TRAFFIC IMPACT STUDY FOR:

MEQUON TOWN CENTER

CITY OF MEQUON, OZAUKEE COUNTY, WISCONSIN
(WisDOT Log #3443)

DATE SUBMITTED: December 22, 2011

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"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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Mequon Town Center
Traffic Impact Analysis
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CHAPTER I – INTRODUCTION & EXECUTIVE SUMMARY

PART A – PURPOSE OF REPORT AND STUDY OBJECTIVES

The City of Mequon is planning for a redevelopment – herein referenced as the "Mequon Town Center" – along Mequon Road, Cedarburg Road, Wauwatosa Road, Industrial Drive, and Buntrock Avenue. The redevelopment plan considers reducing the posted speed limit, reducing lane widths, adding bicycle lanes, and providing on-street parking along a portion of the south side of Mequon Road to provide a more urbanized, accessible, and contextually sensitive roadway environment. Any planned changes to Mequon Road must be reviewed and accepted by the Wisconsin Department of Transportation (WisDOT) since the roadway is a designated State Trunk Highway (STH 167 and STH 57).

An Initial Review document for the Mequon Town Center was submitted on April 2, 2009 to the Wisconsin Department of Transportation (WisDOT) for their use in identifying a traffic impact analysis (TIA) scope. Based on the WisDOT identified scope dated September 17, 2009, Traffic Analysis & Design, Inc. conducted this TIA to determine weekday evening peak hour operating conditions and recommendations to the study area intersections and corridor.

This report documents the procedures, findings and conclusions of the traffic impact analysis. The analysis identifies recommended improvements based on existing intersection geometrics, background traffic volumes, roadway changes desired by the City of Mequon, and additional traffic expected to be generated by potential mixed-use redevelopment within the Mequon Town Center.

PART B – EXECUTIVE SUMMARY

The executive summary includes a description of the study area, description of the development and conclusions based on the findings of the TIA.

B1. Location of Study Site with Respect to Area Roadway Network

A street map illustrating the location of the Mequon Town Center is shown in Exhibit 1-1a at the end of this chapter. A parcel map outlining the boundaries of the Mequon Town Center and redevelopment areas is shown in Exhibit 1-1b. The area immediately surrounding the Mequon Town Center is primarily residential to the north, west and south. The Milwaukee River forms the east boundary.

The study area includes the following intersections, which are shown in Exhibit 1-1a:

- Mequon Road & Wauwatosa Road (traffic signal control);
- Mequon Road & Concord Creek Drive/Mequon Trail (two-way stop control);
- Mequon Road & River Birch Drive (two-way stop control);
- Mequon Road & Buntrock Avenue (traffic signal control);
- Mequon Road & Industrial Drive (two-way stop control);
- Mequon Road & River Centre west access/Logeman access (two-way stop control);
- Mequon Road & River Centre center access (two-way stop control);
- Mequon Road & River Centre east access (two-way stop control); and
- Mequon Road & Cedarburg Road (traffic signal control).

Additional private access points along Mequon Road are included as study area intersections and are discussed under "B5. Access to Mequon Town Center".

B2. On-Site Redevelopment Description

A parcel map outlining the boundaries of the Mequon Town Center and its redevelopment areas is shown in Exhibit 1-1b. For the purpose of this study, the redevelopment has been split into two phases. Phase one includes redevelopment expected in the short term while phase two includes additional redevelopment expected in the future. Phase one plus phase two is herein referenced as the full build of development.

Phase One Redevelopment Sites

There are two planned redevelopment sites within the Mequon Town Center that were, when this study was originally performed in Year 2009, assumed to occur in the Year 2010. At the time it was understood that actual timeline for redevelopment was uncertain due to economic forces. Phase one is now expected to commence in Year 2012. The phase one redevelopment sites include the Brewery Square redevelopment and Weston Center redevelopment.

The Brewery Square redevelopment, shown conceptually in Exhibit 1-1c, is to be located along the south side of Mequon Road between Buntrock Avenue and Industrial Drive. The site is expected to be redeveloped with the following land uses and densities:

- Condominiums – 32 units
- General Office – 18,000 square feet (sf)
- Shopping Center – 25,200 sf
- Brewery/Sit-Down Restaurant – 6,500 sf

The Weston Center redevelopment, shown in Exhibit 1-1d, is to be located along the south side of Mequon Road between Concord Creek Drive/Mequon Trail and River Birch Drive. The site is expected to be redeveloped with the following land uses and densities:

- Condominiums – 23 units
- General Office – 14,400 sf
- Shopping Center – 17,900 sf
- Sit-Down Restaurant – 6,000 sf

The phase one redevelopment sites were included in the Year 2010 build traffic analysis for the purpose of this TIA.

Phase Two Redevelopment Areas

The remaining lands within the Mequon Town Center were broken into eleven redevelopment areas, lettered A through K (see Exhibit 1-1b), to aid in achieving an accurate trip assignment. Except for areas H and K, the land uses and densities consist of 6,575-sf of shopping center and general office land use (70%/30% split) on each acre of land (a 15% FAR) and 3.8 units of condominiums on each acre of land. Actual land uses and densities may vary as more concrete redevelopment plans arise. The following identifies the land uses and densities assumed in each redevelopment area.

- Area A, Northeast corner of Mequon Road & Wauwatosa Road (0.96 ac)
    - Shopping Center – 4,400 sf

  - General Office – 1,900 sf
  - Condominiums – 4 units
- Area B, South side of Mequon Road between Wauwatosa Road and Mequon Trail (13.46 ac)
  - Shopping Center – 61,900 sf
  - General Office – 26,600 sf
  - Condominiums – 51 units
- Area C, South side of Mequon Road between Mequon Trail & Weston Center redevelopment site (7.22 ac)
  - Shopping Center – 33,200 sf
  - General Office – 14,300 sf
  - Condominiums – 27 units
- Area D, South side of Mequon Road between Weston Center redevelopment site & Buntrock Avenue (7.76 ac)
  - Shopping Center – 35,700 sf
  - General Office – 15,300 sf
  - Condominiums – 29 units
- Area E, East side of Buntrock Avenue, south of Brewery Square site (8.99 ac)
  - Shopping Center – 41,400 sf
  - General Office – 17,700 sf
  - Condominiums – 34 units
- Area F, Both sides of Industrial Drive, south & east of Brewery Square site (21.59 ac)
  - Shopping Center – 99,400 sf
  - General Office – 42,600 sf
  - Condominiums – 82 units
- Area G, North of Mequon Road between Buntrock Avenue & railroad tracks (3.76 ac)
  - Shopping Center – 17,300 sf
  - General Office – 7,400 sf
  - Condominiums – 17 units
- Area H, North of Mequon Road between railroad tracks & Cedarburg Road
  - Condominiums – 60 units
- Area I, North of Mequon Road between Cedarburg Road & Milwaukee River (5.17 ac)
  - Shopping Center – 23,800 sf
  - General Office – 10,200 sf
  - Condominiums – 20 units

- Area J, South of Mequon Road between Milwaukee River & Cedarburg Road (2.64 ac)
    - Shopping Center – 12,200 sf
    - General Office – 5,200 sf
    - Condominiums – 10 units
- Area K, South of Mequon Road between railroad tracks & Cedarburg Road
    - Shopping Center – 10,000 sf

For the purpose of a traffic study, these eleven areas plus the Brewery Square and Weston Center sites are together referenced as the "full build redevelopment" of the Mequon Town Center. The anticipated time for completion of the full build redevelopment is unknown and was assumed for this study to occur by the Year 2020. Note that a Year 2025 traffic analysis was conducted based on WisDOT guidelines which state that traffic operating conditions 10 years after the initial build of a development, or 5 years after the final phase of a development, which ever is greater, must be investigated. Therefore, the full build redevelopment was included in the Year 2025 build traffic analysis.

B3. Off-Site Development Description

No off-site development has been identified within the immediate study area.

B4. Site Generated Traffic

Upon completion of the phase one redevelopment (Brewery Square & Weston Center sites), the Mequon Town Center is expected to generate 315 new trips (155 entering/160 exiting) during a typical weekday evening peak hour. On a typical weekday, phase one is expected to generate approximately 3,550 new trips (1,775 entering/1,775 exiting).

With the full build redevelopment, which includes the build-out of the eleven identified areas, the Mequon Town Center is expected to generate 1,965 new trips (915 entering/1,050 exiting) during a typical weekday evening peak hour. The full-build redevelopment is expected to generate approximately 21,610 new trips (10,805 entering/10,805 exiting) on a typical weekday.

B5. Access to Mequon Town Center

For the purpose of this study, the following driveway access was assumed to occur:

- Brewery Square, South side of Mequon Road between Buntrock Avenue and Industrial Drive
    - Existing right-in/right-out access along Mequon Road approximately 285-feet east of Buntrock Avenue (centerline-to-centerline).
    - Existing full access points along Buntrock Avenue approximately 175-feet and 330-feet south of Mequon Road (centerline-to-centerline).
    - Existing full access along Industrial Drive approximately 265-feet south of Mequon Road (centerline-to-centerline).
- Weston Center, south side of Mequon Road between Area C and Area D
    - Existing full access point along Mequon Road approximately 725-feet west of River Birch Drive (centerline-to-centerline).

  - Right-in/right-out access along Mequon Road approximately 450-feet west of River Birch Drive (centerline-to-centerline).
  - Cross access to Area C and Area D.
- Area A, Northeast corner of Mequon Road & Wauwatosa Road (0.96 ac)
  - Existing right-in/right-out access along Wauwatosa Road north of Mequon Road.
  - Existing right-in/right-out access along Mequon Road east of Wauwatosa Road.
- Area B, South side of Mequon Road between Wauwatosa Road and Mequon Trail (13.46 ac)
  - Unspecified access location along Wauwatosa Road, south of Mequon Road.
  - Right-in/right-out access along Mequon Road approximately 525-feet east of Wauwatosa Road (centerline-to-centerline).
  - Existing full access along Mequon Road at first median opening approximately 1,175-feet east of Wauwatosa Road (centerline-to-centerline).
  - Full access along Mequon Trail approximately 450-feet south of Mequon Road (centerline-to-centerline).
- Area C, South side of Mequon Road between Mequon Trail & Weston Center redevelopment site (7.22 ac)
  - Full access along Mequon Trail approximately 450-feet south of Mequon Road (centerline-to-centerline).
  - Right-in/right-out access along Mequon Road approximately 350-feet east of Concord Creek Drive/Mequon Trail (centerline-to-centerline).
  - Cross access to the Weston Center site.
- Area D, South side of Mequon Road between Weston Center redevelopment site & Buntrock Avenue (7.76 ac)
  - Cross access to the Weston Center site.
  - Full access along Mequon Road to align with River Birch Drive.
- Area E, East side of Buntrock Avenue, south of Brewery Square site (8.99 ac)
  - Unspecified access locations along Buntrock Avenue.
  - No direct access is anticipated to Mequon Road.
- Area F, Both sides of Industrial Drive, south & east of Brewery Square site (21.59 ac)
  - Unspecified access locations along Industrial Drive south of Mequon Road.
  - No direct access is anticipated to Mequon Road.
- Area G, North of Mequon Road between Buntrock Avenue & railroad tracks (3.76 ac)
  - Unspecified access locations along Buntrock Avenue south of Mequon Road.
  - Full access along Mequon Road to align with Industrial Drive.

- Area H, North of Mequon Road between railroad tracks & Cedarburg Road
    - Right-in/right-out only access along Mequon Road to align with River Center east access approximately 335-feet west of Cedarburg Road (centerline-to-centerline).
    - Unspecified access location along Cedarburg Avenue north of Mequon Road.
- Area I, North of Mequon Road between Cedarburg Road & Milwaukee River (5.17 ac)
    - Unspecified access location along Cedarburg Road north of Mequon Road.
    - No direct access is anticipated to Mequon Road.
- Area J, South of Mequon Road between Milwaukee River & Cedarburg Road (2.64 ac)
    - No direct access is anticipated to Mequon Road.
    - Unspecified access location along Cedarburg Road south of Mequon Road.
- Area K, South of Mequon Road between railroad tracks & Cedarburg Road
    - Existing River Centre west (right-in/right-out), center (full), and east (right-in/right-out) access points along Mequon Road.
    - Existing River Centre access points south of Mequon Road along Cedarburg Road.

Pedestrian sidewalks are currently located along both sides of Mequon Road through the study area from Wauwatosa Road to east of the study area, and sidewalks are planned to be provided along Cedarburg Road north of Mequon Road. A multi-use trail – the Ozaukee Interurban Trail – crosses Mequon Road immediately east of a railroad crossing (east of Industrial Drive), and auxiliary lanes are provided along Mequon Road to accommodate on-street bicycling. No regularly scheduled transit accommodations are provided. On-street parking is not currently designated on Mequon Road.

The Mequon Town Center redevelopment plan considers reducing the posted speed limit, reducing lane widths, adding bicycle lanes, and providing on-street parking along the south side of Mequon Road from Buntrock Avenue to Cedarburg Road to provide a more urbanized, accessible, and contextually sensitive roadway environment. These roadway elements – speed, lane widths, bicycle lanes, and on-street parking – are discussed in greater detail in the following recommendations and conclusions.

B6. Year 2010 Background Traffic – Recommended Improvements

The study area intersections were analyzed based on the procedures set forth in the *2000 Highway Capacity Manual* (HCM). Intersection operation is defined by "level of service". Level of Service (LOS) is a quantitative measure that refers to the overall quality of flow at an intersection ranging from very good, represented by LOS 'A', to very poor, represented by LOS 'F'. For the purpose of this study, LOS D was used to define acceptable peak hour operating conditions.

Year 2010 background traffic volumes assume annual traffic growth within the study area but do not include any development. The analysis was conducted using existing intersection geometrics and traffic control. The following improvements, shown in Exhibit 1-2, are recommended to accommodate the Year 2010 background traffic volumes. *Improvements are for jurisdictional consideration and are not legally binding. WisDOT and the City of Mequon reserve the right to determine alternative solutions.*

Mequon Road & Wauwatosa Road

- Extend the Mequon Road eastbound left-turn lane. This improvement will require closing the median opening approximately 180-feet west of Wauwatosa Road (centerline-to-centerline). Impacted BP gas station patrons and Crossroads of Mequon patrons may utilize downstream U-turn locations and/or secondary access points to Wauwatosa Road to continue in their intended directions.

Mequon Road & Concord Creek Drive/Mequon Trail

- The Concord Creek Drive southbound left-turn/through movement is expected to operate at LOS E with approximately 5-seconds of average delay over the LOS D/E threshold. The movement services little volume (10 vehicles per hour) and, therefore, no improvements are expected to be necessary.

Mequon Road & River Birch Drive

- No improvements are expected to be necessary.

Mequon Road & Buntrock Avenue

- Modify the traffic signal timings. Note that the Buntrock Avenue northbound left-turn/through movement is expected to operate at LOS E with approximately 3-seconds of average delay over the LOS D/E threshold. The approach services moderate volumes, opposes little southbound traffic, and has a 40-second signal split. No further improvements are expected to be necessary.

Mequon Road & Industrial Drive

- No improvements are expected to be necessary.

Mequon Road & River Centre West Access/Logeman Access

- No improvements are expected to be necessary.

Mequon Road & River Centre Center Access

- No improvements are expected to be necessary.

Mequon Road & River Centre East Access

- No improvements are expected to be necessary.

Mequon Road & Cedarburg Road

- Extend the Mequon Road eastbound left-turn as far west as possible without impacting the turn-bay into the River Centre center access. Additional storage is expected to be necessary but may not be feasible without impacting either the median cross-section of Mequon Road or access to the River Centre.
- Modify the traffic signal timings. Note that the Cedarburg Road southbound left-turn movement is expected to operate at LOS E with approximately 1.5-seconds of average delay over the LOS D/E threshold. Improving this movement to LOS D or better conditions would result in other movements at LOS E or require additional lanes at the intersection. The southbound left-turn queue can fit within the existing turn-bay storage and, therefore, no further improvements are expected to be necessary.

B7. Year 2010 Build Traffic – Recommended Improvements

Year 2010 build traffic volumes include phase one of the Mequon Town Center redevelopment (i.e. Brewery Square and Weston Center).

Recall that the City of Mequon wishes to reduce speed limits along Mequon Road from 40 mph to 35 mph between Wauwatosa Road and Buntrock Avenue, and 30 mph between Buntrock Avenue and Cedarburg Road. The City also wishes to adjust the highway cross-section between Buntrock Avenue and Cedarburg Road to a more contextually-sensitive roadway environment, including a 24-foot wide median, 11-foot through lanes on both sides of the median, bicycle lanes on both sides of the highway, and parking along the south side of the highway. This cross-section would eliminate the auxiliary lanes on both sides of Mequon Road. Four alternatives were considered.

- Alternative One: No speed limit changes, no parking/bike lanes
- Alternative Two: Speed limit changes, no parking/bike lanes
- Alternative Three: No speed limit changes, with parking/bike lanes
- Alternative Four: Speed limit changes, with parking/bike lanes

The following improvements, shown in Exhibits 1-3a and 1-3b, are recommended to accommodate the Year 2010 build traffic volumes. These improvements are in addition to the Year 2010 background traffic recommended improvements shown in Exhibit 1-2. *Improvements are for jurisdictional consideration and are not legally binding. WisDOT and the City of Mequon reserve the right to determine alternative solutions.*

General Improvements & Considerations

- *All Alternatives:* Minimize the number of access points along Mequon Road and provide cross-access where feasible.
- *Alternatives Two & Four:* Reduce the speed limit along Mequon Road to 35 mph between Wauwatosa Road and Buntrock Avenue, and to 30 mph between Buntrock Avenue and Cedarburg Road, to provide a more urbanized feel to the highway.
- *Alternatives Three & Four:* Modify the cross-section along Mequon Road between Buntrock Avenue and Cedarburg Road to include a 5-foot wide westbound on-street bicycle lane, two 11-foot westbound through lanes, a 24-foot wide median (which will accommodate left-turn bays), two 11-foot eastbound through lanes, a 5-foot wide eastbound on-street bicycle lane, and a 9-foot wide eastbound parallel parking lane. The existing auxiliary lanes (and thus right-turn lanes) will no longer exist.
- *Alternatives Three & Four:* Restrict parking within at least 20-feet of the curb return of unsignalized intersections (or within sight-triangle, whichever is greater), at least 30-feet of the curb return of signalized intersections (or within sight-triangle, whichever is greater), and at least 50-feet from midblock crosswalks (i.e. the Ozaukee Interurban Trail). To increase available sight distance for motorists exiting side streets and access points, consider curb extensions. Reducing the number of access points to Mequon Road will result in an increase in available on-street parking.

Mequon Road & Wauwatosa Road

- *All Alternatives:* No further improvements are expected to be necessary.

Mequon Road & Concord Creek Drive/Mequon Trail

- *All Alternatives:* The Concord Creek Drive southbound left-turn/through movement is expected to operate at LOS E with approximately 8-seconds of average delay over the LOS D/E threshold. The movement services little volume (10 vehicles per hour) and, therefore, no further improvements are expected to be necessary.

Mequon Road & Weston Center West Access (proposed)

- *All Alternatives:* Construct the Weston Center west access at the existing median opening along Mequon Road approximately 725-feet west of River Birch Drive (centerline-to-centerline).
- *All Alternatives:* An auxiliary lane exists on the south side of the highway that will function as an eastbound right-turn lane at the intersection.
- *All Alternatives:* Extend the exclusive left-turn lane on the Mequon Road westbound approach.
- *All Alternatives:* Provide a shared left-turn/right-turn lane and install a stop sign on the Weston Center west access northbound approach.

Mequon Road & Weston Center East Access (proposed)

- *All Alternatives:* Construct the Weston Center east access as a right-in/right-out access along Mequon Road approximately 450-feet west of River Birch Drive (centerline-to-centerline).
- *All Alternatives:* An auxiliary lane exists on the south side of the highway that will function as an eastbound right-turn lane at the intersection.
- *All Alternatives:* Provide a right-turn only exit lane and install a stop sign on the Weston Center east access northbound approach.

Mequon Road & River Birch Drive

- No further improvements are expected to be necessary.

Mequon Road & Buntrock Avenue

- *All Alternatives:* Close the median opening approximately 180-feet west of Buntrock Avenue (centerline-to-centerline). Impacted patrons to the business on the north side of the highway may utilize downstream U-turn locations to continue in their intended directions.
- *All Alternatives:* Close the median opening approximately 200-feet east of Buntrock Avenue (centerline-to-centerline). Impacted visitors/operators to the public works facility on the north side of the highway may utilize Buntrock Avenue and internal parking lot connections to continue in their intended directions.
- *All Alternatives:* Modify the traffic signal timings. Note that the Buntrock Avenue northbound left-turn/through movement is expected to operate at LOS E

with approximately 5-seconds of average delay over the LOS D/E threshold. The approach services moderate volumes, opposes little southbound traffic, and has a 40-second signal split.

- *Alternatives One & Two:* No further improvements are expected to be necessary.
- *Alternatives Three & Four:* With modifications to lane widths and the inclusion of parking/bike lanes, the westbound auxiliary lane (and thus a westbound right-turn lane) will no longer exist.

Mequon Road & Brewery Square Access (proposed)

- *All Alternatives:* Construct the Brewery Square access along Mequon Road approximately 285-feet east of Buntrock Avenue (centerline-to-centerline). Intersection sight distance is not currently sufficient to allow the right-turn egress movement. If the horizontal and vertical curves west of the access can be corrected, the access may be constructed as a right-in/right-out driveway. If the curves cannot be corrected, the access is recommended to be a right-in only driveway.
- *Alternatives One & Two:* An auxiliary lane exists on the south side of the highway that will function as an eastbound right-turn lane at the intersection.
- *Alternatives Three & Four:* With modifications to lane widths and the inclusion of parking/bike lanes, an eastbound auxiliary lane (and thus an eastbound right-turn lane) will no longer exist.
- *All Alternatives:* If the horizontal and vertical curves west of the access can be corrected and the access constructed as a right-in/right-out driveway, provide a right-turn only exit lane and install a stop sign on the Brewery Square northbound approach.

Mequon Road & Industrial Drive

- *Alternatives One & Two:* No further improvements are expected to be necessary.
- *Alternatives Three & Four:* With modifications to lane widths and the inclusion of parking/bike lanes, the eastbound and westbound auxiliary lanes (and thus the eastbound and westbound right-turn lanes) will no longer exist.

Mequon Road & River Centre West Access/Logeman Access

- *Alternatives One & Two:* No further improvements are expected to be necessary.
- *Alternatives Three & Four:* With modifications to lane widths and the inclusion of parking/bike lanes, the eastbound and westbound auxiliary lanes (and thus the eastbound and westbound right-turn lanes) will no longer be provided.

Mequon Road & River Centre Center Access

- *Alternatives One & Two:* No further improvements are expected to be necessary.
- *Alternatives Three & Four:* With modifications to lane widths and the inclusion of parking/bike lanes, the eastbound auxiliary lane (and thus the eastbound right-turn lane) will no longer exist.

Mequon Road & River Centre East Access

- *Alternatives One & Two:* No further improvements are expected to be necessary.
- *Alternatives Three & Four:* With modifications to lane widths and the inclusion of parking/bike lanes, the eastbound auxiliary lane (and thus the eastbound right-turn lane) will no longer exist.

Mequon Road & Cedarburg Road

- *All Alternatives:* It was recommended under Year 2010 background traffic volumes to extend the Mequon Road eastbound left-turn as far west as possible without impacting the turn-bay into the River Centre center access. Additional storage is expected to be necessary but may not be feasible without impacting either the median cross-section of Mequon Road or access to the River Centre.
- *All Alternatives:* Modify the traffic signal timings. Note that the Cedarburg Road southbound left-turn movement is expected to operate at LOS E with approximately 1.5-seconds of average delay over the LOS D/E threshold, and the Cedarburg Road northbound left-turn movement is expected to operate at LOS E with approximately 0.5-seconds of average delay over the LOS D/E threshold. Improving these movements to LOS D or better conditions would result in other movements at LOS E or require additional lanes at the intersection. The southbound and northbound left-turn queues can fit within existing turn-bay storage lengths.
- *Alternatives One & Two:* No further improvements are expected to be necessary.
- *Alternatives Three & Four:* With modifications to lane widths and the inclusion of parking/bike lanes, the eastbound auxiliary lane (and thus the continuous eastbound right-turn lane) will no longer exist. Provide dedicated eastbound right-turn storage.

B8. Year 2025 Background Traffic – Recommended Improvements

Exhibit 1-4, reserved by WisDOT to illustrate Year 2010 total traffic recommended improvements, has been intentionally omitted from this report because no total traffic analysis (which would include off-site development) is required.

Exhibits 1-5 through 1-7, reserved by WisDOT to illustrate interim year background, build and total traffic recommended improvements, have been intentionally omitted from this report because no interim year traffic analysis is required.

Year 2025 background traffic volumes assume annual traffic growth within the study area but do not include any development. The analysis was conducted using existing intersection geometrics and traffic control. The following improvements, shown in Exhibit 1-8, are recommended to accommodate the Year 2025 background traffic volumes. These improvements are in addition to the Year 2010 background traffic recommended improvements shown in Exhibit 1-2. *Improvements are for jurisdictional consideration and are not legally binding. WisDOT and the City of Mequon reserve the right to determine alternative solutions.*

Mequon Road & Wauwatosa Road

- Extend the Mequon Road eastbound and westbound left-turn lanes.

Mequon Road & Concord Creek Drive/Mequon Trail

- The Concord Creek Drive southbound left-turn/through movement is expected to operate at LOS F with approximately 46-seconds of average delay over the LOS D/E threshold. The Mequon Trail northbound left-turn/through movement is expected to operate at LOS F with approximately 18-seconds of average delay over the LOS D/E threshold. The movements service minor to little volume (15 vehicles per hour southbound, 40 vehicles per hour northbound). No improvements are expected to be necessary. Should delays result in unsafe conditions, consideration may be given to restricting Concord Creek Drive/Mequon Trail to left-in/right-in/right-out only and forcing left-out/through out movements to downstream U-turn locations.

Mequon Road & River Birch Drive

- No improvements are expected to be necessary.

Mequon Road & Buntrock Avenue

- Install protected-permitted left-turn signal heads to accommodate the Mequon Road eastbound left-turn movement.
- The Buntrock Avenue northbound left-turn/through movement is expected to operate at LOS E with approximately 7-seconds of average delay over the LOS D/E threshold. The approach services moderate volumes, opposes little southbound traffic, and has a 40-second signal split. No further improvements are expected to be necessary.

Mequon Road & Industrial Drive

- The Industrial Drive northbound left-turn/through movement is expected to operate at LOS E with approximately 6-seconds of average delay over the LOS D/E threshold. The movement services moderate volume (85 vehicles per hour). No improvements are expected to be necessary. Should delays result in unsafe conditions, consideration may be given to restricting Industrial Drive to left-in/right-in/right-out only and forcing left-out/through out movements to downstream U-turn locations.

Mequon Road & River Centre West Access/Logeman Access

- No improvements are expected to be necessary.

Mequon Road & River Centre Center Access

- Three westbound through lanes are expected to be necessary at the Mequon Road intersection with Cedarburg Road. Carry the three lanes west to the River Centre center access and taper to two lanes prior to the railroad tracks.
- The River Centre center access northbound left-turn movement is expected to operate at LOS E with approximately 8-seconds of average delay over the LOS D/E threshold. The movement services moderate volume (75 vehicles per hour). No further improvements are expected to be necessary. Should delays result in unsafe conditions, consideration may be given to restricting the access to left-in/right-in/right-out only and forcing left-out movements to downstream U-turn or other access locations.

Mequon Road & River Centre East Access

- Three westbound through lanes are expected to be necessary at the Mequon Road intersection with Cedarburg Road. Carry the three lanes west to the River Centre center access and taper to two lanes prior to the railroad tracks.
- Three eastbound through lanes are expected to be necessary at the Mequon Road intersection with Cedarburg Road. Due to the eastbound queues at the Cedarburg Road intersection, the eastbound auxiliary lane (and thus the eastbound right-turn lane) at the River Centre east access will be needed as a through lane and will no longer exist.

Mequon Road & Cedarburg Road

- Install protected-only left-turn traffic signal heads on the eastbound and westbound approaches. Install protected-overlap right-turn traffic signal heads to accommodate the westbound right-turn movement.
- Provide an additional eastbound left-turn lane, resulting in dual eastbound left-turn lanes.
- Provide an additional eastbound through lane, resulting in three through lanes and an exclusive right-turn lane (i.e. no eastbound auxiliary lane). The three eastbound through lanes will taper back to two lanes east of the intersection.
- Provide an additional westbound left-turn lane, resulting in dual westbound left-turn lanes. Note that providing dual westbound left-turn lanes will require improvements to the bridge over the Milwaukee River.
- Provide an additional westbound through lane, resulting in three through lanes, and maintain an exclusive westbound right-turn lane. Carry the three through lanes west to the River Centre center access and taper to two lanes prior to the railroad tracks. Note that maintaining an exclusive westbound right-turn lane will require improvements to the bridge over the Milwaukee River.
- Extend the Cedarburg Road northbound right-turn lane.
- The eastbound, westbound, northbound and southbound left-turn lanes are expected to operate at LOS E conditions with 4-seconds, 4-seconds, 1-second, and 10-seconds of average vehicle delay beyond the LOS D/E threshold, respectively, during the evening peak hour. Improving these movements to LOS D or better conditions would result in other movements at LOS E or require additional lanes at the intersection. The left-turn queues can fit within the recommended turn-bay storage lengths.

B9. Year 2025 Build Traffic – Recommended Improvements

Year 2025 build traffic volumes include full build-out of the Mequon Town Center redevelopment.

Recall that the City of Mequon wishes to reduce speed limits along Mequon Road from 40 mph to 35 mph between Wauwatosa Road and Buntrock Avenue, and 30 mph between Buntrock Avenue and Cedarburg Road. The City also wishes to adjust the highway cross-section between Buntrock Avenue and Cedarburg Road to a more contextually-sensitive roadway environment. The four alternatives considered are:

- Alternative One: No speed limit changes, no parking/bike lanes
- Alternative Two: Speed limit changes, no parking/bike lanes
- Alternative Three: No speed limit changes, with parking/bike lanes
- Alternative Four: Speed limit changes, with parking/bike lanes

A fifth alternative is presented for the Mequon Road intersections with Buntrock Avenue and Industrial Drive, which is a two-lane roundabout alternative. The following improvements, shown in Exhibits 1-9a through 1-9c, are recommended to accommodate the Year 2025 build traffic volumes. These improvements are in addition to the Year 2010 build traffic recommended improvements shown in Exhibits 1-3a and 1-3b, as well as the Year 2025 background traffic recommended improvements shown in Exhibit 1-8. *Improvements are for jurisdictional consideration and are not legally binding. WisDOT and the City of Mequon reserve the right to determine alternative solutions.*

Mequon Road & Wauwatosa Road

- *All Alternatives:* Provide dual left-turn lanes on the Mequon Road eastbound and westbound approaches. Close the median opening located approximately 390-feet east of Wauwatosa Road (centerline-to-centerline).
- *All Alternatives:* Extend the Wauwatosa Road southbound left-turn lane.

Mequon Road & Area B West Access (proposed)

- *All Alternatives:* Construct the Area B west access approximately 525-feet east of Wauwatosa Road as a right-in/right-out only access (centerline-to-centerline).
- *All Alternatives:* An auxiliary lane exists on the south side of the highway that will function as an eastbound right-turn lane at the intersection.
- *All Alternatives:* Provide a right-turn only exit lane and install a stop sign on the Area B west access northbound approach.

Mequon Road & Area B East Access (proposed)

- *All Alternatives:* Construct the Area B east access at the existing median opening along Mequon Road approximately 1,175-feet east of Wauwatosa Road (centerline-to-centerline).
- *All Alternatives:* An auxiliary lane exists on the south side of the highway that will function as an eastbound right-turn lane at the intersection.
- *All Alternatives:* Extend the exclusive left-turn lane on the Mequon Road westbound approach.
- *All Alternatives:* Provide a shared left-turn/right-turn lane and install a stop sign on the Area B east access northbound approach.
- *All Alternatives:* The Area B east access northbound left-turn/right-turn movement is expected to operate at LOS E with approximately 5-seconds of average delay over the LOS D/E threshold. The movement services little-to-moderate volume (40 left-turn/40 right-turn vehicles per hour) and, therefore, no improvements are expected to be necessary. Should delays result in unsafe conditions, consideration may be given to restricting the access to left-in/right-in/right-out only and forcing left-out movements to downstream U-turn locations.

Mequon Road & Concord Creek Drive/Mequon Trail

- *All Alternatives:* The Concord Creek Drive southbound left-turn/through movement is expected to operate at LOS F with approximately 220-seconds of average delay over the LOS D/E threshold. The Mequon Trail northbound left-turn/through movement is expected to operate at LOS F with approximately 177-seconds of average delay over the LOS D/E threshold. The movements service little-to-moderate volume (15 vehicles per hour southbound, 60 vehicles per hour northbound). No improvements are expected to be necessary. Should delays result in unsafe conditions, consideration may be given to restricting Concord Creek Drive/Mequon Trail to left-in/right-in/right-out only and forcing left-out/through-out movements to downstream U-turn locations.

Mequon Road & Area C Access (proposed)

- *All Alternatives:* Construct the Area C access approximately 350-feet east of Concord Creek Drive/Mequon Trail (centerline-to-centerline). Close the median opening that exists along Mequon Road between Concord Creek Drive/Mequon Trail and the Weston Center west access.
- *All Alternatives:* An auxiliary lane exists on the south side of the highway that will function as an eastbound right-turn lane at the intersection.
- *All Alternatives:* Provide a right-turn only exit lane and install a stop sign on the Area C access northbound approach.

Mequon Road & Weston Center West Access (proposed)

- *All Alternatives:* No further improvements are expected to be necessary beyond those recommended to accommodate Year 2010 build traffic.
- *All Alternatives:* The Weston Center west access northbound left-turn/right-turn movement is expected to operate at LOS E with approximately 9-seconds of average delay over the LOS D/E threshold. The movement services little volume (55 vehicles per hour). Should delays result in unsafe conditions, consideration may be given to restricting the access to left-in/right-in/right-out only and forcing left-out movement to downstream U-turn locations.

Mequon Road & Weston Center East Access (proposed)

- *All Alternatives:* No further improvements are expected to be necessary beyond those recommended to accommodate Year 2010 build traffic.

Mequon Road & River Birch Drive

- *All Alternatives:* The River Birch Drive northbound and southbound left-turn/through/right-turn movements are expected to operate at LOS F with approximately 37-seconds/25-seconds of average delay, respectively, over the LOS D/E threshold. The movements service minor to little volume (30 left/55 right vehicles per hour northbound, less than 5 vehicles per hour southbound). No improvements are expected to be necessary. Should delays result in unsafe conditions, consideration may be given to restricting River Birch Trail to left-in/right-in/right-out only and forcing left-out/through-out movements to downstream U-turn locations.

Mequon Road & Buntrock Avenue

- *Alternatives One, Two, Three & Four:* Install protected-permitted left-turn traffic signal heads to accommodate the Mequon Road eastbound and westbound approaches, as well as to accommodate the Buntrock Avenue northbound approach.
- *Alternatives One, Two, Three & Four:* Extend the Buntrock Avenue northbound right-turn lane.
- *Alternatives One & Two:* No further improvements are expected to be necessary.
- *Alternatives Three & Four:* Recall that, with modifications to lane widths and the inclusion of parking/bike lanes, the westbound auxiliary lane (and thus a westbound right-turn lane) will no longer exist.
- *Alternative Five:* The westbound through traffic queue is expected to extend through Industrial Drive with traffic signal control. Though this is a dynamic queue that is expected to clear prior to a red indication, consideration may be given to constructing a two-lane roundabout, including two lane entries on the eastbound and westbound Mequon Road approaches and one-lane approaches flaring to two lanes on the northbound and southbound Buntrock Avenue approaches.

Mequon Road & Brewery Square Access (proposed)

- *All Alternatives:* No further improvements are expected to be necessary beyond those recommended to accommodate Year 2010 build traffic.

Mequon Road & Industrial Drive

- *Alternatives One, Two, Three & Four:* Install traffic signals, including protected-permitted left-turn traffic signal heads to accommodate the Mequon Road westbound approach. Install protected-permitted left-turn traffic signal heads and permitted-overlap right-turn traffic signal heads on the Industrial Drive northbound approach. Railroad preemption will be necessary to properly clear the westbound approach of the intersection during rail crossings.
- *Alternatives One, Two, Three & Four:* Extend the Industrial Drive northbound right-turn lane.
- *Alternatives One & Two:* No further improvements are expected to be necessary.
- *Alternatives Three & Four:* With modifications to lane widths and the inclusion of parking/bike lanes, the westbound auxiliary lane (and thus the westbound right-turn lane) will no longer exist. Restrict parking on the south side of the eastbound approach for an ample distance to provide an eastbound right-turn lane.
- *Alternatives One, Two, Three & Four:* The Industrial Drive northbound left-turn/through movement is expected to operate at LOS E with approximately 10-seconds of average delay over the LOS D/E threshold. The approach services moderate volumes, opposes little southbound traffic, and has a 40-second signal split.
- *Alternatives Two & Four:* The Mequon Road westbound left-turn movement at Industrial Drive is expected to operate at LOS E with approximately 10-seconds

of average delay over the LOS D/E threshold. The movement has a 25-second signal split and queues are expected to fit within the recommended turn-bay storage length.

- *Alternative Five:* The eastbound through traffic queue is expected to extend through Buntrock Avenue with traffic signal control. Though this is a dynamic queue that is expected to clear prior to a red indication, consideration may be given to construct a two-lane roundabout, including two lane entries on the eastbound and westbound Mequon Road approaches, a one-lane entry flaring to two lanes on the northbound Industrial Drive approach, and a one-lane entry on the southbound Industrial Drive approach. Railroad preemption and crossing gates will be necessary to properly clear the westbound approach of the roundabout during rail crossings.

Mequon Road & River Centre West Access/Logeman Access

- *Alternatives One & Two:* No improvements are expected to be necessary.
- *Alternatives Three & Four:* Recall that, with modifications to lane widths and the inclusion of parking/bike lanes, the eastbound and westbound auxiliary lanes (and thus the eastbound and westbound right-turn lanes) will no longer be provided.

Mequon Road & River Centre Center Access

- *Alternatives One & Two:* No further improvements are expected to be necessary.
- *Alternatives Three & Four:* Restrict parking on the south side of the eastbound approach for an ample distance to provide an eastbound right-turn lane.
- *All Alternatives:* The River Centre center access northbound left-turn movement is expected to operate at LOS F with approximately 145-seconds of average delay over the LOS D/E threshold. The movement services moderate volume (80 vehicles per hour). No further improvements are expected to be necessary. Should delays result in unsafe conditions, consideration may be given to restricting the access to left-in/right-in/right-out only and forcing left-out movements to downstream U-turn or other access locations.

Mequon Road & River Centre East Access

- *Alternatives One & Two:* No further improvements are expected to be necessary.
- *Alternatives Three & Four:* Recall that, with modifications to lane widths and the inclusion of parking/bike lanes, the eastbound and westbound auxiliary lanes (and thus the eastbound and westbound right-turn lanes) will no longer exist.

Mequon Road & Cedarburg Road

- *All Alternatives:* Install protected-overlap right-turn traffic signal heads to accommodate the southbound right-turn movement.
- *All Alternatives:* Extend the eastbound dual left-turn lanes and the eastbound right-turn lane.
- *All Alternatives:* Extend the westbound dual left-turn lanes and the westbound right-turn lane.
- *All Alternatives:* Extend the northbound right-turn lane.

- *All Alternatives:* Provide an exclusive southbound right-turn lane.
- *All Alternatives:* Note that eastbound, westbound, northbound and southbound left-turn lanes are expected to operate at LOS E conditions with 17-seconds, 5-seconds, 1-second, and 21-seconds of average vehicle delay beyond the LOS D/E threshold, respectively, during the evening peak hour. Improving these movements to LOS D or better conditions would result in other movements at LOS E or require additional lanes at the intersection. The left-turn queues can fit within the recommended turn-bay storage lengths.
- *All Alternatives:* The northbound through movement is expected to operate at LOS F conditions with 44-seconds of average vehicle delay beyond the LOS D/E threshold during the evening peak hour. Providing a third northbound through lane would reduce the delay. However, this is not expected to be feasible due to the close proximity of riverfront buildings to Cedarburg Road. A roundabout was considered but would require three lane entries on all approaches plus a westbound-to-northbound free-flow lane, which would also result in three lanes northbound on Cedarburg Road.

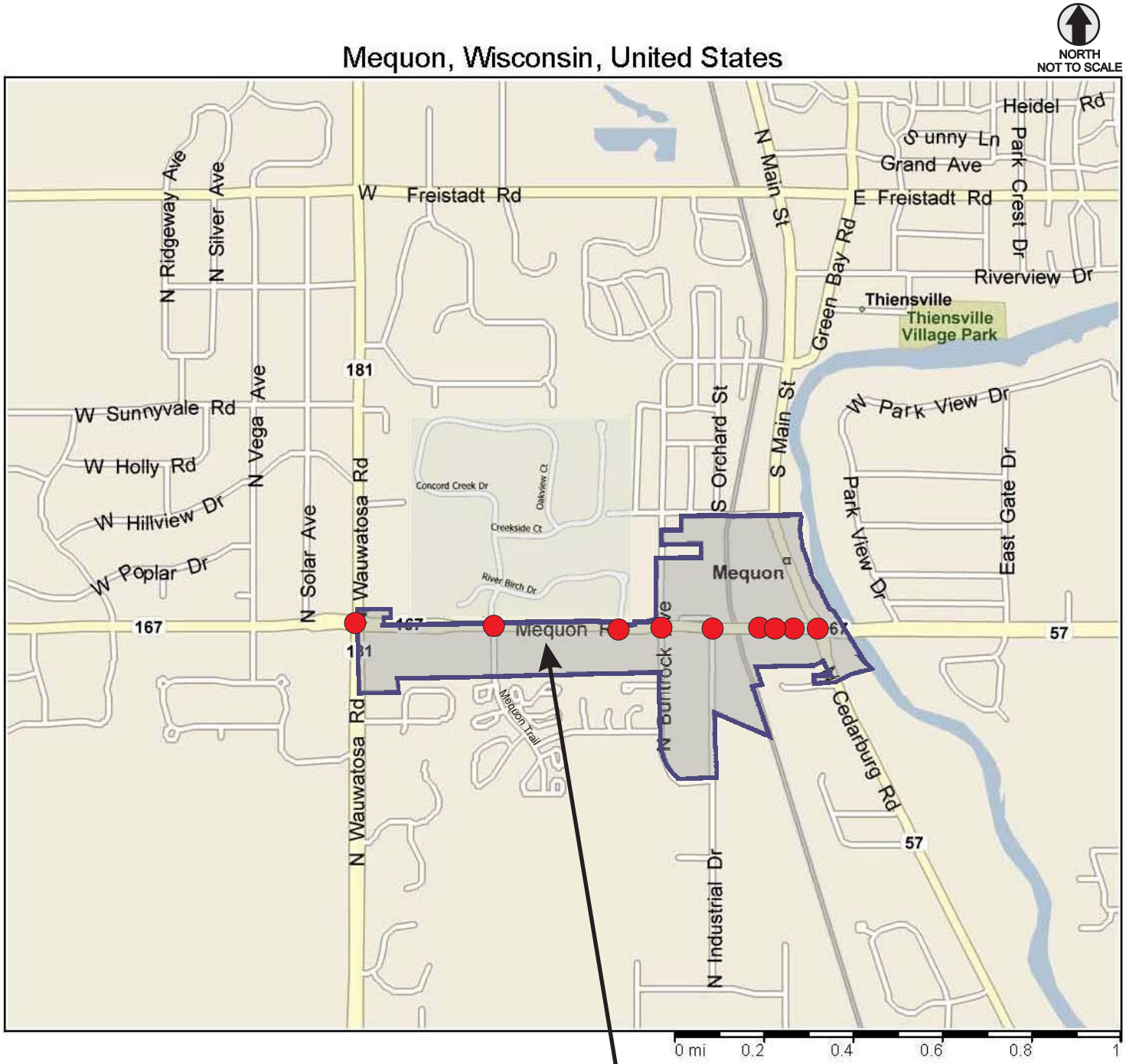
Exhibit 1-10, reserved by WisDOT to illustrate Year 2025 total traffic recommended improvements, has been intentionally omitted from this report because no total traffic analysis (which would include off-site development) is required.

B10. Conclusion

Comparisons of measures of effectiveness (MOEs) for the four traffic signal alternatives, both along the Mequon Road arterial and for the system as a whole, indicate the following (see Chapter V):

- All the alternatives are expected to provide approximately the same total delay per vehicle.
- Alternatives One and Three are expected to provide a slightly higher average speed (19 mph) along Mequon Road than Alternatives Two (18 mph) and Four (17 mph). This result makes sense, as the speed limits are higher under Alternatives One and Three than under Alternatives Two and Four.
- Alternative Two, which assumes reduced speed limits but no parking/bike lanes, is expected to provide the least number of stops per vehicle (0.27 stops per vehicle). Alternative Three, which assumes no speed limit reductions but parking/bike lanes, is expected to provide the most number of stops per vehicle (0.29 stops per vehicle). These values are not substantially different, and a driver is not likely to sense the difference.
- None of the results are substantially different than the others. That is, from the standpoint of effectiveness in servicing traffic operationally along the corridor, the four alternatives are approximately the same.

The fifth alternative is the construction of two-lane roundabouts for the Mequon Road & Buntrock Avenue and Mequon Road & Industrial Drive intersections. Queues and delays are expected to be reduced with the roundabout alternatives, though the roundabouts do not create gaps in traffic to service two-way stop controlled intersections along the corridor like traffic signals do. All four traffic signal alternatives and the roundabout alternative will require railroad preemption at Industrial Drive due to the close proximity of the intersection to the rail crossing to the east.



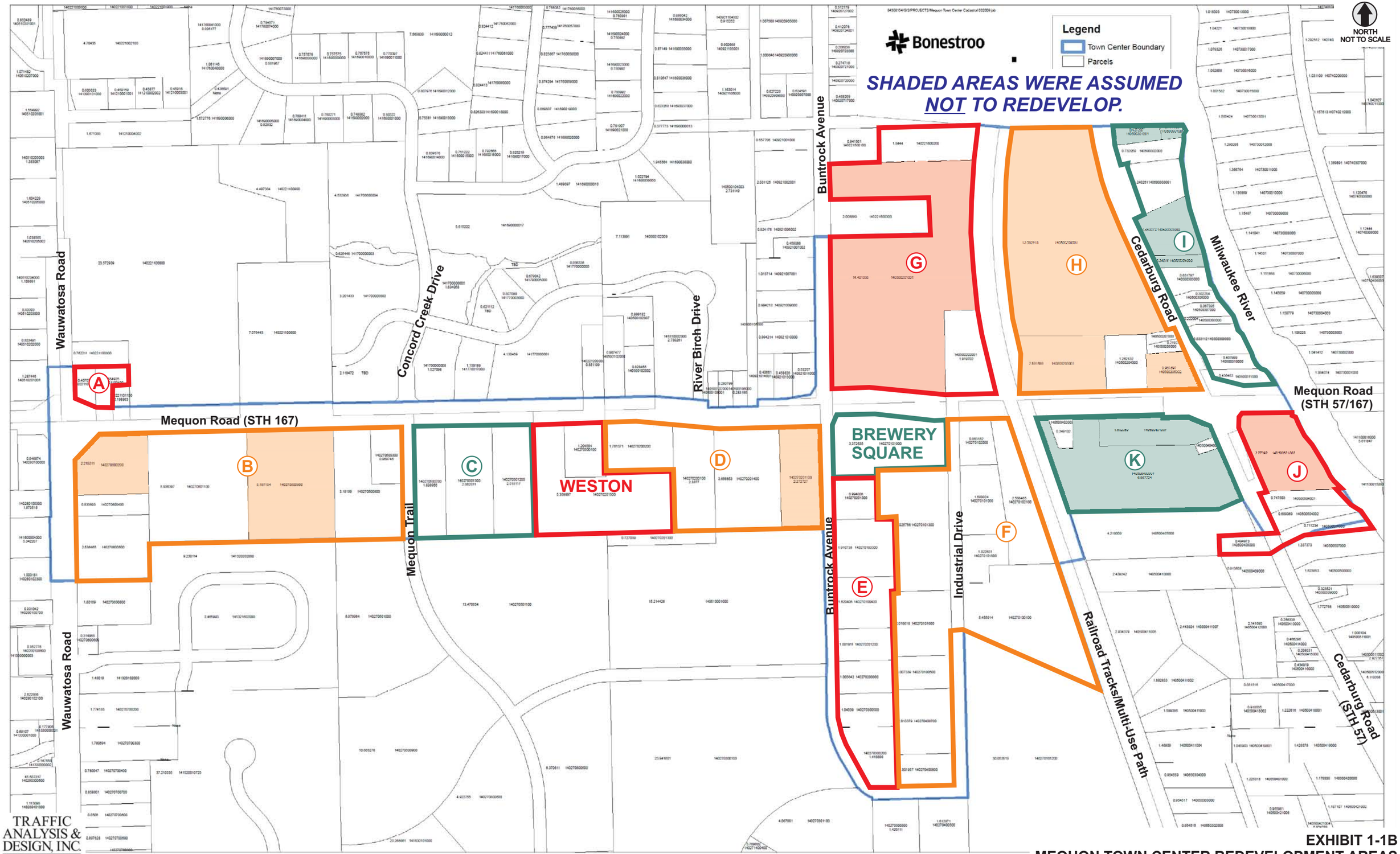
● = Existing Study Area Intersection

▭ = Mequon Town Center Redevelopment Boundary

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 1-1A
SITE LOCATION MAP
MEQUON TOWN CENTER REDEVELOPMENT
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 1-1B
MEQUON TOWN CENTER REDEVELOPMENT AREAS
MEQUON, WISCONSIN

NORTH
NOT TO SCALE

Insight Development Group

Partners In Visionary Development

mha
mayer helminiak
architects

Brewery Square of Mequon

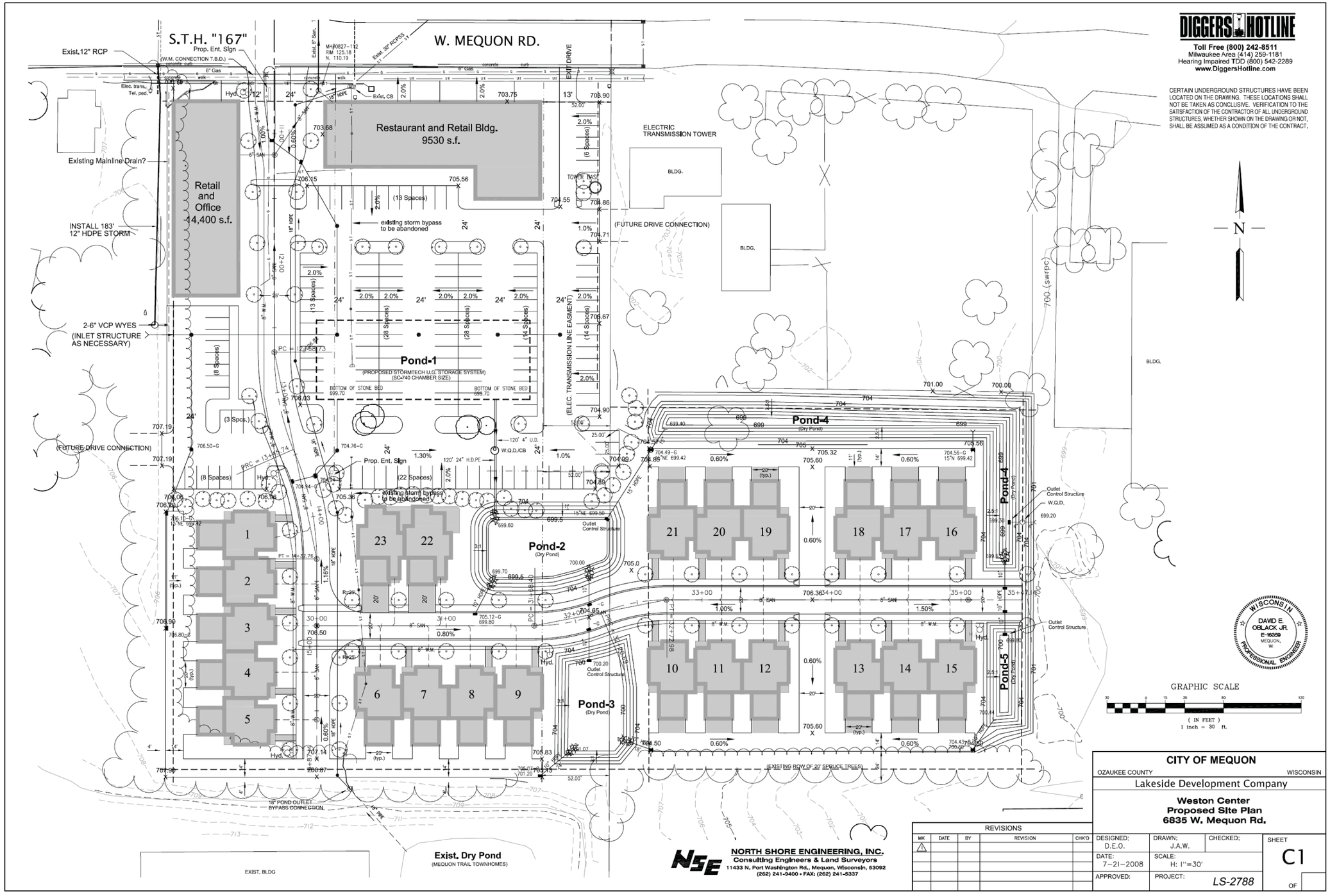
29

Phase 3 Site Concept Plan

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

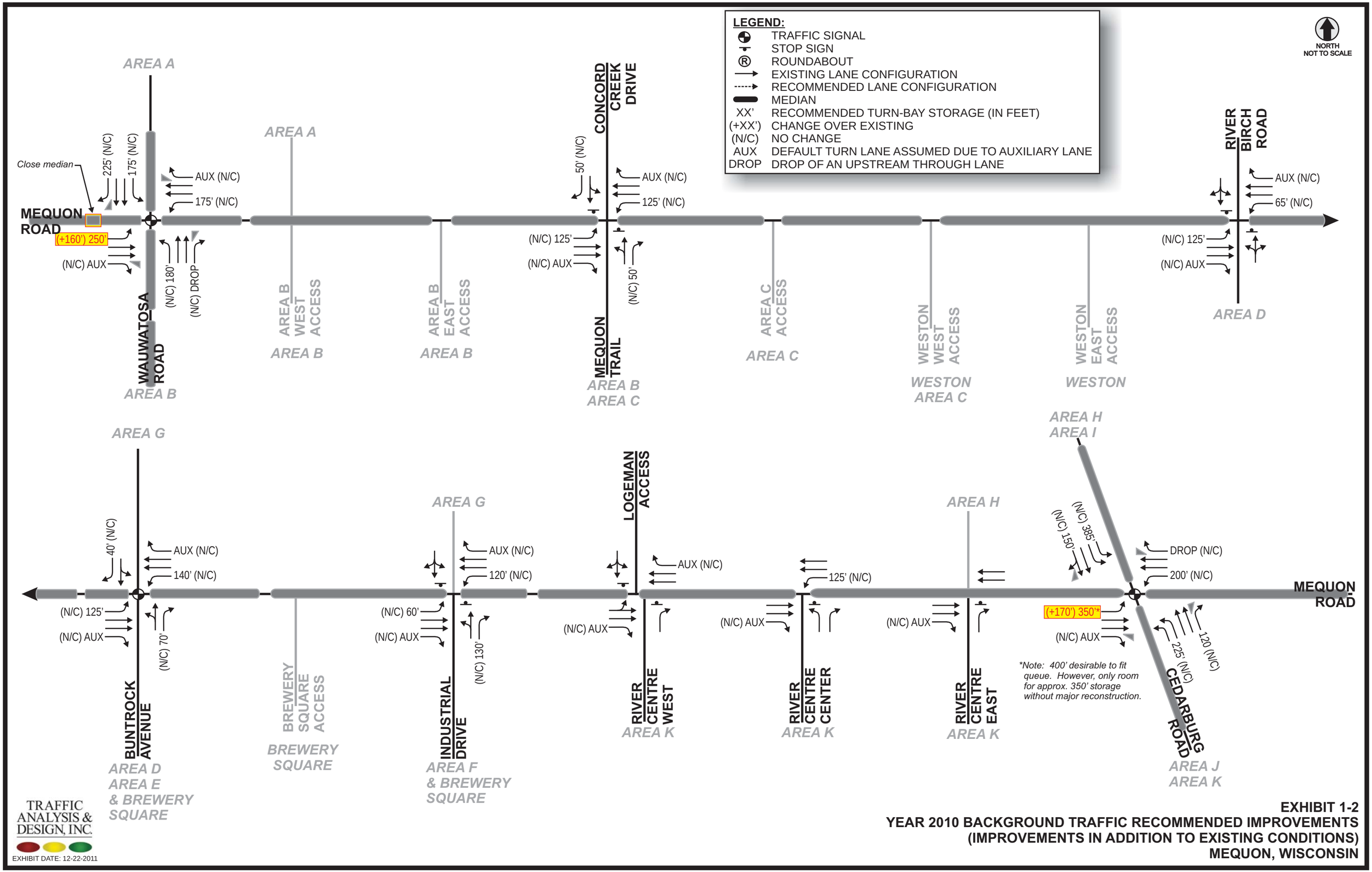
EXHIBIT 1-1C
BREWERY SQUARE CONCEPTUAL SITE PLAN
MEQUON TOWN CENTER REDEVELOPMENT
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 1-1D
WESTON CENTER CONCEPTUAL SITE PLAN
MEQUON TOWN CENTER REDEVELOPMENT
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 1-2
YEAR 2010 BACKGROUND TRAFFIC RECOMMENDED IMPROVEMENTS
(IMPROVEMENTS IN ADDITION TO EXISTING CONDITIONS)
MEQUON, WISCONSIN

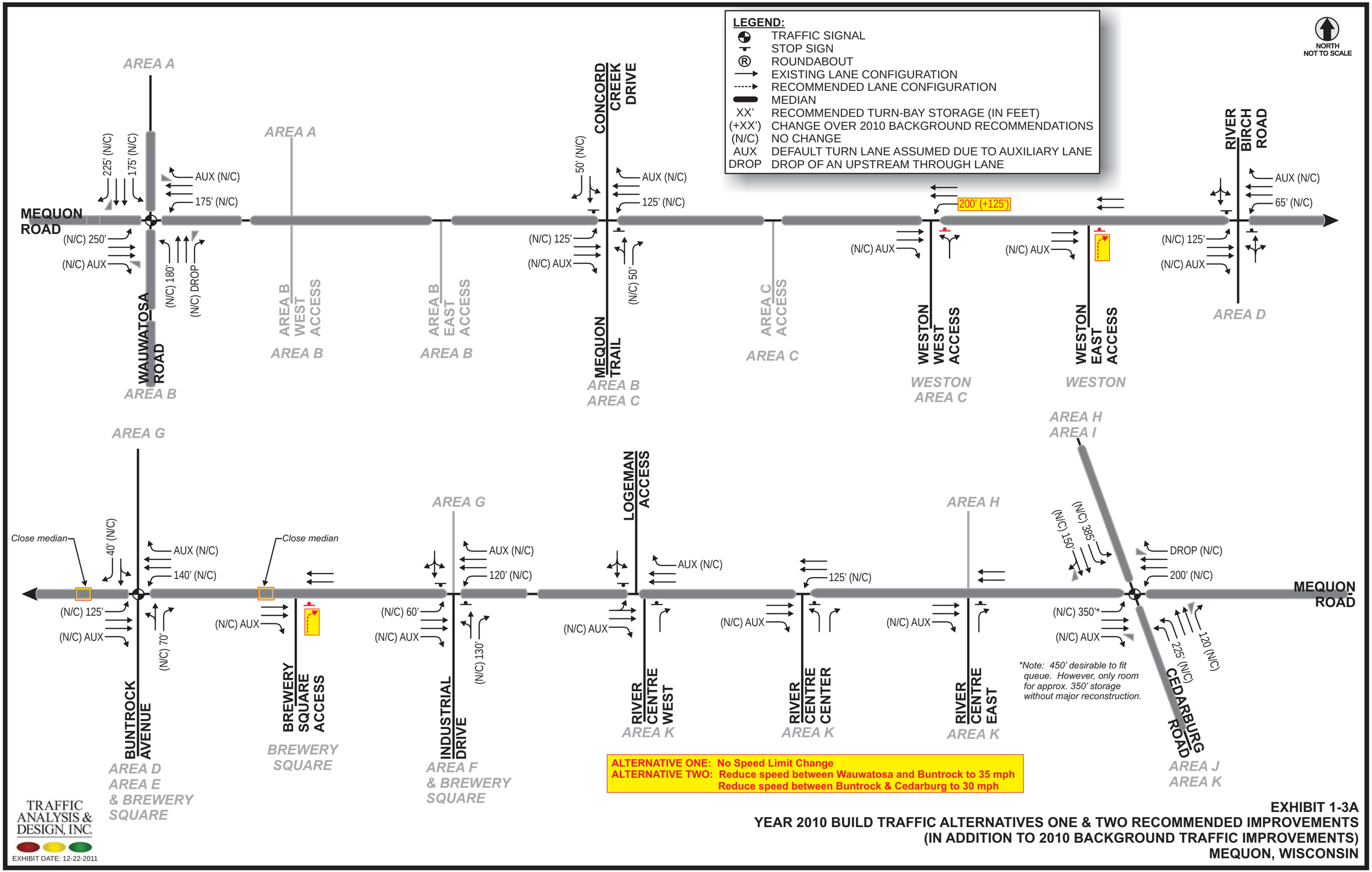
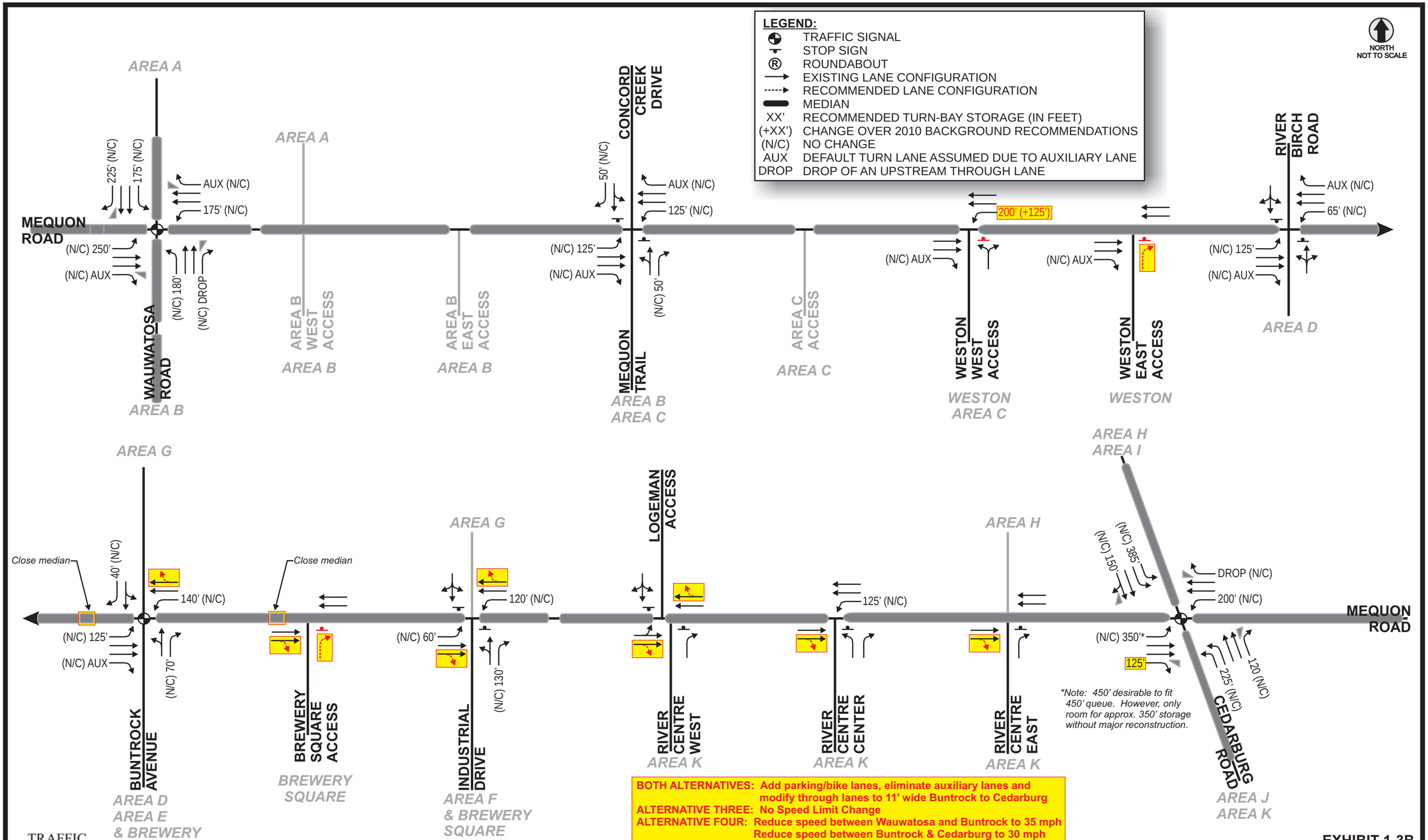


EXHIBIT 1-3A
YEAR 2010 BUILD TRAFFIC ALTERNATIVES ONE & TWO RECOMMENDED IMPROVEMENTS
(IN ADDITION TO 2010 BACKGROUND TRAFFIC IMPROVEMENTS)
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 1-3B

YEAR 2010 BUILD TRAFFIC ALTERNATIVES THREE & FOUR RECOMMENDED IMPROVEMENTS (IN ADDITION TO 2010 BACKGROUND TRAFFIC IMPROVEMENTS)

MEQUON, WISCONSIN

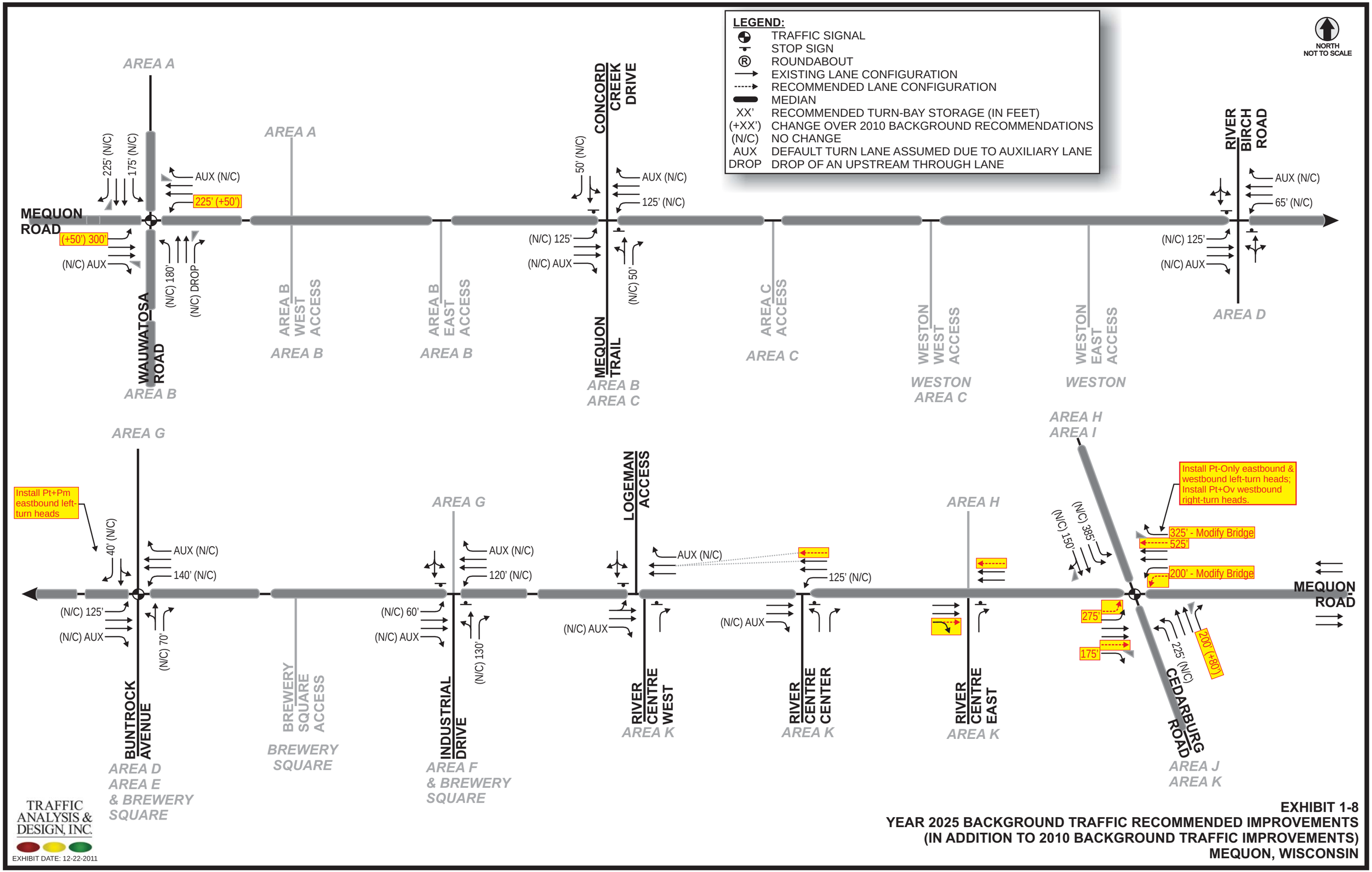


EXHIBIT 1-8
YEAR 2025 BACKGROUND TRAFFIC RECOMMENDED IMPROVEMENTS
(IN ADDITION TO 2010 BACKGROUND TRAFFIC IMPROVEMENTS)
MEQUON, WISCONSIN

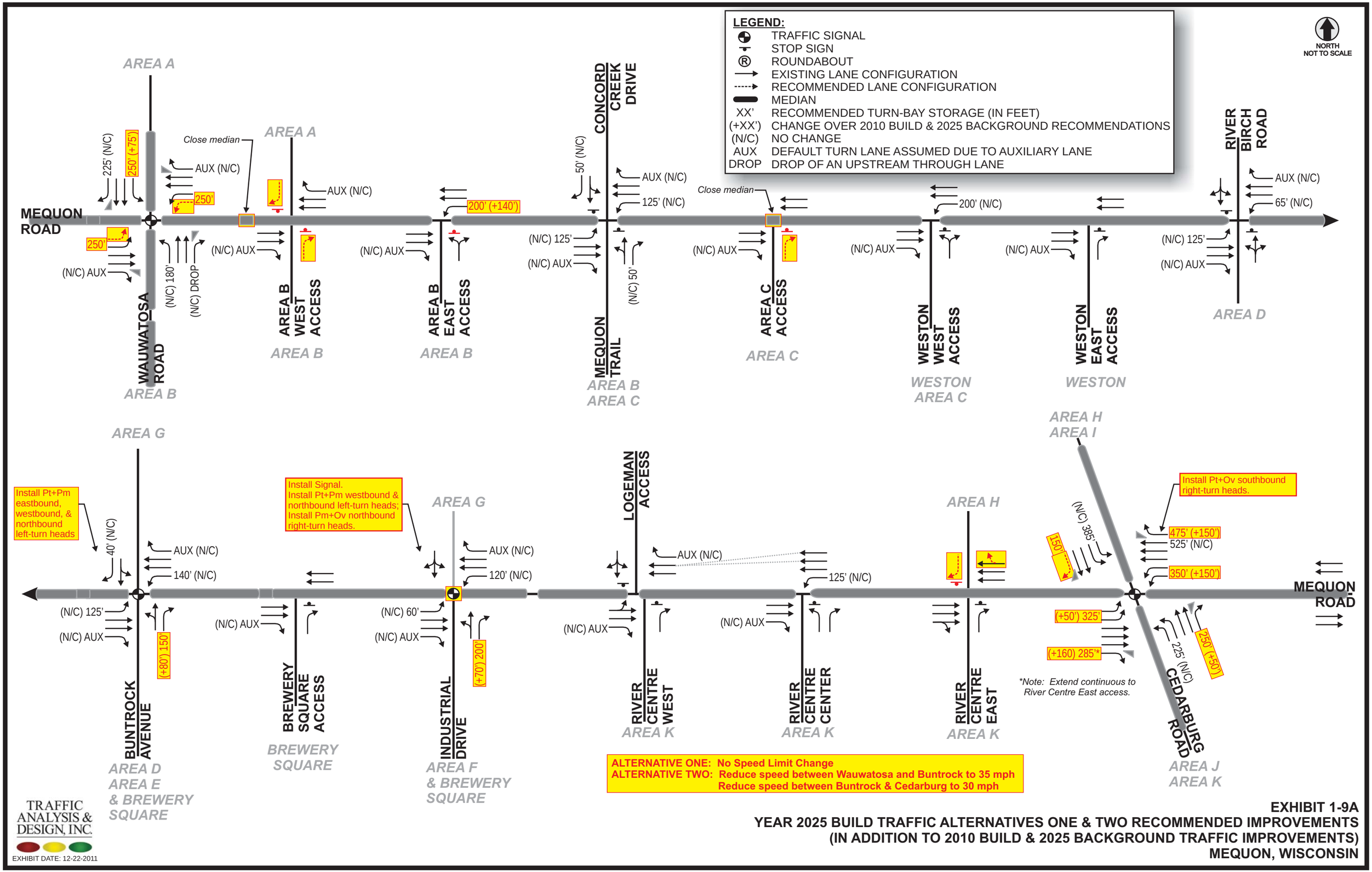
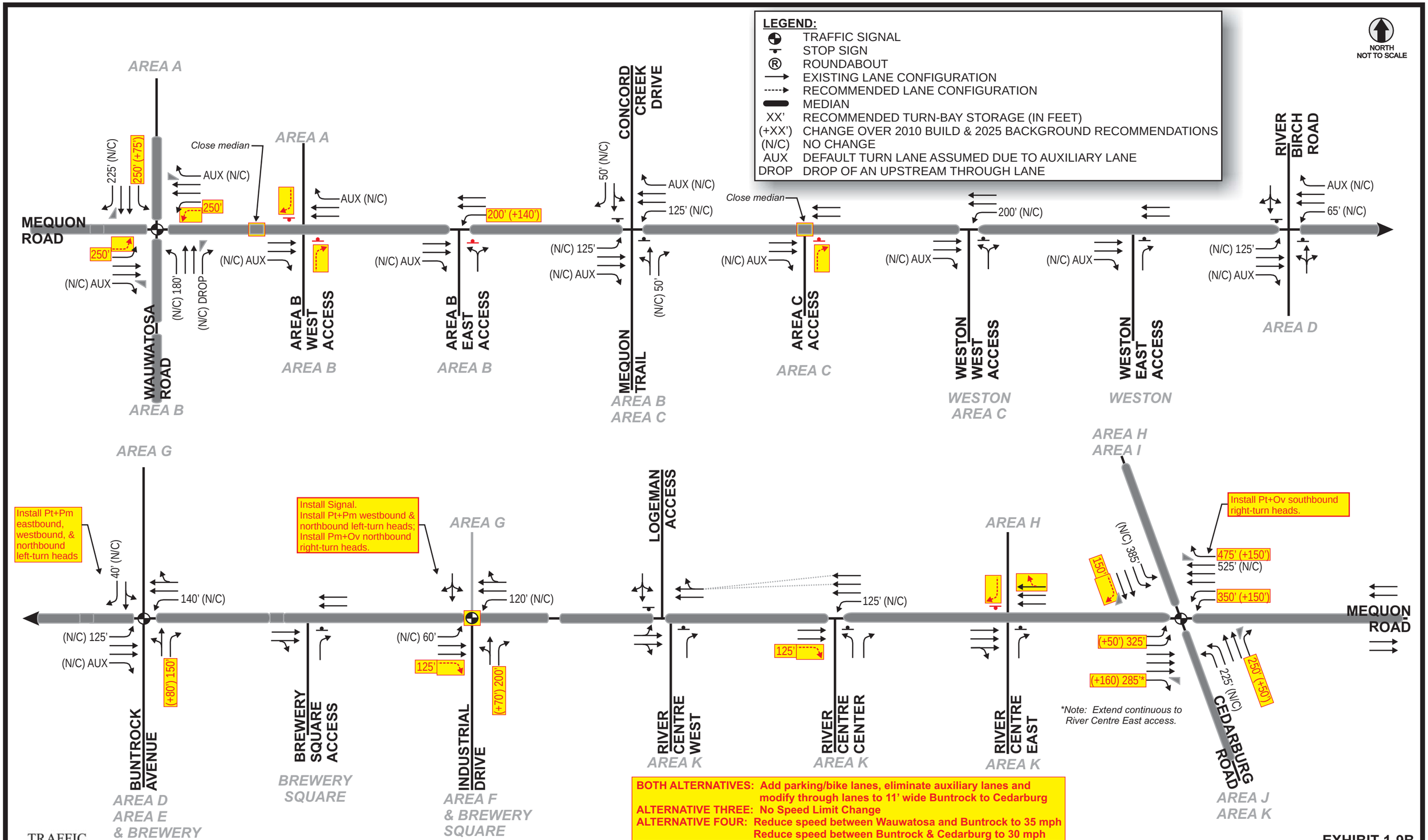


EXHIBIT 1-9A
YEAR 2025 BUILD TRAFFIC ALTERNATIVES ONE & TWO RECOMMENDED IMPROVEMENTS
(IN ADDITION TO 2010 BUILD & 2025 BACKGROUND TRAFFIC IMPROVEMENTS)
MEQUON, WISCONSIN



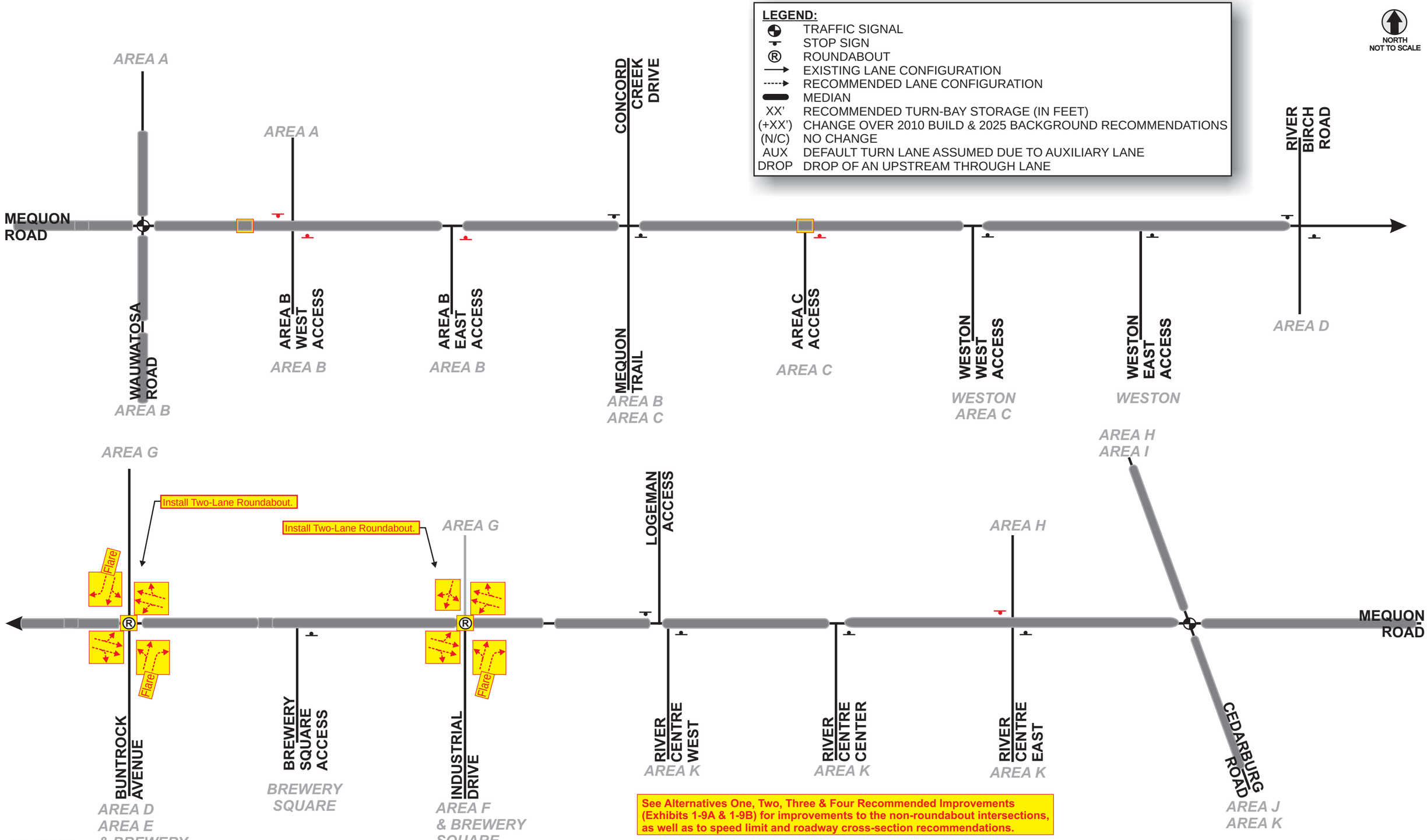
TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 1-9B

YEAR 2025 BUILD TRAFFIC ALTERNATIVES THREE & FOUR RECOMMENDED IMPROVEMENTS (IN ADDITION TO 2010 BUILD & 2025 BACKGROUND TRAFFIC IMPROVEMENTS)

MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 1-9C
YEAR 2025 BUILD TRAFFIC ALTERNATIVE FIVE RECOMMENDED IMPROVEMENTS
(IN ADDITION TO 2010 BUILD & 2025 BACKGROUND TRAFFIC IMPROVEMENTS)
MEQUON, WISCONSIN

CHAPTER II – PROPOSED DEVELOPMENT

PART A – ON-SITE DEVELOPMENT

A1. Development Description and Site Location

The City of Mequon is planning for the Mequon Town Center redevelopment, which is to consist of mixed-use development along Mequon Road, Cedarburg Road, Wauwatosa Road, Industrial Drive, and Buntrock Avenue in the City of Mequon, Ozaukee County. A street map illustrating the location of the Mequon Town Center is shown in Exhibit 2-1.

A2. Land Use and Intensity

A parcel map outlining the boundaries of the Mequon Town Center and its redevelopment areas is shown in Exhibit 2-2a. The area immediately surrounding the Mequon Town Center is primarily residential to the north, west and south. The Milwaukee River forms the east boundary.

For the purpose of this study, the redevelopment has been split into two phases. Phase one includes redevelopment expected in the short term while phase two includes additional redevelopment expected in the future. Phase one plus phase two is herein referenced as the full build of development.

Phase One Redevelopment Sites

There are two planned redevelopment sites within the Mequon Town Center that were assumed to occur under phase one. The phase one redevelopment sites include the Brewery Square redevelopment and Weston Center redevelopment.

The Brewery Square redevelopment, shown conceptually in Exhibit 2-2b, is to be located along the south side of Mequon Road between Buntrock Avenue and Industrial Drive. The site is expected to be redeveloped with the following land uses and densities:

- Condominiums – 32 units
- General Office – 18,000 square feet (sf)
- Shopping Center – 25,200 sf
- Brewery/Sit-Down Restaurant – 6,500 sf

The Weston Center redevelopment, shown in Exhibit 2-2c, is to be located along the south side of Mequon Road between Concord Creek Drive/Mequon Trail and River Birch Drive. The site is expected to be redeveloped with the following land uses and densities:

- Condominiums – 23 units
- General Office – 14,400 sf
- Shopping Center – 17,900 sf
- Sit-Down Restaurant – 6,000 sf

Phase Two Redevelopment Areas

The remaining lands within the Mequon Town Center were broken into eleven redevelopment areas, lettered A through K (see Exhibit 2-2a), to aid in achieving an accurate trip assignment. Except for areas H and K, the land uses and densities consist of 6,575-sf of shopping center and general office land use (70%/30% split) on each acre of land (a 15% FAR) and 3.8 units of

condominiums on each acre of land. Actual land uses and densities may vary as more concrete redevelopment plans arise. The following identifies the land uses and densities assumed in each redevelopment area.

- Area A, Northeast corner of Mequon Road & Wauwatosa Road (0.96 ac)
    - Shopping Center – 4,400 sf
    - General Office – 1,900 sf
    - Condominiums – 4 units
- Area B, South side of Mequon Road between Wauwatosa Road and Mequon Trail (13.46 ac)
    - Shopping Center – 61,900 sf
    - General Office – 26,600 sf
    - Condominiums – 51 units
- Area C, South side of Mequon Road between Mequon Trail & Weston Center redevelopment site (7.22 ac)
    - Shopping Center – 33,200 sf
    - General Office – 14,300 sf
    - Condominiums – 27 units
- Area D, South side of Mequon Road between Weston Center redevelopment site & Buntrock Avenue (7.76 ac)
    - Shopping Center – 35,700 sf
    - General Office – 15,300 sf
    - Condominiums – 29 units
- Area E, East side of Buntrock Avenue, south of Brewery Square site (8.99 ac)
    - Shopping Center – 41,400 sf
    - General Office – 17,700 sf
    - Condominiums – 34 units
- Area F, Both sides of Industrial Drive, south & east of Brewery Square site (21.59 ac)
    - Shopping Center – 99,400 sf
    - General Office – 42,600 sf
    - Condominiums – 82 units
- Area G, North of Mequon Road between Buntrock Avenue & railroad tracks (3.76 ac)
    - Shopping Center – 17,300 sf
    - General Office – 7,400 sf
    - Condominiums – 17 units

- Area H, North of Mequon Road between railroad tracks & Cedarburg Road
    - Condominiums – 60 units
- Area I, North of Mequon Road between Cedarburg Road & Milwaukee River (5.17 ac)
    - Shopping Center – 23,800 sf
    - General Office – 10,200 sf
    - Condominiums – 20 units
- Area J, South of Mequon Road between Milwaukee River & Cedarburg Road (2.64 ac)
    - Shopping Center – 12,200 sf
    - General Office – 5,200 sf
    - Condominiums – 10 units
- Area K, South of Mequon Road between railroad tracks & Cedarburg Road
    - Shopping Center – 10,000 sf

A3. Site Plan

Exhibits 2-2a, 2-2b and 2-2c are the most recent site plans available for the Mequon Town Center. More detailed site plans are not available at this time, as definitive developers and plans for the Center have not yet come to fruition. For the purpose of this study, the following driveway access was assumed to occur:

- Brewery Square, South side of Mequon Road between Buntrock Avenue and Industrial Drive
    - Existing right-in/right-out access along Mequon Road approximately 285-feet east of Buntrock Avenue (centerline-to-centerline).
    - Existing full access points along Buntrock Avenue approximately 175-feet and 330-feet south of Mequon Road (centerline-to-centerline).
    - Existing full access along Industrial Drive approximately 265-feet south of Mequon Road (centerline-to-centerline).
- Weston Center, south side of Mequon Road between Area C and Area D
    - Existing full access point along Mequon Road approximately 725-feet west of River Birch Drive (centerline-to-centerline).
    - Right-in/right-out access along Mequon Road approximately 450-feet west of River Birch Drive (centerline-to-centerline).
    - Cross access to Area C and Area D.
- Area A, Northeast corner of Mequon Road & Wauwatosa Road (0.96 ac)
    - Existing right-in/right-out access along Wauwatosa Road north of Mequon Road.
    - Existing right-in/right-out access along Mequon Road east of Wauwatosa Road.
- Area B, South side of Mequon Road between Wauwatosa Road and Mequon Trail (13.46 ac)
    - Unspecified access location along Wauwatosa Road, south of Mequon Road.

  - Right-in/right-out access along Mequon Road approximately 525-feet east of Wauwatosa Road (centerline-to-centerline).
  - Existing full access along Mequon Road at first median opening approximately 1,175-feet east of Wauwatosa Road (centerline-to-centerline).
  - Full access along Mequon Trail approximately 450-feet south of Mequon Road (centerline-to-centerline).
- Area C, South side of Mequon Road between Mequon Trail & Weston Center redevelopment site (7.22 ac)
  - Full access along Mequon Trail approximately 450-feet south of Mequon Road (centerline-to-centerline).
  - Right-in/right-out access along Mequon Road approximately 350-feet east of Concord Creek Drive/Mequon Trail (centerline-to-centerline).
  - Cross access to the Weston Center site.
- Area D, South side of Mequon Road between Weston Center redevelopment site & Buntrock Avenue (7.76 ac)
  - Cross access to the Weston Center site.
  - Full access along Mequon Road to align with River Birch Drive.
- Area E, East side of Buntrock Avenue, south of Brewery Square site (8.99 ac)
  - Unspecified access locations along Buntrock Avenue.
  - No direct access is anticipated to Mequon Road.
- Area F, Both sides of Industrial Drive, south & east of Brewery Square site (21.59 ac)
  - Unspecified access locations along Industrial Drive south of Mequon Road.
  - No direct access is anticipated to Mequon Road.
- Area G, North of Mequon Road between Buntrock Avenue & railroad tracks (3.76 ac)
  - Unspecified access locations along Buntrock Avenue south of Mequon Road.
  - Full access along Mequon Road to align with Industrial Drive.
- Area H, North of Mequon Road between railroad tracks & Cedarburg Road
  - Right-in/right-out only access along Mequon Road to align with River Center east access approximately 335-feet west of Cedarburg Road (centerline-to-centerline).
  - Unspecified access location along Cedarburg Avenue north of Mequon Road.
- Area I, North of Mequon Road between Cedarburg Road & Milwaukee River (5.17 ac)
  - Unspecified access location along Cedarburg Road north of Mequon Road.
  - No direct access is anticipated to Mequon Road.
- Area J, South of Mequon Road between Milwaukee River & Cedarburg Road (2.64 ac)
  - No direct access is anticipated to Mequon Road.
  - Unspecified access location along Cedarburg Road south of Mequon Road.

- Area K, South of Mequon Road between railroad tracks & Cedarburg Road
    - Existing River Centre west (right-in/right-out), center (full), and east (right-in/right-out) access points along Mequon Road.
    - Existing River Centre access points south of Mequon Road along Cedarburg Road.

A4. Development Phasing and Timing

Exhibit 2-3 illustrates the assumed redevelopment phasing and timing.

There are two planned redevelopment sites within the Mequon Town Center that were, when this study was originally performed in Year 2009, assumed to occur in the Year 2010. At the time it was understood that actual timeline for redevelopment was uncertain due to economic forces. Phase one is now expected to commence in Year 2012.

The anticipated time for completion of the full build (phase one plus phase two) redevelopment is unknown and was assumed for this study to occur by the Year 2020. A Year 2025 traffic analysis was conducted based on WisDOT guidelines which state that traffic operating conditions 10 years after the initial build of a development, or 5 years after the final phase of a development, which ever is greater, must be investigated. Therefore, the full build redevelopment was included in the Year 2025 build traffic analysis.

PART B – STUDY AREA

B1. Influence Area

The primary influence area for the Mequon Town Center includes the communities of Mequon, Thiensville and Cedarburg. Since Mequon Road, Wauwatosa Road and Cedarburg Road serve as regional routes, the influence area also includes the communities of Germantown and Brown Deer.

B2. Area of Significant Traffic Impact

The primary corridor servicing the Mequon Town Center redevelopment plan is Mequon Road. The roadway system is discussed in detail under "Part D – Site Accessibility".

The study area includes the following intersections, which are shown in Exhibit 2-1:

- Mequon Road & Wauwatosa Road (traffic signal control);
- Mequon Road & Concord Creek Drive/Mequon Trail (two-way stop control);
- Mequon Road & River Birch Drive (two-way stop control);
- Mequon Road & Buntrock Avenue (traffic signal control);
- Mequon Road & Industrial Drive (two-way stop control);
- Mequon Road & River Centre west access/Logeman access (two-way stop control);
- Mequon Road & River Centre center access (two-way stop control);
- Mequon Road & River Centre east access (two-way stop control); and
- Mequon Road & Cedarburg Road (traffic signal control).

Additional private access points along Mequon Road are included as study area intersections and are discussed under "A3. Site Plan".

PART C – OFF-SITE LAND USE AND DEVELOPMENT

Reference Exhibit 2-4 for a copy of the City of Mequon 2035 land use plan. Based on conversations with the City of Mequon, no other developments are currently being planned in the vicinity of the Mequon Town Center.

PART D – SITE ACCESSIBILITY

D1. Study Area Roadways

The study area roadways are discussed below:

Mequon Road is a four-lane divided arterial highway with auxiliary lanes and a posted speed limit of 40 miles per hour (mph). The highway reduces to a two-lane undivided highway west of its intersection with Wauwatosa Road. According to WisDOT, the annual average daily traffic (AADT) volumes were approximately 12,200 vehicles per day (vpd) west of Wauwatosa Road (Year 2007), 17,000 vpd east of Wauwatosa Road (Year 2007), 22,100 vpd between Buntrock Avenue and Industrial Drive (Year 2007), 18,700 vpd west of Cedarburg Road (Year 2007), and 24,100 vpd east of Cedarburg Road (Year 2004). Mequon Road is also designated as STH 167 west of Cedarburg Road and STH 57/167 west of Cedarburg Road. The Southeastern Wisconsin Regional Planning Commission (SEWRPC) identifies Mequon Road as a four-lane highway from I-43 to USH 41/45 in their Year 2035 transportation plan.

Wauwatosa Road is a six-lane divided north/south highway with a posted speed limit of 45 mph immediately south of Mequon Road, and reduces to a two-lane undivided highway with a posted speed limit of 35 mph north of its intersection with Mequon Road. The WisDOT Year 2007 AADT volumes were 10,600 vpd south of Mequon Road and 10,500 vpd north of Mequon Road. Wauwatosa Road is also designated as STH 181. The SEWRPC Year 2035 transportation plan identifies Wauwatosa Road as a future four-lane highway north to STH 60 in Grafton.

Concord Creek Drive/Mequon Trail are two-lane north/south undivided roadways with posted speed limits of 25-mph. Concord Creek Drive intersects Mequon Road from the north while Mequon Trail intersects from the south. Existing AADT volumes are not currently available.

River Birch Drive is a two-lane north/south undivided roadway with a posted speed limit of 25-mph within the study area. River Birch Drive intersects Mequon Road as a tee intersection from the north. Existing AADT volumes are not currently available.

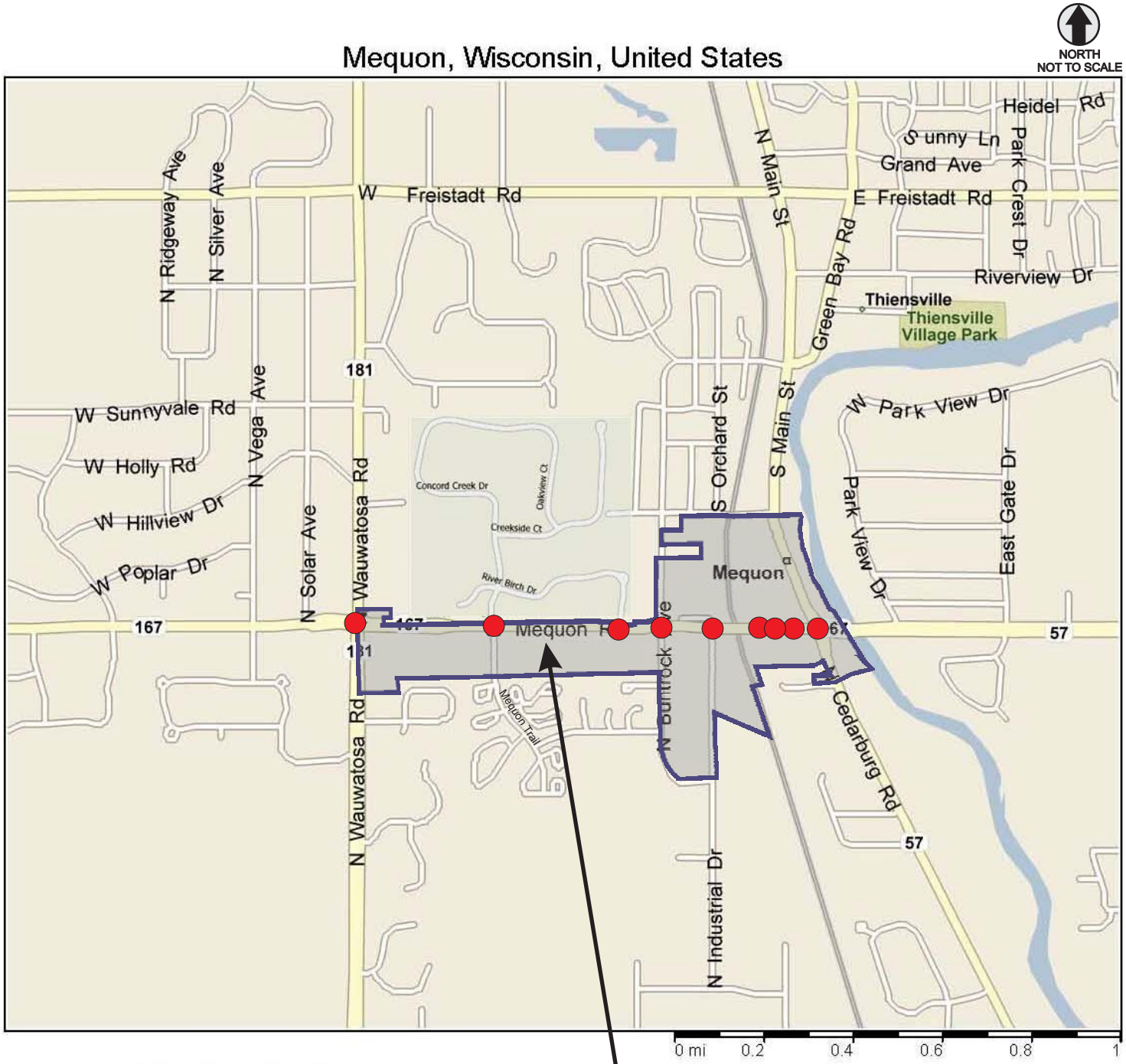
Buntrock Avenue is a two-lane undivided north/south road that with a posted speed limit of 25 mph. South of Mequon Road, Buntrock Avenue intersects Industrial Drive as a tee intersection from the west. Existing AADT volumes are not currently available.

Industrial Drive is a two-lane undivided north/south road that intersects Mequon Road as a tee intersection from the south. Access to a public works facility aligns with Industrial Drive on the north side of Mequon Road. The posted speed limit along Industrial Drive is 25 mph. Existing AADT volumes are not currently available.

Cedarburg Road is a four-lane divided north/south facility in the vicinity of its intersection with Mequon Road, and then tapers to a two-lane facility north and south of the intersection. The roadway has a posted speed limit of 30 mph. The WisDOT Year 2007 AADT volumes were 16,300 vpd south of Mequon Road and 16,000 vpd north of Mequon Road. Cedarburg Road is also designated as STH 57 south of Mequon Road. The SEWRPC Year 2035 transportation plan identifies Cedarburg Road as a future four-lane facility from Mequon Road south into Milwaukee County.

D2. Alternative Modes of Transportation

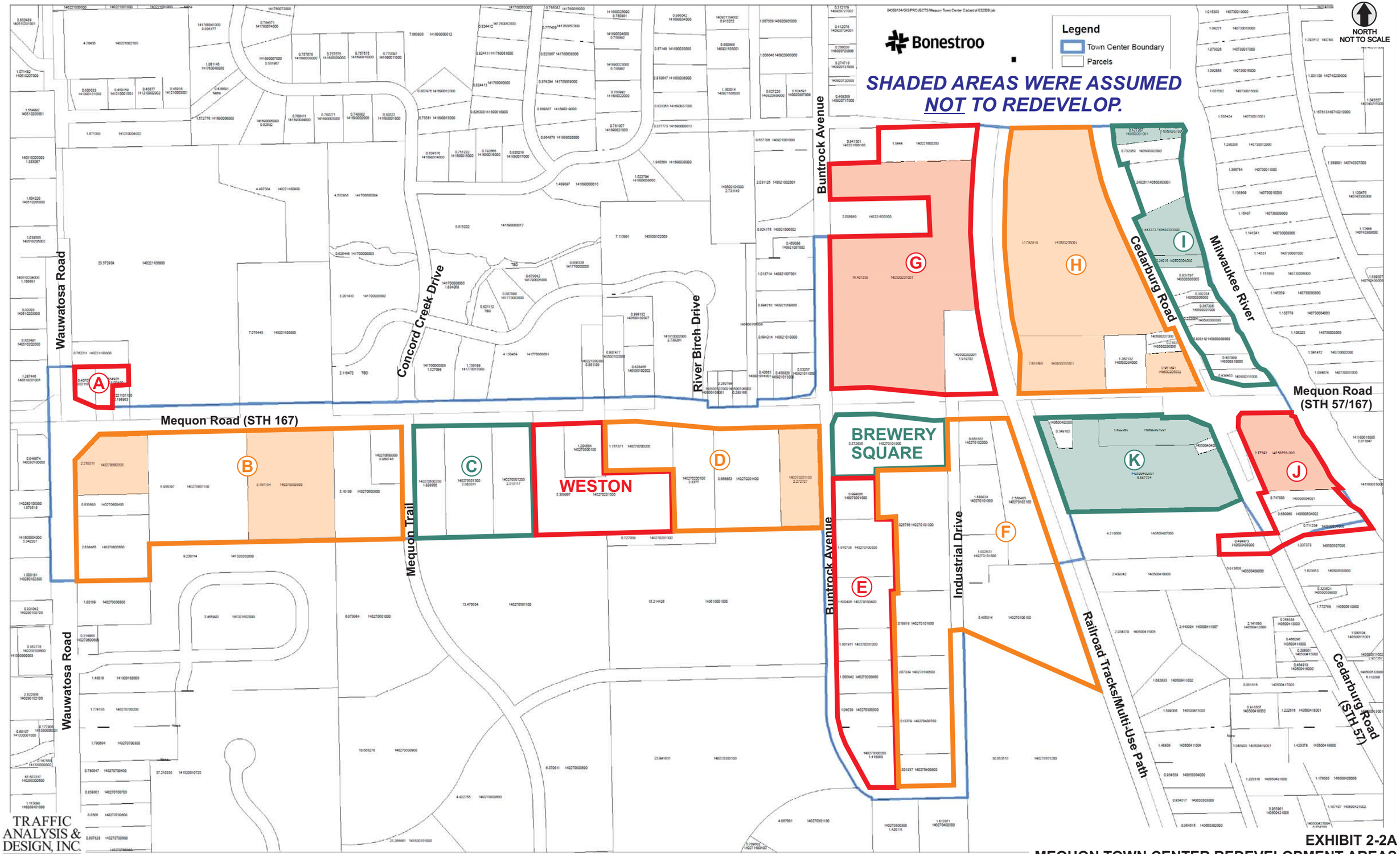
Pedestrian sidewalks are currently located along both sides of Mequon Road through the study area from Wauwatosa Road to east of the study area, and sidewalks are planned to be provided along Cedarburg Road north of Mequon Road. A multi-use trail – the Ozaukee Interurban Trail – crosses Mequon Road immediately east of a railroad crossing (east of Industrial Drive), and auxiliary lanes are provided along Mequon Road to accommodate on-street bicycling. No regularly scheduled transit accommodations are provided. On-street parking is not currently designated on Mequon Road.



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 2-1
SITE LOCATION MAP
MEQUON TOWN CENTER REDEVELOPMENT
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 2-2A
MEQUON TOWN CENTER REDEVELOPMENT AREAS
MEQUON, WISCONSIN

NORTH
NOT TO SCALE

Insight Development Group

Partners In Visionary Development

Brewery Square of Mequon

mha
mayer helminiak
architects

	SF	ACRES	%
SITE	146,300	3.37	100%
EXISTING MEQUON BREWERY	6,500	0.15	4%
32 UNIT RESIDENTIAL BUILDING	16,000	0.37	11%
RETAIL SHOPS	7,000	0.17	5%
2 STORY OFFICE/RETAIL BUILDING	18,000	0.41	12%
PAVEMENT/DRIVES	50,300	1.15	34%
LANDSCAPED/DECORATIVE PEDESTRIAN AREA	47,100	0.58	32%
FAR 18,000 GSF / 146,300 = .44 FAR			

PARKING STALLS	NUMBER
COVERED PARKING	64
SURFACE PARKING	144
ON STREET PARKING	30
TOTAL PARKING	238
POSSIBLE ADDITIONAL COVERED LEVEL BELOW RESIDENTIAL	32
TOTAL PARKING	270

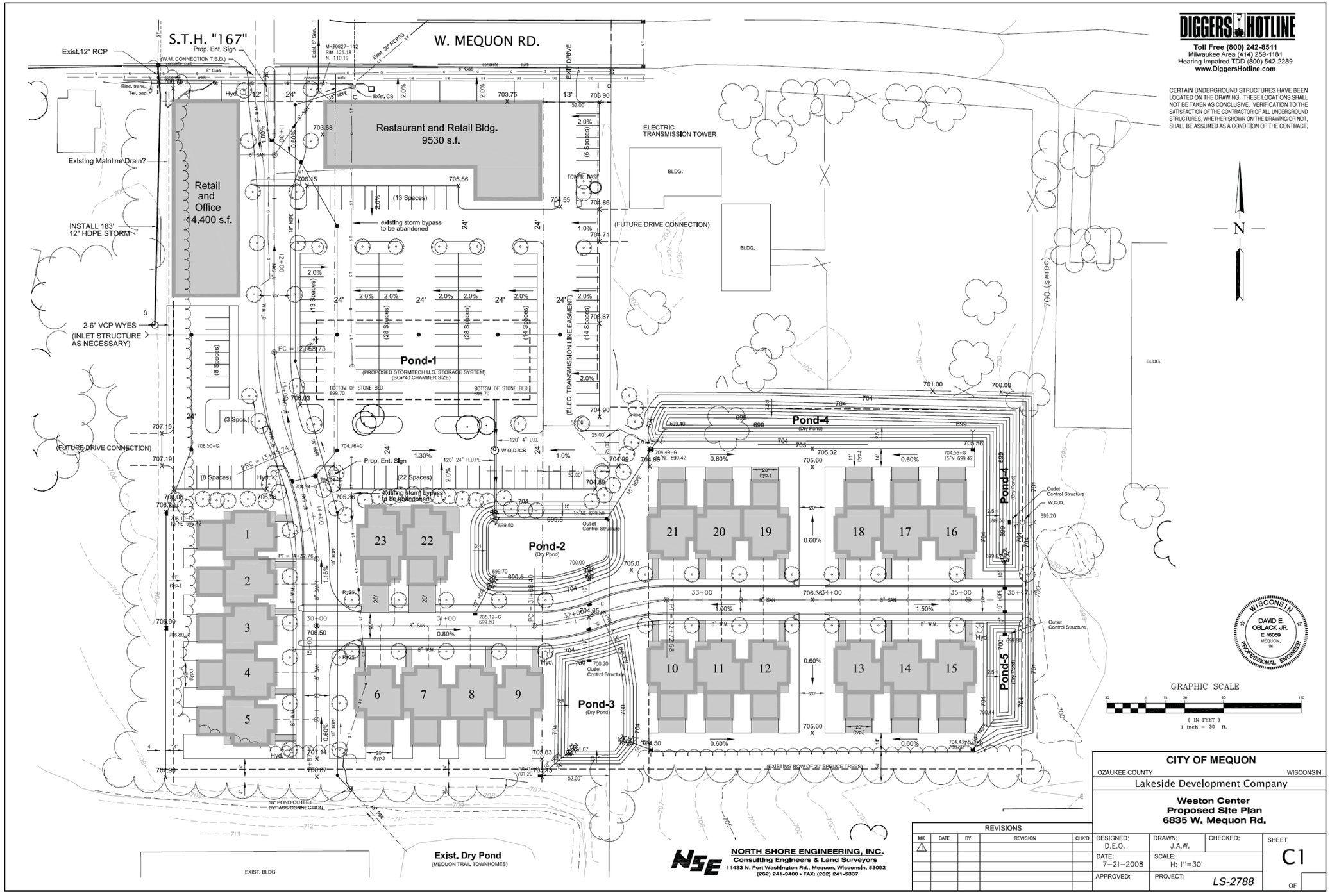
29

Phase 3 Site Concept Plan

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

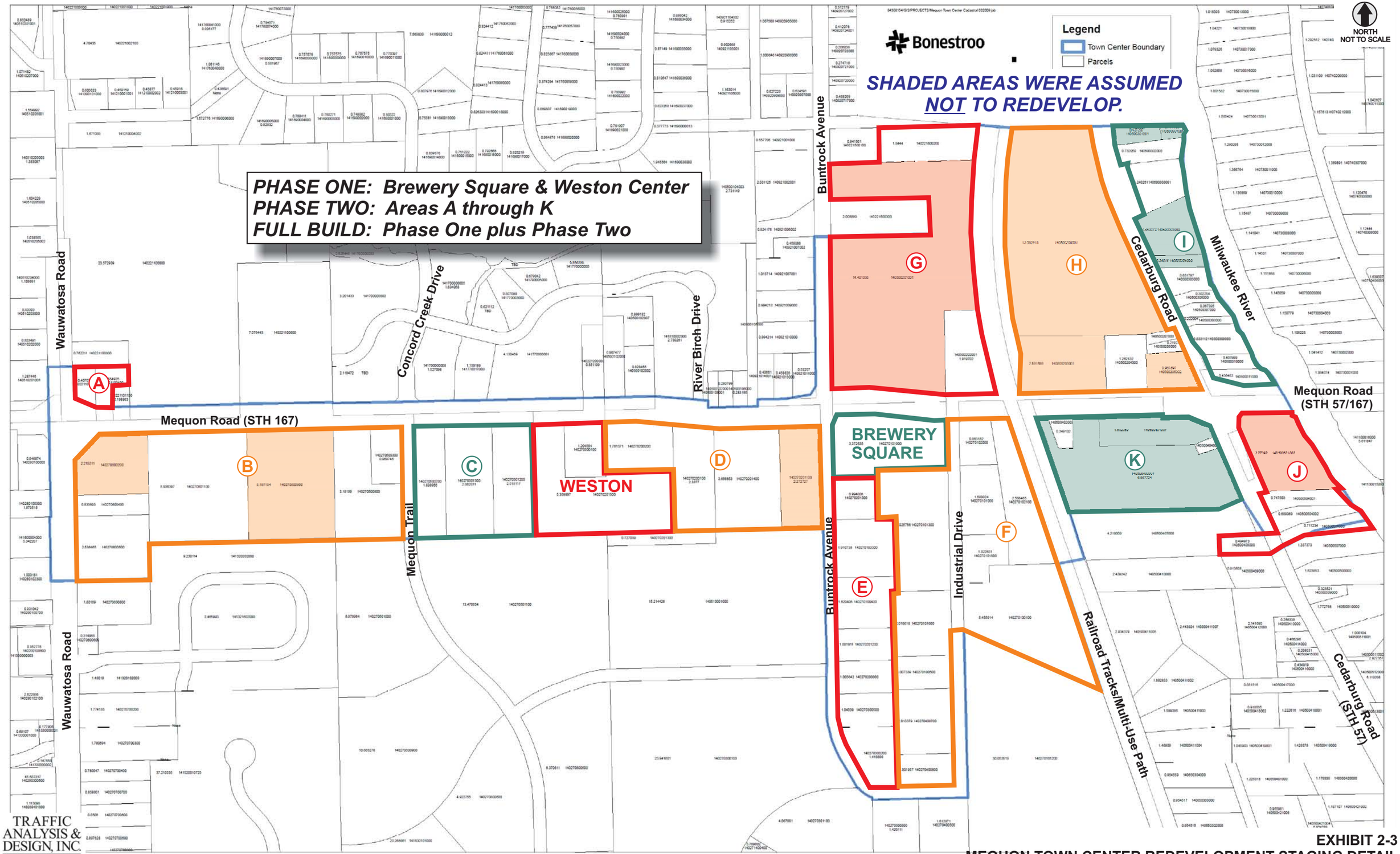
EXHIBIT 2-2B
BREWERY SQUARE CONCEPTUAL SITE PLAN
MEQUON TOWN CENTER REDEVELOPMENT
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

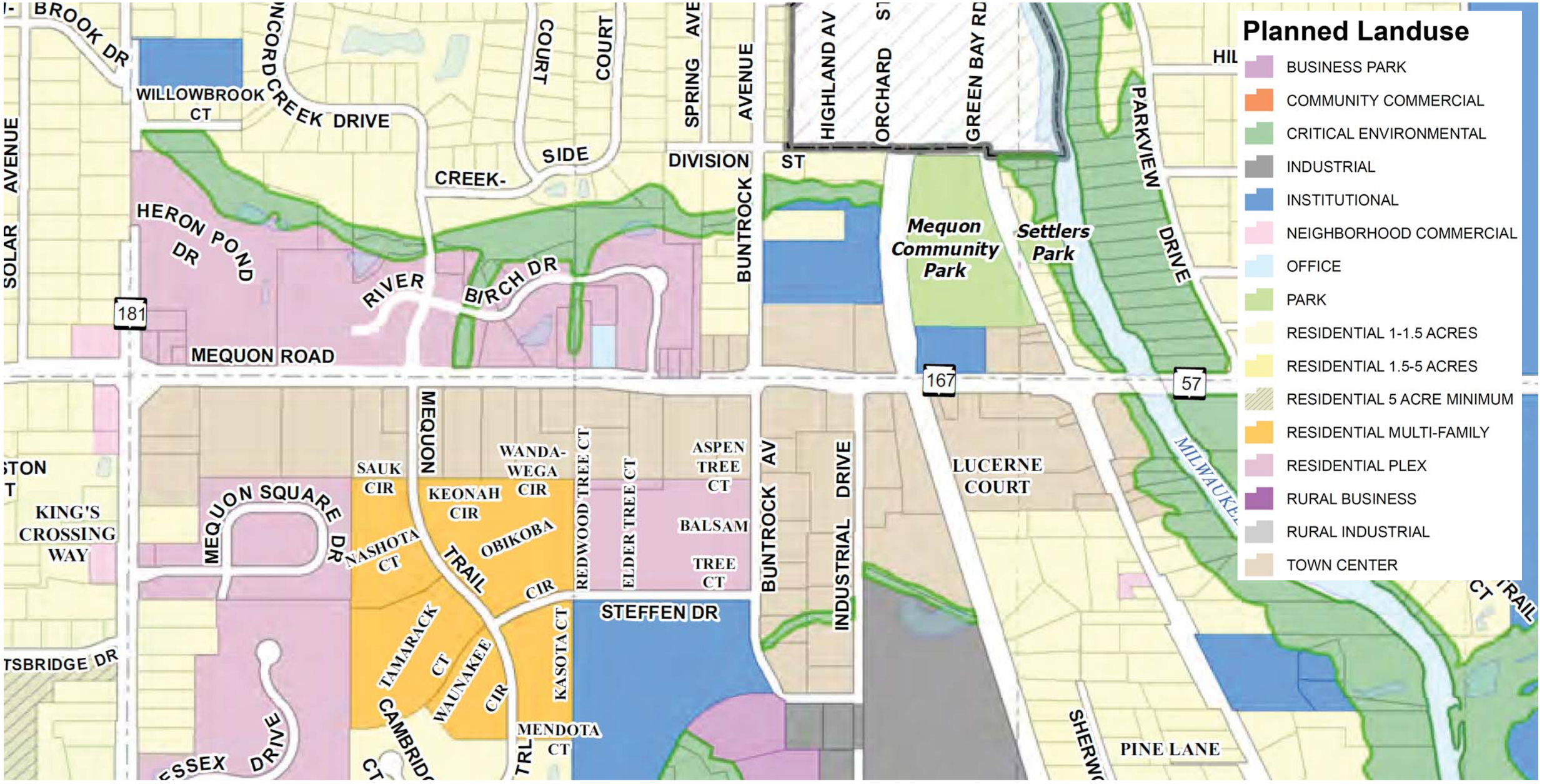
EXHIBIT 2-2C
WESTON CENTER CONCEPTUAL SITE PLAN
MEQUON TOWN CENTER REDEVELOPMENT
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 2-3
MEQUON TOWN CENTER REDEVELOPMENT STAGING DETAIL
MEQUON, WISCONSIN



Source: Excerpts from the City of Mequon 2035 Plan

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 2-4
CITY OF MEQUON LAND USE PLAN: 2035
MEQUON, WISCONSIN

CHAPTER III – ANALYSIS OF EXISTING CONDITIONS

PART A – PHYSICAL CHARACTERISTICS

Exhibit 3-1 shows the existing transportation detail for the study area intersections. More specifically, the exhibit illustrates intersection lane configurations, intersection traffic controls, posted speed limits, and approximate intersection spacing.

PART B – TRAFFIC VOLUMES

Weekday evening peak hour turning movement counts were conducted prior to conducting any traffic analysis. Note that Saturday midday peak hour counts were originally required by the WisDOT scoping letter dated September 17, 2009. Due to construction on Cedarburg Road, WisDOT subsequently dropped the requirement for Saturday counts and analysis. The following table summarizes the date each count was conducted.

Intersection:	***Weekday Evening***
Mequon Road & Wauwatosa Road	Wed. 6-18-2008
Mequon Road & Concord Creek Drive/Mequon Trail	Mon. 9-25-2006
Mequon Road & River Birch Drive	Mon. 5-17-2010
Mequon Road & Buntrock Avenue	Wed. 1-21-2009
Mequon Road & Industrial Drive	Wed. 1-14-2009
Mequon Road & River Centre west access/Logeman access	Wed. 1-14-2009
Mequon Road & River Centre center access	Wed. 1-14-2009
Mequon Road & River Centre east access	Wed. 1-14-2009
Mequon Road & Cedarburg Road	Tues. 1-20-2009

As accepted by WisDOT, the weekday evening peak hour was determined to be 4:30 to 5:30pm. Copies of the existing traffic counts and related calculations are included in Appendix A. Unfactored and unbalanced existing traffic volumes are shown in Exhibit 3-2a. Seasonally factored and balanced existing traffic volumes are shown in Exhibit 3-2b.

This TIA investigates Year 2010 and Year 2025 traffic operations. The seasonally factored and balanced existing traffic volumes were submitted to WisDOT for their use in developing traffic forecasts (i.e. background traffic without development). The Year 2010 background traffic volumes are shown in Exhibit 3-2c of this chapter, and the Year 2025 background traffic volumes are shown in Exhibit 4-2 of the next chapter.

PART C – CAPACITY LEVEL OF SERVICE

C1. Level of Service Definitions

The study area intersections were analyzed based on the procedures set forth in the *2000 Highway Capacity Manual* (HCM). Intersection operation is defined by "level of service". Level of service (LOS) is a quantitative measure that refers to the overall quality of flow at an intersection ranging from very good, represented by LOS 'A', to very poor, represented by LOS 'F'. For the purpose of this study, LOS D was used to define acceptable peak hour operating conditions. Descriptions of the various levels of service are 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. At signalized and unsignalized intersections, average delays are less than 10 seconds.

LOS B represents stable operation. At signalized intersections, average vehicle delays are 10 to 20 seconds. At unsignalized intersections, average delays are 10 to 15 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 objectionably so. 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, thus 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 the capacity of the intersection. 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. At signalized intersections, average vehicle delays exceed 80 seconds. At unsignalized intersections, average delays exceed 50 seconds.

C2. Year 2010 Background Traffic Operations – No Improvements

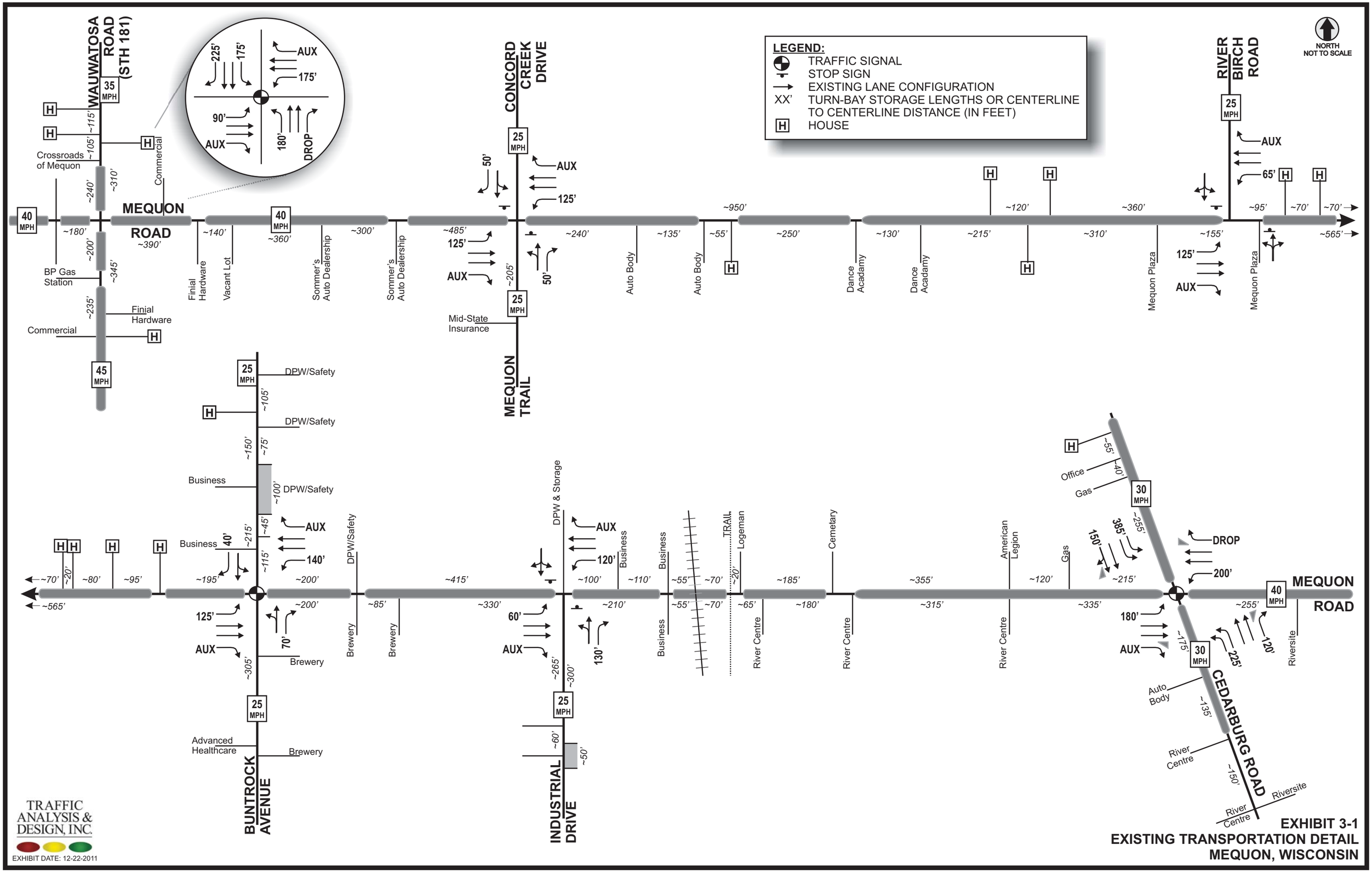
Exhibit 3-3 shows the Year 2010 background traffic (no development) peak hour operating conditions at the study area intersections. The Year 2010 background traffic analysis was conducted using the existing lane configurations shown in Exhibit 3-1, the Year 2010 background traffic volumes shown in Exhibit 3-2c, and the existing traffic signal timings included in Appendix A.

As shown in Exhibit 3-3, select movements at the Mequon Road intersections with Concord Creek Drive/Mequon Trail, Buntrock Avenue, and Cedarburg Road are expected to operate at LOS E conditions during the weekday evening peak hour. Improvement operations and recommendations are discussed in Chapter V and Chapter VI, respectively.

PART D – SOURCES OF DATA

The following sources of data were obtained for use in conducting this traffic study:

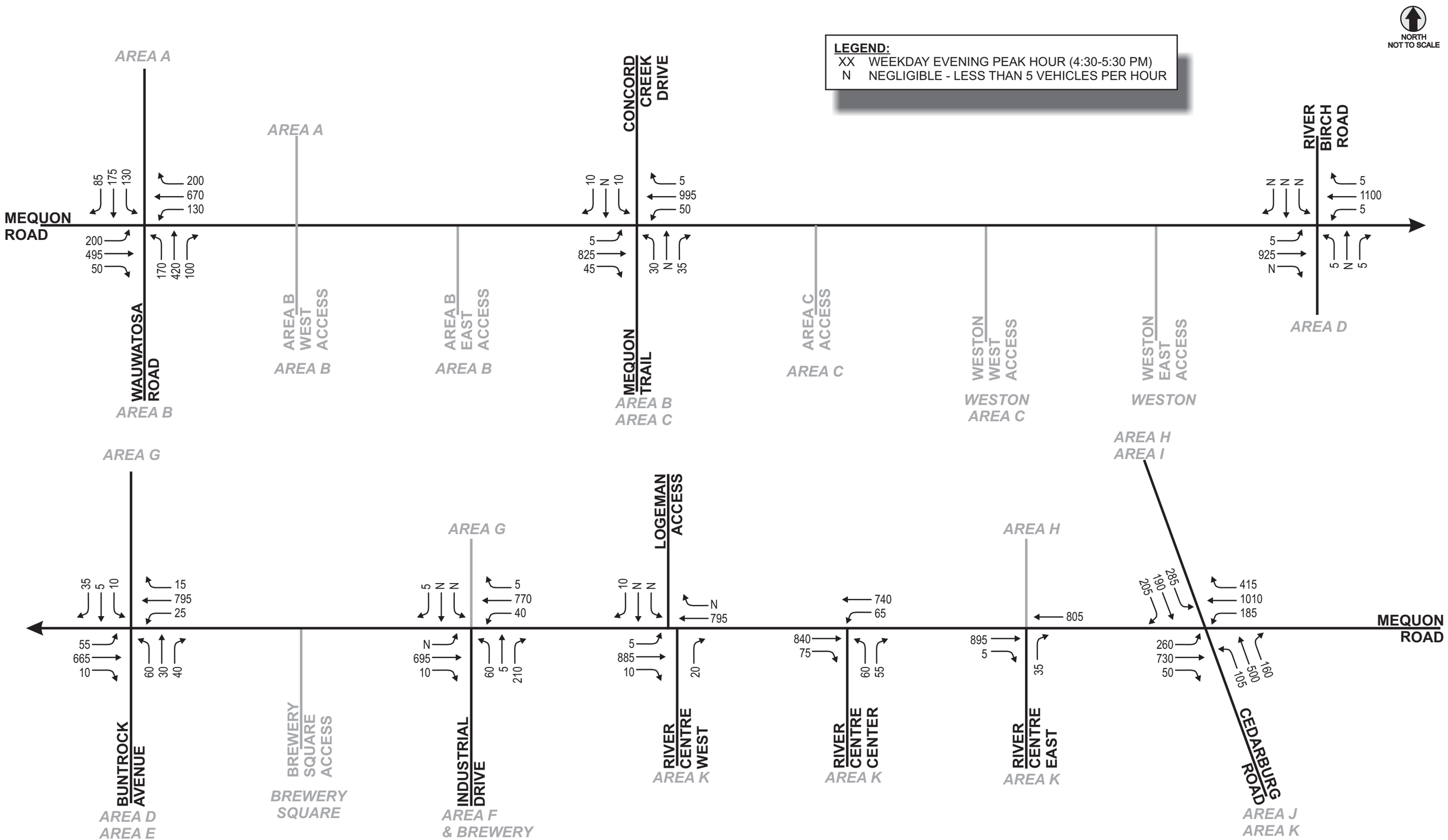
- Traffic counts – WisDOT and Traffic Analysis & Design, Inc.
- Traffic forecast information – WisDOT
- Existing transportation detail – Traffic Analysis & Design, Inc. and Google™ Earth
- Traffic signal timings – WisDOT and City of Mequon
- On-site redevelopment information – City of Mequon
- City of Mequon 2035 Land Use Plan – City of Mequon
- Off-site development verification – City of Mequon
- SEWRPC Year 2035 transportation improvements – SEWRPC *A Regional Transportation System Plan for Southeastern Wisconsin: 2035*



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 3-1
EXISTING TRANSPORTATION DETAIL
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 3-2A
YEAR 2006/2009/2010 EXISTING TRAFFIC
(UNFACTORED & UNBALANCED)
MEQUON, WISCONSIN

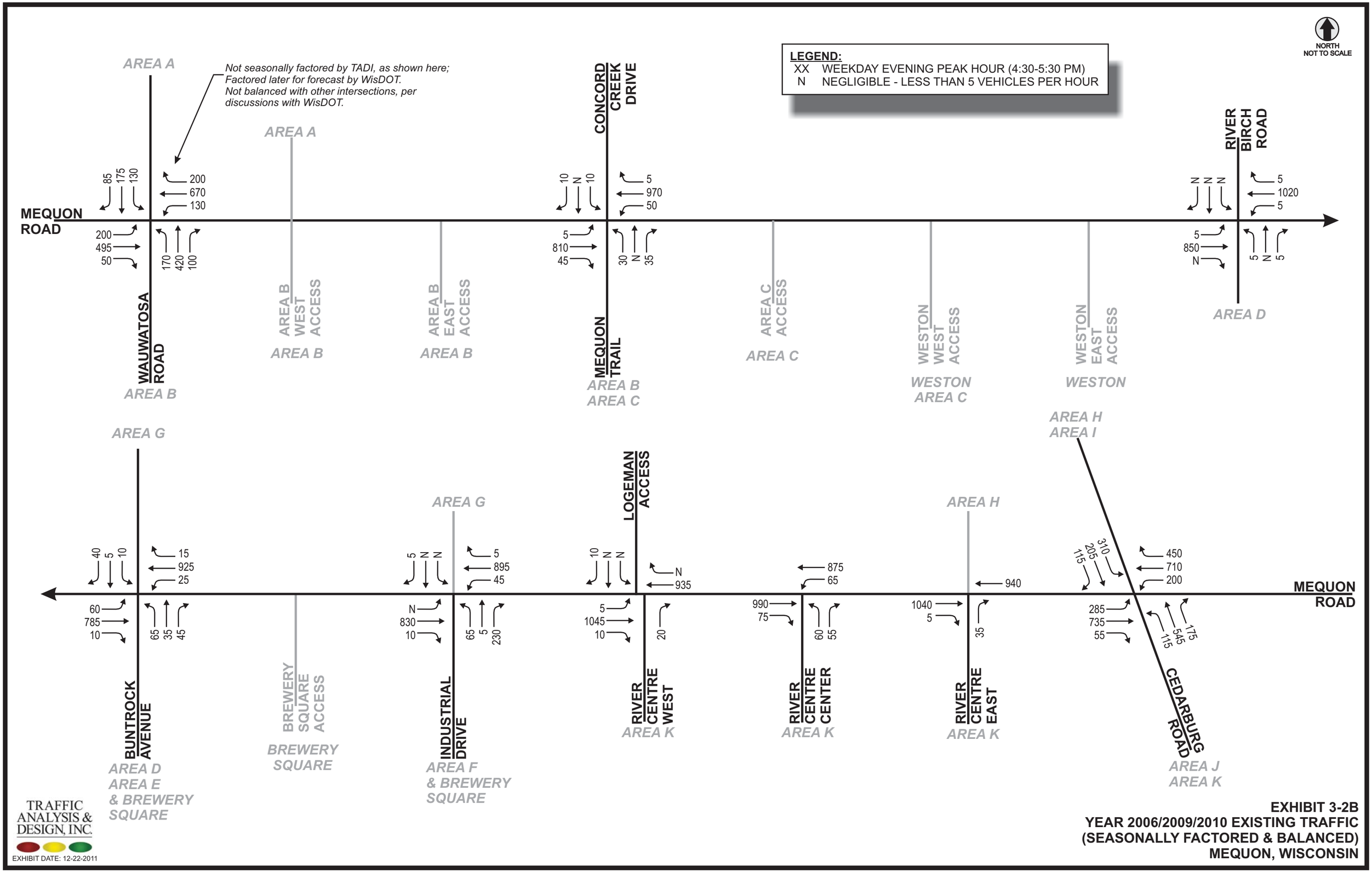
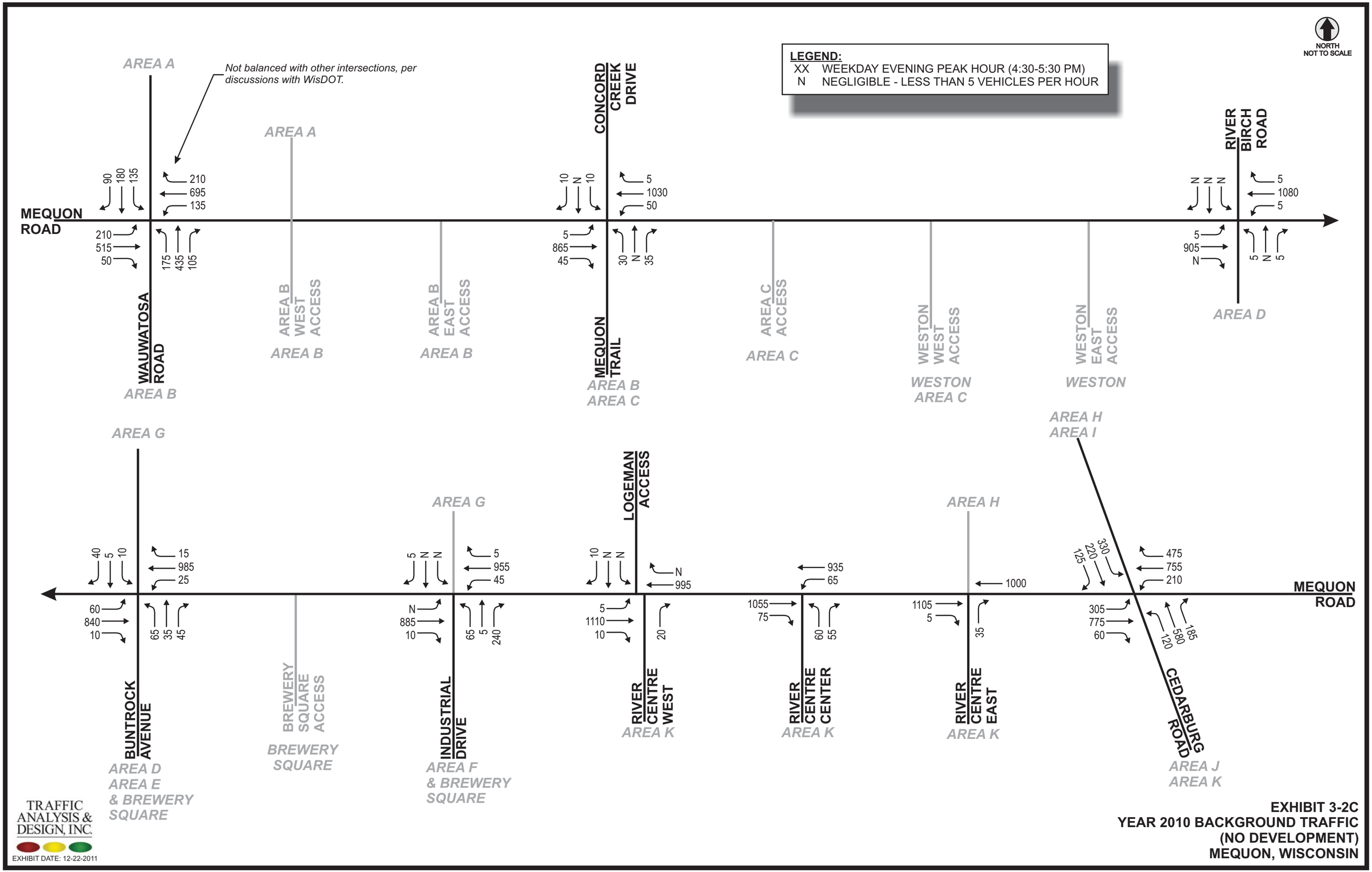


EXHIBIT 3-2B
YEAR 2006/2009/2010 EXISTING TRAFFIC
(SEASONALLY FACTORED & BALANCED)
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 3-2C
YEAR 2010 BACKGROUND TRAFFIC
(NO DEVELOPMENT)
MEQUON, WISCONSIN

Exhibit 3-3
Year 2010 Background Traffic Operations
Existing Geometrics and Traffic Control

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Mequon Road & Wauwatosa Road	Traffic Signal	PM	D	C	C	D	C	C	C	D	C	C	C	C
Mequon Road & Concord Creek Drive/Mequon Trail	Two-Way Stop Sign	PM	B	*	*	B	*	*	D	D	B	**E**	**E**	B
Mequon Road & River Birch Drive	Two-Way Stop Sign	PM	B	*	*	B	*	*	C	C	C	C	C	C
Mequon Road & Buntrock Avenue	Traffic Signal	PM	A	A	A	A	A	A	**E**	**E**	D	D	D	D
Mequon Road & Industrial Drive	Two-Way Stop Sign	PM	A	*	*	B	*	*	C	C	B	B	B	B
Mequon Road & River Centre West Access/Logeman Access	Two-Way Stop Sign	PM	A	*	*	-	*	*	-	-	B	B	B	B
Mequon Road & River Centre Center Access	Two-Way Stop Sign	PM	-	*	*	B	*	-	D	-	B	-	-	-
Mequon Road & River Centre East Access	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Cedarburg Road	Traffic Signal	PM	C	C	C	C	D	D	D	D	D	**E**	D	D

Notes: (-) indicates a movement that is not possible or is prohibited.
(*) indicates a freeflow movement or a movement for which HCM methodologies do not report LOS

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 3-3
YEAR 2010 BACKGROUND TRAFFIC OPERATIONS
WITHOUT IMPROVEMENTS
MEQUON, WISCONSIN

CHAPTER IV – FORECASTED TRAFFIC

PART A – BACKGROUND TRAFFIC FORECASTING

The seasonally factored and balanced existing traffic volumes were submitted to WisDOT for their use in developing traffic forecasts (i.e. background traffic without development). The Year 2010 background traffic volumes are shown in Exhibit 3-2c of the previous chapter, and the Year 2025 background traffic volumes are shown in Exhibit 4-2 of this chapter.

Exhibit 4-1, reserved by WisDOT to illustrate interim year background traffic volumes, has been intentionally omitted from this report because no interim year traffic analysis is required.

PART B – DEVELOPMENT TRAFFIC FORECASTING

To address future traffic impacts along study area roadways and at the intersections adjacent to the development, it is necessary to identify the hourly and daily volume of traffic generated by on-site and off-site developments. The expected traffic volumes generated by the redevelopment are based on the type and density of the proposed land uses, and on trip rates as published in the Institute of Transportation Engineer's (ITE) *Trip Generation Manual, 8th Edition, 2008*.

B1. Trip Generation

The trip generation tables for the Brewery Square site, Weston Center site, and Areas A through K are shown in Exhibits 4-3a and 4-3b. Explanations of mode split, pass-by and linked trips, trip distribution, and trip assignment are made following a summary of the trip generation tables.

Upon completion of the phase one redevelopment (Brewery Square & Weston Center sites), the Mequon Town Center is expected to generate 315 new trips (155 entering/160 exiting) during a typical weekday evening peak hour. On a typical weekday, phase one is expected to generate approximately 3,550 new trips (1,775 entering/1,775 exiting).

With the full build redevelopment, which includes the build-out of the eleven identified areas, the Mequon Town Center is expected to generate 1,965 new trips (915 entering/1,050 exiting) during a typical weekday evening peak hour. The full-build redevelopment is expected to generate approximately 21,610 new trips (10,805 entering/10,805 exiting) on a typical weekday.

B2. Mode Split

Pedestrian and bicycle users may access the Mequon Town Center but are expected to compose a very small portion of the overall trips to/from the redevelopment. Therefore, for the purpose of this TIA, all trips to/from the Mequon Town Center were assumed to occur via motor vehicle.

B3. Determination of Pass-by and Linked Trip Traffic

Pass-by trips occur when motorists on the adjacent roadway system stop off at a development prior to continuing on their intended route. For example, a motorist eastbound on Mequon Road stops at the Brewery Square site prior to continuing eastbound on Mequon Road. Minimal pass-by trips are expected to occur based on the types of land uses proposed within the Mequon Town Center and, therefore, no pass-by trips were included in the analysis.

Linked trips occur when a patron or employee visits more than one tenant within a development site without leaving the site. For example, a brewery patron visits the brewery retail shop prior to leaving the Brewery Square site. Approximately 15-percent of the non-residential total trips at the Brewery Square and Weston Center sites are expected to be linked trips. Minimal linked

trips are expected to occur within the remaining areas of the Mequon Town Center and, therefore, no linked trips for the remaining areas were included in the analysis.

B4. Trip Distribution

The trip distribution for the Mequon Town Center redevelopment was estimated based on existing traffic patterns (Analogy Method), the type of proposed land uses, and the location of regionally populated/anticipated growth areas (Gravity Model Method). The trip distribution is shown in Exhibit 4-4 and is summarized as follows:

- 40 percent to/from the east on Mequon Road;
- 20 percent to/from the west on Mequon Road;
- 10 percent to/from the north on Wauwatosa Road;
- 10 percent to/from the south on Wauwatosa Road;
- 10 percent to/from the north on Cedarburg Road; and
- 10 percent to/from the south on Cedarburg Road.

B5. Trip Assignment

Trips anticipated to be generated by the Mequon Town Center redevelopment were assigned to the study area intersections based on the trip distribution shown in Exhibit 4-4.

The Year 2010 Mequon Town Center redevelopment phase one trip assignment is shown in Exhibit 4-5. The Year 2025 Mequon Town Center redevelopment full build trip assignment is shown in Exhibit 4-7.

Exhibit 4-6, reserved by WisDOT to illustrate interim year on-site trip assignments, has been intentionally omitted from this report because no interim year traffic analysis is required.

Exhibits 4-8 through 4-10, reserved by WisDOT to illustrate off-site development trip assignments under base, interim and horizon years, have been intentionally omitted from this report because no off-site development was assumed to occur.

PART C – TOTAL TRAFFIC

Year 2010 build traffic volumes, shown in Exhibit 4-11, were determined by adding the Year 2010 background traffic volumes (Exhibit 3-2c) to the Mequon Town Center phase one new trips (Exhibit 4-5).

Year 2025 build traffic volumes, shown in Exhibit 4-13, were determined by adding the Year 2025 background traffic volumes (Exhibit 4-2) to the Mequon Town Center full build new trips (Exhibit 4-7).

Exhibit 4-12, reserved by WisDOT to illustrate interim year build traffic volumes, has been intentionally omitted from this report because no interim year traffic analysis is required.

Exhibits 4-14 through 4-16, reserved by WisDOT to illustrate total traffic volumes (including on-site and off-site developments) under base, interim and horizon years, have been intentionally omitted from this report because no off-site development was assumed to occur.

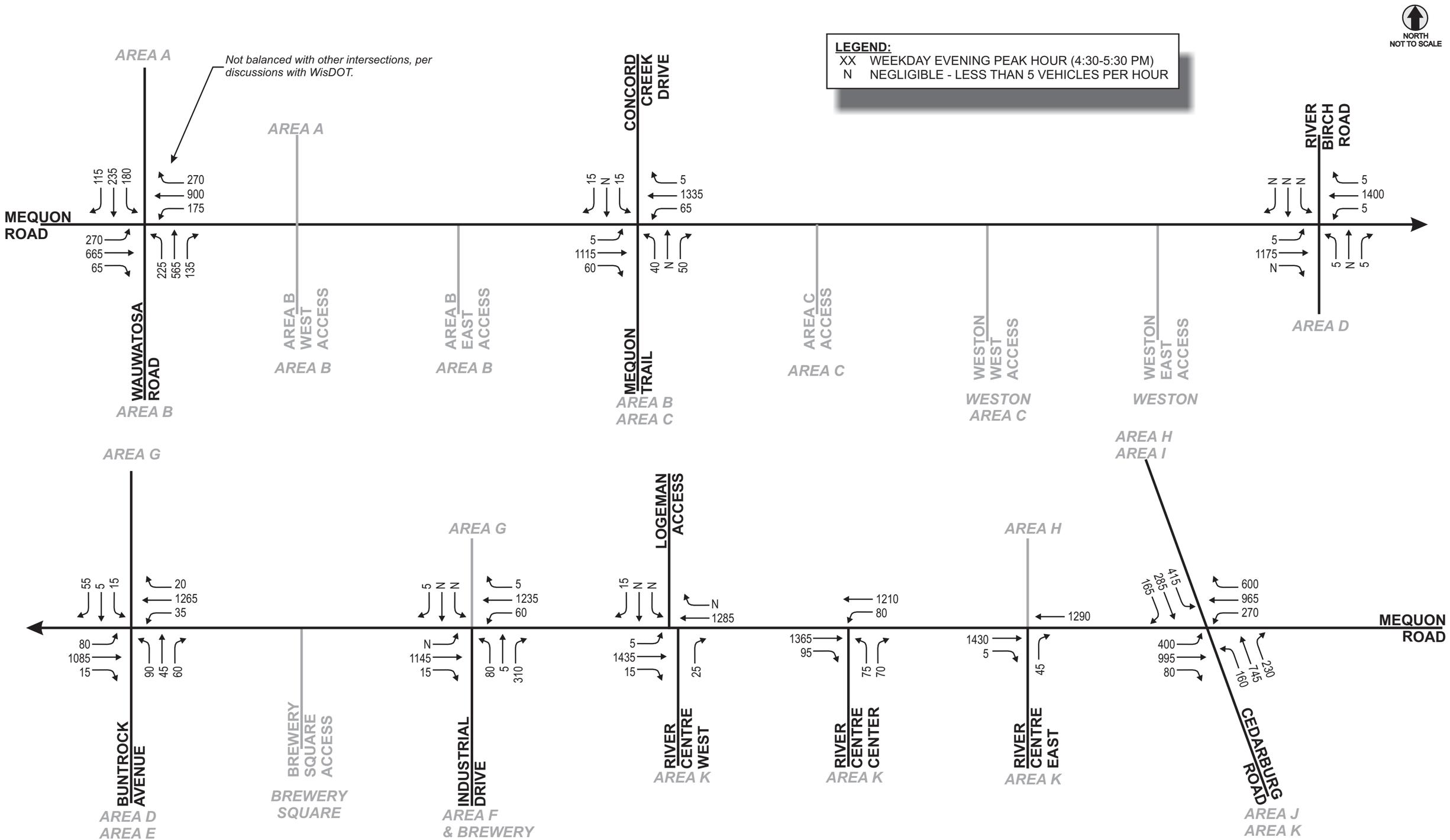


EXHIBIT 4-2
YEAR 2025 BACKGROUND TRAFFIC
(NO DEVELOPMENT)
MEQUON, WISCONSIN

Brewery Square of Mequon - Trip Generation Table

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total	SAT Peak In	SAT Peak Out	SAT Peak Total
Condominiums	230	32 Units	190 (5.81)	5 (17%)	10 (83%)	15 (0.44)	10 (67%)	5 (33%)	15 (0.52)	10 (54%)	5 (46%)	15 (0.47)
General Office	710	18.0 x 1,000 SF	200 (11.01)	25 (88%)	5 (12%)	30 (1.55)	5 (17%)	20 (83%)	25 (1.49)	5 (54%)	0 (46%)	5 (0.41)
Retail Shops	820	25.2 x 1,000 SF	1,080 (42.94)	15 (61%)	10 (39%)	25 (1.00)	45 (49%)	50 (51%)	95 (3.73)	65 (52%)	60 (48%)	125 (4.89)
Brewery	932	6.5 x 1,000 SF	830 (127.15)	40 (52%)	35 (48%)	75 (11.52)	40 (59%)	30 (41%)	70 (11.15)	50 (53%)	40 (47%)	90 (14.07)
Total Trips			**2,300**	**85**	**60**	**145**	**100**	**105**	**205**	**130**	**105**	**235**
Minus Linked Trips		*15%*	*320*	*10*	*10*	*20*	*15*	*15*	*30*	*15*	*15*	*30*
Total New Trips			**1,980**	**75**	**50**	**125**	**85**	**90**	**175**	**115**	**90**	**205**

To be located on the south side of Mequon Road between Buntrock Avenue & Industrial Drive.
Linked trips assumed between ITE 710, 820 and 932.

Weston Center - Trip Generation Table

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total	SAT Peak In	SAT Peak Out	SAT Peak Total
Condominiums/Townhomes	230	23 Units	130 (5.81)	0 (17%)	10 (83%)	10 (0.44)	5 (67%)	5 (33%)	10 (0.52)	5 (54%)	5 (46%)	10 (0.47)
General Office	710	14.4 x 1,000 SF	160 (11.01)	20 (88%)	0 (12%)	20 (1.55)	5 (17%)	15 (83%)	20 (1.49)	5 (54%)	0 (46%)	5 (0.41)
Retail Shops	820	17.9 x 1,000 SF	770 (42.94)	10 (61%)	10 (39%)	20 (1.00)	30 (49%)	35 (51%)	65 (3.73)	45 (52%)	45 (48%)	90 (4.89)
Sit-Down Restaurant	932	6.0 x 1,000 SF	760 (127.15)	35 (52%)	35 (48%)	70 (11.52)	40 (59%)	25 (41%)	65 (11.15)	45 (53%)	40 (47%)	85 (14.07)
Total Trips			**1,820**	**65**	**55**	**120**	**80**	**80**	**160**	**100**	**90**	**190**
Minus Linked Trips		*15%*	*250*	*5*	*5*	*10*	*10*	*10*	*20*	*15*	*15*	*30*
Total New Trips			**1,570**	**60**	**50**	**110**	**70**	**70**	**140**	**85**	**75**	**160**

To be located on the south side of Mequon Road between approimately 750-feet west of Buntrock and 1,450-feet west of Buntrock.
Restaurant size assumed; ITE average sit-down restaurant size is 6,000-sf.
Assumed "retail and office" building and remaining "restaurant and retail" building to be general retail use (ITE 820).
14,400-sf building shown in NE corner of site plan is two stories, per discussion with Jak Zader of Mequon 1-14-2010.
Linked trips assumed between ITE 710, 820 and 932.

Area A - Trip Generation Table

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total	SAT Peak In	SAT Peak Out	SAT Peak Total
Shopping Center	820	4.4 x 1,000 SF	190 (42.94)	5 (61%)	0 (39%)	5 (1.00)	5 (49%)	10 (51%)	15 (3.73)	10 (52%)	10 (48%)	20 (4.89)
General Office	710	1.9 x 1,000 SF	20 (11.01)	5 (88%)	0 (12%)	5 (1.55)	0 (17%)	5 (83%)	5 (1.49)	0 (54%)	0 (46%)	0 (0.41)
Condominium	230	4 Units	20 (5.81)	0 (17%)	0 (83%)	0 (0.44)	0 (67%)	0 (33%)	0 (0.52)	0 (54%)	0 (46%)	0 (0.47)
Total New Trips			**230**	**10**	**0**	**10**	**5**	**15**	**20**	**10**	**10**	**20**

Assumes 6,575-sf per acre (15% FAR) shopping center plus general office. Broken down to 70% shopping center/30% general office.
Assumes 3.8 units of residential per acre. Assumes all condominium. May actually contain apartments, condominiums, or assisted living.
0.96 acres are available for redevelopment in Area A.

Area B - Trip Generation Table

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total	SAT Peak In	SAT Peak Out	SAT Peak Total
Shopping Center	820	61.9 x 1,000 SF	2,660 (42.94)	35 (61%)	25 (39%)	60 (1.00)	115 (49%)	115 (51%)	230 (3.73)	160 (52%)	145 (48%)	305 (4.89)
General Office	710	26.6 x 1,000 SF	290 (11.01)	35 (88%)	5 (12%)	40 (1.55)	5 (17%)	35 (83%)	40 (1.49)	5 (54%)	5 (46%)	10 (0.41)
Condominium	230	51 Units	300 (5.81)	5 (17%)	15 (83%)	20 (0.44)	15 (67%)	10 (33%)	25 (0.52)	15 (54%)	10 (46%)	25 (0.47)
Total New Trips			**3,250**	**75**	**45**	**120**	**135**	**160**	**295**	**180**	**160**	**340**

Assumes 6,575-sf per acre (15% FAR) shopping center plus general office. Broken down to 70% shopping center/30% general office.
Assumes 3.8 units of residential per acre. Assumes all condominium. May actually contain apartments, condominiums, or assisted living.
Assumes the following parcels will not redevelop: 140270600200 (Finial Hardware, 2.22 ac) & 140270600900 (Sommer's Auto, 5.16 ac)
Subtracting the parcels that are assumed not to be redeveloped results in 13.46 acres remaining for redevelopment in Area B.

Area C - Trip Generation Table

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total	SAT Peak In	SAT Peak Out	SAT Peak Total
Shopping Center	820	33.2 x 1,000 SF	1,430 (42.94)	20 (61%)	15 (39%)	35 (1.00)	60 (49%)	65 (51%)	125 (3.73)	85 (52%)	75 (48%)	160 (4.89)
General Office	710	14.3 x 1,000 SF	160 (11.01)	20 (88%)	0 (12%)	20 (1.55)	5 (17%)	15 (83%)	20 (1.49)	5 (54%)	0 (46%)	5 (0.41)
Condominium	230	27 Units	160 (5.81)	0 (17%)	10 (83%)	10 (0.44)	10 (67%)	5 (33%)	15 (0.52)	10 (54%)	5 (46%)	15 (0.47)
Total New Trips			**1,750**	**40**	**25**	**65**	**75**	**85**	**160**	**100**	**80**	**180**

Assumes 6,575-sf per acre (15% FAR) shopping center plus general office. Broken down to 70% shopping center/30% general office.
Assumes 3.8 units of residential per acre. Assumes all condominium. May actually contain apartments, condominiums, or assisted living.
7.22 acres are available for redevelopment in Area C.

Area D - Trip Generation Table

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total	SAT Peak In	SAT Peak Out	SAT Peak Total
Shopping Center	820	35.7 x 1,000 SF	1,530 (42.94)	20 (61%)	15 (39%)	35 (1.00)	65 (49%)	70 (51%)	135 (3.73)	90 (52%)	85 (48%)	175 (4.89)
General Office	710	15.3 x 1,000 SF	170 (11.01)	20 (88%)	5 (12%)	25 (1.55)	5 (17%)	20 (83%)	25 (1.49)	5 (54%)	0 (46%)	5 (0.41)
Condominium	230	29 Units	170 (5.81)	5 (17%)	10 (83%)	15 (0.44)	10 (67%)	5 (33%)	15 (0.52)	10 (54%)	5 (46%)	15 (0.47)
Total New Trips			**1,870**	**45**	**30**	**75**	**80**	**95**	**175**	**105**	**90**	**195**

Assumes 6,575-sf per acre (15% FAR) shopping center plus general office. Broken down to 70% shopping center/30% general office.
Assumes 3.8 units of residential per acre. Assumes all condominium. May actually contain apartments, condominiums, or assisted living.
Assumes the following parcel will not redevelop: 140270201100 (Advanced Healthcare, 2.27 ac)
Subtracting the parcel that is assumed not to be redeveloped results in 7.76 acres remaining for redevelopment in Area D.

Area E - Trip Generation Table

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total	SAT Peak In	SAT Peak Out	SAT Peak Total
Shopping Center	820	41.4 x 1,000 SF	1,780 (42.94)	25 (61%)	15 (39%)	40 (1.00)	75 (49%)	80 (51%)	155 (3.73)	105 (52%)	95 (48%)	200 (4.89)
General Office	710	17.7 x 1,000 SF	190 (11.01)	20 (88%)	5 (12%)	25 (1.55)	5 (17%)	20 (83%)	25 (1.49)	5 (54%)	0 (46%)	5 (0.41)
Condominium	230	34 Units	200 (5.81)	5 (17%)	10 (83%)	15 (0.44)	15 (67%)	5 (33%)	20 (0.52)	10 (54%)	5 (46%)	15 (0.47)
Total New Trips			**2,170**	**50**	**30**	**80**	**95**	**105**	**200**	**120**	**100**	**220**

Assumes 6,575-sf per acre (15% FAR) shopping center plus general office. Broken down to 70% shopping center/30% general office.
Assumes 3.8 units of residential per acre. Assumes all condominium. May actually contain apartments, condominiums, or assisted living.
8.99 acres are available for redevelopment in Area E.

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 4-3A
TRIP GENERATION TABLES
(BREWERY SQUARE, WESTON CENTER, & AREAS A THRU E)
MEQUON, WISCONSIN

Area F - Trip Generation Table

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total	SAT Peak In	SAT Peak Out	SAT Peak Total
Shopping Center	820	99.4 x 1,000 SF	4,270 (42.94)	60 (61%)	40 (39%)	100 (1.00)	180 (49%)	190 (51%)	370 (3.73)	250 (52%)	235 (48%)	485 (4.89)
General Office	710	42.6 x 1,000 SF	470 (11.01)	55 (88%)	10 (12%)	65 (1.55)	10 (17%)	55 (83%)	65 (1.49)	10 (54%)	5 (46%)	15 (0.41)
Condominium	230	82 Units	480 (5.81)	5 (17%)	30 (83%)	35 (0.44)	30 (67%)	15 (33%)	45 (0.52)	20 (54%)	20 (46%)	40 (0.47)
Total New Trips			**5,220**	**120**	**80**	**200**	**220**	**260**	**480**	**280**	**260**	**540**

Assumes 6,575-sf per acre (15% FAR) shopping center plus general office. Broken down to 70% shopping center/30% general office.
Assumes 3.8 units of residential per acre. Assumes all condominium. May actually contain apartments, condominiums, or assisted living.
21.59 acres are available for redevelopment in Area F.

Area G - Trip Generation Table

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total	SAT Peak In	SAT Peak Out	SAT Peak Total
Shopping Center	820	17.3 x 1,000 SF	740 (42.94)	10 (61%)	5 (39%)	15 (1.00)	30 (49%)	35 (51%)	65 (3.73)	45 (52%)	40 (48%)	85 (4.89)
General Office	710	7.4 x 1,000 SF	80 (11.01)	10 (88%)	0 (12%)	10 (1.55)	0 (17%)	10 (83%)	10 (1.49)	5 (54%)	0 (46%)	5 (0.41)
Condominium	230	14 Units	80 (5.81)	0 (17%)	5 (83%)	5 (0.44)	5 (67%)	0 (33%)	5 (0.52)	5 (54%)	0 (46%)	5 (0.47)
Total New Trips			**900**	**20**	**10**	**30**	**35**	**45**	**80**	**55**	**40**	**95**

Assumes 6,575-sf per acre (15% FAR) shopping center plus general office. Broken down to 70% shopping center/30% general office.
Assumes 3.8 units of residential per acre. Assumes all condominium. May actually contain apartments, condominiums, or assisted living.
Assumes the following parcel will not redevelop: 140500201001 (Safety & DPW Building, 14.40 ac)
Subtracting the parcel that is assumed not to be redeveloped results in 3.76 acres remaining for redevelopment in Area G.

Area H - Trip Generation Table

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total	SAT Peak In	SAT Peak Out	SAT Peak Total
Condominium	230	60 Units	350 (5.81)	5 (17%)	20 (83%)	25 (0.44)	20 (67%)	10 (33%)	30 (0.52)	15 (54%)	15 (46%)	30 (0.47)
Total New Trips			**350**	**5**	**20**	**25**	**20**	**10**	**30**	**15**	**15**	**30**

Assumes all will remain the same on parcels 140500208001 (City Hall, 13.09 ac), 140500203001 (Logeman & cemetary, 2.59 ac), and 140500205002 (gas station, 0.96 ac).
Assumes parcels 140500204000 (American Legion, 1.26 ac) and 140500207000 & 140500206000 (0.42 ac) will redevelop with 60 condominium units.

Area I - Trip Generation Table

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total	SAT Peak In	SAT Peak Out	SAT Peak Total
Shopping Center	820	23.8 x 1,000 SF	1,020 (42.94)	15 (61%)	10 (39%)	25 (1.00)	45 (49%)	45 (51%)	90 (3.73)	60 (52%)	55 (48%)	115 (4.89)
General Office	710	10.2 x 1,000 SF	110 (11.01)	15 (88%)	0 (12%)	15 (1.55)	5 (17%)	10 (83%)	15 (1.49)	5 (54%)	0 (46%)	5 (0.41)
Condominium	230	20 Units	120 (5.81)	0 (17%)	10 (83%)	10 (0.44)	5 (67%)	5 (33%)	10 (0.52)	5 (54%)	5 (46%)	10 (0.47)
Total New Trips			**1,250**	**30**	**20**	**50**	**55**	**60**	**115**	**70**	**60**	**130**

Assumes 6,575-sf per acre (15% FAR) shopping center plus general office. Broken down to 70% shopping center/30% general office.
Assumes 3.8 units of residential per acre. Assumes all condominium. May actually contain apartments, condominiums, or assisted living.
Assumes the following parcels will not redevelop: 140500301001 & 000 (medical office, 0.60 ac), 140500303000 (River Oaks, 1.45 ac), 140500304000 (city park, 0.34 ac)
Subtracting the parcels that are assumed not to be redeveloped results in 5.17 acres remaining for redevelopment in Area I.

Area J - Trip Generation Table

Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total	SAT Peak In	SAT Peak Out	SAT Peak Total
Shopping Center	820	12.2 x 1,000 SF	520 (42.94)	5 (61%)	5 (39%)	10 (1.00)	20 (49%)	25 (51%)	45 (3.73)	30 (52%)	30 (48%)	60 (4.89)
General Office	710	5.2 x 1,000 SF	60 (11.01)	10 (88%)	0 (12%)	10 (1.55)	0 (17%)	10 (83%)	10 (1.49)	0 (54%)	0 (46%)	0 (0.41)
Condominium	230	10 Units	60 (5.81)	0 (17%)	5 (83%)	5 (0.44)	5 (67%)	0 (33%)	5 (0.52)	5 (54%)	0 (46%)	5 (0.47)
Total New Trips			**640**	**15**	**10**	**25**	**25**	**35**	**60**	**35**	**30**	**65**

Assumes 6,575-sf per acre (15% FAR) shopping center plus general office. Broken down to 70% shopping center/30% general office.
Assumes 3.8 units of residential per acre. Assumes all condominium. May actually contain apartments, condominiums, or assisted living.
Assumes the following parcel will not redevelop: 140500501000 (Riversite shopping, 2.77 ac).
Subtracting the parcel that is assumed not to be redeveloped results in 2.64 acres remaining for redevelopment in Area J.

Area K - Trip Generation Table

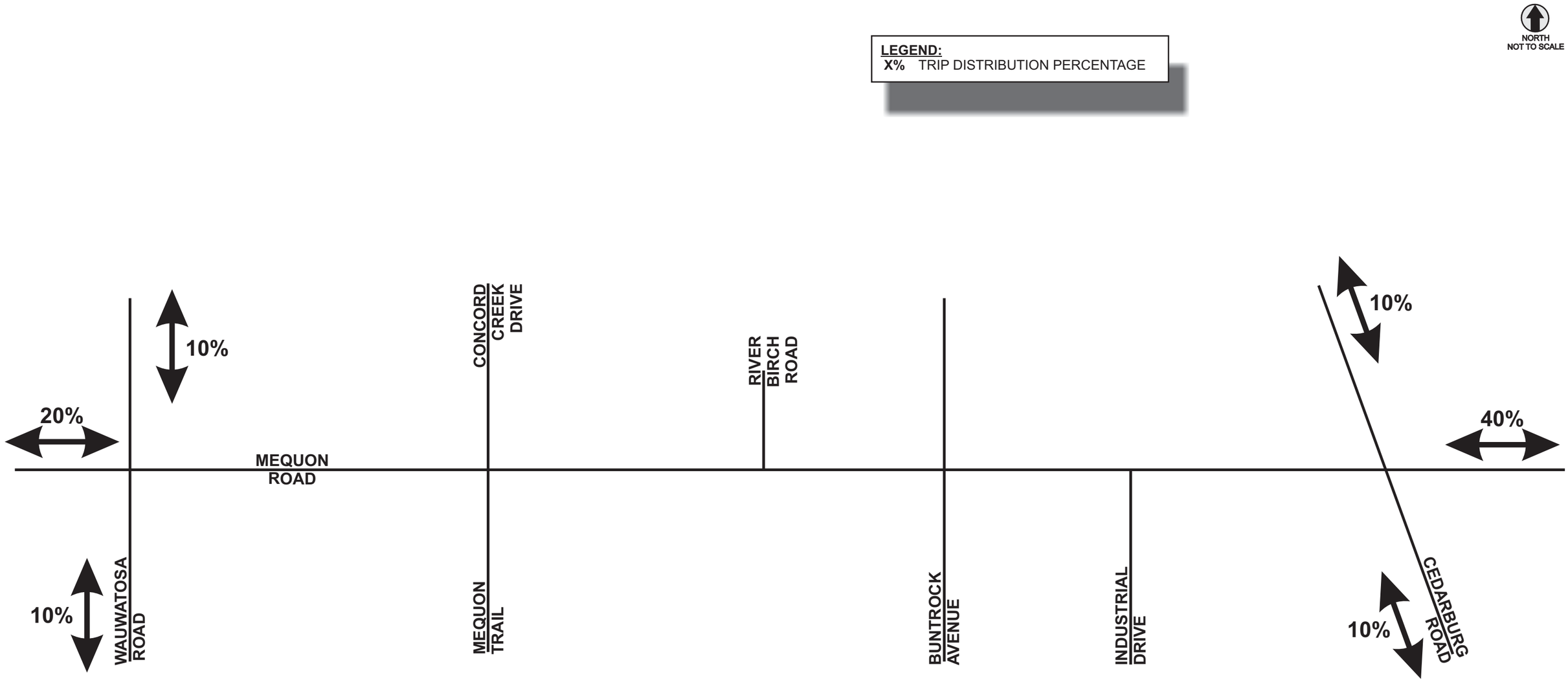
Land Use	ITE Code	Proposed Size	Weekday Daily	AM Peak In	AM Peak Out	AM Peak Total	PM Peak In	PM Peak Out	PM Peak Total	SAT Peak In	SAT Peak Out	SAT Peak Total
Shopping Center	820	10.0 x 1,000 SF	430 (42.94)	5 (61%)	5 (39%)	10 (1.00)	15 (49%)	20 (51%)	35 (3.73)	25 (52%)	25 (48%)	50 (4.89)
Total New Trips			**430**	**5**	**5**	**10**	**15**	**20**	**35**	**25**	**25**	**50**

Assumes the following parcels will not redevelop: 140500402001 (River Centre/Piggly Wiggly, 6.57 ac) & 140500401001 (Chase Bank, 1.68 ac)
Assumes 10,000-sf total of shopping center additional on 140500401001 (Chase Bank), 140500402003 (auto care) and 140500404000 (auto care)

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

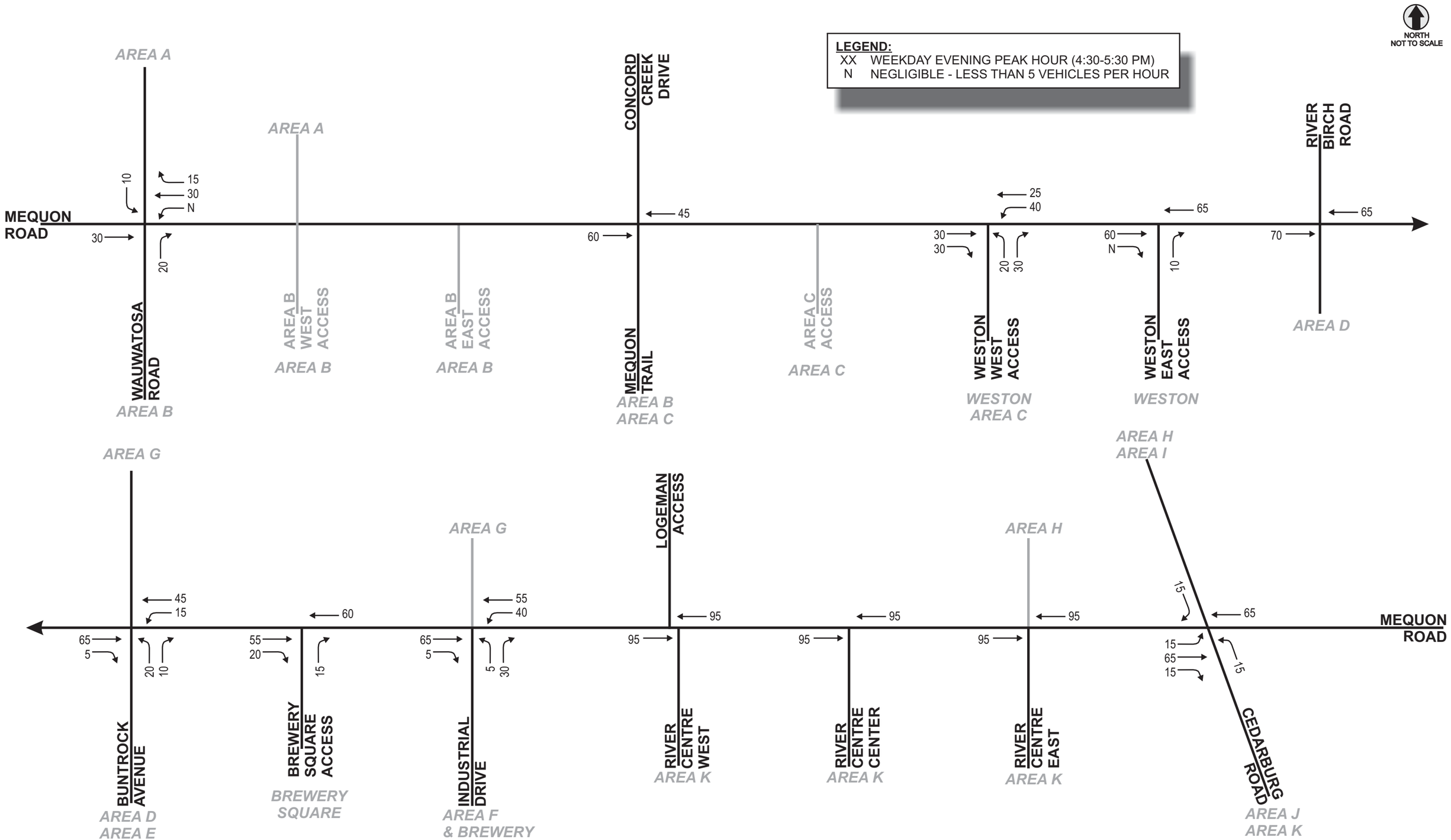
EXHIBIT 4-3B
TRIP GENERATION TABLES
(AREAS F THRU K)
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

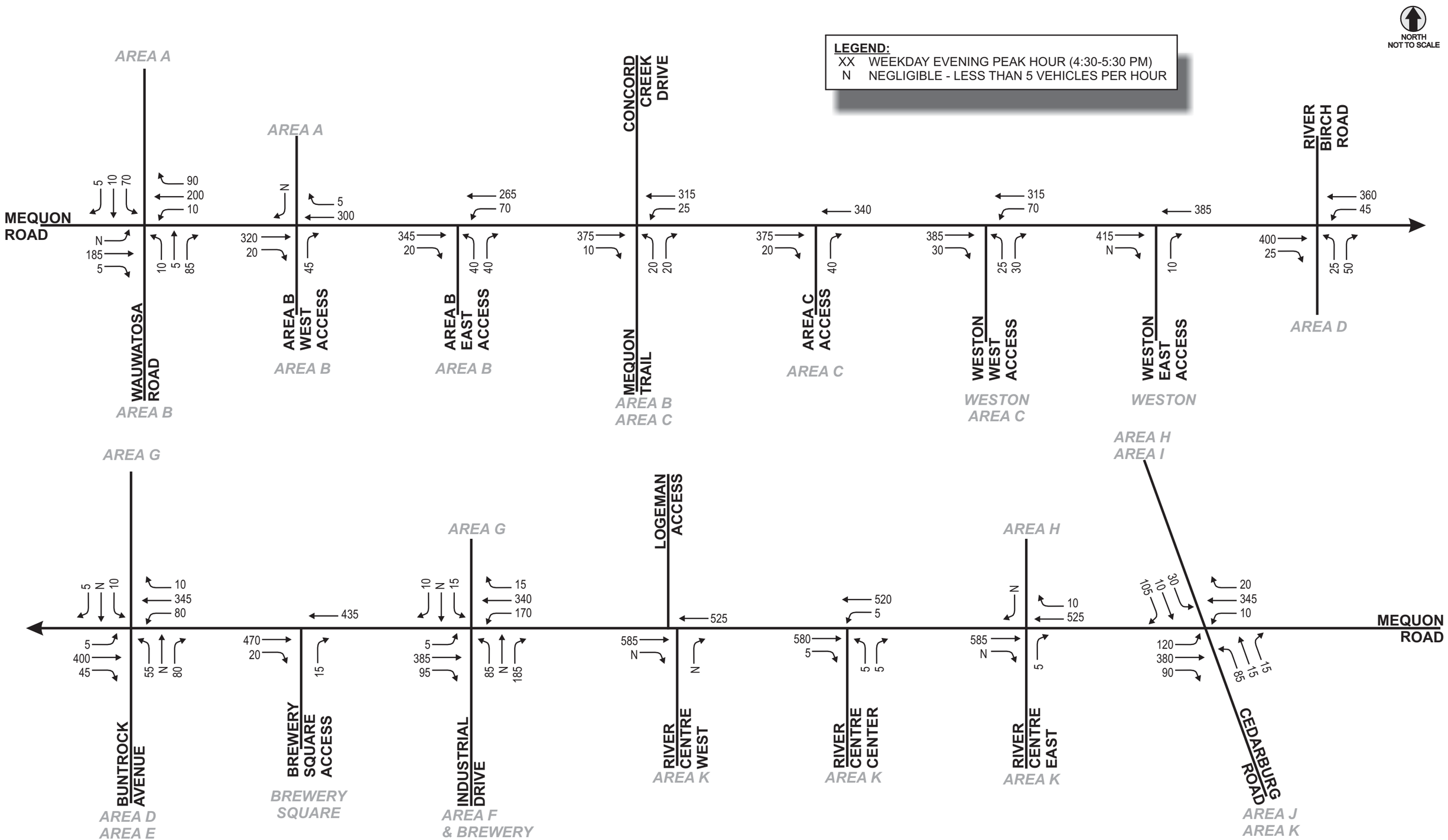
EXHIBIT 4-4
TRIP DISTRIBUTION
MEQUON TOWN CENTER REDEVELOPMENT
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

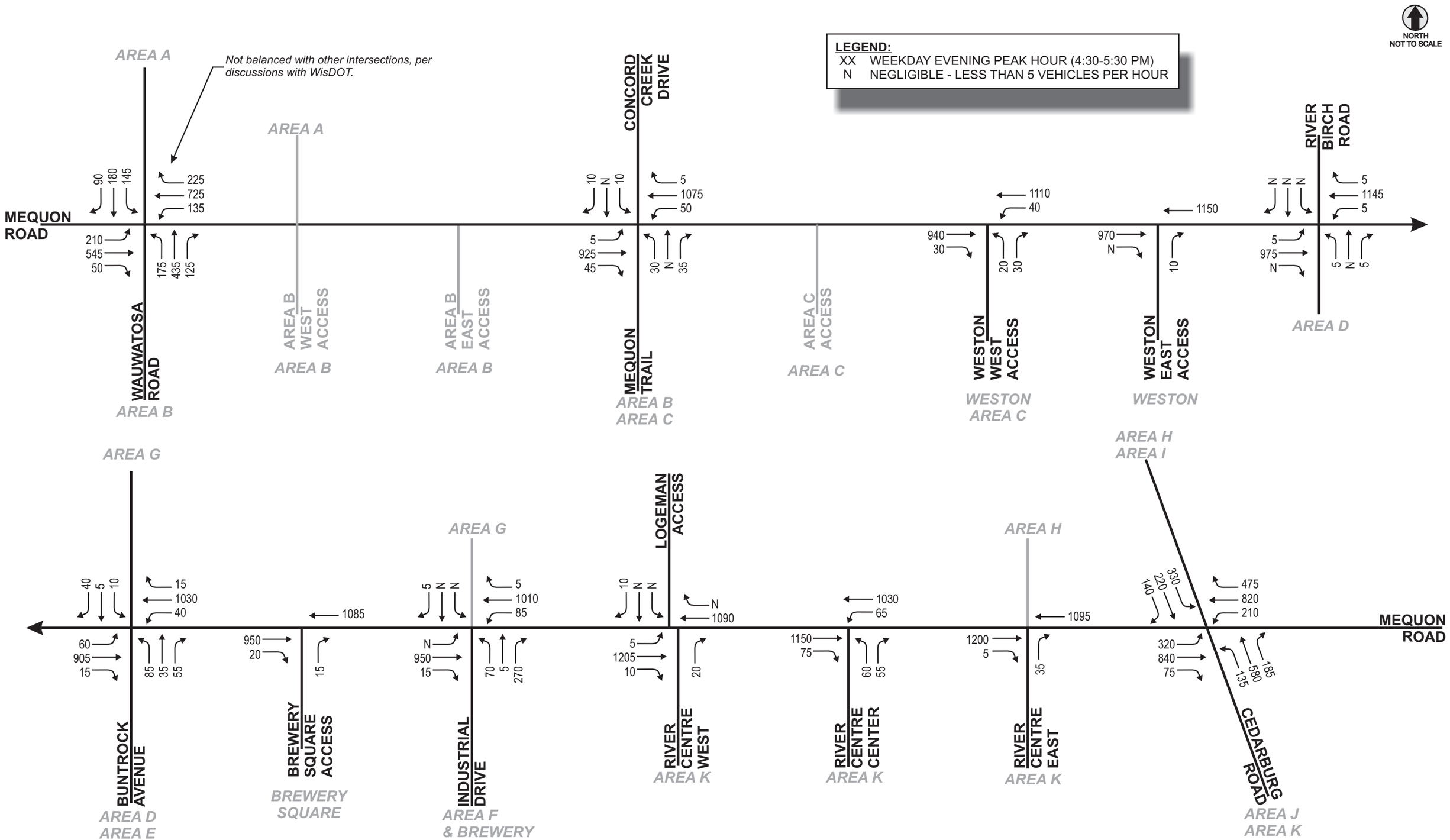
EXHIBIT 4-5
YEAR 2010 ON-SITE TRIP ASSIGNMENT
(PHASE ONE OF MEQUON TOWN CENTER REDEVELOPMENT)
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

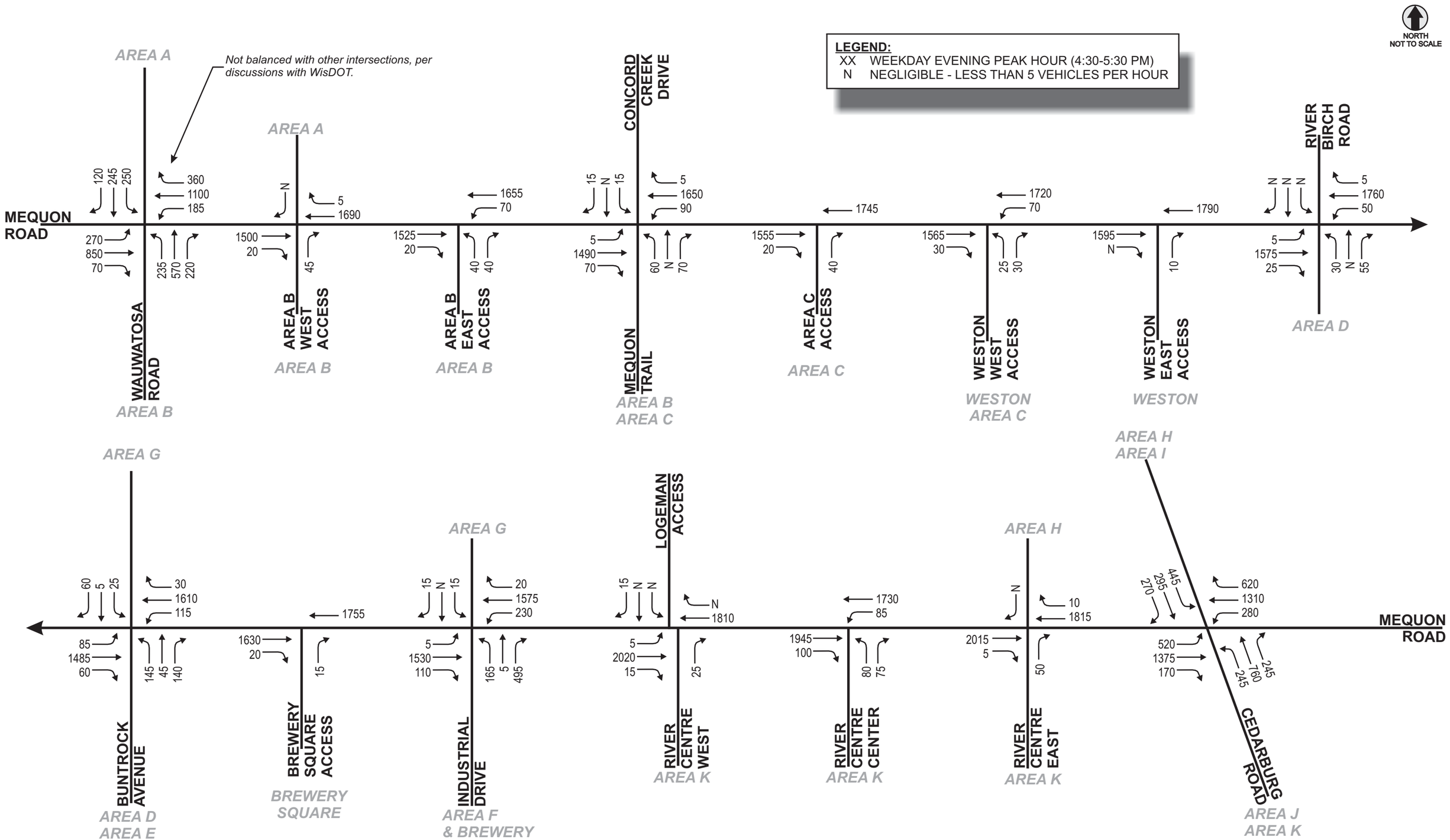
EXHIBIT 4-7
YEAR 2025 ON-SITE TRIP ASSIGNMENT
(FULL BUILD OF MEQUON TOWN CENTER REDEVELOPMENT)
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 4-11
YEAR 2010 BUILD TRAFFIC
(WITH PHASE ONE REDEVELOPMENT)
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 4-13
YEAR 2025 BUILD TRAFFIC
(WITH FULL BUILD REDEVELOPMENT)
MEQUON, WISCONSIN

CHAPTER V – TRAFFIC AND IMPROVEMENT ANALYSIS

PART A – SITE ACCESS

For the purpose of this study, the following driveway access was assumed to occur:

- Brewery Square, South side of Mequon Road between Buntrock Avenue and Industrial Drive
    - Existing right-in/right-out access along Mequon Road approximately 285-feet east of Buntrock Avenue (centerline-to-centerline).
    - Existing full access points along Buntrock Avenue approximately 175-feet and 330-feet south of Mequon Road (centerline-to-centerline).
    - Existing full access along Industrial Drive approximately 265-feet south of Mequon Road (centerline-to-centerline).
- Weston Center, south side of Mequon Road between Area C and Area D
    - Existing full access point along Mequon Road approximately 725-feet west of River Birch Drive (centerline-to-centerline).
    - Right-in/right-out access along Mequon Road approximately 450-feet west of River Birch Drive (centerline-to-centerline).
    - Cross access to Area C and Area D.
- Area A, Northeast corner of Mequon Road & Wauwatosa Road (0.96 ac)
    - Existing right-in/right-out access along Wauwatosa Road north of Mequon Road.
    - Existing right-in/right-out access along Mequon Road east of Wauwatosa Road.
- Area B, South side of Mequon Road between Wauwatosa Road and Mequon Trail (13.46 ac)
    - Unspecified access location along Wauwatosa Road, south of Mequon Road.
    - Right-in/right-out access along Mequon Road approximately 525-feet east of Wauwatosa Road (centerline-to-centerline).
    - Existing full access along Mequon Road at first median opening approximately 1,175-feet east of Wauwatosa Road (centerline-to-centerline).
    - Full access along Mequon Trail approximately 450-feet south of Mequon Road (centerline-to-centerline).
- Area C, South side of Mequon Road between Mequon Trail & Weston Center redevelopment site (7.22 ac)
    - Full access along Mequon Trail approximately 450-feet south of Mequon Road (centerline-to-centerline).
    - Right-in/right-out access along Mequon Road approximately 350-feet east of Concord Creek Drive/Mequon Trail (centerline-to-centerline).
    - Cross access to the Weston Center site.

- Area D, South side of Mequon Road between Weston Center redevelopment site & Buntrock Avenue (7.76 ac)
    - Cross access to the Weston Center site.
    - Full access along Mequon Road to align with River Birch Drive.
- Area E, East side of Buntrock Avenue, south of Brewery Square site (8.99 ac)
    - Unspecified access locations along Buntrock Avenue.
    - No direct access is anticipated to Mequon Road.
- Area F, Both sides of Industrial Drive, south & east of Brewery Square site (21.59 ac)
    - Unspecified access locations along Industrial Drive south of Mequon Road.
    - No direct access is anticipated to Mequon Road.
- Area G, North of Mequon Road between Buntrock Avenue & railroad tracks (3.76 ac)
    - Unspecified access locations along Buntrock Avenue south of Mequon Road.
    - Full access along Mequon Road to align with Industrial Drive.
- Area H, North of Mequon Road between railroad tracks & Cedarburg Road
    - Right-in/right-out only access along Mequon Road to align with River Center east access approximately 335-feet west of Cedarburg Road (centerline-to-centerline).
    - Unspecified access location along Cedarburg Avenue north of Mequon Road.
- Area I, North of Mequon Road between Cedarburg Road & Milwaukee River (5.17 ac)
    - Unspecified access location along Cedarburg Road north of Mequon Road.
    - No direct access is anticipated to Mequon Road.
- Area J, South of Mequon Road between Milwaukee River & Cedarburg Road (2.64 ac)
    - No direct access is anticipated to Mequon Road.
    - Unspecified access location along Cedarburg Road south of Mequon Road.
- Area K, South of Mequon Road between railroad tracks & Cedarburg Road
    - Existing River Centre west (right-in/right-out), center (full), and east (right-in/right-out) access points along Mequon Road.
    - Existing River Centre access points south of Mequon Road along Cedarburg Road.

Pedestrian sidewalks are currently located along both sides of Mequon Road through the study area from Wauwatosa Road to east of the study area, and sidewalks are planned to be provided along Cedarburg Road north of Mequon Road. A multi-use trail – the Ozaukee Interurban Trail – crosses Mequon Road immediately east of a railroad crossing (east of Industrial Drive), and auxiliary lanes are provided along Mequon Road to accommodate on-street bicycling. No regularly scheduled transit accommodations are provided. On-street parking is not currently designated on Mequon Road.

The Mequon Town Center redevelopment plan considers reducing the posted speed limit, reducing lane widths, adding bicycle lanes, and providing on-street parking along the south side of Mequon Road from Buntrock Avenue to Cedarburg Road to provide a more urbanized,

accessible, and contextually sensitive roadway environment. These roadway elements – speed, lane widths, bicycle lanes, and on-street parking – are discussed in greater detail in the recommendations and conclusions of Chapter VI.

PART B – CAPACITY/LEVEL OF SERVICE ANALYSIS

B1. Year 2025 Background Traffic Operating Conditions – No Improvements

Exhibit 5-1, reserved by WisDOT to illustrate interim year background traffic operations, has been intentionally omitted from this report because no interim year traffic analysis is required.

Exhibit 5-2 shows the Year 2025 background traffic (no development) peak hour operating conditions at the study area intersections. The Year 2025 background traffic analysis was conducted using existing lane configurations and modified traffic signal timings.

As shown in Exhibit 5-2, select movements at the Mequon Road intersections with Concord Creek Drive/Mequon Trail, Buntrock Avenue, Industrial Drive, the River Centre center access, and Cedarburg Road are expected to operate at LOS E/F conditions during the weekday evening peak hour. Improvement operations are discussed later in this chapter and recommendations are discussed in Chapter VI.

B2. Year 2010 Build Traffic Operating Conditions – No Improvements

Year 2010 build traffic volumes include phase one of the Mequon Town Center redevelopment (Brewery Square and Weston Center). Exhibit 5-3 shows the Year 2010 build traffic peak hour operating conditions at the study area intersections.

As shown in Exhibit 5-3, select movements at the Mequon Road intersections with Concord Creek Drive/Mequon Trail and Cedarburg Road are expected to operate at LOS E conditions during the weekday evening peak hour. Improvement operations are discussed later in this chapter and recommendations are discussed in Chapter VI.

B3. Year 2025 Build Traffic Operating Conditions – No Improvements

Exhibit 5-4, reserved by WisDOT to illustrate interim year build traffic operations, has been intentionally omitted from this report because no interim year traffic analysis is required.

Year 2025 build traffic volumes include the full build completion of the Mequon Town Center redevelopment. Exhibit 5-5 shows the Year 2025 build traffic peak hour operating conditions, respectively, at the study area intersections.

As shown in Exhibit 5-5, select movements at the Mequon Road intersections with Wauwatosa Road, the Area B east access, Concord Creek Drive/Mequon Trail, Weston Center west access, River Birch Drive, Buntrock Avenue, Industrial Drive, the River Centre center access, and Cedarburg Road are expected to operate at LOS E/F conditions during the weekday evening peak hour. Improvement operations are discussed later in this chapter and recommendations are discussed in Chapter VI.

Exhibits 5-6 through 5-8, reserved by WisDOT to illustrate total traffic operations (including on-site and off-site developments) under base, interim and horizon years, have been intentionally omitted from this report because no off-site development was assumed to occur.

B4. Year 2010 Background Traffic Operating Conditions – *With Recommended Improvements*

Improvements to accommodate the Year 2010 background traffic volumes are summarized in *Chapter VI – Recommendations and Conclusion*. As shown in Exhibit 5-9:

- The Concord Creek Drive southbound left-turn/through movement is expected to operate at LOS E with approximately 5-seconds of average delay over the LOS D/E threshold. The movement services little volume (10 vehicles per hour) and, therefore, no improvements are expected to be necessary.
- The Buntrock Avenue northbound left-turn/through movement is expected to operate at LOS E with approximately 3-seconds of average delay over the LOS D/E threshold. The approach services moderate volumes, opposes little southbound traffic, and has a 40-second signal split. No further improvements are expected to be necessary.
- The Cedarburg Road southbound left-turn movement is expected to operate at LOS E with approximately 1.5-seconds of average delay over the LOS D/E threshold. Improving this movement to LOS D or better conditions would result in other movements at LOS E or require additional lanes at the intersection. The southbound left-turn queue can fit within the existing turn-bay storage and, therefore, no further improvements are expected to be necessary.

All other movements are expected to operate at LOS D or better conditions with the improvements recommended to accommodate Year 2010 background traffic volumes without the Mequon Town Center redevelopment.

B5. Year 2025 Background Traffic Operating Conditions – *With Recommended Improvements*

Exhibit 5-10, reserved by WisDOT to illustrate interim year background traffic operations with improvements, has been intentionally omitted from this report because no interim year traffic analysis is required.

Improvements to accommodate the Year 2025 background traffic volumes are summarized in *Chapter VI – Recommendations and Conclusion*. As shown in Exhibit 5-11:

- The Concord Creek Drive southbound left-turn/through movement is expected to operate at LOS F with approximately 46-seconds of average delay over the LOS D/E threshold. The Mequon Trail northbound left-turn/through movement is expected to operate at LOS F with approximately 18-seconds of average delay over the LOS D/E threshold. The movements service minor to little volume (15 vehicles per hour southbound, 40 vehicles per hour northbound). No improvements are expected to be necessary. Should delays result in unsafe conditions, consideration may be given to restricting Concord Creek Drive/Mequon Trail to left-in/right-in/right-out only and forcing left-out/through out movements to downstream U-turn locations.
- The Buntrock Avenue northbound left-turn/through movement is expected to operate at LOS E with approximately 7-seconds of average delay over the LOS D/E threshold. The approach services moderate volumes, opposes little southbound traffic, and has a 40-second signal split. No further improvements are expected to be necessary.
- The Industrial Drive northbound left-turn/through movement is expected to operate at LOS E with approximately 6-seconds of average delay over the LOS D/E threshold. The movement services moderate volume (85 vehicles per hour). No improvements are

expected to be necessary. Should delays result in unsafe conditions, consideration may be given to restricting Industrial Drive to left-in/right-in/right-out only and forcing left-out/through out movements to downstream U-turn locations.

- The River Centre center access northbound left-turn movement is expected to operate at LOS E with approximately 8-seconds of average delay over the LOS D/E threshold. The movement services moderate volume (75 vehicles per hour). No further improvements are expected to be necessary. Should delays result in unsafe conditions, consideration may be given to restricting the access to left-in/right-in/right-out only and forcing left-out movements to downstream U-turn or other access locations.
- The eastbound, westbound, northbound and southbound left-turn lanes are expected to operate at LOS E conditions with 4-seconds, 4-seconds, 1-second, and 10-seconds of average vehicle delay beyond the LOS D/E threshold, respectively, during the evening peak hour. Improving these movements to LOS D or better conditions would result in other movements at LOS E or require additional lanes at the intersection. The left-turn queues can fit within the recommended turn-bay storage lengths.

All other movements are expected to operate at LOS D or better conditions with the improvements recommended to accommodate Year 2025 background traffic volumes without the Mequon Town Center redevelopment.

B6. Year 2010 Build Traffic Operating Conditions – *With Recommended Improvements*

The City of Mequon wishes to reduce speed limits along Mequon Road from 40 mph to 35 mph between Wauwatosa Road and Buntrock Avenue, and 30 mph between Buntrock Avenue and Cedarburg Road. The City also wishes to adjust the highway cross-section between Buntrock Avenue and Cedarburg Road to a more contextually-sensitive roadway environment, including a 24-foot wide median, 11-foot through lanes on both sides of the median, bicycle lanes on both sides of the highway, and parking along the south side of the highway. This cross-section would eliminate the auxiliary lanes on both sides of Mequon Road. Four alternatives were considered.

- Alternative One: No speed limit changes, no parking/bike lanes
- Alternative Two: Speed limit changes, no parking/bike lanes
- Alternative Three: No speed limit changes, with parking/bike lanes
- Alternative Four: Speed limit changes, with parking/bike lanes

Improvements to accommodate the Year 2010 build traffic volumes are summarized in *Chapter VI – Recommendations and Conclusion*. As shown in Exhibits 5-12a through 5-12d,

- *All Alternatives:* The Concord Creek Drive southbound left-turn/through movement is expected to operate at LOS E with approximately 8-seconds of average delay over the LOS D/E threshold. The movement services little volume (10 vehicles per hour) and, therefore, no further improvements are expected to be necessary.
- *All Alternatives:* The Buntrock Avenue northbound left-turn/through movement is expected to operate at LOS E with approximately 5-seconds of average delay over the LOS D/E threshold. The approach services moderate volumes, opposes little southbound traffic, and has a 40-second signal split.
- *All Alternatives:* The Cedarburg Road southbound left-turn movement is expected to operate at LOS E with approximately 1.5-seconds of average delay over the LOS D/E threshold, and the Cedarburg Road northbound left-turn movement is expected to operate

at LOS E with approximately 0.5-seconds of average delay over the LOS D/E threshold. Improving these movements to LOS D or better conditions would result in other movements at LOS E or require additional lanes at the intersection. The southbound and northbound left-turn queues can fit within existing turn-bay storage lengths.

With the improvements recommended to accommodate Year 2010 build traffic volumes, all other movements at the study area intersections are expected to operate at LOS D or better conditions with phase one of the Mequon Town Center redevelopment (Brewery Square and Weston Center). Note that the analysis assumes a right-in/right-out access to/from Brewery Square along Mequon Road. Intersection sight distance is not currently sufficient to allow the right-turn egress movement. If the horizontal and vertical curves west of the access can be corrected, the access may be constructed as a right-in/right-out driveway. If the curves cannot be corrected, the access is recommended to be a right-in only driveway.

B7. Year 2025 Build Traffic Operating Conditions – *With Recommended Improvements*

Exhibit 5-13, reserved by WisDOT to illustrate interim year build traffic operations with improvements, has been intentionally omitted from this report because no interim year traffic analysis is required.

Improvements to accommodate the Year 2025 build traffic volumes under each of the alternatives are summarized in *Chapter VI – Recommendations and Conclusion*. Note that a fifth alternative is presented for the Mequon Road intersections with Buntrock Avenue and Industrial Drive, which is a two-lane roundabout alternative. As shown in Exhibits 5-14a through 5-14e,

- *All Alternatives:* The Area B east access northbound left-turn/right-turn movement is expected to operate at LOS E with approximately 5-seconds of average delay over the LOS D/E threshold. The movement services little-to-moderate volume (40 left-turn/40 right-turn vehicles per hour) and, therefore, no improvements are expected to be necessary. Should delays result in unsafe conditions, consideration may be given to restricting the access to left-in/right-in/right-out only and forcing left-out movements to downstream U-turn locations.
- *All Alternatives:* The Concord Creek Drive southbound left-turn/through movement is expected to operate at LOS F with approximately 220-seconds of average delay over the LOS D/E threshold. The Mequon Trail northbound left-turn/through movement is expected to operate at LOS F with approximately 177-seconds of average delay over the LOS D/E threshold. The movements service little-to-moderate volume (15 vehicles per hour southbound, 60 vehicles per hour northbound). No improvements are expected to be necessary. Should delays result in unsafe conditions, consideration may be given to restricting Concord Creek Drive/Mequon Trail to left-in/right-in/right-out only and forcing left-out/through-out movements to downstream U-turn locations.
- *All Alternatives:* The Weston Center west access northbound left-turn/right-turn movement is expected to operate at LOS E with approximately 9-seconds of average delay over the LOS D/E threshold. The movement services little volume (55 vehicles per hour). Should delays result in unsafe conditions, consideration may be given to restricting the access to left-in/right-in/right-out only and forcing left-out movement to downstream U-turn locations.
- *All Alternatives:* The River Birch Drive northbound and southbound left-turn/through/right-turn movements are expected to operate at LOS F with approximately 37-seconds/25-seconds of average delay, respectively, over the LOS D/E threshold. The

movements service minor to little volume (30 left/55 right vehicles per hour northbound, less than 5 vehicles per hour southbound). No improvements are expected to be necessary. Should delays result in unsafe conditions, consideration may be given to restricting River Birch Trail to left-in/right-in/right-out only and forcing left-out/through-out movements to downstream U-turn locations.

- *Alternatives One, Two, Three & Four:* The Industrial Drive northbound left-turn/through movement is expected to operate at LOS E with approximately 10-seconds of average delay over the LOS D/E threshold. The approach services moderate volumes, opposes little southbound traffic, and has a 40-second signal split.
- *Alternatives Two & Four:* The Mequon Road westbound left-turn movement at Industrial Drive is expected to operate at LOS E with approximately 10-seconds of average delay over the LOS D/E threshold. The movement has a 25-second signal split, and queues are expected to fit within the recommended turn-bay storage length.
- *All Alternatives:* The River Centre center access northbound left-turn movement is expected to operate at LOS F with approximately 145-seconds of average delay over the LOS D/E threshold. The movement services moderate volume (80 vehicles per hour). No further improvements are expected to be necessary. Should delays result in unsafe conditions, consideration may be given to restricting the access to left-in/right-in/right-out only and forcing left-out movements to downstream U-turn or other access locations.
- *All Alternatives:* Note that eastbound, westbound, northbound and southbound left-turn lanes at the Mequon Road intersection with Cedarburg Road are expected to operate at LOS E conditions with 17-seconds, 5-seconds, 1-second, and 21-seconds of average vehicle delay beyond the LOS D/E threshold, respectively, during the evening peak hour. Improving these movements to LOS D or better conditions would result in other movements at LOS E or require additional lanes at the intersection. The left-turn queues can fit within the recommended turn-bay storage lengths.
- *All Alternatives:* The northbound through movement at the Mequon Road intersection with Cedarburg Road is expected to operate at LOS F conditions with 44-seconds of average vehicle delay beyond the LOS D/E threshold during the evening peak hour. Providing a third northbound through lane would reduce the delay. However, this is not expected to be feasible due to the close proximity of riverfront buildings to Cedarburg Road. A roundabout was considered but would require three lane entries on all approaches plus a westbound-to-northbound free-flow lane, which would also require three lanes northbound on Cedarburg Road.

With the improvements recommended to accommodate Year 2025 build traffic volumes, all other movements at the study area intersections are expected to operate at LOS D or better conditions with the full build completion of the Mequon Town Center redevelopment. Recall that the analysis assumes a right-in/right-out access to/from Brewery Square along Mequon Road. Intersection sight distance is not currently sufficient to allow the right-turn egress movement. If the horizontal and vertical curves west of the access can be corrected, the access may be constructed as a right-in/right-out driveway. If the curves cannot be corrected, the access is recommended to be a right-in only driveway.

Exhibits 5-15 through 5-17, reserved by WisDOT to illustrate total traffic operations (including on-site and off-site developments) with improvements under base, interim and horizon years, have been intentionally omitted from this report because no off-site development was assumed to occur.

B8. MOE Comparison of Year 2025 Build Traffic Signalized Alternatives

In addition to the level of service reports at each intersection, the Synchro Studio 7 software package provides several measures of effectiveness (MOEs) to compare the four signalized alternatives for Mequon Road. The four alternatives are as follows:

- Alternative One: No speed limit changes, no parking/bike lanes
- Alternative Two: Speed limit changes, no parking/bike lanes
- Alternative Three: No speed limit changes, with parking/bike lanes
- Alternative Four: Speed limit changes, with parking/bike lanes

The following MOEs have been used to assess the effectiveness of the four alternatives under Year 2025 build traffic volumes: total delay per vehicle, stops per vehicle, average speed, and performance index. The MOEs have been compared for the weekday evening peak hour.

Total Delay per Vehicle

Total delay per vehicle is calculated by dividing the total delay experienced along an arterial (or on a system) by the number of vehicles analyzed along the arterial (or on the system). Total delay is equal to the total travel time minus the hypothetical travel time for a vehicle assuming no traffic control devices or other vehicles exist (i.e. delayed travel time minus unrestricted travel time). Total delay per vehicle is expressed in units of seconds per vehicle (s/v) and accounts for both control delay and queue delay. The lower the total delay per vehicle, the better the efficiency.

Stops per Vehicle

Stops per vehicle are calculated by dividing the number of total stops along an arterial (or system) by the number of vehicles analyzed along the arterial (or system). Total stops are the summation of vehicle stops. Whenever a vehicle drops below 10 feet per second (fps) a stop is added. A vehicle is considered running again when its speed reaches 15 fps. The fewer the stops per vehicle, the better the efficiency.

Average Speed

Average speed is calculated by dividing the summation of the total distance traveled by each vehicle by the summation of the total time each vehicle was present in the area. Average speed is weighted by volume, includes stopped time, and is measured in units of mph. A higher average speed value indicates less travel time is spent traversing an arterial (or system). The higher the average speed, the better the efficiency.

Performance Index

Performance index is an MOE that takes into account both delays and stops to help determine which alternative may be the best for arterial (or system) operations. The performance index is calculated as follows:

$$PI = [D * 1 + St * 10] / 3600$$

Where:

PI = Performance Index

D = Total Delay (seconds)

St = Vehicle Stops (veh/hr)

The lower the performance index, the better the efficiency.

MOE Findings for Mequon Road
Recall that:

- The lower the total delay per vehicle, the better the efficiency;
- The fewer the stops per vehicle, the better the efficiency;
- The higher the average speed, the better the efficiency; and
- The lower the performance index, the better the efficiency.

Figure 1 compares each of the four MOEs previously described for the Mequon Road arterial. A rank is given to each of the alternatives to illustrate which alternative is the most effective (rank = 1) and which is the least effective (rank = 4) in accommodating Mequon Road arterial traffic.

Figure 1
Comparison of Mequon Road Arterial Measures of Effectiveness (MOEs)

Peak	Measure of Effectiveness (MOE)	Alternative			
		One	Two	Three	Four
PM	Total Delay/Veh (sec/veh)	8	8	8	8
	Stops/Veh	0.22	0.21	0.23	0.22
	Average Speed (mph)	19	18	19	17
	Performance Index	149.6	145.9	154.1	150.2
	Rank (1 = Most Effective)	*2*	*1*	*4*	*3*

Next, Figure 2 compares each of the four MOEs previously described for the system analyzed (which includes side street approach delays, etc.). A rank is given to each of the alternatives to illustrate which alternative is the most effective (rank = 1) and which is the least effective (rank = 4) in accommodating system traffic.

Figure 2
Comparison of System Measures of Effectiveness (MOEs)

Peak	Measure of Effectiveness (MOE)	Alternative			
		One	Two	Three	Four
PM	Total Delay/Veh (sec/veh)	13	13	13	13
	Stops/Veh	0.28	0.27	0.29	0.28
	Average Speed (mph)	15	14	15	14
	Performance Index	243.0	239.2	247.2	243.2
	Rank (1 = Most Effective)	*2*	*1*	*4*	*3*

The results summarized in Figure 1 and Figure 2 indicate the following:

- All the alternatives are expected to provide approximately the same total delay per vehicle along the arterial and within the system as a whole.
- Alternatives One and Three are expected to provide a slightly higher average speed than Alternatives Two and Four. This result makes sense, as the speed limits are lowered under Alternatives Two and Four.

- Alternative Two, which assumes reduced speed limits but no parking/bike lanes, is expected to provide the least number of stops per vehicle. Alternative Three, which assumes no speed limit reductions but parking/bike lanes, is expected to provide the most number of stops per vehicle.
- From a performance index standpoint, Alternative Two is the most effective alternative, followed by Alternative One, Alternative Four, and finally Alternative Three.
- None of the results are substantially different than the others. That is, from the standpoint of effectiveness, the four alternatives are approximately the same.

PART C – QUEUEING ANALYSIS

To estimate storage length requirements for turn bays at the study area intersections with improvements, a queuing analysis has been conducted. Note that the 50th percentile and 95th percentile probable queue lengths obtained from the SYNCHRO software package were used for the design of turn bays at traffic signal and stop sign controlled intersections. Two times the RODEL software package 50th Confidence Level maximum queue, divided by the number of approach lanes, was used to estimate the 95th percentile queue for the design of roundabout intersections. The following is a list of where the results of the queuing results can be found.

- Year 2010 Background Traffic with Improvements – Exhibit 5-18
- Year 2010 Build Traffic with Alternative One Improvements – Exhibit 5-19a
- Year 2010 Build Traffic with Alternative Two Improvements – Exhibit 5-19b
- Year 2010 Build Traffic with Alternative Three Improvements – Exhibit 5-19c
- Year 2010 Build Traffic with Alternative Four Improvements – Exhibit 5-19d
- Year 2010 Total Traffic with Improvements – Exhibit 5-20 *(Not Applicable)*
- Interim Year Background Traffic with Improvements – Exhibit 5-21 *(Not Applicable)*
- Interim Year Build Traffic with Improvements – Exhibit 5-22 *(Not Applicable)*
- Interim Year Total Traffic with Improvements – Exhibit 5-23 *(Not Applicable)*
- Year 2025 Background Traffic with Improvements – Exhibit 5-24
- Year 2025 Build Traffic with Alternative One Improvements – Exhibit 5-25a
- Year 2025 Build Traffic with Alternative Two Improvements – Exhibit 5-25b
- Year 2025 Build Traffic with Alternative Three Improvements – Exhibit 5-25c
- Year 2025 Build Traffic with Alternative Four Improvements – Exhibit 5-25d
- Year 2025 Build Traffic with Alternative Five Improvements – Exhibit 5-25e
- Year 2025 Total Traffic with Improvements – Exhibit 5-26 *(Not Applicable)*

No total traffic analysis (which would include off-site development) or interim year traffic analysis (not required) was performed. Therefore, Exhibits 5-20 through 5-23 and Exhibit 5-26 have been intentionally omitted from this from this report.

PART D – PEDESTRIAN, BICYCLE AND MULTI-USE TRAIL CONSIDERATIONS

As mentioned in *Part A – Site Access*, pedestrian sidewalks are currently located along both sides of Mequon Road through the study area from Wauwatosa Road to east of the study area, and sidewalks are planned to be provided along Cedarburg Road north of Mequon Road. A multi-use trail – the Ozaukee Interurban Trail – crosses Mequon Road immediately east of a railroad crossing (east of Industrial Drive), and auxiliary lanes are provided along Mequon Road to accommodate on-street bicycling.

The Mequon Town Center redevelopment plan considers reducing the posted speed limit, reducing lane widths, adding bicycle lanes, and providing on-street parking along the south side of Mequon Road from Buntrock Avenue to Cedarburg Road to provide a more urbanized, accessible, and contextually sensitive roadway environment. These roadway elements – speed, lane widths, bicycle lanes, and on-street parking – are discussed in greater detail in the recommendations and conclusions of Chapter VI.

PART E – SIGHT DISTANCE

Note that the intersection sight distance (ISD) measurements and photographs are based on approximate intersection placement and on in-field observation by Traffic Analysis & Design, Inc. The party responsible for designing the intersections is responsible for cross-checking, verifying and designing for all applicable sight distances.

All new or improved intersections throughout the study area shall be designed for ISD in accordance with the latest edition of the American Association of State Highway Transportation Officials (AASHTO) *A Policy on Geometric Design of Highways and Streets*. All WisDOT controlled intersections throughout the study area should be designed for ISD in accordance with the latest Facilities Development Manual (FDM) design guidelines (Procedure 11-10-5). ISD has been checked at the three currently proposed access points along Mequon Road: the Weston Center east access, the Weston Center west access, and the Brewery Square access.

As mentioned in the October 2009 WisDOT *Traffic Impact Analysis Guidelines*, "Any recommended modifications to existing speed limits are not within the focus of a TIA… For purposes of any analysis and improvements, all geometrics and traffic controls shall consider a design speed based on the existing posted speed limit" (page 5-9). Therefore, the design speed considered for the ISD analysis was 45 mph, or 5 mph above the existing posted speed limit of 40 mph.

E1. Mequon Road & Weston Center West Access – ISD Analysis

ISD for the Mequon Road intersection with the Weston Center west access, which is proposed to allow all movements, was conducted with the following parameters:

- A design speed of 5 mph above the existing posted speed limit, or 45 mph.
- Assuming a passenger vehicle (P-vehicle) eye height of 3.5 feet and a single-unit trunk (SU-vehicle) eye height of 7.6 feet.
- The height of the object to be seen on Mequon Road of 3.5-feet.
- Since Mequon Road is a designated state highway, WisDOT minimum and desirable ISD guidelines were used. All calculations are provided in Appendix H.

As shown in Exhibits 5-27a and 5-27b, the WisDOT desirable ISD is expected to be met at the Weston Center west access.

E2. Mequon Road & Weston Center East Access – ISD Analysis

ISD for the Mequon Road intersection with the Weston Center east access, which is proposed to be a right-in/right-out access, was conducted with the following parameters:

- A design speed of 5 mph above the existing posted speed limit, or 45 mph.
- Assuming a passenger vehicle (P-vehicle) eye height of 3.5 feet and a single-unit trunk (SU-vehicle) eye height of 7.6 feet.
- The height of the object to be seen on Mequon Road of 3.5-feet.
- Since Mequon Road is a designated state highway, WisDOT minimum and desirable ISD guidelines were used. All calculations are provided in Appendix H.

As shown in Exhibit 5-27c, the WisDOT desirable ISD is expected to be met at the Weston Center east access.

E3. Mequon Road & Brewery Square Access – ISD Analysis

ISD for the Mequon Road intersection with the Brewery Square access, which is proposed to be a right-in/right-out access, was conducted with the following parameters:

- A design speed of 5 mph above the existing posted speed limit, or 45 mph.
- Assuming a passenger vehicle (P-vehicle) eye height of 3.5 feet and a single-unit trunk (SU-vehicle) eye height of 7.6 feet.
- The height of the object to be seen on Mequon Road of 3.5-feet.
- Since Mequon Road is a designated state highway, WisDOT minimum and desirable ISD guidelines were used. All calculations are provided in Appendix H.

As shown in Exhibit 5-27d, the WisDOT desirable and AASHTO minimum ISD are *not* expected to be met at the Brewery Square access due to horizontal and vertical curves west of the access. If the curves west of the access can be corrected, the access may be constructed as a right-in/right-out driveway. If the curve cannot be corrected, the access is recommended to be a right-in only driveway.

PART F – TRAFFIC CONTROL NEEDS

All proposed access to Mequon Road is recommended to have a stop sign installed on the access approach, leaving the mainline to operate free without stop control.

A traffic signal warrant analysis for the Mequon Road intersection with Industrial Drive is discussed below. Traffic signal control additions such as left-turn or right-turn indications for Wauwatosa Road, Buntrock Avenue, Industrial Drive, and Cedarburg Road are discussed in *Chapter VI – Recommendations and Conclusion*. Roundabout alternatives for the Mequon Road intersections with Buntrock Avenue and Industrial Drive are also discussed in *Chapter VI – Recommendations and Conclusion*.

PART G – TRAFFIC SIGNAL WARRANT ANALYSIS

Note that traffic signal warrants should be viewed as guidelines to help decide whether a traffic signal may be installed. Meeting traffic signal warrants does not translate to a legal requirement for their installation. Per WisDOT guidelines, where traffic signal warrants are expected to be met, both a traffic signal improvement option and a roundabout improvement option should be considered.

A traffic signal warrant analysis was conducted for the Mequon Road intersection with Industrial Drive in accordance with the 2009 *Manual on Uniform Traffic Control Devices* (MUTCD) and WisDOT guidelines. The analyses were conducted based on a 12-hour turning movement count at the Mequon Road intersection with Concord Creek Drive/Mequon Trail, traffic forecasts, and anticipated hourly breakdowns of development traffic for the Brewery Square and Area F only. The 12-hour count provides an approximation of eastbound/westbound through traffic along Mequon Road. The hourly breakdown of development traffic provides an estimate of Brewery Square and Area F turning movements to/from Industrial Drive. In reality, more traffic along Mequon Road and more turning movement traffic to/from Industrial Drive are expected due to 1) existing turning movement traffic and 2) additional redevelopment sites that impact Mequon Road. That is, this signal warrant analysis is a low-volume, rough approximation only.

Chapter 4C of the 2009 MUTCD outlines the standards for determining the need for traffic signals at a particular location. For a traffic signal to be installed, at least one of the following warrants must be satisfied. The nine signal warrants are listed below:

- Warrant 1, Eight-Hour Vehicular Volume
- Warrant 2, Four-Hour Vehicular Volume
- Warrant 3, Peak Hour
- Warrant 4, Pedestrian Volume
- Warrant 5, School Crossing
- Warrant 6, Coordinated Signal System
- Warrant 7, Crash Experience
- Warrant 8, Roadway Network
- Warrant 9, Intersection Near a Grade Crossing

Warrant 1 has been evaluated for the Mequon Road intersection with Industrial Drive. All calculations pertaining to the traffic signal warrant analysis are included in Appendix I.

The warrant analysis for the Mequon Road intersection with Industrial Drive was conducted under Year 2025 build traffic volumes (see above). The traffic signal warrant analysis assumes eastbound Mequon Road as the 30 mph major street with two or more lanes per approach, and the Mequon Road westbound left-turn movement as a one-lane minor street approach.

Warrant 1, Eight Hour Vehicular Volume states that a traffic signal may be considered at an intersection similar to the Mequon Road intersection with Industrial Drive if one of the following conditions exists for at least eight hours of an average day:

A. The vehicles per hour given on the major street (Mequon Road eastbound approach) meet or exceed 600 and the vehicles per hour on the minor street approach (Mequon Road westbound left-turn) meet or exceed 150; or

B. The vehicles per hour given on the major street (Mequon Road eastbound approach) meet or exceed 900 and the vehicles per hour on the minor street approach (Mequon Road westbound left-turn) meet or exceed 75.

Or if the following two conditions exist for eight hours of an average day after adequate trial of other remedial measures:

A. The vehicles per hour on the major street (Mequon Road eastbound approach) and minor street approach (Mequon Road westbound left-turn) meet or exceed 80% of the values stated in A (480 major, 120 minor), and

B. The vehicles per hour on the major street (Mequon Road eastbound approach) and minor street approach (Mequon Road westbound left-turn) meet or exceed 80% of the values stated in B (720 major, 60 minor)

Based on the Year 2025 build traffic signal warrant analysis, warrant 1 combination of conditions A and B is met for all of the required eight hours. Therefore, *traffic signals are expected to be warranted* at the Mequon Road intersection with Industrial Drive.

It is important to note that, if the intersection were analyzed with the existing 40 mph speed limit, the warrant thresholds would be approximately 70-percent less than those listed above and Condition B would be met. Also, if additional turning movement traffic along Mequon Road and to/from Industrial Drive were included in the analysis, or if additional traffic from the other redevelopment areas were included in the analysis, the warrants would be shown to be more strongly met.

Exhibit 5-2
Year 2025 Background Traffic Operations
Existing Geometrics and Traffic Control

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Mequon Road & Wauwatosa Road	Traffic Signal	PM	D	C	C	D	D	C	C	D	D	C	D	D
Mequon Road & Concord Creek Drive/Mequon Trail	Two-Way Stop Sign	PM	B	*	*	B	*	*	**F**	**F**	B	**F**	**F**	C
Mequon Road & River Birch Drive	Two-Way Stop Sign	PM	B	*	*	B	*	*	D	D	D	D	D	D
Mequon Road & Buntrock Avenue	Traffic Signal	PM	A	A	A	A	A	A	**E**	**E**	D	D	D	D
Mequon Road & Industrial Drive	Two-Way Stop Sign	PM	B	*	*	B	*	*	**E**	**E**	C	C	C	C
Mequon Road & River Centre West Access/Logeman Access	Two-Way Stop Sign	PM	A	*	*	-	*	*	-	-	B	B	B	B
Mequon Road & River Centre Center Access	Two-Way Stop Sign	PM	-	*	*	C	*	-	**F**	-	B	-	-	-
Mequon Road & River Centre East Access	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	C	-	-	-
Mequon Road & Cedarburg Road	Traffic Signal	PM	**F**	D	C	**E**	**E**	D	**E**	**F**	D	**F**	D	D

Notes: (-) indicates a movement that is not possible or is prohibited.
(*) indicates a freeflow movement or a movement for which HCM methodologies do not report LOS

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 5-2
YEAR 2025 BACKGROUND TRAFFIC OPERATIONS
WITHOUT IMPROVEMENTS
MEQUON, WISCONSIN

Exhibit 5-3
Year 2010 Build Traffic Operations
Existing Geometrics and Traffic Control

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Mequon Road & Wauwatosa Road	Traffic Signal	PM	D	C	C	D	C	C	C	D	C	C	C	C
Mequon Road & Concord Creek Drive/Mequon Trail	Two-Way Stop Sign	PM	B	*	*	B	*	*	D	D	B	**E**	**E**	B
Mequon Road & Weston Center West Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	B	*	-	C	-	C	-	-	-
Mequon Road & Weston Center East Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & River Birch Drive	Two-Way Stop Sign	PM	B	*	*	B	*	*	C	C	C	C	C	C
Mequon Road & Buntrock Avenue	Traffic Signal	PM	A	A	A	A	A	A	D	D	D	D	D	D
Mequon Road & Brewery Square Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Industrial Drive	Two-Way Stop Sign	PM	A	*	*	B	*	*	D	D	B	C	C	C
Mequon Road & River Centre West Access/Logeman Access	Two-Way Stop Sign	PM	A	*	*	-	*	*	-	-	B	B	B	B
Mequon Road & River Centre Center Access	Two-Way Stop Sign	PM	-	*	*	B	*	-	D	-	B	-	-	-
Mequon Road & River Centre East Access	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Cedarburg Road	Traffic Signal	PM	D	D	C	C	D	D	**E**	D	D	**E**	D	D

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(*) indicates a freeflow movement or a movement for which HCM methodologies do not report LOS

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EXHIBIT DATE: 12-22-2011

EXHIBIT 5-3
YEAR 2010 BUILD TRAFFIC OPERATIONS
WITHOUT IMPROVEMENTS
MEQUON, WISCONSIN

Exhibit 5-5
Year 2025 Build Traffic Operations
Existing Geometrics and Traffic Control

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Mequon Road & Wauwatosa Road	Traffic Signal	PM	**E**	C	C	**E**	**E**	C	C	**E**	D	**E**	D	D
Mequon Road & Area B West Access (Anticipated)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Area B East Access (Anticipated)	Two-Way Stop Sign	PM	-	*	*	B	*	-	**E**	-	**E**	-	-	-
Mequon Road & Concord Creek Drive/Mequon Trail	Two-Way Stop Sign	PM	C	*	*	C	*	*	**F**	**F**	C	**F**	**F**	C
Mequon Road & Area C Access (Anticipated)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	C	-	-	-
Mequon Road & Weston Center West Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	C	*	-	**E**	-	**E**	-	-	-
Mequon Road & Weston Center East Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	C	-	-	-
Mequon Road & River Birch Drive	Two-Way Stop Sign	PM	C	*	*	C	*	*	**F**	**F**	**F**	**F**	**F**	**F**
Mequon Road & Buntrock Avenue	Traffic Signal	PM	D	B	A	B	A	A	**E**	**E**	D	D	D	D
Mequon Road & Brewery Square Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Industrial Drive	Two-Way Stop Sign	PM	B	*	*	D	*	*	**F**	**F**	C	**F**	**F**	**F**
Mequon Road & River Centre West Access/Logeman Access	Two-Way Stop Sign	PM	A	*	*	-	*	*	-	-	B	C	C	C
Mequon Road & River Centre Center Access	Two-Way Stop Sign	PM	-	*	*	D	*	-	**F**	-	C	-	-	-
Mequon Road & River Centre East Access	Two-Way Stop Sign	PM	-	*	*	-	*	*	-	-	D	-	-	B
Mequon Road & Cedarburg Road	Traffic Signal	PM	**F**	**F**	C	**F**	**F**	D	**E**	**F**	D	**E**	D	D

Notes: (-) indicates a movement that is not possible or is prohibited.
(*) indicates a freeflow movement or a movement for which HCM methodologies do not report LOS

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EXHIBIT DATE: 12-22-2011

EXHIBIT 5-5
YEAR 2025 BUILD TRAFFIC OPERATIONS
WITHOUT IMPROVEMENTS
MEQUON, WISCONSIN

Exhibit 5-9
Year 2010 Background Traffic Operations
With Improvements

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Mequon Road & Wauwatosa Road	Traffic Signal	PM	D	C	C	D	C	C	C	D	C	C	C	C
Mequon Road & Concord Creek Drive/Mequon Trail	Two-Way Stop Sign	PM	B	*	*	B	*	*	D	D	B	**E**	**E**	B
Mequon Road & River Birch Drive	Two-Way Stop Sign	PM	B	*	*	B	*	*	C	C	C	C	C	C
Mequon Road & Buntrock Avenue	Traffic Signal	PM	A	A	A	A	A	A	**E**	**E**	D	D	D	D
Mequon Road & Industrial Drive	Two-Way Stop Sign	PM	A	*	*	B	*	*	C	C	B	B	B	B
Mequon Road & River Centre West Access/Logeman Access	Two-Way Stop Sign	PM	A	*	*	-	*	*	-	-	B	B	B	B
Mequon Road & River Centre Center Access	Two-Way Stop Sign	PM	-	*	*	B	*	-	D	-	B	-	-	-
Mequon Road & River Centre East Access	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Cedarburg Road	Traffic Signal	PM	C	C	C	C	D	D	D	D	D	**E**	D	D

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(*) indicates a freeflow movement or a movement for which HCM methodologies do not report LOS

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EXHIBIT DATE: 12-22-2011

EXHIBIT 5-9
YEAR 2010 BACKGROUND TRAFFIC OPERATIONS
WITH IMPROVEMENTS
MEQUON, WISCONSIN

Exhibit 5-11
Year 2025 Background Traffic Operations
With Improvements

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Mequon Road & Wauwatosa Road	Traffic Signal	PM	D	C	C	D	D	C	C	D	D	C	D	D
Mequon Road & Concord Creek Drive/Mequon Trail	Two-Way Stop Sign	PM	B	*	*	B	*	*	**F**	**F**	B	**F**	**F**	C
Mequon Road & River Birch Drive	Two-Way Stop Sign	PM	B	*	*	B	*	*	D	D	D	D	D	D
Mequon Road & Buntrock Avenue	Traffic Signal	PM	A	A	A	A	A	A	**E**	**E**	D	D	D	D
Mequon Road & Industrial Drive	Two-Way Stop Sign	PM	B	*	*	B	*	*	**E**	**E**	C	C	C	C
Mequon Road & River Centre West Access/Logeman Access	Two-Way Stop Sign	PM	A	*	*	-	*	*	-	-	B	B	B	B
Mequon Road & River Centre Center Access	Two-Way Stop Sign	PM	-	*	*	C	*	-	**E**	-	B	-	-	-
Mequon Road & River Centre East Access	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Cedarburg Road	Traffic Signal	PM	**E**	D	C	**E**	D	C	**E**	D	D	**E**	C	C

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(*) indicates a freeflow movement or a movement for which HCM methodologies do not report LOS

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EXHIBIT DATE: 12-22-2011

EXHIBIT 5-11
YEAR 2025 BACKGROUND TRAFFIC OPERATIONS
WITH IMPROVEMENTS
MEQUON, WISCONSIN

Exhibit 5-12A
Year 2010 Build Traffic Operations
With Alternative One Improvements
(No Speed Limit Changes, No Parking/Bike Lanes)

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Mequon Road & Wauwatosa Road	Traffic Signal	PM	D	C	C	D	C	C	C	D	C	C	C	C
Mequon Road & Concord Creek Drive/Mequon Trail	Two-Way Stop Sign	PM	B	*	*	B	*	*	D	D	B	**E**	**E**	B
Mequon Road & Weston Center West Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	B	*	-	C	-	C	-	-	-
Mequon Road & Weston Center East Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & River Birch Drive	Two-Way Stop Sign	PM	B	*	*	B	*	*	C	C	C	C	C	C
Mequon Road & Buntrock Avenue	Traffic Signal	PM	A	A	A	A	A	A	**E**	**E**	D	D	D	D
Mequon Road & Brewery Square Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Industrial Drive	Two-Way Stop Sign	PM	A	*	*	B	*	*	D	D	B	C	C	C
Mequon Road & River Centre West Access/Logeman Access	Two-Way Stop Sign	PM	A	*	*	-	*	*	-	-	B	B	B	B
Mequon Road & River Centre Center Access	Two-Way Stop Sign	PM	-	*	*	B	*	-	D	-	B	-	-	-
Mequon Road & River Centre East Access	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Cedarburg Road	Traffic Signal	PM	D	C	C	C	D	D	**E**	D	D	**E**	D	D

Notes: (-) indicates a movement that is not possible or is prohibited.
(*) indicates a freeflow movement or a movement for which HCM methodologies do not report LOS

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EXHIBIT DATE: 12-22-2011

EXHIBIT 5-12A
YEAR 2010 BUILD TRAFFIC OPERATIONS
WITH ALTERNATIVE ONE IMPROVEMENTS
MEQUON, WISCONSIN

Exhibit 5-12B
Year 2010 Build Traffic Operations
With Alternative Two Improvements
(With Speed Limit Changes, No Parking/Bike Lanes)

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Mequon Road & Wauwatosa Road	Traffic Signal	PM	D	C	C	D	C	C	C	D	C	C	C	C
Mequon Road & Concord Creek Drive/Mequon Trail	Two-Way Stop Sign	PM	B	*	*	B	*	*	D	D	B	**E**	**E**	B
Mequon Road & Weston Center West Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	B	*	-	C	-	C	-	-	-
Mequon Road & Weston Center East Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & River Birch Drive	Two-Way Stop Sign	PM	B	*	*	B	*	*	C	C	C	C	C	C
Mequon Road & Buntrock Avenue	Traffic Signal	PM	A	A	A	A	A	A	**E**	**E**	D	D	D	D
Mequon Road & Brewery Square Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Industrial Drive	Two-Way Stop Sign	PM	A	*	*	B	*	*	D	D	B	C	C	C
Mequon Road & River Centre West Access/Logeman Access	Two-Way Stop Sign	PM	A	*	*	-	*	*	-	-	B	B	B	B
Mequon Road & River Centre Center Access	Two-Way Stop Sign	PM	-	*	*	B	*	-	D	-	B	-	-	-
Mequon Road & River Centre East Access	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Cedarburg Road	Traffic Signal	PM	D	C	C	C	D	D	**E**	D	D	**E**	D	D

Notes: (-) indicates a movement that is not possible or is prohibited.
(*) indicates a freeflow movement or a movement for which HCM methodologies do not report LOS

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 5-12B
YEAR 2010 BUILD TRAFFIC OPERATIONS
WITH ALTERNATIVE TWO IMPROVEMENTS
MEQUON, WISCONSIN

Exhibit 5-12C
Year 2010 Build Traffic Operations
With Alternative Three Improvements
(No Speed Limit Changes, With Parking/Bike Lanes)

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Mequon Road & Wauwatosa Road	Traffic Signal	PM	D	C	C	D	C	C	C	D	C	C	C	C
Mequon Road & Concord Creek Drive/Mequon Trail	Two-Way Stop Sign	PM	B	*	*	B	*	*	D	D	B	**E**	**E**	B
Mequon Road & Weston Center West Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	B	*	-	C	-	C	-	-	-
Mequon Road & Weston Center East Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & River Birch Drive	Two-Way Stop Sign	PM	B	*	*	B	*	*	C	C	C	C	C	C
Mequon Road & Buntrock Avenue	Traffic Signal	PM	A	A	A	A	A	A	**E**	**E**	D	D	D	D
Mequon Road & Brewery Square Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Industrial Drive	Two-Way Stop Sign	PM	A	*	*	B	*	*	D	D	B	C	C	C
Mequon Road & River Centre West Access/Logeman Access	Two-Way Stop Sign	PM	A	*	*	-	*	*	-	-	B	B	B	B
Mequon Road & River Centre Center Access	Two-Way Stop Sign	PM	-	*	*	B	*	-	D	-	B	-	-	-
Mequon Road & River Centre East Access	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Cedarburg Road	Traffic Signal	PM	D	C	C	C	D	D	**E**	D	D	**E**	D	D

Notes: (-) indicates a movement that is not possible or is prohibited.
(*) indicates a freeflow movement or a movement for which HCM methodologies do not report LOS

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EXHIBIT DATE: 12-22-2011

EXHIBIT 5-12C
YEAR 2010 BUILD TRAFFIC OPERATIONS
WITH ALTERNATIVE THREE IMPROVEMENTS
MEQUON, WISCONSIN

Exhibit 5-12D
Year 2010 Build Traffic Operations
With Alternative Four Improvements
(With Speed Limit Changes, With Parking/Bike Lanes)

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Mequon Road & Wauwatosa Road	Traffic Signal	PM	D	C	C	D	C	C	C	D	C	C	C	C
Mequon Road & Concord Creek Drive/Mequon Trail	Two-Way Stop Sign	PM	B	*	*	B	*	*	D	D	B	**E**	**E**	B
Mequon Road & Weston Center West Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	B	*	-	C	-	C	-	-	-
Mequon Road & Weston Center East Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & River Birch Drive	Two-Way Stop Sign	PM	B	*	*	B	*	*	C	C	C	C	C	C
Mequon Road & Buntrock Avenue	Traffic Signal	PM	A	A	A	A	A	A	**E**	**E**	D	D	D	D
Mequon Road & Brewery Square Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Industrial Drive	Two-Way Stop Sign	PM	A	*	*	B	*	*	D	D	B	C	C	C
Mequon Road & River Centre West Access/Logeman Access	Two-Way Stop Sign	PM	A	*	*	-	*	*	-	-	B	B	B	B
Mequon Road & River Centre Center Access	Two-Way Stop Sign	PM	-	*	*	B	*	-	D	-	B	-	-	-
Mequon Road & River Centre East Access	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Cedarburg Road	Traffic Signal	PM	D	C	C	C	D	D	**E**	D	D	**E**	D	D

Notes: (-) indicates a movement that is not possible or is prohibited.
(*) indicates a freeflow movement or a movement for which HCM methodologies do not report LOS

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EXHIBIT DATE: 12-22-2011

EXHIBIT 5-12D
YEAR 2010 BUILD TRAFFIC OPERATIONS
WITH ALTERNATIVE FOUR IMPROVEMENTS
MEQUON, WISCONSIN

Exhibit 5-14A
Year 2025 Build Traffic Operations
With Alternative One Improvements
(No Speed Limit Changes, No Parking/Bike Lanes)

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Mequon Road & Wauwatosa Road	Traffic Signal	PM	D	C	C	D	D	C	C	D	D	D	D	C
Mequon Road & Area B West Access (Anticipated)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Area B East Access (Anticipated)	Two-Way Stop Sign	PM	-	*	*	B	*	-	**E**	-	**E**	-	-	-
Mequon Road & Concord Creek Drive/Mequon Trail	Two-Way Stop Sign	PM	C	*	*	C	*	*	**F**	**F**	C	**F**	**F**	C
Mequon Road & Area C Access (Anticipated)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	C	-	-	-
Mequon Road & Weston Center West Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	C	*	-	**E**	-	**E**	-	-	-
Mequon Road & Weston Center East Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	C	-	-	-
Mequon Road & River Birch Drive	Two-Way Stop Sign	PM	C	*	*	C	*	*	**F**	**F**	**F**	**F**	**F**	**F**
Mequon Road & Buntrock Avenue	Traffic Signal	PM	C	C	B	D	B	A	D	D	D	D	D	D
Mequon Road & Brewery Square Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Industrial Drive	Traffic Signal	PM	A	A	A	D	A	A	**E**	**E**	D	D	D	D
Mequon Road & River Centre West Access/Logeman Access	Two-Way Stop Sign	PM	A	*	*	-	*	*	-	-	B	C	C	C
Mequon Road & River Centre Center Access	Two-Way Stop Sign	PM	-	*	*	D	*	-	**F**	-	B	-	-	-
Mequon Road & River Centre East Access	Two-Way Stop Sign	PM	-	*	*	-	*	*	-	-	A	-	-	A
Mequon Road & Cedarburg Road	Traffic Signal	PM	**E**	D	C	**E**	D	B	**E**	**F**	D	**E**	D	B

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(*) indicates a freeflow movement or a movement for which HCM methodologies do not report LOS

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EXHIBIT DATE: 12-22-2011

EXHIBIT 5-14A
YEAR 2025 BUILD TRAFFIC OPERATIONS
WITH ALTERNATIVE ONE IMPROVEMENTS
MEQUON, WISCONSIN

Exhibit 5-14B
Year 2025 Build Traffic Operations
With Alternative Two Improvements
(With Speed Limit Changes, No Parking/Bike Lanes)

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Mequon Road & Wauwatosa Road	Traffic Signal	PM	D	C	C	D	D	C	C	D	D	D	D	C
Mequon Road & Area B West Access (Anticipated)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Area B East Access (Anticipated)	Two-Way Stop Sign	PM	-	*	*	B	*	-	**E**	-	**E**	-	-	-
Mequon Road & Concord Creek Drive/Mequon Trail	Two-Way Stop Sign	PM	C	*	*	C	*	*	**F**	**F**	C	**F**	**F**	C
Mequon Road & Area C Access (Anticipated)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	C	-	-	-
Mequon Road & Weston Center West Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	C	*	-	**E**	-	**E**	-	-	-
Mequon Road & Weston Center East Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	C	-	-	-
Mequon Road & River Birch Drive	Two-Way Stop Sign	PM	C	*	*	C	*	*	**F**	**F**	**F**	**F**	**F**	**F**
Mequon Road & Buntrock Avenue	Traffic Signal	PM	C	C	B	D	B	A	D	D	D	D	D	D
Mequon Road & Brewery Square Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Industrial Drive	Traffic Signal	PM	A	A	A	**E**	A	A	**E**	**E**	D	D	D	D
Mequon Road & River Centre West Access/Logeman Access	Two-Way Stop Sign	PM	A	*	*	-	*	*	-	-	B	C	C	C
Mequon Road & River Centre Center Access	Two-Way Stop Sign	PM	-	*	*	D	*	-	**F**	-	B	-	-	-
Mequon Road & River Centre East Access	Two-Way Stop Sign	PM	-	*	*	-	*	*	-	-	A	-	-	A
Mequon Road & Cedarburg Road	Traffic Signal	PM	**E**	D	C	**E**	D	B	**E**	**F**	D	**E**	D	B

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EXHIBIT DATE: 12-22-2011

EXHIBIT 5-14B
YEAR 2025 BUILD TRAFFIC OPERATIONS
WITH ALTERNATIVE TWO IMPROVEMENTS
MEQUON, WISCONSIN

Exhibit 5-14C
Year 2025 Build Traffic Operations
With Alternative Three Improvements
(No Speed Limit Changes, With Parking/Bike Lanes)

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Mequon Road & Wauwatosa Road	Traffic Signal	PM	D	C	C	D	D	C	C	D	D	D	D	C
Mequon Road & Area B West Access (Anticipated)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Area B East Access (Anticipated)	Two-Way Stop Sign	PM	-	*	*	B	*	-	**E**	-	**E**	-	-	-
Mequon Road & Concord Creek Drive/Mequon Trail	Two-Way Stop Sign	PM	C	*	*	C	*	*	**F**	**F**	C	**F**	**F**	C
Mequon Road & Area C Access (Anticipated)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	C	-	-	-
Mequon Road & Weston Center West Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	C	*	-	**E**	-	**E**	-	-	-
Mequon Road & Weston Center East Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	C	-	-	-
Mequon Road & River Birch Drive	Two-Way Stop Sign	PM	C	*	*	C	*	*	**F**	**F**	**F**	**F**	**F**	**F**
Mequon Road & Buntrock Avenue	Traffic Signal	PM	C	C	B	D	B	B	D	D	D	D	D	D
Mequon Road & Brewery Square Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Industrial Drive	Traffic Signal	PM	A	B	A	D	B	B	**E**	**E**	D	D	D	D
Mequon Road & River Centre West Access/Logeman Access	Two-Way Stop Sign	PM	A	*	*	-	*	*	-	-	B	C	C	C
Mequon Road & River Centre Center Access	Two-Way Stop Sign	PM	-	*	*	D	*	-	**F**	-	B	-	-	-
Mequon Road & River Centre East Access	Two-Way Stop Sign	PM	-	*	*	-	*	*	-	-	C	-	-	A
Mequon Road & Cedarburg Road	Traffic Signal	PM	**E**	D	C	**E**	D	B	**E**	**F**	D	**E**	D	B

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(*) indicates a freeflow movement or a movement for which HCM methodologies do not report LOS

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EXHIBIT DATE: 12-22-2011

EXHIBIT 5-14C
YEAR 2025 BUILD TRAFFIC OPERATIONS
WITH ALTERNATIVE THREE IMPROVEMENTS
MEQUON, WISCONSIN

Exhibit 5-14D
Year 2025 Build Traffic Operations
With Alternative Four Improvements
(With Speed Limit Changes, With Parking/Bike Lanes)

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Mequon Road & Wauwatosa Road	Traffic Signal	PM	D	C	C	D	D	C	C	D	D	D	D	C
Mequon Road & Area B West Access (Anticipated)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Area B East Access (Anticipated)	Two-Way Stop Sign	PM	-	*	*	B	*	-	**E**	-	**E**	-	-	-
Mequon Road & Concord Creek Drive/Mequon Trail	Two-Way Stop Sign	PM	C	*	*	C	*	*	**F**	**F**	C	**F**	**F**	C
Mequon Road & Area C Access (Anticipated)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	C	-	-	-
Mequon Road & Weston Center West Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	C	*	-	**E**	-	**E**	-	-	-
Mequon Road & Weston Center East Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	C	-	-	-
Mequon Road & River Birch Drive	Two-Way Stop Sign	PM	C	*	*	C	*	*	**F**	**F**	**F**	**F**	**F**	**F**
Mequon Road & Buntrock Avenue	Traffic Signal	PM	C	C	B	D	B	B	D	D	D	D	D	D
Mequon Road & Brewery Square Access (Proposed)	Two-Way Stop Sign	PM	-	*	*	-	*	-	-	-	B	-	-	-
Mequon Road & Industrial Drive	Traffic Signal	PM	A	B	A	**E**	A	A	**E**	**E**	D	D	D	D
Mequon Road & River Centre West Access/Logeman Access	Two-Way Stop Sign	PM	A	*	*	-	*	*	-	-	B	C	C	C
Mequon Road & River Centre Center Access	Two-Way Stop Sign	PM	-	*	*	D	*	-	**F**	-	B	-	-	-
Mequon Road & River Centre East Access	Two-Way Stop Sign	PM	-	*	*	-	*	*	-	-	C	-	-	A
Mequon Road & Cedarburg Road	Traffic Signal	PM	**E**	D	C	**E**	D	B	**E**	**F**	D	**E**	D	B

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(*) indicates a freeflow movement or a movement for which HCM methodologies do not report LOS

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EXHIBIT DATE: 12-22-2011

EXHIBIT 5-14D
YEAR 2025 BUILD TRAFFIC OPERATIONS
WITH ALTERNATIVE FOUR IMPROVEMENTS
MEQUON, WISCONSIN

Exhibit 5-14E
Year 2025 Build Traffic Operations
With Alternative Five Improvements
(Roundabout at Buntrock Avenue and at Industrial Drive)

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Mequon Road & Buntrock Avenue	Roundabt	PM	A			A			A			A		
Mequon Road & Industrial Drive	Roundabt	PM	A			A			B			D		

Notes: (-) indicates a movement that is not possible or is prohibited.
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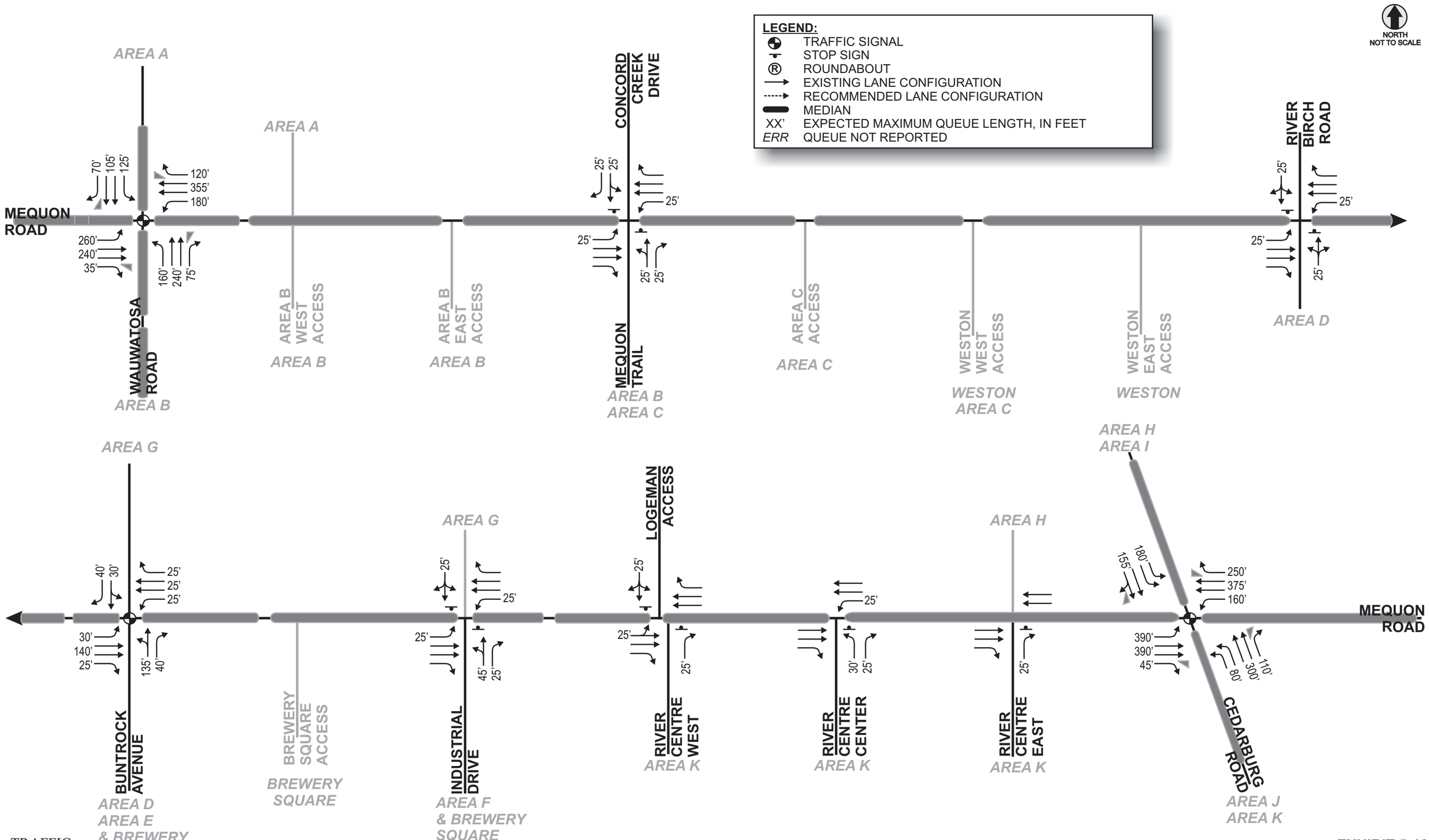
EXHIBIT DATE: 12-22-2011

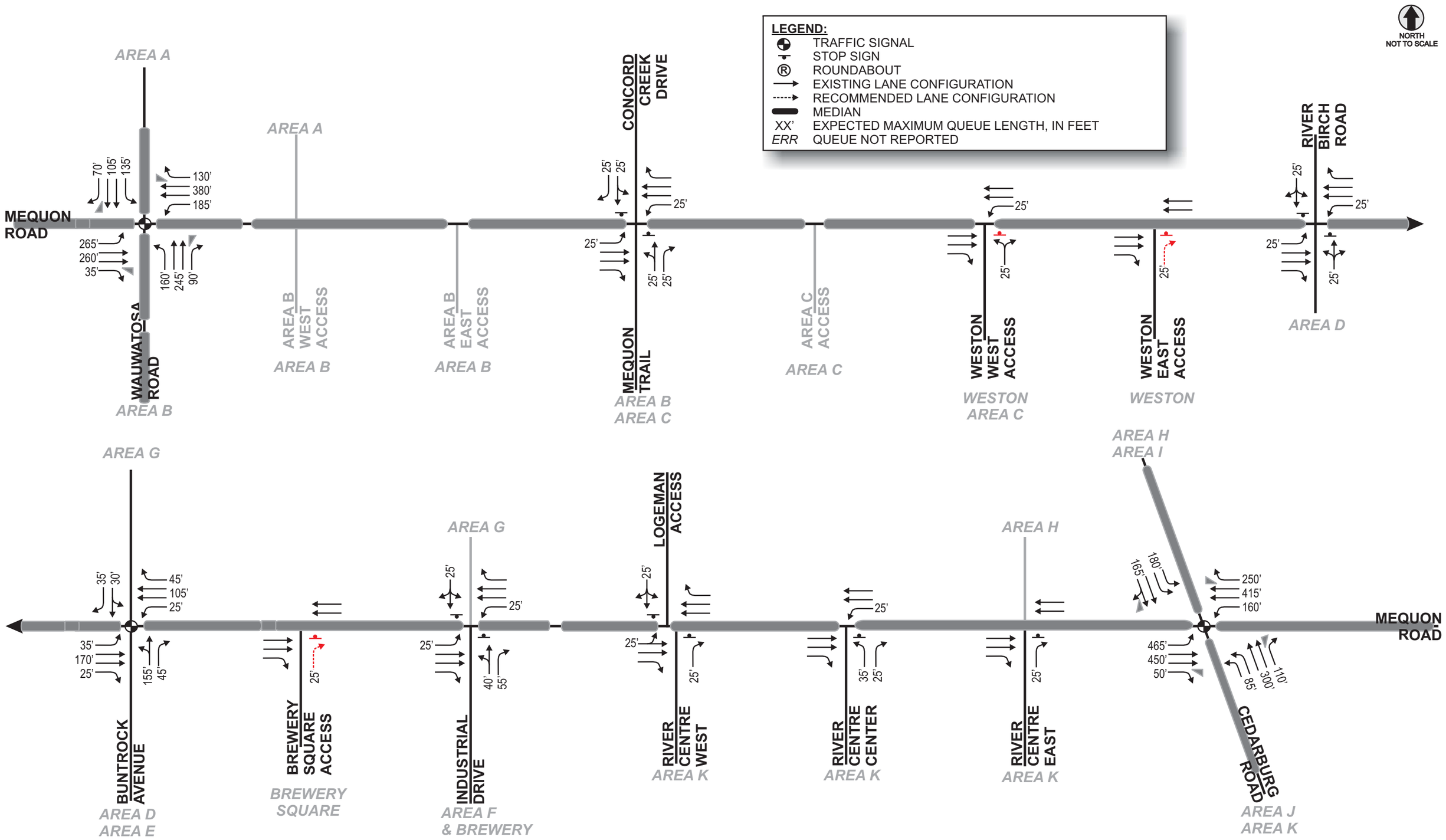
EXHIBIT 5-14E
YEAR 2025 BUILD TRAFFIC OPERATIONS
WITH ALTERNATIVE FIVE IMPROVEMENTS
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

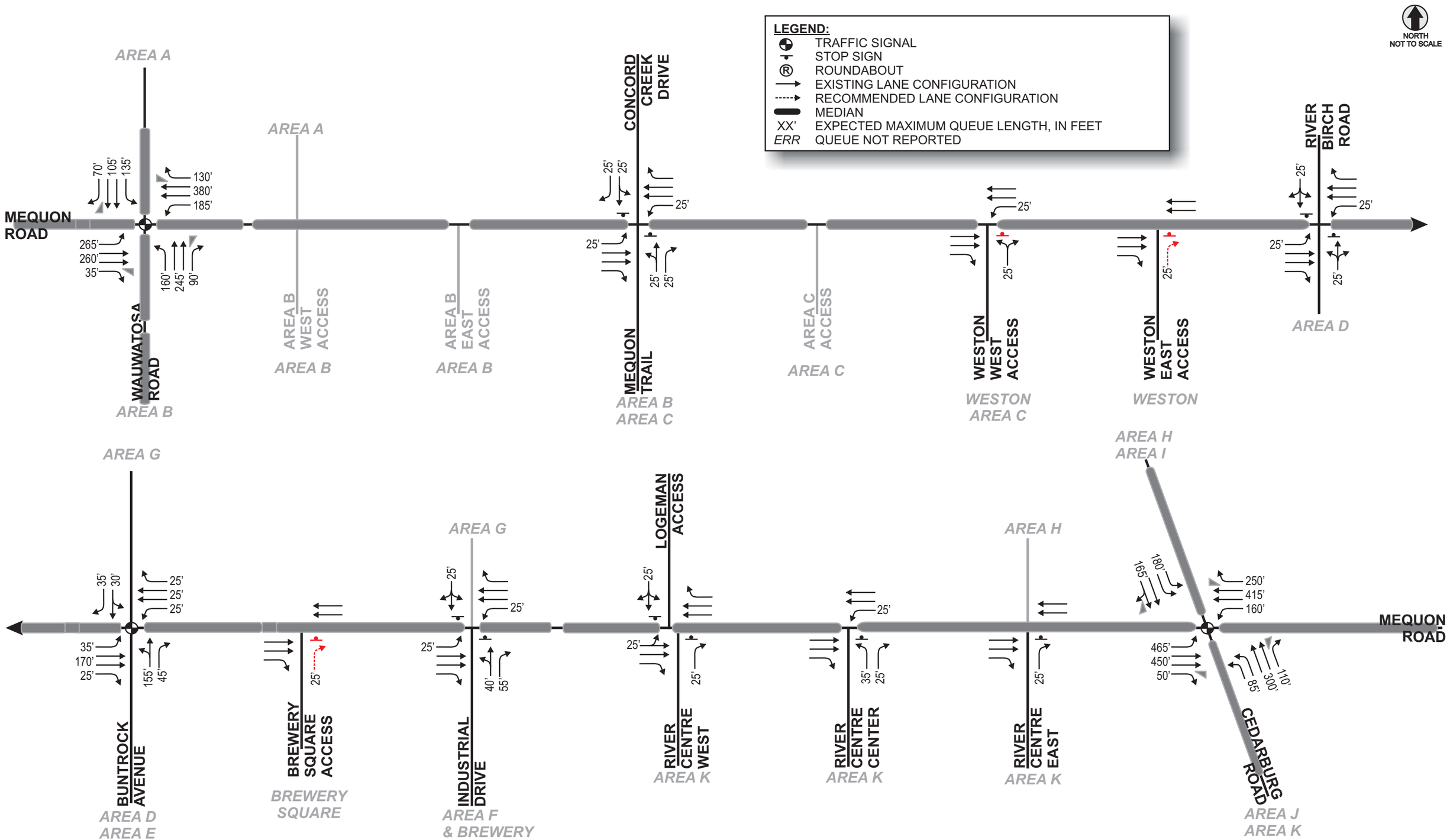
EXHIBIT 5-18
YEAR 2010 BACKGROUND TRAFFIC, WITH IMPROVEMENTS
EXPECTED MAXIMUM QUEUES
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

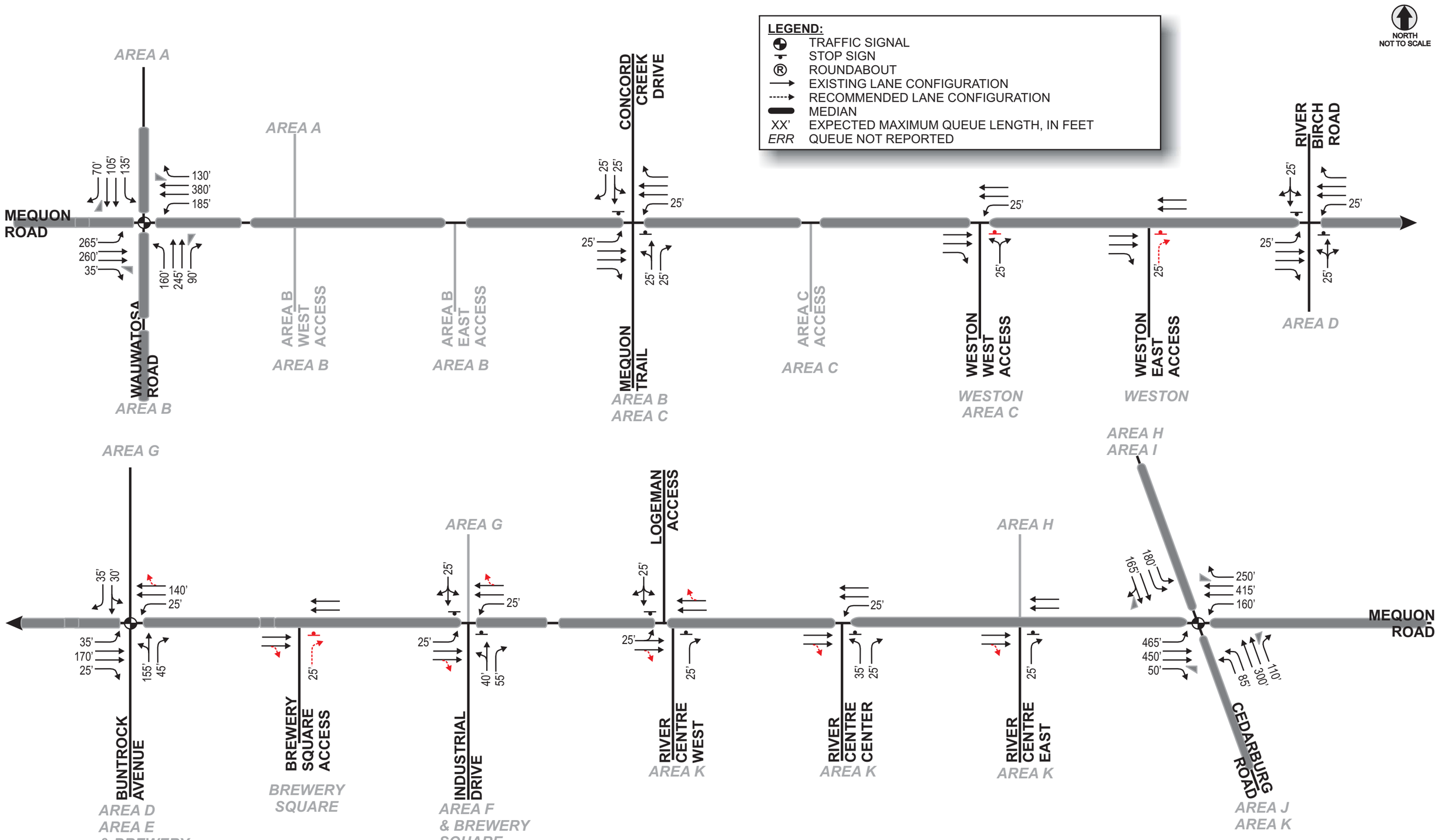
EXHIBIT 5-19A
YEAR 2010 BUILD TRAFFIC, WITH ALTERNATIVE ONE IMPROVEMENTS
EXPECTED MAXIMUM QUEUES
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

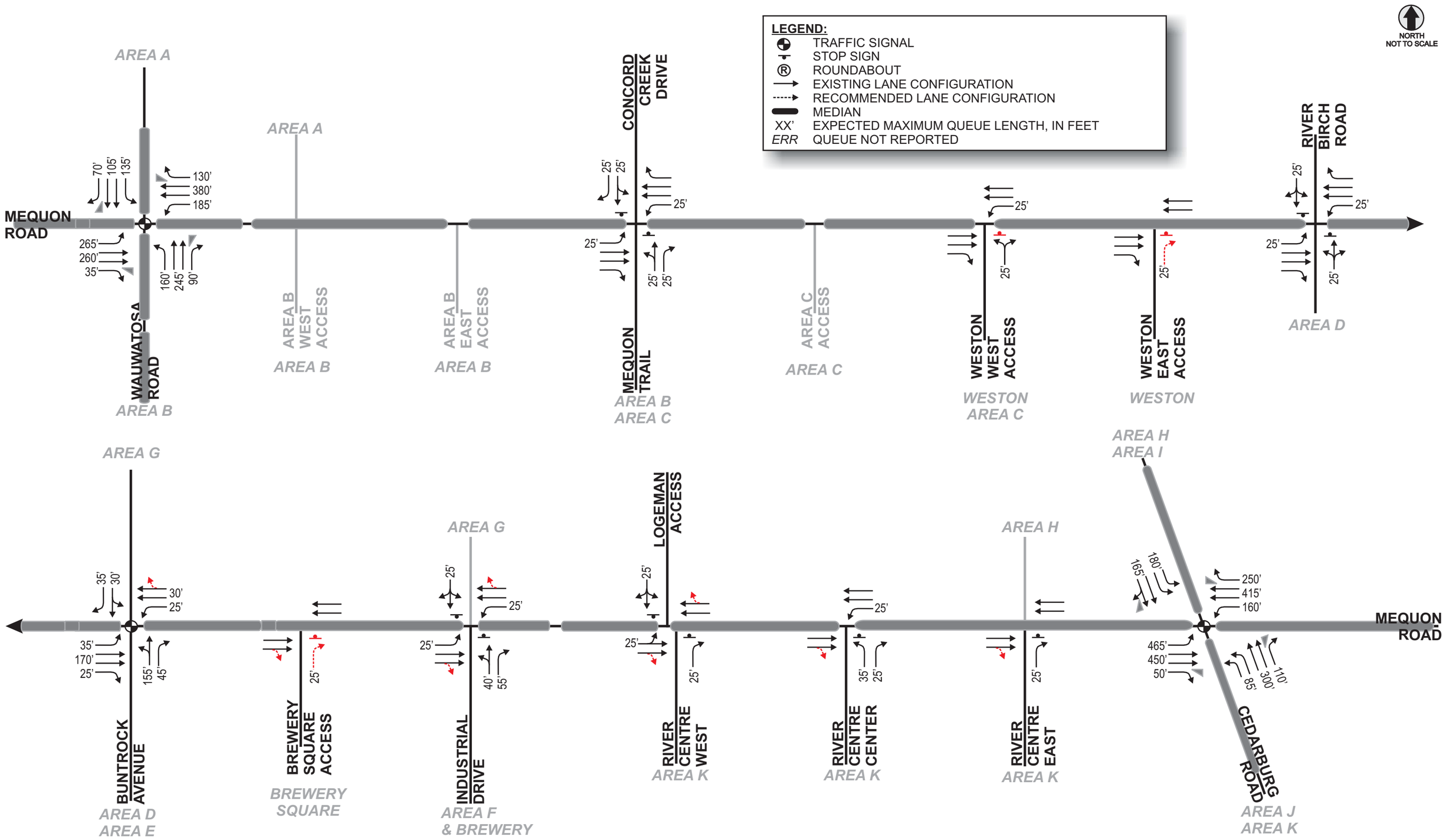
EXHIBIT 5-19B
YEAR 2010 BUILD TRAFFIC, WITH ALTERNATIVE TWO IMPROVEMENTS
EXPECTED MAXIMUM QUEUES
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 5-19C
YEAR 2010 BUILD TRAFFIC, WITH ALTERNATIVE THREE IMPROVEMENTS
EXPECTED MAXIMUM QUEUES
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 5-19D
YEAR 2010 BUILD TRAFFIC, WITH ALTERNATIVE FOUR IMPROVEMENTS
EXPECTED MAXIMUM QUEUES
MEQUON, WISCONSIN

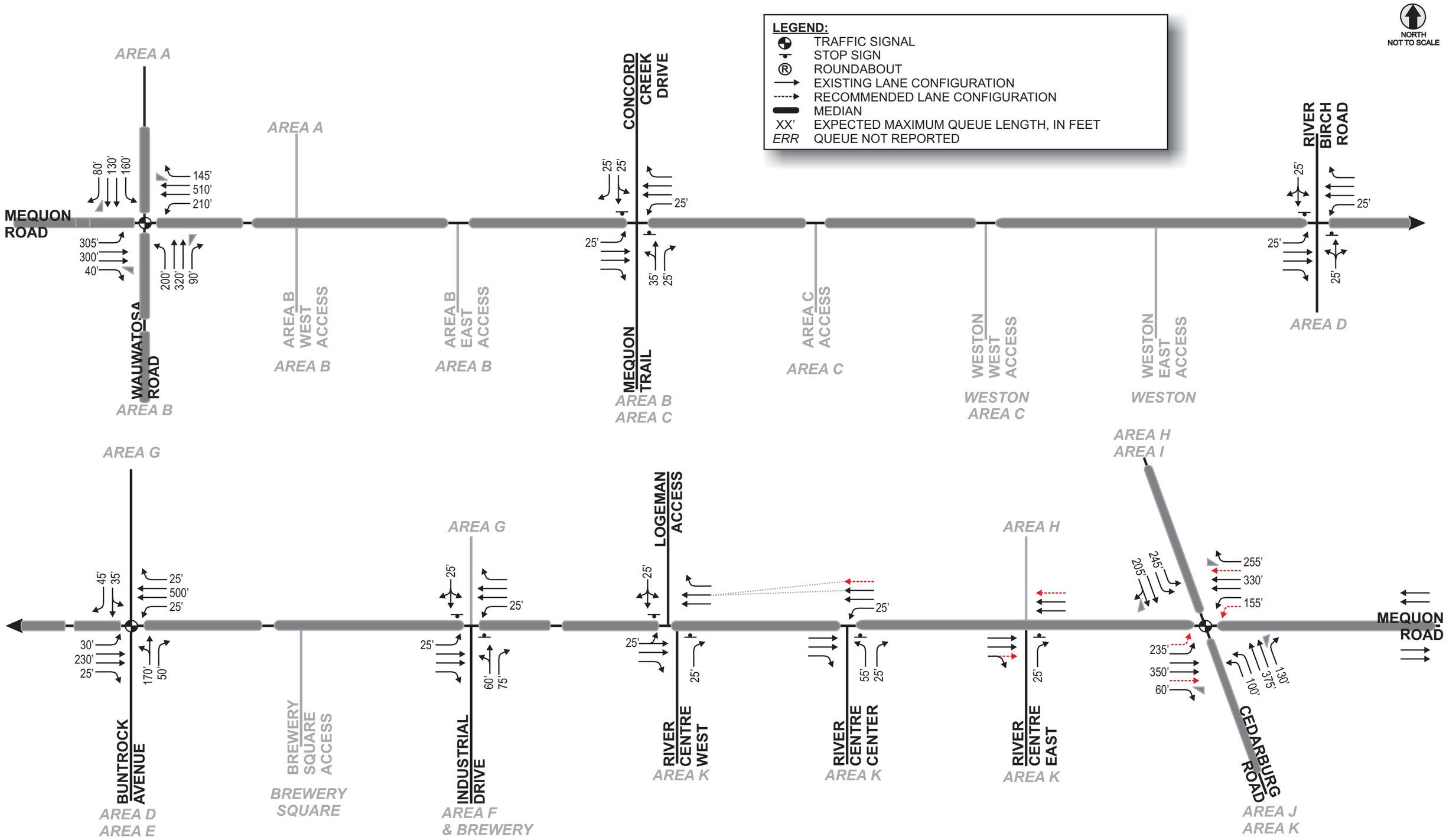


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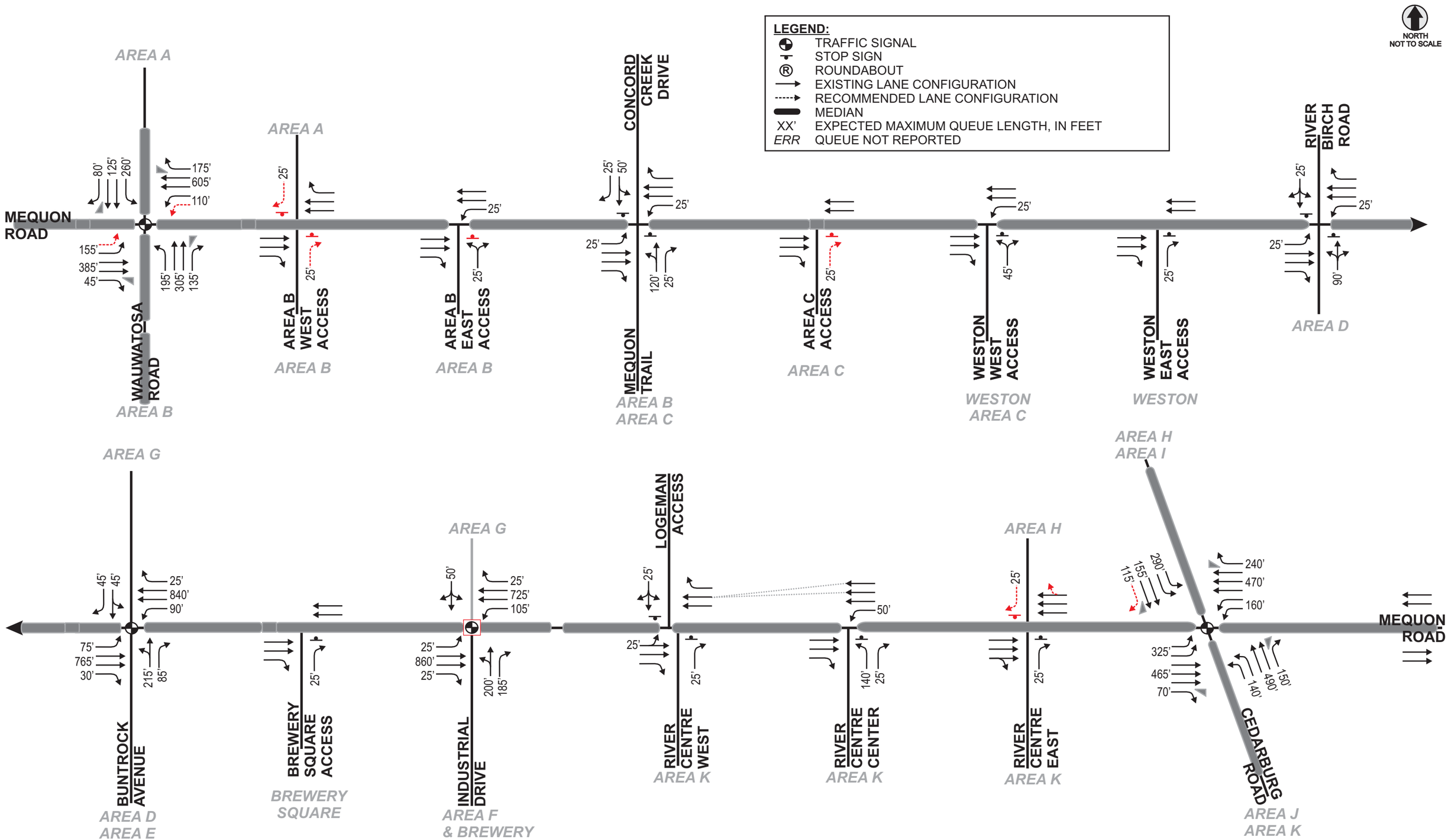
EXHIBIT DATE: 12-22-2011

EXHIBIT 5-24
YEAR 2025 BACKGROUND TRAFFIC, WITH IMPROVEMENTS
EXPECTED MAXIMUM QUEUES
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 5-25A
YEAR 2025 BUILD TRAFFIC, WITH ALTERNATIVE ONE IMPROVEMENTS
EXPECTED MAXIMUM QUEUES
MEQUON, WISCONSIN

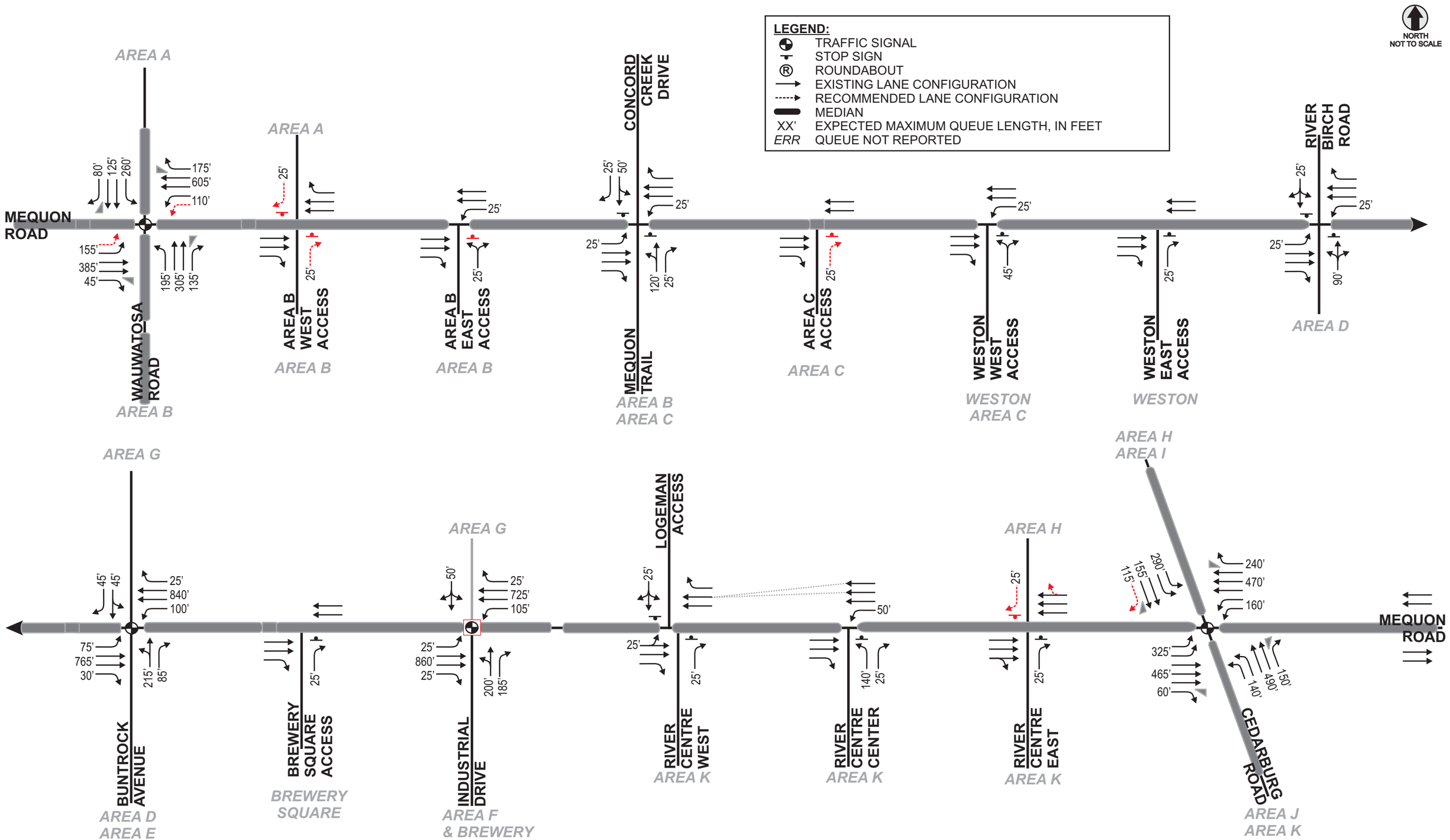


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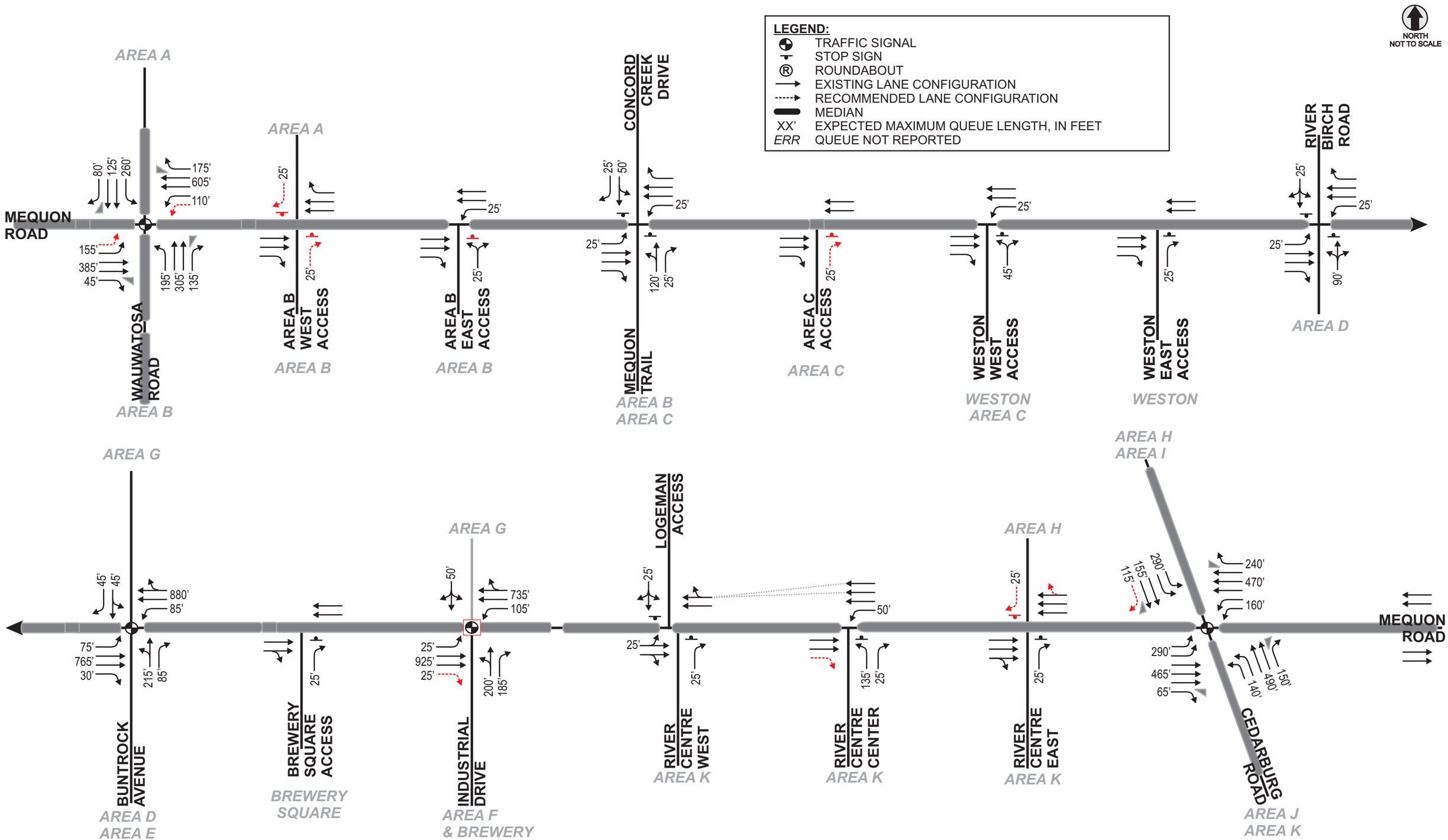
EXHIBIT DATE: 12-22-2011

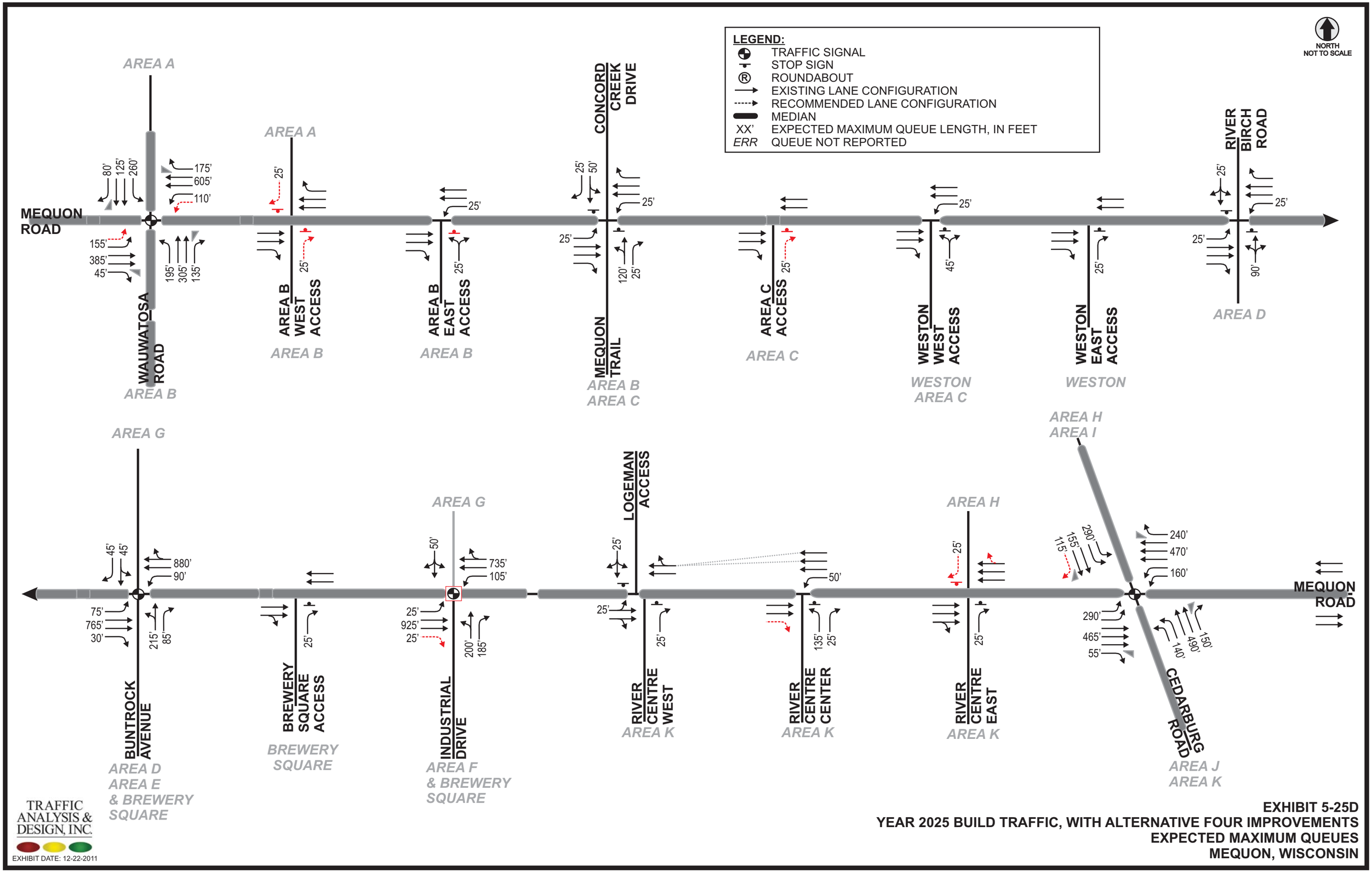
EXHIBIT 5-25B
YEAR 2025 BUILD TRAFFIC, WITH ALTERNATIVE TWO IMPROVEMENTS
EXPECTED MAXIMUM QUEUES
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

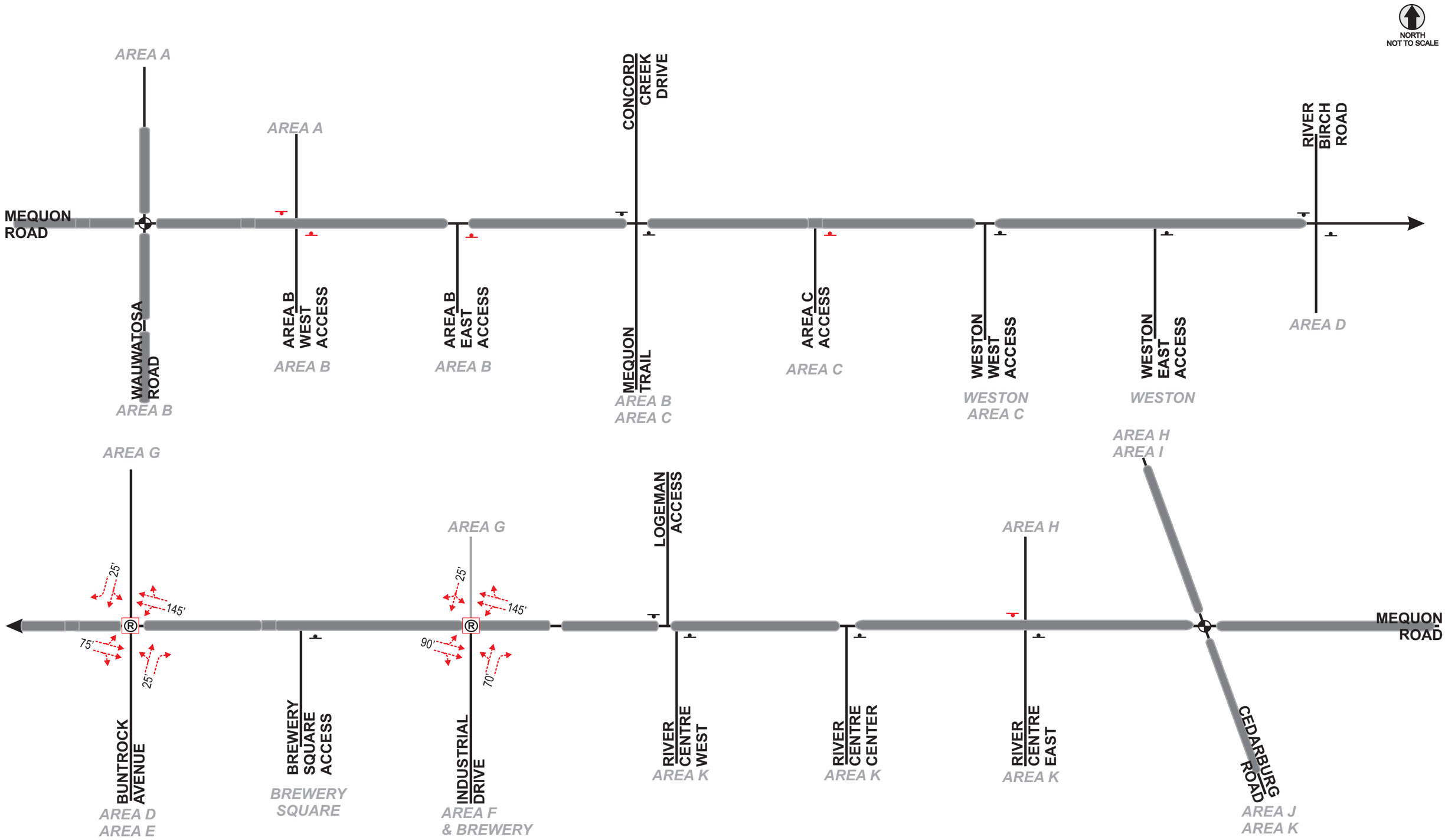
EXHIBIT 5-25C
YEAR 2025 BUILD TRAFFIC, WITH ALTERNATIVE THREE IMPROVEMENTS
EXPECTED MAXIMUM QUEUES
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

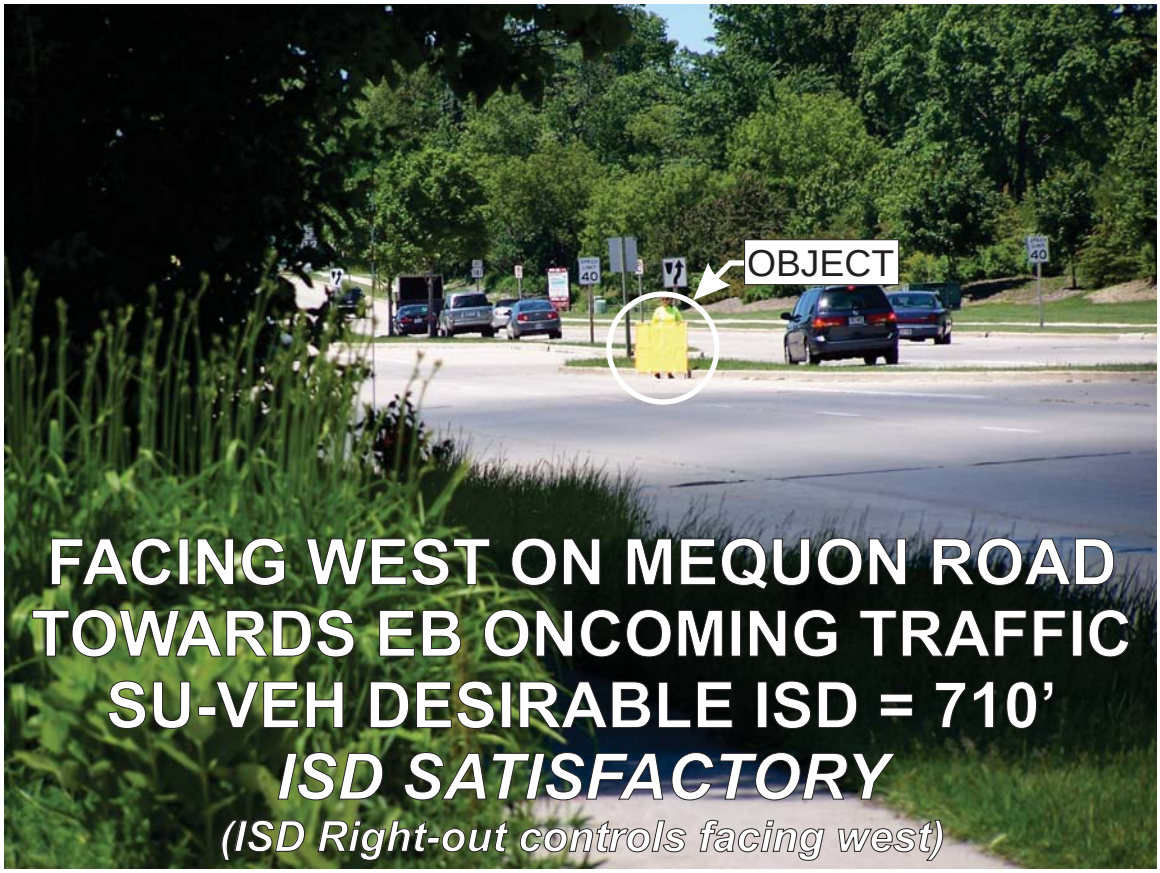
EXHIBIT 5-25D
YEAR 2025 BUILD TRAFFIC, WITH ALTERNATIVE FOUR IMPROVEMENTS
EXPECTED MAXIMUM QUEUES
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 5-25E
YEAR 2025 BUILD TRAFFIC, WITH ALTERNATIVE FIVE IMPROVEMENTS
EXPECTED MAXIMUM QUEUES
MEQUON, WISCONSIN



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 5-27A
INTERSECTION SIGHT DISTANCE PHOTOS
MEQUON ROAD & WESTON CENTER WEST ACCESS
FACING WEST TOWARDS EASTBOUND ONCOMING TRAFFIC
MEQUON, WISCONSIN

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 5-27B
INTERSECTION SIGHT DISTANCE PHOTOS
MEQUON ROAD & WESTON CENTER WEST ACCESS
FACING EAST TOWARDS WESTBOUND ONCOMING TRAFFIC
MEQUON, WISCONSIN

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 5-27C
INTERSECTION SIGHT DISTANCE PHOTOS
MEQUON ROAD & WESTON CENTER EAST ACCESS
FACING WEST TOWARDS EASTBOUND ONCOMING TRAFFIC
MEQUON, WISCONSIN

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 5-27D
INTERSECTION SIGHT DISTANCE PHOTOS
MEQUON ROAD & BREWERY SQUARE ACCESS
FACING WEST TOWARDS EASTBOUND ONCOMING TRAFFIC
MEQUON, WISCONSIN

CHAPTER VI – RECOMMENDATIONS AND CONCLUSION

PART A – RECOMMENDATIONS

A1. Year 2010 Background Traffic – Recommended Improvements

Year 2010 background traffic volumes assume annual traffic growth within the study area but do not include any development. The analysis was conducted using existing intersection geometrics and traffic control. The following improvements are recommended to accommodate the Year 2010 background traffic volumes. *Improvements are for jurisdictional consideration and are not legally binding. WisDOT reserves the right to determine alternative solutions.*

Mequon Road & Wauwatosa Road

- Extend the Mequon Road eastbound left-turn lane. This improvement will require closing the median opening approximately 180-feet west of Wauwatosa Road (centerline-to-centerline). Impacted BP gas station patrons and Crossroads of Mequon patrons may utilize downstream U-turn locations and/or secondary access points to Wauwatosa Road to continue in their intended directions.

Mequon Road & Concord Creek Drive/Mequon Trail

- The Concord Creek Drive southbound left-turn/through movement is expected to operate at LOS E with approximately 5-seconds of average delay over the LOS D/E threshold. The movement services little volume (10 vehicles per hour) and, therefore, no improvements are expected to be necessary.

Mequon Road & River Birch Drive

- No improvements are expected to be necessary.

Mequon Road & Buntrock Avenue

- Modify the traffic signal timings. Note that the Buntrock Avenue northbound left-turn/through movement is expected to operate at LOS E with approximately 3-seconds of average delay over the LOS D/E threshold. The approach services moderate volumes, opposes little southbound traffic, and has a 40-second signal split. No further improvements are expected to be necessary.

Mequon Road & Industrial Drive

- No improvements are expected to be necessary.

Mequon Road & River Centre West Access/Logeman Access

- No improvements are expected to be necessary.

Mequon Road & River Centre Center Access

- No improvements are expected to be necessary.

Mequon Road & River Centre East Access

- No improvements are expected to be necessary.

Mequon Road & Cedarburg Road

- Extend the Mequon Road eastbound left-turn as far west as possible without impacting the turn-bay into the River Centre center access. Additional storage is

expected to be necessary but may not be feasible without impacting either the median cross-section of Mequon Road or access to the River Centre.

- Modify the traffic signal timings. Note that the Cedarburg Road southbound left-turn movement is expected to operate at LOS E with approximately 1.5-seconds of average delay over the LOS D/E threshold. Improving this movement to LOS D or better conditions would result in other movements at LOS E or require additional lanes at the intersection. The southbound left-turn queue can fit within the existing turn-bay storage and, therefore, no further improvements are expected to be necessary.

A2. Year 2010 Build Traffic – Recommended Improvements

Year 2010 build traffic volumes include phase one of the Mequon Town Center redevelopment (i.e. Brewery Square and Weston Center).

Recall that the City of Mequon wishes to reduce speed limits along Mequon Road from 40 mph to 35 mph between Wauwatosa Road and Buntrock Avenue, and 30 mph between Buntrock Avenue and Cedarburg Road. The City also wishes to adjust the highway cross-section between Buntrock Avenue and Cedarburg Road to a more contextually-sensitive roadway environment, including a 24-foot wide median, 11-foot through lanes on both sides of the median, bicycle lanes on both sides of the highway, and parking along the south side of the highway. This cross-section would eliminate the auxiliary lanes on both sides of Mequon Road. Four alternatives were considered.

- Alternative One: No speed limit changes, no parking/bike lanes
- Alternative Two: Speed limit changes, no parking/bike lanes
- Alternative Three: No speed limit changes, with parking/bike lanes
- Alternative Four: Speed limit changes, with parking/bike lanes

The following improvements, shown in Exhibits 1-3a and 1-3b, are recommended to accommodate the Year 2010 build traffic volumes. These improvements are in addition to the Year 2010 background traffic recommended improvements shown in Exhibit 1-2. *Improvements are for jurisdictional consideration and are not legally binding. WisDOT and the City of Mequon reserve the right to determine alternative solutions.*

<u>*General Improvements & Considerations*</u>

- *All Alternatives:* Minimize the number of access points along Mequon Road and provide cross-access where feasible.
- *Alternatives Two & Four:* Reduce the speed limit along Mequon Road to 35 mph between Wauwatosa Road and Buntrock Avenue, and to 30 mph between Buntrock Avenue and Cedarburg Road, to provide a more urbanized feel to the highway.
- *Alternatives Three & Four:* Modify the cross-section along Mequon Road between Buntrock Avenue and Cedarburg Road to include a 5-foot wide westbound on-street bicycle lane, two 11-foot westbound through lanes, a 24-foot wide median (which will accommodate left-turn bays), two 11-foot eastbound through lanes, a 5-foot wide eastbound on-street bicycle lane, and a 9-foot wide eastbound parallel parking lane. The existing auxiliary lanes (and thus right-turn lanes) will no longer exist.

- *Alternatives Three & Four:* Restrict parking within at least 20-feet of the curb return of unsignalized intersections (or within sight-triangle, whichever is greater), at least 30-feet of the curb return of signalized intersections (or within sight-triangle, whichever is greater), and at least 50-feet from midblock crosswalks (i.e. the Ozaukee Interurban Trail). To increase available sight distance for motorists exiting side streets and access points, consider curb extensions. Reducing the number of access points to Mequon Road will result in an increase in available on-street parking.

Mequon Road & Wauwatosa Road

- *All Alternatives:* No further improvements are expected to be necessary.

Mequon Road & Concord Creek Drive/Mequon Trail

- *All Alternatives:* The Concord Creek Drive southbound left-turn/through movement is expected to operate at LOS E with approximately 8-seconds of average delay over the LOS D/E threshold. The movement services little volume (10 vehicles per hour) and, therefore, no further improvements are expected to be necessary.

Mequon Road & Weston Center West Access (proposed)

- *All Alternatives:* Construct the Weston Center west access at the existing median opening along Mequon Road approximately 725-feet west of River Birch Drive (centerline-to-centerline).
- *All Alternatives:* An auxiliary lane exists on the south side of the highway that will function as an eastbound right-turn lane at the intersection.
- *All Alternatives:* Extend the exclusive left-turn lane on the Mequon Road westbound approach.
- *All Alternatives:* Provide a shared left-turn/right-turn lane and install a stop sign on the Weston Center west access northbound approach.

Mequon Road & Weston Center East Access (proposed)

- *All Alternatives:* Construct the Weston Center east access as a right-in/right-out access along Mequon Road approximately 450-feet west of River Birch Drive (centerline-to-centerline).
- *All Alternatives:* An auxiliary lane exists on the south side of the highway that will function as an eastbound right-turn lane at the intersection.
- *All Alternatives:* Provide a right-turn only exit lane and install a stop sign on the Weston Center east access northbound approach.

Mequon Road & River Birch Drive

- No further improvements are expected to be necessary.

Mequon Road & Buntrock Avenue

- *All Alternatives:* Close the median opening approximately 180-feet west of Buntrock Avenue (centerline-to-centerline). Impacted patrons to the business on the north side of the highway may utilize downstream U-turn locations to continue in their intended directions.

- *All Alternatives:* Close the median opening approximately 200-feet east of Buntrock Avenue (centerline-to-centerline). Impacted visitors/operators to the public works facility on the north side of the highway may utilize Buntrock Avenue and internal parking lot connections to continue in their intended directions.
- *All Alternatives:* Modify the traffic signal timings. Note that the Buntrock Avenue northbound left-turn/through movement is expected to operate at LOS E with approximately 5-seconds of average delay over the LOS D/E threshold. The approach services moderate volumes, opposes little southbound traffic, and has a 40-second signal split.
- *Alternatives One & Two:* No further improvements are expected to be necessary.
- *Alternatives Three & Four:* With modifications to lane widths and the inclusion of parking/bike lanes, the westbound auxiliary lane (and thus a westbound right-turn lane) will no longer exist.

Mequon Road & Brewery Square Access (proposed)

- *All Alternatives:* Construct the Brewery Square access along Mequon Road approximately 285-feet east of Buntrock Avenue (centerline-to-centerline). Intersection sight distance is not currently sufficient to allow the right-turn egress movement. If the horizontal and vertical curves west of the access can be corrected, the access may be constructed as a right-in/right-out driveway. If the curves cannot be corrected, the access is recommended to be a right-in only driveway.
- *Alternatives One & Two:* An auxiliary lane exists on the south side of the highway that will function as an eastbound right-turn lane at the intersection.
- *Alternatives Three & Four:* With modifications to lane widths and the inclusion of parking/bike lanes, an eastbound auxiliary lane (and thus an eastbound right-turn lane) will no longer exist.
- *All Alternatives:* If the horizontal and vertical curves west of the access can be corrected and the access constructed as a right-in/right-out driveway, provide a right-turn only exit lane and install a stop sign on the Brewery Square northbound approach.

Mequon Road & Industrial Drive

- *Alternatives One & Two:* No further improvements are expected to be necessary.
- *Alternatives Three & Four:* With modifications to lane widths and the inclusion of parking/bike lanes, the eastbound and westbound auxiliary lanes (and thus the eastbound and westbound right-turn lanes) will no longer exist.

Mequon Road & River Centre West Access/Logeman Access

- *Alternatives One & Two:* No further improvements are expected to be necessary.
- *Alternatives Three & Four:* With modifications to lane widths and the inclusion of parking/bike lanes, the eastbound and westbound auxiliary lanes (and thus the eastbound and westbound right-turn lanes) will no longer be provided.

Mequon Road & River Centre Center Access

- *Alternatives One & Two:* No further improvements are expected to be necessary.
- *Alternatives Three & Four:* With modifications to lane widths and the inclusion of parking/bike lanes, the eastbound auxiliary lane (and thus the eastbound right-turn lane) will no longer exist.

Mequon Road & River Centre East Access

- *Alternatives One & Two:* No further improvements are expected to be necessary.
- *Alternatives Three & Four:* With modifications to lane widths and the inclusion of parking/bike lanes, the eastbound auxiliary lane (and thus the eastbound right-turn lane) will no longer exist.

Mequon Road & Cedarburg Road

- *All Alternatives:* It was recommended under Year 2010 background traffic volumes to extend the Mequon Road eastbound left-turn as far west as possible without impacting the turn-bay into the River Centre center access. Additional storage is expected to be necessary but may not be feasible without impacting either the median cross-section of Mequon Road or access to the River Centre.
- *All Alternatives:* Modify the traffic signal timings. Note that the Cedarburg Road southbound left-turn movement is expected to operate at LOS E with approximately 1.5-seconds of average delay over the LOS D/E threshold, and the Cedarburg Road northbound left-turn movement is expected to operate at LOS E with approximately 0.5-seconds of average delay over the LOS D/E threshold. Improving these movements to LOS D or better conditions would result in other movements at LOS E or require additional lanes at the intersection. The southbound and northbound left-turn queues can fit within existing turn-bay storage lengths.
- *Alternatives One & Two:* No further improvements are expected to be necessary.
- *Alternatives Three & Four:* With modifications to lane widths and the inclusion of parking/bike lanes, the eastbound auxiliary lane (and thus the continuous eastbound right-turn lane) will no longer exist. Provide dedicated eastbound right-turn storage.

A3. Year 2025 Background Traffic – Recommended Improvements

Year 2025 background traffic volumes assume annual traffic growth within the study area but do not include any development. The analysis was conducted using existing intersection geometrics and traffic control. The following improvements, shown in Exhibit 1-8, are recommended to accommodate the Year 2025 background traffic volumes. These improvements are in addition to the Year 2010 background traffic recommended improvements shown in Exhibit 1-2. *Improvements are for jurisdictional consideration and are not legally binding. WisDOT and the City of Mequon reserve the right to determine alternative solutions.*

Mequon Road & Wauwatosa Road

- Extend the Mequon Road eastbound and westbound left-turn lanes.

Mequon Road & Concord Creek Drive/Mequon Trail

- The Concord Creek Drive southbound left-turn/through movement is expected to operate at LOS F with approximately 46-seconds of average delay over the LOS D/E threshold. The Mequon Trail northbound left-turn/through movement is expected to operate at LOS F with approximately 18-seconds of average delay over the LOS D/E threshold. The movements service minor to little volume (15 vehicles per hour southbound, 40 vehicles per hour northbound). No improvements are expected to be necessary. Should delays result in unsafe conditions, consideration may be given to restricting Concord Creek Drive/Mequon Trail to left-in/right-in/right-out only and forcing left-out/through-out movements to downstream U-turn locations.

Mequon Road & River Birch Drive

- No improvements are expected to be necessary.

Mequon Road & Buntrock Avenue

- Install protected-permitted left-turn signal heads to accommodate the Mequon Road eastbound left-turn movement.
- The Buntrock Avenue northbound left-turn/through movement is expected to operate at LOS E with approximately 7-seconds of average delay over the LOS D/E threshold. The approach services moderate volumes, opposes little southbound traffic, and has a 40-second signal split. No further improvements are expected to be necessary.

Mequon Road & Industrial Drive

- The Industrial Drive northbound left-turn/through movement is expected to operate at LOS E with approximately 6-seconds of average delay over the LOS D/E threshold. The movement services moderate volume (85 vehicles per hour). No improvements are expected to be necessary. Should delays result in unsafe conditions, consideration may be given to restricting Industrial Drive to left-in/right-in/right-out only and forcing left-out/through-out movements to downstream U-turn locations.

Mequon Road & River Centre West Access/Logeman Access

- No improvements are expected to be necessary.

Mequon Road & River Centre Center Access

- Three westbound through lanes are expected to be necessary at the Mequon Road intersection with Cedarburg Road. Carry the three lanes west to the River Centre center access and taper to two lanes prior to the railroad tracks.
- The River Centre center access northbound left-turn movement is expected to operate at LOS E with approximately 8-seconds of average delay over the LOS D/E threshold. The movement services moderate volume (75 vehicles per hour). No further improvements are expected to be necessary. Should delays result in unsafe conditions, consideration may be given to restricting the access to left-in/right-in/right-out only and forcing left-out movements to downstream U-turn or other access locations.

Mequon Road & River Centre East Access

- Three westbound through lanes are expected to be necessary at the Mequon Road intersection with Cedarburg Road. Carry the three lanes west to the River Centre center access and taper to two lanes prior to the railroad tracks.
- Three eastbound through lanes are expected to be necessary at the Mequon Road intersection with Cedarburg Road. Due to the eastbound queues at the Cedarburg Road intersection, the eastbound auxiliary lane (and thus the eastbound right-turn lane) at the River Centre east access will be needed as a through lane and will no longer exist.

Mequon Road & Cedarburg Road

- Install protected-only left-turn traffic signal heads on the eastbound and westbound approaches. Install protected-overlap right-turn traffic signal heads to accommodate the westbound right-turn movement.
- Provide an additional eastbound left-turn lane, resulting in dual eastbound left-turn lanes.
- Provide an additional eastbound through lane, resulting in three through lanes and an exclusive right-turn lane (i.e. no eastbound auxiliary lane). The three eastbound through lanes will taper back to two lanes east of the intersection.
- Provide an additional westbound left-turn lane, resulting in dual westbound left-turn lanes. Note that providing dual westbound left-turn lanes will require improvements to the bridge over the Milwaukee River.
- Provide an additional westbound through lane, resulting in three through lanes, and maintain an exclusive westbound right-turn lane. Carry the three through lanes west to the River Centre center access and taper to two lanes prior to the railroad tracks. Note that maintaining an exclusive westbound right-turn lane will require improvements to the bridge over the Milwaukee River.
- Extend the Cedarburg Road northbound right-turn lane.
- The eastbound, westbound, northbound and southbound left-turn lanes are expected to operate at LOS E conditions with 4-seconds, 4-seconds, 1-second, and 10-seconds of average vehicle delay beyond the LOS D/E threshold, respectively, during the evening peak hour. Improving these movements to LOS D or better conditions would result in other movements at LOS E or require additional lanes at the intersection. The left-turn queues can fit within the recommended turn-bay storage lengths.

A4. Year 2025 Build Traffic – Recommended Improvements

Year 2025 build traffic volumes include full build-out of the Mequon Town Center redevelopment.

Recall that the City of Mequon wishes to reduce speed limits along Mequon Road from 40 mph to 35 mph between Wauwatosa Road and Buntrock Avenue, and 30 mph between Buntrock Avenue and Cedarburg Road. The City also wishes to adjust the highway cross-section between Buntrock Avenue and Cedarburg Road to a more contextually-sensitive roadway environment. The four alternatives considered are:

- Alternative One: No speed limit changes, no parking/bike lanes
- Alternative Two: Speed limit changes, no parking/bike lanes
- Alternative Three: No speed limit changes, with parking/bike lanes
- Alternative Four: Speed limit changes, with parking/bike lanes

A fifth alternative is presented for the Mequon Road intersections with Buntrock Avenue and Industrial Drive, which is a two-lane roundabout alternative. The following improvements, shown in Exhibits 1-9a through 1-9c, are recommended to accommodate the Year 2025 build traffic volumes. These improvements are in addition to the Year 2010 build traffic recommended improvements shown in Exhibits 1-3a and 1-3b, as well as the Year 2025 background traffic recommended improvements shown in Exhibit 1-8. *Improvements are for jurisdictional consideration and are not legally binding. WisDOT and the City of Mequon reserve the right to determine alternative solutions.*

Mequon Road & Wauwatosa Road

- *All Alternatives:* Provide dual left-turn lanes on the Mequon Road eastbound and westbound approaches. Close the median opening located approximately 390-feet east of Wauwatosa Road (centerline-to-centerline).
- *All Alternatives:* Extend the Wauwatosa Road southbound left-turn lane.

Mequon Road & Area B West Access (proposed)

- *All Alternatives:* Construct the Area B west access approximately 525-feet east of Wauwatosa Road as a right-in/right-out only access (centerline-to-centerline).
- *All Alternatives:* An auxiliary lane exists on the south side of the highway that will function as an eastbound right-turn lane at the intersection.
- *All Alternatives:* Provide a right-turn only exit lane and install a stop sign on the Area B west access northbound approach.

Mequon Road & Area B East Access (proposed)

- *All Alternatives:* Construct the Area B east access at the existing median opening along Mequon Road approximately 1,175-feet east of Wauwatosa Road (centerline-to-centerline).
- *All Alternatives:* An auxiliary lane exists on the south side of the highway that will function as an eastbound right-turn lane at the intersection.
- *All Alternatives:* Extend the exclusive left-turn lane on the Mequon Road westbound approach.
- *All Alternatives:* Provide a shared left-turn/right-turn lane and install a stop sign on the Area B east access northbound approach.
- *All Alternatives:* The Area B east access northbound left-turn/right-turn movement is expected to operate at LOS E with approximately 5-seconds of average delay over the LOS D/E threshold. The movement services little-to-moderate volume (40 left-turn/40 right-turn vehicles per hour) and, therefore, no improvements are expected to be necessary. Should delays result in unsafe conditions, consideration may be given to restricting the access to left-in/right-in/right-out only and forcing left-out movements to downstream U-turn locations.

Mequon Road & Concord Creek Drive/Mequon Trail

- *All Alternatives:* The Concord Creek Drive southbound left-turn/through movement is expected to operate at LOS F with approximately 220-seconds of average delay over the LOS D/E threshold. The Mequon Trail northbound left-turn/through movement is expected to operate at LOS F with approximately 177-seconds of average delay over the LOS D/E threshold. The movements service little-to-moderate volume (15 vehicles per hour southbound, 60 vehicles per hour northbound). No improvements are expected to be necessary. Should delays result in unsafe conditions, consideration may be given to restricting Concord Creek Drive/Mequon Trail to left-in/right-in/right-out only and forcing left-out/through-out movements to downstream U-turn locations.

Mequon Road & Area C Access (proposed)

- *All Alternatives:* Construct the Area C access approximately 350-feet east of Concord Creek Drive/Mequon Trail (centerline-to-centerline). Close the median opening that exists along Mequon Road between Concord Creek Drive/Mequon Trail and the Weston Center west access.
- *All Alternatives:* An auxiliary lane exists on the south side of the highway that will function as an eastbound right-turn lane at the intersection.
- *All Alternatives:* Provide a right-turn only exit lane and install a stop sign on the Area C access northbound approach.

Mequon Road & Weston Center West Access (proposed)

- *All Alternatives:* No further improvements are expected to be necessary beyond those recommended to accommodate Year 2010 build traffic.
- *All Alternatives:* The Weston Center west access northbound left-turn/right-turn movement is expected to operate at LOS E with approximately 9-seconds of average delay over the LOS D/E threshold. The movement services little volume (55 vehicles per hour). Should delays result in unsafe conditions, consideration may be given to restricting the access to left-in/right-in/right-out only and forcing left-out movement to downstream U-turn locations.

Mequon Road & Weston Center East Access (proposed)

- *All Alternatives:* No further improvements are expected to be necessary beyond those recommended to accommodate Year 2010 build traffic.

Mequon Road & River Birch Drive

- *All Alternatives:* The River Birch Drive northbound and southbound left-turn/through/right-turn movements are expected to operate at LOS F with approximately 37-seconds/25-seconds of average delay, respectively, over the LOS D/E threshold. The movements service minor to little volume (30 left/55 right vehicles per hour northbound, less than 5 vehicles per hour southbound). No improvements are expected to be necessary. Should delays result in unsafe conditions, consideration may be given to restricting River Birch Trail to left-in/right-in/right-out only and forcing left-out/through-out movements to downstream U-turn locations.

Mequon Road & Buntrock Avenue

- *Alternatives One, Two, Three & Four:* Install protected-permitted left-turn traffic signal heads to accommodate the Mequon Road eastbound and westbound approaches, as well as to accommodate the Buntrock Avenue northbound approach.
- *Alternatives One, Two, Three & Four:* Extend the Buntrock Avenue northbound right-turn lane.
- *Alternatives One & Two:* No further improvements are expected to be necessary.
- *Alternatives Three & Four:* Recall that, with modifications to lane widths and the inclusion of parking/bike lanes, the westbound auxiliary lane (and thus a westbound right-turn lane) will no longer exist.
- *Alternative Five:* The westbound through traffic queue is expected to extend through Industrial Drive with traffic signal control. Though this is a dynamic queue that is expected to clear prior to a red indication, consideration may be given to constructing a two-lane roundabout, including two lane entries on the eastbound and westbound Mequon Road approaches and one-lane approaches flaring to two lanes on the northbound and southbound Buntrock Avenue approaches.

Mequon Road & Brewery Square Access (proposed)

- *All Alternatives:* No further improvements are expected to be necessary beyond those recommended to accommodate Year 2010 build traffic.

Mequon Road & Industrial Drive

- *Alternatives One, Two, Three & Four:* Install traffic signals, including protected-permitted left-turn traffic signal heads to accommodate the Mequon Road westbound approach. Install protected-permitted left-turn traffic signal heads and permitted-overlap right-turn traffic signal heads on the Industrial Drive northbound approach. Railroad preemption will be necessary to properly clear the westbound approach of the intersection during rail crossings.
- *Alternatives One, Two, Three & Four:* Extend the Industrial Drive northbound right-turn lane.
- *Alternatives One & Two:* No further improvements are expected to be necessary.
- *Alternatives Three & Four:* With modifications to lane widths and the inclusion of parking/bike lanes, the westbound auxiliary lane (and thus the westbound right-turn lane) will no longer exist. Restrict parking on the south side of the eastbound approach for an ample distance to provide an eastbound right-turn lane.
- *Alternatives One, Two, Three & Four:* The Industrial Drive northbound left-turn/through movement is expected to operate at LOS E with approximately 10-seconds of average delay over the LOS D/E threshold. The approach services moderate volumes, opposes little southbound traffic, and has a 40-second signal split.
- *Alternatives Two & Four:* The Mequon Road westbound left-turn movement at Industrial Drive is expected to operate at LOS E with approximately 10-seconds

of average delay over the LOS D/E threshold. The movement has a 25-second signal split and queues are expected to fit within the recommended turn-bay storage length.

- *Alternative Five:* The eastbound through traffic queue is expected to extend through Buntrock Avenue with traffic signal control. Though this is a dynamic queue that is expected to clear prior to a red indication, consideration may be given to construct a two-lane roundabout, including two lane entries on the eastbound and westbound Mequon Road approaches, a one-lane entry flaring to two lanes on the northbound Industrial Drive approach, and a one-lane entry on the southbound Industrial Drive approach. Railroad preemption and crossing gates will be necessary to properly clear the westbound approach of the roundabout during rail crossings.

Mequon Road & River Centre West Access/Logeman Access

- *Alternatives One & Two:* No improvements are expected to be necessary.
- *Alternatives Three & Four:* Recall that, with modifications to lane widths and the inclusion of parking/bike lanes, the eastbound and westbound auxiliary lanes (and thus the eastbound and westbound right-turn lanes) will no longer be provided.

Mequon Road & River Centre Center Access

- *Alternatives One & Two:* No further improvements are expected to be necessary.
- *Alternatives Three & Four:* Restrict parking on the south side of the eastbound approach for an ample distance to provide an eastbound right-turn lane.
- *All Alternatives:* The River Centre center access northbound left-turn movement is expected to operate at LOS F with approximately 145-seconds of average delay over the LOS D/E threshold. The movement services moderate volume (80 vehicles per hour). No further improvements are expected to be necessary. Should delays result in unsafe conditions, consideration may be given to restricting the access to left-in/right-in/right-out only and forcing left-out movements to downstream U-turn or other access locations.

Mequon Road & River Centre East Access

- *Alternatives One & Two:* No further improvements are expected to be necessary.
- *Alternatives Three & Four:* Recall that, with modifications to lane widths and the inclusion of parking/bike lanes, the eastbound and westbound auxiliary lanes (and thus the eastbound and westbound right-turn lanes) will no longer exist.

Mequon Road & Cedarburg Road

- *All Alternatives:* Install protected-overlap right-turn traffic signal heads to accommodate the southbound right-turn movement.
- *All Alternatives:* Extend the eastbound dual left-turn lanes and the eastbound right-turn lane.
- *All Alternatives:* Extend the westbound dual left-turn lanes and the westbound right-turn lane.
- *All Alternatives:* Extend the northbound right-turn lane.

- *All Alternatives:* Provide an exclusive southbound right-turn lane.
- *All Alternatives:* Note that eastbound, westbound, northbound and southbound left-turn lanes are expected to operate at LOS E conditions with 17-seconds, 5-seconds, 1-second, and 21-seconds of average vehicle delay beyond the LOS D/E threshold, respectively, during the evening peak hour. Improving these movements to LOS D or better conditions would result in other movements at LOS E or require additional lanes at the intersection. The left-turn queues can fit within the recommended turn-bay storage lengths.
- *All Alternatives:* The northbound through movement is expected to operate at LOS F conditions with 44-seconds of average vehicle delay beyond the LOS D/E threshold during the evening peak hour. Providing a third northbound through lane would reduce the delay. However, this is not expected to be feasible due to the close proximity of riverfront buildings to Cedarburg Road. A roundabout was considered but would require three lane entries on all approaches plus a westbound-to-northbound free-flow lane, which would also result in three lanes northbound on Cedarburg Road.

PART B – ALTERNATIVES ANALYSIS

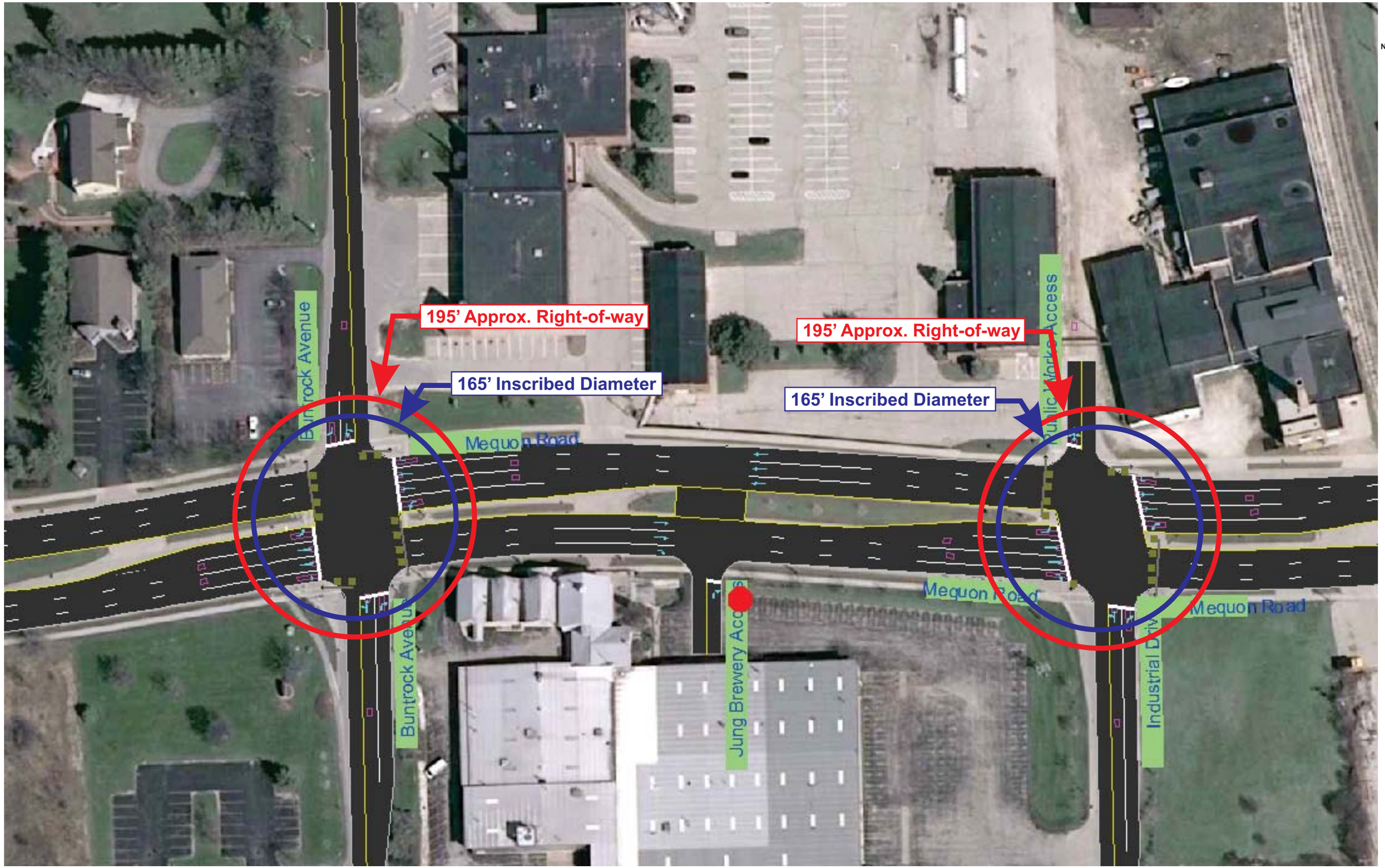
The decision to choose a specific traffic control for highway intersections with control alternatives is best left to WisDOT and impacted jurisdictions. To aid with the decision making processes, Traffic Analysis & Design, Inc. has completed an alternative traffic control analysis to objectively compare traffic signal control to roundabout control. Exhibit 6-1 illustrates a conceptual drawing of a traffic signal footprint and a roundabout circulatory roadway footprint at the Mequon Road intersections with Buntrock Avenue and Industrial Drive. Exhibits 6-2a and 6-2b provide the alternatives analysis in tabular format.

PART C – CONCLUSION

Comparisons of measures of effectiveness (MOEs) for the four traffic signal alternatives, both along the Mequon Road arterial and for the system as a whole, indicate the following (see Chapter V):

- All the alternatives are expected to provide approximately the same total delay per vehicle.
- Alternatives One and Three are expected to provide a slightly higher average speed (19 mph) along Mequon Road than Alternatives Two (18 mph) and Four (17 mph). This result makes sense, as the speed limits are higher under Alternatives One and Three than under Alternatives Two and Four.
- Alternative Two, which assumes reduced speed limits but no parking/bike lanes, is expected to provide the least number of stops per vehicle (0.27 stops per vehicle). Alternative Three, which assumes no speed limit reductions but parking/bike lanes, is expected to provide the most number of stops per vehicle (0.29 stops per vehicle). These values are not substantially different, and a driver is not likely to sense the difference.
- None of the results are substantially different than the others. That is, from the standpoint of effectiveness in servicing traffic operationally along the corridor, the four alternatives are approximately the same.

The fifth alternative is the construction of two-lane roundabouts for the Mequon Road & Buntrock Avenue and Mequon Road & Industrial Drive intersections. Queues and delays are expected to be reduced with the roundabout alternatives, though the roundabouts do not create gaps in traffic to service two-way stop controlled intersections along the corridor like traffic signals do. All four traffic signal alternatives and the roundabout alternative will require railroad preemption at Industrial Drive due to the close proximity of the intersection to the rail crossing to the east.



TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 6-1
iNTERSECTION CONCEPTUAL DRAWING - APPROXIMATE TRAFFIC SIGNAL VS. ROUNDABOUT RIGHT-OF-WAY
MEQUON ROAD & BUNTROCK AVENUE AND MEQUON ROAD & INDUSTRIAL DRIVE
MEQUON, WISCONSIN

	TRAFFIC CONTROL TYPE			
	ROUNDABOUT		*TRAFFIC SIGNAL*	
FACTORS	**Advantages**	**Disadvantages**	**Advantages**	**Disadvantages**
Right-of-Way		More right-of-way is expected to be needed.	Less right-of-way is expected to be needed.	
Safety	A four-legged modern roundabout has 8 points of conflict. Less severe crashes are expected at modern roundabouts than at traffic signals because entering vehicles generally travel at low speeds (18-25 mph) and severe crash types such as angle or head-on crashes are not likely to occur.			A four-legged signalized intersection has 32 points of conflict. Angle crashes and head-on crashes, which are generally more severe than other crash types, are more likely to occur at a traffic signal than a modern roundabout. Red-light running can result in severe crashes, especially at high-speed intersections.
Operation/Maintenance Costs	Generally lower operation and maintenance costs than a traffic signal.	Central and/or splitter islands may require more frequent landscaping depending on the original design.		Higher costs for bulb replacement, electricity, and controller/detector maintenance. Signal poles can be prone to knock downs and are costly to repair and/or replace.
Practical Feasibility	Once installed, a properly designed modern roundabout is typically well accepted by the motoring public.	May require public education process to inform drivers how to safely maneuver through a modern roundabout.	Requires little public education for acceptance by motorists.	
Access	Roundabouts allow for U-turns within the roundabout, meaning driveways with right-in/right-out only access may be better serviced with upstream and downstream roundabouts.		U-turns are allowed at signals, meaning driveways with right-in/right-out only access may be serviced with traffic signals.	U-turn manuever is tighter at a traffic signal than at a roundabout, making the turn more difficult for long or heavy vehicles.
Capacity	Generally, modern roundabouts are expected to have higher capacity than traffic signals because traffic from all approaches can enter simultaneously. Small geometric changes can result in large capacity increases.	To add capacity, the entire roundabout may need to be widened. A poorly designed roundabout can operate with significantly less capacity than a well designed roundabout.	Small increases in capacity can sometimes be achieved through timing or phasing adjustments.	Large capacity increases typically require additional turn lanes, through lanes, and/or median width.
Delay	The multi-lane modern roundabout is expected to operate at LOS A			The traffic signal is expected to operate at LOS D
Queues	NB max queue is expected to be 190 feet less, SB max queue is expected to be 20 feet less, EB max queue is expected to be 690 feet less, WB max queue is expected to be 735 feet less, with modern roundabout control.			NB max queue is expected to be 190 feet more, SB max queue is expected to be 20 feet more, EB max queue is expected to be 690 feet more, WB max queue is expected to be 735 feet more, with traffic signal control.
Pedestrians & Bicycles	Splitter islands can be designed to accommodate pedestrian refuge areas. Crossing distance is smaller, translating to fewer potential vehicle pedestrian conflicts.	Bicycle traffic is typically expected to travel in lanes shared by motorists as opposed to individual bike lanes. Bicycle traffic ramped out of the roundabout shares a multi-use path with pedestrians around the roundabout, which is less safe due to possible bike-to-ped crashes.	Can safety accommodate both pedestrian and bicycle traffic with the use of cross walks and bike lanes.	Pedestrian crossing distances are greater. Higher minimum green signal timings are necessary to accommodate pedestrians, which may result in less vehicular capacity for some movements.
Environment	Less delay is expected to result in less air & noise pollution.			More delay is expected to result in more air & noise pollution.

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 6-2A
ALTERNATIVE TRAFFIC CONTROL ANALYSIS
TRAFFIC SIGNAL VS. ROUNDABOUT
MEQUON ROAD & BUNTROCK AVENUE
MEQUON, WISCONSIN

	TRAFFIC CONTROL TYPE			
	ROUNDABOUT		*TRAFFIC SIGNAL*	
FACTORS	**Advantages**	**Disadvantages**	**Advantages**	**Disadvantages**
Right-of-Way		More right-of-way is expected to be needed.	Less right-of-way is expected to be needed.	
Safety	A four-legged modern roundabout has 8 points of conflict. Less severe crashes are expected at modern roundabouts than at traffic signals because entering vehicles generally travel at low speeds (18-25 mph) and severe crash types such as angle or head-on crashes are not likely to occur.	Railroad preemption may be more costly to implement to ensure vehicles are provided ample time to clear the tracks	Railroad preemption may be less expensive and provides a dedicated green indication for westbound traffic, which is likely to clear the track faster than a roundabout	A four-legged signalized intersection has 32 points of conflict. Angle crashes and head-on crashes, which are generally more severe than other crash types, are more likely to occur at a traffic signal than a modern roundabout. Red-light running can result in severe crashes, especially at high-speed intersections.
Operation/Maintenance Costs	Generally lower operation and maintenance costs than a traffic signal.	Central and/or splitter islands may require more frequent landscaping depending on the original design.		Higher costs for bulb replacement, electricity, and controller/detector maintenance. Signal poles can be prone to knock downs and are costly to repair and/or replace.
Practical Feasibility	Once installed, a properly designed modern roundabout is typically well accepted by the motoring public.	May require public education process to inform drivers how to safely maneuver through a modern roundabout.	Requires little public education for acceptance by motorists.	
Access	Roundabouts allow for U-turns within the roundabout, meaning driveways with right-in/right-out only access may be better serviced with upstream and downstream roundabouts.		U-turns are allowed at signals, meaning driveways with right-in/right-out only access may be serviced with traffic signals.	U-turn manuever is tighter at a traffic signal than at a roundabout, making the turn more difficult for long or heavy vehicles.
Capacity	Generally, modern roundabouts are expected to have higher capacity than traffic signals because traffic from all approaches can enter simultaneously. Small geometric changes can result in large capacity increases.	To add capacity, the entire roundabout may need to be widened. A poorly designed roundabout can operate with significantly less capacity than a well designed roundabout.	Small increases in capacity can sometimes be achieved through timing or phasing adjustments.	Large capacity increases typically require additional turn lanes, through lanes, and/or median width.
Delay	The multi-lane modern roundabout is expected to operate at LOS D			The traffic signal is expected to operate at LOS E
Queues	NB max queue is expected to be 130 feet less, SB max queue is expected to be 25 feet less, EB max queue is expected to be 835 feet less, WB max queue is expected to be 590 feet less, with modern roundabout control.			NB max queue is expected to be 130 feet more, SB max queue is expected to be 25 feet more, EB max queue is expected to be 835 feet more, WB max queue is expected to be 590 feet more, with traffic signal control.
Pedestrians & Bicycles	Splitter islands can be designed to accommodate pedestrian refuge areas. Crossing distance is smaller, translating to fewer potential vehicle pedestrian conflicts.	Bicycle traffic is typically expected to travel in lanes shared by motorists as opposed to individual bike lanes. Bicycle traffic ramped out of the roundabout shares a multi-use path with pedestrians around the roundabout, which is less safe due to possible bike-to-ped crashes.	Can safety accommodate both pedestrian and bicycle traffic with the use of cross walks and bike lanes.	Pedestrian crossing distances are greater. Higher minimum green signal timings are necessary to accommodate pedestrians, which may result in less vehicular capacity for some movements.
Environment	Less delay is expected to result in less air & noise pollution.			More delay is expected to result in more air & noise pollution.

TRAFFIC ANALYSIS & DESIGN, INC.

EXHIBIT DATE: 12-22-2011

EXHIBIT 6-2B
ALTERNATIVE TRAFFIC CONTROL ANALYSIS
TRAFFIC SIGNAL VS. ROUNDABOUT
MEQUON ROAD & INDUSTRIAL DRIVE
MEQUON, WISCONSIN

APPENDIX A

TRAFFIC

APPENDIX A

Existing Traffic Counts

STH 167 & STH 181

AM Peak

		STH 181 from North			STH 167 From East			STH 181 From South			STH 167 from West			Total
Total	**Left**	**Through**	**Right**	**U-turn**	**Left**	**Through**	**Right**	**U-turn**	**Left**	**Through**	**Right**	**U-turn**	**Left**	**Through**	**Right**	**U-turn**	
7:15	53	113	36	0	18	75	7	0	7	48	17	0	16	126	34	0	550
7:30	54	113	36	0	35	104	14	0	17	38	19	0	21	130	32	0	613
7:45	72	101	23	0	42	117	11	0	6	29	18	0	14	167	48	0	648
8:00	30	75	27	0	19	102	13	0	9	35	18	0	16	132	47	0	523
Total	**209**	**402**	**122**	**0**	**114**	**398**	**45**	**0**	**39**	**150**	**72**	**0**	**67**	**555**	**161**	**0**	**2334**

		STH 181 from North			STH 167 From East			STH 181 From South			STH 167 from West			Total
Truck/ Buses	**Left**	**Through**	**Right**	**U-turn**	**Left**	**Through**	**Right**	**U-turn**	**Left**	**Through**	**Right**	**U-turn**	**Left**	**Through**	**Right**	**U-turn**	
7:15	5	6	2	0	1	7	1	0	2	4	0	0	2	10	1	0	41
7:30	6	0	1	0	3	8	1	0	3	7	4	0	3	15	6	0	57
7:45	3	0	1	0	1	5	2	0	2	1	0	0	0	9	4	0	28
8:00	3	3	1	0	1	9	1	0	3	5	3	0	2	6	3	0	40

PHF = 0.90

HV%	4%	7%	13%	8%

PM Peak

		STH 181 from North			STH 167 From East			STH 181 From South			STH 167 from West			Total
Total	**Left**	**Through**	**Right**	**U-turn**	**Left**	**Through**	**Right**	**U-turn**	**Left**	**Through**	**Right**	**U-turn**	**Left**	**Through**	**Right**	**U-turn**	
4:30	28	45	30	0	23	165	30	0	46	105	20	0	53	101	5	0	651
4:45	21	34	17	0	44	158	50	0	36	114	30	0	48	148	14	0	714
5:00	39	46	18	0	36	172	63	0	38	101	31	0	44	120	9	0	717
5:15	44	49	20	0	27	174	59	0	49	100	20	0	56	128	20	0	746
Total	**132**	**174**	**85**	**0**	**130**	**669**	**202**	**0**	**169**	**420**	**101**	**0**	**201**	**497**	**48**	**0**	**2828**

		STH 181 from North			STH 167 From East			STH 181 From South			STH 167 from West			Total
Truck/ Buses	**Left**	**Through**	**Right**	**U-turn**	**Left**	**Through**	**Right**	**U-turn**	**Left**	**Through**	**Right**	**U-turn**	**Left**	**Through**	**Right**	**U-turn**	
4:30	3	4	5	0	0	7	1	0	0	3	1	0	2	2	1	0	29
4:45	2	2	2	0	0	3	1	0	1	5	1	0	1	4	0	0	22
5:00	0	1	2	0	1	3	1	0	0	1	0	0	0	1	0	0	10
5:15	3	2	1	0	0	6	1	0	1	2	0	0	0	5	0	0	21

PHF = 0.95

HV%	7%	2%	2%	2%

PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

Intersection: **Mequon Trail and STH 167 - Mequon Road**
County: **Ozaukee**
Traffic Control: **Two-Way Stop**
Project: **Mequon Town Center**

A.M. PEAK Tuesday, September 26, 2006	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES	Mequon Trail From North				STH 167 - Mequon Road From East				Mequon Trail From South				STH 167 - Mequon Road From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
7:15 AM	0	0	0	0	2	182	3	0	13	0	20	0	15	232	2	0	469
7:30 AM	2	0	0	0	1	179	2	1	8	0	27	1	56	258	3	0	536
7:45 AM	1	0	0	0	7	191	6	0	19	0	25	2	37	315	1	0	602
8:00 AM	3	0	0	0	1	134	7	0	10	0	9	0	5	172	4	0	345
Peak Hour Volume	**6**	**0**	**0**	**0**	**11**	**686**	**18**	**1**	**50**	**0**	**81**	**3**	**113**	**977**	**10**	**0**	**1,952**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**6**				**715**				**131**				**1,100**			**1,952**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	0.0%	0.0%		9.1%	2.5%	5.6%		2.0%	0.0%	2.5%		1.8%	4.5%	30.0%		3.6%
% Heavy Trucks	33.3%	0.0%	0.0%		0.0%	3.8%	0.0%		0.0%	0.0%	0.0%		0.0%	2.3%	10.0%		2.6%
% Trucks (Total)	**33.3%**	**0.0%**	**0.0%**		**9.1%**	**6.3%**	**5.6%**		**2.0%**	**0.0%**	**2.5%**		**1.8%**	**6.8%**	**40.0%**		**6.2%**
By Approach		**33.3%**				**6.3%**				**2.3%**				**6.6%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.50**	**0**	**0**		**0.39**	**0.90**	**0.64**		**0.66**	**0**	**0.75**		**0.50**	**0.78**	**0.63**		**0.81**
By Approach		**0.50**				**0.88**				**0.74**				**0.78**			
HOURLY VOLUME-ROUNDED	**5**	**0**	**0**	**0**	**10**	**685**	**20**	**1**	**50**	**0**	**80**	**3**	**115**	**975**	**10**	**0**	**1,950**
By Approach		**5**				**715**				**130**				**1,100**			

P.M. PEAK Monday, September 25, 2006	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES	Mequon Trail From North				STH 167 - Mequon Road From East				Mequon Trail From South				STH 167 - Mequon Road From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
4:30 PM	5	0	1	2	1	224	8	0	12	0	9	0	12	185	2	0	459
4:45 PM	1	0	3	1	1	246	9	0	6	0	7	2	15	225	0	0	513
5:00 PM	2	0	4	0	2	269	12	1	14	0	4	0	12	199	1	0	519
5:15 PM	4	0	2	0	0	258	21	1	5	0	10	0	8	216	2	0	526
Peak Hour Volume	**12**	**0**	**10**	**3**	**4**	**997**	**50**	**2**	**37**	**0**	**30**	**2**	**47**	**825**	**5**	**0**	**2,017**
U-Turn Hourly Volume			*0*				*1*				*1*				*0*		***2***
By Approach		**22**				**1,051**				**67**				**877**			**2,017**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	0.0%	0.0%		0.0%	1.6%	2.0%		0.0%	0.0%	0.0%		2.1%	1.5%	20.0%		1.5%
% Heavy Trucks	33.3%	0.0%	20.0%		50.0%	1.4%	0.0%		0.0%	0.0%	0.0%		2.2%	1.0%	60.0%		1.7%
% Trucks (Total)	**33.3%**	**0.0%**	**20.0%**		**50.0%**	**3.0%**	**2.0%**		**0.0%**	**0.0%**	**0.0%**		**4.3%**	**2.5%**	**80.0%**		**3.3%**
By Approach		**27.3%**				**3.1%**				**0.0%**				**3.0%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.60**	**0**	**0.63**		**0.50**	**0.93**	**0.60**		**0.66**	**0**	**0.75**		**0.78**	**0.92**	**0.63**		**0.96**
By Approach		**0.92**				**0.93**				**0.80**				**0.91**			
HOURLY VOLUME-ROUNDED	**10**	**0**	**10**	**3**	**5**	**995**	**50**	**2**	**35**	**0**	**30**	**2**	**45**	**825**	**5**	**0**	**2,010**
By Approach		**20**				**1,050**				**65**				**875**			

DOT Growth Factor Group: None Used
Adjustment Factor Used: 1.000
Notes: U-turn volumes included in left-turn volumes.

PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

Intersection: **River Birch and STH 167**
County: **Ozaukee**
Traffic Control: **Two-Way Stop**
Project: **Mequon Town Center**

P.M. PEAK	↓				←				↑				→				**Total Vehicle Volumes**
Monday, May 17, 2010																	
TRAFFIC VOLUMES	River Birch From North				STH 167 From East				Driveway From South				STH 167 From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
4:30 PM	0	0	0	0	1	237	3	0	1	0	1	0	1	203	1	0	448
4:45 PM	0	0	1	0	1	277	1	0	2	0	1	1	0	255	2	0	540
5:00 PM	0	0	0	0	2	278	2	0	3	0	0	0	0	217	0	0	502
5:15 PM	0	0	0	0	0	306	1	0	0	0	1	0	0	248	0	0	556
Peak Hour Volume	**0**	**0**	**1**	**0**	**4**	**1,098**	**7**	**0**	**6**	**0**	**3**	**1**	**1**	**923**	**3**	**0**	**2,046**
U-Turn Hourly Volume			*0*				*1*				*0*				*1*		***2***
By Approach		**1**				**1,109**				**9**				**927**			**2,046**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	0.0%	0.0%		0.0%	2.0%	0.0%		0.0%	0.0%	0.0%		0.0%	1.0%	0.0%		1.5%
% Heavy Trucks	0.0%	0.0%	0.0%		0.0%	0.9%	0.0%		0.0%	0.0%	0.0%		0.0%	0.4%	0.0%		0.7%
% Trucks (Total)	**0.0%**	**0.0%**	**0.0%**		**0.0%**	**2.9%**	**0.0%**		**0.0%**	**0.0%**	**0.0%**		**0.0%**	**1.4%**	**0.0%**		**2.2%**
By Approach		**0.0%**				**2.9%**				**0.0%**				**1.4%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0**	**0**	**0.25**		**0.50**	**0.90**	**0.58**		**0.50**	**0**	**0.75**		**0.25**	**0.90**	**0.38**		**0.92**
By Approach		**0.25**				**0.90**				**0.75**				**0.90**			
HOURLY VOLUME-ROUNDED	**0**	**0**	**0**	**0**	**5**	**1,100**	**5**	**0**	**5**	**0**	**5**	**1**	**0**	**925**	**5**	**0**	**2,050**
By Approach		**0**				**1,110**				**10**				**930**			

DOT Growth Factor Group: None Used
Adjustment Factor Used: 1.000
Notes: U-turn volumes included in left-turn volumes.

PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

Intersection: **Buntrock Avenue and Mequon Road**
County: **Ozaukee**
Traffic Control: **Traffic Signal**
Project: **Mequon Town Center**

A.M. PEAK Thursday, February 05, 2009	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES	Buntrock Avenue From North				Mequon Road From East				Buntrock Avenue From South				Mequon Road From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
7:15 AM	11	8	2	0	4	145	11	0	2	5	3	0	3	197	26	0	417
7:30 AM	14	32	3	0	1	142	12	0	20	11	2	0	3	198	20	0	458
7:45 AM	24	46	4	0	2	122	17	1	39	22	7	0	11	226	27	0	547
8:00 AM	12	16	3	0	0	111	16	0	18	5	7	0	8	170	8	0	374
Peak Hour Volume	**61**	**102**	**12**	**0**	**7**	**520**	**56**	**1**	**79**	**43**	**19**	**0**	**25**	**791**	**81**	**0**	**1,796**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**175**				**583**				**141**				**897**			**1,796**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	10.8%	16.7%		0.0%	1.9%	7.1%		10.1%	14.0%	26.3%		0.0%	2.0%	2.5%		3.6%
% Heavy Trucks	0.0%	0.0%	0.0%		0.0%	2.3%	0.0%		0.0%	0.0%	5.3%		0.0%	1.8%	0.0%		1.5%
% Trucks (Total)	**0.0%**	**10.8%**	**16.7%**		**0.0%**	**4.2%**	**7.1%**		**10.1%**	**14.0%**	**31.6%**		**0.0%**	**3.8%**	**2.5%**		**5.1%**
By Approach		**7.4%**				**4.4%**				**14.2%**				**3.6%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.64**	**0.55**	**0.75**		**0.44**	**0.90**	**0.82**		**0.51**	**0.49**	**0.68**		**0.57**	**0.88**	**0.75**		**0.82**
By Approach		**0.59**				**0.91**				**0.52**				**0.85**			
HOURLY VOLUME-ROUNDED	**60**	**100**	**10**	**0**	**5**	**520**	**55**	**1**	**80**	**45**	**20**	**0**	**25**	**790**	**80**	**0**	**1,790**
By Approach		**170**				**580**				**145**				**895**			

P.M. PEAK Wednesday, January 21, 2009	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES	Buntrock Avenue From North				Mequon Road From East				Buntrock Avenue From South				Mequon Road From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
4:30 PM	15	1	4	0	5	185	12	0	12	9	18	0	3	153	12	0	429
4:45 PM	9	0	0	0	5	174	6	0	6	6	12	0	3	165	15	0	401
5:00 PM	5	2	3	0	3	215	3	0	13	5	16	0	4	161	13	0	443
5:15 PM	8	1	1	0	2	222	6	0	10	9	13	0	1	177	13	0	463
Peak Hour Volume	**37**	**4**	**8**	**0**	**15**	**796**	**27**	**0**	**41**	**29**	**59**	**0**	**11**	**656**	**53**	**0**	**1,736**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**49**				**838**				**129**				**720**			**1,736**
TRUCK PERCENTAGES																	
% Single Unit Trucks	2.7%	0.0%	0.0%		0.0%	1.6%	11.1%		4.9%	0.0%	3.4%		0.0%	1.2%	0.0%		1.7%
% Heavy Trucks	0.0%	0.0%	0.0%		0.0%	0.7%	0.0%		0.0%	0.0%	0.0%		0.0%	1.2%	0.0%		0.7%
% Trucks (Total)	**2.7%**	**0.0%**	**0.0%**		**0.0%**	**2.3%**	**11.1%**		**4.9%**	**0.0%**	**3.4%**		**0.0%**	**2.4%**	**0.0%**		**2.4%**
By Approach		**2.0%**				**2.5%**				**3.1%**				**2.2%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.62**	**0.50**	**0.50**		**0.75**	**0.90**	**0.56**		**0.79**	**0.81**	**0.82**		**0.69**	**0.93**	**0.88**		**0.94**
By Approach		**0.61**				**0.91**				**0.83**				**0.94**			
HOURLY VOLUME-ROUNDED	**35**	**5**	**10**	**0**	**15**	**795**	**25**	**0**	**40**	**30**	**60**	**0**	**10**	**655**	**55**	**0**	**1,735**
By Approach		**50**				**835**				**130**				**720**			

DOT Growth Factor Group: None Used
Adjustment Factor Used: 1.000
Notes: U-turn volumes included in left-turn volumes.

PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

Intersection: **Industrial Drive and Mequon Road**
County: **Ozaukee**
Traffic Control: **Two-Way Stop**
Project: **Mequon Town Center**

A.M. PEAK Thursday, January 22, 2009	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES	Industrial Drive From North				Mequon Road From East				Industrial Drive From South				Mequon Road From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
7:15 AM	0	0	0	0	0	161	36	0	7	1	6	0	20	177	4	0	412
7:30 AM	0	1	0	0	4	185	46	0	3	1	0	0	19	188	2	0	449
7:45 AM	0	0	1	0	0	140	73	0	11	1	1	0	43	264	2	0	536
8:00 AM	0	0	0	0	4	128	42	0	18	0	4	0	23	188	0	0	407
Peak Hour Volume	**0**	**1**	**1**	**0**	**8**	**614**	**197**	**0**	**39**	**3**	**11**	**0**	**105**	**817**	**8**	**0**	**1,804**
U-Turn Hourly Volume			*0*				*0*				*0*				*1*		***1***
By Approach		**2**				**819**				**53**				**930**			**1,804**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	0.0%	0.0%		12.5%	1.1%	2.0%		30.8%	0.0%	0.0%		7.6%	1.3%	0.0%		2.4%
% Heavy Trucks	0.0%	0.0%	0.0%		0.0%	2.3%	0.5%		0.0%	0.0%	18.2%		1.0%	1.5%	0.0%		1.7%
% Trucks (Total)	**0.0%**	**0.0%**	**0.0%**		**12.5%**	**3.4%**	**2.5%**		**30.8%**	**0.0%**	**18.2%**		**8.6%**	**2.8%**	**0.0%**		**4.0%**
By Approach		**0.0%**				**3.3%**				**26.4%**				**3.4%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0**	**0.25**	**0.25**		**0.50**	**0.83**	**0.67**		**0.54**	**0.75**	**0.46**		**0.61**	**0.77**	**0.50**		**0.84**
By Approach		**0.50**				**0.87**				**0.60**				**0.75**			
HOURLY VOLUME-ROUNDED	**0**	**0**	**0**	**0**	**10**	**615**	**195**	**0**	**40**	**5**	**10**	**0**	**105**	**815**	**10**	**0**	**1,805**
By Approach		**0**				**820**				**55**				**930**			

P.M. PEAK Wednesday, January 14, 2009	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES	Industrial Drive From North				Mequon Road From East				Industrial Drive From South				Mequon Road From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
4:30 PM	1	0	0	0	1	171	26	0	55	0	16	0	5	168	0	0	443
4:45 PM	1	0	0	0	0	186	3	0	49	0	14	1	1	153	0	0	407
5:00 PM	2	0	0	0	0	204	2	0	65	3	14	0	0	178	0	0	468
5:15 PM	0	0	0	0	2	211	8	0	42	0	16	0	2	195	0	0	476
Peak Hour Volume	**4**	**0**	**0**	**0**	**3**	**772**	**39**	**0**	**211**	**3**	**60**	**1**	**8**	**694**	**0**	**0**	**1,794**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**4**				**814**				**274**				**702**			**1,794**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	0.0%	0.0%		0.0%	0.6%	38.5%		0.0%	0.0%	0.0%		12.5%	0.6%	0.0%		1.4%
% Heavy Trucks	0.0%	0.0%	0.0%		0.0%	0.4%	0.0%		1.9%	0.0%	1.7%		12.5%	0.7%	0.0%		0.8%
% Trucks (Total)	**0.0%**	**0.0%**	**0.0%**		**0.0%**	**1.0%**	**38.5%**		**1.9%**	**0.0%**	**1.7%**		**25.0%**	**1.3%**	**0.0%**		**2.2%**
By Approach		**0.0%**				**2.8%**				**1.8%**				**1.6%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.50**	**0**	**0**		**0.38**	**0.91**	**0.38**		**0.81**	**0.25**	**0.94**		**0.40**	**0.89**	**0**		**0.94**
By Approach		**0.50**				**0.92**				**0.84**				**0.89**			
HOURLY VOLUME-ROUNDED	**5**	**0**	**0**	**0**	**5**	**770**	**40**	**0**	**210**	**5**	**60**	**1**	**10**	**695**	**0**	**0**	**1,800**
By Approach		**5**				**815**				**275**				**705**			

DOT Growth Factor Group: None Used
Adjustment Factor Used: 1.000
Notes: U-turn volumes included in left-turn volumes.

PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

Intersection: **Logemann and Mequon Road**
County: **Ozaukee**
Traffic Control: **Two-Way Stop**
Project: **Mequon Town Center**

A.M. PEAK Thursday, January 22, 2009	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES	Logemann From North				Mequon Road From East				Logemann From South				Mequon Road From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
7:15 AM	0	0	0	0	0	225	0	0	0	0	0	1	0	209	1	0	435
7:30 AM	0	0	0	0	0	253	0	0	0	0	0	0	0	233	2	0	488
7:45 AM	1	0	0	0	1	253	0	0	0	0	0	0	0	297	4	0	556
8:00 AM	2	0	0	1	2	188	0	0	0	0	0	0	0	205	3	2	400
Peak Hour Volume	**3**	**0**	**0**	**1**	**3**	**919**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**944**	**10**	**2**	**1,879**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**3**				**922**				**0**				**954**			**1,879**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	0.0%	0.0%		0.0%	1.3%	0.0%		0.0%	0.0%	0.0%		0.0%	2.1%	0.0%		1.7%
% Heavy Trucks	0.0%	0.0%	0.0%		0.0%	1.6%	0.0%		0.0%	0.0%	0.0%		0.0%	1.2%	0.0%		1.4%
% Trucks (Total)	**0.0%**	**0.0%**	**0.0%**		**0.0%**	**2.9%**	**0.0%**		**0.0%**	**0.0%**	**0.0%**		**0.0%**	**3.3%**	**0.0%**		**3.1%**
By Approach		**0.0%**				**2.9%**				**0.0%**				**3.3%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.38**	**0**	**0**		**0.38**	**0.91**	**0**		**0**	**0**	**0**		**0**	**0.79**	**0.63**		**0.84**
By Approach		**0.38**				**0.91**				**0**				**0.79**			
HOURLY VOLUME-ROUNDED	**5**	**0**	**0**	**1**	**5**	**920**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**945**	**10**	**2**	**1,885**
By Approach		**5**				**925**				**0**				**955**			

P.M. PEAK Wednesday, January 14, 2009	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES	Logemann From North				Mequon Road From East				Logemann From South				Mequon Road From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
4:30 PM	8	0	0	0	0	193	0	0	5	0	0	0	2	211	2	0	421
4:45 PM	0	0	0	0	1	182	0	1	2	0	0	0	3	200	1	0	389
5:00 PM	1	0	0	0	0	217	0	0	4	0	0	0	1	243	1	0	467
5:15 PM	3	0	0	0	0	202	0	0	8	0	0	0	2	229	0	0	444
Peak Hour Volume	**12**	**0**	**0**	**0**	**1**	**794**	**0**	**1**	**19**	**0**	**0**	**0**	**8**	**883**	**4**	**0**	**1,721**
U-Turn Hourly Volume			*0*				*0*				*0*				*1*		***1***
By Approach		**12**				**795**				**19**				**895**			**1,721**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	0.0%	0.0%		0.0%	2.3%	0.0%		0.0%	0.0%	0.0%		0.0%	0.6%	0.0%		1.3%
% Heavy Trucks	0.0%	0.0%	0.0%		0.0%	0.3%	0.0%		0.0%	0.0%	0.0%		0.0%	0.9%	0.0%		0.6%
% Trucks (Total)	**0.0%**	**0.0%**	**0.0%**		**0.0%**	**2.6%**	**0.0%**		**0.0%**	**0.0%**	**0.0%**		**0.0%**	**1.5%**	**0.0%**		**2.0%**
By Approach		**0.0%**				**2.6%**				**0.0%**				**1.5%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.38**	**0**	**0**		**0.25**	**0.91**	**0**		**0.59**	**0**	**0**		**0.67**	**0.91**	**0.50**		**0.92**
By Approach		**0.38**				**0.92**				**0.59**				**0.91**			
HOURLY VOLUME-ROUNDED	**10**	**0**	**0**	**0**	**0**	**795**	**0**	**1**	**20**	**0**	**0**	**0**	**10**	**885**	**5**	**0**	**1,725**
By Approach		**10**				**795**				**20**				**900**			

DOT Growth Factor Group: None Used
Adjustment Factor Used: 1.000
Notes: U-turn volumes included in left-turn volumes.

PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

Intersection: **Piggly Wiggly Full Access Drive and Mequon Road**
County: **Ozaukee**
Traffic Control: **One-Way Stop**
Project: **Mequon Town Center**

A.M. PEAK Tuesday, January 20, 2009	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES					Mequon Road From East				Piggly Wiggly Full Access Drive From South				Mequon Road From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
7:15 AM	0	0	0	0	0	205	10	0	3	0	6	0	4	167	0	0	395
7:30 AM	0	0	0	0	0	203	9	0	6	0	3	0	6	170	0	0	397
7:45 AM	0	0	0	0	0	239	4	0	4	0	9	0	9	258	0	0	523
8:00 AM	0	0	0	0	0	171	7	0	6	0	9	0	10	217	0	0	420
Peak Hour Volume	**0**	**0**	**0**	**0**	**0**	**818**	**30**	**0**	**19**	**0**	**27**	**0**	**29**	**812**	**0**	**0**	**1,735**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**0**				**848**				**46**				**841**			**1,735**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	0.0%	0.0%		0.0%	1.5%	0.0%		0.0%	0.0%	3.7%		0.0%	3.7%	0.0%		2.5%
% Heavy Trucks	0.0%	0.0%	0.0%		0.0%	1.6%	0.0%		0.0%	0.0%	0.0%		0.0%	1.3%	0.0%		1.4%
% Trucks (Total)	**0.0%**	**0.0%**	**0.0%**		**0.0%**	**3.1%**	**0.0%**		**0.0%**	**0.0%**	**3.7%**		**0.0%**	**5.0%**	**0.0%**		**3.9%**
By Approach		**0.0%**				**3.0%**				**2.2%**				**4.8%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0**	**0**	**0**		**0**	**0.86**	**0.75**		**0.79**	**0**	**0.75**		**0.73**	**0.79**	**0**		**0.83**
By Approach		**0**				**0.87**				**0.77**				**0.79**			
HOURLY VOLUME-ROUNDED	**0**	**0**	**0**	**0**	**0**	**820**	**30**	**0**	**20**	**0**	**25**	**0**	**30**	**810**	**0**	**0**	**1,735**
By Approach		**0**				**850**				**45**				**840**			

P.M. PEAK Wednesday, January 14, 2009	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES					Mequon Road From East				Piggly Wiggly Full Access Drive From South				Mequon Road From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
4:30 PM	0	0	0	0	0	169	14	0	16	0	15	0	15	210	0	0	439
4:45 PM	0	0	0	0	0	183	10	0	10	0	14	0	17	188	0	0	422
5:00 PM	0	0	0	0	0	189	19	0	14	0	19	0	19	218	1	0	479
5:15 PM	0	0	0	0	0	200	22	0	15	0	10	0	22	226	4	0	499
Peak Hour Volume	**0**	**0**	**0**	**0**	**0**	**741**	**65**	**0**	**55**	**0**	**58**	**0**	**73**	**842**	**5**	**0**	**1,839**
U-Turn Hourly Volume			*0*				*3*				*0*				*5*		***8***
By Approach		**0**				**806**				**113**				**920**			**1,839**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	0.0%	0.0%		0.0%	2.4%	0.0%		0.0%	0.0%	1.7%		0.0%	0.7%	0.0%		1.4%
% Heavy Trucks	0.0%	0.0%	0.0%		0.0%	0.4%	0.0%		0.0%	0.0%	0.0%		0.0%	0.8%	0.0%		0.5%
% Trucks (Total)	**0.0%**	**0.0%**	**0.0%**		**0.0%**	**2.8%**	**0.0%**		**0.0%**	**0.0%**	**1.7%**		**0.0%**	**1.5%**	**0.0%**		**1.9%**
By Approach		**0.0%**				**2.6%**				**0.9%**				**1.4%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0**	**0**	**0**		**0**	**0.93**	**0.74**		**0.86**	**0**	**0.76**		**0.83**	**0.93**	**0.31**		**0.92**
By Approach		**0**				**0.91**				**0.86**				**0.91**			
HOURLY VOLUME-ROUNDED	**0**	**0**	**0**	**0**	**0**	**740**	**65**	**0**	**55**	**0**	**60**	**0**	**75**	**840**	**5**	**0**	**1,840**
By Approach		**0**				**805**				**115**				**920**			

DOT Growth Factor Group: None Used
Adjustment Factor Used: 1.000
Notes: U-turn volumes included in left-turn volumes.

PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

Intersection: **Piggly Wiggly Rin-Rout Drive and Mequon Road**
County: **Ozaukee**
Traffic Control: **One-Way Stop**
Project: **Mequon Town Center**

A.M. PEAK Tuesday, January 27, 2009	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES					Mequon Road From East				Piggly Wiggly Rin-Rout Drive From South				Mequon Road From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
7:15 AM	0	0	0	0	0	225	0	0	3	0	0	0	0	198	0	0	426
7:30 AM	0	0	0	0	0	234	0	0	2	0	0	0	2	206	0	0	444
7:45 AM	0	0	0	0	0	243	0	0	1	0	0	0	3	278	0	0	525
8:00 AM	0	0	0	0	0	166	0	0	3	0	0	0	1	168	0	0	338
Peak Hour Volume	**0**	**0**	**0**	**0**	**0**	**868**	**0**	**0**	**9**	**0**	**0**	**0**	**6**	**850**	**0**	**0**	**1,733**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**0**				**868**				**9**				**856**			**1,733**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	0.0%	0.0%		0.0%	1.6%	0.0%		0.0%	0.0%	0.0%		0.0%	3.1%	0.0%		2.3%
% Heavy Trucks	0.0%	0.0%	0.0%		0.0%	1.5%	0.0%		0.0%	0.0%	0.0%		0.0%	1.5%	0.0%		1.5%
% Trucks (Total)	**0.0%**	**0.0%**	**0.0%**		**0.0%**	**3.1%**	**0.0%**		**0.0%**	**0.0%**	**0.0%**		**0.0%**	**4.6%**	**0.0%**		**3.8%**
By Approach		**0.0%**				**3.1%**				**0.0%**				**4.6%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0**	**0**	**0**		**0**	**0.89**	**0**		**0.75**	**0**	**0**		**0.50**	**0.76**	**0**		**0.83**
By Approach		**0**				**0.89**				**0.75**				**0.76**			
HOURLY VOLUME-ROUNDED	**0**	**0**	**0**	**0**	**0**	**870**	**0**	**0**	**10**	**0**	**0**	**0**	**5**	**850**	**0**	**0**	**1,735**
By Approach		**0**				**870**				**10**				**855**			

P.M. PEAK Wednesday, January 14, 2009	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES					Mequon Road From East				Piggly Wiggly Rin-Rout Drive From South				Mequon Road From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
4:30 PM	0	0	0	0	0	183	0	0	9	0	0	0	1	226	0	0	419
4:45 PM	0	0	0	0	0	193	0	0	11	0	0	0	2	198	0	0	404
5:00 PM	0	0	0	0	0	208	0	0	10	0	0	0	0	232	0	0	450
5:15 PM	0	0	0	0	0	219	0	0	3	0	0	0	4	241	0	0	467
Peak Hour Volume	**0**	**0**	**0**	**0**	**0**	**803**	**0**	**0**	**33**	**0**	**0**	**0**	**7**	**897**	**0**	**0**	**1,740**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**0**				**803**				**33**				**904**			**1,740**
TRUCK PERCENTAGES																	
% Single Unit Trucks	0.0%	0.0%	0.0%		0.0%	2.2%	0.0%		0.0%	0.0%	0.0%		14.3%	0.7%	0.0%		1.4%
% Heavy Trucks	0.0%	0.0%	0.0%		0.0%	0.4%	0.0%		0.0%	0.0%	0.0%		0.0%	0.7%	0.0%		0.6%
% Trucks (Total)	**0.0%**	**0.0%**	**0.0%**		**0.0%**	**2.6%**	**0.0%**		**0.0%**	**0.0%**	**0.0%**		**14.3%**	**1.4%**	**0.0%**		**2.0%**
By Approach		**0.0%**				**2.6%**				**0.0%**				**1.5%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0**	**0**	**0**		**0**	**0.92**	**0**		**0.75**	**0**	**0**		**0.44**	**0.93**	**0**		**0.93**
By Approach		**0**				**0.92**				**0.75**				**0.92**			
HOURLY VOLUME-ROUNDED	**0**	**0**	**0**	**0**	**0**	**805**	**0**	**0**	**35**	**0**	**0**	**0**	**5**	**895**	**0**	**0**	**1,740**
By Approach		**0**				**805**				**35**				**900**			

DOT Growth Factor Group: None Used
Adjustment Factor Used: 1.000
Notes: U-turn volumes included in left-turn volumes.

PEAK HOUR TURNING MOVEMENT COUNT SUMMARY

Intersection: **Cedarburg Road and Mequon Road**
County: **Ozaukee**
Traffic Control: **Traffic Signal**
Project: **Mequon Town Center**

A.M. PEAK Friday, January 23, 2009	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES	Cedarburg Road From North				Mequon Road From East				Cedarburg Road From South				Mequon Road From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
7:15 AM	27	121	39	0	24	134	29	0	15	35	10	0	19	112	10	0	575
7:30 AM	33	124	73	0	28	154	34	0	17	29	9	0	24	100	10	0	635
7:45 AM	37	123	112	0	92	177	53	0	29	42	8	0	19	168	18	0	878
8:00 AM	22	94	81	0	53	128	43	0	24	22	9	0	16	124	15	0	631
Peak Hour Volume	**119**	**462**	**305**	**0**	**197**	**593**	**159**	**0**	**85**	**128**	**36**	**0**	**78**	**504**	**53**	**0**	**2,719**
U-Turn Hourly Volume			*1*				*0*				*0*				*0*		***1***
By Approach		**886**				**949**				**249**				**635**			**2,719**
TRUCK PERCENTAGES																	
% Single Unit Trucks	1.7%	0.4%	3.0%		2.5%	2.5%	0.6%		11.8%	4.7%	13.9%		1.3%	2.8%	3.8%		2.6%
% Heavy Trucks	0.0%	0.0%	0.0%		0.0%	1.4%	1.3%		1.1%	0.8%	2.8%		2.5%	3.5%	1.9%		1.3%
% Trucks (Total)	**1.7%**	**0.4%**	**3.0%**		**2.5%**	**3.9%**	**1.9%**		**12.9%**	**5.5%**	**16.7%**		**3.8%**	**6.3%**	**5.7%**		**3.9%**
By Approach		**1.5%**				**3.3%**				**9.6%**				**5.9%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.80**	**0.93**	**0.68**		**0.54**	**0.84**	**0.75**		**0.73**	**0.76**	**0.90**		**0.81**	**0.75**	**0.74**		**0.77**
By Approach		**0.81**				**0.74**				**0.79**				**0.77**			
HOURLY VOLUME-ROUNDED	**120**	**460**	**305**	**0**	**195**	**595**	**160**	**0**	**85**	**130**	**35**	**0**	**80**	**505**	**55**	**0**	**2,725**
By Approach		**885**				**950**				**250**				**640**			

P.M. PEAK Tuesday, January 20, 2009	↓				←				↑				→				**Total Vehicle Volumes**
TRAFFIC VOLUMES	Cedarburg Road From North				Mequon Road From East				Cedarburg Road From South				Mequon Road From West				
Start Time	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	Right	Thru	Left	Ped/Bike	
4:30 PM	38	44	68	0	100	167	49	0	37	132	24	0	17	159	63	0	898
4:45 PM	24	48	80	0	98	281	58	0	38	121	29	0	10	200	68	0	1,055
5:00 PM	28	57	82	0	110	255	27	0	43	134	27	0	7	162	55	0	987
5:15 PM	16	42	55	0	105	308	49	0	41	113	25	0	15	211	73	0	1,053
Peak Hour Volume	**106**	**191**	**285**	**0**	**413**	**1,011**	**183**	**0**	**159**	**500**	**105**	**0**	**49**	**732**	**259**	**0**	**3,993**
U-Turn Hourly Volume			*0*				*0*				*0*				*0*		***0***
By Approach		**582**				**1,607**				**764**				**1,040**			**3,993**
TRUCK PERCENTAGES																	
% Single Unit Trucks	7.5%	0.0%	0.4%		1.5%	1.4%	2.2%		0.6%	0.0%	0.0%		0.0%	0.7%	0.0%		1.0%
% Heavy Trucks	0.0%	0.0%	0.3%		0.0%	0.2%	1.1%		0.7%	0.0%	0.0%		0.0%	1.3%	0.4%		0.4%
% Trucks (Total)	**7.5%**	**0.0%**	**0.7%**		**1.5%**	**1.6%**	**3.3%**		**1.3%**	**0.0%**	**0.0%**		**0.0%**	**2.0%**	**0.4%**		**1.4%**
By Approach		**1.7%**				**1.8%**				**0.3%**				**1.5%**			
PEAK HOUR FACTORS																	
Peak Hour Factor (PHF)	**0.70**	**0.84**	**0.87**		**0.94**	**0.82**	**0.79**		**0.92**	**0.93**	**0.91**		**0.72**	**0.87**	**0.89**		**0.95**
By Approach		**0.87**				**0.87**				**0.94**				**0.87**			
HOURLY VOLUME-ROUNDED	**105**	**190**	**285**	**0**	**415**	**1,010**	**185**	**0**	**160**	**500**	**105**	**0**	**50**	**730**	**260**	**0**	**3,995**
By Approach		**580**				**1,610**				**765**				**1,040**			

DOT Growth Factor Group: None Used
Adjustment Factor Used: 1.000
Notes: U-turn volumes included in left-turn volumes.

INTERSECTION TRAFFIC COUNT REQUEST

DT2184 2005

Wisconsin Department of Transportation

Please provide site sketch on back side of form.

☐ Urgent ☒ NOT Urgent	Project ID 2140-00-00	Date Requested January 23, 2008
Firm Name	Requester Bhuvan Manandhar	Unit Sys. Planning

Location – Main Highway STH 167	Intersecting Side Road STH 181

County Ozaukee	☒ City ☐ Town ☐ Village OF Mequon	Number of Staff Required 1	Hours 6 AM to 6 PM

Special Instructions
If school in session, pick school busses.

☒ Passenger Vehicles (Cars, Light Trucks, Motorcycles) ☒ Heavy Trucks ☒ Bicycles ☒ Pedestrians

☒ Buses ☐ School Buses ☐ School in Session ☒ U-Turns

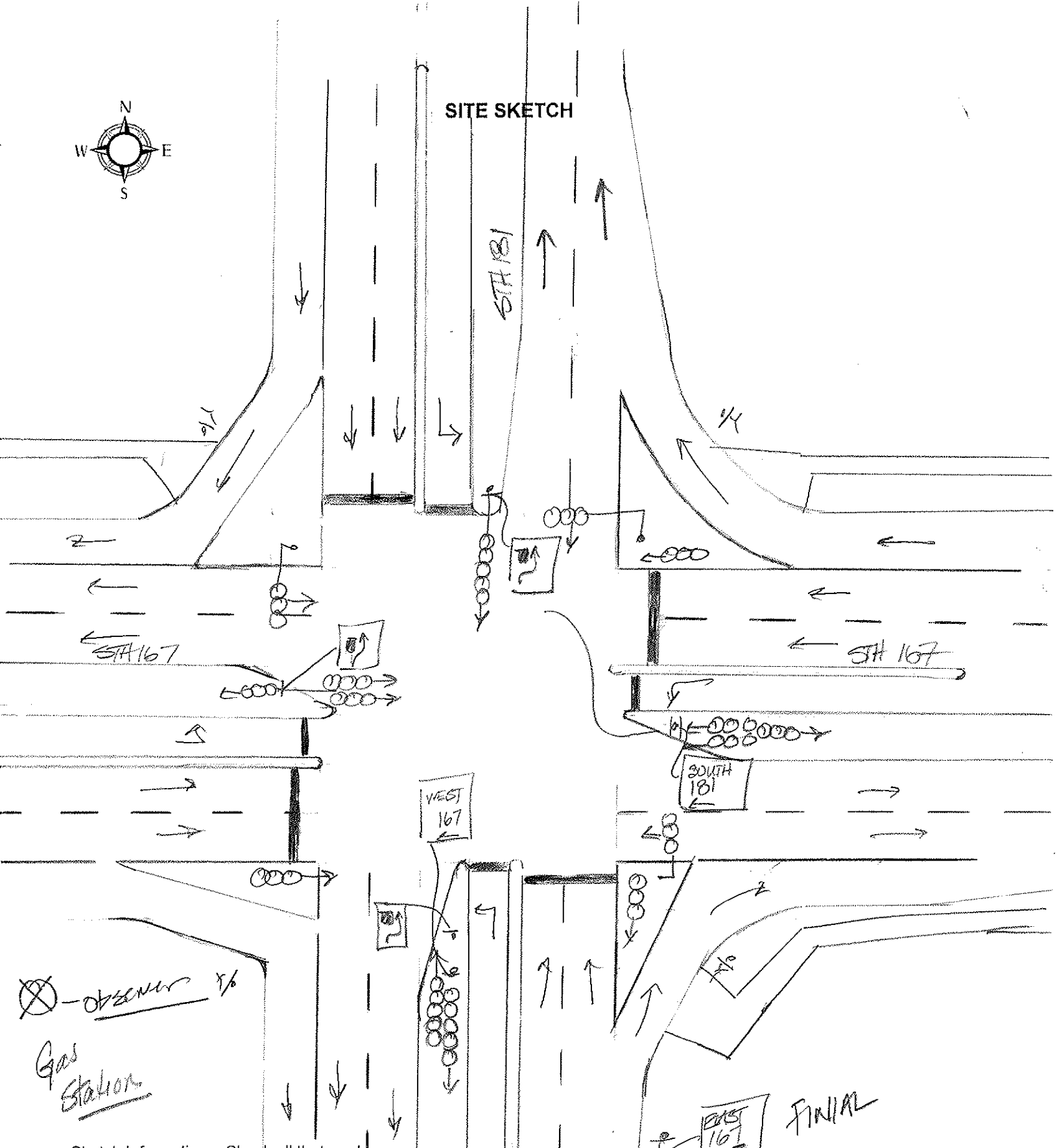
Field Observations

1st Observation – Day 1			2nd Observation – Day 2		
Date (M – D – Y) 06-18-08	Day of Week WENDESDAY	Time of Day 6:00AM-6:00PM	Date (M – D – Y)	Day of Week	Time of Day
Weather SUNNY			Weather		
Observer Name WAYNE HERMANSON	Observer Name		Observer Name	Observer Name	
Observer Name	Observer Name		Observer Name	Observer Name	

Common Observations – Indicate how many times these observations occur.

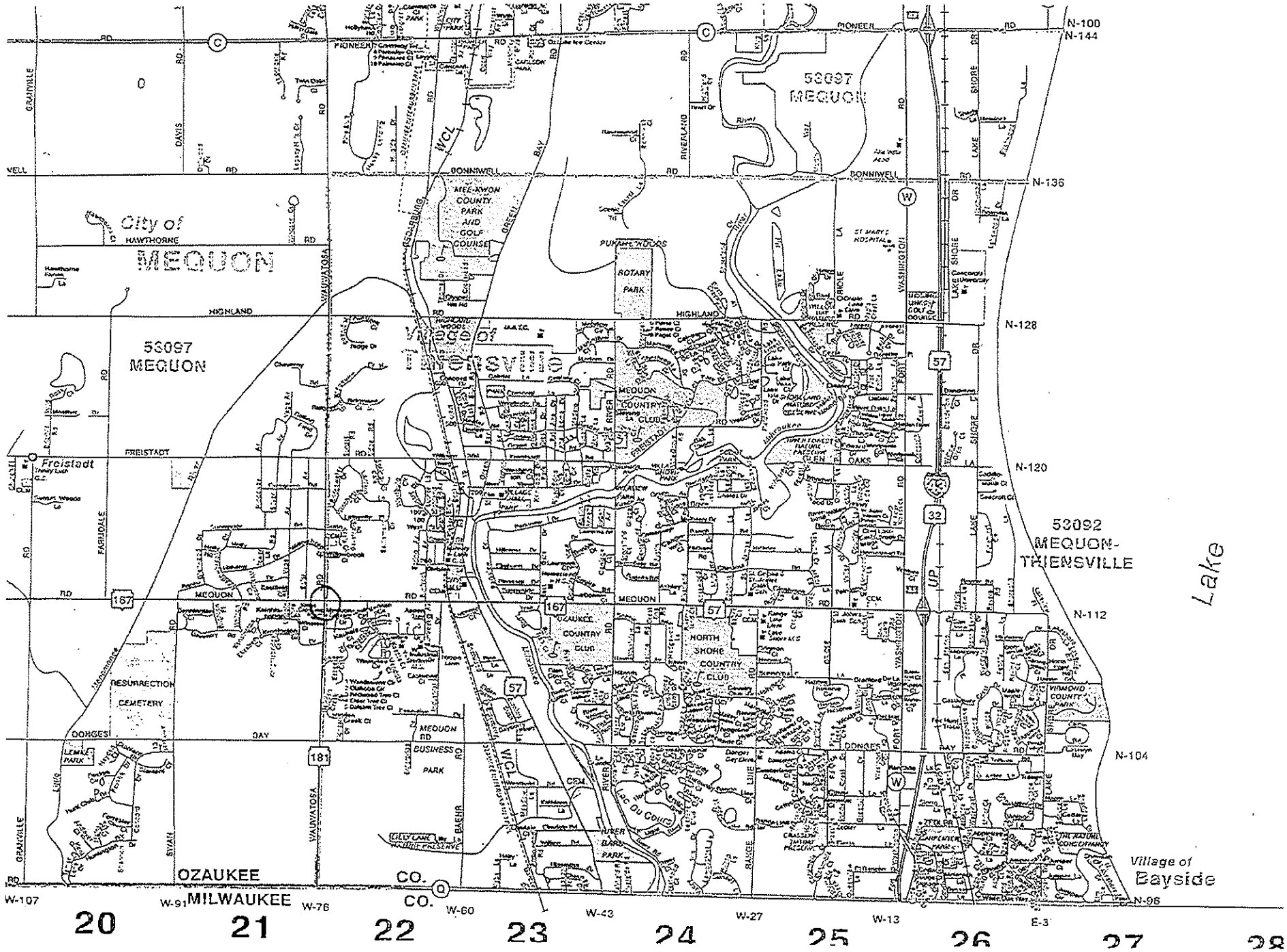
	None	1-2	A Few	Several	Many
Blown Stops	—				
Close Calls	—				
Driveway Cut-Thrus	—				
Funeral Processions	—				
Long Queue – Left Turn	—				
Long Queue – On-Ramp	—				
Trains	—				
Truck – Turning Radius	—				
Truck – Yellow Clearance	—				
Trucks Consistently One Type	—				
U-Turns in Medians	—				
Other:	—				

Comments —



Sketch Information – Check all that apply.

- ☐ Bridges
- ☐ Foliage
- ☐ Parking
- ☐ Stop Signs
- ☐ Buildings
- ☒ Islands
- ☒ Pavement Edges
- ☒ Traffic Lanes
- ☐ Bus Stops
- ☐ Land Uses
- ☐ Road Center Line
- ☒ Traffic Signals
- ☐ Driveways
- ☐ No Parking
- ☐ Shoulders
- ☒ Yield Signs
- ☐ Fence
- ☒ Observer Location
- ☐ Speed Limits
- ☐ _____


City of
MEQUON
53097
MEQUON
Village of
THIENSVILLE
53092
MEQUON-
THIENSVILLE
Lake
Village of
Bayside
OZAUKEE
CO.
MILWAUKEE
CO.
MEE-KWON
COUNTY
PARK
AND
GOLF
COURSE
ROTARY
PARK
MEQUON
COUNTRY
CLUB
OZAUKEE
COUNTRY
CLUB
NORTH
SHORE
COUNTRY
CLUB
RESURRECTION
CEMETERY
MEQUON
BUSINESS
PARK
DIAMOND
COUNTY
PARK
PIONEER
BONNIWELL
HIGHLAND
FREISTADT
MEQUON
DOROSEY
DAY
N-100
N-144
N-136
N-128
N-120
N-112
N-104
N-96
W-107
W-91
W-76
W-60
W-43
W-27
W-13
E-3
20
21
22
23
24
25
26
27
28

TRAFFIC SURVEY VEHICLE VOLUME COUNT
GRAPHIC SUMMARY SHEET

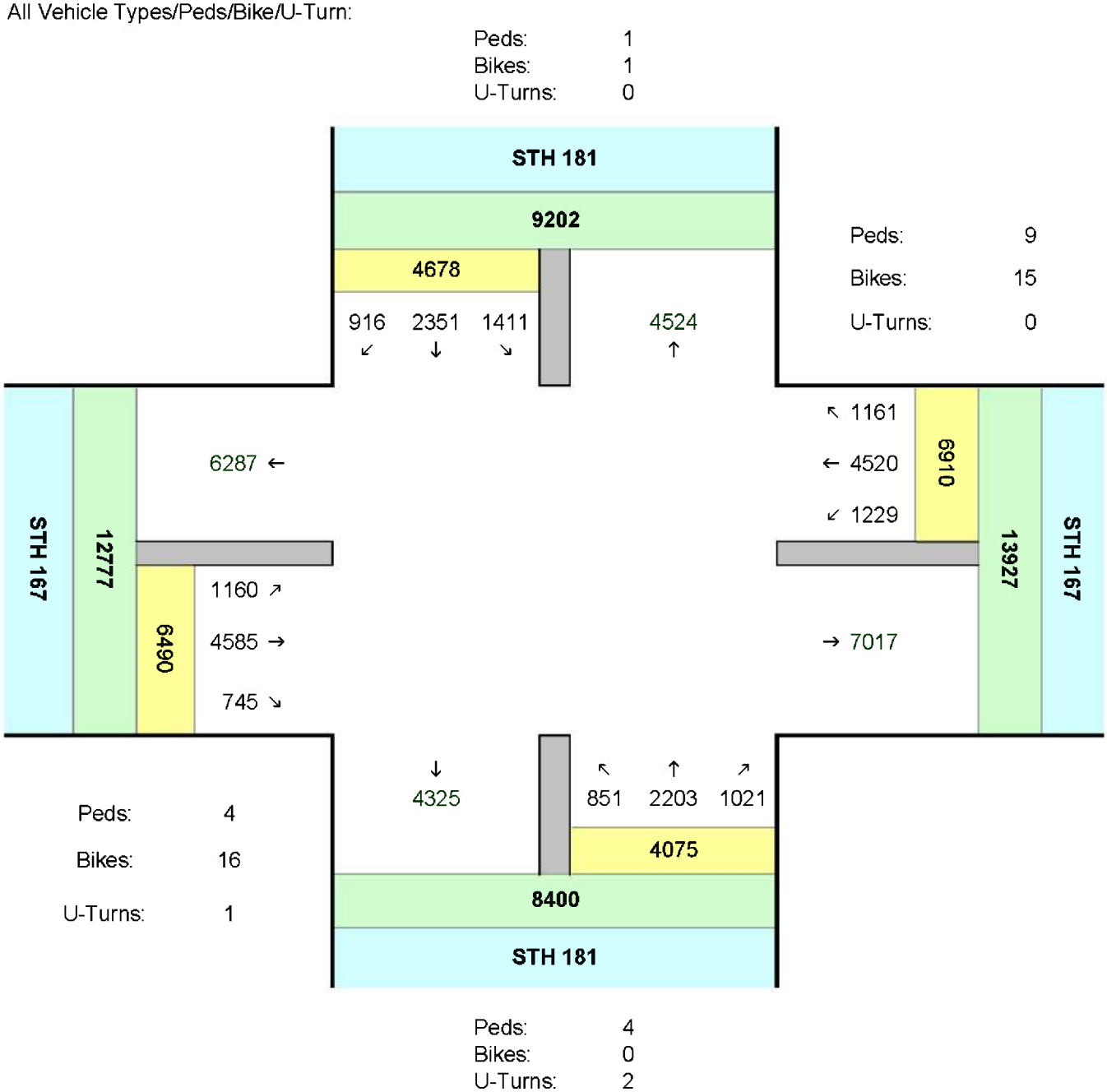
Date: 6/18/2008 **Day: Wed** **Time: 6AM to 6PM**

Region: SE **County: Ozaukee** **Rural: No** **City: Mequon**

Intersection of: STH 167 & STH 181

Weather: Clear **Road Condition: Dry** **Observers: W. Hermanson**

All Vehicle Types/Peds/Bike/U-Turn:



Volume Summary - ALL VEHICLES & U-TURNS

INTERSECTION: STH 167 & STH 181

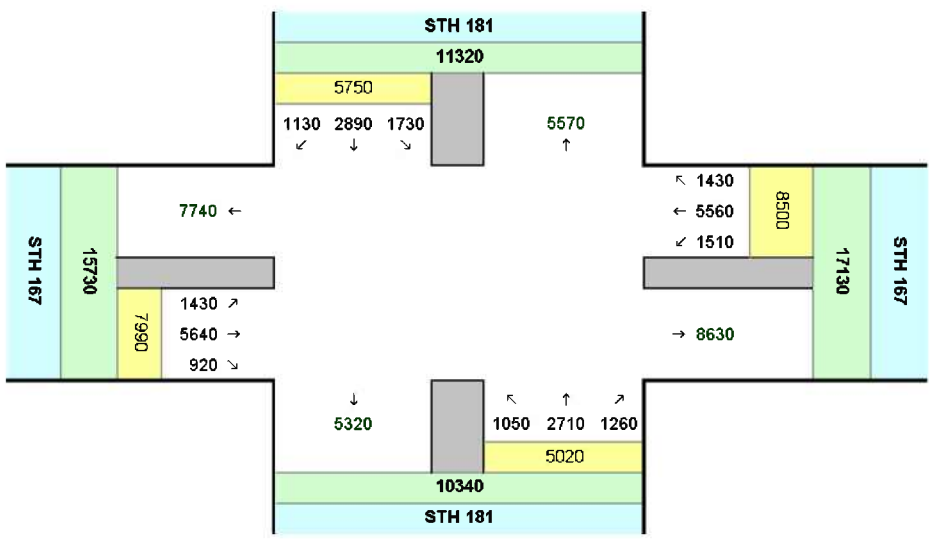
Date: 6/18/2008 Day: Wed City: Mequon
Weather Clear Legend: LT = Left Turn, TH = Thru, RT = Right Turn

Time	STH 181								STH 167								Totals			U - Turns				
	From North				From South				From East				From West				North	East	ALL	From				ALL
Period	LT	TH	RT	Total	LT	TH	RT	Total	LT	TH	RT	Total	LT	TH	RT	Total	South	West	DIR	N	S	E	W	DIR
6-7 am	108	262	124	494	13	75	47	135	38	230	19	287	37	284	105	426	629	713	1342	0	1	0	0	1
7-8 am	217	409	127	753	43	148	61	252	107	361	44	512	73	514	148	735	1005	1247	2252	0	0	0	0	0
8-9 am	130	270	81	481	44	151	87	282	73	323	60	456	84	503	101	688	763	1144	1907	0	0	0	0	0
9-10 am	100	149	50	299	44	136	73	253	87	317	68	472	86	377	47	510	552	982	1534	0	0	0	0	0
10-11 am	101	145	59	305	44	128	95	267	95	291	78	464	52	294	37	383	572	847	1419	0	0	0	0	0
11-12 pm	92	178	81	351	50	134	108	292	112	334	84	530	57	311	38	406	643	936	1579	0	0	0	0	0
12-1 pm	118	129	65	312	51	163	89	303	111	338	107	556	85	312	44	441	615	997	1612	0	0	0	0	0
1-2 pm	97	144	64	305	49	163	74	286	122	303	93	518	70	264	44	378	591	896	1487	0	1	0	0	1
2-3 pm	108	180	52	340	81	159	87	327	135	388	105	628	94	341	53	488	667	1116	1783	0	0	0	0	0
3-4 pm	99	169	73	341	122	239	77	438	118	429	130	677	148	401	43	592	779	1269	2048	0	0	0	0	0
4-5 pm	93	140	72	305	167	366	107	640	119	600	162	881	173	470	36	679	945	1560	2505	0	0	0	0	0
5-6 pm	148	176	68	392	143	341	116	600	112	606	211	929	201	514	49	764	992	1693	2685	0	0	0	1	1
Total	1411	2351	916	4678	851	2203	1021	4075	1229	4520	1161	6910	1160	4585	745	6490	8753	13400	22153	0	2	0	1	3

Estimated Average Daily Flow (AADT)

Expansion Factors:	Hourly: 1.308												Daily and Seasonal Factor: 0.94						
AWT	1730	2890	1130	5750	1050	2710	1260	5020	1510	5560	1430	8500	1430	5640	920	7990	10770	16490	27240

Category: 2 - Ozaukee



Volume Summary - Cars

INTERSECTION: STH 167 & STH 181

Date: 6/18/2008 Day: Wed City: Mequon
Weather: Clear Legend: LT = Left Turn, TH = Thru, RT = Right Turn

Time	STH 181								STH 167								Totals		
	From North				From South				From East				From West				North	East	ALL
Period	LT	TH	RT	Total	LT	TH	RT	Total	LT	TH	RT	Total	LT	TH	RT	Total	South	West	DIR
6-7 am	107	258	124	489	12	74	45	131	38	221	18	277	33	268	102	403	620	680	1300
7-8 am	202	397	122	721	31	135	57	223	102	340	39	481	67	470	137	674	944	1155	2099
8-9 am	122	254	76	452	31	133	78	242	71	298	54	423	75	468	92	635	694	1058	1752
9-10 am	93	140	47	280	28	121	68	217	84	292	65	441	83	340	37	460	497	901	1398
10-11 am	94	128	52	274	31	113	91	235	88	258	72	418	43	267	24	334	509	752	1261
11-12 pm	83	154	71	308	45	117	102	264	109	303	75	487	50	283	33	366	572	853	1425
12-1 pm	110	114	57	281	43	148	84	275	100	316	93	509	80	281	36	397	556	906	1462
1-2 pm	90	128	58	276	40	150	68	258	118	281	80	479	67	241	36	344	534	823	1357
2-3 pm	95	170	47	312	72	147	82	301	132	360	95	587	87	306	41	434	613	1021	1634
3-4 pm	90	147	70	307	116	229	76	421	114	401	118	633	142	384	36	562	728	1195	1923
4-5 pm	86	132	62	280	166	350	104	620	115	577	155	847	165	455	32	652	900	1499	2399
5-6 pm	143	172	63	378	140	337	116	593	110	587	209	906	200	505	48	753	971	1659	2630
Total	1315	2194	849	4358	755	2054	971	3780	1181	4234	1073	6488	1092	4268	654	6014	8138	12502	20640

Volume Summary - Trucks, Buses & Semis

Time	STH 181								STH 167								Totals		
	From North				From South				From East				From West				North	East	ALL
Period	LT	TH	RT	Total	LT	TH	RT	Total	LT	TH	RT	Total	LT	TH	RT	Total	South	West	DIR
6-7 am	1	4	0	5	1	1	2	4	0	9	1	10	4	16	3	23	9	33	42
7-8 am	15	12	5	32	12	13	4	29	5	21	5	31	6	44	11	61	61	92	153
8-9 am	8	16	5	29	13	18	9	40	2	25	6	33	9	35	9	53	69	86	155
9-10 am	7	9	3	19	16	15	5	36	3	25	3	31	3	37	10	50	55	81	136
10-11 am	7	17	7	31	13	15	4	32	7	33	6	46	9	27	13	49	63	95	158
11-12 pm	9	24	10	43	5	17	6	28	3	31	9	43	7	28	5	40	71	83	154
12-1 pm	8	15	8	31	8	15	5	28	11	22	14	47	5	31	8	44	59	91	150
1-2 pm	7	16	6	29	9	13	6	28	4	22	13	39	3	23	8	34	57	73	130
2-3 pm	13	10	5	28	9	12	5	26	3	28	10	41	7	35	12	54	54	95	149
3-4 pm	9	22	3	34	6	10	1	17	4	28	12	44	6	17	7	30	51	74	125
4-5 pm	7	8	10	25	1	16	3	20	4	23	7	34	8	15	4	27	45	61	106
5-6 pm	5	4	5	14	3	4	0	7	2	19	2	23	1	9	1	11	21	34	55
Total	96	157	67	320	96	149	50	295	48	286	88	422	68	317	91	476	615	898	1513

Volume Summary - Trucks (Excludes semis) and Buses

INTERSECTION: STH 167 & STH 181

Date: 6/18/2008 Day: Wed City: Mequon
Weather: Clear Legend: LT = Left Turn, TH = Thru, RT = Right Turn

Time	STH 181								STH 167								Totals		
	From North				From South				From East				From West				North	East	ALL
Period	LT	TH	RT	Total	LT	TH	RT	Total	LT	TH	RT	Total	LT	TH	RT	Total	South	West	DIR
6-7 am	0	4	0	4	1	0	1	2	0	6	1	7	1	9	3	13	6	20	26
7-8 am	15	12	4	31	10	12	2	24	4	14	4	22	6	34	9	49	55	71	126
8-9 am	7	12	1	20	12	17	8	37	2	19	6	27	6	24	7	37	57	64	121
9-10 am	6	8	3	17	13	15	5	33	3	20	3	26	3	27	6	36	50	62	112
10-11 am	6	15	5	26	12	13	4	29	7	23	5	35	7	18	13	38	55	73	128
11-12 pm	8	24	8	40	3	16	6	25	2	26	5	33	6	20	4	30	65	63	128
12-1 pm	8	14	3	25	6	12	5	23	8	18	9	35	3	21	6	30	48	65	113
1-2 pm	7	16	5	28	7	11	5	23	4	18	12	34	3	20	5	28	51	62	113
2-3 pm	11	6	3	20	8	6	4	18	3	24	9	36	6	27	11	44	38	80	118
3-4 pm	8	19	2	29	4	5	1	10	4	20	9	33	5	12	6	23	39	56	95
4-5 pm	7	7	7	21	0	14	3	17	4	19	5	28	6	7	2	15	38	43	81
5-6 pm	3	4	4	11	2	4	0	6	1	16	1	18	1	2	1	4	17	22	39
Total	86	141	45	272	78	125	44	247	42	223	69	334	53	221	73	347	519	681	1200

Volume Summary - Semis

Time	STH 181								STH 167								Totals		
	From North				From South				From East				From West				North	East	ALL
Period	LT	TH	RT	Total	LT	TH	RT	Total	LT	TH	RT	Total	LT	TH	RT	Total	South	West	DIR
6-7 am	1	0	0	1	0	1	1	2	0	3	0	3	3	7	0	10	3	13	16
7-8 am	0	0	1	1	2	1	2	5	1	7	1	9	0	10	2	12	6	21	27
8-9 am	1	4	4	9	1	1	1	3	0	6	0	6	3	11	2	16	12	22	34
9-10 am	1	1	0	2	3	0	0	3	0	5	0	5	0	10	4	14	5	19	24
10-11 am	1	2	2	5	1	2	0	3	0	10	1	11	2	9	0	11	8	22	30
11-12 pm	1	0	2	3	2	1	0	3	1	5	4	10	1	8	1	10	6	20	26
12-1 pm	0	1	5	6	2	3	0	5	3	4	5	12	2	10	2	14	11	26	37
1-2 pm	0	0	1	1	2	2	1	5	0	4	1	5	0	3	3	6	6	11	17
2-3 pm	2	4	2	8	1	6	1	8	0	4	1	5	1	8	1	10	16	15	31
3-4 pm	1	3	1	5	2	5	0	7	0	8	3	11	1	5	1	7	12	18	30
4-5 pm	0	1	3	4	1	2	0	3	0	4	2	6	2	8	2	12	7	18	25
5-6 pm	2	0	1	3	1	0	0	1	1	3	1	5	0	7	0	7	4	12	16
Total	10	16	22	48	18	24	6	48	6	63	19	88	15	96	18	129	96	217	313

Volume Summary - Peds & Bikes Per Hour

INTERSECTION: STH 167 & STH 181

Date: 6/18/2008 Day: Wed City: Mequon
Weather: Clear Legend: LT = Left Turn, TH = Thru, RT = Right Turn

Time Period	Pedestrians								Bicycles						
	From				Totals				From				Totals		
	N	S	E	W	NS	EW	ALL		N	S	E	W	NS	EW	ALL
6-7 am	0	2	0	0	2	0	2		0	0	0	0	0	0	0
7-8 am	1	0	0	0	1	0	1		0	0	0	2	0	2	2
8-9 am	0	1	0	0	1	0	1		0	0	0	3	0	3	3
9-10 am	0	0	0	0	0	0	0		0	0	0	1	0	1	1
10-11 am	0	0	2	1	0	3	3		0	0	2	1	0	3	3
11-12 pm	0	0	1	0	0	1	1		0	0	2	1	0	3	3
12-1 pm	0	0	0	0	0	0	0		0	0	0	5	0	5	5
1-2 pm	0	0	0	0	0	0	0		0	0	4	2	0	6	6
2-3 pm	0	0	5	0	0	5	5		1	0	1	1	1	2	3
3-4 pm	0	0	1	0	0	1	1		0	0	2	0	0	2	2
4-5 pm	0	1	0	1	1	1	2		0	0	1	0	0	1	1
5-6 pm	0	0	0	2	0	2	2		0	0	3	0	0	3	3
Total	1	4	9	4	5	13	18		1	0	15	16	1	31	32

Special Pedestrians

Special Pedestrians	None	1 or 2	A Few	Several	Many
Pre-school Children	X				
Elementary School Age Children	X				
Visually Impaired (white cane/helper dog)	X				
Elderly/Disabled (except wheelchairs)	X				
Wheelchairs/Electric Scooters	X				
Other (Describe)	X				

Volume Summary - ALL VEHICLES

INTERSECTION: STH 167 & STH 181

Date: 6/18/2008 Day: Wed City: Mequon
Weather: Clear Legend: LT = Left Turn, TH = Thru, RT = Right Turn

Time Period	STH 181								STH 167								Total	PHF	
	From North				From South				From East				From West				ALL DIR	Peak Hr Vol	PHF[1]
	LT	TH	RT	Total	LT	TH	RT	Total	LT	TH	RT	Total	LT	TH	RT	Total			
6:00 AM	16	43	16	75	2	14	5	21	5	38	2	45	9	41	15	65	206	*	*
6:15 AM	17	60	31	108	4	23	11	38	10	46	3	59	6	68	26	100	305	*	*
6:30 AM	33	66	38	137	5	24	12	41	10	68	2	80	7	68	28	103	361	*	*
6:45 AM	42	93	39	174	2	14	19	35	13	78	12	103	16	107	36	158	470	1342	0.71
7:00 AM	38	81	33	152	13	33	7	53	12	65	12	89	22	91	34	147	441	1677	0.84
7:15 AM	53	113	36	202	7	48	17	72	18	75	7	100	16	126	34	176	550	1822	0.83
7:30 AM	54	114	35	203	17	38	19	74	35	104	14	153	21	130	32	183	613	2074	0.85
7:45 AM	72	101	23	196	6	29	18	53	42	117	11	170	14	167	48	229	648	2252	0.87
8:00 AM	30	75	27	132	9	35	18	62	19	102	13	134	16	132	47	195	523	2334	0.90
8:15 AM	35	87	26	148	17	27	23	67	20	64	14	98	12	113	17	142	455	2239	0.86
8:30 AM	25	61	13	99	9	39	19	67	19	75	20	114	22	128	17	167	447	2073	0.80
8:45 AM	40	47	15	102	9	50	27	86	15	82	13	110	34	130	20	184	482	1907	0.91
9:00 AM	30	45	16	91	11	43	20	74	21	83	16	120	29	112	14	155	440	1824	0.95
9:15 AM	20	42	14	76	12	34	12	58	28	85	19	132	23	96	11	130	396	1765	0.92
9:30 AM	27	38	14	79	11	38	19	68	21	73	17	111	13	71	11	95	353	1671	0.87
9:45 AM	23	24	6	53	10	21	22	53	17	76	16	109	21	98	11	130	345	1534	0.87
10:00 AM	28	32	8	68	6	30	27	63	24	75	22	121	14	70	15	99	351	1445	0.91
10:15 AM	25	40	21	86	18	31	21	70	20	74	25	119	15	63	10	88	363	1412	0.97
10:30 AM	25	38	17	80	15	36	21	72	22	67	16	105	7	77	4	88	345	1404	0.97
10:45 AM	23	35	13	71	5	31	26	62	29	75	15	119	16	84	8	108	360	1419	0.98
11:00 AM	20	45	32	97	13	29	19	61	27	61	17	105	16	56	11	83	346	1414	0.97
11:15 AM	21	41	15	77	13	31	27	71	31	86	21	138	15	97	4	116	402	1453	0.90
11:30 AM	23	49	19	91	12	41	28	81	33	85	22	140	10	86	13	109	421	1529	0.91
11:45 AM	28	43	15	86	12	33	34	79	21	102	24	147	16	72	10	98	410	1579	0.94
12:00 PM	29	38	16	83	14	37	29	80	23	91	26	140	18	76	9	103	406	1639	0.97
12:15 PM	32	33	17	82	11	33	23	67	25	85	27	137	19	76	12	107	393	1630	0.97
12:30 PM	34	28	19	81	14	49	15	78	32	76	32	140	19	79	12	110	409	1618	0.99
12:45 PM	23	30	13	66	12	44	22	78	31	86	22	139	29	81	11	121	404	1612	0.99
1:00 PM	29	34	23	86	8	40	16	64	24	69	25	118	18	63	18	99	367	1573	0.96
1:15 PM	22	35	11	68	15	32	16	63	37	70	25	132	16	63	7	86	349	1529	0.93
1:30 PM	27	48	18	93	13	43	19	75	27	69	23	119	13	61	10	84	371	1491	0.92
1:45 PM	19	27	12	58	13	48	23	84	34	95	20	149	23	77	9	109	400	1487	0.93
2:00 PM	26	35	15	76	17	43	14	74	30	101	20	151	25	84	17	126	427	1547	0.91
2:15 PM	25	54	14	93	14	42	27	83	31	94	16	141	18	76	9	103	420	1618	0.95
2:30 PM	23	43	15	81	35	38	22	95	24	104	36	164	22	98	12	132	472	1719	0.91
2:45 PM	34	48	8	90	15	36	24	75	50	89	33	172	29	83	15	127	464	1783	0.94
3:00 PM	29	47	12	88	23	51	20	94	35	93	29	157	32	89	13	134	473	1829	0.97
3:15 PM	25	45	18	88	31	65	17	113	19	97	25	141	35	96	10	141	483	1892	0.98
3:30 PM	18	39	19	76	44	75	24	143	32	106	40	178	46	103	6	155	552	1972	0.89
3:45 PM	27	38	24	89	24	48	16	88	32	133	36	201	35	113	14	162	540	2048	0.93
4:00 PM	21	26	11	58	37	67	28	132	24	126	43	193	26	89	8	123	506	2081	0.94
4:15 PM	23	35	14	72	48	80	29	157	28	151	39	218	46	132	9	187	634	2232	0.88
4:30 PM	28	45	30	103	46	105	20	171	23	165	30	218	53	101	5	159	651	2331	0.90
4:45 PM	21	34	17	72	36	114	30	180	44	158	50	252	48	148	14	210	714	2505	0.88
5:00 PM	39	46	18	103	38	101	31	170	36	172	63	271	44	120	9	173	717	2716	0.95
5:15 PM	44	49	20	113	49	100	20	169	27	174	59	260	56	128	20	204	746	2828	0.95
5:30 PM	28	46	14	88	26	81	29	136	32	162	51	235	57	128	9	194	653	2830	0.95
5:45 PM	37	35	16	88	30	59	36	125	17	108	38	163	44	138	11	193	569	2685	0.90
Total	1411	2351	916	4678	851	2203	1021	4075	1229	4520	1161	6910	1160	4585	745	6490	22153		

Notes:

1. PHF shown for hour that ends with that interval. For example, the PHF shown at 6:45 AM is for the 6:00 - 7:00 AM hour.

Volume Summary - Trucks, Buses & Semis

INTERSECTION: STH 167 & STH 181

Date: 6/18/2008 Day: Wed City: Mequon
Weather: Clear Legend: LT = Left Turn, TH = Thru, RT = Right Turn

Time	STH 181								STH 167								Totals		
	From North				From South				From East				From West				North	East	ALL
Period	LT	TH	RT	Total	LT	TH	RT	Total	LT	TH	RT	Total	LT	TH	RT	Total	South	West	DIR
6:00 AM	0	1	0	1	0	1	0	1	0	3	0	3	2	3	0	5	2	8	10
6:15 AM	0	0	0	0	1	0	0	1	0	1	0	1	0	2	0	2	1	3	4
6:30 AM	0	0	0	0	0	0	2	2	0	0	0	0	1	3	0	4	2	4	6
6:45 AM	1	3	0	4	0	0	0	0	0	5	1	6	1	8	3	12	4	18	22
7:00 AM	1	6	1	8	5	1	0	6	0	1	1	2	1	10	0	11	14	13	27
7:15 AM	5	6	2	13	2	4	0	6	1	7	1	9	2	10	1	13	19	22	41
7:30 AM	6	0	1	7	3	7	4	14	3	8	1	12	3	15	6	24	21	36	57
7:45 AM	3	0	1	4	2	1	0	3	1	5	2	8	0	9	4	13	7	21	28
8:00 AM	3	3	1	7	3	5	3	11	1	9	1	11	2	6	3	11	18	22	40
8:15 AM	2	9	1	12	8	3	3	14	0	3	1	4	2	5	0	7	26	11	37
8:30 AM	0	3	1	4	1	6	2	9	0	5	2	7	4	15	2	21	13	28	41
8:45 AM	3	1	2	6	1	4	1	6	1	8	2	11	1	9	4	14	12	25	37
9:00 AM	2	4	0	6	4	4	1	9	1	7	1	9	1	11	2	14	15	23	38
9:15 AM	2	5	1	8	6	2	1	9	2	7	0	9	1	14	3	18	17	27	44
9:30 AM	2	0	2	4	4	7	2	13	0	5	1	6	0	7	1	8	17	14	31
9:45 AM	1	0	0	1	2	2	1	5	0	6	1	7	1	5	4	10	6	17	23
10:00 AM	0	4	2	6	1	3	0	4	2	4	1	7	2	9	9	20	10	27	37
10:15 AM	2	8	3	13	5	1	1	7	0	7	1	8	1	4	3	8	20	16	36
10:30 AM	3	3	2	8	6	8	1	15	4	15	3	22	1	6	0	7	23	29	52
10:45 AM	2	2	0	4	1	3	2	6	1	7	1	9	5	8	1	14	10	23	33
11:00 AM	2	7	3	12	1	2	0	3	0	5	4	9	1	4	1	6	15	15	30
11:15 AM	2	6	2	10	1	4	5	10	1	9	1	11	2	10	1	13	20	24	44
11:30 AM	2	3	3	8	2	4	0	6	1	6	2	9	3	9	2	14	14	23	37
11:45 AM	3	8	2	13	1	7	1	9	1	11	2	14	1	5	1	7	22	21	43
12:00 PM	2	6	2	10	1	5	1	7	1	6	2	9	2	8	2	12	17	21	38
12:15 PM	3	4	2	9	1	5	1	7	0	5	1	6	1	7	2	10	16	16	32
12:30 PM	3	3	3	9	2	4	0	6	5	2	4	11	0	9	4	13	15	24	39
12:45 PM	0	2	1	3	4	1	3	8	5	9	7	21	2	7	0	9	11	30	41
1:00 PM	0	4	1	5	2	2	2	6	0	8	4	12	0	5	2	7	11	19	30
1:15 PM	3	7	1	11	3	0	1	4	1	5	4	10	1	5	1	7	15	17	32
1:30 PM	1	3	3	7	2	5	0	7	1	4	3	8	1	11	3	15	14	23	37
1:45 PM	3	2	1	6	2	6	3	11	2	5	2	9	1	2	2	5	17	14	31
2:00 PM	5	4	3	12	3	2	1	6	1	15	4	20	4	9	4	17	18	37	55
2:15 PM	3	1	1	5	4	3	1	8	1	4	0	5	0	5	1	6	13	11	24
2:30 PM	1	3	0	4	2	3	1	6	0	5	4	9	2	9	4	15	10	24	34
2:45 PM	4	2	1	7	0	4	2	6	1	4	2	7	1	12	3	16	13	23	36
3:00 PM	3	5	0	8	1	4	0	5	1	6	2	9	1	8	2	11	13	20	33
3:15 PM	3	7	0	10	1	3	0	4	0	9	3	12	1	5	0	6	14	18	32
3:30 PM	0	4	1	5	3	3	0	6	2	4	3	9	4	1	2	7	11	16	27
3:45 PM	3	6	2	11	1	0	1	2	1	9	4	14	0	3	3	6	13	20	33
4:00 PM	1	1	0	2	0	4	0	4	2	5	3	10	3	4	1	8	6	18	24
4:15 PM	1	1	3	5	0	4	1	5	2	8	2	12	2	5	2	9	10	21	31
4:30 PM	3	4	5	12	0	3	1	4	0	7	1	8	2	2	1	5	16	13	29
4:45 PM	2	2	2	6	1	5	1	7	0	3	1	4	1	4	0	5	13	9	22
5:00 PM	0	1	2	3	0	1	0	1	1	3	1	5	0	1	0	1	4	6	10
5:15 PM	3	2	1	6	1	2	0	3	0	6	1	7	0	5	0	5	9	12	21
5:30 PM	1	0	2	3	1	0	0	1	0	4	0	4	0	1	0	1	4	5	9
5:45 PM	1	1	0	2	1	1	0	2	1	6	0	7	1	2	1	4	4	11	15
Total	96	157	67	320	96	149	50	295	48	286	88	422	68	317	91	476	615	898	1513

Volume Summary - Peds, Bikes & U-Turns

INTERSECTION: STH 167 & STH 181

Date: 6/18/2008 Day: Wed City: Mequon
Weather: Clear Legend: LT = Left Turn, TH = Thru, RT = Right Turn

Time	Pedestrians							Bicycles							U-Turns						
	From				Totals			From				Totals			From				Totals		
Period	N	S	E	W	NS	EW	ALL	N	S	E	W	NS	EW	ALL	N	S	E	W	NS	EW	ALL
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	1
6:30 AM	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	1	0	0	0	1	0	1	0	0	0	1	0	1	1	0	0	0	0	0	0	0
8:00 AM	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	2	0	2	2	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0
10:30 AM	0	0	0	1	0	1	1	0	0	2	0	0	2	2	0	0	0	0	0	0	0
10 45 AM	0	0	2	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	2	0	0	2	2	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	1	0	0	1	1	0	0	0	1	0	1	1	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	3	0	3	3	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	2	2	0	4	4	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1
1 45 PM	0	0	0	0	0	0	0	0	0	2	0	0	2	2	0	0	0	0	0	0	0
2:00 PM	0	0	5	0	0	5	5	1	0	0	0	1	0	1	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	2	0	0	2	2	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	1	0	1	1	1	2	0	0	1	0	0	1	1	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
5:15 PM	0	0	0	0	0	0	0	0	0	2	0	0	2	2	0	0	0	0	0	0	0
5:30 PM	0	0	0	2	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0
Total	1	4	9	4	5	13	18	1	0	15	16	1	31	32	0	2	0	1	2	1	3

File Name : AM-PM1 Total
Site Code : 00000000
Start Date : 9/26/2006
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

	MEQUON TRL From North				MEQUON RD HWY167 From East				MEQUON TRL From South				MEQUON RD HWY167 From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:00 AM	0	0	0	0	0	43	0	0	4	0	2	0	1	88	0	0	138
06:15 AM	0	0	0	0	1	60	0	0	3	0	6	0	4	113	1	0	188
06:30 AM	0	0	1	0	0	119	1	0	7	0	6	1	1	145	1	1	283
06:45 AM	0	0	0	0	1	87	6	0	11	0	11	1	4	210	6	0	337
Total	0	0	1	0	2	309	7	0	25	0	25	2	10	556	8	1	946
07:00 AM	0	0	0	0	3	160	0	0	9	0	17	0	4	291	8	0	492
07:15 AM	0	0	0	0	3	182	2	0	20	0	13	0	2	232	15	0	469
07:30 AM	0	0	2	0	2	179	1	1	27	0	8	1	3	258	56	0	538
07:45 AM	0	0	1	0	6	191	7	0	25	0	19	2	1	315	37	0	604
Total	0	0	3	0	14	712	10	1	81	0	57	3	10	1096	116	0	2103
08:00 AM	0	0	3	0	7	134	1	0	9	0	10	0	4	172	5	0	345
08:15 AM	0	0	1	0	8	132	0	0	7	0	11	0	3	211	8	0	381
08:30 AM	0	0	1	0	5	129	1	0	5	0	8	0	0	184	6	0	339
08:45 AM	1	0	2	0	3	131	4	0	5	0	6	0	2	178	6	0	338
Total	1	0	7	0	23	526	6	0	26	0	35	0	9	745	25	0	1403
09:00 AM	4	0	3	0	3	127	1	1	4	0	5	0	1	137	4	0	290
09:15 AM	2	0	3	0	4	94	3	0	2	0	7	0	2	118	5	0	240
09:30 AM	0	0	0	1	5	110	2	0	8	0	8	0	4	136	7	0	281
09:45 AM	0	0	2	0	5	114	0	0	5	0	11	0	1	124	2	1	265
Total	6	0	8	1	17	445	6	1	19	0	31	0	8	515	18	1	1076
10:00 AM	0	0	1	0	5	98	1	0	10	0	1	0	0	112	3	1	232
10:15 AM	1	0	1	0	1	99	0	0	8	0	3	0	2	116	3	0	234
10:30 AM	2	0	2	0	8	127	4	0	6	0	7	2	3	112	2	1	276
10:45 AM	1	0	5	1	5	107	1	0	7	0	6	2	3	120	5	0	263
Total	4	0	9	1	19	431	6	0	31	0	17	4	8	460	13	2	1005
11:00 AM	1	0	2	0	6	134	2	0	5	0	14	2	1	120	5	0	292
11:15 AM	0	0	2	1	7	146	1	1	1	0	6	0	2	125	5	0	297
11:30 AM	3	0	1	0	9	146	0	0	8	0	11	0	2	148	11	0	339
11:45 AM	2	0	4	0	2	123	2	0	4	0	5	0	2	127	6	0	277
Total	6	0	9	1	24	549	5	1	18	0	36	2	7	520	27	0	1205
12:00 PM	1	0	1	0	7	144	1	0	3	0	7	0	1	116	4	0	285
12:15 PM	0	0	1	0	5	131	2	0	1	0	8	0	4	97	5	0	254
12:30 PM	3	0	3	0	6	130	2	0	1	0	5	0	3	89	2	1	245
12:45 PM	2	0	2	0	5	125	3	0	7	0	6	0	2	125	4	0	281
Total	6	0	7	0	23	530	8	0	12	0	26	0	10	427	15	1	1065
01:00 PM	1	0	5	0	3	119	5	0	6	0	4	0	2	120	2	0	267
01:15 PM	1	0	1	1	4	126	3	1	8	0	6	0	5	119	1	0	276
01:30 PM	5	0	5	0	5	126	0	0	1	0	2	0	1	133	6	0	284
01:45 PM	1	0	1	2	6	140	2	1	6	0	5	0	0	123	4	0	291
Total	8	0	12	3	18	511	10	2	21	0	17	0	8	495	13	0	1118
02:00 PM	2	0	1	0	3	114	0	0	7	0	5	0	1	104	5	0	242
02:15 PM	3	0	4	0	5	145	2	0	4	0	7	0	3	134	4	0	311
02:30 PM	1	0	2	0	6	144	2	0	7	0	5	0	0	137	11	0	315
02:45 PM	1	0	2	0	8	211	1	0	4	0	7	0	1	157	9	0	401
Total	7	0	9	0	22	614	5	0	22	0	24	0	5	532	29	0	1269
03:00 PM	2	0	2	2	13	167	1	0	7	0	6	0	3	149	17	0	369
03:15 PM	2	0	1	1	5	177	0	0	7	0	6	0	2	159	9	0	369
03:30 PM	6	0	9	0	7	197	0	2	10	0	8	1	3	171	6	1	421
03:45 PM	3	0	2	2	11	201	1	0	9	0	5	0	2	162	11	0	409
Total	13	0	14	5	36	742	2	2	33	0	25	1	10	641	43	1	1568

File Name : AM-PM1 Total
Site Code : 00000000
Start Date : 9/26/2006
Page No : 2

Groups Printed- Unshifted - Bank 1 - Bank 2

	MEQUON TRL From North				MEQUON RD HWY167 From East				MEQUON TRL From South				MEQUON RD HWY167 From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
04:00 PM	1	0	0	0	10	221	0	0	12	0	4	1	1	177	16	0	443
04:15 PM	0	0	0	0	9	219	2	0	6	0	5	0	3	191	6	0	441
04:30 PM	1	0	5	2	8	224	1	0	9	0	12	0	2	185	12	0	461
04:45 PM	3	0	1	1	9	246	1	0	6	0	6	3	0	225	15	0	516
Total	5	0	6	3	36	910	4	0	33	0	27	4	6	778	49	0	1861
05:00 PM	4	0	2	0	11	269	2	2	4	0	14	0	1	199	12	0	520
05:15 PM	2	0	4	0	21	258	0	1	10	0	5	0	2	216	8	0	527
05:30 PM	0	0	4	0	8	232	2	1	3	0	6	0	1	213	11	0	481
05:45 PM	1	0	1	0	21	237	1	1	6	1	3	2	0	185	10	0	469
Total	7	0	11	0	61	996	5	5	23	1	28	2	4	813	41	0	1997
Grand Total	63	0	96	14	295	7275	74	12	344	1	348	18	95	7578	397	6	16616
Apprch %	36.4	0	55.5	8.1	3.9	95	1	0.2	48.4	0.1	48.9	2.5	1.2	93.8	4.9	0.1	
Total %	0.4	0	0.6	0.1	1.8	43.8	0.4	0.1	2.1	0	2.1	0.1	0.6	45.6	2.4	0	
	51	0	54	9	283	6724	57	4	335	1	338	14	46	7067	372	3	15358
%	81	0	56.2	64.3	95.9	92.4	77	33.3	97.4	100	97.1	77.8	48.4	93.3	93.7	50	92.4
	5	0	7	5	6	251	3	4	8	0	7	3	11	267	24	3	604
%	7.9	0	7.3	35.7	2	3.5	4.1	33.3	2.3	0	2	16.7	11.6	3.5	6	50	3.6
	7	0	35	0	6	300	14	4	1	0	3	1	38	244	1	0	654
%	11.1	0	36.5	0	2	4.1	18.9	33.3	0.3	0	0.9	5.6	40	3.2	0.3	0	3.9

Mequon
Weekday PM

JH.

File Name : STH 167-River Birch PM
Site Code : 00000000
Start Date : 5/17/2010
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

	RIVER BIRCH From North				STH 167 From East				RIVER BIRCH From South				STH 167 From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
*** BREAK ***																	
03:00 PM	1	0	0	0	2	237	0	0	0	0	1	0	2	172	1	2	418
03:15 PM	0	0	0	0	0	229	1	1	0	0	0	0	1	182	1	2	417
03:30 PM	4	0	0	0	2	197	0	2	0	0	0	0	0	168	0	0	373
03:45 PM	0	1	0	0	1	239	1	0	0	0	0	0	1	171	1	3	418
Total	5	1	0	0	5	902	2	3	0	0	1	0	4	693	3	7	1626
04:00 PM	0	0	0	0	1	219	0	1	2	0	2	2	0	198	0	1	426
04:15 PM	0	0	0	1	1	235	1	2	1	0	3	2	0	194	1	2	443
04:30 PM	0	0	0	0	3	237	1	0	1	0	1	0	1	203	1	0	448
04:45 PM	1	0	0	0	1	277	1	0	1	0	2	1	1	255	0	1	541
Total	1	0	0	1	6	968	3	3	5	0	8	5	2	850	2	4	1858
05:00 PM	0	0	0	0	2	278	2	0	0	0	3	0	0	217	0	0	502
05:15 PM	0	0	0	0	0	306	0	1	1	0	0	0	0	248	0	0	556
05:30 PM	0	0	0	1	0	273	1	0	0	0	0	0	0	229	1	0	505
05:45 PM	0	0	0	0	2	225	0	0	1	0	1	0	0	205	0	0	434
Total	0	0	0	1	4	1082	3	1	2	0	4	0	0	899	1	0	1997
Grand Total	6	1	0	2	15	2952	8	7	7	0	13	5	6	2442	6	11	5481
Apprch %	66.7	11.1	0	22.2	0.5	99	0.3	0.2	28	0	52	20	0.2	99.1	0.2	0.4	
Total %	0.1	0	0	0	0.3	53.9	0.1	0.1	0.1	0	0.2	0.1	0.1	44.6	0.1	0.2	
Unshifted	6	1	0	1	15	2846	7	1	7	0	13	3	6	2376	5	0	5287
% Unshifted	100	100	0	50	100	96.4	87.5	14.3	100	0	100	60	100	97.3	83.3	0	96.5
Bank 1	0	0	0	1	0	76	0	0	0	0	0	2	0	48	0	0	127
% Bank 1	0	0	0	50	0	2.6	0	0	0	0	0	40	0	2	0	0	2.3
Bank 2	0	0	0	0	0	30	1	6	0	0	0	0	0	18	1	11	67
% Bank 2	0	0	0	0	0	1	12.5	85.7	0	0	0	0	0	0.7	16.7	100	1.2

Mequon
Weekday PM

JH.

File Name : STH 167-River Birch PM
Site Code : 00000000
Start Date : 5/17/2010
Page No : 1

Groups Printed- Bank 1 - Bank 2

	RIVER BIRCH From North				STH 167 From East				RIVER BIRCH From South				STH 167 From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
*** BREAK ***																	
03:00 PM	0	0	0	0	0	7	0	0	0	0	0	0	0	16	1	2	26
03:15 PM	0	0	0	0	0	13	0	0	0	0	0	0	0	6	0	2	21
03:30 PM	0	0	0	0	0	8	0	2	0	0	0	0	0	6	0	0	16
03:45 PM	0	0	0	0	0	18	1	0	0	0	0	0	0	5	0	3	27
Total	0	0	0	0	0	46	1	2	0	0	0	0	0	33	1	7	90
04:00 PM	0	0	0	0	0	13	0	1	0	0	0	0	0	4	0	1	19
04:15 PM	0	0	0	0	0	5	0	2	0	0	0	2	0	10	0	2	21
04:30 PM	0	0	0	0	0	7	0	0	0	0	0	0	0	5	0	0	12
04:45 PM	0	0	0	0	0	6	0	0	0	0	0	0	0	4	0	1	11
Total	0	0	0	0	0	31	0	3	0	0	0	2	0	23	0	4	63
05:00 PM	0	0	0	0	0	7	0	0	0	0	0	0	0	3	0	0	10
05:15 PM	0	0	0	0	0	12	0	1	0	0	0	0	0	1	0	0	14
05:30 PM	0	0	0	1	0	6	0	0	0	0	0	0	0	4	0	0	11
05:45 PM	0	0	0	0	0	4	0	0	0	0	0	0	0	2	0	0	6
Total	0	0	0	1	0	29	0	1	0	0	0	0	0	10	0	0	41
Grand Total	0	0	0	1	0	106	1	6	0	0	0	2	0	66	1	11	194
Apprch %	0	0	0	100	0	93.8	0.9	5.3	0	0	0	100	0	84.6	1.3	14.1	
Total %	0	0	0	0.5	0	54.6	0.5	3.1	0	0	0	1	0	34	0.5	5.7	
Bank 1	0	0	0	1	0	76	0	0	0	0	0	2	0	48	0	0	127
% Bank 1	0	0	0	100	0	71.7	0	0	0	0	0	100	0	72.7	0	0	65.5
Bank 2	0	0	0	0	0	30	1	6	0	0	0	0	0	18	1	11	67
% Bank 2	0	0	0	0	0	28.3	100	100	0	0	0	0	0	27.3	100	100	34.5

Mequon
Weekday

J&KB.

File Name : Mequon-Buntrock AM-PM
Site Code : 00000000
Start Date : 1/21/2009
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

	BUNTROCK From North				MEQUON RD From East				BUNTROCK From South				MEQUON RD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:00 AM	1	0	2	0	1	41	0	0	2	1	1	0	1	78	1	0	129
06:15 AM	1	1	3	0	1	52	0	0	1	0	1	0	0	89	1	0	150
06:30 AM	0	0	5	0	3	81	2	0	4	0	3	0	6	120	1	0	225
06:45 AM	3	3	4	0	2	85	1	0	2	0	1	0	9	183	1	0	294
Total	5	4	14	0	7	259	3	0	9	1	6	0	16	470	4	0	798
07:00 AM	2	8	6	0	7	122	6	0	2	2	8	0	11	257	2	0	433
07:15 AM	2	8	11	0	11	145	4	0	3	5	2	0	26	197	3	0	417
07:30 AM	3	32	14	0	12	142	1	0	2	11	20	0	20	198	3	0	458
07:45 AM	4	46	24	0	17	122	2	1	7	22	39	0	27	226	11	0	548
Total	11	94	55	0	47	531	13	1	14	40	69	0	84	878	19	0	1856
08:00 AM	3	16	12	0	16	111	0	0	7	5	18	0	8	170	8	0	374
08:15 AM	0	6	6	0	9	107	2	0	2	0	6	0	4	147	6	0	295
08:30 AM	3	6	10	0	29	74	2	0	4	0	20	0	5	130	16	0	299
08:45 AM	2	4	7	0	27	70	1	0	15	4	40	0	6	140	29	0	345
Total	8	32	35	0	81	362	5	0	28	9	84	0	23	587	59	0	1313
*** BREAK ***																	
04:00 PM	3	1	12	0	9	142	6	0	16	5	12	0	8	145	2	0	361
04:15 PM	2	5	9	0	2	192	11	0	9	4	12	0	21	134	2	0	403
04:30 PM	4	1	15	0	12	185	5	0	18	9	12	0	12	153	3	0	429
04:45 PM	0	0	9	0	6	174	5	0	12	6	6	0	15	165	3	0	401
Total	9	7	45	0	29	693	27	0	55	24	42	0	56	597	10	0	1594
05:00 PM	3	2	5	0	3	215	3	0	16	5	13	0	13	161	4	0	443
05:15 PM	1	1	8	0	6	222	2	0	13	9	10	0	13	177	1	0	463
05:30 PM	1	0	7	0	1	196	4	0	7	0	3	0	14	151	1	0	385
05:45 PM	2	0	12	0	1	142	2	0	4	2	7	0	14	149	2	0	337
Total	7	3	32	0	11	775	11	0	40	16	33	0	54	638	8	0	1628
Grand Total	40	140	181	0	175	2620	59	1	146	90	234	0	233	3170	100	0	7189
Apprch %	11.1	38.8	50.1	0	6.1	91.8	2.1	0	31.1	19.1	49.8	0	6.7	90.5	2.9	0	
Total %	0.6	1.9	2.5	0	2.4	36.4	0.8	0	2	1.3	3.3	0	3.2	44.1	1.4	0	
	38	127	179	0	162	2521	59	1	131	84	211	0	229	3062	97	0	6901
%	95	90.7	98.9	0	92.6	96.2	100	100	89.7	93.3	90.2	0	98.3	96.6	97	0	96
	2	13	2	0	13	55	0	0	14	6	23	0	4	57	3	0	192
%	5	9.3	1.1	0	7.4	2.1	0	0	9.6	6.7	9.8	0	1.7	1.8	3	0	2.7
	0	0	0	0	0	44	0	0	1	0	0	0	0	51	0	0	96
%	0	0	0	0	0	1.7	0	0	0.7	0	0	0	0	1.6	0	0	1.3

Mequon
Weekday

J&KB.

File Name : Mequon-Buntrock AM-PM
Site Code : 00000000
Start Date : 1/21/2009
Page No : 1

Groups Printed- Bank 1 - Bank 2

	BUNTROCK From North				MEQUON RD From East				BUNTROCK From South				MEQUON RD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:00 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0	0	6
06:15 AM	0	0	0	0	0	5	0	0	1	0	0	0	0	3	0	0	9
06:30 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	6	0	0	8
06:45 AM	0	0	0	0	0	5	0	0	1	0	0	0	1	8	0	0	15
Total	0	0	0	0	0	15	0	0	2	0	0	0	1	20	0	0	38
07:00 AM	0	0	0	0	0	9	0	0	1	0	1	0	0	7	0	0	18
07:15 AM	0	0	0	0	1	5	0	0	0	1	0	0	0	5	0	0	12
07:30 AM	0	7	0	0	2	2	0	0	1	2	0	0	2	8	0	0	24
07:45 AM	2	4	0	0	1	5	0	0	0	3	7	0	0	8	0	0	30
Total	2	11	0	0	4	21	0	0	2	6	8	0	2	28	0	0	84
08:00 AM	0	0	0	0	0	10	0	0	5	0	1	0	0	9	0	0	25
08:15 AM	0	0	1	0	0	7	0	0	0	0	0	0	0	9	0	0	17
08:30 AM	0	1	0	0	4	6	0	0	0	0	6	0	0	6	1	0	24
08:45 AM	0	1	0	0	2	2	0	0	0	0	5	0	0	9	1	0	20
Total	0	2	1	0	6	25	0	0	5	0	12	0	0	33	2	0	86
*** BREAK ***																	
04:00 PM	0	0	0	0	0	5	0	0	3	0	1	0	1	4	0	0	14
04:15 PM	0	0	0	0	0	9	0	0	1	0	0	0	0	4	1	0	15
04:30 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	5	0	0	7
04:45 PM	0	0	0	0	1	8	0	0	1	0	0	0	0	5	0	0	15
Total	0	0	0	0	2	23	0	0	5	0	1	0	1	18	1	0	51
05:00 PM	0	0	0	0	1	6	0	0	1	0	2	0	0	4	0	0	14
05:15 PM	0	0	1	0	0	3	0	0	0	0	0	0	0	2	0	0	6
05:30 PM	0	0	0	0	0	4	0	0	0	0	0	0	0	1	0	0	5
05:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	4
Total	0	0	1	0	1	15	0	0	1	0	2	0	0	9	0	0	29
Grand Total	2	13	2	0	13	99	0	0	15	6	23	0	4	108	3	0	288
Apprch %	11.8	76.5	11.8	0	11.6	88.4	0	0	34.1	13.6	52.3	0	3.5	93.9	2.6	0	
Total %	0.7	4.5	0.7	0	4.5	34.4	0	0	5.2	2.1	8	0	1.4	37.5	1	0	
	2	13	2	0	13	55	0	0	14	6	23	0	4	57	3	0	192
%	100	100	100	0	100	55.6	0	0	93.3	100	100	0	100	52.8	100	0	66.7
	0	0	0	0	0	44	0	0	1	0	0	0	0	51	0	0	96
%	0	0	0	0	0	44.4	0	0	6.7	0	0	0	0	47.2	0	0	33.3

Mequon
Weekday

AS.

File Name : Mequon-Industrial AM-PM
Site Code : 00000000
Start Date : 1/22/2009
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

	INDUSTRIAL DR From North				MEQUON RD From East				INDUSTRIAL DR From South				MEQUON RD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
*** BREAK ***																	
06:30 AM	1	1	0	0	25	81	1	0	0	0	8	0	2	97	21	0	237
06:45 AM	1	0	1	0	38	97	1	0	2	1	18	0	2	147	17	0	325
Total	2	1	1	0	63	178	2	0	2	1	26	0	4	244	38	0	562
07:00 AM	0	0	0	0	39	97	1	0	7	0	7	0	1	232	17	0	401
07:15 AM	0	0	0	0	36	161	0	0	6	1	7	0	4	177	20	0	412
07:30 AM	0	1	0	0	46	185	4	0	0	1	3	0	2	188	19	0	449
07:45 AM	1	0	0	0	73	140	0	0	1	1	11	0	1	264	43	1	536
Total	1	1	0	0	194	583	5	0	14	3	28	0	8	861	99	1	1798
08:00 AM	0	0	0	0	42	128	4	0	4	0	18	0	0	188	23	0	407
08:15 AM	3	0	0	0	31	125	0	0	2	0	14	0	2	144	11	0	332
*** BREAK ***																	
Total	3	0	0	0	73	253	4	0	6	0	32	0	2	332	34	0	739
*** BREAK ***																	
04:00 PM	0	0	1	0	9	167	2	0	13	0	50	0	0	136	5	0	383
04:15 PM	1	0	1	0	21	178	0	0	12	0	37	0	0	162	7	0	419
04:30 PM	0	0	1	0	26	171	1	0	16	0	55	0	0	168	5	0	443
04:45 PM	0	0	1	0	3	186	0	0	14	0	49	1	0	153	1	0	408
Total	1	0	4	0	59	702	3	0	55	0	191	1	0	619	18	0	1653
05:00 PM	0	0	2	0	2	204	0	0	14	3	65	0	0	178	0	0	468
05:15 PM	0	0	0	0	8	211	2	0	16	0	42	0	0	195	2	0	476
05:30 PM	2	0	0	0	8	187	0	0	14	2	27	0	1	183	6	0	430
05:45 PM	3	0	0	0	10	156	0	0	7	0	20	0	1	175	1	0	373
Total	5	0	2	0	28	758	2	0	51	5	154	0	2	731	9	0	1747
Grand Total	12	2	7	0	417	2474	16	0	128	9	431	1	16	2787	198	1	6499
Apprch %	57.1	9.5	33.3	0	14.3	85.1	0.6	0	22.5	1.6	75.7	0.2	0.5	92.8	6.6	0	
Total %	0.2	0	0.1	0	6.4	38.1	0.2	0	2	0.1	6.6	0	0.2	42.9	3	0	
	11	2	7	0	383	2408	15	0	120	9	396	1	16	2717	178	0	6263
%	91.7	100	100	0	91.8	97.3	93.8	0	93.8	100	91.9	100	100	97.5	89.9	0	96.4
	0	0	0	0	31	27	1	0	4	0	25	0	0	41	14	0	143
%	0	0	0	0	7.4	1.1	6.2	0	3.1	0	5.8	0	0	1.5	7.1	0	2.2
	1	0	0	0	3	39	0	0	4	0	10	0	0	29	6	1	93
%	8.3	0	0	0	0.7	1.6	0	0	3.1	0	2.3	0	0	1	3	100	1.4

Mequon
Weekday

AS.

File Name : Mequon-Industrial AM-PM
Site Code : 00000000
Start Date : 1/22/2009
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Groups Printed- Bank 1 - Bank 2

	INDUSTRIAL DR From North				MEQUON RD From East				INDUSTRIAL DR From South				MEQUON RD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
*** BREAK ***																	
06:30 AM	0	0	0	0	0	1	0	0	0	0	2	0	0	6	1	0	10
06:45 AM	0	0	0	0	1	5	0	0	1	0	6	0	0	3	0	0	16
Total	0	0	0	0	1	6	0	0	1	0	8	0	0	9	1	0	26
07:00 AM	0	0	0	0	1	7	0	0	3	0	3	0	0	10	0	0	24
07:15 AM	0	0	0	0	0	4	0	0	0	0	1	0	0	6	1	0	12
07:30 AM	0	0	0	0	0	5	1	0	0	0	0	0	0	6	0	0	12
07:45 AM	0	0	0	0	3	5	0	0	0	0	3	0	0	4	7	1	23
Total	0	0	0	0	4	21	1	0	3	0	7	0	0	26	8	1	71
08:00 AM	0	0	0	0	2	7	0	0	2	0	8	0	0	7	1	0	27
08:15 AM	0	0	0	0	1	4	0	0	0	0	3	0	0	5	0	0	13
*** BREAK ***																	
Total	0	0	0	0	3	11	0	0	2	0	11	0	0	12	1	0	40
*** BREAK ***																	
04:00 PM	0	0	0	0	2	8	0	0	0	0	0	0	0	5	2	0	17
04:15 PM	0	0	0	0	7	1	0	0	0	0	4	0	0	3	6	0	21
04:30 PM	0	0	0	0	15	5	0	0	0	0	0	0	0	2	2	0	24
04:45 PM	0	0	0	0	0	2	0	0	1	0	2	0	0	2	0	0	7
Total	0	0	0	0	24	16	0	0	1	0	6	0	0	12	10	0	69
05:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	4	0	0	5
05:15 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	3
05:30 PM	0	0	0	0	0	6	0	0	0	0	0	0	0	3	0	0	9
05:45 PM	1	0	0	0	2	5	0	0	1	0	1	0	0	3	0	0	13
Total	1	0	0	0	2	12	0	0	1	0	3	0	0	11	0	0	30
Grand Total	1	0	0	0	34	66	1	0	8	0	35	0	0	70	20	1	236
Apprch %	100	0	0	0	33.7	65.3	1	0	18.6	0	81.4	0	0	76.9	22	1.1	
Total %	0.4	0	0	0	14.4	28	0.4	0	3.4	0	14.8	0	0	29.7	8.5	0.4	
	0	0	0	0	31	27	1	0	4	0	25	0	0	41	14	0	143
%	0	0	0	0	91.2	40.9	100	0	50	0	71.4	0	0	58.6	70	0	60.6
	1	0	0	0	3	39	0	0	4	0	10	0	0	29	6	1	93
%	100	0	0	0	8.8	59.1	0	0	50	0	28.6	0	0	41.4	30	100	39.4

Mequon
Weekday

JH.

File Name : Mequon-Logemann AM-PM
Site Code : 00000000
Start Date : 1/22/2009
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

	LOGEMANN From North				MEQUON From East				LOGEMANN From South				MEQUON From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
*** BREAK ***																	
06:30 AM	0	0	0	0	0	99	0	0	0	0	0	0	1	118	0	0	218
06:45 AM	0	0	0	0	0	144	0	0	0	0	0	0	1	171	1	1	318
Total	0	0	0	0	0	243	0	0	0	0	0	0	2	289	1	1	536
07:00 AM	0	0	0	0	0	154	0	0	0	0	0	0	1	263	0	0	418
07:15 AM	0	0	0	0	0	225	0	0	0	0	0	1	1	209	0	0	436
07:30 AM	0	0	0	0	0	253	0	0	0	0	0	0	2	233	0	0	488
07:45 AM	0	0	1	0	0	253	1	0	0	0	0	0	4	297	0	0	556
Total	0	0	1	0	0	885	1	0	0	0	0	1	8	1002	0	0	1898
08:00 AM	0	0	2	1	0	188	2	0	0	0	0	0	3	205	0	2	403
08:15 AM	0	0	1	0	0	144	1	0	0	0	0	1	4	161	0	1	313
*** BREAK ***																	
Total	0	0	3	1	0	332	3	0	0	0	0	1	7	366	0	3	716
*** BREAK ***																	
04:00 PM	0	0	1	0	0	181	0	0	0	0	0	0	0	187	0	0	369
04:15 PM	1	0	0	0	0	184	1	2	0	0	0	0	0	198	0	0	386
04:30 PM	0	0	8	0	0	193	0	0	0	0	5	0	1	211	2	1	421
04:45 PM	0	0	0	0	0	182	1	1	0	0	2	0	1	200	3	0	390
Total	1	0	9	0	0	740	2	3	0	0	7	0	2	796	5	1	1566
05:00 PM	0	0	1	0	0	217	0	0	0	0	4	0	1	243	1	0	467
05:15 PM	0	0	3	0	0	202	0	0	0	0	8	0	0	229	2	0	444
05:30 PM	1	0	0	0	0	186	4	0	0	0	2	0	0	204	3	0	400
05:45 PM	0	0	1	0	0	173	5	0	0	0	0	0	5	196	0	0	380
Total	1	0	5	0	0	778	9	0	0	0	14	0	6	872	6	0	1691
Grand Total	2	0	18	1	0	2978	15	3	0	0	21	2	25	3325	12	5	6407
Apprch %	9.5	0	85.7	4.8	0	99.4	0.5	0.1	0	0	91.3	8.7	0.7	98.8	0.4	0.1	
Total %	0	0	0.3	0	0	46.5	0.2	0	0	0	0.3	0	0.4	51.9	0.2	0.1	
	2	0	16	1	0	2881	14	2	0	0	21	1	24	3224	11	2	6199
%	100	0	88.9	100	0	96.7	93.3	66.7	0	0	100	50	96	97	91.7	40	96.8
	0	0	1	0	0	61	0	0	0	0	0	1	1	60	0	1	125
%	0	0	5.6	0	0	2	0	0	0	0	0	50	4	1.8	0	20	2
	0	0	1	0	0	36	1	1	0	0	0	0	0	41	1	2	83
%	0	0	5.6	0	0	1.2	6.7	33.3	0	0	0	0	0	1.2	8.3	40	1.3

Mequon
Weekday

JH.

File Name : Mequon-Logemann AM-PM
Site Code : 00000000
Start Date : 1/22/2009
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Groups Printed- Bank 1 - Bank 2

	LOGEMANN From North				MEQUON From East				LOGEMANN From South				MEQUON From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
*** BREAK ***																	
06:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	6	0	0	7
06:45 AM	0	0	0	0	0	7	0	0	0	0	0	0	0	13	1	1	22
Total	0	0	0	0	0	8	0	0	0	0	0	0	0	19	1	1	29
07:00 AM	0	0	0	0	0	5	0	0	0	0	0	0	0	13	0	0	18
07:15 AM	0	0	0	0	0	5	0	0	0	0	0	1	0	7	0	0	13
07:30 AM	0	0	0	0	0	5	0	0	0	0	0	0	0	3	0	0	8
07:45 AM	0	0	0	0	0	11	0	0	0	0	0	0	0	8	0	0	19
Total	0	0	0	0	0	26	0	0	0	0	0	1	0	31	0	0	58
08:00 AM	0	0	0	0	0	6	0	0	0	0	0	0	0	13	0	1	20
08:15 AM	0	0	1	0	0	4	1	0	0	0	0	0	0	8	0	0	14
*** BREAK ***																	
Total	0	0	1	0	0	10	1	0	0	0	0	0	0	21	0	1	34
*** BREAK ***																	
04:00 PM	0	0	0	0	0	11	0	0	0	0	0	0	0	4	0	0	15
04:15 PM	0	0	0	0	0	8	0	1	0	0	0	0	0	7	0	0	16
04:30 PM	0	0	0	0	0	18	0	0	0	0	0	0	0	3	0	1	22
04:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	4	0	0	6
Total	0	0	0	0	0	39	0	1	0	0	0	0	0	18	0	1	59
05:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	3	0	0	4
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
05:30 PM	0	0	0	0	0	6	0	0	0	0	0	0	0	3	0	0	9
05:45 PM	0	0	1	0	0	7	0	0	0	0	0	0	1	3	0	0	12
Total	0	0	1	0	0	14	0	0	0	0	0	0	1	12	0	0	28
Grand Total	0	0	2	0	0	97	1	1	0	0	0	1	1	101	1	3	208
Apprch %	0	0	100	0	0	98	1	1	0	0	0	100	0.9	95.3	0.9	2.8	
Total %	0	0	1	0	0	46.6	0.5	0.5	0	0	0	0.5	0.5	48.6	0.5	1.4	
	0	0	1	0	0	61	0	0	0	0	0	1	1	60	0	1	125
%	0	0	50	0	0	62.9	0	0	0	0	0	100	100	59.4	0	33.3	60.1
	0	0	1	0	0	36	1	1	0	0	0	0	0	41	1	2	83
%	0	0	50	0	0	37.1	100	100	0	0	0	0	0	40.6	100	66.7	39.9

Mequon
Weekday

AS.

File Name : Mequon-PigglyWiggly Full Access AM-PM
Site Code : 00000000
Start Date : 1/20/2009
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Groups Printed- Unshifted - Bank 1 - Bank 2

	PIG WIG FULL ACCESS From North				MEQUON RD From East				PIG WIG FULL ACCESS From South				MEQUON RD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
*** BREAK ***																	
06:30 AM	0	0	0	0	3	97	0	0	0	0	1	0	0	112	5	0	218
06:45 AM	0	0	0	0	9	121	0	0	5	0	4	0	0	154	4	0	297
Total	0	0	0	0	12	218	0	0	5	0	5	0	0	266	9	0	515
07:00 AM	0	0	0	0	9	156	0	0	8	0	3	0	0	239	3	0	418
07:15 AM	0	0	0	0	10	205	0	0	6	0	3	0	0	167	4	0	395
07:30 AM	0	0	0	0	9	203	0	0	3	0	6	0	0	170	6	0	397
07:45 AM	0	0	0	0	4	239	0	0	9	0	4	0	0	258	9	0	523
Total	0	0	0	0	32	803	0	0	26	0	16	0	0	834	22	0	1733
08:00 AM	0	0	0	0	7	171	0	0	9	0	6	0	0	217	10	0	420
08:15 AM	0	0	0	0	6	124	0	0	5	0	2	0	0	161	6	0	304
*** BREAK ***																	
Total	0	0	0	0	13	295	0	0	14	0	8	0	0	378	16	0	724
*** BREAK ***																	
04:00 PM	0	0	0	0	25	152	0	1	15	0	14	0	0	167	17	2	393
04:15 PM	0	0	0	0	22	189	0	0	22	0	18	0	0	179	21	0	451
04:30 PM	0	0	0	0	14	169	0	0	15	0	16	0	0	210	15	0	439
04:45 PM	0	0	0	0	10	183	0	0	14	0	10	0	0	188	17	0	422
Total	0	0	0	0	71	693	0	1	66	0	58	0	0	744	70	2	1705
05:00 PM	0	0	0	0	19	189	0	0	19	0	14	0	0	218	19	1	479
05:15 PM	0	0	0	0	19	200	0	3	10	0	15	0	0	226	22	4	499
05:30 PM	0	0	0	0	19	163	0	2	24	0	16	0	0	208	11	0	443
05:45 PM	0	0	0	0	14	170	0	3	11	0	15	0	0	186	16	1	416
Total	0	0	0	0	71	722	0	8	64	0	60	0	0	838	68	6	1837
Grand Total	0	0	0	0	199	2731	0	9	175	0	147	0	0	3060	185	8	6514
Apprch %	0	0	0	0	6.8	92.9	0	0.3	54.3	0	45.7	0	0	94.1	5.7	0.2	
Total %	0	0	0	0	3.1	41.9	0	0.1	2.7	0	2.3	0	0	47	2.8	0.1	
	0	0	0	0	196	2630	0	0	171	0	147	0	0	2954	185	0	6283
%	0	0	0	0	98.5	96.3	0	0	97.7	0	100	0	0	96.5	100	0	96.5
	0	0	0	0	3	62	0	0	3	0	0	0	0	65	0	0	133
%	0	0	0	0	1.5	2.3	0	0	1.7	0	0	0	0	2.1	0	0	2
	0	0	0	0	0	39	0	9	1	0	0	0	0	41	0	8	98
%	0	0	0	0	0	1.4	0	100	0.6	0	0	0	0	1.3	0	100	1.5

Mequon
Weekday

AS.

File Name : Mequon-PigglyWiggly Full Access AM-PM
Site Code : 00000000
Start Date : 1/20/2009
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Groups Printed- Bank 1 - Bank 2

	PIG WIG FULL ACCESS From North				MEQUON RD From East				PIG WIG FULL ACCESS From South				MEQUON RD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
*** BREAK ***																	
06:30 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	6	0	0	9
06:45 AM	0	0	0	0	1	5	0	0	0	0	0	0	0	12	0	0	18
Total	0	0	0	0	1	8	0	0	0	0	0	0	0	18	0	0	27
07:00 AM	0	0	0	0	0	6	0	0	1	0	0	0	0	15	0	0	22
07:15 AM	0	0	0	0	0	5	0	0	0	0	0	0	0	8	0	0	13
07:30 AM	0	0	0	0	0	9	0	0	0	0	0	0	0	6	0	0	15
07:45 AM	0	0	0	0	0	9	0	0	1	0	0	0	0	8	0	0	18
Total	0	0	0	0	0	29	0	0	2	0	0	0	0	37	0	0	68
08:00 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	19	0	0	21
08:15 AM	0	0	0	0	1	11	0	0	0	0	0	0	0	2	0	0	14
*** BREAK ***																	
Total	0	0	0	0	1	13	0	0	0	0	0	0	0	21	0	0	35
*** BREAK ***																	
04:00 PM	0	0	0	0	1	11	0	1	0	0	0	0	0	5	0	2	20
04:15 PM	0	0	0	0	0	8	0	0	0	0	0	0	0	6	0	0	14
04:30 PM	0	0	0	0	0	19	0	0	0	0	0	0	0	3	0	0	22
04:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	3	0	0	4
Total	0	0	0	0	1	39	0	1	0	0	0	0	0	17	0	2	60
05:00 PM	0	0	0	0	0	1	0	0	1	0	0	0	0	4	0	1	7
05:15 PM	0	0	0	0	0	0	0	3	0	0	0	0	0	3	0	4	10
05:30 PM	0	0	0	0	0	3	0	2	1	0	0	0	0	3	0	0	9
05:45 PM	0	0	0	0	0	8	0	3	0	0	0	0	0	3	0	1	15
Total	0	0	0	0	0	12	0	8	2	0	0	0	0	13	0	6	41
Grand Total	0	0	0	0	3	101	0	9	4	0	0	0	0	106	0	8	231
Apprch %	0	0	0	0	2.7	89.4	0	8	100	0	0	0	0	93	0	7	
Total %	0	0	0	0	1.3	43.7	0	3.9	1.7	0	0	0	0	45.9	0	3.5	
	0	0	0	0	3	62	0	0	3	0	0	0	0	65	0	0	133
%	0	0	0	0	100	61.4	0	0	75	0	0	0	0	61.3	0	0	57.6
	0	0	0	0	0	39	0	9	1	0	0	0	0	41	0	8	98
%	0	0	0	0	0	38.6	0	100	25	0	0	0	0	38.7	0	100	42.4

Mequon
Weekday

AS.

File Name : Mequon-Pig Rin-Rout (east) AM-PM
Site Code : 00000000
Start Date : 1/27/2009
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

	PIG WIG RGT INOUT DR From North				MEQUON RD From East				PIG WIG RGT INOUT DR From South				MEQUON RD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
*** BREAK ***																	
06:30 AM	0	0	0	0	0	98	0	0	0	0	1	0	0	112	0	0	211
06:45 AM	0	0	0	0	0	168	0	0	0	0	0	0	0	160	0	0	328
Total	0	0	0	0	0	266	0	0	0	0	1	0	0	272	0	0	539
07:00 AM	0	0	0	0	0	161	0	0	0	0	1	0	0	269	3	0	434
07:15 AM	0	0	0	0	0	225	0	0	0	0	3	0	0	198	0	0	426
07:30 AM	0	0	0	0	0	234	0	0	0	0	2	0	0	206	2	0	444
07:45 AM	0	0	0	0	0	243	0	0	0	0	1	0	0	278	3	0	525
Total	0	0	0	0	0	863	0	0	0	0	7	0	0	951	8	0	1829
08:00 AM	0	0	0	0	0	166	0	0	0	0	3	0	0	168	1	0	338
08:15 AM	0	0	0	0	0	121	0	0	0	0	1	0	0	159	0	0	281
*** BREAK ***																	
Total	0	0	0	0	0	287	0	0	0	0	4	0	0	327	1	0	619
*** BREAK ***																	
04:00 PM	0	0	0	0	0	177	0	0	0	0	10	0	0	181	2	0	370
04:15 PM	0	0	0	0	0	211	0	0	0	0	15	0	0	197	2	0	425
04:30 PM	0	0	0	0	0	183	0	0	0	0	9	0	0	226	1	0	419
04:45 PM	0	0	0	0	0	193	0	0	0	0	11	0	0	198	2	0	404
Total	0	0	0	0	0	764	0	0	0	0	45	0	0	802	7	0	1618
05:00 PM	0	0	0	0	0	208	0	0	0	0	10	0	0	232	0	0	450
05:15 PM	0	0	0	0	0	219	0	0	0	0	3	0	0	241	4	0	467
05:30 PM	0	0	0	0	0	182	0	0	0	0	9	0	0	224	0	0	415
05:45 PM	0	0	0	0	0	184	0	0	0	0	10	0	0	201	2	0	397
Total	0	0	0	0	0	793	0	0	0	0	32	0	0	898	6	0	1729
Grand Total	0	0	0	0	0	2973	0	0	0	0	89	0	0	3250	22	0	6334
Apprch %	0	0	0	0	0	100	0	0	0	0	100	0	0	99.3	0.7	0	
Total %	0	0	0	0	0	46.9	0	0	0	0	1.4	0	0	51.3	0.3	0	
	0	0	0	0	0	2873	0	0	0	0	89	0	0	3149	21	0	6132
%	0	0	0	0	0	96.6	0	0	0	0	100	0	0	96.9	95.5	0	96.8
	0	0	0	0	0	58	0	0	0	0	0	0	0	59	1	0	118
%	0	0	0	0	0	2	0	0	0	0	0	0	0	1.8	4.5	0	1.9
	0	0	0	0	0	42	0	0	0	0	0	0	0	42	0	0	84
%	0	0	0	0	0	1.4	0	0	0	0	0	0	0	1.3	0	0	1.3

Mequon
Weekday

AS.

File Name : Mequon-Pig Rin-Rout (east) AM-PM
Site Code : 00000000
Start Date : 1/27/2009
Page No : 1

Groups Printed- Bank 1 - Bank 2

	PIG WIG RGT INOUT DR From North				MEQUON RD From East				PIG WIG RGT INOUT DR From South				MEQUON RD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
*** BREAK ***																	
06:30 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	6	0	0	8
06:45 AM	0	0	0	0	0	6	0	0	0	0	0	0	0	12	0	0	18
Total	0	0	0	0	0	8	0	0	0	0	0	0	0	18	0	0	26
07:00 AM	0	0	0	0	0	9	0	0	0	0	0	0	0	9	0	0	18
07:15 AM	0	0	0	0	0	8	0	0	0	0	0	0	0	5	0	0	13
07:30 AM	0	0	0	0	0	9	0	0	0	0	0	0	0	6	0	0	15
07:45 AM	0	0	0	0	0	4	0	0	0	0	0	0	0	19	0	0	23
Total	0	0	0	0	0	30	0	0	0	0	0	0	0	39	0	0	69
08:00 AM	0	0	0	0	0	6	0	0	0	0	0	0	0	9	0	0	15
08:15 AM	0	0	0	0	0	4	0	0	0	0	0	0	0	5	0	0	9
*** BREAK ***																	
Total	0	0	0	0	0	10	0	0	0	0	0	0	0	14	0	0	24
*** BREAK ***																	
04:00 PM	0	0	0	0	0	12	0	0	0	0	0	0	0	5	0	0	17
04:15 PM	0	0	0	0	0	8	0	0	0	0	0	0	0	6	0	0	14
04:30 PM	0	0	0	0	0	19	0	0	0	0	0	0	0	3	0	0	22
04:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	3	0	0	4
Total	0	0	0	0	0	40	0	0	0	0	0	0	0	17	0	0	57
05:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	4	0	0	5
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	4
05:30 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0	0	6
05:45 PM	0	0	0	0	0	8	0	0	0	0	0	0	0	3	0	0	11
Total	0	0	0	0	0	12	0	0	0	0	0	0	0	13	1	0	26
Grand Total	0	0	0	0	0	100	0	0	0	0	0	0	0	101	1	0	202
Apprch %	0	0	0	0	0	100	0	0	0	0	0	0	0	99	1	0	
Total %	0	0	0	0	0	49.5	0	0	0	0	0	0	0	50	0.5	0	
	0	0	0	0	0	58	0	0	0	0	0	0	0	59	1	0	118
%	0	0	0	0	0	58	0	0	0	0	0	0	0	58.4	100	0	58.4
	0	0	0	0	0	42	0	0	0	0	0	0	0	42	0	0	84
%	0	0	0	0	0	42	0	0	0	0	0	0	0	41.6	0	0	41.6

Mequon
Weekday

AS.

File Name : Mequon-Cedarburg AM-PM
Site Code : 00000000
Start Date : 1/23/2009
Page No : 1

Groups Printed- - -

	CEDARBURG RD From North				MEQUON RD From East				CEDARBURG RD From South				MEQUON RD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
*** BREAK ***																	
06:30 AM	32	57	15	0	27	62	6	0	5	20	14	0	5	74	17	0	334
06:45 AM	26	73	17	0	45	83	19	0	4	16	14	0	7	100	18	0	422
Total	58	130	32	0	72	145	25	0	9	36	28	0	12	174	35	0	756
07:00 AM	40	86	23	0	35	113	8	0	5	17	21	0	6	94	14	0	462
07:15 AM	39	121	27	0	29	134	24	0	10	35	15	0	10	112	19	0	575
07:30 AM	73	124	33	0	34	154	28	0	9	29	17	0	10	100	24	0	635
07:45 AM	112	123	37	0	53	177	92	0	8	42	29	0	18	168	19	0	878
Total	264	454	120	0	151	578	152	0	32	123	82	0	44	474	76	0	2550
08:00 AM	80	94	22	1	43	128	53	0	9	22	24	0	15	124	16	0	631
08:15 AM	59	62	33	0	45	105	46	0	11	18	26	0	19	106	18	0	548
*** BREAK ***																	
Total	139	156	55	1	88	233	99	0	20	40	50	0	34	230	34	0	1179
*** BREAK ***																	
04:00 PM	35	50	25	0	44	216	117	0	31	77	51	0	48	143	5	0	842
04:15 PM	51	34	18	1	24	194	105	0	18	75	33	0	50	145	13	0	761
04:30 PM	68	44	38	0	49	167	100	0	24	132	37	0	63	159	17	0	898
04:45 PM	80	48	24	0	58	281	98	0	29	121	38	0	68	200	10	0	1055
Total	234	176	105	1	175	858	420	0	102	405	159	0	229	647	45	0	3556
05:00 PM	82	57	28	0	27	255	110	0	27	134	43	0	55	162	7	0	987
05:15 PM	55	42	16	0	49	308	105	0	25	113	41	0	73	211	15	0	1053
05:30 PM	54	53	18	0	41	165	66	0	38	83	42	0	51	158	10	0	779
05:45 PM	61	35	13	0	41	145	99	0	16	81	41	0	40	155	14	0	741
Total	252	187	75	0	158	873	380	0	106	411	167	0	219	686	46	0	3560
Grand Total	947	1103	387	2	644	2687	1076	0	269	1015	486	0	538	2211	236	0	11601
Apprch %	38.8	45.2	15.9	0.1	14.6	61	24.4	0	15.2	57.3	27.5	0	18	74.1	7.9	0	
Total %	8.2	9.5	3.3	0	5.6	23.2	9.3	0	2.3	8.7	4.2	0	4.6	19.1	2	0	
	933	1098	370	1	626	2616	1062	0	259	1006	468	0	529	2132	227	0	11327
%	98.5	99.5	95.6	50	97.2	97.4	98.7	0	96.3	99.1	96.3	0	98.3	96.4	96.2	0	97.6
	12	4	16	0	12	46	13	0	8	7	14	0	6	39	7	0	184
%	1.3	0.4	4.1	0	1.9	1.7	1.2	0	3	0.7	2.9	0	1.1	1.8	3	0	1.6
	2	1	1	1	6	25	1	0	2	2	4	0	3	40	2	0	90
%	0.2	0.1	0.3	50	0.9	0.9	0.1	0	0.7	0.2	0.8	0	0.6	1.8	0.8	0	0.8

Mequon
Weekday

AS.

File Name : Mequon-Cedarburg AM-PM
Site Code : 00000000
Start Date : 1/23/2009
Page No : 1

Groups Printed- -

	CEDARBURG RD From North				MEQUON RD From East				CEDARBURG RD From South				MEQUON RD From West				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
*** BREAK ***																	
06:30 AM	0	0	0	0	1	2	0	0	0	0	0	0	0	3	0	0	6
06:45 AM	0	1	0	0	0	3	1	0	0	1	1	0	2	6	4	0	19
Total	0	1	0	0	1	5	1	0	0	1	1	0	2	9	4	0	25
07:00 AM	0	0	1	0	2	2	0	0	0	0	0	0	1	5	0	0	11
07:15 AM	3	1	0	0	1	3	1	0	2	1	1	0	1	11	2	0	27
07:30 AM	2	0	0	0	0	4	0	0	1	2	5	0	1	7	1	0	23
07:45 AM	4	0	2	0	1	6	4	0	3	1	3	0	1	7	0	0	32
Total	9	1	3	0	4	15	5	0	6	4	9	0	4	30	3	0	93
08:00 AM	0	1	0	1	1	10	0	0	0	3	2	0	0	7	0	0	25
08:15 AM	3	2	0	0	1	3	1	0	2	0	2	0	1	1	2	0	18
*** BREAK ***																	
Total	3	3	0	1	2	13	1	0	2	3	4	0	1	8	2	0	43
*** BREAK ***																	
04:00 PM	0	0	2	0	0	5	0	0	2	0	1	0	1	5	0	0	16
04:15 PM	0	0	3	0	2	12	0	0	0	0	1	0	0	4	0	0	22
04:30 PM	0	0	6	0	4	9	2	0	0	0	0	0	0	2	0	0	23
04:45 PM	0	0	0	0	0	5	2	0	0	0	0	0	0	9	0	0	16
Total	0	0	11	0	6	31	4	0	2	0	2	0	1	20	0	0	77
05:00 PM	1	0	1	0	1	1	1	0	0	0	2	0	0	3	0	0	10
05:15 PM	1	0	1	0	1	1	1	0	0	0	0	0	1	1	0	0	7
05:30 PM	0	0	1	0	1	2	0	0	0	0	0	0	0	3	0	0	7
05:45 PM	0	0	0	0	2	3	1	0	0	1	0	0	0	5	0	0	12
Total	2	0	3	0	5	7	3	0	0	1	2	0	1	12	0	0	36
Grand Total	14	5	17	1	18	71	14	0	10	9	18	0	9	79	9	0	274
Apprch %	37.8	13.5	45.9	2.7	17.5	68.9	13.6	0	27	24.3	48.6	0	9.3	81.4	9.3	0	
Total %	5.1	1.8	6.2	0.4	6.6	25.9	5.1	0	3.6	3.3	6.6	0	3.3	28.8	3.3	0	
	12	4	16	0	12	46	13	0	8	7	14	0	6	39	7	0	184
%	85.7	80	94.1	0	66.7	64.8	92.9	0	80	77.8	77.8	0	66.7	49.4	77.8	0	67.2
	2	1	1	1	6	25	1	0	2	2	4	0	3	40	2	0	90
%	14.3	20	5.9	100	33.3	35.2	7.1	0	20	22.2	22.2	0	33.3	50.6	22.2	0	32.8

APPENDIX A

WisDOT Traffic Forecasts

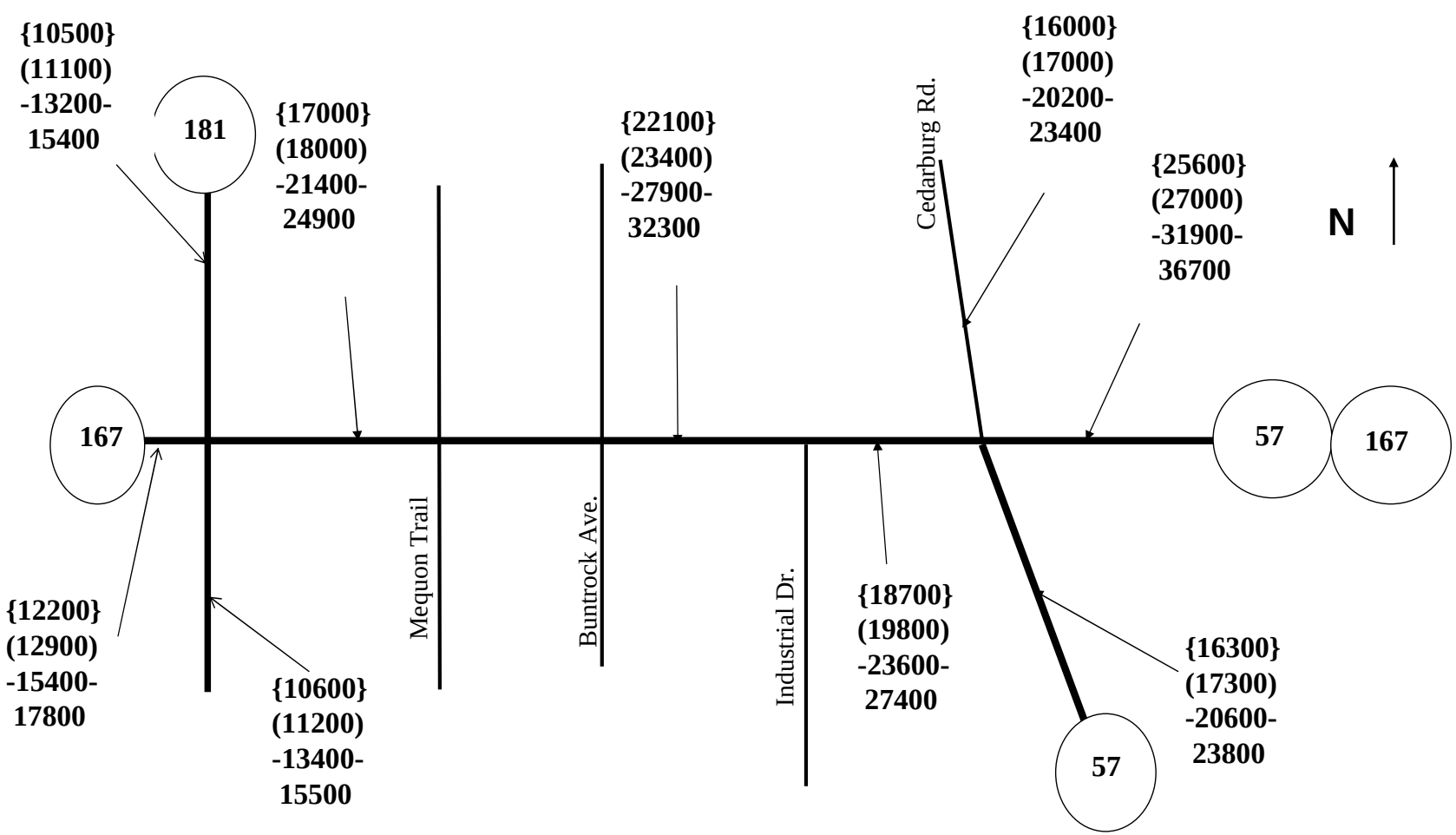
TRAFFIC FORECAST REPORT

PROJECT ID(S): TIA
ROUTE(S): STH 167

SE Region/COUNTY(IES): Ozaukee
LOCATION: Mequon Trail to STH 57
COMPLETED: February 20, 2009; Revised May 27, 2010

Traffic Forecasting Section; Southeast Region; Wisconsin DOT

Developed by: James Harris
Phone: (262)-521-5455
FAX #: (262)-521-4425
E-Mail ID: james.harris-jr@dot.wi.gov



Design Values (%)			
Routes → / Design			
Volume(s):	32800	--	--
K250	9.5	--	--
K100	10.1	--	--
K30	10.5	--	--
P(PHV)	11.7	--	--
T(DHV)	6.2	--	--
T(PHV)	5.8	--	--
D(Dsgn. Hr.)	58/42	--	--
K8(ADT)	--	--	--
T(A8HV)	--	--	--

Last Count/Forecast Years:
{000} 2007 AADT
(000) 2010 AADT
-000- 2020 AADT
000 2030 AADT

Truck Class %'s			
Class	Seg. 1	Seg. 2	Seg. 3
2D	3.6	--	--
3AX	1.4	--	--
2S1+2S2	0.9	--	--
3-S2	1.8	--	--
DBL-BTM	0.0	--	--
TOTAL	7.8%	--	--

NOTES ON THE FORECAST:

1. The forecast assumes no significant new traffic generators will be developed in the area for the foreseeable future.

2. STH 167 is a factor group II highway indicating low to moderate fluctuation in traffic throughout the year. It is considered an Urban Other Principal Arterial highway for count purposes at this location.

3. Truck type percentages were obtained from a vehicle class site on STH 167 east of CTH F.

4. 2007 was the most recent year traffic count data was collected in Ozaukee County at this location.

WisDot SE Region
Traffic Forecasting Section
Forecast by: Jim Harris
Phone: 262-521-5455
Email: jim.harris@dot.wi.gov

Projected AM Design Hour Traffic Volumes

Design Hour: 7:15 - 8:15

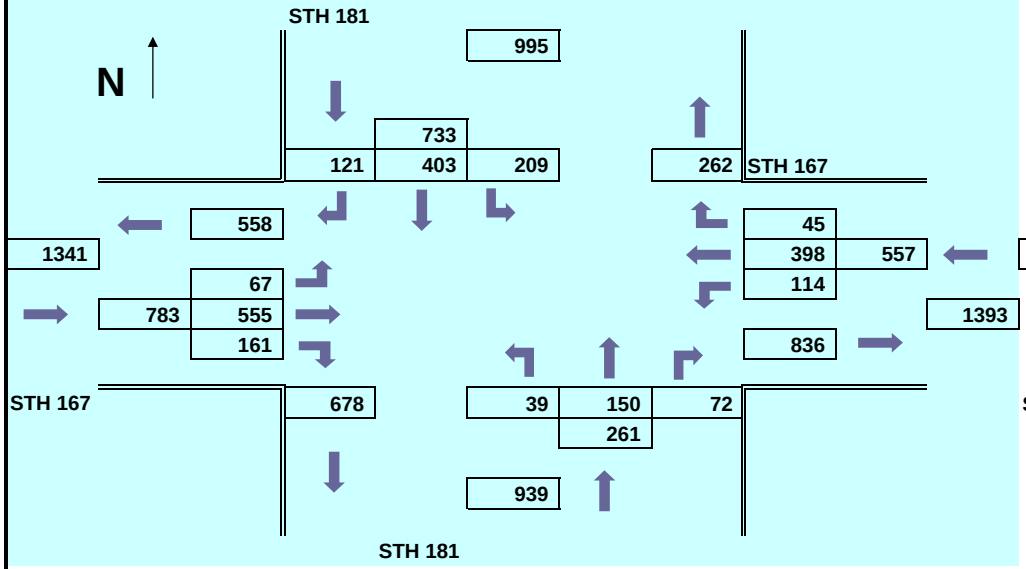
Forecast Completed: May 27, 2010

Project Description

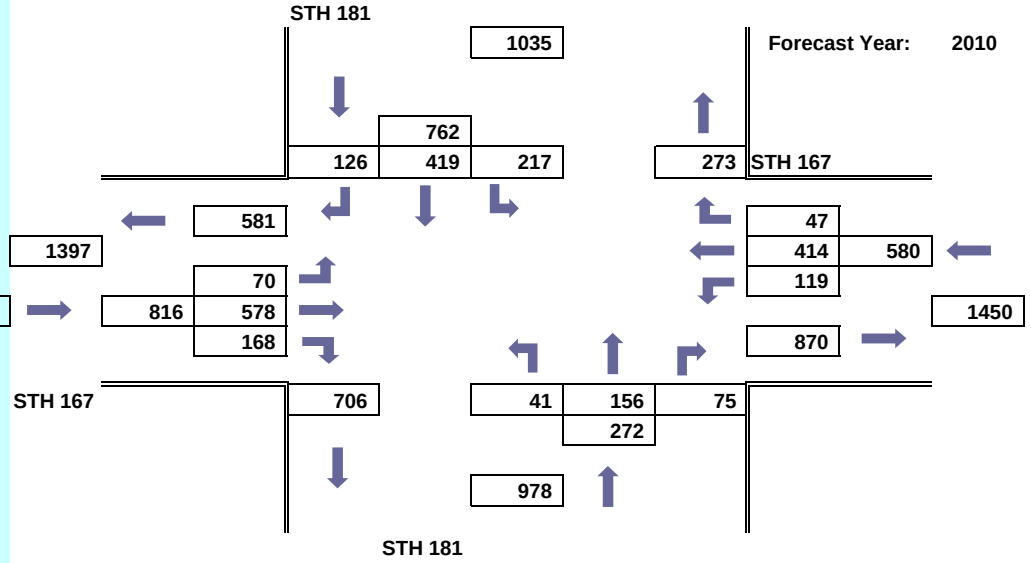
Project ID: TIA
Location: Mequon Trail to STH 57
Route: STH 167
County: Ozaukee

Design Hour Turning Movement Data

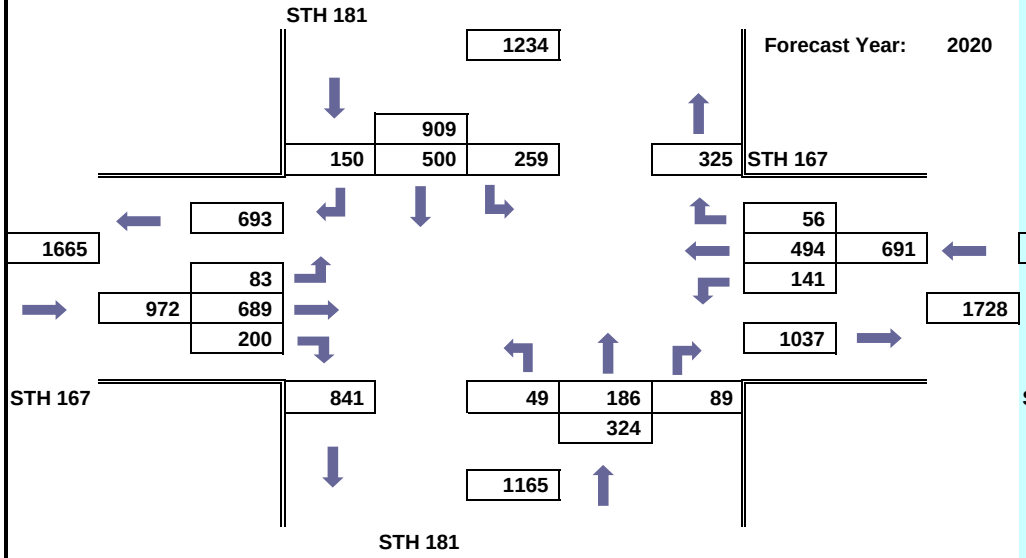
Year: 2008



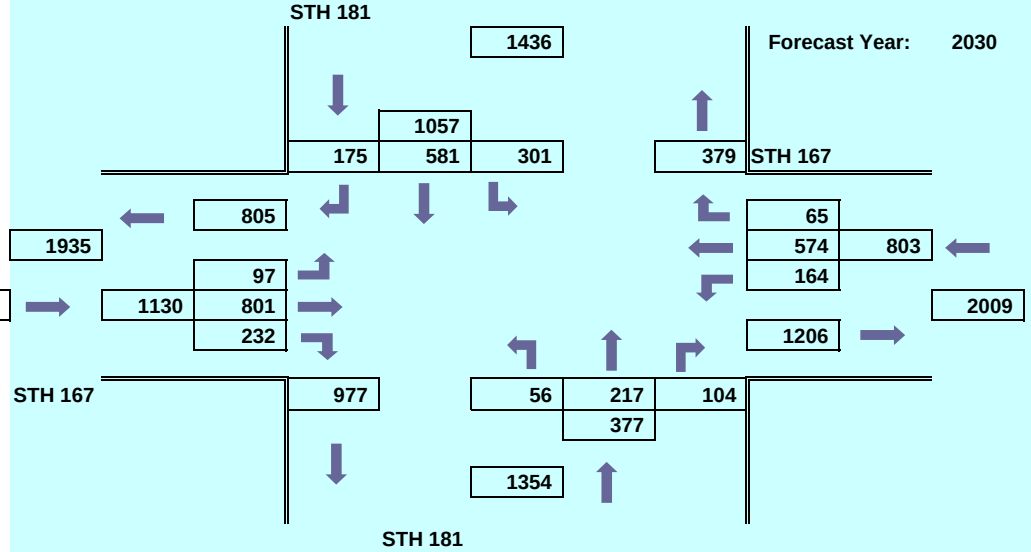
Forecast Year: 2010



Forecast Year: 2020



Forecast Year: 2030



WisDot SE Region
Traffic Forecasting Section
Forecast by: Jim Harris
Phone: 262-521-5455
Email: jim.harris@dot.wi.gov

Projected PM Design Hour Traffic Volumes

Design Hour: 4:30 - 5:30

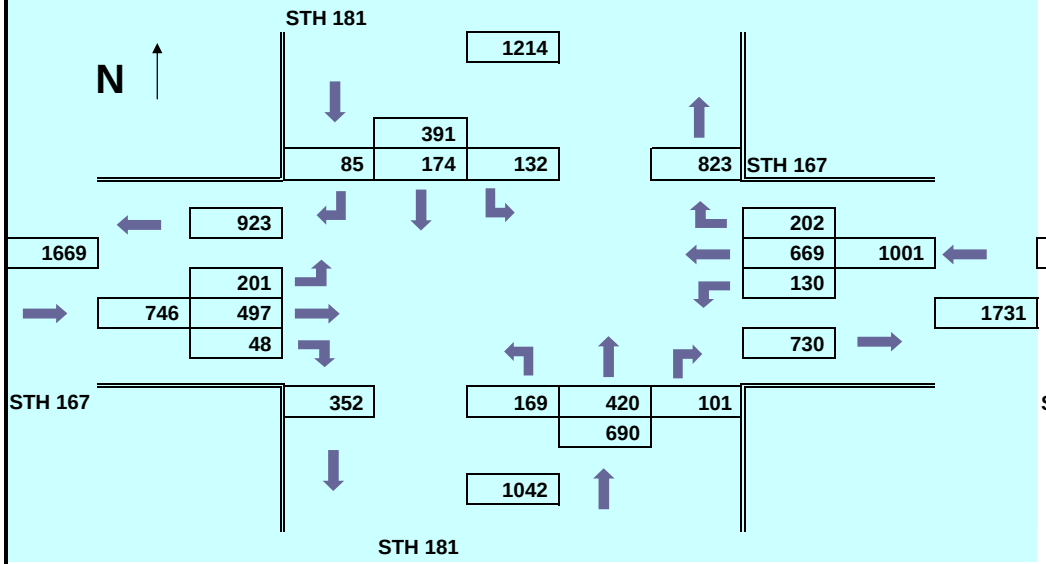
Forecast Completed: May 27, 2010

Project Description

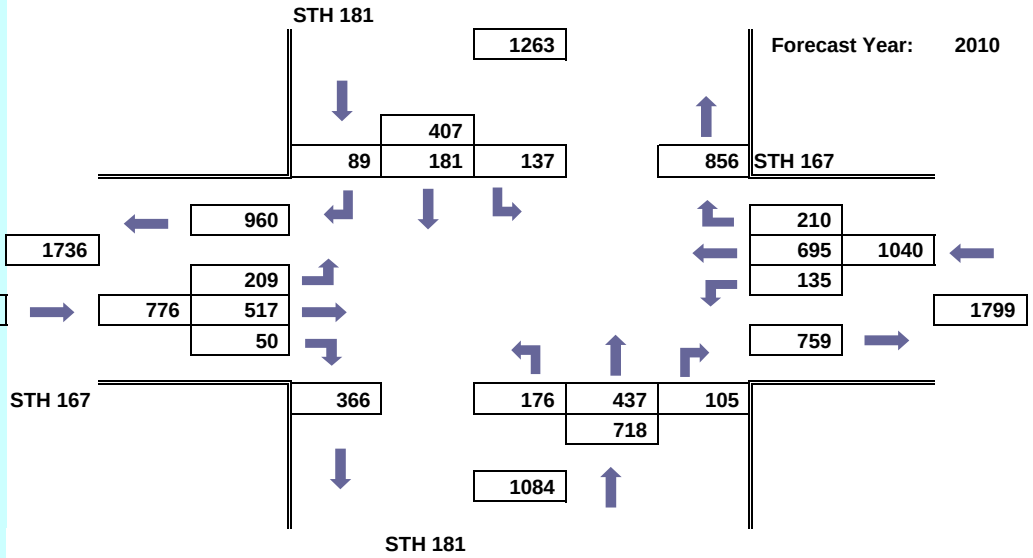
Project ID: TIA
Location: Mequon Trail to STH 57
Route: STH 167
County: Ozaukee

Design Hour Turning Movement Data

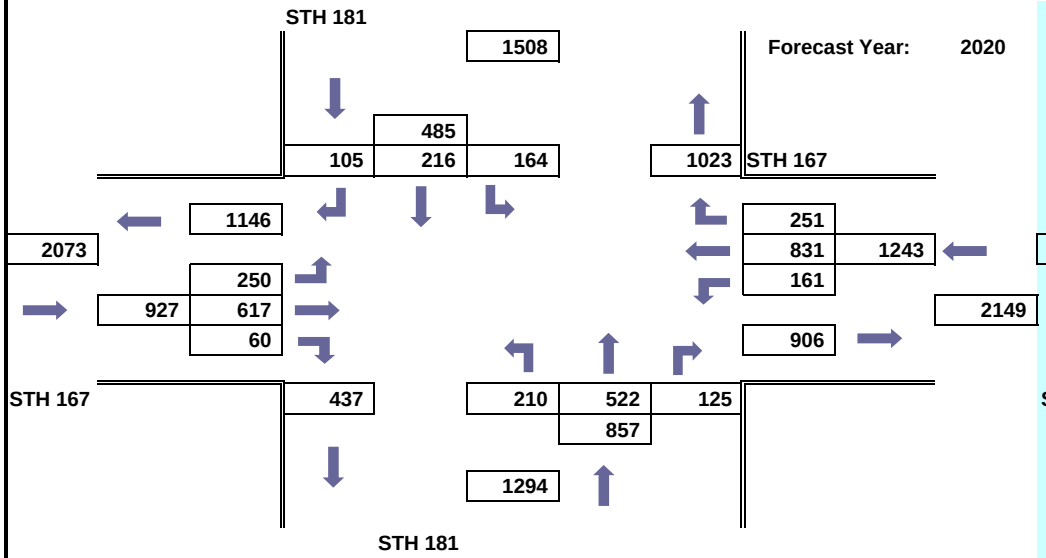
Year: 2008



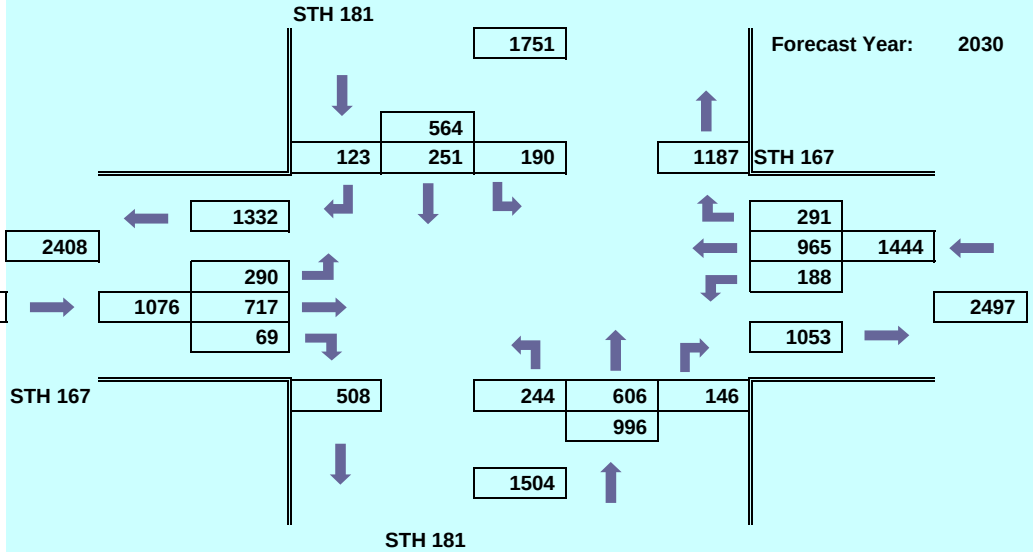
Forecast Year: 2010



Forecast Year: 2020



Forecast Year: 2030



Projected AM Design Hour Traffic Volumes

WisDot SE Region
Traffic Forecasting Section
Forecast by: Jim Harris
Phone: 262-521-5455
Email: james.harris-jr@dot.wi.gov

Design Hour: 7:15 -8:15 AM

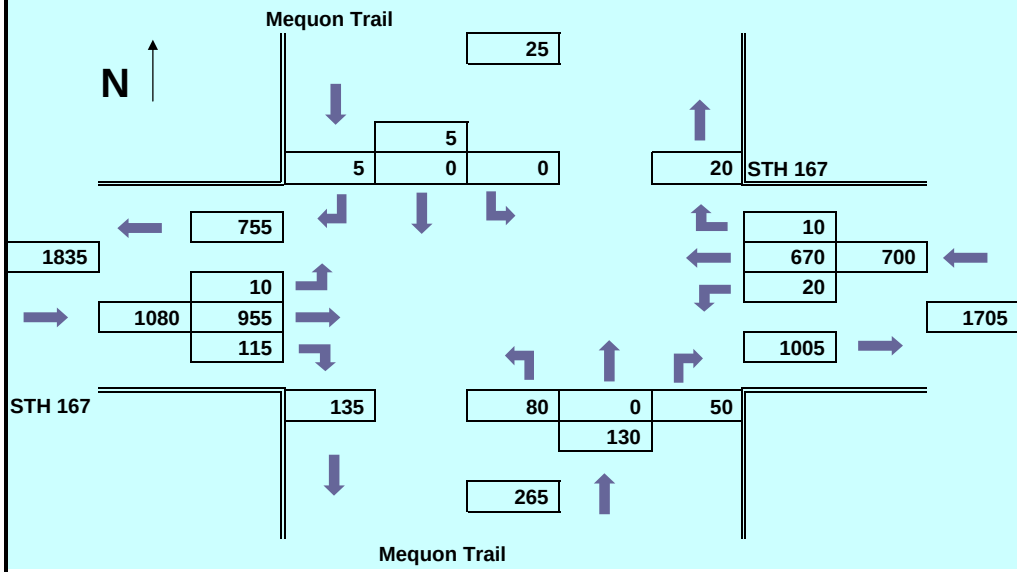
Forecast Completed: February 20, 2009

Project Description

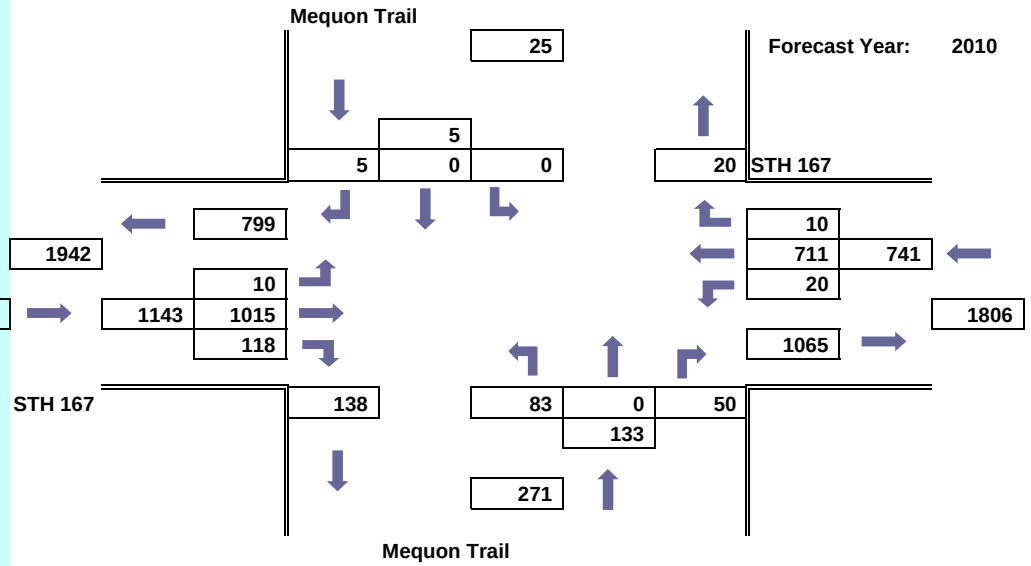
Project ID: TIA
Location: Mequon Trail to STH 57
Route: STH 167
County: Ozaukee

Design Hour Turning Movement Data

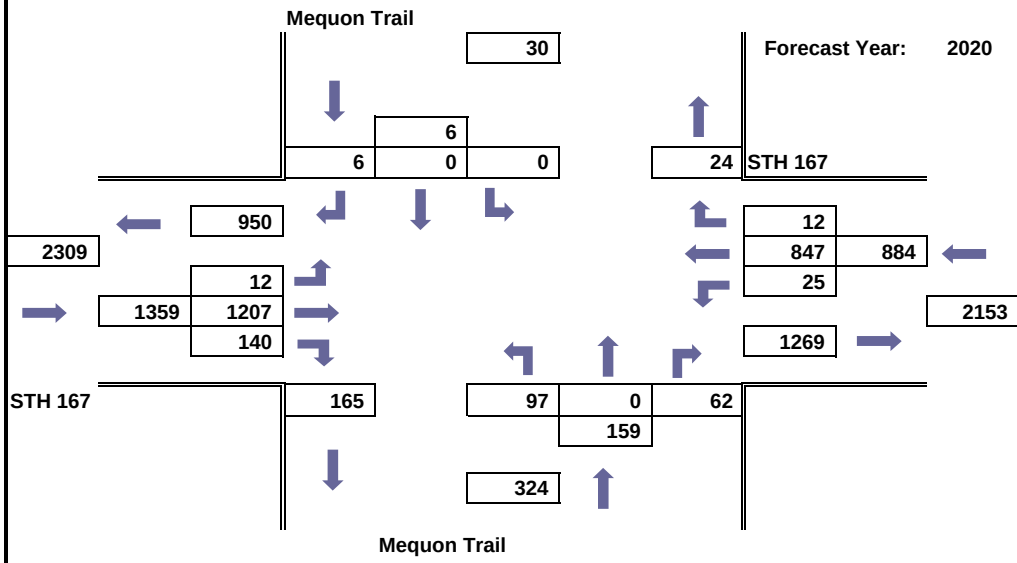
Year: 2006



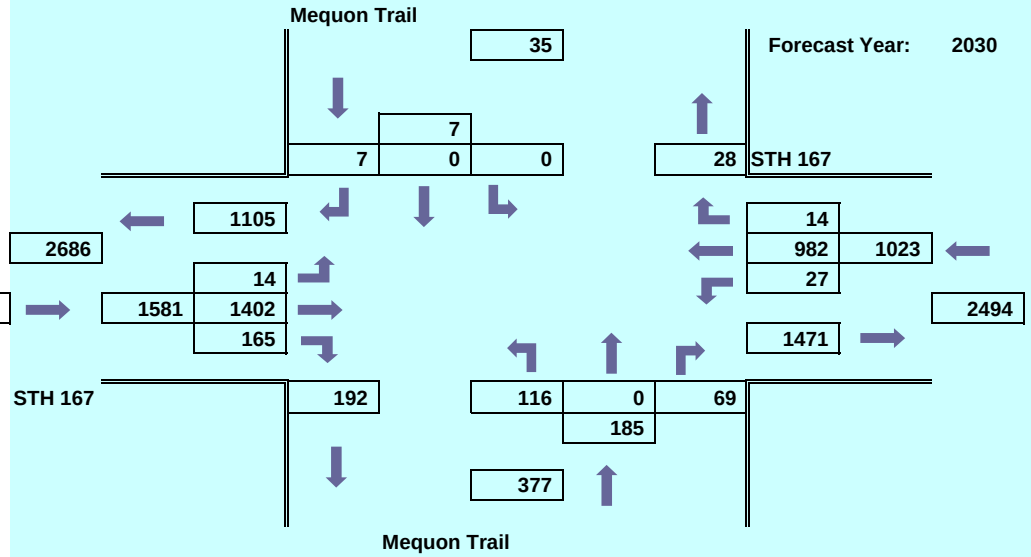
Forecast Year: 2010



Forecast Year: 2020



Forecast Year: 2030



WisDot SE Region
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Forecast by: Jim Harris
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Projected PM Design Hour Traffic Volumes

Design Hour: 4:30 - 5:30 PM

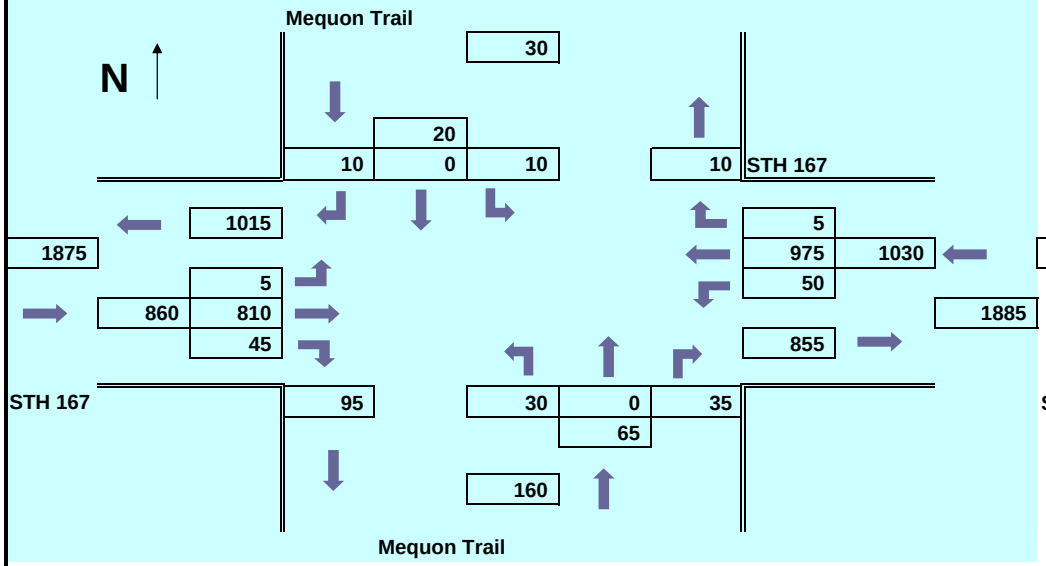
Forecast Completed: February 20, 2009

Project Description

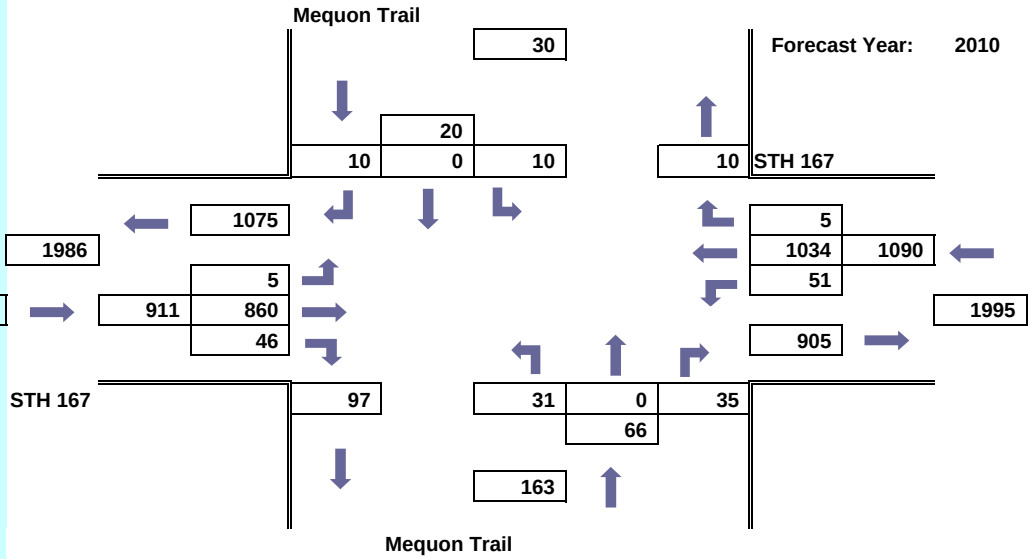
Project ID: TIA
Location: Mequon Trail to STH 57
Route: STH 167
County: Ozaukee

Design Hour Turning Movement Data

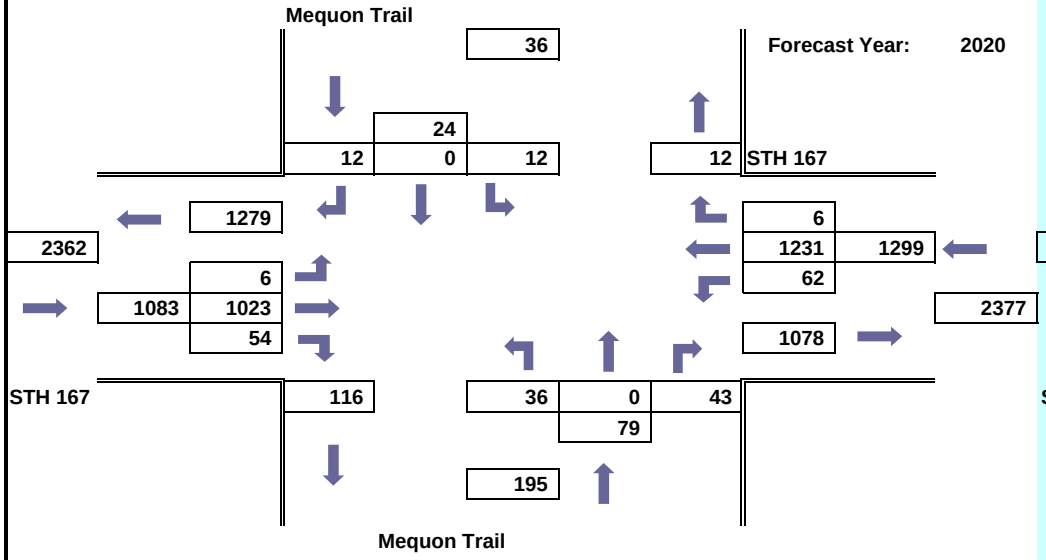
Year: 2006



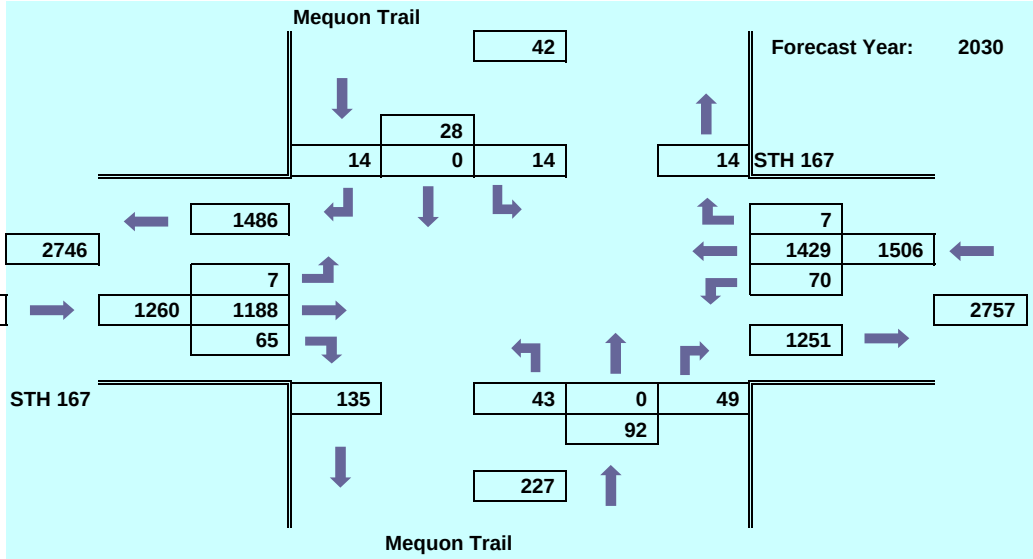
Forecast Year: 2010



Forecast Year: 2020



Forecast Year: 2030



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Projected AM Design Hour Traffic Volumes

Design Hour: 7:15 -8:15 AM

Forecast Completed: February 20, 2009

Project Description

Project ID: TIA
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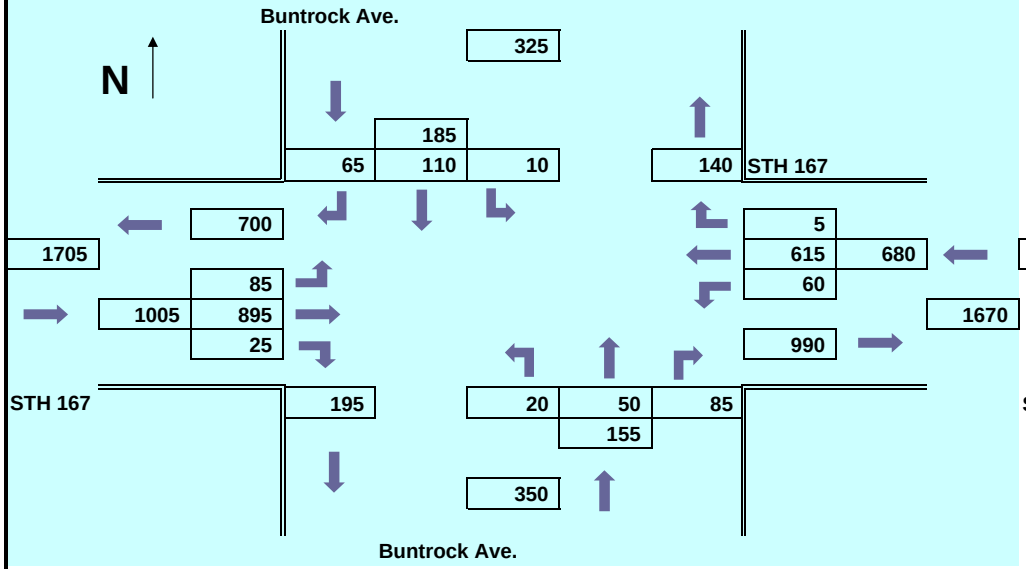
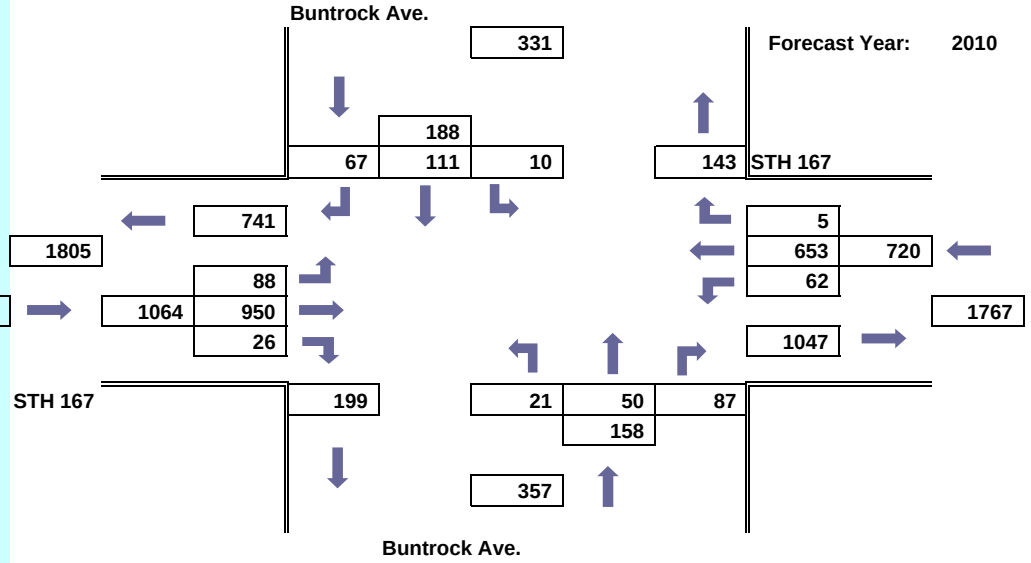
Route: STH 167
County: Ozaukee

Design Hour Turning Movement Data

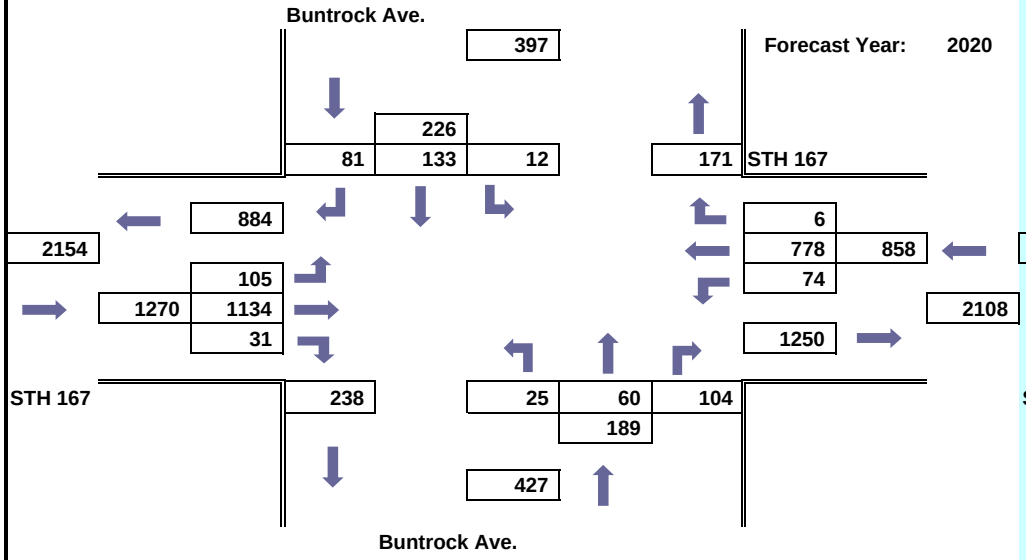
Year: 2009



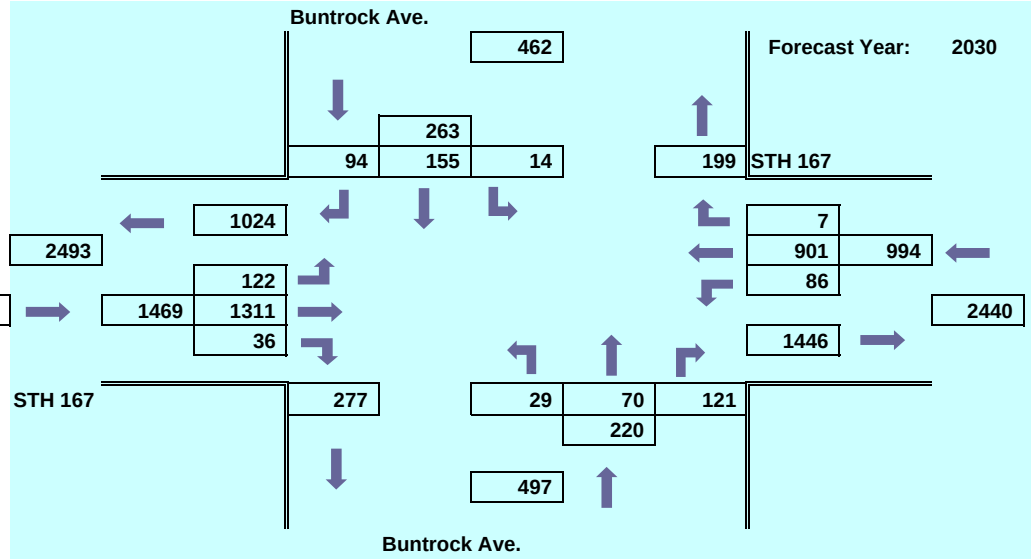
Forecast Year: 2010



Forecast Year: 2020



Forecast Year: 2030



WisDot SE Region
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Projected PM Design Hour Traffic Volumes

Design Hour: 4:30 - 5:30 PM

Forecast Completed: February 20, 2009

Project Description

Project ID: TIA
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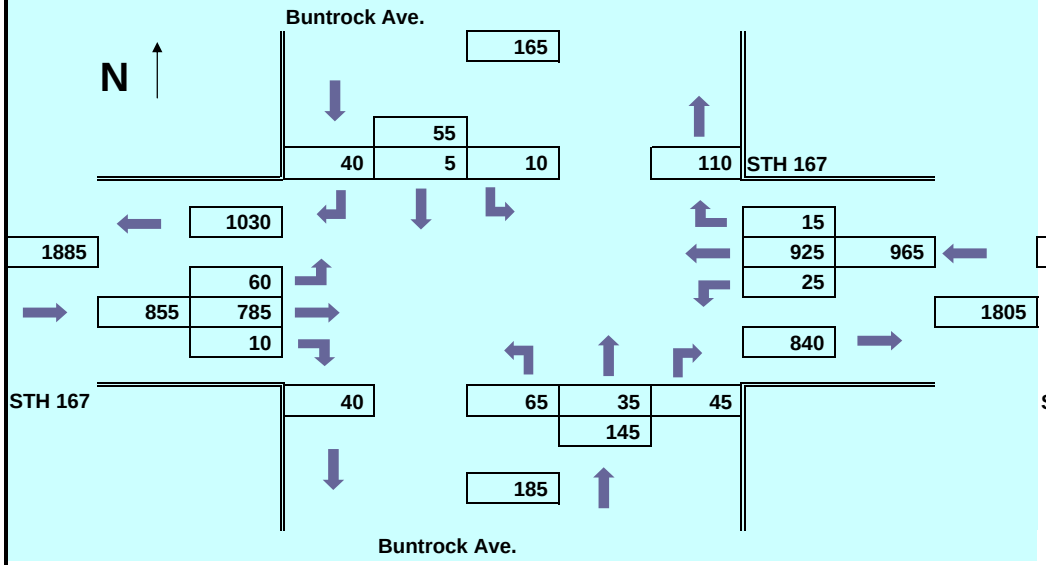
Route: STH 167
County: Ozaukee

Design Hour Turning Movement Data

Year: 2009



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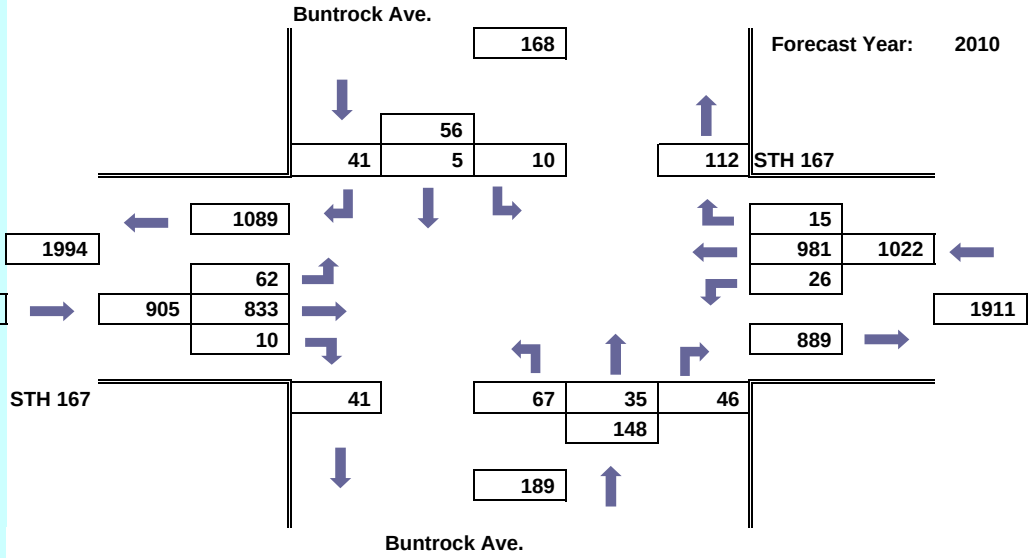
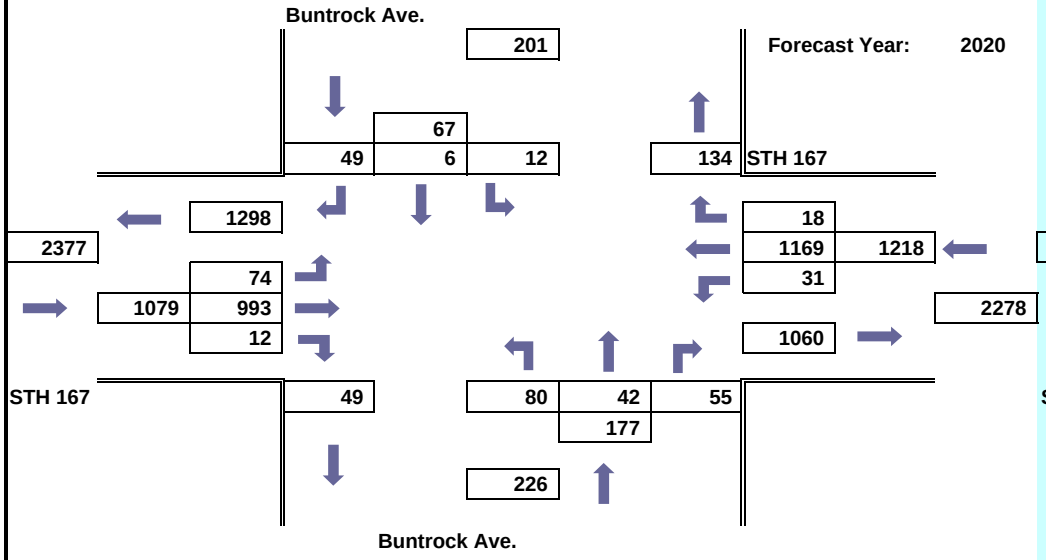
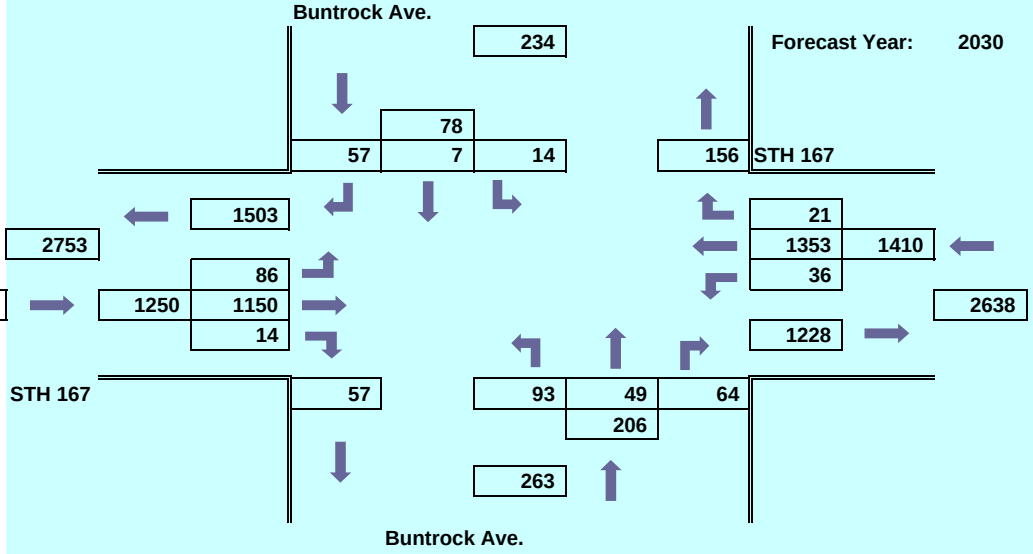


Forecast Year: 2020



Forecast Year: 2030



WisDot SE Region
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Projected AM Design Hour Traffic Volumes

Design Hour: 7:15 -8:15 AM

Forecast Completed: February 20, 2009

Project Description

Project ID: TIA
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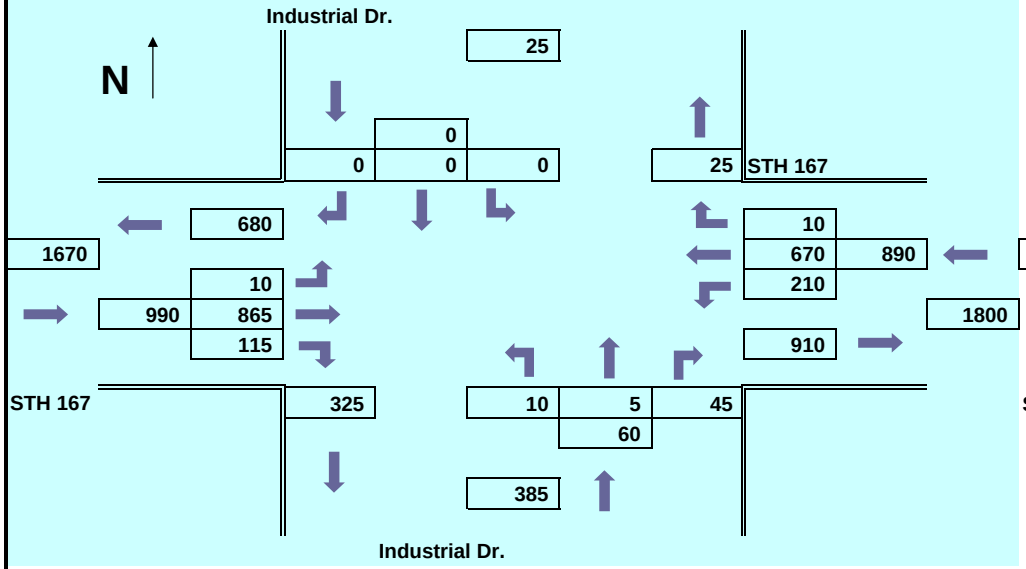
County: Ozaukee

Design Hour Turning Movement Data

Year: 2009



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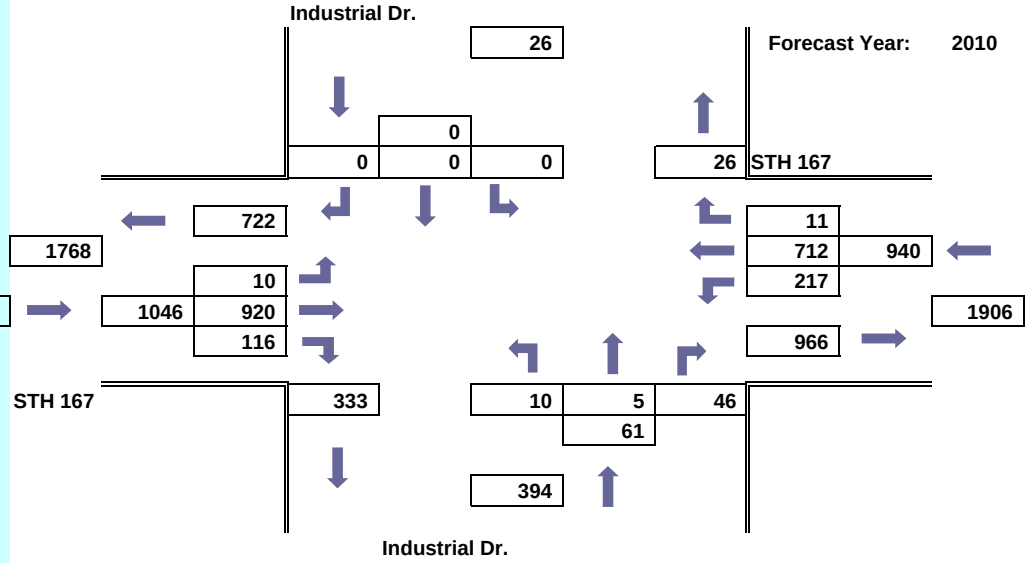

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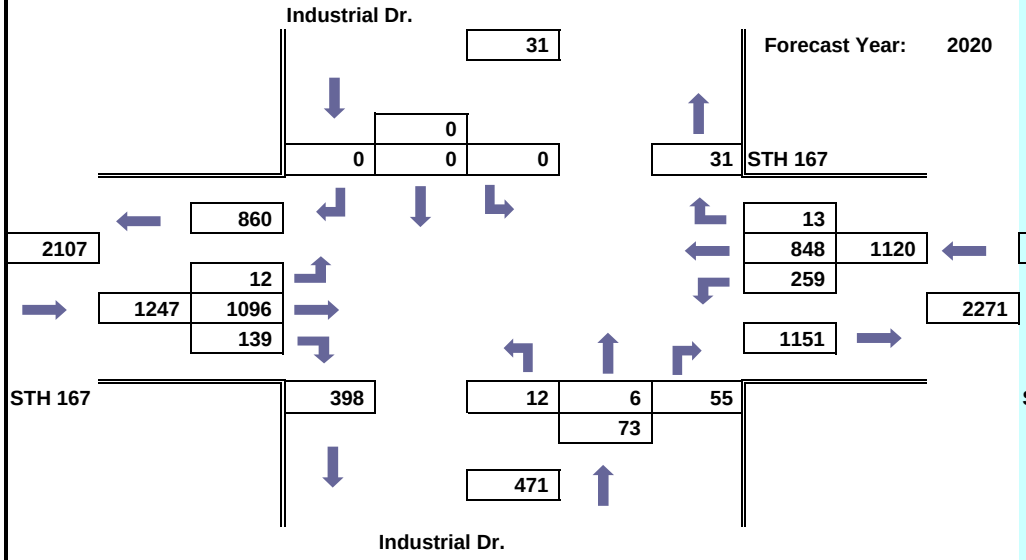
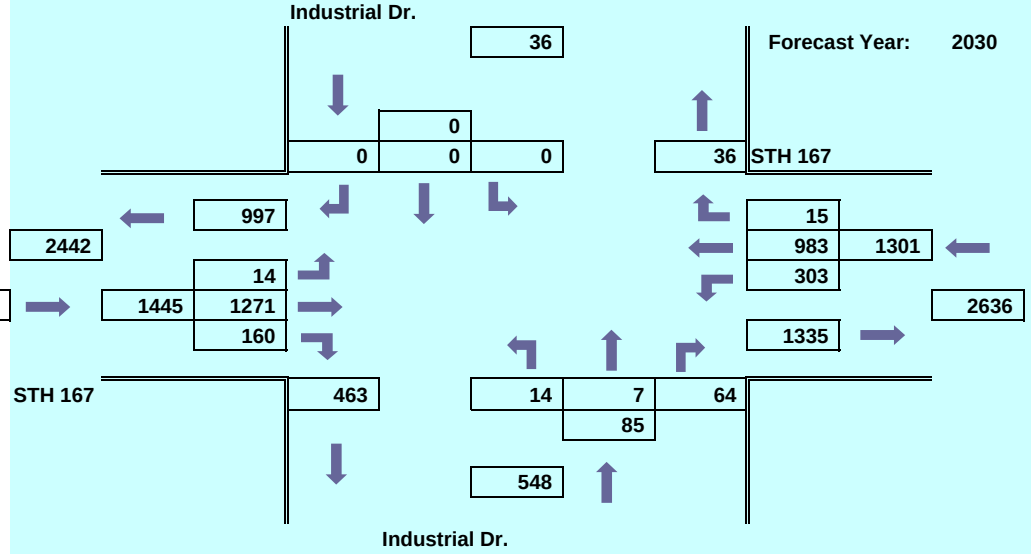


Forecast Year: 2030



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Projected PM Design Hour Traffic Volumes

Design Hour: 4:30 - 5:30 PM

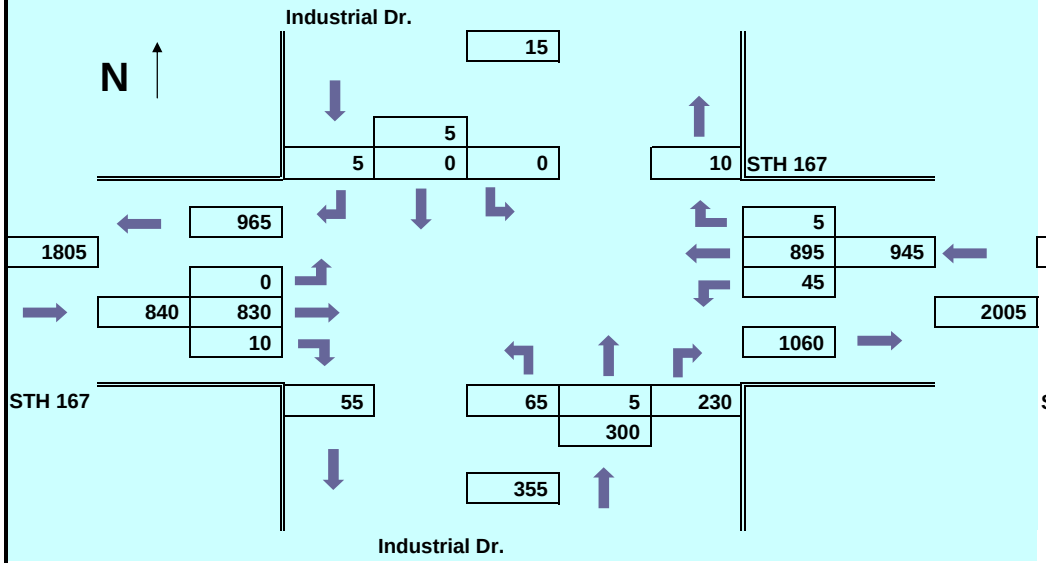
Forecast Completed: February 20, 2009

Project Description

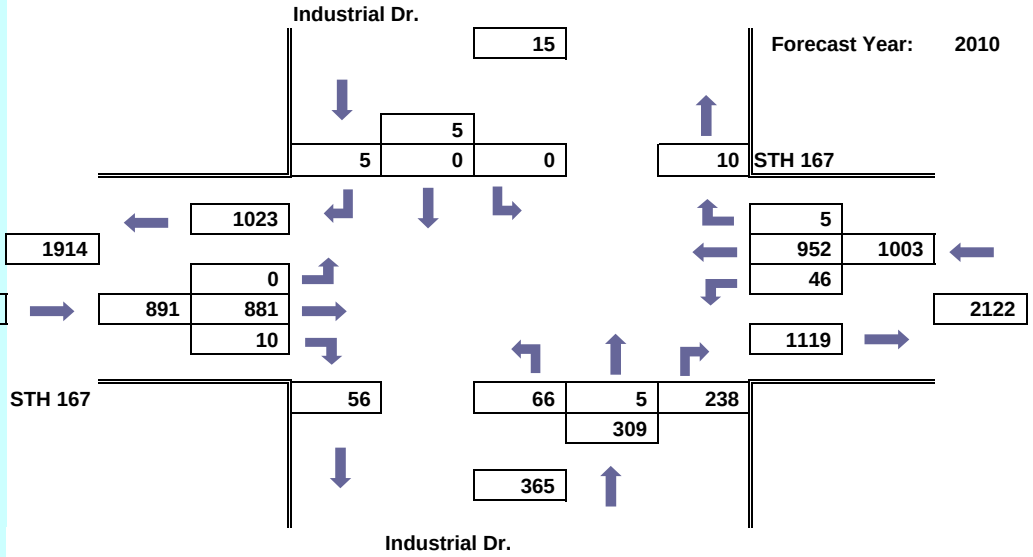
Project ID: TIA
Location: Mequon Trail to STH 57
Route: STH 167
County: Ozaukee

Design Hour Turning Movement Data

Year: 2009



Forecast Year: 2010



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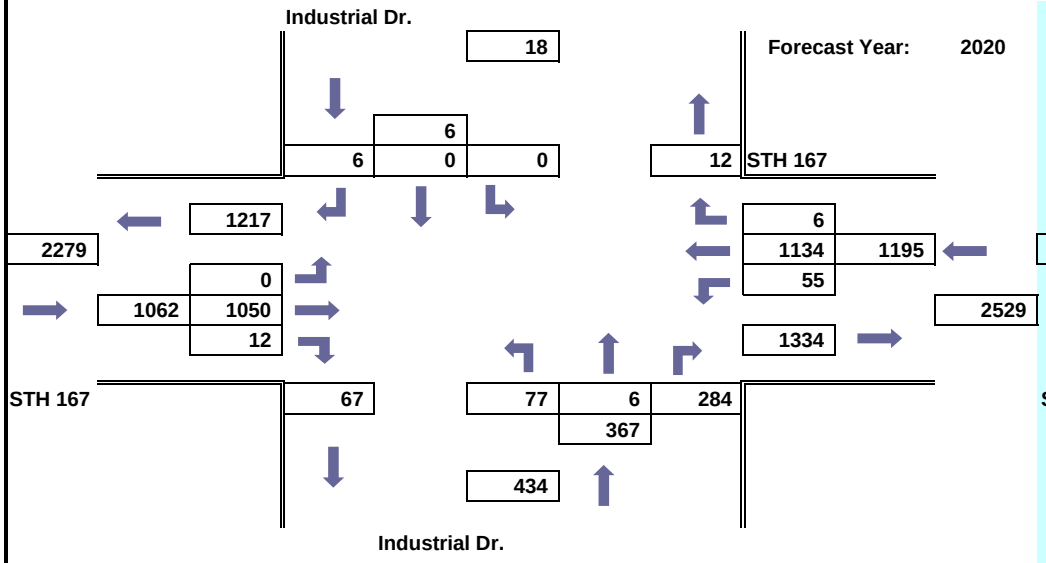

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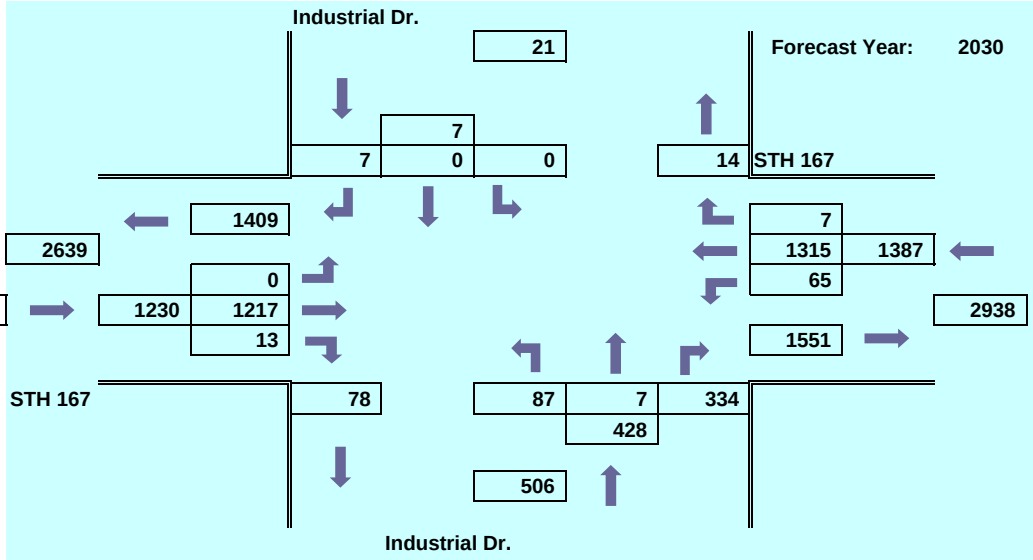

WisDot SE Region
Traffic Forecasting Section
Forecast by: Jim Harris
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Projected AM Design Hour Traffic Volumes

Design Hour: 7:15 -8:15 AM

Forecast Completed: February 20, 2009

Project Description

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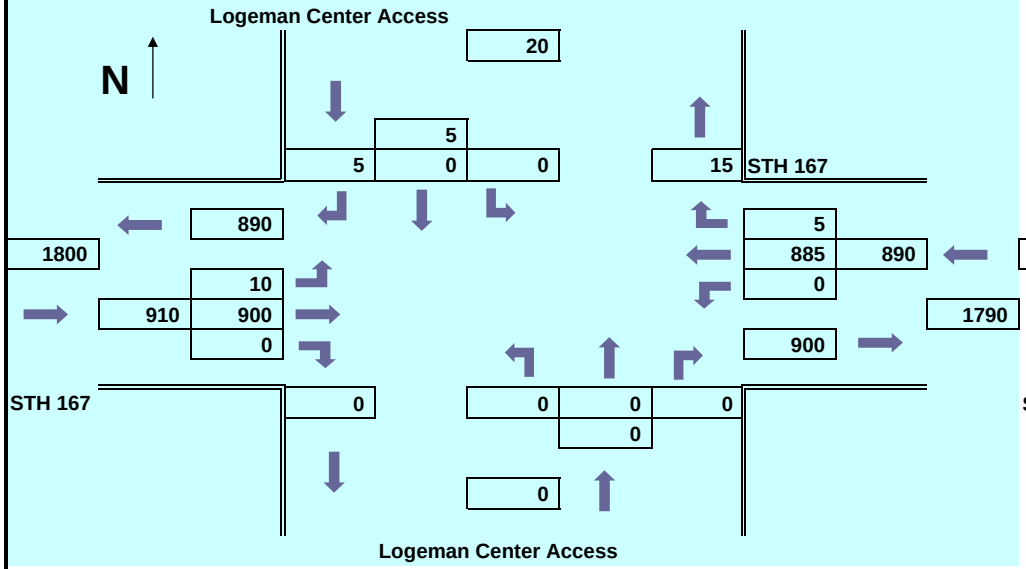
Location: Mequon Trail to STH 57
Route: STH 167
County: Ozaukee

Design Hour Turning Movement Data

Year: 2009



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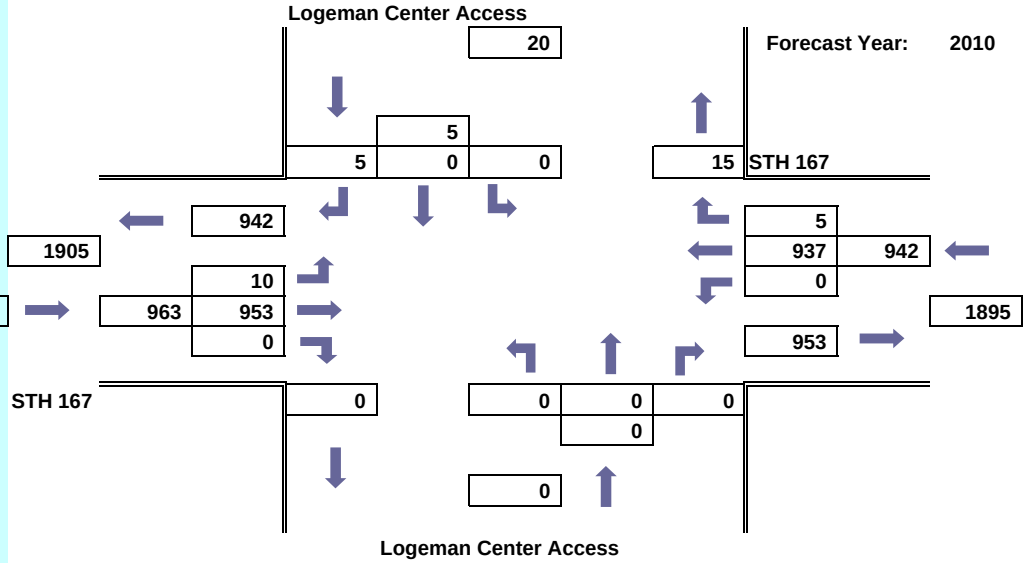

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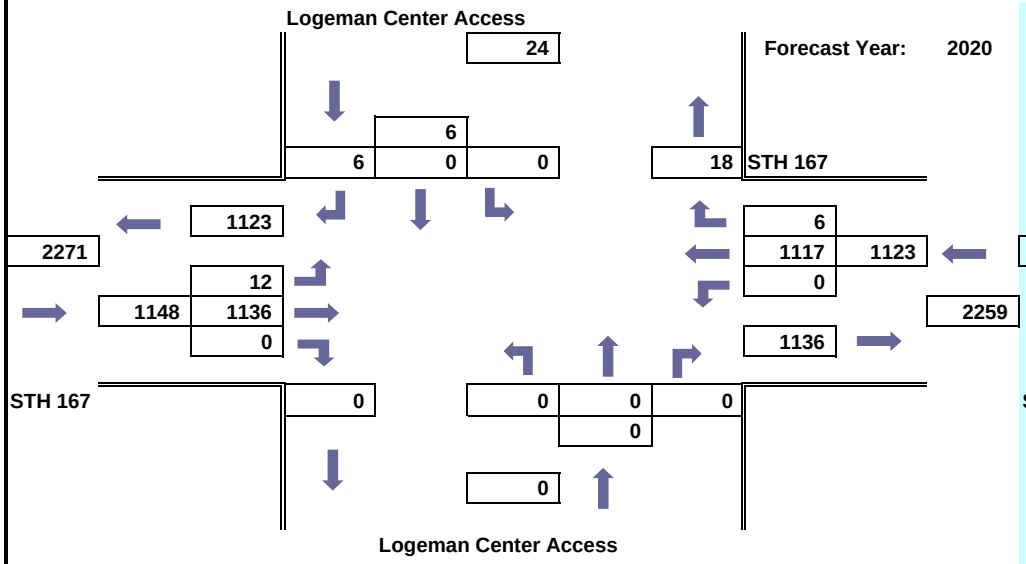

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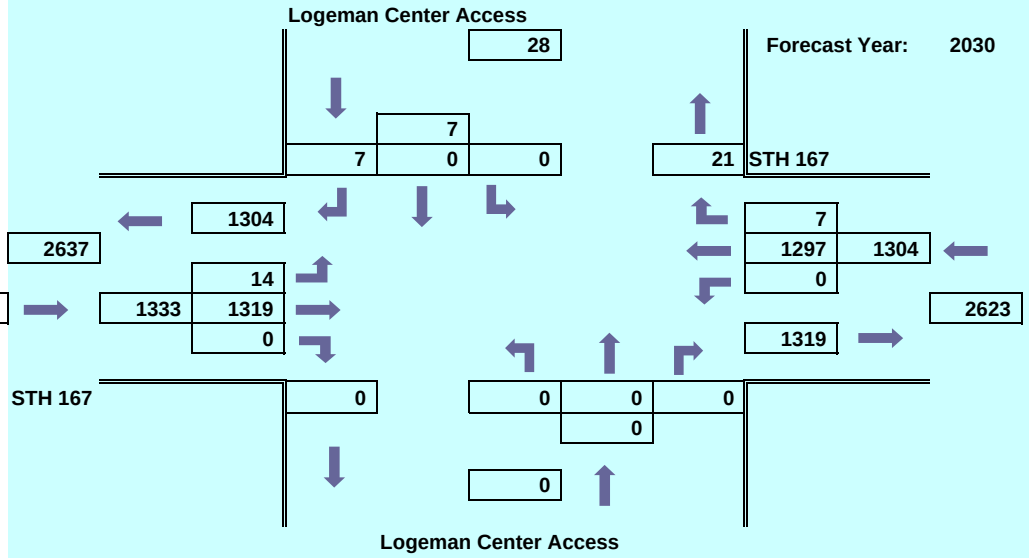

WisDot SE Region
Traffic Forecasting Section
Forecast by: Jim Harris
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Projected PM Design Hour Traffic Volumes

Design Hour: 4:30 - 5:30 PM

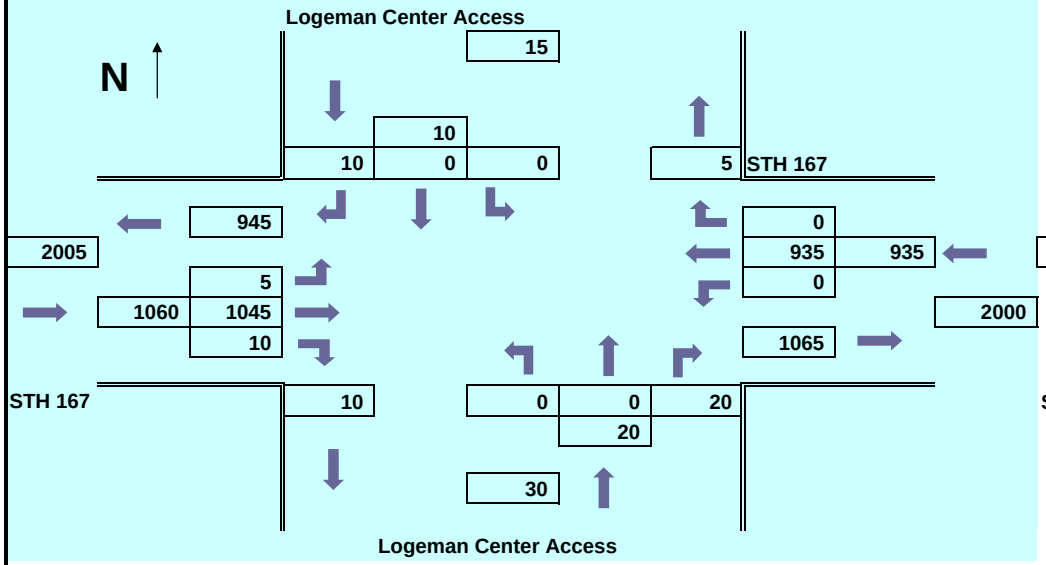
Forecast Completed: February 20, 2009

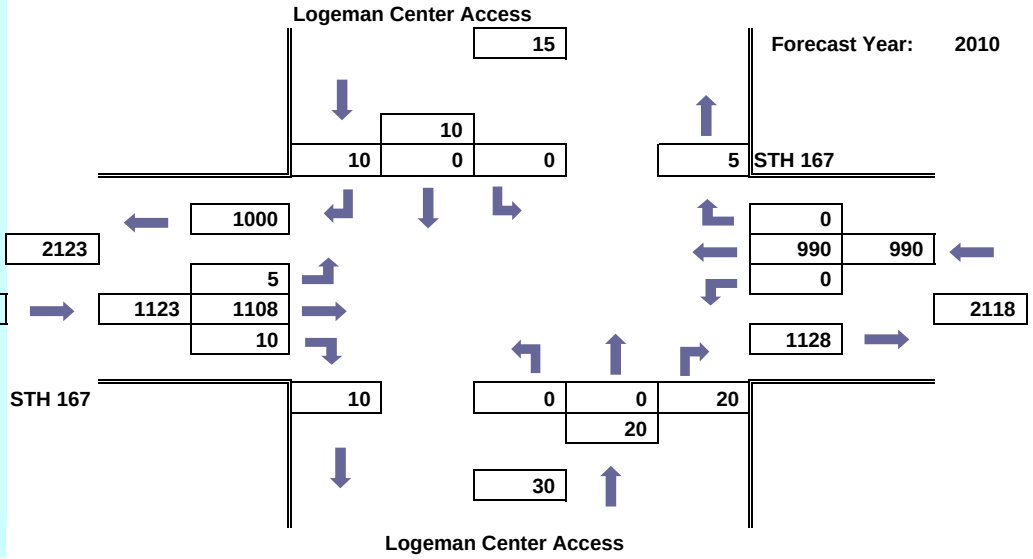
Project Description

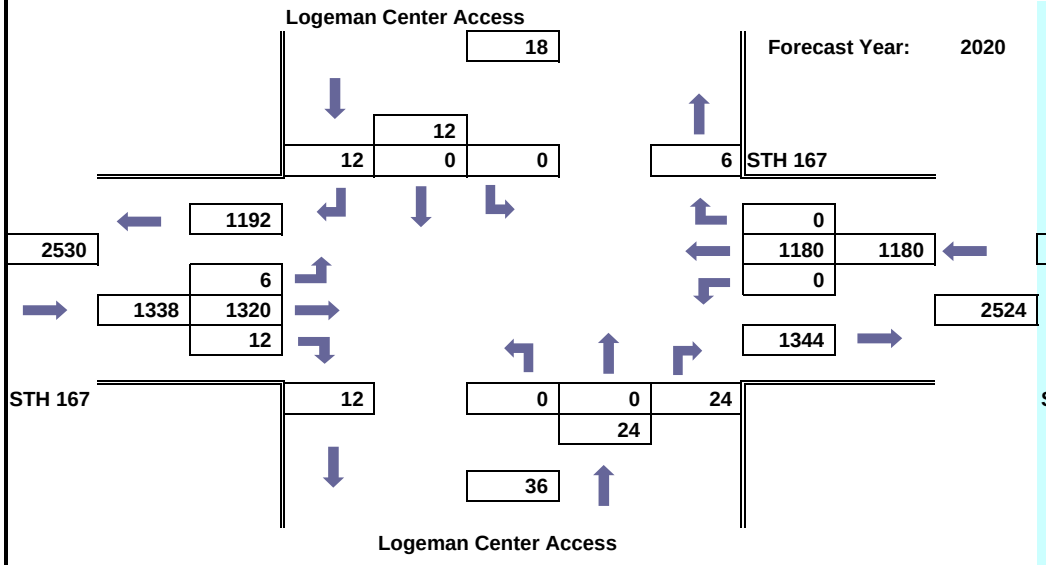
Project ID: TIA
Location: Mequon Trail to STH 57
Route: STH 167
County: Ozaukee

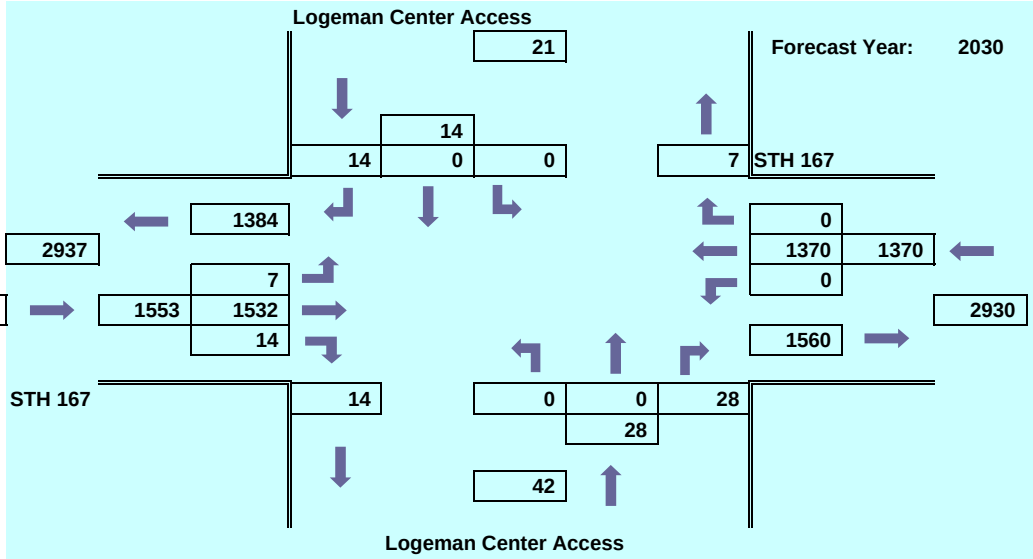
Design Hour Turning Movement Data

Year: 2009









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Projected AM Design Hour Traffic Volumes

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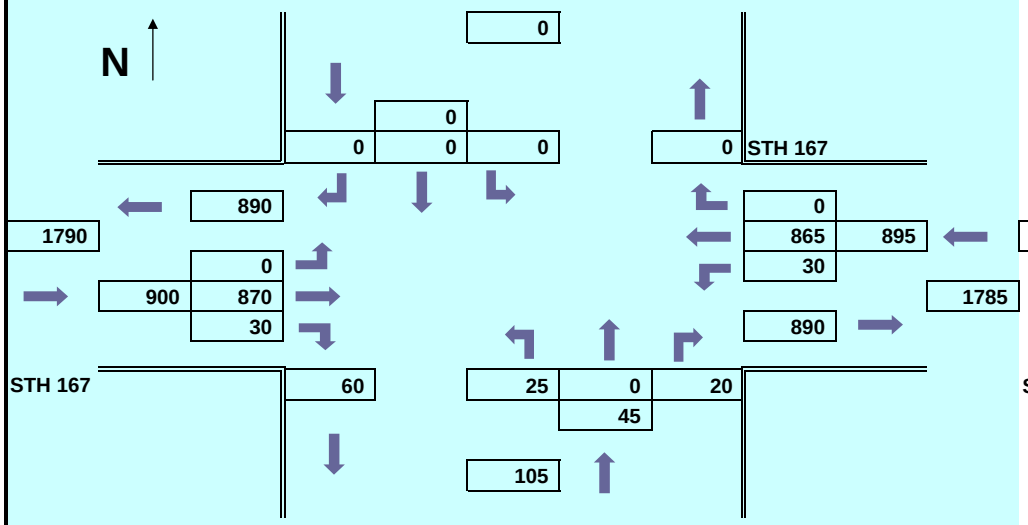
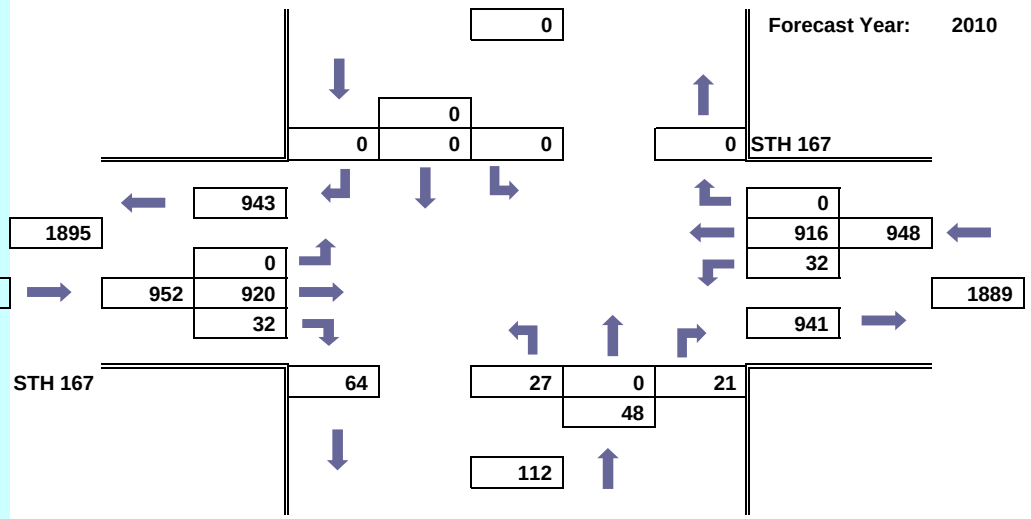
Design Hour Turning Movement Data

Year: 2009



Forecast Year: 2010



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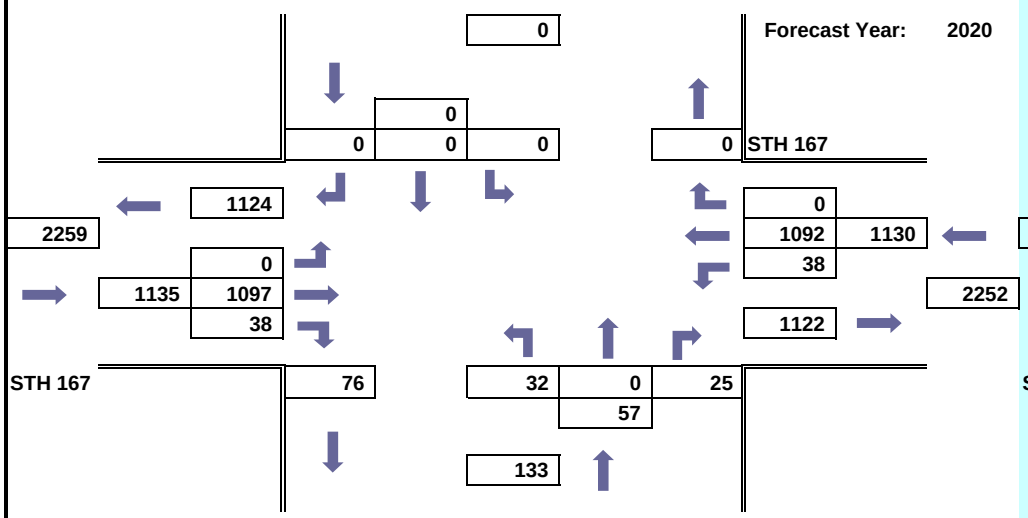
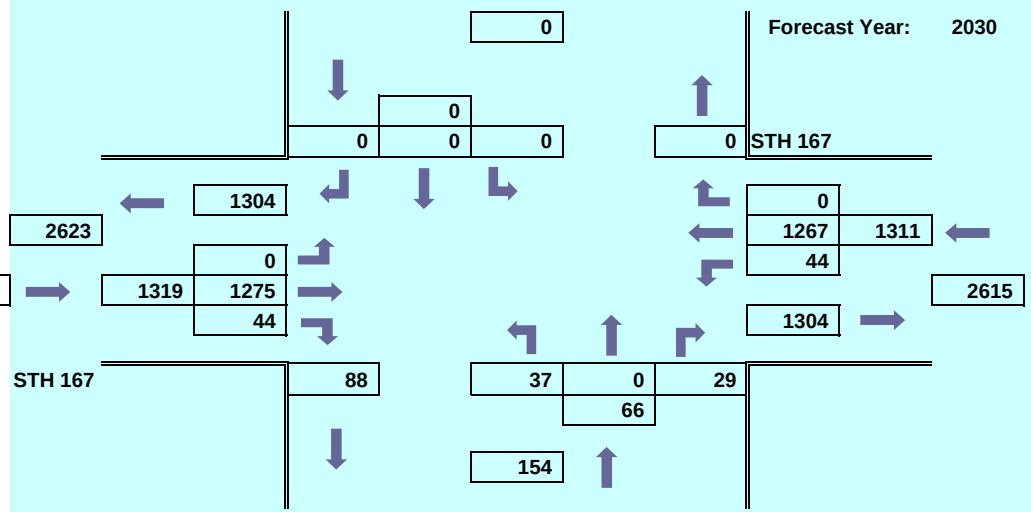


Forecast Year: 2030



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Projected PM Design Hour Traffic Volumes

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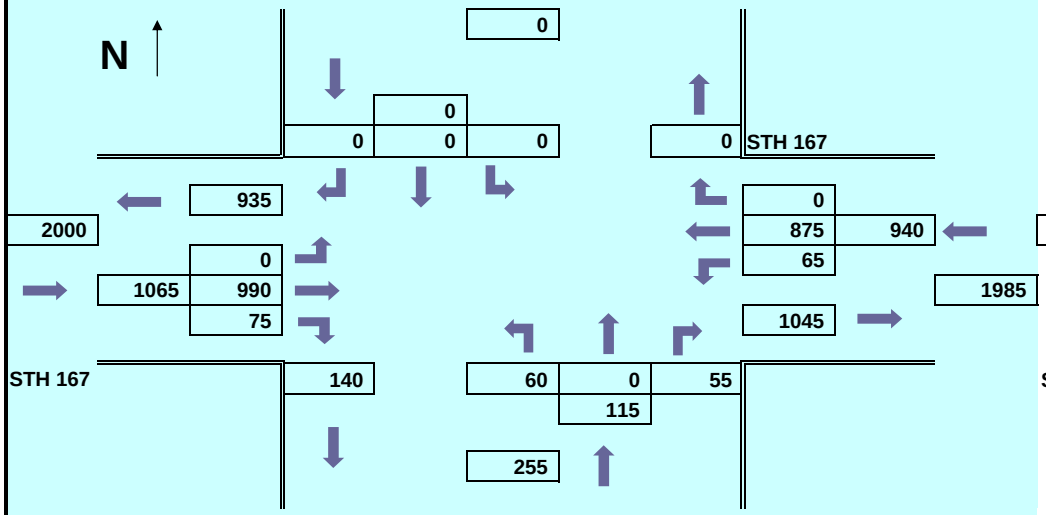
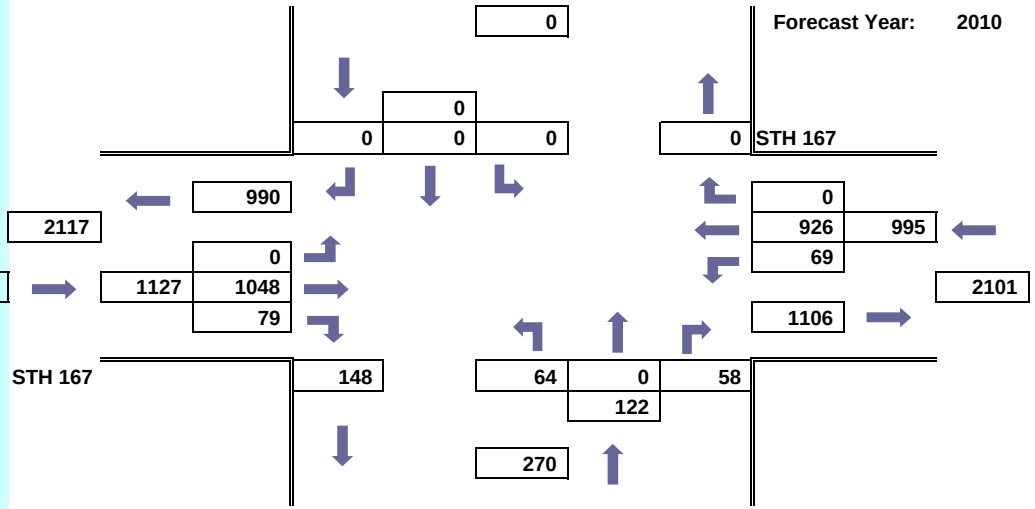
Year: 2009



Piggly Wiggly Access (West)

Forecast Year: 2010



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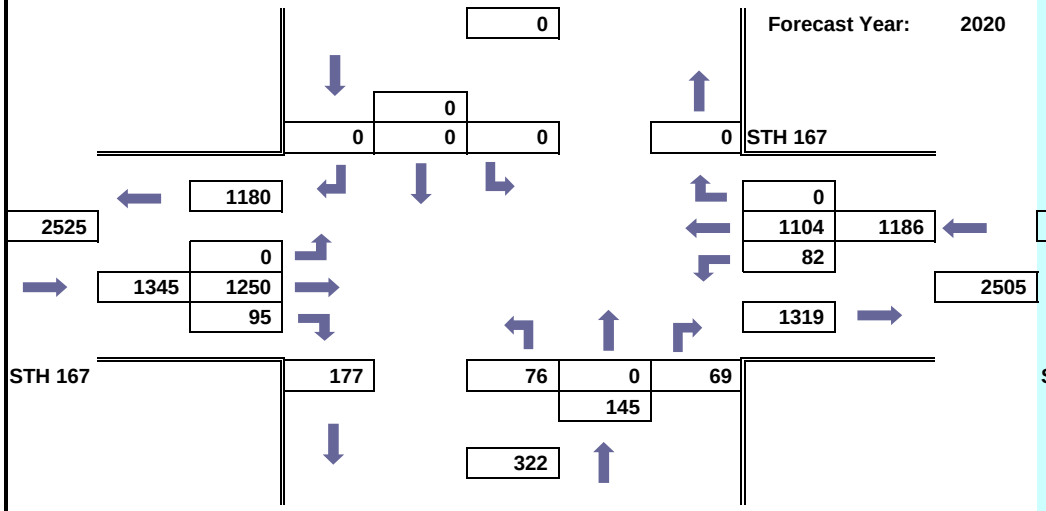

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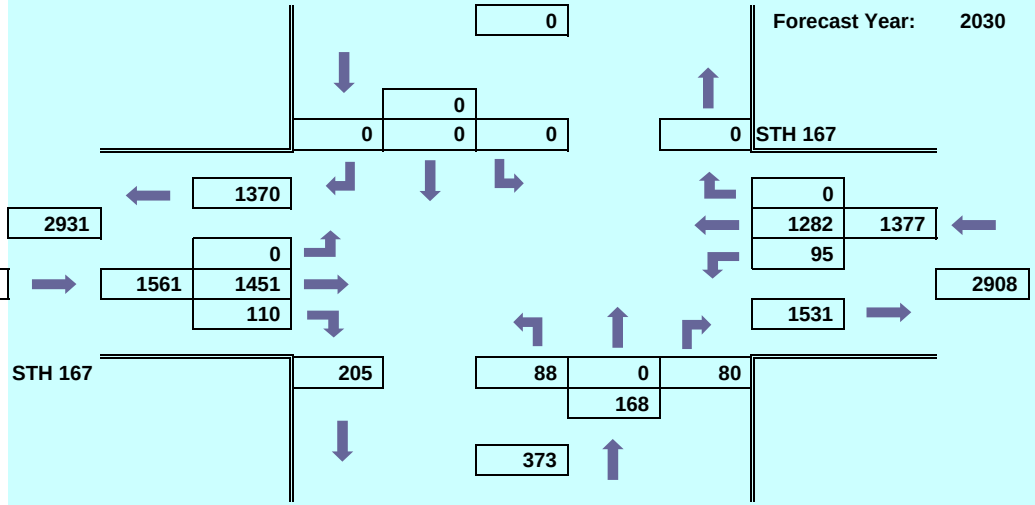

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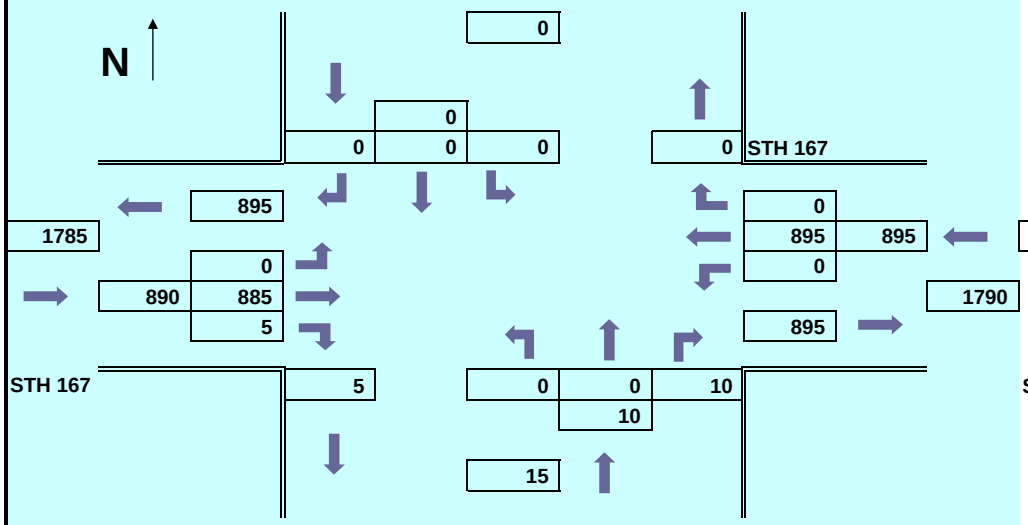
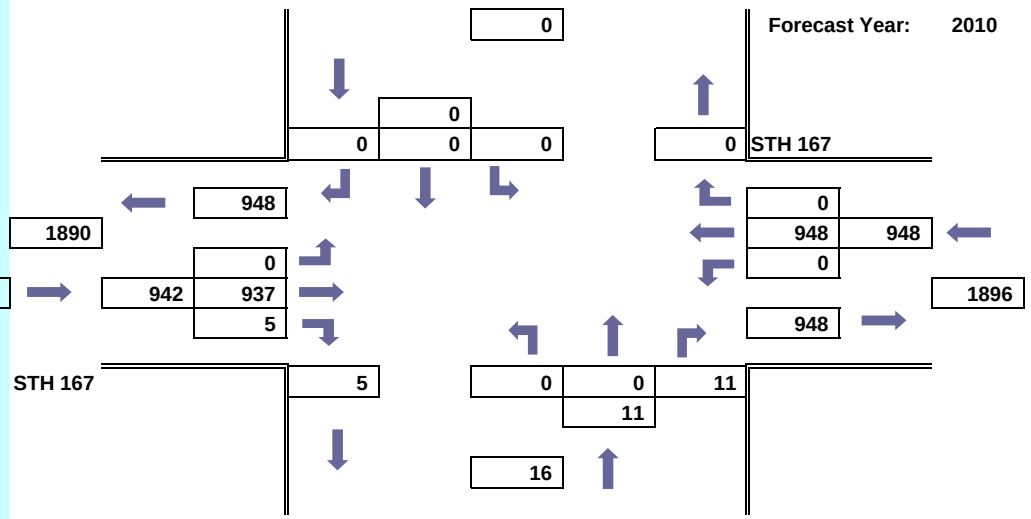


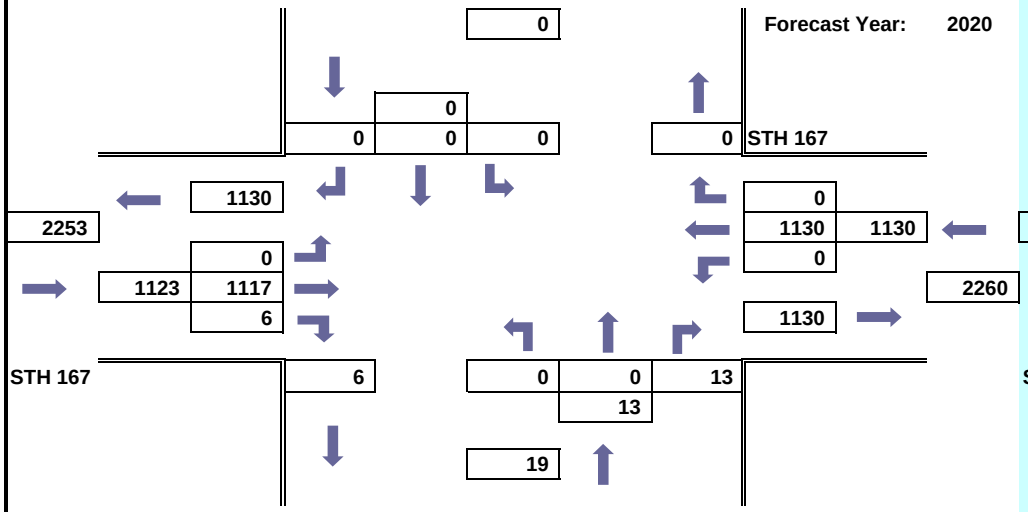
Piggly Wiggly Access (East)

Forecast Year: 2010



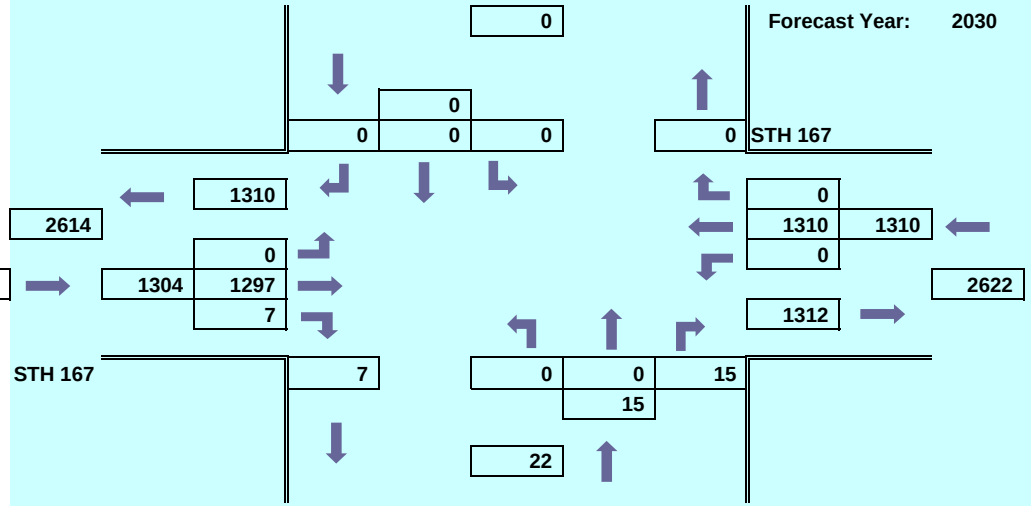
Piggly Wiggly Access (East)

Forecast Year: 2020



Piggly Wiggly Access (East)

Forecast Year: 2030



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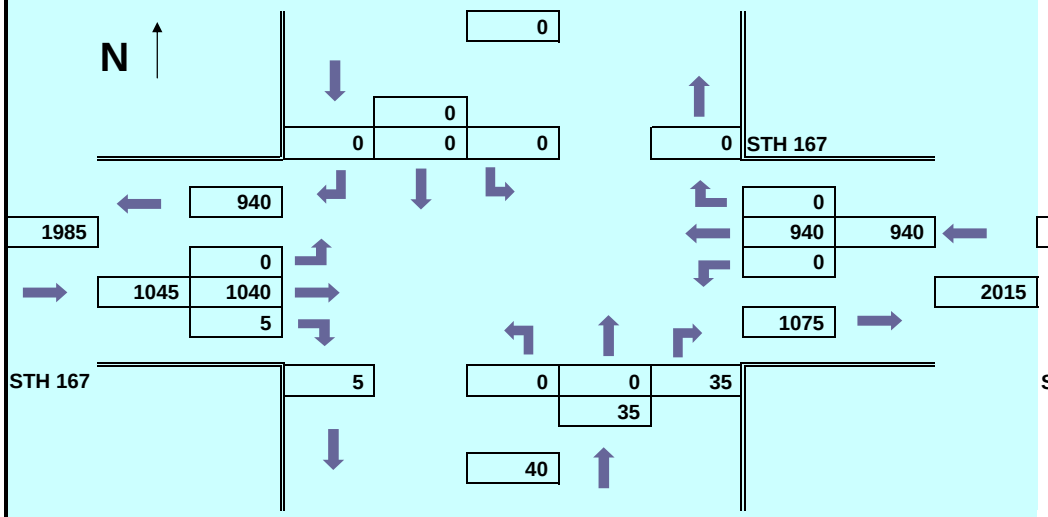
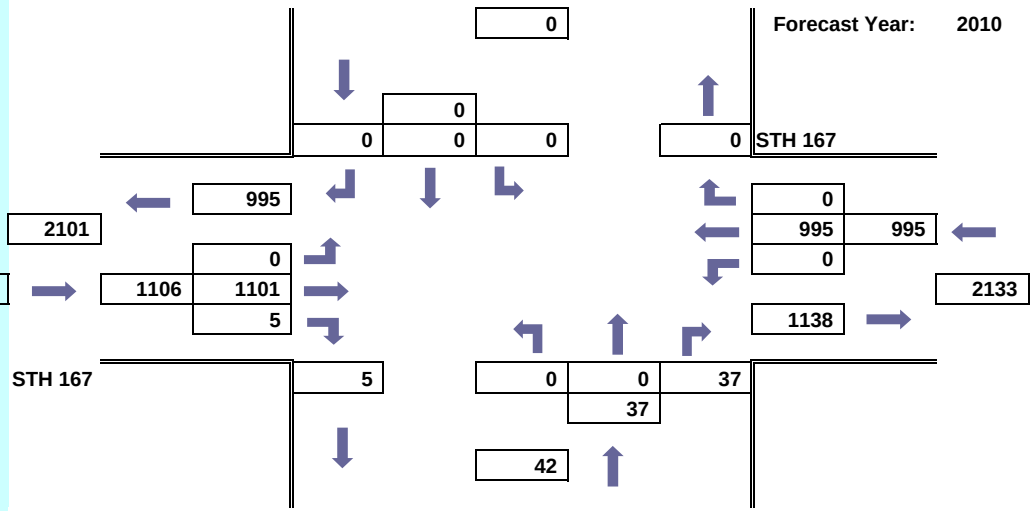
Year: 2009



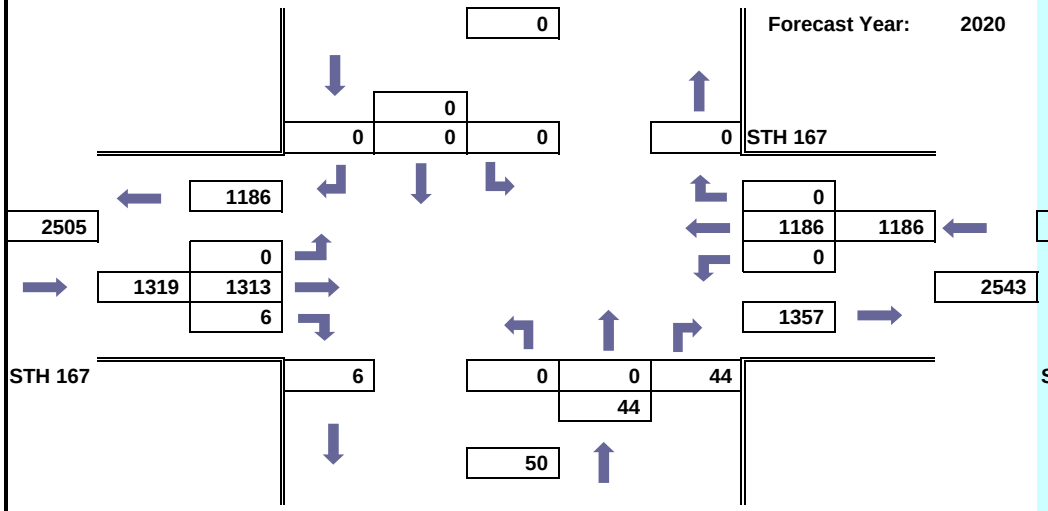
Piggly Wiggly Access (East)

Forecast Year: 2010



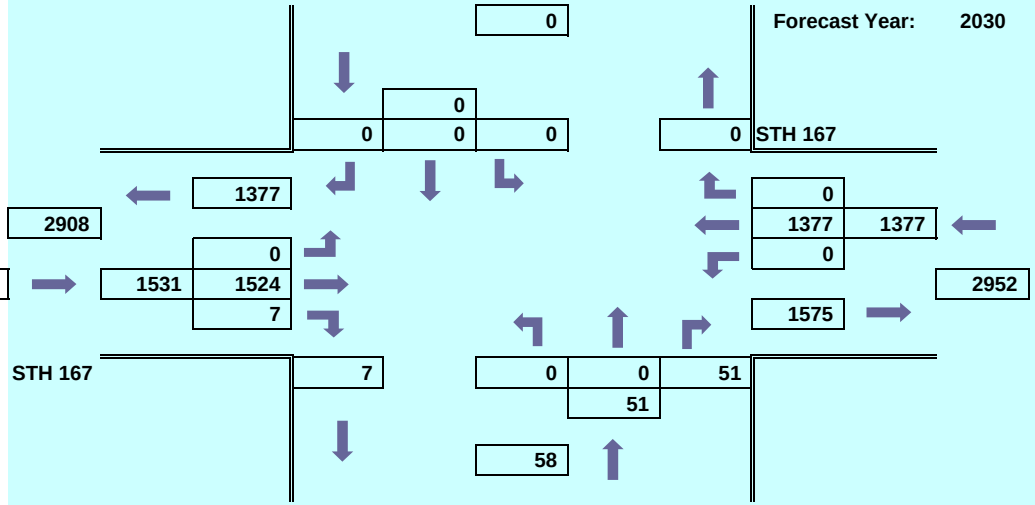
Piggly Wiggly Access (East)

Forecast Year: 2020



Piggly Wiggly Access (East)

Forecast Year: 2030



Piggly Wiggly Access (East)

WisDot SE Region
Traffic Forecasting Section
Forecast by: Jim Harris
Phone: 262-521-5455
Email: james.harris-jr@dot.wi.gov

Projected AM Design Hour Traffic Volumes

Design Hour: 7:15 -8:15 AM

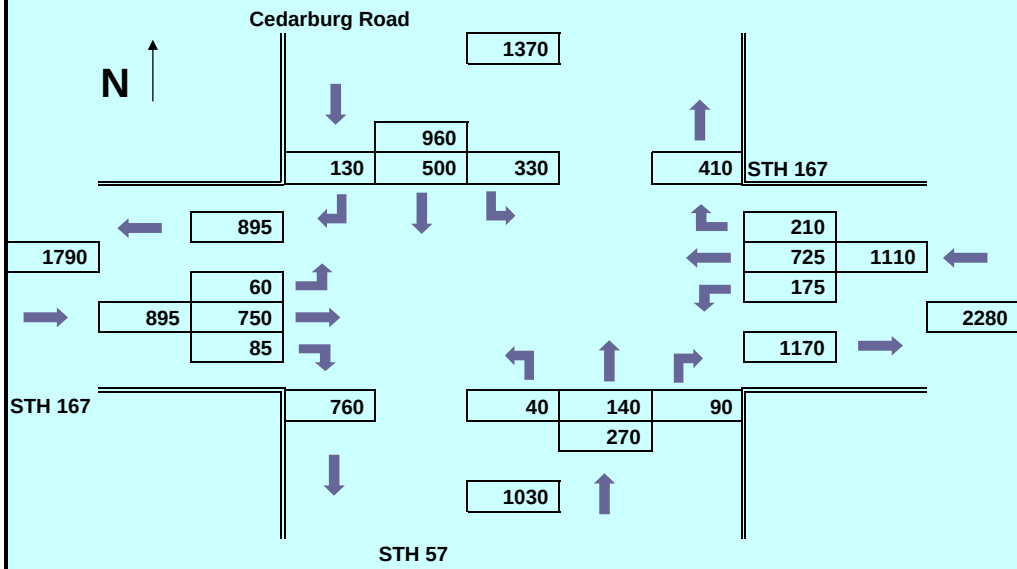
Forecast Completed: February 20, 2009

Project Description

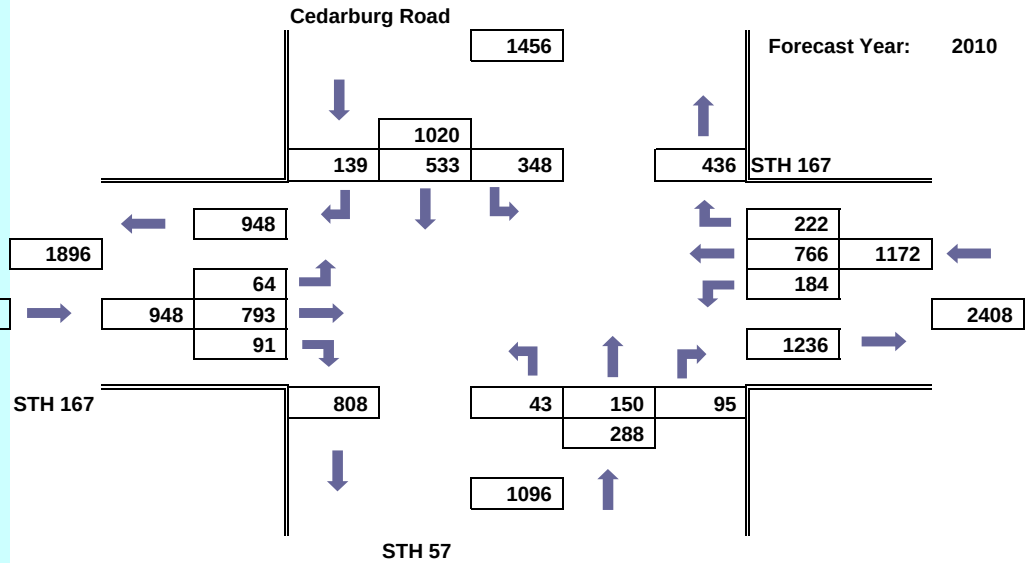
Project ID: TIA
Location: Mequon Trail to STH 57
Route: STH 167
County: Ozaukee

Design Hour Turning Movement Data

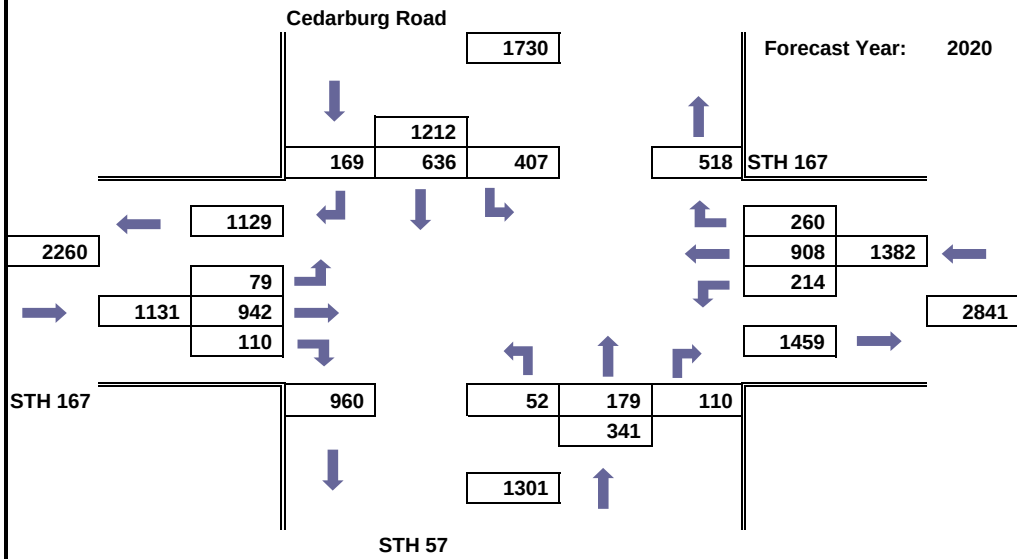
Year: 2009



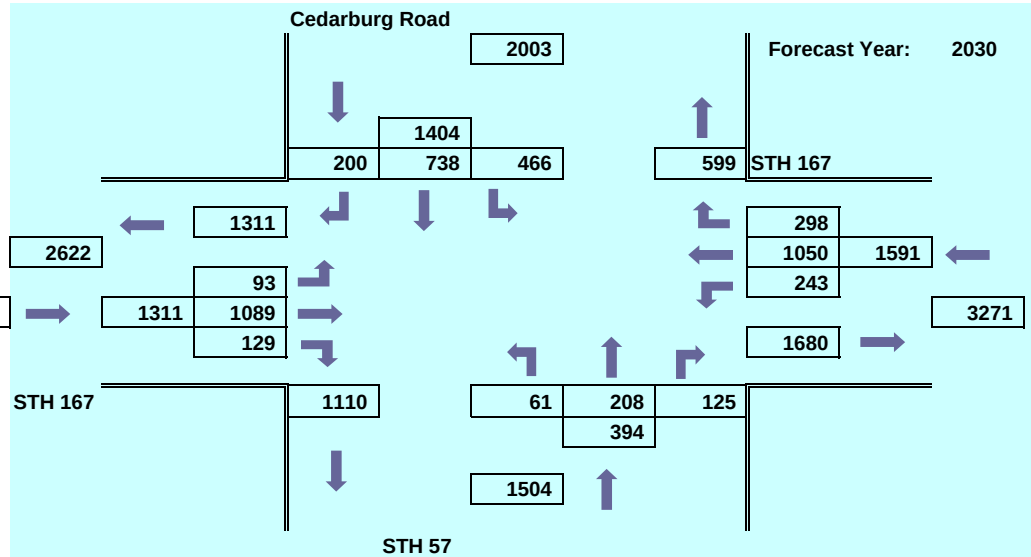
Forecast Year: 2010



Forecast Year: 2020



Forecast Year: 2030



WisDot SE Region
Traffic Forecasting Section
Forecast by: Jim Harris
Phone: 262-521-5455
Email: james.harris-jr@dot.wi.gov

Projected PM Design Hour Traffic Volumes

Design Hour: 4:30 - 5:30 PM

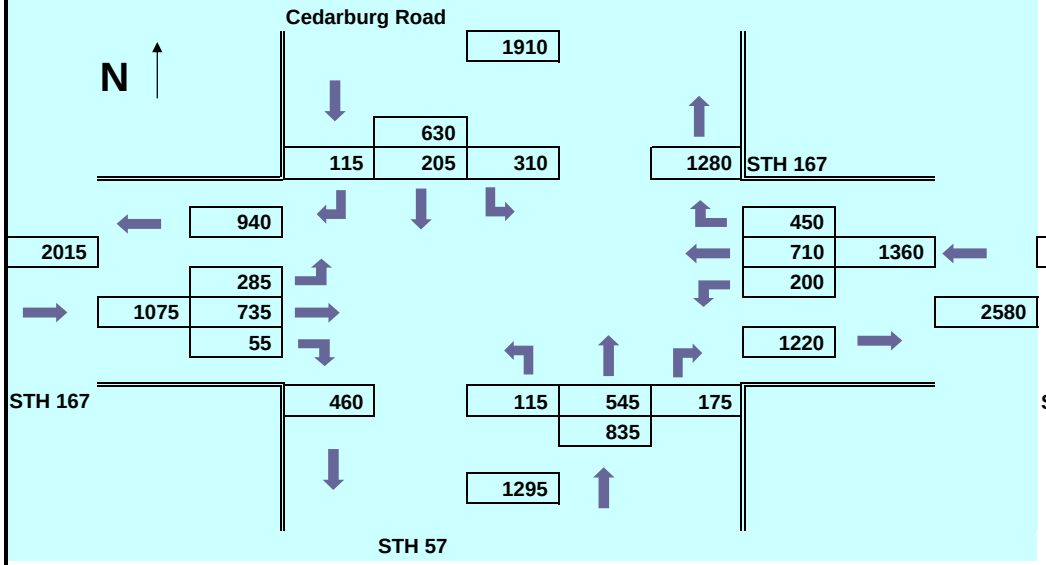
Forecast Completed: February 20, 2009

Project Description

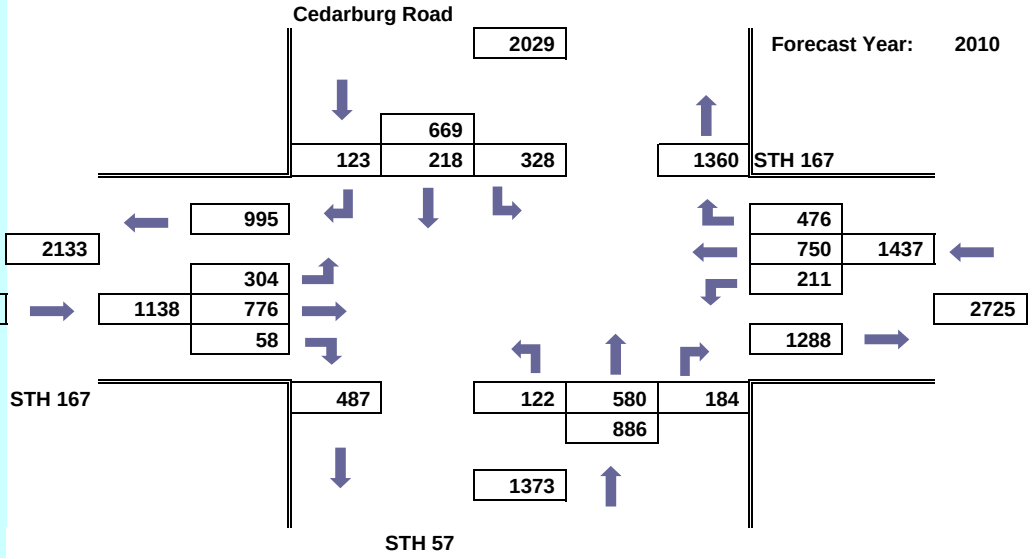
Project ID: TIA
Location: Mequon Trail to STH 57
Route: STH 167
County: Ozaukee

Design Hour Turning Movement Data

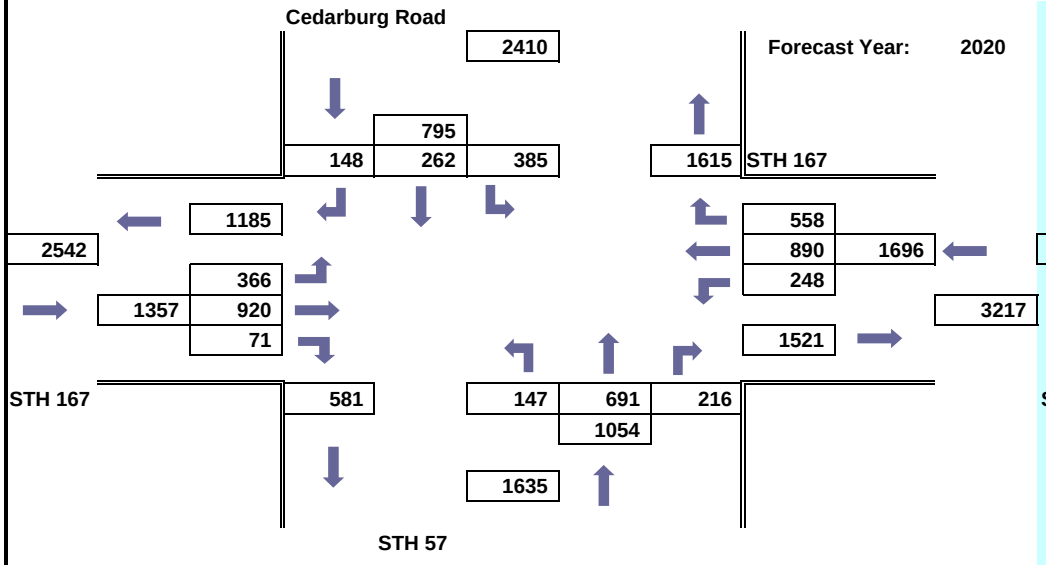
Year: 2009



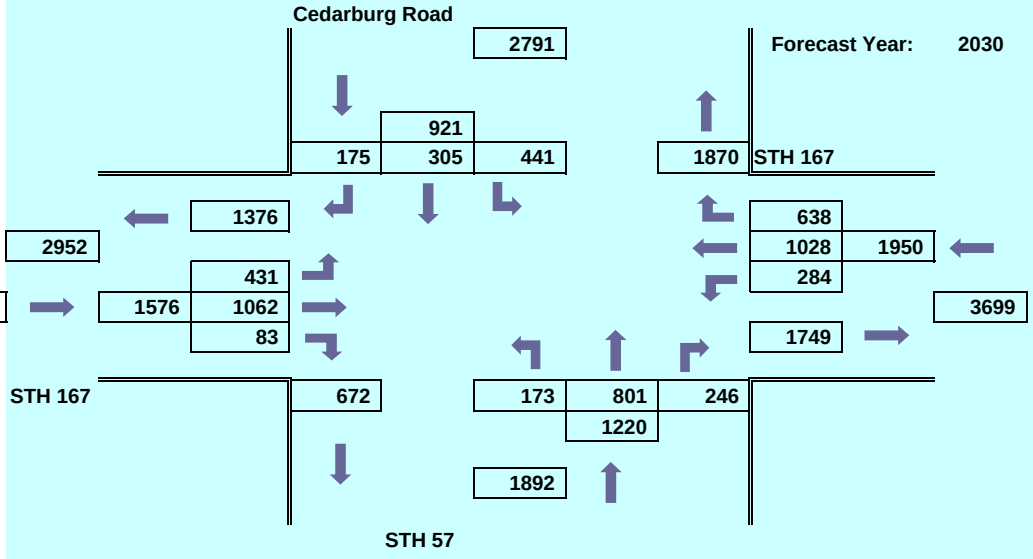
Forecast Year: 2010



Forecast Year: 2020



Forecast Year: 2030



APPENDIX A

Existing Traffic Signal Timings

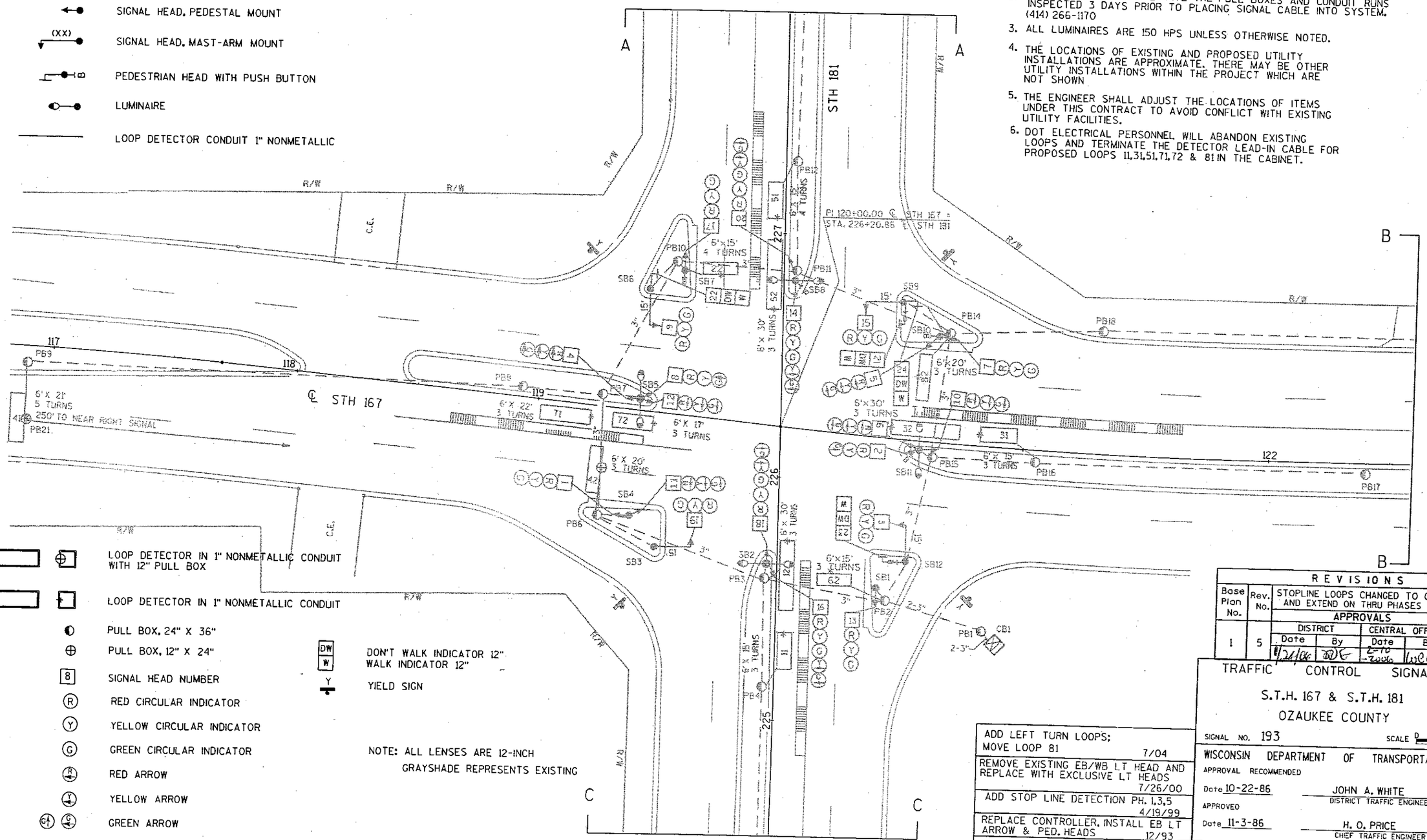
2

LEGEND

- CONTROL CABINET
- NONMETALLIC CONDUIT 2", UNLESS OTHERWISE NOTED
- SIGNAL HEAD, PEDESTAL MOUNT
- (XX) SIGNAL HEAD, MAST-ARM MOUNT
- PEDESTRIAN HEAD WITH PUSH BUTTON
- LUMINAIRE
- LOOP DETECTOR CONDUIT 1" NONMETALLIC

CONSTRUCTION NOTES:

1. * LOCATION IS TO FRONT CENTER OF DETECTOR LOOP.
2. THE CONTRACTOR SHALL HAVE THE PULL BOXES AND CONDUIT RUNS INSPECTED 3 DAYS PRIOR TO PLACING SIGNAL CABLE INTO SYSTEM. (414) 266-1170
3. ALL LUMINAIRES ARE 150 HPS UNLESS OTHERWISE NOTED.
4. THE LOCATIONS OF EXISTING AND PROPOSED UTILITY INSTALLATIONS ARE APPROXIMATE. THERE MAY BE OTHER UTILITY INSTALLATIONS WITHIN THE PROJECT WHICH ARE NOT SHOWN
5. THE ENGINEER SHALL ADJUST THE LOCATIONS OF ITEMS UNDER THIS CONTRACT TO AVOID CONFLICT WITH EXISTING UTILITY FACILITIES.
6. DOT ELECTRICAL PERSONNEL WILL ABANDON EXISTING LOOPS AND TERMINATE THE DETECTOR LEAD-IN CABLE FOR PROPOSED LOOPS 11,31,51,71,72 & 81 IN THE CABINET.



- LOOP DETECTOR IN 1" NONMETALLIC CONDUIT WITH 12" PULL BOX
- LOOP DETECTOR IN 1" NONMETALLIC CONDUIT
- PULL BOX, 24" X 36"
- PULL BOX, 12" X 24"
- 8 SIGNAL HEAD NUMBER
- (R) RED CIRCULAR INDICATOR
- (Y) YELLOW CIRCULAR INDICATOR
- (G) GREEN CIRCULAR INDICATOR
- RED ARROW
- YELLOW ARROW
- GREEN ARROW
- DW / W DON'T WALK INDICATOR 12" / WALK INDICATOR 12"
- Y YIELD SIGN

NOTE: ALL LENSES ARE 12-INCH
GRAYSHADE REPRESENTS EXISTING

REVISIONS					
Base Plan No.	Rev. No.	STOPLINE LOOPS CHANGED TO CALL AND EXTEND ON THRU PHASES			Cont. Type
		APPROVALS			
		DISTRICT		CENTRAL OFFICE	
		Date	By	Date	By
1	5	1/24/06	[illegible]	2-10-2006	[illegible]

LC8000

ADD LEFT TURN LOOPS; MOVE LOOP 81	7/04
REMOVE EXISTING EB/WB LT HEAD AND REPLACE WITH EXCLUSIVE LT HEADS	7/26/00
ADD STOP LINE DETECTION PH. 1,3,5	4/19/99
REPLACE CONTROLLER, INSTALL EB LT ARROW & PED. HEADS	12/93
INITIAL INSTALLATION	1985

TRAFFIC CONTROL SIGNAL

S.T.H. 167 & S.T.H. 181

OZAUKEE COUNTY

SIGNAL NO. 193 SCALE 0 20

WISCONSIN DEPARTMENT OF TRANSPORTATION

APPROVAL RECOMMENDED

Date 10-22-86 JOHN A. WHITE, DISTRICT TRAFFIC ENGINEER

APPROVED

Date 11-3-86 H. O. PRICE, CHIEF TRAFFIC ENGINEER

DISTRICT CONTACT: JOHN HAUG
DESIGNED BY: RANDY SHAFER

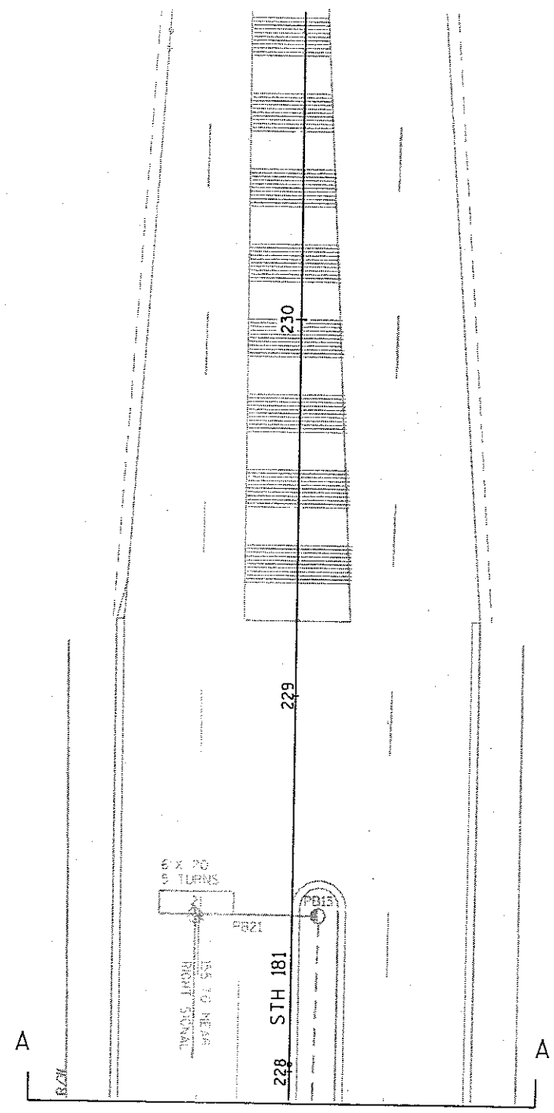
PAGE 1 OF 3

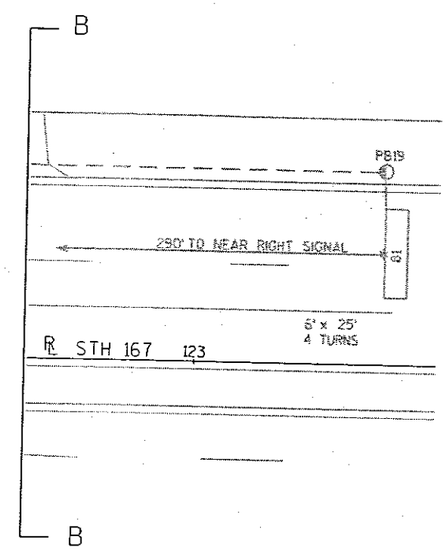
PROJECT NO: 1000-28-23	HWY: STH 167 & STH 181	COUNTY: OZAUKEE	TRAFFIC SIGNAL PLAN	SHEET NO:	E

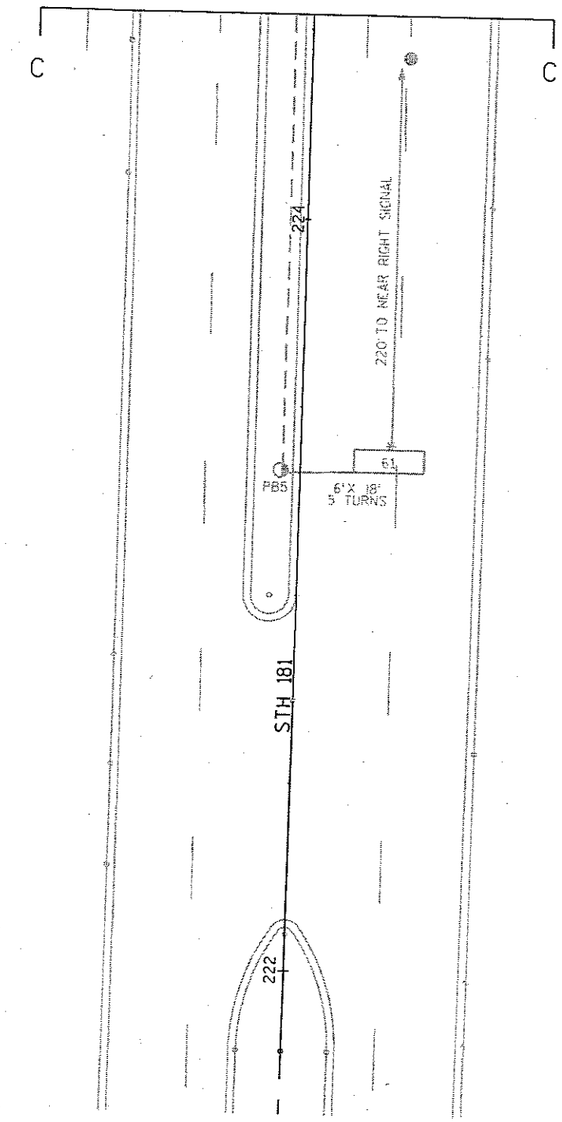
FILE NAME : J:\projects\d2_signals_com\S193_G.dgn PLOT DATE : 24-JAN-2006 10:57 PLOT BY : DOTT6S PLOT NAME : PLOT SCALE : 40:1

WISDOT/CADDS SHEET 42

90-192-1 [illegible]







TRAFFIC CONTROL SIGNAL
STH 167 & STH 181
OZAUKEE COUNTY

SIGNAL NO. 193 SCALE 0 20

DISTRICT CONTACT: JOHN HAUG
DESIGNED BY: RANDY SHAFER

PAGE 2 OF 3

PROJECT NO:1000-28-23	HWY: STH 167 & STH 181	COUNTY: OZAUKEE	TRAFFIC SIGNAL PLAN	SHEET NO: E

FILE NAME : J:\projects\d2_signals_com\S193_G.dgn

PLOT DATE : 24-JAN-2006 10:57 PLOT BY : DOTT6S PLOT NAME : PLOT SCALE : 40:1

SEQUENCE OF OPERATION

		01			02			03			04			FLASH
			CLEAR TO			CLEAR TO			CLEAR TO			CLEAR TO		
	HEAD NUMBERS	R/W	**		R/W	**		R/W	**		R/W	**		
01	14,16	G	Y	-	-	-	-	-	-	-	-	-	-	-
02	17,18,19,20	R	R	R	G	Y	R	R	R	R	R	R	R	R
03	10,11,12	R	R	R	R	R	R	G	Y	R	R	R	R	R
04	1,2,3	R	R	R	R	R	R	R	R	R	G,G	Y	R	R
05	18,20	-	-	-	-	-	-	-	-	-	-	-	-	-
06	13,14,15,16	R	R	R	R	R	R	R	R	R	R	R	R	R
07	4,5,6	R	R	R	R	R	R	R	R	R	R	R	R	R
08	7,8,9	R	R	R	R	R	R	R	R	R	R	R	R	R
02P														
04P														
06P	23,24	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	
08P	21,22	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	

RING 1

		05			06			07			08		
			CLEAR TO			CLEAR TO			CLEAR TO			CLEAR TO	
	HEAD NUMBERS	R/W	**		R/W	**		R/W	**		R/W	**	
01	14,16	-	-	-	-	-	-	-	-	-	-	-	-
02	17,18,19,20	R	R	R	R	R	R	R	R	R	R	R	R
03	10,11,12	R	R	R	R	R	R	R	R	R	R	R	R
04	1,2,3	R	R	R	R	R	R	R	R	R	R	R	R
05	18,20	G	Y	-	-	-	-	-	-	-	-	-	-
06	13,14,15,16	R	R	R	G	Y	R	R	R	R	R	R	R
07	4,5,6	R	R	R	R	R	R	G	Y	R	R	R	R
08	7,8,9	R	R	R	R	R	R	R	R	R	G,G	Y	R
02P													
04P													
06P	23,24	DW	DW	DW	*	DW	DW	DW	DW	DW	DW	DW	DW
08P	21,22	DW	DW	DW	DW	DW	DW	DW	DW	DW	*	DW	DW

RING 2

N

BARRIER

** CLEARANCE TO A PHASE IN CONFLICT WITH THIS PHASE ON (SEE CHART 1)

* WHEN CALLED, TIMED STEADY WALK, THEN FLASHING DON'T WALK, THEN GOES TO STEADY DON'T WALK

CHART 1

PHASE ON	NONCONFLICTING PHASE ALLOWED TO TIME CONCURRENTLY	PHASES IN CONFLICT WITH PHASE ON
01	5 OR 6	2,3,4,7,8
02	5 OR 6	1,3,4,7,8
03	7 OR 8	1,2,4,5,6
04	7 OR 8	1,2,3,5,6
05	1 OR 2	3,4,6,7,8
06	1 OR 2	3,4,5,7,8
07	3 OR 4	1,2,5,6,8
08	3 OR 4	1,2,5,6,7

DETECTOR LOGIC

DETECTOR NUMBER	AMPLIFIER CHANNEL NUMBER	DETECTOR OPERATION: CALLS AND EXTENDS	CALLS ONLY	EXTENDS ONLY	PHASE CALLED	PHASE EXTENDED	DETECTOR DISCONNECT PHASE	CALLING DELAY	EXTENSION STRETCH	SIZE	NUMBER OF TURNS
11	1	X			1	1				6'X15'	3
12	1	X			1	1				6'X30'	3
21	2	X			2	2				6'X20'	5
22	2	X			2	2				6'X15'	4
31	3	X			3	3				6'X15'	3
32	3	X			3	3				6'X30'	3
41	4	X			4	4				6'X20'	5
42	4	X			4	4				6'X20'	3
51	5	X			5	5				6'X15'	4
52	5	X			5	5				6'X30'	3
61	6	X			6	6				6'X18'	5
62	6	X			6	6				6'X15'	3
71	7	X			7	7				6'X22'	3
72	7	X			7	7				6'X17'	3
81	8	X			8	8				6'X25'	4
82	8	X			8	8				6'X20	3

CONTROLLER LOGIC

PHASE NUMBER	PHASE LOCKING	DUAL ENTRY Y / Ø	PHASE RECALL	PHASE ACTIVE
1		6		X
2	X	6		X
3		8		X
4	X	8	MIN.	X
5		2		X
6	X	2		X
7		4		X
8	X	4	MIN.	X

OVERLAPS

O.L. "A" =
O.L. "B" =
O.L. "C" =
O.L. "D" =

TYPE OF INTERCONNECT	
NONE	X
TBC	
CLOSED LOOP	
HARDWIRE	
TONE (FREQ)	
FIBER OPTIC	

TYPE OF PRE-EMPT	
NONE	X
RAILROAD	
EMERGENCY VEHICLE	

TYPE OF LIGHTING	
NONE	
IN TRAFFIC CONTROL CABINET	X
IN SEPARATE CONTROL CABINET	

GENERAL NOTES:

1. ANY ACTUATED PHASE FOR WHICH THERE IS NO CALL SHALL BE SKIPPED.
2. WHEN ONE PHASE IS ON ALONE, ANY NONCONFLICTING PHASE MAY START TIMING CONCURRENTLY WITHOUT A CLEARANCE INTERVAL. (SEE CHART 1 AT LEFT.)
3. IF PHASES 2 & 6 ARE TIMING CONCURRENTLY, THEY SHALL TERMINATE TOGETHER DUE TO PERMISSIVE LEFT TURN CONFLICT.

STH 167 & STH 181
OZAUKEE COUNTY

SIGNAL NO. 193
CONTOLLER TYPE: LC8000
DATE 1/06 PAGE NO. 3 OF 3

1-24-06

Timing Cover Sheet for Signal: S0193 HWY: 167 and STH 181 (Wauwatosa Rd)

Date: 5/6/2005
Signal No S0193 S193
County: OZA
Controller: TCT LC8000
School:

Changes Made By: J. Haug
Highway: 167
Local Hwy: Mequon Rd
Location: STH 181 (Wauwatosa Rd)
Audible Ped: No

Pre-emption

Emergency: No Type: Phases:
Railroad: No Type: Phases:

EVP Maintenance Id:
EVP Contact:
Contact Phone:
Community:

Coordination

System No:
TBC: No
Tone: No
Closed Loop: No
Hardwire: No

CoordType:
Dip Switch Setting:
DST ☐

Controller IP Address:
Comments:

	Length	Split 1	Split 2	Split 3	Split 4
Cycle 1=					
Cycle 2=					
Cycle 3=					
Cycle 4=					

Prom Replacement

Signal Plan No
Pre-empt: No

Part of a Local System: No

Local Contact:
Phone Number:

Overlaps

Overlap A= Phases:
Overlap B= Phases:
Overlap C= Phases:
Overlap D= Phases:

Flash

Emergency: R-R
Off Peak: No

Off Peak Times

Detector Timing

Dilemna Zone No

Video Detection:

Detector Number														
Stretch														
Right Turn Delay														
Left Turn Delay														

Unique Features

Timing Changes Log for Signal S0193 on Hwy 167 in OZAUKEE County

STH 181 (Wauwatosa Rd)

Date Computer Changed	Date Change Made in Field	Timing Change	Reason for Change	Change By	Temp Timing
01/18/06	1/18/2006	Paired the transverse stopline loop to the same amp ch as the adv loop on all approaches.	Stopline queues put in a call effectively blocking the adv loop from increasing the MVI.	J. Haug	No
05/06/05	5/6/2005	Took phases 3,7 off locking. Put phases 4,8 on min recall.	New loops added to EB/WB left turn bays. Wanted signal to rest on STH 167.	J. Haug	No
10/01/02		increased max green from 15 sec to 25 sec for phase 3; increased max green from 15 sec to 20 sec for phases 1, 5, & 7; increased min green from 5 sec to 8 sec for phases 1 & 5	increased congestion at intersection due to detour route, particularly increased WB left turns	M. Milam	No
04/30/01	4/30/2001	Changed Ph. 3 & 7 min. green to 8 sec. and put on locking.	Changed EB/WB Prot. Perm. To Exclusive.	J. Haug	No
06/02/99		add nb/sb lt arrows	operational improvement	S. Langdon	No

SYSTEM: FDL,WASH.,OZ. INTERSECTION: 167-181 S193

INTERVAL TIMES:
SECURITY CODE: 1234

INTERVAL	PHASE 1	2	3	4	5	6	7	8
MINIMUM GREEN	8	12	8	12	8	12	8	12
PASSAGE	2.0	4.0	2.0	3.8	2.0	3.8	2.0	3.4
YELLOW CHANGE	3.5	5	3.5	5	3.5	5	3.5	5
RED CLEARANCE	0	1	0	.9	0	1	0	.9
MAX I	20	40	25	40	20	40	20	40
MAX II	20	40	25	40	20	40	20	40
WALK	0	0	0	0	0	7	0	7
PEDESTRIAN CLEARANCE	0	0	0	0	0	16	0	16
SECONDS PER ACTUATION	0	2.5	0	2.4	0	2.4	0	2.6
TIME BEFORE REDUCTION	15	22	15	24	15	24	15	18
TIME TO REDUCE	0	18	0	16	0	16	0	22
MINIMUM GAP	1.7	2	1.7	2	1.7	2	1.7	2
MAXIMUM INITIAL	5	22	5	24	5	24	5	18

All Entries Are [0 - 12.7 or 0 - 127] seconds
Except YELLOW Which Is [3 - 12.7 or 3 - 127] seconds

PHASE SERVICE MODE:

FUNCTION	PHASE 1	2	3	4	5	6	7	8	
MEMORY	OFF	ON	OFF	ON	OFF	ON	OFF	ON	[ON/OFF]
EXTENDIBLE RECALL	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON	[ON/OFF]
MAXIMUM RECALL	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	[ON/OFF]
PEDESTRIAN RECALL	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	[ON/OFF]
FLASHING WALK	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	[ON/OFF]
PHASE USED	YES	YES	YES	YES	YES	YES	YES	YES	[YES/NO]
DUAL ENTRY PHASE ASSOCIATION	6	6	8	8	2	2	4	4	[0 - 8]

CONTROLLER SEQUENCE:

SEQUENCE 1

0 = SEQUENTIAL
1 = DUAL RING
2 = SPECIAL #1
3 = SPECIAL #2
4 = SPECIAL #3
5 = SPECIAL #4
6 = SPECIAL #5
7 = LEAD/LAG

SYSTEM: FDL,WASH.,OZ. INTERSECTION: 167-181 S193

CONTROLLER SEQUENCE (LEAD/LAG MODE):

φ PAIR	CODE
1 & 2	
3 & 4	
5 & 6	
7 & 8	1

1 = ODD φ LEADS
2 = EVEN φ LEADS
3 = AUTO

SYSTEM LEAD/LAG MODE (AUTO):

PATTERN	CYC	SPL	OFF	φ PAIR 1&2	3&4	5&6	7&8
1							
2							
3							
4							
5							

CYC = 1-4
SPL = 1-4
OFF = 1-3

1 = ODD φ LEADS
2 = EVEN φ LEADS

PER UNIT ENTRIES:

REMOTE FLASH EXIT PHASES	RING 1 =	2	[0 - 8]
	RING 2 =	6	[0 - 8]
DUAL ENTRY MODE		1	0 = OFF 1 = ON 2 = CALLED BY INPUT 3 = CALLED BY CNA
INITIALIZATION PHASE(S)		2+6	[1 - 8, 1+5, 2+6, 3+7, or 4+8]
INITIALIZATION INTERVAL		G	[Green, Yellow, RED]
CALL TO NON-ACT I PHASES CALL TO NON-ACT II PHASES			1 - 8, 1+5, 2+6, 3+7, 4+8, 1+6, 2+5, 3+8, 4+7, 0 for not used
RED REVERT TIME		2	[0 - 12.7] (+ 2 seconds)
LAST CAR PASSAGE		OFF	[ON / OFF]
SPECIAL OVERLAPS		0	0 = NORMAL OVERLAPS 1 = A,B,C,D SPECIAL 2 = A,B SPECIAL

SYSTEM: FDL,WASH.,OZ. INTERSECTION: 167-181 S193

SPECIAL PER UNIT ENTRIES:

CONDITIONAL SERVICE MODE	0	[0=DISABLED, 1=ENABLED, 2=ENABLED BY INPUT]
CNA/MAX2 TIED TO SYS OUTPUT	2	[0=NIETHER, 1=CNA, 2=MAX2, 3=BOTH]
CONDITIONAL SERVICE MAX	0	[0 - 12.7 or 0 - 127]
LOSS OF SYNC TO FREE OP	0	[0=DISABLED, 1=ENABLED]
SYNC REFERENCE	1	[0=STANDARD, 1=SPECIAL #1]
SIMULATANEOUS GAP OUT MODE	1	[0=DISABLED, 1=ENABLED, 2=DISABLED BY INPUT]
PED ENHANCEMENT		[0=NO PED ENHANCEMENT, 1=PED ENHANCEMENT]
COMM/INTERCONNECT		[0=COMM, 1=INTERCONNECT]

	PHASE								
	1	2	3	4	5	6	7	8	
SIMULTANEOUS GAP OUT PHASES DISABLED	NO	NO	NO	NO	NO	NO	NO	NO	[YES/NO]

SYSTEM: FDL,WASH.,OZ. INTERSECTION: 167-181 S193

TIME CLOCK OUTPUT CIRCUITS:

CKT #	FUNCTION	MANUAL/AUTO MODE	INTERCONNECT INHIBIT MODE
1	CYCLE 2	AUTO	ON
2	CYCLE 3	AUTO	ON
3	OFFSET 1	AUTO	ON
4	OFFSET 2	AUTO	ON
5	OFFSET 3	AUTO	ON
6	SPLIT 2	AUTO	ON
7	SPLIT 3	AUTO	ON
8	FLASH	AUTO	ON
9	AUX 1		------
10	AUX 2		------
11	AUX 3		------
12	AUX 4		------
13	SYSTEM	AUTO	ON
enter	[YOUR DESCRIPTION]	[ON/OFF/AUTO]	[ON/OFF/AUTO]

TIME CLOCK DAYLIGHT SAVINGS TIME:

FUNCTION	WEEK	DAY
SPRING AHEAD	0	0
FALL BACK	0	0
	[1-52]	[1-7]

TIME CLOCK WEEK PROGRAMS:

WEEK PROGRAM	DAY OF WEEK 1	2	3	4	5	6	7
1	1	1	1	1	1	2	2
2							
3							
4							
5							
6							
7							
8							

enter DAY PROGRAM number [1-15]

SYSTEM: FDL,WASH.,OZ. INTERSECTION: 167-181 S193

TIME CLOCK YEAR PROGRAM:

TC WEEK	WEEK PROGRAM	TC WEEK	WEEK PROGRAM	TC WEEK	WEEK PROGRAM	TC WEEK	WEEK PROGRAM
1	1	14	1	27	1	40	1
2	1	15	1	28	1	41	1
3	1	16	1	29	1	42	1
4	1	17	1	30	1	43	1
5	1	18	1	31	1	44	1
6	1	19	1	32	1	45	1
7	1	20	1	33	1	46	1
8	1	21	1	34	1	47	1
9	1	22	1	35	1	48	1
10	1	23	1	36	1	49	1
11	1	24	1	37	1	50	1
12	1	25	1	38	1	51	1
13	1	26	1	39	1	52	1

enter WEEK PROGRAM number [1-8]

TIME CLOCK EXCEPTION DAYS:

SPECIAL EVENT	TC WEEK	TC DAY	DAY PROGRAM
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			

SPECIAL EVENT	TC WEEK	TC DAY	DAY PROGRAM
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			
33			
34			
35			
enter	[1-52]	[1-7]	[1-15]

SYSTEM: FDL,WASH.,OZ. INTERSECTION: 167-181 S193

COORDINATION MANUAL DATA:

CYCLE:	0	0 = REMOTE
SPLIT:	0	1 = CYCLE, SPLIT, or OFFSET 1 in effect
OFFSET (MASTER ONLY):	0	2 = CYCLE, SPLIT, or OFFSET 2 in effect
		3 = CYCLE, SPLIT, or OFFSET 3 in effect
		4 = CYCLE, or SPLIT 4 in effect

COORDINATION MODES:

OFFSET SEEKING:	2	[0=SYNC, 1=DWELL, 2=SHORTWAY, 3=INTERRUPTER]
SYSTEM/FREE:	0	[0=FREE, 1=REMOTE(SYSTEM)]

PARAMETERS TO FREE	CYCLE:	0	[0-5]
	SPLIT:	0	[0-5]
	OFFSET:	0	[0-4]
COMBINATION TO CALL ALTERNATE COORD. PHASES	CYCLE:	0	[0-5]
	SPLIT:	0	[0-5]
	OFFSET:	0	[0-4]

where:
0 in CYCLE, SPLIT, OFFSET = NO TRANSFER
1 = CYCLE, SPLIT, or OFFSET 1
2 = CYCLE, SPLIT, or OFFSET 2
3 = CYCLE, SPLIT, or OFFSET 3
4 = CYCLE, SPLIT 4, or OFFSET DON'T CARE
5 = CYCLE, or SPLIT DON'T CARE

COORDINATION PHASES:

	RING 1	RING 2	
PRIMARY	4	8	[PHASES 1 - 8 or 0 for none]
ALTERNATE	2	6	[PHASES 1 - 8 or 0 for none]

COORDINATION CYCLE, OFFSET, AND MAX DWELL TIMES:

	CYCLE 1	CYCLE 2	CYCLE 3	CYCLE 4	
CYCLE LENGTH	0	0	0	0	[0 - 255] seconds
OFFSET 1	0	0	0	0	[0 - 255] seconds
OFFSET 2	0	0	0	0	[0 - 255] seconds
OFFSET 3	0	0	0	0	[0 - 255] seconds
MAX DWELL	15	15	15	15	[0 - 255] seconds

COORDINATION PED PERMISSIVE:	0	[0 - 255] seconds
CALL TO NON-ACT I MODE:		[0 = WILL NOT USE CNA, 1 = WILL USE CNA]
COORDINATED φ GREEN MODE:		[0XY = BEGIN AT XY, 1XY = END AT XY]
		[XY = SECONDS INTO CYCLE]
TYPE OF PERMISSIVE SERVICE:		[0XY = YIELD, 1XY = SINGLE, 2XY = MULTIPLE]
		[XY = % PERM(S) START BEFORE COORD. F.O.]

SYSTEM: FDL,WASH.,OZ. INTERSECTION: 167-181 S193

SPLIT PERCENTAGES:

		PHASE							
		1	2	3	4	5	6	7	8
CYCLE 1	SPLIT 1								
	SPLIT 2								
	SPLIT 3								
	SPLIT 4								
CYCLE 2	SPLIT 1								
	SPLIT 2								
	SPLIT 3								
	SPLIT 4								
CYCLE 3	SPLIT 1								
	SPLIT 2								
	SPLIT 3								
	SPLIT 4								
CYCLE 4	SPLIT 1								
	SPLIT 2								
	SPLIT 3								
	SPLIT 4								

ALL ENTRIES ARE 0 - 100%

COORDINATION FORCE OFF PHASE RELATIONS:

	PHASE							
FORCE OFFS	1	2	3	4	5	6	7	8
1	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
3	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
4	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
5	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
6	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
7	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
8	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON

enter [ON = PHASE ALLOWED
OFF = PHASE OMITTED]

SYSTEM: FDL,WASH.,OZ. INTERSECTION: 167-181 S193

COORDINATION PERMISSIVE PHASE RELATIONS:

PERMISSIVE	PHASE 1	2	3	4	5	6	7	8
1	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
3	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
4	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
5	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
6	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
7	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF
8	ON	OFF	OFF	OFF	OFF	OFF	OFF	ON

enter [ON = PHASE ALLOWED
OFF = PHASE OMITTED]

COORDINATION FORCE OFFS:

FORCE OFFS	CYCLE 1 SPLIT 1	2	3	4	CYCLE 2 SPLIT 1	2	3	4
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0

ALL entries are [0 - 255] seconds

SYSTEM: FDL,WASH.,OZ. INTERSECTION: 167-181 S193

COORDINATION FORCE OFFS:

FORCE OFFS	CYCLE 3 SPLIT 1	2	3	4	CYCLE 4 SPLIT 1	2	3	4
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0

ALL entries are [0 - 255] seconds

COORDINATION PERMISSIVES:

PERMISSIVE PERIOD	CYCLE 1 SPLIT 1 START	SPLIT 1 END	SPLIT 2 START	SPLIT 2 END	SPLIT 3 START	SPLIT 3 END	SPLIT 4 START	SPLIT 4 END
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0

All entries are [0 - 255] seconds

SYSTEM: FDL,WASH.,OZ. INTERSECTION: 167-181 S193

COORDINATION PERMISSIVES:

PERMISSIVE PERIOD	CYCLE 2 SPLIT 1 START	SPLIT 1 END	SPLIT 2 START	SPLIT 2 END	SPLIT 3 START	SPLIT 3 END	SPLIT 4 START	SPLIT 4 END
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0

All entries are [0 - 255] seconds

COORDINATION PERMISSIVES:

PERMISSIVE PERIOD	CYCLE 3 SPLIT 1 START	SPLIT 1 END	SPLIT 2 START	SPLIT 2 END	SPLIT 3 START	SPLIT 3 END	SPLIT 4 START	SPLIT 4 END
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0

All entries are [0 - 255] seconds

SYSTEM: FDL,WASH.,OZ. INTERSECTION: 167-181 S193

COORDINATION PERMISSIVES:

PERMISSIVE PERIOD	CYCLE 4 SPLIT 1 START	SPLIT 1 END	SPLIT 2 START	SPLIT 2 END	SPLIT 3 START	SPLIT 3 END	SPLIT 4 START	SPLIT 4 END
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0

All entries are [0 - 255] seconds

SYSTEM: FDL,WASH.,OZ. INTERSECTION: 167-181 S193

PRE-EMPTION REFERENCE TABLE (for reference only):

INPUT NO.	ENTRY φ(s)	SEQUENCE DESCRIPTION
1		
2		
3		
4		

[YOUR DESCRIPTION]

PRE-EMPTION RAM INTERVALS:

RAM INT. NO.	VALUE	FUNCTION	
1	12.7	DELAY BEFORE PRE-EMPTION NO. 1	[0-12.7 or 0-127]
2	12.7	DELAY BEFORE PRE-EMPTION NO. 2	
3	12.7	DELAY BEFORE PRE-EMPTION NO. 3	
4	12.7	DELAY BEFORE PRE-EMPTION NO. 4	
5		INPUT NO. 1 MODE	[1=NON LOCK 2=LOCK]
6		INPUT NO. 2 MODE	
7		INPUT NO. 3 MODE	
8		INPUT NO. 4 MODE	

PRE-EMPTION RAM INTERVALS continued:

RAM INT. NO.	VALUE	FUNCTION
9	12.7	
10	12.7	
11	12.7	
12	12.7	
13	12.7	
14	12.7	
15	12.7	
16	12.7	
17	12.7	
18	12.7	
19	12.7	
20	12.7	
21	12.7	
22	12.7	
23	12.7	
24	12.7	

[0-12.7] or [0-127] [YOUR DESCRIPTION]

SYSTEM: FDL,WASH.,OZ. INTERSECTION: 167-181 S193

PRE-EMPTION RAM INTERVALS continued:

RAM INT. NO.	VALUE	FUNCTION
25	12.7	
26	12.7	
27	12.7	
28	12.7	
29	12.7	
30	12.7	
31	12.7	
32	12.7	
33	12.7	
34	12.7	
35	12.7	
36	12.7	
37	12.7	
38	12.7	
39	12.7	
40	12.7	

[0-12.7] or [0-127] [YOUR DESCRIPTION]

PRE-EMPTION RAM INTERVALS continued:

RAM INT. NO.	VALUE	FUNCTION
41	12.7	
42	12.7	
43	12.7	
44	12.7	
45	12.7	
46	12.7	
47	12.7	
48	12.7	
49	12.7	
50	12.7	
51	12.7	
52	12.7	
53	12.7	
54	12.7	
55	12.7	

[0-12.7] or [0-127] [YOUR DESCRIPTION]

SYSTEM: FDL,WASH.,OZ. INTERSECTION: 167-181 S193

PRE-EMPTION RAM INTERVALS continued:

RAM INT. NO.	VALUE	FUNCTION
56	12.7	
57	12.7	
58	12.7	
59	12.7	
60	12.7	
61	12.7	
62	12.7	
63	12.7	
64	12.7	
65	12.7	
66	12.7	
67	12.7	
68	12.7	
69	12.7	
70	12.7	

[0-12.7] [YOUR DESCRIPTION]
or
[0-127]

PRE-EMPTION RAM INTERVALS continued:

RAM INT. NO.	VALUE	FUNCTION
71	12.7	
72	12.7	
73	12.7	
74	12.7	
75	12.7	
76	12.7	
77	12.7	
78	12.7	
79	12.7	
80	12.7	
81	12.7	
82	12.7	
83	12.7	
84	12.7	
85	12.7	

[0-12.7] [YOUR DESCRIPTION]
or
[0-127]

SYSTEM: FDL,WASH.,OZ. INTERSECTION: 167-181 S193

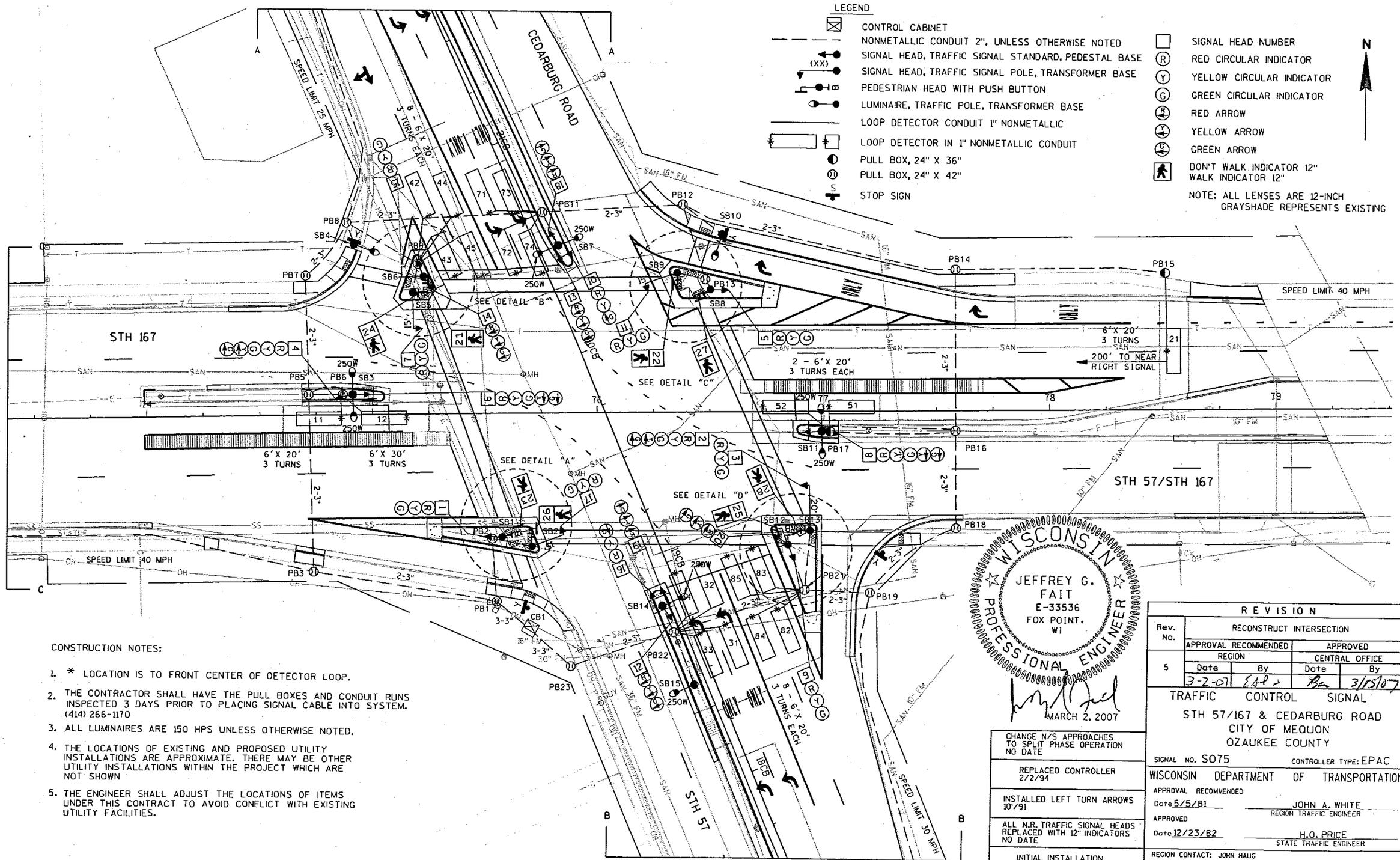
PRE-EMPTION RAM INTERVALS continued:

RAM INT. NO.		VALUE	FUNCTION	
86		12.7	[0-12.7 or 0-127]	
87		12.7		
88		12.7		
89		12.7		
90		12.7		
91		12.7		
92		12.7		
93		12.7		
94		.7	OVERLAP INHIBIT	[0 - 15]
95	*	12.7	OVERLAP YELLOW	[.1-12.7]
96	*	12.7	OVERLAP RED	[.1-12.7]
97		12.7	PRE-EMPTION MINIMUM GREEN	[0-12.7 or 0-127]
98		12.7	PRE-EMPTION WALK	
99		12.7	PRE-EMPTION PEDESTRIAN CLEARANCE [YOUR DESCRIPTION]	

* Entry requires decimal point value

DELAY DETECTOR INPUTS:

FUNCTION	INPUT 1	INPUT 2	INPUT 3	INPUT 4	
DELAY TIME (seconds)	12.7	12.7	12.7	12.7	[0 - 12.7 or 0 - 30]
PHASE	5	5	5	5	[0 - 8]



CONSTRUCTION NOTES:

1. * LOCATION IS TO FRONT CENTER OF DETECTOR LOOP.
2. THE CONTRACTOR SHALL HAVE THE PULL BOXES AND CONDUIT RUNS INSPECTED 3 DAYS PRIOR TO PLACING SIGNAL CABLE INTO SYSTEM. (414) 266-1170
3. ALL LUMINAIRES ARE 150 HPS UNLESS OTHERWISE NOTED.
4. THE LOCATIONS OF EXISTING AND PROPOSED UTILITY INSTALLATIONS ARE APPROXIMATE. THERE MAY BE OTHER UTILITY INSTALLATIONS WITHIN THE PROJECT WHICH ARE NOT SHOWN
5. THE ENGINEER SHALL ADJUST THE LOCATIONS OF ITEMS UNDER THIS CONTRACT TO AVOID CONFLICT WITH EXISTING UTILITY FACILITIES.

WISCONSIN
JEFFREY G. FAIT
E-33536
FOX POINT, WI
PROFESSIONAL ENGINEER

MARCH 2, 2007

REVISION				
Rev. No.	RECONSTRUCT INTERSECTION			
	APPROVAL RECOMMENDED		APPROVED	
	REGION		CENTRAL OFFICE	
5	Date	By	Date	By
	3-2-07			3/15/07

CHANGE N/S APPROACHES TO SPLIT PHASE OPERATION NO DATE
REPLACED CONTROLLER 2/2/94
INSTALLED LEFT TURN ARROWS 10/91
ALL N.R. TRAFFIC SIGNAL HEADS REPLACED WITH 12" INDICATORS NO DATE
INITIAL INSTALLATION 5/24/60

TRAFFIC CONTROL SIGNAL
STH 57/167 & CEDARBURG ROAD
CITY OF MEQUON
OZAUKEE COUNTY

SIGNAL NO. S075 CONTROLLER TYPE: EPAC

WISCONSIN DEPARTMENT OF TRANSPORTATION

APPROVAL RECOMMENDED
Date 5/5/81 JOHN A. WHITE, REGION TRAFFIC ENGINEER

APPROVED
Date 12/23/82 H.O. PRICE, STATE TRAFFIC ENGINEER

REGION CONTACT: JOHN HAUG
DESIGNED BY: TAD, INC.
REVISED BY:

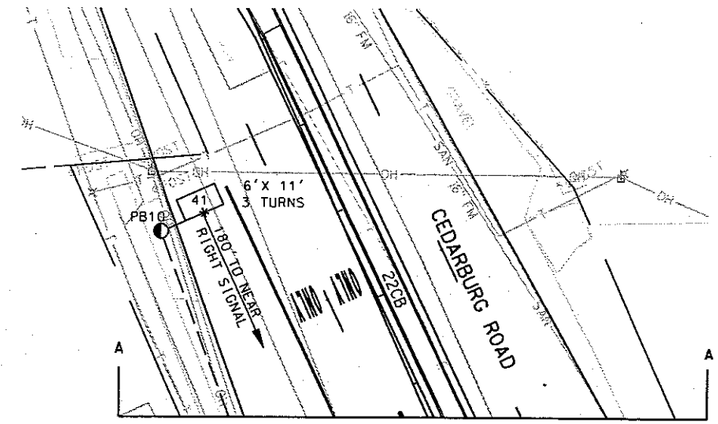
PAGE 1 OF 4

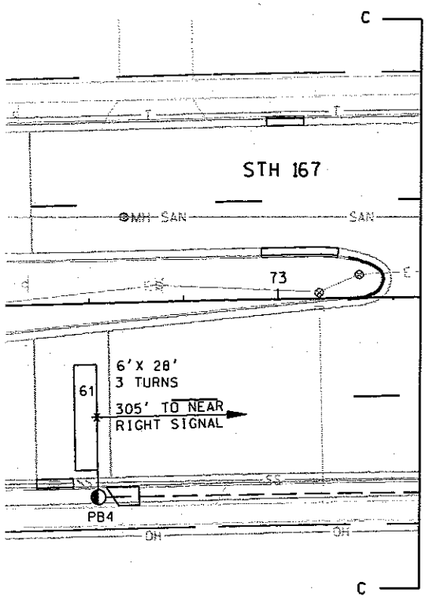
PROJECT NO: 1381-02-70	HWY: STH 57/167	COUNTY: OZAUKEE	TRAFFIC SIGNAL PLAN	SHEET	E

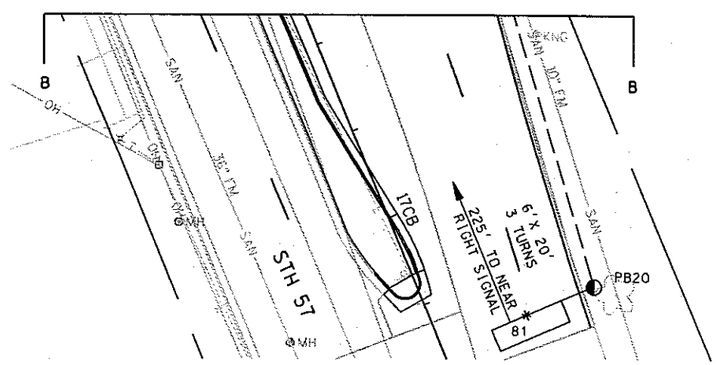
FILE NAME : cedarburg.dgn PLOT DATE : 3/1/2007 PLOT BY : JFAIT-TADI PLOT NAME : PLOT SCALE : 40.0000 ' / IN.

WISDOT/CADDS SHEET 42

10-7-5 3-7-07







N

TRAFFIC CONTROL SIGNAL
STH 57/167 & CEDARBURG ROAD
CITY OF MEQUON
OZAUKEE COUNTY

SIGNAL NO. S075

REGION CONTACT: JOHN HAUG
DESIGNED BY: TAD, INC.
REVISED BY:

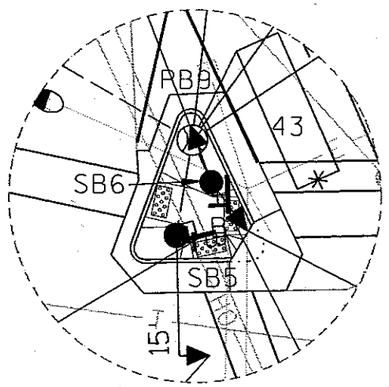
PAGE 2 OF 4

PROJECT NO:1381-02-70	HWY: STH 57/167	COUNTY: OZAUKEE	TRAFFIC SIGNAL PLAN	SHEET	E

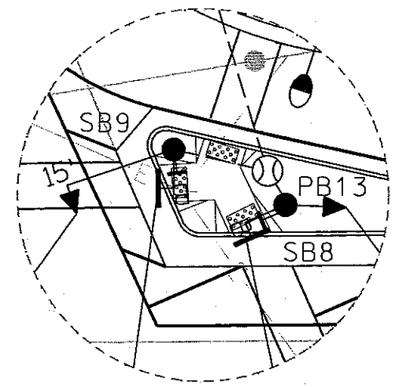
2

2

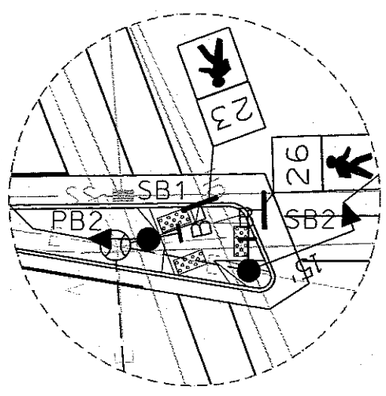
N



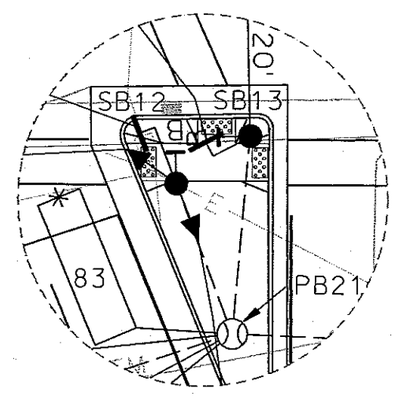
DETAIL "B"
SCALE 1" = 20'



DETAIL "C"
SCALE 1" = 20'



DETAIL "A"
SCALE 1" = 20'



DETAIL "D"
SCALE 1" = 20'

TRAFFIC CONTROL SIGNAL
STH 57/167 & CEDARBURG ROAD
CITY OF MEQUON
OZAUKEE COUNTY

SIGNAL NO. S075

REGION CONTACT: JOHN HAUG
DESIGNED BY: TAD, INC.
REVISED BY:

PAGE 3 OF 4

PROJECT NO: 1381-02-70	HWY: STH 57/167	COUNTY: OZAUKEE	TRAFFIC SIGNAL PLAN	SHEET	E

FILE NAME : cedarburg.dgn PLOT DATE : 3/1/2007 PLOT BY : JFAIT-TADI PLOT NAME : PLOT SCALE : 40.0000 ' / IN.

WISDOT/CADOS SHEET 42

SEQUENCE OF OPERATION

RING 1

	HEAD NUMBERS	01 R/W	01 CLEAR TO **			02 R/W	02 CLEAR TO **			03 R/W	03 CLEAR TO **			04 R/W	04 CLEAR TO **			FLASH
01	2,4	G	Y	-		-	-	-		-	-	-		-	-	-		-
02	5,6,7,8	R	R	R		G	Y	R		R	R	R		R	R	R		R
03	12,13,14	R	R	R		R	R	R		G	Y	R		R	R	R		R
04	15,16,17	R	R	R		R	R	R		R	R	R		G,G	Y	R		R
05	6,8	-	-	-		-	-	-		-	-	-		-	-	-		-
06	1,2,3,4	R	R	R		R	R	R		R	R	R		R	R	R		R
07	18,19,20	R	R	R		R	R	R		R	R	R		R	R	R		R
08	9,10,11	R	R	R		R	R	R		R	R	R		R	R	R		R
02P	21,22	D	D	D		*	D	D		D	D	D		D	D	D		
04P	23,24	D	D	D		D	D	D		D	D	D		*	D	D		
06P	25,26	D	D	D		D	D	D		D	D	D		D	D	D		
08P	27,28	D	D	D		D	D	D		D	D	D		D	D	D		

RING 2

	HEAD NUMBERS	05 R/W	05 CLEAR TO **			06 R/W	06 CLEAR TO **			07 R/W	07 CLEAR TO **			08 R/W	08 CLEAR TO **		
01	2,4	-	-	-		-	-	-		-	-	-		-	-	-	
02	5,6,7,8	R	R	R		R	R	R		R	R	R		R	R	R	
03	12,13,14	R	R	R		R	R	R		R	R	R		R	R	R	
04	15,16,17	R	R	R		R	R	R		R	R	R		R	R	R	
05	6,8	G	Y	-		-	-	-		-	-	-		-	-	-	
06	1,2,3,4	R	R	R		G	Y	R		R	R	R		R	R	R	
07	18,19,20	R	R	R		R	R	R		G	Y	R		R	R	R	
08	9,10,11	R	R	R		R	R	R		R	R	R		G,G	Y	R	
02P	21,22	D	D	D		D	D	D		D	D	D		D	D	D	
04P	23,24	D	D	D		D	D	D		D	D	D		D	D	D	
06P	25,26	D	D	D		*	D	D		D	D	D		D	D	D	
08P	27,28	D	D	D		D	D	D		D	D	D		*	D	D	

N

BARRIER

** CLEARANCE TO A PHASE IN CONFLICT WITH THIS PHASE ON (SEE CHART 1)

* WHEN CALLED, TIMED STEADY WALK, THEN FLASHING DON'T WALK, THEN GOES TO STEADY DON'T WALK

CHART 1

PHASE ON	NONCONFLICTING PHASE ALLOWED TO TIME CONCURRENTLY	PHASES IN CONFLICT WITH PHASE ON
1	5 OR 6	2,3,4,7,8
2	5 OR 6	1,3,4,7,8
3	7 OR 8	1,2,4,5,6
4	7 OR 8	1,2,3,5,6
5	1 OR 2	3,4,6,7,8
6	1 OR 2	3,4,5,7,8
7	3 OR 4	1,2,5,6,8
8	3 OR 4	1,2,5,6,7

DETECTOR LOGIC

DETECTOR NUMBER	AMPLIFIER CHANNEL NUMBER	DETECTOR OPERATION: CALLS AND EXTENDS	CALLS ONLY	EXTENDS ONLY	PHASE CALLED	PHASE EXTENDED	DETECTOR DISCONNECT PHASE	CALLING DELAY	EXTENSION STRETCH	SIZE	NUMBER OF TURNS
11	1	X			1	1				6X20	3
12	1	X			1	1				6X20	3
21	2	X			2	2				6X20	3
31	3	X			3	3				6X20	3
32	3	X			3	3				6X20	3
33	4	X			3	3				6X20	3
34	4	X			3	3				6X20	3
41	5			X		4			X	6X11	3
42	6	X			4	4				6X20	3
43	6	X			4	4				6X20	3
44	7	X			4	4				6X20	3
45	7	X			4	4				6X20	3
51	8	X			5	5				6X20	3
52	8	X			5	5				6X20	3
61	9	X			6	6				6X28	3
71	10	X			7	7				6X20	3
72	10	X			7	7				6X20	3
73	11	X			7	7				6X20	3
74	11	X			7	7				6X20	3
81	12			X		8			X	6X20	3
82	13	X			8	8				6X20	3
83	13	X			8	8				6X20	3
84	14	X			8	8				6X20	3
85	14	X			8	8				6X20	3

CONTROLLER LOGIC

PHASE NUMBER	PHASE LOCKING	DUAL ENTRY W / Ø	PHASE RECALL	PHASE ACTIVE
1		6		X
2	X	6	MIN.	X
3		8		X
4		8		X
5		2		X
6	X	2	MIN.	X
7		4		X
8		4		X

OVERLAPS

O.L. "A" =
O.L. "B" =
O.L. "C" =
O.L. "D" =

TYPE OF INTERCONNECT COMMUNICATION	
NONE	
CLOSED LOOP TWISTED PAIR*	
CLOSED LOOP FIBER OPTIC*	
RADIO	
*LOCATION OF MASTER CONTROLLER NO: S-	
SIGNAL SYSTEM #: SS- -	
TBC	X

TYPE OF PRE-EMPT	
NONE	X
RAILROAD	
EMERGENCY VEHICLE	
3M	
TOMAR	
HARDWIRE	
OTHER	
LIFT BRIDGE	
QUEUE DETECTOR	

TYPE OF LIGHTING	
BY OTHER AGENCY	
IN TRAFFIC SIGNAL CABINET	X
IN SEPARATE DOT LIGHTING CABINET	

GENERAL NOTES:

1. ANY ACTUATED PHASE FOR WHICH THERE IS NO CALL SHALL BE SKIPPED.
2. WHEN ONE PHASE IS ON ALONE, ANY NONCONFLICTING PHASE MAY START TIMING CONCURRENTLY WITHOUT A CLEARANCE INTERVAL. (SEE CHART 1 AT LEFT.)
3. IF PHASES 2 AND 6 ARE TIMING CONCURRENTLY, THEY SHALL TERMINATE TOGETHER DUE TO PERMISSIVE LEFT TURN CONFLICT.

STH 57/167 & CEDARBURG ROAD
CITY OF MEQUON
OZAUKEE COUNTY

SIGNAL NO. S075
CONTROLLER TYPE: EPAC
DATE 03/07 PAGE NO. 4 OF 4

Tick 3-2-07

PROJECT NO: 1381-02-72	HWY: STH 57/167	COUNTY: OZAUKEE	SEQUENCE OF OPERATIONS	SHEET	E

Timing Cover Sheet for Signal: S0075 HWY: 57 and STH 167 (Mequon Rd)

Date:	11/19/2009	Changes Made By:	L. Schneider
Signal No	S0075 S075	Highway:	57
County:	OZA	Local Hwy:	Cedarburg Rd
Controller:	EPAC	Location:	STH 167 (Mequon Rd)
School:	High	Audible Ped:	No

Pre-emption

Emergency:	No	Type:	Phases:	EVP Maintenance Id:	
Railroad:	No	Type:	Phases:	EVP Contact:	
				Contact Phone:	
				Community:	

Coordination

System No: SS0031

Controller IP Address:

TBC: Yes

CoordType: TBC

Tone: No

Comments:

Closed Loop: No

Dip Switch Setting:

Hardwire: No

DST ☑

	Length	Split 1	Split 2	Split 3	Split 4
Cycle 1=	110	7:45 AM to 9:00 AM M-F			
Cycle 2=					
Cycle 3=	120	3:15 PM to 6:30 PM M-F			
Cycle 4=					

Prom Replacement

Signal Plan No

Pre-empt: No

Part of a Local System: Yes

Local Contact: Jon Garms (City of Mequon)

Phone Number: 414-242-3100

Overlaps

Overlap A= Phases:

Overlap B= Phases:

Overlap C= Phases:

Overlap D= Phases:

Flash

Emergency: R-R

Off Peak: No

Off Peak Times

Detector Timing

Dilemna Zone No

Video Detection: No

Detector Number	41	81												
Stretch	3.0	4.0												
Right Turn Delay														
Left Turn Delay														

Unique Features

Timing Changes Log for Signal S0075 on Hwy 57 in OZAUKEE County

STH 167 (Mequon Rd)

Date Computer Changed	Date Change Made In Field	Timing Change	Reason for Change	Change By	Temp Timing
11/19/09	11/20/2009	Change Coord. and Phase time back to normal	End of construction on North leg	E. Schneider	No
09/25/09	9/28/2009	Add time to phase 3	NB left increased volume (detour) due to construction on N leg	E. Schneider	Yes
09/03/09	9/4/2009	Changed coord and phase data back to normal.	STH 181 reconstruction completed.	D. Murphy	No
06/03/09	6/4/2009	Increased ph 1 max time during free operation and ph 1 splits during PM peak.	Closure of STH 181 causing long backups during PM peak.	D. Murphy	Yes
01/26/09		Changed ph. 6 passage, 3&7 max greens, 4&8 stretch & yellow, 4 ped clear, LT all red, coord data, removed exception days, D2/S1, CBR	Complaints about long waits for ph. 3&7, north approach speed limit 30mph, update to current standard.	D. Murphy	No
10/20/08		Changed system time	complaint	S. Pierce	No
03/03/08		Take out of system mid-day and weekends	complaints	S. Pierce	No
02/07/08	2/7/2008	Put Ph. 3 & 7 on locking	Complaints - will investigate more when better weather	S. Pierce	Yes
11/15/07	11/15/2007	Ph. 4 put on min. recall temporarily	Construction	S. Pierce	Yes
11/12/07		Permanent Signal Timing - but Ph. 1,3,5, 7 on max. recall temporarily	Construction Near Complete and New EPAC Controller	S. Pierce	Yes

Timing Changes Log for Signal S0075 on Hwy 57 in OZAUKEE County

STH 167 (Mequon Rd)

Date Computer Changed	Date Change Made in Field	Timing Change	Reason for Change	Change By	Temp Timing
02/13/07		DST	DST	S. Pierce	No
04/13/06	4/14/2006	Placed phases 2 & 6 on min. recall.	Improve operation.	E. Lloyd-Weis	No
04/03/06		DST	DST	D. Lucente	No
02/17/06	2/17/2006	Put signal back in system during pm peak. Changed/restored max times to more appropriate values. Adjusted EBLT/WBLT min gap and passage.	Improve operation.	J. Haug	No
01/28/05		DST and Time Clock Exception Days.	DST	D. Lucente	No
01/21/04		Updated Time Clock Daylight Savings Time and Time Clock Exception Days	DST	J. Haug	No
03/03/03		Updated exception days and time clock event/day programs	DST	M. Milam	No
11/05/02		Took signal out of system during PM peak; Changed max green times to 20 sec for phases 1, 2, 3, 4, 5, and 6 during PM peak.	Increased traffic in PM because this signal is along a detour route.	M. Milam	No
02/05/02		DST & Exception Days		D. Brantner	No
03/21/01		DST		D. Brantner	No

Timing Changes Log for Signal S0075 on Hwy 57 in OZAUKEE County

STH 167 (Mequon Rd)

Date Computer Changed	Date Change Made in Field	Timing Change	Reason for Change	Change By	Temp Timing
03/11/99		DST		S. Pierce	No
09/03/98	9/3/1998	Cycles & Splits		E. Schneider	No
08/31/98	8/31/1998	Splits, Force Offs, Offsets		E. Schneider	No
02/11/98		DST		S. Langdon	No

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

UTILITIES - ACCESS

==========

CODE .....: 9999 CODES: Four Digits (0000-9999)

1) Codes 0000 to 9998 Provide Controlled Access While Code 9999 Provides Free Access.

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

PHASE DATA - VEHICLE TIMINGS

PHASE	1	2	3	4	5	6	7	8
MIN GRN:	6	12	6	10	6	12	6	10
PASS/10:	15	34	15	15	15	52	15	15
MAX # 1:	15	40	20	40	15	40	30	40
MAX # 2:	15	40	20	40	15	40	30	40
YEL/10 :	35	39	35	39	35	39	35	39
RED/10 :	10	28	10	30	10	28	10	30
AINI/10:	0	25	0	0	0	24	0	0
MAX INI:	6	20	6	10	6	28	6	10
TIM BEF:	15	20	20	40	15	28	30	40
CAR BEF:	0	0	0	0	0	0	0	0
TIME To:	0	20	0	0	0	12	0	0
MGAP/10:	15	20	15	15	15	20	15	15

PHASE DATA - PEDESTRIAN & VEHICLE CONTROL DATA

PHASE	1	2	3	4	5	6	7	8
WALK .:	0	5	0	5	0	5	0	5
PED CLR	0	30	0	30	0	30	0	31
PEDESTRIAN CONTROL								
FL WK :	0	0	0	0	0	0	0	0
EXT PCL:	0	2	0	2	0	2	0	2
ACT RIW:	0	0	0	0	0	0	0	0
VEHICLE CONTROL								
NL MEM :	1	0	1	1	1	0	1	1
2 ENTRY:	0	1	0	1	0	1	0	1
LC PASS:	0	0	0	0	0	0	0	0
CON SER:	0	0	0	0	0	0	0	0

Pedestrian & Vehicle Control Entry: '1' = Yes & '0' = No

PHASE DATA - GENERAL CONTROL DATA

PHASE	1	2	3	4	5	6	7	8
INITIAL:	1	4	1	1	1	4	1	1
NA RESP:	0	0	0	0	0	0	0	0
VEH REC:	0	2	0	0	0	2	0	0
PED REC:	0	0	0	0	0	0	0	0
DELAY :	0	0	0	0	0	0	0	0

Codes	0	1	2	3	4	5
INITIAL ..	NONE	INACTV	RED	YELLOW	GREEN	DARK
NA RESP ..	NONE	TO NA1	TO NA2	TO BOTH	---	---
VEH REC ..	NONE	1 CALL	MINI'M	MAXIMUM	SOFT	---
PED REC ..	NONE	1 CALL	RECALL	NON ACT	NA+	---

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

PHASE DATA - SEQUENCE CONTROL DATA

PHASE	1	2	3	4	5	6	7	8
OMIT :	0	0	0	0	0	0	0	0
-YEL :	0	0	0	0	0	0	0	0

CODES.....0.....1 TO 8 (#-PHASE).....
OMIT .....: NONE Phase Is Omitted By #-Phase On.
-YEL .....: NONE Phase Yellow Is Omitted By #-Phase Yellow.

PHASE DATA - VEH DETECTOR CONTROL DATA

DETECTOR	1	2	3	4	5	6	7	8
ASSIGN :	1	2	3	4	5	6	7	8
OP MODE:	0	0	0	0	0	0	0	0
SWITCH :	0	0	0	0	0	0	0	0
EXTD\10:	0	0	0	0	0	0	0	0
DELAY .:	0	0	0	0	0	0	0	0

PHASE DATA - PED DETECTOR CONTROL DATA

DETECTOR	1	2	3	4	5	6	7	8
ASSIGN :	1	2	3	4	5	6	7	8
OP MODE:	1	1	1	1	1	1	1	1
SWITCH :	0	0	0	0	0	0	0	0
EXTD\10:	0	0	0	0	0	0	0	0
DELAY .:	0	0	0	0	0	0	0	0

PHASE DATA - SPC DETECTOR CONTROL DATA

DETECTOR	1	2	3	4	5	6	7	8
ASSIGN :	0	0	0	0	0	0	0	0
OP MODE:	0	0	0	0	0	0	0	0
SWITCH :	0	0	0	0	0	0	0	0
EXTD\10:	0	0	0	0	0	0	0	0
DELAY .:	0	0	0	0	0	0	0	0

CODES:
ASSIGN ..: 0-None #-Detector Is Assigned To #-Phase
OP MODE .: 0-Norm Veh 1-Norm Ped 2-One Call 3-St Bar A
4-St Bar B
SWITCH ..: 0-None #-Detector Is Switched To #-Ph When The
Assigned Ph Is Yel/Red & #-Ph Is Green.

```
DATE: 05-20-10                                                    TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
    LOCAL DATABASE ... For: #17 - STH 167 & STH 57                S075

UNIT DATA - GENERAL CONTROL
==========================================================================
     STARTUP TIME ..........:   10        HDWE I/O    RING...1..2..3..4
 (1) STARTUP STATE .........:    0   (3)  INPUT RESPONSE :  1  2  0  0
     RED REV /10 ...........:   20   (3)  OUTPUT SELECT  :  1  2  0  0
 (2) AUTO PED CLEAR ........:    0   (4) 'D' CONN INPUT MODE .....:  0
 (2) STOP TIME RESET .......:    0   (4) 'D' CONN OUTPUT MODE ....:  0
   (1) = 0-Flash & 1-All Red           (3) = Hdw Rng # For I/O (0-None)
   (2) = 0-No & 1-Yes                  (4) = 0-Std & 1-Alt Function

  TEST A INPUT - REM FLASH .:    0                Codes: 0-No & 1-Yes
   S   Phase....1.2.3.4 5.6.7.8.A.B.C.D.E.F.G.H    Codes:
 L W F  FLSH .: . . . . . . . . . . . . . . . . . . . . < 0-No & 1-Yes
 O I L  YEL ..: . . . . . . . . . . . . . . . . . . . . < 0-Red & 1-Yel
 A T A  ALT ..: . . . . . . . . . . . . . . . . . . . . < 0-No & 1-Yes
 D C S Phase....1.2.3.4 5.6.7.8
   H H  ENTER.: . . . . . . . . .     < Flash Entry In Phase
        EXIT .: . 1 . . . 1 . .       < Flash Exit In Phase


UNIT DATA - OVERLAP CONTROL
==========================================================================

 PHASE ........1....2....3....4....5....6....7....8....#.
  OVLAP A :     .    .    .    .    .    .    .    .    0
  OVLAP B :     .    .    .    .    .    .    .    .    0
  OVLAP C :     .    .    .    .    .    .    .    .    0
  OVLAP D :     .    .    .    .    .    .    .    .    0
  OVLAP E :     .    .    .    .    .    .    .    .    0
  OVLAP F :     .    .    .    .    .    .    .    .    0
  OVLAP G :     .    .    .    .    .    .    .    .    0
  OVLAP H :     .    .    .    .    .    .    .    .    0
    Phase: 0-None  1-Include In Ovlp
      # .: Overlap Uses '#' Ped Outputs

 OVERLAP.......A....B....C....D....E....F....G....H.
  TRL GRN :    0    0    0    0    0    0    0    0
  YEL /10 :   40   40   40   40   40   40   40   40
  RED /10 :   20   20   20   20   20   20   20   20
 -GRN/YEL :    0    0    0    0    0    0    0    0
 +GRN ....:    0    0    0    0    0    0    0    0
    -GRN/YEL: 0-None  #-Ph G Kills Ol G & #-Ph Y Kills Ol Y
    +GRN ...: Overlap Green Starts with #-Ph Green
```

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

UNIT DATA - RING STRUCTURE

	PHASE	RING	PH NXT	CONCURRENT PHASES
Ring Structure	1	1	2	5 6 . . . .
	2	1	3	5 6 . . . .
	3	1	4	7 8 . . . .
	4	1	1	7 8 . . . .
1 To 4 Rings	5	2	6	1 2 . . . .
	6	2	7	1 2 . . . .
	7	2	8	3 4 . . . .
	8	2	5	3 4 . . . .
Excl Ped >	9	1	0	I/O ...: 0

PH NXT : Phase Next or Phase To Follow.

CONCURRENT PHASES: Phases In Other Rings Allowed To Run Concurrent.

< I/O For Excl Ped

UNIT DATA - ALTERNATE SEQUENCES

SEQUENCE	REVERSE PHASES				SEQUENCE	REVERSE PHASES			
00	.....NONE.....				08	78	00	00	00
01	12	00	00	00	09	12	78	00	00
02	34	00	00	00	10	34	78	00	00
03	12	34	00	00	11	12	34	78	00
04	56	00	00	00	12	56	78	00	00
05	12	56	00	00	13	12	56	78	00
06	34	56	00	00	14	34	56	78	00
07	12	34	56	00	15	12	34	56	78

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

COORDINATION DATA - MODE

```
==========================================================================
CONTROL DATA                          CODES.....0....1....2....3....4....5..
 OPERATION ............:      1        < ..  FRE  AUT  MAN  ---  ---  ---
 MODE (NORMAL) ........:      2        < ..  PRM  YLD  PYL  POM  SOM  FAC
 MAXIMUM ..............:      0        < ..  INH  MX1  MX2  ---  ---  ---
 CORRECTION ...........:      3        < ..  DWL  MDW  SWY  SW+  ---  ---
 OFFSET (?? OF GREEN) .:      0        < ..  BEG  END Of Green
 FORCE (?? TIME) ......:      1        < ..  PLN  CYCLE Time
 MAX DWELL TIME (SEC)..:     15        < .. When CORRECTION = MDW
 YIELD PERIOD (SEC)....:      0        < .. When MODE = 1 TO 5
 MANUAL (DIAL/SPL/OFF).: 1/1/1         < .. When OPERTION = MAN
```

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

COORDINATION DATA - DIAL / SPLIT

TIMING PLAN 00 (Dial 1 / Split 1) Cycle Length..: 110

Phase	1	2	3	4	5	6	7	8
Time .:	13	40	17	40	13	40	17	40
Mode .:	0	1	0	0	0	1	0	0

Offset	Time	PM	AS	R2L	R3L	R4L
1	1	0	00	0	0	0
2	0	0	00	0	0	0
3	0	0	00	0	0	0

TIMING PLAN 01 (Dial 1 / Split 2) Cycle Length..: 0

Phase	1	2	3	4	5	6	7	8
Time .:	0	0	0	0	0	0	0	0
Mode .:	0	0	0	0	0	0	0	0

Offset	Time	PM	AS	R2L	R3L	R4L
1	0	0	00	0	0	0
2	0	0	00	0	0	0
3	0	0	00	0	0	0

TIMING PLAN 02 (Dial 1 / Split 3) Cycle Length..: 0

Phase	1	2	3	4	5	6	7	8
Time .:	0	0	0	0	0	0	0	0
Mode .:	0	0	0	0	0	0	0	0

Offset	Time	PM	AS	R2L	R3L	R4L
1	0	0	00	0	0	0
2	0	0	00	0	0	0
3	0	0	00	0	0	0

TIMING PLAN 03 (Dial 1 / Split 4) Cycle Length..: 0

Phase	1	2	3	4	5	6	7	8
Time .:	0	0	0	0	0	0	0	0
Mode .:	0	0	0	0	0	0	0	0

Offset	Time	PM	AS	R2L	R3L	R4L
1	0	0	00	0	0	0
2	0	0	00	0	0	0
3	0	0	00	0	0	0

PHSE MODE: 0-Actuated 1-Coord Phse 2-Min Rec 3-Max Rec 4-Ped Rec
5-Max+Ped Rec 6-Phase Omit 7-Dual Coord
ALT SEQ: 00-15 (Unit Data Has Definition)
PATN MODE: 0-Normal 1-PRM 2-YLD 3-PYL 4-POM 5-SOM 6-FAC
R# LAG: Ring Offset From Local Cycle 0 When Not Barrier Locked To Ring 1.

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

COORDINATION DATA - DIAL / SPLIT

TIMING PLAN 04 (Dial 2 / Split 1) Cycle Length..: 0

Phase.....	1	2	3	4	5	6	7	8
Time .:	0	0	0	0	0	0	0	0
Mode .:	0	0	0	0	0	0	0	0

Offset	Time	PM	AS	R2L	R3L	R4L
1	0	0	00	0	0	0
2	0	0	00	0	0	0
3	0	0	00	0	0	0

TIMING PLAN 05 (Dial 2 / Split 2) Cycle Length..: 0

Phase.....	1	2	3	4	5	6	7	8
Time .:	0	0	0	0	0	0	0	0
Mode .:	0	0	0	0	0	0	0	0

Offset	Time	PM	AS	R2L	R3L	R4L
1	0	0	00	0	0	0
2	0	0	00	0	0	0
3	0	0	00	0	0	0

TIMING PLAN 06 (Dial 2 / Split 3) Cycle Length..: 0

Phase.....	1	2	3	4	5	6	7	8
Time .:	0	0	0	0	0	0	0	0
Mode .:	0	0	0	0	0	0	0	0

Offset	Time	PM	AS	R2L	R3L	R4L
1	0	0	00	0	0	0
2	0	0	00	0	0	0
3	0	0	00	0	0	0

TIMING PLAN 07 (Dial 2 / Split 4) Cycle Length..: 0

Phase.....	1	2	3	4	5	6	7	8
Time .:	0	0	0	0	0	0	0	0
Mode .:	0	0	0	0	0	0	0	0

Offset	Time	PM	AS	R2L	R3L	R4L
1	0	0	00	0	0	0
2	0	0	00	0	0	0
3	0	0	00	0	0	0

PHSE MODE: 0-Actuated 1-Coord Phse 2-Min Rec 3-Max Rec 4-Ped Rec
5-Max+Ped Rec 6-Phase Omit 7-Dual Coord
ALT SEQ: 00-15 (Unit Data Has Definition)
PATN MODE: 0-Normal 1-PRM 2-YLD 3-PYL 4-POM 5-SOM 6-FAC
R# LAG: Ring Offset From Local Cycle 0 When Not Barrier Locked To Ring 1.

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

COORDINATION DATA - DIAL / SPLIT

TIMING PLAN 08 (Dial 3 / Split 1) Cycle Length..: 120

Phase	1	2	3	4	5	6	7	8
Time .:	19	41	15	45	19	41	20	40
Mode .:	0	1	0	0	0	1	0	0

Offset	Time	PM	AS	R2L	R3L	R4L
1	1	0	00	0	0	0
2	0	0	00	0	0	0
3	0	0	00	0	0	0

TIMING PLAN 09 (Dial 3 / Split 2) Cycle Length..: 0

Phase	1	2	3	4	5	6	7	8
Time .:	0	0	0	0	0	0	0	0
Mode .:	0	0	0	0	0	0	0	0

Offset	Time	PM	AS	R2L	R3L	R4L
1	0	0	00	0	0	0
2	0	0	00	0	0	0
3	0	0	00	0	0	0

TIMING PLAN 10 (Dial 3 / Split 3) Cycle Length..: 0

Phase	1	2	3	4	5	6	7	8
Time .:	0	0	0	0	0	0	0	0
Mode .:	0	0	0	0	0	0	0	0

Offset	Time	PM	AS	R2L	R3L	R4L
1	0	0	00	0	0	0
2	0	0	00	0	0	0
3	0	0	00	0	0	0

TIMING PLAN 11 (Dial 3 / Split 4) Cycle Length..: 0

Phase	1	2	3	4	5	6	7	8
Time .:	0	0	0	0	0	0	0	0
Mode .:	0	0	0	0	0	0	0	0

Offset	Time	PM	AS	R2L	R3L	R4L
1	0	0	00	0	0	0
2	0	0	00	0	0	0
3	0	0	00	0	0	0

PHSE MODE: 0-Actuated 1-Coord Phse 2-Min Rec 3-Max Rec 4-Ped Rec
5-Max+Ped Rec 6-Phase Omit 7-Dual Coord
ALT SEQ: 00-15 (Unit Data Has Definition)
PATN MODE: 0-Normal 1-PRM 2-YLD 3-PYL 4-POM 5-SOM 6-FAC
R# LAG: Ring Offset From Local Cycle 0 When Not Barrier Locked To Ring 1.

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

COORDINATION DATA - DIAL / SPLIT

TIMING PLAN 12 (Dial 4 / Split 1) Cycle Length..: 0

Phase.....	1	2	3	4	5	6	7	8
Time .:	0	0	0	0	0	0	0	0
Mode .:	0	0	0	0	0	0	0	0

Offset	Time	PM	AS	R2L	R3L	R4L
1	0	0	00	0	0	0
2	0	0	00	0	0	0
3	0	0	00	0	0	0

TIMING PLAN 13 (Dial 4 / Split 2) Cycle Length..: 0

Phase.....	1	2	3	4	5	6	7	8
Time .:	0	0	0	0	0	0	0	0
Mode .:	0	0	0	0	0	0	0	0

Offset	Time	PM	AS	R2L	R3L	R4L
1	0	0	00	0	0	0
2	0	0	00	0	0	0
3	0	0	00	0	0	0

TIMING PLAN 14 (Dial 4 / Split 3) Cycle Length..: 0

Phase.....	1	2	3	4	5	6	7	8
Time .:	0	0	0	0	0	0	0	0
Mode .:	0	0	0	0	0	0	0	0

Offset	Time	PM	AS	R2L	R3L	R4L
1	0	0	00	0	0	0
2	0	0	00	0	0	0
3	0	0	00	0	0	0

TIMING PLAN 15 (Dial 4 / Split 4) Cycle Length..: 0

Phase.....	1	2	3	4	5	6	7	8
Time .:	0	0	0	0	0	0	0	0
Mode .:	0	0	0	0	0	0	0	0

Offset	Time	PM	AS	R2L	R3L	R4L
1	0	0	00	0	0	0
2	0	0	00	0	0	0
3	0	0	00	0	0	0

PHSE MODE: 0-Actuated 1-Coord Phse 2-Min Rec 3-Max Rec 4-Ped Rec
5-Max+Ped Rec 6-Phase Omit 7-Dual Coord
ALT SEQ: 00-15 (Unit Data Has Definition)
PATN MODE: 0-Normal 1-PRM 2-YLD 3-PYL 4-POM 5-SOM 6-FAC
R# LAG: Ring Offset From Local Cycle 0 When Not Barrier Locked To Ring 1.

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

TIME BASE DATA - MISCELLANEOUS

DST BEGIN: MONTH : 03 WEEK : 2 Month = 01 to 12 (Begin < END)
DST END : MONTH : 11 WEEK : 1 Week = 1 to 5 (5 = Last Week)

COORD CYCLE ZERO .....: 24:00 00:00 = Event Time Else HH:MM

EQUATED DAY:	(DEFINED DAY = DAY)						EQUATED DAY:	(DEFINED DAY = DAY)					
01 = 07	00	00	00	00	00	00	00 = 00	00	00	00	00	00	00
02 = 03	04	05	06	00	00	00	00 = 00	00	00	00	00	00	00
00 = 00	00	00	00	00	00	00	00 = 00	00	00	00	00	00	00
00 = 00	00	00	00	00	00	00	00 = 00	00	00	00	00	00	00
00 = 00	00	00	00	00	00	00	00 = 00	00	00	00	00	00	00
00 = 00	00	00	00	00	00	00	00 = 00	00	00	00	00	00	00

DAY EQUATES: Take Care Not to Equate Days To Undefined Days Or Days that Are Equated To Other Days. The Source Day Should Be The Lowest Numbered Day And The Event Program Day.

TIME BASE CONTROL DATA - TRAFFIC EVENTS

DAY PDAY	TIME HH:MM	COORD PATTERN	MAX 2 PH 12345678	OMIT PH 12345678
01	00:01	0/0/4	00000000	00000000
02	00:01	0/0/4	00000000	00000000
02	07:45	1/1/1	00000000	00000000
02	09:00	0/0/4	00000000	00000000
02	15:15	3/1/1	00000000	00000000
02	18:30	0/0/4	00000000	00000000
00	00:00	0/0/0	00000000	00000000
00	00:00	0/0/0	00000000	00000000
00	00:00	0/0/0	00000000	00000000
00	00:00	0/0/0	00000000	00000000

Reference Data
PDAY - (01-99) Program Day
HH:MM - 24 Hour Clock

PATTERN - (D/S/O)
Flash - 5/5/0
Free - 0/0/4

PHASE FUNCTIONS
Call Free, Set Pattern To 0/0/0

TIME BASE DATA - DIMMING

PHASE OUTPUTS		1	2	3	4	5	6	7	8
Vehicle	Red .....:	0	0	0	0	0	0	0	0
	Yellow ....:	0	0	0	0	0	0	0	0
	Green .....:	0	0	0	0	0	0	0	0
Pedest.	Dont Walk .:	0	0	0	0	0	0	0	0
	Ped Clear .:	0	0	0	0	0	0	0	0
	Walk .....:	0	0	0	0	0	0	0	0

OVERLAP OUTPUTS		A	B	C	D
Vehicle	Red .....:	0	0	0	0
	Yellow ....:	0	0	0	0
	Green .....:	0	0	0	0

CODES:
0-NO DIMMING
1-DIMMING

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

TIME BASE CONTROL DATA - AUXILIARY EVENTS

DAY PDAY	TIME HH:MM	AUXILIARY CONTROL FUNCTIONS A.123	D.123	DIM	S.12345678	Reference Data PDAY - (01-99) Program Day
00	00:00	000	000	0	00000000	HH:MM - 24 Hr Clock
00	00:00	000	000	0	00000000	A.123 - Aux Output
00	00:00	000	000	0	00000000	D.123 - Detector
00	00:00	000	000	0	00000000	1-Det Diag Value
00	00:00	000	000	0	00000000	2-Enables Report
00	00:00	000	000	0	00000000	3-Rep. Multiplier
00	00:00	000	000	0	00000000	DIM - Dimming State
00	00:00	000	000	0	00000000	S.1>8 - Spec Func
00	00:00	000	000	0	00000000	Output
00	00:00	000	000	0	00000000	(All = 0-Off 1-On)

TIME BASE CONTROL DATA - TIME-OF-YEAR EVENTS

DATE MM/DD/YY	SPECIAL DAY	WEEK	DATE MM/DD/YY	SPECIAL DAY	WEEK
00/00/00	00	0	00/00/00	00	0
00/00/00	00	0	00/00/00	00	0
00/00/00	00	0	00/00/00	00	0
00/00/00	00	0	00/00/00	00	0
00/00/00	00	0	00/00/00	00	0
00/00/00	00	0	00/00/00	00	0
00/00/00	00	0	00/00/00	00	0
00/00/00	00	0	00/00/00	00	0
00/00/00	00	0	00/00/00	00	0
00/00/00	00	0	00/00/00	00	0

Reference Data
Special Day - Any Day 01-99

Special

Week		P'day
0	=	01-07
1	=	11-17
:	=	::-::
9	=	91-97

Sp Day = 00 To Use Sp Week.

TIME BASE CONTROL DATA - SPC FUNCTION MAPPING

S FUNCTION NAME	CONTROL-Spc Func 12345678
SPC FUNCTION 1	00000000
SPC FUNCTION 2	00000000
SPC FUNCTION 3	00000000
SPC FUNCTION 4	00000000
SPC FUNCTION 5	00000000
SPC FUNCTION 6	00000000
SPC FUNCTION 7	00000000
SPC FUNCTION 8	00000000
PAS3+MX3=VEH 1-8 TIMES .	00000000
PAS4+MX4=PED 1-8 TIMES .	00000000
PAS5+MX5=SPC 1-8 TIMES .	00000000
DYNA MX3=VEH 1-8 TIMES .	00000000
DYNA MX4=PED 1-8 TIMES .	00000000
DYNA MX5=SPC 1-8 TIMES .	00000000

CODE: 0-No 1-Yes Mapped

Function Mapping Enables The Control Of Numerous Outputs By Varied Inputs By Logical Mapping Of The Control (Input) To The Function (Output).

Spec Func Control May Originate By Local TBC, Master, Or PC Command.

Reserved 01 00000000

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

TIME BASE CONTROL DATA - SPC FUNCTION MAPPING

CONTROL-Spc Func CODE: 0-No 1-Yes Mapped

S FUNCTION NAME	12345678
Reserved 02	00000000
Reserved 03	00000000
Reserved 04	00000000
Reserved 05	00000000
Reserved 06	00000000
Reserved 07	00000000
Reserved 08	00000000
Reserved 09	00000000
Reserved 10	00000000
Reserved 11	00000000
Reserved 12	00000000
AS12-15=OLE-H FL G PHS .	00000000
AS12-15=OLE-H FL R PHS .	00000000
Spare 01	00000000
Spare 02	00000000
Spare 03	00000000
Spare 04	00000000

Multiple Function Outputs May Be Mapped To A Single Control.

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

PREEMPTION DATA - GENERAL

==========

MINIMUM GREEN / WALK

RING	1	2	3	4	Time In
Minimum Time	5	5	5	5	Seconds

FUNCTIONS:

Preemption Over Flash .:	0
Preempt PE1 Over PE2 ..:	0
Preempt PE2 Over PE3 ..:	0
Preempt PE3 Over PE4 ..:	0
Preempt PE4 Over PE5 ..:	0
Preempt PE5 Over PE6 ..:	0

PRIORITY: 0-No, Equal Priority
1-Yes, 1st Has Priority

- When a Function Has Priority Over Another, The Function Of Lower Priority Will Terminate And The Higher Priority Will Assume Control.

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

PREEMPT DATA - PREEMPT 1

```
N-Lock ...:     0   0-No 1-Yes   Selective Ped Clr :     5 |
                                   :  :    Yel /10 :     0 |  Preempt
Link PE# .:     0   Preempt #      :  :    Red /10 :     0 |  Interval
                                 Track Green (*)...:     0  > Times In
Delay ....:     0 |                :   Ped Clr ....:     0 |  Seconds
Extend ...:     0 |  Time In       :   Yel /10 ....:     0 |
Duration .:     0  > Seconds      :   Red /10 ....:     0 |  * - If 0,
                  |  (0-999)     Dwell Green ......:     5 |  Skip All
MxCall ...:     0 |              Return Ped Clr ...:     0 |    Track
Lock Out .:     0 |                :    Yel /10 ...:     0 |  Intervals
                                   :    Red /10 ...:     0
PHASE.....1..2..3..4..5..6..7..8.
Exit ..:  0  1  0  0  0  1  0  0  0-No
Calls .:  1  1  1  1  1  1  1  1  1-Yes
```

PREEMPT DATA - PREEMPT 1

```
STATUS     PHASE VEHICLE.....1.2.3.4.5.6.7.8.  CYCLE
--------    Track Status..._  0 0 0 0 0 0 0 0  --------
Vehicle:    Dwell Status..._  0 0 0 0 0 0 0 0  Vehicle:
 0-Red      Cycle ........_  0 0 0 0 0 0 0 0   0-No
 1-Grn                                          1-Act'd
 2-Fl R    PHASE PEDESTRIAN..1.2.3.4.5.6.7.8.   2-Mn Rec
 3-Fl Y     Track Status..._  0 0 0 0 0 0 0 0   3-Mx Rec
 4-Dark     Dwell Status..._  0 0 0 0 0 0 0 0  Pedest:
            Cycle ........_  0 0 0 0 0 0 0 0   0-No
 Pedest:                                        1-Act'd
 0-D Wk    OVERLAP VEHICLE...A.B.C.D.E.F.G.H.   2-Recall
 1-Walk     Track Status..._  0 0 0 0 0 0 0 0  Overlap:
 2-Fl W     Dwell Status..._  0 0 0 0 0 0 0 0   0-No
 3-Dark     Cycle ........_  0 0 0 0 0 0 0 0   1-Act'd
```

PREEMPT DATA - PREEMPT 1

```
N-Lock ....:    0   0-No 1-Yes                 LOW PRIORITY ROUTINES
                                              ----------------------------
Skip ......:    0   0-No 1-Yes                - When No Dwell Phases Are Set
                                                This Routine Is Disabled.
Delay .....:    0 |                           - Skip (Yes) Will Allow Phases
Extend ....:    0 |  Time In                     To Be Skipped To Service The
Duration ..:    0  > Seconds                    Dwell Phases
Dwell .....:    0 |  (0-999)                  - Set MxCall = 0 To Disable.
MxCall ....:    0 |                           - Lock Out Duration Will Be
Lock Out ..:    0 |                             Dependent On Calls If = 0.
                                              - Calls (Yes) Will Place A Ped
PHASE.....1.2.3.4.5.6.7.8.                      Call On Exit From Routine.
Dwell .:  0 0 0 0 0 0 0 0                          0-No
Calls .:  0 0 0 0 0 0 0 0                          1-Yes
```

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

PREEMPT DATA - PREEMPT 2

```
==========================================================================
 N-Lock ...:     0   0-No 1-Yes   Selective Ped Clr :     5 |
                                     :  :    Yel /10 :     0 |  Preempt
 Link PE# .:     0   Preempt #       :  :    Red /10 :     0 |  Interval
                                   Track Green (*)...:     0  > Times In
 Delay ....:     0 |                 :   Ped Clr ....:     0 |  Seconds
 Extend ...:     0 |  Time In        :   Yel /10 ....:     0 |
 Duration .:     0  > Seconds        :   Red /10 ....:     0 |  * - If 0,
                   |  (0-999)      Dwell Green ......:     5 |  Skip All
 MxCall ...:     0 |               Return Ped Clr ...:     0 |    Track
 Lock Out .:     0 |                  :    Yel /10 ...:     0 |  Intervals
                                     :    Red /10 ...:     0
 PHASE.....1..2..3..4..5..6..7..8.
 Exit ..:  0  1  0  0  0  1  0  0  0-No
 Calls .:  1  1  1  1  1  1  1  1  1-Yes
```

PREEMPT DATA - PREEMPT 2

```
==========================================================================
  STATUS     PHASE VEHICLE.....1.2.3.4.5.6.7.8.  CYCLE
  --------    Track Status..._  0 0 0 0 0 0 0 0  --------
  Vehicle:    Dwell Status..._  0 0 0 0 0 0 0 0  Vehicle:
   0-Red      Cycle ........_  0 0 0 0 0 0 0 0   0-No
   1-Grn                                          1-Act'd
   2-Fl R    PHASE PEDESTRIAN..1.2.3.4.5.6.7.8.   2-Mn Rec
   3-Fl Y      Track Status..._  0 0 0 0 0 0 0 0  3-Mx Rec
   4-Dark      Dwell Status..._  0 0 0 0 0 0 0 0  Pedest:
               Cycle ........_  0 0 0 0 0 0 0 0   0-No
  Pedest:                                         1-Act'd
   0-D Wk    OVERLAP VEHICLE...A.B.C.D.E.F.G.H.   2-Recall
   1-Walk      Track Status..._  0 0 0 0 0 0 0 0  Overlap:
   2-Fl W      Dwell Status..._  0 0 0 0 0 0 0 0   0-No
   3-Dark      Cycle ........_  0 0 0 0 0 0 0 0   1-Act'd
```

PREEMPT DATA - PREEMPT 2

```
==========================================================================
 N-Lock ....:     0   0-No 1-Yes                 LOW PRIORITY ROUTINES
                                                 ----------------------------
 Skip ......:     0   0-No 1-Yes              - When No Dwell Phases Are Set
                                                This Routine Is Disabled.
 Delay .....:     0 |                         - Skip (Yes) Will Allow Phases
 Extend ....:     0 |  Time In                  To Be Skipped To Service The
 Duration ..:     0  > Seconds                  Dwell Phases
 Dwell .....:     0 |  (0-999)                - Set MxCall = 0 To Disable.
 MxCall ....:     0 |                         - Lock Out Duration Will Be
 Lock Out ..:     0 |                           Dependent On Calls If = 0.
                                              - Calls (Yes) Will Place A Ped
 PHASE.....1.2.3.4.5.6.7.8.                     Call On Exit From Routine.
 Dwell .:  0 0 0 0 0 0 0 0                          0-No
 Calls .:  0 0 0 0 0 0 0 0                          1-Yes
```

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

PREEMPT DATA - PREEMPT 3

```
N-Lock ...:     0   0-No 1-Yes   Selective Ped Clr :     5 |
                                  :  :    Yel /10 :     0 |  Preempt
Link PE# .:     0   Preempt #     :  :    Red /10 :     0 |  Interval
                                Track Green (*)...:     0  > Times In
Delay ....:     0 |               :   Ped Clr ....:     0 |  Seconds
Extend ...:     0 |  Time In      :   Yel /10 ....:     0 |
Duration .:     0  > Seconds      :   Red /10 ....:     0 |  * - If 0,
                  |  (0-999)    Dwell Green ......:     5 |  Skip All
MxCall ...:     0 |             Return Ped Clr ...:     0 |    Track
Lock Out .:     0 |               :    Yel /10 ...:     0 |  Intervals
                                  :    Red /10 ...:     0
PHASE.....1..2..3..4..5..6..7..8.
Exit ..:  0  0  0  1  0  0  0  1  0-No
Calls .:  1  1  1  1  1  1  1  1  1-Yes
```

PREEMPT DATA - PREEMPT 3

```
 STATUS     PHASE VEHICLE.....1.2.3.4.5.6.7.8.  CYCLE
 --------    Track Status..._  0 0 0 0 0 0 0 0  --------
 Vehicle:    Dwell Status..._  0 0 0 0 0 0 0 0  Vehicle:
  0-Red      Cycle ........_  0 0 0 0 0 0 0 0   0-No
  1-Grn                                          1-Act'd
  2-Fl R    PHASE PEDESTRIAN..1.2.3.4.5.6.7.8.   2-Mn Rec
  3-Fl Y     Track Status..._  0 0 0 0 0 0 0 0   3-Mx Rec
  4-Dark     Dwell Status..._  0 0 0 0 0 0 0 0  Pedest:
             Cycle ........_  0 0 0 0 0 0 0 0   0-No
 Pedest:                                         1-Act'd
  0-D Wk    OVERLAP VEHICLE...A.B.C.D.E.F.G.H.   2-Recall
  1-Walk     Track Status..._  0 0 0 0 0 0 0 0  Overlap:
  2-Fl W     Dwell Status..._  0 0 0 0 0 0 0 0   0-No
  3-Dark     Cycle ........_  0 0 0 0 0 0 0 0   1-Act'd
```

PREEMPT DATA - PREEMPT 3

```
N-Lock ....:     0   0-No 1-Yes                 LOW PRIORITY ROUTINES
                                                ----------------------------
Skip ......:     0   0-No 1-Yes                - When No Dwell Phases Are Set
                                                 This Routine Is Disabled.
Delay .....:     0 |                           - Skip (Yes) Will Allow Phases
Extend ....:     0 |  Time In                     To Be Skipped To Service The
Duration ..:     0  > Seconds                    Dwell Phases
Dwell .....:     0 |  (0-999)                  - Set MxCall = 0 To Disable.
MxCall ....:     0 |                           - Lock Out Duration Will Be
Lock Out ..:     0 |                             Dependent On Calls If = 0.
                                               - Calls (Yes) Will Place A Ped
PHASE.....1.2.3.4.5.6.7.8.                       Call On Exit From Routine.
Dwell .:  0 0 0 0 0 0 0 0                          0-No
Calls .:  0 0 0 0 0 0 0 0                          1-Yes
```

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

PREEMPT DATA - PREEMPT 4

```
==========================================================================
 N-Lock ...:     0   0-No 1-Yes   Selective Ped Clr :     5 |
                                     :  :    Yel /10 :     0 |  Preempt
 Link PE# .:     0   Preempt #       :  :    Red /10 :     0 |  Interval
                                   Track Green (*)...:     0  > Times In
 Delay ....:     0 |                 :   Ped Clr ....:     0 |  Seconds
 Extend ...:     0 |  Time In        :   Yel /10 ....:     0 |
 Duration .:     0  > Seconds        :   Red /10 ....:     0 |  * - If 0,
                   |  (0-999)      Dwell Green ......:     5 |  Skip All
 MxCall ...:     0 |               Return Ped Clr ...:     0 |   Track
 Lock Out .:     0 |                 :    Yel /10 ...:     0 |  Intervals
                                     :    Red /10 ...:     0
 PHASE.....1..2..3..4..5..6..7..8.
 Exit ..:  0  0  0  1  0  0  0  1  0-No
 Calls .:  1  1  1  1  1  1  1  1  1-Yes
```

PREEMPT DATA - PREEMPT 4

```
==========================================================================
  STATUS     PHASE VEHICLE.....1.2.3.4.5.6.7.8.  CYCLE
  --------    Track Status..._ 0 0 0 0 0 0 0 0   --------
  Vehicle:    Dwell Status..._ 0 0 0 0 0 0 0 0   Vehicle:
   0-Red      Cycle ........_ 0 0 0 0 0 0 0 0    0-No
   1-Grn                                          1-Act'd
   2-Fl R    PHASE PEDESTRIAN..1.2.3.4.5.6.7.8.   2-Mn Rec
   3-Fl Y      Track Status..._ 0 0 0 0 0 0 0 0   3-Mx Rec
   4-Dark      Dwell Status..._ 0 0 0 0 0 0 0 0   Pedest:
               Cycle ........_ 0 0 0 0 0 0 0 0    0-No
  Pedest:                                         1-Act'd
   0-D Wk    OVERLAP VEHICLE...A.B.C.D.E.F.G.H.   2-Recall
   1-Walk      Track Status..._ 0 0 0 0 0 0 0 0   Overlap:
   2-Fl W      Dwell Status..._ 0 0 0 0 0 0 0 0    0-No
   3-Dark      Cycle ........_ 0 0 0 0 0 0 0 0    1-Act'd
```

PREEMPT DATA - PREEMPT 4

```
==========================================================================
 N-Lock ....:     0   0-No 1-Yes                    LOW PRIORITY ROUTINES
                                                  ----------------------------
 Skip ......:     0   0-No 1-Yes                 - When No Dwell Phases Are Set
                                                   This Routine Is Disabled.
 Delay .....:     0 |                            - Skip (Yes) Will Allow Phases
 Extend ....:     0 |  Time In                     To Be Skipped To Service The
 Duration ..:     0  > Seconds                     Dwell Phases
 Dwell .....:     0 |  (0-999)                   - Set MxCall = 0 To Disable.
 MxCall ....:     0 |                            - Lock Out Duration Will Be
 Lock Out ..:     0 |                              Dependent On Calls If = 0.
                                                 - Calls (Yes) Will Place A Ped
 PHASE.....1.2.3.4.5.6.7.8.                        Call On Exit From Routine.
 Dwell .:  0 0 0 0 0 0 0 0                            0-No
 Calls .:  0 0 0 0 0 0 0 0                            1-Yes
```

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

PREEMPT DATA - PREEMPT 5

```
N-Lock ...:     0   0-No 1-Yes   Selective Ped Clr :     8 |
                                   :  :    Yel /10 :     0 |  Preempt
Link PE# .:     0   Preempt #      :  :    Red /10 :     0 |  Interval
                                 Track Green (*)...:    10  > Times In
Delay ....:     0 |                :   Ped Clr ....:     8 |  Seconds
Extend ...:     0 |  Time In       :   Yel /10 ....:     0 |
Duration .:     0  > Seconds      :   Red /10 ....:     0  * - If 0,
                  |  (0-999)     Dwell Green ......:    10 |  Skip All
MxCall ...:     0 |              Return Ped Clr ...:     8 |   Track
Lock Out .:     0 |                :    Yel /10 ...:     0 |  Intervals
                                   :    Red /10 ...:     0
PHASE.....1..2..3..4..5..6..7..8.
Exit ..:  0  1  0  0  0  1  0  0  0-No
Calls .:  1  1  1  1  1  1  1  1  1-Yes
```

PREEMPT DATA - PREEMPT 5

```
 STATUS     PHASE VEHICLE.....1.2.3.4.5.6.7.8.  CYCLE
 --------    Track Status..._  0 0 0 0 0 0 0 0   --------
 Vehicle:    Dwell Status..._  0 0 0 0 0 0 0 0   Vehicle:
  0-Red      Cycle ........_  0 0 0 0 0 0 0 0    0-No
  1-Grn                                           1-Act'd
  2-Fl R    PHASE PEDESTRIAN..1.2.3.4.5.6.7.8.    2-Mn Rec
  3-Fl Y     Track Status..._  0 0 0 0 0 0 0 0    3-Mx Rec
  4-Dark     Dwell Status..._  0 0 0 0 0 0 0 0   Pedest:
             Cycle ........_  0 0 0 0 0 0 0 0    0-No
 Pedest:                                          1-Act'd
  0-D Wk    OVERLAP VEHICLE...A.B.C.D.E.F.G.H.    2-Recall
  1-Walk     Track Status..._  0 0 0 0 0 0 0 0   Overlap:
  2-Fl W     Dwell Status..._  0 0 0 0 0 0 0 0    0-No
  3-Dark     Cycle ........_  0 0 0 0 0 0 0 0    1-Act'd
```

PREEMPT DATA - PREEMPT 5

```
N-Lock ....:     0   0-No 1-Yes                    LOW PRIORITY ROUTINES
                                                  ----------------------------
Skip ......:     0   0-No 1-Yes                 - When No Dwell Phases Are Set
                                                  This Routine Is Disabled.
Delay .....:     0 |                            - Skip (Yes) Will Allow Phases
Extend ....:     0 |  Time In                     To Be Skipped To Service The
Duration ..:     0  > Seconds                    Dwell Phases
Dwell .....:     0 |  (0-999)                   - Set MxCall = 0 To Disable.
MxCall ....:     0 |                            - Lock Out Duration Will Be
Lock Out ..:     0 |                              Dependent On Calls If = 0.
                                                - Calls (Yes) Will Place A Ped
PHASE.....1.2.3.4.5.6.7.8.                        Call On Exit From Routine.
Dwell .:  0 0 0 0 0 0 0 0                           0-No
Calls .:  0 0 0 0 0 0 0 0                           1-Yes
```

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

PREEMPT DATA - PREEMPT 6

```
N-Lock ...:     0   0-No 1-Yes    Selective Ped Clr :     8 |
                                     :  :    Yel /10 :     0 |  Preempt
Link PE# .:     0   Preempt #        :  :    Red /10 :     0 |  Interval
                                  Track Green (*)...:    10  > Times In
Delay ....:     0 |                  :   Ped Clr ....:     8 |  Seconds
Extend ...:     0 |  Time In         :   Yel /10 ....:     0 |
Duration .:     0  > Seconds         :   Red /10 ....:     0 |  * - If 0,
                  |  (0-999)      Dwell Green ......:    10 |  Skip All
MxCall ...:     0 |               Return Ped Clr ...:     8 |    Track
Lock Out .:     0 |                  :    Yel /10 ...:     0 |  Intervals
                                     :    Red /10 ...:     0
PHASE.....1..2..3..4..5..6..7..8.
Exit ..:  0  1  0  0  0  1  0  0  0-No
Calls .:  1  1  1  1  1  1  1  1  1-Yes
```

PREEMPT DATA - PREEMPT 6

```
 STATUS     PHASE VEHICLE.....1.2.3.4.5.6.7.8.  CYCLE
 --------    Track Status..._  0 0 0 0 0 0 0 0  --------
 Vehicle:    Dwell Status..._  0 0 0 0 0 0 0 0  Vehicle:
  0-Red      Cycle ........_  0 0 0 0 0 0 0 0   0-No
  1-Grn                                          1-Act'd
  2-Fl R    PHASE PEDESTRIAN..1.2.3.4.5.6.7.8.   2-Mn Rec
  3-Fl Y     Track Status.._  0 0 0 0 0 0 0 0   3-Mx Rec
  4-Dark     Dwell Status.._  0 0 0 0 0 0 0 0   Pedest:
             Cycle ........_  0 0 0 0 0 0 0 0   0-No
 Pedest:                                         1-Act'd
  0-D Wk    OVERLAP VEHICLE...A.B.C.D.E.F.G.H.   2-Recall
  1-Walk     Track Status.._  0 0 0 0 0 0 0 0   Overlap:
  2-Fl W     Dwell Status.._  0 0 0 0 0 0 0 0   0-No
  3-Dark     Cycle ........_  0 0 0 0 0 0 0 0   1-Act'd
```

PREEMPT DATA - PREEMPT 6

```
N-Lock ....:     0   0-No 1-Yes                 LOW PRIORITY ROUTINES
                                                ----------------------------
Skip ......:     0   0-No 1-Yes              - When No Dwell Phases Are Set
                                                This Routine Is Disabled.
Delay .....:     0 |                         - Skip (Yes) Will Allow Phases
Extend ....:     0 |  Time In                   To Be Skipped To Service The
Duration ..:     0  > Seconds                   Dwell Phases
Dwell .....:     0 |  (0-999)                - Set MxCall = 0 To Disable.
MxCall ....:     0 |                         - Lock Out Duration Will Be
Lock Out ..:     0 |                            Dependent On Calls If = 0.
                                             - Calls (Yes) Will Place A Ped
PHASE.....1.2.3.4.5.6.7.8.                      Call On Exit From Routine.
Dwell .:  0 0 0 0 0 0 0 0                          0-No
Calls .:  0 0 0 0 0 0 0 0                          1-Yes
```

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

SYSTEM DATA - GENERAL

SYSTEM ADDRESS
LOCAL ADDRESS .....: 000 ADDRESS: THREE DIGITS 001-032

An Address Other Than '000' Transfers Local I/O To The System Definition. 'UNIT DATA - GENERAL CONTROL' Provides Programming That Will Modify This Statement.

BACKUP
REVERT TO BACKUP ....: 15 REVERT: MINUTES 001-255

Absence Of Master Polling, For This Time, Will Transfer The Pattern Control To TBC As Backup. '000' = Will Not Revert.

CRITICAL ALARM IDENTIFICATION & ASSIGNMENTS

----- AUTO REPORT TELEPHONE NUMBERS ----- Using 1st Field Will Add
#1 = (- -) #2 = (- -) A '1' For Long Distance.

---------- LOCAL ALARMS ---------- ST:

NO	NAME	ST	NO	NAME	ST	Critical Status
01.	LOCAL FREE	0	09.	CYCLE FAILURE	0	0 = No
02.	PREEMPTION	0	10.	COORD FAILURE	0	1 = Yes
03.	SPECIAL STATUS 6	0	11.	COORD FAULT	0	
04.	SPECIAL STATUS 5	0	12.	CYCLE FAULT	0	
05.	SPECIAL STATUS 4	0	13.	LOCAL FLASH	0	Critical Alarms
06.	SPECIAL STATUS 3	0	14.	CONFLICT FLASH	0	
07.	SPECIAL STATUS 2	0	15.	REMOTE FLASH	0	Initiate Dialup
08.	SPECIAL STATUS 1	0	16.	VOLT MONITOR	0	

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

SYSTEM DATA - SYSTEM DETECTORS

SYSTEM DETECTOR	1	2	3	4	5	6	7	8
Assigned Det :	0	0	0	0	0	0	0	0
VPHR x 100 ..:	0	0	0	0	0	0	0	0
AVGT (Min) ..:	0	0	0	0	0	0	0	0
CTFC / 10 ...:	0	0	0	0	0	0	0	0
MVOL .....:	0	0	0	0	0	0	0	0

To Assign: VEH 01-64 enter #01-08
SPC 01-08 enter #09-16
PED 01-08 enter #17-24

DETECTOR ASSIGNMENT

Det#	1	2	--	7	8
Veh	01	02	--	07	08
Spc	09	10	--	15	16

V+O PARAMETERS
VPHR-Lane Capacity
AVGT-Averaging Time
CTFC-Correct Factor
MVOL-Min Vol b4 Occup Added

SAMPLE INTERVAL ..: 0

REPORT PARAMETERS - Time Base Aux D2 Starts A Report (Sample Interval Sets Duration). AUX D3 May Set RAW Multiplier (b4 v2.25).

SYSTEM DATA - QUEUE ROUTINES

ASSIGNMENT	QUEUE 1				QUEUE 2			
Detector.....	1	2	3	4	1	2	3	4
Sys Det #	0	0	0	0	0	0	0	0
Factor WTFC	0	0	0	0	0	0	0	0
Input Select ..	0	0-Avg	1-Highest		0	0-Avg	1-Highest	
Failed Level ..	0	# to Fail Routine			0	# to Fail Routine		

SELECT Level...	A	B	A	B
Enter (Up)	0	0	0	0
Leave (Dn)	0	0	0	0
Pattern.....	D/S/O	D/S/O	D/S/O	D/S/O
Called	0/0/0	0/0/0	0/0/0	0/0/0

Queue Pattern or Partial Pattern Selection Is Made When The V+O Of Assigned System Detectors Exceeds The Level To Enter.

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

SYSTEM DATA - DETECTOR DIAGNOSTICS

		1	2	3	4	5	6	7	8
VEH DETECTOR		1	2	3	4	5	6	7	8
VALUE 0	MAX PRESENCE .:	0	0	0	0	0	0	0	0
PARAMETERS	NO ACTIVITY ..:	0	0	0	0	0	0	0	0
	ERRATIC CNTS .:	0	0	0	0	0	0	0	0
VEH DETECTOR		1	2	3	4	5	6	7	8
VALUE 1	MAX PRESENCE .:	0	0	0	0	0	0	0	0
PARAMETERS	NO ACTIVITY ..:	0	0	0	0	0	0	0	0
	ERRATIC CNTS .:	0	0	0	0	0	0	0	0
PED DETECTOR		1	2	3	4	5	6	7	8
VALUE 0	MAX PRESENCE .:	0	0	0	0	0	0	0	0
PARAMETERS	NO ACTIVITY ..:	0	0	0	0	0	0	0	0
	ERRATIC CNTS .:	0	0	0	0	0	0	0	0
PED DETECTOR		1	2	3	4	5	6	7	8
VALUE 1	MAX PRESENCE .:	0	0	0	0	0	0	0	0
PARAMETERS	NO ACTIVITY ..:	0	0	0	0	0	0	0	0
	ERRATIC CNTS .:	0	0	0	0	0	0	0	0
SPC DETECTOR		1	2	3	4	5	6	7	8
VALUE 0	MAX PRESENCE .:	0	0	0	0	0	0	0	0
PARAMETERS	NO ACTIVITY ..:	0	0	0	0	0	0	0	0
	ERRATIC CNTS .:	0	0	0	0	0	0	0	0
SPC DETECTOR		1	2	3	4	5	6	7	8
VALUE 1	MAX PRESENCE .:	0	0	0	0	0	0	0	0
PARAMETERS	NO ACTIVITY ..:	0	0	0	0	0	0	0	0
	ERRATIC CNTS .:	0	0	0	0	0	0	0	0

Time Base Auxiliary 'D1' Enables Value 1 Diagnostic Parameters
Note: Veh Det 1 Parameters Will Be Downloaded To EPAC300 v2.24 & b4
As The Unit Diagnostic Parameters For All Detectors.

DATE: 05-20-10 TIME: 09:35

SOLO: WALWORTH, WASHINGTON, & OZAUKEE COUNTIES
LOCAL DATABASE ... For: #17 - STH 167 & STH 57 S075

SYSTEM DATA - SPEED

GENERAL

Measurement .....: 0 0-Miles/Hour 1-Kilometers/Hour

SPEED TRAPS

Trap No. 1	Det 1	Det 2	Trap No. 2	Det 1	Det 2
Assigned Det .....:	0	0	Assigned Det .....:	0	0
Distance .....:	1		Distance .....:	1	

1) Each Speed Trap Needs Two Detectors Assigned, Any Vehicle, Special, or Pedestrian Detector May Be Assigned.
   - To Assign: Veh = Veh #, Spc = Spc #+8, & Ped = Ped #+16
2) The Distance Between Det 1 and Det 2 May Be Either 11 Feet or 22 Feet.
   - Enter '1' For 11 Ft or '2' for 22 Ft.

SYSTEM DATA - SPEED

RANGES / PATTERN

PATTERN.....			OFFSET 1 ...		OFFSET 2 ...		OFFSET 3	
Dial	Split		Low	High	Low	High	Low	High
1	1	:	0	0	0	0	0	0
1	2	:	0	0	0	0	0	0
1	3	:	0	0	0	0	0	0
1	4	:	0	0	0	0	0	0
2	1	:	0	0	0	0	0	0
2	2	:	0	0	0	0	0	0
2	3	:	0	0	0	0	0	0
2	4	:	0	0	0	0	0	0
3	1	:	0	0	0	0	0	0
3	2	:	0	0	0	0	0	0
3	3	:	0	0	0	0	0	0
3	4	:	0	0	0	0	0	0
4	1	:	0	0	0	0	0	0
4	2	:	0	0	0	0	0	0
4	3	:	0	0	0	0	0	0
4	4	:	0	0	0	0	0	0

RANGES: Enter The Low & High Speed In MPH or KPH For Each Pattern To Enable A Report of Lower, Within, & Above It.

TRAFFIC
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PROVIDING TRAFFIC ENGINEERING SOLUTIONS FOR WISCONSIN

January 24, 2007

John Haug
WisDOT Southeast Region
141 NW Barstow Street
Waukesha, WI 53187-0798

RE: Updated Mequon Road Signal Timings
Buntrock Avenue to IH-43 Interchange
Project ID 1381-02-00

Hi John:

Attached please find updated traffic signal timings for the STH 167 (Mequon Road) corridor from Buntrock Avenue through the IH-43 ramps. These timings are based on the improvements anticipated to be implemented as part of the Mequon Road resurfacing efforts.

Per your request, we updated the timings using the WisDOT kinematic equation to calculate Y+AR times, changed passage to 1.5-sec where stop line detection is anticipated, and used 3.5-sec for left-turn Y and 1.0-sec AR where protected-only phasing is anticipated. We also set the minimum green times to 15-sec for the mainline, 10-sec for the side streets and 8.0 for left-turn phases.

We did not time "flashing don't walk" times into the yellow intervals since we felt this to be undesirable for pedestrian operations. Also, we did not eliminate the west side ped crossing times at River Road or Range Line Road as they do not result in adverse operations to these intersections or the corridor. While River Road does operate coordinated, it is nearly a half mile away from East Gate Drive and any early release is not anticipated to create adverse operations downstream. Range Line Road operates uncoordinated, so concerns usually associated with early release do not apply.

Below is proposed implementation information.

Dial 1: AM Peak
Dial 2: MID Peak
Dial 3: PM Peak
FREE: Utilize "FREE" max green times

Weekdays: MIDNIGHT to 6:30 AM: FREE
Weekdays: 6:30 AM to 10:00 AM: Dial 1
Weekdays: 10:00 AM to 3:00 PM: Dial 2
Weekdays: 3:00 PM to 7:00 PM: Dial 3
Weekdays: 7:00 PM to MIDNIGHT: FREE

Saturday & Sunday: MIDNIGHT to 9:00 AM: FREE
Saturday & Sunday: 9:00 AM to 6:00 PM: Dial 3
Saturday & Sunday: 6:00 PM to MIDNIGHT: FREE

TRAFFIC ANALYSIS & DESIGN, INC.
Phone: 262.377.1845 N36 W7505 Buchanan Street Fax: 262.377.4381
Cedarburg, WI 53012
www.traffic-ad.com

Please note that the design plans show an exclusive through lane, shared through/right-turn lane and an exclusive right-turn lane without a right-turn island on the eastbound approach to the IH-43 southbound ramps. A concern with this design is motorists in the shared thru/right-turn will not have adequate sight distance around vehicles in the exclusive right-turn lane to see pedestrians crossing the SB on-ramp. The eastbound green ball would allow a dual right-turn movement to cross the crosswalk at the same time a "WALK" indication is present for pedestrians.

Strong consideration should be given to operating the EB approach to the IH-43 SB ramps with two thru lanes and an exclusive right-turn lane as a temporary solution to alleviate this sight distance concern. In the opening year, the right-turn movement is expected to operate at LOS E during the AM & PM peaks but queues are expected fit within the storage provided based on Synchro modeling. Additional improvements would need to be investigated to accommodate design year traffic volumes.

Feel free to call or email me (414-807-1912, mmay@traffic-ad.com) or John Bieberitz (262-377-1845, jbieberitz@traffic-ad.com) at anytime with questions or comments

Thank you,

Michael May, P.E. PTOE
Encl.

CC: Susan Cook & George Schulz, Bloom
John Bieberitz & Jeff Fait, TADI

Traffic Signal Timing – *STH 167 & Buntrock Avenue*

This traffic signal shall be fully operational, as shown in the "Sequence of Operations" sheet in the plan set. The traffic signals shall be timed according to the following traffic signal timings.

PROPOSED SIGNAL TIMING
STH 167 & Buntrock Avenue – Mequon, WI

Phase	← STH 167 **2**	↓ Buntrock **4**	→ STH 167 **6**	↑ Buntrock **8**
Initial Interval	9.5	8.5	9.5	8.5
Variable Initial	31.0	-	31.0	-
Minimum Assured Green	15.0	10.0	15.0	10.0
Number of Actuations	20	-	20	-
Passage Time	5.5	1.5	5.5	1.5
Extension Stretch	-	-	-	-
Maximum Green AM (MID) [PM] {FREE}	63.6 (63.6) [63.6] {63.6}	32.9 (32.9) [32.9] {32.9}	63.6 (63.6) [63.6] {63.6}	32.9 (32.9) [32.9] {32.9}
Allowable Gap	1.5	1.5	1.5	1.5
Time Before Reduction	30.0	-	30.0	-
Time to Reduce	15.0	-	15.0	-
Yellow	4.0	4.1	4.0	4.1
All-Red	2.4	3.0	2.4	3.0
Walk	7.0	7.0	7.0	7.0
Flashing Don't Walk	21.0	17.0	24.0	17.0

Background Cycle: 110.0
(110.0)
[110.0]
{110.0}

Offset Referenced to Phases 2 & 6: 7.0
(95.0)
[52.0]
{FREE}

Phases 2 & 6 – Max Recall AM, MID & PM peaks; Min Recall Free.

Yellow and All Red times were determined using the WisDOT kinematic equation. All red time was not allowed to exceed 3.0-seconds and any remainder was added to the yellow time per WisDOT request.

Traffic Signal Timing – *STH 167 & Cedarburg Road*

This traffic signal shall be fully operational, as shown in the "Sequence of Operations" sheet in the plan set. The traffic signals shall be timed according to the following traffic signal timings.

PROPOSED SIGNAL TIMING
STH 167 & Cedarburg Road

Phase	STH 167 **1**	STH 167 **2**	Cedarburg **3**	Cedarburg **4**	STH 167 **5**	STH 167 **6**	Cedarburg **7**	Cedarburg **8**
Initial Interval	6.5	11.0	6.5	8.5	6.5	10.0	6.5	8.0
Variable Initial	-	25.0	-	-	-	29.0	-	-
Minimum Assured Green	8.0	15.0	8.0	10.0	8.0	15.0	8.0	10.0
Number of Actuations	-	15	-	-	-	18	-	-
Passage Time	1.5	4.0	1.5	1.5	1.5	5.0	1.5	1.5
Extension Stretch	-	-	-	1.0	-	-	-	1.5
Maximum Green AM (MID) [PM] {FREE}	8.0 (8.5) [8.5] {12.8}	38.8 (32.0) [33.8] {35.0}	8.0 (8.0) [9.7] {13.0}	33.0 (39.3) [35.8] {35.0}	9.5 (8.5) [10.5] {12.8}	37.3 (32.0) [31.8] {35.0}	8.0 (14.3) [12.5] {13.0}	33.0 (33.0) [33.0] {35.0}
Allowable Gap	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Time Before Reduction	-	20.0	-	-	-	20.0	-	-
Time to Reduce	-	10.0	-	-	-	10.0	-	-
Yellow	3.5	4.0	3.5	4.2	3.5	4.0	3.5	4.2
All-Red	-	3.0	1.0	3.0	-	3.0	1.0	3.0
Walk	-	5.0	-	5.0	-	5.0	-	5.0
Flashing Don't Walk	-	27.0	-	27.0	-	26.0	-	28.0

Background Cycle: 110.0
(110.0)
[110.0]
{110.0}

Offset Referenced to Phases 2 & 6: 0.0
(0.0)
[0.0]
{FREE}

Phases 2 & 6 – Max Recall AM, MID & PM peaks; Min Recall Free.

Yellow and All Red times were determined using the WisDOT kinematic equation. All red time was not allowed to exceed 3.0-seconds and any remainder was added to the yellow time per WisDOT request.

Traffic Signal Timing – *STH 167 & East Gate Drive/River Trail*

This traffic signal shall be fully operational, as shown in the "Sequence of Operations" sheet in the plan set. The traffic signals shall be timed according to the following traffic signal timings.

PROPOSED SIGNAL TIMING
STH 167 & East Gate Drive/River Trail

Phase	STH 167 **1**	STH 167 **2**	East Gate Dr. **4**	STH 167 **6**	River Trail **8**
Initial Interval	6.5	10.0	8.5	10.0	8.5
Variable Initial	-	29.0	-	29.0	-
Minimum Assured Green	8.0	15.0	10.0	15.0	10.0
Number of Actuations	-	18	-	18	-
Passage Time	1.5	5.0	1.5	5.0	1.5
Extension Stretch	-	-	1.0	-	-
Maximum Green AM (MID) [PM] {FREE}	39.5 (15.5) [17.5] {17.5}	32.6 (46.1) [52.4] {50.4}	21.0 (31.5) [23.2] {25.2}	75.6 (65.1) [73.4] {71.4}	21.0 (31.5) [23.2] {25.2}
Allowable Gap	1.5	1.5	1.5	1.5	1.5
Time Before Reduction	-	20.0	-	25.0	-
Time to Reduce	-	10.0	-	10.0	-
Yellow	3.5	4.0	3.8	4.0	3.8
All-Red	-	2.6	3.0	2.6	3.0
Walk	-	7.0	-	7.0	7.0
Flashing Don't Walk	-	24.0	-	15.0	14.0

Background Cycle: 110.0
(110.0)
[110.0]
{110.0}

Offset Referenced to Phases 2 & 6: 76.0
(58.0)
[61.0]
{FREE}

Phases 2 & 6 – Max Recall AM, MID & PM peaks; Min Recall Free.

Yellow and All Red times were determined using the WisDOT kinematic equation. All red time was not allowed to exceed 3.0-seconds and any remainder was added to the yellow time per WisDOT request.

Traffic Signal Timing – *STH 167 & River Road*

This traffic signal shall be fully operational, as shown in the "Sequence of Operations" sheet in the plan set. The traffic signals shall be timed according to the following traffic signal timings.

PROPOSED SIGNAL TIMING
STH 167 & River Road – Mequon, WI

Phase	← STH 167 **2**	↓ River Rd **4**	→ STH 167 **6**	↑ River Rd **8**
Initial Interval	10.0	8.5	10.0	8.5
Variable Initial	29.0	-	29.0	-
Minimum Assured Green	15.0	10.0	15.0	10.0
Number of Actuations	18	-	18	-
Passage Time	5.0	1.5	5.0	1.5
Extension Stretch	-	2.0	-	2.0
Maximum Green AM (MID) [PM] {FREE}	58.7 (58.7) [58.7] {58.7}	38.6 (38.6) [38.6] {38.6}	58.7 (58.7) [58.7] {58.7}	38.6 (38.6) [38.6] {38.6}
Allowable Gap	1.5	1.5	1.5	1.5
Time Before Reduction	30.0	-	30.0	-
Time to Reduce	15.0	-	15.0	-
Yellow	4.0	3.6	4.0	3.6
All-Red	2.3	2.8	2.3	2.8
Walk	7.0	5.0	7.0	-
Flashing Don't Walk	14.0	25.0	18.0	-

Background Cycle: 110.0
(110.0)
[110.0]
{110.0}

Offset Referenced to Phases 2 & 6: 65.0
(41.0)
[42.0]
{FREE}

Phases 2 & 6 – Max Recall AM, MID & PM peaks; Min Recall Free.

Yellow and All Red times were determined using the WisDOT kinematic equation. All red time was not allowed to exceed 3.0-seconds and any remainder was added to the yellow time per WisDOT request.

Traffic Signal Timing – *STH 167 & Range Line Road*

This traffic signal shall be fully operational, as shown in the "Sequence of Operations" sheet in the plan set. The traffic signals shall be timed according to the following traffic signal timings.

PROPOSED SIGNAL TIMING
STH 167 & Range Line Road – Mequon, WI

Phase	STH 167 **2**	Private Drwy **4**	STH 167 **5**	STH 167 **6**	Range Line **8**
Initial Interval	10.0	8.5	6.5	10.0	8.5
Variable Initial	29.0	-	-	29.0	-
Minimum Assured Green	15.0	10.0	8.0	15.0	10.0
Number of Actuations	18	-	-	18	-
Passage Time	5.0	1.5	1.5	5.0	1.5
Extension Stretch	-	-	-	-	-
Maximum Green AM (MID) [PM] {FREE}	44.4 (44.4) [44.4] {44.4}	33.0 (33.0) [33.0] {33.0}	8.0 (8.0) [8.0] {8.0}	32.9 (32.9) [32.9] {32.9}	33.0 (33.0) [33.0] {33.0}
Allowable Gap	1.5	1.5	1.5	1.5	1.5
Time Before Reduction	25.0	-	-	20.0	-
Time to Reduce	10.0	-	-	10.0	-
Yellow	4.0	3.8	3.5	4.0	3.8
All-Red	1.8	3.0	-	1.8	3.0
Walk	7.0	5.0	-	7.0	-
Flashing Don't Walk	11.0	28.0	-	19.0	-

Background Cycle: 90.0
(90.0)
[90.0]
{90.0}

Offset Referenced to Phases 2 & 6: *Not in System*

Phases 2 & 6 – Min Recall.

Yellow and All Red times were determined using the WisDOT kinematic equation. All red time was not allowed to exceed 3.0-seconds and any remainder was added to the yellow time per WisDOT request.

Traffic Signal Timing – *STH 167 & CTH W*

This traffic signal shall be fully operational, as shown in the "Sequence of Operations" sheet in the plan set. The traffic signals shall be timed according to the following traffic signal timings.

PROPOSED SIGNAL TIMING
STH 167 & CTH W – Mequon, WI

Phase *(Lag Phases 3 & 7 after Phases 8 & 4 to better progress traffic & reduce queues through the I-43 Ramps)*	STH 167 **1**	STH 167 **2**	CTH W **3**	CTH W **4**	STH 167 **5**	STH 167 **6**	CTH W **7**	CTH W **8**
Initial Interval	6.5	10.5	6.5	8.5	6.5	10.0	6.5	8.5
Variable Initial	-	25.0	-	-	-	29.0	-	-
Minimum Assured Green	8.0	15.0	8.0	10.0	8.0	15.0	8.0	10.0
Number of Actuations	-	15	-	-	-	18	-	-
Passage Time	1.5	4.5	1.5	1.5	1.5	5.0	1.5	1.5
Extension Stretch	-	-	-	2.0	-	-	-	1.0
Maximum Green AM (MID) [PM] {FREE}	13.5 (14.3) [13.5] {14.0}	37.8 (37.0) [37.8] {37.0}	8.7 (11.3) [14.5] {14.5}	22.8 (20.2) [22.0] {22.3}	15.5 (14.4) [15.7] {17.0)	35.8 (36.9) [35.6] {35.0}	12.5 (12.5) [17.5] {16.8}	19.0 (19.0) [19.0] {20.0}
Allowable Gap	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Time Before Reduction	-	25.0	-	-	-	25.0	-	-
Time to Reduce	-	10.0	-	-	-	10.0	-	-
Yellow	3.5	4.4	3.5	3.8	3.5	4.4	3.5	3.8
All-Red	0.0	3.0	1.0	3.0	0.0	3.0	1.0	3.0
Walk	-	5.0	-	5.0	-	5.0	-	5.0
Flashing Don't Walk	-	32.0	-	14.0	-	30.0	-	14.0

Background Cycle: 105.0
(105.0)
[110.0]
{110.0}

Offset Referenced to Phases 2 & 6: 0.0
(0.0)
[0.0]
{FREE}

Phases 2 & 6 – Max Recall AM, MID & PM peaks; Min Recall Free.

Yellow and All Red times were determined using the WisDOT kinematic equation. All red time was not allowed to exceed 3.0-seconds and any remainder was added to the yellow time per WisDOT request.

Traffic Signal Timing – *STH 167 & IH-43 SB Ramps*

This traffic signal shall be fully operational, as shown in the "Sequence of Operations" sheet in the plan set. The traffic signals shall be timed according to the following traffic signal timings.

PROPOSED SIGNAL TIMING
STH 167 & IH-43 SB Ramps - Mequon,WI

Phase	STH 167 **2**	43 SB Off **4**	STH 167 **5**	STH 167 **6**
Initial Interval	10.0	8.5	6.5	11.0
Variable Initial	29.0	-	-	23.0
Minimum Assured Green	15.0	10.0	8.0	15.0
Number of Actuations	18	-	-	13
Passage Time	5.0	1.5	1.5	4.0
Extension Stretch	-	2.0	-	-
Maximum Green AM (MID) [PM] {FREE}	49.5 (61.5) [64.5] {64.5}	44.0 (32.0) [34.0] {34.0}	8.0 (12.0) [8.5] {8.5}	38.0 (46.0) [52.5] {52.5}
Allowable Gap	1.5	1.5	1.5	1.5
Time Before Reduction	30.0			25.0
Time to Reduce	15.0			10.0
Yellow	4.0	3.6	3.5	4.0
All-Red	1.5	2.4	-	1.5
Walk**	-	-	-	7.0**
Flashing Don't Walk**	-	-	-	19.0**

Background Cycle: 105.0 (105.0) [110.0] {110.0}

Offset Referenced to Phases 2 & 6: 99.0 (102.0) [104.0] {FREE}

Phases 2 & 6 – Max Recall AM, MID & PM peaks; Min Recall Free.

Yellow and All Red times were determined using the WisDOT kinematic equation. All red time was not allowed to exceed 3.0-seconds and any remainder was added to the yellow time per WisDOT request.

****NOTE:** The design plans show an exclusive through lane, shared through/right-turn lane and an exclusive right-turn lane without a right-turn island on the eastbound approach to the IH-43 southbound ramps. A concern with this design is motorists in the shared thru/right-turn will not have adequate sight distance around vehicles in the exclusive right-turn lane to see pedestrians crossing the SB on-ramp. The eastbound green ball would allow a dual right-turn movement to cross the crosswalk at the same time a "WALK" indication is present for pedestrians.

Strong consideration should be given to operating the EB approach to the IH-43 SB ramps with two thru lanes and an exclusive right-turn lane as a temporary solution to alleviate this sight distance concern.

Traffic Signal Timing – *STH 167 & IH-43 NB Ramps*

This traffic signal shall be fully operational, as shown in the "Sequence of Operations" sheet in the plan set. The traffic signals shall be timed according to the following traffic signal timings.

PROPOSED SIGNAL TIMING
STH 167 & IH-43 NB Ramps – Mequon, WI

Phase	STH 167 **1**	STH 167 **2**	STH 167 **6**	43 NB Off **8**
Initial Interval	6.5	11.5	10.0	8.5
Variable Initial	-	23.0	29.0	-
Minimum Assured Green	8.0	15.0	15.0	10.0
Number of Actuations	-	9	12	-
Passage Time	1.5	3.5	5.0	1.5
Extension Stretch	-	-	-	2.0
Maximum Green AM (MID) [PM] {FREE}	25.0 (30.5) [41.5] {30.5}	26.3 (20.8) [16.3] {24.8}	54.8 (54.8) [61.3] {58.8}	39.0 (39.0) [37.5] {40.0}
Allowable Gap	1.5	1.5	1.5	1.5
Time Before Reduction	-	10.0	30.0	-
Time to Reduce	-	5.0	15.0	-
Yellow	3.5	4.0	4.0	3.6
All-Red	-	1.7	1.7	1.9
Walk	-	-	7.0	-
Flashing Don't Walk	-	-	18.0	-

Background Cycle: 105.0
(105.0)
[110.0]
{110.0}

Offset Referenced to Phases 2 & 6: 55.0
(58.0)
[69.0]
{FREE}

Phases 2 & 6 – Max Recall AM, MID & PM peaks; Min Recall Free.

Yellow and All Red times were determined using the WisDOT kinematic equation. All red time was not allowed to exceed 3.0-seconds and any remainder was added to the yellow time per WisDOT request.

APPENDIX B

BACKGROUND TRAFFIC
PEAK HOUR ANALYSIS OUTPUTS

APPENDIX B

Year 2010 Background Traffic Analysis – No Improvements

Volume
200: Mequon Road & Wauwatosa Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	515	50	135	695	210	175	435	105	135	180	90
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.950			0.950			0.611			0.362		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1138	3539	1583	643	3374	1509
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Adj. Flow (vph)	221	542	26	142	732	111	184	458	55	142	189	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	221	542	26	142	732	111	184	458	55	142	189	47
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	11.5	17.9	17.9	11.5	17.9	17.9	11.5	18.0	18.0	11.5	18.0	18.0
Total Split (s)	28.5	45.9	45.9	28.5	45.9	45.9	23.5	46.0	46.0	23.5	46.0	46.0
Total Split (%)	19.8%	31.9%	31.9%	19.8%	31.9%	31.9%	16.3%	32.0%	32.0%	16.3%	32.0%	32.0%
Maximum Green (s)	25.0	40.0	40.0	25.0	40.0	40.0	20.0	40.0	40.0	20.0	40.0	40.0
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0
All-Red Time (s)	0.0	0.9	0.9	0.0	0.9	0.9	0.0	1.0	1.0	0.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Minimum Gap (s)	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0
Time Before Reduce (s)	15.0	24.0	24.0	15.0	18.0	18.0	15.0	24.0	24.0	15.0	22.0	22.0
Time To Reduce (s)	0.0	16.0	16.0	0.0	22.0	22.0	0.0	16.0	16.0	0.0	18.0	18.0
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
v/c Ratio	0.70	0.46	0.05	0.60	0.72	0.25	0.37	0.62	0.17	0.40	0.28	0.15
Control Delay	53.2	28.5	25.9	54.5	37.4	31.3	24.1	40.9	37.2	25.2	36.8	38.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.2	28.5	25.9	54.5	37.4	31.3	24.1	40.9	37.2	25.2	36.8	38.0
90th %ile Green (s)	25.0	44.1	44.1	19.7	38.8	38.8	18.5	28.9	28.9	17.4	27.8	27.8
90th %ile Term Code	Max	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
70th %ile Green (s)	21.7	38.5	38.5	16.0	32.8	32.8	15.4	24.1	24.1	14.3	23.0	23.0
70th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
50th %ile Green (s)	17.6	31.8	31.8	13.0	27.2	27.2	12.5	20.6	20.6	11.8	19.9	19.9
50th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
30th %ile Green (s)	14.1	27.6	27.6	10.4	23.9	23.9	10.2	16.6	16.6	9.4	15.8	15.8
30th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
10th %ile Green (s)	10.2	20.3	20.3	8.0	18.1	18.1	8.0	13.1	13.1	8.0	13.1	13.1

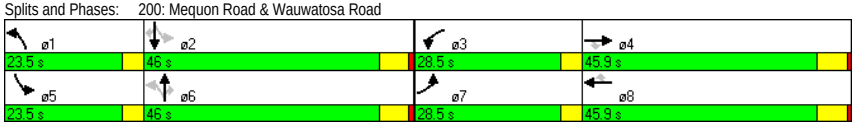
Volume
200: Mequon Road & Wauwatosa Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Gap	Hold	Hold	Min	Gap	Gap	Min	Gap	Gap	Min	Hold	Hold
Queue Length 50th (ft)	127	136	11	83	212	52	74	133	28	56	51	24
Queue Length 95th (ft)	261	238	36	181	355	121	158	238	75	125	105	68
Internal Link Dist (ft)		559			585			1105			792	
Turn Bay Length (ft)	135		35	295		50	185		110	150		200
Base Capacity (vph)	476	1546	691	476	1523	681	586	1523	681	478	1452	650
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.35	0.04	0.30	0.48	0.16	0.31	0.30	0.08	0.30	0.13	0.07

Intersection Summary
Cycle Length: 143.9
Actuated Cycle Length: 97.6
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 129
70th %ile Actuated Cycle: 111.8
50th %ile Actuated Cycle: 96.1
30th %ile Actuated Cycle: 82.9
10th %ile Actuated Cycle: 68.3

Splits and Phases: 200: Mequon Road & Wauwatosa Road



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Traffic Analysis & Design, Inc.
Synchro 7 - Report

HCM Signalized Intersection Capacity Analysis
200: Mequon Road & Wauwatosa Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	515	50	135	695	210	175	435	105	135	180	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.61	1.00	1.00	0.36	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1138	3539	1583	643	3374	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	221	542	26	142	732	111	184	458	55	142	189	47
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	221	542	26	142	732	111	184	458	55	142	189	47
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Actuated Green, G (s)	17.4	32.2	32.2	13.2	28.0	28.0	33.1	20.4	20.4	31.7	19.7	19.7
Effective Green, g (s)	17.4	32.2	32.2	13.2	28.0	28.0	33.1	20.4	20.4	31.7	19.7	19.7
Actuated g/C Ratio	0.18	0.33	0.33	0.14	0.29	0.29	0.34	0.21	0.21	0.33	0.20	0.20
Clearance Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Lane Grp Cap (vph)	318	1178	527	242	1025	458	473	747	334	340	687	307
v/s Ratio Prot	c0.12	0.15		0.08	c0.21		0.05	c0.13		c0.05	0.06	
v/s Ratio Perm			0.02			0.07	0.08		0.03	0.09		0.03
v/c Ratio	0.69	0.46	0.05	0.59	0.71	0.24	0.39	0.61	0.16	0.42	0.28	0.15
Uniform Delay, d1	37.2	25.4	21.9	39.2	30.8	26.2	23.3	34.6	31.2	24.0	32.5	31.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.2	0.4	0.1	2.3	2.5	0.3	0.2	1.7	0.3	0.3	0.3	0.3
Delay (s)	42.4	25.8	21.9	41.5	33.2	26.6	23.5	36.2	31.5	24.3	32.8	32.0
Level of Service	D	C	C	D	C	C	C	D	C	C	C	C
Approach Delay (s)		30.3			33.7			32.5			29.5	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	31.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	96.7	Sum of lost time (s)	12.9
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Volume
230: Mequon Road & Concord Creek Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	865	45	50	1030	5	30	1	35	10	1	10
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.954			0.957	
Satd. Flow (prot)	1752	3505	1411	1752	3505	1411	0	1777	1583	0	1432	1272
Flt Permitted	0.950			0.950				0.954			0.957	
Satd. Flow (perm)	1752	3505	1411	1752	3505	1411	0	1777	1583	0	1432	1272
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	27%	27%	27%
Adj. Flow (vph)	5	901	47	52	1073	5	31	1	36	10	1	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	901	47	52	1073	5	0	32	36	0	11	10
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized
Description: High SB %HV

HCM Unsignalized Intersection Capacity Analysis
230: Mequon Road & Concord Creek Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	865	45	50	1030	5	30	1	35	10	1	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	901	47	52	1073	5	31	1	36	10	1	10
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	1078			948			1563	2094	451	1675	2135	536
vC1, stage 1 conf vol							911	911		1177	1177	
vC2, stage 2 conf vol							652	1182		498	958	
vCu, unblocked vol	1078			948			1563	2094	451	1675	2135	536
tC, single (s)	4.2			4.2			7.5	6.5	6.9	8.0	7.0	7.4
tC, 2 stage (s)							6.5	5.5		7.0	6.0	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.8	4.3	3.6
p0 queue free %	99			93			83	99	93	91	99	98
cM capacity (veh/h)	637			714			181	150	556	115	113	429

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1	SB 2
Volume Total	5	451	451	47	52	536	536	5	32	36	11	10
Volume Left	5	0	0	0	52	0	0	0	31	0	10	0
Volume Right	0	0	0	47	0	0	0	5	0	36	0	10
cSH	637	1700	1700	1700	714	1700	1700	1700	180	556	115	429
Volume to Capacity	0.01	0.27	0.27	0.03	0.07	0.32	0.32	0.00	0.18	0.07	0.10	0.02
Queue Length 95th (ft)	1	0	0	0	6	0	0	0	16	5	8	2
Control Delay (s)	10.7	0.0	0.0	0.0	10.4	0.0	0.0	0.0	29.4	11.9	39.8	13.6
Lane LOS	B				B				D	B	E	B
Approach Delay (s)	0.1				0.5				20.1		27.3	
Approach LOS									C		D	

Intersection Summary				
Average Delay		1.2		
Intersection Capacity Utilization		50.2%	ICU Level of Service	A
Analysis Period (min)		15		
Description: High SB %HV				

Volume
270: Mequon Road & River Birch Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	905	1	5	1080	5	5	1	5	1	1	1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.939			0.955	
Flt Protected	0.950			0.950				0.978			0.984	
Satd. Flow (prot)	1787	3574	1439	1752	3505	1411	0	1728	0	0	1768	0
Flt Permitted	0.950			0.950				0.978			0.984	
Satd. Flow (perm)	1787	3574	1439	1752	3505	1411	0	1728	0	0	1768	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
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	984	1	5	1174	5	5	1	5	1	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	984	1	5	1174	5	0	11	0	0	3	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
270: Mequon Road & River Birch Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	905	1	5	1080	5	5	1	5	1	1	1
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	984	1	5	1174	5	5	1	5	1	1	1
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)					626							
pX, platoon unblocked	0.90						0.90	0.90		0.90	0.90	0.90
vC, conflicting volume	1179			985			1594	2185	492	1693	2180	587
vC1, stage 1 conf vol							995	995		1185	1185	
vC2, stage 2 conf vol							599	1190		509	996	
vCu, unblocked vol	987			985			1445	2098	492	1555	2094	332
tC, single (s)	4.1			4.2			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			99			97	99	99	99	99	100
cM capacity (veh/h)	635			691			195	158	525	173	159	603

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	5	492	492	1	5	587	587	5	12	3
Volume Left	5	0	0	0	5	0	0	0	5	1
Volume Right	0	0	0	1	0	0	0	5	5	1
cSH	635	1700	1700	1700	691	1700	1700	1700	265	219
Volume to Capacity	0.01	0.29	0.29	0.00	0.01	0.35	0.35	0.00	0.05	0.01
Queue Length 95th (ft)	1	0	0	0	1	0	0	0	4	1
Control Delay (s)	10.7	0.0	0.0	0.0	10.3	0.0	0.0	0.0	19.2	21.7
Lane LOS	B				B				C	C
Approach Delay (s)	0.1				0.0				19.2	21.7
Approach LOS									C	C

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		39.9%	ICU Level of Service
Analysis Period (min)		15	

Volume
280: Mequon Road & Buntrock Avenue

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	840	10	25	985	15	65	35	45	10	5	40
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.968			0.967	
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411	0	1786	1568	0	1801	1583
Flt Permitted	0.257			0.308				0.794			0.756	
Satd. Flow (perm)	479	3539	1425	568	3505	1411	0	1465	1568	0	1408	1583
Satd. Flow (RTOR)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	64	894	5	27	1048	8	69	37	24	11	5	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	894	5	27	1048	8	0	106	24	0	16	21
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	6	6	6	2	2	2	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	21.4	21.4	21.4	21.4	21.4	21.4	17.1	17.1	17.1	17.1	17.1	17.1
Total Split (s)	80.0	80.0	80.0	80.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Maximum Green (s)	73.6	73.6	73.6	73.6	73.6	73.6	32.9	32.9	32.9	32.9	32.9	32.9
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.4	7.1	7.1	7.1	7.1	7.1	7.1
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.5	5.5	5.5	5.5	5.5	5.5	1.5	1.5	1.5	1.5	1.5	1.5
Minimum Gap (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Time Before Reduce (s)	30.0	30.0	30.0	30.0	30.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	15.0	15.0	15.0	15.0	15.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	None
v/c Ratio	0.17	0.33	0.00	0.06	0.38	0.01		0.65	0.14		0.10	0.12
Control Delay	5.3	4.6	3.8	0.9	1.2	0.8		69.4	48.1		47.3	47.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	5.3	4.6	3.8	0.9	1.2	0.8		69.4	48.1		47.3	47.6
90th %ile Green (s)	87.9	87.9	87.9	87.9	87.9	87.9	18.6	18.6	18.6	18.6	18.6	18.6
90th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
70th %ile Green (s)	91.4	91.4	91.4	91.4	91.4	91.4	15.1	15.1	15.1	15.1	15.1	15.1
70th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
50th %ile Green (s)	93.9	93.9	93.9	93.9	93.9	93.9	12.6	12.6	12.6	12.6	12.6	12.6
50th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
30th %ile Green (s)	96.4	96.4	96.4	96.4	96.4	96.4	10.1	10.1	10.1	10.1	10.1	10.1
30th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
10th %ile Green (s)	96.5	96.5	96.5	96.5	96.5	96.5	10.0	10.0	10.0	10.0	10.0	10.0

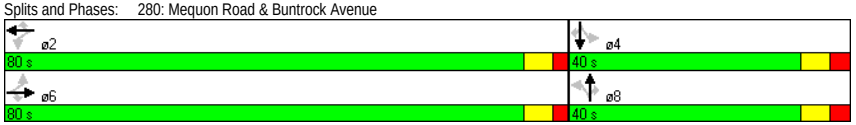
Volume
280: Mequon Road & Buntrock Avenue 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Min	Min	Min	Hold	Hold	Hold
Queue Length 50th (ft)	10	87	1	1	13	0		80	17		11	15
Queue Length 95th (ft)	30	141	4	m2	21	m1		135	42		32	39
Internal Link Dist (ft)		546			209			420			420	
Turn Bay Length (ft)	100			120					70			40
Base Capacity (vph)	372	2749	1107	441	2723	1096		402	430		386	434
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	0.17	0.33	0.00	0.06	0.38	0.01		0.26	0.06		0.04	0.05

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 49 (41%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 280: Mequon Road & Buntrock Avenue



HCM Signalized Intersection Capacity Analysis
280: Mequon Road & Buntrock Avenue 12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	840	10	25	985	15	65	35	45	10	5	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	9	12	12	9	12	12	12	12	12	12
Total Lost time (s)	6.4	6.4	6.4	6.4	6.4	6.4		7.1	7.1		7.1	7.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411		1787	1568		1801	1583
Flt Permitted	0.26	1.00	1.00	0.31	1.00	1.00		0.79	1.00		0.76	1.00
Satd. Flow (perm)	479	3539	1425	568	3505	1411		1464	1568		1409	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	64	894	5	27	1048	8	69	37	24	11	5	21
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	64	894	5	27	1048	8	0	106	24	0	16	21
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Actuated Green, G (s)	93.2	93.2	93.2	93.2	93.2	93.2		13.3	13.3		13.3	13.3
Effective Green, g (s)	93.2	93.2	93.2	93.2	93.2	93.2		13.3	13.3		13.3	13.3
Actuated g/C Ratio	0.78	0.78	0.78	0.78	0.78	0.78		0.11	0.11		0.11	0.11
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4	6.4		7.1	7.1		7.1	7.1
Vehicle Extension (s)	5.5	5.5	5.5	5.5	5.5	5.5		1.5	1.5		1.5	1.5
Lane Grp Cap (vph)	372	2749	1107	441	2722	1096		162	174		156	175
v/s Ratio Prot		0.25			c0.30							
v/s Ratio Perm	0.13		0.00	0.05		0.01		c0.07	0.02		0.01	0.01
v/c Ratio	0.17	0.33	0.00	0.06	0.39	0.01		0.65	0.14		0.10	0.12
Uniform Delay, d1	3.5	4.0	3.0	3.1	4.3	3.0		51.1	48.2		48.0	48.1
Progression Factor	1.00	1.00	1.00	0.16	0.19	0.19		1.00	1.00		1.00	1.00
Incremental Delay, d2	1.0	0.3	0.0	0.2	0.3	0.0		7.0	0.1		0.1	0.1
Delay (s)	4.5	4.3	3.0	0.7	1.1	0.6		58.2	48.3		48.1	48.2
Level of Service	A	A	A	A	A	A		E	D		D	D
Approach Delay (s)		4.3			1.1			56.4			48.1	
Approach LOS		A			A			E			D	

Intersection Summary

HCM Average Control Delay	6.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Volume
300: Mequon Road & Public Works Access

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	885	10	45	955	5	65	5	240	1	1	5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.904	
Flt Protected	0.950			0.950				0.955			0.993	
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411	0	1720	1531	0	1689	0
Flt Permitted	0.950			0.950				0.955			0.993	
Satd. Flow (perm)	1770	3539	1425	1752	3505	1411	0	1720	1531	0	1689	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	1	941	11	48	1016	5	69	5	255	1	1	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	941	11	48	1016	5	0	74	255	0	7	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
300: Mequon Road & Public Works Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	885	10	45	955	5	65	5	240	1	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1	941	11	48	1016	5	69	5	255	1	1	5
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)		618			1272							
pX, platoon unblocked	0.83			0.93			0.86	0.86	0.93	0.86	0.86	0.83
vC, conflicting volume	1021			952			1553	2061	471	1843	2066	508
vC1, stage 1 conf vol							944	944		1112	1112	
vC2, stage 2 conf vol							610	1117		731	954	
vCu, unblocked vol	602			792			942	1531	273	1278	1537	0
tC, single (s)	4.1			4.2			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 %	100			94			74	97	62	99	99	99
cM capacity (veh/h)	802			759			267	203	672	146	193	897

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1
Volume Total	1	471	471	11	48	508	508	5	74	255	7
Volume Left	1	0	0	0	48	0	0	0	69	0	1
Volume Right	0	0	0	11	0	0	0	5	0	255	5
cSH	802	1700	1700	1700	759	1700	1700	1700	261	672	398
Volume to Capacity	0.00	0.28	0.28	0.01	0.06	0.30	0.30	0.00	0.29	0.38	0.02
Queue Length 95th (ft)	0	0	0	0	5	0	0	0	29	44	1
Control Delay (s)	9.5	0.0	0.0	0.0	10.1	0.0	0.0	0.0	24.2	13.6	14.2
Lane LOS	A				B				C	B	B
Approach Delay (s)	0.0				0.5				16.0		14.2
Approach LOS									C		B

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
310: Mequon Road & Logeman Access

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1110	10	0	995	1	0	0	20	1	1	10
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.865		0.886	
Flt Protected											0.996	
Satd. Flow (prot)	0	3539	1425	0	3505	1411	0	0	1627	0	1660	0
Flt Permitted											0.996	
Satd. Flow (perm)	0	3539	1425	0	3505	1411	0	0	1627	0	1660	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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	1207	11	0	1082	1	0	0	22	1	1	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1212	11	0	1082	1	0	0	22	0	13	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
310: Mequon Road & Logeman Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1110	10	0	995	1	0	0	20	1	1	10
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	1207	11	0	1082	1	0	0	22	1	1	11
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)		1048			842							
pX, platoon unblocked	0.81			0.94			0.84	0.84	0.94	0.84	0.84	0.81
vC, conflicting volume	1083			1217			1770	2300	603	1717	2310	541
vC1, stage 1 conf vol							1217	1217		1082	1082	
vC2, stage 2 conf vol							552	1083		636	1228	
vCu, unblocked vol	622			1104			1206	1841	450	1144	1852	0
tC, single (s)	4.1			4.2			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			100			100	100	96	100	99	99
cM capacity (veh/h)	770			585			182	171	525	242	170	877

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	408	804	11	541	541	1	22	13
Volume Left	5	0	0	0	0	0	0	1
Volume Right	0	0	11	0	0	1	22	11
cSH	770	1700	1700	1700	1700	1700	525	561
Volume to Capacity	0.01	0.47	0.01	0.32	0.32	0.00	0.04	0.02
Queue Length 95th (ft)	1	0	0	0	0	0	3	2
Control Delay (s)	0.2	0.0	0.0	0.0	0.0	0.0	12.1	11.6
Lane LOS	A						B	B
Approach Delay (s)	0.1			0.0			12.1	11.6
Approach LOS							B	B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	47.5%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
320: Mequon Road & River Centre Center Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1055	75	65	935	60	55
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3574	1439	1752	3505	1787	1599
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3574	1439	1752	3505	1787	1599
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	1%	1%
Adj. Flow (vph)	1147	82	71	1016	65	60
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1147	82	71	1016	65	60
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
320: Mequon Road & River Centre Center Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1055	75	65	935	60	55
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)	1147	82	71	1016	65	60
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)	1243			647		
pX, platoon unblocked			0.96		0.82	0.96
vC, conflicting volume			1228		1796	573
vC1, stage 1 conf vol					1147	
vC2, stage 2 conf vol					649	
vCu, unblocked vol			1156		1326	475
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			88		70	88
cM capacity (veh/h)			571		219	518

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	573	573	82	71	508	508	65	60
Volume Left	0	0	0	71	0	0	65	0
Volume Right	0	0	82	0	0	0	0	60
cSH	1700	1700	1700	571	1700	1700	219	518
Volume to Capacity	0.34	0.34	0.05	0.12	0.30	0.30	0.30	0.12
Queue Length 95th (ft)	0	0	0	11	0	0	30	10
Control Delay (s)	0.0	0.0	0.0	12.2	0.0	0.0	28.3	12.9
Lane LOS				B			D	B
Approach Delay (s)	0.0			0.8			20.9	
Approach LOS							C	

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
330: Mequon Road & River Centre East Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1105	5	0	1000	0	35
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3539	1425	0	3505	0	1627
Flt Permitted						
Satd. Flow (perm)	3539	1425	0	3505	0	1627
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	3%	3%	1%	1%
Adj. Flow (vph)	1188	5	0	1075	0	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1188	5	0	1075	0	38
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
330: Mequon Road & River Centre East Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1105	5	0	1000	0	35
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)	1188	5	0	1075	0	38
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)				337		
pX, platoon unblocked					0.80	
vC, conflicting volume			1194		1726	594
vC1, stage 1 conf vol					1188	
vC2, stage 2 conf vol					538	
vCu, unblocked vol			1194		1403	594
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	92
cM capacity (veh/h)			575		208	451

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	594	594	5	538	538	38
Volume Left	0	0	0	0	0	0
Volume Right	0	0	5	0	0	38
cSH	1700	1700	1700	1700	1700	451
Volume to Capacity	0.35	0.35	0.00	0.32	0.32	0.08
Queue Length 95th (ft)	0	0	0	0	0	7
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	13.7
Lane LOS						B
Approach Delay (s)	0.0			0.0		13.7
Approach LOS						B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
340: Mequon Road & Cedarburg Road 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	305	775	60	210	755	475	120	580	185	330	220	125
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95
Frt			0.850			0.850			0.850		0.946	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3467	3574	1599	3433	3348	0
Flt Permitted	0.152			0.265			0.950			0.950		
Satd. Flow (perm)	283	3539	1583	494	3539	1583	3467	3574	1599	3433	3348	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Adj. Flow (vph)	321	816	32	221	795	250	126	611	97	347	232	132
Shared Lane Traffic (%)												
Lane Group Flow (vph)	321	816	32	221	795	250	126	611	97	347	364	0
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2			8			
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	6.0	12.0	12.0	6.0	12.0	12.0	6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.5	18.7	18.7	10.5	18.7	18.7	10.5	16.9	16.9	10.5	16.9	
Total Split (s)	19.0	41.0	41.0	19.0	41.0	41.0	15.0	40.0	40.0	20.0	45.0	0.0
Total Split (%)	15.8%	34.2%	34.2%	15.8%	34.2%	34.2%	12.5%	33.3%	33.3%	16.7%	37.5%	0.0%
Maximum Green (s)	14.5	34.3	34.3	14.5	34.3	34.3	10.5	33.1	33.1	15.5	38.1	
Yellow Time (s)	3.5	3.9	3.9	3.5	3.9	3.9	3.5	3.9	3.9	3.5	3.9	
All-Red Time (s)	1.0	2.8	2.8	1.0	2.8	2.8	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4	3.4	1.5	1.5	1.5	1.5	1.5	
Minimum Gap (s)	1.5	2.0	2.0	1.5	2.0	2.0	1.5	1.5	1.5	1.5	1.5	
Time Before Reduce (s)	15.0	28.0	28.0	15.0	20.0	20.0	20.0	40.0	40.0	30.0	40.0	
Time To Reduce (s)	0.0	12.0	12.0	0.0	20.0	20.0	0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
v/c Ratio	0.77	0.62	0.05	0.63	0.74	0.52	0.53	0.82	0.29	0.84	0.42	
Control Delay	35.1	33.3	26.9	25.7	43.2	40.1	61.7	54.3	40.9	69.4	37.6	
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	35.1	33.3	26.9	25.7	43.2	40.1	61.7	54.3	40.9	69.4	37.6	
90th %ile Green (s)	15.9	34.3	34.3	15.9	34.3	34.3	10.5	31.7	31.7	15.5	36.7	
90th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	Gap	Gap	Max	Hold	
70th %ile Green (s)	19.9	37.6	37.6	16.6	34.3	34.3	9.4	27.7	27.7	15.5	33.8	
70th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Gap	Gap	Gap	Max	Hold	
50th %ile Green (s)	22.2	42.7	42.7	13.8	34.3	34.3	8.3	25.4	25.4	15.5	32.6	
50th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Gap	Gap	Gap	Max	Hold	
30th %ile Green (s)	23.8	50.3	50.3	10.5	37.0	37.0	7.2	22.2	22.2	14.4	29.4	
30th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Gap	Gap	Gap	Gap	Hold	
10th %ile Green (s)	25.4	59.2	59.2	7.8	41.6	41.6	6.0	18.7	18.7	11.7	24.4	

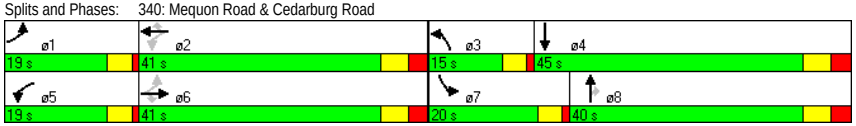
Volume
340: Mequon Road & Cedarburg Road 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Min	Gap	Gap	Gap	Hold	
Queue Length 50th (ft)	152	279	17	89	298	164	49	238	64	136	121	
Queue Length 95th (ft)	#372	390	44	155	375	251	80	285	107	#201	158	
Internal Link Dist (ft)		257			885			746			862	
Turn Bay Length (ft)	180		175	200		235	225		125	385		
Base Capacity (vph)	415	1322	591	383	1071	479	303	986	441	443	1063	
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	0.77	0.62	0.05	0.58	0.74	0.52	0.42	0.62	0.22	0.78	0.34	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 1 (1%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 340: Mequon Road & Cedarburg Road



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HCM Signalized Intersection Capacity Analysis
340: Mequon Road & Cedarburg Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	305	775	60	210	755	475	120	580	185	330	220	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3467	3574	1599	3433	3347	
Flt Permitted	0.15	1.00	1.00	0.26	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	283	3539	1583	493	3539	1583	3467	3574	1599	3433	3347	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	321	816	32	221	795	250	126	611	97	347	232	132
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	321	816	32	221	795	250	126	611	97	347	364	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2			8			
Actuated Green, G (s)	62.2	44.8	44.8	49.2	36.3	36.3	8.3	25.2	25.2	14.5	31.4	
Effective Green, g (s)	62.2	44.8	44.8	49.2	36.3	36.3	8.3	25.2	25.2	14.5	31.4	
Actuated g/C Ratio	0.52	0.37	0.37	0.41	0.30	0.30	0.07	0.21	0.21	0.12	0.26	
Clearance Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4	3.4	1.5	1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	412	1321	591	339	1071	479	240	751	336	415	876	
v/s Ratio Prot	c0.14	0.23		0.07	0.22		0.04	c0.17		c0.10	0.11	
v/s Ratio Perm	c0.27		0.02	0.20		0.16			0.06			
v/c Ratio	0.78	0.62	0.05	0.65	0.74	0.52	0.53	0.81	0.29	0.84	0.42	
Uniform Delay, d1	24.2	30.6	24.0	24.3	37.6	34.7	53.9	45.2	39.9	51.6	36.7	
Progression Factor	0.89	0.95	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.2	2.1	0.2	3.4	4.7	4.0	1.0	6.4	0.2	13.1	0.1	
Delay (s)	29.8	31.1	22.5	27.7	42.3	38.7	54.9	51.6	40.0	64.6	36.8	
Level of Service	C	C	C	C	D	D	D	D	D	E	D	
Approach Delay (s)		30.5			39.0			50.7			50.4	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	41.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX B

Year 2025 Background Traffic Analysis – No Improvements

Volume
200: Mequon Road & Wauwatosa Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	270	665	65	175	900	270	225	565	135	180	235	115
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.950			0.950			0.563			0.204		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1049	3539	1583	362	3374	1509
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Adj. Flow (vph)	284	700	34	184	947	142	237	595	71	189	247	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	284	700	34	184	947	142	237	595	71	189	247	61
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	11.5	17.9	17.9	11.5	17.9	17.9	11.5	18.0	18.0	11.5	18.0	18.0
Total Split (s)	31.0	46.0	46.0	25.0	40.0	40.0	19.0	30.0	30.0	19.0	30.0	30.0
Total Split (%)	25.8%	38.3%	38.3%	20.8%	33.3%	33.3%	15.8%	25.0%	25.0%	15.8%	25.0%	25.0%
Maximum Green (s)	27.5	40.1	40.1	21.5	34.1	34.1	15.5	24.0	24.0	15.5	24.0	24.0
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0
All-Red Time (s)	0.0	0.9	0.9	0.0	0.9	0.9	0.0	1.0	1.0	0.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Minimum Gap (s)	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0
Time Before Reduce (s)	15.0	24.0	24.0	15.0	18.0	18.0	15.0	24.0	24.0	15.0	22.0	22.0
Time To Reduce (s)	0.0	16.0	16.0	0.0	22.0	22.0	0.0	16.0	16.0	0.0	18.0	18.0
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
v/c Ratio	0.82	0.56	0.06	0.73	0.89	0.30	0.51	0.81	0.22	0.67	0.36	0.20
Control Delay	62.4	31.4	26.2	62.9	48.8	33.5	29.6	52.2	40.8	36.9	40.6	40.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.4	31.4	26.2	62.9	48.8	33.5	29.6	52.2	40.8	36.9	40.6	40.8
90th %ile Green (s)	27.5	40.1	40.1	21.5	34.1	34.1	15.5	24.0	24.0	15.5	24.0	24.0
90th %ile Term Code	Max	Hold	Hold	Max	Max	Max	Max	Max	Max	Max	Hold	Hold
70th %ile Green (s)	26.4	41.3	41.3	19.2	34.1	34.1	15.5	24.0	24.0	15.5	24.0	24.0
70th %ile Term Code	Gap	Hold	Hold	Gap	Max	Max	Max	Max	Max	Max	Hold	Hold
50th %ile Green (s)	22.3	40.4	40.4	16.0	34.1	34.1	15.2	24.0	24.0	14.3	23.1	23.1
50th %ile Term Code	Gap	Hold	Hold	Gap	Max	Max	Gap	Max	Max	Gap	Hold	Hold
30th %ile Green (s)	18.5	39.5	39.5	13.1	34.1	34.1	12.5	22.9	22.9	11.9	22.3	22.3
30th %ile Term Code	Gap	Hold	Hold	Gap	Max	Max	Gap	Gap	Gap	Gap	Hold	Hold
10th %ile Green (s)	13.0	30.3	30.3	9.1	26.4	26.4	9.2	17.3	17.3	8.3	16.4	16.4

Volume
200: Mequon Road & Wauwatosa Road

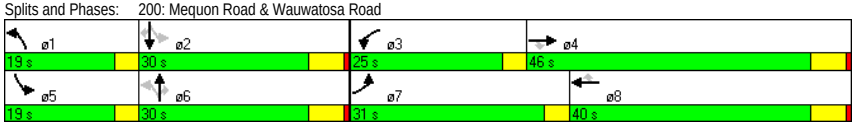
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
Queue Length 50th (ft)	200	214	16	131	347	80	120	218	43	94	82	37
Queue Length 95th (ft)	303	299	42	209	#508	145	199	#322	90	161	128	80
Internal Link Dist (ft)		559			585			1105			792	
Turn Bay Length (ft)	135		35	295		50	185		110	150		200
Base Capacity (vph)	456	1339	599	357	1131	506	489	796	356	324	759	340
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.52	0.06	0.52	0.84	0.28	0.48	0.75	0.20	0.58	0.33	0.18

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 108.5
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 120
70th %ile Actuated Cycle: 118.9
50th %ile Actuated Cycle: 113.6
30th %ile Actuated Cycle: 106.3
10th %ile Actuated Cycle: 83.9
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 200: Mequon Road & Wauwatosa Road



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Traffic Analysis & Design, Inc.
Synchro 7 - Report

HCM Signalized Intersection Capacity Analysis
200: Mequon Road & Wauwatosa Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	270	665	65	175	900	270	225	565	135	180	235	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.56	1.00	1.00	0.20	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1050	3539	1583	362	3374	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	284	700	34	184	947	142	237	595	71	189	247	61
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	284	700	34	184	947	142	237	595	71	189	247	61
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Actuated Green, G (s)	21.2	38.4	38.4	15.5	32.7	32.7	36.0	22.5	22.5	34.8	21.9	21.9
Effective Green, g (s)	21.2	38.4	38.4	15.5	32.7	32.7	36.0	22.5	22.5	34.8	21.9	21.9
Actuated g/C Ratio	0.20	0.35	0.35	0.14	0.30	0.30	0.33	0.21	0.21	0.32	0.20	0.20
Clearance Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Lane Grp Cap (vph)	347	1256	562	254	1070	478	439	736	329	274	683	305
v/s Ratio Prot	c0.16	0.20		0.10	c0.27		0.07	c0.17		c0.08	0.07	
v/s Ratio Perm			0.02			0.09	0.11		0.04	0.14		0.04
v/c Ratio	0.82	0.56	0.06	0.72	0.89	0.30	0.54	0.81	0.22	0.69	0.36	0.20
Uniform Delay, d1	41.7	28.1	23.0	44.3	36.0	28.9	27.8	40.8	35.5	28.8	37.1	35.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.2	0.6	0.1	8.4	9.1	0.4	0.6	6.8	0.4	5.7	0.4	0.4
Delay (s)	54.9	28.7	23.1	52.7	45.0	29.3	28.5	47.6	36.0	34.5	37.6	36.3
Level of Service	D	C	C	D	D	C	C	D	D	C	D	D
Approach Delay (s)		35.8			44.4			41.7			36.3	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	40.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	108.2	Sum of lost time (s)	12.9
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Volume
230: Mequon Road & Concord Creek Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1115	60	65	1335	5	40	1	50	15	1	15
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.953			0.955	
Satd. Flow (prot)	1752	3505	1411	1752	3505	1411	0	1775	1583	0	1429	1272
Flt Permitted	0.950			0.950				0.953			0.955	
Satd. Flow (perm)	1752	3505	1411	1752	3505	1411	0	1775	1583	0	1429	1272
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	27%	27%	27%
Adj. Flow (vph)	5	1161	63	68	1391	5	42	1	52	16	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1161	62	68	1391	5	0	43	52	0	17	16
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized
Description: High SB %HV

HCM Unsignalized Intersection Capacity Analysis
230: Mequon Road & Concord Creek Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1115	60	65	1335	5	40	1	50	15	1	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	1161	62	68	1391	5	42	1	52	16	1	16
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	1396			1224			2019	2703	581	2170	2760	695
vC1, stage 1 conf vol							1172	1172		1526	1526	
vC2, stage 2 conf vol							847	1531		644	1234	
vCu, unblocked vol	1396			1224			2019	2703	581	2170	2760	695
tC, single (s)	4.2			4.2			7.5	6.5	6.9	8.0	7.0	7.4
tC, 2 stage (s)							6.5	5.5		7.0	6.0	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.8	4.3	3.6
p0 queue free %	99			88			64	99	89	75	98	95
cM capacity (veh/h)	481			560			117	95	457	63	64	332

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1	SB 2
Volume Total	5	581	581	62	68	695	695	5	43	52	17	16
Volume Left	5	0	0	0	68	0	0	0	42	0	16	0
Volume Right	0	0	0	62	0	0	0	5	0	52	0	16
cSH	481	1700	1700	1700	560	1700	1700	1700	117	457	63	332
Volume to Capacity	0.01	0.34	0.34	0.04	0.12	0.41	0.41	0.00	0.37	0.11	0.26	0.05
Queue Length 95th (ft)	1	0	0	0	10	0	0	0	37	10	23	4
Control Delay (s)	12.6	0.0	0.0	0.0	12.3	0.0	0.0	0.0	52.7	13.9	81.0	16.4
Lane LOS	B				B				F	B	F	C
Approach Delay (s)	0.1				0.6				31.4		49.7	
Approach LOS									D		E	

Intersection Summary			
Average Delay		1.9	
Intersection Capacity Utilization		59.2%	ICU Level of Service
Analysis Period (min)		15	
Description: High SB %HV			

Volume
270: Mequon Road & River Birch Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1175	1	5	1400	5	5	1	5	1	1	1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.939			0.955	
Flt Protected	0.950			0.950				0.978			0.984	
Satd. Flow (prot)	1787	3574	1439	1752	3505	1411	0	1728	0	0	1768	0
Flt Permitted	0.950			0.950				0.978			0.984	
Satd. Flow (perm)	1787	3574	1439	1752	3505	1411	0	1728	0	0	1768	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
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	1277	1	5	1522	5	5	1	5	1	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1277	1	5	1522	5	0	11	0	0	3	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
270: Mequon Road & River Birch Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1175	1	5	1400	5	5	1	5	1	1	1
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	1277	1	5	1522	5	5	1	5	1	1	1
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)					626							
pX, platoon unblocked	0.84						0.84	0.84		0.84	0.84	0.84
vC, conflicting volume	1527			1278			2061	2826	639	2188	2822	761
vC1, stage 1 conf vol							1288	1288		1533	1533	
vC2, stage 2 conf vol							773	1538		655	1289	
vCu, unblocked vol	1240			1278			1879	2792	639	2030	2787	325
tC, single (s)	4.1			4.2			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			99			96	99	99	99	99	100
cM capacity (veh/h)	471			534			131	104	421	111	105	564

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	5	639	639	1	5	761	761	5	12	3
Volume Left	5	0	0	0	5	0	0	0	5	1
Volume Right	0	0	0	1	0	0	0	5	5	1
cSH	471	1700	1700	1700	534	1700	1700	1700	184	148
Volume to Capacity	0.01	0.38	0.38	0.00	0.01	0.45	0.45	0.00	0.06	0.02
Queue Length 95th (ft)	1	0	0	0	1	0	0	0	5	2
Control Delay (s)	12.7	0.0	0.0	0.0	11.8	0.0	0.0	0.0	25.9	29.9
Lane LOS	B				B				D	D
Approach Delay (s)	0.1				0.0				25.9	29.9
Approach LOS									D	D

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		48.7%	ICU Level of Service
Analysis Period (min)		15	

Volume
280: Mequon Road & Buntrock Avenue

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	1085	15	35	1265	20	90	45	60	15	5	55
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.968			0.963	
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411	0	1786	1568	0	1794	1583
Flt Permitted	0.174			0.222				0.787			0.723	
Satd. Flow (perm)	324	3539	1425	410	3505	1411	0	1452	1568	0	1347	1583
Satd. Flow (RTOR)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	85	1154	8	37	1346	11	96	48	32	16	5	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	85	1154	8	37	1346	11	0	144	32	0	21	29
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	6	6	6	2	2	2	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	21.4	21.4	21.4	21.4	21.4	21.4	17.1	17.1	17.1	17.1	17.1	17.1
Total Split (s)	80.0	80.0	80.0	80.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Maximum Green (s)	73.6	73.6	73.6	73.6	73.6	73.6	32.9	32.9	32.9	32.9	32.9	32.9
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.4	7.1	7.1	7.1	7.1	7.1	7.1
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.5	5.5	5.5	5.5	5.5	5.5	1.5	1.5	1.5	1.5	1.5	1.5
Minimum Gap (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Time Before Reduce (s)	30.0	30.0	30.0	30.0	30.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	15.0	15.0	15.0	15.0	15.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	None
v/c Ratio	0.35	0.43	0.01	0.12	0.51	0.01		0.74	0.15		0.12	0.14
Control Delay	10.8	6.5	5.0	1.7	3.4	1.0		70.9	45.1		44.4	44.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	10.8	6.5	5.0	1.7	3.4	1.0		70.9	45.1		44.4	44.7
90th %ile Green (s)	83.6	83.6	83.6	83.6	83.6	83.6	22.9	22.9	22.9	22.9	22.9	22.9
90th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
70th %ile Green (s)	87.6	87.6	87.6	87.6	87.6	87.6	18.9	18.9	18.9	18.9	18.9	18.9
70th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
50th %ile Green (s)	90.6	90.6	90.6	90.6	90.6	90.6	15.9	15.9	15.9	15.9	15.9	15.9
50th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
30th %ile Green (s)	93.5	93.5	93.5	93.5	93.5	93.5	13.0	13.0	13.0	13.0	13.0	13.0
30th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
10th %ile Green (s)	96.5	96.5	96.5	96.5	96.5	96.5	10.0	10.0	10.0	10.0	10.0	10.0

Volume
280: Mequon Road & Buntrock Avenue

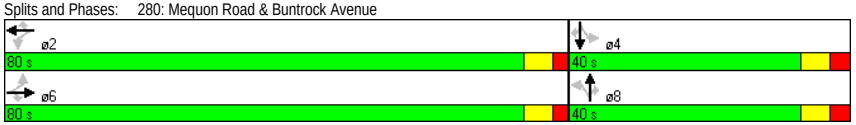
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Min	Min	Min	Hold	Hold	Hold
Queue Length 50th (ft)	19	146	1	1	19	0		109	22		15	20
Queue Length 95th (ft)	60	232	6	m3	m453	m1		170	50		37	46
Internal Link Dist (ft)		546			209			420			420	
Turn Bay Length (ft)	100			120					70			40
Base Capacity (vph)	244	2665	1073	309	2639	1062		398	430		369	434
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	0.35	0.43	0.01	0.12	0.51	0.01		0.36	0.07		0.06	0.07

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 49 (41%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 280: Mequon Road & Buntrock Avenue



HCM Signalized Intersection Capacity Analysis
280: Mequon Road & Buntrock Avenue

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	1085	15	35	1265	20	90	45	60	15	5	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	9	12	12	9	12	12	12	12	12	12
Total Lost time (s)	6.4	6.4	6.4	6.4	6.4	6.4		7.1	7.1		7.1	7.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00		0.96	1.00
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411		1785	1568		1794	1583
Flt Permitted	0.17	1.00	1.00	0.22	1.00	1.00		0.79	1.00		0.72	1.00
Satd. Flow (perm)	324	3539	1425	410	3505	1411		1451	1568		1346	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	85	1154	8	37	1346	11	96	48	32	16	5	29
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	85	1154	8	37	1346	11	0	144	32	0	21	29
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Actuated Green, G (s)	90.4	90.4	90.4	90.4	90.4	90.4		16.1	16.1		16.1	16.1
Effective Green, g (s)	90.4	90.4	90.4	90.4	90.4	90.4		16.1	16.1		16.1	16.1
Actuated g/C Ratio	0.75	0.75	0.75	0.75	0.75	0.75		0.13	0.13		0.13	0.13
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4	6.4		7.1	7.1		7.1	7.1
Vehicle Extension (s)	5.5	5.5	5.5	5.5	5.5	5.5		1.5	1.5		1.5	1.5
Lane Grp Cap (vph)	244	2666	1074	309	2640	1063		195	210		181	212
v/s Ratio Prot		0.33			c0.38							
v/s Ratio Perm	0.26		0.01	0.09		0.01		c0.10	0.02		0.02	0.02
v/c Ratio	0.35	0.43	0.01	0.12	0.51	0.01		0.74	0.15		0.12	0.14
Uniform Delay, d1	4.9	5.4	3.7	4.0	5.9	3.7		49.9	45.9		45.7	45.8
Progression Factor	1.00	1.00	1.00	0.22	0.44	0.20		1.00	1.00		1.00	1.00
Incremental Delay, d2	3.9	0.5	0.0	0.5	0.5	0.0		11.8	0.1		0.1	0.1
Delay (s)	8.8	5.9	3.7	1.4	3.1	0.7		61.8	46.0		45.8	45.9
Level of Service	A	A	A	A	A	A		E	D		D	D
Approach Delay (s)		6.1			3.0			58.9			45.9	
Approach LOS		A			A			E			D	

Intersection Summary

HCM Average Control Delay	8.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Volume
300: Mequon Road & Public Works Access

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	1145	15	60	1235	5	80	5	310	1	1	5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.904	
Flt Protected	0.950			0.950				0.955			0.993	
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411	0	1720	1531	0	1689	0
Flt Permitted	0.950			0.950				0.955			0.993	
Satd. Flow (perm)	1770	3539	1425	1752	3505	1411	0	1720	1531	0	1689	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	1	1218	16	64	1314	5	85	5	330	1	1	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	1218	16	64	1314	5	0	90	330	0	7	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
300: Mequon Road & Public Works Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	1145	15	60	1235	5	80	5	310	1	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1	1218	16	64	1314	5	85	5	330	1	1	5
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)		618			1272							
pX, platoon unblocked	0.75			0.88			0.81	0.81	0.88	0.81	0.81	0.75
vC, conflicting volume	1319			1234			2011	2667	609	2385	2678	657
vC1, stage 1 conf vol							1220	1220		1441	1441	
vC2, stage 2 conf vol							790	1447		944	1236	
vCu, unblocked vol	749			986			1091	1903	273	1554	1916	0
tC, single (s)	4.1			4.2			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 %	100			89			57	96	48	99	99	99
cM capacity (veh/h)	639			605			198	139	635	76	126	812

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1
Volume Total	1	609	609	16	64	657	657	5	90	330	7
Volume Left	1	0	0	0	64	0	0	0	85	0	1
Volume Right	0	0	0	16	0	0	0	5	0	330	5
cSH	639	1700	1700	1700	605	1700	1700	1700	193	635	257
Volume to Capacity	0.00	0.36	0.36	0.01	0.11	0.39	0.39	0.00	0.47	0.52	0.03
Queue Length 95th (ft)	0	0	0	0	9	0	0	0	56	75	2
Control Delay (s)	10.6	0.0	0.0	0.0	11.6	0.0	0.0	0.0	39.0	16.6	19.4
Lane LOS	B				B				E	C	C
Approach Delay (s)	0.0				0.5				21.4		19.4
Approach LOS									C		C

Intersection Summary				
Average Delay	3.3			
Intersection Capacity Utilization	64.2%	ICU Level of Service	C	
Analysis Period (min)	15			

Volume
310: Mequon Road & Logeman Access

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1435	15	0	1285	1	0	0	25	1	1	15
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.865		0.880	
Flt Protected											0.997	
Satd. Flow (prot)	0	3539	1425	0	3505	1411	0	0	1627	0	1650	0
Flt Permitted											0.997	
Satd. Flow (perm)	0	3539	1425	0	3505	1411	0	0	1627	0	1650	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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	1560	16	0	1397	1	0	0	27	1	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1565	16	0	1397	1	0	0	27	0	18	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
310: Mequon Road & Logeman Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1435	15	0	1285	1	0	0	25	1	1	15
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	1560	16	0	1397	1	0	0	27	1	1	16
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)		1048			842							
pX, platoon unblocked	0.73			0.88			0.79	0.79	0.88	0.79	0.79	0.73
vC, conflicting volume	1398			1576			2286	2968	780	2215	2984	698
vC1, stage 1 conf vol							1571	1571		1397	1397	
vC2, stage 2 conf vol							715	1398		818	1587	
vCu, unblocked vol	799			1383			1413	2279	480	1322	2299	0
tC, single (s)	4.1			4.2			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			100			100	100	94	99	99	98
cM capacity (veh/h)	596			428			118	116	471	180	115	792

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	525	1040	16	698	698	1	27	18
Volume Left	5	0	0	0	0	0	0	1
Volume Right	0	0	16	0	0	1	27	16
cSH	596	1700	1700	1700	1700	1700	471	512
Volume to Capacity	0.01	0.61	0.01	0.41	0.41	0.00	0.06	0.04
Queue Length 95th (ft)	1	0	0	0	0	0	5	3
Control Delay (s)	0.3	0.0	0.0	0.0	0.0	0.0	13.1	12.3
Lane LOS	A						B	B
Approach Delay (s)	0.1			0.0			13.1	12.3
Approach LOS							B	B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

Volume
320: Mequon Road & River Centre Center Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1365	95	80	1210	75	70
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3574	1439	1752	3505	1787	1599
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3574	1439	1752	3505	1787	1599
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	1%	1%
Adj. Flow (vph)	1484	103	87	1315	82	76
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1484	103	87	1315	82	76
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
320: Mequon Road & River Centre Center Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1365	95	80	1210	75	70
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)	1484	103	87	1315	82	76
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)	1243			647		
pX, platoon unblocked			0.90		0.78	0.90
vC, conflicting volume			1587		2315	742
vC1, stage 1 conf vol					1484	
vC2, stage 2 conf vol					832	
vCu, unblocked vol			1427		1527	486
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			79		48	84
cM capacity (veh/h)			420		155	476

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	742	742	103	87	658	658	82	76
Volume Left	0	0	0	87	0	0	82	0
Volume Right	0	0	103	0	0	0	0	76
cSH	1700	1700	1700	420	1700	1700	155	476
Volume to Capacity	0.44	0.44	0.06	0.21	0.39	0.39	0.52	0.16
Queue Length 95th (ft)	0	0	0	19	0	0	65	14
Control Delay (s)	0.0	0.0	0.0	15.8	0.0	0.0	51.3	14.0
Lane LOS				C			F	B
Approach Delay (s)	0.0			1.0			33.3	
Approach LOS							D	

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		

Volume
330: Mequon Road & River Centre East Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1430	5	0	1290	0	45
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3539	1425	0	3505	0	1627
Flt Permitted						
Satd. Flow (perm)	3539	1425	0	3505	0	1627
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	3%	3%	1%	1%
Adj. Flow (vph)	1538	5	0	1387	0	48
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1538	5	0	1387	0	48
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
330: Mequon Road & River Centre East Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1430	5	0	1290	0	45
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)	1538	5	0	1387	0	48
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)				337		
pX, platoon unblocked					0.72	
vC, conflicting volume			1543		2231	769
vC1, stage 1 conf vol					1538	
vC2, stage 2 conf vol					694	
vCu, unblocked vol			1543		1926	769
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	86
cM capacity (veh/h)			421		134	346

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	769	769	5	694	694	48
Volume Left	0	0	0	0	0	0
Volume Right	0	0	5	0	0	48
cSH	1700	1700	1700	1700	1700	346
Volume to Capacity	0.45	0.45	0.00	0.41	0.41	0.14
Queue Length 95th (ft)	0	0	0	0	0	12
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	17.1
Lane LOS						C
Approach Delay (s)	0.0			0.0		17.1
Approach LOS						C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
340: Mequon Road & Cedarburg Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	400	995	80	270	965	600	160	745	230	415	285	165
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95
Frt			0.850			0.850			0.850		0.945	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3467	3574	1599	3433	3345	0
Flt Permitted	0.099			0.111			0.950			0.950		
Satd. Flow (perm)	184	3539	1583	207	3539	1583	3467	3574	1599	3433	3345	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Adj. Flow (vph)	421	1047	42	284	1016	316	168	784	121	437	300	174
Shared Lane Traffic (%)												
Lane Group Flow (vph)	421	1047	42	284	1016	316	168	784	121	437	474	0
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2			8			
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	6.0	12.0	12.0	6.0	12.0	12.0	6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.5	18.7	18.7	10.5	18.7	18.7	10.5	16.9	16.9	10.5	16.9	
Total Split (s)	26.0	48.6	48.6	20.0	42.6	42.6	18.0	32.4	32.4	19.0	33.4	0.0
Total Split (%)	21.7%	40.5%	40.5%	16.7%	35.5%	35.5%	15.0%	27.0%	27.0%	15.8%	27.8%	0.0%
Maximum Green (s)	21.5	41.9	41.9	15.5	35.9	35.9	13.5	25.5	25.5	14.5	26.5	
Yellow Time (s)	3.5	3.9	3.9	3.5	3.9	3.9	3.5	3.9	3.9	3.5	3.9	
All-Red Time (s)	1.0	2.8	2.8	1.0	2.8	2.8	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4	3.4	1.5	1.5	1.5	1.5	1.5	
Minimum Gap (s)	1.5	2.0	2.0	1.5	2.0	2.0	1.5	1.5	1.5	1.5	1.5	
Time Before Reduce (s)	15.0	28.0	28.0	15.0	20.0	20.0	20.0	40.0	40.0	30.0	40.0	
Time To Reduce (s)	0.0	12.0	12.0	0.0	20.0	20.0	0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
v/c Ratio	1.10	0.85	0.08	0.97	0.96	0.67	0.60	1.03	0.36	1.05	0.56	
Control Delay	106.5	41.3	23.5	77.8	61.1	44.9	62.0	87.7	43.8	109.4	42.6	
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	106.5	41.3	23.5	77.8	61.1	44.9	62.0	87.7	43.8	109.4	42.6	
90th %ile Green (s)	21.5	41.9	41.9	15.5	35.9	35.9	12.8	25.5	25.5	14.5	27.2	
90th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Gap	Max	Max	Max	Hold	
70th %ile Green (s)	21.5	41.9	41.9	15.5	35.9	35.9	11.0	25.5	25.5	14.5	29.0	
70th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Gap	Max	Max	Max	Hold	
50th %ile Green (s)	21.5	41.9	41.9	15.5	35.9	35.9	9.7	25.5	25.5	14.5	30.3	
50th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Gap	Max	Max	Max	Hold	
30th %ile Green (s)	21.5	41.9	41.9	15.5	35.9	35.9	8.4	25.5	25.5	14.5	31.6	
30th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Gap	Max	Max	Max	Hold	
10th %ile Green (s)	21.5	41.9	41.9	15.5	35.9	35.9	6.6	25.5	25.5	14.5	33.4	

Volume
340: Mequon Road & Cedarburg Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Gap	Max	Max	Max	Hold	
Queue Length 50th (ft)	~318	398	22	166	406	214	65	~343	80	~190	168	
Queue Length 95th (ft)	#522	487	49	#343	#545	318	100	#468	139	#295	233	
Internal Link Dist (ft)		257			885			746			862	
Turn Bay Length (ft)	180		175	200		235	225		125	385		
Base Capacity (vph)	382	1236	553	294	1059	474	390	759	340	415	845	
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	1.10	0.85	0.08	0.97	0.96	0.67	0.43	1.03	0.36	1.05	0.56	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
~ 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: 340: Mequon Road & Cedarburg Road

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HCM Signalized Intersection Capacity Analysis
340: Mequon Road & Cedarburg Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	400	995	80	270	965	600	160	745	230	415	285	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3467	3574	1599	3433	3344	
Flt Permitted	0.10	1.00	1.00	0.11	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	184	3539	1583	208	3539	1583	3467	3574	1599	3433	3344	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	421	1047	42	284	1016	316	168	784	121	437	300	174
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	421	1047	42	284	1016	316	168	784	121	437	474	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2			8			
Actuated Green, G (s)	61.9	41.9	41.9	51.4	35.9	35.9	9.7	25.5	25.5	14.5	30.3	
Effective Green, g (s)	61.9	41.9	41.9	51.4	35.9	35.9	9.7	25.5	25.5	14.5	30.3	
Actuated g/C Ratio	0.52	0.35	0.35	0.43	0.30	0.30	0.08	0.21	0.21	0.12	0.25	
Clearance Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4	3.4	1.5	1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	379	1236	553	291	1059	474	280	759	340	415	844	
v/s Ratio Prot	c0.20	0.30		0.13	0.29		0.05	c0.22		c0.13	0.14	
v/s Ratio Perm	c0.37		0.03	0.29		0.20			0.08			
v/c Ratio	1.11	0.85	0.08	0.98	0.96	0.67	0.60	1.03	0.36	1.05	0.56	
Uniform Delay, d1	37.4	36.1	26.1	33.8	41.3	36.8	53.3	47.2	40.3	52.8	39.1	
Progression Factor	0.89	0.93	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	79.1	7.1	0.3	45.6	19.5	7.2	2.3	41.4	0.2	58.8	0.5	
Delay (s)	112.3	40.8	23.1	79.4	60.8	44.1	55.6	88.7	40.5	111.6	39.6	
Level of Service	F	D	C	E	E	D	E	F	D	F	D	
Approach Delay (s)		60.3			60.8			78.1			74.1	
Approach LOS		E			E			E			E	

Intersection Summary			
HCM Average Control Delay	66.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	100.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX C

BUILD TRAFFIC
PEAK HOUR ANALYSIS OUTPUTS

APPENDIX C

Year 2010 Build Traffic Analysis – No Improvements

Volume
200: Mequon Road & Wauwatosa Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	545	50	135	725	225	175	435	125	145	180	90
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.950			0.950			0.630			0.347		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1174	3539	1583	616	3374	1509
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Adj. Flow (vph)	221	574	26	142	763	118	184	458	66	153	189	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	221	574	26	142	763	118	184	458	66	153	189	47
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	11.5	17.9	17.9	11.5	17.9	17.9	11.5	18.0	18.0	11.5	18.0	18.0
Total Split (s)	28.5	45.9	45.9	28.5	45.9	45.9	23.5	46.0	46.0	23.5	46.0	46.0
Total Split (%)	19.8%	31.9%	31.9%	19.8%	31.9%	31.9%	16.3%	32.0%	32.0%	16.3%	32.0%	32.0%
Maximum Green (s)	25.0	40.0	40.0	25.0	40.0	40.0	20.0	40.0	40.0	20.0	40.0	40.0
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0
All-Red Time (s)	0.0	0.9	0.9	0.0	0.9	0.9	0.0	1.0	1.0	0.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Minimum Gap (s)	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0
Time Before Reduce (s)	15.0	24.0	24.0	15.0	18.0	18.0	15.0	24.0	24.0	15.0	22.0	22.0
Time To Reduce (s)	0.0	16.0	16.0	0.0	22.0	22.0	0.0	16.0	16.0	0.0	18.0	18.0
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
v/c Ratio	0.71	0.49	0.05	0.60	0.74	0.26	0.37	0.62	0.20	0.43	0.27	0.15
Control Delay	54.9	29.3	26.3	55.9	38.5	31.7	24.4	42.1	38.8	25.9	37.1	38.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.9	29.3	26.3	55.9	38.5	31.7	24.4	42.1	38.8	25.9	37.1	38.3
90th %ile Green (s)	25.0	45.0	45.0	20.0	40.0	40.0	18.5	29.1	29.1	18.7	29.3	29.3
90th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Gap	Gap	Gap	Gap	Hold	Hold
70th %ile Green (s)	22.0	40.2	40.2	16.2	34.4	34.4	15.5	24.3	24.3	15.3	24.1	24.1
70th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
50th %ile Green (s)	17.9	33.2	33.2	13.2	28.5	28.5	12.7	20.9	20.9	12.6	20.8	20.8
50th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
30th %ile Green (s)	14.3	27.7	27.7	10.5	23.9	23.9	10.3	16.9	16.9	10.0	16.6	16.6
30th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
10th %ile Green (s)	10.2	21.0	21.0	8.0	18.8	18.8	8.0	13.3	13.3	8.0	13.3	13.3

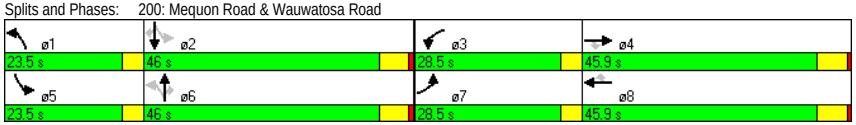
Volume
200: Mequon Road & Wauwatosa Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Gap	Hold	Hold	Min	Gap	Gap	Min	Gap	Gap	Min	Hold	Hold
Queue Length 50th (ft)	131	149	11	85	228	57	76	138	34	62	52	24
Queue Length 95th (ft)	267	258	37	185	378	129	160	243	89	135	105	68
Internal Link Dist (ft)		559			585			1105			792	
Turn Bay Length (ft)	135		35	295		50	185		110	150		200
Base Capacity (vph)	467	1522	681	467	1494	668	589	1494	668	470	1425	637
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.38	0.04	0.30	0.51	0.18	0.31	0.31	0.10	0.33	0.13	0.07

Intersection Summary
Cycle Length: 143.9
Actuated Cycle Length: 99.7
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 131.7
70th %ile Actuated Cycle: 114.9
50th %ile Actuated Cycle: 98.8
30th %ile Actuated Cycle: 84
10th %ile Actuated Cycle: 69.2

Splits and Phases: 200: Mequon Road & Wauwatosa Road



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HCM Signalized Intersection Capacity Analysis
200: Mequon Road & Wauwatosa Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	545	50	135	725	225	175	435	125	145	180	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.63	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1173	3539	1583	615	3374	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	221	574	26	142	763	118	184	458	66	153	189	47
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	221	574	26	142	763	118	184	458	66	153	189	47
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Actuated Green, G (s)	17.6	33.2	33.2	13.3	28.9	28.9	33.5	20.7	20.7	33.3	20.6	20.6
Effective Green, g (s)	17.6	33.2	33.2	13.3	28.9	28.9	33.5	20.7	20.7	33.3	20.6	20.6
Actuated g/C Ratio	0.18	0.34	0.34	0.13	0.29	0.29	0.34	0.21	0.21	0.34	0.21	0.21
Clearance Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Lane Grp Cap (vph)	315	1189	532	238	1035	463	475	741	332	345	703	315
v/s Ratio Prot	c0.12	0.16		0.08	c0.22		0.05	c0.13		c0.06	0.06	
v/s Ratio Perm			0.02			0.07	0.08		0.04	0.09		0.03
v/c Ratio	0.70	0.48	0.05	0.60	0.74	0.25	0.39	0.62	0.20	0.44	0.27	0.15
Uniform Delay, d1	38.1	26.0	22.1	40.2	31.5	26.7	24.1	35.5	32.2	24.1	32.8	31.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.7	0.4	0.0	2.7	2.8	0.3	0.2	1.7	0.4	0.3	0.3	0.3
Delay (s)	43.8	26.4	22.2	42.9	34.4	27.1	24.3	37.2	32.6	24.4	33.1	32.2
Level of Service	D	C	C	D	C	C	C	D	C	C	C	C
Approach Delay (s)		30.9			34.7			33.4			29.6	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	32.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	98.8	Sum of lost time (s)	12.9
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Volume
230: Mequon Road & Concord Creek Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	925	45	50	1075	5	30	1	35	10	1	10
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.954			0.957	
Satd. Flow (prot)	1752	3505	1411	1752	3505	1411	0	1777	1583	0	1432	1272
Flt Permitted	0.950			0.950				0.954			0.957	
Satd. Flow (perm)	1752	3505	1411	1752	3505	1411	0	1777	1583	0	1432	1272
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	27%	27%	27%
Adj. Flow (vph)	5	964	47	52	1120	5	31	1	36	10	1	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	964	47	52	1120	5	0	32	36	0	11	10
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized
Description: High SB %HV

HCM Unsignalized Intersection Capacity Analysis
230: Mequon Road & Concord Creek Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	925	45	50	1075	5	30	1	35	10	1	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	964	47	52	1120	5	31	1	36	10	1	10
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	1125			1010			1649	2203	482	1753	2245	560
vC1, stage 1 conf vol							974	974		1224	1224	
vC2, stage 2 conf vol							675	1229		529	1021	
vCu, unblocked vol	1125			1010			1649	2203	482	1753	2245	560
tC, single (s)	4.2			4.2			7.5	6.5	6.9	8.0	7.0	7.4
tC, 2 stage (s)							6.5	5.5		7.0	6.0	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.8	4.3	3.6
p0 queue free %	99			92			81	99	93	90	99	97
cM capacity (veh/h)	611			676			167	139	531	106	103	413

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1	SB 2
Volume Total	5	482	482	47	52	560	560	5	32	36	11	10
Volume Left	5	0	0	0	52	0	0	0	31	0	10	0
Volume Right	0	0	0	47	0	0	0	5	0	36	0	10
cSH	611	1700	1700	1700	676	1700	1700	1700	166	531	106	413
Volume to Capacity	0.01	0.28	0.28	0.03	0.08	0.33	0.33	0.00	0.20	0.07	0.11	0.03
Queue Length 95th (ft)	1	0	0	0	6	0	0	0	17	6	9	2
Control Delay (s)	10.9	0.0	0.0	0.0	10.8	0.0	0.0	0.0	31.9	12.3	43.2	13.9
Lane LOS	B				B				D	B	E	B
Approach Delay (s)	0.1				0.5				21.5		29.3	
Approach LOS									C		D	

Intersection Summary			
Average Delay		1.2	
Intersection Capacity Utilization		51.4%	ICU Level of Service
Analysis Period (min)		15	
Description: High SB %HV			

Volume
250: Mequon Road & Weston Center West Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	940	30	40	1110	20	30
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850			0.920	
Flt Protected			0.950		0.980	
Satd. Flow (prot)	3505	1411	1752	3505	1679	0
Flt Permitted			0.950		0.980	
Satd. Flow (perm)	3505	1411	1752	3505	1679	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Adj. Flow (vph)	979	31	42	1156	21	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	979	31	42	1156	52	0
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
250: Mequon Road & Weston Center West Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	940	30	40	1110	20	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	979	31	42	1156	21	31
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised			Raised		
Median storage veh)	1			1		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1010		1641	490
vC1, stage 1 conf vol					979	
vC2, stage 2 conf vol					661	
vCu, unblocked vol			1010		1641	490
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			94		90	94
cM capacity (veh/h)			676		209	524

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	490	490	31	42	578	578	52
Volume Left	0	0	0	42	0	0	21
Volume Right	0	0	31	0	0	0	31
cSH	1700	1700	1700	676	1700	1700	327
Volume to Capacity	0.29	0.29	0.02	0.06	0.34	0.34	0.16
Queue Length 95th (ft)	0	0	0	5	0	0	14
Control Delay (s)	0.0	0.0	0.0	10.7	0.0	0.0	18.1
Lane LOS				B			C
Approach Delay (s)	0.0			0.4			18.1
Approach LOS							C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	42.7%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
260: Mequon Road & Weston Center East Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	970	1	0	1150	0	10
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3574	1439	0	3505	0	1611
Flt Permitted						
Satd. Flow (perm)	3574	1439	0	3505	0	1611
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	2%	2%
Adj. Flow (vph)	1054	1	0	1250	0	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1054	1	0	1250	0	11
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
260: Mequon Road & Weston Center East Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	970	1	0	1150	0	10
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)	1054	1	0	1250	0	11
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)				1088		
pX, platoon unblocked					0.89	
vC, conflicting volume			1055		1679	527
vC1, stage 1 conf vol					1054	
vC2, stage 2 conf vol					625	
vCu, unblocked vol			1055		1515	527
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			650		221	496

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	527	527	1	625	625	11
Volume Left	0	0	0	0	0	0
Volume Right	0	0	1	0	0	11
cSH	1700	1700	1700	1700	1700	496
Volume to Capacity	0.31	0.31	0.00	0.37	0.37	0.02
Queue Length 95th (ft)	0	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	12.4
Lane LOS						B
Approach Delay (s)	0.0			0.0		12.4
Approach LOS						B

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		36.8%	ICU Level of Service	A
Analysis Period (min)		15	

Volume
270: Mequon Road & River Birch Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	975	1	5	1145	5	5	1	5	1	1	1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.939			0.955	
Flt Protected	0.950			0.950				0.978			0.984	
Satd. Flow (prot)	1787	3574	1439	1752	3505	1411	0	1728	0	0	1768	0
Flt Permitted	0.950			0.950				0.978			0.984	
Satd. Flow (perm)	1787	3574	1439	1752	3505	1411	0	1728	0	0	1768	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
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	1060	1	5	1245	5	5	1	5	1	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1060	1	5	1245	5	0	11	0	0	3	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
270: Mequon Road & River Birch Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	975	1	5	1145	5	5	1	5	1	1	1
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	1060	1	5	1245	5	5	1	5	1	1	1
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)					626							
pX, platoon unblocked	0.88						0.88	0.88		0.88	0.88	0.88
vC, conflicting volume	1250			1061			1705	2332	530	1802	2327	622
vC1, stage 1 conf vol							1071	1071		1255	1255	
vC2, stage 2 conf vol							635	1261		547	1072	
vCu, unblocked vol	1018			1061			1534	2243	530	1643	2238	307
tC, single (s)	4.1			4.2			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			99			97	99	99	99	99	100
cM capacity (veh/h)	603			646			178	144	496	160	145	611

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	5	530	530	1	5	622	622	5	12	3
Volume Left	5	0	0	0	5	0	0	0	5	1
Volume Right	0	0	0	1	0	0	0	5	5	1
cSH	603	1700	1700	1700	646	1700	1700	1700	244	203
Volume to Capacity	0.01	0.31	0.31	0.00	0.01	0.37	0.37	0.00	0.05	0.02
Queue Length 95th (ft)	1	0	0	0	1	0	0	0	4	1
Control Delay (s)	11.0	0.0	0.0	0.0	10.6	0.0	0.0	0.0	20.5	23.0
Lane LOS	B				B				C	C
Approach Delay (s)	0.1				0.0				20.5	23.0
Approach LOS									C	C

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		41.7%	ICU Level of Service
Analysis Period (min)		15	

Volume
280: Mequon Road & Buntrock Avenue

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	905	15	40	1030	15	85	35	55	10	5	40
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.966			0.967	
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411	0	1782	1568	0	1801	1583
Flt Permitted	0.239			0.281				0.780			0.760	
Satd. Flow (perm)	445	3539	1425	518	3505	1411	0	1439	1568	0	1416	1583
Satd. Flow (RTOR)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	64	963	8	43	1096	8	90	37	29	11	5	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	963	8	43	1096	8	0	127	29	0	16	21
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	6	6	6	2	2	2	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	21.4	21.4	21.4	21.4	21.4	21.4	17.1	17.1	17.1	17.1	17.1	17.1
Total Split (s)	70.0	70.0	70.0	70.0	70.0	70.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	63.6%	63.6%	63.6%	63.6%	63.6%	63.6%	36.4%	36.4%	36.4%	36.4%	36.4%	36.4%
Maximum Green (s)	63.6	63.6	63.6	63.6	63.6	63.6	32.9	32.9	32.9	32.9	32.9	32.9
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.4	7.1	7.1	7.1	7.1	7.1	7.1
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.5	5.5	5.5	5.5	5.5	5.5	1.5	1.5	1.5	1.5	1.5	1.5
Minimum Gap (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Time Before Reduce (s)	30.0	30.0	30.0	30.0	30.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	15.0	15.0	15.0	15.0	15.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	None
v/c Ratio	0.19	0.36	0.01	0.11	0.42	0.01		0.68	0.14		0.09	0.10
Control Delay	6.6	5.6	4.6	5.5	6.1	4.6		63.3	42.0		40.7	41.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	6.6	5.6	4.6	5.5	6.1	4.6		63.3	42.0		40.7	41.0
90th %ile Green (s)	76.3	76.3	76.3	76.3	76.3	76.3	20.2	20.2	20.2	20.2	20.2	20.2
90th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
70th %ile Green (s)	80.1	80.1	80.1	80.1	80.1	80.1	16.4	16.4	16.4	16.4	16.4	16.4
70th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
50th %ile Green (s)	82.8	82.8	82.8	82.8	82.8	82.8	13.7	13.7	13.7	13.7	13.7	13.7
50th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
30th %ile Green (s)	85.5	85.5	85.5	85.5	85.5	85.5	11.0	11.0	11.0	11.0	11.0	11.0
30th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
10th %ile Green (s)	86.5	86.5	86.5	86.5	86.5	86.5	10.0	10.0	10.0	10.0	10.0	10.0

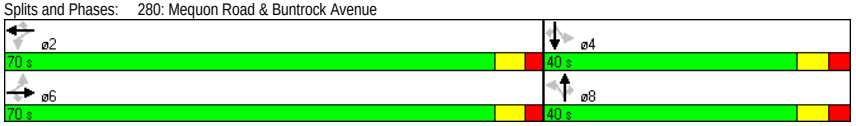
Volume
280: Mequon Road & Buntrock Avenue 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Min	Min	Min	Hold	Hold	Hold
Queue Length 50th (ft)	11	102	1	7	123	1		87	19		10	13
Queue Length 95th (ft)	33	168	6	22	200	6		143	44		30	35
Internal Link Dist (ft)		546			209			420			420	
Turn Bay Length (ft)	100			120					70			40
Base Capacity (vph)	333	2646	1066	387	2620	1055		430	469		424	473
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	0.19	0.36	0.01	0.11	0.42	0.01		0.30	0.06		0.04	0.04

Intersection Summary

Cycle Length: 110
Actuated Cycle Length: 110
Offset: 52 (47%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated

Splits and Phases: 280: Mequon Road & Buntrock Avenue



HCM Signalized Intersection Capacity Analysis
280: Mequon Road & Buntrock Avenue 12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	905	15	40	1030	15	85	35	55	10	5	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	9	12	12	9	12	12	12	12	12	12
Total Lost time (s)	6.4	6.4	6.4	6.4	6.4	6.4		7.1	7.1		7.1	7.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411		1782	1568		1801	1583
Flt Permitted	0.24	1.00	1.00	0.28	1.00	1.00		0.78	1.00		0.76	1.00
Satd. Flow (perm)	446	3539	1425	518	3505	1411		1438	1568		1416	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	64	963	8	43	1096	8	90	37	29	11	5	21
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	64	963	8	43	1096	8	0	127	29	0	16	21
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Actuated Green, G (s)	82.2	82.2	82.2	82.2	82.2	82.2		14.3	14.3		14.3	14.3
Effective Green, g (s)	82.2	82.2	82.2	82.2	82.2	82.2		14.3	14.3		14.3	14.3
Actuated g/C Ratio	0.75	0.75	0.75	0.75	0.75	0.75		0.13	0.13		0.13	0.13
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4	6.4		7.1	7.1		7.1	7.1
Vehicle Extension (s)	5.5	5.5	5.5	5.5	5.5	5.5		1.5	1.5		1.5	1.5
Lane Grp Cap (vph)	333	2645	1065	387	2619	1054		187	204		184	206
v/s Ratio Prot		0.27			c0.31							
v/s Ratio Perm	0.14		0.01	0.08		0.01		c0.09	0.02		0.01	0.01
v/c Ratio	0.19	0.36	0.01	0.11	0.42	0.01		0.68	0.14		0.09	0.10
Uniform Delay, d1	4.1	4.8	3.5	3.8	5.1	3.5		45.7	42.4		42.1	42.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	1.3	0.4	0.0	0.6	0.5	0.0		7.5	0.1		0.1	0.1
Delay (s)	5.4	5.2	3.5	4.4	5.6	3.5		53.1	42.5		42.2	42.3
Level of Service	A	A	A	A	A	A		D	D		D	D
Approach Delay (s)		5.2			5.5			51.2			42.2	
Approach LOS		A			A			D			D	

Intersection Summary

HCM Average Control Delay	9.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Volume
290: Mequon Road & Jung Brewery Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	950	20	0	1085	0	15
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3539	1425	0	3505	0	1596
Flt Permitted						
Satd. Flow (perm)	3539	1425	0	3505	0	1596
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	3%	3%	3%	3%
Adj. Flow (vph)	1011	21	0	1154	0	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1011	21	0	1154	0	16
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
290: Mequon Road & Jung Brewery Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	950	20	0	1085	0	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1011	21	0	1154	0	16
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)	289					
pX, platoon unblocked			0.91		0.91	0.91
vC, conflicting volume			1032		1588	505
vC1, stage 1 conf vol					1011	
vC2, stage 2 conf vol					577	
vCu, unblocked vol			826		1440	245
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)					5.9	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			719		243	681

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	505	505	21	577	577	16
Volume Left	0	0	0	0	0	0
Volume Right	0	0	21	0	0	16
cSH	1700	1700	1700	1700	1700	681
Volume to Capacity	0.30	0.30	0.01	0.34	0.34	0.02
Queue Length 95th (ft)	0	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	10.4
Lane LOS						B
Approach Delay (s)	0.0			0.0		10.4
Approach LOS						B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
300: Mequon Road & Public Works Access

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	950	15	85	1010	5	70	5	270	1	1	5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.904	
Flt Protected	0.950			0.950				0.955			0.993	
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411	0	1720	1531	0	1689	0
Flt Permitted	0.950			0.950				0.955			0.993	
Satd. Flow (perm)	1770	3539	1425	1752	3505	1411	0	1720	1531	0	1689	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	1	1011	16	90	1074	5	74	5	287	1	1	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	1011	16	90	1074	5	0	79	287	0	7	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
300: Mequon Road & Public Works Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	950	15	85	1010	5	70	5	270	1	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1	1011	16	90	1074	5	74	5	287	1	1	5
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)		618			1272							
pX, platoon unblocked	0.80			0.91			0.85	0.85	0.91	0.85	0.85	0.80
vC, conflicting volume	1080			1027			1737	2273	505	2053	2284	537
vC1, stage 1 conf vol							1013	1013		1255	1255	
vC2, stage 2 conf vol							724	1261		797	1029	
vCu, unblocked vol	601			829			1023	1658	256	1397	1670	0
tC, single (s)	4.1			4.2			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 %	100			87			69	97	57	99	99	99
cM capacity (veh/h)	778			720			239	171	676	103	153	871

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1
Volume Total	1	505	505	16	90	537	537	5	80	287	7
Volume Left	1	0	0	0	90	0	0	0	74	0	1
Volume Right	0	0	0	16	0	0	0	5	0	287	5
cSH	778	1700	1700	1700	720	1700	1700	1700	233	676	319
Volume to Capacity	0.00	0.30	0.30	0.01	0.13	0.32	0.32	0.00	0.34	0.43	0.02
Queue Length 95th (ft)	0	0	0	0	11	0	0	0	36	53	2
Control Delay (s)	9.6	0.0	0.0	0.0	10.7	0.0	0.0	0.0	28.3	14.2	16.6
Lane LOS	A				B				D	B	C
Approach Delay (s)	0.0				0.8				17.3		16.6
Approach LOS									C		C

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	56.3%	ICU Level of Service	B	
Analysis Period (min)	15			

Volume
310: Mequon Road & Logeman Access

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1205	10	0	1090	1	0	0	20	1	1	10
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.865		0.886	
Flt Protected											0.996	
Satd. Flow (prot)	0	3539	1425	0	3505	1411	0	0	1627	0	1660	0
Flt Permitted											0.996	
Satd. Flow (perm)	0	3539	1425	0	3505	1411	0	0	1627	0	1660	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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	1310	11	0	1185	1	0	0	22	1	1	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1315	11	0	1185	1	0	0	22	0	13	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
310: Mequon Road & Logeman Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1205	10	0	1090	1	0	0	20	1	1	10
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	1310	11	0	1185	1	0	0	22	1	1	11
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)		1048			842							
pX, platoon unblocked	0.78			0.92			0.82	0.82	0.92	0.82	0.82	0.78
vC, conflicting volume	1186			1321			1924	2507	655	1872	2516	592
vC1, stage 1 conf vol							1321	1321		1185	1185	
vC2, stage 2 conf vol							604	1186		688	1332	
vCu, unblocked vol	663			1177			1247	1961	454	1183	1973	0
tC, single (s)	4.1			4.2			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			100			100	100	96	100	99	99
cM capacity (veh/h)	715			538			162	153	512	224	153	844

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	442	873	11	592	592	1	22	13
Volume Left	5	0	0	0	0	0	0	1
Volume Right	0	0	11	0	0	1	22	11
cSH	715	1700	1700	1700	1700	1700	512	525
Volume to Capacity	0.01	0.51	0.01	0.35	0.35	0.00	0.04	0.02
Queue Length 95th (ft)	1	0	0	0	0	0	3	2
Control Delay (s)	0.2	0.0	0.0	0.0	0.0	0.0	12.3	12.0
Lane LOS	A						B	B
Approach Delay (s)	0.1			0.0			12.3	12.0
Approach LOS							B	B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
320: Mequon Road & River Centre Center Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1150	75	65	1030	60	55
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3574	1439	1752	3505	1787	1599
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3574	1439	1752	3505	1787	1599
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	1%	1%
Adj. Flow (vph)	1250	82	71	1120	65	60
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1250	82	71	1120	65	60
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
320: Mequon Road & River Centre Center Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1150	75	65	1030	60	55
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)	1250	82	71	1120	65	60
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)	1243			647		
pX, platoon unblocked			0.94		0.80	0.94
vC, conflicting volume			1332		1951	625
vC1, stage 1 conf vol					1250	
vC2, stage 2 conf vol					701	
vCu, unblocked vol			1230		1374	481
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			87		67	88
cM capacity (veh/h)			525		200	503

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	625	625	82	71	560	560	65	60
Volume Left	0	0	0	71	0	0	65	0
Volume Right	0	0	82	0	0	0	0	60
cSH	1700	1700	1700	525	1700	1700	200	503
Volume to Capacity	0.37	0.37	0.05	0.13	0.33	0.33	0.33	0.12
Queue Length 95th (ft)	0	0	0	12	0	0	34	10
Control Delay (s)	0.0	0.0	0.0	12.9	0.0	0.0	31.6	13.1
Lane LOS				B			D	B
Approach Delay (s)	0.0			0.8			22.7	
Approach LOS							C	

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
330: Mequon Road & River Centre East Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1200	5	0	1095	0	35
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3539	1425	0	3505	0	1627
Flt Permitted						
Satd. Flow (perm)	3539	1425	0	3505	0	1627
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	3%	3%	1%	1%
Adj. Flow (vph)	1290	5	0	1177	0	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1290	5	0	1177	0	38
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
330: Mequon Road & River Centre East Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1200	5	0	1095	0	35
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)	1290	5	0	1177	0	38
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)				337		
pX, platoon unblocked					0.77	
vC, conflicting volume			1296		1879	645
vC1, stage 1 conf vol					1290	
vC2, stage 2 conf vol					589	
vCu, unblocked vol			1296		1543	645
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	91
cM capacity (veh/h)			525		183	417

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	645	645	5	589	589	38
Volume Left	0	0	0	0	0	0
Volume Right	0	0	5	0	0	38
cSH	1700	1700	1700	1700	1700	417
Volume to Capacity	0.38	0.38	0.00	0.35	0.35	0.09
Queue Length 95th (ft)	0	0	0	0	0	7
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	14.5
Lane LOS						B
Approach Delay (s)	0.0			0.0		14.5
Approach LOS						B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
340: Mequon Road & Cedarburg Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	320	840	75	210	820	475	135	580	185	330	220	140
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95
Frt			0.850			0.850			0.850		0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3467	3574	1599	3433	3334	0
Flt Permitted	0.103			0.226			0.950			0.950		
Satd. Flow (perm)	192	3539	1583	421	3539	1583	3467	3574	1599	3433	3334	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Adj. Flow (vph)	337	884	39	221	863	250	142	611	97	347	232	147
Shared Lane Traffic (%)												
Lane Group Flow (vph)	337	884	39	221	863	250	142	611	97	347	379	0
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2			8			
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	6.0	12.0	12.0	6.0	12.0	12.0	6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.5	18.7	18.7	10.5	18.7	18.7	10.5	16.9	16.9	10.5	16.9	
Total Split (s)	19.0	41.0	41.0	19.0	41.0	41.0	15.0	40.0	40.0	20.0	45.0	0.0
Total Split (%)	15.8%	34.2%	34.2%	15.8%	34.2%	34.2%	12.5%	33.3%	33.3%	16.7%	37.5%	0.0%
Maximum Green (s)	14.5	34.3	34.3	14.5	34.3	34.3	10.5	33.1	33.1	15.5	38.1	
Yellow Time (s)	3.5	3.9	3.9	3.5	3.9	3.9	3.5	3.9	3.9	3.5	3.9	
All-Red Time (s)	1.0	2.8	2.8	1.0	2.8	2.8	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4	3.4	1.5	1.5	1.5	1.5	1.5	
Minimum Gap (s)	1.5	2.0	2.0	1.5	2.0	2.0	1.5	1.5	1.5	1.5	1.5	
Time Before Reduce (s)	15.0	28.0	28.0	15.0	20.0	20.0	20.0	40.0	40.0	30.0	40.0	
Time To Reduce (s)	0.0	12.0	12.0	0.0	20.0	20.0	0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
v/c Ratio	0.82	0.68	0.07	0.67	0.85	0.55	0.57	0.82	0.29	0.84	0.44	
Control Delay	49.0	37.4	29.6	27.7	50.0	41.9	63.0	54.3	40.9	69.4	38.2	
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	49.0	37.4	29.6	27.7	50.0	41.9	63.0	54.3	40.9	69.4	38.2	
90th %ile Green (s)	15.9	34.3	34.3	15.9	34.3	34.3	10.5	31.7	31.7	15.5	36.7	
90th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	Gap	Gap	Max	Hold	
70th %ile Green (s)	19.9	36.4	36.4	17.8	34.3	34.3	10.0	27.7	27.7	15.5	33.2	
70th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Gap	Gap	Gap	Max	Hold	
50th %ile Green (s)	22.2	41.5	41.5	15.0	34.3	34.3	8.8	25.4	25.4	15.5	32.1	
50th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Gap	Gap	Gap	Max	Hold	
30th %ile Green (s)	26.5	48.6	48.6	12.2	34.3	34.3	7.6	22.2	22.2	14.4	29.0	
30th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Gap	Gap	Gap	Gap	Hold	
10th %ile Green (s)	32.7	58.9	58.9	8.1	34.3	34.3	6.0	18.7	18.7	11.7	24.4	

Volume
340: Mequon Road & Cedarburg Road

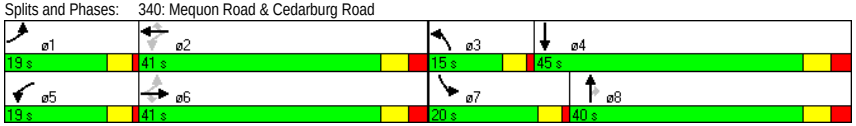
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Min	Gap	Gap	Gap	Hold	
Queue Length 50th (ft)	198	312	20	89	332	164	55	238	64	136	127	
Queue Length 95th (ft)	#448	#450	50	155	#416	251	88	285	107	#201	165	
Internal Link Dist (ft)		257			885			746			862	
Turn Bay Length (ft)	180		175	200		235	225		125	385		
Base Capacity (vph)	409	1296	579	357	1012	452	303	986	441	443	1059	
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	0.82	0.68	0.07	0.62	0.85	0.55	0.47	0.62	0.22	0.78	0.36	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 1 (1%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 340: Mequon Road & Cedarburg Road



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HCM Signalized Intersection Capacity Analysis
340: Mequon Road & Cedarburg Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	320	840	75	210	820	475	135	580	185	330	220	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3467	3574	1599	3433	3333	
Flt Permitted	0.10	1.00	1.00	0.23	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	192	3539	1583	420	3539	1583	3467	3574	1599	3433	3333	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	337	884	39	221	863	250	142	611	97	347	232	147
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	337	884	39	221	863	250	142	611	97	347	379	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2			8			
Actuated Green, G (s)	62.2	43.9	43.9	48.1	34.3	34.3	8.6	25.2	25.2	14.5	31.1	
Effective Green, g (s)	62.2	43.9	43.9	48.1	34.3	34.3	8.6	25.2	25.2	14.5	31.1	
Actuated g/C Ratio	0.52	0.37	0.37	0.40	0.29	0.29	0.07	0.21	0.21	0.12	0.26	
Clearance Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4	3.4	1.5	1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	407	1295	579	324	1012	452	248	751	336	415	864	
v/s Ratio Prot	c0.16	0.25		0.08	0.24		0.04	c0.17		c0.10	0.11	
v/s Ratio Perm	c0.27		0.02	0.20		0.16			0.06			
v/c Ratio	0.83	0.68	0.07	0.68	0.85	0.55	0.57	0.81	0.29	0.84	0.44	
Uniform Delay, d1	32.6	32.2	24.7	25.3	40.5	36.3	53.9	45.2	39.9	51.6	37.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.4	2.9	0.2	4.7	9.1	4.8	2.0	6.4	0.2	13.1	0.1	
Delay (s)	45.0	35.1	25.0	30.0	49.5	41.2	55.9	51.6	40.0	64.6	37.3	
Level of Service	D	D	C	C	D	D	E	D	D	E	D	
Approach Delay (s)		37.4			44.7			51.0			50.4	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	44.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX C

Year 2025 Build Traffic Analysis – No Improvements

Volume
200: Mequon Road & Wauwatosa Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	270	850	70	185	1100	360	235	570	220	250	245	120
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.950			0.950			0.576			0.175		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1073	3539	1583	311	3374	1509
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Adj. Flow (vph)	284	895	37	195	1158	189	247	600	116	263	258	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	284	895	37	195	1158	189	247	600	116	263	258	63
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	11.5	17.9	17.9	11.5	17.9	17.9	11.5	18.0	18.0	11.5	18.0	18.0
Total Split (s)	27.0	47.0	47.0	25.0	45.0	45.0	21.0	28.0	28.0	20.0	27.0	27.0
Total Split (%)	22.5%	39.2%	39.2%	20.8%	37.5%	37.5%	17.5%	23.3%	23.3%	16.7%	22.5%	22.5%
Maximum Green (s)	23.5	41.1	41.1	21.5	39.1	39.1	17.5	22.0	22.0	16.5	21.0	21.0
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0
All-Red Time (s)	0.0	0.9	0.9	0.0	0.9	0.9	0.0	1.0	1.0	0.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Minimum Gap (s)	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0
Time Before Reduce (s)	15.0	24.0	24.0	15.0	18.0	18.0	15.0	24.0	24.0	15.0	22.0	22.0
Time To Reduce (s)	0.0	16.0	16.0	0.0	22.0	22.0	0.0	16.0	16.0	0.0	18.0	18.0
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
v/c Ratio	0.88	0.68	0.06	0.77	0.98	0.36	0.55	0.91	0.40	0.88	0.39	0.21
Control Delay	75.1	34.8	26.0	68.6	61.0	32.7	32.5	67.1	47.4	60.2	44.4	44.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.1	34.8	26.0	68.6	61.0	32.7	32.5	67.1	47.4	60.2	44.4	44.2
90th %ile Green (s)	23.5	41.1	41.1	21.5	39.1	39.1	17.5	22.0	22.0	16.5	21.0	21.0
90th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max	Hold	Hold
70th %ile Green (s)	23.5	42.4	42.4	20.2	39.1	39.1	17.5	22.0	22.0	16.5	21.0	21.0
70th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Max	Max	Max	Max	Hold	Hold
50th %ile Green (s)	23.5	45.1	45.1	17.5	39.1	39.1	16.7	22.0	22.0	16.5	21.8	21.8
50th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Gap	Max	Max	Max	Hold	Hold
30th %ile Green (s)	20.8	45.3	45.3	14.6	39.1	39.1	13.8	22.0	22.0	16.5	24.7	24.7
30th %ile Term Code	Gap	Hold	Hold	Gap	Max	Max	Gap	Max	Max	Max	Hold	Hold
10th %ile Green (s)	15.5	44.2	44.2	10.4	39.1	39.1	10.1	20.5	20.5	14.7	25.1	25.1

Volume
200: Mequon Road & Wauwatosa Road

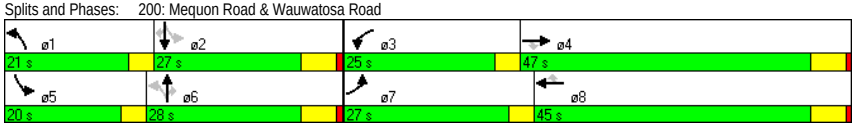
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Gap	Hold	Hold	Gap	Max	Max	Gap	Gap	Gap	Gap	Hold	Hold
Queue Length 50th (ft)	213	301	18	147	~474	112	139	243	80	150	94	42
Queue Length 95th (ft)	#353	397	44	222	#630	179	211	#351	140	#308	138	86
Internal Link Dist (ft)		559			585			1105			792	
Turn Bay Length (ft)	135		35	295		50	185		110	150		200
Base Capacity (vph)	356	1320	590	325	1182	529	486	665	297	303	656	294
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.68	0.06	0.60	0.98	0.36	0.51	0.90	0.39	0.87	0.39	0.21

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 117.2
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 120
70th %ile Actuated Cycle: 120
50th %ile Actuated Cycle: 120
30th %ile Actuated Cycle: 117.3
10th %ile Actuated Cycle: 108.7
~ 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: 200: Mequon Road & Wauwatosa Road



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HCM Signalized Intersection Capacity Analysis
200: Mequon Road & Wauwatosa Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	270	850	70	185	1100	360	235	570	220	250	245	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.58	1.00	1.00	0.18	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1073	3539	1583	312	3374	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	284	895	37	195	1158	189	247	600	116	263	258	63
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	284	895	37	195	1158	189	247	600	116	263	258	63
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Actuated Green, G (s)	21.3	43.8	43.8	16.7	39.2	39.2	36.7	21.7	21.7	38.9	22.8	22.8
Effective Green, g (s)	21.3	43.8	43.8	16.7	39.2	39.2	36.7	21.7	21.7	38.9	22.8	22.8
Actuated g/C Ratio	0.18	0.37	0.37	0.14	0.33	0.33	0.31	0.19	0.19	0.33	0.19	0.19
Clearance Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Lane Grp Cap (vph)	322	1323	592	252	1184	529	425	655	293	292	656	294
v/s Ratio Prot	c0.16	0.25		0.11	c0.33		0.07	0.17		c0.12	0.08	
v/s Ratio Perm			0.02			0.12	0.11		0.07	c0.18		0.04
v/c Ratio	0.88	0.68	0.06	0.77	0.98	0.36	0.58	0.92	0.40	0.90	0.39	0.21
Uniform Delay, d1	46.7	30.8	23.5	48.4	38.6	29.5	32.1	46.9	42.0	32.4	41.2	39.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	22.9	1.5	0.1	12.6	20.8	0.5	1.3	17.8	1.1	28.1	0.5	0.5
Delay (s)	69.6	32.2	23.6	61.0	59.4	30.0	33.4	64.7	43.1	60.5	41.7	40.2
Level of Service	E	C	C	E	E	C	C	E	D	E	D	D
Approach Delay (s)		40.7			56.0			54.1			50.0	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM Average Control Delay	50.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	117.2	Sum of lost time (s)	16.4
Intersection Capacity Utilization	91.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Volume
210: Mequon Road & Area B West Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1500	20	0	1690	0	45
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3539	1583	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	3539	1583	0	3539	0	1611
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1579	21	0	1779	0	47
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1579	21	0	1779	0	47
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
210: Mequon Road & Area B West Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1500	20	0	1690	0	45
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)	1579	21	0	1779	0	47
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)	665					
pX, platoon unblocked			0.79		0.79	0.79
vC, conflicting volume			1600		2468	789
vC1, stage 1 conf vol					1579	
vC2, stage 2 conf vol					889	
vCu, unblocked vol			1224		2326	195
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 %			100		100	93
cM capacity (veh/h)			446		126	641

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	789	789	21	889	889	47
Volume Left	0	0	0	0	0	0
Volume Right	0	0	21	0	0	47
cSH	1700	1700	1700	1700	1700	641
Volume to Capacity	0.46	0.46	0.01	0.52	0.52	0.07
Queue Length 95th (ft)	0	0	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	11.1
Lane LOS						B
Approach Delay (s)	0.0			0.0		11.1
Approach LOS						B

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		51.5%	ICU Level of Service A
Analysis Period (min)		15	

Volume
220: Mequon Road & Area B East Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1525	20	70	1655	40	40
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850			0.932	
Flt Protected			0.950		0.976	
Satd. Flow (prot)	3505	1568	1752	3505	1694	0
Flt Permitted			0.950		0.976	
Satd. Flow (perm)	3505	1568	1752	3505	1694	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Adj. Flow (vph)	1589	21	73	1724	42	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1589	21	73	1724	84	0
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
220: Mequon Road & Area B East Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1525	20	70	1655	40	40
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1589	21	73	1724	42	42
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)	1205					
pX, platoon unblocked			0.79		0.79	0.79
vC, conflicting volume			1609		2596	794
vC1, stage 1 conf vol					1589	
vC2, stage 2 conf vol					1008	
vCu, unblocked vol			1247		2491	220
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			83		61	93
cM capacity (veh/h)			435		108	622

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	794	794	21	73	862	862	83
Volume Left	0	0	0	73	0	0	42
Volume Right	0	0	21	0	0	0	42
cSH	1700	1700	1700	435	1700	1700	184
Volume to Capacity	0.47	0.47	0.01	0.17	0.51	0.51	0.45
Queue Length 95th (ft)	0	0	0	15	0	0	53
Control Delay (s)	0.0	0.0	0.0	14.9	0.0	0.0	39.8
Lane LOS				B			E
Approach Delay (s)	0.0			0.6			39.8
Approach LOS							E

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization		60.7%	ICU Level of Service	B
Analysis Period (min)		15	

Volume
230: Mequon Road & Concord Creek Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1490	70	90	1650	5	60	1	70	15	1	15
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.953			0.955	
Satd. Flow (prot)	1752	3505	1411	1752	3505	1411	0	1775	1583	0	1429	1272
Flt Permitted	0.950			0.950				0.953			0.955	
Satd. Flow (perm)	1752	3505	1411	1752	3505	1411	0	1775	1583	0	1429	1272
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	27%	27%	27%
Adj. Flow (vph)	5	1552	73	94	1719	5	63	1	73	16	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1552	73	94	1719	5	0	63	73	0	17	16
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized
Description: High SB %HV

HCM Unsignalized Intersection Capacity Analysis
230: Mequon Road & Concord Creek Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1490	70	90	1650	5	60	1	70	15	1	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	1552	73	94	1719	5	62	1	73	16	1	16
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	1724			1625			2626	3474	776	2766	3542	859
vC1, stage 1 conf vol							1562	1562		1906	1906	
vC2, stage 2 conf vol							1063	1911		860	1635	
vCu, unblocked vol	1724			1625			2626	3474	776	2766	3542	859
tC, single (s)	4.2			4.2			7.5	6.5	6.9	8.0	7.0	7.4
tC, 2 stage (s)							6.5	5.5		7.0	6.0	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.8	4.3	3.6
p0 queue free %	99			76			4	98	79	45	94	94
cM capacity (veh/h)	358			392			65	52	340	28	19	254

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1	SB 2
Volume Total	5	776	776	73	94	859	859	5	64	73	17	16
Volume Left	5	0	0	0	94	0	0	0	62	0	16	0
Volume Right	0	0	0	73	0	0	0	5	0	73	0	16
cSH	358	1700	1700	1700	392	1700	1700	1700	65	340	28	254
Volume to Capacity	0.01	0.46	0.46	0.04	0.24	0.51	0.51	0.00	0.98	0.21	0.60	0.06
Queue Length 95th (ft)	1	0	0	0	23	0	0	0	120	20	48	5
Control Delay (s)	15.2	0.0	0.0	0.0	17.1	0.0	0.0	0.0	212.0	18.5	254.8	20.1
Lane LOS	C				C				F	C	F	C
Approach Delay (s)	0.0				0.9				108.6		141.3	
Approach LOS									F		F	

Intersection Summary			
Average Delay		5.8	
Intersection Capacity Utilization		69.0%	ICU Level of Service C
Analysis Period (min)		15	
Description: High SB %HV			

Volume
240: Mequon Road & Area C Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1555	20	0	1745	0	40
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3505	1411	0	3505	0	1611
Flt Permitted						
Satd. Flow (perm)	3505	1411	0	3505	0	1611
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Adj. Flow (vph)	1620	21	0	1818	0	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1620	21	0	1818	0	42
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
240: Mequon Road & Area C Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1555	20	0	1745	0	40
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1620	21	0	1818	0	42
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			1641		2529	810
vC1, stage 1 conf vol					1620	
vC2, stage 2 conf vol					909	
vCu, unblocked vol			1641		2529	810
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	87
cM capacity (veh/h)			386		103	323

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	810	810	21	909	909	42
Volume Left	0	0	0	0	0	0
Volume Right	0	0	21	0	0	42
cSH	1700	1700	1700	1700	1700	323
Volume to Capacity	0.48	0.48	0.01	0.53	0.53	0.13
Queue Length 95th (ft)	0	0	0	0	0	11
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	17.8
Lane LOS						C
Approach Delay (s)	0.0			0.0		17.8
Approach LOS						C

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
250: Mequon Road & Weston Center West Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1565	30	70	1720	25	30
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850			0.927	
Flt Protected			0.950		0.978	
Satd. Flow (prot)	3505	1411	1752	3505	1689	0
Flt Permitted			0.950		0.978	
Satd. Flow (perm)	3505	1411	1752	3505	1689	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Adj. Flow (vph)	1630	31	73	1792	26	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1630	31	73	1792	57	0
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
250: Mequon Road & Weston Center West Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1565	30	70	1720	25	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1630	31	73	1792	26	31
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised			Raised		
Median storage veh)	1			1		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1661		2672	815
vC1, stage 1 conf vol					1630	
vC2, stage 2 conf vol					1042	
vCu, unblocked vol			1661		2672	815
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			81		71	90
cM capacity (veh/h)			379		89	320

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	815	815	31	73	896	896	57
Volume Left	0	0	0	73	0	0	26
Volume Right	0	0	31	0	0	0	31
cSH	1700	1700	1700	379	1700	1700	147
Volume to Capacity	0.48	0.48	0.02	0.19	0.53	0.53	0.39
Queue Length 95th (ft)	0	0	0	18	0	0	42
Control Delay (s)	0.0	0.0	0.0	16.7	0.0	0.0	44.3
Lane LOS				C			E
Approach Delay (s)	0.0			0.7			44.3
Approach LOS							E

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

Volume
260: Mequon Road & Weston Center East Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1595	1	0	1790	0	10
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3574	1439	0	3505	0	1611
Flt Permitted						
Satd. Flow (perm)	3574	1439	0	3505	0	1611
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	2%	2%
Adj. Flow (vph)	1734	1	0	1946	0	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1734	1	0	1946	0	11
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
260: Mequon Road & Weston Center East Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1595	1	0	1790	0	10
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)	1734	1	0	1946	0	11
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)				1088		
pX, platoon unblocked					0.69	
vC, conflicting volume			1735		2707	867
vC1, stage 1 conf vol					1734	
vC2, stage 2 conf vol					973	
vCu, unblocked vol			1735		2572	867
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			355		101	296

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	867	867	1	973	973	11
Volume Left	0	0	0	0	0	0
Volume Right	0	0	1	0	0	11
cSH	1700	1700	1700	1700	1700	296
Volume to Capacity	0.51	0.51	0.00	0.57	0.57	0.04
Queue Length 95th (ft)	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	17.6
Lane LOS						C
Approach Delay (s)	0.0			0.0		17.6
Approach LOS						C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
270: Mequon Road & River Birch Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1575	25	50	1760	5	30	1	55	1	1	1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.914			0.955	
Flt Protected	0.950			0.950				0.983			0.984	
Satd. Flow (prot)	1787	3574	1439	1752	3505	1411	0	1690	0	0	1768	0
Flt Permitted	0.950			0.950				0.983			0.984	
Satd. Flow (perm)	1787	3574	1439	1752	3505	1411	0	1690	0	0	1768	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
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	1712	27	54	1913	5	33	1	60	1	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1712	27	54	1913	5	0	94	0	0	3	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
270: Mequon Road & River Birch Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1575	25	50	1760	5	30	1	55	1	1	1
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	1712	27	54	1913	5	33	1	60	1	1	1
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)					626							
pX, platoon unblocked	0.70						0.70	0.70		0.70	0.70	0.70
vC, conflicting volume	1918			1739			2790	3750	856	2949	3772	957
vC1, stage 1 conf vol							1723	1723		2022	2022	
vC2, stage 2 conf vol							1067	2027		927	1750	
vCu, unblocked vol	1455			1739			2699	4072	856	2927	4103	80
tC, single (s)	4.1			4.2			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 %	98			85			54	98	80	98	97	100
cM capacity (veh/h)	326			353			71	51	303	45	42	677

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	5	856	856	27	54	957	957	5	93	3
Volume Left	5	0	0	0	54	0	0	0	33	1
Volume Right	0	0	0	27	0	0	0	5	60	1
cSH	326	1700	1700	1700	353	1700	1700	1700	138	63
Volume to Capacity	0.02	0.50	0.50	0.02	0.15	0.56	0.56	0.00	0.68	0.05
Queue Length 95th (ft)	1	0	0	0	13	0	0	0	94	4
Control Delay (s)	16.2	0.0	0.0	0.0	17.0	0.0	0.0	0.0	73.9	65.6
Lane LOS	C				C				F	F
Approach Delay (s)	0.1				0.5				73.9	65.6
Approach LOS									F	F

Intersection Summary			
Average Delay		2.1	
Intersection Capacity Utilization		62.1%	ICU Level of Service
Analysis Period (min)		15	

Volume
280: Mequon Road & Buntrock Avenue

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	1485	60	115	1610	30	145	45	140	25	5	60
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.963			0.960	
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411	0	1776	1568	0	1788	1583
Flt Permitted	0.093			0.116				0.756			0.586	
Satd. Flow (perm)	173	3539	1425	214	3505	1411	0	1395	1568	0	1092	1583
Satd. Flow (RTOR)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	90	1580	32	122	1713	16	154	48	74	27	5	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	90	1580	32	122	1713	16	0	202	74	0	32	32
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	6	6	6	2	2	2	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	21.4	21.4	21.4	21.4	21.4	21.4	17.1	17.1	17.1	17.1	17.1	17.1
Total Split (s)	80.0	80.0	80.0	80.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Maximum Green (s)	73.6	73.6	73.6	73.6	73.6	73.6	32.9	32.9	32.9	32.9	32.9	32.9
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.4	7.1	7.1	7.1	7.1	7.1	7.1
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.5	5.5	5.5	5.5	5.5	5.5	1.5	1.5	1.5	1.5	1.5	1.5
Minimum Gap (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Time Before Reduce (s)	30.0	30.0	30.0	30.0	30.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	15.0	15.0	15.0	15.0	15.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	None
v/c Ratio	0.73	0.63	0.03	0.80	0.69	0.02		0.81	0.26		0.16	0.11
Control Delay	51.7	11.5	6.8	27.0	6.1	1.9		70.5	42.7		40.7	39.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	51.7	11.5	6.8	27.0	6.1	1.9		70.5	42.7		40.7	39.1
90th %ile Green (s)	76.6	76.6	76.6	76.6	76.6	76.6	29.9	29.9	29.9	29.9	29.9	29.9
90th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
70th %ile Green (s)	81.5	81.5	81.5	81.5	81.5	81.5	25.0	25.0	25.0	25.0	25.0	25.0
70th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
50th %ile Green (s)	85.0	85.0	85.0	85.0	85.0	85.0	21.5	21.5	21.5	21.5	21.5	21.5
50th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
30th %ile Green (s)	88.6	88.6	88.6	88.6	88.6	88.6	17.9	17.9	17.9	17.9	17.9	17.9
30th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
10th %ile Green (s)	93.8	93.8	93.8	93.8	93.8	93.8	12.7	12.7	12.7	12.7	12.7	12.7

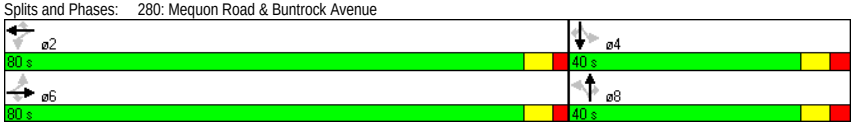
Volume
280: Mequon Road & Buntrock Avenue 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
Queue Length 50th (ft)	38	303	7	72	37	1		152	50		21	21
Queue Length 95th (ft)	#166	470	21	m49	m468	m1		220	88		47	46
Internal Link Dist (ft)		546			209			420			420	
Turn Bay Length (ft)	100			120					70			40
Base Capacity (vph)	123	2510	1011	152	2486	1001		382	430		299	434
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	0.73	0.63	0.03	0.80	0.69	0.02		0.53	0.17		0.11	0.07

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 41 (34%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
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: 280: Mequon Road & Buntrock Avenue



HCM Signalized Intersection Capacity Analysis
280: Mequon Road & Buntrock Avenue 12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	1485	60	115	1610	30	145	45	140	25	5	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	9	12	12	9	12	12	12	12	12	12
Total Lost time (s)	6.4	6.4	6.4	6.4	6.4	6.4		7.1	7.1		7.1	7.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411		1777	1568		1787	1583
Flt Permitted	0.09	1.00	1.00	0.12	1.00	1.00		0.76	1.00		0.59	1.00
Satd. Flow (perm)	172	3539	1425	213	3505	1411		1395	1568		1092	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	90	1580	32	122	1713	16	154	48	74	27	5	32
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	90	1580	32	122	1713	16	0	202	74	0	32	32
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Actuated Green, G (s)	85.1	85.1	85.1	85.1	85.1	85.1		21.4	21.4		21.4	21.4
Effective Green, g (s)	85.1	85.1	85.1	85.1	85.1	85.1		21.4	21.4		21.4	21.4
Actuated g/C Ratio	0.71	0.71	0.71	0.71	0.71	0.71		0.18	0.18		0.18	0.18
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4	6.4		7.1	7.1		7.1	7.1
Vehicle Extension (s)	5.5	5.5	5.5	5.5	5.5	5.5		1.5	1.5		1.5	1.5
Lane Grp Cap (vph)	122	2510	1011	151	2486	1001		249	280		195	282
v/s Ratio Prot		0.45			0.49							
v/s Ratio Perm	0.52		0.02	c0.57		0.01		c0.14	0.05		0.03	0.02
v/c Ratio	0.74	0.63	0.03	0.81	0.69	0.02		0.81	0.26		0.16	0.11
Uniform Delay, d1	10.6	9.2	5.2	11.9	9.9	5.1		47.4	42.5		41.7	41.3
Progression Factor	1.00	1.00	1.00	0.66	0.50	0.27		1.00	1.00		1.00	1.00
Incremental Delay, d2	32.5	1.2	0.1	11.5	0.4	0.0		17.0	0.2		0.1	0.1
Delay (s)	43.2	10.4	5.2	19.4	5.4	1.4		64.4	42.7		41.9	41.4
Level of Service	D	B	A	B	A	A		E	D		D	D
Approach Delay (s)		12.0			6.3			58.6			41.6	
Approach LOS		B			A			E			D	

Intersection Summary

HCM Average Control Delay	13.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Volume
290: Mequon Road & Jung Brewery Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1630	20	0	1755	0	15
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3539	1425	0	3505	0	1596
Flt Permitted						
Satd. Flow (perm)	3539	1425	0	3505	0	1596
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	3%	3%	3%	3%
Adj. Flow (vph)	1734	21	0	1867	0	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1734	21	0	1867	0	16
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
290: Mequon Road & Jung Brewery Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1630	20	0	1755	0	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1734	21	0	1867	0	16
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)	289					
pX, platoon unblocked			0.76		0.76	0.76
vC, conflicting volume			1755		2668	867
vC1, stage 1 conf vol					1734	
vC2, stage 2 conf vol					934	
vCu, unblocked vol			1353		2560	177
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)					5.9	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	97
cM capacity (veh/h)			377		105	629

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	867	867	21	934	934	16
Volume Left	0	0	0	0	0	0
Volume Right	0	0	21	0	0	16
cSH	1700	1700	1700	1700	1700	629
Volume to Capacity	0.51	0.51	0.01	0.55	0.55	0.03
Queue Length 95th (ft)	0	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	10.9
Lane LOS						B
Approach Delay (s)	0.0			0.0		10.9
Approach LOS						B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

Volume
300: Mequon Road & Public Works Access

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1530	110	230	1575	20	165	5	495	15	1	15
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.935	
Flt Protected	0.950			0.950				0.954			0.976	
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411	0	1718	1531	0	1717	0
Flt Permitted	0.950			0.950				0.954			0.976	
Satd. Flow (perm)	1770	3539	1425	1752	3505	1411	0	1718	1531	0	1717	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	5	1628	117	245	1676	21	176	5	527	16	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1628	117	245	1676	21	0	181	527	0	33	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
300: Mequon Road & Public Works Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1530	110	230	1575	20	165	5	495	15	1	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	5	1628	117	245	1676	21	176	5	527	16	1	16
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)		618			1272							
pX, platoon unblocked	0.74			0.76			0.86	0.86	0.76	0.86	0.86	0.74
vC, conflicting volume	1697			1745			2982	3824	814	3519	3920	838
vC1, stage 1 conf vol							1638	1638		2165	2165	
vC2, stage 2 conf vol							1344	2186		1354	1755	
vCu, unblocked vol	1233			1345			1713	2695	118	2338	2806	68
tC, single (s)	4.1			4.2			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			36			0	75	24	0	81	98
cM capacity (veh/h)	414			381			58	22	691	2	6	726

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1
Volume Total	5	814	814	117	245	838	838	21	181	527	33
Volume Left	5	0	0	0	245	0	0	0	176	0	16
Volume Right	0	0	0	117	0	0	0	21	0	527	16
cSH	414	1700	1700	1700	381	1700	1700	1700	55	691	3
Volume to Capacity	0.01	0.48	0.48	0.07	0.64	0.49	0.49	0.01	3.26	0.76	10.08
Queue Length 95th (ft)	1	0	0	0	107	0	0	0	Err	178	Err
Control Delay (s)	13.8	0.0	0.0	0.0	29.9	0.0	0.0	0.0	Err	24.9	Err
Lane LOS	B				D				F	C	F
Approach Delay (s)	0.0				3.8				2574.6		Err
Approach LOS									F		F

Intersection Summary				
Average Delay	487.0			
Intersection Capacity Utilization	86.3%	ICU Level of Service	E	
Analysis Period (min)	15			

Volume
310: Mequon Road & Logeman Access 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	2020	15	0	1810	1	0	0	25	1	1	15
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.865		0.880	
Flt Protected											0.997	
Satd. Flow (prot)	0	3539	1425	0	3505	1411	0	0	1627	0	1650	0
Flt Permitted											0.997	
Satd. Flow (perm)	0	3539	1425	0	3505	1411	0	0	1627	0	1650	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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	2196	16	0	1967	1	0	0	27	1	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2201	16	0	1967	1	0	0	27	0	18	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
310: Mequon Road & Logeman Access 12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	2020	15	0	1810	1	0	0	25	1	1	15
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	2196	16	0	1967	1	0	0	27	1	1	16
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)		1048			842							
pX, platoon unblocked	0.73			0.76			0.85	0.85	0.76	0.85	0.85	0.73
vC, conflicting volume	1968			2212			3207	4175	1098	3103	4190	984
vC1, stage 1 conf vol							2207	2207		1967	1967	
vC2, stage 2 conf vol							1001	1968		1136	2223	
vCu, unblocked vol	1592			1959			1961	3094	486	1839	3112	247
tC, single (s)	4.1			4.2			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 %	98			100			100	100	93	98	98	97
cM capacity (veh/h)	299			219			45	48	401	70	48	554

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	737	1464	16	984	984	1	27	18
Volume Left	5	0	0	0	0	0	0	1
Volume Right	0	0	16	0	0	1	27	16
cSH	299	1700	1700	1700	1700	1700	401	274
Volume to Capacity	0.02	0.86	0.01	0.58	0.58	0.00	0.07	0.07
Queue Length 95th (ft)	1	0	0	0	0	0	5	5
Control Delay (s)	0.7	0.0	0.0	0.0	0.0	0.0	14.6	19.1
Lane LOS	A						B	C
Approach Delay (s)	0.2			0.0			14.6	19.1
Approach LOS							B	C

Intersection Summary				
Average Delay	0.3			
Intersection Capacity Utilization	72.6%	ICU Level of Service	C	
Analysis Period (min)	15			

Volume
320: Mequon Road & River Centre Center Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1945	100	85	1730	80	75
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3574	1439	1752	3505	1787	1599
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3574	1439	1752	3505	1787	1599
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	1%	1%
Adj. Flow (vph)	2114	109	92	1880	87	82
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2114	109	92	1880	87	82
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
320: Mequon Road & River Centre Center Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1945	100	85	1730	80	75
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)	2114	109	92	1880	87	82
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)	1243			647		
pX, platoon unblocked			0.77		0.85	0.77
vC, conflicting volume			2223		3239	1057
vC1, stage 1 conf vol					2114	
vC2, stage 2 conf vol					1125	
vCu, unblocked vol			1992		2062	479
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			57		0	80
cM capacity (veh/h)			217		66	413

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	1057	1057	109	92	940	940	87	82
Volume Left	0	0	0	92	0	0	87	0
Volume Right	0	0	109	0	0	0	0	82
cSH	1700	1700	1700	217	1700	1700	66	413
Volume to Capacity	0.62	0.62	0.06	0.43	0.55	0.55	1.31	0.20
Queue Length 95th (ft)	0	0	0	49	0	0	178	18
Control Delay (s)	0.0	0.0	0.0	33.4	0.0	0.0	320.8	15.9
Lane LOS				D			F	C
Approach Delay (s)	0.0			1.6			173.2	
Approach LOS							F	

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		

Volume
330: Mequon Road & Area H Access

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	2015	5	0	1815	10	0	0	50	0	0	1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.865			0.865
Flt Protected												
Satd. Flow (prot)	0	3539	1425	0	3505	1411	0	0	1627	0	0	1627
Flt Permitted												
Satd. Flow (perm)	0	3539	1425	0	3505	1411	0	0	1627	0	0	1627
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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	0	2167	5	0	1952	11	0	0	54	0	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2167	5	0	1952	11	0	0	54	0	0	1
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
330: Mequon Road & Area H Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	2015	5	0	1815	10	0	0	50	0	0	1
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)	0	2167	5	0	1952	11	0	0	54	0	0	1
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)					337							
pX, platoon unblocked	0.73						0.73	0.73		0.73	0.73	0.73
vC, conflicting volume	1962			2172			3144	4129	1083	3089	4124	976
vC1, stage 1 conf vol							2167	2167		1952	1952	
vC2, stage 2 conf vol							977	1962		1137	2172	
vCu, unblocked vol	1573			2172			3197	4553	1083	3122	4545	216
tC, single (s)	4.1			4.2			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 %	100			100			100	100	75	100	100	100
cM capacity (veh/h)	302			239			41	47	214	52	47	576

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	1083	1083	5	976	976	11	54	1
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	5	0	0	11	54	1
cSH	1700	1700	1700	1700	1700	1700	214	576
Volume to Capacity	0.64	0.64	0.00	0.57	0.57	0.01	0.25	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	24	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	27.4	11.3
Lane LOS							D	B
Approach Delay (s)	0.0			0.0			27.4	11.3
Approach LOS							D	B

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	65.7%	ICU Level of Service	C	
Analysis Period (min)	15			

Volume
340: Mequon Road & Cedarburg Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	520	1375	170	280	1310	620	245	760	245	445	295	270
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95
Frt			0.850			0.850			0.850		0.928	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3467	3574	1599	3433	3284	0
Flt Permitted	0.106			0.120			0.950			0.950		
Satd. Flow (perm)	197	3539	1583	224	3539	1583	3467	3574	1599	3433	3284	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Adj. Flow (vph)	547	1447	89	295	1379	326	258	800	129	468	311	284
Shared Lane Traffic (%)												
Lane Group Flow (vph)	547	1447	89	295	1379	326	258	800	129	468	595	0
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2			8			
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	6.0	12.0	12.0	6.0	12.0	12.0	6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.5	18.7	18.7	10.5	18.7	18.7	10.5	16.9	16.9	10.5	16.9	
Total Split (s)	28.0	50.0	50.0	18.0	40.0	40.0	22.0	29.0	29.0	23.0	30.0	0.0
Total Split (%)	23.3%	41.7%	41.7%	15.0%	33.3%	33.3%	18.3%	24.2%	24.2%	19.2%	25.0%	0.0%
Maximum Green (s)	23.5	43.3	43.3	13.5	33.3	33.3	17.5	22.1	22.1	18.5	23.1	
Yellow Time (s)	3.5	3.9	3.9	3.5	3.9	3.9	3.5	3.9	3.9	3.5	3.9	
All-Red Time (s)	1.0	2.8	2.8	1.0	2.8	2.8	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4	3.4	1.5	1.5	1.5	1.5	1.5	
Minimum Gap (s)	1.5	2.0	2.0	1.5	2.0	2.0	1.5	1.5	1.5	1.5	1.5	
Time Before Reduce (s)	15.0	28.0	28.0	15.0	20.0	20.0	20.0	40.0	40.0	30.0	40.0	
Time To Reduce (s)	0.0	12.0	12.0	0.0	20.0	20.0	0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
v/c Ratio	1.33	1.13	0.16	1.11	1.40	0.74	0.70	1.19	0.43	0.91	0.78	
Control Delay	190.2	105.1	24.2	121.4	222.3	51.1	61.7	141.8	48.4	72.9	52.1	
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	190.2	105.1	24.2	121.4	222.3	51.1	61.7	141.8	48.4	72.9	52.1	
90th %ile Green (s)	23.5	43.3	43.3	13.5	33.3	33.3	16.7	22.1	22.1	18.5	23.9	
90th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Gap	Max	Max	Max	Max	
70th %ile Green (s)	23.5	43.3	43.3	13.5	33.3	33.3	14.4	22.1	22.1	18.5	26.2	
70th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Gap	Max	Max	Max	Max	
50th %ile Green (s)	23.5	43.3	43.3	13.5	33.3	33.3	12.8	22.1	22.1	18.5	27.8	
50th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Gap	Max	Max	Max	Hold	
30th %ile Green (s)	23.5	43.3	43.3	13.5	33.3	33.3	11.2	22.1	22.1	18.5	29.4	
30th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Gap	Max	Max	Max	Hold	
10th %ile Green (s)	23.5	43.3	43.3	13.5	33.3	33.3	8.9	24.6	24.6	16.0	31.7	

Volume
340: Mequon Road & Cedarburg Road

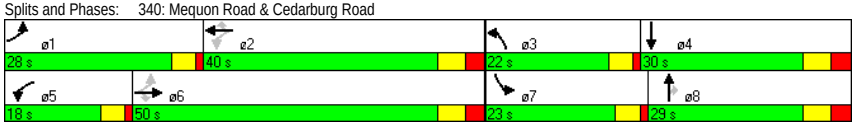
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Gap	Max	Max	Gap	Hold	
Queue Length 50th (ft)	~498	~695	49	~207	~753	230	101	~399	90	185	228	
Queue Length 95th (ft)	#709	#842	m83	#388	#892	#343	141	#526	153	#276	#345	
Internal Link Dist (ft)		257			885			746			862	
Turn Bay Length (ft)	180		175	200		235	225		125	385		
Base Capacity (vph)	412	1277	571	265	982	439	506	673	301	529	761	
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	1.33	1.13	0.16	1.11	1.40	0.74	0.51	1.19	0.43	0.88	0.78	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 1 (1%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
~ 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: 340: Mequon Road & Cedarburg Road



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Synchro 7 - Report

HCM Signalized Intersection Capacity Analysis
340: Mequon Road & Cedarburg Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	520	1375	170	280	1310	620	245	760	245	445	295	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3467	3574	1599	3433	3286	
Flt Permitted	0.11	1.00	1.00	0.12	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	197	3539	1583	224	3539	1583	3467	3574	1599	3433	3286	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	547	1447	89	295	1379	326	258	800	129	468	311	284
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	547	1447	89	295	1379	326	258	800	129	468	595	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2			8			
Actuated Green, G (s)	61.3	43.3	43.3	46.8	33.3	33.3	12.8	22.6	22.6	18.0	27.8	
Effective Green, g (s)	61.3	43.3	43.3	46.8	33.3	33.3	12.8	22.6	22.6	18.0	27.8	
Actuated g/C Ratio	0.51	0.36	0.36	0.39	0.28	0.28	0.11	0.19	0.19	0.15	0.23	
Clearance Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4	3.4	1.5	1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	409	1277	571	261	982	439	370	673	301	515	761	
v/s Ratio Prot	c0.26	0.41		0.13	0.39		0.07	c0.22		c0.14	0.18	
v/s Ratio Perm	c0.42		0.06	0.31		0.21			0.08			
v/c Ratio	1.34	1.13	0.16	1.13	1.40	0.74	0.70	1.19	0.43	0.91	0.78	
Uniform Delay, d1	37.3	38.4	26.0	33.7	43.4	39.4	51.7	48.7	43.0	50.2	43.3	
Progression Factor	0.85	0.98	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	166.7	69.6	0.5	95.4	188.1	10.8	4.6	99.3	0.4	19.4	4.8	
Delay (s)	198.4	107.2	23.8	129.1	231.4	50.3	56.3	148.0	43.4	69.6	48.1	
Level of Service	F	F	C	F	F	D	E	F	D	E	D	
Approach Delay (s)		127.6			186.8			116.7			57.6	
Approach LOS		F			F			F			E	

Intersection Summary			
HCM Average Control Delay	132.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	117.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX D

TOTAL TRAFFIC
PEAK HOUR ANALYSIS OUTPUTS
(NOT APPLICABLE)

APPENDIX E

BACKGROUND TRAFFIC PEAK HOUR ANALYSIS *WITH IMPROVEMENTS*

APPENDIX E

Year 2010 Background Traffic Analysis – With Improvements

Volume
200: Mequon Road & Wauwatosa Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	515	50	135	695	210	175	435	105	135	180	90
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.950			0.950			0.611			0.362		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1138	3539	1583	643	3374	1509
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Adj. Flow (vph)	221	542	26	142	732	111	184	458	55	142	189	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	221	542	26	142	732	111	184	458	55	142	189	47
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	11.5	17.9	17.9	11.5	17.9	17.9	11.5	18.0	18.0	11.5	18.0	18.0
Total Split (s)	28.5	45.9	45.9	28.5	45.9	45.9	23.5	46.0	46.0	23.5	46.0	46.0
Total Split (%)	19.8%	31.9%	31.9%	19.8%	31.9%	31.9%	16.3%	32.0%	32.0%	16.3%	32.0%	32.0%
Maximum Green (s)	25.0	40.0	40.0	25.0	40.0	40.0	20.0	40.0	40.0	20.0	40.0	40.0
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0
All-Red Time (s)	0.0	0.9	0.9	0.0	0.9	0.9	0.0	1.0	1.0	0.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Minimum Gap (s)	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0
Time Before Reduce (s)	15.0	24.0	24.0	15.0	18.0	18.0	15.0	24.0	24.0	15.0	22.0	22.0
Time To Reduce (s)	0.0	16.0	16.0	0.0	22.0	22.0	0.0	16.0	16.0	0.0	18.0	18.0
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
v/c Ratio	0.70	0.46	0.05	0.60	0.72	0.25	0.37	0.62	0.17	0.40	0.28	0.15
Control Delay	53.2	28.5	25.9	54.5	37.4	31.3	24.1	40.9	37.2	25.2	36.8	38.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.2	28.5	25.9	54.5	37.4	31.3	24.1	40.9	37.2	25.2	36.8	38.0
90th %ile Green (s)	25.0	44.1	44.1	19.7	38.8	38.8	18.5	28.9	28.9	17.4	27.8	27.8
90th %ile Term Code	Max	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
70th %ile Green (s)	21.7	38.5	38.5	16.0	32.8	32.8	15.4	24.1	24.1	14.3	23.0	23.0
70th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
50th %ile Green (s)	17.6	31.8	31.8	13.0	27.2	27.2	12.5	20.6	20.6	11.8	19.9	19.9
50th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
30th %ile Green (s)	14.1	27.6	27.6	10.4	23.9	23.9	10.2	16.6	16.6	9.4	15.8	15.8
30th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
10th %ile Green (s)	10.2	20.3	20.3	8.0	18.1	18.1	8.0	13.1	13.1	8.0	13.1	13.1

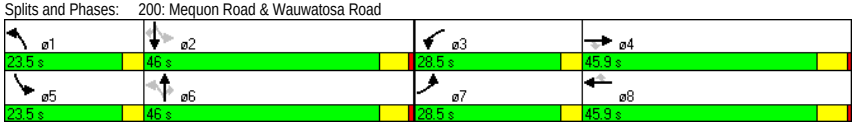
Volume
200: Mequon Road & Wauwatosa Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Gap	Hold	Hold	Min	Gap	Gap	Min	Gap	Gap	Min	Hold	Hold
Queue Length 50th (ft)	127	136	11	83	212	52	74	133	28	56	51	24
Queue Length 95th (ft)	261	238	36	181	355	121	158	238	75	125	105	68
Internal Link Dist (ft)		559			585			1105			792	
Turn Bay Length (ft)	135		35	295		50	185		110	150		200
Base Capacity (vph)	476	1546	691	476	1523	681	586	1523	681	478	1452	650
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.35	0.04	0.30	0.48	0.16	0.31	0.30	0.08	0.30	0.13	0.07

Intersection Summary
Cycle Length: 143.9
Actuated Cycle Length: 97.6
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 129
70th %ile Actuated Cycle: 111.8
50th %ile Actuated Cycle: 96.1
30th %ile Actuated Cycle: 82.9
10th %ile Actuated Cycle: 68.3

Splits and Phases: 200: Mequon Road & Wauwatosa Road



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Traffic Analysis & Design, Inc.
Synchro 7 - Report

HCM Signalized Intersection Capacity Analysis
200: Mequon Road & Wauwatosa Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	515	50	135	695	210	175	435	105	135	180	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.61	1.00	1.00	0.36	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1138	3539	1583	643	3374	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	221	542	26	142	732	111	184	458	55	142	189	47
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	221	542	26	142	732	111	184	458	55	142	189	47
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Actuated Green, G (s)	17.4	32.2	32.2	13.2	28.0	28.0	33.1	20.4	20.4	31.7	19.7	19.7
Effective Green, g (s)	17.4	32.2	32.2	13.2	28.0	28.0	33.1	20.4	20.4	31.7	19.7	19.7
Actuated g/C Ratio	0.18	0.33	0.33	0.14	0.29	0.29	0.34	0.21	0.21	0.33	0.20	0.20
Clearance Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Lane Grp Cap (vph)	318	1178	527	242	1025	458	473	747	334	340	687	307
v/s Ratio Prot	c0.12	0.15		0.08	c0.21		0.05	c0.13		c0.05	0.06	
v/s Ratio Perm			0.02			0.07	0.08		0.03	0.09		0.03
v/c Ratio	0.69	0.46	0.05	0.59	0.71	0.24	0.39	0.61	0.16	0.42	0.28	0.15
Uniform Delay, d1	37.2	25.4	21.9	39.2	30.8	26.2	23.3	34.6	31.2	24.0	32.5	31.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.2	0.4	0.1	2.3	2.5	0.3	0.2	1.7	0.3	0.3	0.3	0.3
Delay (s)	42.4	25.8	21.9	41.5	33.2	26.6	23.5	36.2	31.5	24.3	32.8	32.0
Level of Service	D	C	C	D	C	C	C	D	C	C	C	C
Approach Delay (s)		30.3			33.7			32.5			29.5	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	31.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	96.7	Sum of lost time (s)	12.9
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Volume
230: Mequon Road & Concord Creek Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	865	45	50	1030	5	30	1	35	10	1	10
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.954			0.957	
Satd. Flow (prot)	1752	3505	1411	1752	3505	1411	0	1777	1583	0	1432	1272
Flt Permitted	0.950			0.950				0.954			0.957	
Satd. Flow (perm)	1752	3505	1411	1752	3505	1411	0	1777	1583	0	1432	1272
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	27%	27%	27%
Adj. Flow (vph)	5	901	47	52	1073	5	31	1	36	10	1	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	901	47	52	1073	5	0	32	36	0	11	10
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized
Description: High SB %HV

HCM Unsignalized Intersection Capacity Analysis
230: Mequon Road & Concord Creek Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	865	45	50	1030	5	30	1	35	10	1	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	901	47	52	1073	5	31	1	36	10	1	10
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	1078			948			1563	2094	451	1675	2135	536
vC1, stage 1 conf vol							911	911		1177	1177	
vC2, stage 2 conf vol							652	1182		498	958	
vCu, unblocked vol	1078			948			1563	2094	451	1675	2135	536
tC, single (s)	4.2			4.2			7.5	6.5	6.9	8.0	7.0	7.4
tC, 2 stage (s)							6.5	5.5		7.0	6.0	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.8	4.3	3.6
p0 queue free %	99			93			83	99	93	91	99	98
cM capacity (veh/h)	637			714			181	150	556	115	113	429

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1	SB 2
Volume Total	5	451	451	47	52	536	536	5	32	36	11	10
Volume Left	5	0	0	0	52	0	0	0	31	0	10	0
Volume Right	0	0	0	47	0	0	0	5	0	36	0	10
cSH	637	1700	1700	1700	714	1700	1700	1700	180	556	115	429
Volume to Capacity	0.01	0.27	0.27	0.03	0.07	0.32	0.32	0.00	0.18	0.07	0.10	0.02
Queue Length 95th (ft)	1	0	0	0	6	0	0	0	16	5	8	2
Control Delay (s)	10.7	0.0	0.0	0.0	10.4	0.0	0.0	0.0	29.4	11.9	39.8	13.6
Lane LOS	B				B				D	B	E	B
Approach Delay (s)	0.1				0.5				20.1		27.3	
Approach LOS									C		D	

Intersection Summary			
Average Delay		1.2	
Intersection Capacity Utilization		50.2%	ICU Level of Service
Analysis Period (min)		15	
Description: High SB %HV			

Volume
270: Mequon Road & River Birch Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	905	1	5	1080	5	5	1	5	1	1	1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.939			0.955	
Flt Protected	0.950			0.950				0.978			0.984	
Satd. Flow (prot)	1787	3574	1439	1752	3505	1411	0	1728	0	0	1768	0
Flt Permitted	0.950			0.950				0.978			0.984	
Satd. Flow (perm)	1787	3574	1439	1752	3505	1411	0	1728	0	0	1768	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
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	984	1	5	1174	5	5	1	5	1	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	984	1	5	1174	5	0	11	0	0	3	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
270: Mequon Road & River Birch Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	905	1	5	1080	5	5	1	5	1	1	1
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	984	1	5	1174	5	5	1	5	1	1	1
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)					626							
pX, platoon unblocked	0.90						0.90	0.90		0.90	0.90	0.90
vC, conflicting volume	1179			985			1594	2185	492	1693	2180	587
vC1, stage 1 conf vol							995	995		1185	1185	
vC2, stage 2 conf vol							599	1190		509	996	
vCu, unblocked vol	987			985			1445	2098	492	1555	2094	332
tC, single (s)	4.1			4.2			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			99			97	99	99	99	99	100
cM capacity (veh/h)	635			691			195	158	525	173	159	603

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	5	492	492	1	5	587	587	5	12	3
Volume Left	5	0	0	0	5	0	0	0	5	1
Volume Right	0	0	0	1	0	0	0	5	5	1
cSH	635	1700	1700	1700	691	1700	1700	1700	265	219
Volume to Capacity	0.01	0.29	0.29	0.00	0.01	0.35	0.35	0.00	0.05	0.01
Queue Length 95th (ft)	1	0	0	0	1	0	0	0	4	1
Control Delay (s)	10.7	0.0	0.0	0.0	10.3	0.0	0.0	0.0	19.2	21.7
Lane LOS	B				B				C	C
Approach Delay (s)	0.1				0.0				19.2	21.7
Approach LOS									C	C

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		39.9%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
280: Mequon Road & Buntrock Avenue

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	840	10	25	985	15	65	35	45	10	5	40
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.968			0.967	
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411	0	1786	1568	0	1801	1583
Flt Permitted	0.257			0.308				0.794			0.756	
Satd. Flow (perm)	479	3539	1425	568	3505	1411	0	1465	1568	0	1408	1583
Satd. Flow (RTOR)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	64	894	5	27	1048	8	69	37	24	11	5	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	894	5	27	1048	8	0	106	24	0	16	21
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	6	6	6	2	2	2	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	21.4	21.4	21.4	21.4	21.4	21.4	17.1	17.1	17.1	17.1	17.1	17.1
Total Split (s)	80.0	80.0	80.0	80.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Maximum Green (s)	73.6	73.6	73.6	73.6	73.6	73.6	32.9	32.9	32.9	32.9	32.9	32.9
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.4	7.1	7.1	7.1	7.1	7.1	7.1
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.5	5.5	5.5	5.5	5.5	5.5	1.5	1.5	1.5	1.5	1.5	1.5
Minimum Gap (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Time Before Reduce (s)	30.0	30.0	30.0	30.0	30.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	15.0	15.0	15.0	15.0	15.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	None
v/c Ratio	0.17	0.33	0.00	0.06	0.38	0.01		0.65	0.14		0.10	0.12
Control Delay	5.3	4.6	3.8	0.9	1.3	0.8		69.4	48.1		47.3	47.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	5.3	4.6	3.8	0.9	1.3	0.8		69.4	48.1		47.3	47.6
90th %ile Green (s)	87.9	87.9	87.9	87.9	87.9	87.9	18.6	18.6	18.6	18.6	18.6	18.6
90th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
70th %ile Green (s)	91.4	91.4	91.4	91.4	91.4	91.4	15.1	15.1	15.1	15.1	15.1	15.1
70th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
50th %ile Green (s)	93.9	93.9	93.9	93.9	93.9	93.9	12.6	12.6	12.6	12.6	12.6	12.6
50th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
30th %ile Green (s)	96.4	96.4	96.4	96.4	96.4	96.4	10.1	10.1	10.1	10.1	10.1	10.1
30th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
10th %ile Green (s)	96.5	96.5	96.5	96.5	96.5	96.5	10.0	10.0	10.0	10.0	10.0	10.0

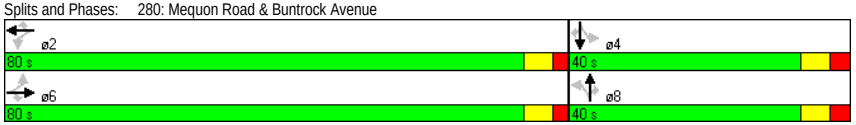
Volume
280: Mequon Road & Buntrock Avenue 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Min	Min	Min	Hold	Hold	Hold
Queue Length 50th (ft)	10	87	1	1	13	0		80	17		11	15
Queue Length 95th (ft)	30	141	4	m2	22	m1		135	42		32	39
Internal Link Dist (ft)		546			209			420			420	
Turn Bay Length (ft)	100			120					70			40
Base Capacity (vph)	372	2749	1107	441	2723	1096		402	430		386	434
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	0.17	0.33	0.00	0.06	0.38	0.01		0.26	0.06		0.04	0.05

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 49 (41%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 280: Mequon Road & Buntrock Avenue



HCM Signalized Intersection Capacity Analysis
280: Mequon Road & Buntrock Avenue 12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	840	10	25	985	15	65	35	45	10	5	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	9	12	12	9	12	12	12	12	12	12
Total Lost time (s)	6.4	6.4	6.4	6.4	6.4	6.4		7.1	7.1		7.1	7.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411		1787	1568		1801	1583
Flt Permitted	0.26	1.00	1.00	0.31	1.00	1.00		0.79	1.00		0.76	1.00
Satd. Flow (perm)	479	3539	1425	568	3505	1411		1464	1568		1409	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	64	894	5	27	1048	8	69	37	24	11	5	21
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	64	894	5	27	1048	8	0	106	24	0	16	21
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Actuated Green, G (s)	93.2	93.2	93.2	93.2	93.2	93.2		13.3	13.3		13.3	13.3
Effective Green, g (s)	93.2	93.2	93.2	93.2	93.2	93.2		13.3	13.3		13.3	13.3
Actuated g/C Ratio	0.78	0.78	0.78	0.78	0.78	0.78		0.11	0.11		0.11	0.11
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4	6.4		7.1	7.1		7.1	7.1
Vehicle Extension (s)	5.5	5.5	5.5	5.5	5.5	5.5		1.5	1.5		1.5	1.5
Lane Grp Cap (vph)	372	2749	1107	441	2722	1096		162	174		156	175
v/s Ratio Prot		0.25			c0.30							
v/s Ratio Perm	0.13		0.00	0.05		0.01		c0.07	0.02		0.01	0.01
v/c Ratio	0.17	0.33	0.00	0.06	0.39	0.01		0.65	0.14		0.10	0.12
Uniform Delay, d1	3.5	4.0	3.0	3.1	4.3	3.0		51.1	48.2		48.0	48.1
Progression Factor	1.00	1.00	1.00	0.17	0.20	0.20		1.00	1.00		1.00	1.00
Incremental Delay, d2	1.0	0.3	0.0	0.2	0.4	0.0		7.0	0.1		0.1	0.1
Delay (s)	4.5	4.3	3.0	0.8	1.2	0.6		58.2	48.3		48.1	48.2
Level of Service	A	A	A	A	A	A		E	D		D	D
Approach Delay (s)		4.3			1.2			56.4			48.1	
Approach LOS		A			A			E			D	

Intersection Summary

HCM Average Control Delay	6.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Volume
300: Mequon Road & Public Works Access 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	885	10	45	955	5	65	5	240	1	1	5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.904	
Flt Protected	0.950			0.950				0.955			0.993	
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411	0	1720	1531	0	1689	0
Flt Permitted	0.950			0.950				0.955			0.993	
Satd. Flow (perm)	1770	3539	1425	1752	3505	1411	0	1720	1531	0	1689	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	1	941	11	48	1016	5	69	5	255	1	1	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	941	11	48	1016	5	0	74	255	0	7	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
300: Mequon Road & Public Works Access 12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	885	10	45	955	5	65	5	240	1	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1	941	11	48	1016	5	69	5	255	1	1	5
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)		618			1272							
pX, platoon unblocked	0.83			0.93			0.86	0.86	0.93	0.86	0.86	0.83
vC, conflicting volume	1021			952			1553	2061	471	1843	2066	508
vC1, stage 1 conf vol							944	944		1112	1112	
vC2, stage 2 conf vol							610	1117		731	954	
vCu, unblocked vol	602			792			942	1531	273	1278	1537	0
tC, single (s)	4.1			4.2			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 %	100			94			74	97	62	99	99	99
cM capacity (veh/h)	801			759			267	203	672	146	193	898

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1
Volume Total	1	471	471	11	48	508	508	5	74	255	7
Volume Left	1	0	0	0	48	0	0	0	69	0	1
Volume Right	0	0	0	11	0	0	0	5	0	255	5
cSH	801	1700	1700	1700	759	1700	1700	1700	261	672	398
Volume to Capacity	0.00	0.28	0.28	0.01	0.06	0.30	0.30	0.00	0.29	0.38	0.02
Queue Length 95th (ft)	0	0	0	0	5	0	0	0	29	44	1
Control Delay (s)	9.5	0.0	0.0	0.0	10.1	0.0	0.0	0.0	24.2	13.6	14.2
Lane LOS	A				B				C	B	B
Approach Delay (s)	0.0				0.5				16.0		14.2
Approach LOS									C		B

Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	52.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Volume
310: Mequon Road & Logeman Access

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1110	10	0	995	1	0	0	20	1	1	10
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.865		0.886	
Flt Protected											0.996	
Satd. Flow (prot)	0	3539	1425	0	3505	1411	0	0	1627	0	1660	0
Flt Permitted											0.996	
Satd. Flow (perm)	0	3539	1425	0	3505	1411	0	0	1627	0	1660	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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	1207	11	0	1082	1	0	0	22	1	1	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1212	11	0	1082	1	0	0	22	0	13	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
310: Mequon Road & Logeman Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1110	10	0	995	1	0	0	20	1	1	10
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	1207	11	0	1082	1	0	0	22	1	1	11
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)		1048			842							
pX, platoon unblocked	0.81			0.94			0.84	0.84	0.94	0.84	0.84	0.81
vC, conflicting volume	1083			1217			1770	2300	603	1717	2310	541
vC1, stage 1 conf vol							1217	1217		1082	1082	
vC2, stage 2 conf vol							552	1083		636	1228	
vCu, unblocked vol	623			1104			1207	1841	450	1145	1853	0
tC, single (s)	4.1			4.2			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			100			100	100	96	100	99	99
cM capacity (veh/h)	770			585			182	171	525	242	170	877

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	408	804	11	541	541	1	22	13
Volume Left	5	0	0	0	0	0	0	1
Volume Right	0	0	11	0	0	1	22	11
cSH	770	1700	1700	1700	1700	1700	525	561
Volume to Capacity	0.01	0.47	0.01	0.32	0.32	0.00	0.04	0.02
Queue Length 95th (ft)	1	0	0	0	0	0	3	2
Control Delay (s)	0.2	0.0	0.0	0.0	0.0	0.0	12.1	11.6
Lane LOS	A						B	B
Approach Delay (s)	0.1			0.0			12.1	11.6
Approach LOS							B	B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	47.5%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
320: Mequon Road & River Centre Center Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1055	75	65	935	60	55
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3574	1439	1752	3505	1787	1599
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3574	1439	1752	3505	1787	1599
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	1%	1%
Adj. Flow (vph)	1147	82	71	1016	65	60
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1147	82	71	1016	65	60
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
320: Mequon Road & River Centre Center Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1055	75	65	935	60	55
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)	1147	82	71	1016	65	60
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)	1243			647		
pX, platoon unblocked			0.96		0.82	0.96
vC, conflicting volume			1228		1796	573
vC1, stage 1 conf vol					1147	
vC2, stage 2 conf vol					649	
vCu, unblocked vol			1156		1327	475
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			88		70	88
cM capacity (veh/h)			571		219	518

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	573	573	82	71	508	508	65	60
Volume Left	0	0	0	71	0	0	65	0
Volume Right	0	0	82	0	0	0	0	60
cSH	1700	1700	1700	571	1700	1700	219	518
Volume to Capacity	0.34	0.34	0.05	0.12	0.30	0.30	0.30	0.12
Queue Length 95th (ft)	0	0	0	11	0	0	30	10
Control Delay (s)	0.0	0.0	0.0	12.2	0.0	0.0	28.3	12.9
Lane LOS				B			D	B
Approach Delay (s)	0.0			0.8			20.9	
Approach LOS							C	

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
330: Mequon Road & River Centre East Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1105	5	0	1000	0	35
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3539	1425	0	3505	0	1627
Flt Permitted						
Satd. Flow (perm)	3539	1425	0	3505	0	1627
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	3%	3%	1%	1%
Adj. Flow (vph)	1188	5	0	1075	0	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1188	5	0	1075	0	38
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
330: Mequon Road & River Centre East Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1105	5	0	1000	0	35
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)	1188	5	0	1075	0	38
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)				337		
pX, platoon unblocked					0.80	
vC, conflicting volume			1194		1726	594
vC1, stage 1 conf vol					1188	
vC2, stage 2 conf vol					538	
vCu, unblocked vol			1194		1404	594
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	92
cM capacity (veh/h)			575		208	451

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	594	594	5	538	538	38
Volume Left	0	0	0	0	0	0
Volume Right	0	0	5	0	0	38
cSH	1700	1700	1700	1700	1700	451
Volume to Capacity	0.35	0.35	0.00	0.32	0.32	0.08
Queue Length 95th (ft)	0	0	0	0	0	7
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	13.7
Lane LOS						B
Approach Delay (s)	0.0			0.0		13.7
Approach LOS						B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
340: Mequon Road & Cedarburg Road 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	305	775	60	210	755	475	120	580	185	330	220	125
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95
Frt			0.850			0.850			0.850		0.946	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3467	3574	1599	3433	3348	0
Flt Permitted	0.153			0.260			0.950			0.950		
Satd. Flow (perm)	285	3539	1583	484	3539	1583	3467	3574	1599	3433	3348	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Adj. Flow (vph)	321	816	32	221	795	250	126	611	97	347	232	132
Shared Lane Traffic (%)												
Lane Group Flow (vph)	321	816	32	221	795	250	126	611	97	347	364	0
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2			8			
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	6.0	12.0	12.0	6.0	12.0	12.0	6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.5	18.7	18.7	10.5	18.7	18.7	10.5	16.9	16.9	10.5	16.9	
Total Split (s)	19.0	41.0	41.0	19.0	41.0	41.0	15.0	35.0	35.0	25.0	45.0	0.0
Total Split (%)	15.8%	34.2%	34.2%	15.8%	34.2%	34.2%	12.5%	29.2%	29.2%	20.8%	37.5%	0.0%
Maximum Green (s)	14.5	34.3	34.3	14.5	34.3	34.3	10.5	28.1	28.1	20.5	38.1	
Yellow Time (s)	3.5	3.9	3.9	3.5	3.9	3.9	3.5	3.9	3.9	3.5	3.9	
All-Red Time (s)	1.0	2.8	2.8	1.0	2.8	2.8	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4	3.4	1.5	1.5	1.5	1.5	1.5	
Minimum Gap (s)	1.5	2.0	2.0	1.5	2.0	2.0	1.5	1.5	1.5	1.5	1.5	
Time Before Reduce (s)	15.0	28.0	28.0	15.0	20.0	20.0	20.0	40.0	40.0	30.0	40.0	
Time To Reduce (s)	0.0	12.0	12.0	0.0	20.0	20.0	0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
v/c Ratio	0.79	0.62	0.05	0.64	0.74	0.52	0.53	0.85	0.30	0.76	0.41	
Control Delay	37.8	33.7	27.4	26.8	43.0	40.0	61.7	57.4	42.2	61.0	36.9	
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	37.8	33.7	27.4	26.8	43.0	40.0	61.7	57.4	42.2	61.0	36.9	
90th %ile Green (s)	14.5	34.3	34.3	14.5	34.3	34.3	10.5	28.1	28.1	20.5	38.1	
90th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Max	Max	Max	Max	Hold	
70th %ile Green (s)	17.8	35.5	35.5	16.6	34.3	34.3	9.4	27.4	27.4	17.9	35.9	
70th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Gap	Gap	Gap	Gap	Hold	
50th %ile Green (s)	21.9	42.4	42.4	13.8	34.3	34.3	8.3	25.2	25.2	16.0	32.9	
50th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Gap	Gap	Gap	Gap	Hold	
30th %ile Green (s)	23.8	50.7	50.7	10.5	37.4	37.4	7.2	22.1	22.1	14.1	29.0	
30th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Gap	Gap	Gap	Gap	Hold	
10th %ile Green (s)	25.3	59.6	59.6	7.8	42.1	42.1	6.0	18.6	18.6	11.4	24.0	

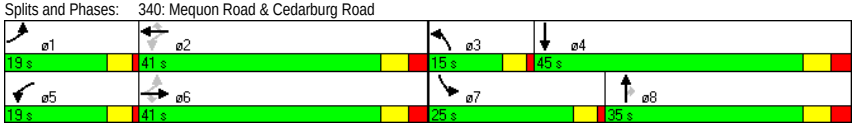
Volume
340: Mequon Road & Cedarburg Road 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Min	Gap	Gap	Gap	Hold	
Queue Length 50th (ft)	152	280	17	90	298	164	49	239	64	135	121	
Queue Length 95th (ft)	#388	390	44	159	375	251	80	298	111	179	156	
Internal Link Dist (ft)		257			885			746			862	
Turn Bay Length (ft)	180		175	200		235	225		125	385		
Base Capacity (vph)	404	1312	587	376	1076	481	303	837	374	586	1063	
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	0.79	0.62	0.05	0.59	0.74	0.52	0.42	0.73	0.26	0.59	0.34	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 1 (1%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 340: Mequon Road & Cedarburg Road



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HCM Signalized Intersection Capacity Analysis
340: Mequon Road & Cedarburg Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	305	775	60	210	755	475	120	580	185	330	220	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3467	3574	1599	3433	3347	
Flt Permitted	0.15	1.00	1.00	0.26	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	284	3539	1583	485	3539	1583	3467	3574	1599	3433	3347	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	321	816	32	221	795	250	126	611	97	347	232	132
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	321	816	32	221	795	250	126	611	97	347	364	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2			8			
Actuated Green, G (s)	61.6	44.5	44.5	49.0	36.4	36.4	8.3	24.3	24.3	16.0	32.0	
Effective Green, g (s)	61.6	44.5	44.5	49.0	36.4	36.4	8.3	24.3	24.3	16.0	32.0	
Actuated g/C Ratio	0.51	0.37	0.37	0.41	0.30	0.30	0.07	0.20	0.20	0.13	0.27	
Clearance Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4	3.4	1.5	1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	402	1312	587	333	1073	480	240	724	324	458	893	
v/s Ratio Prot	c0.14	0.23		0.07	0.22		0.04	c0.17		c0.10	0.11	
v/s Ratio Perm	c0.27		0.02	0.20		0.16			0.06			
v/c Ratio	0.80	0.62	0.05	0.66	0.74	0.52	0.53	0.84	0.30	0.76	0.41	
Uniform Delay, d1	24.4	30.9	24.2	24.5	37.6	34.6	53.9	46.0	40.6	50.1	36.2	
Progression Factor	0.89	0.95	0.93	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.8	2.2	0.2	3.8	4.6	4.0	1.0	8.5	0.2	6.3	0.1	
Delay (s)	31.7	31.4	22.7	28.3	42.2	38.6	54.9	54.6	40.8	56.4	36.3	
Level of Service	C	C	C	C	D	D	D	D	D	E	D	
Approach Delay (s)		31.3			39.1			53.0			46.1	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	41.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX E

Year 2025 Background Traffic Analysis – With Improvements

Volume
200: Mequon Road & Wauwatosa Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	270	665	65	175	900	270	225	565	135	180	235	115
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.950			0.950			0.563			0.204		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1049	3539	1583	362	3374	1509
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Adj. Flow (vph)	284	700	34	184	947	142	237	595	71	189	247	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	284	700	34	184	947	142	237	595	71	189	247	61
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	11.5	17.9	17.9	11.5	17.9	17.9	11.5	18.0	18.0	11.5	18.0	18.0
Total Split (s)	31.0	46.0	46.0	25.0	40.0	40.0	19.0	30.0	30.0	19.0	30.0	30.0
Total Split (%)	25.8%	38.3%	38.3%	20.8%	33.3%	33.3%	15.8%	25.0%	25.0%	15.8%	25.0%	25.0%
Maximum Green (s)	27.5	40.1	40.1	21.5	34.1	34.1	15.5	24.0	24.0	15.5	24.0	24.0
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0
All-Red Time (s)	0.0	0.9	0.9	0.0	0.9	0.9	0.0	1.0	1.0	0.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Minimum Gap (s)	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0
Time Before Reduce (s)	15.0	24.0	24.0	15.0	18.0	18.0	15.0	24.0	24.0	15.0	22.0	22.0
Time To Reduce (s)	0.0	16.0	16.0	0.0	22.0	22.0	0.0	16.0	16.0	0.0	18.0	18.0
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
v/c Ratio	0.82	0.56	0.06	0.73	0.89	0.30	0.51	0.81	0.22	0.67	0.36	0.20
Control Delay	62.4	31.4	26.2	62.9	48.8	33.5	29.6	52.2	40.8	36.9	40.6	40.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.4	31.4	26.2	62.9	48.8	33.5	29.6	52.2	40.8	36.9	40.6	40.8
90th %ile Green (s)	27.5	40.1	40.1	21.5	34.1	34.1	15.5	24.0	24.0	15.5	24.0	24.0
90th %ile Term Code	Max	Hold	Hold	Max	Max	Max	Max	Max	Max	Max	Hold	Hold
70th %ile Green (s)	26.4	41.3	41.3	19.2	34.1	34.1	15.5	24.0	24.0	15.5	24.0	24.0
70th %ile Term Code	Gap	Hold	Hold	Gap	Max	Max	Max	Max	Max	Max	Hold	Hold
50th %ile Green (s)	22.3	40.4	40.4	16.0	34.1	34.1	15.2	24.0	24.0	14.3	23.1	23.1
50th %ile Term Code	Gap	Hold	Hold	Gap	Max	Max	Gap	Max	Max	Gap	Hold	Hold
30th %ile Green (s)	18.5	39.5	39.5	13.1	34.1	34.1	12.5	22.9	22.9	11.9	22.3	22.3
30th %ile Term Code	Gap	Hold	Hold	Gap	Max	Max	Gap	Gap	Gap	Gap	Hold	Hold
10th %ile Green (s)	13.0	30.3	30.3	9.1	26.4	26.4	9.2	17.3	17.3	8.3	16.4	16.4

Volume
200: Mequon Road & Wauwatosa Road

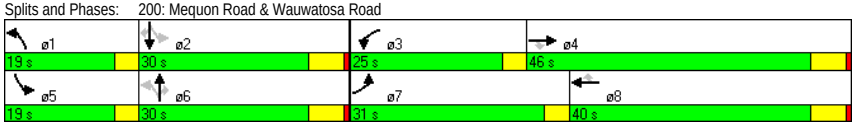
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
Queue Length 50th (ft)	200	214	16	131	347	80	120	218	43	94	82	37
Queue Length 95th (ft)	303	299	42	209	#508	145	199	#322	90	161	128	80
Internal Link Dist (ft)		559			585			1105			792	
Turn Bay Length (ft)	135		35	295		50	185		110	150		200
Base Capacity (vph)	456	1339	599	357	1131	506	489	796	356	324	759	340
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.52	0.06	0.52	0.84	0.28	0.48	0.75	0.20	0.58	0.33	0.18

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 108.5
Natural Cycle: 80
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 120
70th %ile Actuated Cycle: 118.9
50th %ile Actuated Cycle: 113.6
30th %ile Actuated Cycle: 106.3
10th %ile Actuated Cycle: 83.9
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 200: Mequon Road & Wauwatosa Road



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Traffic Analysis & Design, Inc.
Synchro 7 - Report

HCM Signalized Intersection Capacity Analysis
200: Mequon Road & Wauwatosa Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	270	665	65	175	900	270	225	565	135	180	235	115
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.56	1.00	1.00	0.20	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1050	3539	1583	362	3374	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	284	700	34	184	947	142	237	595	71	189	247	61
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	284	700	34	184	947	142	237	595	71	189	247	61
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Actuated Green, G (s)	21.2	38.4	38.4	15.5	32.7	32.7	36.0	22.5	22.5	34.8	21.9	21.9
Effective Green, g (s)	21.2	38.4	38.4	15.5	32.7	32.7	36.0	22.5	22.5	34.8	21.9	21.9
Actuated g/C Ratio	0.20	0.35	0.35	0.14	0.30	0.30	0.33	0.21	0.21	0.32	0.20	0.20
Clearance Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Lane Grp Cap (vph)	347	1256	562	254	1070	478	439	736	329	274	683	305
v/s Ratio Prot	c0.16	0.20		0.10	c0.27		0.07	c0.17		c0.08	0.07	
v/s Ratio Perm			0.02			0.09	0.11		0.04	0.14		0.04
v/c Ratio	0.82	0.56	0.06	0.72	0.89	0.30	0.54	0.81	0.22	0.69	0.36	0.20
Uniform Delay, d1	41.7	28.1	23.0	44.3	36.0	28.9	27.8	40.8	35.5	28.8	37.1	35.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.2	0.6	0.1	8.4	9.1	0.4	0.6	6.8	0.4	5.7	0.4	0.4
Delay (s)	54.9	28.7	23.1	52.7	45.0	29.3	28.5	47.6	36.0	34.5	37.6	36.3
Level of Service	D	C	C	D	D	C	C	D	D	C	D	D
Approach Delay (s)		35.8			44.4			41.7			36.3	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	40.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	108.2	Sum of lost time (s)	12.9
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Volume
230: Mequon Road & Concord Creek Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1115	60	65	1335	5	40	1	50	15	1	15
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.953			0.955	
Satd. Flow (prot)	1752	3505	1411	1752	3505	1411	0	1775	1583	0	1429	1272
Flt Permitted	0.950			0.950				0.953			0.955	
Satd. Flow (perm)	1752	3505	1411	1752	3505	1411	0	1775	1583	0	1429	1272
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	27%	27%	27%
Adj. Flow (vph)	5	1161	63	68	1391	5	42	1	52	16	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1161	62	68	1391	5	0	43	52	0	17	16
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized
Description: High SB %HV

HCM Unsignalized Intersection Capacity Analysis
230: Mequon Road & Concord Creek Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1115	60	65	1335	5	40	1	50	15	1	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	1161	62	68	1391	5	42	1	52	16	1	16
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	1396			1224			2019	2703	581	2170	2760	695
vC1, stage 1 conf vol							1172	1172		1526	1526	
vC2, stage 2 conf vol							847	1531		644	1234	
vCu, unblocked vol	1396			1224			2019	2703	581	2170	2760	695
tC, single (s)	4.2			4.2			7.5	6.5	6.9	8.0	7.0	7.4
tC, 2 stage (s)							6.5	5.5		7.0	6.0	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.8	4.3	3.6
p0 queue free %	99			88			64	99	89	75	98	95
cM capacity (veh/h)	481			560			117	95	457	63	64	332

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1	SB 2
Volume Total	5	581	581	62	68	695	695	5	43	52	17	16
Volume Left	5	0	0	0	68	0	0	0	42	0	16	0
Volume Right	0	0	0	62	0	0	0	5	0	52	0	16
cSH	481	1700	1700	1700	560	1700	1700	1700	117	457	63	332
Volume to Capacity	0.01	0.34	0.34	0.04	0.12	0.41	0.41	0.00	0.37	0.11	0.26	0.05
Queue Length 95th (ft)	1	0	0	0	10	0	0	0	37	10	23	4
Control Delay (s)	12.6	0.0	0.0	0.0	12.3	0.0	0.0	0.0	52.7	13.9	81.0	16.4
Lane LOS	B				B				F	B	F	C
Approach Delay (s)	0.1				0.6				31.4		49.7	
Approach LOS									D		E	

Intersection Summary			
Average Delay		1.9	
Intersection Capacity Utilization		59.2%	ICU Level of Service
Analysis Period (min)		15	
Description: High SB %HV			

Volume
270: Mequon Road & River Birch Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1175	1	5	1400	5	5	1	5	1	1	1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.939			0.955	
Flt Protected	0.950			0.950				0.978			0.984	
Satd. Flow (prot)	1787	3574	1439	1752	3505	1411	0	1728	0	0	1768	0
Flt Permitted	0.950			0.950				0.978			0.984	
Satd. Flow (perm)	1787	3574	1439	1752	3505	1411	0	1728	0	0	1768	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
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	1277	1	5	1522	5	5	1	5	1	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1277	1	5	1522	5	0	11	0	0	3	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
270: Mequon Road & River Birch Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1175	1	5	1400	5	5	1	5	1	1	1
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	1277	1	5	1522	5	5	1	5	1	1	1
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)					626							
pX, platoon unblocked	0.79						0.79	0.79		0.79	0.79	0.79
vC, conflicting volume	1527			1278			2061	2826	639	2188	2822	761
vC1, stage 1 conf vol							1288	1288		1533	1533	
vC2, stage 2 conf vol							773	1538		655	1289	
vCu, unblocked vol	1146			1278			1818	2781	639	1978	2776	181
tC, single (s)	4.1			4.2			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			99			96	99	99	99	99	100
cM capacity (veh/h)	486			534			134	107	421	118	107	662

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	5	639	639	1	5	761	761	5	12	3
Volume Left	5	0	0	0	5	0	0	0	5	1
Volume Right	0	0	0	1	0	0	0	5	5	1
cSH	486	1700	1700	1700	534	1700	1700	1700	188	155
Volume to Capacity	0.01	0.38	0.38	0.00	0.01	0.45	0.45	0.00	0.06	0.02
Queue Length 95th (ft)	1	0	0	0	1	0	0	0	5	2
Control Delay (s)	12.5	0.0	0.0	0.0	11.8	0.0	0.0	0.0	25.4	28.7
Lane LOS	B				B				D	D
Approach Delay (s)	0.1				0.0				25.4	28.7
Approach LOS									D	D

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		48.7%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
280: Mequon Road & Buntrock Avenue

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	1085	15	35	1265	20	90	45	60	15	5	55
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.968			0.963	
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411	0	1786	1568	0	1794	1583
Flt Permitted	0.152			0.244				0.787			0.723	
Satd. Flow (perm)	283	3539	1425	450	3505	1411	0	1452	1568	0	1347	1583
Satd. Flow (RTOR)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	85	1154	8	37	1346	11	96	48	32	16	5	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	85	1154	8	37	1346	11	0	144	32	0	21	29
Turn Type	pm+pt		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases	1	6			2			8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	1	6	6	2	2	2	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.0	21.4	21.4	21.4	21.4	21.4	17.1	17.1	17.1	17.1	17.1	17.1
Total Split (s)	15.0	80.0	80.0	65.0	65.0	65.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	12.5%	66.7%	66.7%	54.2%	54.2%	54.2%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Maximum Green (s)	12.0	73.6	73.6	58.6	58.6	58.6	32.9	32.9	32.9	32.9	32.9	32.9
Yellow Time (s)	3.0	4.0	4.0	4.0	4.0	4.0	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	0.0	2.4	2.4	2.4	2.4	2.4	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.0	6.4	6.4	6.4	6.4	6.4	7.1	7.1	7.1	7.1	7.1	7.1
Lead/Lag	Lead			Lag	Lag	Lag						
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.5	5.5	5.5	5.5	5.5	1.5	1.5	1.5	1.5	1.5	1.5
Minimum Gap (s)	2.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Time Before Reduce (s)	0.0	30.0	30.0	30.0	30.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	15.0	15.0	15.0	15.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	None
v/c Ratio	0.28	0.43	0.01	0.12	0.56	0.01		0.74	0.15		0.12	0.14
Control Delay	6.0	6.5	5.0	2.5	5.7	1.7		70.9	45.1		44.4	44.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	6.0	6.5	5.0	2.5	5.7	1.7		70.9	45.1		44.4	44.7
90th %ile Green (s)	7.7	83.6	83.6	72.9	72.9	72.9	22.9	22.9	22.9	22.9	22.9	22.9
90th %ile Term Code	Gap	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
70th %ile Green (s)	6.4	87.6	87.6	78.2	78.2	78.2	18.9	18.9	18.9	18.9	18.9	18.9
70th %ile Term Code	Gap	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
50th %ile Green (s)	6.0	90.6	90.6	81.6	81.6	81.6	15.9	15.9	15.9	15.9	15.9	15.9
50th %ile Term Code	Min	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
30th %ile Green (s)	6.0	93.5	93.5	84.5	84.5	84.5	13.0	13.0	13.0	13.0	13.0	13.0
30th %ile Term Code	Min	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
10th %ile Green (s)	0.0	96.5	96.5	96.5	96.5	96.5	10.0	10.0	10.0	10.0	10.0	10.0

Volume
280: Mequon Road & Buntrock Avenue

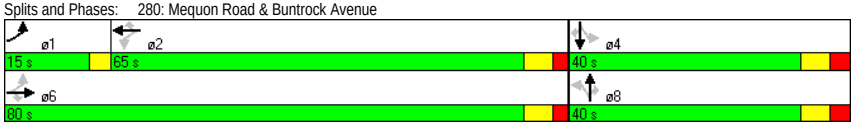
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Skip	Coord	Coord	Coord	Coord	Coord	Min	Min	Min	Hold	Hold	Hold
Queue Length 50th (ft)	12	146	1	2	82	1		109	22		15	20
Queue Length 95th (ft)	31	232	6	m4	502	m1		170	50		37	46
Internal Link Dist (ft)		546			209			420			420	
Turn Bay Length (ft)	100			120					70			40
Base Capacity (vph)	370	2665	1073	310	2417	973		398	430		369	434
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	0.23	0.43	0.01	0.12	0.56	0.01		0.36	0.07		0.06	0.07

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 50 (42%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 280: Mequon Road & Buntrock Avenue



HCM Signalized Intersection Capacity Analysis
280: Mequon Road & Buntrock Avenue

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	80	1085	15	35	1265	20	90	45	60	15	5	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	9	12	12	9	12	12	12	12	12	12
Total Lost time (s)	3.0	6.4	6.4	6.4	6.4	6.4		7.1	7.1		7.1	7.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00		0.96	1.00
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411		1785	1568		1794	1583
Flt Permitted	0.15	1.00	1.00	0.24	1.00	1.00		0.79	1.00		0.72	1.00
Satd. Flow (perm)	284	3539	1425	451	3505	1411		1451	1568		1346	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	85	1154	8	37	1346	11	96	48	32	16	5	29
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	85	1154	8	37	1346	11	0	144	32	0	21	29
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases	1	6			2			8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Actuated Green, G (s)	90.4	90.4	90.4	82.2	82.2	82.2		16.1	16.1		16.1	16.1
Effective Green, g (s)	90.4	90.4	90.4	82.2	82.2	82.2		16.1	16.1		16.1	16.1
Actuated g/C Ratio	0.75	0.75	0.75	0.69	0.69	0.69		0.13	0.13		0.13	0.13
Clearance Time (s)	3.0	6.4	6.4	6.4	6.4	6.4		7.1	7.1		7.1	7.1
Vehicle Extension (s)	2.0	5.5	5.5	5.5	5.5	5.5		1.5	1.5		1.5	1.5
Lane Grp Cap (vph)	278	2666	1074	309	2401	967		195	210		181	212
v/s Ratio Prot	0.01	c0.33			c0.38							
v/s Ratio Perm	0.22		0.01	0.08		0.01		c0.10	0.02		0.02	0.02
v/c Ratio	0.31	0.43	0.01	0.12	0.56	0.01		0.74	0.15		0.12	0.14
Uniform Delay, d1	6.2	5.4	3.7	6.5	9.7	6.0		49.9	45.9		45.7	45.8
Progression Factor	1.00	1.00	1.00	0.21	0.46	0.21		1.00	1.00		1.00	1.00
Incremental Delay, d2	0.2	0.5	0.0	0.7	0.8	0.0		11.8	0.1		0.1	0.1
Delay (s)	6.5	5.9	3.7	2.0	5.3	1.3		61.8	46.0		45.8	45.9
Level of Service	A	A	A	A	A	A		E	D		D	D
Approach Delay (s)		6.0			5.1			58.9			45.9	
Approach LOS		A			A			E			D	

Intersection Summary

HCM Average Control Delay	9.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.9
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Volume
300: Mequon Road & Public Works Access 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	1145	15	60	1235	5	80	5	310	1	1	5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.904	
Flt Protected	0.950			0.950				0.955			0.993	
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411	0	1720	1531	0	1689	0
Flt Permitted	0.950			0.950				0.955			0.993	
Satd. Flow (perm)	1770	3539	1425	1752	3505	1411	0	1720	1531	0	1689	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	1	1218	16	64	1314	5	85	5	330	1	1	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	1218	16	64	1314	5	0	90	330	0	7	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
300: Mequon Road & Public Works Access 12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	1145	15	60	1235	5	80	5	310	1	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1	1218	16	64	1314	5	85	5	330	1	1	5
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)		618			1272							
pX, platoon unblocked	0.79			0.88			0.85	0.85	0.88	0.85	0.85	0.79
vC, conflicting volume	1319			1234			2011	2667	609	2385	2678	657
vC1, stage 1 conf vol							1220	1220		1441	1441	
vC2, stage 2 conf vol							790	1447		944	1236	
vCu, unblocked vol	874			986			1189	1959	273	1628	1972	36
tC, single (s)	4.1			4.2			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 %	100			89			55	96	48	99	99	99
cM capacity (veh/h)	607			605			191	134	635	73	122	816

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1
Volume Total	1	609	609	16	64	657	657	5	90	330	7
Volume Left	1	0	0	0	64	0	0	0	85	0	1
Volume Right	0	0	0	16	0	0	0	5	0	330	5
cSH	607	1700	1700	1700	605	1700	1700	1700	186	635	250
Volume to Capacity	0.00	0.36	0.36	0.01	0.11	0.39	0.39	0.00	0.49	0.52	0.03
Queue Length 95th (ft)	0	0	0	0	9	0	0	0	59	75	2
Control Delay (s)	10.9	0.0	0.0	0.0	11.6	0.0	0.0	0.0	41.4	16.6	19.8
Lane LOS	B				B				E	C	C
Approach Delay (s)	0.0				0.5				22.0		19.8
Approach LOS									C		C

Intersection Summary				
Average Delay	3.3			
Intersection Capacity Utilization	64.2%	ICU Level of Service	C	
Analysis Period (min)	15			

Volume
310: Mequon Road & Logeman Access 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1435	15	0	1285	1	0	0	25	1	1	15
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.865		0.880	
Flt Protected											0.997	
Satd. Flow (prot)	0	3539	1425	0	3505	1411	0	0	1627	0	1650	0
Flt Permitted											0.997	
Satd. Flow (perm)	0	3539	1425	0	3505	1411	0	0	1627	0	1650	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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	1560	16	0	1397	1	0	0	27	1	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1565	16	0	1397	1	0	0	27	0	18	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
310: Mequon Road & Logeman Access 12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1435	15	0	1285	1	0	0	25	1	1	15
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	1560	16	0	1397	1	0	0	27	1	1	16
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)		1048			842							
pX, platoon unblocked	0.79			0.88			0.85	0.85	0.88	0.85	0.85	0.79
vC, conflicting volume	1398			1576			2286	2968	780	2215	2984	698
vC1, stage 1 conf vol							1571	1571		1397	1397	
vC2, stage 2 conf vol							715	1398		818	1587	
vCu, unblocked vol	974			1383			1530	2332	480	1446	2350	89
tC, single (s)	4.1			4.2			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			100			100	100	94	99	99	98
cM capacity (veh/h)	557			428			116	112	471	159	111	755

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	525	1040	16	698	698	1	27	18
Volume Left	5	0	0	0	0	0	0	1
Volume Right	0	0	16	0	0	1	27	16
cSH	557	1700	1700	1700	1700	1700	471	484
Volume to Capacity	0.01	0.61	0.01	0.41	0.41	0.00	0.06	0.04
Queue Length 95th (ft)	1	0	0	0	0	0	5	3
Control Delay (s)	0.3	0.0	0.0	0.0	0.0	0.0	13.1	12.7
Lane LOS	A						B	B
Approach Delay (s)	0.1			0.0			13.1	12.7
Approach LOS							B	B

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	56.5%	ICU Level of Service	B	
Analysis Period (min)	15			

Volume
320: Mequon Road & River Centre Center Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1365	95	80	1210	75	70
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3574	1439	1752	5036	1787	1599
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3574	1439	1752	5036	1787	1599
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	1%	1%
Adj. Flow (vph)	1484	103	87	1315	82	76
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1484	103	87	1315	82	76
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
320: Mequon Road & River Centre Center Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1365	95	80	1210	75	70
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)	1484	103	87	1315	82	76
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)	1243			647		
pX, platoon unblocked			0.90		0.88	0.90
vC, conflicting volume			1587		2096	742
vC1, stage 1 conf vol					1484	
vC2, stage 2 conf vol					612	
vCu, unblocked vol			1427		1165	486
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			79		53	84
cM capacity (veh/h)			420		173	476

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2
Volume Total	742	742	103	87	438	438	438	82	76
Volume Left	0	0	0	87	0	0	0	82	0
Volume Right	0	0	103	0	0	0	0	0	76
cSH	1700	1700	1700	420	1700	1700	1700	173	476
Volume to Capacity	0.44	0.44	0.06	0.21	0.26	0.26	0.26	0.47	0.16
Queue Length 95th (ft)	0	0	0	19	0	0	0	56	14
Control Delay (s)	0.0	0.0	0.0	15.8	0.0	0.0	0.0	43.3	14.0
Lane LOS				C				E	B
Approach Delay (s)	0.0			1.0				29.1	
Approach LOS								D	

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		

Volume
330: Mequon Road & River Centre East Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1430	5	0	1290	0	45
Lane Util. Factor	0.91	0.91	1.00	0.91	1.00	1.00
Frt						0.865
Flt Protected						
Satd. Flow (prot)	5085	0	0	5036	0	1627
Flt Permitted						
Satd. Flow (perm)	5085	0	0	5036	0	1627
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	3%	3%	1%	1%
Adj. Flow (vph)	1538	5	0	1387	0	48
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1543	0	0	1387	0	48
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
330: Mequon Road & River Centre East Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1430	5	0	1290	0	45
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)	1538	5	0	1387	0	48
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)				337		
pX, platoon unblocked					0.82	
vC, conflicting volume			1543		2003	515
vC1, stage 1 conf vol					1540	
vC2, stage 2 conf vol					462	
vCu, unblocked vol			1543		1461	515
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	90
cM capacity (veh/h)			421		145	507

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	615	615	313	462	462	462	48
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	5	0	0	0	48
cSH	1700	1700	1700	1700	1700	1700	507
Volume to Capacity	0.36	0.36	0.18	0.27	0.27	0.27	0.10
Queue Length 95th (ft)	0	0	0	0	0	0	8
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	12.8
Lane LOS							B
Approach Delay (s)	0.0			0.0			12.8
Approach LOS							B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
340: Mequon Road & Cedarburg Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	400	995	80	270	965	600	160	745	230	415	285	165
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	0.95
Frt			0.850			0.850			0.850		0.945	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3467	3574	1599	3433	3345	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	3467	3574	1599	3433	3345	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Adj. Flow (vph)	421	1047	42	284	1016	316	168	784	121	437	300	174
Shared Lane Traffic (%)												
Lane Group Flow (vph)	421	1047	42	284	1016	316	168	784	121	437	474	0
Turn Type	Prot		Perm	Prot		pt+ov	Prot		Perm	Prot		
Protected Phases	1	6		5	2	2 7	3	8		7	4	
Permitted Phases			6						8			
Detector Phase	1	6	6	5	2	2 7	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	6.0	12.0	12.0	6.0	12.0		6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.5	18.7	18.7	10.5	18.7		10.5	16.9	16.9	10.5	16.9	
Total Split (s)	23.0	38.0	38.0	20.0	35.0	58.0	20.0	39.0	39.0	23.0	42.0	0.0
Total Split (%)	19.2%	31.7%	31.7%	16.7%	29.2%	48.3%	16.7%	32.5%	32.5%	19.2%	35.0%	0.0%
Maximum Green (s)	18.5	31.3	31.3	15.5	28.3		15.5	32.1	32.1	18.5	35.1	
Yellow Time (s)	3.5	3.9	3.9	3.5	3.9		3.5	3.9	3.9	3.5	3.9	
All-Red Time (s)	1.0	2.8	2.8	1.0	2.8		1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4		1.5	1.5	1.5	1.5	1.5	
Minimum Gap (s)	1.5	2.0	2.0	1.5	2.0		1.5	1.5	1.5	1.5	1.5	
Time Before Reduce (s)	15.0	28.0	28.0	15.0	20.0		20.0	40.0	40.0	30.0	40.0	
Time To Reduce (s)	0.0	12.0	12.0	0.0	20.0		0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None	None	None	None	
v/c Ratio	0.85	0.67	0.09	0.75	0.73	0.44	0.60	0.89	0.31	0.87	0.45	
Control Delay	62.8	40.9	33.4	64.0	44.3	25.5	62.0	56.1	38.3	68.9	34.4	
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	62.8	40.9	33.4	64.0	44.3	25.5	62.0	56.1	38.3	68.9	34.4	
90th %ile Green (s)	18.5	31.3	31.3	15.5	28.3		12.8	32.1	32.1	18.5	37.8	
90th %ile Term Code	Max	Coord	Coord	Max	Coord		Gap	Max	Max	Max	Hold	
70th %ile Green (s)	18.5	31.4	31.4	15.4	28.3		11.0	32.1	32.1	18.5	39.6	
70th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Max	Max	Max	Hold	
50th %ile Green (s)	18.8	33.3	33.3	13.8	28.3		9.7	31.8	31.8	18.5	40.6	
50th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Gap	Gap	Max	Hold	
30th %ile Green (s)	16.8	39.3	39.3	12.1	34.6		8.4	28.5	28.5	17.5	37.6	
30th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Gap	Gap	Gap	Gap	Hold	
10th %ile Green (s)	13.9	49.2	49.2	9.7	45.0		6.6	24.0	24.0	14.5	31.9	

Volume
340: Mequon Road & Cedarburg Road

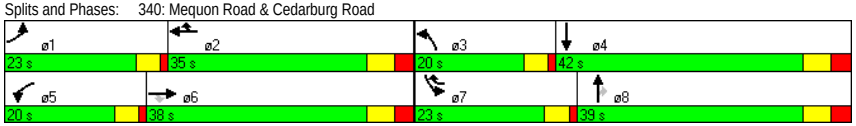
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Gap	Gap	Gap	Gap	Hold	
Queue Length 50th (ft)	163	284	25	110	276	172	65	301	75	171	148	
Queue Length 95th (ft)	#234	352	59	156	332	256	100	377	129	#247	204	
Internal Link Dist (ft)		257			885			746			862	
Turn Bay Length (ft)	180		125	200		235	225		125	385		
Base Capacity (vph)	531	1564	487	443	1394	738	448	956	428	529	1063	
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	0.79	0.67	0.09	0.64	0.73	0.43	0.38	0.82	0.28	0.83	0.45	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 1 (1%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 340: Mequon Road & Cedarburg Road



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HCM Signalized Intersection Capacity Analysis
340: Mequon Road & Cedarburg Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	400	995	80	270	965	600	160	745	230	415	285	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3467	3574	1599	3433	3344	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	3467	3574	1599	3433	3344	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	421	1047	42	284	1016	316	168	784	121	437	300	174
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	421	1047	42	284	1016	316	168	784	121	437	474	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Prot		Perm	Prot		pt+ov	Prot		Perm	Prot		
Protected Phases	1	6		5	2	2 7	3	8		7	4	
Permitted Phases			6						8			
Actuated Green, G (s)	17.3	36.9	36.9	13.3	32.9	57.1	9.7	29.7	29.7	17.5	37.5	
Effective Green, g (s)	17.3	36.9	36.9	13.3	32.9	57.1	9.7	29.7	29.7	17.5	37.5	
Actuated g/C Ratio	0.14	0.31	0.31	0.11	0.27	0.48	0.08	0.25	0.25	0.15	0.31	
Clearance Time (s)	4.5	6.7	6.7	4.5	6.7		4.5	6.9	6.9	4.5	6.9	
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4		1.5	1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	495	1564	487	380	1394	753	280	885	396	501	1045	
v/s Ratio Prot	c0.12	c0.21		0.08	c0.20	0.20	0.05	c0.22		c0.13	0.14	
v/s Ratio Perm			0.03						0.08			
v/c Ratio	0.85	0.67	0.09	0.75	0.73	0.42	0.60	0.89	0.31	0.87	0.45	
Uniform Delay, d1	50.1	36.2	29.6	51.7	39.5	20.6	53.3	43.5	36.8	50.2	33.0	
Progression Factor	0.93	1.03	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.4	2.2	0.3	6.9	3.4	0.1	2.3	10.3	0.2	14.9	0.1	
Delay (s)	58.9	39.4	29.7	58.6	42.9	20.7	55.6	53.8	36.9	65.1	33.2	
Level of Service	E	D	C	E	D	C	E	D	D	E	C	
Approach Delay (s)		44.6			41.3			52.2			48.5	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	45.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	29.3
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX F

BUILD TRAFFIC
PEAK HOUR ANALYSIS
WITH IMPROVEMENTS

APPENDIX F

Year 2010 Build Traffic Analysis – With Alternative One Improvements

Volume
200: Mequon Road & Wauwatosa Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	545	50	135	725	225	175	435	125	145	180	90
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.950			0.950			0.630			0.347		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1174	3539	1583	616	3374	1509
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Adj. Flow (vph)	221	574	26	142	763	118	184	458	66	153	189	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	221	574	26	142	763	118	184	458	66	153	189	47
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	11.5	17.9	17.9	11.5	17.9	17.9	11.5	18.0	18.0	11.5	18.0	18.0
Total Split (s)	28.5	45.9	45.9	28.5	45.9	45.9	23.5	46.0	46.0	23.5	46.0	46.0
Total Split (%)	19.8%	31.9%	31.9%	19.8%	31.9%	31.9%	16.3%	32.0%	32.0%	16.3%	32.0%	32.0%
Maximum Green (s)	25.0	40.0	40.0	25.0	40.0	40.0	20.0	40.0	40.0	20.0	40.0	40.0
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0
All-Red Time (s)	0.0	0.9	0.9	0.0	0.9	0.9	0.0	1.0	1.0	0.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Minimum Gap (s)	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0
Time Before Reduce (s)	15.0	24.0	24.0	15.0	18.0	18.0	15.0	24.0	24.0	15.0	22.0	22.0
Time To Reduce (s)	0.0	16.0	16.0	0.0	22.0	22.0	0.0	16.0	16.0	0.0	18.0	18.0
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
v/c Ratio	0.71	0.49	0.05	0.60	0.74	0.26	0.37	0.62	0.20	0.43	0.27	0.15
Control Delay	54.9	29.3	26.3	55.9	38.5	31.7	24.4	42.1	38.8	25.9	37.1	38.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.9	29.3	26.3	55.9	38.5	31.7	24.4	42.1	38.8	25.9	37.1	38.3
90th %ile Green (s)	25.0	45.0	45.0	20.0	40.0	40.0	18.5	29.1	29.1	18.7	29.3	29.3
90th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Gap	Gap	Gap	Gap	Hold	Hold
70th %ile Green (s)	22.0	40.2	40.2	16.2	34.4	34.4	15.5	24.3	24.3	15.3	24.1	24.1
70th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
50th %ile Green (s)	17.9	33.2	33.2	13.2	28.5	28.5	12.7	20.9	20.9	12.6	20.8	20.8
50th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
30th %ile Green (s)	14.3	27.7	27.7	10.5	23.9	23.9	10.3	16.9	16.9	10.0	16.6	16.6
30th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
10th %ile Green (s)	10.2	21.0	21.0	8.0	18.8	18.8	8.0	13.3	13.3	8.0	13.3	13.3

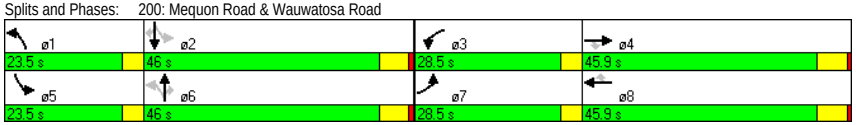
Volume
200: Mequon Road & Wauwatosa Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Gap	Hold	Hold	Min	Gap	Gap	Min	Gap	Gap	Min	Hold	Hold
Queue Length 50th (ft)	131	149	11	85	228	57	76	138	34	62	52	24
Queue Length 95th (ft)	267	258	37	185	378	129	160	243	89	135	105	68
Internal Link Dist (ft)		559			585			1105			792	
Turn Bay Length (ft)	135		35	295		50	185		110	150		200
Base Capacity (vph)	467	1522	681	467	1494	668	589	1494	668	470	1425	637
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.38	0.04	0.30	0.51	0.18	0.31	0.31	0.10	0.33	0.13	0.07

Intersection Summary
Cycle Length: 143.9
Actuated Cycle Length: 99.7
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 131.7
70th %ile Actuated Cycle: 114.9
50th %ile Actuated Cycle: 98.8
30th %ile Actuated Cycle: 84
10th %ile Actuated Cycle: 69.2

Splits and Phases: 200: Mequon Road & Wauwatosa Road



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HCM Signalized Intersection Capacity Analysis
200: Mequon Road & Wauwatosa Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	545	50	135	725	225	175	435	125	145	180	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.63	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1173	3539	1583	615	3374	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	221	574	26	142	763	118	184	458	66	153	189	47
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	221	574	26	142	763	118	184	458	66	153	189	47
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Actuated Green, G (s)	17.6	33.2	33.2	13.3	28.9	28.9	33.5	20.7	20.7	33.3	20.6	20.6
Effective Green, g (s)	17.6	33.2	33.2	13.3	28.9	28.9	33.5	20.7	20.7	33.3	20.6	20.6
Actuated g/C Ratio	0.18	0.34	0.34	0.13	0.29	0.29	0.34	0.21	0.21	0.34	0.21	0.21
Clearance Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Lane Grp Cap (vph)	315	1189	532	238	1035	463	475	741	332	345	703	315
v/s Ratio Prot	c0.12	0.16		0.08	c0.22		0.05	c0.13		c0.06	0.06	
v/s Ratio Perm			0.02			0.07	0.08		0.04	0.09		0.03
v/c Ratio	0.70	0.48	0.05	0.60	0.74	0.25	0.39	0.62	0.20	0.44	0.27	0.15
Uniform Delay, d1	38.1	26.0	22.1	40.2	31.5	26.7	24.1	35.5	32.2	24.1	32.8	31.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.7	0.4	0.0	2.7	2.8	0.3	0.2	1.7	0.4	0.3	0.3	0.3
Delay (s)	43.8	26.4	22.2	42.9	34.4	27.1	24.3	37.2	32.6	24.4	33.1	32.2
Level of Service	D	C	C	D	C	C	C	D	C	C	C	C
Approach Delay (s)		30.9			34.7			33.4			29.6	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	32.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	98.8	Sum of lost time (s)	12.9
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Volume
230: Mequon Road & Concord Creek Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	925	45	50	1075	5	30	1	35	10	1	10
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.954			0.957	
Satd. Flow (prot)	1752	3505	1411	1752	3505	1411	0	1777	1583	0	1432	1272
Flt Permitted	0.950			0.950				0.954			0.957	
Satd. Flow (perm)	1752	3505	1411	1752	3505	1411	0	1777	1583	0	1432	1272
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	27%	27%	27%
Adj. Flow (vph)	5	964	47	52	1120	5	31	1	36	10	1	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	964	47	52	1120	5	0	32	36	0	11	10
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized
Description: High SB %HV

HCM Unsignalized Intersection Capacity Analysis
230: Mequon Road & Concord Creek Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	925	45	50	1075	5	30	1	35	10	1	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	964	47	52	1120	5	31	1	36	10	1	10
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	1125			1010			1649	2203	482	1753	2245	560
vC1, stage 1 conf vol							974	974		1224	1224	
vC2, stage 2 conf vol							675	1229		529	1021	
vCu, unblocked vol	1125			1010			1649	2203	482	1753	2245	560
tC, single (s)	4.2			4.2			7.5	6.5	6.9	8.0	7.0	7.4
tC, 2 stage (s)							6.5	5.5		7.0	6.0	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.8	4.3	3.6
p0 queue free %	99			92			81	99	93	90	99	97
cM capacity (veh/h)	611			676			167	139	531	106	103	413

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1	SB 2
Volume Total	5	482	482	47	52	560	560	5	32	36	11	10
Volume Left	5	0	0	0	52	0	0	0	31	0	10	0
Volume Right	0	0	0	47	0	0	0	5	0	36	0	10
cSH	611	1700	1700	1700	676	1700	1700	1700	166	531	106	413
Volume to Capacity	0.01	0.28	0.28	0.03	0.08	0.33	0.33	0.00	0.20	0.07	0.11	0.03
Queue Length 95th (ft)	1	0	0	0	6	0	0	0	17	6	9	2
Control Delay (s)	10.9	0.0	0.0	0.0	10.8	0.0	0.0	0.0	31.9	12.3	43.2	13.9
Lane LOS	B				B				D	B	E	B
Approach Delay (s)	0.1				0.5				21.5		29.3	
Approach LOS									C		D	

Intersection Summary			
Average Delay		1.2	
Intersection Capacity Utilization		51.4%	ICU Level of Service
Analysis Period (min)		15	
Description: High SB %HV			

Volume
250: Mequon Road & Weston Center West Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	940	30	40	1110	20	30
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850			0.920	
Flt Protected			0.950		0.980	
Satd. Flow (prot)	3505	1411	1752	3505	1679	0
Flt Permitted			0.950		0.980	
Satd. Flow (perm)	3505	1411	1752	3505	1679	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Adj. Flow (vph)	979	31	42	1156	21	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	979	31	42	1156	52	0
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
250: Mequon Road & Weston Center West Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	940	30	40	1110	20	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	979	31	42	1156	21	31
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised			Raised		
Median storage veh)	1			1		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1010		1641	490
vC1, stage 1 conf vol					979	
vC2, stage 2 conf vol					661	
vCu, unblocked vol			1010		1641	490
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			94		90	94
cM capacity (veh/h)			676		209	524

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	490	490	31	42	578	578	52
Volume Left	0	0	0	42	0	0	21
Volume Right	0	0	31	0	0	0	31
cSH	1700	1700	1700	676	1700	1700	327
Volume to Capacity	0.29	0.29	0.02	0.06	0.34	0.34	0.16
Queue Length 95th (ft)	0	0	0	5	0	0	14
Control Delay (s)	0.0	0.0	0.0	10.7	0.0	0.0	18.1
Lane LOS				B			C
Approach Delay (s)	0.0			0.4			18.1
Approach LOS							C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	42.7%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
260: Mequon Road & Weston Center East Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	970	1	0	1150	0	10
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3574	1439	0	3505	0	1611
Flt Permitted						
Satd. Flow (perm)	3574	1439	0	3505	0	1611
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	2%	2%
Adj. Flow (vph)	1054	1	0	1250	0	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1054	1	0	1250	0	11
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
260: Mequon Road & Weston Center East Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	970	1	0	1150	0	10
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)	1054	1	0	1250	0	11
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)				1088		
pX, platoon unblocked					0.90	
vC, conflicting volume			1055		1679	527
vC1, stage 1 conf vol					1054	
vC2, stage 2 conf vol					625	
vCu, unblocked vol			1055		1525	527
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			650		220	496

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	527	527	1	625	625	11
Volume Left	0	0	0	0	0	0
Volume Right	0	0	1	0	0	11
cSH	1700	1700	1700	1700	1700	496
Volume to Capacity	0.31	0.31	0.00	0.37	0.37	0.02
Queue Length 95th (ft)	0	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	12.4
Lane LOS						B
Approach Delay (s)	0.0			0.0		12.4
Approach LOS						B

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		36.8%	ICU Level of Service A
Analysis Period (min)		15	

Volume
270: Mequon Road & River Birch Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	975	1	5	1145	5	5	1	5	1	1	1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.939			0.955	
Flt Protected	0.950			0.950				0.978			0.984	
Satd. Flow (prot)	1787	3574	1439	1752	3505	1411	0	1728	0	0	1768	0
Flt Permitted	0.950			0.950				0.978			0.984	
Satd. Flow (perm)	1787	3574	1439	1752	3505	1411	0	1728	0	0	1768	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
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	1060	1	5	1245	5	5	1	5	1	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1060	1	5	1245	5	0	11	0	0	3	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
270: Mequon Road & River Birch Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	975	1	5	1145	5	5	1	5	1	1	1
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	1060	1	5	1245	5	5	1	5	1	1	1
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)					626							
pX, platoon unblocked	0.89						0.89	0.89		0.89	0.89	0.89
vC, conflicting volume	1250			1061			1705	2332	530	1802	2327	622
vC1, stage 1 conf vol							1071	1071		1255	1255	
vC2, stage 2 conf vol							635	1261		547	1072	
vCu, unblocked vol	1034			1061			1545	2249	530	1654	2244	328
tC, single (s)	4.1			4.2			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			99			97	99	99	99	99	100
cM capacity (veh/h)	600			646			177	144	496	158	145	597

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	5	530	530	1	5	622	622	5	12	3
Volume Left	5	0	0	0	5	0	0	0	5	1
Volume Right	0	0	0	1	0	0	0	5	5	1
cSH	600	1700	1700	1700	646	1700	1700	1700	243	201
Volume to Capacity	0.01	0.31	0.31	0.00	0.01	0.37	0.37	0.00	0.05	0.02
Queue Length 95th (ft)	1	0	0	0	1	0	0	0	4	1
Control Delay (s)	11.1	0.0	0.0	0.0	10.6	0.0	0.0	0.0	20.6	23.2
Lane LOS	B				B				C	C
Approach Delay (s)	0.1				0.0				20.6	23.2
Approach LOS									C	C

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		41.7%	ICU Level of Service
Analysis Period (min)		15	

Volume
280: Mequon Road & Buntrock Avenue

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	905	15	40	1030	15	85	35	55	10	5	40
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.966			0.967	
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411	0	1782	1568	0	1801	1583
Flt Permitted	0.240			0.282				0.780			0.762	
Satd. Flow (perm)	447	3539	1425	520	3505	1411	0	1439	1568	0	1419	1583
Satd. Flow (RTOR)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	64	963	8	43	1096	8	90	37	29	11	5	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	963	8	43	1096	8	0	127	29	0	16	21
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	6	6	6	2	2	2	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	21.4	21.4	21.4	21.4	21.4	21.4	17.1	17.1	17.1	17.1	17.1	17.1
Total Split (s)	80.0	80.0	80.0	80.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Maximum Green (s)	73.6	73.6	73.6	73.6	73.6	73.6	32.9	32.9	32.9	32.9	32.9	32.9
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.4	7.1	7.1	7.1	7.1	7.1	7.1
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.5	5.5	5.5	5.5	5.5	5.5	1.5	1.5	1.5	1.5	1.5	1.5
Minimum Gap (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Time Before Reduce (s)	30.0	30.0	30.0	30.0	30.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	15.0	15.0	15.0	15.0	15.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	None
v/c Ratio	0.19	0.36	0.01	0.11	0.41	0.01		0.71	0.15		0.09	0.11
Control Delay	6.3	5.5	4.5	1.4	2.0	0.9		70.3	46.3		44.9	45.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	6.3	5.5	4.5	1.4	2.0	0.9		70.3	46.3		44.9	45.2
90th %ile Green (s)	85.2	85.2	85.2	85.2	85.2	85.2	21.3	21.3	21.3	21.3	21.3	21.3
90th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
70th %ile Green (s)	89.2	89.2	89.2	89.2	89.2	89.2	17.3	17.3	17.3	17.3	17.3	17.3
70th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
50th %ile Green (s)	91.9	91.9	91.9	91.9	91.9	91.9	14.6	14.6	14.6	14.6	14.6	14.6
50th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
30th %ile Green (s)	94.6	94.6	94.6	94.6	94.6	94.6	11.9	11.9	11.9	11.9	11.9	11.9
30th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
10th %ile Green (s)	96.5	96.5	96.5	96.5	96.5	96.5	10.0	10.0	10.0	10.0	10.0	10.0

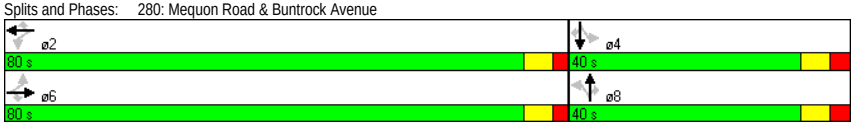
Volume
280: Mequon Road & Buntrock Avenue 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Min	Min	Min	Hold	Hold	Hold
Queue Length 50th (ft)	11	107	1	1	14	0		96	20		11	15
Queue Length 95th (ft)	34	172	6	m2	105	m1		155	47		31	37
Internal Link Dist (ft)		546			209			420			420	
Turn Bay Length (ft)	100			120					70			40
Base Capacity (vph)	340	2698	1086	396	2672	1076		395	430		389	434
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	0.19	0.36	0.01	0.11	0.41	0.01		0.32	0.07		0.04	0.05

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 50 (42%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 280: Mequon Road & Buntrock Avenue



HCM Signalized Intersection Capacity Analysis
280: Mequon Road & Buntrock Avenue 12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	905	15	40	1030	15	85	35	55	10	5	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	9	12	12	9	12	12	12	12	12	12
Total Lost time (s)	6.4	6.4	6.4	6.4	6.4	6.4		7.1	7.1		7.1	7.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411		1782	1568		1801	1583
Flt Permitted	0.24	1.00	1.00	0.28	1.00	1.00		0.78	1.00		0.76	1.00
Satd. Flow (perm)	448	3539	1425	520	3505	1411		1438	1568		1420	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	64	963	8	43	1096	8	90	37	29	11	5	21
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	64	963	8	43	1096	8	0	127	29	0	16	21
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Actuated Green, G (s)	91.5	91.5	91.5	91.5	91.5	91.5		15.0	15.0		15.0	15.0
Effective Green, g (s)	91.5	91.5	91.5	91.5	91.5	91.5		15.0	15.0		15.0	15.0
Actuated g/C Ratio	0.76	0.76	0.76	0.76	0.76	0.76		0.12	0.12		0.12	0.12
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4	6.4		7.1	7.1		7.1	7.1
Vehicle Extension (s)	5.5	5.5	5.5	5.5	5.5	5.5		1.5	1.5		1.5	1.5
Lane Grp Cap (vph)	342	2698	1087	397	2673	1076		180	196		178	198
v/s Ratio Prot		0.27			c0.31							
v/s Ratio Perm	0.14		0.01	0.08		0.01		c0.09	0.02		0.01	0.01
v/c Ratio	0.19	0.36	0.01	0.11	0.41	0.01		0.71	0.15		0.09	0.11
Uniform Delay, d1	3.9	4.6	3.4	3.7	4.9	3.4		50.4	46.8		46.5	46.6
Progression Factor	1.00	1.00	1.00	0.21	0.31	0.19		1.00	1.00		1.00	1.00
Incremental Delay, d2	1.2	0.4	0.0	0.4	0.4	0.0		9.8	0.1		0.1	0.1
Delay (s)	5.2	5.0	3.4	1.2	1.9	0.7		60.2	46.9		46.5	46.6
Level of Service	A	A	A	A	A	A		E	D		D	D
Approach Delay (s)		5.0			1.8			57.7			46.6	
Approach LOS		A			A			E			D	

Intersection Summary

HCM Average Control Delay	7.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Volume
290: Mequon Road & Jung Brewery Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	950	20	0	1085	0	15
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3539	1425	0	3505	0	1596
Flt Permitted						
Satd. Flow (perm)	3539	1425	0	3505	0	1596
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	3%	3%	3%	3%
Adj. Flow (vph)	1011	21	0	1154	0	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1011	21	0	1154	0	16
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
290: Mequon Road & Jung Brewery Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	950	20	0	1085	0	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1011	21	0	1154	0	16
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)	289					
pX, platoon unblocked			0.91		0.91	0.91
vC, conflicting volume			1032		1588	505
vC1, stage 1 conf vol					1011	
vC2, stage 2 conf vol					577	
vCu, unblocked vol			840		1450	262
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)					5.9	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			715		241	668

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	505	505	21	577	577	16
Volume Left	0	0	0	0	0	0
Volume Right	0	0	21	0	0	16
cSH	1700	1700	1700	1700	1700	668
Volume to Capacity	0.30	0.30	0.01	0.34	0.34	0.02
Queue Length 95th (ft)	0	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	10.5
Lane LOS						B
Approach Delay (s)	0.0			0.0		10.5
Approach LOS						B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
300: Mequon Road & Public Works Access

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	950	15	85	1010	5	70	5	270	1	1	5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.904	
Flt Protected	0.950			0.950				0.955			0.993	
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411	0	1720	1531	0	1689	0
Flt Permitted	0.950			0.950				0.955			0.993	
Satd. Flow (perm)	1770	3539	1425	1752	3505	1411	0	1720	1531	0	1689	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	1	1011	16	90	1074	5	74	5	287	1	1	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	1011	16	90	1074	5	0	79	287	0	7	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
300: Mequon Road & Public Works Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	950	15	85	1010	5	70	5	270	1	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1	1011	16	90	1074	5	74	5	287	1	1	5
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)		618			1272							
pX, platoon unblocked	0.80			0.91			0.84	0.84	0.91	0.84	0.84	0.80
vC, conflicting volume	1080			1027			1737	2273	505	2053	2284	537
vC1, stage 1 conf vol							1013	1013		1255	1255	
vC2, stage 2 conf vol							724	1261		797	1029	
vCu, unblocked vol	601			842			1045	1682	272	1420	1694	0
tC, single (s)	4.1			4.2			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 %	100			87			68	97	57	99	99	99
cM capacity (veh/h)	778			716			235	169	664	100	152	871

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1
Volume Total	1	505	505	16	90	537	537	5	80	287	7
Volume Left	1	0	0	0	90	0	0	0	74	0	1
Volume Right	0	0	0	16	0	0	0	5	0	287	5
cSH	778	1700	1700	1700	716	1700	1700	1700	229	664	313
Volume to Capacity	0.00	0.30	0.30	0.01	0.13	0.32	0.32	0.00	0.35	0.43	0.02
Queue Length 95th (ft)	0	0	0	0	11	0	0	0	37	55	2
Control Delay (s)	9.6	0.0	0.0	0.0	10.8	0.0	0.0	0.0	28.9	14.5	16.8
Lane LOS	A				B				D	B	C
Approach Delay (s)	0.0				0.8				17.6		16.8
Approach LOS									C		C

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	56.3%	ICU Level of Service	B	
Analysis Period (min)	15			

Volume
310: Mequon Road & Logeman Access

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1205	10	0	1090	1	0	0	20	1	1	10
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.865		0.886	
Flt Protected											0.996	
Satd. Flow (prot)	0	3539	1425	0	3505	1411	0	0	1627	0	1660	0
Flt Permitted											0.996	
Satd. Flow (perm)	0	3539	1425	0	3505	1411	0	0	1627	0	1660	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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	1310	11	0	1185	1	0	0	22	1	1	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1315	11	0	1185	1	0	0	22	0	13	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
310: Mequon Road & Logeman Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1205	10	0	1090	1	0	0	20	1	1	10
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	1310	11	0	1185	1	0	0	22	1	1	11
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)		1048			842							
pX, platoon unblocked	0.78			0.93			0.81	0.81	0.93	0.81	0.81	0.78
vC, conflicting volume	1186			1321			1924	2507	655	1872	2516	592
vC1, stage 1 conf vol							1321	1321		1185	1185	
vC2, stage 2 conf vol							604	1186		688	1332	
vCu, unblocked vol	663			1185			1264	1979	465	1200	1991	0
tC, single (s)	4.1			4.2			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			100			100	100	96	100	99	99
cM capacity (veh/h)	715			536			161	152	506	222	152	844

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	442	873	11	592	592	1	22	13
Volume Left	5	0	0	0	0	0	0	1
Volume Right	0	0	11	0	0	1	22	11
cSH	715	1700	1700	1700	1700	1700	506	523
Volume to Capacity	0.01	0.51	0.01	0.35	0.35	0.00	0.04	0.02
Queue Length 95th (ft)	1	0	0	0	0	0	3	2
Control Delay (s)	0.2	0.0	0.0	0.0	0.0	0.0	12.4	12.1
Lane LOS	A						B	B
Approach Delay (s)	0.1			0.0			12.4	12.1
Approach LOS							B	B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
320: Mequon Road & River Centre Center Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1150	75	65	1030	60	55
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3574	1439	1752	3505	1787	1599
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3574	1439	1752	3505	1787	1599
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	1%	1%
Adj. Flow (vph)	1250	82	71	1120	65	60
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1250	82	71	1120	65	60
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
320: Mequon Road & River Centre Center Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1150	75	65	1030	60	55
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)	1250	82	71	1120	65	60
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)	1243			647		
pX, platoon unblocked			0.94		0.80	0.94
vC, conflicting volume			1332		1951	625
vC1, stage 1 conf vol					1250	
vC2, stage 2 conf vol					701	
vCu, unblocked vol			1234		1382	486
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			87		67	88
cM capacity (veh/h)			524		199	501

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	625	625	82	71	560	560	65	60
Volume Left	0	0	0	71	0	0	65	0
Volume Right	0	0	82	0	0	0	0	60
cSH	1700	1700	1700	524	1700	1700	199	501
Volume to Capacity	0.37	0.37	0.05	0.13	0.33	0.33	0.33	0.12
Queue Length 95th (ft)	0	0	0	12	0	0	34	10
Control Delay (s)	0.0	0.0	0.0	12.9	0.0	0.0	31.7	13.2
Lane LOS				B			D	B
Approach Delay (s)	0.0			0.8			22.8	
Approach LOS							C	

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
330: Mequon Road & River Centre East Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1200	5	0	1095	0	35
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3539	1425	0	3505	0	1627
Flt Permitted						
Satd. Flow (perm)	3539	1425	0	3505	0	1627
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	3%	3%	1%	1%
Adj. Flow (vph)	1290	5	0	1177	0	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1290	5	0	1177	0	38
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
330: Mequon Road & River Centre East Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1200	5	0	1095	0	35
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)	1290	5	0	1177	0	38
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)				337		
pX, platoon unblocked					0.77	
vC, conflicting volume			1296		1879	645
vC1, stage 1 conf vol					1290	
vC2, stage 2 conf vol					589	
vCu, unblocked vol			1296		1543	645
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	91
cM capacity (veh/h)			525		183	417

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	645	645	5	589	589	38
Volume Left	0	0	0	0	0	0
Volume Right	0	0	5	0	0	38
cSH	1700	1700	1700	1700	1700	417
Volume to Capacity	0.38	0.38	0.00	0.35	0.35	0.09
Queue Length 95th (ft)	0	0	0	0	0	7
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	14.5
Lane LOS						B
Approach Delay (s)	0.0			0.0		14.5
Approach LOS						B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
340: Mequon Road & Cedarburg Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	320	840	75	210	820	475	135	580	185	330	220	140
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95
Frt			0.850			0.850			0.850		0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3467	3574	1599	3433	3334	0
Flt Permitted	0.103			0.222			0.950			0.950		
Satd. Flow (perm)	192	3539	1583	414	3539	1583	3467	3574	1599	3433	3334	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Adj. Flow (vph)	337	884	39	221	863	250	142	611	97	347	232	147
Shared Lane Traffic (%)												
Lane Group Flow (vph)	337	884	39	221	863	250	142	611	97	347	379	0
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2			8			
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	6.0	12.0	12.0	6.0	12.0	12.0	6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.5	18.7	18.7	10.5	18.7	18.7	10.5	16.9	16.9	10.5	16.9	
Total Split (s)	19.0	41.0	41.0	19.0	41.0	41.0	18.0	35.0	35.0	25.0	42.0	0.0
Total Split (%)	15.8%	34.2%	34.2%	15.8%	34.2%	34.2%	15.0%	29.2%	29.2%	20.8%	35.0%	0.0%
Maximum Green (s)	14.5	34.3	34.3	14.5	34.3	34.3	13.5	28.1	28.1	20.5	35.1	
Yellow Time (s)	3.5	3.9	3.9	3.5	3.9	3.9	3.5	3.9	3.9	3.5	3.9	
All-Red Time (s)	1.0	2.8	2.8	1.0	2.8	2.8	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4	3.4	1.5	1.5	1.5	1.5	1.5	
Minimum Gap (s)	1.5	2.0	2.0	1.5	2.0	2.0	1.5	1.5	1.5	1.5	1.5	
Time Before Reduce (s)	15.0	28.0	28.0	15.0	20.0	20.0	20.0	40.0	40.0	30.0	40.0	
Time To Reduce (s)	0.0	12.0	12.0	0.0	20.0	20.0	0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
v/c Ratio	0.84	0.69	0.07	0.68	0.85	0.55	0.56	0.85	0.30	0.76	0.43	
Control Delay	49.2	35.4	27.2	29.0	50.0	41.9	61.8	57.4	42.2	61.0	37.8	
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	49.2	35.4	27.2	29.0	50.0	41.9	61.8	57.4	42.2	61.0	37.8	
90th %ile Green (s)	14.5	34.3	34.3	14.5	34.3	34.3	11.7	28.1	28.1	20.5	36.9	
90th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Gap	Max	Max	Max	Hold	
70th %ile Green (s)	17.8	34.3	34.3	17.8	34.3	34.3	10.0	27.4	27.4	17.9	35.3	
70th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Gap	Gap	Gap	Gap	Hold	
50th %ile Green (s)	21.9	41.2	41.2	15.0	34.3	34.3	8.8	25.2	25.2	16.0	32.4	
50th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Gap	Gap	Gap	Gap	Hold	
30th %ile Green (s)	26.9	49.0	49.0	12.2	34.3	34.3	7.6	22.1	22.1	14.1	28.6	
30th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Gap	Gap	Gap	Gap	Hold	
10th %ile Green (s)	33.1	59.3	59.3	8.1	34.3	34.3	6.0	18.6	18.6	11.4	24.0	

Volume
340: Mequon Road & Cedarburg Road

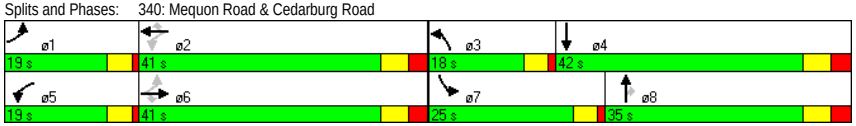
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Min	Gap	Gap	Gap	Hold	
Queue Length 50th (ft)	200	315	20	90	332	164	55	239	64	135	127	
Queue Length 95th (ft)	#465	#451	51	159	#416	251	87	298	111	179	165	
Internal Link Dist (ft)		257			885			746			862	
Turn Bay Length (ft)	180		175	200		235	225		125	385		
Base Capacity (vph)	400	1287	575	351	1012	452	390	837	374	586	986	
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	0.84	0.69	0.07	0.63	0.85	0.55	0.36	0.73	0.26	0.59	0.38	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 1 (1%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 340: Mequon Road & Cedarburg Road



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HCM Signalized Intersection Capacity Analysis
340: Mequon Road & Cedarburg Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	320	840	75	210	820	475	135	580	185	330	220	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3467	3574	1599	3433	3333	
Flt Permitted	0.10	1.00	1.00	0.22	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	192	3539	1583	413	3539	1583	3467	3574	1599	3433	3333	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	337	884	39	221	863	250	142	611	97	347	232	147
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	337	884	39	221	863	250	142	611	97	347	379	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2			8			
Actuated Green, G (s)	61.6	43.6	43.6	47.8	34.3	34.3	8.8	24.3	24.3	16.0	31.5	
Effective Green, g (s)	61.6	43.6	43.6	47.8	34.3	34.3	8.8	24.3	24.3	16.0	31.5	
Actuated g/C Ratio	0.51	0.36	0.36	0.40	0.29	0.29	0.07	0.20	0.20	0.13	0.26	
Clearance Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4	3.4	1.5	1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	398	1286	575	317	1012	452	254	724	324	458	875	
v/s Ratio Prot	c0.16	0.25		0.08	0.24		0.04	c0.17		c0.10	0.11	
v/s Ratio Perm	c0.27		0.02	0.20		0.16			0.06			
v/c Ratio	0.85	0.69	0.07	0.70	0.85	0.55	0.56	0.84	0.30	0.76	0.43	
Uniform Delay, d1	33.0	32.4	24.9	25.6	40.5	36.3	53.7	46.0	40.6	50.1	36.8	
Progression Factor	0.90	0.93	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.5	3.0	0.2	5.3	9.1	4.8	1.5	8.5	0.2	6.3	0.1	
Delay (s)	44.0	33.1	22.7	30.9	49.5	41.2	55.2	54.6	40.8	56.4	36.9	
Level of Service	D	C	C	C	D	D	E	D	D	E	D	
Approach Delay (s)		35.7			44.9			53.1			46.2	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	44.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX F

Year 2010 Build Traffic Analysis – With Alternative Two Improvements

Volume
200: Mequon Road & Wauwatosa Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	545	50	135	725	225	175	435	125	145	180	90
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.950			0.950			0.630			0.344		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1174	3539	1583	611	3374	1509
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Adj. Flow (vph)	221	574	26	142	763	118	184	458	66	153	189	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	221	574	26	142	763	118	184	458	66	153	189	47
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	11.5	17.9	17.9	11.5	17.9	17.9	11.5	18.0	18.0	11.5	18.0	18.0
Total Split (s)	28.5	45.9	45.9	28.5	45.9	45.9	23.5	46.0	46.0	23.5	46.0	46.0
Total Split (%)	19.8%	31.9%	31.9%	19.8%	31.9%	31.9%	16.3%	32.0%	32.0%	16.3%	32.0%	32.0%
Maximum Green (s)	25.0	40.0	40.0	25.0	40.0	40.0	20.0	40.0	40.0	20.0	40.0	40.0
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0
All-Red Time (s)	0.0	0.9	0.9	0.0	0.9	0.9	0.0	1.0	1.0	0.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Minimum Gap (s)	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0
Time Before Reduce (s)	15.0	24.0	24.0	15.0	18.0	18.0	15.0	24.0	24.0	15.0	22.0	22.0
Time To Reduce (s)	0.0	16.0	16.0	0.0	22.0	22.0	0.0	16.0	16.0	0.0	18.0	18.0
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
v/c Ratio	0.71	0.48	0.05	0.60	0.73	0.25	0.37	0.63	0.20	0.43	0.27	0.15
Control Delay	55.5	29.1	26.2	56.4	38.0	31.6	24.6	42.4	39.0	26.2	37.3	38.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.5	29.1	26.2	56.4	38.0	31.6	24.6	42.4	39.0	26.2	37.3	38.5
90th %ile Green (s)	25.0	45.0	45.0	20.0	40.0	40.0	18.5	29.1	29.1	18.7	29.3	29.3
90th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Gap	Gap	Gap	Gap	Hold	Hold
70th %ile Green (s)	22.0	40.2	40.2	16.2	34.4	34.4	15.5	24.3	24.3	15.3	24.1	24.1
70th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
50th %ile Green (s)	18.0	34.3	34.3	13.2	29.5	29.5	12.8	21.0	21.0	12.7	20.9	20.9
50th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
30th %ile Green (s)	14.3	28.7	28.7	10.5	24.9	24.9	10.3	16.9	16.9	10.0	16.6	16.6
30th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
10th %ile Green (s)	10.2	22.0	22.0	8.0	19.8	19.8	8.0	13.3	13.3	8.0	13.3	13.3

Volume
200: Mequon Road & Wauwatosa Road

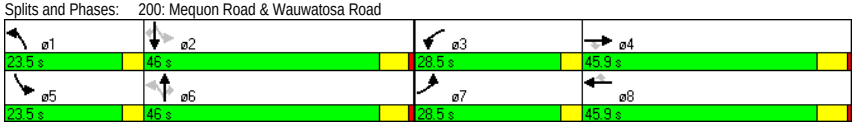
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Gap	Hold	Hold	Min	Gap	Gap	Min	Gap	Gap	Min	Hold	Hold
Queue Length 50th (ft)	134	150	11	87	230	57	78	140	35	64	53	25
Queue Length 95th (ft)	267	258	37	185	378	129	160	243	89	135	105	68
Internal Link Dist (ft)		559			585			1105			792	
Turn Bay Length (ft)	135		35	295		50	185		110	150		200
Base Capacity (vph)	463	1509	675	463	1481	662	585	1481	662	465	1412	631
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.38	0.04	0.31	0.52	0.18	0.31	0.31	0.10	0.33	0.13	0.07

Intersection Summary

Cycle Length: 143.9
Actuated Cycle Length: 100.4
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 131.7
70th %ile Actuated Cycle: 114.9
50th %ile Actuated Cycle: 100.1
30th %ile Actuated Cycle: 85
10th %ile Actuated Cycle: 70.2

Splits and Phases: 200: Mequon Road & Wauwatosa Road



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HCM Signalized Intersection Capacity Analysis
200: Mequon Road & Wauwatosa Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	545	50	135	725	225	175	435	125	145	180	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.63	1.00	1.00	0.34	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1173	3539	1583	611	3374	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	221	574	26	142	763	118	184	458	66	153	189	47
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	221	574	26	142	763	118	184	458	66	153	189	47
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Actuated Green, G (s)	17.6	33.9	33.9	13.3	29.6	29.6	33.5	20.7	20.7	33.3	20.6	20.6
Effective Green, g (s)	17.6	33.9	33.9	13.3	29.6	29.6	33.5	20.7	20.7	33.3	20.6	20.6
Actuated g/C Ratio	0.18	0.34	0.34	0.13	0.30	0.30	0.34	0.21	0.21	0.33	0.21	0.21
Clearance Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Lane Grp Cap (vph)	313	1206	539	237	1053	471	472	736	329	342	699	312
v/s Ratio Prot	c0.12	0.16		0.08	c0.22		0.05	c0.13		c0.06	0.06	
v/s Ratio Perm			0.02			0.07	0.08		0.04	0.09		0.03
v/c Ratio	0.71	0.48	0.05	0.60	0.72	0.25	0.39	0.62	0.20	0.45	0.27	0.15
Uniform Delay, d1	38.5	25.8	22.0	40.6	31.3	26.5	24.4	35.8	32.6	24.4	33.1	32.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.8	0.4	0.0	2.7	2.6	0.3	0.2	1.8	0.4	0.3	0.3	0.3
Delay (s)	44.3	26.2	22.0	43.3	33.9	26.9	24.6	37.7	33.0	24.8	33.4	32.6
Level of Service	D	C	C	D	C	C	C	D	C	C	C	C
Approach Delay (s)		30.9			34.4			33.8			29.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	32.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	99.5	Sum of lost time (s)	12.9
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Volume
230: Mequon Road & Concord Creek Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	925	45	50	1075	5	30	1	35	10	1	10
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.954			0.957	
Satd. Flow (prot)	1752	3505	1411	1752	3505	1411	0	1777	1583	0	1432	1272
Flt Permitted	0.950			0.950				0.954			0.957	
Satd. Flow (perm)	1752	3505	1411	1752	3505	1411	0	1777	1583	0	1432	1272
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	27%	27%	27%
Adj. Flow (vph)	5	964	47	52	1120	5	31	1	36	10	1	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	964	47	52	1120	5	0	32	36	0	11	10
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized
Description: High SB %HV

HCM Unsignalized Intersection Capacity Analysis
230: Mequon Road & Concord Creek Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	925	45	50	1075	5	30	1	35	10	1	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	964	47	52	1120	5	31	1	36	10	1	10
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	1125			1010			1649	2203	482	1753	2245	560
vC1, stage 1 conf vol							974	974		1224	1224	
vC2, stage 2 conf vol							675	1229		529	1021	
vCu, unblocked vol	1125			1010			1649	2203	482	1753	2245	560
tC, single (s)	4.2			4.2			7.5	6.5	6.9	8.0	7.0	7.4
tC, 2 stage (s)							6.5	5.5		7.0	6.0	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.8	4.3	3.6
p0 queue free %	99			92			81	99	93	90	99	97
cM capacity (veh/h)	611			676			167	139	531	106	103	413

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1	SB 2
Volume Total	5	482	482	47	52	560	560	5	32	36	11	10
Volume Left	5	0	0	0	52	0	0	0	31	0	10	0
Volume Right	0	0	0	47	0	0	0	5	0	36	0	10
cSH	611	1700	1700	1700	676	1700	1700	1700	166	531	106	413
Volume to Capacity	0.01	0.28	0.28	0.03	0.08	0.33	0.33	0.00	0.20	0.07	0.11	0.03
Queue Length 95th (ft)	1	0	0	0	6	0	0	0	17	6	9	2
Control Delay (s)	10.9	0.0	0.0	0.0	10.8	0.0	0.0	0.0	31.9	12.3	43.2	13.9
Lane LOS	B				B				D	B	E	B
Approach Delay (s)	0.1				0.5				21.5		29.3	
Approach LOS									C		D	

Intersection Summary			
Average Delay		1.2	
Intersection Capacity Utilization		51.4%	ICU Level of Service
Analysis Period (min)		15	
Description: High SB %HV			

Volume
250: Mequon Road & Weston Center West Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	940	30	40	1110	20	30
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850			0.920	
Flt Protected			0.950		0.980	
Satd. Flow (prot)	3505	1411	1752	3505	1679	0
Flt Permitted			0.950		0.980	
Satd. Flow (perm)	3505	1411	1752	3505	1679	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Adj. Flow (vph)	979	31	42	1156	21	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	979	31	42	1156	52	0
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
250: Mequon Road & Weston Center West Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	940	30	40	1110	20	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	979	31	42	1156	21	31
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised			Raised		
Median storage veh)	1			1		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1010		1641	490
vC1, stage 1 conf vol					979	
vC2, stage 2 conf vol					661	
vCu, unblocked vol			1010		1641	490
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			94		90	94
cM capacity (veh/h)			676		209	524

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	490	490	31	42	578	578	52
Volume Left	0	0	0	42	0	0	21
Volume Right	0	0	31	0	0	0	31
cSH	1700	1700	1700	676	1700	1700	327
Volume to Capacity	0.29	0.29	0.02	0.06	0.34	0.34	0.16
Queue Length 95th (ft)	0	0	0	5	0	0	14
Control Delay (s)	0.0	0.0	0.0	10.7	0.0	0.0	18.1
Lane LOS				B			C
Approach Delay (s)	0.0			0.4			18.1
Approach LOS							C

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		42.7%	ICU Level of Service	A
Analysis Period (min)		15	

Volume
260: Mequon Road & Weston Center East Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	970	1	0	1150	0	10
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3574	1439	0	3505	0	1611
Flt Permitted						
Satd. Flow (perm)	3574	1439	0	3505	0	1611
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	2%	2%
Adj. Flow (vph)	1054	1	0	1250	0	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1054	1	0	1250	0	11
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
260: Mequon Road & Weston Center East Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	970	1	0	1150	0	10
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)	1054	1	0	1250	0	11
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)				1088		
pX, platoon unblocked					0.90	
vC, conflicting volume			1055		1679	527
vC1, stage 1 conf vol					1054	
vC2, stage 2 conf vol					625	
vCu, unblocked vol			1055		1530	527
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			650		219	496

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	527	527	1	625	625	11
Volume Left	0	0	0	0	0	0
Volume Right	0	0	1	0	0	11
cSH	1700	1700	1700	1700	1700	496
Volume to Capacity	0.31	0.31	0.00	0.37	0.37	0.02
Queue Length 95th (ft)	0	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	12.4
Lane LOS						B
Approach Delay (s)	0.0			0.0		12.4
Approach LOS						B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	36.8%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
270: Mequon Road & River Birch Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	975	1	5	1145	5	5	1	5	1	1	1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.939			0.955	
Flt Protected	0.950			0.950				0.978			0.984	
Satd. Flow (prot)	1787	3574	1439	1752	3505	1411	0	1728	0	0	1768	0
Flt Permitted	0.950			0.950				0.978			0.984	
Satd. Flow (perm)	1787	3574	1439	1752	3505	1411	0	1728	0	0	1768	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
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	1060	1	5	1245	5	5	1	5	1	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1060	1	5	1245	5	0	11	0	0	3	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
270: Mequon Road & River Birch Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	975	1	5	1145	5	5	1	5	1	1	1
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	1060	1	5	1245	5	5	1	5	1	1	1
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)					626							
pX, platoon unblocked	0.89						0.89	0.89		0.89	0.89	0.89
vC, conflicting volume	1250			1061			1705	2332	530	1802	2327	622
vC1, stage 1 conf vol							1071	1071		1255	1255	
vC2, stage 2 conf vol							635	1261		547	1072	
vCu, unblocked vol	1034			1061			1546	2249	530	1655	2244	329
tC, single (s)	4.1			4.2			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			99			97	99	99	99	99	100
cM capacity (veh/h)	600			646			177	144	496	158	145	596

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	5	530	530	1	5	622	622	5	12	3
Volume Left	5	0	0	0	5	0	0	0	5	1
Volume Right	0	0	0	1	0	0	0	5	5	1
cSH	600	1700	1700	1700	646	1700	1700	1700	243	201
Volume to Capacity	0.01	0.31	0.31	0.00	0.01	0.37	0.37	0.00	0.05	0.02
Queue Length 95th (ft)	1	0	0	0	1	0	0	0	4	1
Control Delay (s)	11.1	0.0	0.0	0.0	10.6	0.0	0.0	0.0	20.6	23.2
Lane LOS	B				B				C	C
Approach Delay (s)	0.1				0.0				20.6	23.2
Approach LOS									C	C

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		41.7%	ICU Level of Service
Analysis Period (min)		15	

Volume
280: Mequon Road & Buntrock Avenue

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	905	15	40	1030	15	85	35	55	10	5	40
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.966			0.967	
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411	0	1782	1568	0	1801	1583
Flt Permitted	0.240			0.282				0.780			0.762	
Satd. Flow (perm)	447	3539	1425	520	3505	1411	0	1439	1568	0	1419	1583
Satd. Flow (RTOR)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	64	963	8	43	1096	8	90	37	29	11	5	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	963	8	43	1096	8	0	127	29	0	16	21
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	6	6	6	2	2	2	8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0	15.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	21.4	21.4	21.4	21.4	21.4	21.4	17.1	17.1	17.1	17.1	17.1	17.1
Total Split (s)	80.0	80.0	80.0	80.0	80.0	80.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Maximum Green (s)	73.6	73.6	73.6	73.6	73.6	73.6	32.9	32.9	32.9	32.9	32.9	32.9
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4	2.4	3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	6.4	7.1	7.1	7.1	7.1	7.1	7.1
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.5	5.5	5.5	5.5	5.5	5.5	1.5	1.5	1.5	1.5	1.5	1.5
Minimum Gap (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Time Before Reduce (s)	30.0	30.0	30.0	30.0	30.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	15.0	15.0	15.0	15.0	15.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None	None	None
v/c Ratio	0.19	0.36	0.01	0.11	0.41	0.01		0.71	0.15		0.09	0.11
Control Delay	6.3	5.5	4.5	1.3	1.1	0.9		70.3	46.3		44.9	45.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0
Total Delay	6.3	5.5	4.5	1.3	1.1	0.9		70.3	46.3		44.9	45.2
90th %ile Green (s)	85.2	85.2	85.2	85.2	85.2	85.2	21.3	21.3	21.3	21.3	21.3	21.3
90th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
70th %ile Green (s)	89.2	89.2	89.2	89.2	89.2	89.2	17.3	17.3	17.3	17.3	17.3	17.3
70th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
50th %ile Green (s)	91.9	91.9	91.9	91.9	91.9	91.9	14.6	14.6	14.6	14.6	14.6	14.6
50th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
30th %ile Green (s)	94.6	94.6	94.6	94.6	94.6	94.6	11.9	11.9	11.9	11.9	11.9	11.9
30th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Gap	Gap	Gap	Hold	Hold	Hold
10th %ile Green (s)	96.5	96.5	96.5	96.5	96.5	96.5	10.0	10.0	10.0	10.0	10.0	10.0

Volume
280: Mequon Road & Buntrock Avenue

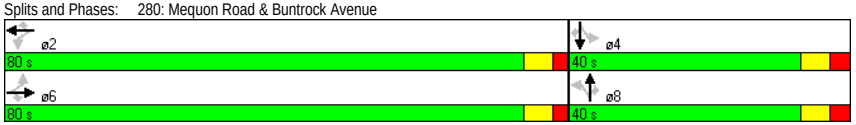
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Coord	Coord	Coord	Coord	Coord	Coord	Min	Min	Min	Hold	Hold	Hold
Queue Length 50th (ft)	11	107	1	1	16	0		96	20		11	15
Queue Length 95th (ft)	34	172	6	m3	27	m1		155	47		31	37
Internal Link Dist (ft)		546			209			420			420	
Turn Bay Length (ft)	100			120					70			40
Base Capacity (vph)	340	2698	1086	396	2672	1076		395	430		389	434
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	0.19	0.36	0.01	0.11	0.41	0.01		0.32	0.07		0.04	0.05

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 54 (45%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 280: Mequon Road & Buntrock Avenue



HCM Signalized Intersection Capacity Analysis
280: Mequon Road & Buntrock Avenue

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	905	15	40	1030	15	85	35	55	10	5	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	9	12	12	9	12	12	12	12	12	12
Total Lost time (s)	6.4	6.4	6.4	6.4	6.4	6.4		7.1	7.1		7.1	7.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411		1782	1568		1801	1583
Flt Permitted	0.24	1.00	1.00	0.28	1.00	1.00		0.78	1.00		0.76	1.00
Satd. Flow (perm)	448	3539	1425	520	3505	1411		1438	1568		1420	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	64	963	8	43	1096	8	90	37	29	11	5	21
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	64	963	8	43	1096	8	0	127	29	0	16	21
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Actuated Green, G (s)	91.5	91.5	91.5	91.5	91.5	91.5		15.0	15.0		15.0	15.0
Effective Green, g (s)	91.5	91.5	91.5	91.5	91.5	91.5		15.0	15.0		15.0	15.0
Actuated g/C Ratio	0.76	0.76	0.76	0.76	0.76	0.76		0.12	0.12		0.12	0.12
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4	6.4		7.1	7.1		7.1	7.1
Vehicle Extension (s)	5.5	5.5	5.5	5.5	5.5	5.5		1.5	1.5		1.5	1.5
Lane Grp Cap (vph)	342	2698	1087	397	2673	1076		180	196		178	198
v/s Ratio Prot		0.27			c0.31							
v/s Ratio Perm	0.14		0.01	0.08		0.01		c0.09	0.02		0.01	0.01
v/c Ratio	0.19	0.36	0.01	0.11	0.41	0.01		0.71	0.15		0.09	0.11
Uniform Delay, d1	3.9	4.6	3.4	3.7	4.9	3.4		50.4	46.8		46.5	46.6
Progression Factor	1.00	1.00	1.00	0.18	0.14	0.20		1.00	1.00		1.00	1.00
Incremental Delay, d2	1.2	0.4	0.0	0.4	0.4	0.0		9.8	0.1		0.1	0.1
Delay (s)	5.2	5.0	3.4	1.1	1.1	0.7		60.2	46.9		46.5	46.6
Level of Service	A	A	A	A	A	A		E	D		D	D
Approach Delay (s)		5.0			1.1			57.7			46.6	
Approach LOS		A			A			E			D	

Intersection Summary

HCM Average Control Delay	7.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Volume
290: Mequon Road & Jung Brewery Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	950	20	0	1085	0	15
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3539	1425	0	3505	0	1596
Flt Permitted						
Satd. Flow (perm)	3539	1425	0	3505	0	1596
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	3%	3%	3%	3%
Adj. Flow (vph)	1011	21	0	1154	0	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1011	21	0	1154	0	16
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
290: Mequon Road & Jung Brewery Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	950	20	0	1085	0	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1011	21	0	1154	0	16
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)	289					
pX, platoon unblocked			0.91		0.91	0.91
vC, conflicting volume			1032		1588	505
vC1, stage 1 conf vol					1011	
vC2, stage 2 conf vol					577	
vCu, unblocked vol			840		1450	263
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)					5.9	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			715		241	668

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	505	505	21	577	577	16
Volume Left	0	0	0	0	0	0
Volume Right	0	0	21	0	0	16
cSH	1700	1700	1700	1700	1700	668
Volume to Capacity	0.30	0.30	0.01	0.34	0.34	0.02
Queue Length 95th (ft)	0	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	10.5
Lane LOS						B
Approach Delay (s)	0.0			0.0		10.5
Approach LOS						B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	36.3%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
300: Mequon Road & Public Works Access

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	950	15	85	1010	5	70	5	270	1	1	5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.904	
Flt Protected	0.950			0.950				0.955			0.993	
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411	0	1720	1531	0	1689	0
Flt Permitted	0.950			0.950				0.955			0.993	
Satd. Flow (perm)	1770	3539	1425	1752	3505	1411	0	1720	1531	0	1689	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	1	1011	16	90	1074	5	74	5	287	1	1	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	1011	16	90	1074	5	0	79	287	0	7	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
300: Mequon Road & Public Works Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	950	15	85	1010	5	70	5	270	1	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1	1011	16	90	1074	5	74	5	287	1	1	5
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)		618			1272							
pX, platoon unblocked	0.81			0.92			0.85	0.85	0.92	0.85	0.85	0.81
vC, conflicting volume	1080			1027			1737	2273	505	2053	2284	537
vC1, stage 1 conf vol							1013	1013		1255	1255	
vC2, stage 2 conf vol							724	1261		797	1029	
vCu, unblocked vol	638			851			1089	1717	283	1459	1730	0
tC, single (s)	4.1			4.2			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 %	100			87			68	97	56	99	99	99
cM capacity (veh/h)	766			714			229	166	656	96	149	884

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1
Volume Total	1	505	505	16	90	537	537	5	80	287	7
Volume Left	1	0	0	0	90	0	0	0	74	0	1
Volume Right	0	0	0	16	0	0	0	5	0	287	5
cSH	766	1700	1700	1700	714	1700	1700	1700	224	656	307
Volume to Capacity	0.00	0.30	0.30	0.01	0.13	0.32	0.32	0.00	0.36	0.44	0.02
Queue Length 95th (ft)	0	0	0	0	11	0	0	0	38	56	2
Control Delay (s)	9.7	0.0	0.0	0.0	10.8	0.0	0.0	0.0	29.8	14.7	17.0
Lane LOS	A				B				D	B	C
Approach Delay (s)	0.0				0.8				18.0		17.0
Approach LOS									C		C

Intersection Summary				
Average Delay	3.0			
Intersection Capacity Utilization	56.3%	ICU Level of Service	B	
Analysis Period (min)	15			

Volume
310: Mequon Road & Logeman Access

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1205	10	0	1090	1	0	0	20	1	1	10
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.865		0.886	
Flt Protected											0.996	
Satd. Flow (prot)	0	3539	1425	0	3505	1411	0	0	1627	0	1660	0
Flt Permitted											0.996	
Satd. Flow (perm)	0	3539	1425	0	3505	1411	0	0	1627	0	1660	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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	1310	11	0	1185	1	0	0	22	1	1	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1315	11	0	1185	1	0	0	22	0	13	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
310: Mequon Road & Logeman Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1205	10	0	1090	1	0	0	20	1	1	10
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	1310	11	0	1185	1	0	0	22	1	1	11
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)		1048			842							
pX, platoon unblocked	0.78			0.94			0.81	0.81	0.94	0.81	0.81	0.78
vC, conflicting volume	1186			1321			1924	2507	655	1872	2516	592
vC1, stage 1 conf vol							1321	1321		1185	1185	
vC2, stage 2 conf vol							604	1186		688	1332	
vCu, unblocked vol	671			1212			1332	2052	503	1268	2064	0
tC, single (s)	4.1			4.2			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			100			100	100	96	99	99	99
cM capacity (veh/h)	713			531			156	149	485	214	148	847

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	442	873	11	592	592	1	22	13
Volume Left	5	0	0	0	0	0	0	1
Volume Right	0	0	11	0	0	1	22	11
cSH	713	1700	1700	1700	1700	1700	485	516
Volume to Capacity	0.01	0.51	0.01	0.35	0.35	0.00	0.04	0.03
Queue Length 95th (ft)	1	0	0	0	0	0	4	2
Control Delay (s)	0.2	0.0	0.0	0.0	0.0	0.0	12.8	12.2
Lane LOS	A						B	B
Approach Delay (s)	0.1			0.0			12.8	12.2
Approach LOS							B	B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	50.1%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
320: Mequon Road & River Centre Center Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1150	75	65	1030	60	55
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3574	1439	1752	3505	1787	1599
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3574	1439	1752	3505	1787	1599
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	1%	1%
Adj. Flow (vph)	1250	82	71	1120	65	60
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1250	82	71	1120	65	60
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
320: Mequon Road & River Centre Center Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1150	75	65	1030	60	55
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)	1250	82	71	1120	65	60
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)	1243			647		
pX, platoon unblocked			0.97		0.79	0.97
vC, conflicting volume			1332		1951	625
vC1, stage 1 conf vol					1250	
vC2, stage 2 conf vol					701	
vCu, unblocked vol			1278		1499	549
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			86		66	87
cM capacity (veh/h)			517		189	467

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	625	625	82	71	560	560	65	60
Volume Left	0	0	0	71	0	0	65	0
Volume Right	0	0	82	0	0	0	0	60
cSH	1700	1700	1700	517	1700	1700	189	467
Volume to Capacity	0.37	0.37	0.05	0.14	0.33	0.33	0.34	0.13
Queue Length 95th (ft)	0	0	0	12	0	0	36	11
Control Delay (s)	0.0	0.0	0.0	13.1	0.0	0.0	33.7	13.8
Lane LOS				B			D	B
Approach Delay (s)	0.0			0.8			24.2	
Approach LOS							C	

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
330: Mequon Road & River Centre East Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1200	5	0	1095	0	35
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3539	1425	0	3505	0	1627
Flt Permitted						
Satd. Flow (perm)	3539	1425	0	3505	0	1627
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	3%	3%	1%	1%
Adj. Flow (vph)	1290	5	0	1177	0	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1290	5	0	1177	0	38
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
330: Mequon Road & River Centre East Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1200	5	0	1095	0	35
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)	1290	5	0	1177	0	38
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)				337		
pX, platoon unblocked					0.77	
vC, conflicting volume			1296		1879	645
vC1, stage 1 conf vol					1290	
vC2, stage 2 conf vol					589	
vCu, unblocked vol			1296		1543	645
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	91
cM capacity (veh/h)			525		183	417

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	645	645	5	589	589	38
Volume Left	0	0	0	0	0	0
Volume Right	0	0	5	0	0	38
cSH	1700	1700	1700	1700	1700	417
Volume to Capacity	0.38	0.38	0.00	0.35	0.35	0.09
Queue Length 95th (ft)	0	0	0	0	0	7
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	14.5
Lane LOS						B
Approach Delay (s)	0.0			0.0		14.5
Approach LOS						B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
340: Mequon Road & Cedarburg Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	320	840	75	210	820	475	135	580	185	330	220	140
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95
Frt			0.850			0.850			0.850		0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3467	3574	1599	3433	3334	0
Flt Permitted	0.103			0.222			0.950			0.950		
Satd. Flow (perm)	192	3539	1583	414	3539	1583	3467	3574	1599	3433	3334	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Adj. Flow (vph)	337	884	39	221	863	250	142	611	97	347	232	147
Shared Lane Traffic (%)												
Lane Group Flow (vph)	337	884	39	221	863	250	142	611	97	347	379	0
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2			8			
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	6.0	12.0	12.0	6.0	12.0	12.0	6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.5	18.7	18.7	10.5	18.7	18.7	10.5	16.9	16.9	10.5	16.9	
Total Split (s)	19.0	41.0	41.0	19.0	41.0	41.0	18.0	35.0	35.0	25.0	42.0	0.0
Total Split (%)	15.8%	34.2%	34.2%	15.8%	34.2%	34.2%	15.0%	29.2%	29.2%	20.8%	35.0%	0.0%
Maximum Green (s)	14.5	34.3	34.3	14.5	34.3	34.3	13.5	28.1	28.1	20.5	35.1	
Yellow Time (s)	3.5	3.9	3.9	3.5	3.9	3.9	3.5	3.9	3.9	3.5	3.9	
All-Red Time (s)	1.0	2.8	2.8	1.0	2.8	2.8	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4	3.4	1.5	1.5	1.5	1.5	1.5	
Minimum Gap (s)	1.5	2.0	2.0	1.5	2.0	2.0	1.5	1.5	1.5	1.5	1.5	
Time Before Reduce (s)	15.0	28.0	28.0	15.0	20.0	20.0	20.0	40.0	40.0	30.0	40.0	
Time To Reduce (s)	0.0	12.0	12.0	0.0	20.0	20.0	0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
v/c Ratio	0.84	0.69	0.07	0.68	0.85	0.55	0.56	0.85	0.30	0.76	0.43	
Control Delay	49.0	35.2	26.9	29.0	50.0	41.9	61.8	57.4	42.2	61.0	37.8	
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	49.0	35.2	26.9	29.0	50.0	41.9	61.8	57.4	42.2	61.0	37.8	
90th %ile Green (s)	14.5	34.3	34.3	14.5	34.3	34.3	11.7	28.1	28.1	20.5	36.9	
90th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Gap	Max	Max	Max	Hold	
70th %ile Green (s)	17.8	34.3	34.3	17.8	34.3	34.3	10.0	27.4	27.4	17.9	35.3	
70th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Gap	Gap	Gap	Gap	Hold	
50th %ile Green (s)	21.9	41.2	41.2	15.0	34.3	34.3	8.8	25.2	25.2	16.0	32.4	
50th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Gap	Gap	Gap	Gap	Hold	
30th %ile Green (s)	26.9	49.0	49.0	12.2	34.3	34.3	7.6	22.1	22.1	14.1	28.6	
30th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Gap	Gap	Gap	Gap	Hold	
10th %ile Green (s)	33.1	59.3	59.3	8.1	34.3	34.3	6.0	18.6	18.6	11.4	24.0	

Volume
340: Mequon Road & Cedarburg Road

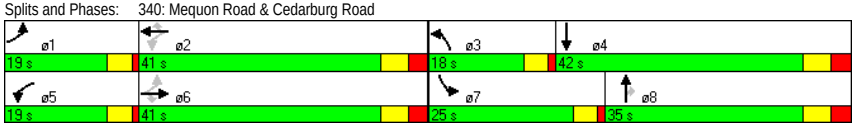
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Min	Gap	Gap	Gap	Hold	
Queue Length 50th (ft)	200	315	20	90	332	164	55	239	64	135	127	
Queue Length 95th (ft)	#465	#451	51	159	#416	251	87	298	111	179	165	
Internal Link Dist (ft)		257			885			746			862	
Turn Bay Length (ft)	180		175	200		235	225		125	385		
Base Capacity (vph)	400	1287	575	351	1012	452	390	837	374	586	986	
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	0.84	0.69	0.07	0.63	0.85	0.55	0.36	0.73	0.26	0.59	0.38	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 1 (1%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 340: Mequon Road & Cedarburg Road



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HCM Signalized Intersection Capacity Analysis
340: Mequon Road & Cedarburg Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	320	840	75	210	820	475	135	580	185	330	220	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3467	3574	1599	3433	3333	
Flt Permitted	0.10	1.00	1.00	0.22	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	192	3539	1583	413	3539	1583	3467	3574	1599	3433	3333	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	337	884	39	221	863	250	142	611	97	347	232	147
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	337	884	39	221	863	250	142	611	97	347	379	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2			8			
Actuated Green, G (s)	61.6	43.6	43.6	47.8	34.3	34.3	8.8	24.3	24.3	16.0	31.5	
Effective Green, g (s)	61.6	43.6	43.6	47.8	34.3	34.3	8.8	24.3	24.3	16.0	31.5	
Actuated g/C Ratio	0.51	0.36	0.36	0.40	0.29	0.29	0.07	0.20	0.20	0.13	0.26	
Clearance Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4	3.4	1.5	1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	398	1286	575	317	1012	452	254	724	324	458	875	
v/s Ratio Prot	c0.16	0.25		0.08	0.24		0.04	c0.17		c0.10	0.11	
v/s Ratio Perm	c0.27		0.02	0.20		0.16			0.06			
v/c Ratio	0.85	0.69	0.07	0.70	0.85	0.55	0.56	0.84	0.30	0.76	0.43	
Uniform Delay, d1	33.0	32.4	24.9	25.6	40.5	36.3	53.7	46.0	40.6	50.1	36.8	
Progression Factor	0.89	0.92	0.89	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.5	3.0	0.2	5.3	9.1	4.8	1.5	8.5	0.2	6.3	0.1	
Delay (s)	43.8	32.9	22.5	30.9	49.5	41.2	55.2	54.6	40.8	56.4	36.9	
Level of Service	D	C	C	C	D	D	E	D	D	E	D	
Approach Delay (s)		35.5			44.9			53.1			46.2	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	43.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX F

Year 2010 Build Traffic Analysis – With Alternative Three Improvements

Volume
200: Mequon Road & Wauwatosa Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	545	50	135	725	225	175	435	125	145	180	90
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.950			0.950			0.630			0.347		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1174	3539	1583	616	3374	1509
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Adj. Flow (vph)	221	574	26	142	763	118	184	458	66	153	189	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	221	574	26	142	763	118	184	458	66	153	189	47
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	11.5	17.9	17.9	11.5	17.9	17.9	11.5	18.0	18.0	11.5	18.0	18.0
Total Split (s)	28.5	45.9	45.9	28.5	45.9	45.9	23.5	46.0	46.0	23.5	46.0	46.0
Total Split (%)	19.8%	31.9%	31.9%	19.8%	31.9%	31.9%	16.3%	32.0%	32.0%	16.3%	32.0%	32.0%
Maximum Green (s)	25.0	40.0	40.0	25.0	40.0	40.0	20.0	40.0	40.0	20.0	40.0	40.0
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0
All-Red Time (s)	0.0	0.9	0.9	0.0	0.9	0.9	0.0	1.0	1.0	0.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Minimum Gap (s)	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0
Time Before Reduce (s)	15.0	24.0	24.0	15.0	18.0	18.0	15.0	24.0	24.0	15.0	22.0	22.0
Time To Reduce (s)	0.0	16.0	16.0	0.0	22.0	22.0	0.0	16.0	16.0	0.0	18.0	18.0
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
v/c Ratio	0.71	0.49	0.05	0.60	0.74	0.26	0.37	0.62	0.20	0.43	0.27	0.15
Control Delay	54.9	29.3	26.3	55.9	38.5	31.7	24.4	42.1	38.8	25.9	37.1	38.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.9	29.3	26.3	55.9	38.5	31.7	24.4	42.1	38.8	25.9	37.1	38.3
90th %ile Green (s)	25.0	45.0	45.0	20.0	40.0	40.0	18.5	29.1	29.1	18.7	29.3	29.3
90th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Gap	Gap	Gap	Gap	Hold	Hold
70th %ile Green (s)	22.0	40.2	40.2	16.2	34.4	34.4	15.5	24.3	24.3	15.3	24.1	24.1
70th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
50th %ile Green (s)	17.9	33.2	33.2	13.2	28.5	28.5	12.7	20.9	20.9	12.6	20.8	20.8
50th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
30th %ile Green (s)	14.3	27.7	27.7	10.5	23.9	23.9	10.3	16.9	16.9	10.0	16.6	16.6
30th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
10th %ile Green (s)	10.2	21.0	21.0	8.0	18.8	18.8	8.0	13.3	13.3	8.0	13.3	13.3

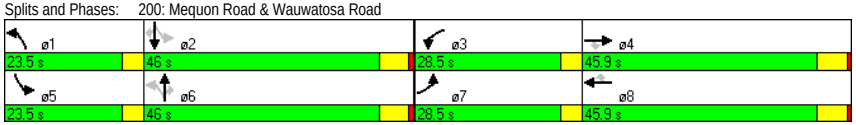
Volume
200: Mequon Road & Wauwatosa Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Gap	Hold	Hold	Min	Gap	Gap	Min	Gap	Gap	Min	Hold	Hold
Queue Length 50th (ft)	131	149	11	85	228	57	76	138	34	62	52	24
Queue Length 95th (ft)	267	258	37	185	378	129	160	243	89	135	105	68
Internal Link Dist (ft)		559			585			1105			792	
Turn Bay Length (ft)	135		35	295		50	185		110	150		200
Base Capacity (vph)	467	1522	681	467	1494	668	589	1494	668	470	1425	637
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.38	0.04	0.30	0.51	0.18	0.31	0.31	0.10	0.33	0.13	0.07

Intersection Summary
Cycle Length: 143.9
Actuated Cycle Length: 99.7
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 131.7
70th %ile Actuated Cycle: 114.9
50th %ile Actuated Cycle: 98.8
30th %ile Actuated Cycle: 84
10th %ile Actuated Cycle: 69.2

Splits and Phases: 200: Mequon Road & Wauwatosa Road



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HCM Signalized Intersection Capacity Analysis
200: Mequon Road & Wauwatosa Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	545	50	135	725	225	175	435	125	145	180	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.63	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1173	3539	1583	615	3374	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	221	574	26	142	763	118	184	458	66	153	189	47
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	221	574	26	142	763	118	184	458	66	153	189	47
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Actuated Green, G (s)	17.6	33.2	33.2	13.3	28.9	28.9	33.5	20.7	20.7	33.3	20.6	20.6
Effective Green, g (s)	17.6	33.2	33.2	13.3	28.9	28.9	33.5	20.7	20.7	33.3	20.6	20.6
Actuated g/C Ratio	0.18	0.34	0.34	0.13	0.29	0.29	0.34	0.21	0.21	0.34	0.21	0.21
Clearance Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Lane Grp Cap (vph)	315	1189	532	238	1035	463	475	741	332	345	703	315
v/s Ratio Prot	c0.12	0.16		0.08	c0.22		0.05	c0.13		c0.06	0.06	
v/s Ratio Perm			0.02			0.07	0.08		0.04	0.09		0.03
v/c Ratio	0.70	0.48	0.05	0.60	0.74	0.25	0.39	0.62	0.20	0.44	0.27	0.15
Uniform Delay, d1	38.1	26.0	22.1	40.2	31.5	26.7	24.1	35.5	32.2	24.1	32.8	31.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.7	0.4	0.0	2.7	2.8	0.3	0.2	1.7	0.4	0.3	0.3	0.3
Delay (s)	43.8	26.4	22.2	42.9	34.4	27.1	24.3	37.2	32.6	24.4	33.1	32.2
Level of Service	D	C	C	D	C	C	C	D	C	C	C	C
Approach Delay (s)		30.9			34.7			33.4			29.6	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	32.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	98.8	Sum of lost time (s)	12.9
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Volume
230: Mequon Road & Concord Creek Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	925	45	50	1075	5	30	1	35	10	1	10
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.954			0.957	
Satd. Flow (prot)	1752	3505	1411	1752	3505	1411	0	1777	1583	0	1432	1272
Flt Permitted	0.950			0.950				0.954			0.957	
Satd. Flow (perm)	1752	3505	1411	1752	3505	1411	0	1777	1583	0	1432	1272
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	27%	27%	27%
Adj. Flow (vph)	5	964	47	52	1120	5	31	1	36	10	1	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	964	47	52	1120	5	0	32	36	0	11	10
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized
Description: High SB %HV

HCM Unsignalized Intersection Capacity Analysis
230: Mequon Road & Concord Creek Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	925	45	50	1075	5	30	1	35	10	1	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	964	47	52	1120	5	31	1	36	10	1	10
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	1125			1010			1649	2203	482	1753	2245	560
vC1, stage 1 conf vol							974	974		1224	1224	
vC2, stage 2 conf vol							675	1229		529	1021	
vCu, unblocked vol	1125			1010			1649	2203	482	1753	2245	560
tC, single (s)	4.2			4.2			7.5	6.5	6.9	8.0	7.0	7.4
tC, 2 stage (s)							6.5	5.5		7.0	6.0	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.8	4.3	3.6
p0 queue free %	99			92			81	99	93	90	99	97
cM capacity (veh/h)	611			676			167	139	531	106	103	413

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1	SB 2
Volume Total	5	482	482	47	52	560	560	5	32	36	11	10
Volume Left	5	0	0	0	52	0	0	0	31	0	10	0
Volume Right	0	0	0	47	0	0	0	5	0	36	0	10
cSH	611	1700	1700	1700	676	1700	1700	1700	166	531	106	413
Volume to Capacity	0.01	0.28	0.28	0.03	0.08	0.33	0.33	0.00	0.20	0.07	0.11	0.03
Queue Length 95th (ft)	1	0	0	0	6	0	0	0	17	6	9	2
Control Delay (s)	10.9	0.0	0.0	0.0	10.8	0.0	0.0	0.0	31.9	12.3	43.2	13.9
Lane LOS	B				B				D	B	E	B
Approach Delay (s)	0.1				0.5				21.5		29.3	
Approach LOS									C		D	

Intersection Summary			
Average Delay		1.2	
Intersection Capacity Utilization		51.4%	ICU Level of Service
Analysis Period (min)		15	
Description: High SB %HV			

Volume
250: Mequon Road & Weston Center West Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	940	30	40	1110	20	30
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850			0.920	
Flt Protected			0.950		0.980	
Satd. Flow (prot)	3505	1411	1752	3505	1679	0
Flt Permitted			0.950		0.980	
Satd. Flow (perm)	3505	1411	1752	3505	1679	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Adj. Flow (vph)	979	31	42	1156	21	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	979	31	42	1156	52	0
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
250: Mequon Road & Weston Center West Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	940	30	40	1110	20	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	979	31	42	1156	21	31
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised			Raised		
Median storage veh)	1			1		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1010		1641	490
vC1, stage 1 conf vol					979	
vC2, stage 2 conf vol					661	
vCu, unblocked vol			1010		1641	490
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			94		90	94
cM capacity (veh/h)			676		209	524

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	490	490	31	42	578	578	52
Volume Left	0	0	0	42	0	0	21
Volume Right	0	0	31	0	0	0	31
cSH	1700	1700	1700	676	1700	1700	327
Volume to Capacity	0.29	0.29	0.02	0.06	0.34	0.34	0.16
Queue Length 95th (ft)	0	0	0	5	0	0	14
Control Delay (s)	0.0	0.0	0.0	10.7	0.0	0.0	18.1
Lane LOS				B			C
Approach Delay (s)	0.0			0.4			18.1
Approach LOS							C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	42.7%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
260: Mequon Road & Weston Center East Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	970	1	0	1150	0	10
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3574	1439	0	3505	0	1611
Flt Permitted						
Satd. Flow (perm)	3574	1439	0	3505	0	1611
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	2%	2%
Adj. Flow (vph)	1054	1	0	1250	0	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1054	1	0	1250	0	11
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
260: Mequon Road & Weston Center East Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	970	1	0	1150	0	10
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)	1054	1	0	1250	0	11
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)				1088		
pX, platoon unblocked					0.89	
vC, conflicting volume			1055		1679	527
vC1, stage 1 conf vol					1054	
vC2, stage 2 conf vol					625	
vCu, unblocked vol			1055		1521	527
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			650		220	496

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	527	527	1	625	625	11
Volume Left	0	0	0	0	0	0
Volume Right	0	0	1	0	0	11
cSH	1700	1700	1700	1700	1700	496
Volume to Capacity	0.31	0.31	0.00	0.37	0.37	0.02
Queue Length 95th (ft)	0	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	12.4
Lane LOS						B
Approach Delay (s)	0.0			0.0		12.4
Approach LOS						B

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		36.8%	ICU Level of Service	A
Analysis Period (min)		15	

Volume
270: Mequon Road & River Birch Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	975	1	5	1145	5	5	1	5	1	1	1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.939			0.955	
Flt Protected	0.950			0.950				0.978			0.984	
Satd. Flow (prot)	1787	3574	1439	1752	3505	1411	0	1728	0	0	1768	0
Flt Permitted	0.950			0.950				0.978			0.984	
Satd. Flow (perm)	1787	3574	1439	1752	3505	1411	0	1728	0	0	1768	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
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	1060	1	5	1245	5	5	1	5	1	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1060	1	5	1245	5	0	11	0	0	3	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
270: Mequon Road & River Birch Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	975	1	5	1145	5	5	1	5	1	1	1
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	1060	1	5	1245	5	5	1	5	1	1	1
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)					626							
pX, platoon unblocked	0.89						0.89	0.89		0.89	0.89	0.89
vC, conflicting volume	1250			1061			1705	2332	530	1802	2327	622
vC1, stage 1 conf vol							1071	1071		1255	1255	
vC2, stage 2 conf vol							635	1261		547	1072	
vCu, unblocked vol	1026			1061			1540	2246	530	1649	2241	318
tC, single (s)	4.1			4.2			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			99			97	99	99	99	99	100
cM capacity (veh/h)	602			646			177	144	496	159	145	604

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	5	530	530	1	5	622	622	5	12	3
Volume Left	5	0	0	0	5	0	0	0	5	1
Volume Right	0	0	0	1	0	0	0	5	5	1
cSH	602	1700	1700	1700	646	1700	1700	1700	243	202
Volume to Capacity	0.01	0.31	0.31	0.00	0.01	0.37	0.37	0.00	0.05	0.02
Queue Length 95th (ft)	1	0	0	0	1	0	0	0	4	1
Control Delay (s)	11.0	0.0	0.0	0.0	10.6	0.0	0.0	0.0	20.6	23.1
Lane LOS	B				B				C	C
Approach Delay (s)	0.1				0.0				20.6	23.1
Approach LOS									C	C

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		41.7%	ICU Level of Service
Analysis Period (min)		15	

Volume
280: Mequon Road & Buntrock Avenue

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	905	15	40	1030	15	85	35	55	10	5	40
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.999				0.850			0.850
Flt Protected	0.950			0.950				0.966			0.967	
Satd. Flow (prot)	1770	3539	1425	1752	3385	0	0	1782	1568	0	1801	1583
Flt Permitted	0.238			0.282				0.780			0.762	
Satd. Flow (perm)	443	3539	1425	520	3385	0	0	1439	1568	0	1419	1583
Satd. Flow (RTOR)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	64	963	8	43	1096	8	90	37	29	11	5	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	963	8	43	1104	0	0	127	29	0	16	21
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6		6	2			8		8	4		4
Detector Phase	6	6	6	2	2		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	21.4	21.4	21.4	21.4	21.4		17.1	17.1	17.1	17.1	17.1	17.1
Total Split (s)	80.0	80.0	80.0	80.0	80.0	0.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	66.7%	0.0%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Maximum Green (s)	73.6	73.6	73.6	73.6	73.6		32.9	32.9	32.9	32.9	32.9	32.9
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	4.0	7.1	7.1	7.1	7.1	7.1	7.1
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.5	5.5	5.5	5.5	5.5		1.5	1.5	1.5	1.5	1.5	1.5
Minimum Gap (s)	1.5	1.5	1.5	1.5	1.5		1.5	1.5	1.5	1.5	1.5	1.5
Time Before Reduce (s)	30.0	30.0	30.0	30.0	30.0		0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	15.0	15.0	15.0	15.0	15.0		0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max		None	None	None	None	None	None
v/c Ratio	0.19	0.36	0.01	0.11	0.43			0.71	0.15		0.09	0.11
Control Delay	6.4	5.5	4.5	1.4	2.2			70.3	46.3		44.9	45.2
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	0.0
Total Delay	6.4	5.5	4.5	1.4	2.2			70.3	46.3		44.9	45.2
90th %ile Green (s)	85.2	85.2	85.2	85.2	85.2		21.3	21.3	21.3	21.3	21.3	21.3
90th %ile Term Code	Coord	Coord	Coord	Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
70th %ile Green (s)	89.2	89.2	89.2	89.2	89.2		17.3	17.3	17.3	17.3	17.3	17.3
70th %ile Term Code	Coord	Coord	Coord	Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
50th %ile Green (s)	91.9	91.9	91.9	91.9	91.9		14.6	14.6	14.6	14.6	14.6	14.6
50th %ile Term Code	Coord	Coord	Coord	Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
30th %ile Green (s)	94.6	94.6	94.6	94.6	94.6		11.9	11.9	11.9	11.9	11.9	11.9
30th %ile Term Code	Coord	Coord	Coord	Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
10th %ile Green (s)	96.5	96.5	96.5	96.5	96.5		10.0	10.0	10.0	10.0	10.0	10.0

Volume
280: Mequon Road & Buntrock Avenue

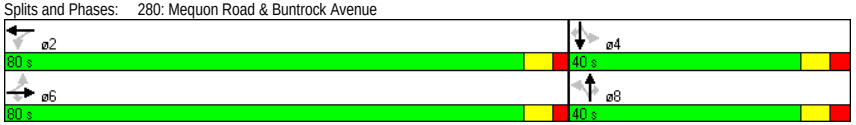
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Coord	Coord	Coord	Coord	Coord		Min	Min	Min	Hold	Hold	Hold
Queue Length 50th (ft)	12	107	1	1	14			96	20		11	15
Queue Length 95th (ft)	34	172	6	m2	138			155	47		31	37
Internal Link Dist (ft)		546			209			420			420	
Turn Bay Length (ft)	100			120					70			40
Base Capacity (vph)	338	2698	1086	396	2580			395	430		389	434
Starvation Cap Reductn	0	0	0	0	0			0	0		0	0
Spillback Cap Reductn	0	0	0	0	0			0	0		0	0
Storage Cap Reductn	0	0	0	0	0			0	0		0	0
Reduced v/c Ratio	0.19	0.36	0.01	0.11	0.43			0.32	0.07		0.04	0.05

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 50 (42%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 280: Mequon Road & Buntrock Avenue



HCM Signalized Intersection Capacity Analysis
280: Mequon Road & Buntrock Avenue

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	905	15	40	1030	15	85	35	55	10	5	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	9	12	11	9	12	12	12	12	12	12
Total Lost time (s)	6.4	6.4	6.4	6.4	6.4			7.1	7.1		7.1	7.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	3539	1425	1752	3384			1782	1568		1801	1583
Flt Permitted	0.24	1.00	1.00	0.28	1.00			0.78	1.00		0.76	1.00
Satd. Flow (perm)	443	3539	1425	520	3384			1438	1568		1420	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	64	963	8	43	1096	8	90	37	29	11	5	21
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	64	963	8	43	1104	0	0	127	29	0	16	21
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6		6	2			8		8	4		4
Actuated Green, G (s)	91.5	91.5	91.5	91.5	91.5			15.0	15.0		15.0	15.0
Effective Green, g (s)	91.5	91.5	91.5	91.5	91.5			15.0	15.0		15.0	15.0
Actuated g/C Ratio	0.76	0.76	0.76	0.76	0.76			0.12	0.12		0.12	0.12
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4			7.1	7.1		7.1	7.1
Vehicle Extension (s)	5.5	5.5	5.5	5.5	5.5			1.5	1.5		1.5	1.5
Lane Grp Cap (vph)	338	2698	1087	397	2580			180	196		178	198
v/s Ratio Prot		0.27			c0.33							
v/s Ratio Perm	0.14		0.01	0.08				c0.09	0.02		0.01	0.01
v/c Ratio	0.19	0.36	0.01	0.11	0.43			0.71	0.15		0.09	0.11
Uniform Delay, d1	4.0	4.6	3.4	3.7	5.0			50.4	46.8		46.5	46.6
Progression Factor	1.00	1.00	1.00	0.21	0.33			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.2	0.4	0.0	0.4	0.4			9.8	0.1		0.1	0.1
Delay (s)	5.2	5.0	3.4	1.2	2.1			60.2	46.9		46.5	46.6
Level of Service	A	A	A	A	A			E	D		D	D
Approach Delay (s)		5.0			2.0			57.7			46.6	
Approach LOS		A			A			E			D	

Intersection Summary

HCM Average Control Delay	7.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Volume
290: Mequon Road & Jung Brewery Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	950	20	0	1085	0	15
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.997					0.865
Flt Protected						
Satd. Flow (prot)	3198	0	0	3388	0	1596
Flt Permitted						
Satd. Flow (perm)	3198	0	0	3388	0	1596
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	3%	3%	3%	3%
Parking (#/hr)	5	5				
Adj. Flow (vph)	1011	21	0	1154	0	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1032	0	0	1154	0	16
Sign Control	Free			Free	Stop	

Intersection Summary

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
290: Mequon Road & Jung Brewery Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	950	20	0	1085	0	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1011	21	0	1154	0	16
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)	289					
pX, platoon unblocked			0.91		0.91	0.91
vC, conflicting volume			1032		1598	516
vC1, stage 1 conf vol					1021	
vC2, stage 2 conf vol					577	
vCu, unblocked vol			837		1460	271
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)					5.9	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			715		239	659

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	674	358	577	577	16
Volume Left	0	0	0	0	0
Volume Right	0	21	0	0	16
cSH	1700	1700	1700	1700	659
Volume to Capacity	0.40	0.21	0.34	0.34	0.02
Queue Length 95th (ft)	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	10.6
Lane LOS					B
Approach Delay (s)	0.0		0.0		10.6
Approach LOS					B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
300: Mequon Road & Public Works Access 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	950	15	85	1010	5	70	5	270	1	1	5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.999				0.850		0.904	
Flt Protected	0.950			0.950				0.955			0.993	
Satd. Flow (prot)	1770	3201	0	1752	3385	0	0	1720	1531	0	1689	0
Flt Permitted	0.950			0.950				0.955			0.993	
Satd. Flow (perm)	1770	3201	0	1752	3385	0	0	1720	1531	0	1689	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Parking (#/hr)		5	5									
Adj. Flow (vph)	1	1011	16	90	1074	5	74	5	287	1	1	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	1027	0	90	1079	0	0	79	287	0	7	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
300: Mequon Road & Public Works Access 12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	950	15	85	1010	5	70	5	270	1	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1	1011	16	90	1074	5	74	5	287	1	1	5
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)		618			1272							
pX, platoon unblocked	0.80			0.91			0.84	0.84	0.91	0.84	0.84	0.80
vC, conflicting volume	1080			1027			1745	2281	513	2055	2287	540
vC1, stage 1 conf vol							1021	1021		1258	1258	
vC2, stage 2 conf vol							724	1261		797	1029	
vCu, unblocked vol	598			838			1046	1683	276	1415	1689	0
tC, single (s)	4.1			4.2			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 %	100			87			68	97	56	99	99	99
cM capacity (veh/h)	779			717			234	169	659	99	152	870

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	1	674	353	90	716	363	80	287	7
Volume Left	1	0	0	90	0	0	74	0	1
Volume Right	0	0	16	0	0	5	0	287	5
cSH	779	1700	1700	717	1700	1700	228	659	313
Volume to Capacity	0.00	0.40	0.21	0.13	0.42	0.21	0.35	0.44	0.02
Queue Length 95th (ft)	0	0	0	11	0	0	37	55	2
Control Delay (s)	9.6	0.0	0.0	10.7	0.0	0.0	29.0	14.6	16.8
Lane LOS	A			B			D	B	C
Approach Delay (s)	0.0			0.8			17.8		16.8
Approach LOS							C		C

Intersection Summary

Average Delay	3.0		
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		

Volume
310: Mequon Road & Logeman Access 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1205	10	0	1090	1	0	0	20	1	1	10
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999							0.865		0.886	
Flt Protected											0.996	
Satd. Flow (prot)	0	3204	0	0	3388	0	0	0	1627	0	1660	0
Flt Permitted											0.996	
Satd. Flow (perm)	0	3204	0	0	3388	0	0	0	1627	0	1660	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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		5	5									
Adj. Flow (vph)	5	1310	11	0	1185	1	0	0	22	1	1	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1326	0	0	1186	0	0	0	22	0	13	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
310: Mequon Road & Logeman Access 12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1205	10	0	1090	1	0	0	20	1	1	10
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	1310	11	0	1185	1	0	0	22	1	1	11
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)		1048			842							
pX, platoon unblocked	0.78			0.92			0.81	0.81	0.92	0.81	0.81	0.78
vC, conflicting volume	1186			1321			1930	2512	660	1873	2517	593
vC1, stage 1 conf vol							1326	1326		1185	1185	
vC2, stage 2 conf vol							604	1186		688	1332	
vCu, unblocked vol	663			1182			1265	1980	467	1195	1986	0
tC, single (s)	4.1			4.2			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			100			100	100	96	100	99	99
cM capacity (veh/h)	716			537			160	152	503	223	152	844

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	660	666	790	396	22	13
Volume Left	5	0	0	0	0	1
Volume Right	0	11	0	1	22	11
cSH	716	1700	1700	1700	503	524
Volume to Capacity	0.01	0.39	0.46	0.23	0.04	0.02
Queue Length 95th (ft)	1	0	0	0	3	2
Control Delay (s)	0.2	0.0	0.0	0.0	12.5	12.0
Lane LOS	A				B	B
Approach Delay (s)	0.1		0.0		12.5	12.0
Approach LOS					B	B

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		50.4%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
320: Mequon Road & River Centre Center Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1150	75	65	1030	60	55
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.991					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3210	0	1752	3388	1787	1599
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3210	0	1752	3388	1787	1599
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	1%	1%
Parking (#/hr)	5	5				
Adj. Flow (vph)	1250	82	71	1120	65	60
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1332	0	71	1120	65	60
Sign Control	Free			Free	Stop	

Intersection Summary

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
320: Mequon Road & River Centre Center Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1150	75	65	1030	60	55
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)	1250	82	71	1120	65	60
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)	1243			647		
pX, platoon unblocked			0.93		0.81	0.93
vC, conflicting volume			1332		1992	666
vC1, stage 1 conf vol					1291	
vC2, stage 2 conf vol					701	
vCu, unblocked vol			1211		1379	498
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			87		66	88
cM capacity (veh/h)			528		194	486

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	833	498	71	560	560	65	60
Volume Left	0	0	71	0	0	65	0
Volume Right	0	82	0	0	0	0	60
cSH	1700	1700	528	1700	1700	194	486
Volume to Capacity	0.49	0.29	0.13	0.33	0.33	0.34	0.12
Queue Length 95th (ft)	0	0	11	0	0	35	10
Control Delay (s)	0.0	0.0	12.9	0.0	0.0	32.7	13.4
Lane LOS			B			D	B
Approach Delay (s)	0.0		0.8			23.5	
Approach LOS						C	

Intersection Summary

Average Delay	1.5		
Intersection Capacity Utilization	51.1%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
330: Mequon Road & River Centre East Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1200	5	0	1095	0	35
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.999					0.865
Flt Protected						
Satd. Flow (prot)	3204	0	0	3388	0	1627
Flt Permitted						
Satd. Flow (perm)	3204	0	0	3388	0	1627
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	3%	3%	1%	1%
Parking (#/hr)	5	5				
Adj. Flow (vph)	1290	5	0	1177	0	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1295	0	0	1177	0	38
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
330: Mequon Road & River Centre East Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1200	5	0	1095	0	35
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)	1290	5	0	1177	0	38
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)				337		
pX, platoon unblocked					0.77	
vC, conflicting volume			1296		1882	648
vC1, stage 1 conf vol					1293	
vC2, stage 2 conf vol					589	
vCu, unblocked vol			1296		1546	648
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	91
cM capacity (veh/h)			525		182	416

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	860	435	589	589	38
Volume Left	0	0	0	0	0
Volume Right	0	5	0	0	38
cSH	1700	1700	1700	1700	416
Volume to Capacity	0.51	0.26	0.35	0.35	0.09
Queue Length 95th (ft)	0	0	0	0	7
Control Delay (s)	0.0	0.0	0.0	0.0	14.5
Lane LOS					B
Approach Delay (s)	0.0		0.0		14.5
Approach LOS					B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	43.3%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
340: Mequon Road & Cedarburg Road 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	320	840	75	210	820	475	135	580	185	330	220	140
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95
Frt			0.850			0.850			0.850		0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3467	3574	1599	3433	3334	0
Flt Permitted	0.103			0.222			0.950			0.950		
Satd. Flow (perm)	192	3539	1583	414	3539	1583	3467	3574	1599	3433	3334	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Adj. Flow (vph)	337	884	39	221	863	250	142	611	97	347	232	147
Shared Lane Traffic (%)												
Lane Group Flow (vph)	337	884	39	221	863	250	142	611	97	347	379	0
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2			8			
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	6.0	12.0	12.0	6.0	12.0	12.0	6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.5	18.7	18.7	10.5	18.7	18.7	10.5	16.9	16.9	10.5	16.9	
Total Split (s)	19.0	41.0	41.0	19.0	41.0	41.0	18.0	35.0	35.0	25.0	42.0	0.0
Total Split (%)	15.8%	34.2%	34.2%	15.8%	34.2%	34.2%	15.0%	29.2%	29.2%	20.8%	35.0%	0.0%
Maximum Green (s)	14.5	34.3	34.3	14.5	34.3	34.3	13.5	28.1	28.1	20.5	35.1	
Yellow Time (s)	3.5	3.9	3.9	3.5	3.9	3.9	3.5	3.9	3.9	3.5	3.9	
All-Red Time (s)	1.0	2.8	2.8	1.0	2.8	2.8	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4	3.4	1.5	1.5	1.5	1.5	1.5	
Minimum Gap (s)	1.5	2.0	2.0	1.5	2.0	2.0	1.5	1.5	1.5	1.5	1.5	
Time Before Reduce (s)	15.0	28.0	28.0	15.0	20.0	20.0	20.0	40.0	40.0	30.0	40.0	
Time To Reduce (s)	0.0	12.0	12.0	0.0	20.0	20.0	0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
v/c Ratio	0.84	0.69	0.07	0.68	0.85	0.55	0.56	0.85	0.30	0.76	0.43	
Control Delay	49.2	35.4	27.2	29.0	50.0	41.9	61.8	57.4	42.2	61.0	37.8	
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	49.2	35.4	27.2	29.0	50.0	41.9	61.8	57.4	42.2	61.0	37.8	
90th %ile Green (s)	14.5	34.3	34.3	14.5	34.3	34.3	11.7	28.1	28.1	20.5	36.9	
90th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Gap	Max	Max	Max	Hold	
70th %ile Green (s)	17.8	34.3	34.3	17.8	34.3	34.3	10.0	27.4	27.4	17.9	35.3	
70th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Gap	Gap	Gap	Gap	Hold	
50th %ile Green (s)	21.9	41.2	41.2	15.0	34.3	34.3	8.8	25.2	25.2	16.0	32.4	
50th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Gap	Gap	Gap	Gap	Hold	
30th %ile Green (s)	26.9	49.0	49.0	12.2	34.3	34.3	7.6	22.1	22.1	14.1	28.6	
30th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Gap	Gap	Gap	Gap	Hold	
10th %ile Green (s)	33.1	59.3	59.3	8.1	34.3	34.3	6.0	18.6	18.6	11.4	24.0	

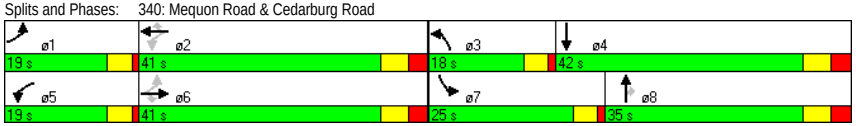
Volume
340: Mequon Road & Cedarburg Road 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Min	Gap	Gap	Gap	Hold	
Queue Length 50th (ft)	200	315	20	90	332	164	55	239	64	135	127	
Queue Length 95th (ft)	#465	#451	51	159	#416	251	87	298	111	179	165	
Internal Link Dist (ft)		257			885			746			862	
Turn Bay Length (ft)	180		125	200		235	225		125	385		
Base Capacity (vph)	400	1287	575	351	1012	452	390	837	374	586	986	
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	0.84	0.69	0.07	0.63	0.85	0.55	0.36	0.73	0.26	0.59	0.38	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 1 (1%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 340: Mequon Road & Cedarburg Road



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HCM Signalized Intersection Capacity Analysis
340: Mequon Road & Cedarburg Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	320	840	75	210	820	475	135	580	185	330	220	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3467	3574	1599	3433	3333	
Flt Permitted	0.10	1.00	1.00	0.22	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	192	3539	1583	413	3539	1583	3467	3574	1599	3433	3333	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	337	884	39	221	863	250	142	611	97	347	232	147
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	337	884	39	221	863	250	142	611	97	347	379	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2			8			
Actuated Green, G (s)	61.6	43.6	43.6	47.8	34.3	34.3	8.8	24.3	24.3	16.0	31.5	
Effective Green, g (s)	61.6	43.6	43.6	47.8	34.3	34.3	8.8	24.3	24.3	16.0	31.5	
Actuated g/C Ratio	0.51	0.36	0.36	0.40	0.29	0.29	0.07	0.20	0.20	0.13	0.26	
Clearance Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4	3.4	1.5	1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	398	1286	575	317	1012	452	254	724	324	458	875	
v/s Ratio Prot	c0.16	0.25		0.08	0.24		0.04	c0.17		c0.10	0.11	
v/s Ratio Perm	c0.27		0.02	0.20		0.16			0.06			
v/c Ratio	0.85	0.69	0.07	0.70	0.85	0.55	0.56	0.84	0.30	0.76	0.43	
Uniform Delay, d1	33.0	32.4	24.9	25.6	40.5	36.3	53.7	46.0	40.6	50.1	36.8	
Progression Factor	0.90	0.93	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.5	3.0	0.2	5.3	9.1	4.8	1.5	8.5	0.2	6.3	0.1	
Delay (s)	44.0	33.1	22.7	30.9	49.5	41.2	55.2	54.6	40.8	56.4	36.9	
Level of Service	D	C	C	C	D	D	E	D	D	E	D	
Approach Delay (s)		35.7			44.9			53.1			46.2	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	44.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX F

Year 2010 Build Traffic Analysis – With Alternative Four Improvements

Volume
200: Mequon Road & Wauwatosa Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	545	50	135	725	225	175	435	125	145	180	90
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.950			0.950			0.630			0.344		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1174	3539	1583	611	3374	1509
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Adj. Flow (vph)	221	574	26	142	763	118	184	458	66	153	189	47
Shared Lane Traffic (%)												
Lane Group Flow (vph)	221	574	26	142	763	118	184	458	66	153	189	47
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	11.5	17.9	17.9	11.5	17.9	17.9	11.5	18.0	18.0	11.5	18.0	18.0
Total Split (s)	28.5	45.9	45.9	28.5	45.9	45.9	23.5	46.0	46.0	23.5	46.0	46.0
Total Split (%)	19.8%	31.9%	31.9%	19.8%	31.9%	31.9%	16.3%	32.0%	32.0%	16.3%	32.0%	32.0%
Maximum Green (s)	25.0	40.0	40.0	25.0	40.0	40.0	20.0	40.0	40.0	20.0	40.0	40.0
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0
All-Red Time (s)	0.0	0.9	0.9	0.0	0.9	0.9	0.0	1.0	1.0	0.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Minimum Gap (s)	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0
Time Before Reduce (s)	15.0	24.0	24.0	15.0	18.0	18.0	15.0	24.0	24.0	15.0	22.0	22.0
Time To Reduce (s)	0.0	16.0	16.0	0.0	22.0	22.0	0.0	16.0	16.0	0.0	18.0	18.0
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
v/c Ratio	0.71	0.48	0.05	0.60	0.73	0.25	0.37	0.63	0.20	0.43	0.27	0.15
Control Delay	55.5	29.1	26.2	56.4	38.0	31.6	24.6	42.4	39.0	26.2	37.3	38.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.5	29.1	26.2	56.4	38.0	31.6	24.6	42.4	39.0	26.2	37.3	38.5
90th %ile Green (s)	25.0	45.0	45.0	20.0	40.0	40.0	18.5	29.1	29.1	18.7	29.3	29.3
90th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Gap	Gap	Gap	Gap	Hold	Hold
70th %ile Green (s)	22.0	40.2	40.2	16.2	34.4	34.4	15.5	24.3	24.3	15.3	24.1	24.1
70th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
50th %ile Green (s)	18.0	34.3	34.3	13.2	29.5	29.5	12.8	21.0	21.0	12.7	20.9	20.9
50th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
30th %ile Green (s)	14.3	28.7	28.7	10.5	24.9	24.9	10.3	16.9	16.9	10.0	16.6	16.6
30th %ile Term Code	Gap	Hold	Hold	Gap	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
10th %ile Green (s)	10.2	22.0	22.0	8.0	19.8	19.8	8.0	13.3	13.3	8.0	13.3	13.3

Volume
200: Mequon Road & Wauwatosa Road

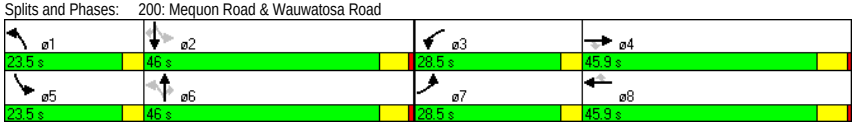
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Gap	Hold	Hold	Min	Gap	Gap	Min	Gap	Gap	Min	Hold	Hold
Queue Length 50th (ft)	134	150	11	87	230	57	78	140	35	64	53	25
Queue Length 95th (ft)	267	258	37	185	378	129	160	243	89	135	105	68
Internal Link Dist (ft)		559			585			1105			792	
Turn Bay Length (ft)	135		35	295		50	185		110	150		200
Base Capacity (vph)	463	1509	675	463	1481	662	585	1481	662	465	1412	631
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.38	0.04	0.31	0.52	0.18	0.31	0.31	0.10	0.33	0.13	0.07

Intersection Summary

Cycle Length: 143.9
Actuated Cycle Length: 100.4
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 131.7
70th %ile Actuated Cycle: 114.9
50th %ile Actuated Cycle: 100.1
30th %ile Actuated Cycle: 85
10th %ile Actuated Cycle: 70.2

Splits and Phases: 200: Mequon Road & Wauwatosa Road



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HCM Signalized Intersection Capacity Analysis
200: Mequon Road & Wauwatosa Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	210	545	50	135	725	225	175	435	125	145	180	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.63	1.00	1.00	0.34	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	1173	3539	1583	611	3374	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	221	574	26	142	763	118	184	458	66	153	189	47
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	221	574	26	142	763	118	184	458	66	153	189	47
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Actuated Green, G (s)	17.6	33.9	33.9	13.3	29.6	29.6	33.5	20.7	20.7	33.3	20.6	20.6
Effective Green, g (s)	17.6	33.9	33.9	13.3	29.6	29.6	33.5	20.7	20.7	33.3	20.6	20.6
Actuated g/C Ratio	0.18	0.34	0.34	0.13	0.30	0.30	0.34	0.21	0.21	0.33	0.21	0.21
Clearance Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Lane Grp Cap (vph)	313	1206	539	237	1053	471	472	736	329	342	699	312
v/s Ratio Prot	c0.12	0.16		0.08	c0.22		0.05	c0.13		c0.06	0.06	
v/s Ratio Perm			0.02			0.07	0.08		0.04	0.09		0.03
v/c Ratio	0.71	0.48	0.05	0.60	0.72	0.25	0.39	0.62	0.20	0.45	0.27	0.15
Uniform Delay, d1	38.5	25.8	22.0	40.6	31.3	26.5	24.4	35.8	32.6	24.4	33.1	32.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.8	0.4	0.0	2.7	2.6	0.3	0.2	1.8	0.4	0.3	0.3	0.3
Delay (s)	44.3	26.2	22.0	43.3	33.9	26.9	24.6	37.7	33.0	24.8	33.4	32.6
Level of Service	D	C	C	D	C	C	C	D	C	C	C	C
Approach Delay (s)		30.9			34.4			33.8			29.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM Average Control Delay	32.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	99.5	Sum of lost time (s)	12.9
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Volume
230: Mequon Road & Concord Creek Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	925	45	50	1075	5	30	1	35	10	1	10
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.954			0.957	
Satd. Flow (prot)	1752	3505	1411	1752	3505	1411	0	1777	1583	0	1432	1272
Flt Permitted	0.950			0.950				0.954			0.957	
Satd. Flow (perm)	1752	3505	1411	1752	3505	1411	0	1777	1583	0	1432	1272
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	27%	27%	27%
Adj. Flow (vph)	5	964	47	52	1120	5	31	1	36	10	1	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	964	47	52	1120	5	0	32	36	0	11	10
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized
Description: High SB %HV

HCM Unsignalized Intersection Capacity Analysis
230: Mequon Road & Concord Creek Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	925	45	50	1075	5	30	1	35	10	1	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	964	47	52	1120	5	31	1	36	10	1	10
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	1125			1010			1649	2203	482	1753	2245	560
vC1, stage 1 conf vol							974	974		1224	1224	
vC2, stage 2 conf vol							675	1229		529	1021	
vCu, unblocked vol	1125			1010			1649	2203	482	1753	2245	560
tC, single (s)	4.2			4.2			7.5	6.5	6.9	8.0	7.0	7.4
tC, 2 stage (s)							6.5	5.5		7.0	6.0	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.8	4.3	3.6
p0 queue free %	99			92			81	99	93	90	99	97
cM capacity (veh/h)	611			676			167	139	531	106	103	413

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1	SB 2
Volume Total	5	482	482	47	52	560	560	5	32	36	11	10
Volume Left	5	0	0	0	52	0	0	0	31	0	10	0
Volume Right	0	0	0	47	0	0	0	5	0	36	0	10
cSH	611	1700	1700	1700	676	1700	1700	1700	166	531	106	413
Volume to Capacity	0.01	0.28	0.28	0.03	0.08	0.33	0.33	0.00	0.20	0.07	0.11	0.03
Queue Length 95th (ft)	1	0	0	0	6	0	0	0	17	6	9	2
Control Delay (s)	10.9	0.0	0.0	0.0	10.8	0.0	0.0	0.0	31.9	12.3	43.2	13.9
Lane LOS	B				B				D	B	E	B
Approach Delay (s)	0.1				0.5				21.5		29.3	
Approach LOS									C		D	

Intersection Summary			
Average Delay		1.2	
Intersection Capacity Utilization		51.4%	ICU Level of Service
Analysis Period (min)		15	
Description: High SB %HV			

Volume
250: Mequon Road & Weston Center West Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	940	30	40	1110	20	30
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850			0.920	
Flt Protected			0.950		0.980	
Satd. Flow (prot)	3505	1411	1752	3505	1679	0
Flt Permitted			0.950		0.980	
Satd. Flow (perm)	3505	1411	1752	3505	1679	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Adj. Flow (vph)	979	31	42	1156	21	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	979	31	42	1156	52	0
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
250: Mequon Road & Weston Center West Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	940	30	40	1110	20	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	979	31	42	1156	21	31
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised			Raised		
Median storage veh)	1			1		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1010		1641	490
vC1, stage 1 conf vol					979	
vC2, stage 2 conf vol					661	
vCu, unblocked vol			1010		1641	490
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			94		90	94
cM capacity (veh/h)			676		209	524

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	490	490	31	42	578	578	52
Volume Left	0	0	0	42	0	0	21
Volume Right	0	0	31	0	0	0	31
cSH	1700	1700	1700	676	1700	1700	327
Volume to Capacity	0.29	0.29	0.02	0.06	0.34	0.34	0.16
Queue Length 95th (ft)	0	0	0	5	0	0	14
Control Delay (s)	0.0	0.0	0.0	10.7	0.0	0.0	18.1
Lane LOS				B			C
Approach Delay (s)	0.0			0.4			18.1
Approach LOS							C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	42.7%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
260: Mequon Road & Weston Center East Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	970	1	0	1150	0	10
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3574	1439	0	3505	0	1611
Flt Permitted						
Satd. Flow (perm)	3574	1439	0	3505	0	1611
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	2%	2%
Adj. Flow (vph)	1054	1	0	1250	0	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1054	1	0	1250	0	11
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
260: Mequon Road & Weston Center East Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	970	1	0	1150	0	10
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)	1054	1	0	1250	0	11
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)				1088		
pX, platoon unblocked					0.90	
vC, conflicting volume			1055		1679	527
vC1, stage 1 conf vol					1054	
vC2, stage 2 conf vol					625	
vCu, unblocked vol			1055		1528	527
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			650		220	496

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	527	527	1	625	625	11
Volume Left	0	0	0	0	0	0
Volume Right	0	0	1	0	0	11
cSH	1700	1700	1700	1700	1700	496
Volume to Capacity	0.31	0.31	0.00	0.37	0.37	0.02
Queue Length 95th (ft)	0	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	12.4
Lane LOS						B
Approach Delay (s)	0.0			0.0		12.4
Approach LOS						B

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		36.8%	ICU Level of Service	A
Analysis Period (min)		15	

Volume
270: Mequon Road & River Birch Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	975	1	5	1145	5	5	1	5	1	1	1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.939			0.955	
Flt Protected	0.950			0.950				0.978			0.984	
Satd. Flow (prot)	1787	3574	1439	1752	3505	1411	0	1728	0	0	1768	0
Flt Permitted	0.950			0.950				0.978			0.984	
Satd. Flow (perm)	1787	3574	1439	1752	3505	1411	0	1728	0	0	1768	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
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	1060	1	5	1245	5	5	1	5	1	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1060	1	5	1245	5	0	11	0	0	3	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
270: Mequon Road & River Birch Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	975	1	5	1145	5	5	1	5	1	1	1
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	1060	1	5	1245	5	5	1	5	1	1	1
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)					626							
pX, platoon unblocked	0.89						0.89	0.89		0.89	0.89	0.89
vC, conflicting volume	1250			1061			1705	2332	530	1802	2327	622
vC1, stage 1 conf vol							1071	1071		1255	1255	
vC2, stage 2 conf vol							635	1261		547	1072	
vCu, unblocked vol	1027			1061			1541	2246	530	1650	2242	320
tC, single (s)	4.1			4.2			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			99			97	99	99	99	99	100
cM capacity (veh/h)	601			646			177	144	496	159	145	602

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	5	530	530	1	5	622	622	5	12	3
Volume Left	5	0	0	0	5	0	0	0	5	1
Volume Right	0	0	0	1	0	0	0	5	5	1
cSH	601	1700	1700	1700	646	1700	1700	1700	243	202
Volume to Capacity	0.01	0.31	0.31	0.00	0.01	0.37	0.37	0.00	0.05	0.02
Queue Length 95th (ft)	1	0	0	0	1	0	0	0	4	1
Control Delay (s)	11.0	0.0	0.0	0.0	10.6	0.0	0.0	0.0	20.6	23.1
Lane LOS	B				B				C	C
Approach Delay (s)	0.1				0.0				20.6	23.1
Approach LOS									C	C

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		41.7%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
280: Mequon Road & Buntrock Avenue

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	905	15	40	1030	15	85	35	55	10	5	40
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.999				0.850			0.850
Flt Protected	0.950			0.950				0.966			0.967	
Satd. Flow (prot)	1770	3539	1425	1752	3385	0	0	1782	1568	0	1801	1583
Flt Permitted	0.238			0.282				0.780			0.762	
Satd. Flow (perm)	443	3539	1425	520	3385	0	0	1439	1568	0	1419	1583
Satd. Flow (RTOR)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	64	963	8	43	1096	8	90	37	29	11	5	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	963	8	43	1104	0	0	127	29	0	16	21
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6		6	2			8		8	4		4
Detector Phase	6	6	6	2	2		8	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	15.0	15.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	21.4	21.4	21.4	21.4	21.4		17.1	17.1	17.1	17.1	17.1	17.1
Total Split (s)	80.0	80.0	80.0	80.0	80.0	0.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	66.7%	0.0%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Maximum Green (s)	73.6	73.6	73.6	73.6	73.6		32.9	32.9	32.9	32.9	32.9	32.9
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		4.1	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	2.4	2.4	2.4	2.4	2.4		3.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.4	6.4	6.4	6.4	6.4	4.0	7.1	7.1	7.1	7.1	7.1	7.1
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	5.5	5.5	5.5	5.5	5.5		1.5	1.5	1.5	1.5	1.5	1.5
Minimum Gap (s)	1.5	1.5	1.5	1.5	1.5		1.5	1.5	1.5	1.5	1.5	1.5
Time Before Reduce (s)	30.0	30.0	30.0	30.0	30.0		0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	15.0	15.0	15.0	15.0	15.0		0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max		None	None	None	None	None	None
v/c Ratio	0.19	0.36	0.01	0.11	0.43			0.71	0.15		0.09	0.11
Control Delay	6.4	5.5	4.5	1.3	1.2			70.3	46.3		44.9	45.2
Queue Delay	0.0	0.0	0.0	0.0	0.0			0.0	0.0		0.0	0.0
Total Delay	6.4	5.5	4.5	1.3	1.2			70.3	46.3		44.9	45.2
90th %ile Green (s)	85.2	85.2	85.2	85.2	85.2		21.3	21.3	21.3	21.3	21.3	21.3
90th %ile Term Code	Coord	Coord	Coord	Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
70th %ile Green (s)	89.2	89.2	89.2	89.2	89.2		17.3	17.3	17.3	17.3	17.3	17.3
70th %ile Term Code	Coord	Coord	Coord	Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
50th %ile Green (s)	91.9	91.9	91.9	91.9	91.9		14.6	14.6	14.6	14.6	14.6	14.6
50th %ile Term Code	Coord	Coord	Coord	Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
30th %ile Green (s)	94.6	94.6	94.6	94.6	94.6		11.9	11.9	11.9	11.9	11.9	11.9
30th %ile Term Code	Coord	Coord	Coord	Coord	Coord		Gap	Gap	Gap	Hold	Hold	Hold
10th %ile Green (s)	96.5	96.5	96.5	96.5	96.5		10.0	10.0	10.0	10.0	10.0	10.0

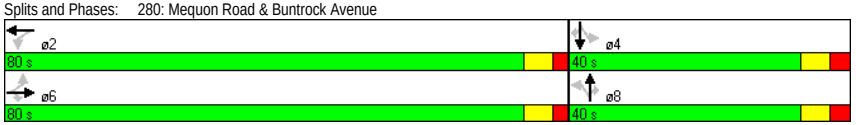
Volume
280: Mequon Road & Buntrock Avenue

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Coord	Coord	Coord	Coord	Coord		Min	Min	Min	Hold	Hold	Hold
Queue Length 50th (ft)	12	107	1	1	16			96	20		11	15
Queue Length 95th (ft)	34	172	6	m3	28			155	47		31	37
Internal Link Dist (ft)		546			209			420			420	
Turn Bay Length (ft)	100			120					70			40
Base Capacity (vph)	338	2698	1086	396	2580			395	430		389	434
Starvation Cap Reductn	0	0	0	0	0			0	0		0	0
Spillback Cap Reductn	0	0	0	0	0			0	0		0	0
Storage Cap Reductn	0	0	0	0	0			0	0		0	0
Reduced v/c Ratio	0.19	0.36	0.01	0.11	0.43			0.32	0.07		0.04	0.05

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 53 (44%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 280: Mequon Road & Buntrock Avenue



HCM Signalized Intersection Capacity Analysis
280: Mequon Road & Buntrock Avenue

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	905	15	40	1030	15	85	35	55	10	5	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	9	12	11	9	12	12	12	12	12	12
Total Lost time (s)	6.4	6.4	6.4	6.4	6.4			7.1	7.1		7.1	7.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1770	3539	1425	1752	3384			1782	1568		1801	1583
Flt Permitted	0.24	1.00	1.00	0.28	1.00			0.78	1.00		0.76	1.00
Satd. Flow (perm)	443	3539	1425	520	3384			1438	1568		1420	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	64	963	8	43	1096	8	90	37	29	11	5	21
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	64	963	8	43	1104	0	0	127	29	0	16	21
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Turn Type	Perm		Perm	Perm			Perm		Perm	Perm		Perm
Protected Phases		6			2			8			4	
Permitted Phases	6		6	2			8		8	4		4
Actuated Green, G (s)	91.5	91.5	91.5	91.5	91.5			15.0	15.0		15.0	15.0
Effective Green, g (s)	91.5	91.5	91.5	91.5	91.5			15.0	15.0		15.0	15.0
Actuated g/C Ratio	0.76	0.76	0.76	0.76	0.76			0.12	0.12		0.12	0.12
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4			7.1	7.1		7.1	7.1
Vehicle Extension (s)	5.5	5.5	5.5	5.5	5.5			1.5	1.5		1.5	1.5
Lane Grp Cap (vph)	338	2698	1087	397	2580			180	196		178	198
v/s Ratio Prot		0.27			c0.33							
v/s Ratio Perm	0.14		0.01	0.08				c0.09	0.02		0.01	0.01
v/c Ratio	0.19	0.36	0.01	0.11	0.43			0.71	0.15		0.09	0.11
Uniform Delay, d1	4.0	4.6	3.4	3.7	5.0			50.4	46.8		46.5	46.6
Progression Factor	1.00	1.00	1.00	0.19	0.14			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.2	0.4	0.0	0.4	0.4			9.8	0.1		0.1	0.1
Delay (s)	5.2	5.0	3.4	1.1	1.1			60.2	46.9		46.5	46.6
Level of Service	A	A	A	A	A			E	D		D	D
Approach Delay (s)		5.0			1.1			57.7			46.6	
Approach LOS		A			A			E			D	

Intersection Summary			
HCM Average Control Delay	7.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Volume
290: Mequon Road & Jung Brewery Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	950	20	0	1085	0	15
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.997					0.865
Flt Protected						
Satd. Flow (prot)	3198	0	0	3388	0	1596
Flt Permitted						
Satd. Flow (perm)	3198	0	0	3388	0	1596
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	3%	3%	3%	3%
Parking (#/hr)	5	5				
Adj. Flow (vph)	1011	21	0	1154	0	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1032	0	0	1154	0	16
Sign Control	Free			Free	Stop	

Intersection Summary

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
290: Mequon Road & Jung Brewery Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	950	20	0	1085	0	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1011	21	0	1154	0	16
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)	289					
pX, platoon unblocked			0.91		0.91	0.91
vC, conflicting volume			1032		1598	516
vC1, stage 1 conf vol					1021	
vC2, stage 2 conf vol					577	
vCu, unblocked vol			837		1460	270
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)					5.9	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			716		239	659

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	674	358	577	577	16
Volume Left	0	0	0	0	0
Volume Right	0	21	0	0	16
cSH	1700	1700	1700	1700	659
Volume to Capacity	0.40	0.21	0.34	0.34	0.02
Queue Length 95th (ft)	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	10.6
Lane LOS					B
Approach Delay (s)	0.0		0.0		10.6
Approach LOS					B

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
300: Mequon Road & Public Works Access 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	950	15	85	1010	5	70	5	270	1	1	5
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.999				0.850		0.904	
Flt Protected	0.950			0.950				0.955			0.993	
Satd. Flow (prot)	1770	3201	0	1752	3385	0	0	1720	1531	0	1689	0
Flt Permitted	0.950			0.950				0.955			0.993	
Satd. Flow (perm)	1770	3201	0	1752	3385	0	0	1720	1531	0	1689	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Parking (#/hr)		5	5									
Adj. Flow (vph)	1	1011	16	90	1074	5	74	5	287	1	1	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	1027	0	90	1079	0	0	79	287	0	7	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
300: Mequon Road & Public Works Access 12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	950	15	85	1010	5	70	5	270	1	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1	1011	16	90	1074	5	74	5	287	1	1	5
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)		618			1272							
pX, platoon unblocked	0.81			0.92			0.85	0.85	0.92	0.85	0.85	0.81
vC, conflicting volume	1080			1027			1745	2281	513	2055	2287	540
vC1, stage 1 conf vol							1021	1021		1258	1258	
vC2, stage 2 conf vol							724	1261		797	1029	
vCu, unblocked vol	634			846			1087	1716	286	1451	1722	0
tC, single (s)	4.1			4.2			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 %	100			87			67	97	56	99	99	99
cM capacity (veh/h)	767			715			228	166	651	96	149	883

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	SB 1
Volume Total	1	674	353	90	716	363	80	287	7
Volume Left	1	0	0	90	0	0	74	0	1
Volume Right	0	0	16	0	0	5	0	287	5
cSH	767	1700	1700	715	1700	1700	223	651	307
Volume to Capacity	0.00	0.40	0.21	0.13	0.42	0.21	0.36	0.44	0.02
Queue Length 95th (ft)	0	0	0	11	0	0	39	56	2
Control Delay (s)	9.7	0.0	0.0	10.8	0.0	0.0	29.9	14.8	17.0
Lane LOS	A			B			D	B	C
Approach Delay (s)	0.0			0.8			18.1		17.0
Approach LOS							C		C

Intersection Summary

Average Delay	3.0		
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
Analysis Period (min)	15		

Volume
310: Mequon Road & Logeman Access 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1205	10	0	1090	1	0	0	20	1	1	10
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999							0.865		0.886	
Flt Protected											0.996	
Satd. Flow (prot)	0	3204	0	0	3388	0	0	0	1627	0	1660	0
Flt Permitted											0.996	
Satd. Flow (perm)	0	3204	0	0	3388	0	0	0	1627	0	1660	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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		5	5									
Adj. Flow (vph)	5	1310	11	0	1185	1	0	0	22	1	1	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1326	0	0	1186	0	0	0	22	0	13	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
310: Mequon Road & Logeman Access 12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1205	10	0	1090	1	0	0	20	1	1	10
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	1310	11	0	1185	1	0	0	22	1	1	11
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)		1048			842							
pX, platoon unblocked	0.78			0.94			0.81	0.81	0.94	0.81	0.81	0.78
vC, conflicting volume	1186			1321			1930	2512	660	1873	2517	593
vC1, stage 1 conf vol							1326	1326		1185	1185	
vC2, stage 2 conf vol							604	1186		688	1332	
vCu, unblocked vol	670			1209			1331	2050	504	1261	2056	0
tC, single (s)	4.1			4.2			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			100			100	100	96	99	99	99
cM capacity (veh/h)	713			532			155	148	483	214	148	847

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	660	666	790	396	22	13
Volume Left	5	0	0	0	0	1
Volume Right	0	11	0	1	22	11
cSH	713	1700	1700	1700	483	517
Volume to Capacity	0.01	0.39	0.46	0.23	0.04	0.03
Queue Length 95th (ft)	1	0	0	0	4	2
Control Delay (s)	0.2	0.0	0.0	0.0	12.8	12.1
Lane LOS	A				B	B
Approach Delay (s)	0.1		0.0		12.8	12.1
Approach LOS					B	B

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		50.4%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
320: Mequon Road & River Centre Center Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1150	75	65	1030	60	55
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.991					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3210	0	1752	3388	1787	1599
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3210	0	1752	3388	1787	1599
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	1%	1%
Parking (#/hr)	5	5				
Adj. Flow (vph)	1250	82	71	1120	65	60
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1332	0	71	1120	65	60
Sign Control	Free			Free	Stop	

Intersection Summary

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
320: Mequon Road & River Centre Center Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1150	75	65	1030	60	55
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)	1250	82	71	1120	65	60
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)	1243			647		
pX, platoon unblocked			0.95		0.80	0.95
vC, conflicting volume			1332		1992	666
vC1, stage 1 conf vol					1291	
vC2, stage 2 conf vol					701	
vCu, unblocked vol			1250		1478	552
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			86		65	87
cM capacity (veh/h)			522		186	458

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	833	498	71	560	560	65	60
Volume Left	0	0	71	0	0	65	0
Volume Right	0	82	0	0	0	0	60
cSH	1700	1700	522	1700	1700	186	458
Volume to Capacity	0.49	0.29	0.14	0.33	0.33	0.35	0.13
Queue Length 95th (ft)	0	0	12	0	0	37	11
Control Delay (s)	0.0	0.0	13.0	0.0	0.0	34.5	14.0
Lane LOS			B			D	B
Approach Delay (s)	0.0		0.8			24.7	
Approach LOS						C	

Intersection Summary

Average Delay	1.5		
Intersection Capacity Utilization	51.1%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
330: Mequon Road & River Centre East Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1200	5	0	1095	0	35
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.999					0.865
Flt Protected						
Satd. Flow (prot)	3204	0	0	3388	0	1627
Flt Permitted						
Satd. Flow (perm)	3204	0	0	3388	0	1627
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	2%	2%	3%	3%	1%	1%
Parking (#/hr)	5	5				
Adj. Flow (vph)	1290	5	0	1177	0	38
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1295	0	0	1177	0	38
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
330: Mequon Road & River Centre East Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1200	5	0	1095	0	35
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)	1290	5	0	1177	0	38
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)				337		
pX, platoon unblocked					0.77	
vC, conflicting volume			1296		1882	648
vC1, stage 1 conf vol					1293	
vC2, stage 2 conf vol					589	
vCu, unblocked vol			1296		1546	648
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	91
cM capacity (veh/h)			525		182	416

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	860	435	589	589	38
Volume Left	0	0	0	0	0
Volume Right	0	5	0	0	38
cSH	1700	1700	1700	1700	416
Volume to Capacity	0.51	0.26	0.35	0.35	0.09
Queue Length 95th (ft)	0	0	0	0	7
Control Delay (s)	0.0	0.0	0.0	0.0	14.5
Lane LOS					B
Approach Delay (s)	0.0		0.0		14.5
Approach LOS					B

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		43.3%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
340: Mequon Road & Cedarburg Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	320	840	75	210	820	475	135	580	185	330	220	140
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95
Frt			0.850			0.850			0.850		0.942	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3467	3574	1599	3433	3334	0
Flt Permitted	0.103			0.222			0.950			0.950		
Satd. Flow (perm)	192	3539	1583	414	3539	1583	3467	3574	1599	3433	3334	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Adj. Flow (vph)	337	884	39	221	863	250	142	611	97	347	232	147
Shared Lane Traffic (%)												
Lane Group Flow (vph)	337	884	39	221	863	250	142	611	97	347	379	0
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2			8			
Detector Phase	1	6	6	5	2	2	3	8	8	7	4	
Switch Phase												
Minimum Initial (s)	6.0	12.0	12.0	6.0	12.0	12.0	6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.5	18.7	18.7	10.5	18.7	18.7	10.5	16.9	16.9	10.5	16.9	
Total Split (s)	19.0	41.0	41.0	19.0	41.0	41.0	18.0	35.0	35.0	25.0	42.0	0.0
Total Split (%)	15.8%	34.2%	34.2%	15.8%	34.2%	34.2%	15.0%	29.2%	29.2%	20.8%	35.0%	0.0%
Maximum Green (s)	14.5	34.3	34.3	14.5	34.3	34.3	13.5	28.1	28.1	20.5	35.1	
Yellow Time (s)	3.5	3.9	3.9	3.5	3.9	3.9	3.5	3.9	3.9	3.5	3.9	
All-Red Time (s)	1.0	2.8	2.8	1.0	2.8	2.8	1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4	3.4	1.5	1.5	1.5	1.5	1.5	
Minimum Gap (s)	1.5	2.0	2.0	1.5	2.0	2.0	1.5	1.5	1.5	1.5	1.5	
Time Before Reduce (s)	15.0	28.0	28.0	15.0	20.0	20.0	20.0	40.0	40.0	30.0	40.0	
Time To Reduce (s)	0.0	12.0	12.0	0.0	20.0	20.0	0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
v/c Ratio	0.84	0.69	0.07	0.68	0.85	0.55	0.56	0.85	0.30	0.76	0.43	
Control Delay	49.0	35.2	26.9	29.0	50.0	41.9	61.8	57.4	42.2	61.0	37.8	
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	49.0	35.2	26.9	29.0	50.0	41.9	61.8	57.4	42.2	61.0	37.8	
90th %ile Green (s)	14.5	34.3	34.3	14.5	34.3	34.3	11.7	28.1	28.1	20.5	36.9	
90th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Gap	Max	Max	Max	Hold	
70th %ile Green (s)	17.8	34.3	34.3	17.8	34.3	34.3	10.0	27.4	27.4	17.9	35.3	
70th %ile Term Code	Max	Coord	Coord	Max	Coord	Coord	Gap	Gap	Gap	Gap	Hold	
50th %ile Green (s)	21.9	41.2	41.2	15.0	34.3	34.3	8.8	25.2	25.2	16.0	32.4	
50th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Gap	Gap	Gap	Gap	Hold	
30th %ile Green (s)	26.9	49.0	49.0	12.2	34.3	34.3	7.6	22.1	22.1	14.1	28.6	
30th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Gap	Gap	Gap	Gap	Hold	
10th %ile Green (s)	33.1	59.3	59.3	8.1	34.3	34.3	6.0	18.6	18.6	11.4	24.0	

Volume
340: Mequon Road & Cedarburg Road

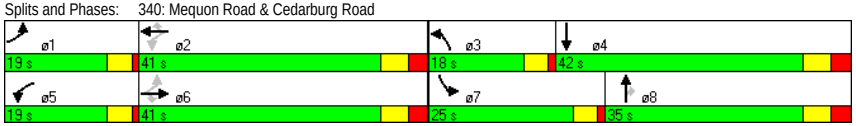
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Max	Coord	Coord	Gap	Coord	Coord	Min	Gap	Gap	Gap	Hold	
Queue Length 50th (ft)	200	315	20	90	332	164	55	239	64	135	127	
Queue Length 95th (ft)	#465	#451	51	159	#416	251	87	298	111	179	165	
Internal Link Dist (ft)		257			885			746			862	
Turn Bay Length (ft)	180		125	200		235	225		125	385		
Base Capacity (vph)	400	1287	575	351	1012	452	390	837	374	586	986	
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	0.84	0.69	0.07	0.63	0.85	0.55	0.36	0.73	0.26	0.59	0.38	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 1 (1%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 340: Mequon Road & Cedarburg Road



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HCM Signalized Intersection Capacity Analysis
340: Mequon Road & Cedarburg Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	320	840	75	210	820	475	135	580	185	330	220	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	0.95	1.00	0.97	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3467	3574	1599	3433	3333	
Flt Permitted	0.10	1.00	1.00	0.22	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	192	3539	1583	413	3539	1583	3467	3574	1599	3433	3333	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	337	884	39	221	863	250	142	611	97	347	232	147
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	337	884	39	221	863	250	142	611	97	347	379	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6		6	2		2			8			
Actuated Green, G (s)	61.6	43.6	43.6	47.8	34.3	34.3	8.8	24.3	24.3	16.0	31.5	
Effective Green, g (s)	61.6	43.6	43.6	47.8	34.3	34.3	8.8	24.3	24.3	16.0	31.5	
Actuated g/C Ratio	0.51	0.36	0.36	0.40	0.29	0.29	0.07	0.20	0.20	0.13	0.26	
Clearance Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4	3.4	1.5	1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	398	1286	575	317	1012	452	254	724	324	458	875	
v/s Ratio Prot	c0.16	0.25		0.08	0.24		0.04	c0.17		c0.10	0.11	
v/s Ratio Perm	c0.27		0.02	0.20		0.16			0.06			
v/c Ratio	0.85	0.69	0.07	0.70	0.85	0.55	0.56	0.84	0.30	0.76	0.43	
Uniform Delay, d1	33.0	32.4	24.9	25.6	40.5	36.3	53.7	46.0	40.6	50.1	36.8	
Progression Factor	0.89	0.92	0.89	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.5	3.0	0.2	5.3	9.1	4.8	1.5	8.5	0.2	6.3	0.1	
Delay (s)	43.8	32.9	22.5	30.9	49.5	41.2	55.2	54.6	40.8	56.4	36.9	
Level of Service	D	C	C	C	D	D	E	D	D	E	D	
Approach Delay (s)		35.5			44.9			53.1			46.2	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	44.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX F

Year 2025 Build Traffic Analysis – With Alternative One Improvements

Volume
200: Mequon Road & Wauwatosa Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	270	850	70	185	1100	360	235	570	220	250	245	120
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.950			0.950			0.592			0.165		
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	1103	3539	1583	293	3374	1509
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Adj. Flow (vph)	284	895	37	195	1158	189	247	600	116	263	258	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	284	895	37	195	1158	189	247	600	116	263	258	63
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	11.5	17.9	17.9	11.5	17.9	17.9	11.5	18.0	18.0	11.5	18.0	18.0
Total Split (s)	20.0	47.0	47.0	20.0	47.0	47.0	19.0	31.0	31.0	22.0	34.0	34.0
Total Split (%)	16.7%	39.2%	39.2%	16.7%	39.2%	39.2%	15.8%	25.8%	25.8%	18.3%	28.3%	28.3%
Maximum Green (s)	16.5	41.1	41.1	16.5	41.1	41.1	15.5	25.0	25.0	18.5	28.0	28.0
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0
All-Red Time (s)	0.0	0.9	0.9	0.0	0.9	0.9	0.0	1.0	1.0	0.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Minimum Gap (s)	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0
Time Before Reduce (s)	15.0	24.0	24.0	15.0	18.0	18.0	15.0	24.0	24.0	15.0	22.0	22.0
Time To Reduce (s)	0.0	16.0	16.0	0.0	22.0	22.0	0.0	16.0	16.0	0.0	18.0	18.0
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
v/c Ratio	0.69	0.67	0.06	0.58	0.92	0.34	0.53	0.82	0.35	0.80	0.32	0.18
Control Delay	58.0	33.2	24.7	56.9	49.0	30.1	28.2	53.6	43.2	44.3	37.9	37.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.0	33.2	24.7	56.9	49.0	30.1	28.2	53.6	43.2	44.3	37.9	37.8
90th %ile Green (s)	16.5	43.1	43.1	14.5	41.1	41.1	15.5	25.0	25.0	18.5	28.0	28.0
90th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Max	Max	Max	Max	Hold	Hold
70th %ile Green (s)	15.8	44.4	44.4	12.5	41.1	41.1	15.5	25.0	25.0	18.5	28.0	28.0
70th %ile Term Code	Gap	Hold	Hold	Gap	Max	Max	Max	Max	Max	Max	Hold	Hold
50th %ile Green (s)	14.0	44.1	44.1	11.0	41.1	41.1	15.5	25.0	25.0	18.5	28.0	28.0
50th %ile Term Code	Gap	Hold	Hold	Gap	Max	Max	Max	Max	Max	Max	Hold	Hold
30th %ile Green (s)	12.1	43.7	43.7	9.5	41.1	41.1	13.0	23.5	23.5	17.3	27.8	27.8
30th %ile Term Code	Gap	Hold	Hold	Gap	Max	Max	Gap	Gap	Gap	Gap	Hold	Hold
10th %ile Green (s)	9.2	35.3	35.3	8.0	34.1	34.1	9.7	18.1	18.1	12.4	20.8	20.8

Volume
200: Mequon Road & Wauwatosa Road

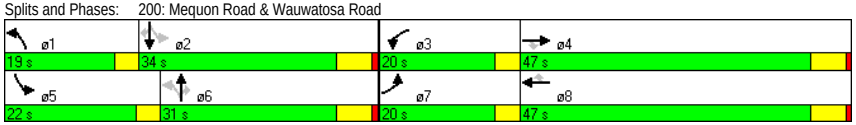
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Gap	Hold	Hold	Min	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
Queue Length 50th (ft)	108	295	18	74	443	105	124	228	75	134	85	38
Queue Length 95th (ft)	154	386	43	112	#604	174	196	#304	135	#262	127	79
Internal Link Dist (ft)		559			585			1105			792	
Turn Bay Length (ft)	135		35	295		50	185		110	150		200
Base Capacity (vph)	508	1371	613	508	1305	584	499	794	355	352	848	379
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.65	0.06	0.38	0.89	0.32	0.49	0.76	0.33	0.75	0.30	0.17

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 112.5
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 120
70th %ile Actuated Cycle: 119.3
50th %ile Actuated Cycle: 117.5
30th %ile Actuated Cycle: 112.9
10th %ile Actuated Cycle: 92.7
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 200: Mequon Road & Wauwatosa Road



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HCM Signalized Intersection Capacity Analysis
200: Mequon Road & Wauwatosa Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	270	850	70	185	1100	360	235	570	220	250	245	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.59	1.00	1.00	0.17	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	1103	3539	1583	294	3374	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	284	895	37	195	1158	189	247	600	116	263	258	63
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	284	895	37	195	1158	189	247	600	116	263	258	63
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Actuated Green, G (s)	13.4	42.2	42.2	11.0	39.8	39.8	37.0	23.3	23.3	43.6	26.6	26.6
Effective Green, g (s)	13.4	42.2	42.2	11.0	39.8	39.8	37.0	23.3	23.3	43.6	26.6	26.6
Actuated g/C Ratio	0.12	0.38	0.38	0.10	0.35	0.35	0.33	0.21	0.21	0.39	0.24	0.24
Clearance Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Lane Grp Cap (vph)	409	1329	594	336	1253	561	444	734	328	325	798	357
v/s Ratio Prot	c0.08	0.25		0.06	c0.33		0.07	0.17		c0.12	0.08	
v/s Ratio Perm			0.02			0.12	0.12		0.07	c0.19		0.04
v/c Ratio	0.69	0.67	0.06	0.58	0.92	0.34	0.56	0.82	0.35	0.81	0.32	0.18
Uniform Delay, d1	47.5	29.3	22.4	48.5	34.9	26.6	29.4	42.5	38.1	26.7	35.5	34.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.1	1.5	0.1	1.6	11.6	0.4	0.9	7.3	0.9	13.1	0.3	0.3
Delay (s)	51.6	30.8	22.5	50.1	46.4	27.0	30.3	49.8	39.0	39.8	35.8	34.5
Level of Service	D	C	C	D	D	C	C	D	D	D	D	C
Approach Delay (s)		35.4			44.5			43.5			37.5	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	40.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	112.4	Sum of lost time (s)	16.4
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Volume
210: Mequon Road & Area B West Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1500	20	0	1690	0	45
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3539	1583	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	3539	1583	0	3539	0	1611
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1579	21	0	1779	0	47
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1579	21	0	1779	0	47
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
210: Mequon Road & Area B West Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1500	20	0	1690	0	45
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)	1579	21	0	1779	0	47
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)	665					
pX, platoon unblocked			0.79		0.79	0.79
vC, conflicting volume			1600		2468	789
vC1, stage 1 conf vol					1579	
vC2, stage 2 conf vol					889	
vCu, unblocked vol			1225		2326	197
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 %			100		100	93
cM capacity (veh/h)			445		126	639

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	789	789	21	889	889	47
Volume Left	0	0	0	0	0	0
Volume Right	0	0	21	0	0	47
cSH	1700	1700	1700	1700	1700	639
Volume to Capacity	0.46	0.46	0.01	0.52	0.52	0.07
Queue Length 95th (ft)	0	0	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	11.1
Lane LOS						B
Approach Delay (s)	0.0			0.0		11.1
Approach LOS						B

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		51.5%	ICU Level of Service A
Analysis Period (min)		15	

Volume
220: Mequon Road & Area B East Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1525	20	70	1655	40	40
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850			0.932	
Flt Protected			0.950		0.976	
Satd. Flow (prot)	3505	1568	1752	3505	1694	0
Flt Permitted			0.950		0.976	
Satd. Flow (perm)	3505	1568	1752	3505	1694	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Adj. Flow (vph)	1589	21	73	1724	42	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1589	21	73	1724	84	0
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
220: Mequon Road & Area B East Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1525	20	70	1655	40	40
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1589	21	73	1724	42	42
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)	1205					
pX, platoon unblocked			0.79		0.79	0.79
vC, conflicting volume			1609		2596	794
vC1, stage 1 conf vol					1589	
vC2, stage 2 conf vol					1008	
vCu, unblocked vol			1250		2492	224
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			83		61	93
cM capacity (veh/h)			435		108	619

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	794	794	21	73	862	862	83
Volume Left	0	0	0	73	0	0	42
Volume Right	0	0	21	0	0	0	42
cSH	1700	1700	1700	435	1700	1700	184
Volume to Capacity	0.47	0.47	0.01	0.17	0.51	0.51	0.45
Queue Length 95th (ft)	0	0	0	15	0	0	53
Control Delay (s)	0.0	0.0	0.0	14.9	0.0	0.0	39.9
Lane LOS				B			E
Approach Delay (s)	0.0			0.6			39.9
Approach LOS							E

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization		60.7%	ICU Level of Service	B
Analysis Period (min)		15	

Volume
230: Mequon Road & Concord Creek Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1490	70	90	1650	5	60	1	70	15	1	15
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.953			0.955	
Satd. Flow (prot)	1752	3505	1411	1752	3505	1411	0	1775	1583	0	1429	1272
Flt Permitted	0.950			0.950				0.953			0.955	
Satd. Flow (perm)	1752	3505	1411	1752	3505	1411	0	1775	1583	0	1429	1272
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	27%	27%	27%
Adj. Flow (vph)	5	1552	73	94	1719	5	63	1	73	16	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1552	73	94	1719	5	0	63	73	0	17	16
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized
Description: High SB %HV

HCM Unsignalized Intersection Capacity Analysis
230: Mequon Road & Concord Creek Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1490	70	90	1650	5	60	1	70	15	1	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	1552	73	94	1719	5	62	1	73	16	1	16
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	1724			1625			2626	3474	776	2766	3542	859
vC1, stage 1 conf vol							1562	1562		1906	1906	
vC2, stage 2 conf vol							1063	1911		860	1635	
vCu, unblocked vol	1724			1625			2626	3474	776	2766	3542	859
tC, single (s)	4.2			4.2			7.5	6.5	6.9	8.0	7.0	7.4
tC, 2 stage (s)							6.5	5.5		7.0	6.0	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.8	4.3	3.6
p0 queue free %	99			76			4	98	79	45	94	94
cM capacity (veh/h)	358			392			65	52	340	28	19	254

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1	SB 2
Volume Total	5	776	776	73	94	859	859	5	64	73	17	16
Volume Left	5	0	0	0	94	0	0	0	62	0	16	0
Volume Right	0	0	0	73	0	0	0	5	0	73	0	16
cSH	358	1700	1700	1700	392	1700	1700	1700	65	340	28	254
Volume to Capacity	0.01	0.46	0.46	0.04	0.24	0.51	0.51	0.00	0.98	0.21	0.60	0.06
Queue Length 95th (ft)	1	0	0	0	23	0	0	0	120	20	48	5
Control Delay (s)	15.2	0.0	0.0	0.0	17.1	0.0	0.0	0.0	212.0	18.5	254.8	20.1
Lane LOS	C				C				F	C	F	C
Approach Delay (s)	0.0				0.9				108.6		141.3	
Approach LOS									F		F	

Intersection Summary			
Average Delay		5.8	
Intersection Capacity Utilization		69.0%	ICU Level of Service C
Analysis Period (min)		15	
Description: High SB %HV			

Volume
240: Mequon Road & Area C Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1555	20	0	1745	0	40
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3505	1411	0	3505	0	1611
Flt Permitted						
Satd. Flow (perm)	3505	1411	0	3505	0	1611
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Adj. Flow (vph)	1620	21	0	1818	0	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1620	21	0	1818	0	42
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
240: Mequon Road & Area C Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1555	20	0	1745	0	40
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1620	21	0	1818	0	42
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			1641		2529	810
vC1, stage 1 conf vol					1620	
vC2, stage 2 conf vol					909	
vCu, unblocked vol			1641		2529	810
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	87
cM capacity (veh/h)			386		103	323

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	810	810	21	909	909	42
Volume Left	0	0	0	0	0	0
Volume Right	0	0	21	0	0	42
cSH	1700	1700	1700	1700	1700	323
Volume to Capacity	0.48	0.48	0.01	0.53	0.53	0.13
Queue Length 95th (ft)	0	0	0	0	0	11
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	17.8
Lane LOS						C
Approach Delay (s)	0.0			0.0		17.8
Approach LOS						C

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		53.0%	ICU Level of Service	A
Analysis Period (min)		15	

Volume
250: Mequon Road & Weston Center West Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1565	30	70	1720	25	30
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850			0.927	
Flt Protected			0.950		0.978	
Satd. Flow (prot)	3505	1411	1752	3505	1689	0
Flt Permitted			0.950		0.978	
Satd. Flow (perm)	3505	1411	1752	3505	1689	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Adj. Flow (vph)	1630	31	73	1792	26	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1630	31	73	1792	57	0
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
250: Mequon Road & Weston Center West Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1565	30	70	1720	25	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1630	31	73	1792	26	31
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised			Raised		
Median storage veh)	1			1		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1661		2672	815
vC1, stage 1 conf vol					1630	
vC2, stage 2 conf vol					1042	
vCu, unblocked vol			1661		2672	815
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			81		71	90
cM capacity (veh/h)			379		89	320

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	815	815	31	73	896	896	57
Volume Left	0	0	0	73	0	0	26
Volume Right	0	0	31	0	0	0	31
cSH	1700	1700	1700	379	1700	1700	147
Volume to Capacity	0.48	0.48	0.02	0.19	0.53	0.53	0.39
Queue Length 95th (ft)	0	0	0	18	0	0	42
Control Delay (s)	0.0	0.0	0.0	16.7	0.0	0.0	44.3
Lane LOS				C			E
Approach Delay (s)	0.0			0.7			44.3
Approach LOS							E

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization		60.5%	ICU Level of Service B
Analysis Period (min)		15	

Volume
260: Mequon Road & Weston Center East Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1595	1	0	1790	0	10
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3574	1439	0	3505	0	1611
Flt Permitted						
Satd. Flow (perm)	3574	1439	0	3505	0	1611
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	2%	2%
Adj. Flow (vph)	1734	1	0	1946	0	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1734	1	0	1946	0	11
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
260: Mequon Road & Weston Center East Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1595	1	0	1790	0	10
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)	1734	1	0	1946	0	11
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)				1088		
pX, platoon unblocked					0.57	
vC, conflicting volume			1735		2707	867
vC1, stage 1 conf vol					1734	
vC2, stage 2 conf vol					973	
vCu, unblocked vol			1735		2483	867
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			355		99	296

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	867	867	1	973	973	11
Volume Left	0	0	0	0	0	0
Volume Right	0	0	1	0	0	11
cSH	1700	1700	1700	1700	1700	296
Volume to Capacity	0.51	0.51	0.00	0.57	0.57	0.04
Queue Length 95th (ft)	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	17.6
Lane LOS						C
Approach Delay (s)	0.0			0.0		17.6
Approach LOS						C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
270: Mequon Road & River Birch Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1575	25	50	1760	5	30	1	55	1	1	1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.914			0.955	
Flt Protected	0.950			0.950				0.983			0.984	
Satd. Flow (prot)	1787	3574	1439	1752	3505	1411	0	1690	0	0	1768	0
Flt Permitted	0.950			0.950				0.983			0.984	
Satd. Flow (perm)	1787	3574	1439	1752	3505	1411	0	1690	0	0	1768	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
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	1712	27	54	1913	5	33	1	60	1	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1712	27	54	1913	5	0	94	0	0	3	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
270: Mequon Road & River Birch Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1575	25	50	1760	5	30	1	55	1	1	1
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	1712	27	54	1913	5	33	1	60	1	1	1
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)					626							
pX, platoon unblocked	0.58						0.58	0.58		0.58	0.58	0.58
vC, conflicting volume	1918			1739			2790	3750	856	2949	3772	957
vC1, stage 1 conf vol							1723	1723		2022	2022	
vC2, stage 2 conf vol							1067	2027		927	1750	
vCu, unblocked vol	1142			1739			2639	4289	856	2912	4326	0
tC, single (s)	4.1			4.2			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 %	98			85			55	98	80	98	98	100
cM capacity (veh/h)	357			353			72	55	303	52	44	633

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	5	856	856	27	54	957	957	5	93	3
Volume Left	5	0	0	0	54	0	0	0	33	1
Volume Right	0	0	0	27	0	0	0	5	60	1
cSH	357	1700	1700	1700	353	1700	1700	1700	140	69
Volume to Capacity	0.02	0.50	0.50	0.02	0.15	0.56	0.56	0.00	0.67	0.05
Queue Length 95th (ft)	1	0	0	0	13	0	0	0	92	4
Control Delay (s)	15.2	0.0	0.0	0.0	17.0	0.0	0.0	0.0	71.5	59.9
Lane LOS	C				C				F	F
Approach Delay (s)	0.0				0.5				71.5	59.9
Approach LOS									F	F

Intersection Summary			
Average Delay		2.1	
Intersection Capacity Utilization		62.1%	ICU Level of Service
Analysis Period (min)		15	

Volume
280: Mequon Road & Buntrock Avenue

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	1485	60	115	1610	30	145	45	140	25	5	60
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.963			0.960	
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411	0	1776	1568	0	1788	1583
Flt Permitted	0.058			0.073				0.756			0.674	
Satd. Flow (perm)	108	3539	1425	135	3505	1411	0	1395	1568	0	1255	1583
Satd. Flow (RTOR)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	90	1580	32	122	1713	16	154	48	74	27	5	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	90	1580	32	122	1713	16	0	202	74	0	32	32
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	Perm		Perm
Protected Phases	1	6		5	2		3	8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	1	6	6	5	2	2	3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.5	21.4	21.4	9.5	21.4	21.4	9.0	17.1	17.1	17.1	17.1	17.1
Total Split (s)	18.0	62.0	62.0	18.0	62.0	62.0	22.0	40.0	40.0	18.0	18.0	18.0
Total Split (%)	15.0%	51.7%	51.7%	15.0%	51.7%	51.7%	18.3%	33.3%	33.3%	15.0%	15.0%	15.0%
Maximum Green (s)	14.5	55.6	55.6	14.5	55.6	55.6	19.0	32.9	32.9	10.9	10.9	10.9
Yellow Time (s)	3.5	4.0	4.0	3.5	4.0	4.0	3.0	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	0.0	2.4	2.4	0.0	2.4	2.4	0.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.4	6.4	3.5	6.4	6.4	3.0	7.1	7.1	7.1	7.1	7.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.5	5.5	2.0	5.5	5.5	2.0	1.5	1.5	1.5	1.5	1.5
Minimum Gap (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	1.5	1.5	1.5	1.5	1.5
Time Before Reduce (s)	0.0	30.0	30.0	0.0	30.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	15.0	15.0	0.0	15.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
v/c Ratio	0.52	0.77	0.04	0.59	0.83	0.02		0.69	0.22		0.12	0.10
Control Delay	26.1	24.7	14.5	38.2	13.6	4.5		54.9	38.5		36.3	35.6
Queue Delay	0.0	0.0	0.0	0.0	0.3	0.0		0.0	0.0		0.0	0.0
Total Delay	26.1	24.7	14.5	38.2	13.9	4.5		54.9	38.5		36.3	35.6
90th %ile Green (s)	10.5	56.9	56.9	13.2	59.6	59.6	0.0	32.9	32.9	32.9	32.9	32.9
90th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Skip	Max	Max	Hold	Hold	Hold
70th %ile Green (s)	7.9	62.8	62.8	9.7	64.6	64.6	0.0	30.5	30.5	30.5	30.5	30.5
70th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Skip	Gap	Gap	Hold	Hold	Hold
50th %ile Green (s)	6.4	69.6	69.6	7.2	70.4	70.4	0.0	26.2	26.2	26.2	26.2	26.2
50th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Skip	Gap	Gap	Hold	Hold	Hold
30th %ile Green (s)	6.0	75.1	75.1	6.2	75.3	75.3	0.0	21.7	21.7	21.7	21.7	21.7
30th %ile Term Code	Min	Coord	Coord	Gap	Coord	Coord	Skip	Gap	Gap	Hold	Hold	Hold
10th %ile Green (s)	6.0	81.8	81.8	6.0	81.8	81.8	0.0	15.2	15.2	15.2	15.2	15.2

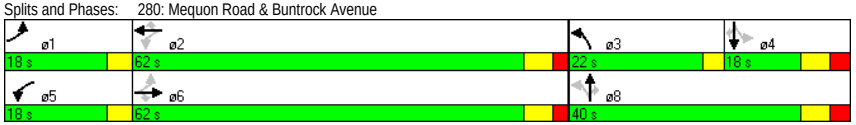
Volume
280: Mequon Road & Buntrock Avenue 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Min	Coord	Coord	Min	Coord	Coord	Skip	Gap	Gap	Hold	Hold	Hold
Queue Length 50th (ft)	20	463	10	33	528	2		144	47		20	20
Queue Length 95th (ft)	75	#767	31	m91	#839	m3		213	85		45	44
Internal Link Dist (ft)		546			209			420			420	
Turn Bay Length (ft)	100			120					70			40
Base Capacity (vph)	276	2042	822	290	2054	827		382	430		265	334
Starvation Cap Reductn	0	0	0	0	54	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	0.33	0.77	0.04	0.42	0.86	0.02		0.53	0.17		0.12	0.10

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 52 (43%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
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: 280: Mequon Road & Buntrock Avenue



HCM Signalized Intersection Capacity Analysis
280: Mequon Road & Buntrock Avenue 12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	1485	60	115	1610	30	145	45	140	25	5	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	9	12	12	9	12	12	12	12	12	12
Total Lost time (s)	3.5	6.4	6.4	3.5	6.4	6.4		7.1	7.1		7.1	7.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411		1777	1568		1787	1583
Flt Permitted	0.06	1.00	1.00	0.07	1.00	1.00		0.76	1.00		0.67	1.00
Satd. Flow (perm)	108	3539	1425	134	3505	1411		1395	1568		1255	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	90	1580	32	122	1713	16	154	48	74	27	5	32
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	90	1580	32	122	1713	16	0	202	74	0	32	32
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	Perm		Perm
Protected Phases	1	6		5	2		3	8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Actuated Green, G (s)	76.6	69.2	69.2	78.8	70.3	70.3		25.3	25.3		25.3	25.3
Effective Green, g (s)	76.6	69.2	69.2	78.8	70.3	70.3		25.3	25.3		25.3	25.3
Actuated g/C Ratio	0.64	0.58	0.58	0.66	0.59	0.59		0.21	0.21		0.21	0.21
Clearance Time (s)	3.5	6.4	6.4	3.5	6.4	6.4		7.1	7.1		7.1	7.1
Vehicle Extension (s)	2.0	5.5	5.5	2.0	5.5	5.5		1.5	1.5		1.5	1.5
Lane Grp Cap (vph)	171	2041	822	203	2053	827		294	331		265	334
v/s Ratio Prot	0.03	0.45		c0.04	c0.49							
v/s Ratio Perm	0.30		0.02	0.35		0.01		c0.14	0.05		0.03	0.02
v/c Ratio	0.53	0.77	0.04	0.60	0.83	0.02		0.69	0.22		0.12	0.10
Uniform Delay, d1	19.3	19.4	11.0	18.0	20.1	10.4		43.7	39.2		38.3	38.1
Progression Factor	1.00	1.00	1.00	2.12	0.42	0.33		1.00	1.00		1.00	1.00
Incremental Delay, d2	1.3	2.9	0.1	2.6	3.2	0.0		5.2	0.1		0.1	0.0
Delay (s)	20.7	22.4	11.1	41.0	11.7	3.5		48.9	39.3		38.4	38.2
Level of Service	C	C	B	D	B	A		D	D		D	D
Approach Delay (s)		22.1			13.5			46.4			38.3	
Approach LOS		C			B			D			D	

Intersection Summary

HCM Average Control Delay	20.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.1
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Volume
290: Mequon Road & Jung Brewery Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1630	20	0	1755	0	15
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3539	1425	0	3505	0	1596
Flt Permitted						
Satd. Flow (perm)	3539	1425	0	3505	0	1596
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	3%	3%	3%	3%
Adj. Flow (vph)	1734	21	0	1867	0	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1734	21	0	1867	0	16
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
290: Mequon Road & Jung Brewery Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1630	20	0	1755	0	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1734	21	0	1867	0	16
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)	289			329		
pX, platoon unblocked			0.65		0.78	0.65
vC, conflicting volume			1755		2668	867
vC1, stage 1 conf vol					1734	
vC2, stage 2 conf vol					934	
vCu, unblocked vol			1081		1032	0
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)					5.9	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			412		175	701

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	867	867	21	934	934	16
Volume Left	0	0	0	0	0	0
Volume Right	0	0	21	0	0	16
cSH	1700	1700	1700	1700	1700	701
Volume to Capacity	0.51	0.51	0.01	0.55	0.55	0.02
Queue Length 95th (ft)	0	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	10.3
Lane LOS						B
Approach Delay (s)	0.0			0.0		10.3
Approach LOS						B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

Volume
300: Mequon Road & Public Works Access 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1530	110	230	1575	20	165	5	495	15	1	15
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.935	
Flt Protected	0.950			0.950				0.954			0.976	
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411	0	1718	1531	0	1717	0
Flt Permitted	0.129			0.058				0.708			0.824	
Satd. Flow (perm)	240	3539	1425	107	3505	1411	0	1275	1531	0	1449	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	5	1628	59	245	1676	11	176	5	263	16	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1628	59	245	1676	11	0	181	263	0	33	0
Turn Type	Perm		Perm	pm+pt		Perm	pm+pt		pm+ov	Perm		
Protected Phases		6		5	2		3	8	5		4	
Permitted Phases	6		6	2		2	8		8	4		
Detector Phase	6	6	6	5	2	2	3	8	5	4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	6.0	10.0	10.0	
Minimum Split (s)	21.0	21.0	21.0	9.5	21.0	21.0	9.0	16.0	9.5	16.0	16.0	
Total Split (s)	55.0	55.0	55.0	25.0	80.0	80.0	22.0	40.0	25.0	18.0	18.0	0.0
Total Split (%)	45.8%	45.8%	45.8%	20.8%	66.7%	66.7%	18.3%	33.3%	20.8%	15.0%	15.0%	0.0%
Maximum Green (s)	49.0	49.0	49.0	21.5	74.0	74.0	19.0	34.0	21.5	12.0	12.0	
Yellow Time (s)	4.0	4.0	4.0	3.5	4.0	4.0	3.0	4.0	3.5	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	3.5	6.0	6.0	3.0	6.0	3.5	6.0	6.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead			Lead		Lead	Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0	5.0	2.0	5.0	5.0	2.0	2.0	2.0	2.0	2.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
v/c Ratio	0.04	0.81	0.07	0.86	0.66	0.01		0.80	0.49		0.13	
Control Delay	8.2	12.3	7.1	51.1	11.0	2.2		71.6	31.7		39.6	
Queue Delay	0.0	0.1	0.0	0.0	0.1	0.0		0.0	0.0		0.0	
Total Delay	8.2	12.4	7.1	51.1	11.2	2.2		71.6	31.7		39.6	
90th %ile Green (s)	51.1	51.1	51.1	23.6	78.2	78.2	0.0	29.8	23.6	29.8	29.8	
90th %ile Term Code	Coord	Coord	Coord	Gap	Coord	Coord	Skip	Gap	Gap	Hold	Hold	
70th %ile Green (s)	61.1	61.1	61.1	18.5	83.1	83.1	0.0	24.9	18.5	24.9	24.9	
70th %ile Term Code	Coord	Coord	Coord	Gap	Coord	Coord	Skip	Gap	Gap	Hold	Hold	
50th %ile Green (s)	68.3	68.3	68.3	14.9	86.7	86.7	0.0	21.3	14.9	21.3	21.3	
50th %ile Term Code	Coord	Coord	Coord	Gap	Coord	Coord	Skip	Gap	Gap	Hold	Hold	
30th %ile Green (s)	75.7	75.7	75.7	11.2	90.4	90.4	0.0	17.6	11.2	17.6	17.6	
30th %ile Term Code	Coord	Coord	Coord	Gap	Coord	Coord	Skip	Gap	Gap	Hold	Hold	
10th %ile Green (s)	85.7	85.7	85.7	6.3	95.5	95.5	0.0	12.5	6.3	12.5	12.5	
10th %ile Term Code	Coord	Coord	Coord	Gap	Coord	Coord	Skip	Gap	Gap	Hold	Hold	
Queue Length 50th (ft)	0	89	6	93	553	1		136	158		22	
Queue Length 95th (ft)	m1	#861	m12	m104	m725	m3		202	184		48	

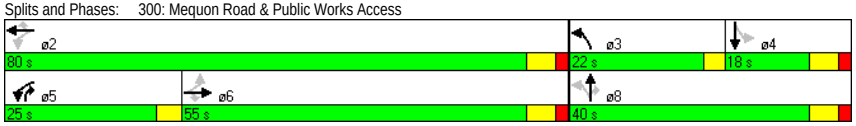
Volume
300: Mequon Road & Public Works Access 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		249			350			420			58	
Turn Bay Length (ft)	55			120					135			
Base Capacity (vph)	137	2017	812	380	2534	1020		361	627		256	
Starvation Cap Reductn	0	33	0	0	0	0		0	0		0	
Spillback Cap Reductn	0	0	0	0	146	0		0	0		0	
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	
Reduced v/c Ratio	0.04	0.82	0.07	0.64	0.70	0.01		0.50	0.42		0.13	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 63 (53%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
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: 300: Mequon Road & Public Works Access



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Traffic Analysis & Design, Inc. Synchro 7 - Report

HCM Signalized Intersection Capacity Analysis
300: Mequon Road & Public Works Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1530	110	230	1575	20	165	5	495	15	1	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	9	12	12	9	11	11	11	12	12	12
Total Lost time (s)	6.0	6.0	6.0	3.5	6.0	6.0		6.0	3.5		6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00		0.98	
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411		1717	1531		1716	
Flt Permitted	0.13	1.00	1.00	0.06	1.00	1.00		0.71	1.00		0.82	
Satd. Flow (perm)	240	3539	1425	107	3505	1411		1274	1531		1448	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	5	1628	59	245	1676	11	176	5	263	16	1	16
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	5	1628	59	245	1676	11	0	181	263	0	33	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm		Perm	pm+pt		Perm	pm+pt		pm+ov	Perm		
Protected Phases		6		5	2		3	8	5		4	
Permitted Phases	6		6	2		2	8		8	4		
Actuated Green, G (s)	68.4	68.4	68.4	86.8	86.8	86.8		21.2	36.1		21.2	
Effective Green, g (s)	68.4	68.4	68.4	86.8	86.8	86.8		21.2	36.1		21.2	
Actuated g/C Ratio	0.57	0.57	0.57	0.72	0.72	0.72		0.18	0.30		0.18	
Clearance Time (s)	6.0	6.0	6.0	3.5	6.0	6.0		6.0	3.5		6.0	
Vehicle Extension (s)	5.0	5.0	5.0	2.0	5.0	5.0		2.0	2.0		2.0	
Lane Grp Cap (vph)	137	2017	812	282	2535	1021		225	461		256	
v/s Ratio Prot		0.46		c0.11	0.48				0.07			
v/s Ratio Perm	0.02		0.04	c0.52		0.01		c0.14	0.10		0.02	
v/c Ratio	0.04	0.81	0.07	0.87	0.66	0.01		0.80	0.57		0.13	
Uniform Delay, d1	11.3	20.5	11.6	37.3	8.8	4.6		47.4	35.4		41.6	
Progression Factor	0.42	0.33	0.44	0.95	1.00	0.34		1.00	1.00		1.00	
Incremental Delay, d2	0.3	2.5	0.1	18.1	1.0	0.0		17.6	1.1		0.1	
Delay (s)	5.1	9.3	5.2	53.8	9.8	1.6		65.0	36.5		41.7	
Level of Service	A	A	A	D	A	A		E	D		D	
Approach Delay (s)		9.2			15.3			48.1			41.7	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM Average Control Delay	16.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Volume
310: Mequon Road & Logeman Access

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	2020	15	0	1810	1	0	0	25	1	1	15
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.865		0.880	
Flt Protected											0.997	
Satd. Flow (prot)	0	3539	1425	0	3505	1411	0	0	1627	0	1650	0
Flt Permitted											0.997	
Satd. Flow (perm)	0	3539	1425	0	3505	1411	0	0	1627	0	1650	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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	2196	16	0	1967	1	0	0	27	1	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2201	16	0	1967	1	0	0	27	0	18	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
310: Mequon Road & Logeman Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	2020	15	0	1810	1	0	0	25	1	1	15
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	2196	16	0	1967	1	0	0	27	1	1	16
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)		430			842							
pX, platoon unblocked	0.72			0.62			0.76	0.76	0.62	0.76	0.76	0.72
vC, conflicting volume	1968			2212			3207	4175	1098	3103	4190	984
vC1, stage 1 conf vol							2207	2207		1967	1967	
vC2, stage 2 conf vol							1001	1968		1136	2223	
vCu, unblocked vol	1559			1724			1589	2863	0	1452	2883	183
tC, single (s)	4.1			4.2			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 %	98			100			100	100	96	99	98	97
cM capacity (veh/h)	301			221			52	52	672	77	52	595

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	737	1464	16	984	984	1	27	18
Volume Left	5	0	0	0	0	0	0	1
Volume Right	0	0	16	0	0	1	27	16
cSH	301	1700	1700	1700	1700	1700	672	295
Volume to Capacity	0.02	0.86	0.01	0.58	0.58	0.00	0.04	0.06
Queue Length 95th (ft)	1	0	0	0	0	0	3	5
Control Delay (s)	0.7	0.0	0.0	0.0	0.0	0.0	10.6	18.0
Lane LOS	A						B	C
Approach Delay (s)	0.2			0.0			10.6	18.0
Approach LOS							B	C

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		72.6%	ICU Level of Service C
Analysis Period (min)		15	

Volume
320: Mequon Road & River Centre Center Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1945	100	85	1815	80	75
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3574	1439	1752	5036	1787	1599
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3574	1439	1752	5036	1787	1599
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	1%	1%
Adj. Flow (vph)	2114	109	92	1973	87	82
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2114	109	92	1973	87	82
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
320: Mequon Road & River Centre Center Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1945	100	85	1815	80	75
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)	2114	109	92	1973	87	82
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)	625			647		
pX, platoon unblocked			0.62		0.75	0.62
vC, conflicting volume			2223		2957	1057
vC1, stage 1 conf vol					2114	
vC2, stage 2 conf vol					842	
vCu, unblocked vol			1749		895	0
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			58		1	88
cM capacity (veh/h)			218		88	676

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2
Volume Total	1057	1057	109	92	658	658	658	87	82
Volume Left	0	0	0	92	0	0	0	87	0
Volume Right	0	0	109	0	0	0	0	0	82
cSH	1700	1700	1700	218	1700	1700	1700	88	676
Volume to Capacity	0.62	0.62	0.06	0.42	0.39	0.39	0.39	0.99	0.12
Queue Length 95th (ft)	0	0	0	49	0	0	0	142	10
Control Delay (s)	0.0	0.0	0.0	33.2	0.0	0.0	0.0	180.1	11.1
Lane LOS				D				F	B
Approach Delay (s)	0.0			1.5				98.3	
Approach LOS								F	

Intersection Summary			
Average Delay		4.4	
Intersection Capacity Utilization		72.9%	ICU Level of Service	C
Analysis Period (min)		15	

Volume
330: Mequon Road & Area H Access

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	2015	5	0	1815	10	0	0	50	0	0	1
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.999				0.865			0.865
Flt Protected												
Satd. Flow (prot)	0	5085	0	0	5031	0	0	0	1627	0	0	1627
Flt Permitted												
Satd. Flow (perm)	0	5085	0	0	5031	0	0	0	1627	0	0	1627
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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	0	2167	5	0	1952	11	0	0	54	0	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2172	0	0	1963	0	0	0	54	0	0	1
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
330: Mequon Road & Area H Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	2015	5	0	1815	10	0	0	50	0	0	1
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)	0	2167	5	0	1952	11	0	0	54	0	0	1
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)		935			337							
pX, platoon unblocked	0.74			0.73			0.86	0.86	0.73	0.86	0.86	0.74
vC, conflicting volume	1962			2172			2821	4132	725	2733	4129	656
vC1, stage 1 conf vol							2169	2169		1957	1957	
vC2, stage 2 conf vol							652	1962		776	2172	
vCu, unblocked vol	1064			1298			485	2013	0	382	2010	0
tC, single (s)	4.1			4.2			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 %	100			100			0	100	93	100	100	100
cM capacity (veh/h)	481			381			-734	110	791	6269	110	803

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	867	867	439	781	781	401	54	1
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	5	0	0	11	54	1
cSH	1700	1700	1700	1700	1700	1700	791	803
Volume to Capacity	0.51	0.51	0.26	0.46	0.46	0.24	0.07	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	5	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.9	9.5
Lane LOS							A	A
Approach Delay (s)	0.0			0.0			9.9	9.5
Approach LOS							A	A

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		49.0%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
340: Mequon Road & Cedarburg Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	520	1375	170	280	1310	620	245	760	245	445	295	270
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3467	3574	1599	3433	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	3467	3574	1599	3433	3539	1583
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Adj. Flow (vph)	547	1447	89	295	1379	326	258	800	129	468	311	142
Shared Lane Traffic (%)												
Lane Group Flow (vph)	547	1447	89	295	1379	326	258	800	129	468	311	142
Turn Type	Prot		Perm	Prot		pt+ov	Prot		Perm	Prot		pt+ov
Protected Phases	1	6		5	2	2 7	3	8		7	4	4 1
Permitted Phases			6						8			
Detector Phase	1	6	6	5	2	2 7	3	8	8	7	4	4 1
Switch Phase												
Minimum Initial (s)	6.0	12.0	12.0	6.0	12.0		6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.5	18.7	18.7	10.5	18.7		10.5	16.9	16.9	10.5	16.9	
Total Split (s)	24.0	46.0	46.0	20.0	42.0	64.0	22.0	32.0	32.0	22.0	32.0	56.0
Total Split (%)	20.0%	38.3%	38.3%	16.7%	35.0%	53.3%	18.3%	26.7%	26.7%	18.3%	26.7%	46.7%
Maximum Green (s)	19.5	39.3	39.3	15.5	35.3		17.5	25.1	25.1	17.5	25.1	
Yellow Time (s)	3.5	3.9	3.9	3.5	3.9		3.5	3.9	3.9	3.5	3.9	
All-Red Time (s)	1.0	2.8	2.8	1.0	2.8		1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	6.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4		1.5	1.5	1.5	1.5	1.5	
Minimum Gap (s)	1.5	2.0	2.0	1.5	2.0		1.5	1.5	1.5	1.5	1.5	
Time Before Reduce (s)	15.0	28.0	28.0	15.0	20.0		20.0	40.0	40.0	30.0	40.0	
Time To Reduce (s)	0.0	12.0	12.0	0.0	20.0		0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None	None	None	None	
v/c Ratio	0.98	0.83	0.16	0.76	0.92	0.43	0.70	1.07	0.38	0.94	0.35	0.20
Control Delay	73.0	37.6	22.9	64.8	52.1	22.9	61.7	96.8	44.8	79.1	39.2	21.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.0	37.6	22.9	64.8	52.1	22.9	61.7	96.8	44.8	79.1	39.2	21.8
90th %ile Green (s)	19.5	39.3	39.3	15.5	35.3		16.7	25.1	25.1	17.5	25.9	
90th %ile Term Code	Max	Coord	Coord	Max	Coord		Gap	Max	Max	Max	Hold	
70th %ile Green (s)	19.5	39.3	39.3	15.5	35.3		14.4	25.1	25.1	17.5	28.2	
70th %ile Term Code	Max	Coord	Coord	Max	Coord		Gap	Max	Max	Max	Hold	
50th %ile Green (s)	19.5	40.7	40.7	14.1	35.3		12.8	25.1	25.1	17.5	29.8	
50th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Max	Max	Max	Hold	
30th %ile Green (s)	19.5	42.3	42.3	12.5	35.3		11.2	25.1	25.1	17.5	31.4	
30th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Max	Max	Max	Hold	
10th %ile Green (s)	19.5	44.8	44.8	10.0	35.3		8.9	25.7	25.7	16.9	33.7	

Volume
340: Mequon Road & Cedarburg Road

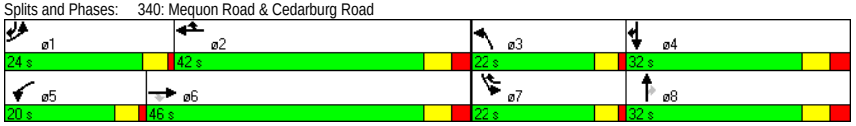
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Max	Max	Gap	Hold	
Queue Length 50th (ft)	219	391	55	115	379	162	101	~361	87	187	104	65
Queue Length 95th (ft)	m#326	467	m68	161	#469	240	141	#488	148	#288	154	116
Internal Link Dist (ft)		257			885			746			862	
Turn Bay Length (ft)	180		175	200		235	225		125	385		150
Base Capacity (vph)	558	1749	544	443	1496	756	506	751	336	501	879	710
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.83	0.16	0.67	0.92	0.43	0.51	1.07	0.38	0.93	0.35	0.20

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 1 (1%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
~ 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: 340: Mequon Road & Cedarburg Road



HCM Signalized Intersection Capacity Analysis
340: Mequon Road & Cedarburg Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	520	1375	170	280	1310	620	245	760	245	445	295	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	6.9
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3467	3574	1599	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	3467	3574	1599	3433	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	547	1447	89	295	1379	326	258	800	129	468	311	142
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	547	1447	89	295	1379	326	258	800	129	468	311	142
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Prot		Perm	Prot		pt+ov	Prot		Perm	Prot		pt+ov
Protected Phases	1	6		5	2	2 7	3	8		7	4	4 1
Permitted Phases			6						8			
Actuated Green, G (s)	19.5	41.3	41.3	13.5	35.3	59.4	12.8	25.2	25.2	17.4	29.8	56.2
Effective Green, g (s)	19.5	41.3	41.3	13.5	35.3	59.4	12.8	25.2	25.2	17.4	29.8	56.2
Actuated g/C Ratio	0.16	0.34	0.34	0.11	0.29	0.49	0.11	0.21	0.21	0.14	0.25	0.47
Clearance Time (s)	4.5	6.7	6.7	4.5	6.7		4.5	6.9	6.9	4.5	6.9	
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4		1.5	1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	558	1750	545	386	1496	784	370	751	336	498	879	741
v/s Ratio Prot	c0.16	0.28		0.09	c0.27	0.21	0.07	c0.22		c0.14	0.09	0.09
v/s Ratio Perm			0.06						0.08			
v/c Ratio	0.98	0.83	0.16	0.76	0.92	0.42	0.70	1.07	0.38	0.94	0.35	0.19
Uniform Delay, d1	50.1	36.1	27.3	51.7	41.0	19.3	51.7	47.4	40.7	50.8	37.2	18.6
Progression Factor	0.85	0.92	0.78	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	29.1	3.8	0.5	7.9	10.8	0.1	4.6	51.6	0.3	25.4	0.1	0.0
Delay (s)	71.5	36.9	22.0	59.6	51.9	19.4	56.3	99.0	41.0	76.2	37.3	18.7
Level of Service	E	D	C	E	D	B	E	F	D	E	D	B
Approach Delay (s)		45.4			47.7			83.4			54.2	
Approach LOS		D			D			F			D	

Intersection Summary

HCM Average Control Delay	54.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	22.6
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Mequon Road

Direction	EB	WB	All
Total Delay / Veh (s/v)	8	9	8
Total Delay (hr)	54	63	117
Stops / Veh	0.18	0.27	0.22
Stops (#)	4488	7112	11600
Average Speed (mph)	19	19	19
Total Travel Time (hr)	106	118	224
Distance Traveled (mi)	2065	2197	4262
Fuel Consumed (gal)	158	195	353
Fuel Economy (mpg)	13.1	11.3	12.1
Performance Index	66.8	82.8	149.6

Network Totals

Number of Intersections	15
Total Delay / Veh (s/v)	13
Total Delay (hr)	199
Stops / Veh	0.28
Stops (#)	15892
Average Speed (mph)	15
Total Travel Time (hr)	328
Distance Traveled (mi)	5005
Fuel Consumed (gal)	469
Fuel Economy (mpg)	10.7
Performance Index	243.0

APPENDIX F

Year 2025 Build Traffic Analysis – With Alternative Two Improvements

Volume
200: Mequon Road & Wauwatosa Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	270	850	70	185	1100	360	235	570	220	250	245	120
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.950			0.950			0.592			0.165		
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	1103	3539	1583	293	3374	1509
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Adj. Flow (vph)	284	895	37	195	1158	189	247	600	116	263	258	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	284	895	37	195	1158	189	247	600	116	263	258	63
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	11.5	17.9	17.9	11.5	17.9	17.9	11.5	18.0	18.0	11.5	18.0	18.0
Total Split (s)	20.0	47.0	47.0	20.0	47.0	47.0	19.0	31.0	31.0	22.0	34.0	34.0
Total Split (%)	16.7%	39.2%	39.2%	16.7%	39.2%	39.2%	15.8%	25.8%	25.8%	18.3%	28.3%	28.3%
Maximum Green (s)	16.5	41.1	41.1	16.5	41.1	41.1	15.5	25.0	25.0	18.5	28.0	28.0
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0
All-Red Time (s)	0.0	0.9	0.9	0.0	0.9	0.9	0.0	1.0	1.0	0.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Minimum Gap (s)	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0
Time Before Reduce (s)	15.0	24.0	24.0	15.0	18.0	18.0	15.0	24.0	24.0	15.0	22.0	22.0
Time To Reduce (s)	0.0	16.0	16.0	0.0	22.0	22.0	0.0	16.0	16.0	0.0	18.0	18.0
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
v/c Ratio	0.69	0.67	0.06	0.58	0.92	0.34	0.53	0.82	0.35	0.80	0.32	0.18
Control Delay	58.0	33.2	24.7	56.9	49.0	30.1	28.2	53.6	43.2	44.3	37.9	37.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.0	33.2	24.7	56.9	49.0	30.1	28.2	53.6	43.2	44.3	37.9	37.8
90th %ile Green (s)	16.5	43.1	43.1	14.5	41.1	41.1	15.5	25.0	25.0	18.5	28.0	28.0
90th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Max	Max	Max	Max	Hold	Hold
70th %ile Green (s)	15.8	44.4	44.4	12.5	41.1	41.1	15.5	25.0	25.0	18.5	28.0	28.0
70th %ile Term Code	Gap	Hold	Hold	Gap	Max	Max	Max	Max	Max	Max	Hold	Hold
50th %ile Green (s)	14.0	44.1	44.1	11.0	41.1	41.1	15.5	25.0	25.0	18.5	28.0	28.0
50th %ile Term Code	Gap	Hold	Hold	Gap	Max	Max	Max	Max	Max	Max	Hold	Hold
30th %ile Green (s)	12.1	43.7	43.7	9.5	41.1	41.1	13.0	23.5	23.5	17.3	27.8	27.8
30th %ile Term Code	Gap	Hold	Hold	Gap	Max	Max	Gap	Gap	Gap	Gap	Hold	Hold
10th %ile Green (s)	9.2	35.3	35.3	8.0	34.1	34.1	9.7	18.1	18.1	12.4	20.8	20.8

Volume
200: Mequon Road & Wauwatosa Road

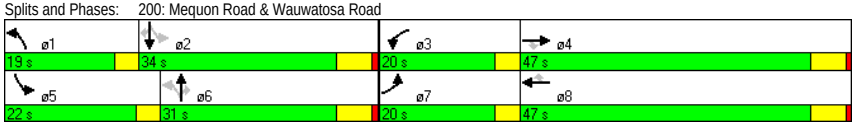
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Gap	Hold	Hold	Min	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
Queue Length 50th (ft)	108	295	18	74	443	105	124	228	75	134	85	38
Queue Length 95th (ft)	154	386	43	112	#604	174	196	#304	135	#262	127	79
Internal Link Dist (ft)		559			585			1105			792	
Turn Bay Length (ft)	135		35	295		50	185		110	150		200
Base Capacity (vph)	508	1371	613	508	1305	584	499	794	355	352	848	379
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.65	0.06	0.38	0.89	0.32	0.49	0.76	0.33	0.75	0.30	0.17

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 112.5
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 120
70th %ile Actuated Cycle: 119.3
50th %ile Actuated Cycle: 117.5
30th %ile Actuated Cycle: 112.9
10th %ile Actuated Cycle: 92.7
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 200: Mequon Road & Wauwatosa Road



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Traffic Analysis & Design, Inc.
Synchro 7 - Report

HCM Signalized Intersection Capacity Analysis
200: Mequon Road & Wauwatosa Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	270	850	70	185	1100	360	235	570	220	250	245	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.59	1.00	1.00	0.17	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	1103	3539	1583	294	3374	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	284	895	37	195	1158	189	247	600	116	263	258	63
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	284	895	37	195	1158	189	247	600	116	263	258	63
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Actuated Green, G (s)	13.4	42.2	42.2	11.0	39.8	39.8	37.0	23.3	23.3	43.6	26.6	26.6
Effective Green, g (s)	13.4	42.2	42.2	11.0	39.8	39.8	37.0	23.3	23.3	43.6	26.6	26.6
Actuated g/C Ratio	0.12	0.38	0.38	0.10	0.35	0.35	0.33	0.21	0.21	0.39	0.24	0.24
Clearance Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Lane Grp Cap (vph)	409	1329	594	336	1253	561	444	734	328	325	798	357
v/s Ratio Prot	c0.08	0.25		0.06	c0.33		0.07	0.17		c0.12	0.08	
v/s Ratio Perm			0.02			0.12	0.12		0.07	c0.19		0.04
v/c Ratio	0.69	0.67	0.06	0.58	0.92	0.34	0.56	0.82	0.35	0.81	0.32	0.18
Uniform Delay, d1	47.5	29.3	22.4	48.5	34.9	26.6	29.4	42.5	38.1	26.7	35.5	34.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.1	1.5	0.1	1.6	11.6	0.4	0.9	7.3	0.9	13.1	0.3	0.3
Delay (s)	51.6	30.8	22.5	50.1	46.4	27.0	30.3	49.8	39.0	39.8	35.8	34.5
Level of Service	D	C	C	D	D	C	C	D	D	D	D	C
Approach Delay (s)		35.4			44.5			43.5			37.5	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	40.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	112.4	Sum of lost time (s)	16.4
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Volume
210: Mequon Road & Area B West Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1500	20	0	1690	0	45
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3539	1583	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	3539	1583	0	3539	0	1611
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1579	21	0	1779	0	47
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1579	21	0	1779	0	47
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
210: Mequon Road & Area B West Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1500	20	0	1690	0	45
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)	1579	21	0	1779	0	47
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)	665					
pX, platoon unblocked			0.79		0.79	0.79
vC, conflicting volume			1600		2468	789
vC1, stage 1 conf vol					1579	
vC2, stage 2 conf vol					889	
vCu, unblocked vol			1225		2326	198
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 %			100		100	93
cM capacity (veh/h)			445		126	639

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	789	789	21	889	889	47
Volume Left	0	0	0	0	0	0
Volume Right	0	0	21	0	0	47
cSH	1700	1700	1700	1700	1700	639
Volume to Capacity	0.46	0.46	0.01	0.52	0.52	0.07
Queue Length 95th (ft)	0	0	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	11.1
Lane LOS						B
Approach Delay (s)	0.0			0.0		11.1
Approach LOS						B

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		51.5%	ICU Level of Service A
Analysis Period (min)		15	

Volume
220: Mequon Road & Area B East Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1525	20	70	1655	40	40
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850			0.932	
Flt Protected			0.950		0.976	
Satd. Flow (prot)	3505	1568	1752	3505	1694	0
Flt Permitted			0.950		0.976	
Satd. Flow (perm)	3505	1568	1752	3505	1694	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Adj. Flow (vph)	1589	21	73	1724	42	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1589	21	73	1724	84	0
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
220: Mequon Road & Area B East Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1525	20	70	1655	40	40
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1589	21	73	1724	42	42
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)	1205					
pX, platoon unblocked			0.80		0.80	0.80
vC, conflicting volume			1609		2596	794
vC1, stage 1 conf vol					1589	
vC2, stage 2 conf vol					1008	
vCu, unblocked vol			1254		2493	231
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			83		61	93
cM capacity (veh/h)			434		108	614

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	794	794	21	73	862	862	83
Volume Left	0	0	0	73	0	0	42
Volume Right	0	0	21	0	0	0	42
cSH	1700	1700	1700	434	1700	1700	183
Volume to Capacity	0.47	0.47	0.01	0.17	0.51	0.51	0.45
Queue Length 95th (ft)	0	0	0	15	0	0	53
Control Delay (s)	0.0	0.0	0.0	15.0	0.0	0.0	40.1
Lane LOS				B			E
Approach Delay (s)	0.0			0.6			40.1
Approach LOS							E

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization		60.7%	ICU Level of Service B
Analysis Period (min)		15	

Volume
230: Mequon Road & Concord Creek Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1490	70	90	1650	5	60	1	70	15	1	15
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.953			0.955	
Satd. Flow (prot)	1752	3505	1411	1752	3505	1411	0	1775	1583	0	1429	1272
Flt Permitted	0.950			0.950				0.953			0.955	
Satd. Flow (perm)	1752	3505	1411	1752	3505	1411	0	1775	1583	0	1429	1272
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	27%	27%	27%
Adj. Flow (vph)	5	1552	73	94	1719	5	63	1	73	16	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1552	73	94	1719	5	0	63	73	0	17	16
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized
Description: High SB %HV

HCM Unsignalized Intersection Capacity Analysis
230: Mequon Road & Concord Creek Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1490	70	90	1650	5	60	1	70	15	1	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	1552	73	94	1719	5	62	1	73	16	1	16
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	1724			1625			2626	3474	776	2766	3542	859
vC1, stage 1 conf vol							1562	1562		1906	1906	
vC2, stage 2 conf vol							1063	1911		860	1635	
vCu, unblocked vol	1724			1625			2626	3474	776	2766	3542	859
tC, single (s)	4.2			4.2			7.5	6.5	6.9	8.0	7.0	7.4
tC, 2 stage (s)							6.5	5.5		7.0	6.0	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.8	4.3	3.6
p0 queue free %	99			76			4	98	79	45	94	94
cM capacity (veh/h)	358			392			65	52	340	28	19	254

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1	SB 2
Volume Total	5	776	776	73	94	859	859	5	64	73	17	16
Volume Left	5	0	0	0	94	0	0	0	62	0	16	0
Volume Right	0	0	0	73	0	0	0	5	0	73	0	16
cSH	358	1700	1700	1700	392	1700	1700	1700	65	340	28	254
Volume to Capacity	0.01	0.46	0.46	0.04	0.24	0.51	0.51	0.00	0.98	0.21	0.60	0.06
Queue Length 95th (ft)	1	0	0	0	23	0	0	0	120	20	48	5
Control Delay (s)	15.2	0.0	0.0	0.0	17.1	0.0	0.0	0.0	212.0	18.5	254.8	20.1
Lane LOS	C				C				F	C	F	C
Approach Delay (s)	0.0				0.9				108.6		141.3	
Approach LOS									F		F	

Intersection Summary			
Average Delay		5.8	
Intersection Capacity Utilization		69.0%	ICU Level of Service	C
Analysis Period (min)		15	
Description: High SB %HV			

Volume
240: Mequon Road & Area C Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1555	20	0	1745	0	40
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3505	1411	0	3505	0	1611
Flt Permitted						
Satd. Flow (perm)	3505	1411	0	3505	0	1611
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Adj. Flow (vph)	1620	21	0	1818	0	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1620	21	0	1818	0	42
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
240: Mequon Road & Area C Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1555	20	0	1745	0	40
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1620	21	0	1818	0	42
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			1641		2529	810
vC1, stage 1 conf vol					1620	
vC2, stage 2 conf vol					909	
vCu, unblocked vol			1641		2529	810
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	87
cM capacity (veh/h)			386		103	323

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	810	810	21	909	909	42
Volume Left	0	0	0	0	0	0
Volume Right	0	0	21	0	0	42
cSH	1700	1700	1700	1700	1700	323
Volume to Capacity	0.48	0.48	0.01	0.53	0.53	0.13
Queue Length 95th (ft)	0	0	0	0	0	11
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	17.8
Lane LOS						C
Approach Delay (s)	0.0			0.0		17.8
Approach LOS						C

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
250: Mequon Road & Weston Center West Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1565	30	70	1720	25	30
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850			0.927	
Flt Protected			0.950		0.978	
Satd. Flow (prot)	3505	1411	1752	3505	1689	0
Flt Permitted			0.950		0.978	
Satd. Flow (perm)	3505	1411	1752	3505	1689	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Adj. Flow (vph)	1630	31	73	1792	26	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1630	31	73	1792	57	0
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
250: Mequon Road & Weston Center West Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1565	30	70	1720	25	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1630	31	73	1792	26	31
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised			Raised		
Median storage veh)	1			1		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1661		2672	815
vC1, stage 1 conf vol					1630	
vC2, stage 2 conf vol					1042	
vCu, unblocked vol			1661		2672	815
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			81		71	90
cM capacity (veh/h)			379		89	320

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	815	815	31	73	896	896	57
Volume Left	0	0	0	73	0	0	26
Volume Right	0	0	31	0	0	0	31
cSH	1700	1700	1700	379	1700	1700	147
Volume to Capacity	0.48	0.48	0.02	0.19	0.53	0.53	0.39
Queue Length 95th (ft)	0	0	0	18	0	0	42
Control Delay (s)	0.0	0.0	0.0	16.7	0.0	0.0	44.3
Lane LOS				C			E
Approach Delay (s)	0.0			0.7			44.3
Approach LOS							E

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization		60.5%	ICU Level of Service	B
Analysis Period (min)		15	

Volume
260: Mequon Road & Weston Center East Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1595	1	0	1790	0	10
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3574	1439	0	3505	0	1611
Flt Permitted						
Satd. Flow (perm)	3574	1439	0	3505	0	1611
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	2%	2%
Adj. Flow (vph)	1734	1	0	1946	0	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1734	1	0	1946	0	11
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
260: Mequon Road & Weston Center East Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1595	1	0	1790	0	10
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)	1734	1	0	1946	0	11
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)				1088		
pX, platoon unblocked					0.56	
vC, conflicting volume			1735		2707	867
vC1, stage 1 conf vol					1734	
vC2, stage 2 conf vol					973	
vCu, unblocked vol			1735		2479	867
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			355		99	296

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	867	867	1	973	973	11
Volume Left	0	0	0	0	0	0
Volume Right	0	0	1	0	0	11
cSH	1700	1700	1700	1700	1700	296
Volume to Capacity	0.51	0.51	0.00	0.57	0.57	0.04
Queue Length 95th (ft)	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	17.6
Lane LOS						C
Approach Delay (s)	0.0			0.0		17.6
Approach LOS						C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
270: Mequon Road & River Birch Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1575	25	50	1760	5	30	1	55	1	1	1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.914			0.955	
Flt Protected	0.950			0.950				0.983			0.984	
Satd. Flow (prot)	1787	3574	1439	1752	3505	1411	0	1690	0	0	1768	0
Flt Permitted	0.950			0.950				0.983			0.984	
Satd. Flow (perm)	1787	3574	1439	1752	3505	1411	0	1690	0	0	1768	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
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	1712	27	54	1913	5	33	1	60	1	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1712	27	54	1913	5	0	94	0	0	3	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
270: Mequon Road & River Birch Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1575	25	50	1760	5	30	1	55	1	1	1
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	1712	27	54	1913	5	33	1	60	1	1	1
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)					626							
pX, platoon unblocked	0.58						0.58	0.58		0.58	0.58	0.58
vC, conflicting volume	1918			1739			2790	3750	856	2949	3772	957
vC1, stage 1 conf vol							1723	1723		2022	2022	
vC2, stage 2 conf vol							1067	2027		927	1750	
vCu, unblocked vol	1133			1739			2637	4295	856	2912	4332	0
tC, single (s)	4.1			4.2			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 %	98			85			55	98	80	98	98	100
cM capacity (veh/h)	358			353			72	56	303	52	44	630

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	5	856	856	27	54	957	957	5	93	3
Volume Left	5	0	0	0	54	0	0	0	33	1
Volume Right	0	0	0	27	0	0	0	5	60	1
cSH	358	1700	1700	1700	353	1700	1700	1700	140	69
Volume to Capacity	0.02	0.50	0.50	0.02	0.15	0.56	0.56	0.00	0.67	0.05
Queue Length 95th (ft)	1	0	0	0	13	0	0	0	92	4
Control Delay (s)	15.2	0.0	0.0	0.0	17.0	0.0	0.0	0.0	71.6	59.8
Lane LOS	C				C				F	F
Approach Delay (s)	0.0				0.5				71.6	59.8
Approach LOS									F	F

Intersection Summary			
Average Delay		2.1	
Intersection Capacity Utilization		62.1%	ICU Level of Service
Analysis Period (min)		15	

Volume
280: Mequon Road & Buntrock Avenue

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	1485	60	115	1610	30	145	45	140	25	5	60
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.963			0.960	
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411	0	1776	1568	0	1788	1583
Flt Permitted	0.058			0.073				0.756			0.674	
Satd. Flow (perm)	108	3539	1425	135	3505	1411	0	1395	1568	0	1255	1583
Satd. Flow (RTOR)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	90	1580	32	122	1713	16	154	48	74	27	5	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	90	1580	32	122	1713	16	0	202	74	0	32	32
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	Perm		Perm
Protected Phases	1	6		5	2		3	8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Detector Phase	1	6	6	5	2	2	3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.5	21.4	21.4	9.5	21.4	21.4	9.0	17.1	17.1	17.1	17.1	17.1
Total Split (s)	18.0	62.0	62.0	18.0	62.0	62.0	22.0	40.0	40.0	18.0	18.0	18.0
Total Split (%)	15.0%	51.7%	51.7%	15.0%	51.7%	51.7%	18.3%	33.3%	33.3%	15.0%	15.0%	15.0%
Maximum Green (s)	14.5	55.6	55.6	14.5	55.6	55.6	19.0	32.9	32.9	10.9	10.9	10.9
Yellow Time (s)	3.5	4.0	4.0	3.5	4.0	4.0	3.0	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	0.0	2.4	2.4	0.0	2.4	2.4	0.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.4	6.4	3.5	6.4	6.4	3.0	7.1	7.1	7.1	7.1	7.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.5	5.5	2.0	5.5	5.5	2.0	1.5	1.5	1.5	1.5	1.5
Minimum Gap (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	1.5	1.5	1.5	1.5	1.5
Time Before Reduce (s)	0.0	30.0	30.0	0.0	30.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	15.0	15.0	0.0	15.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	None
v/c Ratio	0.52	0.77	0.04	0.59	0.83	0.02		0.69	0.22		0.12	0.10
Control Delay	26.1	24.7	14.5	37.2	12.9	7.0		54.9	38.5		36.3	35.6
Queue Delay	0.0	0.0	0.0	0.0	0.3	0.0		0.0	0.0		0.0	0.0
Total Delay	26.1	24.7	14.5	37.2	13.2	7.0		54.9	38.5		36.3	35.6
90th %ile Green (s)	10.5	56.9	56.9	13.2	59.6	59.6	0.0	32.9	32.9	32.9	32.9	32.9
90th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Skip	Max	Max	Hold	Hold	Hold
70th %ile Green (s)	7.9	62.8	62.8	9.7	64.6	64.6	0.0	30.5	30.5	30.5	30.5	30.5
70th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Skip	Gap	Gap	Hold	Hold	Hold
50th %ile Green (s)	6.4	69.6	69.6	7.2	70.4	70.4	0.0	26.2	26.2	26.2	26.2	26.2
50th %ile Term Code	Gap	Coord	Coord	Gap	Coord	Coord	Skip	Gap	Gap	Hold	Hold	Hold
30th %ile Green (s)	6.0	75.1	75.1	6.2	75.3	75.3	0.0	21.7	21.7	21.7	21.7	21.7
30th %ile Term Code	Min	Coord	Coord	Gap	Coord	Coord	Skip	Gap	Gap	Hold	Hold	Hold
10th %ile Green (s)	6.0	81.8	81.8	6.0	81.8	81.8	0.0	15.2	15.2	15.2	15.2	15.2

Volume
280: Mequon Road & Buntrock Avenue

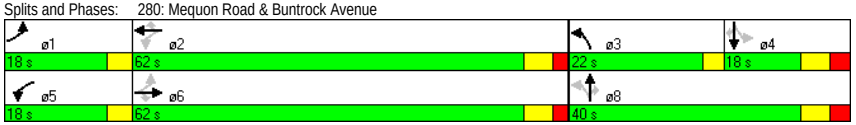
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Min	Coord	Coord	Min	Coord	Coord	Skip	Gap	Gap	Hold	Hold	Hold
Queue Length 50th (ft)	20	463	10	33	123	2		144	47		20	20
Queue Length 95th (ft)	75	#767	31	m98	#838	m5		213	85		45	44
Internal Link Dist (ft)		546			209			420			420	
Turn Bay Length (ft)	100			120					70			40
Base Capacity (vph)	276	2042	822	290	2054	827		382	430		265	334
Starvation Cap Reductn	0	0	0	0	54	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	0.33	0.77	0.04	0.42	0.86	0.02		0.53	0.17		0.12	0.10

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 49 (41%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
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: 280: Mequon Road & Buntrock Avenue



HCM Signalized Intersection Capacity Analysis
280: Mequon Road & Buntrock Avenue

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	1485	60	115	1610	30	145	45	140	25	5	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	9	12	12	9	12	12	12	12	12	12
Total Lost time (s)	3.5	6.4	6.4	3.5	6.4	6.4		7.1	7.1		7.1	7.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411		1777	1568		1787	1583
Flt Permitted	0.06	1.00	1.00	0.07	1.00	1.00		0.76	1.00		0.67	1.00
Satd. Flow (perm)	108	3539	1425	134	3505	1411		1395	1568		1255	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	90	1580	32	122	1713	16	154	48	74	27	5	32
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	90	1580	32	122	1713	16	0	202	74	0	32	32
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	Perm		Perm
Protected Phases	1	6		5	2		3	8			4	
Permitted Phases	6		6	2		2	8		8	4		4
Actuated Green, G (s)	76.6	69.2	69.2	78.8	70.3	70.3		25.3	25.3		25.3	25.3
Effective Green, g (s)	76.6	69.2	69.2	78.8	70.3	70.3		25.3	25.3		25.3	25.3
Actuated g/C Ratio	0.64	0.58	0.58	0.66	0.59	0.59		0.21	0.21		0.21	0.21
Clearance Time (s)	3.5	6.4	6.4	3.5	6.4	6.4		7.1	7.1		7.1	7.1
Vehicle Extension (s)	2.0	5.5	5.5	2.0	5.5	5.5		1.5	1.5		1.5	1.5
Lane Grp Cap (vph)	171	2041	822	203	2053	827		294	331		265	334
v/s Ratio Prot	0.03	0.45		c0.04	c0.49							
v/s Ratio Perm	0.30		0.02	0.35		0.01		c0.14	0.05		0.03	0.02
v/c Ratio	0.53	0.77	0.04	0.60	0.83	0.02		0.69	0.22		0.12	0.10
Uniform Delay, d1	19.3	19.4	11.0	18.0	20.1	10.4		43.7	39.2		38.3	38.1
Progression Factor	1.00	1.00	1.00	2.05	0.38	0.51		1.00	1.00		1.00	1.00
Incremental Delay, d2	1.3	2.9	0.1	2.6	3.2	0.0		5.2	0.1		0.1	0.0
Delay (s)	20.7	22.4	11.1	39.6	11.0	5.4		48.9	39.3		38.4	38.2
Level of Service	C	C	B	D	B	A		D	D		D	D
Approach Delay (s)		22.1			12.8			46.4			38.3	
Approach LOS		C			B			D			D	

Intersection Summary

HCM Average Control Delay	19.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.1
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Volume
290: Mequon Road & Jung Brewery Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1630	20	0	1755	0	15
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3539	1425	0	3505	0	1596
Flt Permitted						
Satd. Flow (perm)	3539	1425	0	3505	0	1596
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	3%	3%	3%	3%
Adj. Flow (vph)	1734	21	0	1867	0	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1734	21	0	1867	0	16
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
290: Mequon Road & Jung Brewery Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1630	20	0	1755	0	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1734	21	0	1867	0	16
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)	289			329		
pX, platoon unblocked			0.65		0.78	0.65
vC, conflicting volume			1755		2668	867
vC1, stage 1 conf vol					1734	
vC2, stage 2 conf vol					934	
vCu, unblocked vol			1074		1007	0
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)					5.9	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			413		176	699

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	867	867	21	934	934	16
Volume Left	0	0	0	0	0	0
Volume Right	0	0	21	0	0	16
cSH	1700	1700	1700	1700	1700	699
Volume to Capacity	0.51	0.51	0.01	0.55	0.55	0.02
Queue Length 95th (ft)	0	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	10.3
Lane LOS						B
Approach Delay (s)	0.0			0.0		10.3
Approach LOS						B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

Volume
300: Mequon Road & Public Works Access 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1530	110	230	1575	20	165	5	495	15	1	15
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.935	
Flt Protected	0.950			0.950				0.954			0.976	
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411	0	1718	1531	0	1717	0
Flt Permitted	0.129			0.058				0.708			0.824	
Satd. Flow (perm)	240	3539	1425	107	3505	1411	0	1275	1531	0	1449	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Adj. Flow (vph)	5	1628	59	245	1676	11	176	5	263	16	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1628	59	245	1676	11	0	181	263	0	33	0
Turn Type	Perm		Perm	pm+pt		Perm	pm+pt		pm+ov	Perm		
Protected Phases		6		5	2		3	8	5		4	
Permitted Phases	6		6	2		2	8		8	4		
Detector Phase	6	6	6	5	2	2	3	8	5	4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	6.0	15.0	15.0	6.0	10.0	6.0	10.0	10.0	
Minimum Split (s)	21.0	21.0	21.0	9.5	21.0	21.0	9.0	16.0	9.5	16.0	16.0	
Total Split (s)	55.0	55.0	55.0	25.0	80.0	80.0	22.0	40.0	25.0	18.0	18.0	0.0
Total Split (%)	45.8%	45.8%	45.8%	20.8%	66.7%	66.7%	18.3%	33.3%	20.8%	15.0%	15.0%	0.0%
Maximum Green (s)	49.0	49.0	49.0	21.5	74.0	74.0	19.0	34.0	21.5	12.0	12.0	
Yellow Time (s)	4.0	4.0	4.0	3.5	4.0	4.0	3.0	4.0	3.5	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	3.5	6.0	6.0	3.0	6.0	3.5	6.0	6.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead			Lead		Lead	Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0	5.0	2.0	5.0	5.0	2.0	2.0	2.0	2.0	2.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
v/c Ratio	0.04	0.81	0.07	0.86	0.66	0.01		0.80	0.49		0.13	
Control Delay	8.6	12.4	7.5	60.4	7.4	1.6		71.6	31.7		39.6	
Queue Delay	0.0	0.1	0.0	0.0	0.1	0.0		0.0	0.0		0.0	
Total Delay	8.6	12.6	7.5	60.4	7.5	1.6		71.6	31.7		39.6	
90th %ile Green (s)	51.1	51.1	51.1	23.6	78.2	78.2	0.0	29.8	23.6	29.8	29.8	
90th %ile Term Code	Coord	Coord	Coord	Gap	Coord	Coord	Skip	Gap	Gap	Hold	Hold	
70th %ile Green (s)	61.1	61.1	61.1	18.5	83.1	83.1	0.0	24.9	18.5	24.9	24.9	
70th %ile Term Code	Coord	Coord	Coord	Gap	Coord	Coord	Skip	Gap	Gap	Hold	Hold	
50th %ile Green (s)	68.3	68.3	68.3	14.9	86.7	86.7	0.0	21.3	14.9	21.3	21.3	
50th %ile Term Code	Coord	Coord	Coord	Gap	Coord	Coord	Skip	Gap	Gap	Hold	Hold	
30th %ile Green (s)	75.7	75.7	75.7	11.2	90.4	90.4	0.0	17.6	11.2	17.6	17.6	
30th %ile Term Code	Coord	Coord	Coord	Gap	Coord	Coord	Skip	Gap	Gap	Hold	Hold	
10th %ile Green (s)	85.7	85.7	85.7	6.3	95.5	95.5	0.0	12.5	6.3	12.5	12.5	
10th %ile Term Code	Coord	Coord	Coord	Gap	Coord	Coord	Skip	Gap	Gap	Hold	Hold	
Queue Length 50th (ft)	0	92	6	105	84	1		136	158		22	
Queue Length 95th (ft)	m1	#861	m13	m104	m725	m1		202	184		48	

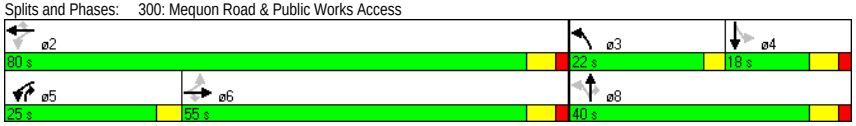
Volume
300: Mequon Road & Public Works Access 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		249			350			420			58	
Turn Bay Length (ft)	55			120					135			
Base Capacity (vph)	137	2017	812	380	2534	1020		361	627		256	
Starvation Cap Reductn	0	33	0	0	0	0		0	0		0	
Spillback Cap Reductn	0	0	0	0	88	0		0	0		0	
Storage Cap Reductn	0	0	0	0	0	0		0	0		0	
Reduced v/c Ratio	0.04	0.82	0.07	0.64	0.69	0.01		0.50	0.42		0.13	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 63 (53%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
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: 300: Mequon Road & Public Works Access



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Traffic Analysis & Design, Inc. Synchro 7 - Report

HCM Signalized Intersection Capacity Analysis
300: Mequon Road & Public Works Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1530	110	230	1575	20	165	5	495	15	1	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	9	12	12	9	11	11	11	12	12	12
Total Lost time (s)	6.0	6.0	6.0	3.5	6.0	6.0		6.0	3.5		6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.95	1.00		0.98	
Satd. Flow (prot)	1770	3539	1425	1752	3505	1411		1717	1531		1716	
Flt Permitted	0.13	1.00	1.00	0.06	1.00	1.00		0.71	1.00		0.82	
Satd. Flow (perm)	240	3539	1425	107	3505	1411		1274	1531		1448	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	5	1628	59	245	1676	11	176	5	263	16	1	16
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	5	1628	59	245	1676	11	0	181	263	0	33	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Turn Type	Perm		Perm	pm+pt		Perm	pm+pt		pm+ov	Perm		
Protected Phases		6		5	2		3	8	5		4	
Permitted Phases	6		6	2		2	8		8	4		
Actuated Green, G (s)	68.4	68.4	68.4	86.8	86.8	86.8		21.2	36.1		21.2	
Effective Green, g (s)	68.4	68.4	68.4	86.8	86.8	86.8		21.2	36.1		21.2	
Actuated g/C Ratio	0.57	0.57	0.57	0.72	0.72	0.72		0.18	0.30		0.18	
Clearance Time (s)	6.0	6.0	6.0	3.5	6.0	6.0		6.0	3.5		6.0	
Vehicle Extension (s)	5.0	5.0	5.0	2.0	5.0	5.0		2.0	2.0		2.0	
Lane Grp Cap (vph)	137	2017	812	282	2535	1021		225	461		256	
v/s Ratio Prot		0.46		c0.11	0.48				0.07			
v/s Ratio Perm	0.02		0.04	c0.52		0.01		c0.14	0.10		0.02	
v/c Ratio	0.04	0.81	0.07	0.87	0.66	0.01		0.80	0.57		0.13	
Uniform Delay, d1	11.3	20.5	11.6	37.3	8.8	4.6		47.4	35.4		41.6	
Progression Factor	0.44	0.34	0.46	1.26	0.64	0.24		1.00	1.00		1.00	
Incremental Delay, d2	0.3	2.5	0.1	18.1	1.0	0.0		17.6	1.1		0.1	
Delay (s)	5.4	9.5	5.5	65.1	6.7	1.1		65.0	36.5		41.7	
Level of Service	A	A	A	E	A	A		E	D		D	
Approach Delay (s)		9.3			14.0			48.1			41.7	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM Average Control Delay	16.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Volume
310: Mequon Road & Logeman Access

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	2020	15	0	1810	1	0	0	25	1	1	15
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.865		0.880	
Flt Protected											0.997	
Satd. Flow (prot)	0	3539	1425	0	3505	1411	0	0	1627	0	1650	0
Flt Permitted											0.997	
Satd. Flow (perm)	0	3539	1425	0	3505	1411	0	0	1627	0	1650	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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	2196	16	0	1967	1	0	0	27	1	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2201	16	0	1967	1	0	0	27	0	18	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
310: Mequon Road & Logeman Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	2020	15	0	1810	1	0	0	25	1	1	15
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	2196	16	0	1967	1	0	0	27	1	1	16
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)		430			842							
pX, platoon unblocked	0.71			0.61			0.76	0.76	0.61	0.76	0.76	0.71
vC, conflicting volume	1968			2212			3207	4175	1098	3103	4190	984
vC1, stage 1 conf vol							2207	2207		1967	1967	
vC2, stage 2 conf vol							1001	1968		1136	2223	
vCu, unblocked vol	1555			1715			1570	2850	0	1432	2870	174
tC, single (s)	4.1			4.2			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 %	98			100			100	100	96	99	98	97
cM capacity (veh/h)	301			222			53	52	667	77	52	601

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	737	1464	16	984	984	1	27	18
Volume Left	5	0	0	0	0	0	0	1
Volume Right	0	0	16	0	0	1	27	16
cSH	301	1700	1700	1700	1700	1700	667	297
Volume to Capacity	0.02	0.86	0.01	0.58	0.58	0.00	0.04	0.06
Queue Length 95th (ft)	1	0	0	0	0	0	3	5
Control Delay (s)	0.7	0.0	0.0	0.0	0.0	0.0	10.6	17.9
Lane LOS	A						B	C
Approach Delay (s)	0.2			0.0			10.6	17.9
Approach LOS							B	C

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		72.6%	ICU Level of Service C
Analysis Period (min)		15	

Volume
320: Mequon Road & River Centre Center Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1945	100	85	1815	80	75
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3574	1439	1752	5036	1787	1599
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3574	1439	1752	5036	1787	1599
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	1%	1%
Adj. Flow (vph)	2114	109	92	1973	87	82
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2114	109	92	1973	87	82
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
320: Mequon Road & River Centre Center Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1945	100	85	1815	80	75
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)	2114	109	92	1973	87	82
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)	625			647		
pX, platoon unblocked			0.62		0.74	0.62
vC, conflicting volume			2223		2957	1057
vC1, stage 1 conf vol					2114	
vC2, stage 2 conf vol					842	
vCu, unblocked vol			1741		898	0
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			58		2	88
cM capacity (veh/h)			218		88	671

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2
Volume Total	1057	1057	109	92	658	658	658	87	82
Volume Left	0	0	0	92	0	0	0	87	0
Volume Right	0	0	109	0	0	0	0	0	82
cSH	1700	1700	1700	218	1700	1700	1700	88	671
Volume to Capacity	0.62	0.62	0.06	0.42	0.39	0.39	0.39	0.98	0.12
Queue Length 95th (ft)	0	0	0	49	0	0	0	141	10
Control Delay (s)	0.0	0.0	0.0	33.2	0.0	0.0	0.0	176.9	11.1
Lane LOS				D				F	B
Approach Delay (s)	0.0			1.5				96.7	
Approach LOS								F	

Intersection Summary			
Average Delay		4.3	
Intersection Capacity Utilization		72.9%	ICU Level of Service C
Analysis Period (min)		15	

Volume
330: Mequon Road & Area H Access

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	2015	5	0	1815	10	0	0	50	0	0	1
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.999				0.865			0.865
Flt Protected												
Satd. Flow (prot)	0	5085	0	0	5031	0	0	0	1627	0	0	1627
Flt Permitted												
Satd. Flow (perm)	0	5085	0	0	5031	0	0	0	1627	0	0	1627
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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	0	2167	5	0	1952	11	0	0	54	0	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2172	0	0	1963	0	0	0	54	0	0	1
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
330: Mequon Road & Area H Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	2015	5	0	1815	10	0	0	50	0	0	1
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)	0	2167	5	0	1952	11	0	0	54	0	0	1
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)		935			337							
pX, platoon unblocked	0.74			0.76			0.86	0.86	0.76	0.86	0.86	0.74
vC, conflicting volume	1962			2172			2821	4132	725	2733	4129	656
vC1, stage 1 conf vol							2169	2169		1957	1957	
vC2, stage 2 conf vol							652	1962		776	2172	
vCu, unblocked vol	1065			1418			632	2154	0	530	2151	0
tC, single (s)	4.1			4.2			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 %	100			100			0	100	93	100	100	100
cM capacity (veh/h)	480			356			-62	101	821	33	101	804

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	867	867	439	781	781	401	54	1
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	5	0	0	11	54	1
cSH	1700	1700	1700	1700	1700	1700	821	804
Volume to Capacity	0.51	0.51	0.26	0.46	0.46	0.24	0.07	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	5	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	9.7	9.5
Lane LOS							A	A
Approach Delay (s)	0.0			0.0			9.7	9.5
Approach LOS							A	A

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		49.0%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
340: Mequon Road & Cedarburg Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	520	1375	170	280	1310	620	245	760	245	445	295	270
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3467	3574	1599	3433	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	3467	3574	1599	3433	3539	1583
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Adj. Flow (vph)	547	1447	89	295	1379	326	258	800	129	468	311	142
Shared Lane Traffic (%)												
Lane Group Flow (vph)	547	1447	89	295	1379	326	258	800	129	468	311	142
Turn Type	Prot		Perm	Prot		pt+ov	Prot		Perm	Prot		pt+ov
Protected Phases	1	6		5	2	2 7	3	8		7	4	4 1
Permitted Phases			6						8			
Detector Phase	1	6	6	5	2	2 7	3	8	8	7	4	4 1
Switch Phase												
Minimum Initial (s)	6.0	12.0	12.0	6.0	12.0		6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.5	18.7	18.7	10.5	18.7		10.5	16.9	16.9	10.5	16.9	
Total Split (s)	24.0	46.0	46.0	20.0	42.0	64.0	22.0	32.0	32.0	22.0	32.0	56.0
Total Split (%)	20.0%	38.3%	38.3%	16.7%	35.0%	53.3%	18.3%	26.7%	26.7%	18.3%	26.7%	46.7%
Maximum Green (s)	19.5	39.3	39.3	15.5	35.3		17.5	25.1	25.1	17.5	25.1	
Yellow Time (s)	3.5	3.9	3.9	3.5	3.9		3.5	3.9	3.9	3.5	3.9	
All-Red Time (s)	1.0	2.8	2.8	1.0	2.8		1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	6.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4		1.5	1.5	1.5	1.5	1.5	
Minimum Gap (s)	1.5	2.0	2.0	1.5	2.0		1.5	1.5	1.5	1.5	1.5	
Time Before Reduce (s)	15.0	28.0	28.0	15.0	20.0		20.0	40.0	40.0	30.0	40.0	
Time To Reduce (s)	0.0	12.0	12.0	0.0	20.0		0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None	None	None	None	
v/c Ratio	0.98	0.83	0.16	0.76	0.92	0.43	0.70	1.07	0.38	0.94	0.35	0.20
Control Delay	74.8	35.4	21.2	64.8	52.1	22.9	61.7	96.8	44.8	79.1	39.2	21.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.8	35.4	21.2	64.8	52.1	22.9	61.7	96.8	44.8	79.1	39.2	21.8
90th %ile Green (s)	19.5	39.3	39.3	15.5	35.3		16.7	25.1	25.1	17.5	25.9	
90th %ile Term Code	Max	Coord	Coord	Max	Coord		Gap	Max	Max	Max	Hold	
70th %ile Green (s)	19.5	39.3	39.3	15.5	35.3		14.4	25.1	25.1	17.5	28.2	
70th %ile Term Code	Max	Coord	Coord	Max	Coord		Gap	Max	Max	Max	Hold	
50th %ile Green (s)	19.5	40.7	40.7	14.1	35.3		12.8	25.1	25.1	17.5	29.8	
50th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Max	Max	Max	Hold	
30th %ile Green (s)	19.5	42.3	42.3	12.5	35.3		11.2	25.1	25.1	17.5	31.4	
30th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Max	Max	Max	Hold	
10th %ile Green (s)	19.5	44.8	44.8	10.0	35.3		8.9	25.7	25.7	16.9	33.7	

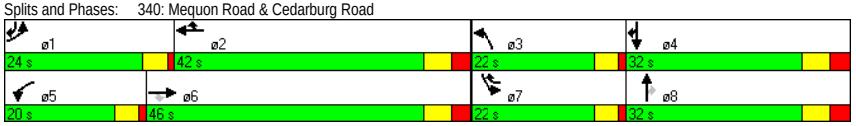
Volume
340: Mequon Road & Cedarburg Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Max	Max	Gap	Hold	
Queue Length 50th (ft)	207	407	53	115	379	162	101	~361	87	187	104	65
Queue Length 95th (ft)	m#326	467	m59	161	#469	240	141	#488	148	#288	154	116
Internal Link Dist (ft)		257			885			746			862	
Turn Bay Length (ft)	180		175	200		235	225		125	385		150
Base Capacity (vph)	558	1749	544	443	1496	756	506	751	336	501	879	710
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.83	0.16	0.67	0.92	0.43	0.51	1.07	0.38	0.93	0.35	0.20

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 1 (1%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
~ 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: 340: Mequon Road & Cedarburg Road



HCM Signalized Intersection Capacity Analysis
340: Mequon Road & Cedarburg Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	520	1375	170	280	1310	620	245	760	245	445	295	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	6.9
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3467	3574	1599	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	3467	3574	1599	3433	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	547	1447	89	295	1379	326	258	800	129	468	311	142
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	547	1447	89	295	1379	326	258	800	129	468	311	142
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Prot		Perm	Prot		pt+ov	Prot		Perm	Prot		pt+ov
Protected Phases	1	6		5	2	2 7	3	8		7	4	4 1
Permitted Phases			6						8			
Actuated Green, G (s)	19.5	41.3	41.3	13.5	35.3	59.4	12.8	25.2	25.2	17.4	29.8	56.2
Effective Green, g (s)	19.5	41.3	41.3	13.5	35.3	59.4	12.8	25.2	25.2	17.4	29.8	56.2
Actuated g/C Ratio	0.16	0.34	0.34	0.11	0.29	0.49	0.11	0.21	0.21	0.14	0.25	0.47
Clearance Time (s)	4.5	6.7	6.7	4.5	6.7		4.5	6.9	6.9	4.5	6.9	
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4		1.5	1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	558	1750	545	386	1496	784	370	751	336	498	879	741
v/s Ratio Prot	c0.16	0.28		0.09	c0.27	0.21	0.07	c0.22		c0.14	0.09	0.09
v/s Ratio Perm			0.06						0.08			
v/c Ratio	0.98	0.83	0.16	0.76	0.92	0.42	0.70	1.07	0.38	0.94	0.35	0.19
Uniform Delay, d1	50.1	36.1	27.3	51.7	41.0	19.3	51.7	47.4	40.7	50.8	37.2	18.6
Progression Factor	0.89	0.86	0.72	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	29.1	3.8	0.5	7.9	10.8	0.1	4.6	51.6	0.3	25.4	0.1	0.0
Delay (s)	73.5	34.7	20.3	59.6	51.9	19.4	56.3	99.0	41.0	76.2	37.3	18.7
Level of Service	E	C	C	E	D	B	E	F	D	E	D	B
Approach Delay (s)		44.3			47.7			83.4			54.2	
Approach LOS		D			D			F			D	

Intersection Summary			
HCM Average Control Delay	54.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	22.6
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Mequon Road

Direction	EB	WB	All
Total Delay / Veh (s/v)	8	8	8
Total Delay (hr)	54	62	115
Stops / Veh	0.18	0.24	0.21
Stops (#)	4459	6479	10938
Average Speed (mph)	18	17	18
Total Travel Time (hr)	115	126	241
Distance Traveled (mi)	2065	2197	4262
Fuel Consumed (gal)	151	177	328
Fuel Economy (mpg)	13.7	12.4	13.0
Performance Index	66.2	79.7	145.9

Network Totals

Number of Intersections	15
Total Delay / Veh (s/v)	13
Total Delay (hr)	197
Stops / Veh	0.27
Stops (#)	15230
Average Speed (mph)	14
Total Travel Time (hr)	346
Distance Traveled (mi)	5005
Fuel Consumed (gal)	445
Fuel Economy (mpg)	11.3
Performance Index	239.2

APPENDIX F

Year 2025 Build Traffic Analysis – With Alternative Three Improvements

Volume
200: Mequon Road & Wauwatosa Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	270	850	70	185	1100	360	235	570	220	250	245	120
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.950			0.950			0.592			0.165		
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	1103	3539	1583	293	3374	1509
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Adj. Flow (vph)	284	895	37	195	1158	189	247	600	116	263	258	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	284	895	37	195	1158	189	247	600	116	263	258	63
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	11.5	17.9	17.9	11.5	17.9	17.9	11.5	18.0	18.0	11.5	18.0	18.0
Total Split (s)	20.0	47.0	47.0	20.0	47.0	47.0	19.0	31.0	31.0	22.0	34.0	34.0
Total Split (%)	16.7%	39.2%	39.2%	16.7%	39.2%	39.2%	15.8%	25.8%	25.8%	18.3%	28.3%	28.3%
Maximum Green (s)	16.5	41.1	41.1	16.5	41.1	41.1	15.5	25.0	25.0	18.5	28.0	28.0
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0
All-Red Time (s)	0.0	0.9	0.9	0.0	0.9	0.9	0.0	1.0	1.0	0.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Minimum Gap (s)	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0
Time Before Reduce (s)	15.0	24.0	24.0	15.0	18.0	18.0	15.0	24.0	24.0	15.0	22.0	22.0
Time To Reduce (s)	0.0	16.0	16.0	0.0	22.0	22.0	0.0	16.0	16.0	0.0	18.0	18.0
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
v/c Ratio	0.69	0.67	0.06	0.58	0.92	0.34	0.53	0.82	0.35	0.80	0.32	0.18
Control Delay	58.0	33.2	24.7	56.9	49.0	30.1	28.2	53.6	43.2	44.3	37.9	37.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.0	33.2	24.7	56.9	49.0	30.1	28.2	53.6	43.2	44.3	37.9	37.8
90th %ile Green (s)	16.5	43.1	43.1	14.5	41.1	41.1	15.5	25.0	25.0	18.5	28.0	28.0
90th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Max	Max	Max	Max	Hold	Hold
70th %ile Green (s)	15.8	44.4	44.4	12.5	41.1	41.1	15.5	25.0	25.0	18.5	28.0	28.0
70th %ile Term Code	Gap	Hold	Hold	Gap	Max	Max	Max	Max	Max	Max	Hold	Hold
50th %ile Green (s)	14.0	44.1	44.1	11.0	41.1	41.1	15.5	25.0	25.0	18.5	28.0	28.0
50th %ile Term Code	Gap	Hold	Hold	Gap	Max	Max	Max	Max	Max	Max	Hold	Hold
30th %ile Green (s)	12.1	43.7	43.7	9.5	41.1	41.1	13.0	23.5	23.5	17.3	27.8	27.8
30th %ile Term Code	Gap	Hold	Hold	Gap	Max	Max	Gap	Gap	Gap	Gap	Hold	Hold
10th %ile Green (s)	9.2	35.3	35.3	8.0	34.1	34.1	9.7	18.1	18.1	12.4	20.8	20.8

Volume
200: Mequon Road & Wauwatosa Road

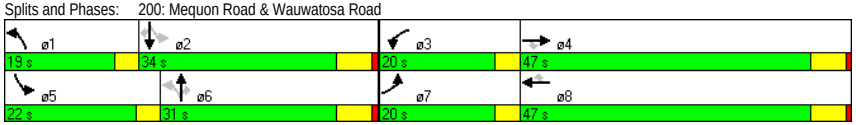
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Gap	Hold	Hold	Min	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
Queue Length 50th (ft)	108	295	18	74	443	105	124	228	75	134	85	38
Queue Length 95th (ft)	154	386	43	112	#604	174	196	#304	135	#262	127	79
Internal Link Dist (ft)		559			585			1105			792	
Turn Bay Length (ft)	135		35	295		50	185		110	150		200
Base Capacity (vph)	508	1371	613	508	1305	584	499	794	355	352	848	379
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.65	0.06	0.38	0.89	0.32	0.49	0.76	0.33	0.75	0.30	0.17

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 112.5
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 120
70th %ile Actuated Cycle: 119.3
50th %ile Actuated Cycle: 117.5
30th %ile Actuated Cycle: 112.9
10th %ile Actuated Cycle: 92.7
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 200: Mequon Road & Wauwatosa Road



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Traffic Analysis & Design, Inc.
Synchro 7 - Report

HCM Signalized Intersection Capacity Analysis
200: Mequon Road & Wauwatosa Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	270	850	70	185	1100	360	235	570	220	250	245	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.59	1.00	1.00	0.17	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	1103	3539	1583	294	3374	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	284	895	37	195	1158	189	247	600	116	263	258	63
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	284	895	37	195	1158	189	247	600	116	263	258	63
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Actuated Green, G (s)	13.4	42.2	42.2	11.0	39.8	39.8	37.0	23.3	23.3	43.6	26.6	26.6
Effective Green, g (s)	13.4	42.2	42.2	11.0	39.8	39.8	37.0	23.3	23.3	43.6	26.6	26.6
Actuated g/C Ratio	0.12	0.38	0.38	0.10	0.35	0.35	0.33	0.21	0.21	0.39	0.24	0.24
Clearance Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Lane Grp Cap (vph)	409	1329	594	336	1253	561	444	734	328	325	798	357
v/s Ratio Prot	c0.08	0.25		0.06	c0.33		0.07	0.17		c0.12	0.08	
v/s Ratio Perm			0.02			0.12	0.12		0.07	c0.19		0.04
v/c Ratio	0.69	0.67	0.06	0.58	0.92	0.34	0.56	0.82	0.35	0.81	0.32	0.18
Uniform Delay, d1	47.5	29.3	22.4	48.5	34.9	26.6	29.4	42.5	38.1	26.7	35.5	34.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.1	1.5	0.1	1.6	11.6	0.4	0.9	7.3	0.9	13.1	0.3	0.3
Delay (s)	51.6	30.8	22.5	50.1	46.4	27.0	30.3	49.8	39.0	39.8	35.8	34.5
Level of Service	D	C	C	D	D	C	C	D	D	D	D	C
Approach Delay (s)		35.4			44.5			43.5			37.5	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	40.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	112.4	Sum of lost time (s)	16.4
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Volume
210: Mequon Road & Area B West Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1500	20	0	1690	0	45
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3539	1583	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	3539	1583	0	3539	0	1611
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1579	21	0	1779	0	47
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1579	21	0	1779	0	47
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
210: Mequon Road & Area B West Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1500	20	0	1690	0	45
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)	1579	21	0	1779	0	47
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)	665					
pX, platoon unblocked			0.79		0.79	0.79
vC, conflicting volume			1600		2468	789
vC1, stage 1 conf vol					1579	
vC2, stage 2 conf vol					889	
vCu, unblocked vol			1225		2326	197
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 %			100		100	93
cM capacity (veh/h)			445		126	639

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	789	789	21	889	889	47
Volume Left	0	0	0	0	0	0
Volume Right	0	0	21	0	0	47
cSH	1700	1700	1700	1700	1700	639
Volume to Capacity	0.46	0.46	0.01	0.52	0.52	0.07
Queue Length 95th (ft)	0	0	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	11.1
Lane LOS						B
Approach Delay (s)	0.0			0.0		11.1
Approach LOS						B

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		51.5%	ICU Level of Service A
Analysis Period (min)		15	

Volume
220: Mequon Road & Area B East Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1525	20	70	1655	40	40
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850			0.932	
Flt Protected			0.950		0.976	
Satd. Flow (prot)	3505	1568	1752	3505	1694	0
Flt Permitted			0.950		0.976	
Satd. Flow (perm)	3505	1568	1752	3505	1694	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Adj. Flow (vph)	1589	21	73	1724	42	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1589	21	73	1724	84	0
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
220: Mequon Road & Area B East Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1525	20	70	1655	40	40
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1589	21	73	1724	42	42
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)	1205					
pX, platoon unblocked			0.79		0.79	0.79
vC, conflicting volume			1609		2596	794
vC1, stage 1 conf vol					1589	
vC2, stage 2 conf vol					1008	
vCu, unblocked vol			1250		2492	224
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			83		61	93
cM capacity (veh/h)			435		108	619

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	794	794	21	73	862	862	83
Volume Left	0	0	0	73	0	0	42
Volume Right	0	0	21	0	0	0	42
cSH	1700	1700	1700	435	1700	1700	184
Volume to Capacity	0.47	0.47	0.01	0.17	0.51	0.51	0.45
Queue Length 95th (ft)	0	0	0	15	0	0	53
Control Delay (s)	0.0	0.0	0.0	14.9	0.0	0.0	39.9
Lane LOS				B			E
Approach Delay (s)	0.0			0.6			39.9
Approach LOS							E

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization		60.7%	ICU Level of Service	B
Analysis Period (min)		15	

Volume
230: Mequon Road & Concord Creek Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1490	70	90	1650	5	60	1	70	15	1	15
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.953			0.955	
Satd. Flow (prot)	1752	3505	1411	1752	3505	1411	0	1775	1583	0	1429	1272
Flt Permitted	0.950			0.950				0.953			0.955	
Satd. Flow (perm)	1752	3505	1411	1752	3505	1411	0	1775	1583	0	1429	1272
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	27%	27%	27%
Adj. Flow (vph)	5	1552	73	94	1719	5	63	1	73	16	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1552	73	94	1719	5	0	63	73	0	17	16
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized
Description: High SB %HV

HCM Unsignalized Intersection Capacity Analysis
230: Mequon Road & Concord Creek Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1490	70	90	1650	5	60	1	70	15	1	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	1552	73	94	1719	5	62	1	73	16	1	16
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	1724			1625			2626	3474	776	2766	3542	859
vC1, stage 1 conf vol							1562	1562		1906	1906	
vC2, stage 2 conf vol							1063	1911		860	1635	
vCu, unblocked vol	1724			1625			2626	3474	776	2766	3542	859
tC, single (s)	4.2			4.2			7.5	6.5	6.9	8.0	7.0	7.4
tC, 2 stage (s)							6.5	5.5		7.0	6.0	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.8	4.3	3.6
p0 queue free %	99			76			4	98	79	45	94	94
cM capacity (veh/h)	358			392			65	52	340	28	19	254

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1	SB 2
Volume Total	5	776	776	73	94	859	859	5	64	73	17	16
Volume Left	5	0	0	0	94	0	0	0	62	0	16	0
Volume Right	0	0	0	73	0	0	0	5	0	73	0	16
cSH	358	1700	1700	1700	392	1700	1700	1700	65	340	28	254
Volume to Capacity	0.01	0.46	0.46	0.04	0.24	0.51	0.51	0.00	0.98	0.21	0.60	0.06
Queue Length 95th (ft)	1	0	0	0	23	0	0	0	120	20	48	5
Control Delay (s)	15.2	0.0	0.0	0.0	17.1	0.0	0.0	0.0	212.0	18.5	254.8	20.1
Lane LOS	C				C				F	C	F	C
Approach Delay (s)	0.0				0.9				108.6		141.3	
Approach LOS									F		F	

Intersection Summary			
Average Delay		5.8	
Intersection Capacity Utilization		69.0%	ICU Level of Service	C
Analysis Period (min)		15	
Description: High SB %HV			

Volume
240: Mequon Road & Area C Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1555	20	0	1745	0	40
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3505	1411	0	3505	0	1611
Flt Permitted						
Satd. Flow (perm)	3505	1411	0	3505	0	1611
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Adj. Flow (vph)	1620	21	0	1818	0	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1620	21	0	1818	0	42
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
240: Mequon Road & Area C Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1555	20	0	1745	0	40
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1620	21	0	1818	0	42
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			1641		2529	810
vC1, stage 1 conf vol					1620	
vC2, stage 2 conf vol					909	
vCu, unblocked vol			1641		2529	810
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	87
cM capacity (veh/h)			386		103	323

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	810	810	21	909	909	42
Volume Left	0	0	0	0	0	0
Volume Right	0	0	21	0	0	42
cSH	1700	1700	1700	1700	1700	323
Volume to Capacity	0.48	0.48	0.01	0.53	0.53	0.13
Queue Length 95th (ft)	0	0	0	0	0	11
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	17.8
Lane LOS						C
Approach Delay (s)	0.0			0.0		17.8
Approach LOS						C

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		53.0%	ICU Level of Service	A
Analysis Period (min)		15	

Volume
250: Mequon Road & Weston Center West Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1565	30	70	1720	25	30
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850			0.927	
Flt Protected			0.950		0.978	
Satd. Flow (prot)	3505	1411	1752	3505	1689	0
Flt Permitted			0.950		0.978	
Satd. Flow (perm)	3505	1411	1752	3505	1689	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Adj. Flow (vph)	1630	31	73	1792	26	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1630	31	73	1792	57	0
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
250: Mequon Road & Weston Center West Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1565	30	70	1720	25	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1630	31	73	1792	26	31
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised			Raised		
Median storage veh)	1			1		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1661		2672	815
vC1, stage 1 conf vol					1630	
vC2, stage 2 conf vol					1042	
vCu, unblocked vol			1661		2672	815
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			81		71	90
cM capacity (veh/h)			379		89	320

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	815	815	31	73	896	896	57
Volume Left	0	0	0	73	0	0	26
Volume Right	0	0	31	0	0	0	31
cSH	1700	1700	1700	379	1700	1700	147
Volume to Capacity	0.48	0.48	0.02	0.19	0.53	0.53	0.39
Queue Length 95th (ft)	0	0	0	18	0	0	42
Control Delay (s)	0.0	0.0	0.0	16.7	0.0	0.0	44.3
Lane LOS				C			E
Approach Delay (s)	0.0			0.7			44.3
Approach LOS							E

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

Volume
260: Mequon Road & Weston Center East Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1595	1	0	1790	0	10
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3574	1439	0	3505	0	1611
Flt Permitted						
Satd. Flow (perm)	3574	1439	0	3505	0	1611
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	2%	2%
Adj. Flow (vph)	1734	1	0	1946	0	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1734	1	0	1946	0	11
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
260: Mequon Road & Weston Center East Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1595	1	0	1790	0	10
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)	1734	1	0	1946	0	11
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)				1088		
pX, platoon unblocked					0.54	
vC, conflicting volume			1735		2707	867
vC1, stage 1 conf vol					1734	
vC2, stage 2 conf vol					973	
vCu, unblocked vol			1735		2456	867
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			355		98	296

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	867	867	1	973	973	11
Volume Left	0	0	0	0	0	0
Volume Right	0	0	1	0	0	11
cSH	1700	1700	1700	1700	1700	296
Volume to Capacity	0.51	0.51	0.00	0.57	0.57	0.04
Queue Length 95th (ft)	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	17.6
Lane LOS						C
Approach Delay (s)	0.0			0.0		17.6
Approach LOS						C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
270: Mequon Road & River Birch Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1575	25	50	1760	5	30	1	55	1	1	1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.914			0.955	
Flt Protected	0.950			0.950				0.983			0.984	
Satd. Flow (prot)	1787	3574	1439	1752	3505	1411	0	1690	0	0	1768	0
Flt Permitted	0.950			0.950				0.983			0.984	
Satd. Flow (perm)	1787	3574	1439	1752	3505	1411	0	1690	0	0	1768	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
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	1712	27	54	1913	5	33	1	60	1	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1712	27	54	1913	5	0	94	0	0	3	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
270: Mequon Road & River Birch Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1575	25	50	1760	5	30	1	55	1	1	1
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	1712	27	54	1913	5	33	1	60	1	1	1
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)					626							
pX, platoon unblocked	0.55						0.55	0.55		0.55	0.55	0.55
vC, conflicting volume	1918			1739			2790	3750	856	2949	3772	957
vC1, stage 1 conf vol							1723	1723		2022	2022	
vC2, stage 2 conf vol							1067	2027		927	1750	
vCu, unblocked vol	1034			1739			2618	4364	856	2907	4403	0
tC, single (s)	4.1			4.2			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			85			54	98	80	98	98	100
cM capacity (veh/h)	371			353			72	57	303	55	45	598

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	5	856	856	27	54	957	957	5	93	3
Volume Left	5	0	0	0	54	0	0	0	33	1
Volume Right	0	0	0	27	0	0	0	5	60	1
cSH	371	1700	1700	1700	353	1700	1700	1700	139	71
Volume to Capacity	0.01	0.50	0.50	0.02	0.15	0.56	0.56	0.00	0.67	0.05
Queue Length 95th (ft)	1	0	0	0	13	0	0	0	93	4
Control Delay (s)	14.9	0.0	0.0	0.0	17.0	0.0	0.0	0.0	72.2	58.1
Lane LOS	B				C				F	F
Approach Delay (s)	0.0				0.5				72.2	58.1
Approach LOS									F	F

Intersection Summary				
Average Delay		2.1		
Intersection Capacity Utilization		62.1%	ICU Level of Service	B
Analysis Period (min)		15		

Volume
280: Mequon Road & Buntrock Avenue

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	1485	60	115	1610	30	145	45	140	25	5	60
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.999				0.850			0.850
Flt Protected	0.950			0.950				0.963			0.960	
Satd. Flow (prot)	1770	3539	1425	1752	3385	0	0	1776	1568	0	1788	1583
Flt Permitted	0.058			0.073				0.756			0.674	
Satd. Flow (perm)	108	3539	1425	135	3385	0	0	1395	1568	0	1255	1583
Satd. Flow (RTOR)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	90	1580	32	122	1713	16	154	48	74	27	5	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	90	1580	32	122	1729	0	0	202	74	0	32	32
Turn Type	pm+pt		Perm	pm+pt			pm+pt		Perm	Perm		Perm
Protected Phases	1	6		5	2		3	8			4	
Permitted Phases	6		6	2			8		8	4		4
Detector Phase	1	6	6	5	2		3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0		6.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.5	21.4	21.4	9.5	21.4		9.0	17.1	17.1	17.1	17.1	17.1
Total Split (s)	18.0	62.0	62.0	18.0	62.0	0.0	22.0	40.0	40.0	18.0	18.0	18.0
Total Split (%)	15.0%	51.7%	51.7%	15.0%	51.7%	0.0%	18.3%	33.3%	33.3%	15.0%	15.0%	15.0%
Maximum Green (s)	14.5	55.6	55.6	14.5	55.6		19.0	32.9	32.9	10.9	10.9	10.9
Yellow Time (s)	3.5	4.0	4.0	3.5	4.0		3.0	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	0.0	2.4	2.4	0.0	2.4		0.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.4	6.4	3.5	6.4	4.0	3.0	7.1	7.1	7.1	7.1	7.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.5	5.5	2.0	5.5		2.0	1.5	1.5	1.5	1.5	1.5
Minimum Gap (s)	2.0	1.5	1.5	2.0	1.5		2.0	1.5	1.5	1.5	1.5	1.5
Time Before Reduce (s)	0.0	30.0	30.0	0.0	30.0		0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	15.0	15.0	0.0	15.0		0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None	None	None	None	None
v/c Ratio	0.52	0.77	0.04	0.59	0.87			0.69	0.22		0.12	0.10
Control Delay	26.1	24.7	14.5	37.2	15.9			54.9	38.5		36.3	35.6
Queue Delay	0.0	0.2	0.0	0.0	0.4			0.0	0.0		0.0	0.0
Total Delay	26.1	24.8	14.5	37.2	16.4			54.9	38.5		36.3	35.6
90th %ile Green (s)	10.5	56.9	56.9	13.2	59.6		0.0	32.9	32.9	32.9	32.9	32.9
90th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Skip	Max	Max	Hold	Hold	Hold
70th %ile Green (s)	7.9	62.8	62.8	9.7	64.6		0.0	30.5	30.5	30.5	30.5	30.5
70th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Skip	Gap	Gap	Hold	Hold	Hold
50th %ile Green (s)	6.4	69.6	69.6	7.2	70.4		0.0	26.2	26.2	26.2	26.2	26.2
50th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Skip	Gap	Gap	Hold	Hold	Hold
30th %ile Green (s)	6.0	75.1	75.1	6.2	75.3		0.0	21.7	21.7	21.7	21.7	21.7
30th %ile Term Code	Min	Coord	Coord	Gap	Coord		Skip	Gap	Gap	Hold	Hold	Hold
10th %ile Green (s)	6.0	81.8	81.8	6.0	81.8		0.0	15.2	15.2	15.2	15.2	15.2

Volume
280: Mequon Road & Buntrock Avenue

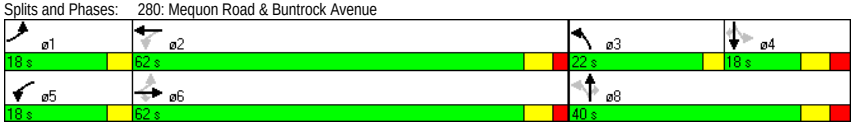
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Min	Coord	Coord	Min	Coord		Skip	Gap	Gap	Hold	Hold	Hold
Queue Length 50th (ft)	20	463	10	32	570			144	47		20	20
Queue Length 95th (ft)	75	#767	31	m86	#880			213	85		45	44
Internal Link Dist (ft)		546			209			420			420	
Turn Bay Length (ft)	100			120					70			40
Base Capacity (vph)	276	2042	822	290	1984			382	430		265	334
Starvation Cap Reductn	0	0	0	0	47			0	0		0	0
Spillback Cap Reductn	0	57	0	0	0			0	0		0	0
Storage Cap Reductn	0	0	0	0	0			0	0		0	0
Reduced v/c Ratio	0.33	0.80	0.04	0.42	0.89			0.53	0.17		0.12	0.10

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 52 (43%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
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: 280: Mequon Road & Buntrock Avenue



HCM Signalized Intersection Capacity Analysis
280: Mequon Road & Buntrock Avenue

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	1485	60	115	1610	30	145	45	140	25	5	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	9	12	11	9	12	12	12	12	12	12
Total Lost time (s)	3.5	6.4	6.4	3.5	6.4			7.1	7.1		7.1	7.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	3539	1425	1752	3383			1777	1568		1787	1583
Flt Permitted	0.06	1.00	1.00	0.07	1.00			0.76	1.00		0.67	1.00
Satd. Flow (perm)	108	3539	1425	134	3383			1395	1568		1255	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	90	1580	32	122	1713	16	154	48	74	27	5	32
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	90	1580	32	122	1729	0	0	202	74	0	32	32
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt		Perm	pm+pt			pm+pt		Perm	Perm		Perm
Protected Phases	1	6		5	2		3	8			4	
Permitted Phases	6		6	2			8		8	4		4
Actuated Green, G (s)	76.6	69.2	69.2	78.8	70.3			25.3	25.3		25.3	25.3
Effective Green, g (s)	76.6	69.2	69.2	78.8	70.3			25.3	25.3		25.3	25.3
Actuated g/C Ratio	0.64	0.58	0.58	0.66	0.59			0.21	0.21		0.21	0.21
Clearance Time (s)	3.5	6.4	6.4	3.5	6.4			7.1	7.1		7.1	7.1
Vehicle Extension (s)	2.0	5.5	5.5	2.0	5.5			1.5	1.5		1.5	1.5
Lane Grp Cap (vph)	171	2041	822	203	1982			294	331		265	334
v/s Ratio Prot	0.03	0.45		c0.04	c0.51							
v/s Ratio Perm	0.30		0.02	0.35				c0.14	0.05		0.03	0.02
v/c Ratio	0.53	0.77	0.04	0.60	0.87			0.69	0.22		0.12	0.10
Uniform Delay, d1	19.6	19.4	11.0	18.0	21.0			43.7	39.2		38.3	38.1
Progression Factor	1.00	1.00	1.00	2.07	0.44			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.3	2.9	0.1	2.5	4.3			5.2	0.1		0.1	0.0
Delay (s)	21.0	22.4	11.1	39.9	13.6			48.9	39.3		38.4	38.2
Level of Service	C	C	B	D	B			D	D		D	D
Approach Delay (s)		22.1			15.4			46.4			38.3	
Approach LOS		C			B			D			D	

Intersection Summary

HCM Average Control Delay	20.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.1
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Volume
290: Mequon Road & Jung Brewery Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1630	20	0	1755	0	15
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.998					0.865
Flt Protected						
Satd. Flow (prot)	3201	0	0	3388	0	1596
Flt Permitted						
Satd. Flow (perm)	3201	0	0	3388	0	1596
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	3%	3%	3%	3%
Parking (#/hr)	5	5				
Adj. Flow (vph)	1734	21	0	1867	0	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1755	0	0	1867	0	16
Sign Control	Free			Free	Stop	

Intersection Summary

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
290: Mequon Road & Jung Brewery Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1630	20	0	1755	0	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1734	21	0	1867	0	16
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)	289			329		
pX, platoon unblocked			0.65		0.79	0.65
vC, conflicting volume			1755		2678	878
vC1, stage 1 conf vol					1745	
vC2, stage 2 conf vol					934	
vCu, unblocked vol			1078		958	0
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)					5.9	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			412		172	700

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1156	599	934	934	16
Volume Left	0	0	0	0	0
Volume Right	0	21	0	0	16
cSH	1700	1700	1700	1700	700
Volume to Capacity	0.68	0.35	0.55	0.55	0.02
Queue Length 95th (ft)	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	10.3
Lane LOS					B
Approach Delay (s)	0.0		0.0		10.3
Approach LOS					B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

Volume
300: Mequon Road & Public Works Access 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1530	110	230	1575	20	165	5	495	15	1	15
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.999				0.850		0.935	
Flt Protected	0.950			0.950				0.954			0.976	
Satd. Flow (prot)	1770	3207	1247	1752	3385	0	0	1718	1531	0	1717	0
Flt Permitted	0.127			0.058				0.708			0.824	
Satd. Flow (perm)	237	3207	1247	107	3385	0	0	1275	1531	0	1449	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Parking (#/hr)		5	5									
Adj. Flow (vph)	5	1628	59	245	1676	11	176	5	263	16	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1628	59	245	1687	0	0	181	263	0	33	0
Turn Type	Perm		Perm	pm+pt			pm+pt		pm+ov	Perm		
Protected Phases		6		5	2		3	8	5		4	
Permitted Phases	6		6	2			8		8	4		
Detector Phase	6	6	6	5	2		3	8	5	4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	6.0	15.0		6.0	10.0	6.0	10.0	10.0	
Minimum Split (s)	21.0	21.0	21.0	9.5	21.0		9.0	16.0	9.5	16.0	16.0	
Total Split (s)	55.0	55.0	55.0	25.0	80.0	0.0	22.0	40.0	25.0	18.0	18.0	0.0
Total Split (%)	45.8%	45.8%	45.8%	20.8%	66.7%	0.0%	18.3%	33.3%	20.8%	15.0%	15.0%	0.0%
Maximum Green (s)	49.0	49.0	49.0	21.5	74.0		19.0	34.0	21.5	12.0	12.0	
Yellow Time (s)	4.0	4.0	4.0	3.5	4.0		3.0	4.0	3.5	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	0.0	2.0		0.0	2.0	0.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	3.5	6.0	4.0	3.0	6.0	3.5	6.0	6.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead			Lead		Lead	Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0	5.0	2.0	5.0		2.0	2.0	2.0	2.0	2.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		None	None	None	None	None	
v/c Ratio	0.04	0.89	0.08	0.86	0.69			0.80	0.49		0.13	
Control Delay	8.2	17.1	7.2	51.1	12.2			71.6	31.7		39.6	
Queue Delay	0.0	0.0	0.0	0.0	0.3			0.0	0.0		0.0	
Total Delay	8.2	17.1	7.2	51.1	12.5			71.6	31.7		39.6	
90th %ile Green (s)	51.1	51.1	51.1	23.6	78.2		0.0	29.8	23.6	29.8	29.8	
90th %ile Term Code	Coord	Coord	Coord	Gap	Coord		Skip	Gap	Gap	Hold	Hold	
70th %ile Green (s)	61.1	61.1	61.1	18.5	83.1		0.0	24.9	18.5	24.9	24.9	
70th %ile Term Code	Coord	Coord	Coord	Gap	Coord		Skip	Gap	Gap	Hold	Hold	
50th %ile Green (s)	68.3	68.3	68.3	14.9	86.7		0.0	21.3	14.9	21.3	21.3	
50th %ile Term Code	Coord	Coord	Coord	Gap	Coord		Skip	Gap	Gap	Hold	Hold	
30th %ile Green (s)	75.7	75.7	75.7	11.2	90.4		0.0	17.6	11.2	17.6	17.6	
30th %ile Term Code	Coord	Coord	Coord	Gap	Coord		Skip	Gap	Gap	Hold	Hold	
10th %ile Green (s)	85.7	85.7	85.7	6.3	95.5		0.0	12.5	6.3	12.5	12.5	
10th %ile Term Code	Coord	Coord	Coord	Gap	Coord		Skip	Gap	Gap	Hold	Hold	
Queue Length 50th (ft)	0	89	6	93	559			136	158		22	

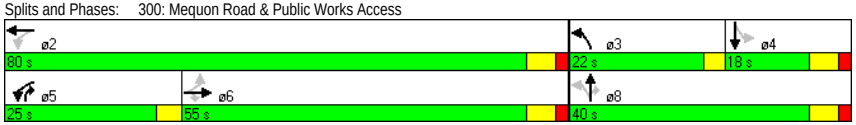
Volume
300: Mequon Road & Public Works Access 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	m1	#923	m12	m104	m737			202	184		48	
Internal Link Dist (ft)		249			350			420			58	
Turn Bay Length (ft)	55			120					135			
Base Capacity (vph)	135	1827	711	380	2448			361	627		256	
Starvation Cap Reductn	0	0	0	0	0			0	0		0	
Spillback Cap Reductn	0	0	0	0	247			0	0		0	
Storage Cap Reductn	0	0	0	0	0			0	0		0	
Reduced v/c Ratio	0.04	0.89	0.08	0.64	0.77			0.50	0.42		0.13	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 63 (53%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
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: 300: Mequon Road & Public Works Access



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Traffic Analysis & Design, Inc. Synchro 7 - Report

HCM Signalized Intersection Capacity Analysis
300: Mequon Road & Public Works Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1530	110	230	1575	20	165	5	495	15	1	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	9	12	11	9	11	11	11	12	12	12
Total Lost time (s)	6.0	6.0	6.0	3.5	6.0			6.0	3.5		6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85		0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.98	
Satd. Flow (prot)	1770	3207	1247	1752	3385			1717	1531		1716	
Flt Permitted	0.13	1.00	1.00	0.06	1.00			0.71	1.00		0.82	
Satd. Flow (perm)	236	3207	1247	107	3385			1274	1531		1448	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	5	1628	59	245	1676	11	176	5	263	16	1	16
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	5	1628	59	245	1687	0	0	181	263	0	33	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Parking (#/hr)		5	5									
Turn Type	Perm		Perm	pm+pt			pm+pt		pm+ov	Perm		
Protected Phases		6		5	2		3	8	5		4	
Permitted Phases	6		6	2			8		8	4		
Actuated Green, G (s)	68.4	68.4	68.4	86.8	86.8			21.2	36.1		21.2	
Effective Green, g (s)	68.4	68.4	68.4	86.8	86.8			21.2	36.1		21.2	
Actuated g/C Ratio	0.57	0.57	0.57	0.72	0.72			0.18	0.30		0.18	
Clearance Time (s)	6.0	6.0	6.0	3.5	6.0			6.0	3.5		6.0	
Vehicle Extension (s)	5.0	5.0	5.0	2.0	5.0			2.0	2.0		2.0	
Lane Grp Cap (vph)	135	1828	711	282	2448			225	461		256	
v/s Ratio Prot		0.51		c0.11	0.50				0.07			
v/s Ratio Perm	0.02		0.05	c0.52				c0.14	0.10		0.02	
v/c Ratio	0.04	0.89	0.08	0.87	0.69			0.80	0.57		0.13	
Uniform Delay, d1	11.3	22.5	11.6	37.3	9.2			47.4	35.4		41.6	
Progression Factor	0.42	0.35	0.44	0.95	1.04			1.00	1.00		1.00	
Incremental Delay, d2	0.4	5.1	0.2	18.1	1.2			17.6	1.1		0.1	
Delay (s)	5.2	13.0	5.3	53.8	10.8			65.0	36.5		41.7	
Level of Service	A	B	A	D	B			E	D		D	
Approach Delay (s)		12.7			16.2			48.1			41.7	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	18.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Volume
310: Mequon Road & Logeman Access

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	2020	15	0	1810	1	0	0	25	1	1	15
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999							0.865		0.880	
Flt Protected											0.997	
Satd. Flow (prot)	0	3204	0	0	3388	0	0	0	1627	0	1650	0
Flt Permitted											0.997	
Satd. Flow (perm)	0	3204	0	0	3388	0	0	0	1627	0	1650	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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		5	5									
Adj. Flow (vph)	5	2196	16	0	1967	1	0	0	27	1	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2217	0	0	1968	0	0	0	27	0	18	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
310: Mequon Road & Logeman Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	2020	15	0	1810	1	0	0	25	1	1	15
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	2196	16	0	1967	1	0	0	27	1	1	16
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)		430			842							
pX, platoon unblocked	0.72			0.55			0.69	0.69	0.55	0.69	0.69	0.72
vC, conflicting volume	1968			2212			3215	4183	1106	3104	4191	984
vC1, stage 1 conf vol							2215	2215		1968	1968	
vC2, stage 2 conf vol							1001	1968		1136	2223	
vCu, unblocked vol	1559			1559			1456	2861	0	1294	2872	184
tC, single (s)	4.1			4.2			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 %	98			100			100	100	95	99	98	97
cM capacity (veh/h)	301			227			58	53	595	77	53	594

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1103	1114	1312	657	27	18
Volume Left	5	0	0	0	0	1
Volume Right	0	16	0	1	27	16
cSH	301	1700	1700	1700	595	298
Volume to Capacity	0.02	0.66	0.77	0.39	0.05	0.06
Queue Length 95th (ft)	1	0	0	0	4	5
Control Delay (s)	1.0	0.0	0.0	0.0	11.3	17.9
Lane LOS	A				B	C
Approach Delay (s)	0.5		0.0		11.3	17.9
Approach LOS					B	C

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		73.1%	ICU Level of Service D
Analysis Period (min)		15	

Volume
320: Mequon Road & River Centre Center Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1945	100	85	1815	80	75
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3239	1259	1752	4868	1787	1599
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3239	1259	1752	4868	1787	1599
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	1%	1%
Parking (#/hr)	5	5				
Adj. Flow (vph)	2114	109	92	1973	87	82
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2114	109	92	1973	87	82
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
320: Mequon Road & River Centre Center Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1945	100	85	1815	80	75
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)	2114	109	92	1973	87	82
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)	625			647		
pX, platoon unblocked			0.55		0.68	0.55
vC, conflicting volume			2223		2957	1057
vC1, stage 1 conf vol					2114	
vC2, stage 2 conf vol					842	
vCu, unblocked vol			1599		689	0
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			58		5	86
cM capacity (veh/h)			222		92	603

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2
Volume Total	1057	1057	109	92	658	658	658	87	82
Volume Left	0	0	0	92	0	0	0	87	0
Volume Right	0	0	109	0	0	0	0	0	82
cSH	1700	1700	1700	222	1700	1700	1700	92	603
Volume to Capacity	0.62	0.62	0.06	0.42	0.39	0.39	0.39	0.95	0.14
Queue Length 95th (ft)	0	0	0	48	0	0	0	136	12
Control Delay (s)	0.0	0.0	0.0	32.2	0.0	0.0	0.0	163.1	11.9
Lane LOS				D				F	B
Approach Delay (s)	0.0			1.4				90.0	
Approach LOS								F	

Intersection Summary			
Average Delay		4.1	
Intersection Capacity Utilization		72.9%	ICU Level of Service	C
Analysis Period (min)		15	

Volume
330: Mequon Road & Area H Access

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	2015	5	0	1815	10	0	0	50	0	0	1
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.999				0.865			0.865
Flt Protected												
Satd. Flow (prot)	0	4916	0	0	4863	0	0	0	1627	0	0	1627
Flt Permitted												
Satd. Flow (perm)	0	4916	0	0	4863	0	0	0	1627	0	0	1627
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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	0	2167	5	0	1952	11	0	0	54	0	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2172	0	0	1963	0	0	0	54	0	0	1
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
330: Mequon Road & Area H Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	2015	5	0	1815	10	0	0	50	0	0	1
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)	0	2167	5	0	1952	11	0	0	54	0	0	1
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)		935			337							
pX, platoon unblocked	0.74						0.74	0.74		0.74	0.74	0.74
vC, conflicting volume	1962			2172			2821	4132	725	2733	4129	656
vC1, stage 1 conf vol							2169	2169		1957	1957	
vC2, stage 2 conf vol							652	1962		776	2172	
vCu, unblocked vol	1064			2172			2226	4001	725	2107	3998	0
tC, single (s)	4.1			4.2			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 %	100			100			100	100	85	100	100	100
cM capacity (veh/h)	481			239			43	57	370	111	57	803

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	867	867	439	781	781	401	54	1
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	5	0	0	11	54	1
cSH	1700	1700	1700	1700	1700	1700	370	803
Volume to Capacity	0.51	0.51	0.26	0.46	0.46	0.24	0.15	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	13	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	16.4	9.5
Lane LOS							C	A
Approach Delay (s)	0.0			0.0			16.4	9.5
Approach LOS							C	A

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		49.0%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
340: Mequon Road & Cedarburg Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	520	1375	170	280	1310	620	245	760	245	445	295	270
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3467	3574	1599	3433	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	3467	3574	1599	3433	3539	1583
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Adj. Flow (vph)	547	1447	89	295	1379	326	258	800	129	468	311	142
Shared Lane Traffic (%)												
Lane Group Flow (vph)	547	1447	89	295	1379	326	258	800	129	468	311	142
Turn Type	Prot		Perm	Prot		pt+ov	Prot		Perm	Prot		pt+ov
Protected Phases	1	6		5	2	2 7	3	8		7	4	4 1
Permitted Phases			6						8			
Detector Phase	1	6	6	5	2	2 7	3	8	8	7	4	4 1
Switch Phase												
Minimum Initial (s)	6.0	12.0	12.0	6.0	12.0		6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.5	18.7	18.7	10.5	18.7		10.5	16.9	16.9	10.5	16.9	
Total Split (s)	24.0	46.0	46.0	20.0	42.0	64.0	22.0	32.0	32.0	22.0	32.0	56.0
Total Split (%)	20.0%	38.3%	38.3%	16.7%	35.0%	53.3%	18.3%	26.7%	26.7%	18.3%	26.7%	46.7%
Maximum Green (s)	19.5	39.3	39.3	15.5	35.3		17.5	25.1	25.1	17.5	25.1	
Yellow Time (s)	3.5	3.9	3.9	3.5	3.9		3.5	3.9	3.9	3.5	3.9	
All-Red Time (s)	1.0	2.8	2.8	1.0	2.8		1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	6.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4		1.5	1.5	1.5	1.5	1.5	
Minimum Gap (s)	1.5	2.0	2.0	1.5	2.0		1.5	1.5	1.5	1.5	1.5	
Time Before Reduce (s)	15.0	28.0	28.0	15.0	20.0		20.0	40.0	40.0	30.0	40.0	
Time To Reduce (s)	0.0	12.0	12.0	0.0	20.0		0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None	None	None	None	
v/c Ratio	0.98	0.83	0.16	0.76	0.92	0.43	0.70	1.07	0.38	0.94	0.35	0.20
Control Delay	72.1	36.8	22.4	64.8	52.1	22.9	61.7	96.8	44.8	79.1	39.2	21.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.1	36.8	22.4	64.8	52.1	22.9	61.7	96.8	44.8	79.1	39.2	21.8
90th %ile Green (s)	19.5	39.3	39.3	15.5	35.3		16.7	25.1	25.1	17.5	25.9	
90th %ile Term Code	Max	Coord	Coord	Max	Coord		Gap	Max	Max	Max	Hold	
70th %ile Green (s)	19.5	39.3	39.3	15.5	35.3		14.4	25.1	25.1	17.5	28.2	
70th %ile Term Code	Max	Coord	Coord	Max	Coord		Gap	Max	Max	Max	Hold	
50th %ile Green (s)	19.5	40.7	40.7	14.1	35.3		12.8	25.1	25.1	17.5	29.8	
50th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Max	Max	Max	Hold	
30th %ile Green (s)	19.5	42.3	42.3	12.5	35.3		11.2	25.1	25.1	17.5	31.4	
30th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Max	Max	Max	Hold	
10th %ile Green (s)	19.5	44.8	44.8	10.0	35.3		8.9	25.7	25.7	16.9	33.7	

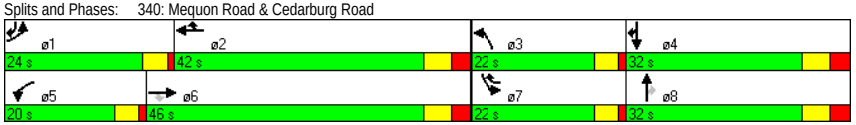
Volume
340: Mequon Road & Cedarburg Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Max	Max	Gap	Hold	
Queue Length 50th (ft)	209	391	53	115	379	162	101	~361	87	187	104	65
Queue Length 95th (ft)	m#289	467	m64	161	#469	240	141	#488	148	#288	154	116
Internal Link Dist (ft)		257			885			746			862	
Turn Bay Length (ft)	180		175	200		235	225		125	385		150
Base Capacity (vph)	558	1749	544	443	1496	756	506	751	336	501	879	710
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.83	0.16	0.67	0.92	0.43	0.51	1.07	0.38	0.93	0.35	0.20

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 1 (1%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
~ 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: 340: Mequon Road & Cedarburg Road



HCM Signalized Intersection Capacity Analysis
340: Mequon Road & Cedarburg Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	520	1375	170	280	1310	620	245	760	245	445	295	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	6.9
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3467	3574	1599	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	3467	3574	1599	3433	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	547	1447	89	295	1379	326	258	800	129	468	311	142
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	547	1447	89	295	1379	326	258	800	129	468	311	142
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Prot		Perm	Prot		pt+ov	Prot		Perm	Prot		pt+ov
Protected Phases	1	6		5	2	2 7	3	8		7	4	4 1
Permitted Phases			6						8			
Actuated Green, G (s)	19.5	41.3	41.3	13.5	35.3	59.4	12.8	25.2	25.2	17.4	29.8	56.2
Effective Green, g (s)	19.5	41.3	41.3	13.5	35.3	59.4	12.8	25.2	25.2	17.4	29.8	56.2
Actuated g/C Ratio	0.16	0.34	0.34	0.11	0.29	0.49	0.11	0.21	0.21	0.14	0.25	0.47
Clearance Time (s)	4.5	6.7	6.7	4.5	6.7		4.5	6.9	6.9	4.5	6.9	
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4		1.5	1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	558	1750	545	386	1496	784	370	751	336	498	879	741
v/s Ratio Prot	c0.16	0.28		0.09	c0.27	0.21	0.07	c0.22		c0.14	0.09	0.09
v/s Ratio Perm			0.06						0.08			
v/c Ratio	0.98	0.83	0.16	0.76	0.92	0.42	0.70	1.07	0.38	0.94	0.35	0.19
Uniform Delay, d1	50.1	36.1	27.3	51.7	41.0	19.3	51.7	47.4	40.7	50.8	37.2	18.6
Progression Factor	0.85	0.90	0.77	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	28.0	3.5	0.5	7.9	10.8	0.1	4.6	51.6	0.3	25.4	0.1	0.0
Delay (s)	70.7	36.2	21.5	59.6	51.9	19.4	56.3	99.0	41.0	76.2	37.3	18.7
Level of Service	E	D	C	E	D	B	E	F	D	E	D	B
Approach Delay (s)		44.6			47.7			83.4			54.2	
Approach LOS		D			D			F			D	

Intersection Summary				
HCM Average Control Delay	54.5	HCM Level of Service	D	
HCM Volume to Capacity ratio	0.97			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	22.6	
Intersection Capacity Utilization	92.7%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

Mequon Road

Direction	EB	WB	All
Total Delay / Veh (s/v)	8	9	8
Total Delay (hr)	56	65	121
Stops / Veh	0.19	0.27	0.23
Stops (#)	4789	7155	11944
Average Speed (mph)	19	18	19
Total Travel Time (hr)	108	120	227
Distance Traveled (mi)	2065	2197	4262
Fuel Consumed (gal)	162	196	359
Fuel Economy (mpg)	12.7	11.2	11.9
Performance Index	69.4	84.6	154.1

Network Totals

Number of Intersections	15
Total Delay / Veh (s/v)	13
Total Delay (hr)	202
Stops / Veh	0.29
Stops (#)	16236
Average Speed (mph)	15
Total Travel Time (hr)	331
Distance Traveled (mi)	5005
Fuel Consumed (gal)	475
Fuel Economy (mpg)	10.5
Performance Index	247.2

APPENDIX F

Year 2025 Build Traffic Analysis – With Alternative Four Improvements

Volume
200: Mequon Road & Wauwatosa Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	270	850	70	185	1100	360	235	570	220	250	245	120
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.950			0.950			0.592			0.165		
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	1103	3539	1583	293	3374	1509
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Adj. Flow (vph)	284	895	37	195	1158	189	247	600	116	263	258	63
Shared Lane Traffic (%)												
Lane Group Flow (vph)	284	895	37	195	1158	189	247	600	116	263	258	63
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Detector Phase	7	4	4	3	8	8	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0	8.0	12.0	12.0
Minimum Split (s)	11.5	17.9	17.9	11.5	17.9	17.9	11.5	18.0	18.0	11.5	18.0	18.0
Total Split (s)	20.0	47.0	47.0	20.0	47.0	47.0	19.0	31.0	31.0	22.0	34.0	34.0
Total Split (%)	16.7%	39.2%	39.2%	16.7%	39.2%	39.2%	15.8%	25.8%	25.8%	18.3%	28.3%	28.3%
Maximum Green (s)	16.5	41.1	41.1	16.5	41.1	41.1	15.5	25.0	25.0	18.5	28.0	28.0
Yellow Time (s)	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0	3.5	5.0	5.0
All-Red Time (s)	0.0	0.9	0.9	0.0	0.9	0.9	0.0	1.0	1.0	0.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Minimum Gap (s)	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0	1.7	2.0	2.0
Time Before Reduce (s)	15.0	24.0	24.0	15.0	18.0	18.0	15.0	24.0	24.0	15.0	22.0	22.0
Time To Reduce (s)	0.0	16.0	16.0	0.0	22.0	22.0	0.0	16.0	16.0	0.0	18.0	18.0
Recall Mode	None	Min	Min	None	Min	Min	None	None	None	None	None	None
v/c Ratio	0.69	0.67	0.06	0.58	0.92	0.34	0.53	0.82	0.35	0.80	0.32	0.18
Control Delay	58.0	33.2	24.7	56.9	49.0	30.1	28.2	53.6	43.2	44.3	37.9	37.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.0	33.2	24.7	56.9	49.0	30.1	28.2	53.6	43.2	44.3	37.9	37.8
90th %ile Green (s)	16.5	43.1	43.1	14.5	41.1	41.1	15.5	25.0	25.0	18.5	28.0	28.0
90th %ile Term Code	Max	Hold	Hold	Gap	Max	Max	Max	Max	Max	Max	Hold	Hold
70th %ile Green (s)	15.8	44.4	44.4	12.5	41.1	41.1	15.5	25.0	25.0	18.5	28.0	28.0
70th %ile Term Code	Gap	Hold	Hold	Gap	Max	Max	Max	Max	Max	Max	Hold	Hold
50th %ile Green (s)	14.0	44.1	44.1	11.0	41.1	41.1	15.5	25.0	25.0	18.5	28.0	28.0
50th %ile Term Code	Gap	Hold	Hold	Gap	Max	Max	Max	Max	Max	Max	Hold	Hold
30th %ile Green (s)	12.1	43.7	43.7	9.5	41.1	41.1	13.0	23.5	23.5	17.3	27.8	27.8
30th %ile Term Code	Gap	Hold	Hold	Gap	Max	Max	Gap	Gap	Gap	Gap	Hold	Hold
10th %ile Green (s)	9.2	35.3	35.3	8.0	34.1	34.1	9.7	18.1	18.1	12.4	20.8	20.8

Volume
200: Mequon Road & Wauwatosa Road

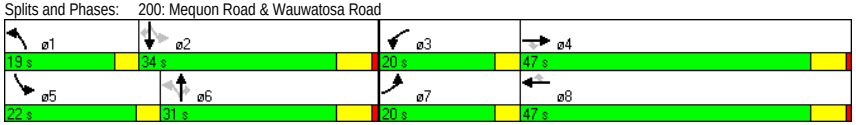
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Gap	Hold	Hold	Min	Gap	Gap	Gap	Gap	Gap	Gap	Hold	Hold
Queue Length 50th (ft)	108	295	18	74	443	105	124	228	75	134	85	38
Queue Length 95th (ft)	154	386	43	112	#604	174	196	#304	135	#262	127	79
Internal Link Dist (ft)		559			585			1105			792	
Turn Bay Length (ft)	135		35	295		50	185		110	150		200
Base Capacity (vph)	508	1371	613	508	1305	584	499	794	355	352	848	379
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.65	0.06	0.38	0.89	0.32	0.49	0.76	0.33	0.75	0.30	0.17

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 112.5
Natural Cycle: 75
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 120
70th %ile Actuated Cycle: 119.3
50th %ile Actuated Cycle: 117.5
30th %ile Actuated Cycle: 112.9
10th %ile Actuated Cycle: 92.7
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 200: Mequon Road & Wauwatosa Road



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Traffic Analysis & Design, Inc.
Synchro 7 - Report

HCM Signalized Intersection Capacity Analysis
200: Mequon Road & Wauwatosa Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	270	850	70	185	1100	360	235	570	220	250	245	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	1770	3539	1583	1687	3374	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.59	1.00	1.00	0.17	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	1103	3539	1583	294	3374	1509
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	284	895	37	195	1158	189	247	600	116	263	258	63
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	284	895	37	195	1158	189	247	600	116	263	258	63
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	7%	7%	7%
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases			4			8	6		6	2		2
Actuated Green, G (s)	13.4	42.2	42.2	11.0	39.8	39.8	37.0	23.3	23.3	43.6	26.6	26.6
Effective Green, g (s)	13.4	42.2	42.2	11.0	39.8	39.8	37.0	23.3	23.3	43.6	26.6	26.6
Actuated g/C Ratio	0.12	0.38	0.38	0.10	0.35	0.35	0.33	0.21	0.21	0.39	0.24	0.24
Clearance Time (s)	3.5	5.9	5.9	3.5	5.9	5.9	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	3.8	3.8	2.0	3.4	3.4	2.0	3.8	3.8	2.0	4.0	4.0
Lane Grp Cap (vph)	409	1329	594	336	1253	561	444	734	328	325	798	357
v/s Ratio Prot	c0.08	0.25		0.06	c0.33		0.07	0.17		c0.12	0.08	
v/s Ratio Perm			0.02			0.12	0.12		0.07	c0.19		0.04
v/c Ratio	0.69	0.67	0.06	0.58	0.92	0.34	0.56	0.82	0.35	0.81	0.32	0.18
Uniform Delay, d1	47.5	29.3	22.4	48.5	34.9	26.6	29.4	42.5	38.1	26.7	35.5	34.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.1	1.5	0.1	1.6	11.6	0.4	0.9	7.3	0.9	13.1	0.3	0.3
Delay (s)	51.6	30.8	22.5	50.1	46.4	27.0	30.3	49.8	39.0	39.8	35.8	34.5
Level of Service	D	C	C	D	D	C	C	D	D	D	D	C
Approach Delay (s)		35.4			44.5			43.5			37.5	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	40.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	112.4	Sum of lost time (s)	16.4
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Volume
210: Mequon Road & Area B West Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1500	20	0	1690	0	45
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3539	1583	0	3539	0	1611
Flt Permitted						
Satd. Flow (perm)	3539	1583	0	3539	0	1611
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1579	21	0	1779	0	47
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1579	21	0	1779	0	47
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
210: Mequon Road & Area B West Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1500	20	0	1690	0	45
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)	1579	21	0	1779	0	47
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)	665					
pX, platoon unblocked			0.79		0.79	0.79
vC, conflicting volume			1600		2468	789
vC1, stage 1 conf vol					1579	
vC2, stage 2 conf vol					889	
vCu, unblocked vol			1225		2326	198
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 %			100		100	93
cM capacity (veh/h)			445		126	639

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	789	789	21	889	889	47
Volume Left	0	0	0	0	0	0
Volume Right	0	0	21	0	0	47
cSH	1700	1700	1700	1700	1700	639
Volume to Capacity	0.46	0.46	0.01	0.52	0.52	0.07
Queue Length 95th (ft)	0	0	0	0	0	6
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	11.1
Lane LOS						B
Approach Delay (s)	0.0			0.0		11.1
Approach LOS						B

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		51.5%	ICU Level of Service A
Analysis Period (min)		15	

Volume
220: Mequon Road & Area B East Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1525	20	70	1655	40	40
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850			0.932	
Flt Protected			0.950		0.976	
Satd. Flow (prot)	3505	1568	1752	3505	1694	0
Flt Permitted			0.950		0.976	
Satd. Flow (perm)	3505	1568	1752	3505	1694	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Adj. Flow (vph)	1589	21	73	1724	42	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1589	21	73	1724	84	0
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
220: Mequon Road & Area B East Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1525	20	70	1655	40	40
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1589	21	73	1724	42	42
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)	1205					
pX, platoon unblocked			0.80		0.80	0.80
vC, conflicting volume			1609		2596	794
vC1, stage 1 conf vol					1589	
vC2, stage 2 conf vol					1008	
vCu, unblocked vol			1254		2493	231
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			83		61	93
cM capacity (veh/h)			434		108	614

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	794	794	21	73	862	862	83
Volume Left	0	0	0	73	0	0	42
Volume Right	0	0	21	0	0	0	42
cSH	1700	1700	1700	434	1700	1700	183
Volume to Capacity	0.47	0.47	0.01	0.17	0.51	0.51	0.45
Queue Length 95th (ft)	0	0	0	15	0	0	53
Control Delay (s)	0.0	0.0	0.0	15.0	0.0	0.0	40.1
Lane LOS				B			E
Approach Delay (s)	0.0			0.6			40.1
Approach LOS							E

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization		60.7%	ICU Level of Service	B
Analysis Period (min)		15	

Volume
230: Mequon Road & Concord Creek Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1490	70	90	1650	5	60	1	70	15	1	15
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950				0.953			0.955	
Satd. Flow (prot)	1752	3505	1411	1752	3505	1411	0	1775	1583	0	1429	1272
Flt Permitted	0.950			0.950				0.953			0.955	
Satd. Flow (perm)	1752	3505	1411	1752	3505	1411	0	1775	1583	0	1429	1272
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	27%	27%	27%
Adj. Flow (vph)	5	1552	73	94	1719	5	63	1	73	16	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1552	73	94	1719	5	0	63	73	0	17	16
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized
Description: High SB %HV

HCM Unsignalized Intersection Capacity Analysis
230: Mequon Road & Concord Creek Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1490	70	90	1650	5	60	1	70	15	1	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	5	1552	73	94	1719	5	62	1	73	16	1	16
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	1724			1625			2626	3474	776	2766	3542	859
vC1, stage 1 conf vol							1562	1562		1906	1906	
vC2, stage 2 conf vol							1063	1911		860	1635	
vCu, unblocked vol	1724			1625			2626	3474	776	2766	3542	859
tC, single (s)	4.2			4.2			7.5	6.5	6.9	8.0	7.0	7.4
tC, 2 stage (s)							6.5	5.5		7.0	6.0	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.8	4.3	3.6
p0 queue free %	99			76			4	98	79	45	94	94
cM capacity (veh/h)	358			392			65	52	340	28	19	254

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2	SB 1	SB 2
Volume Total	5	776	776	73	94	859	859	5	64	73	17	16
Volume Left	5	0	0	0	94	0	0	0	62	0	16	0
Volume Right	0	0	0	73	0	0	0	5	0	73	0	16
cSH	358	1700	1700	1700	392	1700	1700	1700	65	340	28	254
Volume to Capacity	0.01	0.46	0.46	0.04	0.24	0.51	0.51	0.00	0.98	0.21	0.60	0.06
Queue Length 95th (ft)	1	0	0	0	23	0	0	0	120	20	48	5
Control Delay (s)	15.2	0.0	0.0	0.0	17.1	0.0	0.0	0.0	212.0	18.5	254.8	20.1
Lane LOS	C				C				F	C	F	C
Approach Delay (s)	0.0				0.9				108.6		141.3	
Approach LOS									F		F	

Intersection Summary			
Average Delay		5.8	
Intersection Capacity Utilization		69.0%	ICU Level of Service C
Analysis Period (min)		15	
Description: High SB %HV			

Volume
240: Mequon Road & Area C Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1555	20	0	1745	0	40
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3505	1411	0	3505	0	1611
Flt Permitted						
Satd. Flow (perm)	3505	1411	0	3505	0	1611
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Adj. Flow (vph)	1620	21	0	1818	0	42
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1620	21	0	1818	0	42
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
240: Mequon Road & Area C Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1555	20	0	1745	0	40
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1620	21	0	1818	0	42
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			1641		2529	810
vC1, stage 1 conf vol					1620	
vC2, stage 2 conf vol					909	
vCu, unblocked vol			1641		2529	810
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	87
cM capacity (veh/h)			386		103	323

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	810	810	21	909	909	42
Volume Left	0	0	0	0	0	0
Volume Right	0	0	21	0	0	42
cSH	1700	1700	1700	1700	1700	323
Volume to Capacity	0.48	0.48	0.01	0.53	0.53	0.13
Queue Length 95th (ft)	0	0	0	0	0	11
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	17.8
Lane LOS						C
Approach Delay (s)	0.0			0.0		17.8
Approach LOS						C

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		53.0%	ICU Level of Service	A
Analysis Period (min)		15	

Volume
250: Mequon Road & Weston Center West Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1565	30	70	1720	25	30
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850			0.927	
Flt Protected			0.950		0.978	
Satd. Flow (prot)	3505	1411	1752	3505	1689	0
Flt Permitted			0.950		0.978	
Satd. Flow (perm)	3505	1411	1752	3505	1689	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Adj. Flow (vph)	1630	31	73	1792	26	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1630	31	73	1792	57	0
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
250: Mequon Road & Weston Center West Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1565	30	70	1720	25	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	1630	31	73	1792	26	31
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	Raised			Raised		
Median storage veh)	1			1		
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1661		2672	815
vC1, stage 1 conf vol					1630	
vC2, stage 2 conf vol					1042	
vCu, unblocked vol			1661		2672	815
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			81		71	90
cM capacity (veh/h)			379		89	320

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	815	815	31	73	896	896	57
Volume Left	0	0	0	73	0	0	26
Volume Right	0	0	31	0	0	0	31
cSH	1700	1700	1700	379	1700	1700	147
Volume to Capacity	0.48	0.48	0.02	0.19	0.53	0.53	0.39
Queue Length 95th (ft)	0	0	0	18	0	0	42
Control Delay (s)	0.0	0.0	0.0	16.7	0.0	0.0	44.3
Lane LOS				C			E
Approach Delay (s)	0.0			0.7			44.3
Approach LOS							E

Intersection Summary			
Average Delay		1.0	
Intersection Capacity Utilization		60.5%	ICU Level of Service	B
Analysis Period (min)		15	

Volume
260: Mequon Road & Weston Center East Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1595	1	0	1790	0	10
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt		0.850				0.865
Flt Protected						
Satd. Flow (prot)	3574	1439	0	3505	0	1611
Flt Permitted						
Satd. Flow (perm)	3574	1439	0	3505	0	1611
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	2%	2%
Adj. Flow (vph)	1734	1	0	1946	0	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1734	1	0	1946	0	11
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
260: Mequon Road & Weston Center East Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1595	1	0	1790	0	10
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)	1734	1	0	1946	0	11
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)				1088		
pX, platoon unblocked					0.54	
vC, conflicting volume			1735		2707	867
vC1, stage 1 conf vol					1734	
vC2, stage 2 conf vol					973	
vCu, unblocked vol			1735		2452	867
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			355		98	296

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	867	867	1	973	973	11
Volume Left	0	0	0	0	0	0
Volume Right	0	0	1	0	0	11
cSH	1700	1700	1700	1700	1700	296
Volume to Capacity	0.51	0.51	0.00	0.57	0.57	0.04
Queue Length 95th (ft)	0	0	0	0	0	3
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	17.6
Lane LOS						C
Approach Delay (s)	0.0			0.0		17.6
Approach LOS						C

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		

Volume
270: Mequon Road & River Birch Drive

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1575	25	50	1760	5	30	1	55	1	1	1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.914			0.955	
Flt Protected	0.950			0.950				0.983			0.984	
Satd. Flow (prot)	1787	3574	1439	1752	3505	1411	0	1690	0	0	1768	0
Flt Permitted	0.950			0.950				0.983			0.984	
Satd. Flow (perm)	1787	3574	1439	1752	3505	1411	0	1690	0	0	1768	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
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	5	1712	27	54	1913	5	33	1	60	1	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1712	27	54	1913	5	0	94	0	0	3	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
270: Mequon Road & River Birch Drive

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	1575	25	50	1760	5	30	1	55	1	1	1
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	1712	27	54	1913	5	33	1	60	1	1	1
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)					626							
pX, platoon unblocked	0.55						0.55	0.55		0.55	0.55	0.55
vC, conflicting volume	1918			1739			2790	3750	856	2949	3772	957
vC1, stage 1 conf vol							1723	1723		2022	2022	
vC2, stage 2 conf vol							1067	2027		927	1750	
vCu, unblocked vol	1026			1739			2616	4369	856	2907	4409	0
tC, single (s)	4.1			4.2			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			85			54	98	80	98	98	100
cM capacity (veh/h)	372			353			72	57	303	55	45	596

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1
Volume Total	5	856	856	27	54	957	957	5	93	3
Volume Left	5	0	0	0	54	0	0	0	33	1
Volume Right	0	0	0	27	0	0	0	5	60	1
cSH	372	1700	1700	1700	353	1700	1700	1700	139	71
Volume to Capacity	0.01	0.50	0.50	0.02	0.15	0.56	0.56	0.00	0.67	0.05
Queue Length 95th (ft)	1	0	0	0	13	0	0	0	93	4
Control Delay (s)	14.8	0.0	0.0	0.0	17.0	0.0	0.0	0.0	72.2	58.0
Lane LOS	B				C				F	F
Approach Delay (s)	0.0				0.5				72.2	58.0
Approach LOS									F	F

Intersection Summary			
Average Delay		2.1	
Intersection Capacity Utilization		62.1%	ICU Level of Service
Analysis Period (min)		15	

Volume
280: Mequon Road & Buntrock Avenue

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	1485	60	115	1610	30	145	45	140	25	5	60
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.999				0.850			0.850
Flt Protected	0.950			0.950				0.963			0.960	
Satd. Flow (prot)	1770	3539	1425	1752	3385	0	0	1776	1568	0	1788	1583
Flt Permitted	0.058			0.073				0.756			0.674	
Satd. Flow (perm)	108	3539	1425	135	3385	0	0	1395	1568	0	1255	1583
Satd. Flow (RTOR)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	90	1580	32	122	1713	16	154	48	74	27	5	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	90	1580	32	122	1729	0	0	202	74	0	32	32
Turn Type	pm+pt		Perm	pm+pt			pm+pt		Perm	Perm		Perm
Protected Phases	1	6		5	2		3	8			4	
Permitted Phases	6		6	2			8		8	4		4
Detector Phase	1	6	6	5	2		3	8	8	4	4	4
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0		6.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	9.5	21.4	21.4	9.5	21.4		9.0	17.1	17.1	17.1	17.1	17.1
Total Split (s)	18.0	62.0	62.0	18.0	62.0	0.0	22.0	40.0	40.0	18.0	18.0	18.0
Total Split (%)	15.0%	51.7%	51.7%	15.0%	51.7%	0.0%	18.3%	33.3%	33.3%	15.0%	15.0%	15.0%
Maximum Green (s)	14.5	55.6	55.6	14.5	55.6		19.0	32.9	32.9	10.9	10.9	10.9
Yellow Time (s)	3.5	4.0	4.0	3.5	4.0		3.0	4.1	4.1	4.1	4.1	4.1
All-Red Time (s)	0.0	2.4	2.4	0.0	2.4		0.0	3.0	3.0	3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	3.5	6.4	6.4	3.5	6.4	4.0	3.0	7.1	7.1	7.1	7.1	7.1
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead			Lag	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	5.5	5.5	2.0	5.5		2.0	1.5	1.5	1.5	1.5	1.5
Minimum Gap (s)	2.0	1.5	1.5	2.0	1.5		2.0	1.5	1.5	1.5	1.5	1.5
Time Before Reduce (s)	0.0	30.0	30.0	0.0	30.0		0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	15.0	15.0	0.0	15.0		0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None	None	None	None	None
v/c Ratio	0.52	0.77	0.04	0.59	0.87			0.69	0.22		0.12	0.10
Control Delay	26.1	24.7	14.5	36.1	15.0			54.9	38.5		36.3	35.6
Queue Delay	0.0	0.1	0.0	0.0	0.4			0.0	0.0		0.0	0.0
Total Delay	26.1	24.8	14.5	36.1	15.5			54.9	38.5		36.3	35.6
90th %ile Green (s)	10.5	56.9	56.9	13.2	59.6		0.0	32.9	32.9	32.9	32.9	32.9
90th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Skip	Max	Max	Hold	Hold	Hold
70th %ile Green (s)	7.9	62.8	62.8	9.7	64.6		0.0	30.5	30.5	30.5	30.5	30.5
70th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Skip	Gap	Gap	Hold	Hold	Hold
50th %ile Green (s)	6.4	69.6	69.6	7.2	70.4		0.0	26.2	26.2	26.2	26.2	26.2
50th %ile Term Code	Gap	Coord	Coord	Gap	Coord		Skip	Gap	Gap	Hold	Hold	Hold
30th %ile Green (s)	6.0	75.1	75.1	6.2	75.3		0.0	21.7	21.7	21.7	21.7	21.7
30th %ile Term Code	Min	Coord	Coord	Gap	Coord		Skip	Gap	Gap	Hold	Hold	Hold
10th %ile Green (s)	6.0	81.8	81.8	6.0	81.8		0.0	15.2	15.2	15.2	15.2	15.2

Volume
280: Mequon Road & Buntrock Avenue

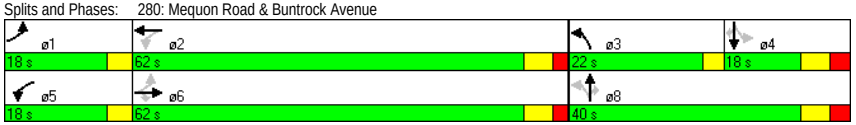
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Min	Coord	Coord	Min	Coord		Skip	Gap	Gap	Hold	Hold	Hold
Queue Length 50th (ft)	20	463	10	33	124			144	47		20	20
Queue Length 95th (ft)	75	#767	31	m91	#880			213	85		45	44
Internal Link Dist (ft)		546			209			420			420	
Turn Bay Length (ft)	100			120					70			40
Base Capacity (vph)	276	2042	822	290	1984			382	430		265	334
Starvation Cap Reductn	0	0	0	0	47			0	0		0	0
Spillback Cap Reductn	0	54	0	0	0			0	0		0	0
Storage Cap Reductn	0	0	0	0	0			0	0		0	0
Reduced v/c Ratio	0.33	0.79	0.04	0.42	0.89			0.53	0.17		0.12	0.10

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 49 (41%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
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: 280: Mequon Road & Buntrock Avenue



HCM Signalized Intersection Capacity Analysis
280: Mequon Road & Buntrock Avenue

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	1485	60	115	1610	30	145	45	140	25	5	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	9	12	11	9	12	12	12	12	12	12
Total Lost time (s)	3.5	6.4	6.4	3.5	6.4			7.1	7.1		7.1	7.1
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	3539	1425	1752	3383			1777	1568		1787	1583
Flt Permitted	0.06	1.00	1.00	0.07	1.00			0.76	1.00		0.67	1.00
Satd. Flow (perm)	108	3539	1425	134	3383			1395	1568		1255	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	90	1580	32	122	1713	16	154	48	74	27	5	32
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	90	1580	32	122	1729	0	0	202	74	0	32	32
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	3%	3%	3%	2%	2%	2%
Turn Type	pm+pt		Perm	pm+pt			pm+pt		Perm	Perm		Perm
Protected Phases	1	6		5	2		3	8			4	
Permitted Phases	6		6	2			8		8	4		4
Actuated Green, G (s)	76.6	69.2	69.2	78.8	70.3			25.3	25.3		25.3	25.3
Effective Green, g (s)	76.6	69.2	69.2	78.8	70.3			25.3	25.3		25.3	25.3
Actuated g/C Ratio	0.64	0.58	0.58	0.66	0.59			0.21	0.21		0.21	0.21
Clearance Time (s)	3.5	6.4	6.4	3.5	6.4			7.1	7.1		7.1	7.1
Vehicle Extension (s)	2.0	5.5	5.5	2.0	5.5			1.5	1.5		1.5	1.5
Lane Grp Cap (vph)	171	2041	822	203	1982			294	331		265	334
v/s Ratio Prot	0.03	0.45		c0.04	c0.51							
v/s Ratio Perm	0.30		0.02	0.35				c0.14	0.05		0.03	0.02
v/c Ratio	0.53	0.77	0.04	0.60	0.87			0.69	0.22		0.12	0.10
Uniform Delay, d1	19.6	19.4	11.0	18.0	21.0			43.7	39.2		38.3	38.1
Progression Factor	1.00	1.00	1.00	1.99	0.40			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.3	2.9	0.1	2.5	4.3			5.2	0.1		0.1	0.0
Delay (s)	21.0	22.4	11.1	38.5	12.7			48.9	39.3		38.4	38.2
Level of Service	C	C	B	D	B			D	D		D	D
Approach Delay (s)		22.1			14.4			46.4			38.3	
Approach LOS		C			B			D			D	

Intersection Summary

HCM Average Control Delay	20.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.1
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Volume
290: Mequon Road & Jung Brewery Access 12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1630	20	0	1755	0	15
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Frt	0.998					0.865
Flt Protected						
Satd. Flow (prot)	3201	0	0	3388	0	1596
Flt Permitted						
Satd. Flow (perm)	3201	0	0	3388	0	1596
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	2%	3%	3%	3%	3%
Parking (#/hr)	5	5				
Adj. Flow (vph)	1734	21	0	1867	0	16
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1755	0	0	1867	0	16
Sign Control	Free			Free	Stop	

Intersection Summary

Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
290: Mequon Road & Jung Brewery Access 12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1630	20	0	1755	0	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1734	21	0	1867	0	16
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)	289			329		
pX, platoon unblocked			0.64		0.79	0.64
vC, conflicting volume			1755		2678	878
vC1, stage 1 conf vol					1745	
vC2, stage 2 conf vol					934	
vCu, unblocked vol			1069		935	0
tC, single (s)			4.2		6.9	7.0
tC, 2 stage (s)					5.9	
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	98
cM capacity (veh/h)			414		173	697

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	1156	599	934	934	16
Volume Left	0	0	0	0	0
Volume Right	0	21	0	0	16
cSH	1700	1700	1700	1700	697
Volume to Capacity	0.68	0.35	0.55	0.55	0.02
Queue Length 95th (ft)	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	10.3
Lane LOS					B
Approach Delay (s)	0.0		0.0		10.3
Approach LOS					B

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

Volume
300: Mequon Road & Public Works Access 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1530	110	230	1575	20	165	5	495	15	1	15
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.999				0.850		0.935	
Flt Protected	0.950			0.950				0.954			0.976	
Satd. Flow (prot)	1770	3207	1247	1752	3385	0	0	1718	1531	0	1717	0
Flt Permitted	0.127			0.058				0.708			0.824	
Satd. Flow (perm)	237	3207	1247	107	3385	0	0	1275	1531	0	1449	0
Satd. Flow (RTOR)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Parking (#/hr)		5	5									
Adj. Flow (vph)	5	1628	59	245	1676	11	176	5	263	16	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1628	59	245	1687	0	0	181	263	0	33	0
Turn Type	Perm		Perm	pm+pt			pm+pt		pm+ov	Perm		
Protected Phases		6		5	2		3	8	5		4	
Permitted Phases	6		6	2			8		8	4		
Detector Phase	6	6	6	5	2		3	8	5	4	4	
Switch Phase												
Minimum Initial (s)	15.0	15.0	15.0	6.0	15.0		6.0	10.0	6.0	10.0	10.0	
Minimum Split (s)	21.0	21.0	21.0	9.5	21.0		9.0	16.0	9.5	16.0	16.0	
Total Split (s)	55.0	55.0	55.0	25.0	80.0	0.0	22.0	40.0	25.0	18.0	18.0	0.0
Total Split (%)	45.8%	45.8%	45.8%	20.8%	66.7%	0.0%	18.3%	33.3%	20.8%	15.0%	15.0%	0.0%
Maximum Green (s)	49.0	49.0	49.0	21.5	74.0		19.0	34.0	21.5	12.0	12.0	
Yellow Time (s)	4.0	4.0	4.0	3.5	4.0		3.0	4.0	3.5	4.0	4.0	
All-Red Time (s)	2.0	2.0	2.0	0.0	2.0		0.0	2.0	0.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	3.5	6.0	4.0	3.0	6.0	3.5	6.0	6.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead			Lead		Lead	Lag	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	5.0	5.0	5.0	2.0	5.0		2.0	2.0	2.0	2.0	2.0	
Recall Mode	C-Max	C-Max	C-Max	None	C-Max		None	None	None	None	None	
v/c Ratio	0.04	0.89	0.08	0.86	0.69			0.80	0.49		0.13	
Control Delay	8.6	17.2	7.5	60.4	8.4			71.6	31.7		39.6	
Queue Delay	0.0	0.0	0.0	0.0	0.2			0.0	0.0		0.0	
Total Delay	8.6	17.2	7.5	60.4	8.6			71.6	31.7		39.6	
90th %ile Green (s)	51.1	51.1	51.1	23.6	78.2		0.0	29.8	23.6	29.8	29.8	
90th %ile Term Code	Coord	Coord	Coord	Gap	Coord		Skip	Gap	Gap	Hold	Hold	
70th %ile Green (s)	61.1	61.1	61.1	18.5	83.1		0.0	24.9	18.5	24.9	24.9	
70th %ile Term Code	Coord	Coord	Coord	Gap	Coord		Skip	Gap	Gap	Hold	Hold	
50th %ile Green (s)	68.3	68.3	68.3	14.9	86.7		0.0	21.3	14.9	21.3	21.3	
50th %ile Term Code	Coord	Coord	Coord	Gap	Coord		Skip	Gap	Gap	Hold	Hold	
30th %ile Green (s)	75.7	75.7	75.7	11.2	90.4		0.0	17.6	11.2	17.6	17.6	
30th %ile Term Code	Coord	Coord	Coord	Gap	Coord		Skip	Gap	Gap	Hold	Hold	
10th %ile Green (s)	85.7	85.7	85.7	6.3	95.5		0.0	12.5	6.3	12.5	12.5	
10th %ile Term Code	Coord	Coord	Coord	Gap	Coord		Skip	Gap	Gap	Hold	Hold	
Queue Length 50th (ft)	0	93	6	105	114			136	158		22	

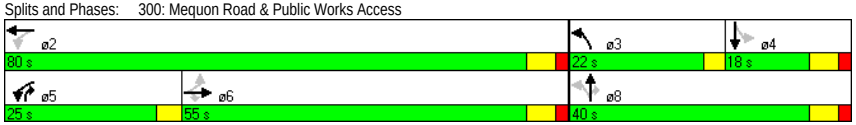
Volume
300: Mequon Road & Public Works Access 12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)	m1	#923	m13	m104	m734			202	184		48	
Internal Link Dist (ft)		249			350			420			58	
Turn Bay Length (ft)	55			120					135			
Base Capacity (vph)	135	1827	711	380	2448			361	627		256	
Starvation Cap Reductn	0	0	0	0	0			0	0		0	
Spillback Cap Reductn	0	0	0	0	170			0	0		0	
Storage Cap Reductn	0	0	0	0	0			0	0		0	
Reduced v/c Ratio	0.04	0.89	0.08	0.64	0.74			0.50	0.42		0.13	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 63 (53%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
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: 300: Mequon Road & Public Works Access



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Traffic Analysis & Design, Inc. Synchro 7 - Report

HCM Signalized Intersection Capacity Analysis
300: Mequon Road & Public Works Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1530	110	230	1575	20	165	5	495	15	1	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	11	9	12	11	9	11	11	11	12	12	12
Total Lost time (s)	6.0	6.0	6.0	3.5	6.0			6.0	3.5		6.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85		0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.98	
Satd. Flow (prot)	1770	3207	1247	1752	3385			1717	1531		1716	
Flt Permitted	0.13	1.00	1.00	0.06	1.00			0.71	1.00		0.82	
Satd. Flow (perm)	236	3207	1247	107	3385			1274	1531		1448	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	100%
Adj. Flow (vph)	5	1628	59	245	1676	11	176	5	263	16	1	16
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	5	1628	59	245	1687	0	0	181	263	0	33	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	1%	1%	1%
Parking (#/hr)		5	5									
Turn Type	Perm		Perm	pm+pt			pm+pt		pm+ov	Perm		
Protected Phases		6		5	2		3	8	5		4	
Permitted Phases	6		6	2			8		8	4		
Actuated Green, G (s)	68.4	68.4	68.4	86.8	86.8			21.2	36.1		21.2	
Effective Green, g (s)	68.4	68.4	68.4	86.8	86.8			21.2	36.1		21.2	
Actuated g/C Ratio	0.57	0.57	0.57	0.72	0.72			0.18	0.30		0.18	
Clearance Time (s)	6.0	6.0	6.0	3.5	6.0			6.0	3.5		6.0	
Vehicle Extension (s)	5.0	5.0	5.0	2.0	5.0			2.0	2.0		2.0	
Lane Grp Cap (vph)	135	1828	711	282	2448			225	461		256	
v/s Ratio Prot		0.51		c0.11	0.50				0.07			
v/s Ratio Perm	0.02		0.05	c0.52				c0.14	0.10		0.02	
v/c Ratio	0.04	0.89	0.08	0.87	0.69			0.80	0.57		0.13	
Uniform Delay, d1	11.3	22.5	11.6	37.3	9.2			47.4	35.4		41.6	
Progression Factor	0.45	0.36	0.46	1.26	0.69			1.00	1.00		1.00	
Incremental Delay, d2	0.4	5.1	0.2	18.1	1.2			17.6	1.1		0.1	
Delay (s)	5.4	13.1	5.5	65.1	7.5			65.0	36.5		41.7	
Level of Service	A	B	A	E	A			E	D		D	
Approach Delay (s)		12.8			14.8			48.1			41.7	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	17.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Volume
310: Mequon Road & Logeman Access

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	2020	15	0	1810	1	0	0	25	1	1	15
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999							0.865		0.880	
Flt Protected											0.997	
Satd. Flow (prot)	0	3204	0	0	3388	0	0	0	1627	0	1650	0
Flt Permitted											0.997	
Satd. Flow (perm)	0	3204	0	0	3388	0	0	0	1627	0	1650	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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		5	5									
Adj. Flow (vph)	5	2196	16	0	1967	1	0	0	27	1	1	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2217	0	0	1968	0	0	0	27	0	18	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
310: Mequon Road & Logeman Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	2020	15	0	1810	1	0	0	25	1	1	15
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	2196	16	0	1967	1	0	0	27	1	1	16
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)		430			842							
pX, platoon unblocked	0.71			0.54			0.69	0.69	0.54	0.69	0.69	0.71
vC, conflicting volume	1968			2212			3215	4183	1106	3104	4191	984
vC1, stage 1 conf vol							2215	2215		1968	1968	
vC2, stage 2 conf vol							1001	1968		1136	2223	
vCu, unblocked vol	1554			1551			1437	2846	0	1275	2857	175
tC, single (s)	4.1			4.2			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 %	98			100			100	100	95	99	98	97
cM capacity (veh/h)	301			228			58	53	592	78	53	600

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	1103	1114	1312	657	27	18
Volume Left	5	0	0	0	0	1
Volume Right	0	16	0	1	27	16
cSH	301	1700	1700	1700	592	300
Volume to Capacity	0.02	0.66	0.77	0.39	0.05	0.06
Queue Length 95th (ft)	1	0	0	0	4	5
Control Delay (s)	1.0	0.0	0.0	0.0	11.4	17.8
Lane LOS	A				B	C
Approach Delay (s)	0.5		0.0		11.4	17.8
Approach LOS					B	C

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		73.1%	ICU Level of Service D
Analysis Period (min)		15	

Volume
320: Mequon Road & River Centre Center Access

12/21/2011

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1945	100	85	1815	80	75
Lane Util. Factor	0.95	1.00	1.00	0.91	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3239	1259	1752	4868	1787	1599
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3239	1259	1752	4868	1787	1599
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	3%	3%	1%	1%
Parking (#/hr)	5	5				
Adj. Flow (vph)	2114	109	92	1973	87	82
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2114	109	92	1973	87	82
Sign Control	Free			Free	Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
320: Mequon Road & River Centre Center Access

12/21/2011

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1945	100	85	1815	80	75
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)	2114	109	92	1973	87	82
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)	625			647		
pX, platoon unblocked			0.55		0.68	0.55
vC, conflicting volume			2223		2957	1057
vC1, stage 1 conf vol					2114	
vC2, stage 2 conf vol					842	
vCu, unblocked vol			1597		703	0
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			58		6	86
cM capacity (veh/h)			222		93	603

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	NB 2
Volume Total	1057	1057	109	92	658	658	658	87	82
Volume Left	0	0	0	92	0	0	0	87	0
Volume Right	0	0	109	0	0	0	0	0	82
cSH	1700	1700	1700	222	1700	1700	1700	93	603
Volume to Capacity	0.62	0.62	0.06	0.42	0.39	0.39	0.39	0.94	0.14
Queue Length 95th (ft)	0	0	0	48	0	0	0	134	12
Control Delay (s)	0.0	0.0	0.0	32.2	0.0	0.0	0.0	157.9	11.9
Lane LOS				D				F	B
Approach Delay (s)	0.0			1.4				87.3	
Approach LOS								F	

Intersection Summary			
Average Delay		4.0	
Intersection Capacity Utilization		72.9%	ICU Level of Service C
Analysis Period (min)		15	

Volume
330: Mequon Road & Area H Access

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	2015	5	0	1815	10	0	0	50	0	0	1
Lane Util. Factor	1.00	0.91	0.91	1.00	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.999				0.865			0.865
Flt Protected												
Satd. Flow (prot)	0	4916	0	0	4863	0	0	0	1627	0	0	1627
Flt Permitted												
Satd. Flow (perm)	0	4916	0	0	4863	0	0	0	1627	0	0	1627
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
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	0	2167	5	0	1952	11	0	0	54	0	0	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	2172	0	0	1963	0	0	0	54	0	0	1
Sign Control		Free			Free			Stop			Stop	

Intersection Summary
Control Type: Unsignalized

HCM Unsignalized Intersection Capacity Analysis
330: Mequon Road & Area H Access

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	2015	5	0	1815	10	0	0	50	0	0	1
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)	0	2167	5	0	1952	11	0	0	54	0	0	1
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)		935			337							
pX, platoon unblocked	0.74						0.74	0.74		0.74	0.74	0.74
vC, conflicting volume	1962			2172			2821	4132	725	2733	4129	656
vC1, stage 1 conf vol							2169	2169		1957	1957	
vC2, stage 2 conf vol							652	1962		776	2172	
vCu, unblocked vol	1065			2172			2227	4002	725	2108	3998	0
tC, single (s)	4.1			4.2			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 %	100			100			100	100	85	100	100	100
cM capacity (veh/h)	480			239			43	57	370	111	57	804

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	867	867	439	781	781	401	54	1
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	5	0	0	11	54	1
cSH	1700	1700	1700	1700	1700	1700	370	804
Volume to Capacity	0.51	0.51	0.26	0.46	0.46	0.24	0.15	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	13	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	16.4	9.5
Lane LOS							C	A
Approach Delay (s)	0.0			0.0			16.4	9.5
Approach LOS							C	A

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		49.0%	ICU Level of Service	A
Analysis Period (min)		15		

Volume
340: Mequon Road & Cedarburg Road

12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	520	1375	170	280	1310	620	245	760	245	445	295	270
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3467	3574	1599	3433	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	3467	3574	1599	3433	3539	1583
Satd. Flow (RTOR)												
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Adj. Flow (vph)	547	1447	89	295	1379	326	258	800	129	468	311	142
Shared Lane Traffic (%)												
Lane Group Flow (vph)	547	1447	89	295	1379	326	258	800	129	468	311	142
Turn Type	Prot		Perm	Prot		pt+ov	Prot		Perm	Prot		pt+ov
Protected Phases	1	6		5	2	2 7	3	8		7	4	4 1
Permitted Phases			6						8			
Detector Phase	1	6	6	5	2	2 7	3	8	8	7	4	4 1
Switch Phase												
Minimum Initial (s)	6.0	12.0	12.0	6.0	12.0		6.0	10.0	10.0	6.0	10.0	
Minimum Split (s)	10.5	18.7	18.7	10.5	18.7		10.5	16.9	16.9	10.5	16.9	
Total Split (s)	24.0	46.0	46.0	20.0	42.0	64.0	22.0	32.0	32.0	22.0	32.0	56.0
Total Split (%)	20.0%	38.3%	38.3%	16.7%	35.0%	53.3%	18.3%	26.7%	26.7%	18.3%	26.7%	46.7%
Maximum Green (s)	19.5	39.3	39.3	15.5	35.3		17.5	25.1	25.1	17.5	25.1	
Yellow Time (s)	3.5	3.9	3.9	3.5	3.9		3.5	3.9	3.9	3.5	3.9	
All-Red Time (s)	1.0	2.8	2.8	1.0	2.8		1.0	3.0	3.0	1.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	6.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4		1.5	1.5	1.5	1.5	1.5	
Minimum Gap (s)	1.5	2.0	2.0	1.5	2.0		1.5	1.5	1.5	1.5	1.5	
Time Before Reduce (s)	15.0	28.0	28.0	15.0	20.0		20.0	40.0	40.0	30.0	40.0	
Time To Reduce (s)	0.0	12.0	12.0	0.0	20.0		0.0	0.0	0.0	0.0	0.0	
Recall Mode	None	C-Max	C-Max	None	C-Max		None	None	None	None	None	
v/c Ratio	0.98	0.83	0.16	0.76	0.92	0.43	0.70	1.07	0.38	0.94	0.35	0.20
Control Delay	74.6	34.6	20.7	64.8	52.1	22.9	61.7	96.8	44.8	79.1	39.2	21.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.6	34.6	20.7	64.8	52.1	22.9	61.7	96.8	44.8	79.1	39.2	21.8
90th %ile Green (s)	19.5	39.3	39.3	15.5	35.3		16.7	25.1	25.1	17.5	25.9	
90th %ile Term Code	Max	Coord	Coord	Max	Coord		Gap	Max	Max	Max	Hold	
70th %ile Green (s)	19.5	39.3	39.3	15.5	35.3		14.4	25.1	25.1	17.5	28.2	
70th %ile Term Code	Max	Coord	Coord	Max	Coord		Gap	Max	Max	Max	Hold	
50th %ile Green (s)	19.5	40.7	40.7	14.1	35.3		12.8	25.1	25.1	17.5	29.8	
50th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Max	Max	Max	Hold	
30th %ile Green (s)	19.5	42.3	42.3	12.5	35.3		11.2	25.1	25.1	17.5	31.4	
30th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Max	Max	Max	Hold	
10th %ile Green (s)	19.5	44.8	44.8	10.0	35.3		8.9	25.7	25.7	16.9	33.7	

Volume
340: Mequon Road & Cedarburg Road

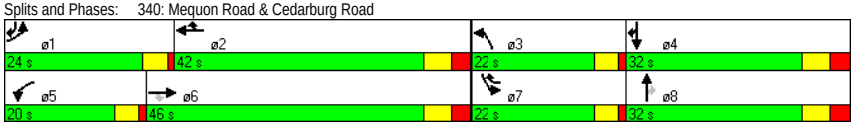
12/21/2011

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
10th %ile Term Code	Max	Coord	Coord	Gap	Coord		Gap	Max	Max	Gap	Hold	
Queue Length 50th (ft)	209	407	49	115	379	162	101	~361	87	187	104	65
Queue Length 95th (ft)	m#289	467	m56	161	#469	240	141	#488	148	#288	154	116
Internal Link Dist (ft)		257			885			746			862	
Turn Bay Length (ft)	180		175	200		235	225		125	385		150
Base Capacity (vph)	558	1749	544	443	1496	756	506	751	336	501	879	710
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.83	0.16	0.67	0.92	0.43	0.51	1.07	0.38	0.93	0.35	0.20

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 1 (1%), Referenced to phase 2:WBT and 6:EBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
~ 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: 340: Mequon Road & Cedarburg Road



HCM Signalized Intersection Capacity Analysis
340: Mequon Road & Cedarburg Road

12/21/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	520	1375	170	280	1310	620	245	760	245	445	295	270
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.7	6.7	4.5	6.7	6.7	4.5	6.9	6.9	4.5	6.9	6.9
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.95	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3467	3574	1599	3433	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	3467	3574	1599	3433	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor (vph)	100%	100%	50%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Adj. Flow (vph)	547	1447	89	295	1379	326	258	800	129	468	311	142
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	547	1447	89	295	1379	326	258	800	129	468	311	142
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Turn Type	Prot		Perm	Prot		pt+ov	Prot		Perm	Prot		pt+ov
Protected Phases	1	6		5	2	2 7	3	8		7	4	4 1
Permitted Phases			6						8			
Actuated Green, G (s)	19.5	41.3	41.3	13.5	35.3	59.4	12.8	25.2	25.2	17.4	29.8	56.2
Effective Green, g (s)	19.5	41.3	41.3	13.5	35.3	59.4	12.8	25.2	25.2	17.4	29.8	56.2
Actuated g/C Ratio	0.16	0.34	0.34	0.11	0.29	0.49	0.11	0.21	0.21	0.14	0.25	0.47
Clearance Time (s)	4.5	6.7	6.7	4.5	6.7		4.5	6.9	6.9	4.5	6.9	
Vehicle Extension (s)	1.5	5.2	5.2	1.5	3.4		1.5	1.5	1.5	1.5	1.5	
Lane Grp Cap (vph)	558	1750	545	386	1496	784	370	751	336	498	879	741
v/s Ratio Prot	c0.16	0.28		0.09	c0.27	0.21	0.07	c0.22		c0.14	0.09	0.09
v/s Ratio Perm			0.06						0.08			
v/c Ratio	0.98	0.83	0.16	0.76	0.92	0.42	0.70	1.07	0.38	0.94	0.35	0.19
Uniform Delay, d1	50.1	36.1	27.3	51.7	41.0	19.3	51.7	47.4	40.7	50.8	37.2	18.6
Progression Factor	0.91	0.84	0.71	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	28.0	3.5	0.5	7.9	10.8	0.1	4.6	51.6	0.3	25.4	0.1	0.0
Delay (s)	73.4	34.0	19.9	59.6	51.9	19.4	56.3	99.0	41.0	76.2	37.3	18.7
Level of Service	E	C	B	E	D	B	E	F	D	E	D	B
Approach Delay (s)		43.7			47.7			83.4			54.2	
Approach LOS		D			D			F			D	

Intersection Summary

HCM Average Control Delay	54.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	22.6
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Mequon Road

Direction	EB	WB	All
Total Delay / Veh (s/v)	8	9	8
Total Delay (hr)	56	63	119
Stops / Veh	0.19	0.25	0.22
Stops (#)	4752	6540	11292
Average Speed (mph)	18	17	17
Total Travel Time (hr)	117	128	245
Distance Traveled (mi)	2065	2197	4262
Fuel Consumed (gal)	154	179	333
Fuel Economy (mpg)	13.4	12.3	12.8
Performance Index	68.9	81.4	150.2

Network Totals

Number of Intersections	15
Total Delay / Veh (s/v)	13
Total Delay (hr)	200
Stops / Veh	0.28
Stops (#)	15584
Average Speed (mph)	14
Total Travel Time (hr)	349
Distance Traveled (mi)	5005
Fuel Consumed (gal)	449
Fuel Economy (mpg)	11.2
Performance Index	243.2

APPENDIX F

Year 2025 Build Traffic Analysis – With Alternative Five Improvements

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--------------------------------------------------------------------------------
|                                                                              |
|   4:6:10              INDUSTRIAL & 167 - 2025 BUILD                     28   |
|                                                                              |
|------------------------------------------------------------------------------|
|                                                   |                          |
| E    (m)    8.00   8.00   8.00   4.00             | TIME PERIOD     min    90  |
| L'   (m)   40.00  40.00  40.00  40.00             | TIME SLICE      min    15  |
| V    (m)    7.30   3.65   7.30   3.65             | RESULTS PERIOD  min 15 75  |
| RAD  (m)   20.00  20.00  20.00  20.00             | TIME COST      $/hr 15.00  |
| PHI  (d)   25.00  25.00  25.00  25.00             | FLOW PERIOD     min 15 75  |
| DIA  (m)   50.00  50.00  50.00  50.00             | FLOW TYPE   pcu/veh   VEH  |
| GRAD SEP       0      0      0      0             | FLOW PEAK  am/op/pm    PM  |
|                                                   |                          |
|------------------------------------------------------------------------------|
| LEG NAME |PCU | TURNS (1st exit, 2nd..U)   |FLOF|CL|  FLOW RATIO   |FLOW TIME|
|          |    |                            |    |  |               |         |
|EB 167    |1.02|  110 1530    5  0          |1.00|50|0.75 0.924 0.75|15 45 75 |
|NB INDUSTR|1.02|  495    5  165  0          |1.00|50|0.75 0.924 0.75|15 45 75 |
|WB 167    |1.03|   20 1575  230  0          |1.00|50|0.75 0.924 0.75|15 45 75 |
|SB DRWY   |1.01|   15    1   15  0          |1.00|50|0.75 0.924 0.75|15 45 75 |
|          |    |                            |    |  |               |         |
|          |    |                            |    |  |               |         |
|          |    |                            |    |  |               |         |
|------------------------------------------------------------------------------|
|                                                                  |           |
| FLOW        veh    1645    665   1825     31                    | AVEDEL  s   8.1 |
| CAPACITY    veh    2219   1005   2252    165                    | LOS   SIG     A |
| AVE DELAY  secs     6.2   10.9    8.5   30.4                    | LOS UNSIG     A |
| MAX DELAY  secs     8.2   15.4   11.7   31.0                    |               |
| AVE QUEUE   veh     2.9    2.1    4.4    0.3                    | VEHIC HRS   9.4 |
| MAX QUEUE   veh     3.5    2.7    5.7    0.4                    | COST    $   141 |
|                                                                  |           |
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|                                                                              |
|   4:6:10              INDUSTRIAL & 167 - 2025 BUILD                     30   |
|                                                                              |
|------------------------------------------------------------------------------|
|                                                   |                          |
| E    (m)    8.00   8.00   8.00   4.00             | TIME PERIOD     min    90  |
| L'   (m)   40.00  40.00  40.00  40.00             | TIME SLICE      min    15  |
| V    (m)    7.30   3.65   7.30   3.65             | RESULTS PERIOD  min 15 75  |
| RAD  (m)   20.00  20.00  20.00  20.00             | TIME COST      $/hr 15.00  |
| PHI  (d)   25.00  25.00  25.00  25.00             | FLOW PERIOD     min 15 75  |
| DIA  (m)   50.00  50.00  50.00  50.00             | FLOW TYPE   pcu/veh   VEH  |
| GRAD SEP       0      0      0      0             | FLOW PEAK  am/op/pm    PM  |
|                                                   |                          |
|------------------------------------------------------------------------------|
| LEG NAME |PCU | TURNS (1st exit, 2nd..U)   |FLOF|CL|  FLOW RATIO   |FLOW TIME|
|          |    |                            |    |  |               |         |
|EB 167    |1.02|  110 1530    5  0          |1.00|85|0.75 0.924 0.75|15 45 75 |
|NB INDUSTR|1.02|  495    5  165  0          |1.00|85|0.75 0.924 0.75|15 45 75 |
|WB 167    |1.03|   20 1575  230  0          |1.00|85|0.75 0.924 0.75|15 45 75 |
|SB DRWY   |1.01|   15    1   15  0          |1.00|85|0.75 0.924 0.75|15 45 75 |
|          |    |                            |    |  |               |         |
|          |    |                            |    |  |               |         |
|          |    |                            |    |  |               |         |
|------------------------------------------------------------------------------|
|                                                                  |           |
| FLOW        veh    1645    665   1825     31                    | AVEDEL  s  18.3 |
| CAPACITY    veh    2027    811   2051      5                    | LOS   SIG     B |
| AVE DELAY  secs     9.4   28.6   16.3   31.0                    | LOS UNSIG     C |
| MAX DELAY  secs    13.1   49.3   25.8   31.0                    |               |
| AVE QUEUE   veh     4.5    5.5    8.6    3.7                    | VEHIC HRS  21.2 |
| MAX QUEUE   veh     5.7    9.0   12.6    3.7                    | COST    $   318 |
|                                                                  |           |
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---------------------------------------------------------------------------
|                                                                         |
|   4:6:10                BUNTROCK & 167 - 2025 BUILD                  14 |
|                                                                         |
|-------------------------------------------------------------------------|
|                                                  |                      |
| E    (m)    8.00   8.00   8.00   8.00            | TIME PERIOD     min    90 |
| L'   (m)   40.00  40.00  40.00  40.00            | TIME SLICE      min    15 |
| V    (m)    7.30   3.65   7.00   3.65            | RESULTS PERIOD  min 15 75 |
| RAD  (m)   20.00  20.00  20.00  20.00            | TIME COST      $/hr 15.00 |
| PHI  (d)   25.00  25.00  25.00  25.00            | FLOW PERIOD     min 15 75 |
| DIA  (m)   50.00  50.00  50.00  50.00            | FLOW TYPE   pcu/veh   VEH |
| GRAD SEP       0      0      0      0            | FLOW PEAK  am/op/pm    PM |
|                                                  |                      |
|-------------------------------------------------------------------------|
| LEG NAME |PCU | TURNS (1st exit, 2nd..U)   |CAPF|CL|  FLOW RATIO   |FLOW TIME|
|          |    |                            |    |  |               |         |
|EB 167    |1.02|   60 1485   85  0          |1.00|50|0.75 0.924 0.75|15 45 75 |
|NB BUNTROC|1.03|  140   45  145  0          |1.00|50|0.75 0.924 0.75|15 45 75 |
|WB 167    |1.03|   30 1610  115  0          |1.00|50|0.75 0.924 0.75|15 45 75 |
|SB BUNTROC|1.02|   60    5   25  0          |1.00|50|0.75 0.924 0.75|15 45 75 |
|          |    |                            |    |  |               |         |
|          |    |                            |    |  |               |         |
|          |    |                            |    |  |               |         |
|-------------------------------------------------------------------------|
|                                                        |                |
| FLOW        veh    1630    330   1755     90          | AVEDEL  s   7.0 |
| CAPACITY    veh    2296    964   2165    770          | LOS   SIG     A |
| AVE DELAY  secs     5.3    5.6    8.8    5.2          | LOS UNSIG     A |
| MAX DELAY  secs     6.8    7.1   12.4    6.5          |                 |
| AVE QUEUE   veh     2.5    0.5    4.4    0.1          | VEHIC HRS   7.4 |
| MAX QUEUE   veh     2.9    0.6    5.7    0.2          | COST    $   110 |
|                                                        |                |
---------------------------------------------------------------------------
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---------------------------------------------------------------------------
|                                                                         |
|   4:6:10                BUNTROCK & 167 - 2025 BUILD                  17 |
|                                                                         |
|-------------------------------------------------------------------------|
|                                                  |                      |
| E    (m)    8.00   8.00   8.00   8.00            | TIME PERIOD     min    90 |
| L'   (m)   40.00  40.00  40.00  40.00            | TIME SLICE      min    15 |
| V    (m)    7.30   3.65   7.00   3.65            | RESULTS PERIOD  min 15 75 |
| RAD  (m)   20.00  20.00  20.00  20.00            | TIME COST      $/hr 15.00 |
| PHI  (d)   25.00  25.00  25.00  25.00            | FLOW PERIOD     min 15 75 |
| DIA  (m)   50.00  50.00  50.00  50.00            | FLOW TYPE   pcu/veh   VEH |
| GRAD SEP       0      0      0      0            | FLOW PEAK  am/op/pm    PM |
|                                                  |                      |
|-------------------------------------------------------------------------|
| LEG NAME |PCU | TURNS (1st exit, 2nd..U)   |CAPF|CL|  FLOW RATIO   |FLOW TIME|
|          |    |                            |    |  |               |         |
|EB 167    |1.02|   60 1485   85  0          |1.00|85|0.75 0.924 0.75|15 45 75 |
|NB BUNTROC|1.03|  140   45  145  0          |1.00|85|0.75 0.924 0.75|15 45 75 |
|WB 167    |1.03|   30 1610  115  0          |1.00|85|0.75 0.924 0.75|15 45 75 |
|SB BUNTROC|1.02|   60    5   25  0          |1.00|85|0.75 0.924 0.75|15 45 75 |
|          |    |                            |    |  |               |         |
|          |    |                            |    |  |               |         |
|          |    |                            |    |  |               |         |
|-------------------------------------------------------------------------|
|                                                        |                |
| FLOW        veh    1630    330   1755     90          | AVEDEL  s  12.5 |
| CAPACITY    veh    2093    763   1964    569          | LOS   SIG     B |
| AVE DELAY  secs     7.7    8.3   17.9    7.4          | LOS UNSIG     B |
| MAX DELAY  secs    10.4   11.0   29.0    9.7          |                 |
| AVE QUEUE   veh     3.6    0.8    9.1    0.2          | VEHIC HRS  13.2 |
| MAX QUEUE   veh     4.5    1.0   13.6    0.2          | COST    $   198 |
|                                                        |                |
---------------------------------------------------------------------------
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APPENDIX G

TOTAL TRAFFIC
PEAK HOUR ANALYSIS
WITH IMPROVEMENTS
(NOT APPLICABLE)

APPENDIX H

JUSTIFICATION FOR REGULATORY SPEED LIMIT CHANGE

Intersection Sight Distance Calculations

APPENDIX H

Intersection Sight Distance Calculations

ISD CALCULATIONS

Performed by: Michael May Date: 6/4/2010
Location: Mequon Road (with 40 mph speed limit)
Weston Center West Access

SPECIAL INSTRUCTIONS:

Access to be located on south side of Mequon Road at first median opening west of River Birch Drive
P-vehicle eye height = 3.5'; SU-vehicle eye height = 7.6'; Object to be seen height = 3.5'
Driver from side street = 14.4' from traveled way.
If desirable distance is met, no need to check minimum.
If desirable distance is not met, note the distance at which sight distance is met.

		Minimum	*Desirable*
X	P	500	665
X	SU	820	985
	WB	955	1050

Mequon Road **Mequon Road**

		Minimum	*Desirable*
X	P	465	565
X	SU	610	710
	WB	740	905

Weston Center-West

DRIVER

DRIVER

Mequon Road **Mequon Road**

		Minimum	*Desirable*
X	P	430	595
X	SU	525	625
	WB	590	625

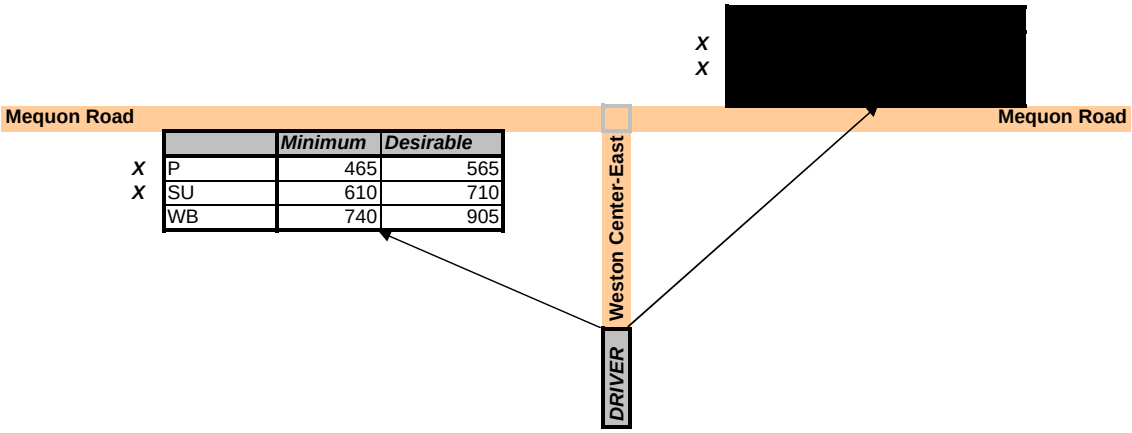
Weston Center-West

ISD CALCULATIONS

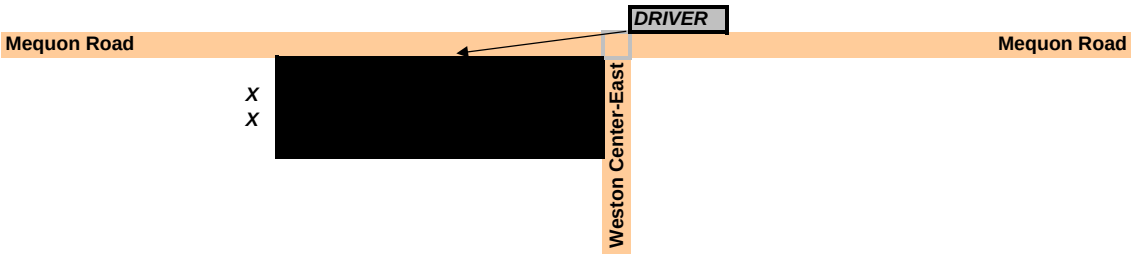
Performed by: Michael May Date: 6/4/2010
Location: Mequon Road (with 40 mph speed limit)
Weston Center East Access

SPECIAL INSTRUCTIONS:

Access to be located on south side of Mequon Road approximately 460-feet west of River Birch Drive
P-vehicle eye height = 3.5'; SU-vehicle eye height = 7.6'; Object to be seen height = 3.5'
Driver from side street = 14.4' from traveled way.
If desirable distance is met, no need to check minimum.
If desirable distance is not met, note the distance at which sight distance is met.



		Minimum	*Desirable*
X	P	465	565
X	SU	610	710
	WB	740	905

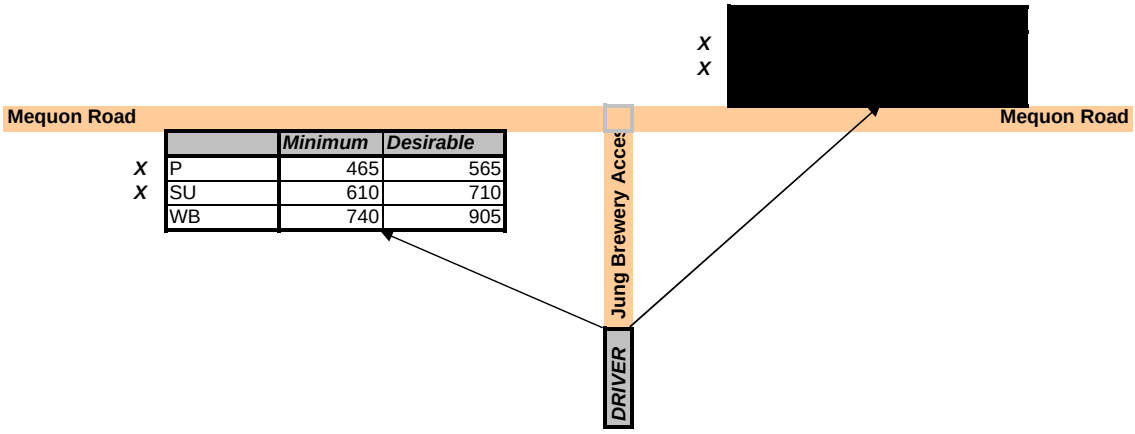


ISD CALCULATIONS

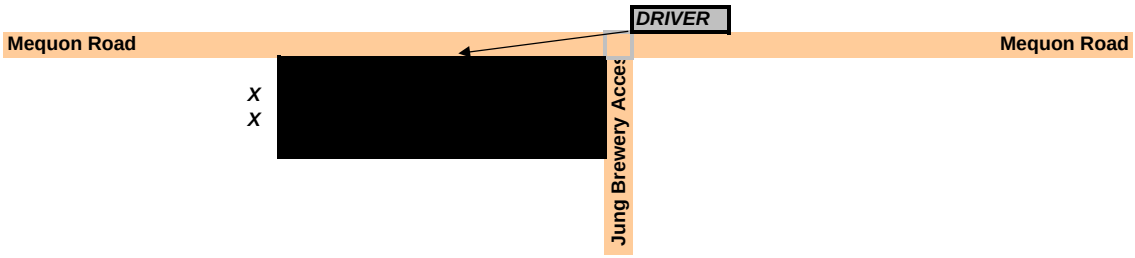
Performed by: Michael May Date: 6/4/2010
Location: Mequon Road (with 40 mph speed limit)
Jung Brewery Access

SPECIAL INSTRUCTIONS:

Access to be located on south side of Mequon Road approximately 280-feet east of Buntrock Avenue
P-vehicle eye height = 3.5'; SU-vehicle eye height = 7.6'; Object to be seen height = 3.5'
Driver from side street = 14.4' from traveled way.
If desirable distance is met, no need to check minimum.
If desirable distance is not met, note the distance at which sight distance is met.



		Minimum	*Desirable*
X	P	465	565
X	SU	610	710
	WB	740	905



APPENDIX I

WARRANT ANALYSIS FOR INTERSECTION CONTROL

APPENDIX I

Traffic Signal Warrant Analysis – Mequon Road & Industrial Drive

SIGNAL WARRANT: Mequon Road & Industrial Drive

2006 "EXISTING" TRAFFIC VOLUMES (EB/WB estimated from count at Mequon Trail)

	EB		WB			NB					SB				
Start Time	Lt	Total	LT	Total	Total	Lt	Th	Rt	Lt + Th	ALL	Lt	Th	Rt	Lt + Th	ALL
6-7a	0	581	0	318	899	0	0	0	0	0	0	0	0	0	0
7-8a	0	1153	0	739	1892	0	0	0	0	0	0	0	0	0	0
8-9a	0	781	0	555	1336	0	0	0	0	0	0	0	0	0	0
9-10a	0	552	0	468	1020	0	0	0	0	0	0	0	0	0	0
10-11a	0	481	0	456	937	0	0	0	0	0	0	0	0	0	0
11-12p	0	562	0	578	1140	0	0	0	0	0	0	0	0	0	0
12-1p	0	459	0	561	1020	0	0	0	0	0	0	0	0	0	0
1-2p	0	520	0	539	1059	0	0	0	0	0	0	0	0	0	0
2-3p	0	563	0	641	1204	0	0	0	0	0	0	0	0	0	0
3-4p	0	679	0	780	1459	0	0	0	0	0	0	0	0	0	0
4-5p	0	810	0	950	1760	0	0	0	0	0	0	0	0	0	0
5-6p	0	848	0	1062	1910	0	0	0	0	0	0	0	0	0	0

2025 BACKGROUND TRAFFIC VOLUMES (1.675% Annual Growth)

	EB		WB			NB					SB				
Start Time	Lt	Total	LT	Total	Total	Lt	Th	Rt	Lt + Th	ALL	Lt	Th	Rt	Lt + Th	ALL
6-7a	0	795	0	435	1230	0	0	0	0	0	0	0	0	0	0
7-8a	0	1580	0	1015	2595	0	0	0	0	0	0	0	0	0	0
8-9a	0	1070	0	760	1830	0	0	0	0	0	0	0	0	0	0
9-10a	0	755	0	640	1395	0	0	0	0	0	0	0	0	0	0
10-11a	0	660	0	625	1285	0	0	0	0	0	0	0	0	0	0
11-12p	0	770	0	790	1560	0	0	0	0	0	0	0	0	0	0
12-1p	0	630	0	770	1400	0	0	0	0	0	0	0	0	0	0
1-2p	0	715	0	740	1455	0	0	0	0	0	0	0	0	0	0
2-3p	0	770	0	880	1650	0	0	0	0	0	0	0	0	0	0
3-4p	0	930	0	1070	2000	0	0	0	0	0	0	0	0	0	0
4-5p	0	1110	0	1305	2415	0	0	0	0	0	0	0	0	0	0
5-6p	0	1165	0	1455	2620	0	0	0	0	0	0	0	0	0	0

	Daily In	Daily Out
See Note-->	3600	3600
	18%	18%
	2952	2952

Area F & Jung Brewery Retail Trips

	EB		WB			NB					SB					IN	OUT		
Start Time	Lt	Total	LT	Total	Total	Lt	Th	Rt	Lt + Th	ALL	Lt	Th	Rt	Lt + Th	ALL				
6-7a	0	25	35	40	65	15	0	30	15	45	0	0	0	0	0	60	60	2.0%	2.0%
7-8a	0	30	45	45	75	15	0	30	15	45	0	0	0	0	0	75	60	2.5%	2.0%
8-9a	0	45	70	75	120	25	0	55	25	80	0	0	0	0	0	120	105	4.0%	3.5%
9-10a	0	65	95	100	165	40	0	80	40	120	0	0	0	0	0	160	150	5.5%	5.0%
10-11a	0	80	130	140	220	30	0	60	30	90	0	0	0	0	0	220	110	7.5%	3.7%
11-12p	0	95	150	160	255	45	0	95	45	140	0	0	0	0	0	255	175	8.6%	5.9%
12-1p	0	110	160	175	285	60	0	125	60	185	0	0	0	0	0	280	235	9.5%	7.9%
1-2p	0	100	150	160	260	60	0	130	60	190	0	0	0	0	0	255	240	8.7%	8.2%
2-3p	0	95	135	150	245	70	0	140	70	210	0	0	0	0	0	235	260	7.9%	8.8%
3-4p	0	95	130	140	235	70	0	145	70	215	0	0	0	0	0	225	265	7.7%	8.9%
4-5p	0	100	140	150	250	70	0	145	70	215	0	0	0	0	0	240	270	8.2%	9.1%
5-6p	0	100	140	155	255	75	0	150	75	225	0	0	0	0	0	245	280	8.3%	9.5%
																		80.4%	74.5%

YEAR 2010 BUILD TRAFFIC (BACKGROUND + WOODMAN'S)

	EB		WB			NB					SB				
Start Time	Lt	Total	LT	Total	Total	Lt	Th	Rt	Lt + Th	ALL	Lt	Th	Rt	Lt + Th	ALL
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6-7a	0	820	35	475	1295	15	0	30	15	45	0	0	0	0	0
7-8a	0	1610	45	1060	2670	15	0	30	15	45	0	0	0	0	0
8-9a	0	1115	70	835	1950	25	0	55	25	80	0	0	0	0	0
9-10a	0	820	95	740	1560	40	0	80	40	120	0	0	0	0	0
10-11a	0	740	130	765	1505	30	0	60	30	90	0	0	0	0	0
11-12p	0	865	150	950	1815	45	0	95	45	140	0	0	0	0	0
12-1p	0	740	160	945	1685	60	0	125	60	185	0	0	0	0	0
1-2p	0	815	150	900	1715	60	0	130	60	190	0	0	0	0	0
2-3p	0	865	135	1030	1895	70	0	140	70	210	0	0	0	0	0
3-4p	0	1025	130	1210	2235	70	0	145	70	215	0	0	0	0	0
4-5p	0	1210	140	1455	2665	70	0	145	70	215	0	0	0	0	0
5-6p	0	1265	140	1610	2875	75	0	150	75	225	0	0	0	0	0

HIGHER VOLUME SIDESTREET APPROACH LT+TH IS THE MINOR STREET

	1A		1B		1C		1D	
Start Time	MAJOR	MINOR	MAJOR	MINOR	MAJOR	MINOR	MAJOR	MINOR
	NO	NO	NO	NO	NO	NO	NO	NO
6-7a	YES	NO	YES	NO	YES	NO	YES	NO
7-8a	YES	NO	YES	NO	YES	NO	YES	NO
8-9a	YES	NO	YES	NO	YES	NO	YES	NO
9-10a	YES	NO	YES	NO	YES	NO	YES	NO
10-11a	YES	NO	YES	NO	YES	NO	YES	NO
11-12p	YES	NO	YES	NO	YES	NO	YES	NO
12-1p	YES	NO	YES	NO	YES	NO	YES	YES
1-2p	YES	NO	YES	NO	YES	NO	YES	YES
2-3p	YES	NO	YES	NO	YES	NO	YES	YES
3-4p	YES	NO	YES	NO	YES	NO	YES	YES
4-5p	YES	NO	YES	NO	YES	NO	YES	YES
5-6p	YES	NO	YES	YES	YES	NO	YES	YES
	NO	NO	NO	NO	NO	NO	NO	NO
REQ'S	600	150	900	75	480	120	720	60
MET?		**NO**		**NO**		**NO**		

No Minor Rts included
2 & 1
URBAN WARRANTS

MAINLINE NB LEFT-TURNS AS MINOR; OPPOSING VOLUME AS MAJOR

	1A		1B		1C		1D	
Start Time	MAJOR	MINOR	MAJOR	MINOR	MAJOR	MINOR	MAJOR	MINOR
	NO	NO	NO	NO	NO	NO	NO	NO
6-7a	YES	NO	NO	NO	YES	NO	YES	NO
7-8a	YES	NO	YES	NO	YES	NO	YES	NO
8-9a	YES	NO	YES	NO	YES	NO	YES	YES
9-10a	YES	NO	NO	YES	YES	NO	YES	YES
10-11a	YES	NO	NO	YES	YES	YES	YES	YES
11-12p	YES	YES	NO	YES	YES	YES	YES	YES
12-1p	YES	YES	NO	YES	YES	YES	YES	YES
1-2p	YES	YES	NO	YES	YES	YES	YES	YES
2-3p	YES	NO	NO	YES	YES	YES	YES	YES
3-4p	YES	NO	YES	YES	YES	YES	YES	YES
4-5p	YES	NO	YES	YES	YES	YES	YES	YES
5-6p	YES	NO	YES	YES	YES	YES	YES	YES
	NO	NO	NO	NO	NO	NO	NO	NO
REQ'S	600	150	900	75	480	120	720	60
MET?		**NO**		**NO**		**YES**		

No Minor Rts included
2 & 1
URBAN WARRANTS