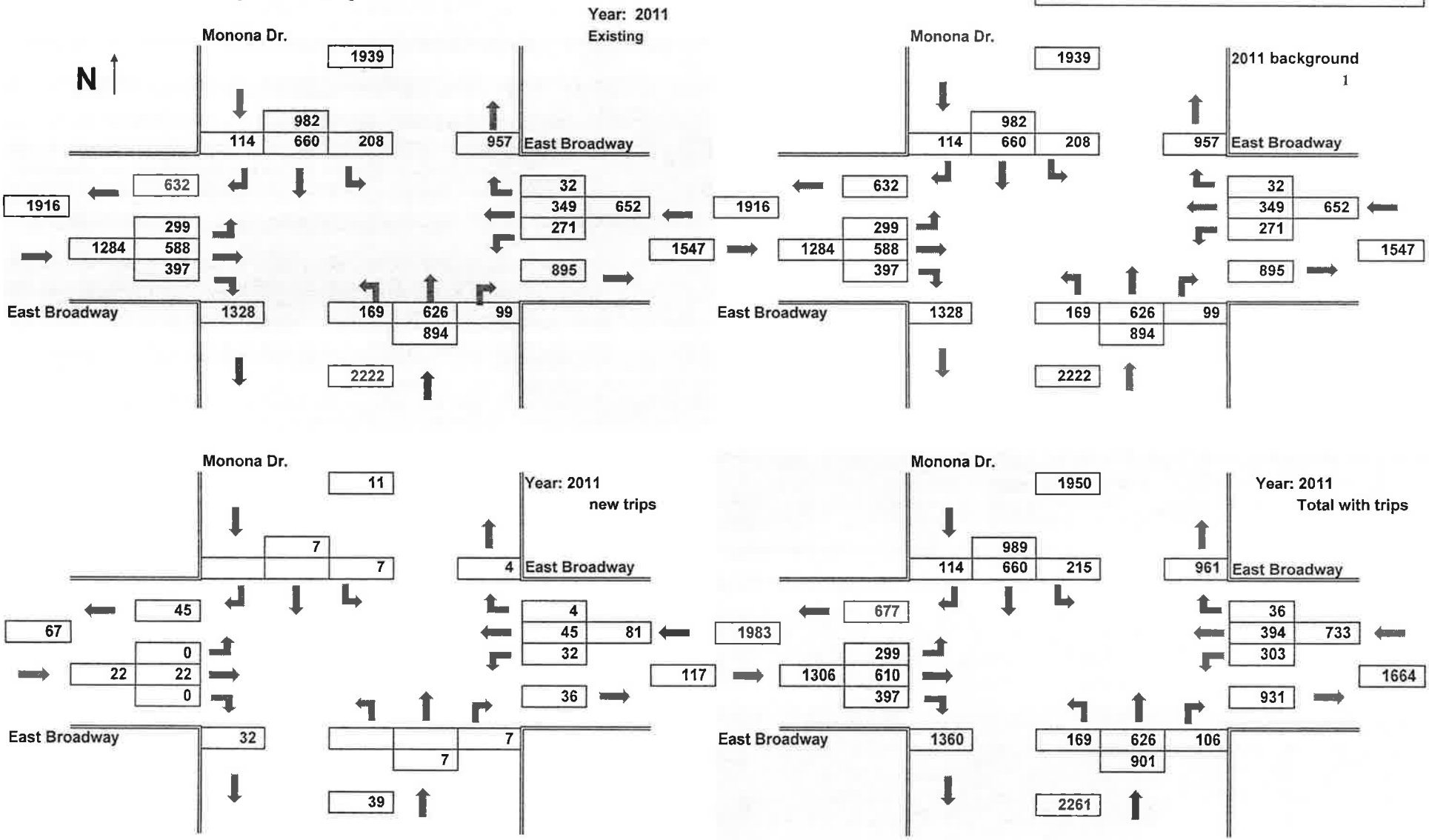
Design Hour: 4:30-5:30

Mary Greuel
KL Engineering

Project Description

Project ID:
Location: East Broadway
Cross Street: Monona Drive
City of Monona, Dane County, WI

Design Hour Turning Movement Data



2011 Projected PM Design Hour Traffic Volumes

With Added Trips

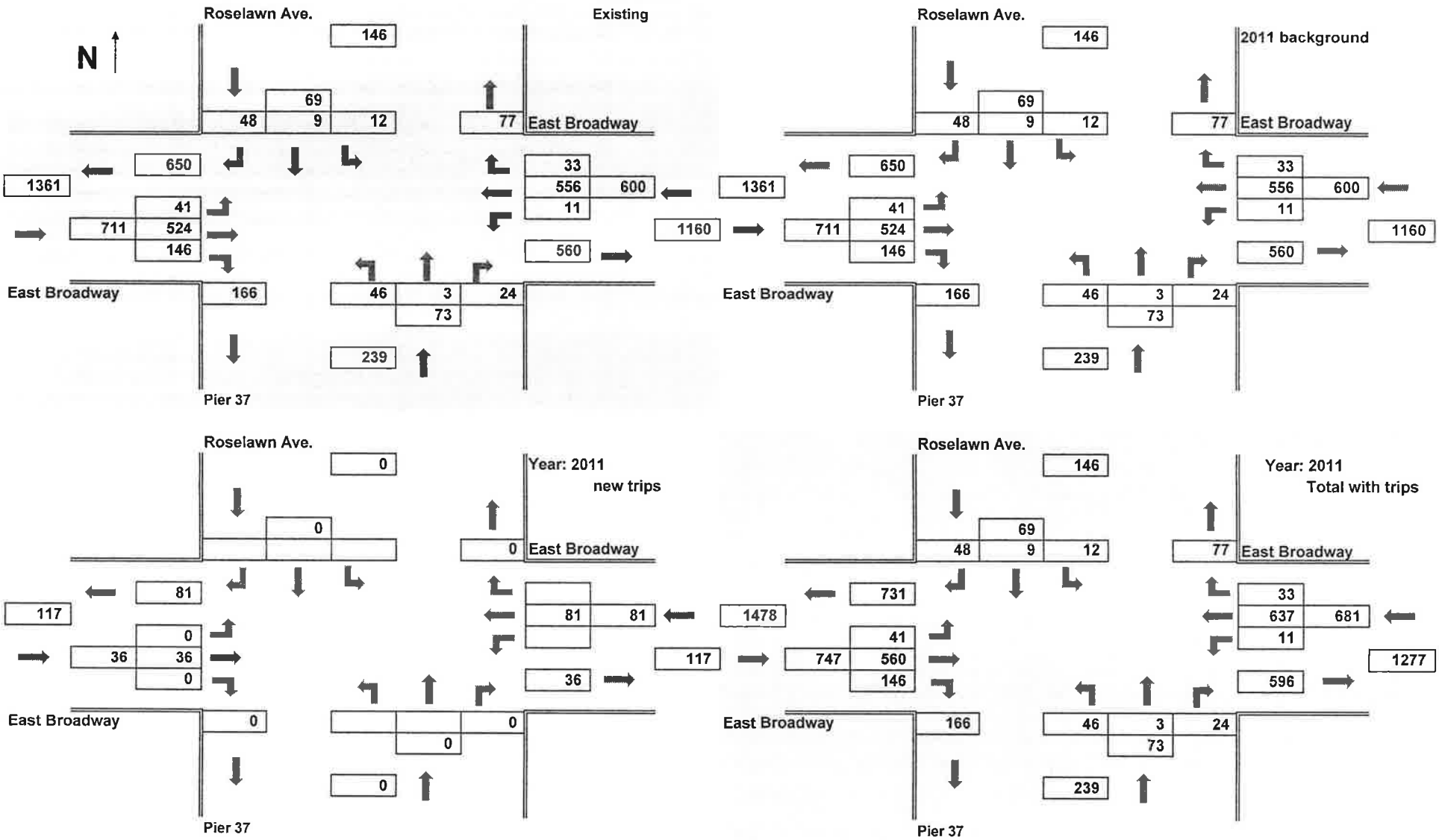
Design Hour: 4:30-5:30

Mary Greuel
KL Engineering

Project Description

Project ID:
Location: East Broadway
Cross Street: Roselawn Ave./Pier 37 west ent.
City of Monona, Dane County, WI

Design Hour Turning Movement Data



2011 Projected PM Design Hour Traffic Volumes

With Added Trips

Mary Greuel
KL Engineering

Design Hour: 4:30-5:30

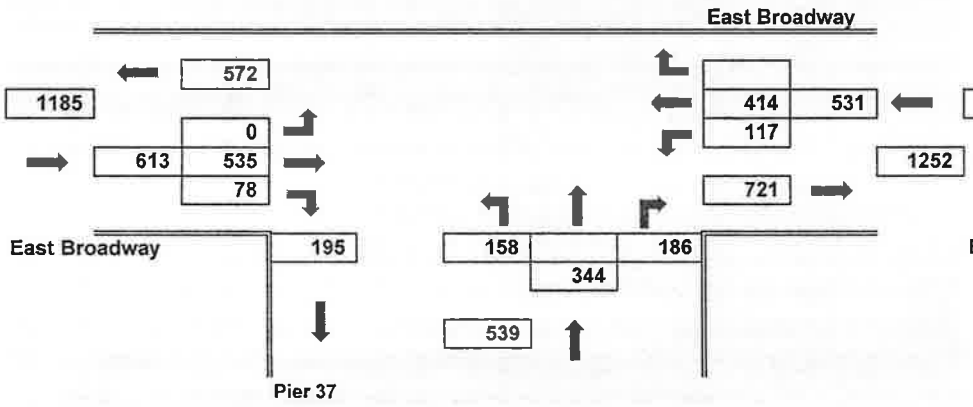
Project Description

Project ID:
Location: East Broadway
Cross: Pier 37 east ent/exit
City of Monona, Dane County, WI

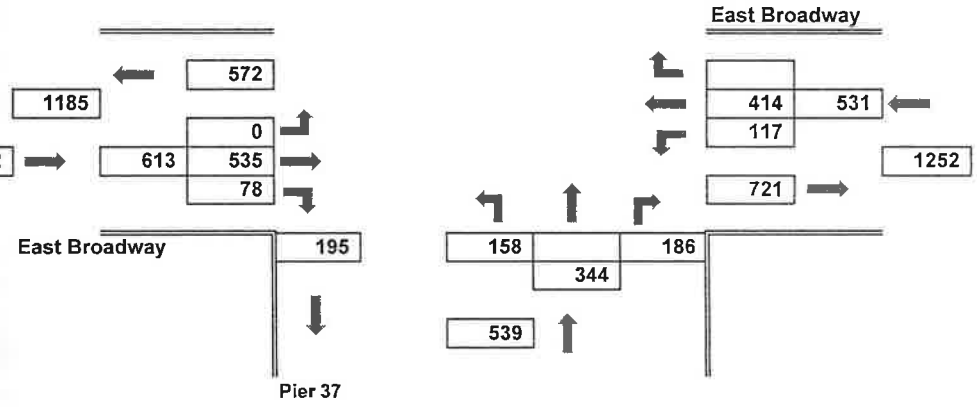
Design Hour Turning Movement Data

Year: 2011
Existing

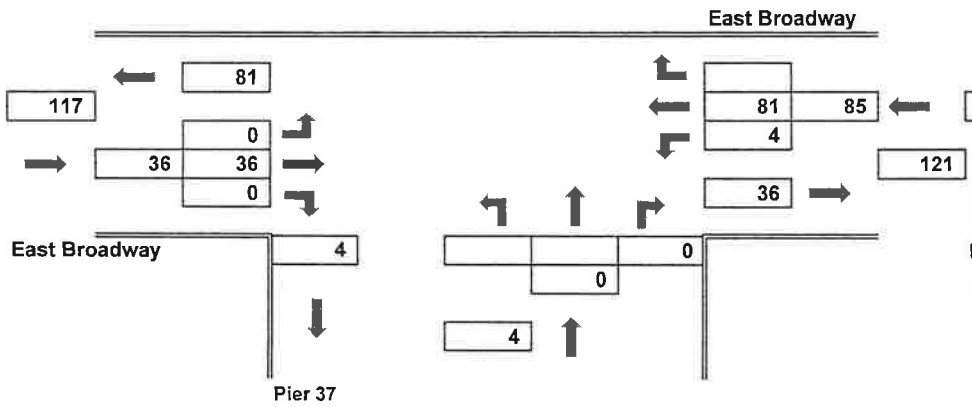
N



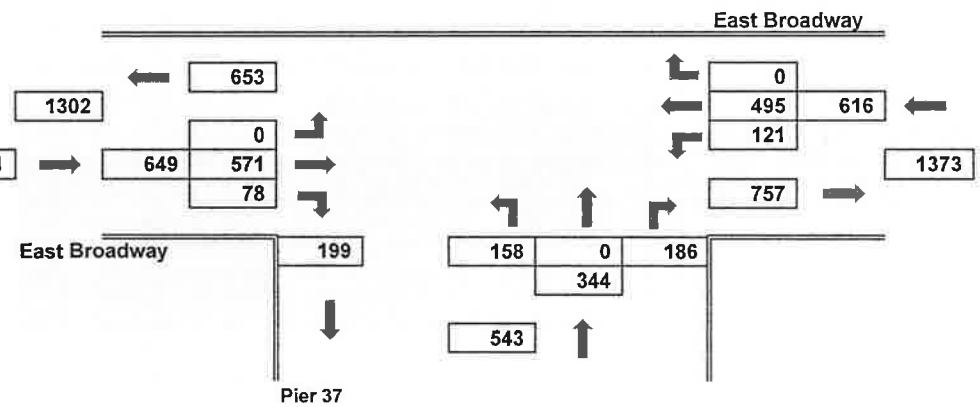
2011 background



Year: 2011
new trips



Year: 2011
Total with trips



2011 Projected PM Design Hour Traffic Volumes

With Added Trips

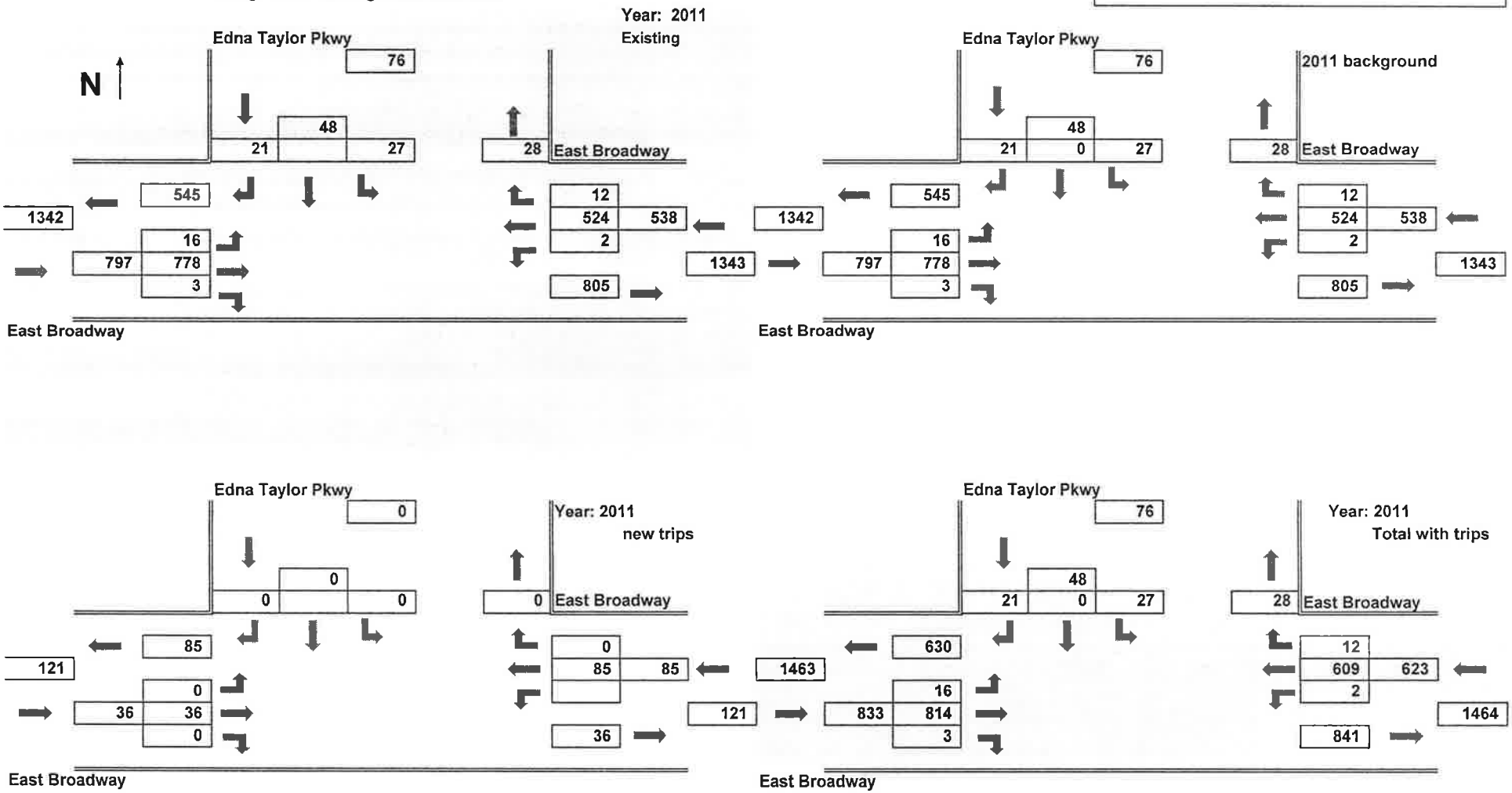
Design Hour: 4:30-5:30

Mary Greuel
KL Engineering

Project Description

Project ID:
Location: East Broadway
Cross Street: Edna Taylor Pkwy
City of Monona, Dane County, WI

Design Hour Turning Movement Data



2011 Projected PM Design Hour Traffic Volumes

With Added Trips

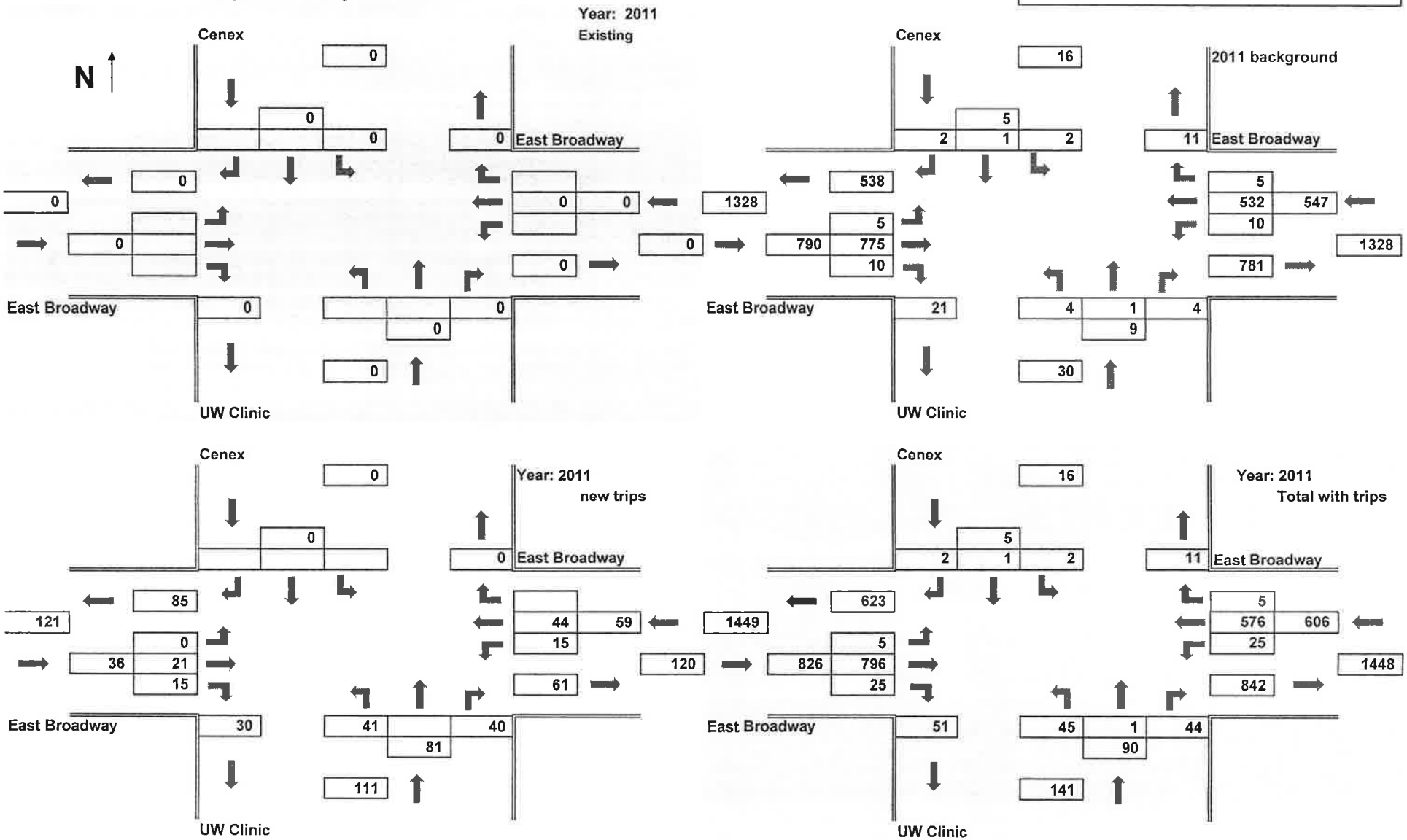
Design Hour: 4:30-5:30

Mary Greuel
KL Engineering

Project Description

Project ID:
Location: East Broadway
Cross Street: UW Clinics
City of Monona, Dane County, WI

Design Hour Turning Movement Data



2011 Projected PM Design Hour Traffic Volumes

With Added Trips

Design Hour: 4:30-5:30

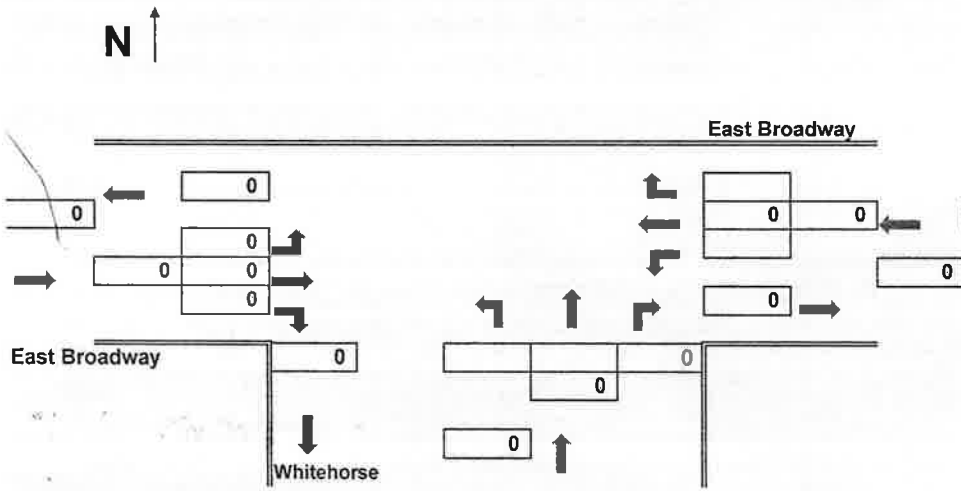
Mary Greuel
KL Engineering

Project Description

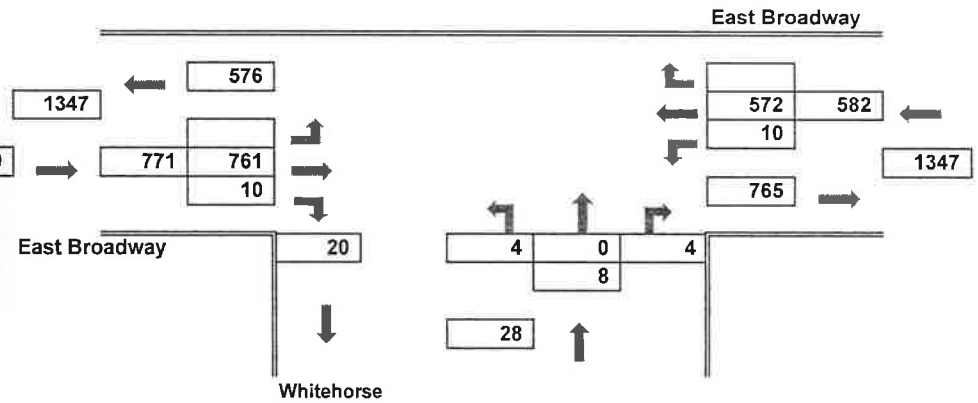
Project ID:
Location: East Broadway
Cross Street: Whitehorse Commons
City of Monona, Dane County, WI

Design Hour Turning Movement Data

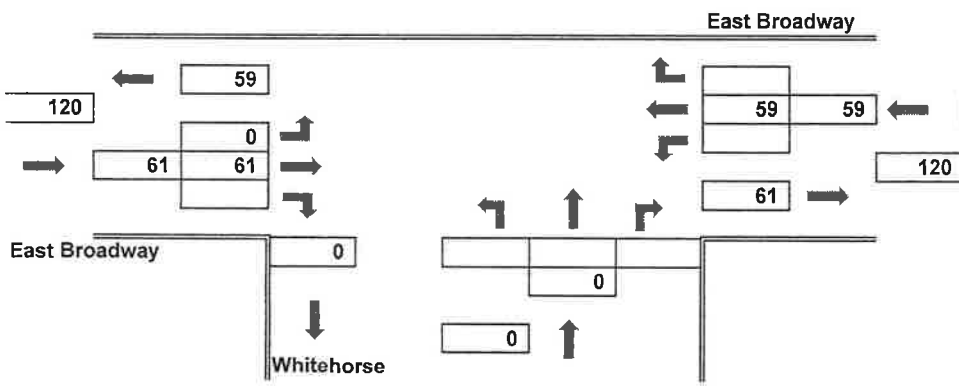
Year: 2011
Existing



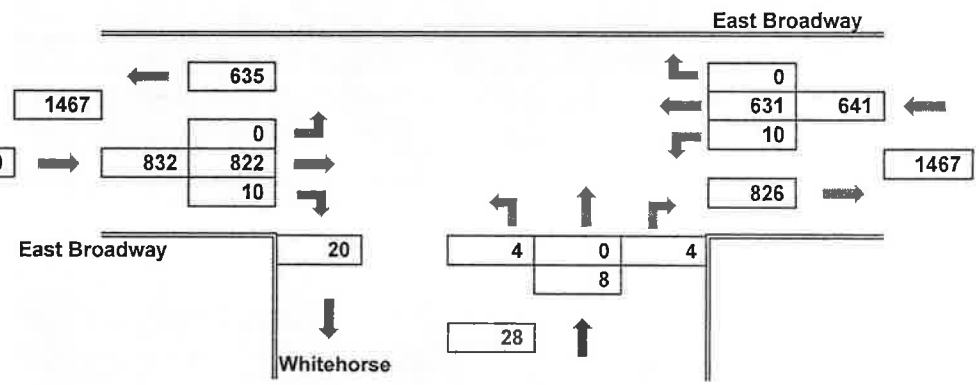
2011 background



Year: 2011
new trips



Year: 2011
Total with trips



2011 Projected PM Design Hour Traffic Volumes

With Added Trips

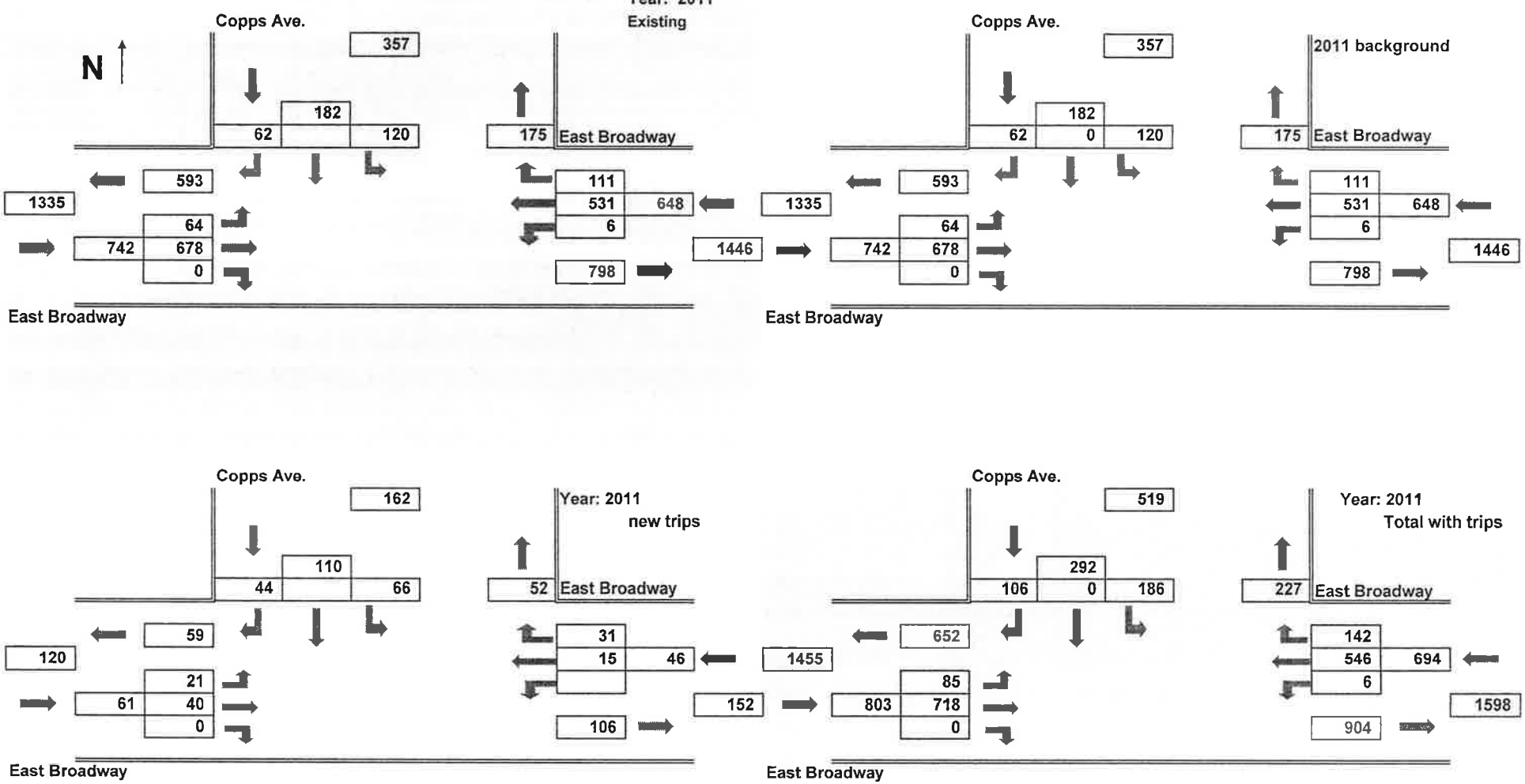
Design Hour: 4:30-5:30

Mary Greuel
KL Engineering

Project Description

Project ID:
Location: East Broadway
Cross Street: Copps Ave.
City of Monona, Dane County, WI

Design Hour Turning Movement Data



2016 Projected PM Design Hour Traffic Volumes

With Added Trips

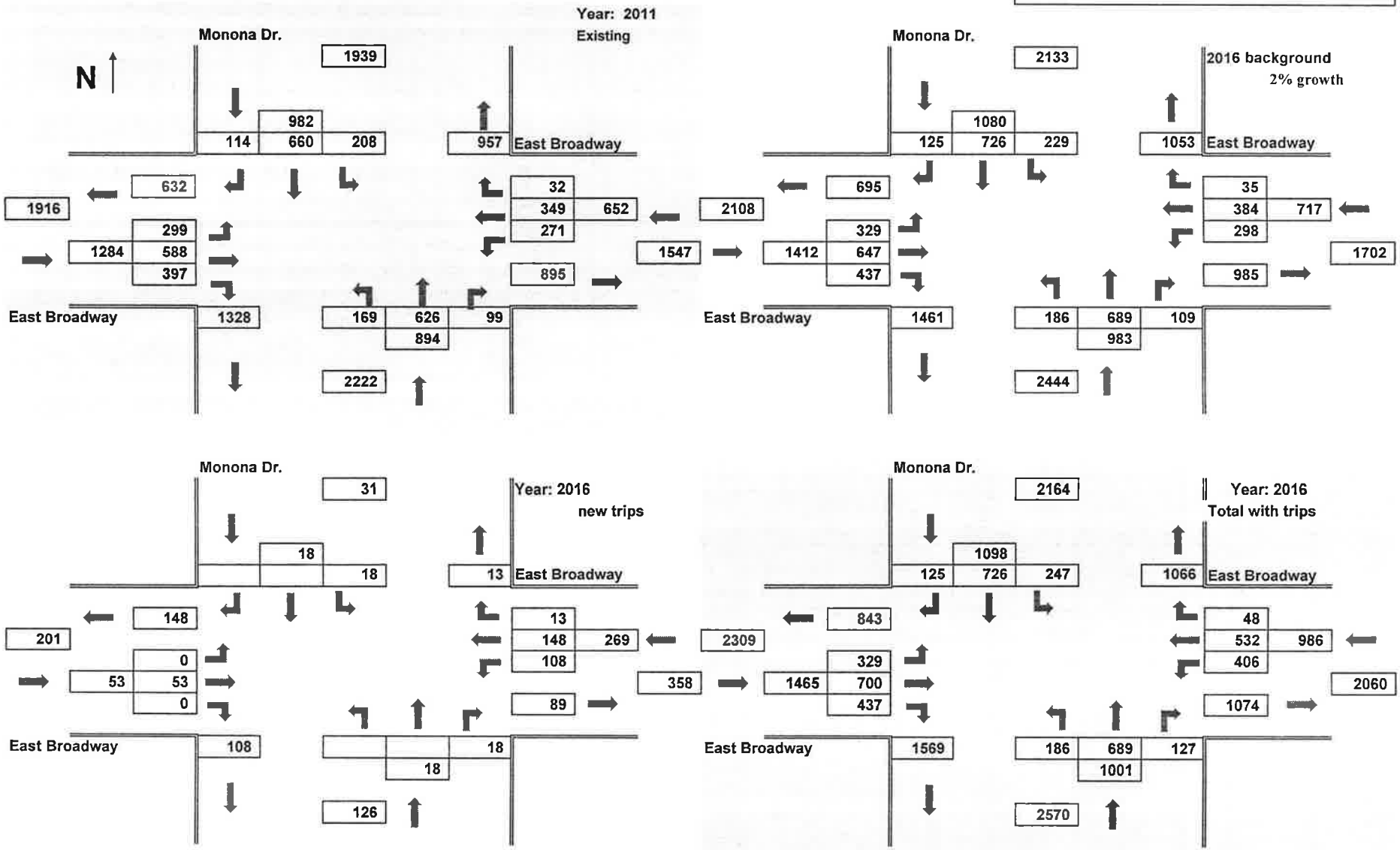
Mary Greuel
KL Engineering

Design Hour: 4:30-5:30

Project Description

Project ID:
Location: East Broadway
Cross Street: Monona Drive
City of Monona, Dane County, WI

Design Hour Turning Movement Data



2016 Projected PM Design Hour Traffic Volumes

With Added Trips

Mary Greuel
KL Engineering

Design Hour: 4:30-5:30

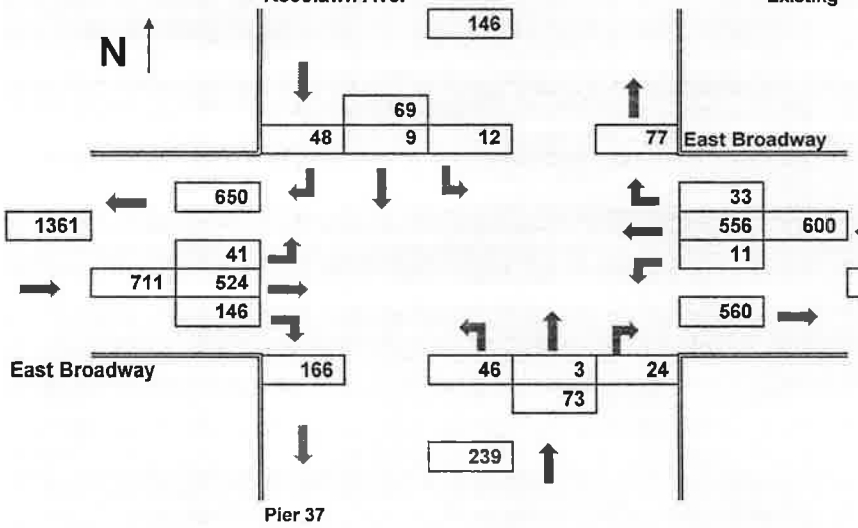
Project Description

Project ID:
Location: East Broadway
Cross Street: Roselawn Ave./Pier 37 west ent.
City of Monona, Dane County, WI

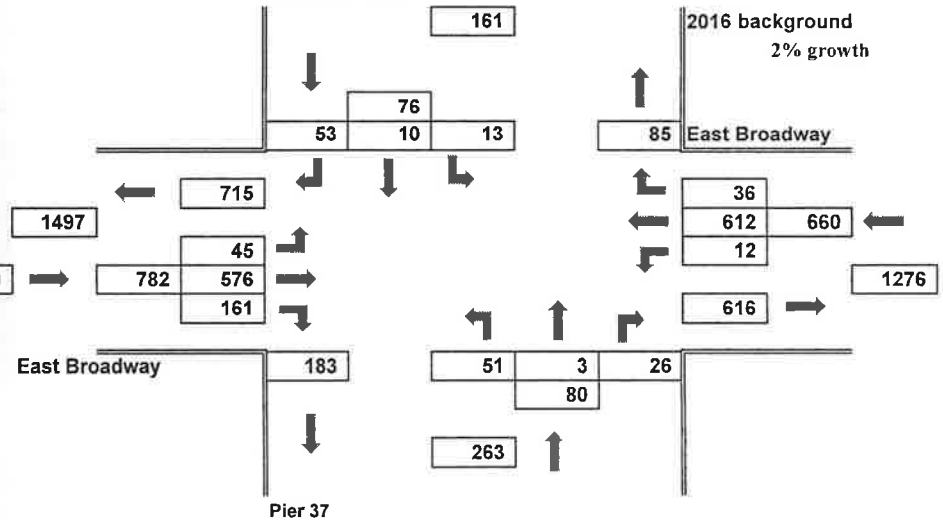
Design Hour Turning Movement Data

N

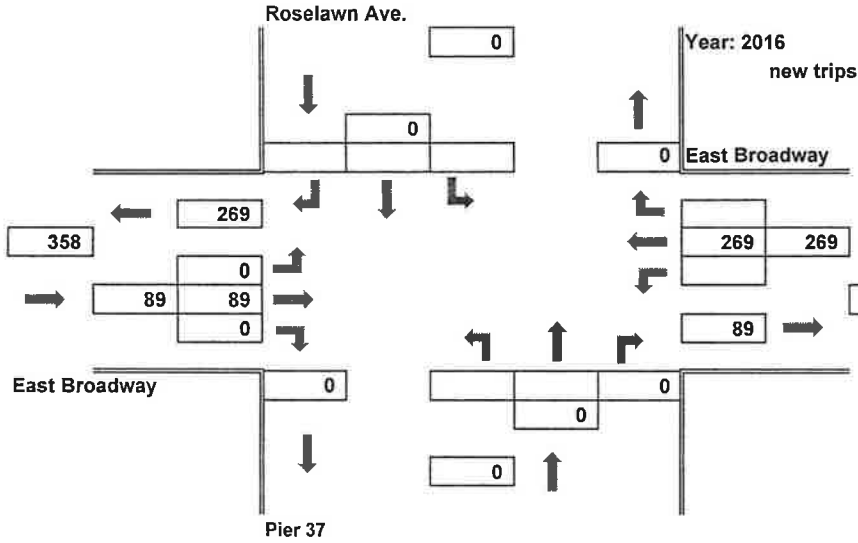
Year: 2011
Existing



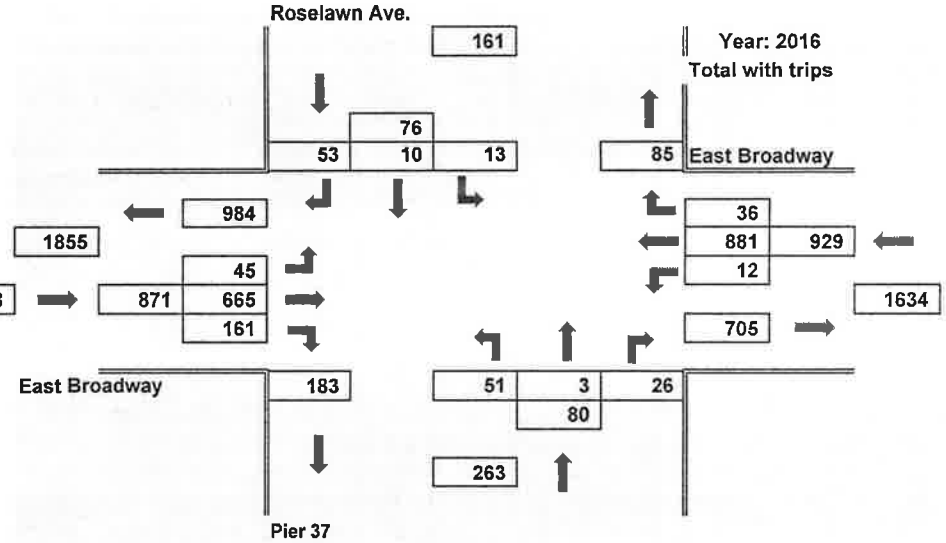
2016 background
2% growth



Year: 2016
new trips



Year: 2016
Total with trips



2016 Projected PM Design Hour Traffic Volumes

With Added Trips

Design Hour: 4:30-5:30

Mary Greuel
KL Engineering

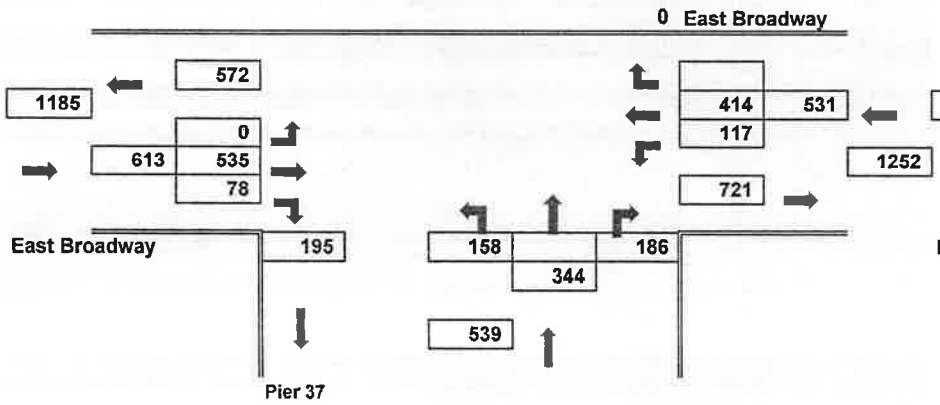
Project Description

Project ID:
Location: East Broadway
Cross: Pier 37 east ent/exit
City of Monona, Dane County, WI

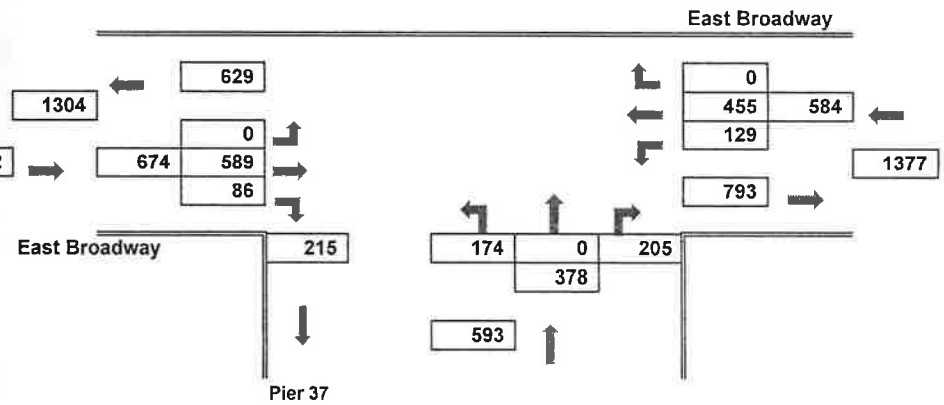
Design Hour Turning Movement Data

N

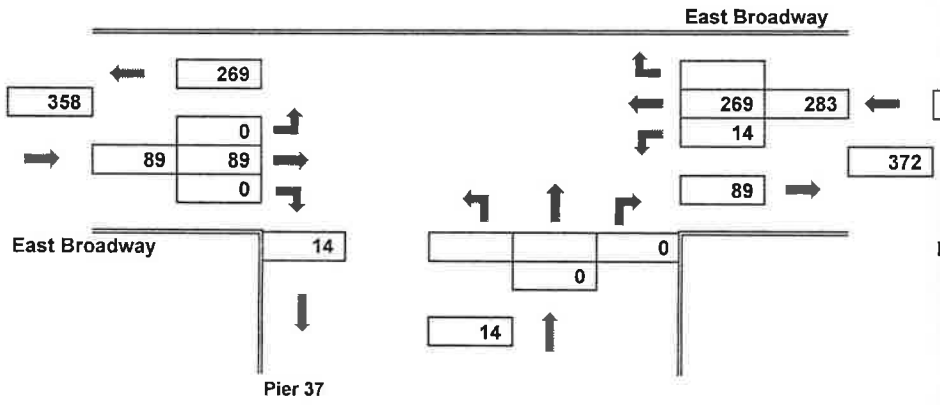
Year: 2011
Existing



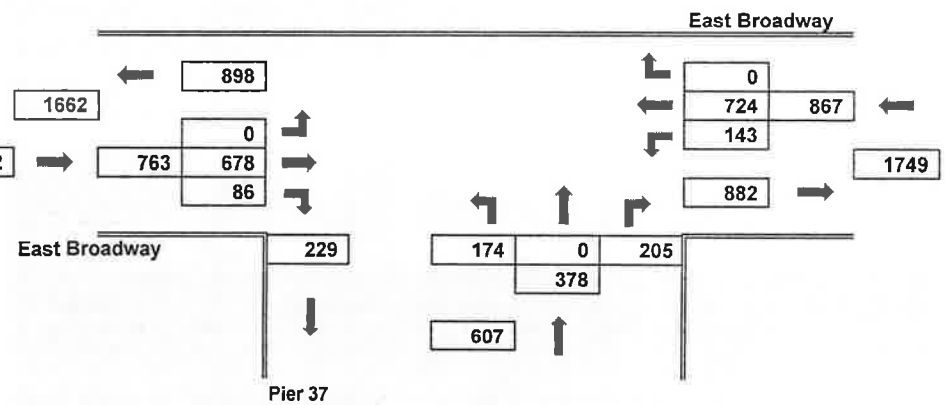
2016 background
2% growth



Year: 2016
new trips



Year: 2016
Total with trips



2016 Projected PM Design Hour Traffic Volumes

With Added Trips

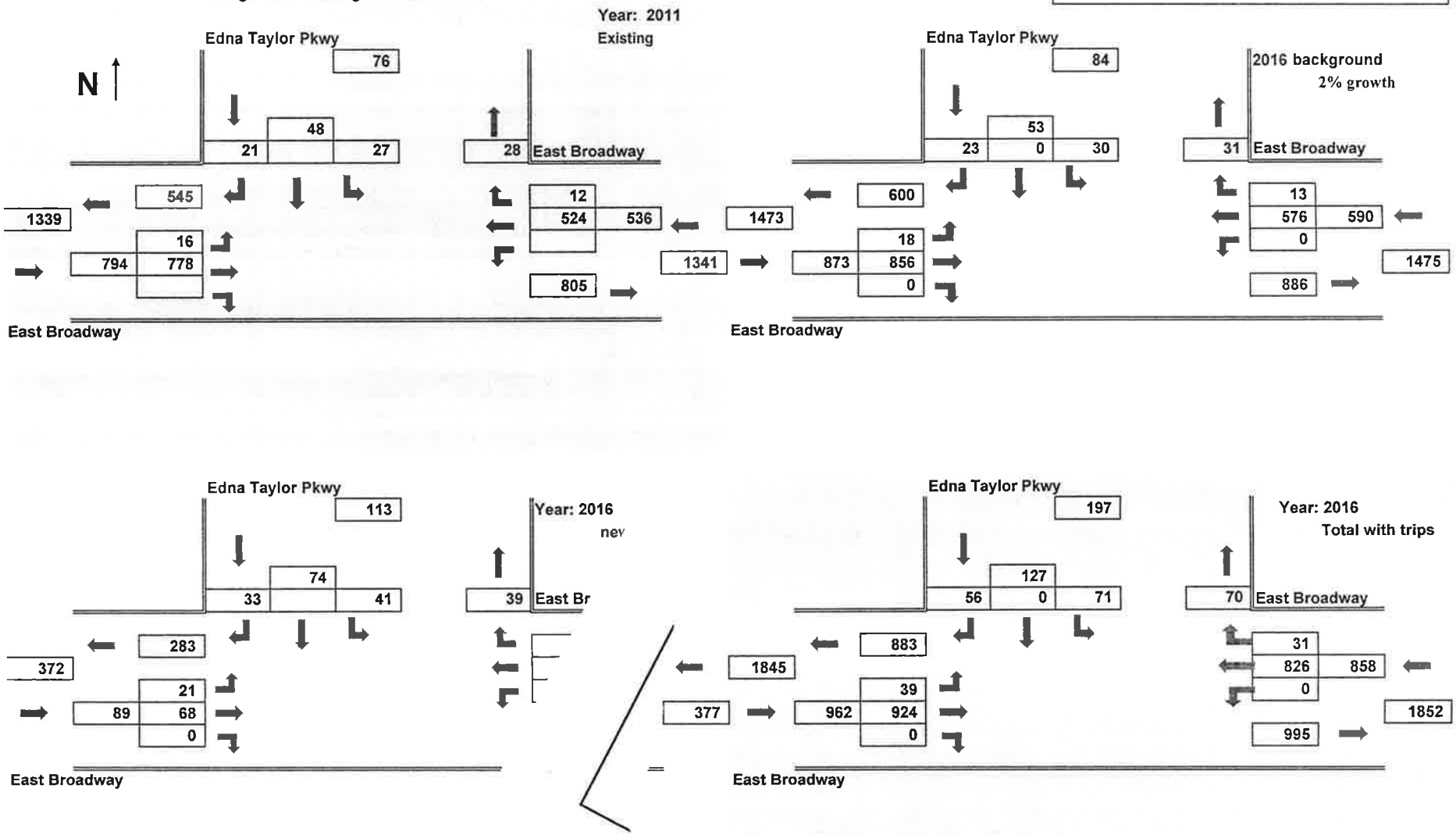
Mary Greuel
KL Engineering

Design Hour: 4:30-5:30

Project Description

Project ID:
Location: East Broadway
Cross Street: Edna Taylor Pkwy
City of Monona, Dane County, WI

Design Hour Turning Movement Data



2016 Projected PM Design Hour Traffic Volumes

With Added Trips

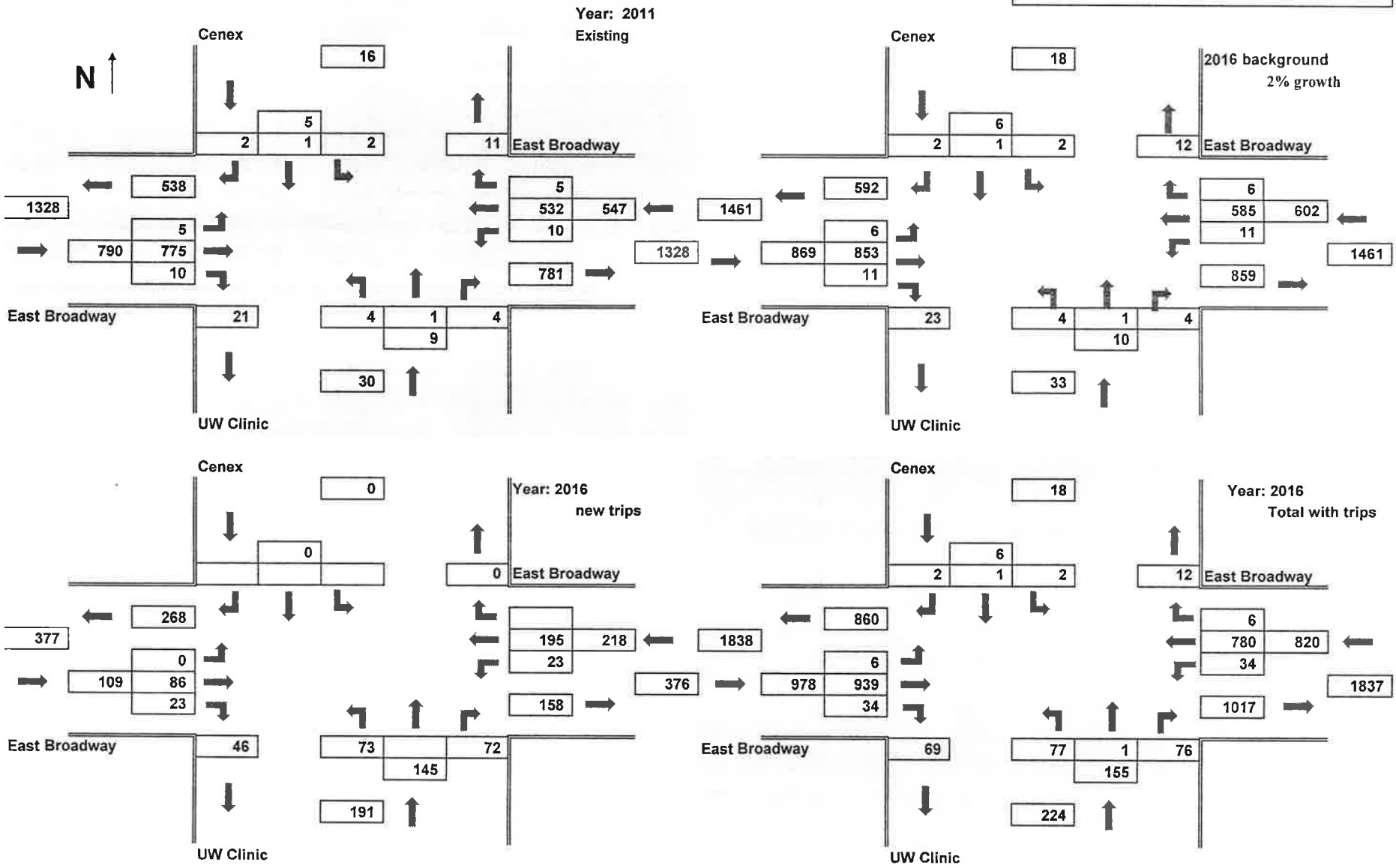
Design Hour: 4:30-5:30

Mary Greuel
KL Engineering

Project Description

Project ID:
Location: East Broadway
Cross Street: UW Clinics
City of Monona, Dane County, WI

Design Hour Turning Movement Data



2016 Projected PM Design Hour Traffic Volumes

With Added Trips

Design Hour: 4:30-5:30

Mary Greuel
KL Engineering

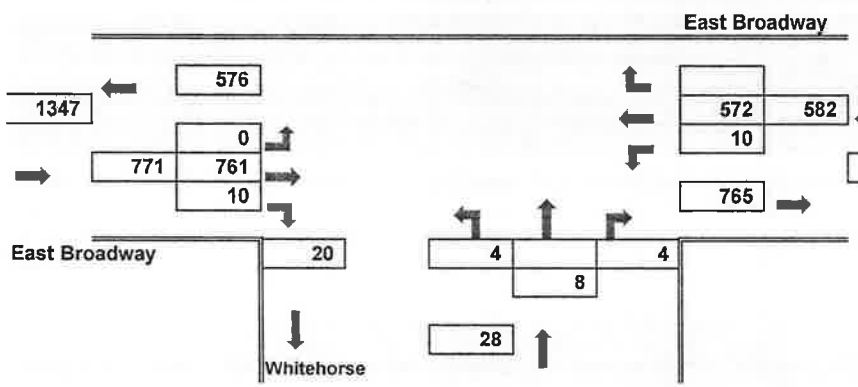
Project Description

Project ID:
Location: East Broadway
Cross Street: Whitehorse Commons
City of Monona, Dane County, WI

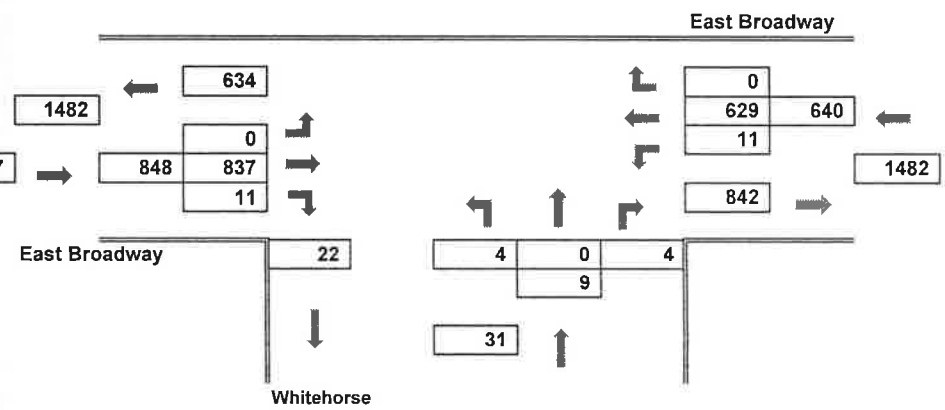
Design Hour Turning Movement Data

N

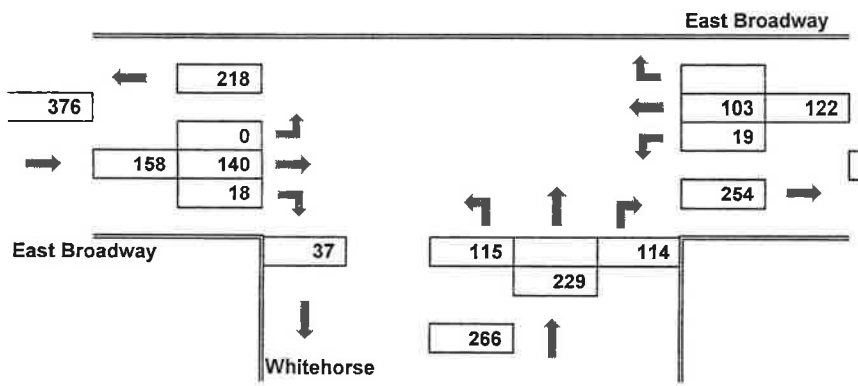
Year: 2011
Existing



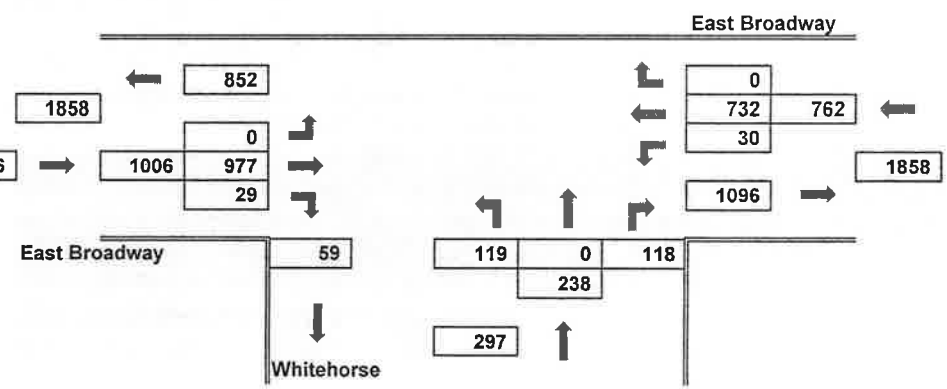
2016 background
2% growth



Year: 2016
new trips



Year: 2016
Total with trips



2016 Projected PM Design Hour Traffic Volumes

With Added Trips

Design Hour: 4:30-5:30

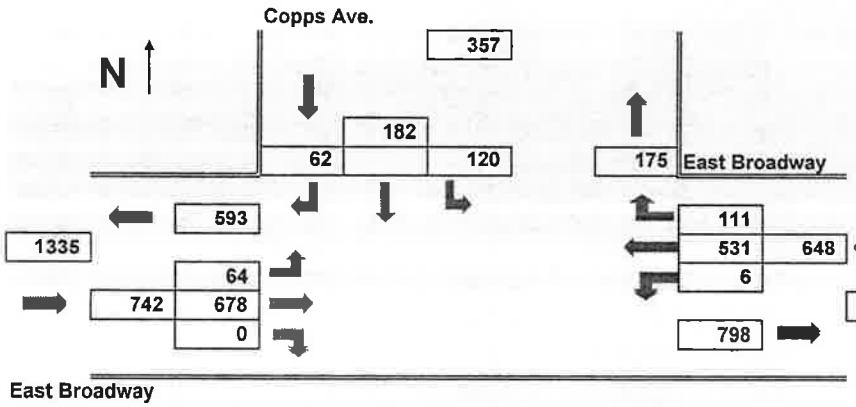
Mary Greuel
KL Engineering

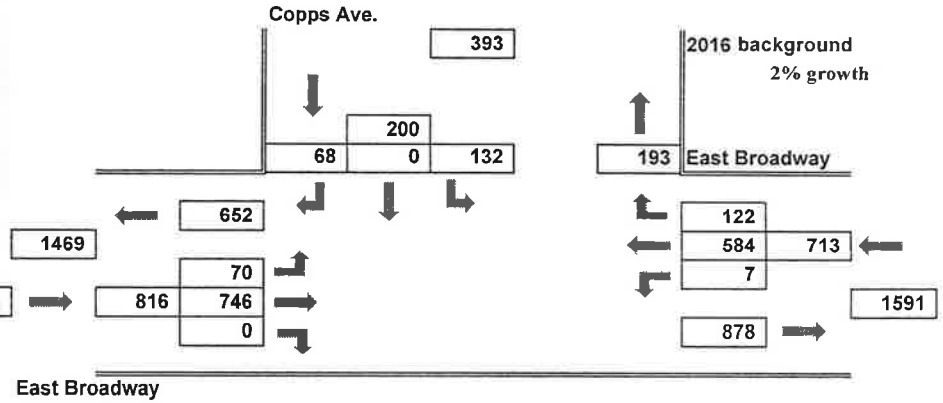
Project Description

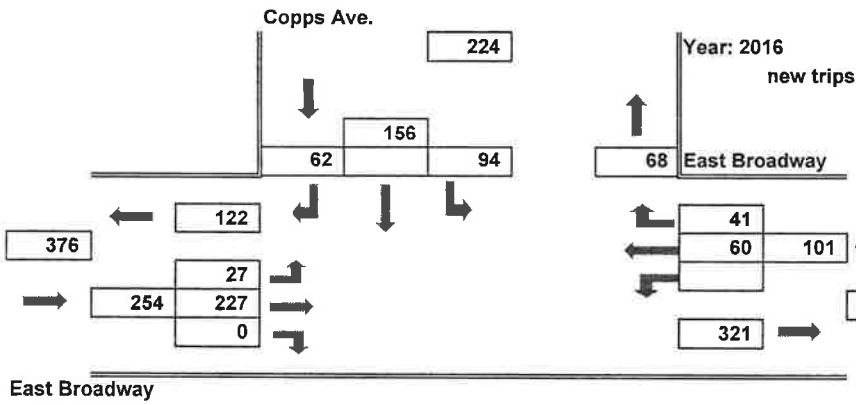
Project ID:
Location: East Broadway
Cross Street: Copps Ave.
City of Monona, Dane County, WI

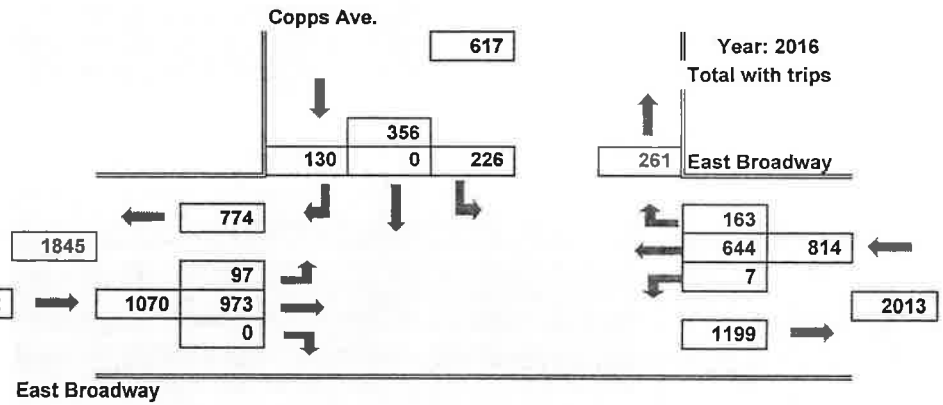
Design Hour Turning Movement Data

Year: 2011









2021 Projected PM Design Hour Traffic Volumes

With Added Trips

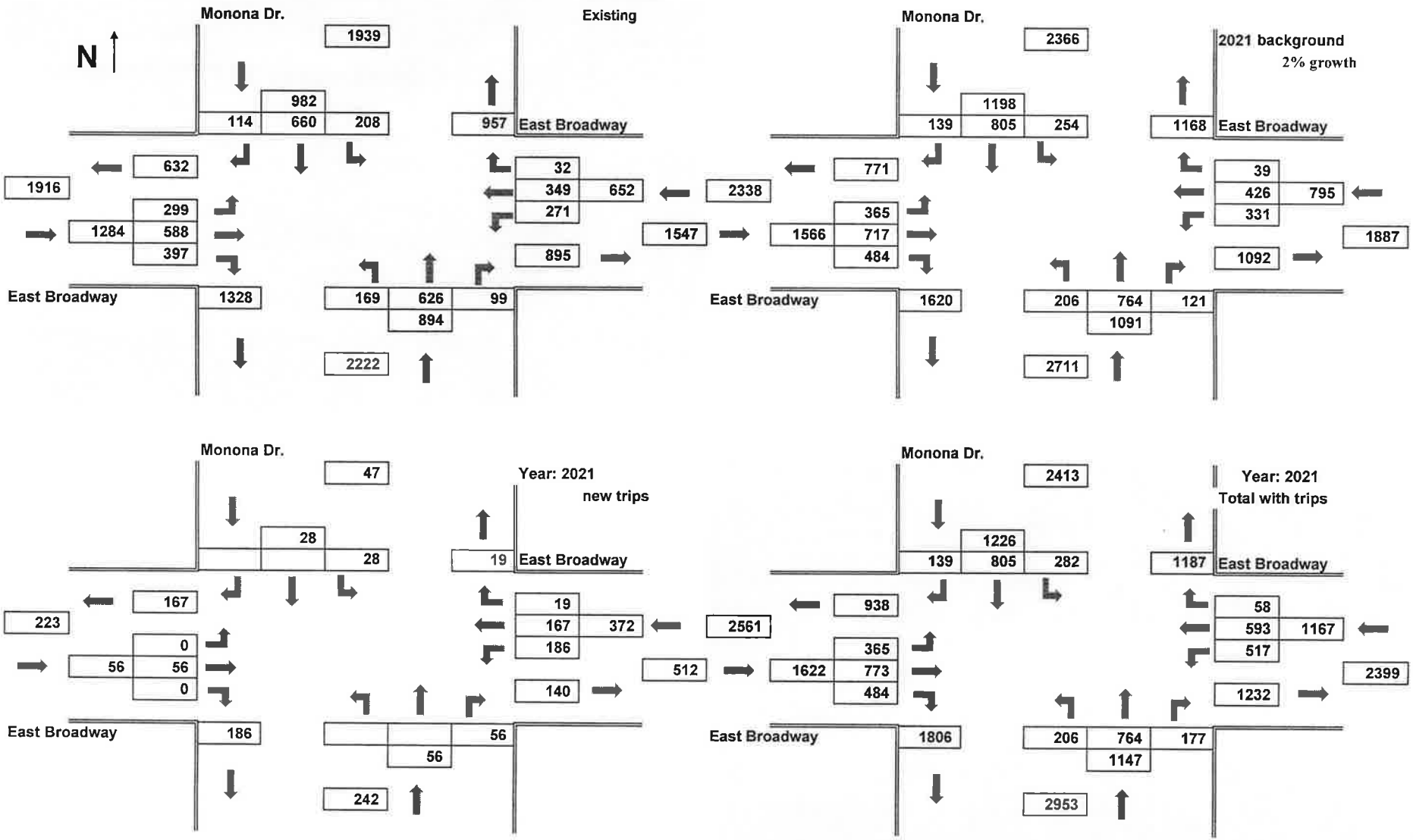
Design Hour: 4:30-5:30

Mary Greuel
KL Engineering

Project Description

Project ID:
Location: East Broadway
Cross Street: Monona Drive
City of Monona, Dane County, WI

Design Hour Turning Movement Data



2021 Projected PM Design Hour Traffic Volumes

With Added Trips

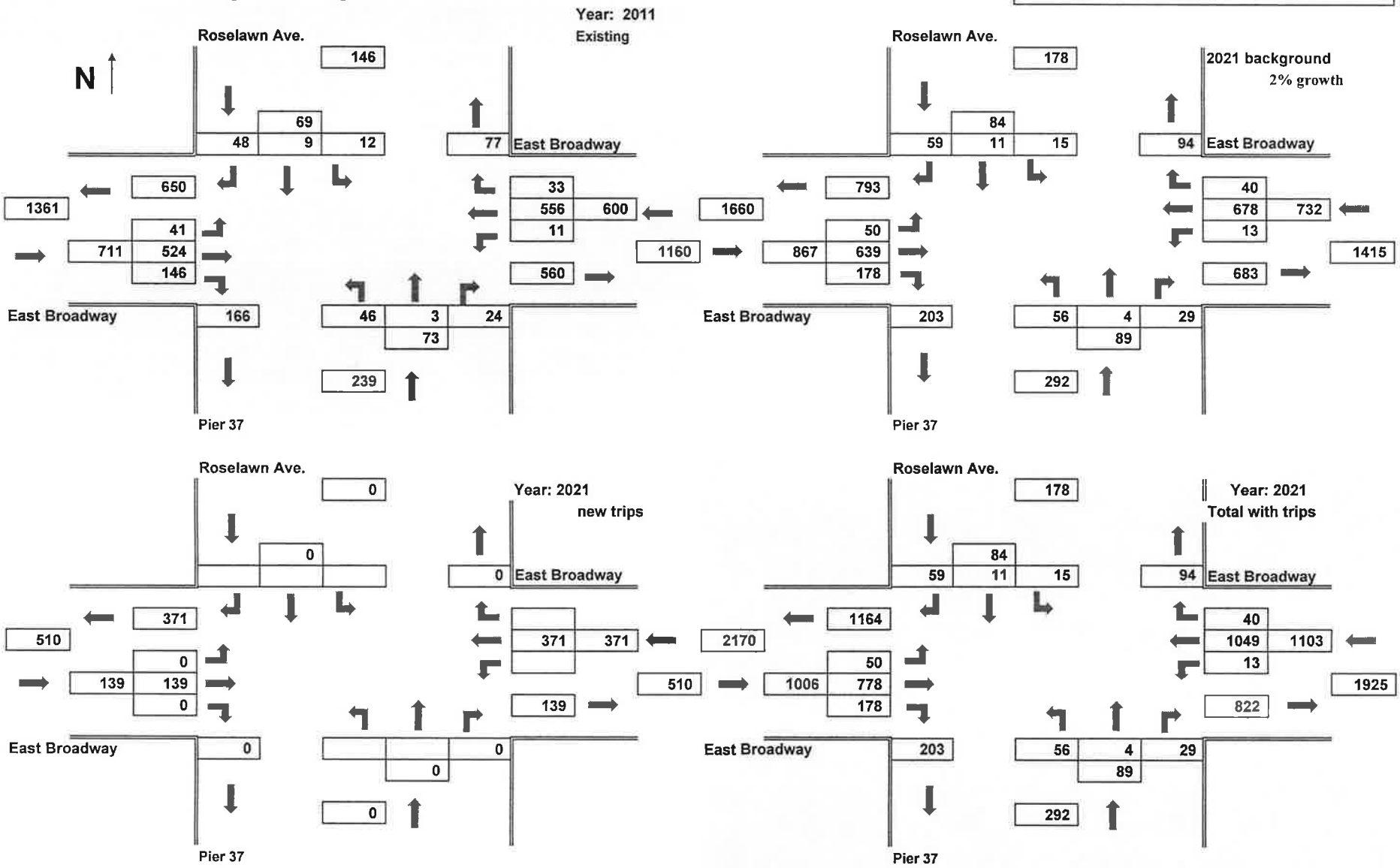
Mary Greuel
KL Engineering

Design Hour: 4:30-5:30

Project Description

Project ID:
Location: East Broadway
Cross Street: Roselawn Ave./Pier 37 west ent.
City of Monona, Dane County, WI

Design Hour Turning Movement Data



2021 Projected PM Design Hour Traffic Volumes

With Added Trips

Design Hour: 4:30-5:30

Mary Greuel
KL Engineering

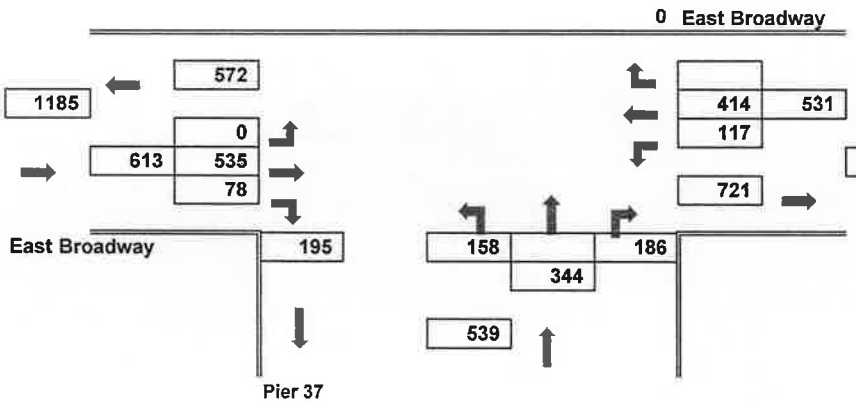
Project Description

Project ID:
Location: East Broadway
Cross: Pier 37 east ent/exit
City of Monona, Dane County, WI

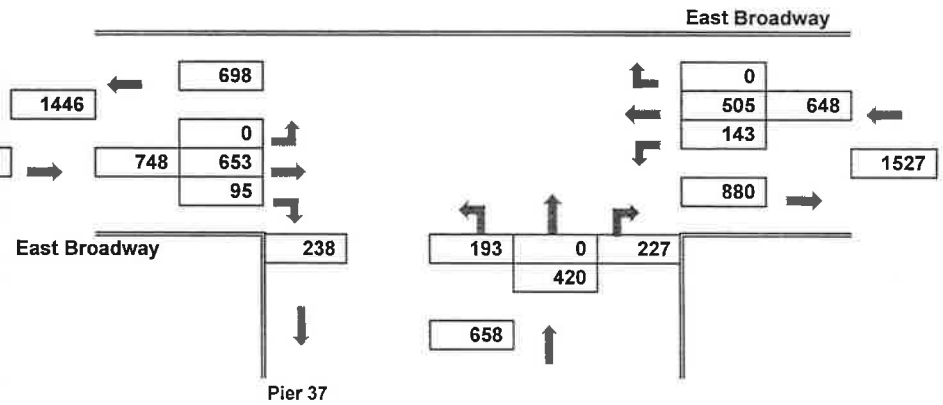
Design Hour Turning Movement Data

N

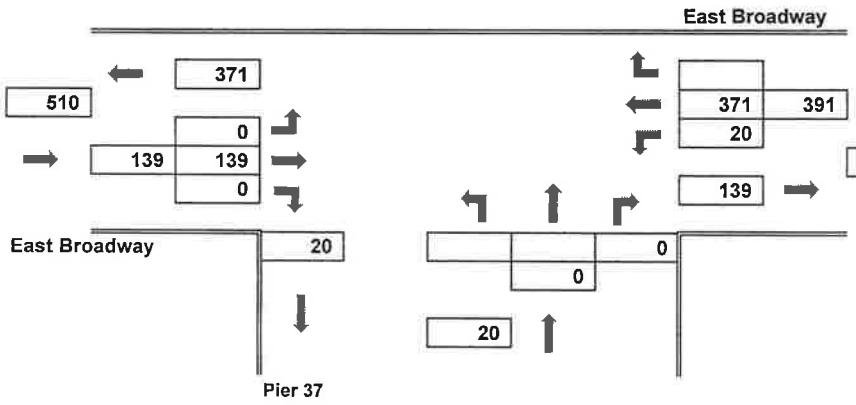
Year: 2011
Existing



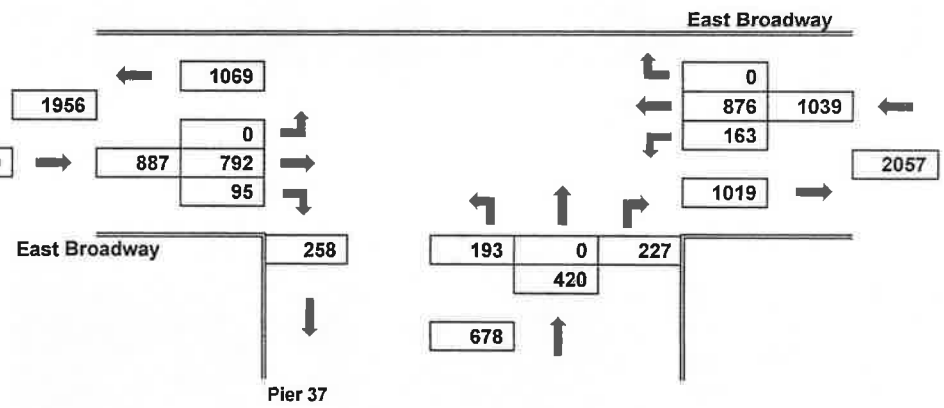
2021 background
2% growth



Year: 2021
new trips



Year: 2021
Total with trips



2021 Projected PM Design Hour Traffic Volumes

With Added Trips

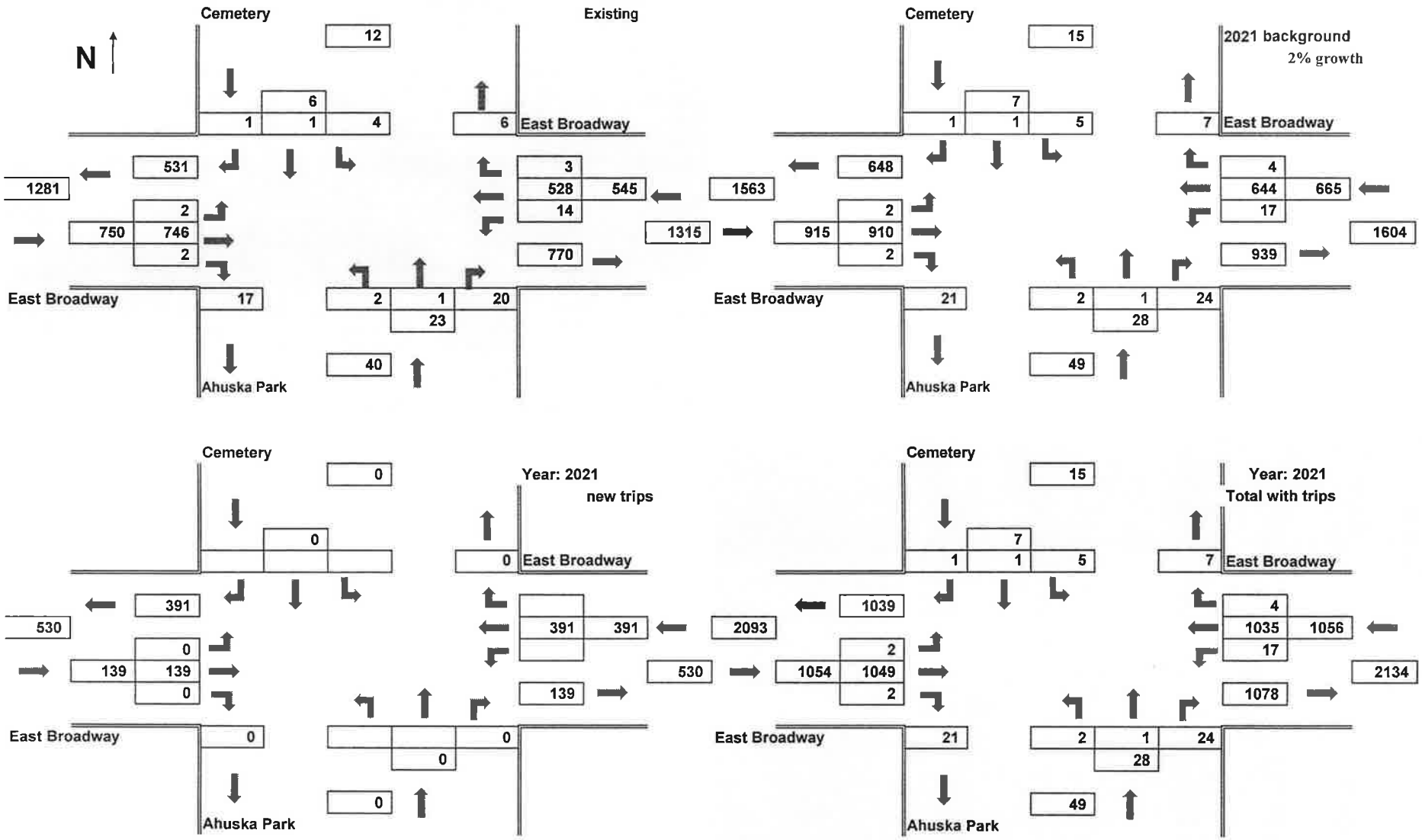
Mary Greuel
KL Engineering

Design Hour: 4:30-5:30

Project Description

Project ID:
Location: East Broadway
Cross Street: Cemetery/Ahuska Park
City of Monona, Dane County, WI

Design Hour Turning Movement Data



2021 Projected PM Design Hour Traffic Volumes

With Added Trips

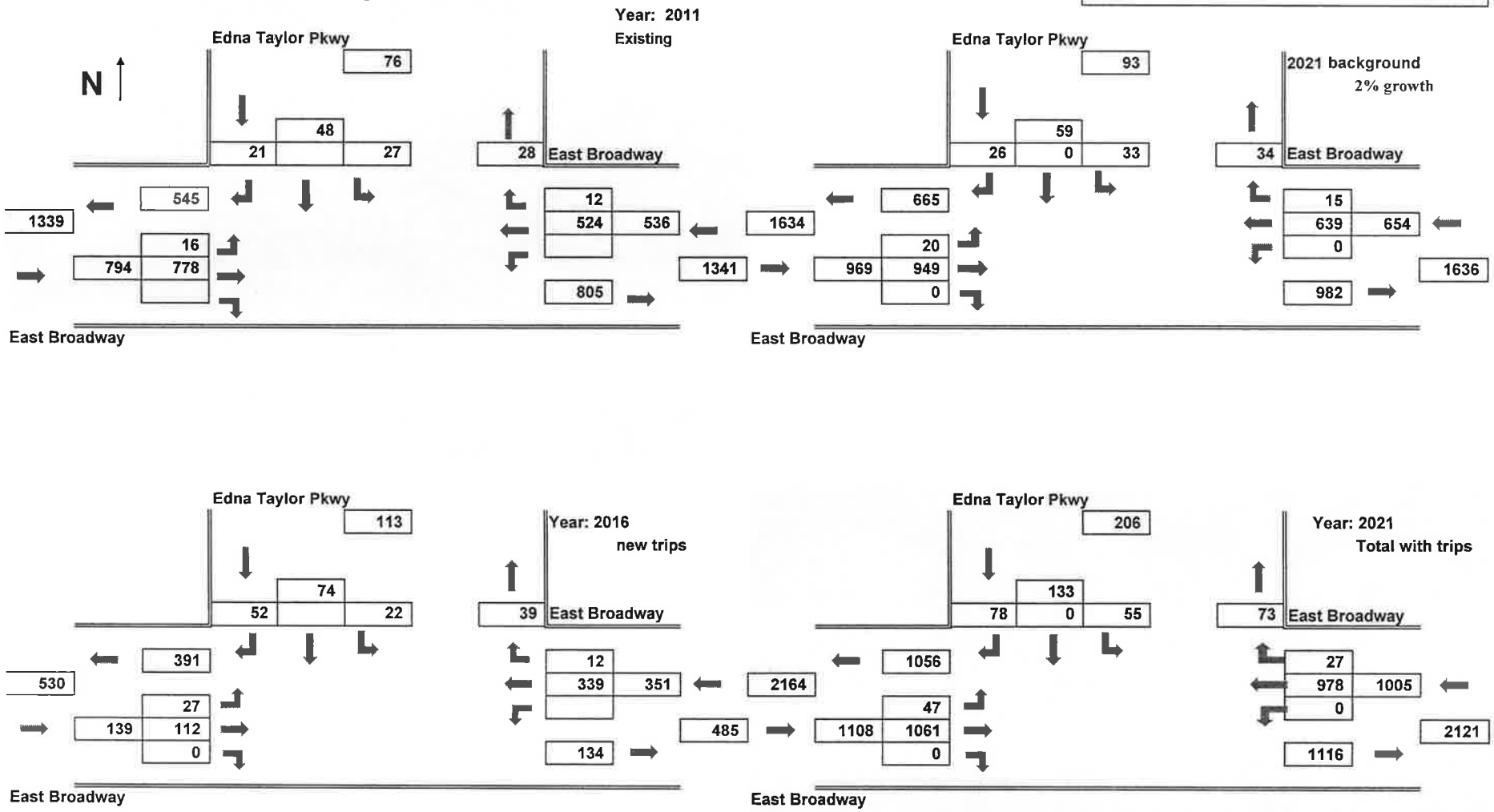
Mary Greuel
KL Engineering

Design Hour: 4:30-5:30

Project Description

Project ID:
Location: East Broadway
Cross Street: Edna Taylor Pkwy
City of Monona, Dane County, WI

Design Hour Turning Movement Data



2016 Projected PM Design Hour Traffic Volumes

With Added Trips

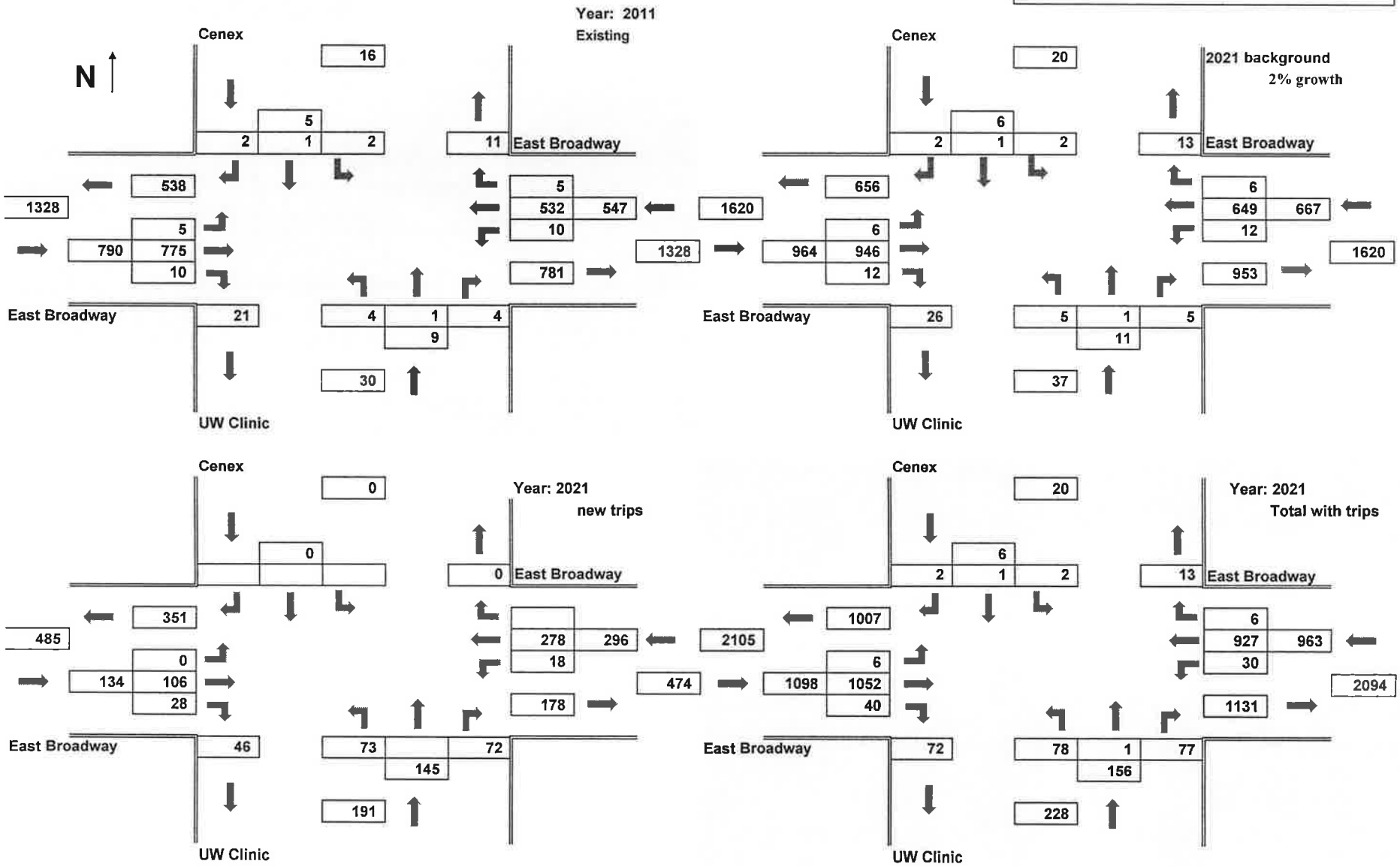
Design Hour: 4:30-5:30

Mary Greuel
KL Engineering

Project Description

Project ID:
Location: East Broadway
Cross Street: UW Clinics
City of Monona, Dane County, WI

Design Hour Turning Movement Data



2021 Projected PM Design Hour Traffic Volumes

With Added Trips

Mary Greuel
KL Engineering

Design Hour: 4:30-5:30

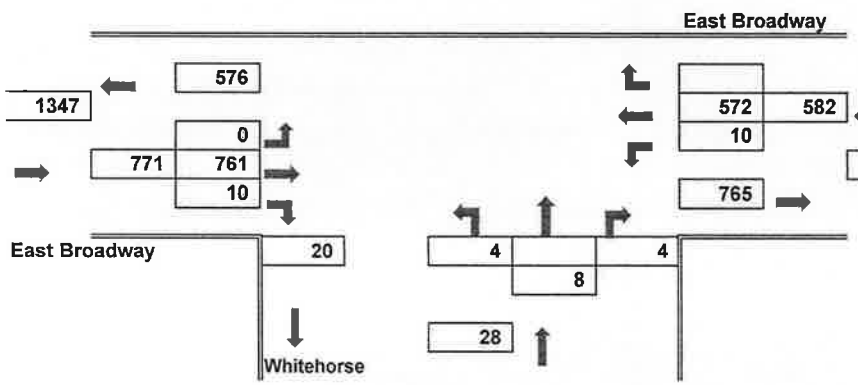
Project Description

Project ID:
Location: East Broadway
Cross Street: Whitehorse Commons
City of Monona, Dane County, WI

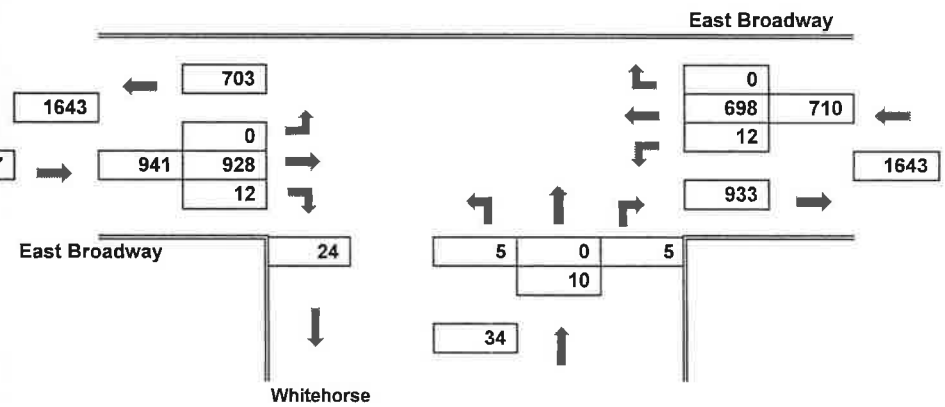
Design Hour Turning Movement Data

N

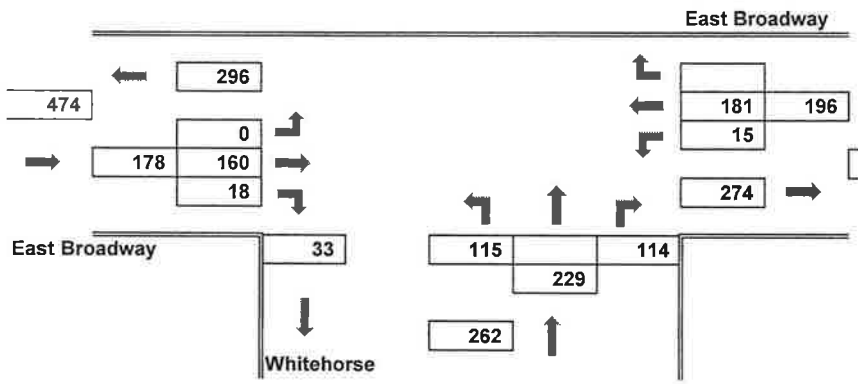
Year: 2011
Existing



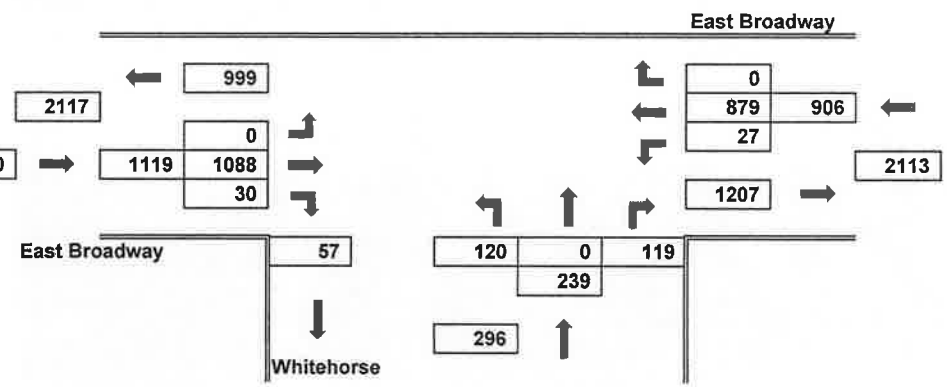
2021 background
2% growth



Year: 2021
new trips



Year: 2021
Total with trips



2021 Projected PM Design Hour Traffic Volumes

With Added Trips

Mary Greuel
KL Engineering

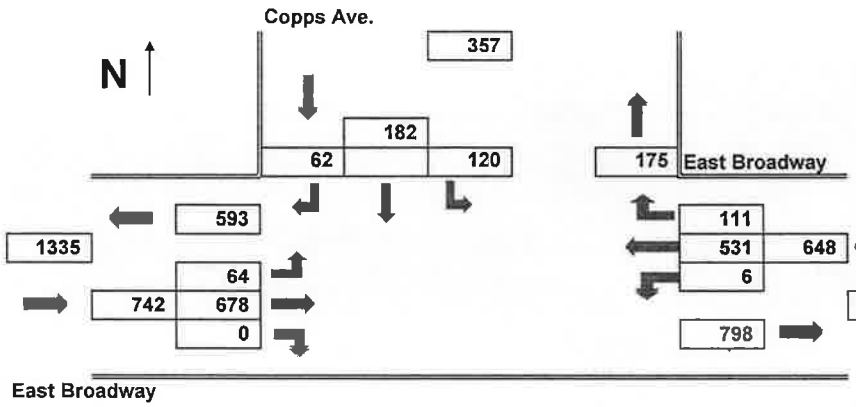
Design Hour: 4:30-5:30

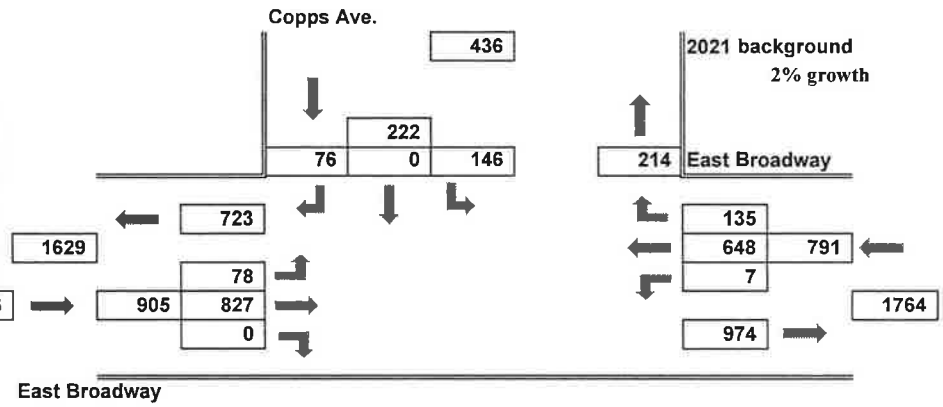
Project Description

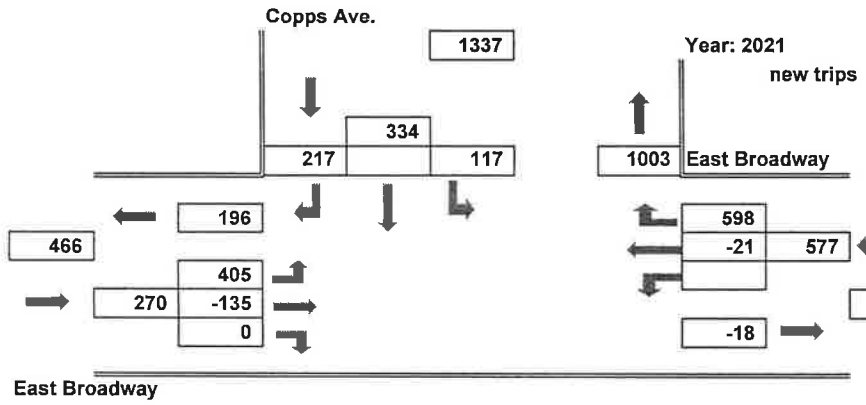
Project ID:
Location: East Broadway
Cross Street: Copps Ave.
City of Monona, Dane County, WI

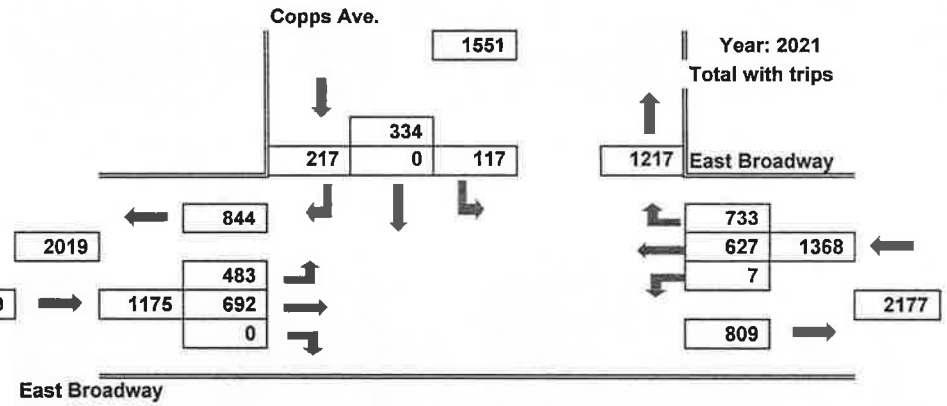
Design Hour Turning Movement Data

Year: 2011









2011 Projected AM Design Hour Traffic Volumes

With Added Trips

Design Hour: 7:15-8:15 am

Mary Greuel
KL Engineering

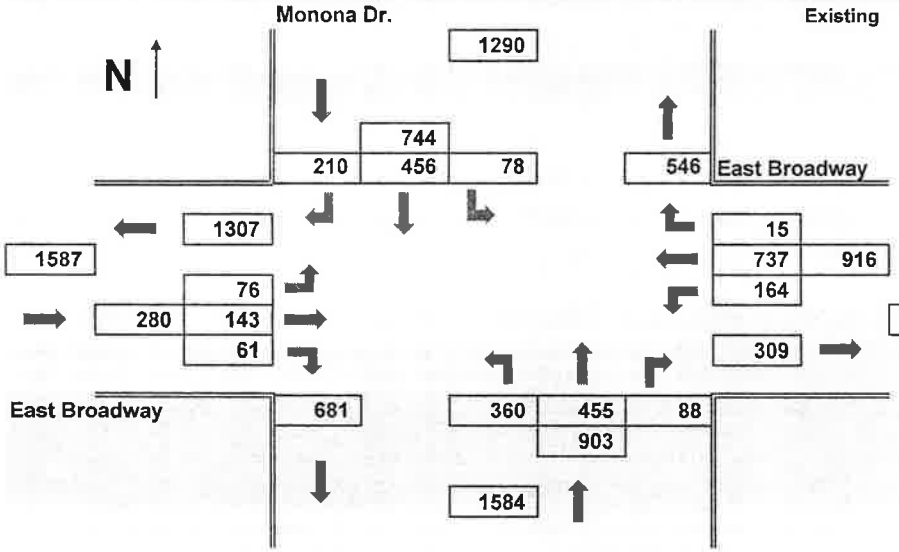
Project Description

Project ID:
Location: East Broadway
Cross Street: Monona Drive
City of Monona, Dane County, WI

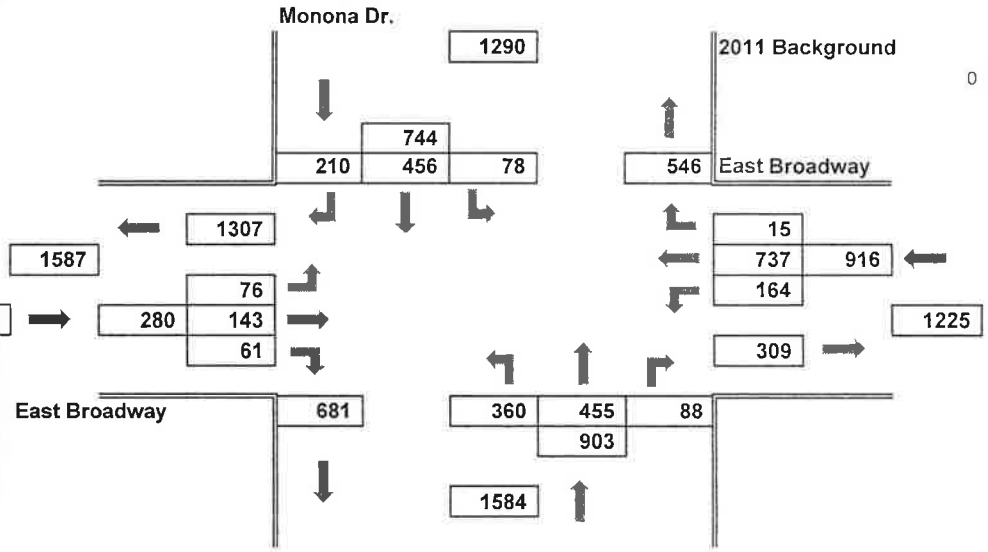
Design Hour Turning Movement Data

N

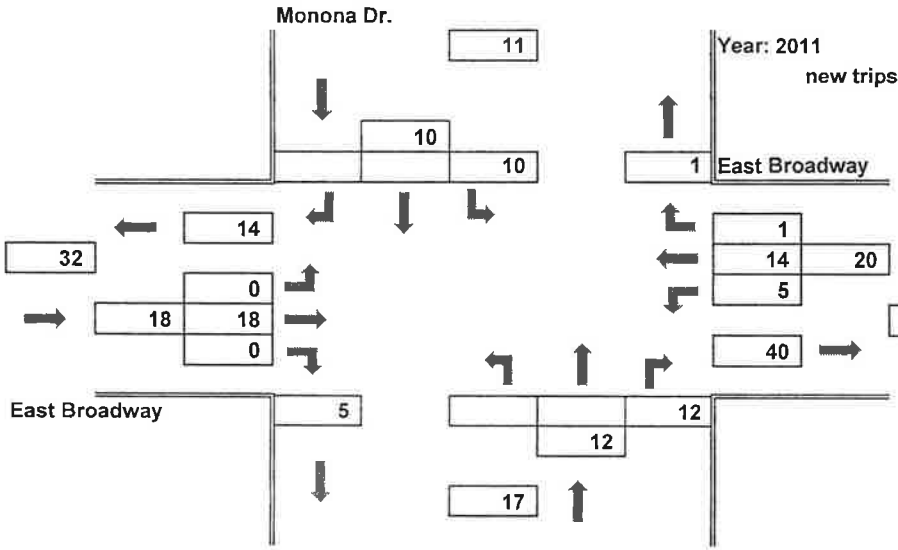
Year: 2011
Existing



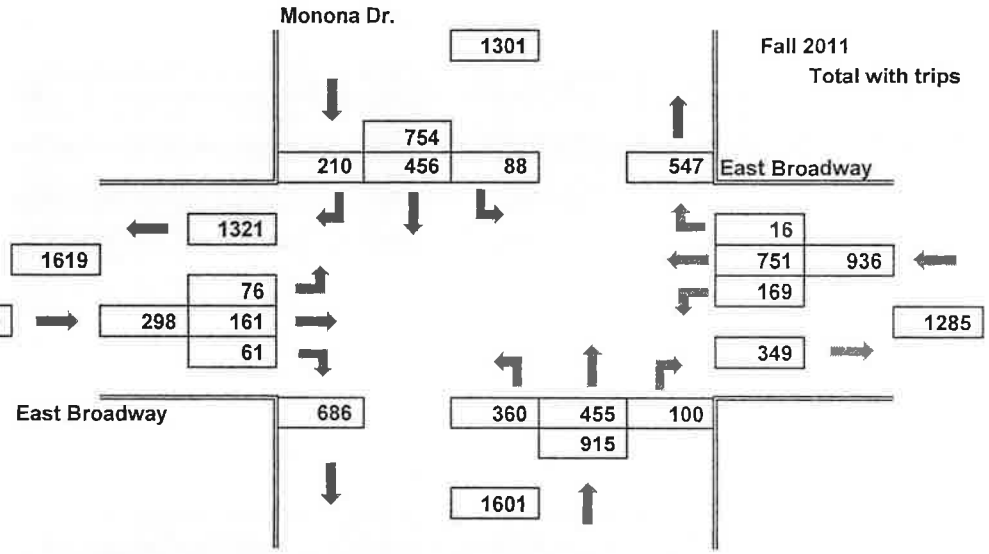
2011 Background



Year: 2011
new trips



Fall 2011
Total with trips



2011 Projected AM Design Hour Traffic Volumes

With Added Trips

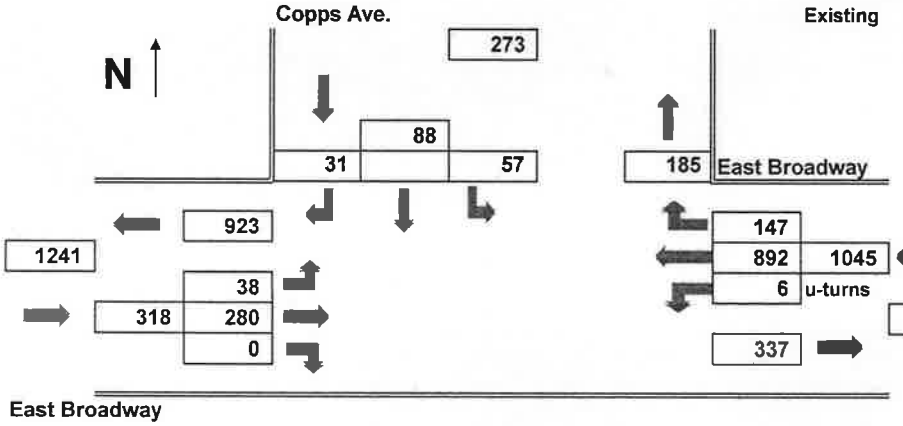
Mary Greuel
KL Engineering

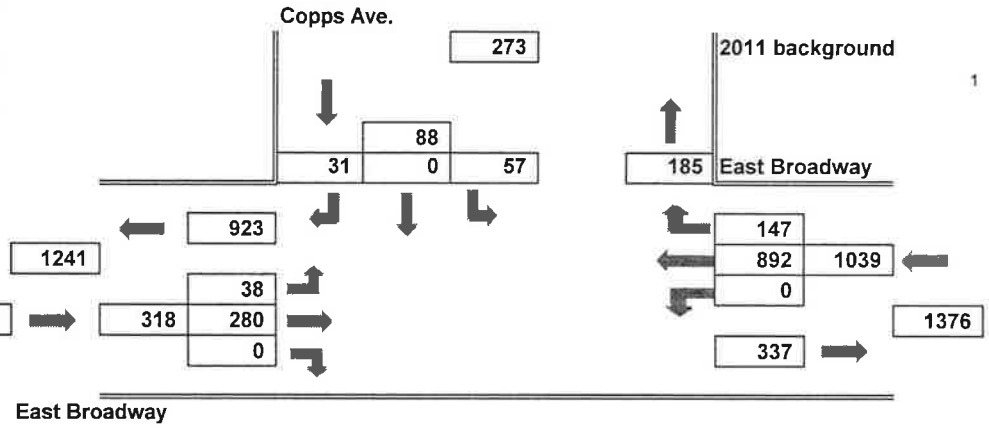
Design Hour: 7:15-8:15 am

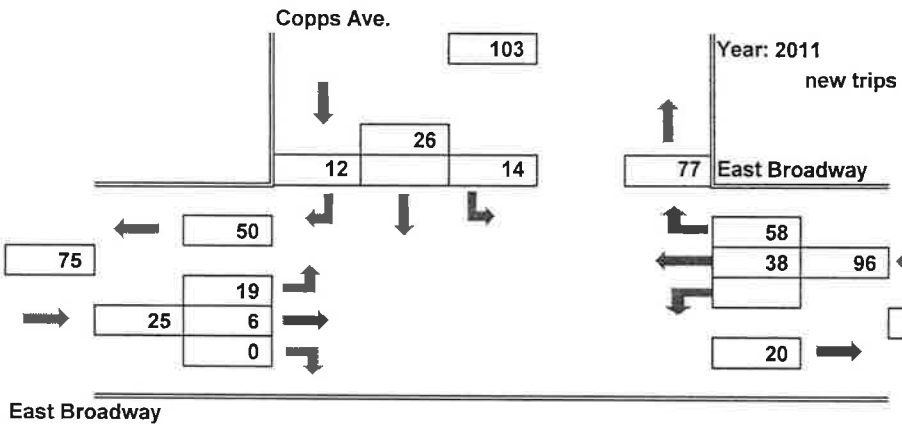
Project Description

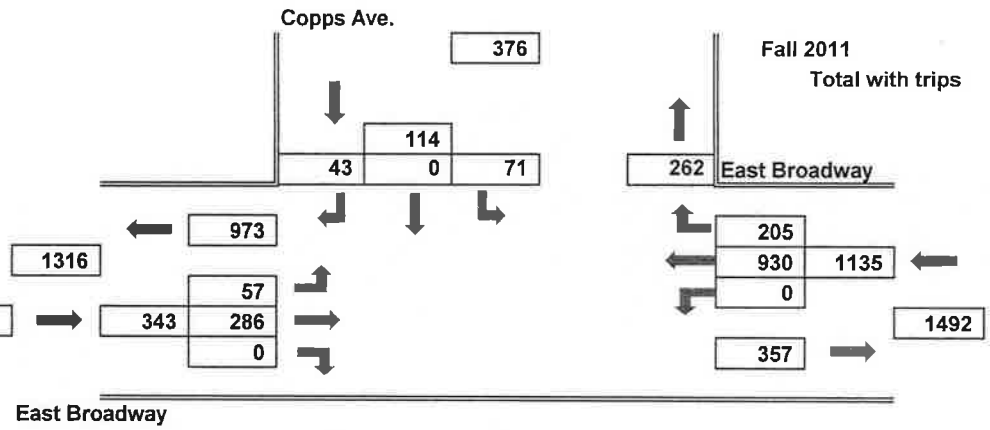
Project ID:
Location: East Broadway
Cross Street: Copps Ave.
City of Monona, Dane County, WI

Design Hour Turning Movement Data









2016 Projected AM Design Hour Traffic Volumes

With Added Trips

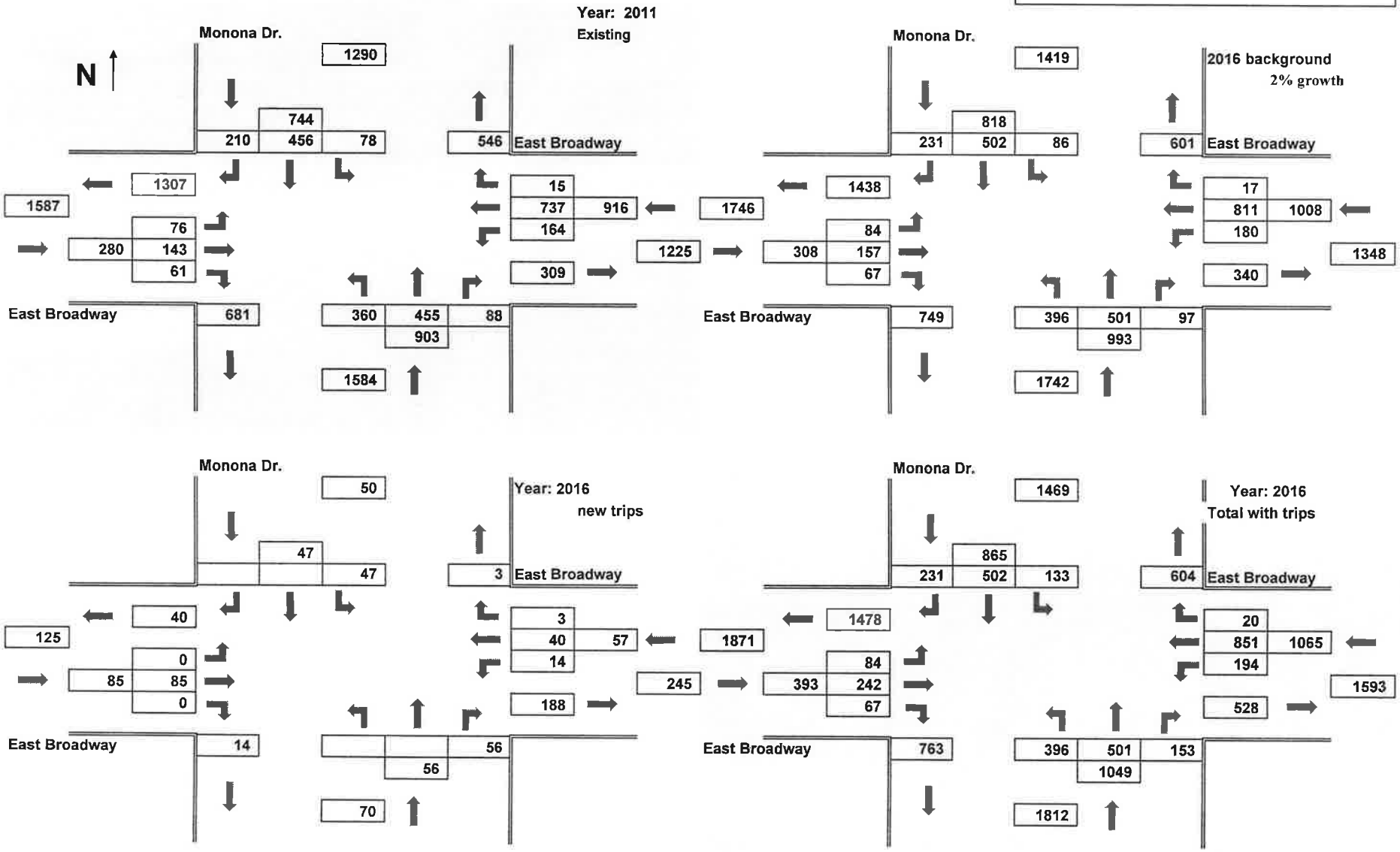
Design Hour: 7:15-8:15

Mary Greuel
KL Engineering

Project Description

Project ID:
Location: East Broadway
Cross Street: Monona Drive
City of Monona, Dane County, WI

Design Hour Turning Movement Data



2016 Projected AM Design Hour Traffic Volumes

With Added Trips

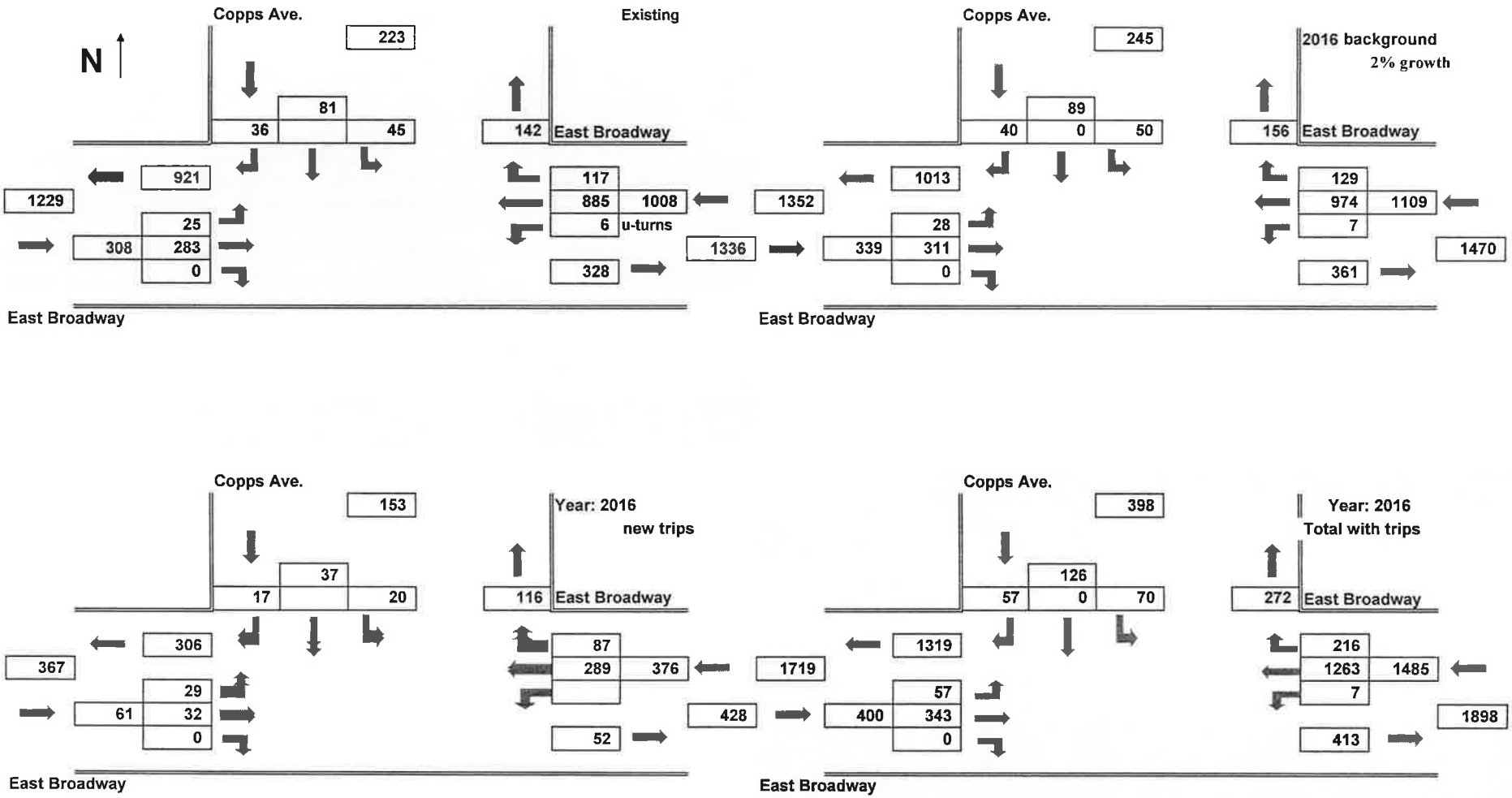
Mary Greuel
KL Engineering

Design Hour: 7:15-8:15

Project Description

Project ID:
Location: East Broadway
Cross Street: Copps Ave.
City of Monona, Dane County, WI

Design Hour Turning Movement Data



APPENDIX C

Existing Transportation System with Background Traffic Operational Analysis

2011 Existing Synchro Inputs/Outputs

Lanes, Volumes, Timings
1: East Broadway & Monona Drive

3/29/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	299	588	397	271	349	32	169	626	99	208	660	114
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3468	0	1770	3461	0
Flt Permitted	0.482			0.188			0.140			0.134		
Satd. Flow (perm)	898	3539	1583	350	3539	1583	261	3468	0	250	3461	0
Satd. Flow (RTOR)			259			21		10			12	
Lane Group Flow (vph)	318	626	422	288	371	34	180	771	0	221	823	0
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt			pm+pt		
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8		8	4		4	2			6		
Total Split (s)	33.9	49.0	49.0	35.0	50.1	50.1	25.0	53.0	0.0	31.0	59.0	0.0
Total Lost Time (s)	5.5	6.0	6.0	5.5	6.0	6.0	5.5	6.0	4.0	5.5	6.0	4.0
Act Effct Green (s)	53.2	32.1	32.1	58.9	35.0	35.0	51.3	36.1		55.9	38.4	
Actuated g/C Ratio	0.40	0.24	0.24	0.44	0.26	0.26	0.39	0.27		0.42	0.29	
v/c Ratio	0.64	0.73	0.73	0.71	0.40	0.08	0.67	0.81		0.74	0.81	
Control Delay	31.3	53.7	26.8	36.6	43.8	23.5	40.7	54.0		42.7	51.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	31.3	53.7	26.8	36.6	43.8	23.5	40.7	54.0		42.7	51.7	
LOS	C	D	C	D	D	C	D	D		D	D	
Approach Delay		40.2			39.8			51.5			49.8	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	173	263	132	153	137	8	95	325		120	346	
Queue Length 95th (ft)	308	403	305	300	231	41	192	493		233	505	
Internal Link Dist (ft)		380			344			701			527	
Turn Bay Length (ft)	150		150	110		80	110			160		
Base Capacity (vph)	597	1203	709	491	1234	565	342	1294		418	1457	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.53	0.52	0.60	0.59	0.30	0.06	0.53	0.60		0.53	0.56	

Intersection Summary

Cycle Length: 168
Actuated Cycle Length: 132.8
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 45.2 — Intersection LOS: D
Intersection Capacity Utilization 82.4% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: East Broadway & Monona Drive

ø1	ø2	ø3	ø4
31 s	53 s	33.9 s	50.1 s
ø5	ø6	ø7	ø8
25 s	59 s	35 s	49 s

HCM Unsignalized Intersection Capacity Analysis
2: East Broadway & Rose Lawn Ave.

3/31/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	41	524	146	11	556	33	46	3	24	12	9	48
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	44	563	157	12	598	35	49	3	26	13	10	52
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)		424			357							
pX, platoon unblocked	0.97			0.90			0.91	0.91	0.90	0.91	0.91	0.97
vC, conflicting volume	633			720			1031	1309	282	1037	1448	317
vC1, stage 1 conf vol							652	652		639	639	
vC2, stage 2 conf vol							379	657		397	809	
vCu, unblocked vol	550			457			676	981	0	683	1133	223
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			99			87	99	97	97	97	93
cM capacity (veh/h)	981			986			371	313	972	375	286	755

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	44	282	282	157	12	399	235	51	27	74
Volume Left	44	0	0	0	12	0	0	49	0	13
Volume Right	0	0	0	157	0	0	35	0	26	52
cSH	981	1700	1700	1700	986	1700	1700	368	865	543
Volume to Capacity	0.04	0.17	0.17	0.09	0.01	0.23	0.14	0.14	0.03	0.14
Queue Length 95th (ft)	4	0	0	0	1	0	0	12	2	12
Control Delay (s)	8.8	0.0	0.0	0.0	8.7	0.0	0.0	16.3	9.3	12.7
Lane LOS	A				A			C	A	B
Approach Delay (s)	0.5				0.2			13.9		12.7
Approach LOS								B		B

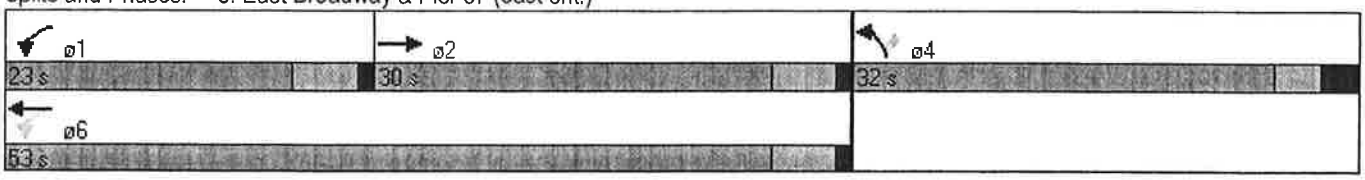
Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↰	↑↑	↰	↱
Volume (vph)	535	78	117	414	158	186
Satd. Flow (prot)	3472	0	1770	3539	1770	1583
Flt Permitted			0.284		0.950	
Satd. Flow (perm)	3472	0	529	3539	1770	1583
Satd. Flow (RTOR)	19					194
Lane Group Flow (vph)	638	0	122	431	165	194
Turn Type			pm+pt			Perm
Protected Phases	2		1	6	4	
Permitted Phases			6			4
Total Split (s)	30.0	0.0	23.0	53.0	32.0	32.0
Total Lost Time (s)	5.0	4.0	5.0	5.0	5.5	5.5
Act Effct Green (s)	19.1		28.7	28.7	10.8	10.8
Actuated g/C Ratio	0.38		0.57	0.57	0.21	0.21
v/c Ratio	0.48		0.25	0.21	0.44	0.40
Control Delay	14.4		6.5	5.7	22.6	6.3
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	14.4		6.5	5.7	22.6	6.3
LOS	B		A	A	C	A
Approach Delay	14.4			5.9	13.8	
Approach LOS	B			A	B	
Queue Length 50th (ft)	73		13	26	44	0
Queue Length 95th (ft)	137		37	54	99	43
Internal Link Dist (ft)	277			644	99	
Turn Bay Length (ft)			110			
Base Capacity (vph)	1786		759	3255	960	948
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.36		0.16	0.13	0.17	0.20

Intersection Summary

Cycle Length: 85
Actuated Cycle Length: 50.3
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.48
Intersection Signal Delay: 11.2 Intersection LOS: B
Intersection Capacity Utilization 45.4% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: East Broadway & Pier 37 (east ent.)



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	16	778	524	12	27	21
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	18	864	582	13	30	23
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	596				1057	298
vC1, stage 1 conf vol					589	
vC2, stage 2 conf vol					468	
vCu, unblocked vol	596				1057	298
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 %	98				91	97
cM capacity (veh/h)	977				349	698

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	18	432	432	388	207	53
Volume Left	18	0	0	0	0	30
Volume Right	0	0	0	0	13	23
cSH	977	1700	1700	1700	1700	447
Volume to Capacity	0.02	0.25	0.25	0.23	0.12	0.12
Queue Length 95th (ft)	1	0	0	0	0	10
Control Delay (s)	8.8	0.0	0.0	0.0	0.0	14.1
Lane LOS	A					B
Approach Delay (s)	0.2			0.0		14.1
Approach LOS						B

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	31.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	64	678	531	111	120	62
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	67	714	559	117	126	65
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						3
Median type		Raised	None			
Median storage veh)		1				
Upstream signal (ft)			771			
pX, platoon unblocked	0.96				0.96	0.96
vC, conflicting volume	676				1051	279
vC1, stage 1 conf vol					559	
vC2, stage 2 conf vol					492	
vCu, unblocked vol	577				968	164
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 %	93				65	92
cM capacity (veh/h)	952				357	817

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	67	357	357	279	279	117	192
Volume Left	67	0	0	0	0	0	126
Volume Right	0	0	0	0	0	117	65
cSH	952	1700	1700	1700	1700	1700	542
Volume to Capacity	0.07	0.21	0.21	0.16	0.16	0.07	0.35
Queue Length 95th (ft)	6	0	0	0	0	0	40
Control Delay (s)	9.1	0.0	0.0	0.0	0.0	0.0	16.8
Lane LOS	A						C
Approach Delay (s)	0.8			0.0			16.8
Approach LOS							C

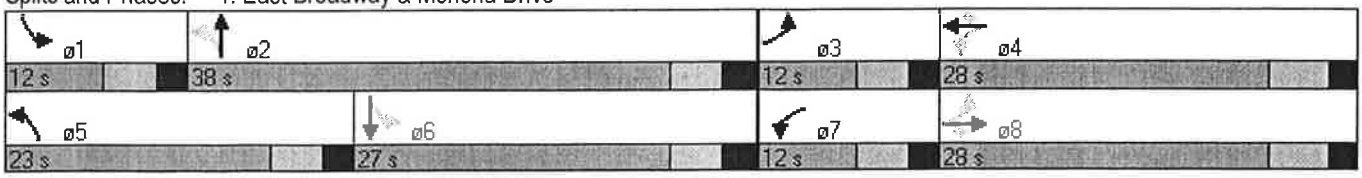
Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	76	143	61	164	737	15	360	455	88	78	456	210
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3454	0	1770	3373	0
Flt Permitted	0.194			0.608			0.152			0.434		
Satd. Flow (perm)	361	3539	1583	1133	3539	1583	283	3454	0	808	3373	0
Satd. Flow (RTOR)			65			9		28			78	
Lane Group Flow (vph)	81	152	65	174	784	16	383	578	0	83	708	0
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt			pm+pt		
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8		8	4		4	2			6		
Total Split (s)	12.0	28.0	28.0	12.0	28.0	28.0	23.0	38.0	0.0	12.0	27.0	0.0
Total Lost Time (s)	5.5	6.0	6.0	5.5	6.0	6.0	5.5	6.0	4.0	5.5	6.0	4.0
Act Effct Green (s)	26.1	19.3	19.3	27.7	22.2	22.2	43.0	33.3		26.4	19.5	
Actuated g/C Ratio	0.30	0.22	0.22	0.32	0.26	0.26	0.50	0.39		0.31	0.23	
v/c Ratio	0.38	0.19	0.16	0.42	0.86	0.04	0.86	0.43		0.26	0.86	
Control Delay	23.6	27.6	8.4	23.5	42.7	18.2	42.1	21.1		16.1	40.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	23.6	27.6	8.4	23.5	42.7	18.2	42.1	21.1		16.1	40.4	
LOS	C	C	A	C	D	B	D	C		B	D	
Approach Delay		22.3			38.9			29.4			37.8	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)	29	35	0	66	228	3	158	124		24	181	
Queue Length 95th (ft)	60	61	31	114	#336	19	#324	173		48	#272	
Internal Link Dist (ft)		380			344			701			527	
Turn Bay Length (ft)	150		150	110		80	110			160		
Base Capacity (vph)	218	914	457	413	914	416	447	1356		323	890	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.37	0.17	0.14	0.42	0.86	0.04	0.86	0.43		0.26	0.80	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 86
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 34.0 — Intersection LOS: C
Intersection Capacity Utilization 83.0% — ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: East Broadway & Monona Drive



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	38	280	892	147	57	31
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	40	295	939	155	60	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						3
Median type		Raised	None			
Median storage veh)		1				
Upstream signal (ft)			771			
pX, platoon unblocked	0.97				0.97	0.97
vC, conflicting volume	1094				1166	469
vC1, stage 1 conf vol					939	
vC2, stage 2 conf vol					227	
vCu, unblocked vol	1045				1119	404
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 %	94				79	94
cM capacity (veh/h)	645				287	581

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	40	147	147	469	469	155	93
Volume Left	40	0	0	0	0	0	60
Volume Right	0	0	0	0	0	155	33
cSH	645	1700	1700	1700	1700	1700	443
Volume to Capacity	0.06	0.09	0.09	0.28	0.28	0.09	0.21
Queue Length 95th (ft)	5	0	0	0	0	0	20
Control Delay (s)	10.9	0.0	0.0	0.0	0.0	0.0	17.6
Lane LOS	B						C
Approach Delay (s)	1.3			0.0			17.6
Approach LOS							C

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
8: East Broadway & Copps Ave.

Saturday
3/31/2011

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	108	376	394	161	156	84
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	116	404	424	173	168	90
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						3
Median type		Raised	None			
Median storage veh)		1				
Upstream signal (ft)			771			
pX, platoon unblocked						
vC, conflicting volume	597				858	212
vC1, stage 1 conf vol					424	
vC2, stage 2 conf vol					434	
vCu, unblocked vol	597				858	212
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				56	89
cM capacity (veh/h)	976				385	794

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	116	202	202	212	212	173	258
Volume Left	116	0	0	0	0	0	168
Volume Right	0	0	0	0	0	173	90
cSH	976	1700	1700	1700	1700	1700	592
Volume to Capacity	0.12	0.12	0.12	0.12	0.12	0.10	0.44
Queue Length 95th (ft)	10	0	0	0	0	0	55
Control Delay (s)	9.2	0.0	0.0	0.0	0.0	0.0	17.4
Lane LOS	A						C
Approach Delay (s)	2.0			0.0			17.4
Approach LOS							C

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	35.5%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX D

Existing Transportation System with Background plus Development Traffic Operational Analysis

Fall 2011, 2016, and 2021
Synchro Inputs/Outputs
SimTraffic Outputs (Queues)

Lanes, Volumes, Timings
1: East Broadway & Monona Drive

3/29/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	299	610	397	303	394	36	169	626	106	215	660	114
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3461	0	1770	3461	0
Flt Permitted	0.391			0.192			0.146			0.127		
Satd. Flow (perm)	728	3539	1583	358	3539	1583	272	3461	0	237	3461	0
Satd. Flow (RTOR)			249			21		11			12	
Lane Group Flow (vph)	318	649	422	322	419	38	180	779	0	229	823	0
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt			pm+pt		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6	4			8		
Total Split (s)	33.9	49.0	49.0	35.0	50.1	50.1	25.0	53.0	0.0	31.0	59.0	0.0
Total Lost Time (s)	5.5	6.0	6.0	5.5	6.0	6.0	5.5	6.0	4.0	5.5	6.0	4.0
Act Effct Green (s)	57.2	33.8	33.8	57.8	34.1	34.1	52.5	37.0		58.2	39.9	
Actuated g/C Ratio	0.42	0.25	0.25	0.42	0.25	0.25	0.39	0.27		0.43	0.29	
v/c Ratio	0.66	0.74	0.73	0.82	0.47	0.09	0.67	0.82		0.76	0.80	
Control Delay	32.4	54.5	28.1	46.3	46.9	25.4	40.3	55.5		45.8	51.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	32.4	54.5	28.1	46.3	46.9	25.4	40.3	55.5		45.8	51.6	
LOS	C	D	C	D	D	C	D	E		D	D	
Approach Delay		41.4			45.6			52.6			50.3	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	183	285	147	187	169	12	98	344		131	357	
Queue Length 95th (ft)	308	420	318	#368	261	48	188	499		250	505	
Internal Link Dist (ft)		380			344			701			527	
Turn Bay Length (ft)	150		150	110		80	110			160		
Base Capacity (vph)	554	1174	691	485	1204	552	339	1262		408	1422	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.57	0.55	0.61	0.66	0.35	0.07	0.53	0.62		0.56	0.58	

Intersection Summary

Cycle Length: 168
Actuated Cycle Length: 136
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 47.0 — Intersection LOS: D
Intersection Capacity Utilization 85.4% — ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: East Broadway & Monona Drive

ø1	ø2	ø3	ø4
35 s	49 s	31 s	53 s
ø5	ø6	ø7	ø8
33.9 s	50.1 s	25 s	59 s

HCM Unsignalized Intersection Capacity Analysis
2: East Broadway & Rose Lawn Ave.

3/31/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	41	560	146	11	637	33	46	3	24	12	9	48
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	44	602	157	12	685	35	49	3	26	13	10	52
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)		424			357							
pX, platoon unblocked	0.95			0.88			0.91	0.91	0.88	0.91	0.91	0.95
vC, conflicting volume	720			759			1113	1434	301	1143	1574	360
vC1, stage 1 conf vol							690	690		726	726	
vC2, stage 2 conf vol							423	744		417	847	
vCu, unblocked vol	594			452			656	1011	0	689	1164	214
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			99			87	99	97	96	96	93
cM capacity (veh/h)	927			972			370	297	954	356	274	750

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	44	301	301	157	12	457	264	51	27	74
Volume Left	44	0	0	0	12	0	0	49	0	13
Volume Right	0	0	0	157	0	0	35	0	26	52
cSH	927	1700	1700	1700	972	1700	1700	367	844	528
Volume to Capacity	0.05	0.18	0.18	0.09	0.01	0.27	0.16	0.14	0.03	0.14
Queue Length 95th (ft)	4	0	0	0	1	0	0	12	3	12
Control Delay (s)	9.1	0.0	0.0	0.0	8.8	0.0	0.0	16.4	9.4	12.9
Lane LOS	A				A			C	A	B
Approach Delay (s)	0.5				0.1			13.9		12.9
Approach LOS								B		B

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	42.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	↗
Volume (vph)	571	78	121	495	158	186
Satd. Flow (prot)	3476	0	1770	3539	1770	1583
Flt Permitted			0.268		0.950	
Satd. Flow (perm)	3476	0	499	3539	1770	1583
Satd. Flow (RTOR)	18					194
Lane Group Flow (vph)	676	0	126	516	165	194
Turn Type			pm+pt			Perm
Protected Phases	2		1	6	4	
Permitted Phases			6			4
Total Split (s)	30.0	0.0	23.0	53.0	32.0	32.0
Total Lost Time (s)	5.0	4.0	5.0	5.0	5.5	5.5
Act Effct Green (s)	19.7		29.3	29.3	10.9	10.9
Actuated g/C Ratio	0.39		0.57	0.57	0.21	0.21
v/c Ratio	0.50		0.26	0.25	0.44	0.40
Control Delay	14.6		6.6	5.8	23.2	6.4
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	14.6		6.6	5.8	23.2	6.4
LOS	B		A	A	C	A
Approach Delay	14.6			6.0	14.1	
Approach LOS	B			A	B	
Queue Length 50th (ft)	80		14	32	44	0
Queue Length 95th (ft)	146		38	64	104	44
Internal Link Dist (ft)	277			644	99	
Turn Bay Length (ft)			110			
Base Capacity (vph)	1770		750	3221	951	940
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.38		0.17	0.16	0.17	0.21

Intersection Summary

Cycle Length: 85
Actuated Cycle Length: 51
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.50
Intersection Signal Delay: 11.2 Intersection LOS: B
Intersection Capacity Utilization 46.6% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: East Broadway & Pier 37 (east ent.)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	16	814	609	12	27	21
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	18	904	677	13	30	23
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	690				1171	345
vC1, stage 1 conf vol					683	
vC2, stage 2 conf vol					488	
vCu, unblocked vol	690				1171	345
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 %	98				90	96
cM capacity (veh/h)	900				315	651

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	18	452	452	451	239	53
Volume Left	18	0	0	0	0	30
Volume Right	0	0	0	0	13	23
cSH	900	1700	1700	1700	1700	407
Volume to Capacity	0.02	0.27	0.27	0.27	0.14	0.13
Queue Length 95th (ft)	2	0	0	0	0	11
Control Delay (s)	9.1	0.0	0.0	0.0	0.0	15.2
Lane LOS	A					C
Approach Delay (s)	0.2			0.0		15.2
Approach LOS						C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	32.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	796	25	25	576	5	45	1	44	2	1	2
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)	5	865	27	27	626	5	49	1	48	2	1	2
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	632			892			1260	1576	446	1175	1586	316
vC1, stage 1 conf vol							890	890		683	683	
vC2, stage 2 conf vol							370	686		492	903	
vCu, unblocked vol	632			892			1260	1576	446	1175	1586	316
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 %	99			96			79	100	91	99	99	100
cM capacity (veh/h)	947			756			230	224	560	250	215	680

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	5	577	316	27	417	214	50	48	5
Volume Left	5	0	0	27	0	0	49	0	2
Volume Right	0	0	27	0	0	5	0	48	2
cSH	947	1700	1700	756	1700	1700	230	560	320
Volume to Capacity	0.01	0.34	0.19	0.04	0.25	0.13	0.22	0.09	0.02
Queue Length 95th (ft)	0	0	0	3	0	0	20	7	1
Control Delay (s)	8.8	0.0	0.0	9.9	0.0	0.0	24.9	12.0	16.4
Lane LOS	A			A			C	B	C
Approach Delay (s)	0.1			0.4			18.6		16.4
Approach LOS							C		C

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	822	10	10	631	4	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)	893	11	11	686	4	4
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)				1237		
pX, platoon unblocked					1.00	
vC, conflicting volume			904		1264	452
vC1, stage 1 conf vol					899	
vC2, stage 2 conf vol					365	
vCu, unblocked vol			904		1258	452
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 %			99		98	99
cM capacity (veh/h)			748		276	555

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	596	309	11	343	343	4	4
Volume Left	0	0	11	0	0	4	0
Volume Right	0	11	0	0	0	0	4
cSH	1700	1700	748	1700	1700	276	555
Volume to Capacity	0.35	0.18	0.01	0.20	0.20	0.02	0.01
Queue Length 95th (ft)	0	0	1	0	0	1	1
Control Delay (s)	0.0	0.0	9.9	0.0	0.0	18.3	11.5
Lane LOS			A			C	B
Approach Delay (s)	0.0		0.2			14.9	
Approach LOS						B	

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	33.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	85	718	546	142	186	106
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	89	756	575	149	196	112
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						3
Median type		Raised	None			
Median storage veh)		1				
Upstream signal (ft)			771			
pX, platoon unblocked	0.96				0.96	0.96
vC, conflicting volume	724				1132	287
vC1, stage 1 conf vol					575	
vC2, stage 2 conf vol					557	
vCu, unblocked vol	640				1062	187
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				40	86
cM capacity (veh/h)	907				324	794

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	89	378	378	287	287	149	307
Volume Left	89	0	0	0	0	0	196
Volume Right	0	0	0	0	0	149	112
cSH	907	1700	1700	1700	1700	1700	508
Volume to Capacity	0.10	0.22	0.22	0.17	0.17	0.09	0.60
Queue Length 95th (ft)	8	0	0	0	0	0	99
Control Delay (s)	9.4	0.0	0.0	0.0	0.0	0.0	24.0
Lane LOS	A						C
Approach Delay (s)	1.0			0.0			24.0
Approach LOS							C

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
1: East Broadway & Monona Drive

3/31/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	329	700	437	406	532	48	186	689	127	247	726	125
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3458	0	1770	3461	0
Flt Permitted	0.337			0.127			0.129			0.114		
Satd. Flow (perm)	628	3539	1583	237	3539	1583	240	3458	0	212	3461	0
Satd. Flow (RTOR)			231			28		17			16	
Lane Group Flow (vph)	350	745	465	432	566	51	198	868	0	263	905	0
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt			pm+pt		
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8		8	4		4	2			6		
Total Split (s)	28.0	32.0	32.0	31.0	35.0	35.0	16.0	37.0	0.0	20.0	41.0	0.0
Total Lost Time (s)	5.5	6.0	6.0	5.5	6.0	6.0	5.5	6.0	4.0	5.5	6.0	4.0
Act Effct Green (s)	46.5	26.0	26.0	56.2	31.5	31.5	42.0	31.0		50.0	35.0	
Actuated g/C Ratio	0.39	0.22	0.22	0.47	0.26	0.26	0.35	0.26		0.42	0.29	
v/c Ratio	0.81	0.97	0.89	0.99	0.61	0.12	0.91	0.96		0.95	0.89	
Control Delay	36.8	73.1	42.8	75.6	42.8	20.4	70.6	64.6		74.3	51.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	36.8	73.1	42.8	75.6	42.8	20.4	70.6	64.6		74.3	51.6	
LOS	D	E	D	E	D	C	E	E		E	D	
Approach Delay		56.0			55.2			65.7			56.7	
Approach LOS		E			E			E			E	
Queue Length 50th (ft)	171	303	189	285	206	14	101	344		152	347	
Queue Length 95th (ft)	249	#431	#385	#503	272	47	#246	#477		#321	#460	
Internal Link Dist (ft)		380			344			701			527	
Turn Bay Length (ft)	150		150	110		80	110			160		
Base Capacity (vph)	471	767	524	436	929	436	218	906		277	1021	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.74	0.97	0.89	0.99	0.61	0.12	0.91	0.96		0.95	0.89	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.99

Intersection Signal Delay: 58.1 — Intersection LOS: E

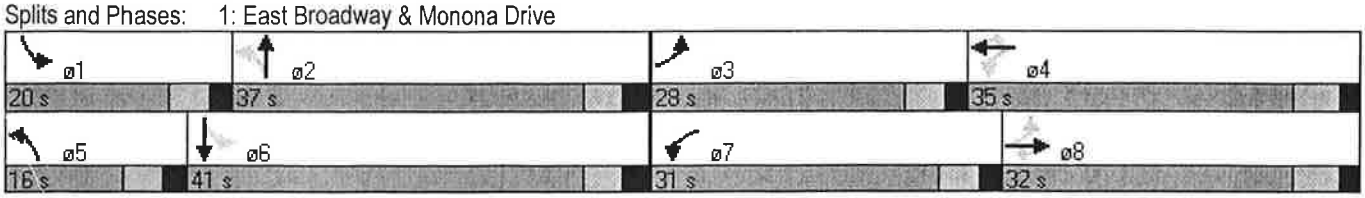
Intersection Capacity Utilization 97.8% — ICU Level of Service F

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: East Broadway & Monona Drive



HCM Unsignalized Intersection Capacity Analysis
2: East Broadway & Rose Lawn Ave.

3/31/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	45	665	161	12	881	36	51	3	26	13	10	53
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	48	715	173	13	947	39	55	3	28	14	11	57
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)		424			357							
pX, platoon unblocked	0.90			0.84			0.89	0.89	0.84	0.89	0.89	0.90
vC, conflicting volume	986			888			1374	1824	358	1476	1977	493
vC1, stage 1 conf vol							812	812		992	992	
vC2, stage 2 conf vol							562	1012		484	985	
vCu, unblocked vol	751			479			644	1150	0	759	1323	201
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 %	94			99			84	99	97	95	95	92
cM capacity (veh/h)	765			905			346	239	908	283	226	722

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	48	358	358	173	13	632	354	56	30	82
Volume Left	48	0	0	0	13	0	0	55	0	14
Volume Right	0	0	0	173	0	0	39	0	28	57
cSH	765	1700	1700	1700	905	1700	1700	341	788	465
Volume to Capacity	0.06	0.21	0.21	0.10	0.01	0.37	0.21	0.17	0.04	0.18
Queue Length 95th (ft)	5	0	0	0	1	0	0	15	3	16
Control Delay (s)	10.0	0.0	0.0	0.0	9.0	0.0	0.0	17.6	9.7	14.4
Lane LOS	B				A			C	A	B
Approach Delay (s)	0.5				0.1			14.9		14.4
Approach LOS								B		B

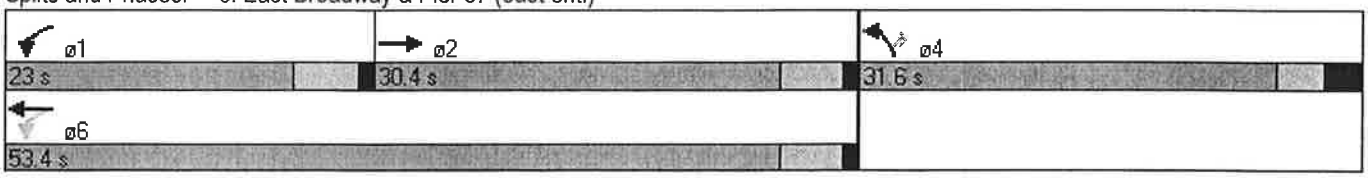
Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	↱
Volume (vph)	694	86	143	724	179	205
Satd. Flow (prot)	3479	0	1770	3539	1770	1583
Flt Permitted			0.208		0.950	
Satd. Flow (perm)	3479	0	387	3539	1770	1583
Satd. Flow (RTOR)	16					214
Lane Group Flow (vph)	813	0	149	754	186	214
Turn Type			pm+pt			Perm
Protected Phases	2		1	6	4	
Permitted Phases			6			4
Total Split (s)	30.4	0.0	23.0	53.4	31.6	31.6
Total Lost Time (s)	5.0	4.0	5.0	5.0	5.5	5.5
Act Effct Green (s)	21.2		31.1	31.1	11.8	11.8
Actuated g/C Ratio	0.39		0.58	0.58	0.22	0.22
v/c Ratio	0.59		0.34	0.37	0.48	0.42
Control Delay	16.2		7.6	6.7	24.9	6.5
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	16.2		7.6	6.7	24.9	6.5
LOS	B		A	A	C	A
Approach Delay	16.2			6.8	15.1	
Approach LOS	B			A	B	
Queue Length 50th (ft)	108		18	56	53	0
Queue Length 95th (ft)	194		46	104	120	47
Internal Link Dist (ft)	277			644	99	
Turn Bay Length (ft)			110			
Base Capacity (vph)	1724		707	3096	897	908
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.47		0.21	0.24	0.21	0.24

Intersection Summary

Cycle Length: 85
Actuated Cycle Length: 53.8
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.59
Intersection Signal Delay: 12.0 Intersection LOS: B
Intersection Capacity Utilization 52.7% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: East Broadway & Pier 37 (east ent.)



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	39	924	826	31	71	56
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	43	1027	918	34	79	62
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	952				1535	476
vC1, stage 1 conf vol					935	
vC2, stage 2 conf vol					600	
vCu, unblocked vol	952				1535	476
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 %	94				65	88
cM capacity (veh/h)	717				227	535

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	43	513	513	612	340	141
Volume Left	43	0	0	0	0	79
Volume Right	0	0	0	0	34	62
cSH	717	1700	1700	1700	1700	304
Volume to Capacity	0.06	0.30	0.30	0.36	0.20	0.46
Queue Length 95th (ft)	5	0	0	0	0	58
Control Delay (s)	10.3	0.0	0.0	0.0	0.0	26.7
Lane LOS	B					D
Approach Delay (s)	0.4			0.0		26.7
Approach LOS						D

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	939	34	34	780	6	77	1	76	2	1	2
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)	7	1021	37	37	848	7	84	1	83	2	1	2
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	854			1058			1553	1980	529	1532	1996	427
vC1, stage 1 conf vol							1052	1052		925	925	
vC2, stage 2 conf vol							501	928		607	1071	
vCu, unblocked vol	854			1058			1553	1980	529	1532	1996	427
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 %	99			94			52	99	83	99	99	100
cM capacity (veh/h)	781			654			175	167	494	165	156	576

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	7	680	377	37	565	289	85	83	5
Volume Left	7	0	0	37	0	0	84	0	2
Volume Right	0	0	37	0	0	7	0	83	2
cSH	781	1700	1700	654	1700	1700	175	494	228
Volume to Capacity	0.01	0.40	0.22	0.06	0.33	0.17	0.49	0.17	0.02
Queue Length 95th (ft)	1	0	0	4	0	0	59	15	2
Control Delay (s)	9.6	0.0	0.0	10.8	0.0	0.0	43.7	13.7	21.2
Lane LOS	A			B			E	B	C
Approach Delay (s)	0.1			0.4			28.9		21.2
Approach LOS							D		C

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	977	29	30	732	119	118
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)	1062	32	33	796	129	128
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)				1237		
pX, platoon unblocked						
vC, conflicting volume			1093		1541	547
vC1, stage 1 conf vol					1078	
vC2, stage 2 conf vol					463	
vCu, unblocked vol			1093		1541	547
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 %			95		40	73
cM capacity (veh/h)			634		214	481

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	708	386	33	398	398	129	128
Volume Left	0	0	33	0	0	129	0
Volume Right	0	32	0	0	0	0	128
cSH	1700	1700	634	1700	1700	214	481
Volume to Capacity	0.42	0.23	0.05	0.23	0.23	0.60	0.27
Queue Length 95th (ft)	0	0	4	0	0	86	27
Control Delay (s)	0.0	0.0	11.0	0.0	0.0	44.6	15.2
Lane LOS			B			E	C
Approach Delay (s)	0.0		0.4			30.0	
Approach LOS						D	

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	97	973	644	163	226	130
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	102	1024	678	172	238	137
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						3
Median type		Raised	None			
Median storage veh)		1				
Upstream signal (ft)			771			
pX, platoon unblocked	0.98				0.98	0.98
vC, conflicting volume	849				1394	339
vC1, stage 1 conf vol					678	
vC2, stage 2 conf vol					716	
vCu, unblocked vol	795				1354	272
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 %	87				6	81
cM capacity (veh/h)	808				253	711

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	102	512	512	339	339	172	375
Volume Left	102	0	0	0	0	0	238
Volume Right	0	0	0	0	0	172	137
cSH	808	1700	1700	1700	1700	1700	360
Volume to Capacity	0.13	0.30	0.30	0.20	0.20	0.10	1.04
Queue Length 95th (ft)	11	0	0	0	0	0	321
Control Delay (s)	10.1	0.0	0.0	0.0	0.0	0.0	93.7
Lane LOS	B						F
Approach Delay (s)	0.9			0.0			93.7
Approach LOS							F

Intersection Summary			
Average Delay	15.4		
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
1: East Broadway & Monona Drive

4/7/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	365	773	484	517	593	58	206	764	177	282	805	139
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3440	0	1770	3461	0
Flt Permitted	0.237			0.128			0.118			0.109		
Satd. Flow (perm)	441	3539	1583	238	3539	1583	220	3440	0	203	3461	0
Satd. Flow (RTOR)			199			30		22			16	
Lane Group Flow (vph)	388	822	515	550	631	62	219	1001	0	300	1004	0
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt			pm+pt		
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases	8		8	4		4	2			6		
Total Split (s)	29.8	34.0	34.0	32.0	36.2	36.2	16.2	40.0	0.0	19.0	42.8	0.0
Total Lost Time (s)	5.5	6.0	6.0	5.5	6.0	6.0	5.5	6.0	4.0	5.5	6.0	4.0
Act Effct Green (s)	51.7	28.0	28.0	57.9	31.3	31.3	45.2	34.0		50.8	36.8	
Actuated g/C Ratio	0.41	0.22	0.22	0.46	0.25	0.25	0.36	0.27		0.41	0.29	
v/c Ratio	0.90	1.04	1.01	1.26	0.71	0.15	1.03	1.05		1.19	0.97	
Control Delay	52.6	89.0	72.7	168.7	48.3	22.7	102.5	86.7		149.2	65.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	52.6	89.0	72.7	168.7	48.3	22.7	102.5	86.7		149.2	65.7	
LOS	D	F	E	F	D	C	F	F		F	E	
Approach Delay		76.0			100.3			89.5			84.9	
Approach LOS		E			F			F			F	
Queue Length 50th (ft)	214	~376	~292	~513	248	20	~136	~457		~242	417	
Queue Length 95th (ft)	#391	#505	#525	#736	318	58	#301	#593		#426	#563	
Internal Link Dist (ft)		380			344			701			527	
Turn Bay Length (ft)	150		150	110		80	110			160		
Base Capacity (vph)	445	793	509	435	887	419	212	952		252	1030	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.87	1.04	1.01	1.26	0.71	0.15	1.03	1.05		1.19	0.97	

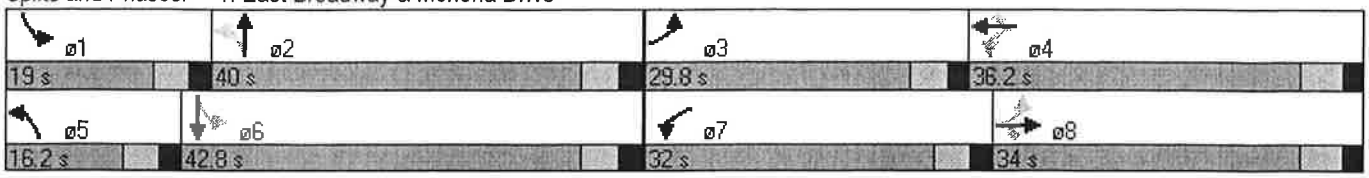
Intersection Summary

Cycle Length: 125
Actuated Cycle Length: 125
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.26
Intersection Signal Delay: 86.6 Intersection LOS: F
Intersection Capacity Utilization 111.6% ICU Level of Service H
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: East Broadway & Monona Drive



HCM Unsignalized Intersection Capacity Analysis
2: East Broadway & Rose Lawn Ave.

4/7/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	50	778	178	13	1049	40	56	4	29	15	11	59
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	54	837	191	14	1128	43	60	4	31	16	12	63
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		424			357							
pX, platoon unblocked	0.90			0.82			0.87	0.87	0.82	0.87	0.87	0.90
vC, conflicting volume	1171			1028			1605	2143	418	1737	2313	585
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	961			584			859	1479	0	1011	1675	309
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			98			62	96	96	89	84	90
cM capacity (veh/h)	638			805			158	97	885	145	74	617

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	54	418	418	191	14	752	419	62	33	91
Volume Left	54	0	0	0	14	0	0	60	0	16
Volume Right	0	0	0	191	0	0	43	0	31	63
cSH	638	1700	1700	1700	805	1700	1700	155	581	244
Volume to Capacity	0.08	0.25	0.25	0.11	0.02	0.44	0.25	0.40	0.06	0.37
Queue Length 95th (ft)	7	0	0	0	1	0	0	44	5	41
Control Delay (s)	11.2	0.0	0.0	0.0	9.6	0.0	0.0	43.2	11.6	28.3
Lane LOS	B				A			E	B	D
Approach Delay (s)	0.6				0.1			32.2		28.3
Approach LOS								D		D

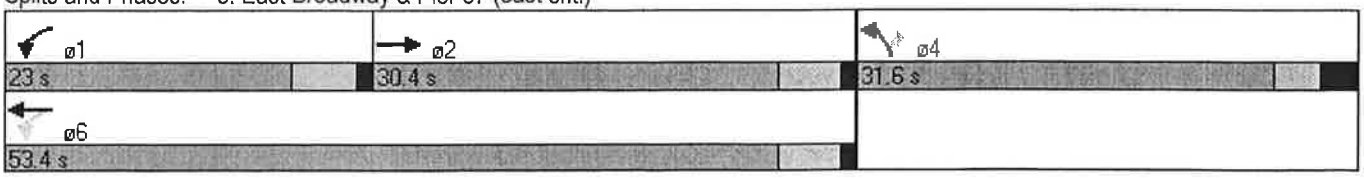
Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	792	95	163	876	193	227
Satd. Flow (prot)	3483	0	1770	3539	1770	1583
Flt Permitted			0.221		0.950	
Satd. Flow (perm)	3483	0	412	3539	1770	1583
Satd. Flow (RTOR)	15					236
Lane Group Flow (vph)	924	0	170	912	201	236
Turn Type			pm+pt			Perm
Protected Phases	2		1	6	4	
Permitted Phases			6			4
Total Split (s)	30.4	0.0	23.0	53.4	31.6	31.6
Total Lost Time (s)	5.0	4.0	5.0	5.0	5.5	5.5
Act Effct Green (s)	45.8		59.6	59.6	14.9	14.9
Actuated g/C Ratio	0.54		0.70	0.70	0.18	0.18
v/c Ratio	0.49		0.40	0.37	0.65	0.50
Control Delay	14.4		7.7	6.1	41.7	7.9
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	14.4		7.7	6.1	41.7	7.9
LOS	B		A	A	D	A
Approach Delay	14.4			6.4	23.5	
Approach LOS	B			A	C	
Queue Length 50th (ft)	147		26	87	101	0
Queue Length 95th (ft)	252		58	148	158	55
Internal Link Dist (ft)	277			644	99	
Turn Bay Length (ft)			110			
Base Capacity (vph)	1883		576	2480	543	650
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.49		0.30	0.37	0.37	0.36

Intersection Summary

Cycle Length: 85
Actuated Cycle Length: 85
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 12.5 Intersection LOS: B
Intersection Capacity Utilization 57.6% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: East Broadway & Pier 37 (east ent.)



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	47	1061	978	27	55	78
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	52	1179	1087	30	61	87
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	1117				1796	558
vC1, stage 1 conf vol					1102	
vC2, stage 2 conf vol					694	
vCu, unblocked vol	1117				1796	558
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 %	92				66	82
cM capacity (veh/h)	621				182	473

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	52	589	589	724	392	148
Volume Left	52	0	0	0	0	61
Volume Right	0	0	0	0	30	87
cSH	621	1700	1700	1700	1700	284
Volume to Capacity	0.08	0.35	0.35	0.43	0.23	0.52
Queue Length 95th (ft)	7	0	0	0	0	70
Control Delay (s)	11.3	0.0	0.0	0.0	0.0	30.6
Lane LOS	B					D
Approach Delay (s)	0.5			0.0		30.6
Approach LOS						D

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	1052	40	30	927	6	78	1	77	2	1	2
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)	7	1143	43	33	1008	7	85	1	84	2	1	2
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)					1082							
pX, platoon unblocked	0.88						0.88	0.88		0.88	0.88	0.88
vC, conflicting volume	1014			1187			1750	2258	593	1745	2276	507
vC1, stage 1 conf vol							1178	1178		1076	1076	
vC2, stage 2 conf vol							572	1079		669	1200	
vCu, unblocked vol	756			1187			1587	2161	593	1582	2182	183
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 %	99			94			46	99	81	99	99	100
cM capacity (veh/h)	753			584			157	147	448	154	136	733

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	7	762	425	33	672	342	85	84	5
Volume Left	7	0	0	33	0	0	85	0	2
Volume Right	0	0	43	0	0	7	0	84	2
cSH	753	1700	1700	584	1700	1700	157	443	217
Volume to Capacity	0.01	0.45	0.25	0.06	0.40	0.20	0.54	0.19	0.03
Queue Length 95th (ft)	1	0	0	4	0	0	69	17	2
Control Delay (s)	9.8	0.0	0.0	11.5	0.0	0.0	52.5	15.0	22.0
Lane LOS	A			B			F	C	C
Approach Delay (s)	0.1			0.4			33.9		22.0
Approach LOS							D		C

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1088	30	27	879	120	119
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)	1183	33	29	955	130	129
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)				466		
pX, platoon unblocked					0.84	
vC, conflicting volume			1215		1735	608
vC1, stage 1 conf vol					1199	
vC2, stage 2 conf vol					536	
vCu, unblocked vol			1215		1499	608
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 %			95		34	71
cM capacity (veh/h)			570		199	439

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	788	427	29	478	478	130	129
Volume Left	0	0	29	0	0	130	0
Volume Right	0	33	0	0	0	0	129
cSH	1700	1700	570	1700	1700	199	439
Volume to Capacity	0.46	0.25	0.05	0.28	0.28	0.66	0.29
Queue Length 95th (ft)	0	0	4	0	0	98	30
Control Delay (s)	0.0	0.0	11.7	0.0	0.0	52.2	16.6
Lane LOS			B			F	C
Approach Delay (s)	0.0		0.3			34.5	
Approach LOS						D	

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
8: East Broadway & Copps Ave.

4/7/2011

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	483	692	627	733	117	217
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	508	728	660	772	123	228
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						3
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			771			
pX, platoon unblocked						
vC, conflicting volume	1432				2041	330
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1432				2041	330
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	0				0	66
cM capacity (veh/h)	471				0	666

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	508	364	364	330	330	772	352
Volume Left	508	0	0	0	0	0	123
Volume Right	0	0	0	0	0	772	228
cSH	471	1700	1700	1700	1700	1700	0
Volume to Capacity	1.08	0.21	0.21	0.19	0.19	0.45	Err
Queue Length 95th (ft)	409	0	0	0	0	0	Err
Control Delay (s)	94.3	0.0	0.0	0.0	0.0	0.0	Err
Lane LOS	F						F
Approach Delay (s)	38.8			0.0			Err
Approach LOS							F

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		

Intersection: 1: East Broadway & Monona Drive

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (ft)	250	446	427	250	210	358	366	180	210	541	527	259
Average Queue (ft)	217	280	278	164	203	311	184	27	124	299	325	135
95th Queue (ft)	287	453	442	306	240	424	307	80	212	478	490	254
Link Distance (ft)		412	412			348	348			728	728	
Upstream Blk Time (%)		3	3			16	0					
Queuing Penalty (veh)		0	0			57	0					
Storage Bay Dist (ft)	150			150	110			80	110			160
Storage Blk Time (%)	32	25	31	3	67	23	39		12	39		6
Queuing Penalty (veh)	99	74	123	8	133	68	14		38	66		21

Intersection: 1: East Broadway & Monona Drive

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	433	407
Average Queue (ft)	255	268
95th Queue (ft)	370	372
Link Distance (ft)	546	546
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)	22	
Queuing Penalty (veh)	46	

Intersection: 2: East Broadway & Rose Lawn Ave.

Movement	EB	EB	WB	WB	WB	NB	NB	SB
Directions Served	L	R	L	T	TR	LT	TR	LTR
Maximum Queue (ft)	52	48	30	242	148	71	67	136
Average Queue (ft)	18	3	7	58	9	33	12	44
95th Queue (ft)	50	18	27	190	56	60	38	93
Link Distance (ft)				275	275	198	198	330
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	40	70	100					
Storage Blk Time (%)	1			7				
Queuing Penalty (veh)	3			1				

Intersection: 3: East Broadway & Pier 37 (east ent.)

Movement	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	TR	L	T	T	L	R
Maximum Queue (ft)	200	228	118	160	96	117	74
Average Queue (ft)	71	89	44	58	44	72	38
95th Queue (ft)	140	159	91	116	85	113	71
Link Distance (ft)	275	275		662	662	130	130
Upstream Blk Time (%)						0	
Queuing Penalty (veh)						0	
Storage Bay Dist (ft)			110				
Storage Blk Time (%)			0	1			
Queuing Penalty (veh)			0	1			

Intersection: 4: East Broadway & Cemetery

Movement	WB	NB	SB
Directions Served	L	TR	LTR
Maximum Queue (ft)	30	20	30
Average Queue (ft)	3	9	9
95th Queue (ft)	17	24	32
Link Distance (ft)		228	450
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	110		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: East Broadway & Edna Taylor Pkwy

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	31	76
Average Queue (ft)	4	31
95th Queue (ft)	21	65
Link Distance (ft)		423
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: East Broadway & UW Clinic

Movement	EB	WB	NB	NB	SB
Directions Served	L	L	LT	R	LTR
Maximum Queue (ft)	29	24	94	56	54
Average Queue (ft)	2	5	30	31	9
95th Queue (ft)	13	19	62	57	34
Link Distance (ft)			210	210	253
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	175	150			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 7: East Broadway & Whitehorse Dev.

Movement	WB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	31	29	31
Average Queue (ft)	5	3	5
95th Queue (ft)	23	18	24
Link Distance (ft)		182	182
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	125		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 8: East Broadway & Copps Ave.

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	53	21	402	175
Average Queue (ft)	27	1	130	58
95th Queue (ft)	53	7	281	156
Link Distance (ft)			399	
Upstream Blk Time (%)			0	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	75	100		75
Storage Blk Time (%)			40	0
Queuing Penalty (veh)			42	0

Intersection: 1: East Broadway & Monona Drive

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (ft)	250	427	427	250	210	353	340	180	210	588	630	260
Average Queue (ft)	216	339	334	165	204	278	207	37	201	467	481	257
95th Queue (ft)	273	443	479	312	225	406	325	111	219	670	686	267
Link Distance (ft)		412	412			348	348			728	728	
Upstream Blk Time (%)		2	5			5	0					
Queuing Penalty (veh)		0	0			22	1					
Storage Bay Dist (ft)	150			150	110			80	110			160
Storage Blk Time (%)	28	36	39	0	62	16	42	0	72	60		82
Queuing Penalty (veh)	98	117	171	0	164	66	20	0	248	112		299

Intersection: 1: East Broadway & Monona Drive

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	579	568
Average Queue (ft)	489	448
95th Queue (ft)	646	672
Link Distance (ft)	546	546
Upstream Blk Time (%)	30	4
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)	32	
Queuing Penalty (veh)	79	

Intersection: 2: East Broadway & Rose Lawn Ave.

Movement	EB	WB	WB	NB	NB	SB
Directions Served	L	L	T	LT	TR	LTR
Maximum Queue (ft)	30	30	116	71	49	72
Average Queue (ft)	19	4	20	35	15	45
95th Queue (ft)	42	20	76	67	41	79
Link Distance (ft)			275	198	198	330
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	40	100				
Storage Blk Time (%)	1		1			
Queuing Penalty (veh)	3		0			

Intersection: 3: East Broadway & Pier 37 (east ent.)

Movement	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	TR	L	T	T	L	R
Maximum Queue (ft)	193	206	75	92	94	146	94
Average Queue (ft)	91	112	46	45	54	75	58
95th Queue (ft)	185	203	79	85	94	122	93
Link Distance (ft)	275	275		662	662	130	130
Upstream Blk Time (%)						1	
Queuing Penalty (veh)						0	
Storage Bay Dist (ft)			110				
Storage Blk Time (%)				0			
Queuing Penalty (veh)				0			

Intersection: 4: East Broadway & Cemetery

Movement	WB	NB	SB
Directions Served	L	TR	LTR
Maximum Queue (ft)	52	42	30
Average Queue (ft)	14	14	2
95th Queue (ft)	41	37	14
Link Distance (ft)		228	450
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	110		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: East Broadway & Edna Taylor Pkwy

Movement	EB	EB	SB
Directions Served	L	T	LR
Maximum Queue (ft)	50	27	96
Average Queue (ft)	17	2	65
95th Queue (ft)	45	13	103
Link Distance (ft)		569	423
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	125		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: East Broadway & UW Clinic

Movement	EB	WB	NB	NB	SB
Directions Served	L	L	LT	R	LTR
Maximum Queue (ft)	28	24	187	90	30
Average Queue (ft)	2	10	57	39	6
95th Queue (ft)	14	27	130	65	26
Link Distance (ft)			210	210	253
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	175	150			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 7: East Broadway & Whitehorse Dev.

Movement	WB	NB	NB
Directions Served	L	L	R
Maximum Queue (ft)	31	122	80
Average Queue (ft)	12	68	46
95th Queue (ft)	36	118	79
Link Distance (ft)		182	182
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	125		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 8: East Broadway & Copps Ave. STOP SIGN

Movement	EB	WB	SB	SB
Directions Served	L	R	L	R
Maximum Queue (ft)	53	22	427	175
Average Queue (ft)	26	3	285	75
95th Queue (ft)	56	15	517	195
Link Distance (ft)			393	
Upstream Blk Time (%)			48	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)	75	100		75
Storage Blk Time (%)			84	0
Queuing Penalty (veh)			110	0

Intersection: 6: East Broadway & UW Clinic

Movement	EB	EB	WB	NB	NB	SB
Directions Served	L	T	L	LT	R	LTR
Maximum Queue (ft)	29	22	24	96	90	31
Average Queue (ft)	6	1	12	50	43	8
95th Queue (ft)	24	10	29	82	69	31
Link Distance (ft)		500		210	210	253
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	175		150			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7: East Broadway & Whitehorse Dev.

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	22	31	129	72
Average Queue (ft)	1	14	63	41
95th Queue (ft)	10	40	111	64
Link Distance (ft)	543		183	183
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		125		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: East Broadway & Copps Ave. Traffic Signal

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (ft)	95	179	176	142	153	163	117	110
Average Queue (ft)	37	94	110	86	81	57	61	42
95th Queue (ft)	74	150	159	138	143	110	108	91
Link Distance (ft)		398	398	649	649		399	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	75					100		75
Storage Blk Time (%)	2	8			5	2	4	2
Queuing Penalty (veh)	11	7			8	7	6	5

APPENDIX E

Transportation System Improvements Operational Analysis

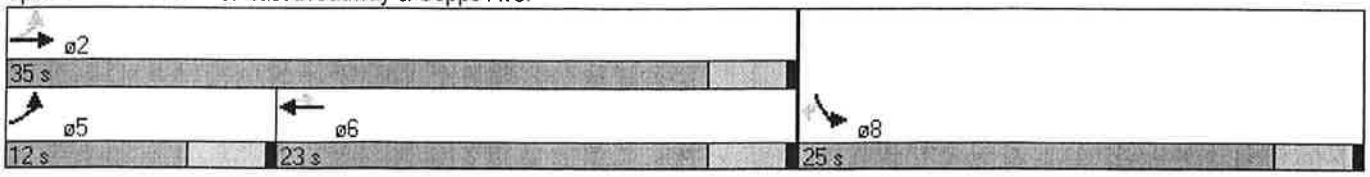
Fall 2011, 2016 and 2021
Synchro Analysis Inputs/Outputs
SimTraffic Outputs (Queues)
Rodel Roundabout Analysis Inputs/Outputs

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	85	718	546	142	186	106
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.355				0.950	
Satd. Flow (perm)	661	3539	3539	1583	1770	1583
Satd. Flow (RTOR)						
Lane Group Flow (vph)	89	756	575	149	196	112
Turn Type	pm+pt			Perm		Perm
Protected Phases	5	2	6		8	
Permitted Phases	2			6		8
Total Split (s)	12.0	35.0	23.0	23.0	25.0	25.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Act Effct Green (s)	40.0	40.0	30.3	30.3	12.0	12.0
Actuated g/C Ratio	0.67	0.67	0.50	0.50	0.20	0.20
v/c Ratio	0.15	0.32	0.32	0.19	0.55	0.35
Control Delay	5.0	5.2	10.7	10.2	26.9	22.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.0	5.2	10.7	10.2	26.9	22.7
LOS	A	A	B	B	C	C
Approach Delay		5.2	10.6		25.4	
Approach LOS		A	B		C	
Queue Length 50th (ft)	9	48	84	40	64	35
Queue Length 95th (ft)	27	93	117	m69	109	67
Internal Link Dist (ft)		386	691		377	
Turn Bay Length (ft)	75			100		75
Base Capacity (vph)	590	2357	1787	799	620	554
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	0.15	0.32	0.32	0.19	0.32	0.20

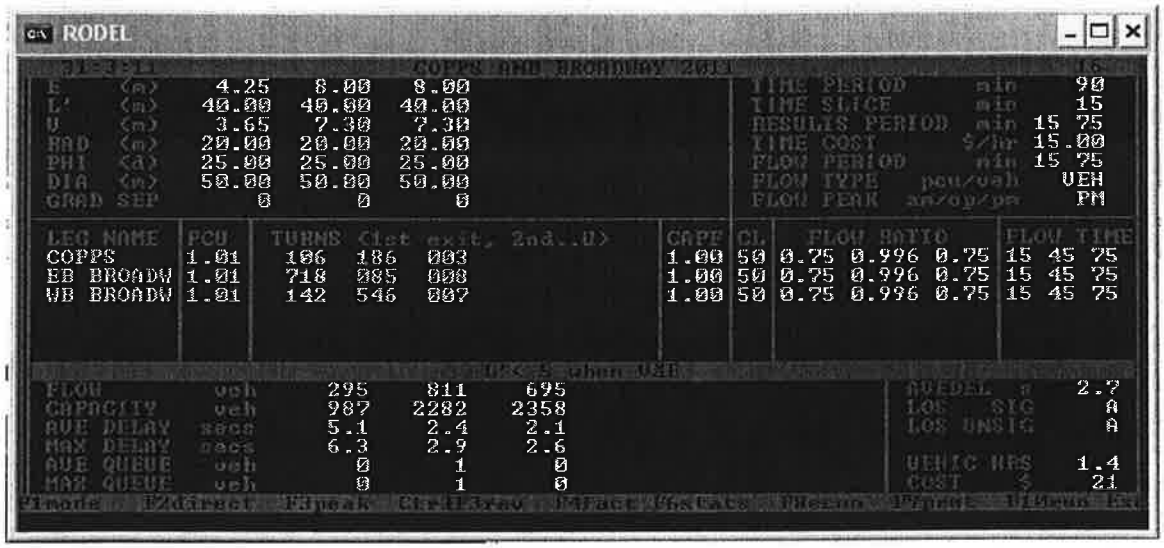
Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 60
Offset: 33 (55%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 10.6 — Intersection LOS: B
Intersection Capacity Utilization 42.1% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: East Broadway & Copps Ave.

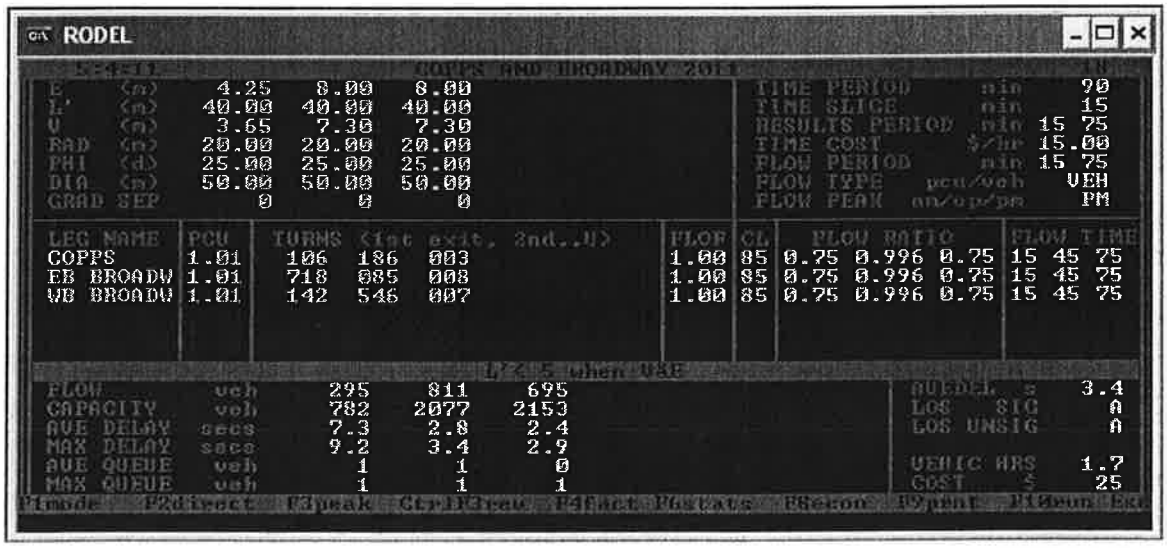


East Broadway and Copps Avenue Roundabout Analysis
PM Fall 2011
Dual Lane Eastbound & Westbound East Broadway, Single Lane Copps Ave.
50% Confidence Level



	SB	EB	WB	Intersection
Average Stopped Delay(from above)	5.1	2.4	2.1	2.7
Geometric Delay	9	12	12	12
Total Delay	**14.1**	**14.4**	**14.1**	**14.7**
Level of Service (LOS)	**B**	**B**	**B**	**B**
95% Queue	**50**	**50**	**50**	

85% Confidence Level



	SB	EB	WB	Intersection
Average Stopped Delay(from above)	7.3	2.8	2.4	3.4
Geometric Delay	9	12	12	12
Total Delay	**16.3**	**14.8**	**14.4**	**15.4**
Level of Service (LOS)	**B**	**B**	**B**	**B**

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	329	700	437	406	532	48	186	689	127	247	726	125
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3458	0	1770	3461	0
Flt Permitted	0.358			0.134			0.146			0.136		
Satd. Flow (perm)	667	3539	1583	250	3539	1583	272	3458	0	253	3461	0
Satd. Flow (RTOR)			248			32		18			17	
Lane Group Flow (vph)	350	745	465	432	566	51	198	868	0	263	905	0
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt			pm+pt		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6	4			8		
Total Split (s)	23.6	30.4	30.4	28.2	35.0	35.0	15.9	33.4	0.0	18.0	35.5	0.0
Total Lost Time (s)	5.5	6.0	6.0	5.5	6.0	6.0	5.5	6.0	4.0	5.5	6.0	4.0
Act Effct Green (s)	42.2	24.4	24.4	52.4	29.8	29.8	38.3	27.4		42.5	29.5	
Actuated g/C Ratio	0.38	0.22	0.22	0.48	0.27	0.27	0.35	0.25		0.39	0.27	
v/c Ratio	0.82	0.95	0.85	1.00	0.59	0.11	0.84	0.99		0.97	0.96	
Control Delay	36.6	64.6	35.4	78.4	30.0	10.4	54.5	69.5		77.6	61.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	36.6	64.6	35.4	78.4	30.0	10.4	54.5	69.5		77.6	61.0	
LOS	D	E	D	E	C	B	D	E		E	E	
Approach Delay		49.6			49.0			66.7			64.7	
Approach LOS		D			D			E			E	
Queue Length 50th (ft)	154	274	155	~260	148	5	90	317		134	326	
Queue Length 95th (ft)	#255	#394	#339	#463	188	m24	#212	#456		#302	#461	
Internal Link Dist (ft)		380			701			701			527	
Turn Bay Length (ft)	150		150	450		80	110			160		
Base Capacity (vph)	442	785	544	433	960	453	236	875		270	941	
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.79	0.95	0.85	1.00	0.59	0.11	0.84	0.99		0.97	0.96	

Intersection Summary

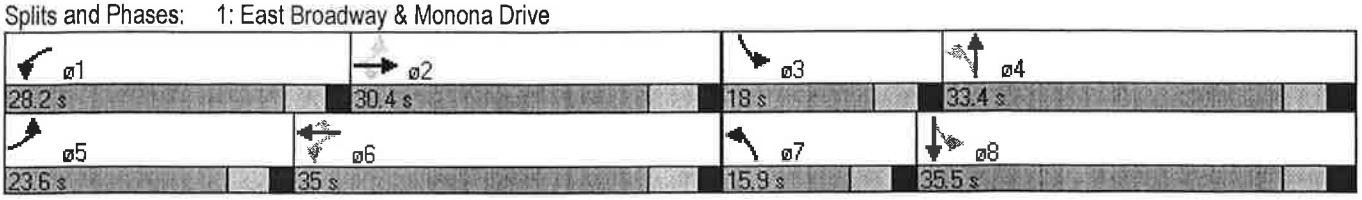
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 85 (77%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 56.9 Intersection LOS: E
Intersection Capacity Utilization 97.8% ICU Level of Service F
Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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

Splits and Phases: 1: East Broadway & Monona Drive



Lanes, Volumes, Timings
3: East Broadway & Pier 37 (east ent.)

4/14/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	45	694	86	155	724	0	230	0	205	0	0	0
Satd. Flow (prot)	1770	3479	0	1770	3539	0	1770	0	1583	0	0	0
Flt Permitted	0.366			0.277			0.950					
Satd. Flow (perm)	682	3479	0	516	3539	0	1770	0	1583	0	0	0
Satd. Flow (RTOR)		15							214			
Lane Group Flow (vph)	49	813	0	161	754	0	240	0	214	0	0	0
Turn Type	Perm			pm+pt			Prot		custom			
Protected Phases		2		1	6		4					
Permitted Phases	2			6					4			
Total Split (s)	50.0	50.0	0.0	24.0	74.0	0.0	36.0	0.0	36.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	5.5	4.0	5.5	4.0	4.0	4.0
Act Effct Green (s)	65.4	65.4		79.3	79.3		20.2		20.2			
Actuated g/C Ratio	0.59	0.59		0.72	0.72		0.18		0.18			
v/c Ratio	0.12	0.39		0.34	0.30		0.74		0.46			
Control Delay	5.1	5.0		7.5	6.3		55.7		8.1			
Queue Delay	0.0	0.0		0.0	0.0		0.0		0.0			
Total Delay	5.1	5.0		7.5	6.3		55.7		8.1			
LOS	A	A		A	A		E		A			
Approach Delay		5.0			6.5							
Approach LOS		A			A							
Queue Length 50th (ft)	5	32		30	86		162		0			
Queue Length 95th (ft)	m5	m33		64	142		231		59			
Internal Link Dist (ft)		701			644			99			137	
Turn Bay Length (ft)	25			110								
Base Capacity (vph)	406	2076		589	2552		491		594			
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	0.12	0.39		0.27	0.30		0.49		0.36			

Intersection Summary

Cycle Length: 110

Actuated Cycle Length: 110

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

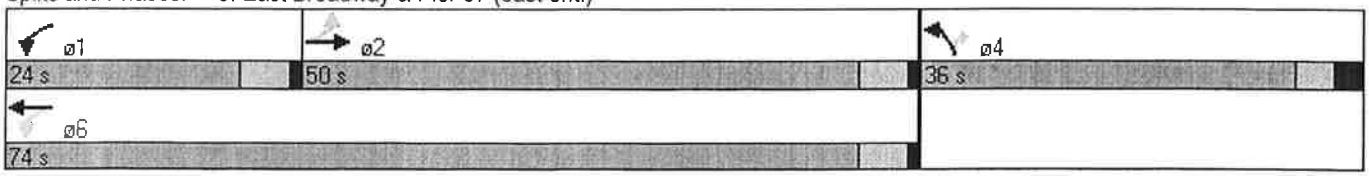
Intersection Signal Delay: 11.4 — Intersection LOS: B

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: 3: East Broadway & Pier 37 (east ent.)



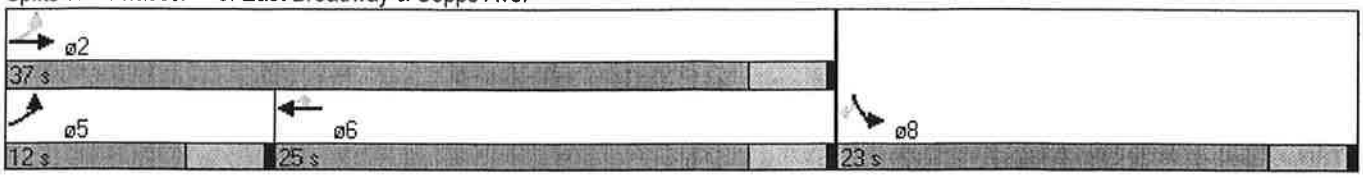
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	97	973	644	163	226	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75			100	0	75
Storage Lanes	1			1	1	1
Taper Length (ft)	100			100	100	100
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.298				0.950	
Satd. Flow (perm)	555	3539	3539	1583	1770	1583
Right Turn on Red				No		No
Satd. Flow (RTOR)						
Link Speed (mph)		40	40		25	
Link Distance (ft)		466	771		457	
Travel Time (s)		7.9	13.1		12.5	
Lane Group Flow (vph)	102	1024	678	172	238	137
Turn Type	pm+pt			Perm		Perm
Protected Phases	5	2	6		8	
Permitted Phases	2			6		8
Total Split (s)	12.0	37.0	25.0	25.0	23.0	23.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Act Effct Green (s)	38.8	38.8	29.0	29.0	13.2	13.2
Actuated g/C Ratio	0.65	0.65	0.48	0.48	0.22	0.22
v/c Ratio	0.19	0.45	0.40	0.22	0.61	0.39
Control Delay	5.9	6.7	9.3	9.0	27.3	22.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.9	6.7	9.3	9.0	27.3	22.2
LOS	A	A	A	A	C	C
Approach Delay		6.6	9.2		25.4	
Approach LOS		A	A		C	
Queue Length 50th (ft)	12	80	114	53	78	42
Queue Length 95th (ft)	33	148	m154	m86	126	77
Internal Link Dist (ft)		386	691		377	
Turn Bay Length (ft)	75			100		75
Base Capacity (vph)	524	2288	1712	766	561	501
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	0.19	0.45	0.40	0.22	0.42	0.27

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 16 (27%), Referenced to phase 2:EBTL and 6:WBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 10.6 Intersection LOS: B
Intersection Capacity Utilization 47.0% ICU Level of Service A
Analysis Period (min) 15

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

Splits and Phases: 8: East Broadway & Copps Ave.



Intersection: 1: East Broadway & Monona Drive

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (ft)	250	427	427	250	550	726	678	55	210	742	743	260
Average Queue (ft)	191	262	270	159	541	662	231	24	189	655	662	209
95th Queue (ft)	266	431	444	286	613	906	560	56	246	867	869	300
Link Distance (ft)		412	412			695	695			728	728	
Upstream Blk Time (%)		3	3			32	0			16	13	
Queuing Penalty (veh)		0	0			154	0			0	0	
Storage Bay Dist (ft)	150			150	450			80	110			160
Storage Blk Time (%)	18	26	28	2	75		32		69	64		37
Queuing Penalty (veh)	63	85	123	7	199		16		237	119		136

Intersection: 1: East Broadway & Monona Drive

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	561	561
Average Queue (ft)	338	353
95th Queue (ft)	540	527
Link Distance (ft)	546	546
Upstream Blk Time (%)	1	1
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)	33	
Queuing Penalty (veh)	82	

Intersection: 3: East Broadway & Pier 37 (east ent.)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	T	TR	L	T	T	L	R
Maximum Queue (ft)	43	81	152	210	313	219	147	166
Average Queue (ft)	13	35	67	70	140	97	129	44
95th Queue (ft)	31	70	118	154	269	182	168	127
Link Distance (ft)		695	695		656	656	132	132
Upstream Blk Time (%)							65	3
Queuing Penalty (veh)							0	0
Storage Bay Dist (ft)	25			110				
Storage Blk Time (%)	8	19		0	15			
Queuing Penalty (veh)	27	8		0	23			

Intersection: 4: East Broadway & Cemetery

Movement	EB	WB	NB	NB	SB
Directions Served	L	L	LT	TR	LTR
Maximum Queue (ft)	30	30	25	40	30
Average Queue (ft)	3	7	1	11	3
95th Queue (ft)	17	28	9	30	18
Link Distance (ft)			228	228	450
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	80	110			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: East Broadway & Edna Taylor Pkwy

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	31	160
Average Queue (ft)	13	61
95th Queue (ft)	37	115
Link Distance (ft)		423
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: East Broadway & UW Clinic

Movement	EB	EB	WB	NB	NB	SB
Directions Served	L	TR	L	LT	R	LTR
Maximum Queue (ft)	28	20	46	77	72	31
Average Queue (ft)	2	1	9	43	34	6
95th Queue (ft)	13	7	31	74	63	25
Link Distance (ft)		500		210	210	253
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	175		150			
Storage Blk Time (%)						
Queuing Penalty (veh)						

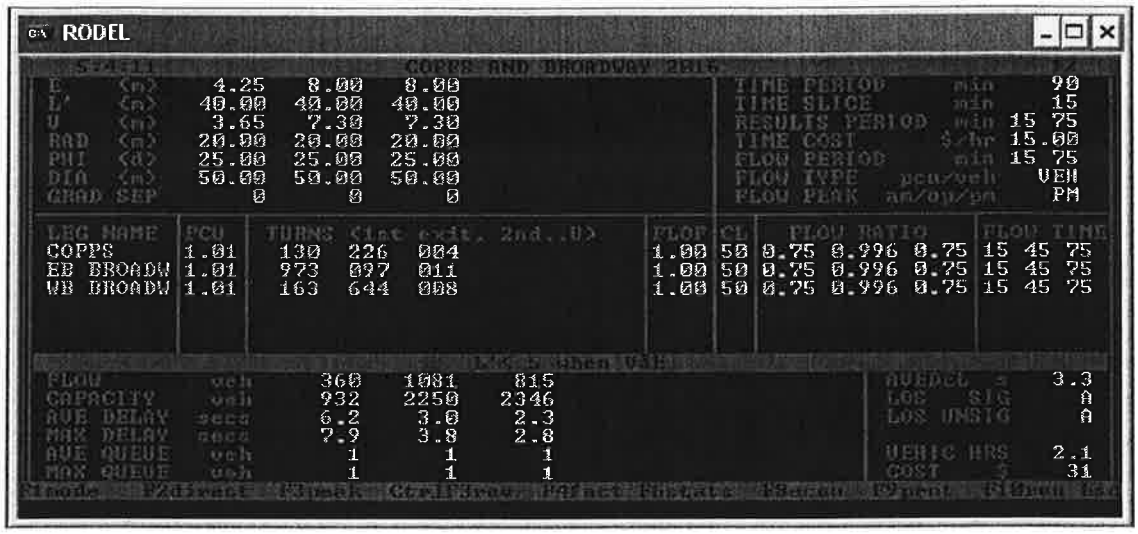
Intersection: 7: East Broadway & Whitehorse Dev.

Movement	EB	WB	NB	NB
Directions Served	TR	L	L	R
Maximum Queue (ft)	31	49	198	136
Average Queue (ft)	2	21	97	49
95th Queue (ft)	13	46	179	97
Link Distance (ft)	543		183	183
Upstream Blk Time (%)			6	
Queuing Penalty (veh)			0	
Storage Bay Dist (ft)		125		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 8: East Broadway & Copps Ave.

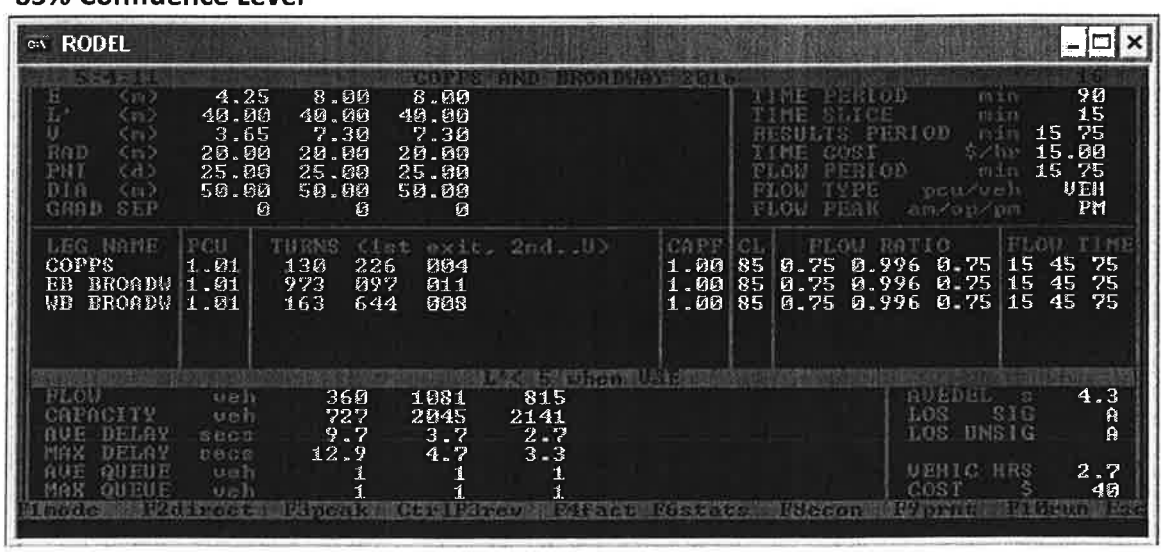
Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (ft)	137	138	198	183	177	111	176	175
Average Queue (ft)	38	67	90	69	55	49	97	61
95th Queue (ft)	80	122	169	131	119	92	155	116
Link Distance (ft)		398	398	649	649		399	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	75					100		75
Storage Blk Time (%)	2	4			1	1	16	3
Queuing Penalty (veh)	7	4			1	2	20	7

East Broadway and Copps Avenue Roundabout Analysis
PM 2016
Dual Lane Eastbound & Westbound East Broadway, Single Lane Copps Ave.
50% Confidence Level



	SB	EB	WB	Intersection
Average Stopped Delay(from above)	6.2	3	2.3	3.3
Geometric Delay	9	12	12	12
Total Delay	**15.2**	**15**	**14.3**	**15.3**
Level of Service (LOS)	**B**	**B**	**B**	**B**
95% Queue	**50**	**50**	**50**	

85% Confidence Level



	SB	EB	WB	Intersection
Average Stopped Delay(from above)	9.7	3.7	2.7	4.3
Geometric Delay	9	12	12	12
Total Delay	**18.7**	**15.7**	**14.7**	**16.3**
Level of Service (LOS)	**B**	**B**	**B**	**B**

Lanes, Volumes, Timings
1: East Broadway & Monona Drive

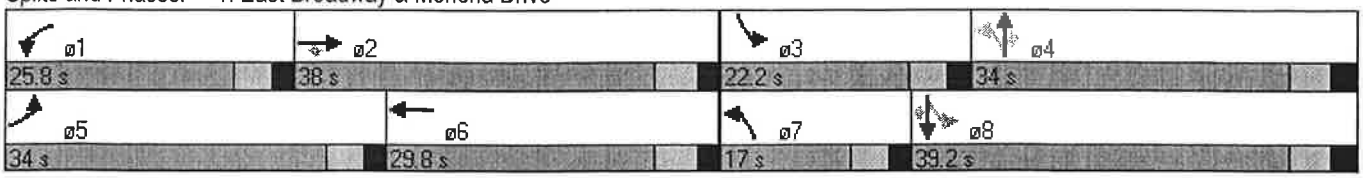
4/14/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	365	773	484	517	593	58	206	764	177	282	805	139
Satd. Flow (prot)	1770	3539	1583	3433	3493	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.143			0.120		
Satd. Flow (perm)	1770	3539	1583	3433	3493	0	266	3539	1583	224	3539	1583
Satd. Flow (RTOR)			222		8				188			148
Lane Group Flow (vph)	388	822	515	550	693	0	219	813	188	300	856	148
Turn Type	Prot		Perm	Prot			pm+pt		Perm	pm+pt		Perm
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases			2				4		4	8		8
Total Split (s)	34.0	38.0	38.0	25.8	29.8	0.0	17.0	34.0	34.0	22.2	39.2	39.2
Total Lost Time (s)	5.5	6.0	6.0	5.5	6.0	4.0	5.5	6.0	6.0	5.5	6.0	6.0
Act Effct Green (s)	27.9	32.0	32.0	20.3	24.4		40.0	28.0	28.0	50.4	33.2	33.2
Actuated g/C Ratio	0.23	0.27	0.27	0.17	0.20		0.33	0.23	0.23	0.42	0.28	0.28
v/c Ratio	0.94	0.87	0.88	0.95	0.97		0.94	0.98	0.37	0.97	0.87	0.27
Control Delay	78.0	53.3	41.5	78.2	65.4		76.3	73.8	7.4	77.2	52.6	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.0	53.3	41.5	78.2	65.4		76.3	73.8	7.4	77.2	52.6	6.6
LOS	E	D	D	E	E		E	E	A	E	D	A
Approach Delay		55.3			71.1			64.0			53.0	
Approach LOS		E			E			E			D	
Queue Length 50th (ft)	295	321	234	208	286		117	331	0	181	333	0
Queue Length 95th (ft)	#482	#424	#438	#329	#394		#273	#466	59	#362	#440	50
Internal Link Dist (ft)		380			701			701			527	
Turn Bay Length (ft)	150		150	600			110			160		
Base Capacity (vph)	420	944	585	581	717		233	826	514	309	979	545
Starvation Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.87	0.88	0.95	0.97		0.94	0.98	0.37	0.97	0.87	0.27

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 101 (84%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 60.3 Intersection LOS: E
Intersection Capacity Utilization 94.4% 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: East Broadway & Monona Drive



Lanes, Volumes, Timings
3: East Broadway & Pier 37 (east ent.)

4/14/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	792	95	176	876	0	249	0	227	0	0	0
Satd. Flow (prot)	1770	3483	0	1770	3539	0	1770	0	1583	0	0	0
Flt Permitted	0.313			0.242			0.950					
Satd. Flow (perm)	583	3483	0	451	3539	0	1770	0	1583	0	0	0
Satd. Flow (RTOR)		14							236			
Lane Group Flow (vph)	54	924	0	183	912	0	259	0	236	0	0	0
Turn Type	Perm			pm+pt			Prot		custom			
Protected Phases		2		1	6		7					
Permitted Phases	2			6					4			
Total Split (s)	59.0	59.0	0.0	24.0	83.0	0.0	37.0	0.0	37.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	5.5	4.0	4.0	4.0
Act Effct Green (s)	73.7	73.7		88.2	88.2		22.8		21.3			
Actuated g/C Ratio	0.61	0.61		0.74	0.74		0.19		0.18			
v/c Ratio	0.15	0.43		0.42	0.35		0.77		0.50			
Control Delay	3.5	3.5		8.5	6.7		60.8		8.6			
Queue Delay	0.0	0.0		0.0	0.0		0.0		0.0			
Total Delay	3.5	3.5		8.5	6.7		60.8		8.6			
LOS	A	A		A	A		E		A			
Approach Delay		3.5			7.0							
Approach LOS		A			A							
Queue Length 50th (ft)	4	30		37	116		192		0			
Queue Length 95th (ft)	m4	m90		75	185		267		64			
Internal Link Dist (ft)		701			644			166			15	
Turn Bay Length (ft)	25			110								
Base Capacity (vph)	358	2145		540	2601		487		590			
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	0.15	0.43		0.34	0.35		0.53		0.40			

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 11.2 — Intersection LOS: B

Intersection Capacity Utilization 62.2% — ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 3: East Broadway & Pier 37 (east ent.)

ø1	ø2	ø4
24 s	59 s	37 s
ø6		ø7
83 s		37 s

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	47	1061	978	27	55	78
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	52	1179	1087	30	61	87
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	1117				1796	558
vC1, stage 1 conf vol					1102	
vC2, stage 2 conf vol					694	
vCu, unblocked vol	1117				1796	558
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 %	92				66	82
cM capacity (veh/h)	621				182	473

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	52	589	589	724	392	148
Volume Left	52	0	0	0	0	61
Volume Right	0	0	0	0	30	87
cSH	621	1700	1700	1700	1700	284
Volume to Capacity	0.08	0.35	0.35	0.43	0.23	0.52
Queue Length 95th (ft)	7	0	0	0	0	70
Control Delay (s)	11.3	0.0	0.0	0.0	0.0	30.6
Lane LOS	B					D
Approach Delay (s)	0.5			0.0		30.6
Approach LOS						D

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: East Broadway & UW Clinic

4/13/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	1052	40	30	927	6	78	1	77	2	1	2
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)	7	1143	43	33	1008	7	85	1	84	2	1	2
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)					1082							
pX, platoon unblocked	0.90						0.90	0.90		0.90	0.90	0.90
vC, conflicting volume	1014			1187			1750	2258	593	1745	2276	507
vC1, stage 1 conf vol							1178	1178		1076	1076	
vC2, stage 2 conf vol							572	1079		669	1200	
vCu, unblocked vol	790			1187			1609	2174	593	1603	2194	225
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 %	99			94			45	99	81	99	99	100
cM capacity (veh/h)	742			584			155	146	448	152	135	699

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	7	762	425	33	672	342	85	84	5
Volume Left	7	0	0	33	0	0	85	0	2
Volume Right	0	0	43	0	0	7	0	84	2
cSH	742	1700	1700	584	1700	1700	155	443	213
Volume to Capacity	0.01	0.45	0.25	0.06	0.40	0.20	0.55	0.19	0.03
Queue Length 95th (ft)	1	0	0	4	0	0	69	17	2
Control Delay (s)	9.9	0.0	0.0	11.5	0.0	0.0	53.4	15.0	22.3
Lane LOS	A			B			F	C	C
Approach Delay (s)	0.1			0.4			34.3		22.3
Approach LOS							D		C

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1088	30	27	879	120	119
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)	1183	33	29	955	130	129
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)				466		
pX, platoon unblocked					0.86	
vC, conflicting volume			1215		1735	608
vC1, stage 1 conf vol					1199	
vC2, stage 2 conf vol					536	
vCu, unblocked vol			1215		1527	608
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 %			95		34	71
cM capacity (veh/h)			570		197	439

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	788	427	29	478	478	130	129
Volume Left	0	0	29	0	0	130	0
Volume Right	0	33	0	0	0	0	129
cSH	1700	1700	570	1700	1700	197	439
Volume to Capacity	0.46	0.25	0.05	0.28	0.28	0.66	0.29
Queue Length 95th (ft)	0	0	4	0	0	99	30
Control Delay (s)	0.0	0.0	11.7	0.0	0.0	53.2	16.6
Lane LOS			B			F	C
Approach Delay (s)	0.0		0.3			35.0	
Approach LOS						D	

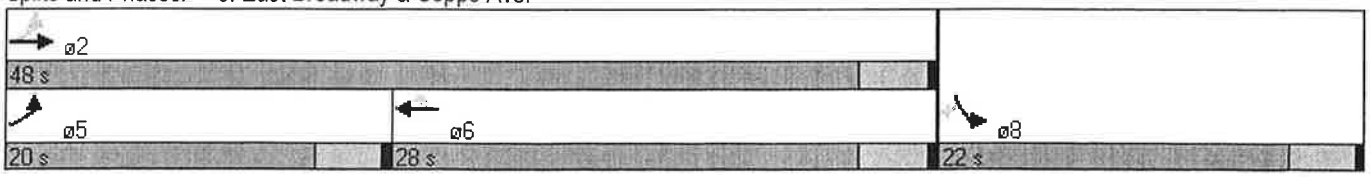
Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	483	692	627	733	117	217
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.249				0.950	
Satd. Flow (perm)	464	3539	3539	1583	1770	1583
Satd. Flow (RTOR)				647		228
Lane Group Flow (vph)	508	728	660	772	123	228
Turn Type	pm+pt			Perm		Perm
Protected Phases	5	2	6		8	
Permitted Phases	2			6		8
Total Split (s)	20.0	48.0	28.0	28.0	22.0	22.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Act Effct Green (s)	44.0	44.0	24.6	24.6	18.0	18.0
Actuated g/C Ratio	0.63	0.63	0.35	0.35	0.26	0.26
v/c Ratio	0.88	0.33	0.53	0.79	0.27	0.40
Control Delay	29.1	6.6	20.2	11.2	22.7	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.1	6.6	20.2	11.2	22.7	5.7
LOS	C	A	C	B	C	A
Approach Delay		15.8	15.3		11.6	
Approach LOS		B	B		B	
Queue Length 50th (ft)	111	67	118	38	42	0
Queue Length 95th (ft)	#281	94	167	#213	84	48
Internal Link Dist (ft)		386	691		377	
Turn Bay Length (ft)	150			100		75
Base Capacity (vph)	590	2225	1244	976	455	576
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	0.86	0.33	0.53	0.79	0.27	0.40

Intersection Summary

Cycle Length: 70
Actuated Cycle Length: 70
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 15.1 Intersection LOS: B
Intersection Capacity Utilization 78.8% 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: 8: East Broadway & Copps Ave.



Intersection: 1: East Broadway & Monona Drive

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	L	T	TR	L	T	T	R
Maximum Queue (ft)	250	410	413	250	687	712	686	685	210	676	697	113
Average Queue (ft)	212	215	194	156	504	512	259	272	153	343	355	52
95th Queue (ft)	275	360	344	240	802	821	584	558	228	616	601	90
Link Distance (ft)		400	400			684	684	684		722	722	722
Upstream Blk Time (%)		0	0		5	16	2	0				
Queuing Penalty (veh)		0	0		0	59	6	0				
Storage Bay Dist (ft)	150			150	600				110			
Storage Blk Time (%)	31	13	14	7	22	31			21	49		
Queuing Penalty (veh)	119	49	66	26	57	79			80	100		

Intersection: 1: East Broadway & Monona Drive

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	260	567	576	565
Average Queue (ft)	241	426	421	52
95th Queue (ft)	298	637	626	211
Link Distance (ft)		552	552	552
Upstream Blk Time (%)		6	5	1
Queuing Penalty (veh)		0	0	0
Storage Bay Dist (ft)	160			
Storage Blk Time (%)	54	44		
Queuing Penalty (veh)	216	124		

Intersection: 3: East Broadway & Pier 37 (east ent.)

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	T	TR	L	T	T	L	R
Maximum Queue (ft)	102	70	76	210	330	359	214	188
Average Queue (ft)	20	30	41	86	122	117	167	59
95th Queue (ft)	60	66	73	175	271	263	243	123
Link Distance (ft)		684	684		661	661	199	199
Upstream Blk Time (%)							31	0
Queuing Penalty (veh)							0	0
Storage Bay Dist (ft)	25			110				
Storage Blk Time (%)	13	15		5	11			
Queuing Penalty (veh)	50	7		21	19			

Intersection: 4: East Broadway & Cemetery

Movement	EB	WB	NB	SB
Directions Served	L	L	TR	LTR
Maximum Queue (ft)	25	28	44	47
Average Queue (ft)	1	9	15	6
95th Queue (ft)	10	30	34	27
Link Distance (ft)			228	450
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	80	110		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: East Broadway & Edna Taylor Pkwy

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	53	195
Average Queue (ft)	18	81
95th Queue (ft)	47	156
Link Distance (ft)		423
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: East Broadway & UW Clinic

Movement	EB	WB	NB	NB
Directions Served	L	L	LT	TR
Maximum Queue (ft)	29	52	157	79
Average Queue (ft)	2	16	59	38
95th Queue (ft)	13	47	114	64
Link Distance (ft)			295	295
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	175	150		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: East Broadway & Whitehorse Dev.

Movement	EB	EB	WB	NB	NB
Directions Served	T	TR	L	L	R
Maximum Queue (ft)	138	136	54	330	243
Average Queue (ft)	10	8	12	131	72
95th Queue (ft)	63	58	38	276	161
Link Distance (ft)	543	543		361	361
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			125		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 8: East Broadway & Copps Ave.

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	L	T	T	T	T	R	L	R
Maximum Queue (ft)	250	406	389	339	503	200	138	89
Average Queue (ft)	224	201	111	170	252	190	55	44
95th Queue (ft)	295	454	270	334	450	215	103	76
Link Distance (ft)		397	397	649	649		399	
Upstream Blk Time (%)		3	0					
Queuing Penalty (veh)		16	0					
Storage Bay Dist (ft)	150					100		75
Storage Blk Time (%)	46	0			11	43	4	1
Queuing Penalty (veh)	160	0			81	135	9	1

Intersection: 9: East Broadway & USH 51 Stoughton Rd.

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	T	T	T	T	T	T	T	T	T
Maximum Queue (ft)	160	152	130	294	171	244	239	158	214	222	246
Average Queue (ft)	58	68	66	124	91	115	142	72	83	111	146
95th Queue (ft)	114	128	121	218	158	190	213	134	150	174	222
Link Distance (ft)	649	649	476	476	523	523	523	864	864	864	864
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)											
Storage Blk Time (%)				5	1		9				
Queuing Penalty (veh)				0	0		0				

Network Summary

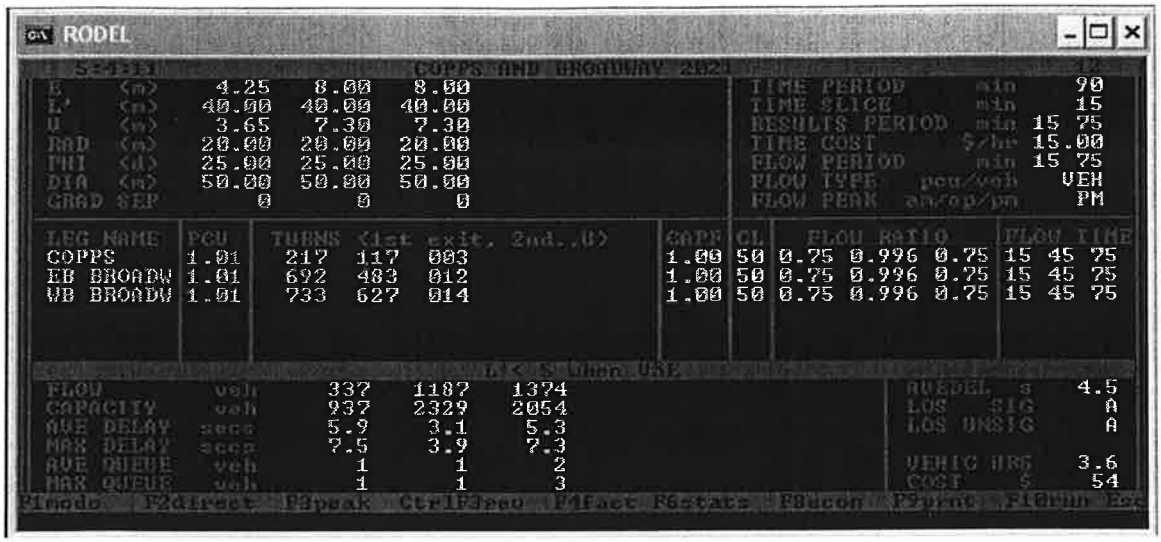
Network wide Queuing Penalty: 1481

East Broadway and Copps Avenue Roundabout Analysis

PM 2021

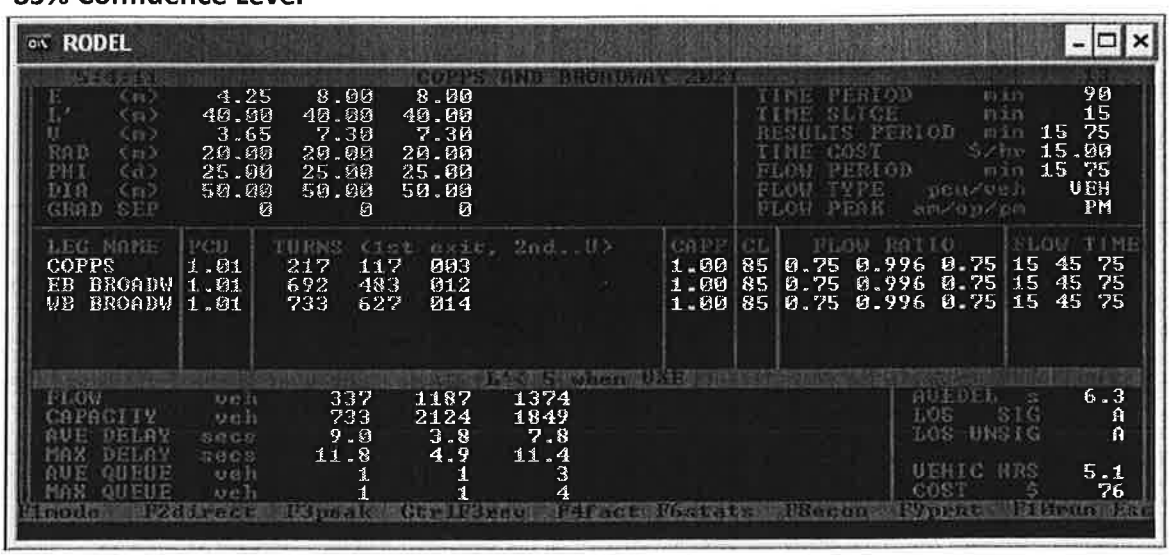
Dual Lane Eastbound & Westbound East Broadway, Single Lane Copps Ave.

50% Confidence Level



	SB	EB	WB	Intersection
Average Stopped Delay(from above)	5.9	3.1	5.3	4.5
Geometric Delay	9	12	12	12
Total Delay	**14.9**	**15.1**	**17.3**	**16.5**
Level of Service (LOS)	**B**	**B**	**B**	**B**
95% Queue	**50**	**75**	**125**	

85% Confidence Level



	SB	EB	WB	Intersection
Average Stopped Delay(from above)	9	3.8	7.8	
Geometric Delay	9	12	12	12
Total Delay	**18**	**15.8**	**19.8**	**12**
Level of Service (LOS)	**B**	**B**	**B**	**B**

APPENDIX F

Warrant Analysis for Intersection Control

Traffic Signal Warrant Analysis
East Broadway and Copps Avenue

Wisconsin Department of Transportation
Traffic Signal Warrant Summary Sheet

100% URBAN

The Worksheet(s) attached are provided as an attachment to the Engineering Investigation Study for:

Intersection: East Broadway and Copps Avenue Date: 3/30/2011

County: Dane

Town
Village
City Monona

Major Street	East Broadway	Critical Approach Speed	40 mph	Lanes	2
Minor Street	Copps Avenue	Critical Approach Speed	25 mph	Lanes	2

THIS INTERSECTION IS ANALYZED FOR URBAN WARRANTS. COMMENTS:

Note: The warrants for rural areas (70% of urban warrant) are used when the 85% speed on the major street exceeds 40 m.p.h. or when the intersection lies within the built-up area of an isolated community having a population of less than 10,000.

THE ANALYSIS IS BASED ON COUNTS CONDUCTED ON 2/15 & 4/5 , 20 11 (DATES), Tues, Wed (DAYS), FROM 7:00 AM 6:00 PM TO AM PM

0% Right Turns Included

Warrant Evaluation Summary **YES/NO/NOT EVALUATED**

Warrant 1 Eight-Hour Vehicular Volume ..... **NO**

Warrant 1A Minimum Vehicular Volume ..... NO

Warrant 1B Interruption of Continuous Traffic ..... NO

Warrant 1A+B Combination of Warrants ..... NO

Warrant 2 Four Hour Volume ..... **YES**

Warrant 3 Peak Hour Volume .....

Warrant 4 Pedestrian Volume .....

Warrant 5 School Crossing .....

Warrant 6 Coordinated Signal System .....

Warrant 7 Crash Experience .....

Warrant 8 Roadway network .....

Left Turn Conflict Analysis .....

This analysis was conducted by:

Mary Greuel
(Name)

KL Engineering
(Agency)

3/30/2011
(Date)

TRAFFIC SIGNAL WARRANTS ANALYSIS FORM

Sheet 1

Date: 3/30/2011

County: Dane

Town
Village
City Monona

Major Street	East Broadway	Critical Approach Speed	40 mph	Lanes	2
Minor Street	Copps Avenue	Approach Speed	25 mph	Lanes	2

Volume Level

1. Critical speed of major road traffic > 40 mph : ☒ Yes ☐ No
2. In built-up area of isolated community of < 10,000 pop.: ☐ Yes ☒ No

If Question 1 or 2 above is answered "Yes" then use "70%" volume level: ☒ 70% ☐ 100%

WARRANT 1 – Eight-Hour Vehicular Volume

Warrant is satisfied if Condition A or Condition B is "100 % satisfied." Warrant is also satisfied if both Condition A and Condition B are "80% satisfied."

8 Highest Hours								
Hour	12-1 pm	3-4 pm	4-5 pm	11a-12 pm	5-6 pm	1-2 pm	2-3 pm	10-11 am
Major Road-Both Approaches	1354	1155	1318	1202	1147	1067	986	818
Minor Road - Highest Approach	177	234	94	144	119	153	189	139

Record hours where condition is met and the corresponding volumes in boxes provided. Condition is 100% satisfied if the minimum volumes are met for eight hours. Condition is 80% satisfied if parenthetical volumes are met for eight hours.

Condition A – Minimum Vehicular Volume

(volumes in veh/h)	Minimum Requirements (80% Shown in Brackets)			
Approach Lanes:	1		2 or more	
Volume Level:	100%	Hours	100%	Hours
Major Road-Both Approaches	**500**		**600**	11
	(400)		**(480)**	12
Minor Road-Highest Approach	**150**	4	**200**	
	(120)	6	**(160)**	

100% Satisfied: NO
80 % Satisfied: NO

Condition B – Interruption of Continuous Traffic

(volumes in veh/h)	Minimum Requirements (80% Shown in Brackets)			
Approach Lanes:	1		2 or more	
Volume Level:	100%	Hours	100%	Hours
Major Road-Both Approaches	**750**		**900**	7
	(600)		**(720)**	11
Minor Road-Highest Approach	**75**	10	**100**	
	(60)	10	**(80)**	

100% Satisfied: NO
80 % Satisfied: YES

Warrant 100% Satisfied?: NO
Warrants Both 80% Satisfied?: NO

% Right Turns Included: 0

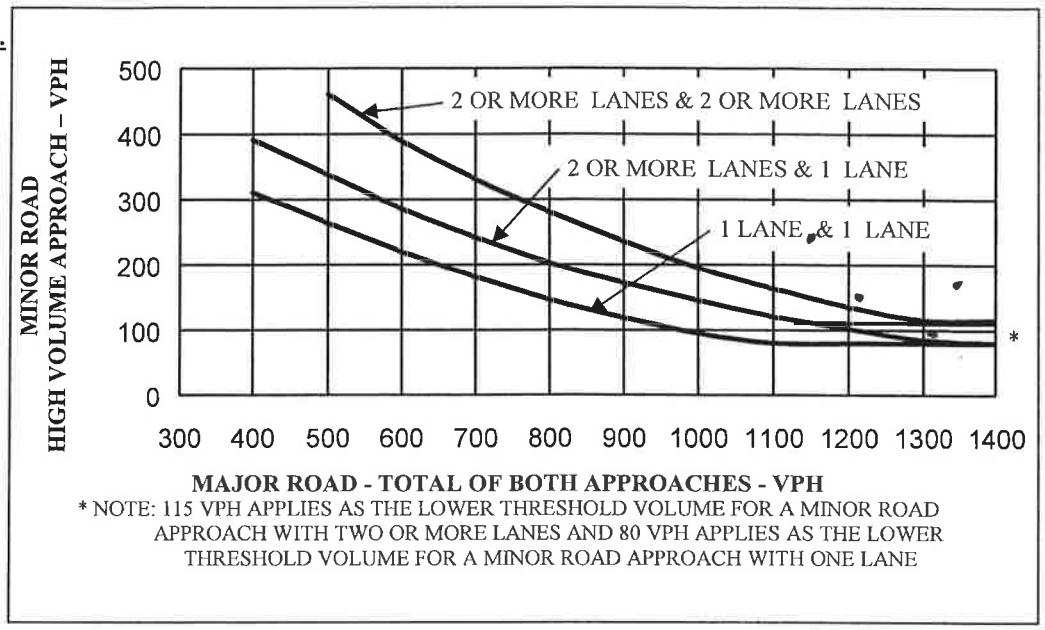
TRAFFIC SIGNAL WARRANTS ANALYSIS FORM

Warrant 2 – Four-Hour Vehicular Volume

Plot four volume combinations on the applicable figure below. If four points lie above the appropriate line, then the warrant is satisfied.

Figure A. Criteria for "100%" volume level.

Satisfied: YES



Warrant 3 – Peak Hour

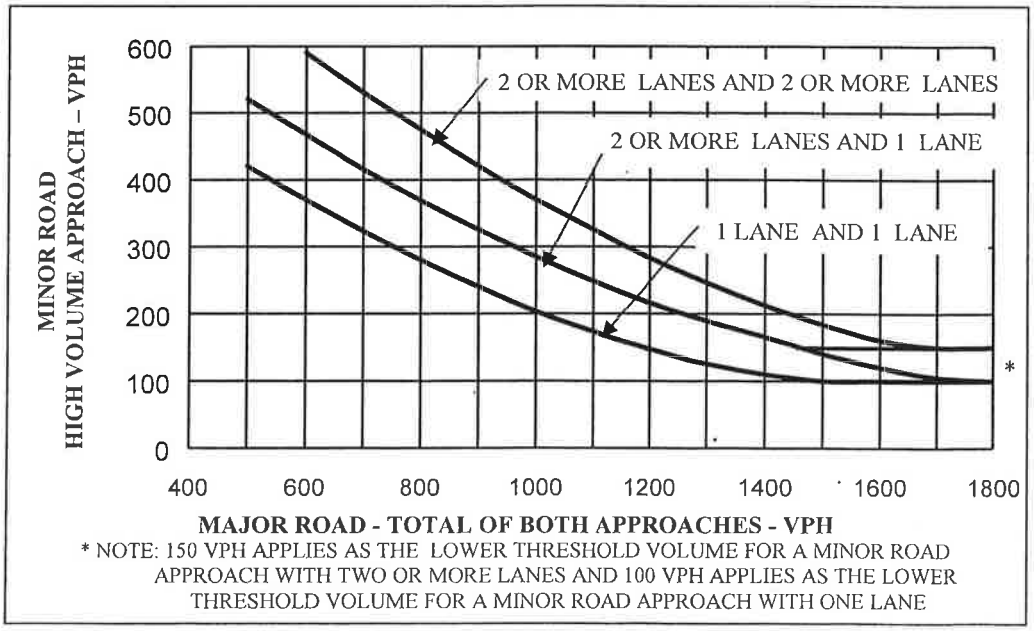
Unusual condition justifying use of warrant: _____

Record hour where criteria are fulfilled and the corresponding delay or volume in boxes provided. Plot the peak hour volume combination on the applicable figure below. If all three criteria are fulfilled or the plotted point lies above the appropriate line, then the warrant is satisfied.

Criteria	Approach Lanes		No. of Approaches		Hour	Fulfilled?	
	1	2	3	4		Yes	No
1. Delay on Minor Approach (veh-h)	4	5				☐	☐
2. Volume on Minor Approach (veh/h)	100	150				☐	☐
3. Total Entering Volume (veh/h)			650	800		☐	☐

Figure A. Criteria for "100%" volume level.

Satisfied:



TRAFFIC SIGNAL WARRANTS ANALYSIS FORM

Warrant 4 – Pedestrian Volume

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided.
The warrant is satisfied if all three of the criteria are fulfilled.

Criteria	Hour				Fulfilled?	
					Yes	No
1. Pedestrian volume crossing the major road is **100 ped/h** or more for each of any four hours or is **190 ped/h** or more during any one hour.	Volume				☐	☐
2. There are less than **60** gaps per hour in the major road traffic stream of adequate length for pedestrians to cross during the same hours as the pedestrian volume criterion is satisfied.	Gaps				☐	☐
3. The nearest traffic signal along the major road is located more than 300 ft away. Or, the nearest traffic signal is within 300 ft but the proposed traffic signal will not restrict the progressive movement of traffic.					☐	☐

Warrant Satisfied:

Warrant 5 – School Crossing

Record hours where criteria are fulfilled and the corresponding volume or gap frequency in the boxes provided.
The warrant is satisfied if all three of the criteria are fulfilled.

Criteria	Fulfilled?	
	Yes	No
1. There are a minimum of **20** students during the highest crossing hour.	☐	☐
2. There are fewer adequate gaps in the major road traffic stream during the period when the children are using the crossing than the number of minutes in the same period.	☐	☐
3. The nearest traffic signal along the major road is located more than 300 ft away. Or, the nearest traffic signal is within 300 ft but the proposed traffic signal will not restrict the progressive movement of traffic.	☐	☐

Warrant Satisfied:

Warrant 6 – Coordinated Signal System

Indicate if the criteria are fulfilled in the boxes provided. The warrant is satisfied if either criterion is fulfilled. This warrant should not be applied when the resulting signal spacing would be less than 300 m (1000 ft).

Criteria	Fulfilled?	
	Yes	No
1. On a one-way road or a road that has traffic predominantly in one direction, the adjacent signals are so far apart that they do not provide the necessary degree of vehicle platooning.	☐	☐
2. On a two-way road, adjacent signals do not provide the necessary degree of platooning and the proposed, adjacent signals will collectively provide a progressive operation.	☐	☐

Warrant Satisfied:

TRAFFIC SIGNAL WARRANTS ANALYSIS FORM

Warrant 7 – Crash Experience

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if all three of the criteria are fulfilled.

Criteria		Hour				Met?		Fulfilled?	
						Yes	No	Yes	No
1. One of the warrants to the right is met.	Warrant 4.1 is 80% of volume requirements: **80 ped/h** for 4 hrs or **152 ped/h** for 1 hr					☐	☐		
	Warrant 1, Condition A (80% satisfied)					☐	☐		
	Warrant 1, Condition B (80% satisfied)					☐	☐	☐	☐
2. Adequate trial of other remedial measures has failed to reduce crash frequency.		Measures tried:						☐	☐
3. Five or more reported crashes, of types susceptible to correction by signal, have occurred within a 12-mo. Period.		Number of crashes per 12 months:						☐	☐

Warrant Satisfied:

Warrant 8 – Roadway Network

Record hours where criteria are fulfilled, the corresponding volume, and other information in the boxes provided. The warrant is satisfied if at least one of the criteria is fulfilled and if all intersecting routes have one or more of the characteristics listed.

Criteria			Met?		Fulfilled?	
			Yes	No	Yes	No
1. Both of the criteria to the right are met.	a. Total entering volume of at least **1,000 veh/h** during typical weekday peak hour.	Entering volume:	☐	☐		
	b. Five-year projected volumes that satisfy one or more of Warrants 1, 2, or 3.	Warrant(s) satisfied:	☐	☐	☐	☐
2. Total entering volume at least **1,000 veh/h** for each of any 5 hrs of a non-normal business day (Sat. or Sun.)						

						-Hr.
						-Vol.

Characteristics of Major Routes	Fulfilled? Yes	Fulfilled? No
1. Part of the road or highway system that serves as the principal roadway network for through traffic flow.	☐	☐
2. Rural or suburban highway outside of, entering, or traversing a city.	☐	☐
3. Appears as a major route on an official plan.	☐	☐

Warrant Satisfied:

TRAFFIC SIGNAL WARRANTS ANALYSIS FORM

Left Turn Conflict Analysis

Criteria (Condition satisfied when the product of the mainline left turns in one direction and the opposing traffic exceed the thresholds given. NOTE: This is not a signal warrant.)							
	A		B	Product of peak left turning vehicles (A) and opposing plus right turn vehicles (B).			
No. of Left Turn Lanes	Peak Volume Left Turns	No. of Opposing Lanes	Peak Opposing Volume in Same Hour	**A x B**	**Threshold**	**Exceeded?**	
						Yes	**No**
1		1		0	80,000	☐	☐
1		2		0	100,000	☐	☐

Condition Satisfied?:

CONCLUSIONS: _____