#2016-08
Willow Creek Church Special Use Permit
Project Review for Planning and Zoning Commission

Meeting Date:	April 6, 2016	
Request:	Special Use Permit for Willow Creek Church.	
Location:	100 South Main Street	
Acreage:	Approximately 25 acres, 193,000 square-foot building	
Zoning:	M Manufacturing	
Surrounding Properties:	North:	M Manufacturing
	South:	M-PUD Manufacturing (G and M Manufacturing)
	East:	M Manufacturing
	West:	B-4 Downtown Commercial
Staff Contact:	Elizabeth Maxwell (815.356.3615)	

Background:

- The property is the existing University Center, which over the past several years has received numerous zoning requests and occupancies for a variety of tenants, including the UNE church, the Friendship House daycare, temporary vehicle storage for Brilliance Honda, and a teen center. Friendship House daycare would remain
- The current request is for a Special Use Permit for Willow Creek Church. They are currently located at 220 Exchange Drive.
- Their relocation would be done in several phases, with the main focus of the first phase being the interior improvements to create the auditorium/seating area.

Development Analysis:

Land Use/Zoning

- The site is currently zoned M Manufacturing. The principal use of a Religious Organization is a Special Use in the M Zoning District. The petitioner has requested the Special Use Permit.
- The current land use is Mixed Use. This site is also within the Crystal Lake Avenue and Main Street TIF District. The TIF redevelopment plan calls for Mixed Use. This use fits within the live, work, play goals for Mixed Use.

Site Layout

- The site will be similar to the existing site improvements. The building and parking fields are staying in their current locations. In addition, the two driveways on Main Street would remain. The access along Crystal Lake Avenue would be modified to provide two distinct driveways.
- The traffic study has been completed and is attached. Some specifics from the report are:
    - The public roadway system adjacent to the proposed site can accommodate both the Phase I and Full-Build-out development of the site without excessive negative impacts to the operation of the roadways.
    - The intersection of Main Street and Crystal Lake Avenue as proposed in the Intersection Design Study will satisfactorily accommodate the proposed church development without any modifications to the plan at the intersection itself.
    - There are some recommendations for the off-site improvements, which include turn lanes into the access points.
- The building would remain in the same location. In later phases exterior improvements would provide a large gathering and entrance feature at the building's northwest corner.

Building Elevations

- The majority of the building structure would remain intact. Their priority is to move into the space and do interior renovations to accommodate their 2,000 seat auditorium.
- Planned improvements to the building include:
    - Raising the section of roof over the Adult Auditorium area
    - Removing the northwest corner of the building creating a covered sheltered play area.
    - Extending the corner of the building out to a circular multi-purpose room.
    - Adding unique architectural elements to the west elevation including large glass windows, exposed steel structure and the plaza feature.
- One of the main design objectives is to provide a building that is welcoming to the general public.
- Staff will work with the petitioner as they propose the architecture for the later phases to ensure that it enhances the area and replicates the vision illustrated in the concept plans.

Landscape

- To soften the feel of the building landscape would be planted around the building's base. This would help provide a more welcoming entrance for the members and any guests.
- In the future phases additional landscape materials would be planted around the front plaza area, creating a courtyard, paths, water feature and outside auditorium.

Parking

- The parking requirement is 1 space per 4 fixed seats + 1 space per 8 feet of bench length + 1 space per 28 feet in areas where no permanent seats are maintained in the main place of worship + spaces for accessory uses.
- Willow Creek is required to have 824 spaces. There are currently 1,037 spaces on site. There is also opportunity for additional parking in the wooded area to the east.

2,000 seat auditorium	1 space per 4 fixed seats	500 spaces
	1 space per 8 feet of bench length	0
9,063 square foot overflow worship auditorium	1 space per 28 feet where no seats are maintained in main place of worship	324
	Spaces per accessory use.	0

- Staff would work with the petitioner to finalize the site and parking layout and how it is phased.

Roadway and Railroad Improvements:

When Immanuel Lutheran Church received their subdivision approval, there was discussion that Teckler Boulevard needed to cross the railroad tracks and connect to Congress Parkway at Main Street. In addition to this intersection improvement, future modifications to the area would remove the at-grade track crossings on Main Street and Crystal Lake Avenue, create a new rail storage yard and install a new spur for train maneuvering. These improvements would benefit all properties in this area including those at the intersection at Main Street and Crystal Lake Avenue. A phased implementation plan is being finalized for City Council's consideration in the near future.

Findings of fact:

SPECIAL USE PERMIT

The petitioner has requested a Special Use Permit to allow a Religious Organization in the M Manufacturing zoning district. Special Uses require a separate review because of their potential to impact surrounding properties and the orderly development of the City. Section 2-400 of the Unified Development Ordinance establishes standard for all Special Uses in Crystal Lake. The criteria are as follows:

1. That the proposed use is necessary or desirable, at the location involved, to provide a service or facility which will further the public convenience and contribute to the general welfare of the neighborhood or community.
   ☐ *Meets* ☐ *Does not meet*

2. That the proposed use will not be detrimental to the value of other properties or improvements in the vicinity.
   ☐ *Meets* ☐ *Does not meet*

3. That the proposed use will comply with the regulations of the zoning district in which it is located and this Ordinance generally, including, but not limited to, all applicable yard and bulk regulations, parking and loading regulations, sign control regulations, watershed, wetlands, and flood plain regulations, Building and Fire Codes and all other applicable City Ordinances.
   ☐ *Meets* ☐ *Does not meet*

4. That the proposed use will not negatively impact the existing off-site traffic circulation; will adequately address on-site traffic circulation; will provide adequate on-site parking facilities; and, if required, will contribute financially, in proportion to its impact, to upgrading roadway and parking systems.
   ☐ *Meets* ☐ *Does not meet*

5. That the proposed use will not negatively impact existing public utilities and municipal service delivery systems and, if required, will contribute financially, in proportion to its impact, to the upgrading of public utility systems and municipal service delivery systems.
   ☐ *Meets* ☐ *Does not meet*

6. That the proposed use will not impact negatively on the environment by creating air, noise, or water pollution; ground contamination; or unsightly views.
   ☐ *Meets* ☐ *Does not meet*

7. That the proposed use will maintain, where possible, existing mature vegetation; provide adequate screening to residential properties; provide landscaping in forms of ground covers, trees and shrubs; and provide architecture, which is aesthetically appealing, compatible or complementary to surrounding properties and acceptable by community standards, as further detailed in Article 4, Development and Design Standards.
   ☐ *Meets* ☐ *Does not meet*

8. That the proposed use will meet standards and requirements established by jurisdictions other than the City such as Federal, State or County statutes requiring licensing procedures or health/safety inspections, and submit written evidence thereof.
   ☐ *Meets* ☐ *Does not meet*

9. That the proposed use shall conform to any stipulations or conditions approved as part of a Special Use Permit issued for such use.
   ☐ *Meets* ☐ *Does not meet*

10. That the proposed use shall conform to the standards established for specific special uses as provided in this section.
    ☐ *Meets* ☐ *Does not meet*

More specifically, Religious Establishments are required to meet the following specific special use standards.

1. Site Design: Where possible, open space areas, including but not limited to storm water detention facilities shall be located adjacent to residential property. Parking lots shall be located close to the right-of-ways and away from residential property.
   ☐ *Meets* ☐ *Does not meet*

2. Outdoor Activities: Group outdoor activities shall not be permitted after 10:00p.m. in residential districts or on lots which are adjacent to residential property.
   ☐ *Meets* ☐ *Does not meet*

3. Traffic Control: For high attendance events, manual traffic control by the Police Department may be required, if determined to be necessary by the Chief of Police.
   ☐ *Meets* ☐ *Does not meet*

4. Nursery School/Pre-School: Any accessory nursery school or pre-school associated with the religious establishment shall comply with the standards of Section 302C-20, Nursery School, Pre-School.
   ☐ *Meets* ☐ *Does not meet*

5. Modification of Standards: The Zoning Administrator shall have the authority to grant modifications to any of the standards listed in this Section in order to eliminate a substantial burden on religious exercise as guaranteed by the Federal Religious Land Use and Institutionalized Persons Act of 2000 (42 U.S.C. Sec. 2000), as amended. In granting such a modification, the Zoning Administrator may require conditions consistent with the Federal Act that will secure substantially the objectives of the modified standard and that will substantially mitigate any potential adverse impact on the environment or on adjacent properties.
   ☐ *Meets* ☐ *Does not meet*

Recommended Conditions:

If a motion to recommend approval of the petitioner's Special Use Permit request to allow a Religious Organization is made, the following conditions are recommended:

1. Approved plans, reflecting staff and advisory board recommendations, as approved by the City Council:
   A. Application (Greetham, received 02/24/16)
   B. Site Plan (BLDD, dated 04/01/16, received 04/01/16)
   C. Architectural Plans (BLDD, dated 02/03/16, received 02/24/16)
   D. Traffic Study (CivilTech, dated 04/01/16, received 04/01/16)
   E. Phasing Plan (BLDD, dated 03/02/16, received 03/03/16)
   F. Landscape Plan (Midwest Arbor, dated 01/20/16, received 03/03/16)

2. All signage shall meet the requirements of the Unified Development Ordinance.

3. Architecture and Landscape
   A. Work with staff during the phased exterior improvements to the building façade to ensure the architecture is high quality and provides a consistent look for the building.
   B. Work with staff on the final landscape design and materials.

4. The petitioner shall work with staff to provide the necessary plat and easement documents:
   A. A plat of dedication shall be provided which dedicates the necessary right-of-way along Main Street and Crystal Lake Avenue to accommodate the City's intersection improvement project.
   B. A plat of easement shall be provided which dedicates a 20-foot municipal utility easement for water main directly adjacent to the detention pond to allow for future water system improvements.
   C. Temporary construction easements shall be donated to the City for construction of the City's intersection improvement project, as well as, the required improvements specific for this use.
   D. Work with staff to dedicate property for the future railroad spur, which likely would clip the southeast and northeast corners of the lot.

5. The petitioner shall address all of the review comments and requirements of the Fire Rescue, Public Works, Police and Community Development Departments.

6. The petitioner shall comply with the recommendations in the final Traffic Study.
   A. Work with staff to complete the necessary roadway network modifications and driveway improvements specifically required due to this use, in conjunction with the City's intersection improvement project. The petitioner is required to pay for the engineering services and cost for the improvements specifically warranted by this use. Specifically listed as:
      i. A northbound right turn lane should be constructed into the site at Access Drive #1. It should be 11 feet wide to the edge of pavement, with a 120-foot storage length, and a 175-foot taper.
      ii. The proposed painted median between Access Drives #1 and #2 should be restriped to provide a southbound left turn lane into the site at Access #1. It should provide 125 feet of storage and a 155-foot taper.
      iii. The proposed painted median between Access Drives #3 and #4 should be restriped to provide a southbound left turn lane into the site at Access #3. It should provide 125 feet of storage and a 155-foot taper.
      iv. An eastbound right turn lane should be constructed into the site at Access Drive #4. It should be 11 feet wide, with a 100-foot storage length, and a 155-foot taper.
      v. Extension of the barrier median along Crystal Lake Avenue at the eastern railroad tracks to ensure left turns are not allowed into this site at Willow Creek's eastern Crystal Lake Avenue driveway.

B. Prior to occupancy, install centerline delineators along Crystal Lake Avenue west of the railroad tracks near East Street to eliminate the ability of westbound traffic to turn left into the far eastern driveway.

C. It is recommended that a marked crosswalk be constructed along the south leg at the intersection of Main Street and Crystal Lake Avenue. This will likely necessitate relocation of traffic and/or railroad signal equipment in order to install a section of sidewalk from the intersection, along the south side of Crystal Lake Avenue, to the site. This may also require a revision to the striping, signal timing, and/or pedestrian signal equipment on the Intersection Design Study. The petitioner is responsible for this costs including the construction, railroad costs and fees and the engineering service.

D. The petitioner shall work with staff and Civiltech on the site layout/parking plan for both Phase I and the Full Build-Out. Modifications are anticipated based on City and Civiltech review comments. These parties will continue to work toward a site plan which strives to meet the needs of both the City and Willow Creek Church.

2016 08

City of Crystal Lake
Development Application

Office Use Only
File # _____

Project Title: WILLOW CREEK PROJECT

RECEIVED
FEB 24 2016
BY:

Action Requested

___ **Annexation**
___ **Comprehensive Plan Amendment**
___ **Conceptual PUD Review**
___ **Final PUD**
___ **Final PUD Amendment**
___ **Final Plat of Subdivision**
___ **Preliminary PUD**
___ **Preliminary Plat of Subdivision**
___ **Rezoning**
X **Special Use Permit**
___ **Variation**
___ **Other**

Petitioner Information

Name: WILLOW CREEK COMMUNITY CHURCH, INC, AN Illinois not for profit corporation
Address: 220 Exchange Drive, Suite A
Crystal Lake, IL 60014
Phone: 224-512-1880
Fax: 224-512-2530
E-mail: dgreetham@willowcreek.org

Owner Information (if different)

Name: 100 S. MAIN STREET, LLC
Address: 40 Grant Street
Crystal Lake, IL 60014
Phone: 815-459-2000
Fax: 815-477-5846
E-mail: jgreen@homestbk.com

Property Information

Project Description: Redevelopment of the Oak Industry parcel at the southeast corner of Main Street and East Crystal Lake Avenue in Crystal Lake, IL to create a Willow Creek Church Campus.

Project Address/Location: 100 S. Main Street, Crystal Lake, IL 60014

PIN Number(s): 19-04-101-002, 19-04-101-016

Development Team

Please include address, phone, fax and e-mail

Developer: WILLOW CREEK COMMUNITY CHURCH, INC.

Architect: BLDD ARCHITECHTS, INC., R. Carson Durham,, 833 W. Jackson Blvd. Chicago, IL 60607
ph: 844-784-4440 fax: 312-666-8967

Attorney:

Engineer:

Landscape Architect: MIDWEST ARBOR, 1700 Holian Drive, Spring Grove, IL 60081 ph: 815-675-6766

Planner:

Surveyor: VSEI VANDERSTAPPEN, 1316 N.Madison St., Woodstock, IL 60098 ph: 815-337-8310 fax: 815-337-8314

Other:

Signatures

Donald Greetham Donald Greetham 2/23/16

PETITIONER: Print and Sign name (*if different from owner*) **Date**

As owner of the property in question, I hereby authorize the seeking of the above requested action.

2/23/16

OWNER: Print and Sign name **Date**

NOTE: If the property is held in trust, the trust officer must sign this petition as owner. In addition, the trust officer must provide a letter that names all beneficiaries of the trust.

BASIS FOR ISSUANCE OF SPECIAL USE PERMIT

Facts and circumstances with respect to Willow Creek Community Church, Inc.'s request for a Special Use Permit to conduct Christian worship services and related religious and charitable activities at 100 S. Main Street, Crystal Lake, Illinois ("site").

The main/original Willow Creek Community Church ("Main Church") has been located in Barrington, Illinois for over 35 years. In addition to the Main Church, the Church in 2006, established a satellite church in Crystal Lake, Illinois ("Willow Crystal Lake"). At the existing 220 Exchange Street address, Willow Crystal Lake conducts weekly religious services, religious activities related children and young adults, and various charitable activities, including various community not-for-profit related activities. The Church has determined that it would like a permanent facility in the Crystal Lake area and to this end, the Church has signed a contract to purchase approximately 25 acres of real estate at 100 S. Main St., Crystal Lake, Illinois ("New Church Site"). The New Church Site currently has located on it an existing structure of approximately 190,000 square feet. With respect to the New Church Site and the existing building, the Church intends: (1) to remodel the existing building by constructing an auditorium of sufficient size to accommodate the current Church's attendance and its anticipated future attendance at weekend worship services; (2) to create spaces for child care for the children of members who are attending a service or function at the Church; (3) to conduct age appropriate religious activities for children and young adults ages 6 through final year of high school; (4) to create or utilize existing space for the administration of Willow Crystal Lake's administrative functions; (5) to utilize part of the space to conduct religious and charitable activities which the Church determines are important or relevant; (6) conduct or participate in activities or services that the Church determines are needed by Crystal Lake residents; (7) conduct activities which the church believes benefit the Crystal Lake community in general; and (8) to own and maintain a nature area to allow members a place to meditate and reflect.

Based on the above, the Willow Creek Community Church, Inc. requests that the entire property of approximately 25 acres at 100 S. Main St., Crystal Lake, Illinois be issued a Special Use Permit to utilize the property for the religious, charitable, and beneficial uses of the Willow Creek Community Church, Inc., its members and the needs of the community.

It is anticipated that the activities would include, but not be limited to, the special use list attached hereto.

SPECIAL USE LIST - 100 SOUTH MAIN
Adult Education
Café with Light Food for Attendees & Guests
Care Center
Children's Education
Community Garage Sales
Community Meeting Space
Community Park
Concert Venue
Farmer's Market
Fountains
Global Leadership Summit
Graduations
Gymnasium
Homeless Day Shelter
Indoor Athletic Venue
Indoor & Outdoor Recreation
Kids Summer Camps
Lakes for Baptism, Fishing, Ice Skating
Leadership Training Center
Multi-Season Outdoor Venue (sledding, skating, etc)
Nature Trail
NGO/Non-Profit Training Center
Outdoor Amphitheater
Outdoor Athletic Venue
Overnight Shelter
Overnight Student Lock-Ins
Paintball Field
Party Venue
Parent's-on-site Childcare
Playground/Special Needs Playground
Recording Studio
Recreational Room Use
Retail Bookstore
Rock Climbing Wall
Early Learning School/Daycare
Skate Park
Skating Rink
Splash-pad
Staff Offices
Swimming Pool
Thrift Store
Trunk or Treat
Tutoring
Weddings and Funerals
Women's Shelter
Worship Gatherings
Youth Education

THE FUTURE OF WILLOW CRYSTAL LAKE

THE PROBLEM

WCL has outgrown its current 56,000 square-foot leased facility at 220 Exchange. At optimal service times, overcrowded parking lots, seating, and hallways are ever-growing barriers to creating a fantastic experience for our guests and congregation to encounter God and experience our faith community. Our children's and student ministries gathering spaces are woefully inadequate for the growth WCL is experiencing, with students meeting in offices and hallways creating suboptimal conditions for connecting. Community impact events and civic gatherings hosted in our facility are losing effectiveness due to mounting space limitations and WCL's invisible location.

EVALUATION & STRATEGY

To bring further clarity to its vision and strategy, WCL endeavored to identify the chief needs of the families in our community and region in order to gain a deeper understanding of how we could most effectively meet those needs. Through a) multiple focus groups, b) meetings with Members of City Council, c) extensive research on public space design and architecture, d) an extensive property search process, and e) the creation of a Site Comparison Study which allowed us to quantitatively evaluate multiple property options and their alignment with our vision and strategy, WCL developed a clear vision for its permanent home—a visible and centrally-located space where individuals and families, regardless of their affiliation with WCL, can gather for recreation, connection, and growth. In essence, WCL has set out to create a community center for the benefit of our entire region.

THE SOLUTION

Our Site Comparison Study revealed 100 South Main Street as Willow Crystal Lake's *ideal* permanent home. WCL's master plan is to create an iconic multi-use facility, over the next 12-years, that will serve the community for the next 100 years. Anchored by acres of outdoor green spaces which will include playgrounds, a splash-pad, nature trails and small and large-group gathering spaces, the community will have a clean, safe, inviting, and intriguing community center and park in which to meet, play, and deepen connection.

Through a functional transition of outdoor spaces into the interior of the building, WCL will create approximately 10,000 square feet of open-air plaza space, using original building column & beam elements to define the space. This will be a year-round gathering space for families in our community to connect and to allow children play in the park, whether in the sun or the snow.

Looking into the building from outside, guests will immediately notice the area's largest indoor play space. This creative playground will offer a fun, safe and special-needs-friendly place for children to explore, while their parents connect inside by the fireplace over coffee and light food from the café. Families will also discover cool hangout areas for middle and high-school age kids with their own game, small group, and activity-center spaces. In the common areas and classrooms, guests will regularly enjoy parenting, marriage, and life-skill classes and workshops provided for all ages and stages of life—meeting the overwhelming needs identified by our focus groups.

Finally, large and small group gathering spaces will provide ample venues for a myriad of community uses and gatherings, in addition to meeting the needs of our church's weekend gatherings. These spaces include a 2,000-seat adult auditorium/worship center, a 400-seat student auditorium, and a 300-seat multi-purpose gathering space.

In keeping with Willow Crystal Lake's strong design aesthetic, the architecture of the campus will focus on use of wood, stone, concrete, steel and clear glass, attempting, at every turn, to blur the lines between the outdoor and indoor community space.

PUBLIC NOTICE

BEFORE THE PLANNING AND ZONING COMMISSION OF THE CITY OF CRYSTAL LAKE, MCHENRY COUNTY, ILLINOIS

IN THE MATTER OF THE APPLICATION
OF 100 S. MAIN ST. LLC AND WILLOW CREEK COMMUNITY CHURCH, INC.

LEGAL NOTICE

Notice is hereby given in compliance with the Unified Development Ordinance of the City of Crystal Lake, Illinois, that a public hearing will be held before the Planning and Zoning Commission upon the application of Home State Bank and Willow Creek Community Church, Inc. relating to the real estate which has permanent property index numbers of 19-04-101-002 and 19-04-101-016, which is approximately 25 acres at the southeast corner of Main Street and East Crystal Lake Avenue in Crystal Lake, Illinois, commonly known as

100 S. Main Street, Crystal Lake, IL 60014.

This application is filed for a Special Use Permit for a Religious Establishment to allow Willow Creek to conduct Christian Worship Services and related religious charitable activities pursuant to the requirements of Section 2-400 and 9-200 D of the Crystal Lake Unified Development Ordinance. Plans for this project can be viewed at the Crystal Lake Community Development Department at City Hall.

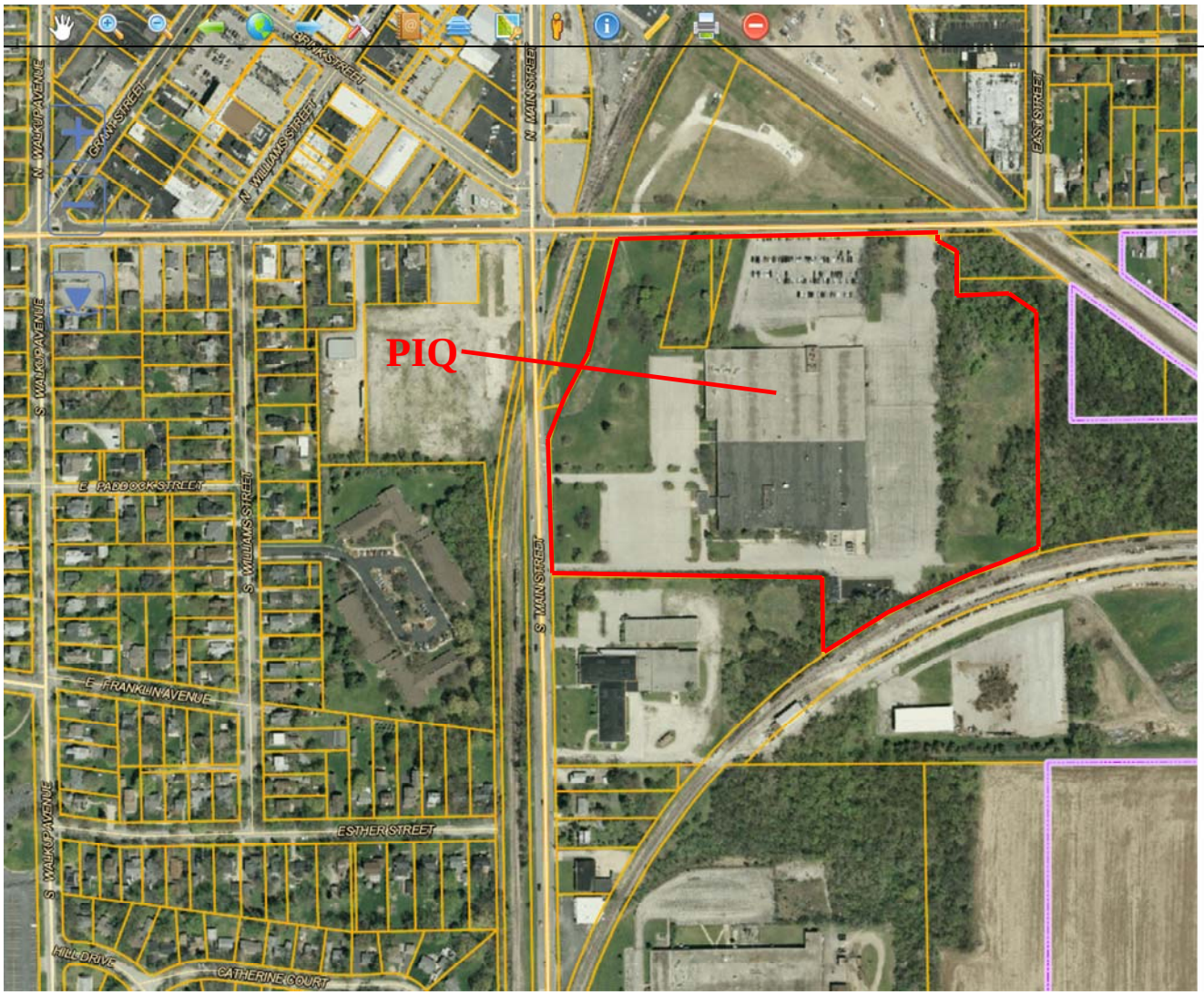
A public hearing before the Planning and Zoning Commission on the request will be held at 7:30 p.m. on Wednesday April 6, 2016, at the Crystal Lake City Hall, 100 West Woodstock Street, at which time and place any person determining to be heard may be present.

Tom Hayden, Chairperson
Planning and Zoning
Commission
City of Crystal Lake

Attorney for Petitioner
Thomas C. Zanck
Zanck, Coen, Wright & Saladin,
P.C. 40 Brink Street
Crystal Lake, IL 60014

(Published in the Northwest Herald
March 21, 2016) 1169838

CITY OF Crystal Lake Illinois



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CRYSTAL LAKE PLANNING AND ZONING COMMISSION
WEDNESDAY, DECEMBER 2, 2015
HELD AT THE CRYSTAL LAKE CITY COUNCIL CHAMBERS

The meeting was called to order by Chairman Hayden at 7:30 p.m. On roll call, members Batastini, Goss, Greenman, Jouron, Skluzacek, and Hayden were present. Mr. Esposito arrived at 7:32 p.m.

Michelle Rentzsch, Director of Community Development, James Richter II, Planning and Economic Development Manager, Kathryn Cowlin and Elizabeth Maxwell, both Planners, were present from Staff.

Mr. Hayden asked those in attendance to rise to say the Pledge of Allegiance. He led those in attendance in the Pledge.

Mr. Hayden stated that this meeting was being televised now as well as recorded for future playback on the City's cable station.

2015-61 WILLOW CREEK – 100 S. Main Street – PUBLIC MEETING
Conceptual Review for the Willow Creek Church

Tom Zanck, attorney, Marcus Bieschke, Pastor, and Don Greetham , Business manager, both with Willow Creek, and Carson Durham with BLDD Architects, were present to represent the petition.

Mr. Hayden read a prepared statement. He appreciates this conceptual review coming before the PZC to discuss the architecture.

Mr. Zanck said they are excited to present this conceptual review. This is not a mega church like the one in South Barrington, but it is affiliated with it. Pastor Marcus said Willow Creek has seven sites in the Chicago area. They want to have a positive impact in their community/City. He added that they have outgrown their leased space and added another campus in Huntley. Even after that site opening, Crystal Lake has still outgrown their facilities. Pastor Bieschke said they are eager to move into a new home. They have looked at over 80 properties during their search. They also had a comparison study done to help narrow down the number of parcels. He said they want this to be a visible community center. Pastor Bieschke said they are grateful to the City Staff for pointing them in the direction of this property. Their plan is to develop this site over 10 to 12 years. The community center will be for the community's use and not just by the church. This will be a year round gathering place and geared for all age groups. There will be large and small group gathering spaces in the building.

Mr. Durham showed the conceptual view of building from the downtown area. The design is to be inviting to the community. He showed the overall building footprint and how the plan is divided between the 3 phases. The first phase will be to renovate the existing building as well as demolishing a portion of the existing building and build a new worship center. Phase 2 will include an addition of another portion of building with more junior and senior high school-aged children areas. Mr. Hayden asked about possible time

lines. Mr. Durham said Phase 1 could possibly start in early spring. Mr. Greetham said the other phases could be in 3 to 4 year segments which could take about 10 to 12 years total. Mr. Durham said the last phase is the outdoor plaza, open space and remaining landscaping.

Mr. Greenman asked if phase 1 will only be internal. Mr. Durham said they will be raising the roof so that will be very visible to the community. Mr. Hayden said waiting for phase 3 is like a kid waiting for Christmas morning. He asked if some could be done now. Mr. Durham said they don't want to put the members is financial difficulties. Mr. Greetham said they wanted to be sure the City knew what the outside time frame is, but it could be sooner. Pastor Bieschke said they will go as far as they can, as fast as they can.

Mr. Greenman said the City's desires are exactly the same as the Church's. He understands the application of the phasing but from the City's standpoint it is a critical property to our downtown area. He would like to think about the different phases to give to the community a visual statement sooner. The sooner that is created, he believes that more involvement will take place.

Mr. Hayden understands that funds need to be raised as they go. He asked if this site will be combined with Huntley. Pastor Bieschke said no. They will remain separate.

Mr. Goss asked if the Council members have been shown the architecture. Pastor Bieschke said it was not available at the time they met with each member one on one. Mr. Goss said he was on the City Council when the new City Hall was being finalized and there were many split votes when moving this building forward due to architecture.

Mr. Goss said the northern portion of the building will transform Crystal Lake Avenue. Mr. Durham showed the landscape plan for the site.

Mr. Batastini said he personally likes phase 3. He said the parking lot itself is large and asked if there is any way to improve the look. Pastor Bieschke said there will be landscaping in the parking lot. Mr. Greetham said they know there will be improvements to the Main Street - Crystal Lake Avenue intersection so most of the paved area won't be seen.

Pastor Marcus said they want this property to be an expression of the Crystal Lake community. They want this to be the heart of the City.

Mr. Greenman said the overall project is very open and inviting. He is comfortable with modern architecture and feels it doesn't take away from the downtown area. It might be a good idea to do portions of the architecture with each phase. Mr. Greenman believes it would be a missed opportunity if it is not include each phase of the project.

John Fuhler, a member of Willow Creek for many years, assured the Commissioners that leadership of Willow Creek promises conservatively and usually comes through earlier than promised.

Mr. Batastini asked about the membership. Pastor Bieschke said they currently have multiple services due to the size of the facility they are currently in but with the new facility more could be accommodated. Mr. Batastini asked about a café. Mr. Durham said that will be in phase 1 and another in phase 2. Pastor Bieschke said the intent is to have the building open throughout the week.

Mr. Greenman asked if there were any thoughts to create a connection with the bike path. Mr. Greetham said they are working on how to safely cross from this site to the downtown area.

Mr. Batastini said he would like to see phase 3 up front but understands the need to get the people in the building. It would be nice if portions of the outside work for phase 3 be included in phases 1 and 2. Pastor Bieschke said they will do everything to increase their time line. They want the community to know that there are new owners of this property and good things are going to happen. Mr. Batastini asked why they chose this property. Pastor Bieschke said they wanted to be in the heart of the city. They are very cautious not to move out too far.

Mr. Jouron said he loves the architecture. Mr. Goss said the change in elevations and the glass will make a big statement.

Mr. Hayden asked if they had considered renting out retail space to help generate some money for the project. Mr. Greetham said they need to be careful due to their status with the IRS.

Mr. Batastini asked where they have expanded in other communities and has that attracted other businesses. Pastor Bieschke said they have expanded in West Chicago, Lincolnshire, Glenview, Huntley, and Downtown Chicago by the Auditorium Theater. Businesses do take notice of them and they usually go into communities that have strong businesses. In sites in other states, businesses have said it has been good for their business.

Mr. Greenman asked what is the next step for Willow Creek. Mr. Greetham said they are in their final stages of due diligence which should be completed in the next week or two. They hope to finalize the plans in December and be back before the City in January.

Mr. Hayden asked if the presenters needed anything else from the Commissioners or did they get enough feedback. Mr. Zanck said they wanted input on the architectural and they received what they were looking for. Mr. Hayden said they can't discuss traffic until there is a study before them. Mr. Greetham said they wanted the City to get a better idea of what to expect on the property. They want this to be a center of the community first and a place of worship second.

Mr. Hayden said this is exciting. Mr. Goss agreed. Mr. Skluzacek said the project will be beautiful and would like phase 3 to come quickly. Mr. Esposito said any redevelopment of the property will be good. Mr. Greenman appreciates the opportunity to share thoughts prior to formal submittal. Mr. Jouron said the architecture is beautiful. Mr. Batastini said he has no issues with the project. This is setting the bar high for

the area.

Pastor Bieschke thanked the members for their time.

Mr. Goss suggested that a special meeting be held for this request so they can take their time to do what they need to do.

11. Report of the Planning & Zoning Commission-Conceptual Review for Willow Creek, 100 S. Main Street.

Attorney Tom Zanck, Pastor Marcus Bieschke and Business Manager Don Greetham were present. Pastor Bieschke provided a brief background on Willow Creek, advising that it is a multi-site church with seven locations in the Chicago area, serving 1200 people for each service on Saturday and Sunday . He stated that they had outgrown their present facility in Crystal Lake on Exchange Drive and had started researching and planning relocation four years ago, noting that they had evaluated multiple property options and had determined that the Main Street location was an ideal place to create a beautiful and functional community center. He thanked Mayor Shepley for encouraging them to explore the site two years ago, and stated that they envisioned it as a place where they could serve the community for the next 100 years and beyond.

Carson Durham, the principal architect, presented an onscreen overview of the proposed three phase plan, which included a 2,000-seat auditorium, outdoor space with nature trails and a splash pad, gathering spaces and classrooms. He stated that Phase 1 would be to build the 2,000 seat auditorium, Phase 2 would include an additional build-out to the east with a smaller auditorium space and classrooms, and Phase 3 would include the outdoor plaza area, community space, chapel, indoor play space and cafe, all of the outdoor landscaping and amenities. He showed the landscape plan which included green space and very natural looking landscaping all around so that it would not be a "building in a parking lot. He showed building elevations and described the clear glass, stone, wood, masonry and brick exterior, which he stated were warm materials that would reinforce the church's connection to the community, and the building would also be very transparent and welcoming.

Mayor Shepley asked if anyone in the audience wished to speak on the matter.

John Fuhler, 887 North Shore Drive, stated that he was a lifelong resident of Crystal Lake and a long time member of Willow Creek, and he believed the new church location would be an asset to the entire community.

There was no further public comment.

Councilman Dawson asked how many stories the new auditorium would be, and Mr. Greetham said the estimated height was 40 feet. Mr. Greetham and Councilman Dawson discussed how the plan would compensate for the parking lot being higher in some areas and lower in others; with Mr. Greetham advising that the grades would be fully landscaped for a park-like setting. Councilman Dawson stated that Oak Industries had employed hundreds of people in its time and served the community, and now that location would again serve the community, and he was very enthused with the concept they had presented.

Councilman Ferguson stated that she would wait until the traffic studies were completed, but her only concern was regarding traffic and stacking to and from the parking lots at the easternmost entrance by the railroad tracks, which could become a neighborhood issue. She stated that the

building design was beautiful and the church would be a great use for the property. Councilman Hopkins thanked the church representatives for keeping the church in Crystal Lake, which he stated would have an even deeper impact on the community by moving to a permanent residence. He stated that he was glad that green space would be featured in their design, and that he felt the building was beautiful. He also commented that this project could spark interest in future development of the vacant parcel across Main Street, which would be very good.

Councilman Hubbard agreed with Councilwoman Ferguson about the traffic, but said that the overall plan looked great.

Councilman Haleblian agreed, stating that his only concern was traffic and that they had "knocked it out of the park" with the contemporary architecture plan. He stated that he felt this would be a huge asset to the Crystal Lake community.

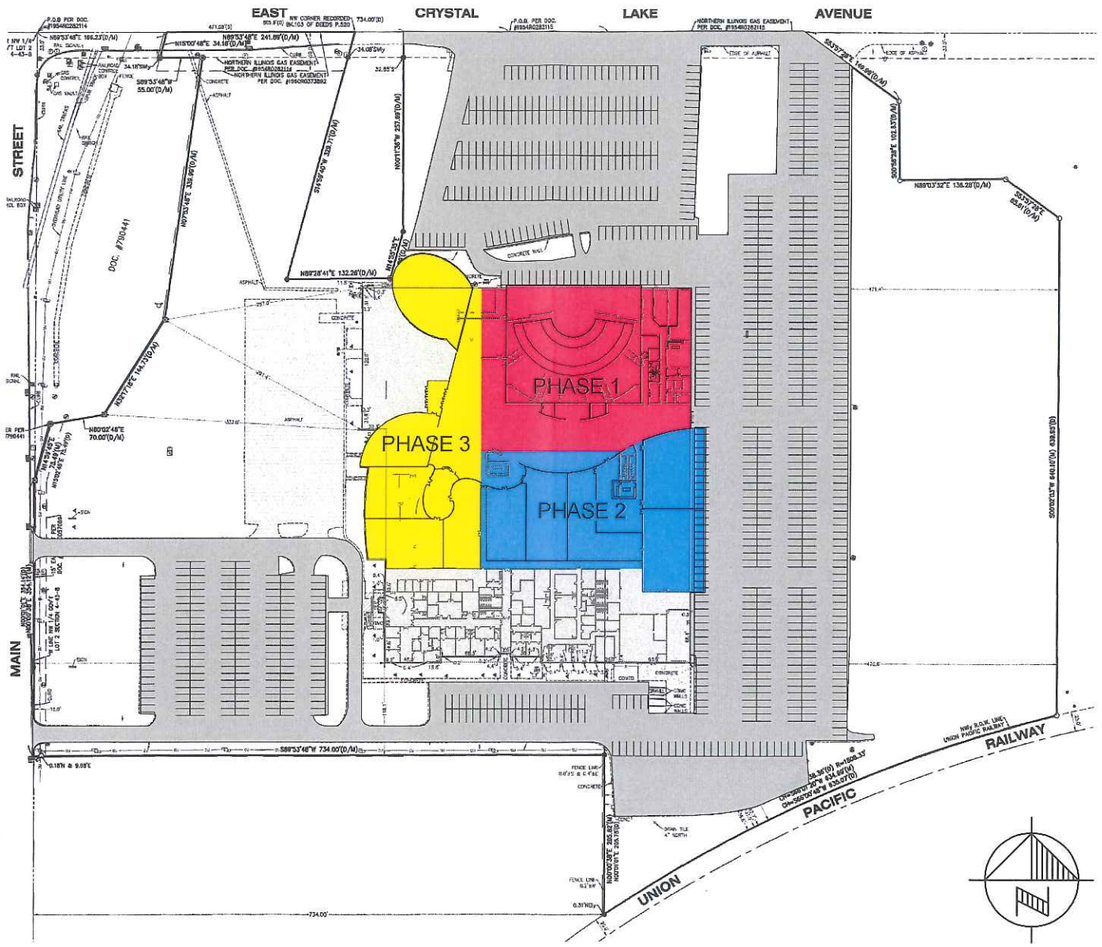
Mayor Shepley recalled that the church had been looking at another property in Crystal Lake when he suggested the former Oak Industries property, which he felt would be a better option, and this proposal only validated those discussions. He agreed with Councilman Haleblian's comment about the architecture, saying that it was a gorgeous building. He asked about the time frame for the phases. Mr. Greetham said that they planned to complete each phase every 3 or 4 years in order to give their congregation some breathing space between fundraising efforts, and that the entire plan would be complete in 10 or 12 years. He said that they had already raised $8 million for Phase 1. Mayor Shepley stated that traffic would be an issue, but not an insurmountable one. He stated that having the church in the downtown area could lead to more shops being open on Sundays, and he agreed with Councilman Hopkins that this plan would stimulate development on the other side of Main Street, noting that there had been a very nice proposal for the area ten years ago with upscale condominiums, retail shopping and underground parking, and it would be very nice to see that come back. Mayor Shepley thanked the church representatives for bringing such a nice proposal to the Council for review.

13. Bid award and resolution authorizing the execution of a contract with Hecker and Company, Inc. for the Illuminated Street Name Sign program.

Councilman Hubbard moved to award the Illuminated Street Name Sign bid to the lowest responsive and responsible bidder, Hecker and Company, Inc., in the bid amount of $52,416.00 and to adopt a Resolution authorizing the City Manager to execute a contract with Hecker and Company, Inc., in the amount of $52,416.00, allowing for a 10% contingency. Councilman Hopkins seconded the motion. On roll call, all voted yes. Motion passed.

14. Bid award and resolution authorizing the execution of a service contract with Northwest Technical for Raw Sewage Pump Station #1 MCC Replacement.

Councilman Hubbard moved to award the bid for Raw Sewage Pump Station #1 MCC Replacement to the lowest responsible, responsive bidder, Northwest Technical, and to adopt a Resolution authorizing the City Manager to execute a service contract with Northwest Technical in the submitted bid amount, allowing for a 10% contingency. Councilman Hopkins seconded the motion. On roll call, all voted yes. Motion passed.



MASTER SITE PLAN PHASING
1" = 160'-0"

RECEIVED
MAR 03 2016
BY:
2016 08

WILLOW CREEK COMMUNITY CHURCH

101 S. MAIN ST. | CRYSTAL LAKE, IL
03/02/2016

SCALE:

BLDD ARCHITECTS
BLDD Project No. 152R108.400

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nditions will result in civil action.

EAST CRYSTAL LAKE AVENUE

515.68'

241.89'

34.18'

55.00'

NORTHERN ILLINOIS GAS EASEMENT

FUTURE VOW RENEWAL

PAVILLION

ICE RINK/ SPORTS COURT

257.69'

325.71'

339.99'

102.68'

136.28'

85.61'

9.98'

61.73'

132.26'

FOUNTAIN GARDEN

CHILDREN'S GARDEN

GATHERING PLAZA

SCULPTURE GARDEN

REFLECTIVE GARDEN

144.73'

75.49'

354.10'

100 SOUTH MAIN STREET

734.00'

56.14'

78.94'

343.55'

205.82'

294.74'

UNION PACIFIC RAILWAY

388.21'

640.10'

PHASE 1
PHASE 2
PHASE 3
PHASE 4

WILLOW CREEK CHURCH
Crystal Lake, IL 60014

N
S

MIDWEST ARBOR
Spring Grove, IL 60081

1 of 2

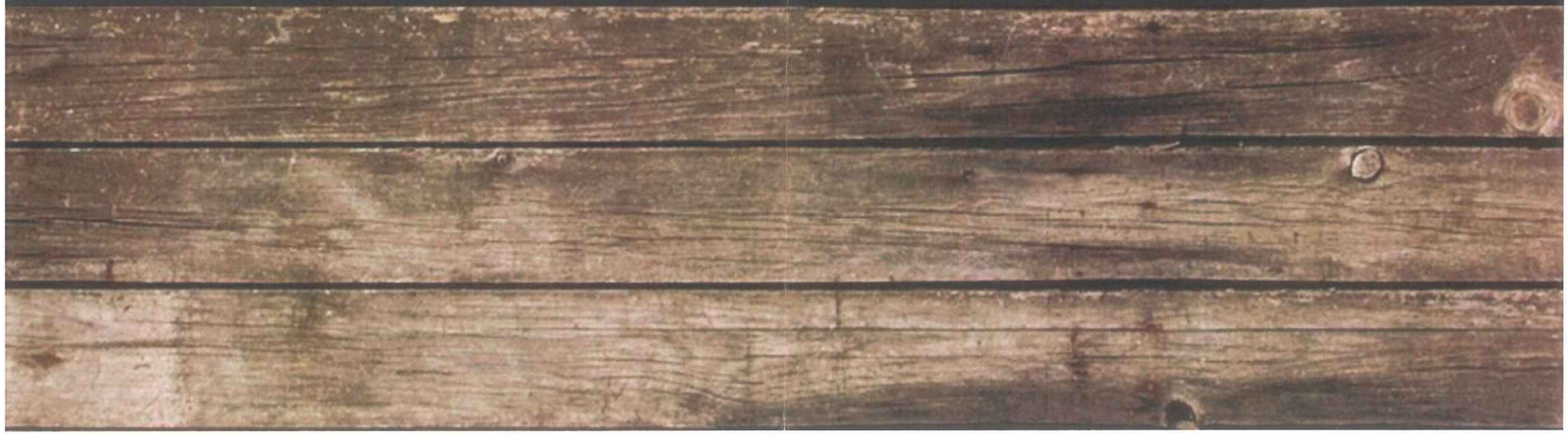
SCALE:
APPROVED BY:
DRAWN BY
DATE:
Scale: 1" = 40'
REVISED
Date: 1-20-16 Rev:
(815) 675-6768

2016 08

RECEIVED
MAR 03 2016
BY:

Willow Creek Community Church Crystal Lake

100 South Main Street



2016 08

RECEIVED
FEB 24 2016
BY:



The architectural design of the Willow Creek Community Church – Crystal Lake is a direct result of the core convictions and mission of the church.



West Entry

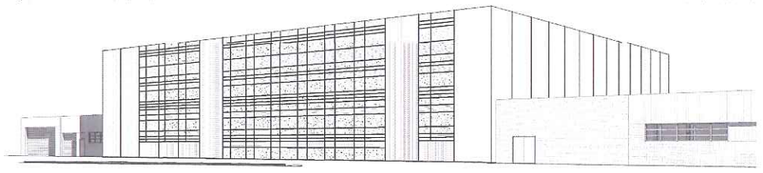
WILLOW CREEK COMMUNITY CHURCH

PHASE 1

101 S. MAIN ST
CRYSTAL LAKE, IL

SCHEMATIC DESIGN

02/03/2016



ARCHITECT

BLDD ARCHITECTS

INDEX OF DRAWINGS

SITE & LANDSCAPING

PLAT OF SURVEY

~~MASTER LANDSCAPE PLAN WITH SECTIONS~~

MASTER LANDSCAPE PLAN

SITE INTENT:

THE SITE WORK FOR PHASE 1 OF THE WILLOW CREEK PROJECT INCLUDES NO CHANGES TO THE EXISTING PARKING LOT AND SIGNAGE. IF ANY CHANGES WERE TO BE MADE THEY WOULD BE IN COMPLIANCE WITH THE CITY ORDANINCES.

THE LANDSCAPING PLAN SHOWN IN THIS PACKET REPRESENTS THE MASTER LANDSCAPE PLAN THAT WOULD BE IMPLEMENTED OVER THE NEXT 12 OR SO YEARS.

ARCHITECTURAL

A101 FIRST FLOOR PLAN

A201 BUILDING ELEVATIONS & PERSPECTIVES

SET NO.

date 02/03/2016
revised

drawn by ACL
checked by ACL

BLDD ARCHITECTS
Design Firm Registration #184.000723

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COVER SHEET
WILLOW CREEK COMMUNITY CHURCH
PHASE 1
101 S. MAIN ST
CRYSTAL LAKE, IL

sheet
G101

project 152R08.400

SCHEMATIC DESIGN

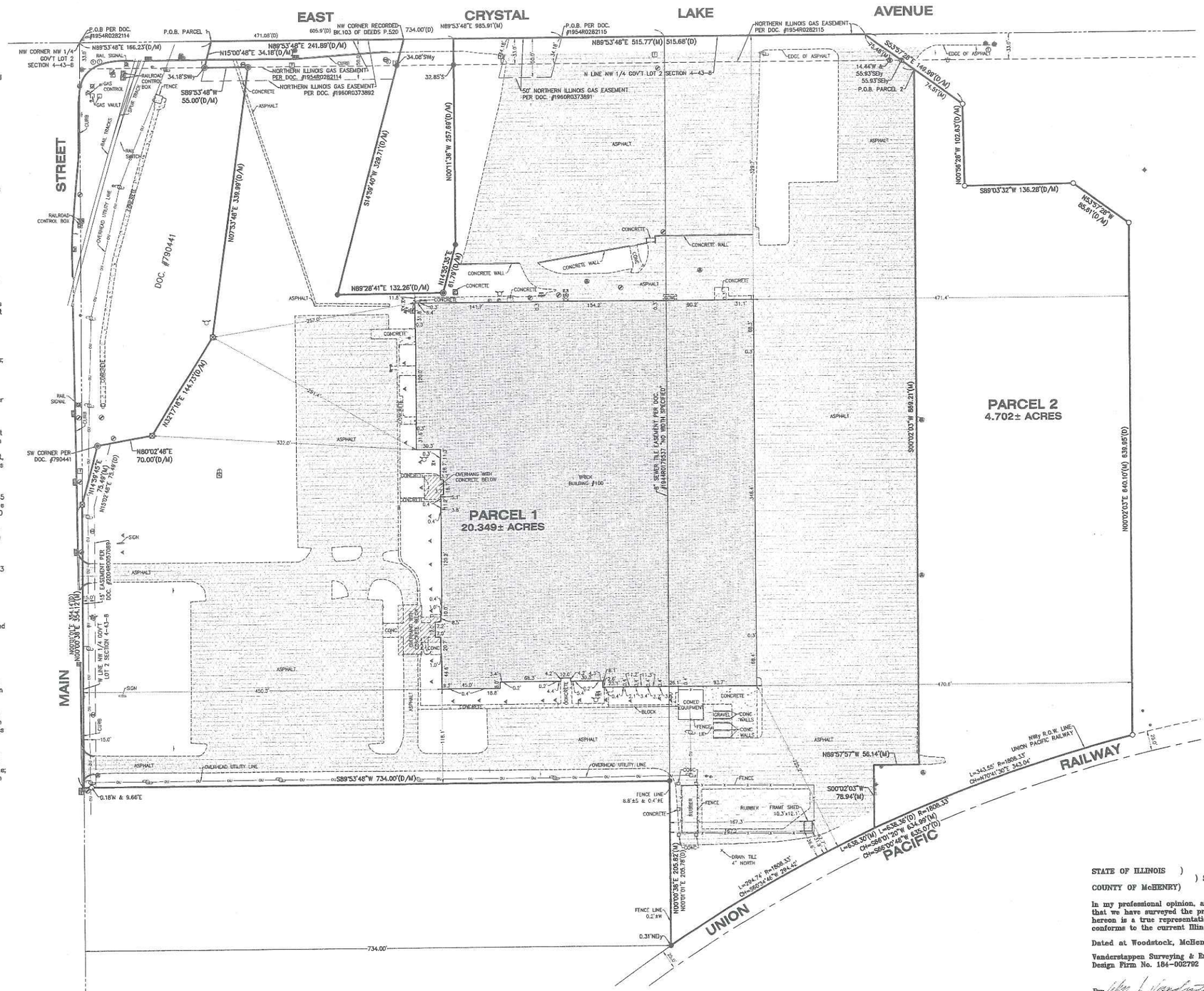
PLAT OF SURVEY

VSEI
Vanderstappen Surveying & Engineering, Incorporated
1316 North Madison Street, Woodstock, Illinois
(815) 337-8310 www.vsellerstine.com

LEGAL DESCRIPTION

PARCEL 1:
That part of Government Lot 2 of the Northwest Quarter of Section 4, Township 43 North, Range 8 East of the Third Principal Meridian, described as follows: Commencing at the Northwest corner of said Northwest Quarter; thence North 89 degrees 53 minutes 48 seconds East, 166.23 feet along the North line of said Northwest Quarter for a Place of Beginning; thence continuing North 89 degrees 53 minutes 48 seconds East, 241.89 feet along said North line to the Northwest corner of lands described in Book 103 of Deeds, page 520, as monumented and as recorded in McHenry County, Illinois; thence South 14 degrees 59 minutes 40 seconds West, 329.71 feet along the West line of said lands to the Southwest corner of said lands; thence North 89 degrees 28 minutes 41 seconds East, 132.26 feet along the South line of said lands to the Southeast corner of said lands; thence North 14 degrees 55 minutes 35 seconds East, 61.79 feet along the East line of said lands; thence North 0 degrees 11 minutes 36 seconds West, 257.69 feet to a point on said North line of the Northwest Quarter; thence North 89 degrees 53 minutes 48 seconds East, 515.68 feet along said North line; thence South 53 degrees 57 minutes 28 seconds East, 149.99 feet; thence South 0 degrees 56 minutes 28 seconds East, 102.63 feet; thence North 89 degrees 03 minutes 32 seconds East, 136.28 feet; thence South 53 degrees 57 minutes 28 seconds East, 85.61 feet; thence South 0 degrees 02 minutes 03 seconds West, 639.95 feet to the Point of intersection with the Northwesterly right-of-way line of the Union Pacific Railway "Y" Connection Spur Line; thence Southwesterly along said Northwesterly right-of-way line, being along a non-tangential curve, having a radius of 1808.33 feet as said curve is convexed to the Northwest, for an arc distance of 638.36 feet (said curve having a chord bearing of South 66 degrees 00 minutes 48 seconds West and a chord distance of 635.07 feet) to a Point of Intersection with the East line of the West 734.00 feet of said Northwest Quarter; thence North 00 degrees 01 minutes 01 seconds East, 205.78 feet along said East line of the West 734.00 feet; thence South 89 degrees 53 minutes 48 seconds West, 734.00 feet to a point on the West line of said Northwest Quarter; thence North 0 degrees 01 minutes 01 seconds East, 354.14 feet along said West line; thence North 15 degrees 02 minutes 48 seconds East, 75.49 feet to the Southwest corner of lands described in Document Number 790441, as recorded February 22, 1980 in McHenry County, Illinois; thence North 80 degrees 02 minutes 48 seconds East, 70.00 feet along the South line of said lands to the Southeast corner of said lands; thence North 32 degrees 17 minutes 18 seconds East, 144.73 feet along the Easterly line of said lands; thence North 7 degrees 53 minutes 48 seconds East, 339.99 feet along said Easterly line to the Northeast corner of said lands; thence South 89 degrees 53 minutes 48 seconds West, 55.00 feet along the North line of said lands; thence North 15 degrees 00 minutes 48 seconds East, 34.18 feet to the Place of Beginning, (excepting therefrom that part being described as follows: Commencing at the Northwest corner of said Northwest Quarter; thence North 89 degrees 53 minutes 48 seconds East, 985.91 feet along the North line of said Northwest Quarter; thence South 53 degrees 57 minutes 28 seconds East, 75.48 feet to the Place of Beginning; thence South 0 degrees 02 minutes 03 seconds West, 869.21 feet; thence North 89 degrees 57 minutes 57 seconds West, 56.14 feet; thence South 0 degrees 02 minutes 03 seconds West, 78.94 feet to the Northwesterly right-of-way line of the Union Pacific Railway "Y" Connection Spur Line; thence Northeasterly 343.55 feet along the Northwesterly right-of-way line, being along a curve to the right, having a radius of 1808.33 feet, the chord of which bears North 70 degrees 41 minutes 30 seconds East for a length of 343.04 feet to the Southeast corner of the lands described in document No. 1997R0004285; thence North 00 degrees 02 minutes 03 seconds East, 639.95 feet along the East line thereof; thence North 53 degrees 57 minutes 28 seconds West, 85.61 feet along said Northeasterly line; thence South 89 degrees 03 minutes 32 seconds West, 136.28 feet along the north line thereof; thence North 00 degrees 00 degrees 56 minutes 28 seconds West, 102.63 feet along said East line; thence North 53 degrees 57 minutes 28 seconds West, 74.51 feet to the Place of Beginning), in McHenry County, Illinois.

PARCEL 2:
That part of Government Lot 2 of the Northwest Quarter of Section 4, Township 43 North, Range 8 East of the Third Principal Meridian, described as follows: Commencing at the Northwest corner of said Northwest Quarter; thence North 89 degrees 53 minutes 48 seconds East, 985.91 feet along the North line of said Northwest Quarter; thence South 53 degrees 57 minutes 28 seconds East, 75.48 feet to the Place of Beginning; thence South 0 degrees 02 minutes 03 seconds West, 869.21 feet; thence North 89 degrees 57 minutes 57 seconds West, 56.14 feet; thence South 0 degrees 02 minutes 03 seconds West, 78.94 feet to the Northwesterly right-of-way line of the Union Pacific Railway "Y" Connection Spur Line; thence Northeasterly 343.55 feet along the Northwesterly right-of-way line, being along a curve to the right, having a radius of 1808.33 feet, the chord of which bears North 70 degrees 41 minutes 30 seconds East for a length of 343.04 feet to the Southeast corner of the lands described in document No. 1997R0004285; thence North 00 degrees 02 minutes 03 seconds East, 639.95 feet along the East line thereof; thence North 53 degrees 57 minutes 28 seconds West, 85.61 feet along said Northeasterly line; thence South 89 degrees 03 minutes 32 seconds West, 136.28 feet along the north line thereof; thence North 00 degrees 00 degrees 56 minutes 28 seconds West, 102.63 feet along said East line; thence North 53 degrees 57 minutes 28 seconds West, 74.51 feet to the Place of Beginning, in McHenry County, Illinois.



LEGEND	
•	BOLLARD
◉	CATCH BASIN
⊕	CLEAN OUT
▭	CURB INLET
⌐	DOWN GUY
◧	ELECTRIC METER
◱	ELECTRIC OUTLET
◪	ELECTRIC RISER
⌣	FIRE CONNECTION
⍑	FIRE HYDRANT
▷	FLARED END SECTION
●	FOUND IRON BAR
○	FOUND IRON PIPE
⊠	FOUND MONUMENT
⊛	FOUND RR SPIKE
⍟	GAS VALVE
⊘	MANHOLE
⌖	MONITORING WELL
⊜	SANITARY MANHOLE
⊙	SET IRON BAR
⊦	SIGN
⊛	STORM MANHOLE
Ⓣ	TELEPHONE MANHOLE
Ⓣ	TELEPHONE RISER
▦	TRAFFIC CONTROL BOX
⌘	TRAFFIC SIGNAL POLE
▥	TRANSFORMER
⊞	TV RISER
⍥	UTILITY POLE
⊖	VALVE VAULT
⍒	WATER SHUT-OFF
⍋	WATER VALVE
⍲	YARD LIGHT
(D)	DEED
(R)	RECORD
(M)	MEASURE

60' 0' 60' 120'
SCALE: 1" = 60'

CLIENT: HOME STATE BANK
DRAWN BY: SES CHECKED BY: WJV
SCALE: 1"=60' SEC. 4 T. 43 R. 8 E.
BASIS OF BEARING: ASSUMED
P.I.N.: 19-04-101-002, 016
JOB NO.: 140768-A I.D. MBSI
FIELDWORK COMP.: 1/22/15 BK. 102 PG. 44
ALL DISTANCES SHOWN IN FEET AND DECIMAL PARTS THEREOF CORRECTED TO 68° F. REF:

STATE OF ILLINOIS)
) S.S.
COUNTY OF McHENRY)

In my professional opinion, and based on my observations, I hereby certify that we have surveyed the premises above described, and that the plat hereon is a true representation of the said survey. This professional service conforms to the current Illinois minimum standards for a boundary survey.

Dated at Woodstock, McHenry County, Illinois 11/10 A.D., 2015.

Vanderstappen Surveying & Engineering, Inc.
Design Firm No. 184-002782

By: _____
Illinois Professional Land Surveyor No. 2709

I:\PLATS\2014\2800-2799\140768_VI-140768\140768-MBSI.dwg-Layout1-11/10/2015 9:42 PM

WILLOW
CRYSTAL LAKE

date 02/18/2016
revised

drawn by ADM
checked by RCD

BLDD ARCHITECTS
Design Firm Registration #184-007123

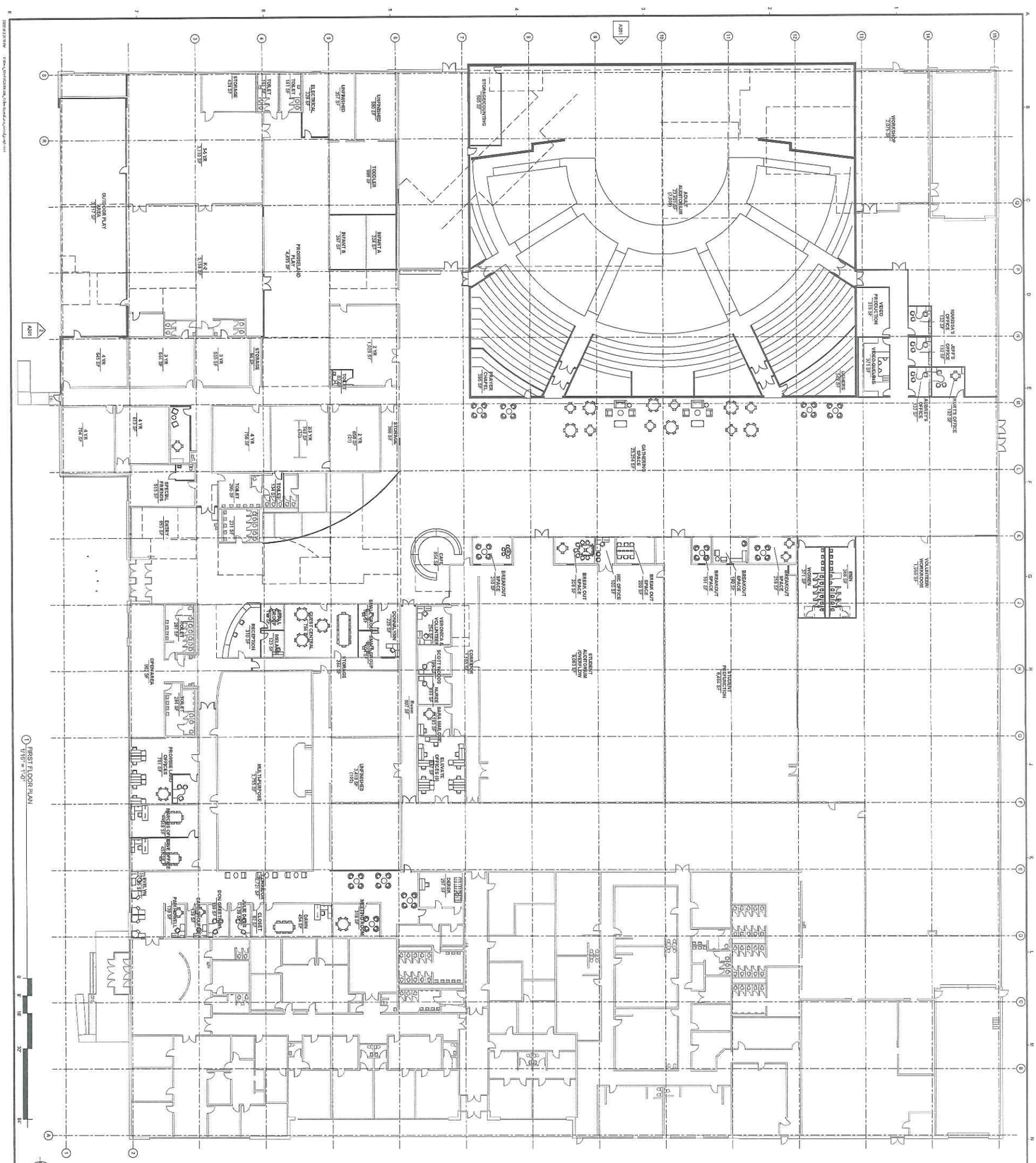
PRELIMINARY SITE / LANDSCAPE / PARKING PLAN

WILLOW CREEK COMMUNITY CHURCH
PHASE 1
101 S. MAIN ST
CRYSTAL LAKE, IL

sheet
SD-AS102

project 152R08.400

DESIGN DEVELOPMENT



SCHEMATIC DESIGN

sheet A101

project 1525B08.400

FIRST FLOOR PLAN

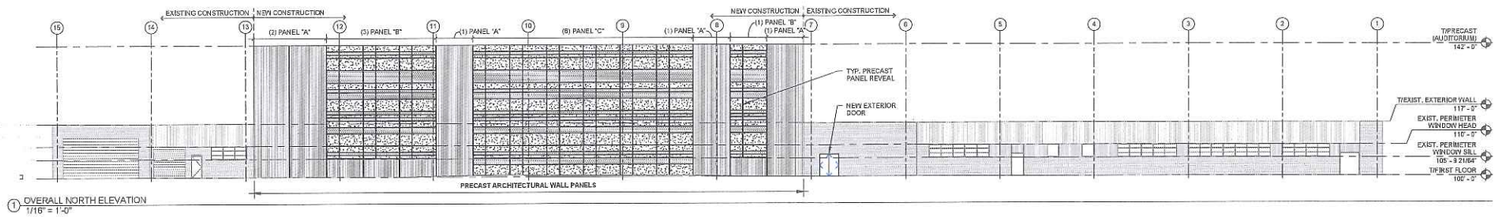
WILLOW CREEK COMMUNITY CHURCH
PHASE 1
101 S. MAIN ST
CRYSTAL LAKE, IL

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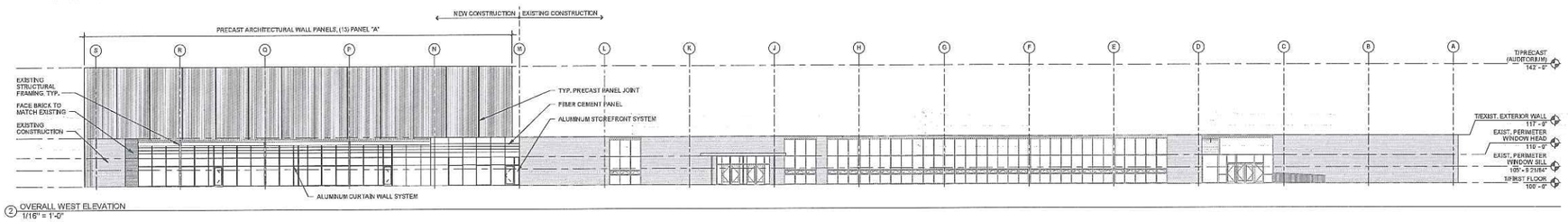
Design Firm Registration #184-000723

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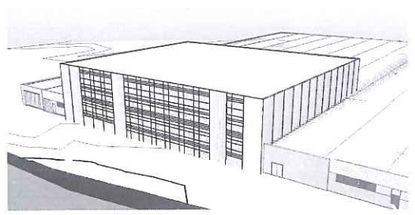
drawn by: KES
checked by: ACL
issue: 02/02/16
revised:



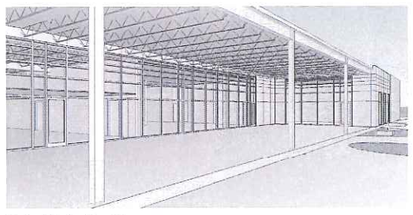
1 OVERALL NORTH ELEVATION
1/16" = 1'-0"



2 OVERALL WEST ELEVATION
1/16" = 1'-0"



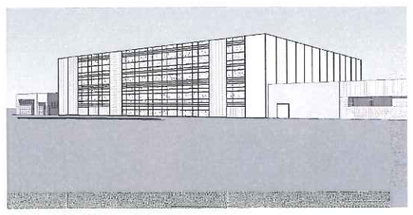
Auditorium Exterior NW Aerial Perspective



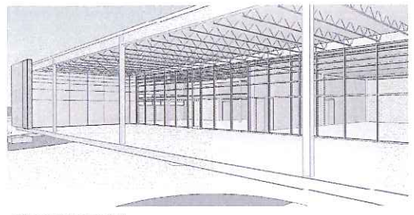
Sheltered Play Area from NW



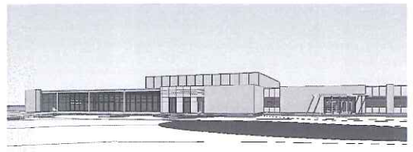
Proposed West Facade NW



Auditorium Exterior NW Perspective



Sheltered Play Area from SW



Proposed West Facade SW

BLDD ARCHITECTS

Design Firm Registration #184-000723

date 02/03/2016
revised

drawn by ADM
checked by RCD

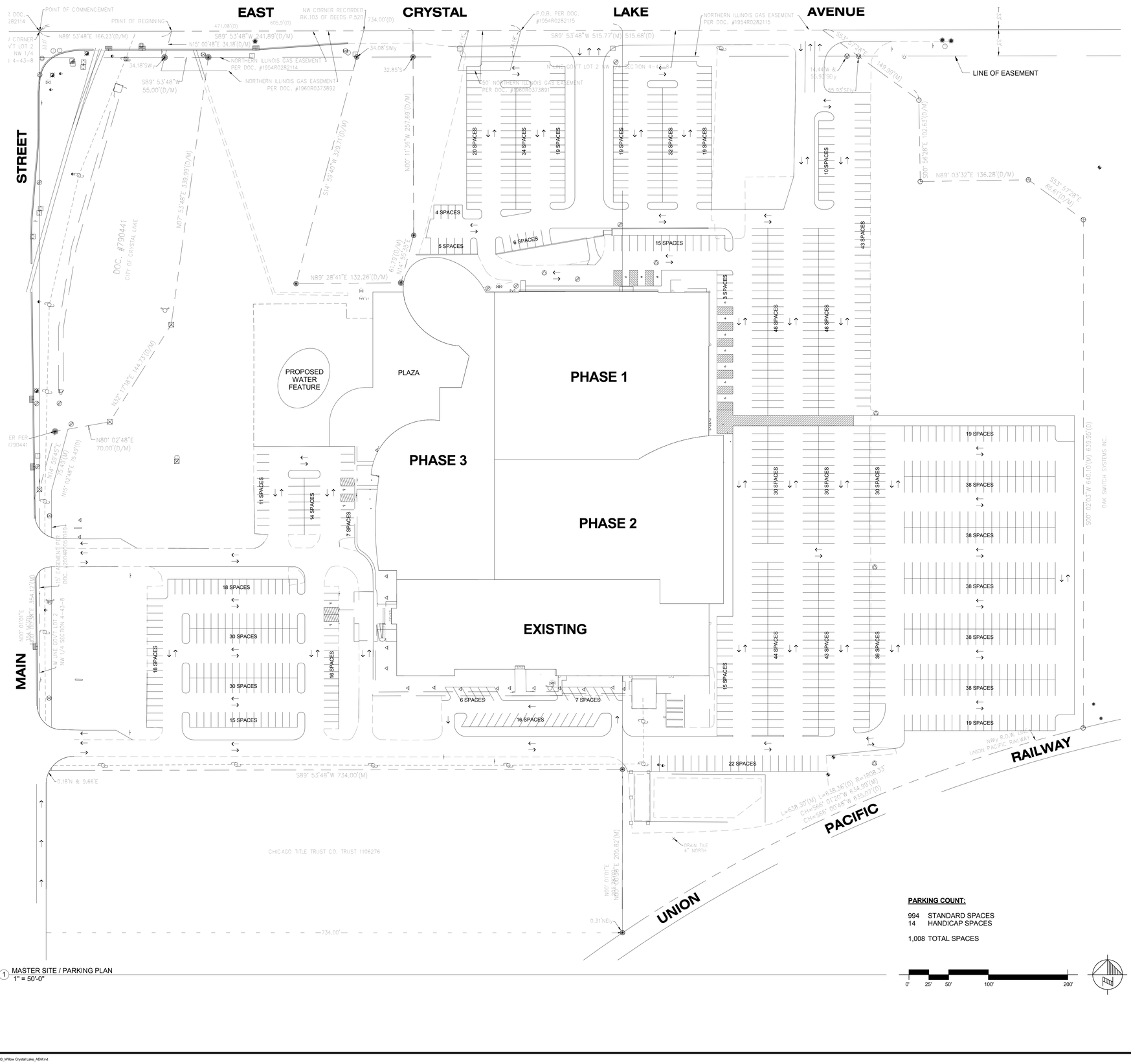
BUILDING ELEVATIONS & PERSPECTIVES

WILLOW CREEK COMMUNITY CHURCH
PHASE 1
101 S. MAIN ST
CRYSTAL LAKE, IL

sheet
A201

project 152R108.400

SCHEMATIC DESIGN



1 MASTER SITE / PARKING PLAN
1" = 50'-0"

PARKING COUNT:

994 STANDARD SPACES
14 HANDICAP SPACES

1,008 TOTAL SPACES

0' 25' 50' 100' 200'

Received 04/01/16

WILLOW CRYSTAL LAKE

date 04/01/2016
revised

drawn by ADM
checked by RCD

BLDD ARCHITECTS
Design Firm Registration #184-000723

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MASTER SITE / PARKING PLAN
WILLOW CREEK COMMUNITY CHURCH
PHASE 1
100 S. MAIN ST. | CRYSTAL LAKE, IL

sheet
DD004

project 152RI08.400

DESIGN DEVELOPMENT

Technical Memorandum

Date: April 1, 2016

To: Ms. Abigail Wilgreen, P.E.
City Engineer
City of Crystal Lake

From: Civiltech Engineering, Inc.
James R. Woods, P.E., PTOE
Gary P. Overbay, P.E.

Re: Traffic Impact Study Revision
Proposed Willow Creek Church
Southeast Corner Main Street and Crystal Lake Avenue, Crystal Lake, IL

I. INTRODUCTION

Civiltech Engineering, Inc. has been retained by Willow Creek Church through the City of Crystal Lake to revise and complete a Traffic Impact Study (TIS) that was initiated by another consultant for a new worship and community facility in the southeast quadrant of the intersection of Main Street and Crystal Lake Avenue in Crystal Lake, Illinois. Currently, the church is located in a converted warehouse building in the Amli Industrial Park, approximately 3/4-mile southeast of the proposed site, northwest of the intersection of Congress Parkway and Exchange Drive. **Exhibit A** in **Appendix A** is a regional map showing the location of the proposed site and the current site in relation to the area roadway system. **Exhibit B** is an aerial photograph showing the existing conditions at the proposed church site.

The proposed full build-out plan shown in **Exhibit C** includes a 2,000-seat main auditorium, other assembly spaces, classrooms, offices, a day care center and outdoor natural areas and gathering spaces. The Phase I site plan shown in **Exhibit D** includes a 1,600-seat auditorium with ancillary facilities retro-fit into the existing building structure. Additional exhibits are provided in **Appendix A**.

The primary purpose of this study is to examine existing traffic conditions near the proposed site, assess the impact that the proposed development will have on traffic conditions in the area, and determine if any roadway or access improvements are necessary to accommodate traffic generated by the proposed church. The study also estimates parking demand, evaluates the parking lot layout, and evaluates alternatives for providing pedestrian routes to and from downtown Crystal Lake to the north and west.

This memorandum contains the following:

- A description of the study area and proposed development,
- A trip generation, distribution and assignment analysis based on operations at Willow Creek's existing location,
- An analysis of traffic conditions with site-generated traffic added to background traffic for both the Phase I and Full Build-Out scenarios,
- An analysis of the proposed of intersections adjacent to the site and site access intersections,
- An on-site parking and circulation evaluation, and
- An evaluation of pedestrian connectivity to downtown.

II. EXISTING CONDITIONS

A. Site Location and Existing Condition

See **Exhibits A** and **B.** The proposed church site is located on the southwest quadrant of the intersection of Main Street and Crystal Lake Avenue in the southwest corner of what is considered to be downtown Crystal Lake. The 25-acre site is currently occupied by a 193,000 square-foot one-story office/manufacturing/ warehouse building that was originally occupied by Oak Industries. The building is currently home to six organizations and companies including Friendship House, a non-profit child care center. Friendship House will continue its operations within the new Willow Creek Church building. The proposed site is now under the ownership of Willow Creek Crystal Lake Church.

There are currently six access locations to the site: two on Main Street and four on Crystal Lake Avenue. The northerly Main Street access driveway is approximately 650 feet south of the Crystal Lake Avenue intersection and 280 feet south of the Union Pacific Railroad spur. This driveway will be referenced as "Access #2" in this report. The southerly Main Street driveway (Access #1) is 240 feet further south, and is along the southerly boundary of the property. There is currently no left or right turn channelization into the site at these locations. Both driveways are approximately 22 feet wide; enough width to provide one entering and one shared left turn/right turn exiting lane. Access drives #1 and #2 provide access directly to what we have labeled as "Lot A" on **Exhibit B**. There are currently no driveways directly opposite the existing site driveways on Main Street.

The westerly Crystal Lake Avenue access driveway (Access #3a) is approximately 590 feet east of the Main Street intersection. Two additional driveways to Crystal Lake Avenue toward the center of the site (Access #3b and #3c) are 740 and 870 feet east of Main Street, respectively. These three driveways all provide access to the north parking lot (Lot C). All of these driveways are between 24 and 30-feet wide and are created simply by removing wheel stops that define the entire north edge of Lot C. The ultimate number of driveways to Lot C, as well as their location and configuration, will be determined by this report. The center of the easterly Crystal Lake Avenue driveway (Access #4) is 1,035 feet east of Main Street and provides access to Lot D. Access #4, which appears to have once be used as a tractor/semi-trailer truck driveway, is approximately 95 feet wide. The center of the Union Pacific/Metra Railroad crossing is approximately 155 feet east of the east edge of Access #4. There are currently no driveways opposite the proposed site driveways on Crystal Lake Avenue. Each of the existing access drives are labeled on **Exhibit B** for reference.

The site currently contains what may be described as five distinct parking areas surrounding the existing building. They are labeled as Lots "A" through "E" on **Exhibit B**. Lot A is in the southwest corner of the site, immediately west of the existing building, and is served by driveways leading to/from Access Points #1 and #2 on Main Street. Lot A currently contains approximately 168 parking spaces. Lot B is directly north of Lot A along the west side of the existing building and is only accessible through Lot A. Lot B contains approximately 97 spaces. Lot C is located north of the existing building and is served primarily from Crystal Lake Avenue by Access point #3a, 3b and 3c. The parking spaces in this lot are not currently well defined, but it is believed that the area could serve as parking for a maximum of approximately 275 vehicles. Lot D is located to the east of the existing building. Its primary access is Access #4 on Crystal Lake Avenue. The spaces and aisles in Lot D are also not well-defined but the lot could contain approximately 350 to 400 spaces. Lot E is located south of the building. It is a smaller service lot containing approximately 30 spaces and currently serves Friendship House. In total, the site may currently contain paved areas capable of accommodating approximately 900 to 1,000 parking spaces. Under existing conditions, the only connection between Lots B and C and the rest of the parking is a perimeter roadway along the south and east edges of the property running from Main Street to Crystal Lake Avenue. In other words, there is no direct connection between Lots B and C.

B. Existing Land Use

Vacant parcels exist to the immediate north and east of the proposed site. A small manufacturing company exists south of the site. To the west of the site, across Main Street, there is an apartment complex, which does not have access to Main Street, and a vacant parcel planned as a mixed-use high density development. The current plan for this development does indicate a potential future access to Main Street, which would be located directly opposite Access #2 on the church site plan, as shown on **Exhibit B**. Downtown Crystal Lake is located just to the northwest of the proposed site.

A very low volume Union Pacific spur railroad line runs along the west side of Main Street , and then curves northeast across the south and east legs of the Main Street/Crystal Lake intersection. This spur is used primarily for rail car storage and assembly of trains. Just east of the proposed site a high-volume/high-speed Union Pacific Freight/Metra Commuter Rail line crosses Crystal Lake Avenue.

C. Existing Roadway System Characteristics

The proposed church site is bordered by Main Street on the west and Crystal Lake Avenue along the north side. **Exhibit E** illustrates the characteristics of the existing adjacent roadway network, including posted speed limits, lane configurations, marked crosswalks and intersection control.

Main Street south of Crystal Lake Avenue is a north-south four-lane minor arterial roadway that is under the maintenance and jurisdiction of the City of Crystal Lake. At its signalized intersection with Crystal Lake Avenue, the inside lane on northbound Main Street becomes an exclusive left turn lane, the outside northbound lane is a combination through lane to Main Street north of Crystal Lake Avenue, and a 70-foot exclusive northbound to eastbound right turn lane exists. South of Crystal Lake Avenue, Main Street is currently undivided, with northbound and southbound directions separated by a double-yellow pavement marking. North of Crystal Lake Avenue, Main Street is a two-lane major collector roadway that runs through downtown.

At the intersection with Crystal Lake Avenue, there is a southbound shared through/right turn lane, a through lane, and an exclusive left turn lane. Main Street has a posted speed limit of 40 mph south of Crystal Lake Avenue and 30 mph north of the intersection. The City is in the design phase for a new traffic signal to be located at the intersection of Main Street and Illinois Route 176 (one-half mile north of Crystal Lake Avenue). This installation of this signal will likely result in a shifting of some north-south traffic from Walkup Avenue (one-quarter mile west of Main Street) to Main Street. According to the Intersection Design Study (IDS) for the improvement of this intersection (discussed below), the Average Daily Traffic (ADT) volume on Main Street is currently 19,600 vehicles per day (vpd) south of Crystal Lake Avenue and 13,600 vpd north of the intersection.

Approximately 390 feet south of the Crystal Lake Avenue intersection, a single-track Union Pacific Railroad spur line crosses Main Street at-grade in the southwest-northeast direction at a very acute angle. This rail spur is infrequently used, and according to the Illinois Commerce Commission (ICC) online crossing inventory, train speeds are between 5 to 10 mph when they do cross. The warning system at the crossing consists of two sets of "wig-wag" flashing lights in each direction: one set on a mast arm and the other on the mast arm post below a set of crossbucks. There are no gates at this crossing.

Crystal Lake Avenue is an east-west two-lane undivided minor arterial both east and west of Main Street that is also under the maintenance and jurisdiction of the City of Crystal Lake. At its signalized intersection with Main Street, westbound Crystal Lake Avenue has one shared through/right turn lane and one 150-foot long exclusive left turn lane. Eastbound Crystal Lake Avenue has a 165-foot long exclusive left turn lane, one through lane, and one 175-foot long exclusive right turn lane. Eastbound Crystal Lake Avenue east of Main Street provides approximately 250 feet of two through lanes before tapering down to a single eastbound through lane. Crystal Lake Avenue has a posted speed limit of 30 mph east and west of Main Street. According to the IDS for the improvement of this intersection (discussed below), the ADT volume on Crystal Lake Avenue is currently 10,000 vpd west of Main Street and 10,100 vpd east of the intersection.

Approximately 125 feet east of the Main Street intersection, the same Union Pacific Railroad spur line that crosses the south leg of the intersection also crosses Crystal Lake Avenue at-grade in a southwesterly-northeasterly direction at a slight angle. Here, there are two sets of tracks due to a bifurcation located on the southeast quadrant of the roadway intersection. Just as on the south leg of the roadway intersection, the warning system at the crossing on the east leg consists of two sets of wig-wag flashing lights in each direction: one set on a mast arm and the other on the mast arm post below a set of crossbucks. There are no gates at this crossing.

Another Union Pacific Railroad line crosses Crystal Lake Avenue at-grade in a northwest-southeast direction approximately 1,250 from the intersection of Main Street and Crystal Lake Avenue. There are three sets of tracks at this crossing. The line accommodates both freight trains and Metra commuter trains. According to the ICC database, this line carries 56 trains per day of which 54 are commuter trains, and speeds range from 20 mph to 70 mph. The warning system at this crossing consists of gates and flashing lights.

There is sidewalk along both sides of all four legs of the Main Street/Crystal Lake Avenue intersection with the exception of the east side on the south leg and the south side on the east leg. There are no sidewalks on the southeast quadrant of the intersection. Marked crosswalks exist only across the west and north legs of the intersection, and pedestrian push-buttons with pedestrian signals/countdown timers are provided.

D. Existing Traffic Conditions

In order to quantify current traffic conditions adjacent to the proposed site, a four-hour turning movement count was performed at the intersection of Main Street and Crystal Lake Avenue on Saturday, November 21, 2015 from 4:00 P.M. to 8:00 P.M. and on Sunday, November 21, 2015 from 7:00 A.M. to 1:00 P.M. These time periods were chosen to capture the anticipated arrival and departure periods for the proposed Church for both Saturday evening and Sunday morning services. The results indicated that the existing peak traffic hour within the chosen periods occurs at 4:15 P.M. on Saturday and at 11:30 A.M. on Sunday. **Exhibit F** illustrates existing peak hour traffic volumes. Traffic count data sheets are provided in **Appendix B**.

E. Traffic Operation at Existing Willow Creek Facility

Civiltech staff conducted a field observation of the existing Willow Creek facility on February 28, 2016 during the Sunday morning peak period identified above. This was done to help develop trip generation rates for the Willow operation, observe parking patterns and rates, and to gain some understand of directions of approach to and departure from the facility, to apply to the new facility. The details of these investigations have not been included in this report, but rather have been used to develop projections for operation of the proposed campus. This information is available upon request. This information supplemented traffic counts that were performed by the previous consultant in November of 2015. These data collection efforts are further discussed in Section IV below.

III. PLANNED IMPROVEMENT AT THE MAIN STREET/CRYSTAL LAKE AVENUE INTERSECTION

The City of Crystal Lake is in the process of planning for an improvement at the intersection of Main Street and Crystal Lake Avenue. A copy of the Intersection Design Study (IDS) dated 5/2013 is provided in **Appendix C**. It is anticipated that this intersection improvement will be constructed in 2017 or 2018 depending on coordination with the railroad. Willow Creek is targeting to move into its new facility in 2017. As such, Civiltech has performed analyses for two scenarios. Scenario 1 assumes existing traffic plus Phase I site-generated traffic on the existing pre-intersection improvement roadway network. Scenario 2 assumes 2020 future background traffic plus Full Build-Out site-generated traffic on the post-intersection improvement roadway network. These scenarios will be described further later in this memo.

Following are the key improvements as proposed in the IDS. Lane configuration modifications to the roadway network associated with the intersection improvement as presented on the IDS plans are indicated on **Exhibit E**. This report will propose necessary refinements to the IDS geometrics at the access points to the proposed Willow Creek Campus.

- *South Leg:* Currently, heading northbound on Main Street toward the Crystal Lake Avenue intersection, the inside lane of the two through lanes becomes an exclusive left turn lane, while the outside through lane continues north as a single through lane through the intersection. The improvement will move the left turn movement into its own dedicated 294-foot northbound to westbound left turn lane, thus providing two northbound through lanes at the intersection. North of the intersection, the two through lanes would taper down to one. The northbound to eastbound exclusive right turn lane will be extended from approximately 70 feet to 117 feet long by maximizing the available space between the intersection and the Union Pacific Railroad spur. South of the intersection, Main Street is proposed to be widened to provide a painted center median through the southern access driveway. A marked crosswalk was previously proposed (and shown on the IDS in **Appendix C**). It has since been removed from the plan.
- *North Leg:* No changes are proposed to the lane configuration or storage lengths in the southbound direction approaching the intersection. The alignment of the through lanes through the intersection will be improved over the existing condition. In the northbound direction, the proposed two through lanes will quickly taper down to one.
- *West Leg:* No changes are proposed to the lane configuration, however the left turn and right turn lane storage lengths will be slightly shortened from approximately 170 feet down to 146 feet. The left turn lane is proposed to be fully shadowed vs. the tapered double yellow line condition today. (Fully shadowed means that the striped median tapers out to full width prior to the taper that leads to the auxiliary lane.) In the westbound direction, the receiving lane is proposed to be widened.
- *East Leg:* Crystal Lake Avenue between Main Street and the Union Pacific/Metra Railroad will be widened to provide a painted center bi-directional left turn lane median. This will match a recent improvement to the east of the Union Pacific/Metra Railroad. The east leg will continue to provide one left turn lane and one shared through/right turn lane at the Main Street intersection, however the left turn storage will be increased from approximately 150 feet to 378 feet.
- *Site Access Driveways:* At Access drives #1 and #2 on Main Street, a painted median is proposed in which left turns into the proposed site can be accommodated. Existing Access drives #3a, 3b and 3c on Crystal Lake Avenue are proposed to be combined into a single driveway approximately 720 feet east of the centerline of Main Street, roughly at the location of existing Access #3b. It is wide enough for one left turn and one right turn exiting lane plus one entering lane. Left turns into the site at Access #3 can be accommodated in the proposed center bi-directional left turn lane. Access to the vacant site north of Crystal Lake Avenue is proposed opposite Access #3. Proposed Access #4 is roughly in the location of existing Access #4, however its width is proposed to be reduced to a standard driveway providing one left turn exiting lane, one right turn exiting lane and one entering lane. The center of Access #4 will be approximately 200 feet west of the westerly UP/Metra railroad track. A barrier median will be constructed in the painted median between Access #4 and the railroad, to match what was constructed on the east leg, therefore limiting the amount of potential storage for left turns into the site at this location. The IDS currently does not show right turn lanes at any of the four access driveways to the site.

IV. TRAFFIC CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

In order to evaluate future traffic conditions in the surrounding area, it was necessary to estimate the traffic characteristics of the proposed development, including the volumes of traffic that it will generate, the directional distribution (percent "in" vs. "out" during a given time period), trip distribution (an estimation of where trips are destined to/from) and assignment of trips to the site access driveways and roadway network.

A. Proposed Development Plan[1]

Currently, the church is located in a warehouse building to the southeast of the proposed site, northwest of the intersection of Congress Parkway and Exchange Drive. The ultimate build-out plan proposed at the Main Street/Crystal Lake Avenue intersection (See **Exhibit C**) includes a reconstruction of most or all of the existing building to provide a 2,000-seat auditorium, gathering spaces, classrooms, offices, a day care center and outdoor natural areas and gathering spaces. A more recent and detailed site/parking plan for the Full Build-Out site conditions is provided in **Appendix F**. Per that plan, approximately 180 parking spaces are show in Lot A, 31 spaces in Lot B, 170 spaces in Lot C, 518 spaces in Lot D and 56 spaces in Lot E, for a total of approximately 955 spaces.

Phase I (See **Exhibit D**) will be the construction of a 1,600 seat auditorium partly or wholly within the existing building footprint. A more recent and detailed site/parking plan for the Phase I development conditions is provided in **Appendix F**. Per that plan, approximately 180 parking spaces are show in Lot A, 97 spaces in Lot B, 170 spaces in Lot C, 534 spaces in Lot D and 56 spaces in Lot E, for a total of approximately 1,037 spaces.

At this time, it is assumed that access to the site under both the Phase I and Full Build-Out site plans will be provided via Access points #1 and #2 in their current locations on Main Street. It is assumed that access on Crystal Lake Avenue will be made via Access point #3b and #4 as described in Section III above.

Willow Creek Church anticipates activities throughout the week on the new campus to include classes, small group meetings, Friendship House activities and outdoor gathering and recreation activities. None of these uses will, however, impact the surrounding roadway system to the degree that the Saturday evening and Sunday morning worship services will. Therefore, the analyses have been confined to Saturday evenings and Sunday mornings.

[1] Coordination between the City, Site Architect, and Civiltech on the site layout/parking plan for both Phase I and the Full Build-Out condition is ongoing and modifications are anticipated based on City and Civiltech review comments. These parties will continue to work toward a site plan which strives to meet the needs of both the City and Willow Creek Church.

B. Estimated Site Traffic Generation

A Traffic Impact Study projects future traffic conditions and recommends methods to offset the impacts of the anticipated increase in traffic volumes due to land development. The volume of traffic generated by a development is based on the type of land use and the size of the development. At the core of a Traffic Impact Study are trip generation estimates. These estimates are typically completed with the aid of the publication *Trip Generation, 9th Edition*, published by the Institute of Transportation Engineers (ITE). *Trip Generation* provides average trip generation rates representing weighted averages of traffic counts and studies collected from various land uses throughout the United States and Canada since the 1960's. For the purposes of this study, we have not estimated trip generation in this manner.

In the case of this study, we believe that analysis of the conditions at the existing facility will provide a far better indication of what to expect at the new facility than the generalized rates contained in *Trip Generation*. Additionally, based on data collection during our field observation, we were able to determine existing trip distribution and vehicle occupancy, which can also be applied to the proposed site. **Exhibits A** and **G** show the location and an aerial photograph of the current church location, respectively. As shown in **Exhibit G**, there are four primary points of ingress/egress to the current church site as follows:

- Exchange Drive at West Driveway
- Exchange Drive at East Driveway
- Memorial Drive at West Driveway
- Congress Parkway and East Driveway

November 2015 Counts at Existing Willow Creek Site

Just as was performed at the intersection of Main Street and Crystal Lake Avenue, intersection turning movement counts were simultaneously performed using video cameras by the previous consultant at each of the above driveways from 4:00 P.M. to 8:00 P.M. on Saturday, November 21, 2015 and from 7:00 A.M. to 12:00 P.M. on Sunday, November 22, 2015. These periods were chosen to capture the majority of the arrival and departure periods surrounding the single Saturday evening service which was held at 5:30 P.M. and the two Sunday morning services which were held at 9:00 A.M. and 10:45 A.M. Results from the above four counts, in addition to a count at the intersection of Congress Parkway and Exchange Drive are provided in **Appendix B**.

A second light industrial/warehouse building of nearly the same size as the existing church building is located due south of the existing church building and shares the above four driveways with the current church site. This location was observed to generate almost no traffic during the Saturday evening and Sunday morning count periods, and thus all traffic counted at the above four locations was generated almost entirely by the church.

Unfortunately, traffic counts were not performed by the previous consultant at the three access driveways to the building to the immediate east of the existing church building. The church has an agreement with the owner of that building and currently uses its parking lot to accommodate a significant number of church attendees. Furthermore, based on our field observations, church attendees also par on Exchange Drive itself. These trips were therefore not picked up in the counts, and thus, though some information relating to directional distribution can be gleaned from that data, the November 2015 effort cannot solely be used to estimate trip generation of the existing site for application to the future site.

February 2016 Counts at Existing Church Site

A second field observation/data collection effort at the existing church site was performed by Civiltech on Sunday, February 28, 2016. After the beginning of the both the 9:00 A.M. and 10:45 A.M. services, Civiltech staff counted parked vehicles in the lots of the existing church building, the building to the immediate south, the building to the immediate east, and those parallel-parked along Exchange Drive. Following are the results:

Table 1: Parked Vehicle Count at Existing Church Site, Sunday February 28, 2016

Lot	Parked Vehicles (Church Attendees Only)	
	9:00 A.M. Service	**10:45 A.M. Service**
Existing Church Lot	223	203
Building to South	73	82
Building to East	145	147
Exchange Drive On-Street	6	6
Total	**447**	**438**

It should be noted that a Sky High Volleyball event was ongoing at the time of the above data collection at the sports facility north of Exchange Drive. The number of vehicles that remained in the lots well after the final church service and nearly all church attendees had departed, were counted. These parked vehicles were assumed to be associated with the volleyball event and are not included in the above counts to isolate the number of parked vehicles attributable to the church.

Civiltech obtained attendance data from church staff for the services during which parking data was collected. At the 9:00 A.M. service, there were 698 people in the main auditorium and 94 people in the adjacent atrium, for a total of 792 attendees. The main auditorium has 975 seats, and therefore it was 71.6% of capacity. Church staff has indicated that at approximately 75% of capacity, the atrium "feels full". The atrium is essentially an overflow area, where the service is simulcast on televisions. If all attendees used the auditorium, it would have been at 81.2% of the 975-person maximum capacity. Therefore, this can be considered a "fully attended" service. Comparing the number of parked vehicles to the total auditorium + atrium attendance results in a rate of 0.56 vehicles per seat occupied during the 9:00 A.M. service.

At the 10:45 A.M. service, there were 748 people in the main auditorium and 106 people in the adjacent atrium, for a total of 854 attendees. The main auditorium was 76.7% of capacity. The total of 792 people is 81.2% of the 975-person auditorium capacity. If all attendees used the auditorium, it would have been at 87.6% of the 975-person maximum capacity. This service can therefore also be considered "fully attended". Comparing the number of parked vehicles to the total auditorium + atrium attendance results in a rate of 0.51 vehicles per seat occupied during the 10:45 A.M. service.

Based on the above information, Civiltech feels that a good trip generation estimate for the existing site is 0.55 vehicles per seat occupied at the adult service in the main auditorium. It should be noted that the total attendance at the facility overall is substantially higher than the numbers of people in the auditorium and atrium provided above. Youth programs add an additional 500 people to the campus count, but they generally have arrived at the campus with someone in the adult auditorium or the atrium, and have not generated additional vehicle trips. Instead of trying to count the entire population of the campus and relate it to a "vehicle occupancy", the "vehicles per occupied seat" method was felt to be more straightforward.

To estimate the vehicle trip generation per service on Sunday at the proposed location based on the data from the existing location, we have assumed that the reasonable capacity of a single service is 80% of the seating capacity, or 80% of the proposed 2,000 seat auditorium. This equates to 1,600 attendees in the auditorium at a "fully attended" service. Using the 0.55 vehicles-per-occupied-seat estimate, this results in a total of 1,600 x 0.55 = 880 vehicles per service on Sunday morning, or 1,760 total vehicle trips per Sunday morning service.

According to church staff, the typical attendance at a Saturday evening service is approximately half of the typical attendance at a Sunday morning service. Therefore, we have assumed that a typical Saturday evening service will be attended by 1,600 x 50% = approximately 800 people. This is 40% of the 2,000-seat capacity in the proposed auditorium. Using the 0.55 vehicles-per-occupied-seat estimate, this results in a total of 800 x 0.55 = 440 vehicles per service on Saturday evening, or 880 total vehicle trips per Saturday evening service.

Based on a review of the November, 2015 counts performed by the previous consultant, we determined that not all of the attendees for each service will arrive within a single peak hour preceding the service, and not all attendees will depart the site within the single hour after the service. We determined that 75% to 90% of the total vehicles arrived within the peak arrival hour and departed within the peak departure hour. The other 10% to 25% generally arrived before the peak arrival hour or departed after the peak departure hour.

Furthermore, as would be expected, the peak traffic hour at the existing site was observed in the hour starting at 10:15 A.M., during the "crossover" period between the 9:00 A.M. and 10:45 A.M. services on Sunday morning. For a Saturday evening service, based on the count data from the previous consultant, the departure peak hour contained a higher concentration of vehicle trips than the arrival peak hour. Willow Creek Church plans to maintain its current services schedule which includes one Saturday evening service and two Sunday morning services.

Considering all of the above, following are the peak hour trip generation numbers that are assumed in this analysis for the proposed Willow Creek Church site:

Saturday Peak Hour (Departure Period after Service: 6:30 P.M. – 7:30 P.M.)

- 55 vehicles entering
- 355 vehicles exiting
- 410 total vehicle trips

Sunday Peak Hour (Crossover Period between Services: 10:15 A.M. – 11:15 A.M.)

- 705 vehicles entering
- 625 vehicles exiting
- 1,330 total vehicle trips

It is important to note that not only is there a peak hour during the overall arrival and departure period, but there is also a significant peak 15 minutes within the peak hour that occurs. Based on the counts at the exiting church site performed by the previous consultant, in addition to Civiltech's subsequent field observations and data collection, approximately 45% to 55% of the overall peak hour arrives in the 15 minutes leading up to the start of the service time, and a similar 45% to 55% of the overall peak hour departs in the 15 minutes immediately following the end of the service time. This is an important consideration when performing capacity analyses, since these spikes during the peak hour can have a significant effect on the operation of the site access driveways and the adjacent roadway network compared to generators which produce traffic that is more evenly dispersed over the peak hour.

Considering the "peak of the peak" data above, following are the peak 15-minute trip generation numbers that are assumed in this analysis:

Saturday Peak 15-minutes (Departure after Service: 6:30 P.M. – 6:45 P.M.)

- 30 vehicles entering
- 195 vehicles exiting
- 225 total vehicle trips

Sunday Peak 15-minutes (Crossover Period between Services: Approx. 10:15 A.M. – 10:30 A.M.)

- 315 vehicles entering
- 280 vehicles exiting
- 595 total vehicle trips

B. Estimated Distribution and Assignment of Site Generated Traffic

Trip Distribution – Trip distribution refers to the process of determining the directions outside of the immediate study area from which church attendees are coming before the service, and the directions to which they are departing after the service. For this particular study, Civiltech estimated the percentages of the total trips during the Saturday evening and Sunday morning peak hours that are destined to and from the north and south on Main Street, and to and from the east and west on Crystal Lake Avenue. The actual distribution percentages are based largely upon the areas in which members of the congregation reside and the configuration of the roadway network.

Civiltech used several sources of information to arrive at the estimated directional distribution percentages shown on **Exhibit H**. Sources included the November 2015 traffic counts that were performed at the existing site, other traffic counts provided by the City of Crystal Lake at the Congress Parkway intersections with both Main Street and Pingree Road, church membership residence location estimates provided by church staff, supplemental counts performed by Civiltech during the February 28, 2016 service, and local knowledge. Based on these sources, we estimate that trips will be distributed to the surrounding roadway network based on the following percentages:

- To/From North on Main Street – 20%
- To/From South on Main Street – 34%
- To/From West on Crystal Lake Avenue – 13%
- To/From East on Crystal Lake Avenue – 33%

Significant additional detail is available regarding development of these estimates and can be provided, if requested.

Trip Assignment – Once directional and trip distribution percentages are estimated, the next step is the assignment of entering and exiting site-generated vehicle trips to the site access driveways and adjacent roadway network. This process is primarily based on the operational characteristics of the surrounding roadway system and the ease with which drivers can enter and exit the site and travel over various sections of the roadway system without encountering congestion. It is also based on the internal site layout including parking lot locations and capacities, and drive aisles. The use of a temporary parking and circulation management plan during peak arrival and/or departure periods (which might include elements such as prohibiting certain movements at certain driveways, implementing one-way movements, and/or stopping traffic on the adjacent roadway network to provide gaps for entering/exiting motorists) would also affect trip assignment. At this time, however, no manual circulation/parking management plans have been assumed.

Exhibit I shows our estimated assignment of the site-generated trips to the site access driveways and the adjacent roadway network during the peak hours. This exhibit depicts the estimated traffic assuming the Full Build-Out site plan (2,000 seat auditorium). At this time, we have assumed that all driveways will be fully open and accessible to all entering and exiting vehicles at all times throughout the arrival and departure periods. In other words, attendees will be able to enter or exit the site at any of the four access driveways of their choosing, to and from either direction on the applicable adjacent roadway. The exception to this is motorists wishing to make a westbound to southbound left turn movement into the site at Access driveway #4. Here, we recommend that these left turns be prohibited due to the proximity of the Union Pacific/Metra Railroad 200 feet to the east to minimize the potential for queues to back through the railroad crossing.

While having motorists access the site in an unrestricted (without traffic control) manner is desirable, due to the peaking factor associated with a church of this size, it may be necessary to provide manual traffic control at some or all access points immediately before and after the services. This is currently the case at the existing Willow Creek facility in Crystal Lake, which restricts access at some specific locations during specific times to improve traffic flow. If an initial analysis does not show traffic to be

able to access or depart the site in a satisfactory manner, recommendations will be made regarding manual traffic control. Manual traffic control could include strategically placing cones or barricades across portions or access driveways to restrict access, or trained professionals (off-duty police officers, paid for by the Church) who will stop traffic on Main Street and/or Crystal Lake Avenue to create gaps for entering and existing motorists, in the same manner that a traffic signal would create gaps.

As shown in **Exhibit I**, one of the most substantial movements is the westbound to southbound entering left turn at Access #3. Here, approximately 235 left turning vehicles are estimated during the peak hour on Sunday. Conversely, 160 northbound to eastbound right turning vehicles are estimated to exit the site at Access #4. As noted in the Trip Generation discussion above, approximately 105 (45%) of the 235 entering vehicles, and approximately 75 (45%) of the 160 exiting vehicles occur within a single peak 15 minutes within the peak hour.

Another substantial movement is the northbound to eastbound entering right turn (195 vehicles) and the westbound to southbound exiting left turn (130 vehicles) at Access #1. During the peak 15 minutes, this access could experience 90 entering and 60 exiting vehicles. 90 vehicles is equivalent to 6 cars per minute, or one car entering every 10 seconds. 60 vehicles is equivalent to four cars per minute or one exiting car every 15 seconds.

V. PROJECTED TRAFFIC VOLUMES

Two future conditions scenarios were analyzed. Scenario 1 assumes that Phase I of the proposed church is open for operations in 2017, prior to the construction of the intersection improvement at Main Street/Crystal Lake Avenue. Trip generation estimates were added to 2015 existing traffic counts for traffic analysis purposes. Though Phase I is anticipated to provide only 1,600 seats in the auditorium, we have assumed the trip generation estimates for the Full Build-Out condition (2,000-seat auditorium). This would be representative of a heavily-attended service in the Phase I building and would result in conservative total traffic volume estimate (i.e., higher factor of safety). The total peak hour traffic volumes for Scenario 1 are shown on **Exhibit J**.

In addition to the traffic generated by the proposed development, for the analysis of the Full Build-Out condition (Scenario 2), a growth factor was applied to the existing traffic on the network to account for trips that may be generated by other potential developments in the area. The ambient growth factor selected for this project was 1.5 percent per year based on anticipated population and employment growth projected by the Chicago Metropolitan Agency for Planning (CMAP) for the City of Crystal Lake. This growth was applied based on a horizon year of opening day plus three years resulting in an analysis year of 2020, assuming opening day is in 2017. The 2020 Background traffic volumes are shown in **Exhibit K**. The 2020 Background traffic volumes were added to the anticipated peak hour trips generated by the proposed site on Saturday evening and Sunday morning to determine the 2020 Total traffic volumes which are shown in **Exhibit L**.

VI. TRAFFIC ANALYSIS

Traffic analyses were performed for the Main Street/Crystal Lake Avenue signalized intersection to evaluate existing traffic operations at the intersection and to determine the impact, if any, of the proposed Willow Creek Church site on existing traffic operations, for both Scenarios 1 and 2. Analyses were also performed for the four unsignalized site access driveways to evaluate the ease with which motorists will be able to enter and exit the site during the peak arrival/departure hour on both Saturday evening and Sunday morning.

We have analyzed both the existing and future operation of the project area using Synchro/SimTraffic, a widely-used and accepted software package for both macroscopic (Synchro) and microscopic (SimTraffic) analyses. Synchro is a traditional capacity analysis software program which uses methodologies that are based on the Transportation Research Board's (TRB) *Highway Capacity Manual* (HCM) methodologies.

The ability of an intersection to accommodate traffic flow is expressed in terms of Level-of-Service (LOS), which is assigned a letter grade from A to F based on the average control delay experienced by vehicles passing through the intersection. Control delay is that portion of the total delay attributed to the traffic signal or stop sign control operation, and includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Level-of-Service A is the highest grade (best traffic flow and least delay), Level-of-Service E represents saturated or at-capacity conditions, and Level-of-Service F is the lowest grade (oversaturated conditions, extensive delays). The Highway Capacity Manual definitions for Levels-of-Service and the corresponding control delay for both signalized and unsignalized intersections are shown in **Table 2**. In the Chicago area, LOS "D" is typically considered to be the lowest acceptable LOS at signalized intersections. At unsignalized intersections, Level-of-Service "E" and "F" are not uncommon, and are actually tolerable for short durations, as long as the number of vehicles presented at the unsignalized intersection from the side street does not exceed the number of adequate gaps in the main traffic flow into which those vehicles may turn. If there are too few gaps, the volume-to-capacity ratio (v/c) exceeds 1.0 and the intersection breaks down. In this case either manual control would be recommended, the warrants for a signal could be investigated or a movement would be prohibited.

The results of the capacity analysis for existing conditions are summarized in **Table 3**. The results for Scenario 1 (Phase I of the proposed church is open for operations in 2017, prior to the construction of the intersection improvement at Main Street/Crystal Lake Avenue) are summarized in **Table 4,** and the results for Scenario 2 (Full Build-Out of the proposed church on top of 2020 background traffic) are summarized in **Table 5.** Summary reports from the HCS and SimTraffic analyses are provided in **Appendix D**.

Table 2: Level-of-Service Criteria

LEVEL OF SERVICE CRITERIA

Unsignalized Intersections

Level of Service	Average Control Delay (seconds per vehicle)
A	0 - 10
B	> 10 - 15
C	> 15 – 25
D	> 25 – 35
E	> 35 – 50
F	> 50

Signalized Intersections

Level of Service	Interpretation	Average Control Delay (seconds per vehicle)
A	Favorable progression. Most vehicles arrive during the green indication and travel through the intersection without stopping.	≤ 10
B	Good progression, with more vehicles stopping than for Level of Service A.	> 10 - 20
C	Individual cycle failures (i.e. one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear. Number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.	> 20 - 35
D	The volume-to-capacity ratio is high and either progression is ineffective or the cycle length is too long. Many vehicles stop and individual cycle failures are noticeable.	> 35 – 55
E	Progression is unfavorable. The volume-to-capacity ratio is high and the cycle length is long. Individual cycle failures are frequent.	> 55 – 80
F	The volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.	> 80

Source: *Highway Capacity Manual, 2010.*

Source: Reproduced from 2010 *Highway Capacity Manual*.

Table 3: Capacity Analysis Results – 2015 Existing Traffic Conditions
(Without proposed Main Street/Crystal Lake Avenue Improvements)

Intersection	Saturday Evening Peak Hour*		Sunday Morning Peak Hour*	
	LOS	Delay	LOS	Delay
Main Street and Crystal Lake Avenue				
Overall	B	16.5	C	21.8
Eastbound Approach	B	10.9	B	12.5
Westbound Approach	B	19.4	B	16.3
Northbound Approach	B	17.4	C	32.5
Southbound Approach	B	17.7	C	21.0

Table 4: Capacity Analysis Results – Total Traffic Conditions – Phase I Site Plan
(2015 Existing Traffic + Site-Generated Traffic, w/o proposed Main St/Crystal Lake Ave Improvements)

Intersection	Saturday Evening Peak Hour*		Sunday Morning Peak Hour*	
	LOS	Delay	LOS	Delay
Main Street and Crystal Lake Avenue [(1)]				
Overall	B	19.8	C	30.6
Eastbound Approach	B	10.8	B	19.6
Westbound Approach	B	19.9	B	19.1
Northbound Approach	C	23.4	D	44.5
Southbound Approach	C	20.0	C	32.1
Access #1 – Main Street and South Driveway [(2)]				
Left Turn Out	C	20.2	F	>120.0
Right Turn Out	B	10.5	C	15.6
Left Turn In	A	8.2	B	10.7
Access #2 – Main Street and North Driveway [(2)]				
Left Turn Out	C	18.2	F	>120.0
Right Turn Out	B	10.1	B	11.1
Left Turn In	A	8.5	A	9.4
Access #3 – Crystal Lake Avenue and West Driveway [(2)]				
Left Turn Out	B	12.1	F	>120.0
Right Turn Out	B	9.3	B	11.8
Left Turn In	A	7.6	B	10.4
Access #4 – Crystal Lake Avenue and East Driveway [(2)]				
Left Turn Out	B	11.2	C	23.6
Right Turn Out	B	10.2	B	14.0

LOS = Level-of-Service. Delay reported in seconds per vehicle.

Results are reported from Synchro capacity analysis software, unless otherwise noted.

* Anticipated vehicle peak hours of proposed church activities: Saturday 6:30-7:30 P.M. and Sunday 10:15-11:15 A.M.

[(1)] Signalized Intersection. [(2)] Unsignalized Intersection.

Table 5: Capacity Analysis Results – Total Traffic Conditions – Full Build-Out
(2020 Background Traffic + Site-Generated Traffic, w/Main St/Crystal Lake Ave Improvements)

Intersection	Saturday Evening Peak Hour*		Sunday Morning Peak Hour*	
	LOS	Delay	LOS	Delay
Main Street and Crystal Lake Avenue [1]				
Overall	B	17.8	C	28.5
Eastbound Approach	B	11.4	C	23.3
Westbound Approach	C	26.4	C	35.0
Northbound Approach	B	14.5	C	22.8
Southbound Approach	C	21.3	D	35.6
Access #1 – Main Street and South Driveway [2]				
Left Turn Out	C	21.4	F	>120.0
Right Turn Out	B	10.5	B	12.6
Left Turn In	A	8.2	A	9.3
Access #2 – Main Street and North Driveway [2]				
Left Turn Out	C	19.5	F	>120.0
Right Turn Out	B	10.3	B	12.1
Left Turn In	A	8.6	B	10.3
Access #3 – Crystal Lake Avenue and West Driveway [2]				
Left Turn Out	B	12.4	F	116.7
Right Turn Out	A	9.3	B	12.1
Left Turn In	A	7.6	B	10.5
Access #4 – Crystal Lake Avenue and East Driveway [2]				
Left Turn Out	B	11.5	C	22.4
Right Turn Out	B	10.4	B	12.9

LOS = Level-of-Service. Delay reported in seconds per vehicle.

Results are reported from Synchro capacity analysis software, unless otherwise noted.

* Anticipated vehicle peak hours of proposed church activities: Saturday 6:30-7:30 P.M. and Sunday 10:15-11:15 A.M.

[1] Signalized Intersection

[2] Unsignalized Intersection

VII. TRAFFIC EVALUATION

The results of the capacity analyses at the roadway network intersections and site access driveways, for Existing Traffic, Phase I Total Traffic and Full Build-Out Total Traffic conditions are discussed below.

A. Main Street and Crystal Lake Avenue

The results of the existing capacity analysis indicate that the signalized intersection at Main Street and Crystal Lake Avenue currently operates at an acceptable Level-of-Service (LOS) B during the Saturday evening peak hour of proposed church service activity and LOS C during the Sunday morning peak hour of proposed church activity. With the additional traffic resulting from the proposed development, the intersection will continue to operate satisfactorily, at these same overall Levels of Service, during the Saturday and Sunday peak hours under both the Phase I (with no intersection improvement) and Full Build-out (with intersection improvement) scenarios. Under the Phase I scenario, the overall average delay per vehicle will be 3 to 9 seconds greater than the existing conditions during the Saturday and Sunday peak hours, respectively. Under the Full-Buildout scenario, overall operation will be slightly better than the Phase I scenario operation due to the intersection improvement which is anticipated to be in place by that time, with delays anticipated to be 1 to 7 seconds greater than the existing condition. These small increases in delay attributable to the church development will be very short-lived, confined to the 15 minutes prior to, and after worship services. No additional improvements to this intersection will be necessary as a result of the church development.

B. Access Driveway #1 (Southerly Main Street Access)

The results of the capacity analysis for the Phase I and Full Build-Out Total traffic conditions indicate that this intersection will operate satisfactorily during the Saturday evening service peak hour with Levels of Service for turning movements in the A to C range. During the Sunday morning “crossover” period between the two services, there will be substantial delays for motorists exiting the site due to high left turn volumes and lack of an appropriate number of suitable gaps in northbound and southbound Main Street traffic. The exiting delays will be heavily focused on the peak 15 minutes within the peak hour associated with the departure after the first service. During this time, attendees of the second service will be starting to arrive, and the left turn path of those arriving from the north will need to cross over the path of those exiting to the south. The exiting left turn movement will operate at LOS F, with substantial queuing and delays, however the movements on Main Street will continue to operate satisfactorily. It is recommended that this driveway be monitored for several Sundays after opening day, as well as in the future as the congregation numbers expand. It is possible that motorists may choose other driveways and routes home as the “path of least resistance”. If the delays for exiting motorists become excessive, it is recommended that a traffic control professional be retained during the crossover hour between the services in order to periodically stop traffic on Main Street to allow left turning motorists to exit the site. Volunteer or professional parking lot attendants may also be used to direct traffic on site.

This access drive will be stop sign controlled on the driveway leg. The exit drive should provide two exiting lanes (one for left turns and the other for right turns) and one wide entering lane. The left turn lane should provide at least 250 feet of storage. Under Phase I conditions before the Main

Street/Crystal Lake Avenue intersection improvement is in place, the southbound left turn into the site at this location will be made out of the easterly southbound through lane. This condition should operate acceptably until the intersection improvement is constructed, at which time a painted median will be included where left turns can be accommodated. When the intersection improvement is constructed, the painted median should be restriped to provide a 125-foot left turn lane with a 155-foot taper into the site. An 11-foot wide, 120-foot northbound right turn lane with a 175-foot taper should also be constructed leading into the site. This recommendation is based on Figure 36-3.B in the IDOT Bureau of Design and Environment (BDE) Manual. A copy of this figure is provided in **Appendix E**.

C. Access Driveway #2 (Northerly Main Street Access)

The results of the capacity analysis for the Phase I and Full Build-Out Total traffic conditions indicate that this intersection will operate satisfactorily during the Saturday evening service peak hour with Levels of Service for turning movements in the A to B range. During the Sunday morning "crossover" period between the two services, just as at Access #1 to the south, there will be substantial delays for motorists exiting the site due to high left turn volumes and lack of an appropriate number of suitable gaps in northbound and southbound Main Street traffic. The exiting delays will be heavily focused on the peak 15 minutes within the peak hour associated with the departure after the first service. During this time, attendees of the second service will be starting to arrive, and the left turn path of those arriving from the north will need to cross over the path of those exiting to the south. The exiting left turn movement will operate at LOS F, with substantial queuing and delays, however the movements on Main Street will continue to operate satisfactorily. Just as to the south, it is recommended that this driveway be monitored for several Sundays after opening day, as well as in the future as the congregation numbers expand. If the delays for exiting motorists become excessive, it is recommended that a traffic control professional be retained during the crossover hour between the services in order to periodically stop traffic on Main Street to allow left turning motorists to exit the site. Volunteer or professional parking lot attendants may also be used to direct traffic on site.

This access drive will be stop sign controlled on the driveway leg. The exit drive should provide two exiting lanes (one for left turns and the other for right turns) and one entering lane. The left turn lane should provide at least 200 feet of storage. Under Phase I conditions before the Main Street/Crystal Lake Avenue intersection improvement is in place, the southbound left turn into the site at this location will be made out of the easterly southbound through lane. This condition should operate acceptably until the intersection improvement is constructed, which includes a painted left turn lane.

D. Access Driveway #3 (Westerly Crystal Lake Avenue Access)

The results of the capacity analysis for the Phase I and Full Build-Out Total traffic conditions indicate that this intersection will operate satisfactorily during the Saturday evening service peak hour with Levels of Service for turning movements in the A to B range. During the Sunday morning "crossover" period between the two services, the turns out of the site are anticipated to operate at low Levels of Service – in the E to F range, however the delays and queuing will not be as excessive as experienced at Access drives #1 and #2. It is again recommended that this driveway be monitored for several Sundays after opening day, as well as in the future as the congregation numbers expand.

This access drive will be stop sign controlled on the driveway leg. The exit drive should provide two exiting lanes (one for left turns and the other for right turns) and one entering lane. The left turn lane should provide at least 100 feet of storage. Under Phase I conditions before the Main Street/Crystal Lake Avenue intersection improvement is in place, the westbound left turn into the site at this location will be made out of the westbound through lane. This condition should operate acceptably until the intersection improvement is constructed, at which time a painted median will be included where left turns can be accommodated. When the intersection improvement is constructed, the painted median should be restriped to provide a 125-foot left turn lane with a 155-foot taper into the site.

E. Access Driveway #4 (Easterly Crystal Lake Avenue Access)

The results of the capacity analysis for the Phase I and Full Build-Out Total traffic conditions indicate that this intersection will operate satisfactorily during both the Saturday evening and Sunday morning service peak hours with Levels of Service for turning movements in the A to C range.

This access drive will be stop sign controlled on the driveway leg. The exit drive should provide two exiting lanes (one for left turns and the other for right turns) and one entering lane. The left turn lane should provide at least 100 feet of storage. As noted earlier, left turns into the site at this drive should be prohibited due to the proximity to the Union Pacific/Metra Railroad and potential for queues to extend back across the tracks. It is recommended that the barrier median on the west side of the tracks as proposed in the plans for the Main Street/Crystal Lake Avenue intersection improvement be extended to the west to discourage lefts into the site at this location. An 11-foot wide, 100-foot eastbound right turn lane with a 155-foot taper should also be constructed leading into the site. This recommendation is based on Figure 36-3.A in the IDOT Bureau of Design and Environment (BDE) Manual. A copy of this figure is provided in **Appendix E**.

See **Exhibit M** for a schematic exhibit showing the recommended lane configurations at the site access driveway intersections.

VIII. SITE CIRCULATION ANALYSIS

A copy of the architect's latest draft layout plan (as of March 18, 2016) for both Phase I and the Full Build-Out scenarios is provided in **Appendix F.** These plans provide more engineering detail than the earlier color-rendered plans shown in **Exhibits C** and **D**. [2]

IX. PARKING ANALYSIS

The current conceptual Phase I site plan in **Appendix F** proposes a total of approximately 1,037 surface parking spaces on site. This plan is a revision to the color-rendered Phase I site plan show in **Exhibit D**. The latest Full Build-Out site plan is also provided in **Appendix F**. It proposes a total of 955 parking spaces and is a revision to the color-rendered Full Build-Out site plan shown in **Exhibit C**.

[2] Coordination between the City, Site Architect, and Civiltech on the site layout/parking plan for both Phase I and the Full Build-Out condition is ongoing and modifications are anticipated based on City and Civiltech review comments. These parties will continue to work toward a site plan which strives to meet the needs of both the City and Willow Creek Church.

The parking supply on the Full Build-Out site plan was compared to 1) the City of Crystal Lake Municipal Code, 2) ITE's Parking Generation manual, 4th Edition, and 3) Civiltech's estimate of parking needs based on the evaluations at the existing location, to determine if the proposed parking supply is adequate for the anticipated demand on a Sunday morning.

First, based on the City's municipal code, the proposed church site should provide 1 space per four fixed seats, plus 1 space per 8 feet of bench length, plus 1 space per 28 square feet in areas where no permanent seats are maintained in the main place of worship, plus spaces required for accessory uses. At this time, we assume there are no benches in addition to the seats. Also, we are unable to determine the spaces required for the areas not containing fixed seats, such as the atrium in the existing facility, unless a more detailed site plan is provided. We also know that based on current operations the children's programs (Promise Land, Elevate and Impact) are in progress during the main service and would constitute an "accessory use" under the City's definition. Based on current operations, it would not be unreasonable to assume that approximately 700 additional individuals could be involved in these "accessory uses" during the service (this would equate to 875 additional "seats" using the 80% occupancy factor). Given the above assumptions, the church parking lot should provide a minimum of 719 spaces, plus whatever additional spaces would be necessary to account for space in an area that functions like the atrium in the current facility.

Secondly, based on ITE's Parking Generation manual, the average peak parking demand based on studies at 12 different churches is 0.20 vehicles per seat however, this rate appears to be based on all attendee being in the church during the service, which would not be a rate reflected by the operation of Willow Creek. ITE also provides parking demand statistics based on number of attendees. The average peak parking demand based on studies at 17 different churches is 0.45 vehicles per attendee, or 1,035 parked vehicles. This is based on the 80% reasonable capacity assumption discussed in the Trip Generation section above, which would be an attendance of 1,600 per Sunday morning service based on the proposed 2,000-seat auditorium, plus the 700 people estimated at the children's programs.

Finally, as noted earlier, parking counts performed by Civiltech at the existing church location on February 26, 2016 found that there were 0.55 occupied parking spaces per attendee in the adult auditorium plus the atrium during each of the Sunday morning services on that date. This rate falls somewhere between ITE's average and the City requirements. At 0.55 occupied spaces per attendee, and assuming 1,600 attendees in the auditorium and atrium, this would result in a demand of 880 parked vehicles.

Based on the above, the proposed 955-space parking supply provided by the Full Build-Out Site Plan in **Appendix F** should be adequate for the anticipated peak period demand.[3] Whether the proposed development formally meets City code will depend upon the amount of worship area that functions similarly to the current atrium. It should be noted that there is undeveloped land on the east side of the parcel which could be converted to parking if the need arises.

[3] Coordination between the City, Site Architect, and Civiltech on the site layout/parking plan for both Phase I and the Full Build-Out condition is ongoing and modifications are anticipated based on City and Civiltech review comments. These parties will continue to work toward a site plan which strives to meet the needs of both the City and Willow Creek Church.

X. PEDESTRIAN CONNECTIVITY ANALYSIS

The new Willow Creek Church campus has been designed to be an extension of the downtown area of the City of Crystal Lake. As such, it is important to provide safe and efficient pedestrian routes to the campus, as well as those for vehicles. Due to the high volume roadways and the numerous railway crossings in the vicinity of the project, it is desirable to direct pedestrians across these facilities at controlled locations.

We believe that the safest location for access to/from the site would be to/from the intersection of Main Street and Crystal Lake Avenue. This location will likely necessitate relocation of traffic and/or railroad signal equipment in order to install a section of sidewalk along the south side of Crystal Lake Avenue between the intersection and the westerly site access driveway. Relocation of this equipment would be costly. The crosswalk would be across the south leg of the Main Street/Crystal Lake Avenue intersection. This will require installation of pedestrian signals and countdown timers, a potential re-optimization of the traffic signal timing plan on the IDS, and modifications to the striping plan (including crosswalks, stop bars, and storage bays). *It is noted that a proposed marked crosswalk is shown across the south leg of the intersection on the IDS plan.*

Another option would be to route pedestrians on the existing sidewalk along the north side of Crystal Lake Avenue to western side of site Access Point #3. At this location a crosswalk and a pedestrian actuated rapid flashing beacon and refuge island could be installed. While less desirable than crossing at the existing traffic signal at the Main Street/Crystal Lake Avenue intersection, this location has low enough vehicle speeds and a sufficiently narrow cross section to afford reasonable protection to pedestrians accessing the new Willow Creek campus.

XI. CONCLUSIONS AND RECOMMENDATIONS

Based on the proposed development plans and the preceding traffic impact study, the following conclusions and recommendations are presented.

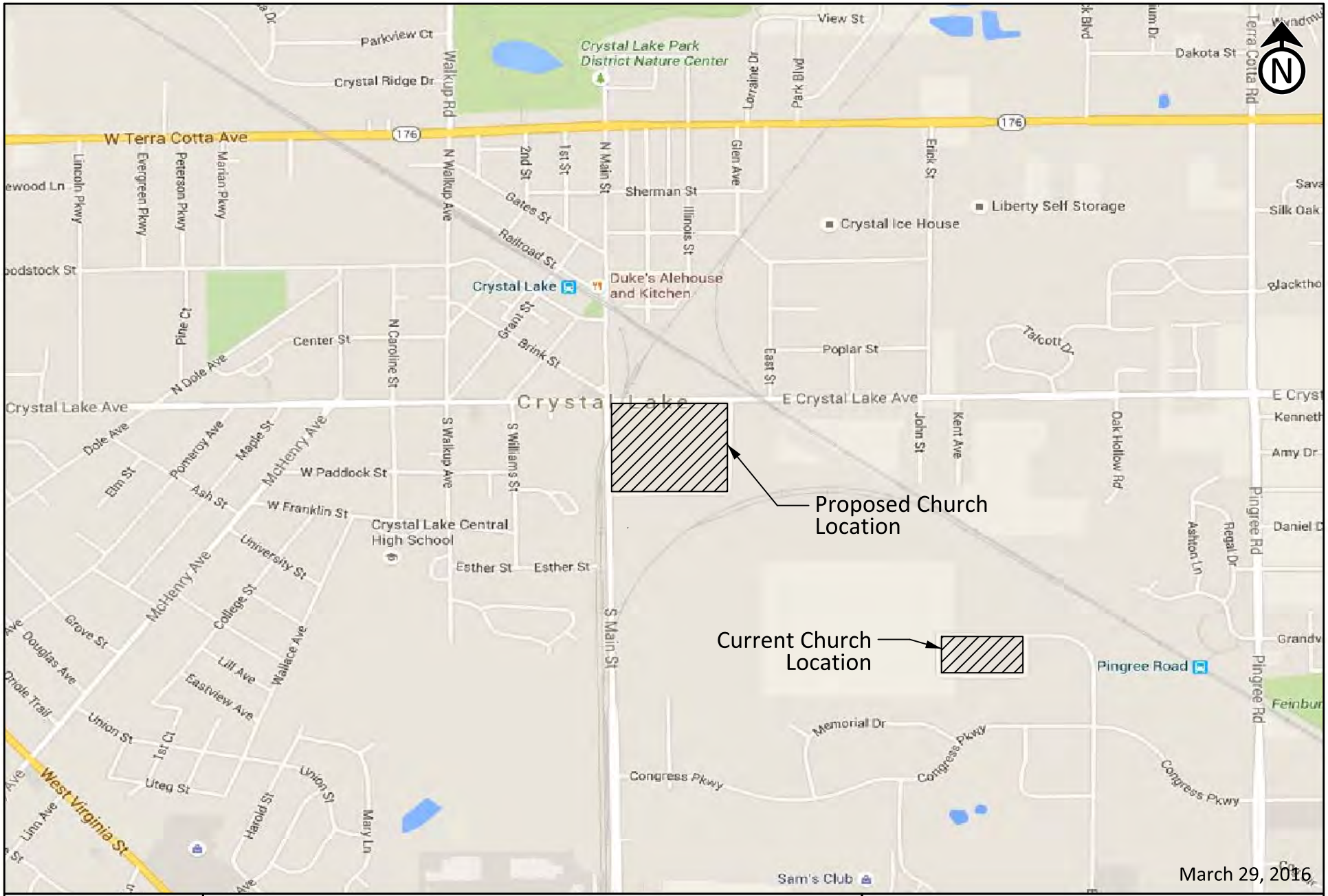
- The public roadway system adjacent to the proposed site can accommodate both the Phase I and Full-Buildout development of the site without excessive negative impacts to the operation of the roadways.
- The intersection of Main Street and Crystal Lake Avenue as proposed in the Intersection Design Study will satisfactorily accommodate the proposed church development without any modifications to the plan at the intersection itself.
- The following roadway network modifications should be made to the IDS (outside of the actual Main Street/Crystal Lake Avenue intersection)
    - A northbound right turn lane should be constructed into the site at Access Drive #1. It should be 11 feet wide to the edge of pavement, with a 120-foot storage length, and a 175-foot taper.
    - The proposed painted median between Access Drives #1 and #2 should be restriped to provide a southbound left turn lane into the site at Access #1. It should provide 125 feet of storage and a 155-foot taper.

  - The proposed painted median between Access Drives #3 and #4 should be restriped to provide a southbound left turn lane into the site at Access #3. It should provide 125 feet of storage and a 155-foot taper.
  - An eastbound right turn lane should be constructed into the site at Access Drive #4. It should be 11 feet wide, with a 100-foot storage length, and a 155-foot taper.
- Each of the access drives should remain as stop-sign controlled for the exiting movement and be constructed to provide two exiting lanes (one right turn and one left turn lane) and one entering lane.
- There is the potential for excessive delays for exiting/left turning motorists at Access Drives #1 and #2 during the "crossover" period between the first and second services on Sunday mornings. It is recommended that these driveways be monitored for several Sundays after opening day, as well as in the future as the congregation numbers expand. If the delays for exiting motorists become excessive, it is recommended that a traffic control professional be retained during the crossover hour between the services in order to periodically stop traffic on Main Street to allow left turning motorists to exit the site.
- Two options for providing pedestrian connectivity were proposed for consideration. Of the two, it is recommended that a marked crosswalk be constructed along the south leg at the intersection of Main Street and Crystal Lake Avenue. This will likely necessitate relocation of traffic and/or railroad signal equipment in order to install a section of sidewalk from the intersection, along the south side of Crystal Lake Avenue, to the site. This may also require a revision to the striping, signal timing, and/or pedestrian signal equipment on the Intersection Design Study.
- The 955-space parking supply as proposed by the latest Full Build-Out development plan in **Appendix F** is likely adequate considering both City Code and the anticipated parking generation of the proposed land uses.[4]

[4] Coordination between the City, Site Architect, and Civiltech on the site layout/parking plan for both Phase I and the Full Build-Out condition is ongoing and modifications are anticipated based on City and Civiltech review comments. These parties will continue to work toward a site plan which strives to meet the needs of both the City and Willow Creek Church.

APPENDIX A

Exhibits



CIVILTECH

Proposed Willow Creek Church - Crystal Lake, Illinois

Site Location Map

Exhibit A

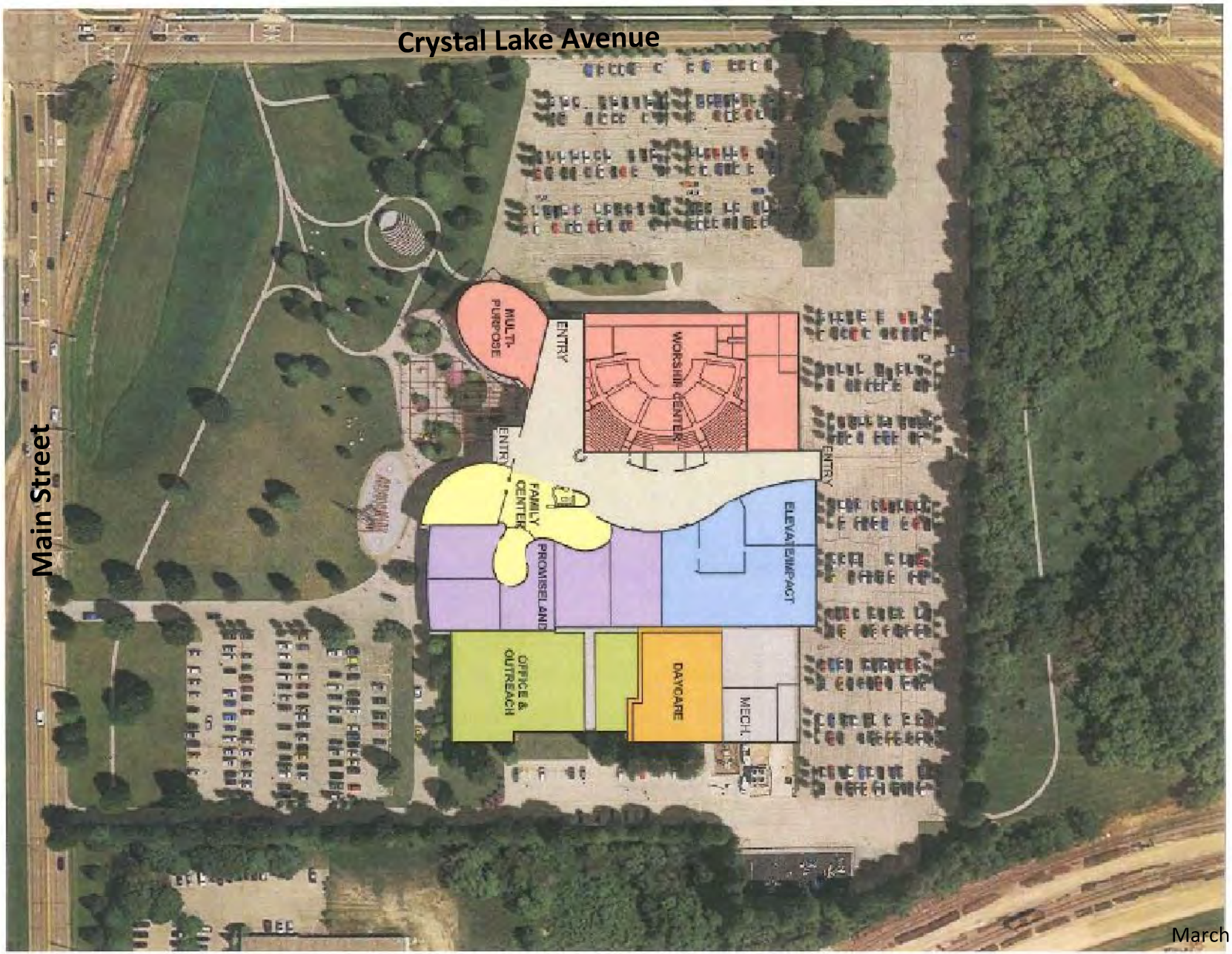


CIVILTECH

Proposed Willow Creek Church - Crystal Lake, Illinois

Aerial View of Proposed Location

Exhibit B



March 29, 2016

CIVILTECH

Proposed Willow Creek Church - Crystal Lake, Illinois

Proposed Full Build-Out Site Plan

(Dated November 9, 2015)

Exhibit C



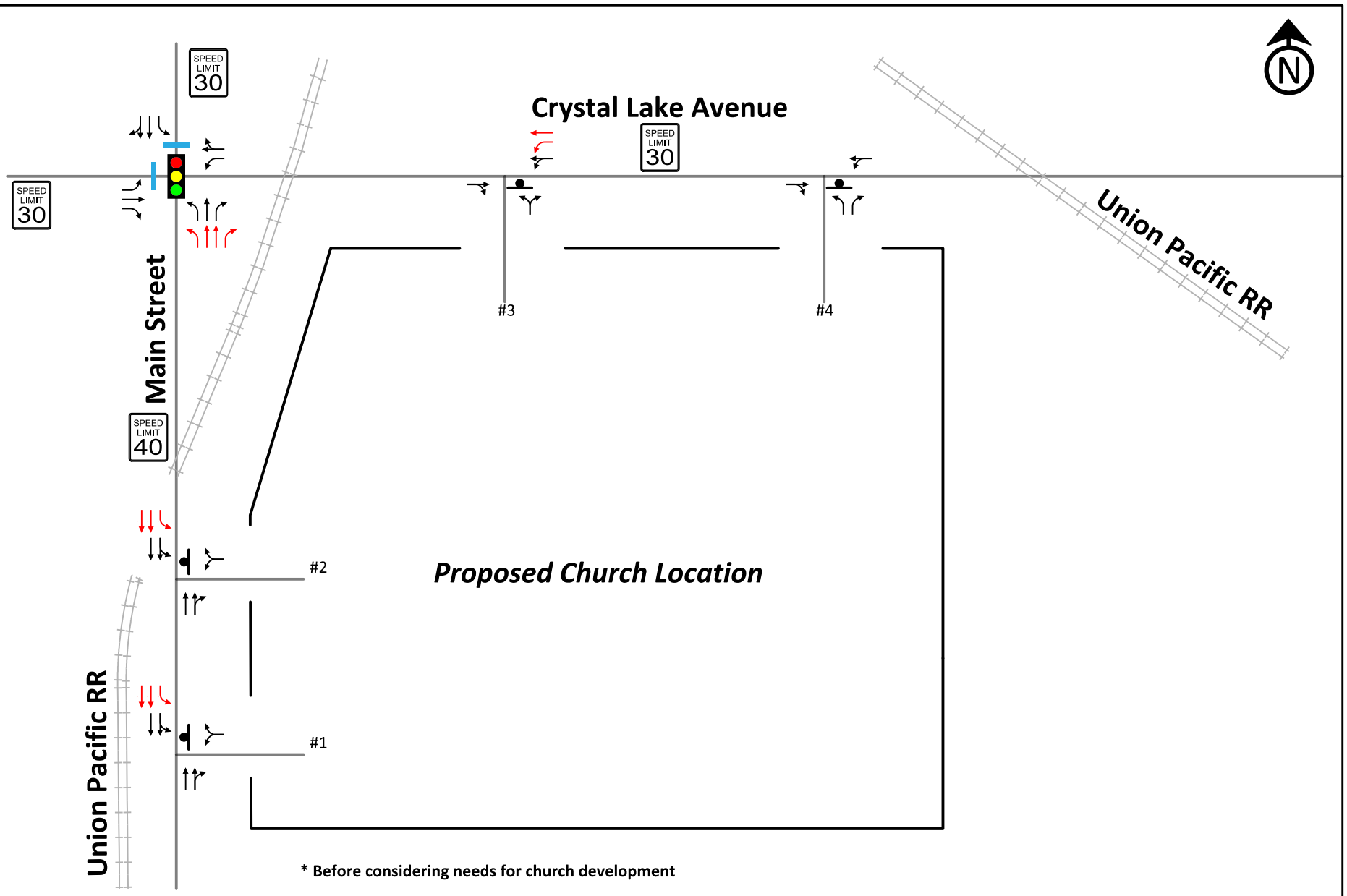
March 29, 2016

CIVILTECH

Proposed Willow Creek Church - Crystal Lake, Illinois

Proposed Phase I Site Plan
(Dated February 18, 2016)

Exhibit D



*** Before considering needs for church development**

**** Village Planned Improvement of Main Street/Crystal Lake Avenue Intersection**

March 29, 2016

CIVILTECH

Legend

SPEED LIMIT 30 — Speed Limit

\# — Access Reference Number

Existing Lane Configuration
Pre-Intersection Improvement **

Base Lane Configuration
Post-Intersection Improvement **

Traffic Signal

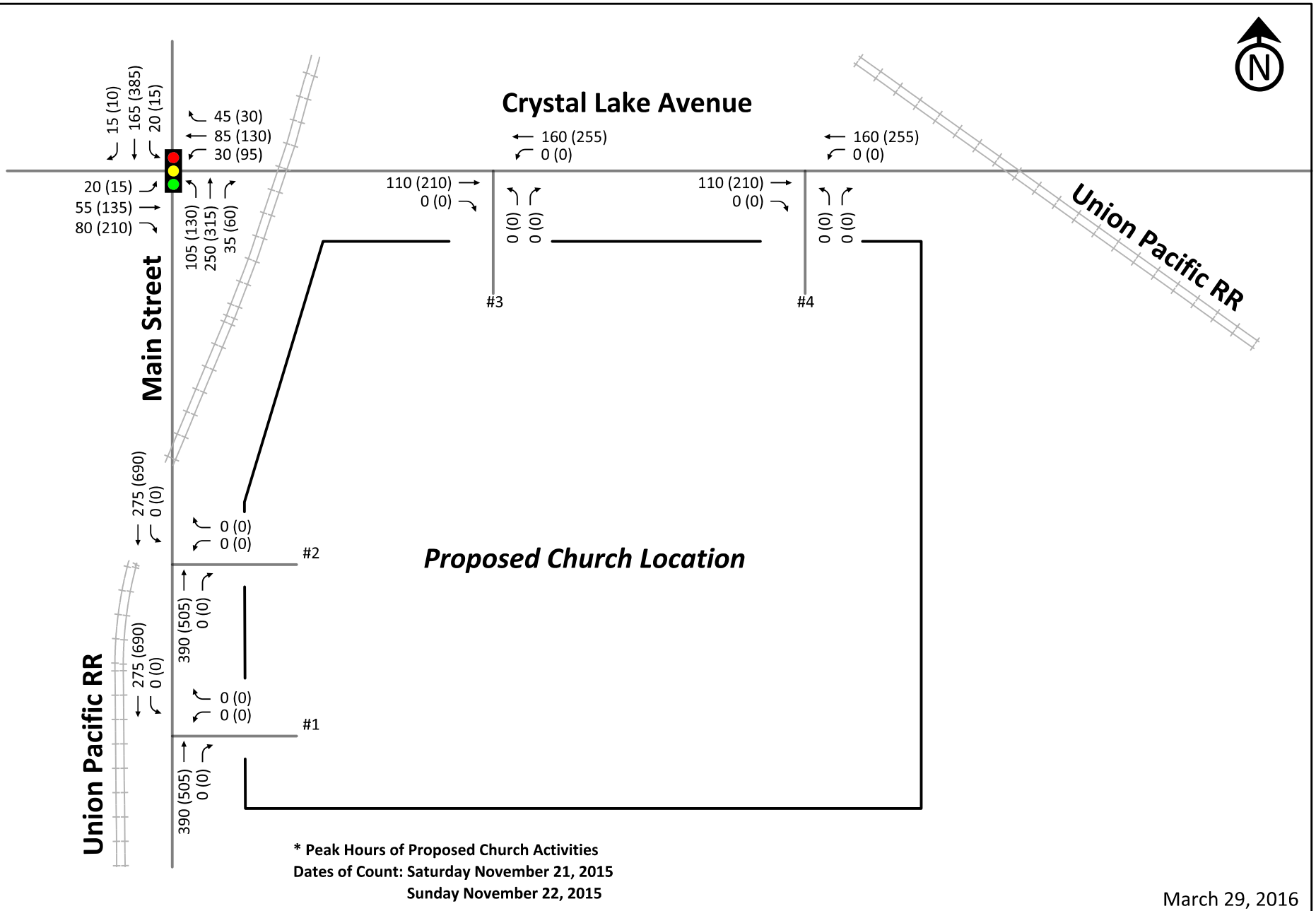
Stop Sign

Crosswalk

Proposed Willow Creek Church - Crystal Lake, Illinois

Existing Street Characteristics *
(Pre-and Post-Intersection Improvement)**

Exhibit E



*** Peak Hours of Proposed Church Activities**
Dates of Count: Saturday November 21, 2015
Sunday November 22, 2015

March 29, 2016

CIVILTECH

Legend

\# - Access Reference Number
000 - Saturday Evening Peak Hour Volume (6:30 P.M. - 7:30 P.M.) *
(000) - Sunday Morning Peak Hour Volume (10:15 A.M. - 11:15 A.M.) *

Traffic Signal
Stop Sign

Proposed Willow Creek Church - Crystal Lake, Illinois

2015 Existing Sat. (Sun.) Peak Hour Traffic Volumes

Exhibit F

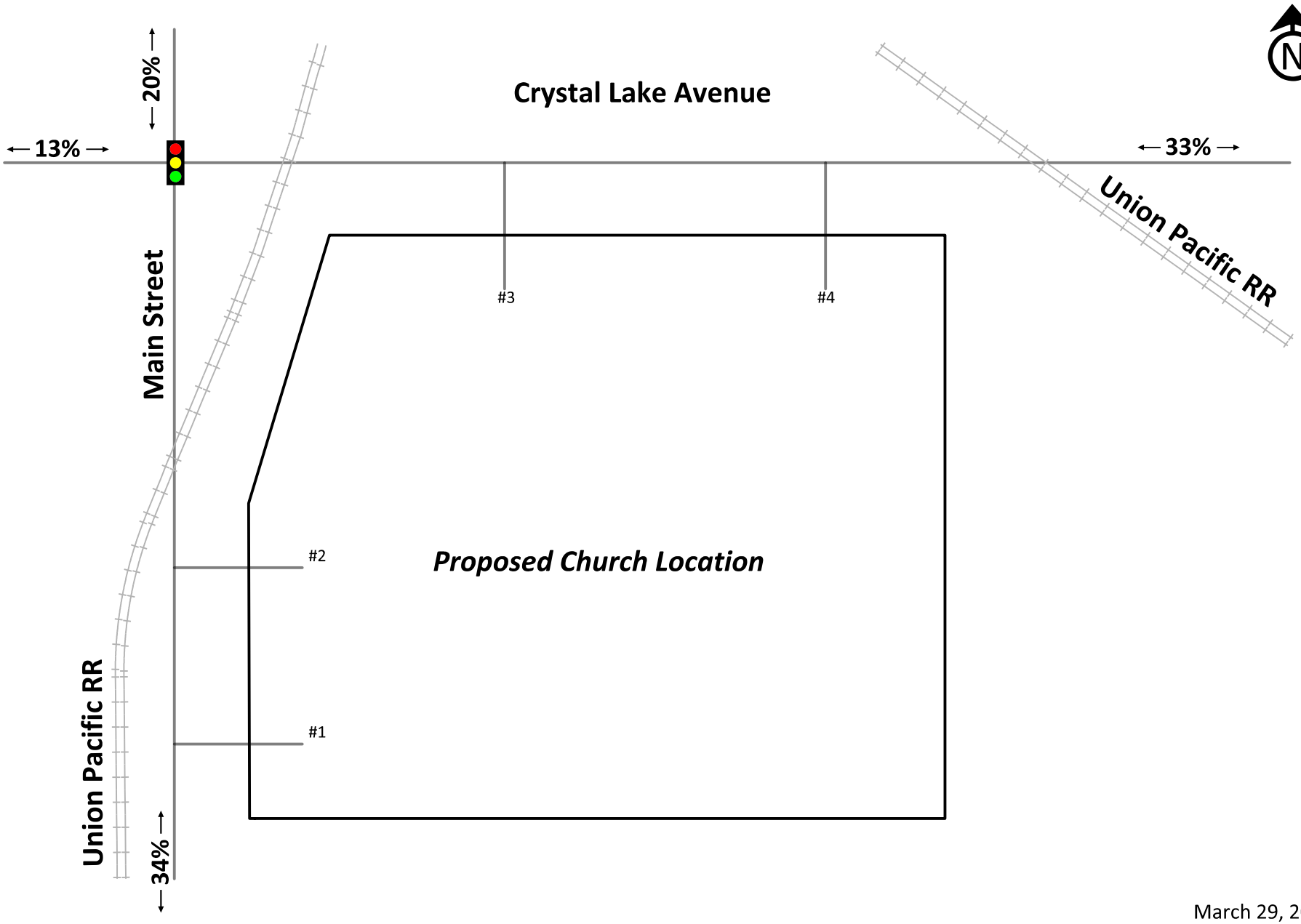


CIVILTECH

Proposed Willow Creek Church - Crystal Lake, Illinois

Aerial View of Current Location

Exhibit G



March 29, 2016

CIVILTECH

Legend

00% Percent Distribution

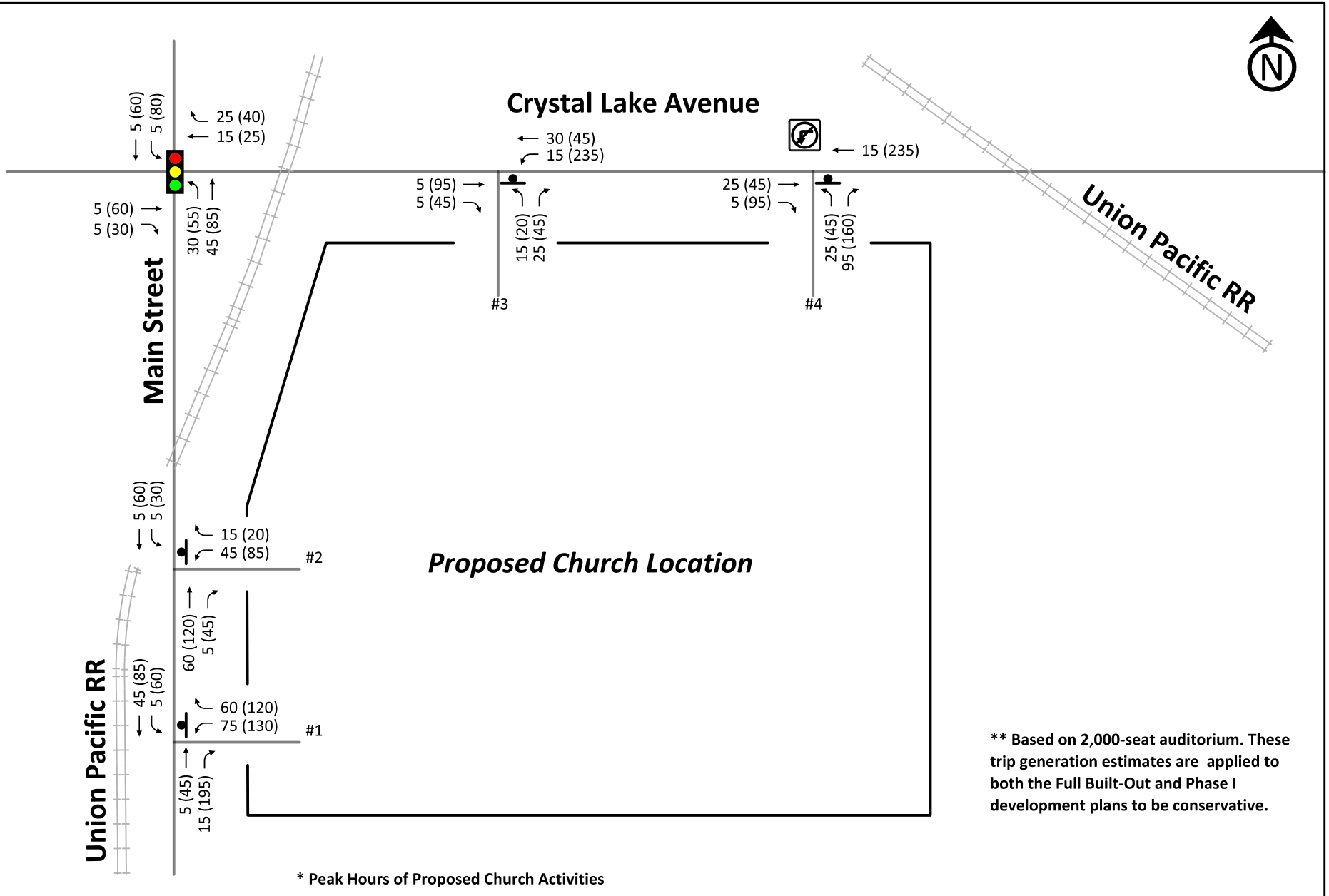
Traffic Signal

\# - Access Reference Number

Proposed Willow Creek Church - Crystal Lake, Illinois

Directional Distribution of Site-Generated Trips

Exhibit H



** Based on 2,000-seat auditorium. These trip generation estimates are applied to both the Full Built-Out and Phase I development plans to be conservative.

* Peak Hours of Proposed Church Activities

March 29, 2016

CIVILTECH

Legend

- Access Reference Number
000 - Saturday Evening Peak Hour Volume (6:30 P.M. - 7:30 P.M.) *
(000) - Sunday Morning Peak Hour Volume (10:15 A.M. - 11:15 A.M.) *

Traffic Signal
Stop Sign
No Left Turn

Proposed Willow Creek Church - Crystal Lake, Illinois

Site-Generated Sat. (Sun.) Peak Hour Traffic Volumes **

Exhibit I

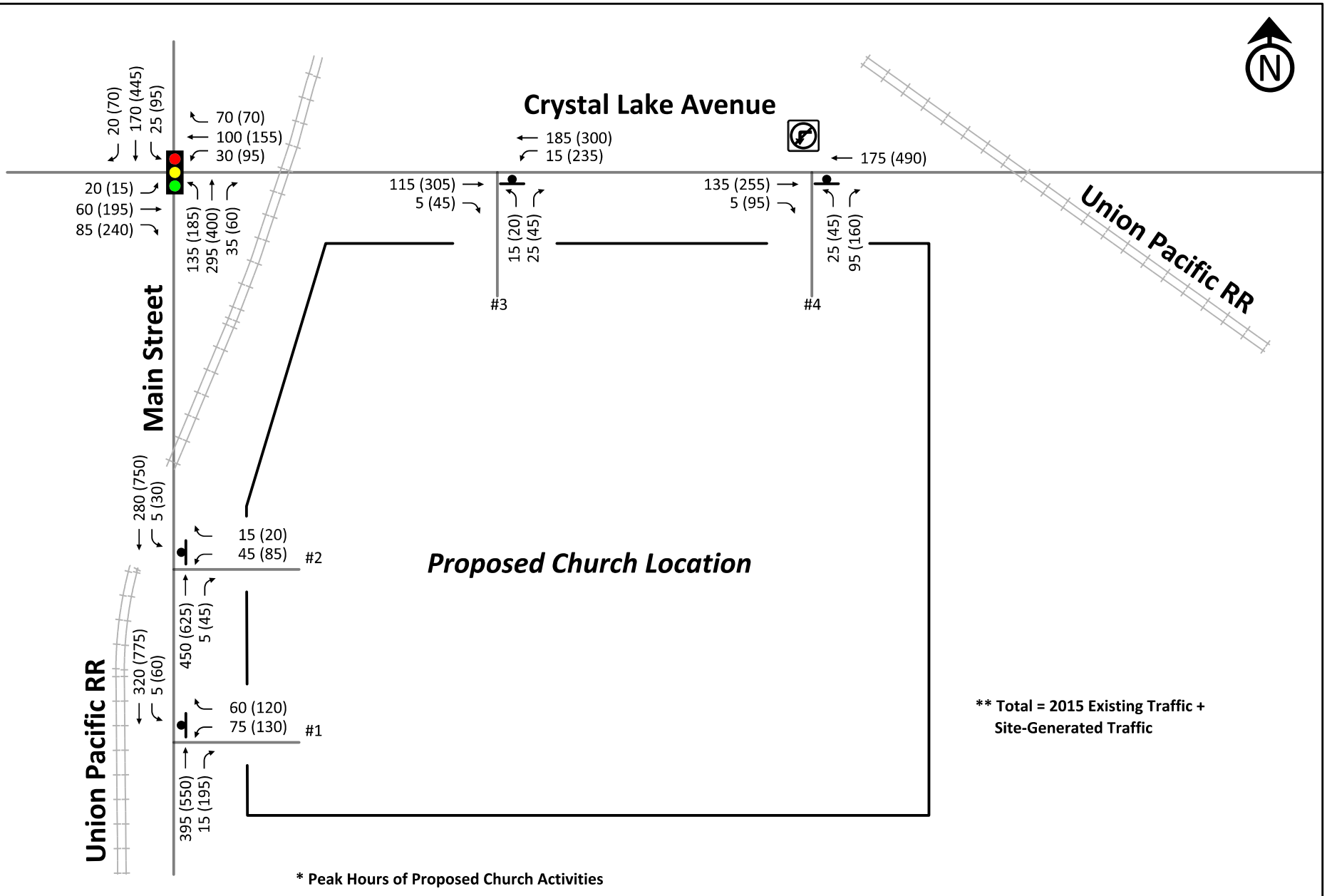
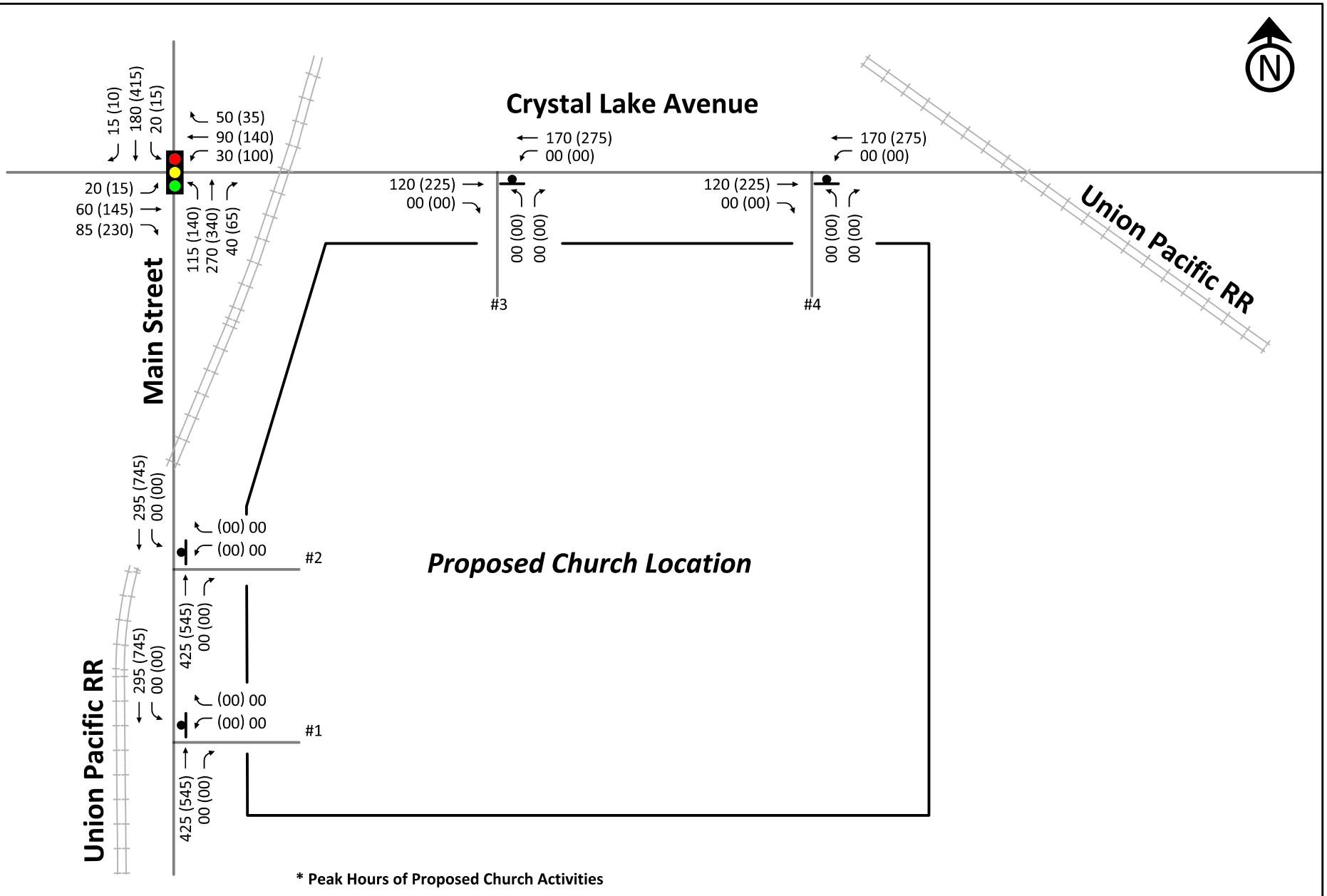

Crystal Lake Avenue
Main Street
Union Pacific RR
Union Pacific RR
Proposed Church Location
20 (70)
170 (445)
25 (95)
70 (70)
100 (155)
30 (95)
185 (300)
15 (235)
175 (490)
20 (15)
60 (195)
85 (240)
135 (185)
295 (400)
35 (60)
115 (305)
5 (45)
15 (20)
25 (45)
#3
135 (255)
5 (95)
25 (45)
95 (160)
#4
280 (750)
5 (30)
15 (20)
45 (85)
#2
450 (625)
5 (45)
320 (775)
5 (60)
60 (120)
75 (130)
#1
395 (550)
15 (195)
N
** Total = 2015 Existing Traffic + Site-Generated Traffic
* Peak Hours of Proposed Church Activities
March 29, 2016
Legend
000 - Saturday Evening Peak Hour Volume (6:30 P.M. - 7:30 P.M.) *
(000) - Sunday Morning Peak Hour Volume (10:15 A.M. - 11:15 A.M.) *
Traffic Signal
Stop Sign
No Left Turn
Proposed Willow Creek Church - Crystal Lake, Illinois
Total Phase I Sat. (Sun.) Peak Hour Traffic Volumes **
CIVILTECH

Exhibit J



March 29, 2016

CIVILTECH

Legend

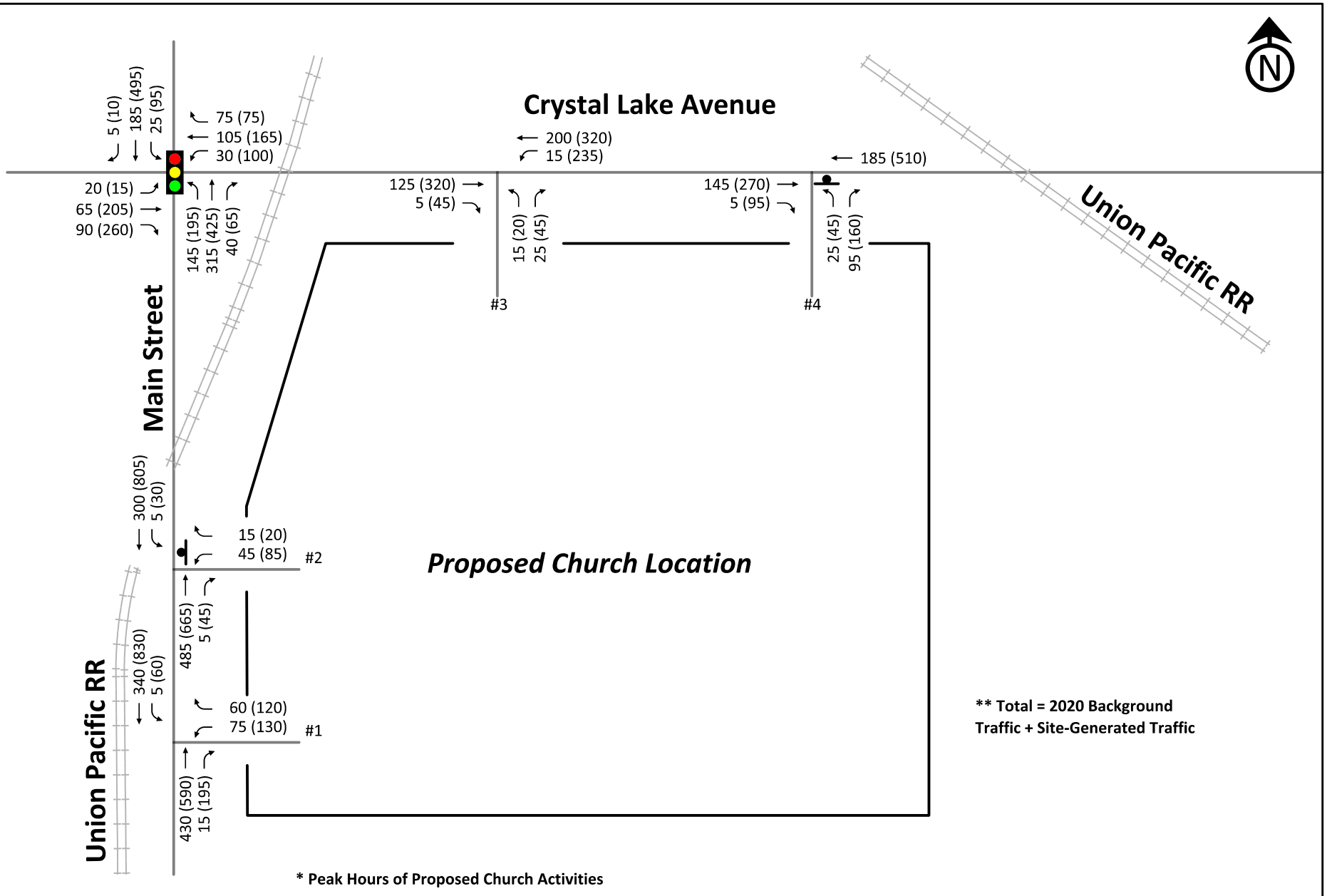
\# - Access Reference Number
000 - Saturday Evening Peak Hour Volume (6:30 P.M. - 7:30 P.M.) *
(000) - Sunday Morning Peak Hour Volume (10:15 A.M. - 11:15 A.M.) *

Traffic Signal
Stop Sign

Proposed Willow Creek Church - Crystal Lake, Illinois

2020 Background Sat. (Sun.) Peak Hour Traffic Volumes

Exhibit K



March 29, 2016

CIVILTECH

Legend

000 - Saturday Evening Peak Hour Volume (6:30 P.M. - 7:30 P.M.) *
(000) - Sunday Morning Peak Hour Volume (10:15 A.M. - 11:15 A.M.) *

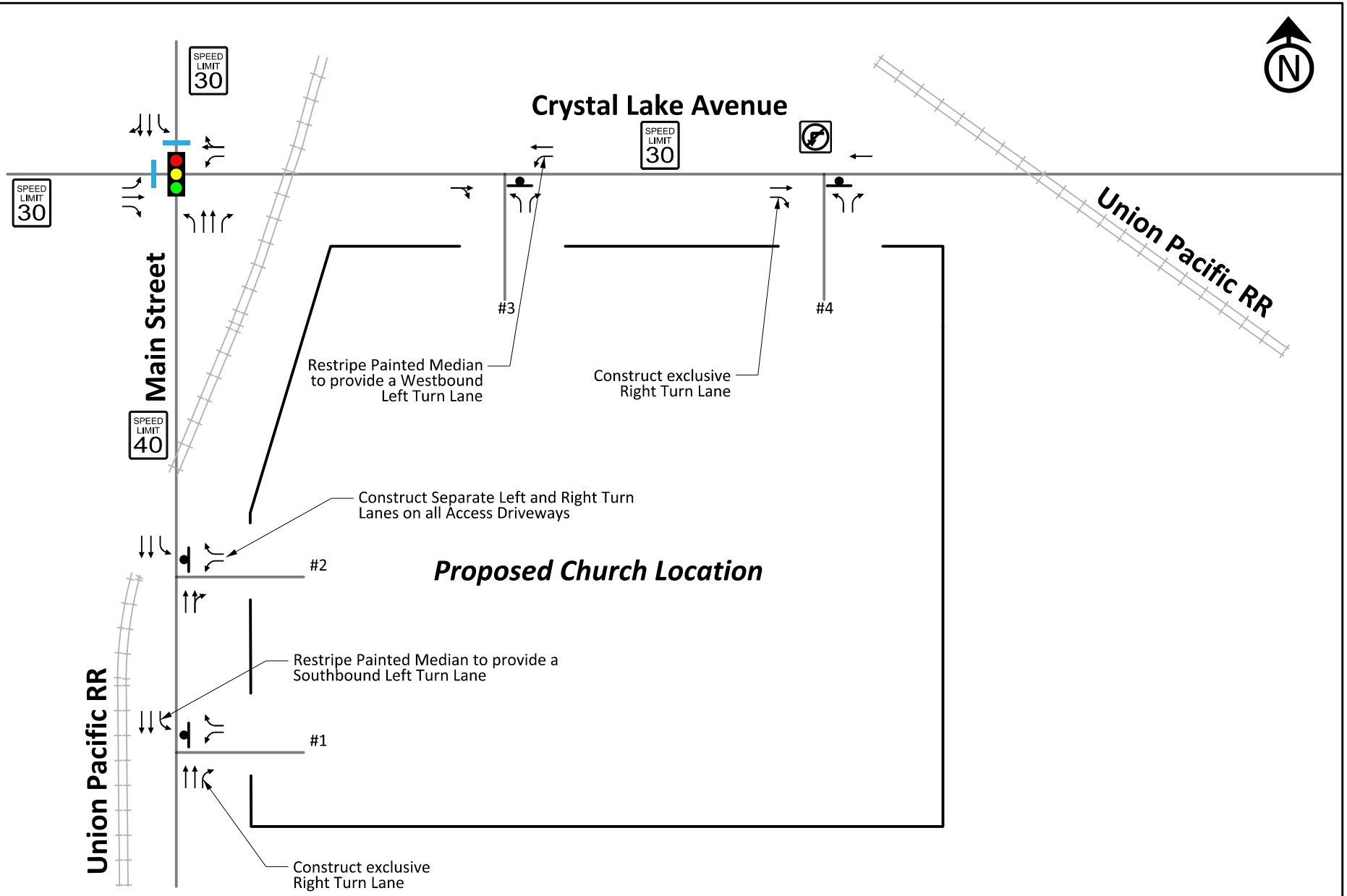
Traffic Signal

Stop Sign

Proposed Willow Creek Church - Crystal Lake, Illinois

Total Full Built-Out Sat. (Sun.) Peak Hour Traffic Volumes **

Exhibit L



March 29, 2016

CIVILTECH

Legend

SPEED LIMIT 30 Speed Limit

\# Access Reference Number

Lane Configuration

Crosswalk

Traffic Signal

Stop Sign

No Left Turn

Proposed Willow Creek Church - Crystal Lake, Illinois

Proposed Street Characteristics

Exhibit M

APPENDIX B

Traffic Counts

4153.910 Crystal Lake
Crystal Lake Ave. and Main St.
10-hr
GHA MIO

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

Vernon Hills, Illinois, United States 60061
(847) 478-9700 lbeckham@gha-engineers.com

Count Name: Crystal Lake and Main
Site Code:
Start Date: 11/21/2015

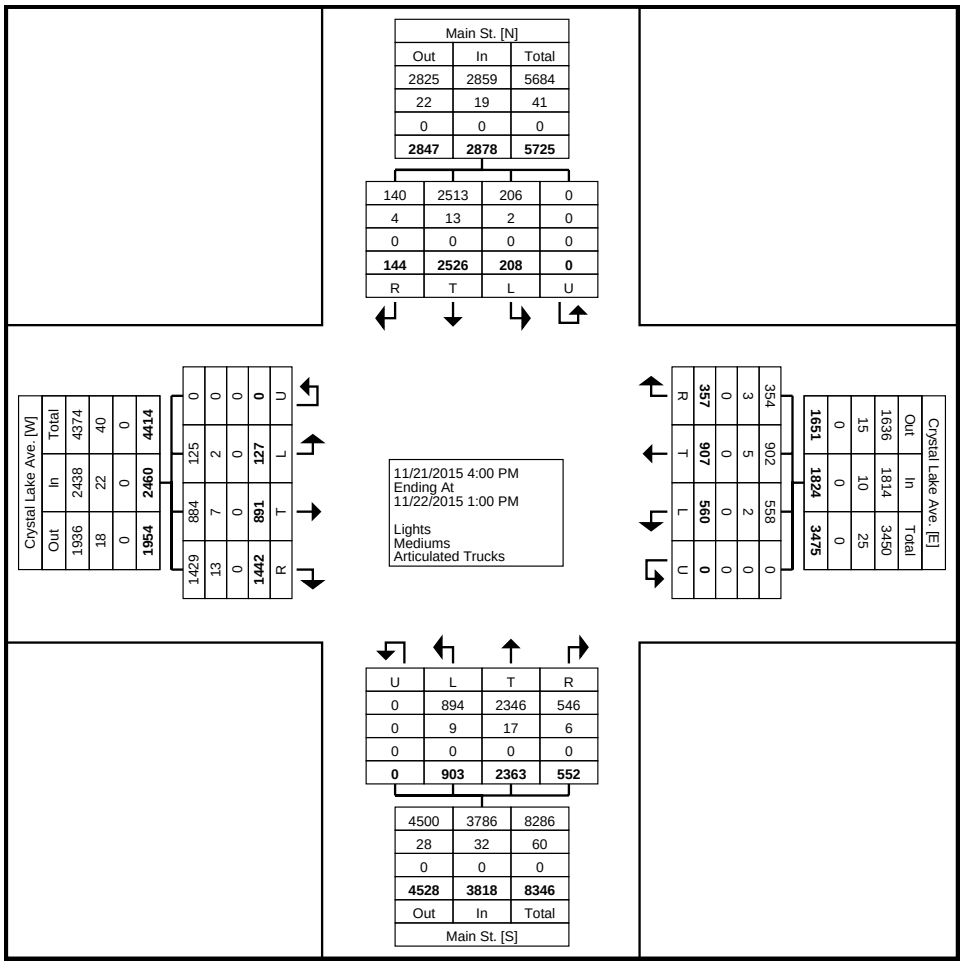
Turning Movement Data

Start Time	Main St. Southbound					Crystal Lake Ave. Westbound					Main St. Northbound					Crystal Lake Ave. Eastbound					
	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	Int. Total
4:00 PM	0	3	45	7	55	0	13	22	10	45	0	24	73	15	112	0	2	17	34	53	265
4:15 PM	0	3	86	6	95	0	14	21	13	48	0	32	71	17	120	0	3	34	36	73	336
4:30 PM	0	4	54	6	64	0	16	21	11	48	0	20	57	20	97	0	2	26	49	77	286
4:45 PM	0	2	59	5	66	0	7	28	11	46	0	26	75	12	113	0	6	20	38	64	289
Hourly Total	0	12	244	24	280	0	50	92	45	187	0	102	276	64	442	0	13	97	157	267	1176
5:00 PM	0	8	67	3	78	0	17	32	10	59	0	23	59	13	95	0	7	25	30	62	294
5:15 PM	0	5	62	3	70	0	11	22	5	38	0	27	66	16	109	0	3	26	41	70	287
5:30 PM	0	7	72	6	85	0	12	32	7	51	0	30	85	13	128	0	4	20	38	62	326
5:45 PM	0	5	57	2	64	0	10	20	15	45	0	32	70	21	123	0	6	23	23	52	284
Hourly Total	0	25	258	14	297	0	50	106	37	193	0	112	280	63	455	0	20	94	132	246	1191
6:00 PM	0	13	62	7	82	0	11	18	12	41	0	22	61	18	101	0	3	13	25	41	265
6:15 PM	0	6	55	2	63	0	9	14	9	32	0	30	69	10	109	0	4	13	34	51	255
6:30 PM	0	12	47	3	62	0	8	18	11	37	0	30	65	7	102	0	3	17	10	30	231
6:45 PM	0	1	38	2	41	0	11	26	12	49	0	29	55	14	98	0	2	10	28	40	228
Hourly Total	0	32	202	14	248	0	39	76	44	159	0	111	250	49	410	0	12	53	97	162	979
7:00 PM	0	1	42	4	47	0	4	19	13	36	0	23	67	12	102	0	9	17	25	51	236
7:15 PM	0	4	38	3	45	0	5	21	11	37	0	24	63	3	90	0	4	13	16	33	205
7:30 PM	0	3	36	7	46	0	5	27	18	50	0	22	45	10	77	0	4	15	17	36	209
7:45 PM	0	4	52	3	59	0	8	18	8	34	0	16	53	9	78	0	3	11	14	28	199
Hourly Total	0	12	168	17	197	0	22	85	50	157	0	85	228	34	347	0	20	56	72	148	849
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7:00 AM	0	1	22	0	23	0	4	10	2	16	0	2	9	3	14	0	0	7	15	22	75
7:15 AM	0	2	23	1	26	0	6	4	2	12	0	3	17	8	28	0	2	9	16	27	93
7:30 AM	0	0	18	3	21	0	9	7	2	18	0	2	18	3	23	0	0	6	14	20	82
7:45 AM	0	2	52	3	57	0	8	13	1	22	0	5	13	6	24	0	0	11	26	37	140
Hourly Total	0	5	115	7	127	0	27	34	7	68	0	12	57	20	89	0	2	33	71	106	390
8:00 AM	0	1	30	1	32	0	11	7	4	22	0	8	23	10	41	0	1	11	18	30	125
8:15 AM	0	5	45	2	52	0	5	10	6	21	0	7	22	7	36	0	1	16	24	41	150
8:30 AM	0	2	60	1	63	0	7	35	8	50	0	6	37	13	56	0	1	19	21	41	210
8:45 AM	0	11	78	4	93	0	13	34	12	59	0	9	43	20	72	0	1	39	36	76	300
Hourly Total	0	19	213	8	240	0	36	86	30	152	0	30	125	50	205	0	4	85	99	188	785
9:00 AM	0	6	50	5	61	0	19	27	6	52	0	14	31	17	62	0	1	27	38	66	241
9:15 AM	0	1	57	0	58	0	17	22	4	43	0	15	34	12	61	0	2	12	33	47	209
9:30 AM	0	3	59	1	63	0	9	12	4	25	0	17	39	15	71	0	2	10	28	40	199
9:45 AM	0	7	58	1	66	0	22	13	4	39	0	6	49	10	65	0	2	22	41	65	235
Hourly Total	0	17	224	7	248	0	67	74	18	159	0	52	153	54	259	0	7	71	140	218	884
10:00 AM	0	6	97	4	107	0	17	31	14	62	0	13	46	8	67	0	1	26	57	84	320
10:15 AM	0	0	76	1	77	0	20	38	10	68	0	40	78	8	126	0	1	30	45	76	347
10:30 AM	0	6	115	4	125	0	28	25	6	59	0	28	77	20	125	0	5	40	68	113	422
10:45 AM	0	3	105	2	110	0	19	30	6	55	0	30	86	21	137	0	5	34	53	92	394
Hourly Total	0	15	393	11	419	0	84	124	36	244	0	111	287	57	455	0	12	130	223	365	1483

11:00 AM	0	6	91	2	99	0	28	36	10	74	0	32	75	11	118	0	5	32	46	83	374
11:15 AM	0	5	60	4	69	0	18	19	12	49	0	34	75	22	131	0	2	22	60	84	333
11:30 AM	0	12	106	7	125	0	20	32	12	64	0	32	84	15	131	0	6	42	56	104	424
11:45 AM	0	17	111	6	134	0	21	31	15	67	0	38	81	18	137	0	5	46	77	128	466
Hourly Total	0	40	368	19	427	0	87	118	49	254	0	136	315	66	517	0	18	142	239	399	1597
12:00 PM	0	11	105	7	123	0	13	17	9	39	0	39	110	24	173	0	9	35	61	105	440
12:15 PM	0	5	96	4	105	0	34	31	12	77	0	43	101	21	165	0	0	31	50	81	428
12:30 PM	0	9	66	5	80	0	35	35	16	86	0	37	103	31	171	0	2	31	44	77	414
12:45 PM	0	6	74	7	87	0	16	29	4	49	0	33	78	19	130	0	8	33	57	98	364
Hourly Total	0	31	341	23	395	0	98	112	41	251	0	152	392	95	639	0	19	130	212	361	1646
Grand Total	0	208	2526	144	2878	0	560	907	357	1824	0	903	2363	552	3818	0	127	891	1442	2460	10980
Approach %	0.0	7.2	87.8	5.0	-	0.0	30.7	49.7	19.6	-	0.0	23.7	61.9	14.5	-	0.0	5.2	36.2	58.6	-	-
Total %	0.0	1.9	23.0	1.3	26.2	0.0	5.1	8.3	3.3	16.6	0.0	8.2	21.5	5.0	34.8	0.0	1.2	8.1	13.1	22.4	-
Lights	0	206	2513	140	2859	0	558	902	354	1814	0	894	2346	546	3786	0	125	884	1429	2438	10897
% Lights	-	99.0	99.5	97.2	99.3	-	99.6	99.4	99.2	99.5	-	99.0	99.3	98.9	99.2	-	98.4	99.2	99.1	99.1	99.2
Mediums	0	2	13	4	19	0	2	5	3	10	0	9	17	6	32	0	2	7	13	22	83
% Mediums	-	1.0	0.5	2.8	0.7	-	0.4	0.6	0.8	0.5	-	1.0	0.7	1.1	0.8	-	1.6	0.8	0.9	0.9	0.8
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

Vernon Hills, Illinois, United States 60061
(847) 478-9700 lbeckham@gha-engineers.com



Turning Movement Data Plot

4153.910 Crystal Lake
Crystal Lake Ave. and Main St.
10-hr
GHA MIO

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

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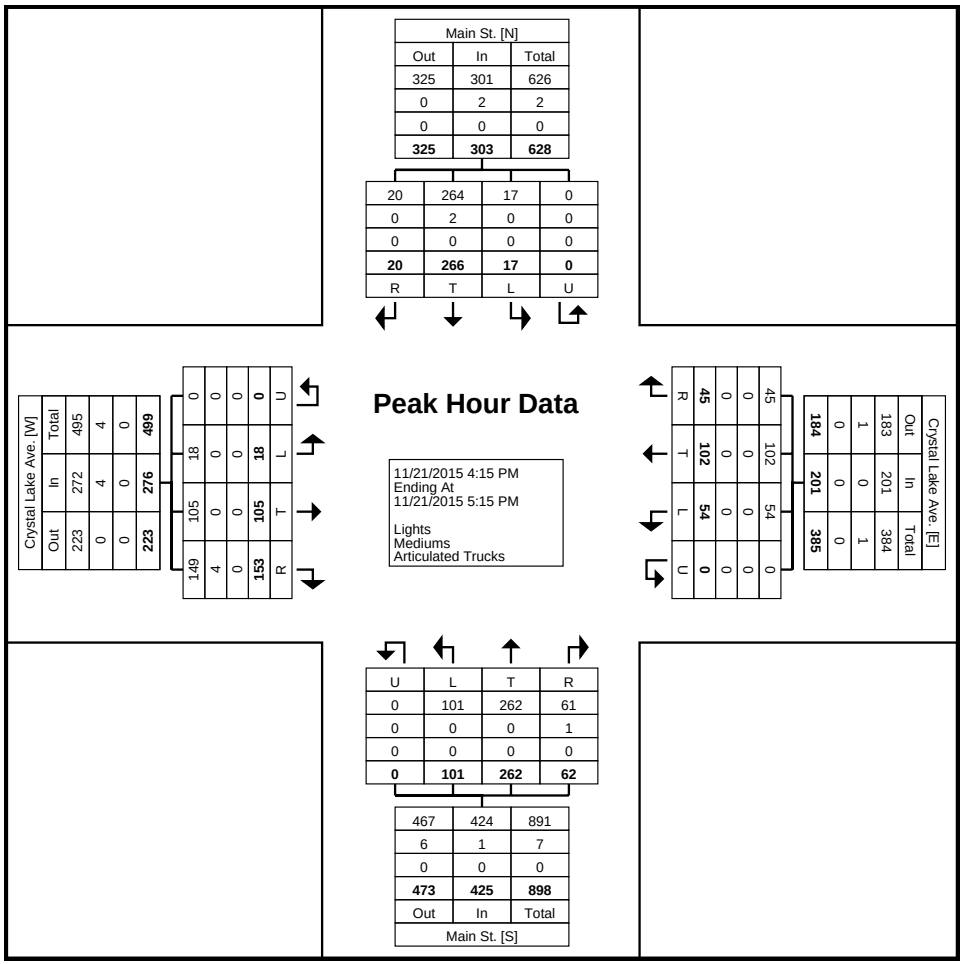
Count Name: Crystal Lake and Main
Site Code:
Start Date: 11/21/2015

Turning Movement Peak Hour Data (4:15 PM)

Start Time	Main St. Southbound					Crystal Lake Ave. Westbound					Main St. Northbound					Crystal Lake Ave. Eastbound					
	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	Int. Total
4:15 PM	0	3	86	6	95	0	14	21	13	48	0	32	71	17	120	0	3	34	36	73	336
4:30 PM	0	4	54	6	64	0	16	21	11	48	0	20	57	20	97	0	2	26	49	77	286
4:45 PM	0	2	59	5	66	0	7	28	11	46	0	26	75	12	113	0	6	20	38	64	289
5:00 PM	0	8	67	3	78	0	17	32	10	59	0	23	59	13	95	0	7	25	30	62	294
Total	0	17	266	20	303	0	54	102	45	201	0	101	262	62	425	0	18	105	153	276	1205
Approach %	0.0	5.6	87.8	6.6	-	0.0	26.9	50.7	22.4	-	0.0	23.8	61.6	14.6	-	0.0	6.5	38.0	55.4	-	-
Total %	0.0	1.4	22.1	1.7	25.1	0.0	4.5	8.5	3.7	16.7	0.0	8.4	21.7	5.1	35.3	0.0	1.5	8.7	12.7	22.9	-
PHF	0.000	0.531	0.773	0.833	0.797	0.000	0.794	0.797	0.865	0.852	0.000	0.789	0.873	0.775	0.885	0.000	0.643	0.772	0.781	0.896	0.897
Lights	0	17	264	20	301	0	54	102	45	201	0	101	262	61	424	0	18	105	149	272	1198
% Lights	-	100.0	99.2	100.0	99.3	-	100.0	100.0	100.0	100.0	-	100.0	100.0	98.4	99.8	-	100.0	100.0	97.4	98.6	99.4
Mediums	0	0	2	0	2	0	0	0	0	0	0	0	0	1	1	0	0	0	4	4	7
% Mediums	-	0.0	0.8	0.0	0.7	-	0.0	0.0	0.0	0.0	-	0.0	0.0	1.6	0.2	-	0.0	0.0	2.6	1.4	0.6
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

Gewalt Hamilton Associates Inc.
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Turning Movement Peak Hour Data Plot (4:15 PM)

4153.910 Crystal Lake
Crystal Lake Ave. and Main St.
10-hr
GHA MIO

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

Vernon Hills, Illinois, United States 60061
(847) 478-9700 lbeckham@gha-engineers.com

Count Name: Crystal Lake and Main
Site Code:
Start Date: 11/21/2015

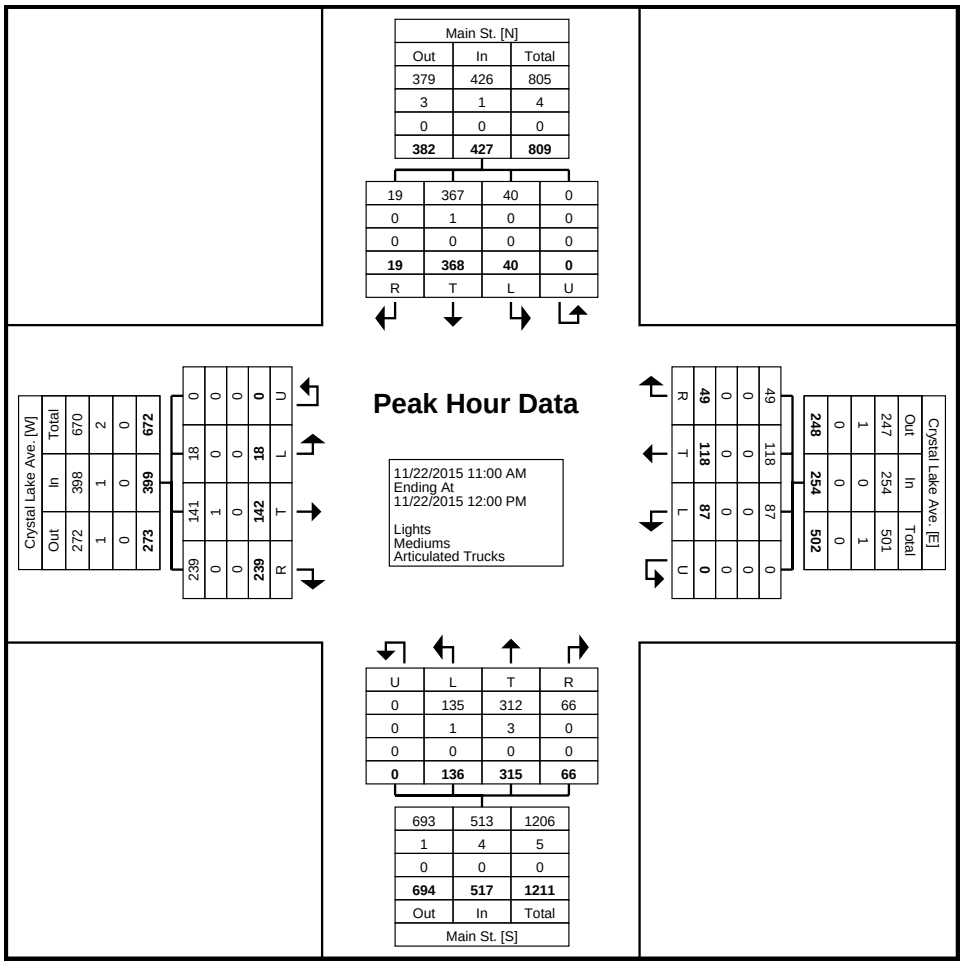
Turning Movement Peak Hour Data (11:00 AM)

Start Time	Main St. Southbound					Crystal Lake Ave. Westbound					Main St. Northbound					Crystal Lake Ave. Eastbound					
	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	Int. Total
11:00 AM	0	6	91	2	99	0	28	36	10	74	0	32	75	11	118	0	5	32	46	83	374
11:15 AM	0	5	60	4	69	0	18	19	12	49	0	34	75	22	131	0	2	22	60	84	333
11:30 AM	0	12	106	7	125	0	20	32	12	64	0	32	84	15	131	0	6	42	56	104	424
11:45 AM	0	17	111	6	134	0	21	31	15	67	0	38	81	18	137	0	5	46	77	128	466
Total	0	40	368	19	427	0	87	118	49	254	0	136	315	66	517	0	18	142	239	399	1597
Approach %	0.0	9.4	86.2	4.4	-	0.0	34.3	46.5	19.3	-	0.0	26.3	60.9	12.8	-	0.0	4.5	35.6	59.9	-	-
Total %	0.0	2.5	23.0	1.2	26.7	0.0	5.4	7.4	3.1	15.9	0.0	8.5	19.7	4.1	32.4	0.0	1.1	8.9	15.0	25.0	-
PHF	0.000	0.588	0.829	0.679	0.797	0.000	0.777	0.819	0.817	0.858	0.000	0.895	0.938	0.750	0.943	0.000	0.750	0.772	0.776	0.779	0.857
Lights	0	40	367	19	426	0	87	118	49	254	0	135	312	66	513	0	18	141	239	398	1591
% Lights	-	100.0	99.7	100.0	99.8	-	100.0	100.0	100.0	100.0	-	99.3	99.0	100.0	99.2	-	100.0	99.3	100.0	99.7	99.6
Mediums	0	0	1	0	1	0	0	0	0	0	0	1	3	0	4	0	0	1	0	1	6
% Mediums	-	0.0	0.3	0.0	0.2	-	0.0	0.0	0.0	0.0	-	0.7	1.0	0.0	0.8	-	0.0	0.7	0.0	0.3	0.4
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

4153.910 Crystal Lake
Crystal Lake Ave. and Main St.
10-hr
GHA MIO

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625 Forest Edge Drive

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Turning Movement Peak Hour Data Plot (11:00 AM)

4153.910 Crystal Lake
Crystal Lake Ave. and Main St.
10-hr
GHA MIO

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

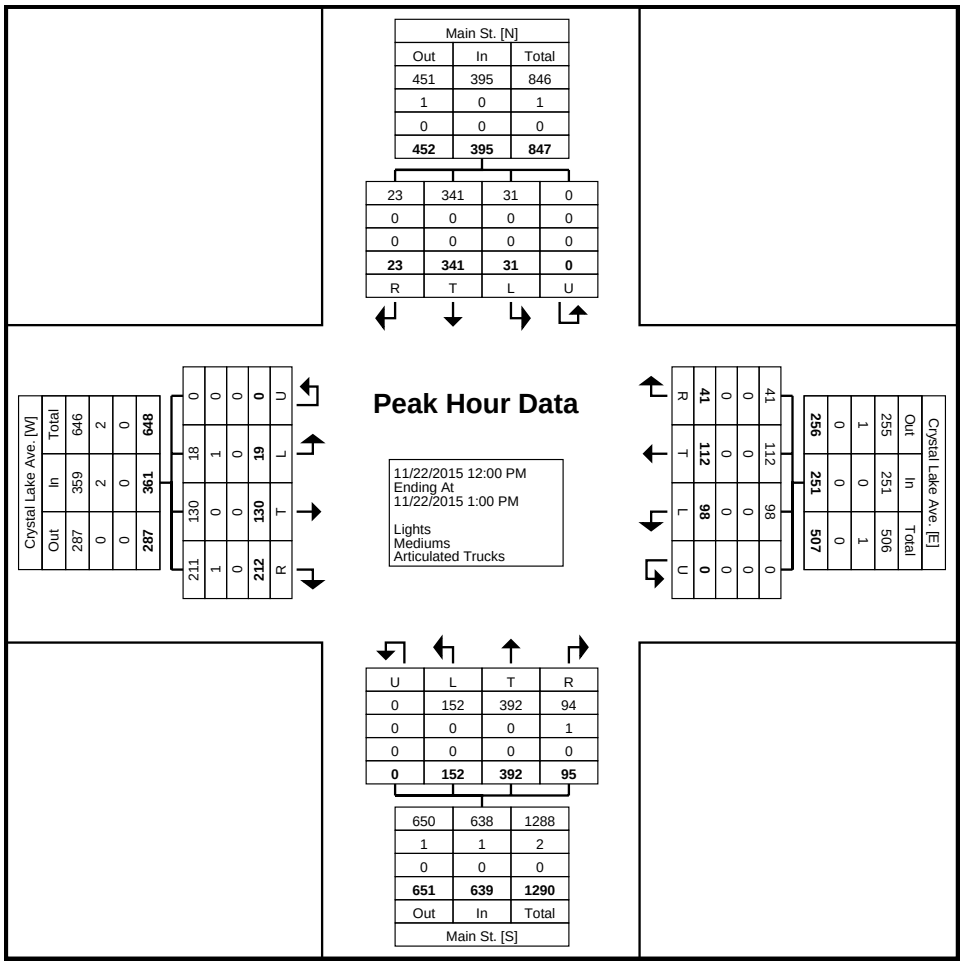
Vernon Hills, Illinois, United States 60061
(847) 478-9700 lbeckham@gha-engineers.com

Turning Movement Peak Hour Data (12:00 PM)

Start Time	Main St. Southbound					Crystal Lake Ave. Westbound					Main St. Northbound					Crystal Lake Ave. Eastbound					
	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	Int. Total
12:00 PM	0	11	105	7	123	0	13	17	9	39	0	39	110	24	173	0	9	35	61	105	440
12:15 PM	0	5	96	4	105	0	34	31	12	77	0	43	101	21	165	0	0	31	50	81	428
12:30 PM	0	9	66	5	80	0	35	35	16	86	0	37	103	31	171	0	2	31	44	77	414
12:45 PM	0	6	74	7	87	0	16	29	4	49	0	33	78	19	130	0	8	33	57	98	364
Total	0	31	341	23	395	0	98	112	41	251	0	152	392	95	639	0	19	130	212	361	1646
Approach %	0.0	7.8	86.3	5.8	-	0.0	39.0	44.6	16.3	-	0.0	23.8	61.3	14.9	-	0.0	5.3	36.0	58.7	-	-
Total %	0.0	1.9	20.7	1.4	24.0	0.0	6.0	6.8	2.5	15.2	0.0	9.2	23.8	5.8	38.8	0.0	1.2	7.9	12.9	21.9	-
PHF	0.000	0.705	0.812	0.821	0.803	0.000	0.700	0.800	0.641	0.730	0.000	0.884	0.891	0.766	0.923	0.000	0.528	0.929	0.869	0.860	0.935
Lights	0	31	341	23	395	0	98	112	41	251	0	152	392	94	638	0	18	130	211	359	1643
% Lights	-	100.0	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0	-	100.0	100.0	98.9	99.8	-	94.7	100.0	99.5	99.4	99.8
Mediums	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	2	3
% Mediums	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	1.1	0.2	-	5.3	0.0	0.5	0.6	0.2
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

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Turning Movement Peak Hour Data Plot (12:00 PM)

4153.910 Crystal Lake
Congress Pkwy and Exchange Rd.
10-hr
GHA MIO

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

Vernon Hills, Illinois, United States 60061
(847) 478-9700 lbeckham@gha-engineers.com

Count Name: Congress and Exchange
Site Code:
Start Date: 11/21/2015

Turning Movement Data

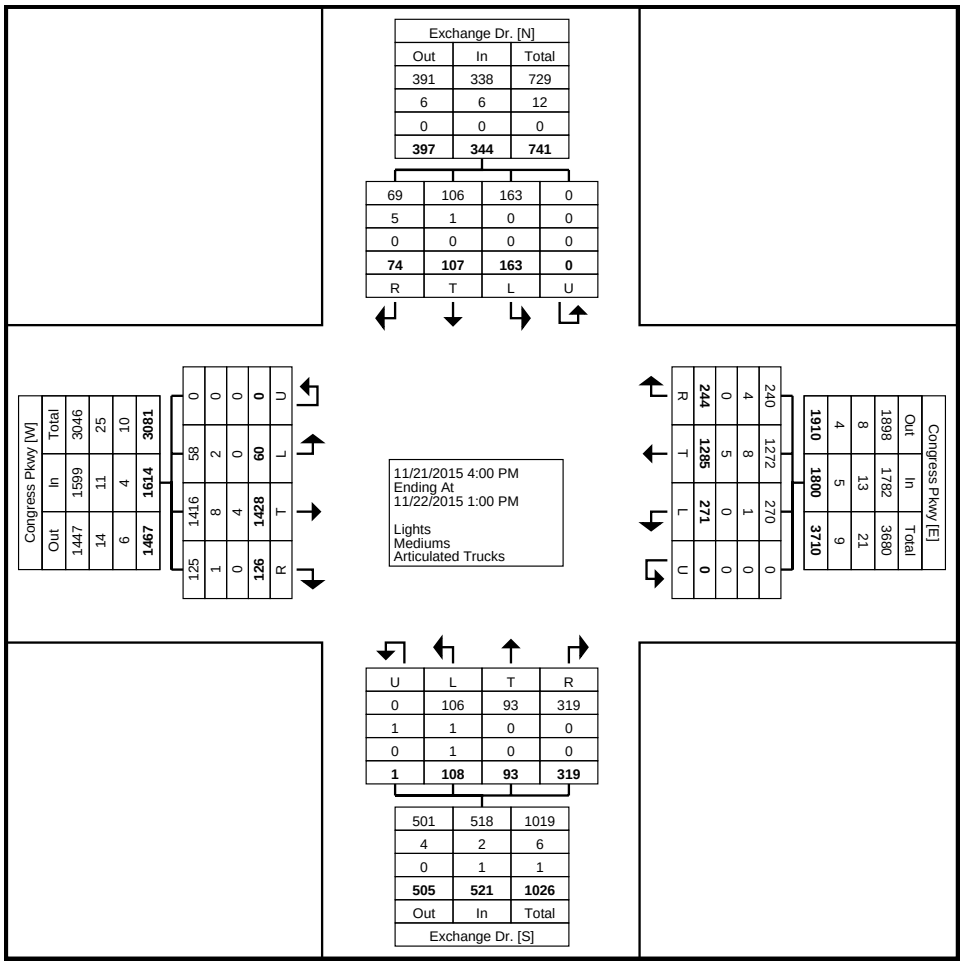
Start Time	Exchange Dr. Southbound					Congress Pkwy Westbound					Exchange Dr. Northbound					Congress Pkwy Eastbound					
	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	Int. Total
4:00 PM	0	9	9	0	18	0	7	42	3	52	0	3	1	9	13	0	1	37	5	43	126
4:15 PM	0	3	9	2	14	0	6	29	0	35	0	2	1	11	14	0	0	38	1	39	102
4:30 PM	0	2	4	4	10	0	2	27	5	34	0	1	1	12	14	0	3	32	0	35	93
4:45 PM	0	1	5	1	7	0	7	30	5	42	0	5	2	9	16	0	1	27	1	29	94
Hourly Total	0	15	27	7	49	0	22	128	13	163	0	11	5	41	57	0	5	134	7	146	415
5:00 PM	0	3	7	3	13	0	8	32	4	44	0	5	2	7	14	0	2	28	1	31	102
5:15 PM	0	5	1	1	7	0	4	26	14	44	0	2	6	9	17	0	3	38	1	42	110
5:30 PM	0	0	2	3	5	0	1	27	4	32	0	2	5	5	12	0	4	39	1	44	93
5:45 PM	0	1	1	0	2	0	5	17	0	22	0	2	2	9	13	0	3	26	2	31	68
Hourly Total	0	9	11	7	27	0	18	102	22	142	0	11	15	30	56	0	12	131	5	148	373
6:00 PM	0	0	2	0	2	0	3	24	1	28	0	2	2	8	12	0	0	30	1	31	73
6:15 PM	0	0	1	0	1	0	7	23	0	30	0	2	0	8	10	0	0	19	1	20	61
6:30 PM	0	1	1	0	2	0	4	15	0	19	0	2	0	8	10	0	0	30	3	33	64
6:45 PM	0	13	10	7	30	0	3	18	2	23	0	2	3	7	12	0	3	29	7	39	104
Hourly Total	0	14	14	7	35	0	17	80	3	100	0	8	5	31	44	0	3	108	12	123	302
7:00 PM	0	11	5	2	18	0	3	21	1	25	0	3	0	8	11	0	0	37	4	41	95
7:15 PM	0	5	1	2	8	0	6	11	0	17	1	1	0	10	12	0	0	25	0	25	62
7:30 PM	0	1	0	1	2	0	3	11	0	14	0	1	0	4	5	0	0	18	1	19	40
7:45 PM	0	1	0	2	3	0	3	9	0	12	0	0	1	10	11	0	0	12	1	13	39
Hourly Total	0	18	6	7	31	0	15	52	1	68	1	5	1	32	39	0	0	92	6	98	236
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7:00 AM	0	0	0	0	0	0	0	8	0	8	0	0	0	0	0	0	1	1	0	2	10
7:15 AM	0	0	0	0	0	0	0	8	5	13	0	0	0	0	0	0	1	3	0	4	17
7:30 AM	0	2	1	3	6	0	2	12	9	23	0	3	5	0	8	0	3	5	0	8	45
7:45 AM	0	2	0	0	2	0	2	28	9	39	0	1	5	3	9	0	2	10	2	14	64
Hourly Total	0	4	1	3	8	0	4	56	23	83	0	4	10	3	17	0	7	19	2	28	136
8:00 AM	0	0	0	0	0	0	2	14	4	20	0	1	3	1	5	0	1	9	2	12	37
8:15 AM	0	1	0	0	1	0	6	23	10	39	0	1	1	2	4	0	1	13	0	14	58
8:30 AM	0	0	0	2	2	0	5	38	19	62	0	2	3	0	5	0	4	19	4	27	96
8:45 AM	0	3	1	1	5	0	12	59	32	103	0	10	5	2	17	0	8	26	5	39	164
Hourly Total	0	4	1	3	8	0	25	134	65	224	0	14	12	5	31	0	14	67	11	92	355
9:00 AM	0	0	2	1	3	0	3	50	15	68	0	2	6	0	8	0	3	23	1	27	106
9:15 AM	0	1	0	0	1	0	6	31	5	42	0	3	0	2	5	0	0	21	2	23	71
9:30 AM	0	2	0	0	2	0	9	21	4	34	0	2	4	0	6	0	2	35	1	38	80
9:45 AM	0	0	0	1	1	0	4	30	16	50	0	2	8	3	13	0	1	24	3	28	92
Hourly Total	0	3	2	2	7	0	22	132	40	194	0	9	18	5	32	0	6	103	7	116	349
10:00 AM	0	3	2	0	5	0	11	40	5	56	0	1	3	5	9	0	1	41	6	48	118
10:15 AM	0	19	10	3	32	0	8	61	14	83	0	1	2	8	11	0	1	92	6	99	225
10:30 AM	0	7	3	4	14	0	5	77	24	106	0	12	7	10	29	0	5	52	4	61	210
10:45 AM	0	2	2	1	5	0	13	70	15	98	0	5	3	20	28	0	1	57	5	63	194
Hourly Total	0	31	17	8	56	0	37	248	58	343	0	19	15	43	77	0	8	242	21	271	747

11:00 AM	0	1	2	2	5	0	13	41	9	63	0	3	3	13	19	0	0	53	3	56	143
11:15 AM	0	2	1	1	4	0	13	47	2	62	0	2	3	17	22	0	1	38	1	40	128
11:30 AM	0	4	3	0	7	0	15	43	2	60	0	3	1	18	22	0	0	56	7	63	152
11:45 AM	0	2	0	3	5	0	12	38	1	51	0	3	3	8	14	0	1	70	6	77	147
Hourly Total	0	9	6	6	21	0	53	169	14	236	0	11	10	56	77	0	2	217	17	236	570
12:00 PM	0	29	6	19	54	0	15	43	1	59	0	3	0	15	18	0	2	110	17	129	260
12:15 PM	0	17	9	5	31	0	22	46	2	70	0	1	1	22	24	0	0	93	9	102	227
12:30 PM	0	8	4	0	12	0	12	61	1	74	0	6	1	15	22	0	1	59	10	70	178
12:45 PM	0	2	3	0	5	0	9	34	1	44	0	6	0	21	27	0	0	53	2	55	131
Hourly Total	0	56	22	24	102	0	58	184	5	247	0	16	2	73	91	0	3	315	38	356	796
Grand Total	0	163	107	74	344	0	271	1285	244	1800	1	108	93	319	521	0	60	1428	126	1614	4279
Approach %	0.0	47.4	31.1	21.5	-	0.0	15.1	71.4	13.6	-	0.2	20.7	17.9	61.2	-	0.0	3.7	88.5	7.8	-	-
Total %	0.0	3.8	2.5	1.7	8.0	0.0	6.3	30.0	5.7	42.1	0.0	2.5	2.2	7.5	12.2	0.0	1.4	33.4	2.9	37.7	-
Lights	0	163	106	69	338	0	270	1272	240	1782	0	106	93	319	518	0	58	1416	125	1599	4237
% Lights	-	100.0	99.1	93.2	98.3	-	99.6	99.0	98.4	99.0	0.0	98.1	100.0	100.0	99.4	-	96.7	99.2	99.2	99.1	99.0
Mediums	0	0	1	5	6	0	1	8	4	13	1	1	0	0	2	0	2	8	1	11	32
% Mediums	-	0.0	0.9	6.8	1.7	-	0.4	0.6	1.6	0.7	100.0	0.9	0.0	0.0	0.4	-	3.3	0.6	0.8	0.7	0.7
Articulated Trucks	0	0	0	0	0	0	0	5	0	5	0	1	0	0	1	0	0	4	0	4	10
% Articulated Trucks	-	0.0	0.0	0.0	0.0	-	0.0	0.4	0.0	0.3	0.0	0.9	0.0	0.0	0.2	-	0.0	0.3	0.0	0.2	0.2

4153.910 Crystal Lake
Congress Pkwy and Exchange Rd.
10-hr
GHA MIO

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

Vernon Hills, Illinois, United States 60061
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Turning Movement Data Plot

4153.910 Crystal Lake
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10-hr
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Count Name: Congress and Exchange
Site Code:
Start Date: 11/21/2015

Turning Movement Peak Hour Data (4:00 PM)

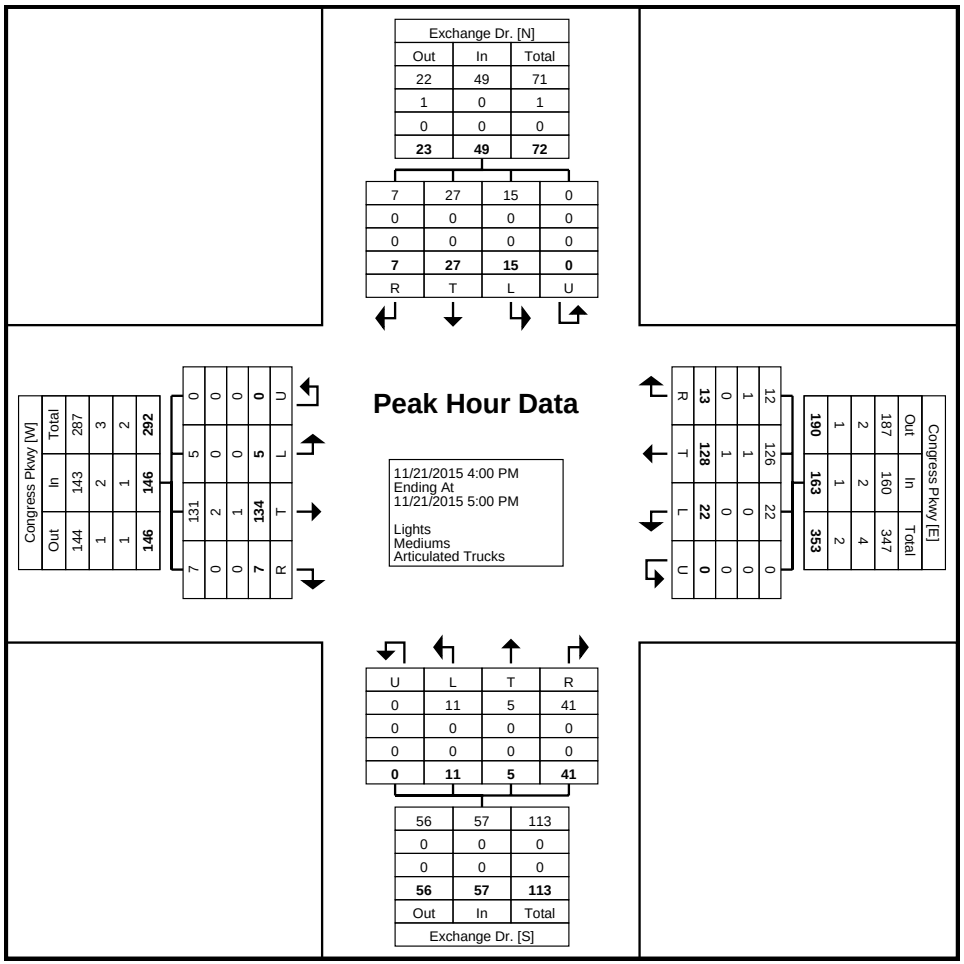
Start Time	Exchange Dr. Southbound					Congress Pkwy Westbound					Exchange Dr. Northbound					Congress Pkwy Eastbound					
	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	Int. Total
4:00 PM	0	9	9	0	18	0	7	42	3	52	0	3	1	9	13	0	1	37	5	43	126
4:15 PM	0	3	9	2	14	0	6	29	0	35	0	2	1	11	14	0	0	38	1	39	102
4:30 PM	0	2	4	4	10	0	2	27	5	34	0	1	1	12	14	0	3	32	0	35	93
4:45 PM	0	1	5	1	7	0	7	30	5	42	0	5	2	9	16	0	1	27	1	29	94
Total	0	15	27	7	49	0	22	128	13	163	0	11	5	41	57	0	5	134	7	146	415
Approach %	0.0	30.6	55.1	14.3	-	0.0	13.5	78.5	8.0	-	0.0	19.3	8.8	71.9	-	0.0	3.4	91.8	4.8	-	-
Total %	0.0	3.6	6.5	1.7	11.8	0.0	5.3	30.8	3.1	39.3	0.0	2.7	1.2	9.9	13.7	0.0	1.2	32.3	1.7	35.2	-
PHF	0.000	0.417	0.750	0.438	0.681	0.000	0.786	0.762	0.650	0.784	0.000	0.550	0.625	0.854	0.891	0.000	0.417	0.882	0.350	0.849	0.823
Lights	0	15	27	7	49	0	22	126	12	160	0	11	5	41	57	0	5	131	7	143	409
% Lights	-	100.0	100.0	100.0	100.0	-	100.0	98.4	92.3	98.2	-	100.0	100.0	100.0	100.0	-	100.0	97.8	100.0	97.9	98.6
Mediums	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	2	0	2	4
% Mediums	-	0.0	0.0	0.0	0.0	-	0.0	0.8	7.7	1.2	-	0.0	0.0	0.0	0.0	-	0.0	1.5	0.0	1.4	1.0
Articulated Trucks	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1	2
% Articulated Trucks	-	0.0	0.0	0.0	0.0	-	0.0	0.8	0.0	0.6	-	0.0	0.0	0.0	0.0	-	0.0	0.7	0.0	0.7	0.5

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4153.910 Crystal Lake
Congress Pkwy and Exchange Rd.
10-hr
GHA MIO

Count Name: Congress and Exchange
Site Code:
Start Date: 11/21/2015



Turning Movement Peak Hour Data Plot (4:00 PM)

4153.910 Crystal Lake
Congress Pkwy and Exchange Rd.
10-hr
GHA MIO

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Count Name: Congress and Exchange
Site Code:
Start Date: 11/21/2015

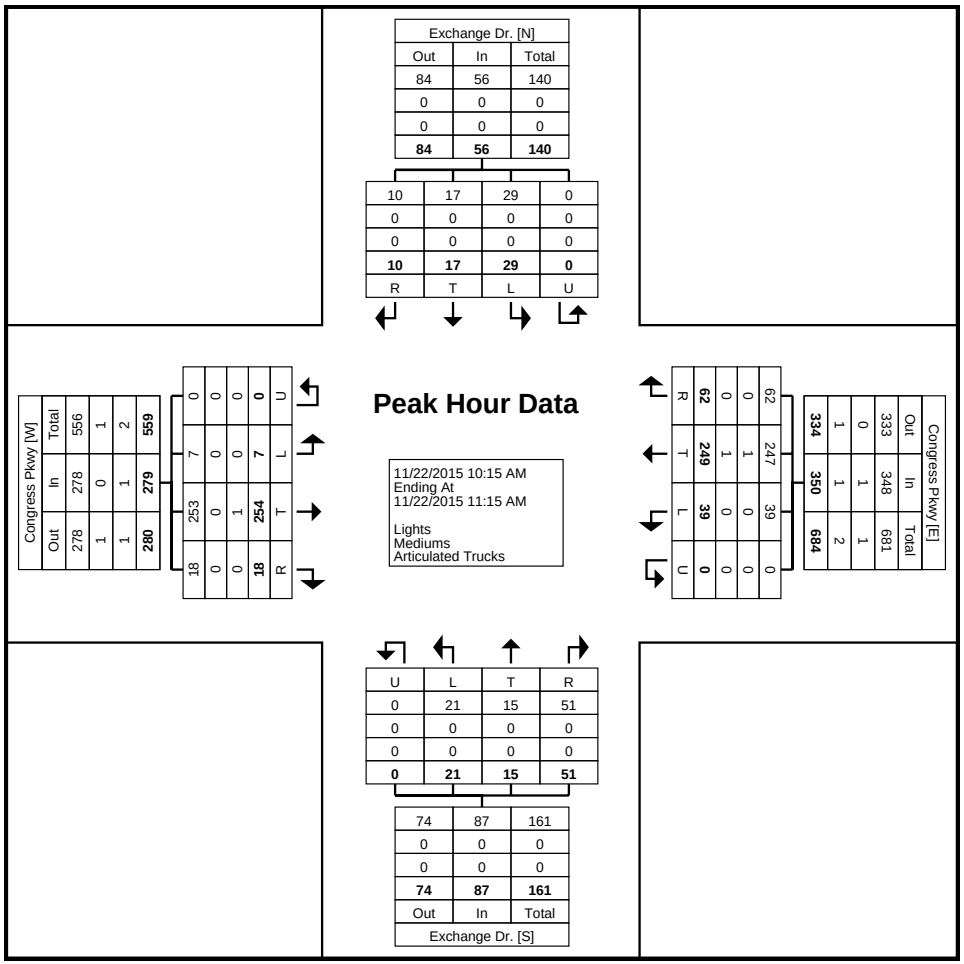
Turning Movement Peak Hour Data (10:15 AM)

Start Time	Exchange Dr. Southbound					Congress Pkwy Westbound					Exchange Dr. Northbound					Congress Pkwy Eastbound					
	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	Int. Total
10:15 AM	0	19	10	3	32	0	8	61	14	83	0	1	2	8	11	0	1	92	6	99	225
10:30 AM	0	7	3	4	14	0	5	77	24	106	0	12	7	10	29	0	5	52	4	61	210
10:45 AM	0	2	2	1	5	0	13	70	15	98	0	5	3	20	28	0	1	57	5	63	194
11:00 AM	0	1	2	2	5	0	13	41	9	63	0	3	3	13	19	0	0	53	3	56	143
Total	0	29	17	10	56	0	39	249	62	350	0	21	15	51	87	0	7	254	18	279	772
Approach %	0.0	51.8	30.4	17.9	-	0.0	11.1	71.1	17.7	-	0.0	24.1	17.2	58.6	-	0.0	2.5	91.0	6.5	-	-
Total %	0.0	3.8	2.2	1.3	7.3	0.0	5.1	32.3	8.0	45.3	0.0	2.7	1.9	6.6	11.3	0.0	0.9	32.9	2.3	36.1	-
PHF	0.000	0.382	0.425	0.625	0.438	0.000	0.750	0.808	0.646	0.825	0.000	0.438	0.536	0.638	0.750	0.000	0.350	0.690	0.750	0.705	0.858
Lights	0	29	17	10	56	0	39	247	62	348	0	21	15	51	87	0	7	253	18	278	769
% Lights	-	100.0	100.0	100.0	100.0	-	100.0	99.2	100.0	99.4	-	100.0	100.0	100.0	100.0	-	100.0	99.6	100.0	99.6	99.6
Mediums	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1
% Mediums	-	0.0	0.0	0.0	0.0	-	0.0	0.4	0.0	0.3	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.1
Articulated Trucks	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1	2
% Articulated Trucks	-	0.0	0.0	0.0	0.0	-	0.0	0.4	0.0	0.3	-	0.0	0.0	0.0	0.0	-	0.0	0.4	0.0	0.4	0.3

4153.910 Crystal Lake
Congress Pkwy and Exchange Rd.
10-hr
GHA MIO

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Turning Movement Peak Hour Data Plot (10:15 AM)

4153.910 Crystal Lake
Congress Pkwy and Exchange Rd.
10-hr
GHA MIO

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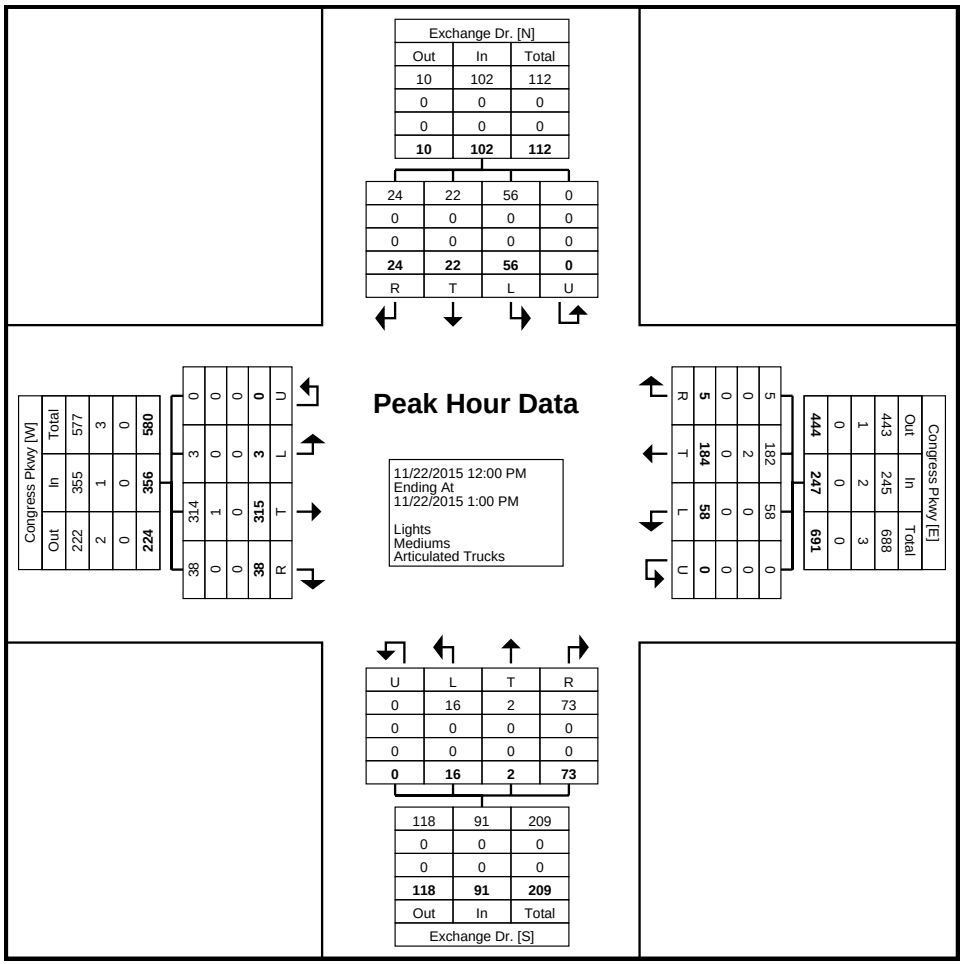
Turning Movement Peak Hour Data (12:00 PM)

Start Time	Exchange Dr. Southbound					Congress Pkwy Westbound					Exchange Dr. Northbound					Congress Pkwy Eastbound					
	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	Int. Total
12:00 PM	0	29	6	19	54	0	15	43	1	59	0	3	0	15	18	0	2	110	17	129	260
12:15 PM	0	17	9	5	31	0	22	46	2	70	0	1	1	22	24	0	0	93	9	102	227
12:30 PM	0	8	4	0	12	0	12	61	1	74	0	6	1	15	22	0	1	59	10	70	178
12:45 PM	0	2	3	0	5	0	9	34	1	44	0	6	0	21	27	0	0	53	2	55	131
Total	0	56	22	24	102	0	58	184	5	247	0	16	2	73	91	0	3	315	38	356	796
Approach %	0.0	54.9	21.6	23.5	-	0.0	23.5	74.5	2.0	-	0.0	17.6	2.2	80.2	-	0.0	0.8	88.5	10.7	-	-
Total %	0.0	7.0	2.8	3.0	12.8	0.0	7.3	23.1	0.6	31.0	0.0	2.0	0.3	9.2	11.4	0.0	0.4	39.6	4.8	44.7	-
PHF	0.000	0.483	0.611	0.316	0.472	0.000	0.659	0.754	0.625	0.834	0.000	0.667	0.500	0.830	0.843	0.000	0.375	0.716	0.559	0.690	0.765
Lights	0	56	22	24	102	0	58	182	5	245	0	16	2	73	91	0	3	314	38	355	793
% Lights	-	100.0	100.0	100.0	100.0	-	100.0	98.9	100.0	99.2	-	100.0	100.0	100.0	100.0	-	100.0	99.7	100.0	99.7	99.6
Mediums	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	1	0	1	3
% Mediums	-	0.0	0.0	0.0	0.0	-	0.0	1.1	0.0	0.8	-	0.0	0.0	0.0	0.0	-	0.0	0.3	0.0	0.3	0.4
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0

4153.910 Crystal Lake
Congress Pkwy and Exchange Rd.
10-hr
GHA MIO

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Turning Movement Peak Hour Data Plot (12:00 PM)

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4153.910 Crystal Lake
Exchange Dr. and Parking Lot - East Side
10-hr
GHA MIO

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

Vernon Hills, Illinois, United States 60061
(847) 478-9700 lbeckham@gha-engineers.com

Count Name: Exchange and Parking Lot-East
Site Code:
Start Date: 11/21/2015

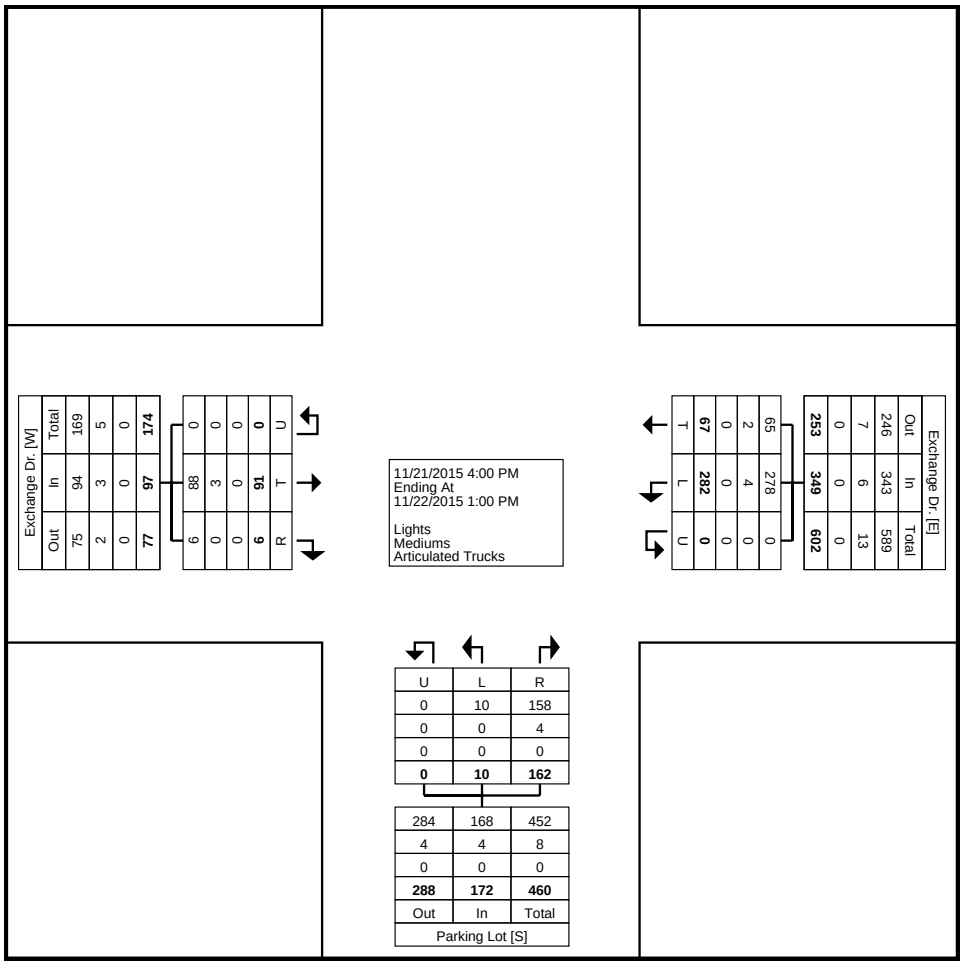
Turning Movement Data

Start Time	Exchange Dr. Westbound				Parking Lot Northbound				Exchange Dr. Eastbound				
	U-Turn	Left	Thru	App. Total	U-Turn	Left	Right	App. Total	U-Turn	Thru	Right	App. Total	Int. Total
4:00 PM	0	2	0	2	0	0	0	0	0	15	0	15	17
4:15 PM	0	2	0	2	0	0	1	1	0	12	1	13	16
4:30 PM	0	7	0	7	0	0	1	1	0	1	0	1	9
4:45 PM	0	8	1	9	0	0	0	0	0	1	0	1	10
Hourly Total	0	19	1	20	0	0	2	2	0	29	1	30	52
5:00 PM	0	11	1	12	0	0	1	1	0	11	0	11	24
5:15 PM	0	26	1	27	0	0	0	0	0	4	0	4	31
5:30 PM	0	12	2	14	0	0	2	2	0	2	0	2	18
5:45 PM	0	3	0	3	0	0	0	0	0	0	0	0	3
Hourly Total	0	52	4	56	0	0	3	3	0	17	0	17	76
6:00 PM	0	2	1	3	0	0	0	0	0	1	0	1	4
6:15 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
6:30 PM	0	0	0	0	0	1	3	4	0	0	0	0	4
6:45 PM	0	5	1	6	0	1	25	26	0	2	0	2	34
Hourly Total	0	7	2	9	0	2	28	30	0	4	0	4	43
7:00 PM	0	2	1	3	0	2	13	15	0	2	0	2	20
7:15 PM	0	0	0	0	0	1	5	6	0	1	0	1	7
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	2	1	3	0	3	18	21	0	3	0	3	27
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
7:00 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
7:15 AM	0	3	0	3	0	0	3	3	0	1	0	1	7
7:30 AM	0	5	1	6	0	0	4	4	0	1	0	1	11
7:45 AM	0	8	1	9	0	0	4	4	0	0	0	0	13
Hourly Total	0	17	2	19	0	0	11	11	0	2	0	2	32
8:00 AM	0	4	0	4	0	0	1	1	0	0	0	0	5
8:15 AM	0	9	0	9	0	0	0	0	0	1	0	1	10
8:30 AM	0	20	1	21	0	0	1	1	0	2	0	2	24
8:45 AM	0	31	6	37	0	0	0	0	0	1	1	2	39
Hourly Total	0	64	7	71	0	0	2	2	0	4	1	5	78
9:00 AM	0	18	3	21	0	1	1	2	0	1	0	1	24
9:15 AM	0	5	0	5	0	2	1	3	0	0	0	0	8
9:30 AM	0	3	8	11	0	0	0	0	0	1	0	1	12
9:45 AM	0	5	19	24	0	0	1	1	0	0	0	0	25
Hourly Total	0	31	30	61	0	3	3	6	0	2	0	2	69
10:00 AM	0	3	6	9	0	0	8	8	0	0	0	0	17
10:15 AM	0	13	3	16	0	0	17	17	0	7	0	7	40
10:30 AM	0	30	2	32	0	0	5	5	0	1	1	2	39
10:45 AM	0	17	1	18	0	0	3	3	0	2	0	2	23
Hourly Total	0	63	12	75	0	0	33	33	0	10	1	11	119

11:00 AM	0	13	0	13	0	0	3	3	0	0	0	0	16
11:15 AM	0	5	1	6	0	0	1	1	0	3	1	4	11
11:30 AM	0	0	3	3	0	0	0	0	0	3	1	4	7
11:45 AM	0	3	1	4	0	0	0	0	0	0	0	0	4
Hourly Total	0	21	5	26	0	0	4	4	0	6	2	8	38
12:00 PM	0	1	2	3	0	2	27	29	0	9	0	9	41
12:15 PM	0	1	1	2	0	0	19	19	0	4	1	5	26
12:30 PM	0	3	0	3	0	0	7	7	0	0	0	0	10
12:45 PM	0	1	0	1	0	0	5	5	0	1	0	1	7
Hourly Total	0	6	3	9	0	2	58	60	0	14	1	15	84
Grand Total	0	282	67	349	0	10	162	172	0	91	6	97	618
Approach %	0.0	80.8	19.2	-	0.0	5.8	94.2	-	0.0	93.8	6.2	-	-
Total %	0.0	45.6	10.8	56.5	0.0	1.6	26.2	27.8	0.0	14.7	1.0	15.7	-
Lights	0	278	65	343	0	10	158	168	0	88	6	94	605
% Lights	-	98.6	97.0	98.3	-	100.0	97.5	97.7	-	96.7	100.0	96.9	97.9
Mediums	0	4	2	6	0	0	4	4	0	3	0	3	13
% Mediums	-	1.4	3.0	1.7	-	0.0	2.5	2.3	-	3.3	0.0	3.1	2.1
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

Vernon Hills, Illinois, United States 60061
(847) 478-9700 lbeckham@gha-engineers.com



Turning Movement Data Plot

4153.910 Crystal Lake
Exchange Dr. and Parking Lot - East Side
10-hr
GHA MIO

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

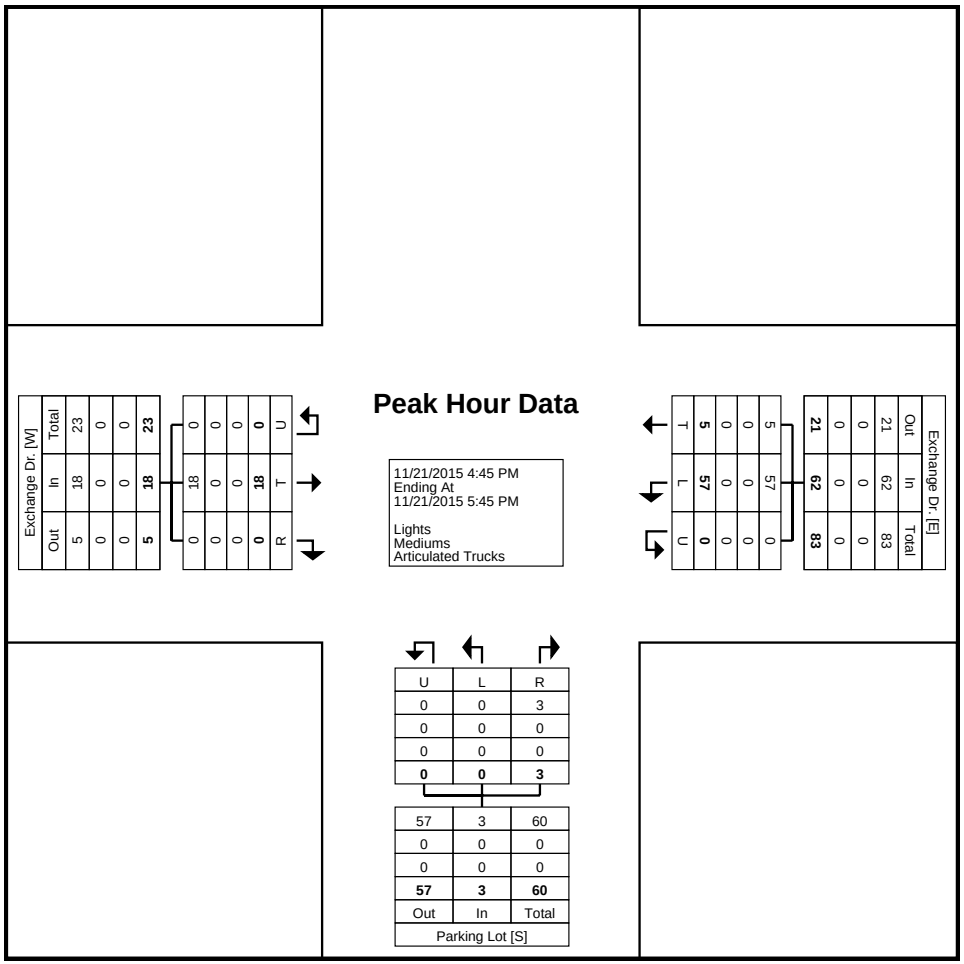
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(847) 478-9700 lbeckham@gha-engineers.com

Turning Movement Peak Hour Data (4:45 PM)

Start Time	Exchange Dr. Westbound				Parking Lot Northbound				Exchange Dr. Eastbound				
	U-Turn	Left	Thru	App. Total	U-Turn	Left	Right	App. Total	U-Turn	Thru	Right	App. Total	Int. Total
4:45 PM	0	8	1	9	0	0	0	0	0	1	0	1	10
5:00 PM	0	11	1	12	0	0	1	1	0	11	0	11	24
5:15 PM	0	26	1	27	0	0	0	0	0	4	0	4	31
5:30 PM	0	12	2	14	0	0	2	2	0	2	0	2	18
Total	0	57	5	62	0	0	3	3	0	18	0	18	83
Approach %	0.0	91.9	8.1	-	0.0	0.0	100.0	-	0.0	100.0	0.0	-	-
Total %	0.0	68.7	6.0	74.7	0.0	0.0	3.6	3.6	0.0	21.7	0.0	21.7	-
PHF	0.000	0.548	0.625	0.574	0.000	0.000	0.375	0.375	0.000	0.409	0.000	0.409	0.669
Lights	0	57	5	62	0	0	3	3	0	18	0	18	83
% Lights	-	100.0	100.0	100.0	-	-	100.0	100.0	-	100.0	-	100.0	100.0
Mediums	0	0	0	0	0	0	0	0	0	0	0	0	0
% Mediums	-	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	0.0	0.0
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	-	0.0	0.0

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Turning Movement Peak Hour Data Plot (4:45 PM)

4153.910 Crystal Lake
Exchange Dr. and Parking Lot - East Side
10-hr
GHA MIO

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

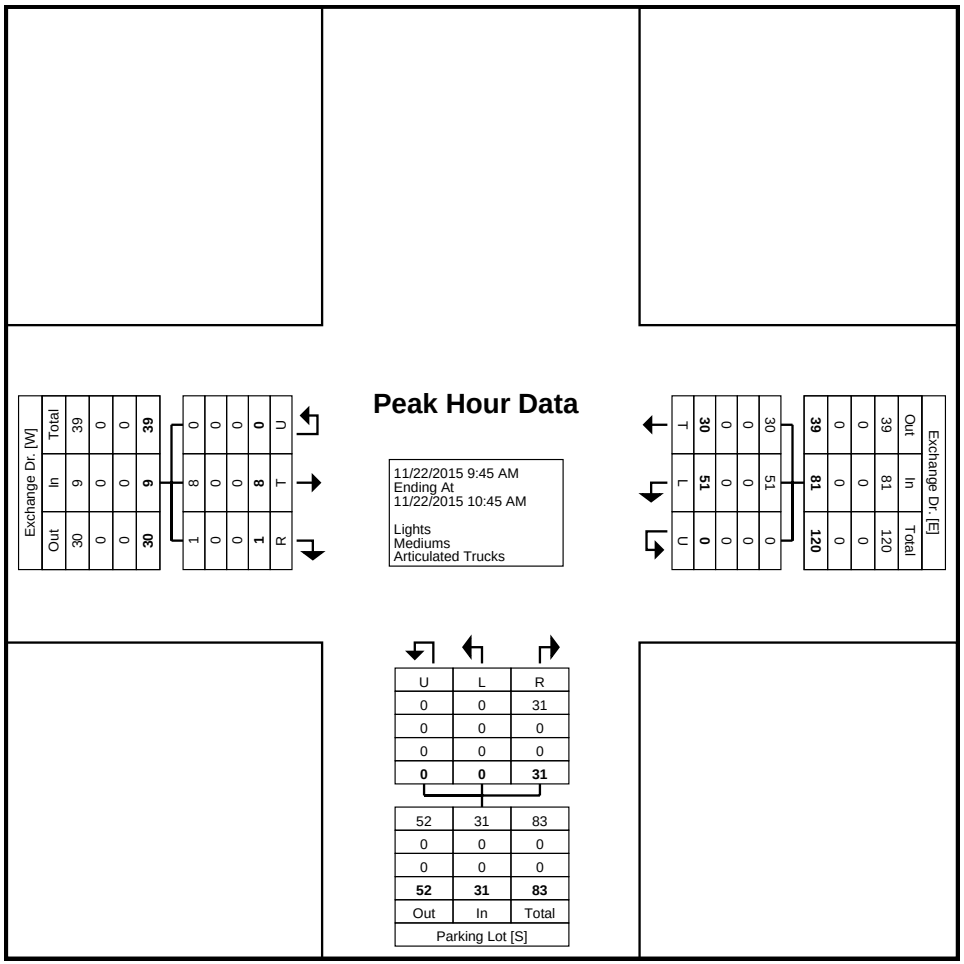
Vernon Hills, Illinois, United States 60061
(847) 478-9700 lbeckham@gha-engineers.com

Turning Movement Peak Hour Data (9:45 AM)

Start Time	Exchange Dr. Westbound				Parking Lot Northbound				Exchange Dr. Eastbound				
	U-Turn	Left	Thru	App. Total	U-Turn	Left	Right	App. Total	U-Turn	Thru	Right	App. Total	Int. Total
9:45 AM	0	5	19	24	0	0	1	1	0	0	0	0	25
10:00 AM	0	3	6	9	0	0	8	8	0	0	0	0	17
10:15 AM	0	13	3	16	0	0	17	17	0	7	0	7	40
10:30 AM	0	30	2	32	0	0	5	5	0	1	1	2	39
Total	0	51	30	81	0	0	31	31	0	8	1	9	121
Approach %	0.0	63.0	37.0	-	0.0	0.0	100.0	-	0.0	88.9	11.1	-	-
Total %	0.0	42.1	24.8	66.9	0.0	0.0	25.6	25.6	0.0	6.6	0.8	7.4	-
PHF	0.000	0.425	0.395	0.633	0.000	0.000	0.456	0.456	0.000	0.286	0.250	0.321	0.756
Lights	0	51	30	81	0	0	31	31	0	8	1	9	121
% Lights	-	100.0	100.0	100.0	-	-	100.0	100.0	-	100.0	100.0	100.0	100.0
Mediums	0	0	0	0	0	0	0	0	0	0	0	0	0
% Mediums	-	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0

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Turning Movement Peak Hour Data Plot (9:45 AM)

4153.910 Crystal Lake
Exchange Dr. and Parking Lot - East Side
10-hr
GHA MIO

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

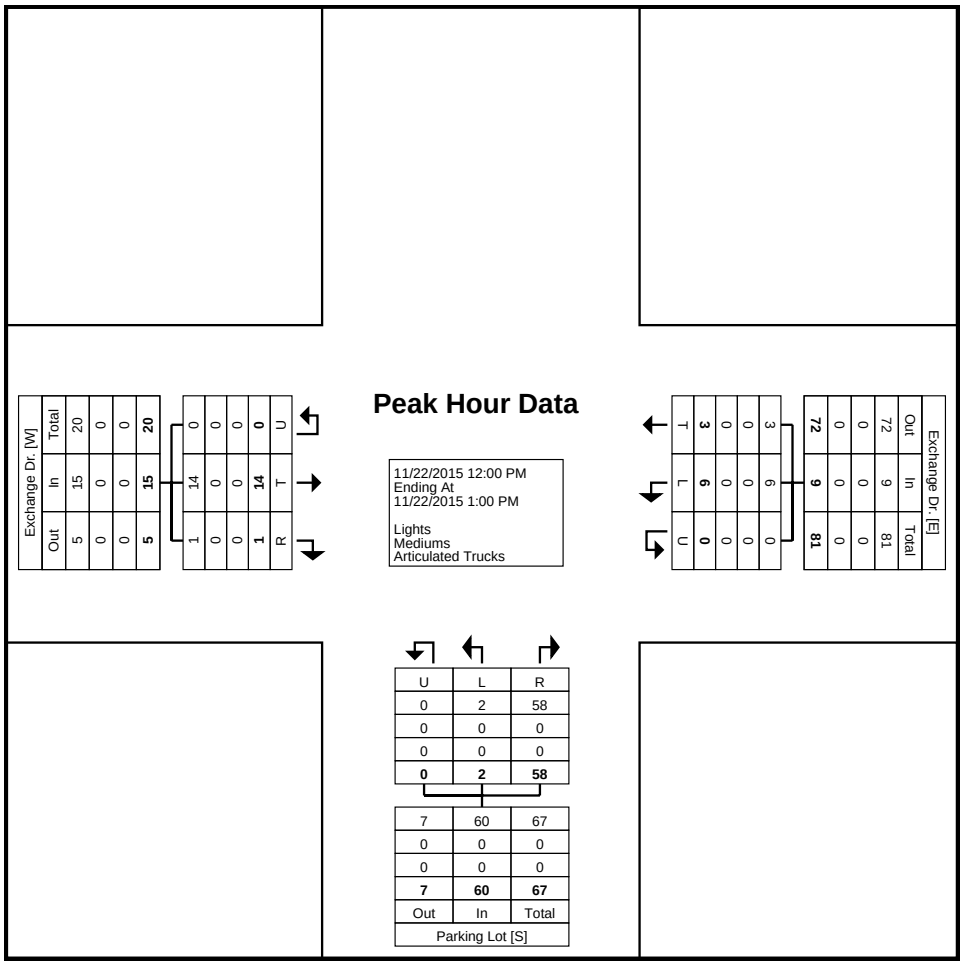
Vernon Hills, Illinois, United States 60061
(847) 478-9700 lbeckham@gha-engineers.com

Turning Movement Peak Hour Data (12:00 PM)

Start Time	Exchange Dr. Westbound				Parking Lot Northbound				Exchange Dr. Eastbound				
	U-Turn	Left	Thru	App. Total	U-Turn	Left	Right	App. Total	U-Turn	Thru	Right	App. Total	Int. Total
12:00 PM	0	1	2	3	0	2	27	29	0	9	0	9	41
12:15 PM	0	1	1	2	0	0	19	19	0	4	1	5	26
12:30 PM	0	3	0	3	0	0	7	7	0	0	0	0	10
12:45 PM	0	1	0	1	0	0	5	5	0	1	0	1	7
Total	0	6	3	9	0	2	58	60	0	14	1	15	84
Approach %	0.0	66.7	33.3	-	0.0	3.3	96.7	-	0.0	93.3	6.7	-	-
Total %	0.0	7.1	3.6	10.7	0.0	2.4	69.0	71.4	0.0	16.7	1.2	17.9	-
PHF	0.000	0.500	0.375	0.750	0.000	0.250	0.537	0.517	0.000	0.389	0.250	0.417	0.512
Lights	0	6	3	9	0	2	58	60	0	14	1	15	84
% Lights	-	100.0	100.0	100.0	-	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0
Mediums	0	0	0	0	0	0	0	0	0	0	0	0	0
% Mediums	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0

Gewalt Hamilton Associates Inc.
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Turning Movement Peak Hour Data Plot (12:00 PM)

4153.910 Crystal Lake
Exchange Dr. and Parking Lot - East Side
10-hr
GHA MIO

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

Vernon Hills, Illinois, United States 60061
(847) 478-9700 lbeckham@gha-engineers.com

Count Name: Exchange and Parking Lot-East
Site Code:
Start Date: 11/21/2015

4153.910 Crystal Lake
Exchange Dr. and Parking Lot - West Side
10-hr
GHA MIO

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

Vernon Hills, Illinois, United States 60061
(847) 478-9700 lbeckham@gha-engineers.com

Count Name: Exchange and Parking Lot-West
Site Code:
Start Date: 11/21/2015

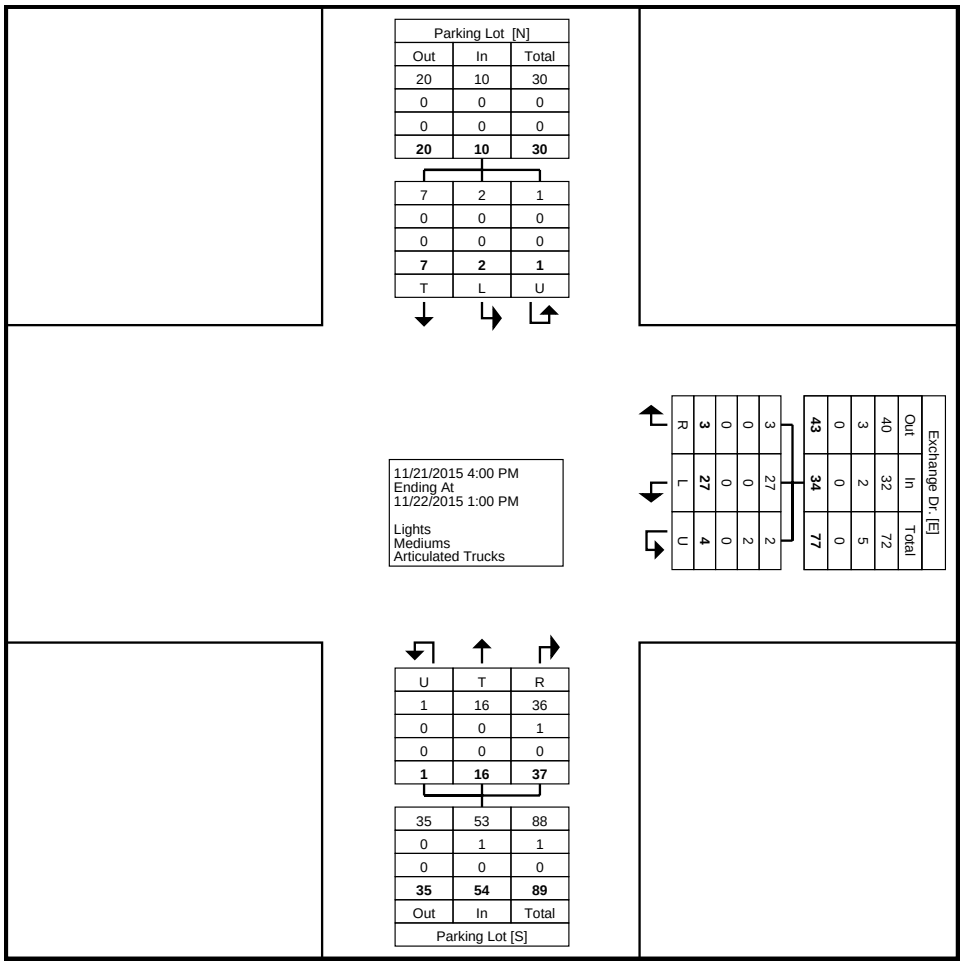
Turning Movement Data

Start Time	Parking Lot Southbound				Exchange Dr. Westbound				Parking Lot Northbound				
	U-Turn	Left	Thru	App. Total	U-Turn	Left	Right	App. Total	U-Turn	Thru	Right	App. Total	Int. Total
4:00 PM	0	0	1	1	0	1	0	1	0	0	1	1	3
4:15 PM	0	0	1	1	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	1	0	1	0	0	1	1	2
Hourly Total	0	0	2	2	0	2	0	2	0	0	2	2	6
5:00 PM	0	0	0	0	0	1	0	1	0	2	0	2	3
5:15 PM	1	0	1	2	0	1	0	1	0	0	2	2	5
5:30 PM	0	0	0	0	0	0	2	2	0	0	1	1	3
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	1	0	1	2	0	2	2	4	0	2	3	5	11
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	2	0	2	0	0	0	0	0	0	0	0	2
6:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
6:45 PM	0	0	1	1	0	0	1	1	0	0	1	1	3
Hourly Total	0	2	1	3	0	1	1	2	0	0	1	1	6
7:00 PM	0	0	2	2	1	0	0	1	0	0	1	1	4
7:15 PM	0	0	0	0	0	1	0	1	1	0	1	2	3
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	1	1	0	0	0	0	0	0	0	0	1
Hourly Total	0	0	3	3	1	1	0	2	1	0	2	3	8
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	1	1	1
7:30 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
7:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
Hourly Total	0	0	0	0	1	1	0	2	0	0	1	1	3
8:00 AM	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	1	1	1
8:30 AM	0	0	0	0	1	0	0	1	0	1	1	2	3
8:45 AM	0	0	0	0	0	6	0	6	0	1	2	3	9
Hourly Total	0	0	0	0	1	6	0	7	0	2	4	6	13
9:00 AM	0	0	0	0	0	3	0	3	0	2	0	2	5
9:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
9:30 AM	0	0	0	0	1	0	0	1	0	4	1	5	6
9:45 AM	0	0	0	0	0	0	0	0	0	4	2	6	6
Hourly Total	0	0	0	0	1	4	0	5	0	10	3	13	18
10:00 AM	0	0	0	0	0	0	0	0	0	1	0	1	1
10:15 AM	0	0	0	0	0	1	0	1	0	0	7	7	8
10:30 AM	0	0	0	0	0	0	0	0	0	1	2	3	3
10:45 AM	0	0	0	0	0	3	0	3	0	0	2	2	5
Hourly Total	0	0	0	0	0	4	0	4	0	2	11	13	17

11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	1	0	1	0	0	0	0	1
12:00 PM	0	0	0	0	0	4	0	4	0	0	6	6	10
12:15 PM	0	0	0	0	0	0	0	0	0	0	4	4	4
12:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	0	0	0	5	0	5	0	0	10	10	15
Grand Total	1	2	7	10	4	27	3	34	1	16	37	54	98
Approach %	10.0	20.0	70.0	-	11.8	79.4	8.8	-	1.9	29.6	68.5	-	-
Total %	1.0	2.0	7.1	10.2	4.1	27.6	3.1	34.7	1.0	16.3	37.8	55.1	-
Lights	1	2	7	10	2	27	3	32	1	16	36	53	95
% Lights	100.0	100.0	100.0	100.0	50.0	100.0	100.0	94.1	100.0	100.0	97.3	98.1	96.9
Mediums	0	0	0	0	2	0	0	2	0	0	1	1	3
% Mediums	0.0	0.0	0.0	0.0	50.0	0.0	0.0	5.9	0.0	0.0	2.7	1.9	3.1
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Gewalt Hamilton Associates Inc.
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Turning Movement Data Plot

4153.910 Crystal Lake
Exchange Dr. and Parking Lot - West Side
10-hr
GHA MIO

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625 Forest Edge Drive

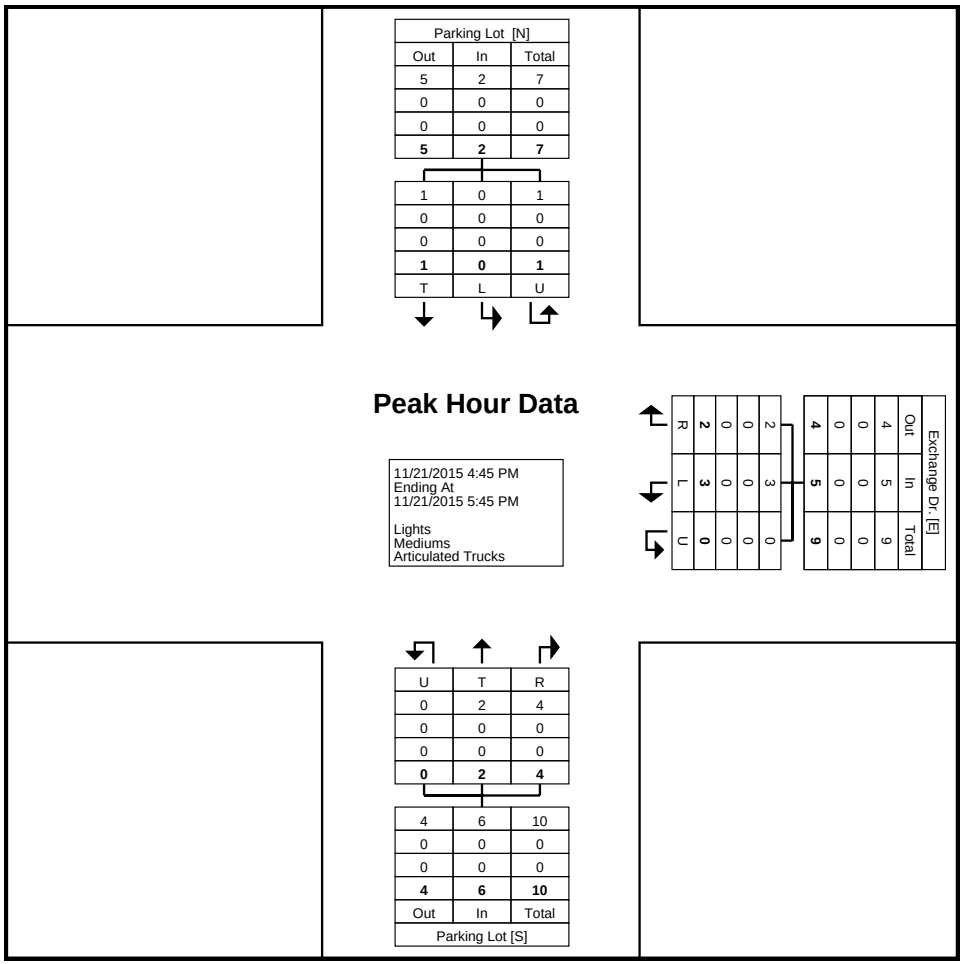
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Turning Movement Peak Hour Data (4:45 PM)

Start Time	Parking Lot Southbound				Exchange Dr. Westbound				Parking Lot Northbound				
	U-Turn	Left	Thru	App. Total	U-Turn	Left	Right	App. Total	U-Turn	Thru	Right	App. Total	Int. Total
4:45 PM	0	0	0	0	0	1	0	1	0	0	1	1	2
5:00 PM	0	0	0	0	0	1	0	1	0	2	0	2	3
5:15 PM	1	0	1	2	0	1	0	1	0	0	2	2	5
5:30 PM	0	0	0	0	0	0	2	2	0	0	1	1	3
Total	1	0	1	2	0	3	2	5	0	2	4	6	13
Approach %	50.0	0.0	50.0	-	0.0	60.0	40.0	-	0.0	33.3	66.7	-	-
Total %	7.7	0.0	7.7	15.4	0.0	23.1	15.4	38.5	0.0	15.4	30.8	46.2	-
PHF	0.250	0.000	0.250	0.250	0.000	0.750	0.250	0.625	0.000	0.250	0.500	0.750	0.650
Lights	1	0	1	2	0	3	2	5	0	2	4	6	13
% Lights	100.0	-	100.0	100.0	-	100.0	100.0	100.0	-	100.0	100.0	100.0	100.0
Mediums	0	0	0	0	0	0	0	0	0	0	0	0	0
% Mediums	0.0	-	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	0.0	-	0.0	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0

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Turning Movement Peak Hour Data Plot (4:45 PM)

4153.910 Crystal Lake
Exchange Dr. and Parking Lot - West Side
10-hr
GHA MIO

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625 Forest Edge Drive

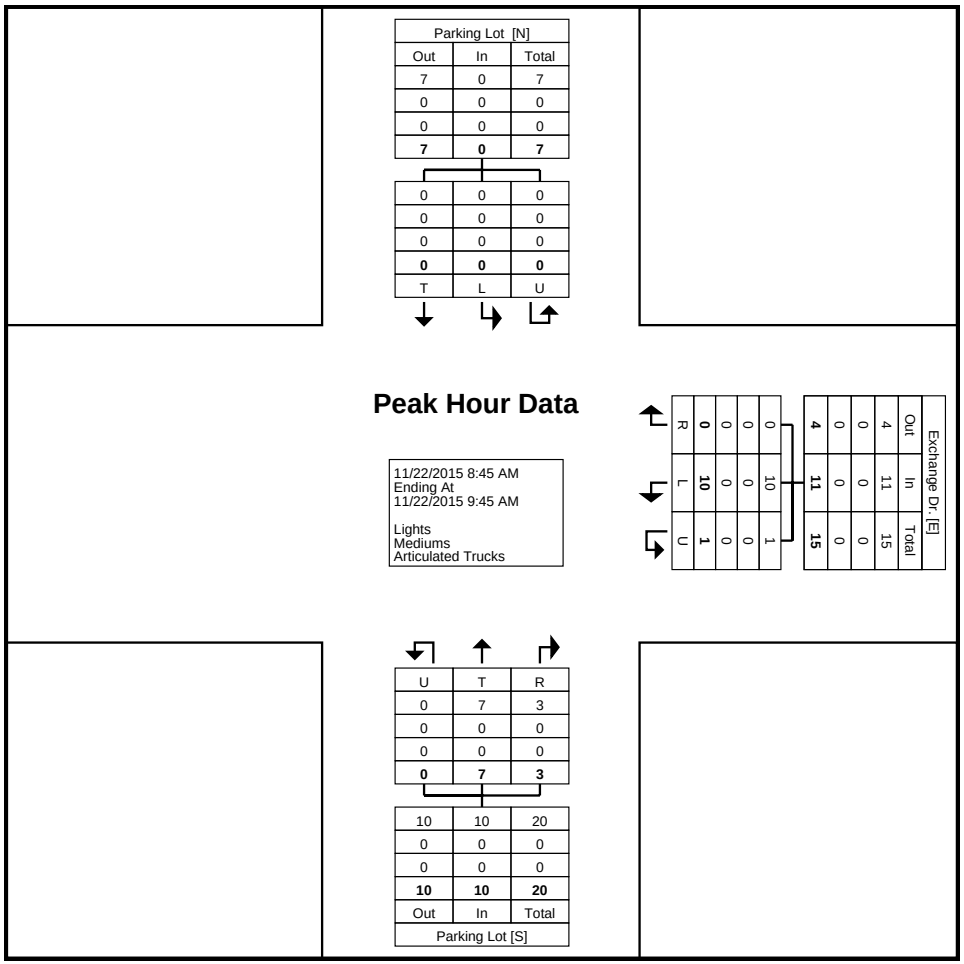
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Turning Movement Peak Hour Data (8:45 AM)

Start Time	Parking Lot Southbound				Exchange Dr. Westbound				Parking Lot Northbound				
	U-Turn	Left	Thru	App. Total	U-Turn	Left	Right	App. Total	U-Turn	Thru	Right	App. Total	Int. Total
8:45 AM	0	0	0	0	0	6	0	6	0	1	2	3	9
9:00 AM	0	0	0	0	0	3	0	3	0	2	0	2	5
9:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
9:30 AM	0	0	0	0	1	0	0	1	0	4	1	5	6
Total	0	0	0	0	1	10	0	11	0	7	3	10	21
Approach %	NaN	NaN	NaN	-	9.1	90.9	0.0	-	0.0	70.0	30.0	-	-
Total %	0.0	0.0	0.0	0.0	4.8	47.6	0.0	52.4	0.0	33.3	14.3	47.6	-
PHF	0.000	0.000	0.000	0.000	0.250	0.417	0.000	0.458	0.000	0.438	0.375	0.500	0.583
Lights	0	0	0	0	1	10	0	11	0	7	3	10	21
% Lights	-	-	-	-	100.0	100.0	-	100.0	-	100.0	100.0	100.0	100.0
Mediums	0	0	0	0	0	0	0	0	0	0	0	0	0
% Mediums	-	-	-	-	0.0	0.0	-	0.0	-	0.0	0.0	0.0	0.0
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	-	-	-	0.0	0.0	-	0.0	-	0.0	0.0	0.0	0.0

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

Vernon Hills, Illinois, United States 60061
(847) 478-9700 lbeckham@gha-engineers.com



Turning Movement Peak Hour Data Plot (8:45 AM)

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

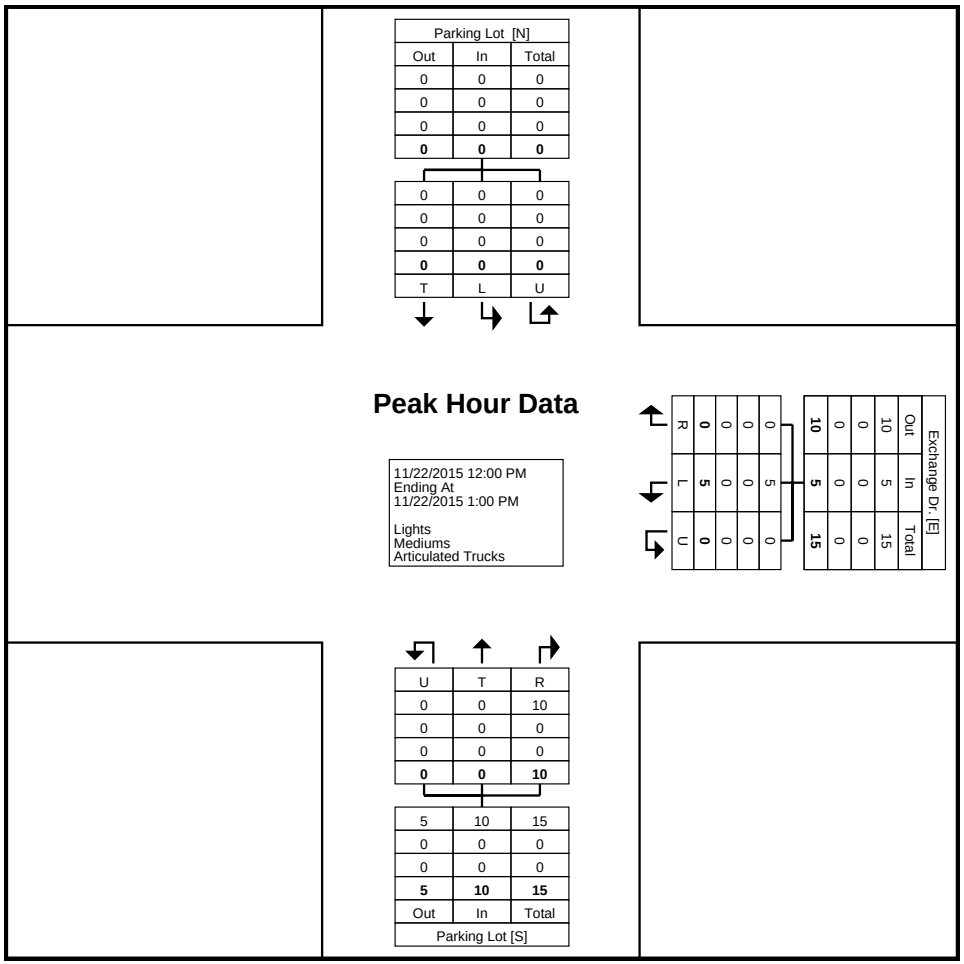
Vernon Hills, Illinois, United States 60061
(847) 478-9700 lbeckham@gha-engineers.com

Turning Movement Peak Hour Data (12:00 PM)

Start Time	Parking Lot Southbound				Exchange Dr. Westbound				Parking Lot Northbound				
	U-Turn	Left	Thru	App. Total	U-Turn	Left	Right	App. Total	U-Turn	Thru	Right	App. Total	Int. Total
12:00 PM	0	0	0	0	0	4	0	4	0	0	6	6	10
12:15 PM	0	0	0	0	0	0	0	0	0	0	4	4	4
12:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	5	0	5	0	0	10	10	15
Approach %	NaN	NaN	NaN	-	0.0	100.0	0.0	-	0.0	0.0	100.0	-	-
Total %	0.0	0.0	0.0	0.0	0.0	33.3	0.0	33.3	0.0	0.0	66.7	66.7	-
PHF	0.000	0.000	0.000	0.000	0.000	0.313	0.000	0.313	0.000	0.000	0.417	0.417	0.375
Lights	0	0	0	0	0	5	0	5	0	0	10	10	15
% Lights	-	-	-	-	-	100.0	-	100.0	-	-	100.0	100.0	100.0
Mediums	0	0	0	0	0	0	0	0	0	0	0	0	0
% Mediums	-	-	-	-	-	0.0	-	0.0	-	-	0.0	0.0	0.0
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	-	-	-	-	0.0	-	0.0	-	-	0.0	0.0	0.0

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625 Forest Edge Drive

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Turning Movement Peak Hour Data Plot (12:00 PM)

4153.910 Crystal Lake
Memorial Dr. and Parking Lot
10-hr
GHA MIO

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

Vernon Hills, Illinois, United States 60061
(847) 478-9700 lbeckham@gha-engineers.com

Count Name: Memorial and Parking Lot
Site Code:
Start Date: 11/21/2015

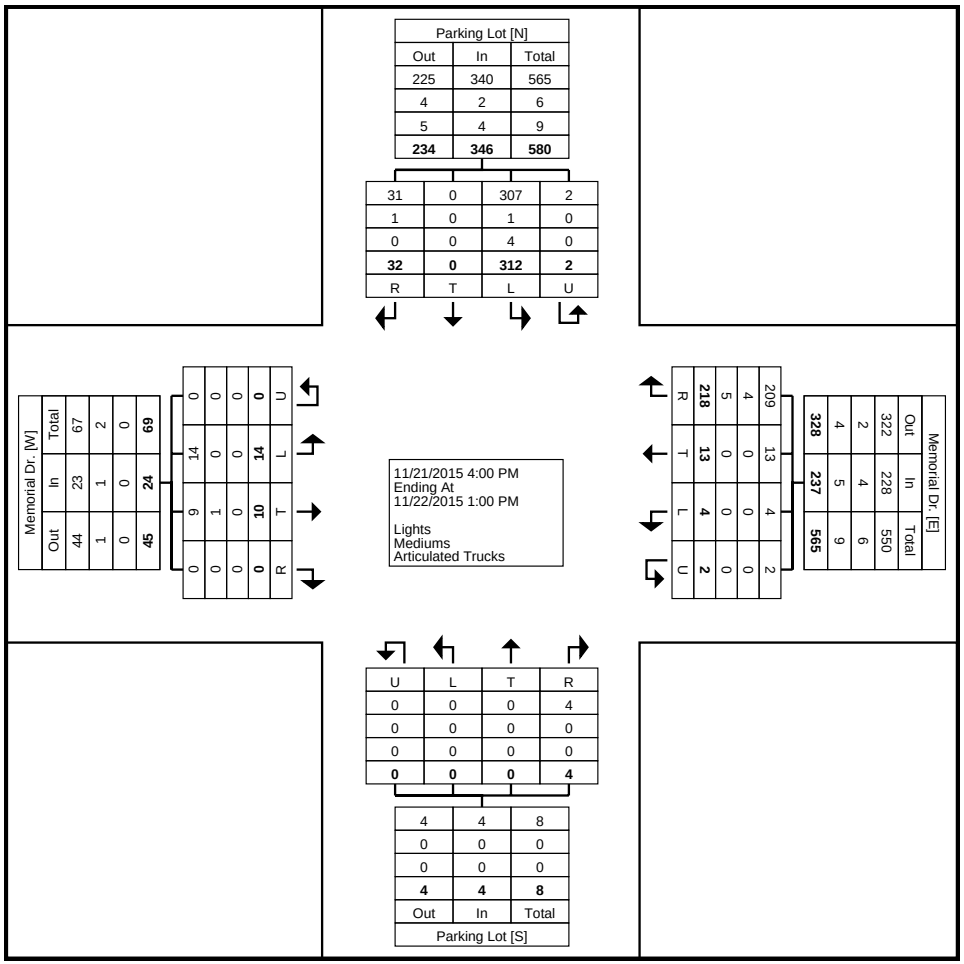
Turning Movement Data

Start Time	Parking Lot Southbound					Memorial Dr. Westbound					Parking Lot Northbound					Memorial Dr. Eastbound					Int. Total
	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	
4:00 PM	0	0	0	1	1	0	1	1	2	4	0	0	0	0	0	0	0	0	0	0	5
4:15 PM	0	1	0	1	2	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	4
4:30 PM	0	1	0	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	3
4:45 PM	0	1	0	0	1	0	0	1	4	5	0	0	0	0	0	0	0	0	0	0	6
Hourly Total	0	3	0	2	5	0	1	2	10	13	0	0	0	0	0	0	0	0	0	0	18
5:00 PM	0	0	0	0	0	0	0	0	5	5	0	0	0	0	0	0	0	1	0	1	6
5:15 PM	0	0	0	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	10
5:30 PM	0	2	0	0	2	0	0	1	8	9	0	0	0	0	0	0	1	0	0	1	12
5:45 PM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1	2
Hourly Total	0	2	0	0	2	0	1	1	23	25	0	0	0	0	0	0	1	2	0	3	30
6:00 PM	2	3	0	0	5	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	6
6:15 PM	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
6:30 PM	0	5	0	0	5	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	7
6:45 PM	0	38	0	2	40	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	41
Hourly Total	2	49	0	2	53	0	0	1	2	3	0	0	0	0	0	0	0	1	0	1	57
7:00 PM	0	11	0	2	13	0	0	0	1	1	0	0	0	0	0	0	2	0	0	2	16
7:15 PM	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
7:30 PM	0	4	0	0	4	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	5
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	21	0	2	23	0	0	1	1	2	0	0	0	0	0	0	2	0	0	2	27
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7:00 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
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	1	1	0	0	0	0	0	0	0	0	0	0	1
7:45 AM	0	0	0	0	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	4
Hourly Total	0	0	0	0	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	6
8:00 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	2	2	0	0	0	0	0	3
8:15 AM	0	1	0	0	1	0	0	0	9	9	0	0	0	0	0	0	1	0	0	1	11
8:30 AM	0	3	0	0	3	0	0	1	10	11	0	0	0	0	0	0	0	1	0	1	15
8:45 AM	0	2	0	1	3	0	2	0	22	24	0	0	0	0	0	0	1	0	0	1	28
Hourly Total	0	6	0	1	7	0	2	1	42	45	0	0	0	2	2	0	2	1	0	3	57
9:00 AM	0	3	0	0	3	0	0	1	25	26	0	0	0	0	0	0	0	0	0	0	29
9:15 AM	0	2	0	0	2	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	8
9:30 AM	0	1	0	0	1	0	0	0	6	6	0	0	0	1	1	0	1	0	0	1	9
9:45 AM	0	0	0	0	0	0	0	0	4	4	0	0	0	1	1	0	3	1	0	4	9
Hourly Total	0	6	0	0	6	0	0	1	41	42	0	0	0	2	2	0	4	1	0	5	55
10:00 AM	0	9	0	2	11	1	0	2	2	5	0	0	0	0	0	0	1	0	0	1	17
10:15 AM	0	78	0	4	82	0	0	1	9	10	0	0	0	0	0	0	0	0	0	0	92
10:30 AM	0	19	0	2	21	0	0	1	39	40	0	0	0	0	0	0	2	0	0	2	63
10:45 AM	0	6	0	1	7	0	0	0	31	31	0	0	0	0	0	0	2	0	0	2	40
Hourly Total	0	112	0	9	121	1	0	4	81	86	0	0	0	0	0	0	5	0	0	5	212

11:00 AM	0	5	0	0	5	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	10
11:15 AM	0	0	0	0	0	0	0	1	3	4	0	0	0	0	0	0	0	0	0	0	4
11:30 AM	0	2	0	0	2	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	4
11:45 AM	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	2	0	2	4
Hourly Total	0	8	0	0	8	1	0	2	9	12	0	0	0	0	0	0	0	2	0	2	22
12:00 PM	0	75	0	11	86	0	0	0	1	1	0	0	0	0	0	0	0	1	0	1	88
12:15 PM	0	19	0	3	22	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	23
12:30 PM	0	9	0	1	10	0	0	0	1	1	0	0	0	0	0	0	0	2	0	2	13
12:45 PM	0	2	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Hourly Total	0	105	0	16	121	0	0	0	3	3	0	0	0	0	0	0	0	3	0	3	127
Grand Total	2	312	0	32	346	2	4	13	218	237	0	0	0	4	4	0	14	10	0	24	611
Approach %	0.6	90.2	0.0	9.2	-	0.8	1.7	5.5	92.0	-	0.0	0.0	0.0	100.0	-	0.0	58.3	41.7	0.0	-	-
Total %	0.3	51.1	0.0	5.2	56.6	0.3	0.7	2.1	35.7	38.8	0.0	0.0	0.0	0.7	0.7	0.0	2.3	1.6	0.0	3.9	-
Lights	2	307	0	31	340	2	4	13	209	228	0	0	0	4	4	0	14	9	0	23	595
% Lights	100.0	98.4	-	96.9	98.3	100.0	100.0	100.0	95.9	96.2	-	-	-	100.0	100.0	-	100.0	90.0	-	95.8	97.4
Mediums	0	1	0	1	2	0	0	0	4	4	0	0	0	0	0	0	0	1	0	1	7
% Mediums	0.0	0.3	-	3.1	0.6	0.0	0.0	0.0	1.8	1.7	-	-	-	0.0	0.0	-	0.0	10.0	-	4.2	1.1
Articulated Trucks	0	4	0	0	4	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	9
% Articulated Trucks	0.0	1.3	-	0.0	1.2	0.0	0.0	0.0	2.3	2.1	-	-	-	0.0	0.0	-	0.0	0.0	-	0.0	1.5

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

Vernon Hills, Illinois, United States 60061
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Turning Movement Data Plot

4153.910 Crystal Lake
Memorial Dr. and Parking Lot
10-hr
GHA MIO

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625 Forest Edge Drive

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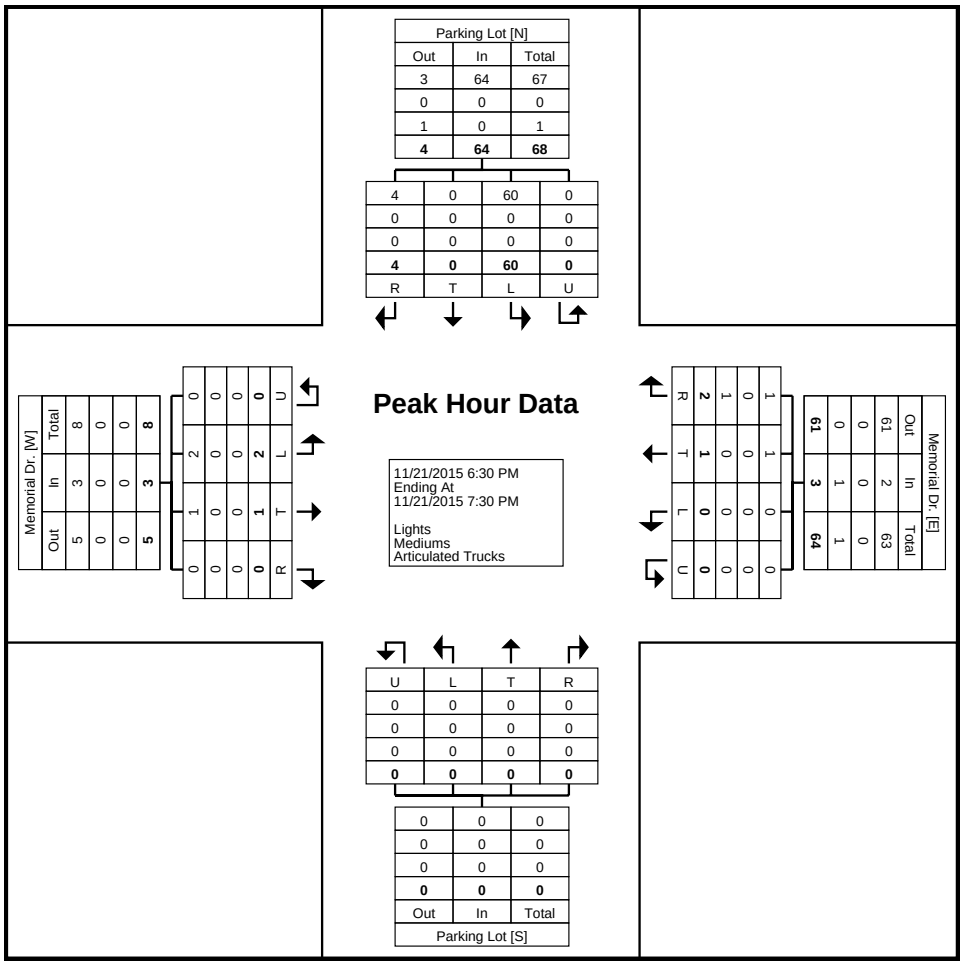
Turning Movement Peak Hour Data (6:30 PM)

Start Time	Parking Lot Southbound					Memorial Dr. Westbound					Parking Lot Northbound					Memorial Dr. Eastbound					
	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	Int. Total
6:30 PM	0	5	0	0	5	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	7
6:45 PM	0	38	0	2	40	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	41
7:00 PM	0	11	0	2	13	0	0	0	1	1	0	0	0	0	0	0	2	0	0	2	16
7:15 PM	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Total	0	60	0	4	64	0	0	1	2	3	0	0	0	0	0	0	2	1	0	3	70
Approach %	0.0	93.8	0.0	6.3	-	0.0	0.0	33.3	66.7	-	NaN	NaN	NaN	NaN	-	0.0	66.7	33.3	0.0	-	-
Total %	0.0	85.7	0.0	5.7	91.4	0.0	0.0	1.4	2.9	4.3	0.0	0.0	0.0	0.0	0.0	0.0	2.9	1.4	0.0	4.3	-
PHF	0.000	0.395	0.000	0.500	0.400	0.000	0.000	0.250	0.500	0.375	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.000	0.375	0.427
Lights	0	60	0	4	64	0	0	1	1	2	0	0	0	0	0	0	2	1	0	3	69
% Lights	-	100.0	-	100.0	100.0	-	-	100.0	50.0	66.7	-	-	-	-	-	-	100.0	100.0	-	100.0	98.6
Mediums	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Mediums	-	0.0	-	0.0	0.0	-	-	0.0	0.0	0.0	-	-	-	-	-	-	0.0	0.0	-	0.0	0.0
Articulated Trucks	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
% Articulated Trucks	-	0.0	-	0.0	0.0	-	-	0.0	50.0	33.3	-	-	-	-	-	-	0.0	0.0	-	0.0	1.4

4153.910 Crystal Lake
Memorial Dr. and Parking Lot
10-hr
GHA MIO

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Turning Movement Peak Hour Data Plot (6:30 PM)

4153.910 Crystal Lake
Memorial Dr. and Parking Lot
10-hr
GHA MIO

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625 Forest Edge Drive

Vernon Hills, Illinois, United States 60061
(847) 478-9700 lbeckham@gha-engineers.com

Count Name: Memorial and Parking Lot
Site Code:
Start Date: 11/21/2015

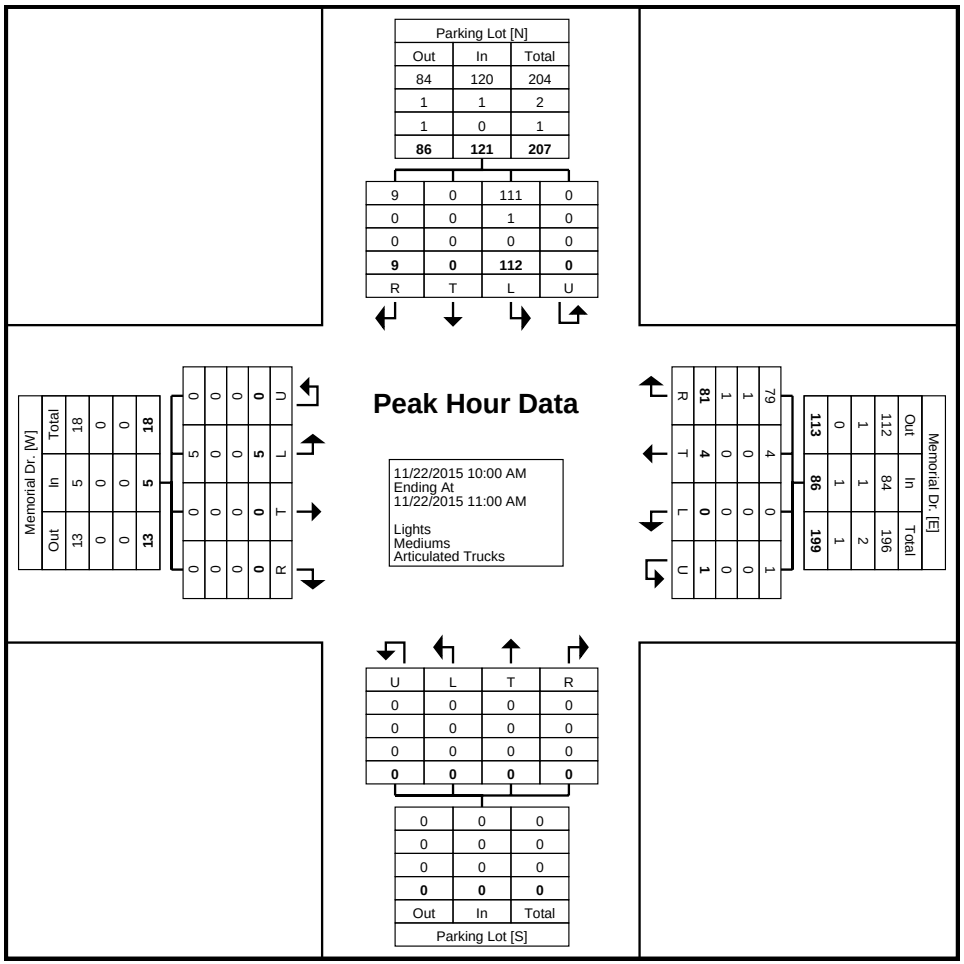
Turning Movement Peak Hour Data (10:00 AM)

Start Time	Parking Lot Southbound					Memorial Dr. Westbound					Parking Lot Northbound					Memorial Dr. Eastbound					
	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	Int. Total
10:00 AM	0	9	0	2	11	1	0	2	2	5	0	0	0	0	0	0	1	0	0	1	17
10:15 AM	0	78	0	4	82	0	0	1	9	10	0	0	0	0	0	0	0	0	0	0	92
10:30 AM	0	19	0	2	21	0	0	1	39	40	0	0	0	0	0	0	2	0	0	2	63
10:45 AM	0	6	0	1	7	0	0	0	31	31	0	0	0	0	0	0	2	0	0	2	40
Total	0	112	0	9	121	1	0	4	81	86	0	0	0	0	0	0	5	0	0	5	212
Approach %	0.0	92.6	0.0	7.4	-	1.2	0.0	4.7	94.2	-	NaN	NaN	NaN	NaN	-	0.0	100.0	0.0	0.0	-	-
Total %	0.0	52.8	0.0	4.2	57.1	0.5	0.0	1.9	38.2	40.6	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	2.4	-
PHF	0.000	0.359	0.000	0.563	0.369	0.250	0.000	0.500	0.519	0.538	0.000	0.000	0.000	0.000	0.000	0.000	0.625	0.000	0.000	0.625	0.576
Lights	0	111	0	9	120	1	0	4	79	84	0	0	0	0	0	0	5	0	0	5	209
% Lights	-	99.1	-	100.0	99.2	100.0	-	100.0	97.5	97.7	-	-	-	-	-	-	100.0	-	-	100.0	98.6
Mediums	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2
% Mediums	-	0.9	-	0.0	0.8	0.0	-	0.0	1.2	1.2	-	-	-	-	-	-	0.0	-	-	0.0	0.9
Articulated Trucks	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1
% Articulated Trucks	-	0.0	-	0.0	0.0	0.0	-	0.0	1.2	1.2	-	-	-	-	-	-	0.0	-	-	0.0	0.5

4153.910 Crystal Lake
Memorial Dr. and Parking Lot
10-hr
GHA MIO

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Turning Movement Peak Hour Data Plot (10:00 AM)

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

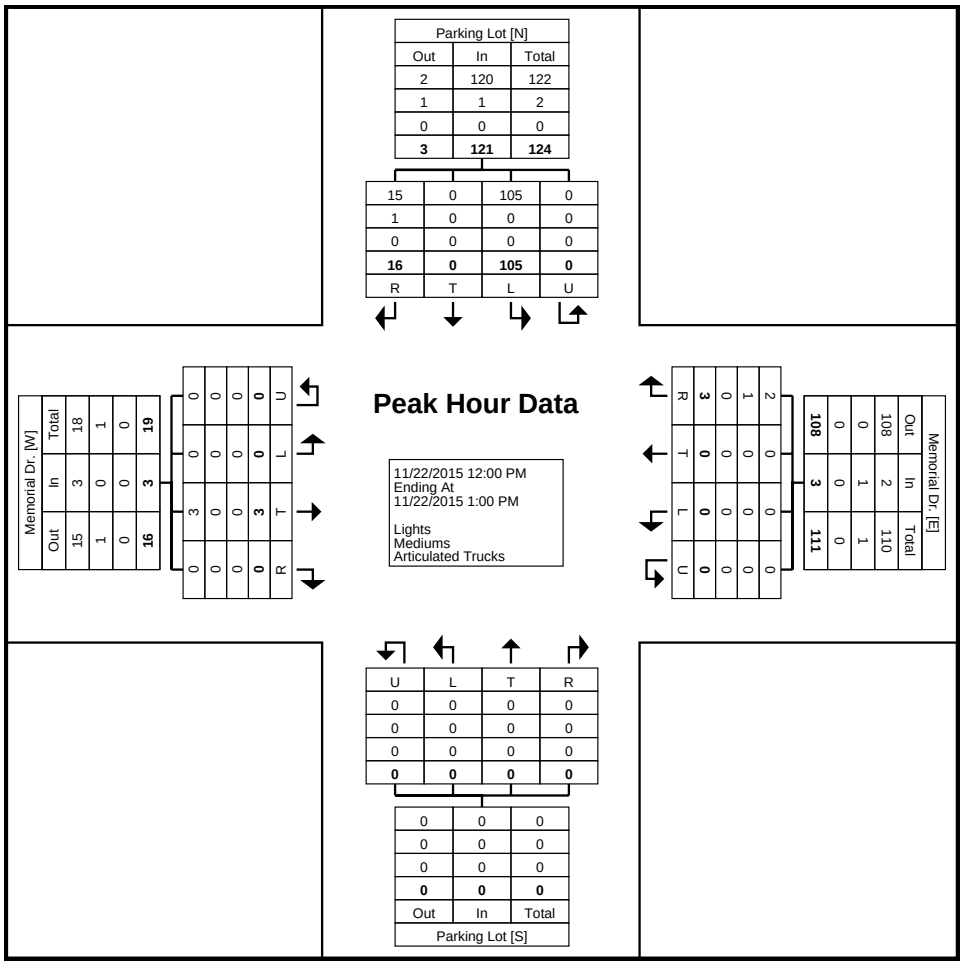
Vernon Hills, Illinois, United States 60061
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Turning Movement Peak Hour Data (12:00 PM)

Start Time	Parking Lot Southbound					Memorial Dr. Westbound					Parking Lot Northbound					Memorial Dr. Eastbound					
	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	Int. Total
12:00 PM	0	75	0	11	86	0	0	0	1	1	0	0	0	0	0	0	0	1	0	1	88
12:15 PM	0	19	0	3	22	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	23
12:30 PM	0	9	0	1	10	0	0	0	1	1	0	0	0	0	0	0	0	2	0	2	13
12:45 PM	0	2	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Total	0	105	0	16	121	0	0	0	3	3	0	0	0	0	0	0	0	3	0	3	127
Approach %	0.0	86.8	0.0	13.2	-	0.0	0.0	0.0	100.0	-	NaN	NaN	NaN	NaN	-	0.0	0.0	100.0	0.0	-	-
Total %	0.0	82.7	0.0	12.6	95.3	0.0	0.0	0.0	2.4	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	2.4	-
PHF	0.000	0.350	0.000	0.364	0.352	0.000	0.000	0.000	0.750	0.750	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.375	0.361
Lights	0	105	0	15	120	0	0	0	2	2	0	0	0	0	0	0	0	3	0	3	125
% Lights	-	100.0	-	93.8	99.2	-	-	-	66.7	66.7	-	-	-	-	-	-	-	100.0	-	100.0	98.4
Mediums	0	0	0	1	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2
% Mediums	-	0.0	-	6.3	0.8	-	-	-	33.3	33.3	-	-	-	-	-	-	-	0.0	-	0.0	1.6
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	0.0	-	0.0	0.0	-	-	-	0.0	0.0	-	-	-	-	-	-	-	0.0	-	0.0	0.0

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

Vernon Hills, Illinois, United States 60061
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Turning Movement Peak Hour Data Plot (12:00 PM)

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4153.910 Crystal Lake
Congress Pkwy and Station Dr,
10-hr
GHA MIO

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

Vernon Hills, Illinois, United States 60061
(847) 478-9700 lbeckham@gha-engineers.com

Count Name: Station and Congress
Site Code:
Start Date: 11/21/2015

Turning Movement Data

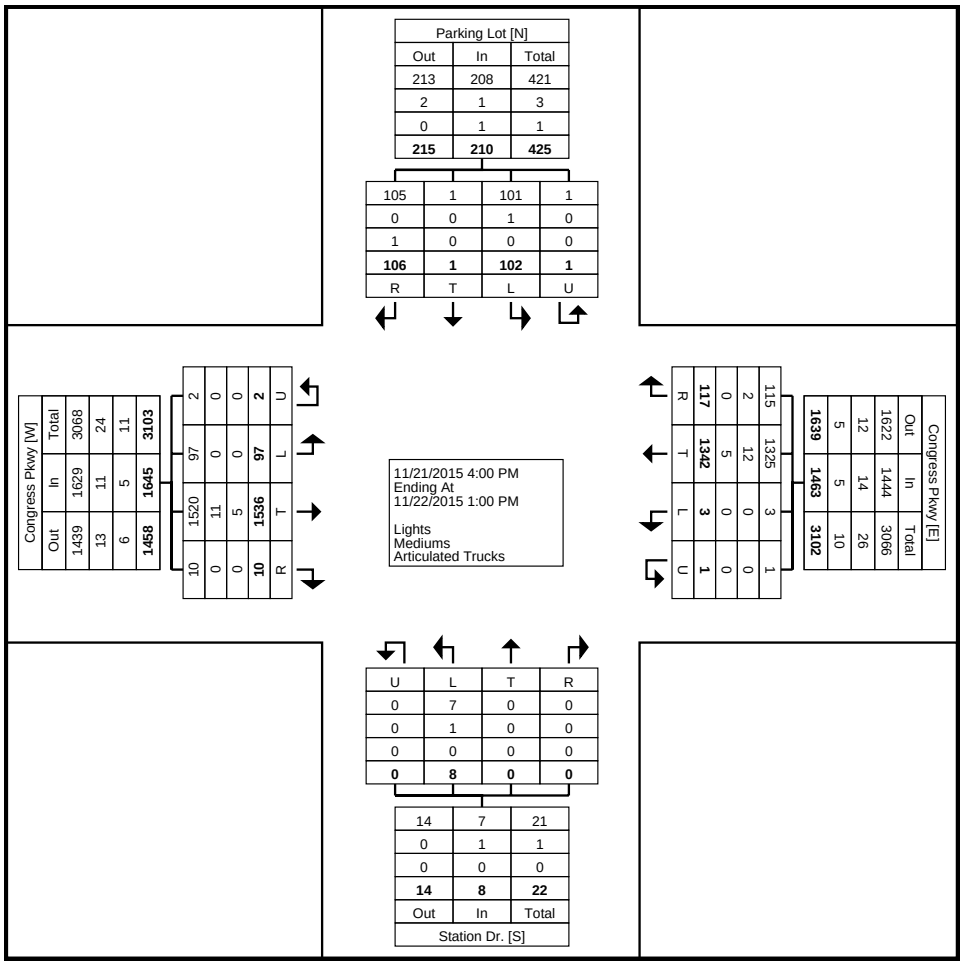
Start Time	Parking Lot Southbound					Congress Pkwy Westbound					Station Dr. Northbound					Congress Pkwy Eastbound					
	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	Int. Total
4:00 PM	0	1	0	0	1	0	1	44	0	45	0	0	0	0	0	0	2	41	1	44	90
4:15 PM	0	2	0	0	2	0	0	29	3	32	0	1	0	0	1	0	0	40	0	40	75
4:30 PM	0	1	0	1	2	0	0	33	0	33	0	0	0	0	0	0	2	38	0	40	75
4:45 PM	0	1	0	0	1	0	0	34	2	36	0	0	0	0	0	0	4	29	0	33	70
Hourly Total	0	5	0	1	6	0	1	140	5	146	0	1	0	0	1	0	8	148	1	157	310
5:00 PM	0	1	0	0	1	0	0	35	3	38	0	0	0	0	0	0	4	32	0	36	75
5:15 PM	0	0	0	0	0	0	0	23	4	27	0	2	0	0	2	0	5	46	0	51	80
5:30 PM	0	0	0	0	0	0	0	25	5	30	0	0	0	0	0	0	4	45	0	49	79
5:45 PM	0	1	0	0	1	0	0	18	1	19	0	0	0	0	0	0	0	32	0	32	52
Hourly Total	0	2	0	0	2	0	0	101	13	114	0	2	0	0	2	0	13	155	0	168	286
6:00 PM	0	0	0	0	0	0	0	25	0	25	0	0	0	0	0	0	0	29	0	29	54
6:15 PM	1	0	1	0	2	0	0	26	0	26	0	1	0	0	1	0	0	21	0	21	50
6:30 PM	0	5	0	3	8	0	0	18	0	18	0	0	0	0	0	0	0	26	0	26	52
6:45 PM	0	5	0	10	15	0	0	22	0	22	0	1	0	0	1	0	0	31	0	31	69
Hourly Total	1	10	1	13	25	0	0	91	0	91	0	2	0	0	2	0	0	107	0	107	225
7:00 PM	0	4	0	5	9	0	0	21	3	24	0	0	0	0	0	0	1	37	0	38	71
7:15 PM	0	1	0	0	1	0	0	16	0	16	0	0	0	0	0	0	0	23	0	23	40
7:30 PM	0	0	0	0	0	0	0	14	0	14	0	0	0	0	0	0	0	19	0	19	33
7:45 PM	0	0	0	0	0	0	0	10	0	10	0	0	0	0	0	0	0	14	0	14	24
Hourly Total	0	5	0	5	10	0	0	61	3	64	0	0	0	0	0	0	1	93	0	94	168
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7:00 AM	0	1	0	2	3	0	0	7	0	7	0	0	0	0	0	0	0	1	0	1	11
7:15 AM	0	1	0	1	2	0	0	8	0	8	0	0	0	0	0	0	0	3	0	3	13
7:30 AM	0	0	0	1	1	0	0	14	2	16	0	1	0	0	1	0	2	10	2	14	32
7:45 AM	0	0	0	1	1	0	0	28	0	28	0	0	0	0	0	0	3	18	1	22	51
Hourly Total	0	2	0	5	7	0	0	57	2	59	0	1	0	0	1	0	5	32	3	40	107
8:00 AM	0	0	0	0	0	0	0	13	0	13	0	0	0	0	0	0	2	11	0	13	26
8:15 AM	0	2	0	0	2	0	0	21	0	21	0	0	0	0	0	0	2	12	0	14	37
8:30 AM	0	0	0	1	1	0	0	20	10	30	0	0	0	0	0	0	1	30	1	32	63
8:45 AM	0	0	0	0	0	0	0	33	22	55	0	0	0	0	0	0	12	58	0	70	125
Hourly Total	0	2	0	1	3	0	0	87	32	119	0	0	0	0	0	0	17	111	1	129	251
9:00 AM	0	0	0	0	0	0	0	30	8	38	0	0	0	0	0	0	11	37	1	49	87
9:15 AM	0	0	0	0	0	0	0	30	4	34	0	0	0	0	0	1	2	27	0	30	64
9:30 AM	0	1	0	0	1	0	1	22	0	23	0	0	0	0	0	0	1	37	0	38	62
9:45 AM	0	0	0	0	0	0	0	29	1	30	0	0	0	0	0	0	0	29	1	30	60
Hourly Total	0	1	0	0	1	0	1	111	13	125	0	0	0	0	0	1	14	130	2	147	273
10:00 AM	0	7	0	3	10	0	0	41	2	43	0	0	0	0	0	0	3	39	0	42	95
10:15 AM	0	13	0	19	32	0	0	84	4	88	0	1	0	0	1	0	3	79	0	82	203
10:30 AM	0	4	0	5	9	0	0	68	17	85	0	0	0	0	0	0	13	71	0	84	178
10:45 AM	0	1	0	3	4	0	0	54	15	69	0	0	0	0	0	0	9	63	0	72	145
Hourly Total	0	25	0	30	55	0	0	247	38	285	0	1	0	0	1	0	28	252	0	280	621

11:00 AM	0	2	0	6	8	0	0	42	5	47	0	0	0	0	0	0	5	57	0	62	117
11:15 AM	0	0	0	1	1	0	0	48	2	50	0	0	0	0	0	0	4	40	2	46	97
11:30 AM	0	0	0	0	0	0	0	46	0	46	0	0	0	0	0	0	0	64	0	64	110
11:45 AM	0	3	0	1	4	0	1	44	0	45	0	0	0	0	0	0	1	73	0	74	123
Hourly Total	0	5	0	8	13	0	1	180	7	188	0	0	0	0	0	0	10	234	2	246	447
12:00 PM	0	28	0	25	53	1	0	95	0	96	0	0	0	0	0	1	0	78	1	80	229
12:15 PM	0	10	0	12	22	0	0	62	2	64	0	0	0	0	0	0	0	86	0	86	172
12:30 PM	0	5	0	5	10	0	0	71	1	72	0	0	0	0	0	0	1	60	0	61	143
12:45 PM	0	2	0	1	3	0	0	39	1	40	0	1	0	0	1	0	0	50	0	50	94
Hourly Total	0	45	0	43	88	1	0	267	4	272	0	1	0	0	1	1	1	274	1	277	638
Grand Total	1	102	1	106	210	1	3	1342	117	1463	0	8	0	0	8	2	97	1536	10	1645	3326
Approach %	0.5	48.6	0.5	50.5	-	0.1	0.2	91.7	8.0	-	0.0	100.0	0.0	0.0	-	0.1	5.9	93.4	0.6	-	-
Total %	0.0	3.1	0.0	3.2	6.3	0.0	0.1	40.3	3.5	44.0	0.0	0.2	0.0	0.0	0.2	0.1	2.9	46.2	0.3	49.5	-
Lights	1	101	1	105	208	1	3	1325	115	1444	0	7	0	0	7	2	97	1520	10	1629	3288
% Lights	100.0	99.0	100.0	99.1	99.0	100.0	100.0	98.7	98.3	98.7	-	87.5	-	-	87.5	100.0	100.0	99.0	100.0	99.0	98.9
Mediums	0	1	0	0	1	0	0	12	2	14	0	1	0	0	1	0	0	11	0	11	27
% Mediums	0.0	1.0	0.0	0.0	0.5	0.0	0.0	0.9	1.7	1.0	-	12.5	-	-	12.5	0.0	0.0	0.7	0.0	0.7	0.8
Articulated Trucks	0	0	0	1	1	0	0	5	0	5	0	0	0	0	0	0	0	5	0	5	11
% Articulated Trucks	0.0	0.0	0.0	0.9	0.5	0.0	0.0	0.4	0.0	0.3	-	0.0	-	-	0.0	0.0	0.0	0.3	0.0	0.3	0.3

4153.910 Crystal Lake
Congress Pkwy and Station Dr,
10-hr
GHA MIO

Gewalt Hamilton Associates Inc.
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Turning Movement Data Plot

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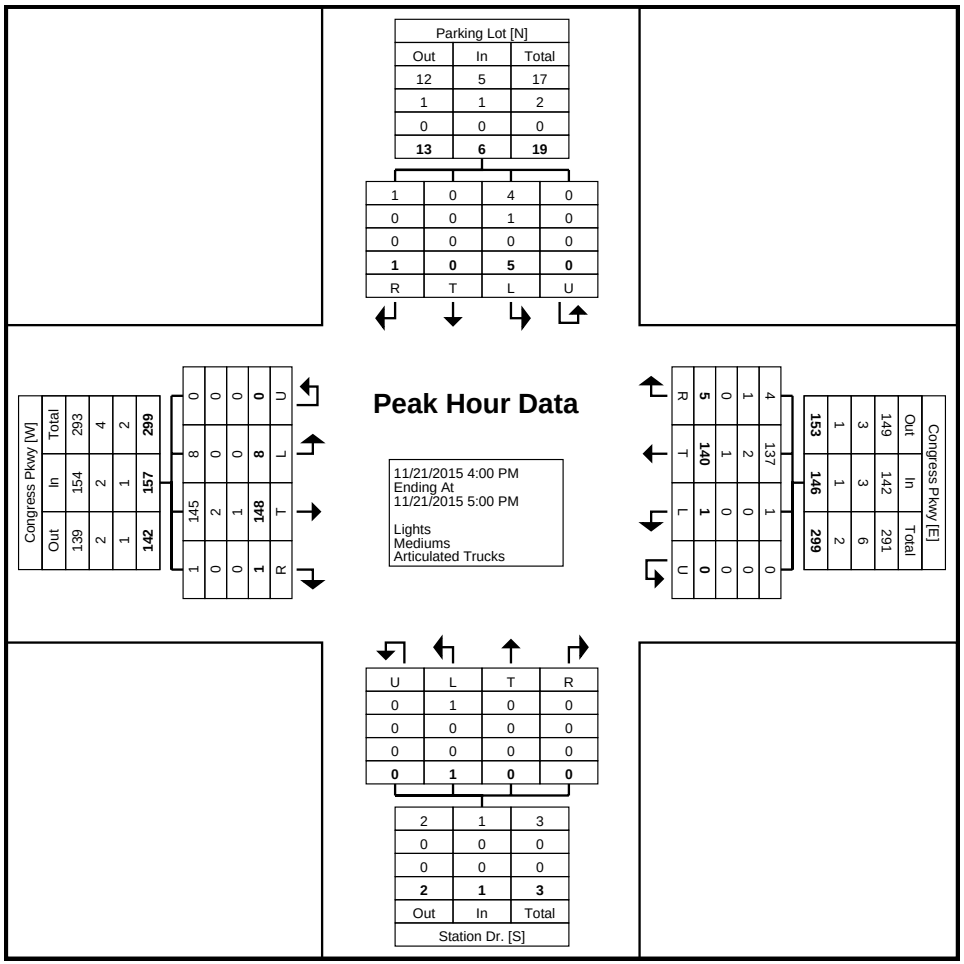
Turning Movement Peak Hour Data (4:00 PM)

Start Time	Parking Lot Southbound					Congress Pkwy Westbound					Station Dr. Northbound					Congress Pkwy Eastbound					
	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	Int. Total
4:00 PM	0	1	0	0	1	0	1	44	0	45	0	0	0	0	0	0	2	41	1	44	90
4:15 PM	0	2	0	0	2	0	0	29	3	32	0	1	0	0	1	0	0	40	0	40	75
4:30 PM	0	1	0	1	2	0	0	33	0	33	0	0	0	0	0	0	2	38	0	40	75
4:45 PM	0	1	0	0	1	0	0	34	2	36	0	0	0	0	0	0	4	29	0	33	70
Total	0	5	0	1	6	0	1	140	5	146	0	1	0	0	1	0	8	148	1	157	310
Approach %	0.0	83.3	0.0	16.7	-	0.0	0.7	95.9	3.4	-	0.0	100.0	0.0	0.0	-	0.0	5.1	94.3	0.6	-	-
Total %	0.0	1.6	0.0	0.3	1.9	0.0	0.3	45.2	1.6	47.1	0.0	0.3	0.0	0.0	0.3	0.0	2.6	47.7	0.3	50.6	-
PHF	0.000	0.625	0.000	0.250	0.750	0.000	0.250	0.795	0.417	0.811	0.000	0.250	0.000	0.000	0.250	0.000	0.500	0.902	0.250	0.892	0.861
Lights	0	4	0	1	5	0	1	137	4	142	0	1	0	0	1	0	8	145	1	154	302
% Lights	-	80.0	-	100.0	83.3	-	100.0	97.9	80.0	97.3	-	100.0	-	-	100.0	-	100.0	98.0	100.0	98.1	97.4
Mediums	0	1	0	0	1	0	0	2	1	3	0	0	0	0	0	0	0	2	0	2	6
% Mediums	-	20.0	-	0.0	16.7	-	0.0	1.4	20.0	2.1	-	0.0	-	-	0.0	-	0.0	1.4	0.0	1.3	1.9
Articulated Trucks	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1	2
% Articulated Trucks	-	0.0	-	0.0	0.0	-	0.0	0.7	0.0	0.7	-	0.0	-	-	0.0	-	0.0	0.7	0.0	0.6	0.6

4153.910 Crystal Lake
Congress Pkwy and Station Dr,
10-hr
GHA MIO

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Turning Movement Peak Hour Data Plot (4:00 PM)

4153.910 Crystal Lake
Congress Pkwy and Station Dr,
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Gewalt Hamilton Associates Inc.
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Vernon Hills, Illinois, United States 60061
(847) 478-9700 lbeckham@gha-engineers.com

Count Name: Station and Congress
Site Code:
Start Date: 11/21/2015

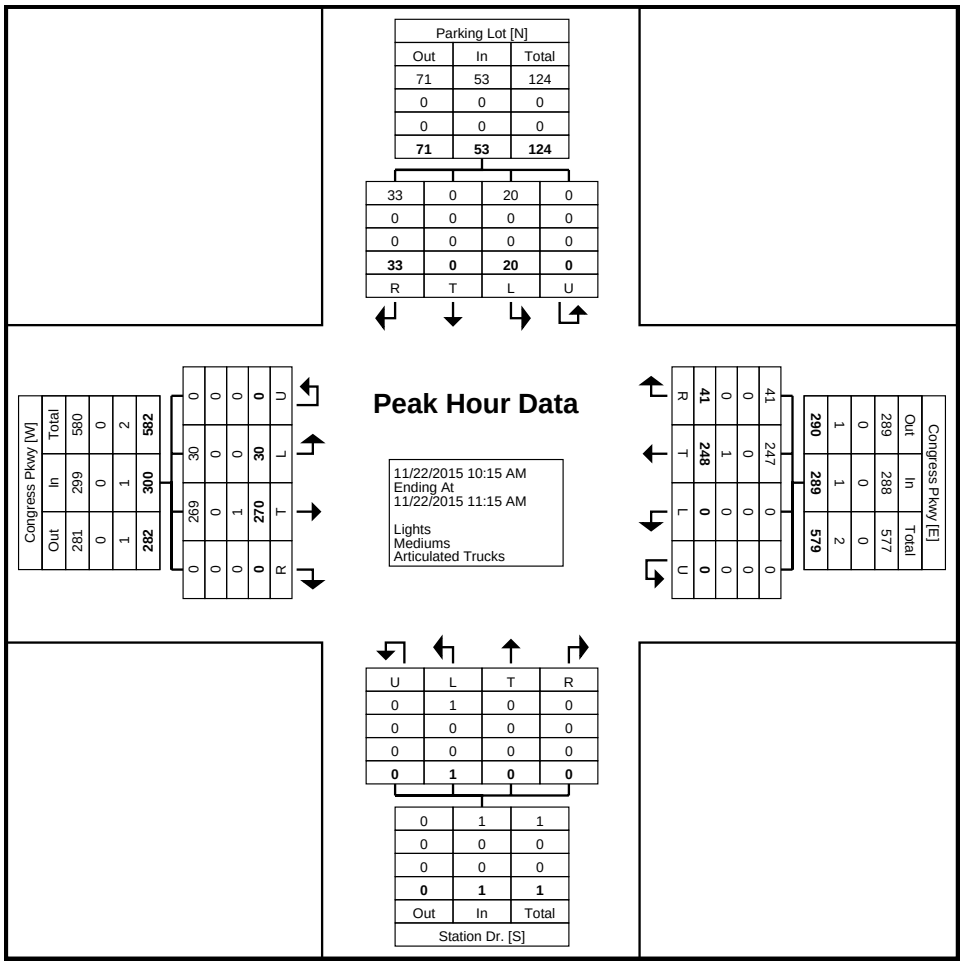
Turning Movement Peak Hour Data (10:15 AM)

Start Time	Parking Lot Southbound					Congress Pkwy Westbound					Station Dr. Northbound					Congress Pkwy Eastbound					
	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	Int. Total
10:15 AM	0	13	0	19	32	0	0	84	4	88	0	1	0	0	1	0	3	79	0	82	203
10:30 AM	0	4	0	5	9	0	0	68	17	85	0	0	0	0	0	0	13	71	0	84	178
10:45 AM	0	1	0	3	4	0	0	54	15	69	0	0	0	0	0	0	9	63	0	72	145
11:00 AM	0	2	0	6	8	0	0	42	5	47	0	0	0	0	0	0	5	57	0	62	117
Total	0	20	0	33	53	0	0	248	41	289	0	1	0	0	1	0	30	270	0	300	643
Approach %	0.0	37.7	0.0	62.3	-	0.0	0.0	85.8	14.2	-	0.0	100.0	0.0	0.0	-	0.0	10.0	90.0	0.0	-	-
Total %	0.0	3.1	0.0	5.1	8.2	0.0	0.0	38.6	6.4	44.9	0.0	0.2	0.0	0.0	0.2	0.0	4.7	42.0	0.0	46.7	-
PHF	0.000	0.385	0.000	0.434	0.414	0.000	0.000	0.738	0.603	0.821	0.000	0.250	0.000	0.000	0.250	0.000	0.577	0.854	0.000	0.893	0.792
Lights	0	20	0	33	53	0	0	247	41	288	0	1	0	0	1	0	30	269	0	299	641
% Lights	-	100.0	-	100.0	100.0	-	-	99.6	100.0	99.7	-	100.0	-	-	100.0	-	100.0	99.6	-	99.7	99.7
Mediums	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Mediums	-	0.0	-	0.0	0.0	-	-	0.0	0.0	0.0	-	0.0	-	-	0.0	-	0.0	0.0	-	0.0	0.0
Articulated Trucks	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	1	2
% Articulated Trucks	-	0.0	-	0.0	0.0	-	-	0.4	0.0	0.3	-	0.0	-	-	0.0	-	0.0	0.4	-	0.3	0.3

4153.910 Crystal Lake
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Turning Movement Peak Hour Data Plot (10:15 AM)

4153.910 Crystal Lake
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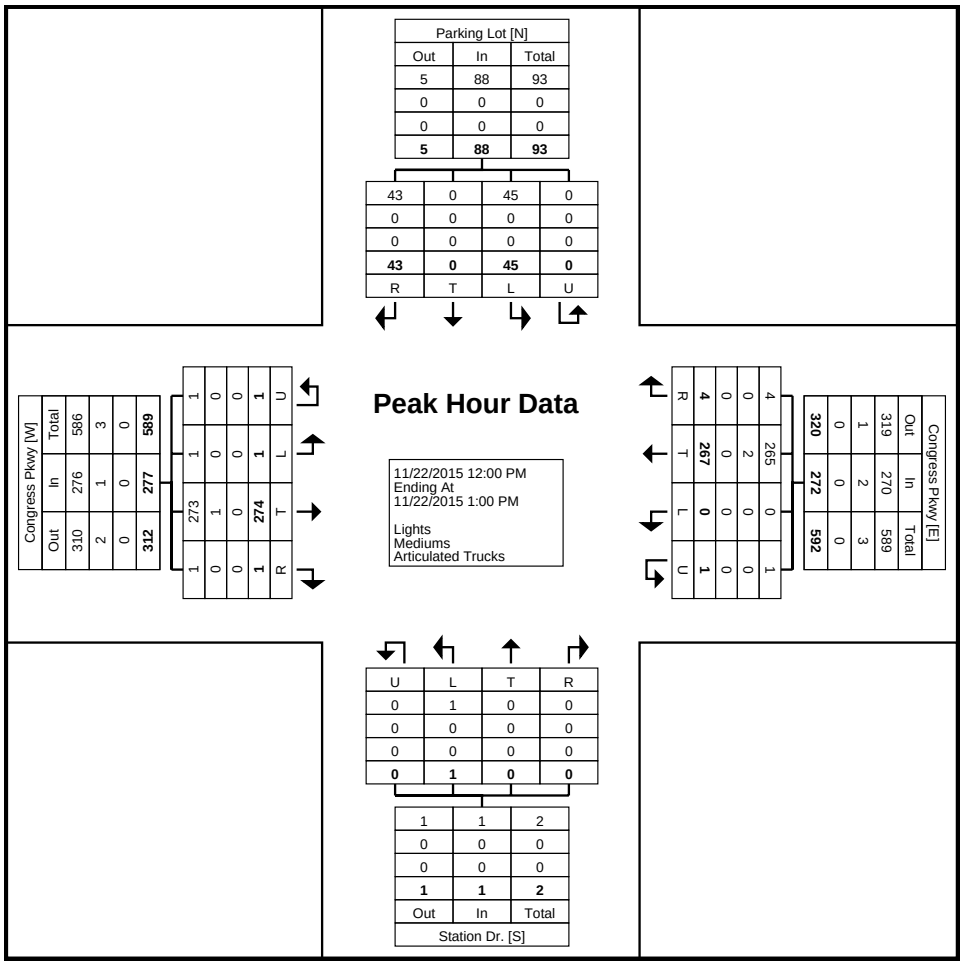
Turning Movement Peak Hour Data (12:00 PM)

Start Time	Parking Lot Southbound					Congress Pkwy Westbound					Station Dr. Northbound					Congress Pkwy Eastbound					
	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	U-Turn	Left	Thru	Right	App. Total	Int. Total
12:00 PM	0	28	0	25	53	1	0	95	0	96	0	0	0	0	0	1	0	78	1	80	229
12:15 PM	0	10	0	12	22	0	0	62	2	64	0	0	0	0	0	0	0	86	0	86	172
12:30 PM	0	5	0	5	10	0	0	71	1	72	0	0	0	0	0	0	1	60	0	61	143
12:45 PM	0	2	0	1	3	0	0	39	1	40	0	1	0	0	1	0	0	50	0	50	94
Total	0	45	0	43	88	1	0	267	4	272	0	1	0	0	1	1	1	274	1	277	638
Approach %	0.0	51.1	0.0	48.9	-	0.4	0.0	98.2	1.5	-	0.0	100.0	0.0	0.0	-	0.4	0.4	98.9	0.4	-	-
Total %	0.0	7.1	0.0	6.7	13.8	0.2	0.0	41.8	0.6	42.6	0.0	0.2	0.0	0.0	0.2	0.2	0.2	42.9	0.2	43.4	-
PHF	0.000	0.402	0.000	0.430	0.415	0.250	0.000	0.703	0.500	0.708	0.000	0.250	0.000	0.000	0.250	0.250	0.250	0.797	0.250	0.805	0.697
Lights	0	45	0	43	88	1	0	265	4	270	0	1	0	0	1	1	1	273	1	276	635
% Lights	-	100.0	-	100.0	100.0	100.0	-	99.3	100.0	99.3	-	100.0	-	-	100.0	100.0	100.0	99.6	100.0	99.6	99.5
Mediums	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	1	0	1	3
% Mediums	-	0.0	-	0.0	0.0	0.0	-	0.7	0.0	0.7	-	0.0	-	-	0.0	0.0	0.0	0.4	0.0	0.4	0.5
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Articulated Trucks	-	0.0	-	0.0	0.0	0.0	-	0.0	0.0	0.0	-	0.0	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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Turning Movement Peak Hour Data Plot (12:00 PM)

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APPENDIX C

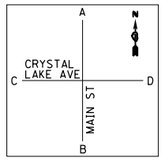
Crystal Lake Avenue/Main Street IDS

PLOT DATE = $DATE$
FILE NAME = $FILEL$
PLOT SCALE = $SCALE$
USER NAME = $USER$

SIGNALIZED INTERSECTION

CAPACITY ANALYSIS

HIGHWAY CAPACITY SOFTWARE
PROGRAM NAME HCS 2010
VERSION 6.50



BASIC CONDITIONS

AREA: CBD (OTHER) PHF 0.90 (CIRCLE ONE)

SIGNAL TYPE ACTUATED ARRIVAL TYPE 3

C = SIGNAL CYCLE = 95 SEC. ΣA/C 20 / 95 = 0.21

	PHASE	AMBER + ALL RED	PHASE	AMBER + ALL RED	PHASE	AMBER + ALL RED	PHASE	AMBER + ALL RED		
A.M.	G/C= 0.12 G = 11 Sec.	4 Sec.	G/C= 0.27 G = 26 Sec.	6 Sec.	G/C= 0.07 G = 7 Sec.	4 Sec.	G/C= 0.33 G = 31 Sec.	6 Sec.		
P.M.	G/C= 0.05 G = 5 Sec.	4 Sec.	G/C= 0.03 G = 3 Sec.	4 Sec.	G/C= 0.32 G = 30 Sec.	6 Sec.	G/C= 0.05 G = 5 Sec.	4 Sec.	G/C= 0.29 G = 28 Sec.	6 Sec.

APPR. A GR=0% A.M. T=81% R=12% L=7% PKG 0 (MNV/HR) BUS 0 (STOP/HR) PEDS/HR 15 BIKES/HR 0
P.M. T=80% R=11% L=9% PKG 0 (MNV/HR) BUS 0 (STOP/HR) PEDS/HR 15 BIKES/HR 0

	MOVEMENT	L/W	DHV	PHF	BASE SAT.	V/S	USED G/C	CAP C	V/C	DELAY d	LOS	APPR. DELAY	APPR. LOS	95th % QUEUE	RED-TIME QUEUE
A.M.	AD	1/11	35	0.90	1900	0.02	0.39	499	0.08	18.4	B	31.2	C	23	32
	AB	2/11	405	0.90	2000	0.13	0.27	542	0.49	32.0	C			225	196
	AC		60	0.90	1900	0.13	0.27	513	0.49	32.3	C			220	
P.M.	AD	1/11	60	0.90	1900	0.04	0.37	294	0.23	20.7	C	29.5	C	43	60
	AB	2/11	530	0.90	2000	0.17	0.32	625	0.55	30.2	C			273	242
	AC		70	0.90	1900	0.17	0.32	596	0.55	30.5	C			263	

APPR. B GR=-1% A.M. T=54% R=19% L=28% PKG 0 (MNV/HR) BUS 0 (STOP/HR) PEDS/HR 1 BIKES/HR 0
P.M. T=63% R=12% L=25% PKG 0 (MNV/HR) BUS 0 (STOP/HR) PEDS/HR 1 BIKES/HR 0

	MOVEMENT	L/W	DHV	PHF	BASE SAT.	V/S	USED G/C	CAP C	V/C	DELAY d	LOS	APPR. DELAY	APPR. LOS	95th % QUEUE	RED-TIME QUEUE
A.M.	BC	1/11	135	0.90	1900	0.08	0.39	409	0.37	20.5	C	25.8	C	95	134
	BA	2/11	260	0.90	2000	0.15	0.27	1037	0.28	27.8	C			115	126
	BD	1/11	90	0.90	1900	0.06	0.27	438	0.23	27.9	C			83	87
P.M.	BC	1/11	315	0.90	1900	0.19	0.46	438	0.80	29.1	C	25.3	C	245	294
	BA	2/11	775	0.90	2000	0.45	0.39	1476	0.58	24.6	C			298	315
	BD	1/11	150	0.90	1900	0.10	0.39	623	0.27	20.8	C			115	122

APPR. C GR=-1% A.M. T=43% R=50% L=7% PKG 0 (MNV/HR) BUS 0 (STOP/HR) PEDS/HR 0 BIKES/HR 0
P.M. T=45% R=49% L=6% PKG 0 (MNV/HR) BUS 0 (STOP/HR) PEDS/HR 0 BIKES/HR 0

	MOVEMENT	L/W	DHV	PHF	BASE SAT.	V/S	USED G/C	CAP C	V/C	DELAY d	LOS	APPR. DELAY	APPR. LOS	95th % QUEUE	RED-TIME QUEUE
A.M.	CA	1/11	45	0.90	1900	0.03	0.40	383	0.13	19.0	B	21.8	C	30	46
	CD	1/11	275	0.90	2000	0.15	0.33	649	0.47	25.7	C			228	247
	CB	1/11	320	0.90	1900	0.17	0.44	708	0.39	18.0	B			173	238
P.M.	CA	1/11	40	0.90	1900	0.02	0.35	184	0.24	24.9	C	24.6	C	30	49
	CD	1/11	295	0.90	2000	0.16	0.29	587	0.56	29.0	C			258	277
	CB	1/11	325	0.90	1900	0.17	0.42	675	0.41	19.4	B			185	251

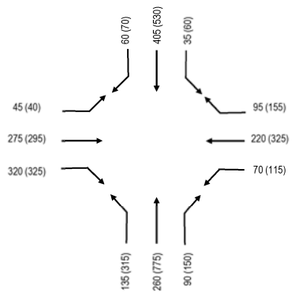
APPR. D GR=-3% A.M. T=57% R=18% L=25% PKG 0 (MNV/HR) BUS 0 (STOP/HR) PEDS/HR 10 BIKES/HR 3
P.M. T=55% R=19% L=26% PKG 0 (MNV/HR) BUS 0 (STOP/HR) PEDS/HR 6 BIKES/HR 1

	MOVEMENT	L/W	DHV	PHF	BASE SAT.	V/S	USED G/C	CAP C	V/C	DELAY d	LOS	APPR. DELAY	APPR. LOS	95th % QUEUE	RED-TIME QUEUE
A.M.	DB	1/11	95	0.90	1900	0.06	0.40	407	0.26	19.4	B	24.9	C	65	95
	DC	1/11	220	0.90	1900	0.18	0.33	593	0.54	26.8	C			245	198
	DA		70												
P.M.	DB	1/11	155	0.90	1900	0.10	0.35	314	0.55	27.9	C	46.0	D	53	170
	DC	1/11	325	0.90	1900	0.27	0.29	534	0.92	52.4	D			483	305
	DA		115												

INTERSECTION DELAY 25.9 (A.M.), C (P.M.)
INTERSECTION LOS 30.1 (A.M.), C (P.M.)

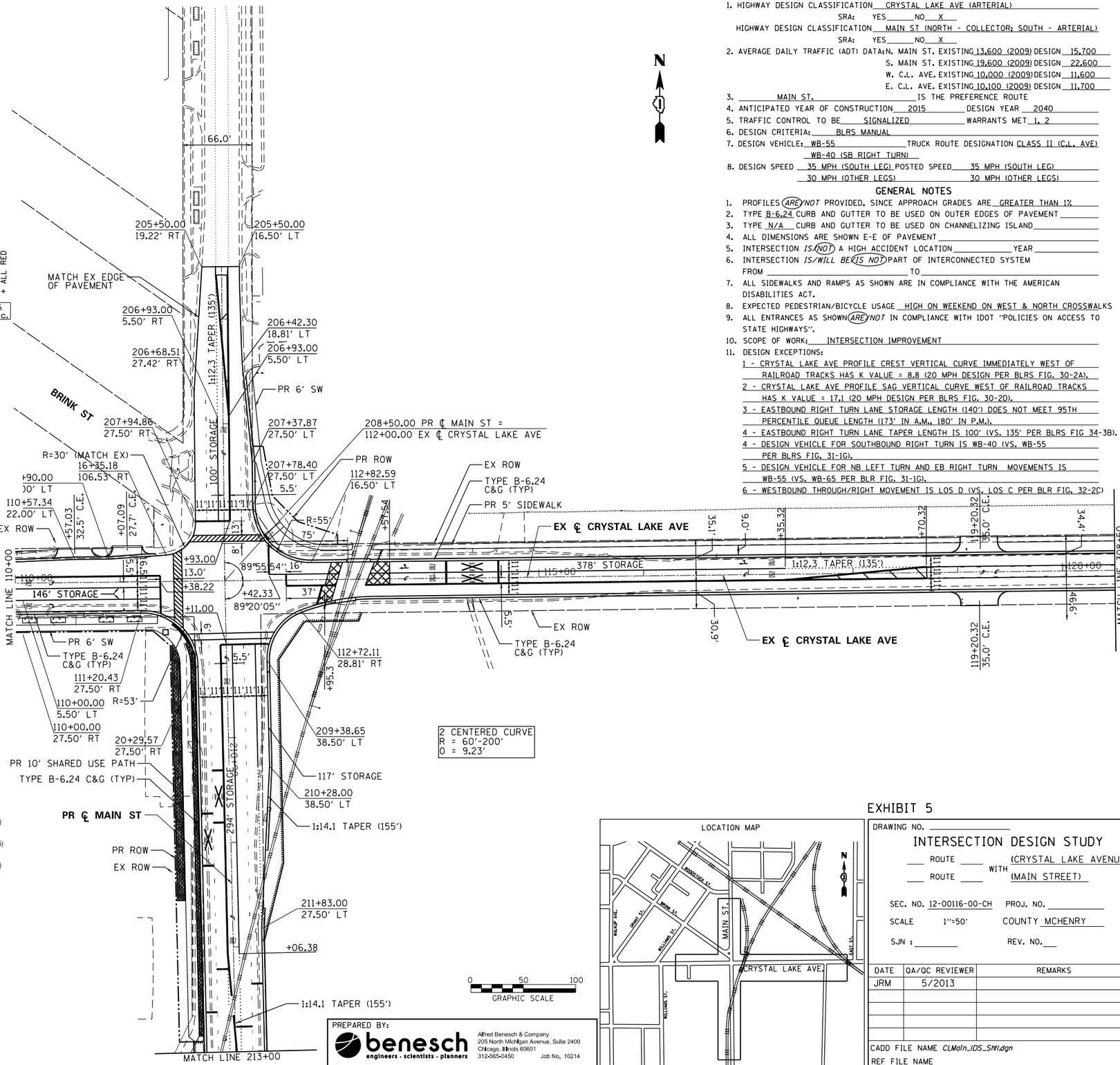
TRAFFIC DATA

MOVEMENT	YEAR 2012 PEAK HOUR TRAFFIC		PERCENTAGE TRUCK TRAFFIC IN PEAK HOUR		ESTIMATED PERCENT INCREASE BY 2040		YEAR 2040 DESIGN PEAK HOUR TRAFFIC	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
AB	350	445	1.0%	1.0%	15.7%	19.1%	405	530
AD	30	40	0.0%	0.0%	16.7%	50.0%	35	60
AC	35	40	0.0%	0.0%	71.4%	75.0%	60	70
BA	215	675	1.0%	1.0%	20.9%	14.8%	260	775
BC	115	275	1.0%	1.0%	17.4%	14.5%	135	315
BD	75	125	1.0%	1.0%	20.0%	20.0%	90	150
CD	210	235	1.0%	1.0%	31.0%	25.5%	275	295
CA	20	20	0.0%	0.0%	125.0%	100.0%	45	40
CB	285	280	1.0%	1.0%	12.3%	16.1%	320	325
DC	175	260	1.0%	1.0%	25.7%	25.0%	220	325
DB	70	120	2.0%	2.0%	35.7%	29.2%	95	155
DA	55	100	0.0%	0.0%	27.3%	15.0%	70	115
TOTAL A	705	1320			24.1%	20.5%	875	1590
TOTAL B	1110	1920			17.6%	17.2%	1305	2250
TOTAL C	840	1110			25.6%	23.4%	1055	1370
TOTAL D	615	880			27.6%	25.0%	785	1100



2040 DHV: A.M. (P.M.)

APPROACH	8TH MAX HOUR TRAFFIC
A	290
B	590
C	290
D	260



ELEMENTS CONTROLLING DESIGN

1. HIGHWAY DESIGN CLASSIFICATION CRYSTAL LAKE AVE (ARTERIAL)
   SRA: YES____ NO X
   HIGHWAY DESIGN CLASSIFICATION MAIN ST (NORTH - COLLECTOR; SOUTH - ARTERIAL)
   SRA: YES____ NO X
2. AVERAGE DAILY TRAFFIC (ADT) DATA: N. MAIN ST. EXISTING 13,600 (2009) DESIGN 15,700
   S. MAIN ST. EXISTING 19,600 (2009) DESIGN 22,600
   W. C.L. AVE. EXISTING 10,000 (2009) DESIGN 11,600
   E. C.L. AVE. EXISTING 10,100 (2009) DESIGN 11,700
3. MAIN ST. IS THE PREFERENCE ROUTE
4. ANTICIPATED YEAR OF CONSTRUCTION 2015 DESIGN YEAR 2040
5. TRAFFIC CONTROL TO BE SIGNALIZED WARRANTS MET 1, 2
6. DESIGN CRITERIA: BLRS MANUAL
7. DESIGN VEHICLE: WB-55 TRUCK ROUTE DESIGNATION CLASS II (C.L. AVE)
   WB-40 (SB RIGHT TURN)
8. DESIGN SPEED 35 MPH (SOUTH LEG) POSTED SPEED 35 MPH (SOUTH LEG)
   30 MPH (OTHER LEGS) 30 MPH (OTHER LEGS)

GENERAL NOTES

1. PROFILES (ARE) / *NOT* PROVIDED, SINCE APPROACH GRADES ARE GREATER THAN 1%
2. TYPE B-6.24 CURB AND GUTTER TO BE USED ON OUTER EDGES OF PAVEMENT
3. TYPE N/A CURB AND GUTTER TO BE USED ON CHANNELIZING ISLAND
4. ALL DIMENSIONS ARE SHOWN E-E OF PAVEMENT
5. INTERSECTION *IS* (NOT) A HIGH ACCIDENT LOCATION YEAR
6. INTERSECTION *IS/WILL BE* (IS NOT) PART OF INTERCONNECTED SYSTEM
   FROM TO
7. ALL SIDEWALKS AND RAMPS AS SHOWN ARE IN COMPLIANCE WITH THE AMERICAN DISABILITIES ACT.
8. EXPECTED PEDESTRIAN/BICYCLE USAGE HIGH ON WEEKEND ON WEST & NORTH CROSSWALKS
9. ALL ENTRANCES AS SHOWN (ARE) / *NOT* IN COMPLIANCE WITH IDOT "POLICIES ON ACCESS TO STATE HIGHWAYS".
10. SCOPE OF WORK: INTERSECTION IMPROVEMENT
11. DESIGN EXCEPTIONS:
    1 - CRYSTAL LAKE AVE PROFILE CREST VERTICAL CURVE IMMEDIATELY WEST OF RAILROAD TRACKS HAS K VALUE = 8.8 (20 MPH DESIGN PER BLRS FIG. 30-2A).
    2 - CRYSTAL LAKE AVE PROFILE SAG VERTICAL CURVE WEST OF RAILROAD TRACKS HAS K VALUE = 17.1 (20 MPH DESIGN PER BLRS FIG. 30-2D).
    3 - EASTBOUND RIGHT TURN LANE STORAGE LENGTH (140') DOES NOT MEET 95TH PERCENTILE QUEUE LENGTH (173' IN A.M., 180' IN P.M.).
    4 - EASTBOUND RIGHT TURN LANE TAPER LENGTH IS 100' (VS. 135' PER BLRS FIG 34-3B).
    4 - DESIGN VEHICLE FOR SOUTHBOUND RIGHT TURN IS WB-40 (VS. WB-55 PER BLRS FIG. 31-1G).
    5 - DESIGN VEHICLE FOR NB LEFT TURN AND EB RIGHT TURN MOVEMENTS IS WB-55 (VS. WB-65 PER BLR FIG. 31-1G).
    6 - WESTBOUND THROUGH/RIGHT MOVEMENT IS LOS D (VS. LOS C PER BLR FIG. 32-2C)

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PROJ. MGR. M. MAGNUSON PROJ. ENG. J. R. MORELAND

LOCATION MAP

EXHIBIT 5

DRAWING NO.

INTERSECTION DESIGN STUDY

___ ROUTE ___ (CRYSTAL LAKE AVENUE)
WITH
___ ROUTE ___ (MAIN STREET)

SEC. NO. 12-00116-00-CH PROJ. NO.
SCALE 1"=50' COUNTY MCHENRY
SJN : REV. NO.

DATE	QA/QC REVIEWER	REMARKS
JRM	5/2013	

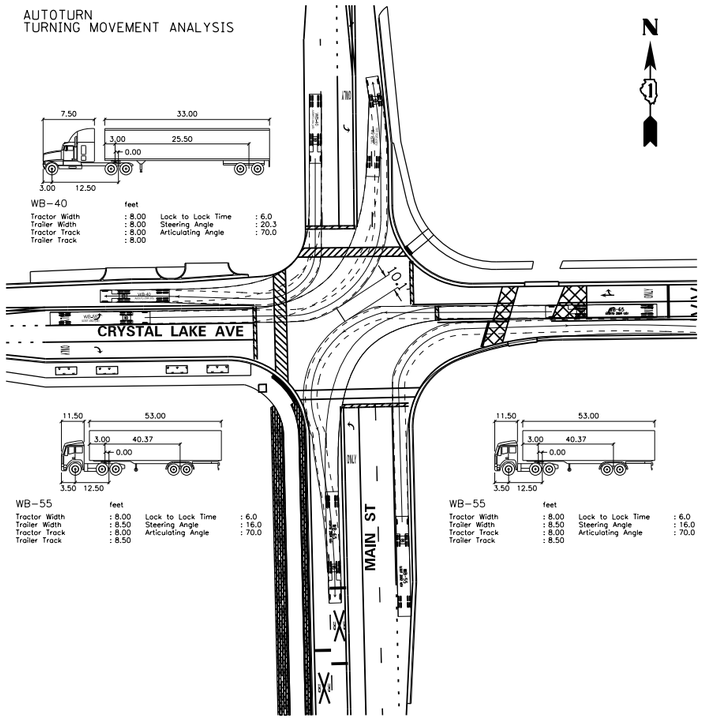
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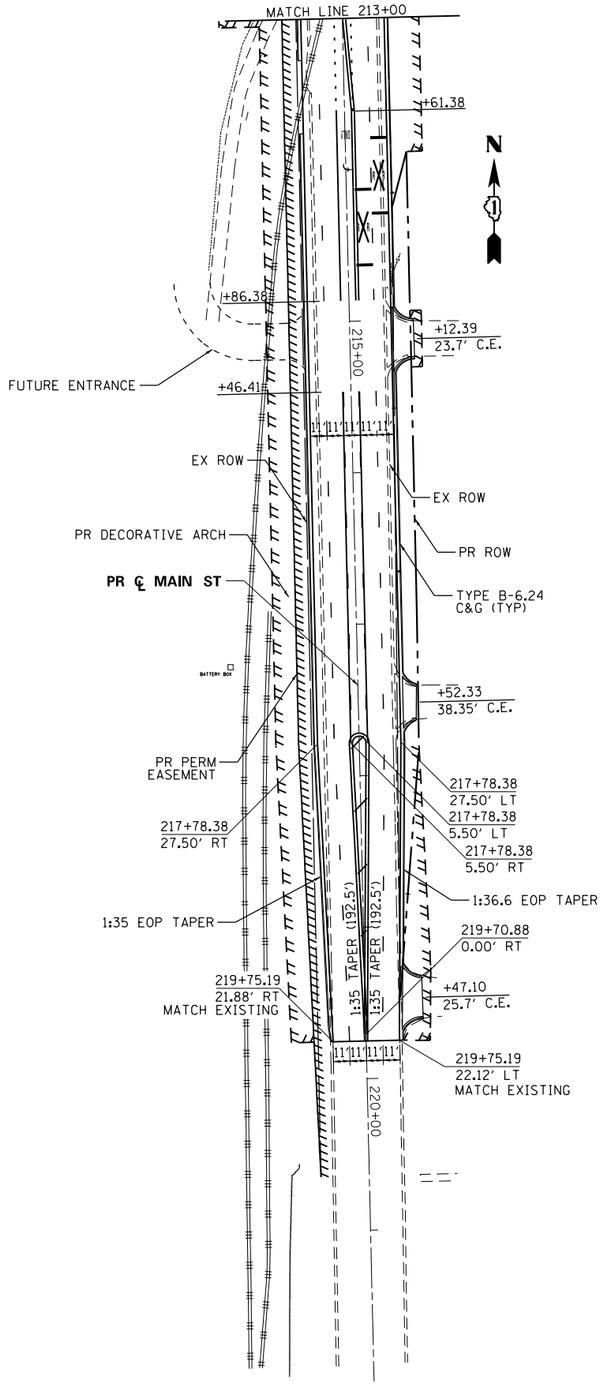
I.D.S. SHEET 1 OF 3

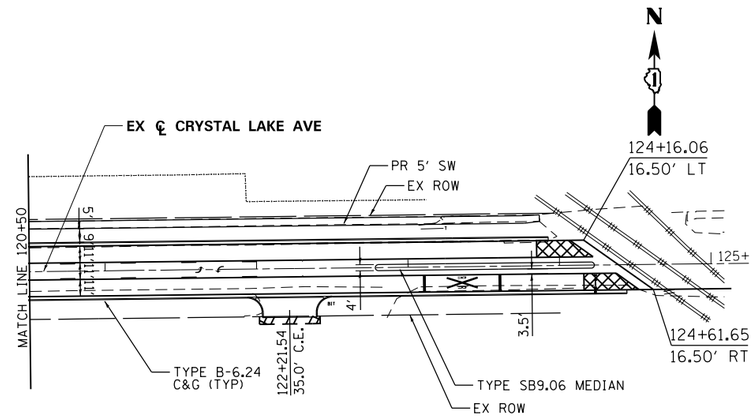
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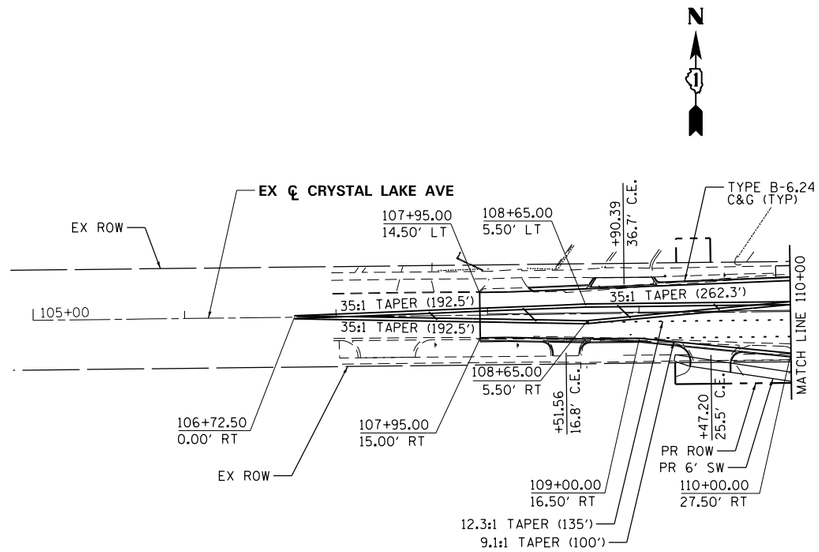
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FILE NAME = $FILEL$
PLOT SCALE = $SCALE$
USER NAME = $USERS$

AUTOTURN
TURNING MOVEMENT ANALYSIS









0 50 100
GRAPHIC SCALE

EXHIBIT 5

INTERSECTION DESIGN STUDY

___ ROUTE ____ (CRYSTAL LAKE AVENUE)
___ ROUTE ____ WITH (MAIN STREET)

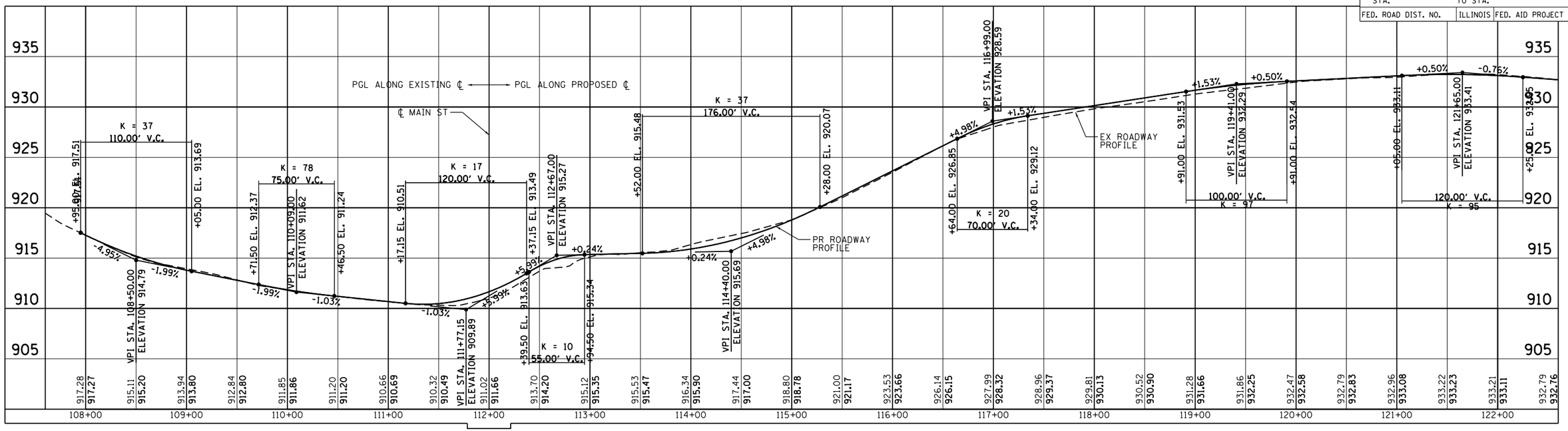
SEC. NO. 12-00116-00-CH
SCALE 1"=50' COUNTY MCHENRY
SJN : _____ PROJ. NO. _____
I.D.S. SHEET 2 OF 3

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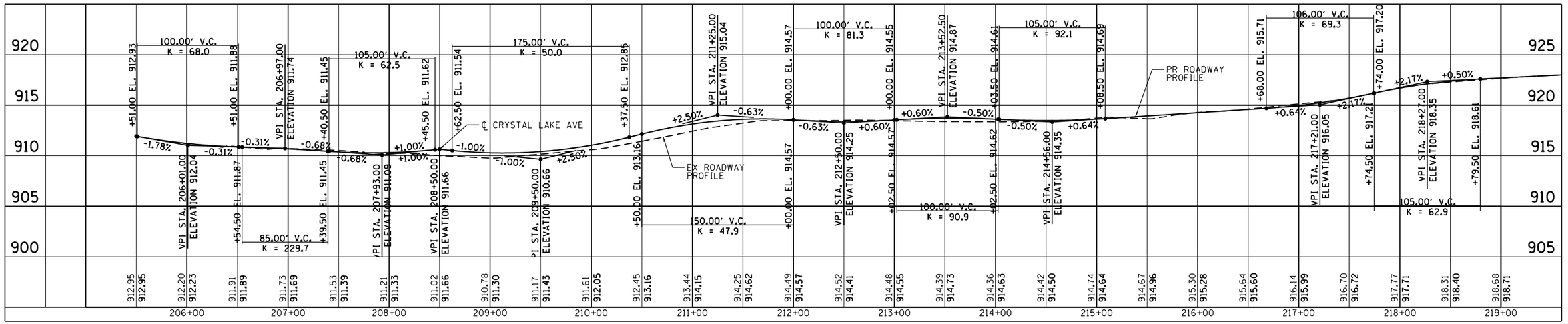
BDE-9908

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	12-00116-00-CH	MCHENRY		
STA.		TO STA.		
FED. ROAD DIST. NO.		ILLINOIS	FED. AID PROJECT	

CRYSTAL LAKE AVE PROFILE



MAIN ST PROFILE



206+00

EXHIBIT 5

0 50 100
HORIZONTAL GRAPHIC SCALE

2 1 0 VERTICAL GRAPHIC SCALE

INTERSECTION DESIGN STUDY

___ ROUTE ____ (CRYSTAL LAKE AVENUE)
___ ROUTE ____ WITH (MAIN STREET)

SEC. NO. 12-00116-00-CH

SCALE 1:50 HORIZ. 1:5 VERT. COUNTY MCHENRY

SJN : _____ PROJ. NO. _____

I.D.S. SHEET 3 OF 3

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BDE-9908

PLOT DATE = $DATE$
FILE NAME = $FILEL$
PLOT SCALE = $SCALE$
USER NAME = $USER$

APPENDIX D

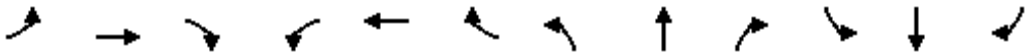
Capacity Analysis Software Summary Reports

2015 Existing Conditions

Saturday and Sunday Peak Hours

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	2000	1900	1900	1900	1900	1900	2000	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		1%			-3%			0%			0%	
Storage Length (ft)	165		175	0		150	500		70	115		115
Storage Lanes	1		1	1		1	0		1	1		1
Taper Length (ft)	145			260			25			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor	0.99				0.99		0.98				1.00	
Frt			0.850		0.970				0.850		0.994	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1905	1553	1771	1798	0	1728	1914	1561	1745	3461	0
Flt Permitted	0.637			0.541			0.950			0.950		
Satd. Flow (perm)	1157	1905	1553	1009	1798	0	1698	1914	1561	1745	3461	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			208		16				141		5	
Link Speed (mph)		30			30			35			30	
Link Distance (ft)		417			251			665			391	
Travel Time (s)		9.5			5.7			13.0			8.9	

Intersection Summary	
Area Type:	Other



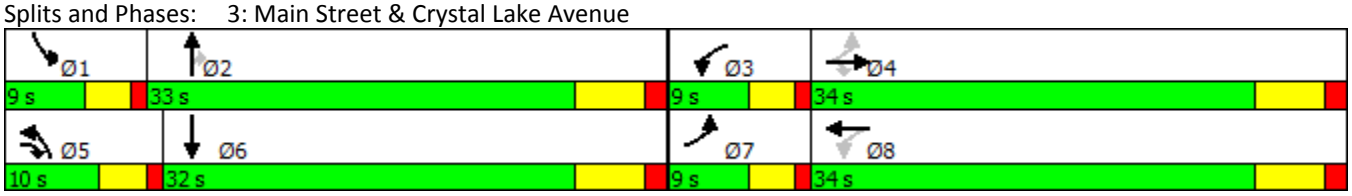
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	15	135	210	95	130	30	130	315	60	15	385	10
Future Volume (vph)	15	135	210	95	130	30	130	315	60	15	385	10
Confl. Peds. (#/hr)	5					5	20					20
Confl. Bikes (#/hr)						1						5
Peak Hour Factor	0.80	0.85	0.78	0.85	0.85	0.80	0.81	0.92	0.71	0.63	0.84	0.56
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	19	159	269	112	153	38	160	342	85	24	458	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	19	159	269	112	191	0	160	342	85	24	476	0

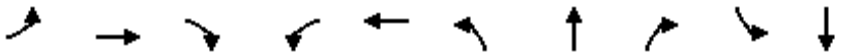
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	15	135	210	95	130	130	315	60	15	385
Future Volume (vph)	15	135	210	95	130	130	315	60	15	385
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	5	3	8	5	2		1	6
Permitted Phases	4		4	8				2		
Detector Phase	7	4	5	3	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	8.0	5.0	5.0	8.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	9.0	14.0	9.0	9.0	34.0	9.0	21.0	21.0	9.0	32.0
Total Split (s)	9.0	34.0	10.0	9.0	34.0	10.0	33.0	33.0	9.0	32.0
Total Split (%)	10.6%	40.0%	11.8%	10.6%	40.0%	11.8%	38.8%	38.8%	10.6%	37.6%
Yellow Time (s)	3.0	4.5	3.0	3.0	4.5	3.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.5	1.5	1.0	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	6.0	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	17.2	12.5	21.3	21.0	18.2	6.3	25.0	25.0	5.2	17.6
Actuated g/C Ratio	0.29	0.21	0.35	0.35	0.30	0.10	0.42	0.42	0.09	0.29
v/c Ratio	0.05	0.40	0.39	0.27	0.34	0.89	0.43	0.12	0.16	0.47
Control Delay	12.5	24.3	5.5	14.5	17.2	79.1	18.5	1.3	33.9	20.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.5	24.3	5.5	14.5	17.2	79.1	18.5	1.3	33.9	20.3
LOS	B	C	A	B	B	E	B	A	C	C
Approach Delay		12.5			16.3		32.5			21.0
Approach LOS		B			B		C			C

Intersection Summary	
Cycle Length: 85	
Actuated Cycle Length: 60.1	
Natural Cycle: 85	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 21.8	Intersection LOS: C
Intersection Capacity Utilization 56.0%	ICU Level of Service B
Analysis Period (min) 15	

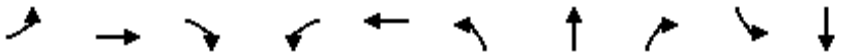
Splits and Phases: 3: Main Street & Crystal Lake Avenue





Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Protected Phases	7	4	5	3	8	5	2		1	6
Permitted Phases	4		4	8				2		
Minimum Initial (s)	5.0	8.0	5.0	5.0	8.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	9.0	14.0	9.0	9.0	34.0	9.0	21.0	21.0	9.0	32.0
Total Split (s)	9.0	34.0	10.0	9.0	34.0	10.0	33.0	33.0	9.0	32.0
Total Split (%)	10.6%	40.0%	11.8%	10.6%	40.0%	11.8%	38.8%	38.8%	10.6%	37.6%
Maximum Green (s)	5.0	28.0	6.0	5.0	28.0	6.0	27.0	27.0	5.0	26.0
Yellow Time (s)	3.0	4.5	3.0	3.0	4.5	3.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.5	1.5	1.0	1.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	Min	Min	None	Min
Walk Time (s)					7.0					7.0
Flash Dont Walk (s)					21.0					19.0
Pedestrian Calls (#/hr)					5					5
90th %ile Green (s)	5.0	28.0	6.0	5.0	28.0	6.0	27.0	27.0	5.0	26.0
90th %ile Term Code	Max	Hold	Max	Max	Ped	Max	Hold	Hold	Max	Ped
70th %ile Green (s)	0.0	11.9	6.0	5.0	20.9	6.0	17.9	17.9	5.0	16.9
70th %ile Term Code	Skip	Gap	Max	Max	Hold	Max	Gap	Gap	Max	Hold
50th %ile Green (s)	0.0	9.9	6.0	5.0	18.9	6.0	25.0	25.0	0.0	15.0
50th %ile Term Code	Skip	Gap	Max	Max	Hold	Max	Hold	Hold	Skip	Min
30th %ile Green (s)	0.0	8.6	6.0	5.0	17.6	6.0	25.0	25.0	0.0	15.0
30th %ile Term Code	Skip	Gap	Max	Max	Hold	Max	Hold	Hold	Skip	Min
10th %ile Green (s)	0.0	0.0	6.0	0.0	8.0	6.0	25.0	25.0	0.0	15.0
10th %ile Term Code	Skip	Skip	Max	Skip	Min	Max	Hold	Hold	Skip	Min

Intersection Summary
Cycle Length: 85
Actuated Cycle Length: 60.1
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 85
70th %ile Actuated Cycle: 59.8
50th %ile Actuated Cycle: 55.9
30th %ile Actuated Cycle: 54.6
10th %ile Actuated Cycle: 45



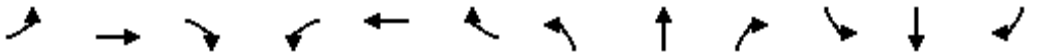
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	19	159	269	112	191	160	342	85	24	476
v/c Ratio	0.05	0.40	0.39	0.27	0.34	0.89	0.43	0.12	0.16	0.47
Control Delay	12.5	24.3	5.5	14.5	17.2	79.1	18.5	1.3	33.9	20.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.5	24.3	5.5	14.5	17.2	79.1	18.5	1.3	33.9	20.3
Queue Length 50th (ft)	4	48	12	24	42	54	72	0	8	69
Queue Length 95th (ft)	15	102	41	59	114	#200	235	0	25	138
Internal Link Dist (ft)		337			171		585			311
Turn Bay Length (ft)	165		175			500		70	115	
Base Capacity (vph)	380	927	684	419	883	180	898	807	151	1566
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	0.05	0.17	0.39	0.27	0.22	0.89	0.38	0.11	0.16	0.30

Intersection Summary

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	2000	1900	1900	1900	1900	1900	2000	1900	1900	1900	1900
Lane Width (ft)	10	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		1%			-3%			0%			0%	
Storage Length (ft)	165		175	0		150	500		70	115		115
Storage Lanes	1		1	1		1	0		1	1		1
Taper Length (ft)	145			260			25			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt			0.850		0.952				0.850		0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	1924	1508	1771	1775	0	1745	1933	1531	1745	3407	0
Flt Permitted	0.659			0.716			0.950			0.950		
Satd. Flow (perm)	1163	1924	1508	1335	1775	0	1745	1933	1531	1745	3407	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			109		33				171		16	
Link Speed (mph)		30			30			35			30	
Link Distance (ft)		417			251			665			391	
Travel Time (s)		9.5			5.7			13.0			8.9	

Intersection Summary	
Area Type:	Other



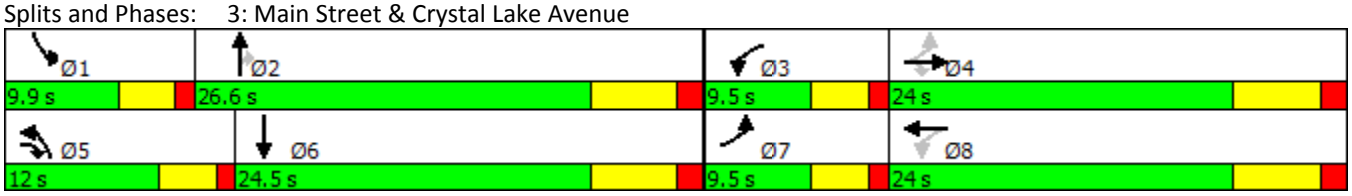
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	20	55	80	30	85	45	105	250	35	20	165	15
Future Volume (vph)	20	55	80	30	85	45	105	250	35	20	165	15
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.38	0.88	0.75	0.64	0.81	0.90	0.88	0.93	0.64	0.50	0.84	0.71
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	3%	0%	0%	0%	0%	0%	2%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	53	63	107	47	105	50	119	269	55	40	196	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	63	107	47	155	0	119	269	55	40	217	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	20	55	80	30	85	105	250	35	20	165
Future Volume (vph)	20	55	80	30	85	105	250	35	20	165
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	5	3	8	5	2		1	6
Permitted Phases	4		4	8				2		
Detector Phase	7	4	5	3	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	8.0	5.0	5.0	8.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	24.0	24.0	9.5	24.0
Total Split (s)	9.5	24.0	12.0	9.5	24.0	12.0	26.6	26.6	9.9	24.5
Total Split (%)	13.6%	34.3%	17.1%	13.6%	34.3%	17.1%	38.0%	38.0%	14.1%	35.0%
Yellow Time (s)	3.0	4.5	3.0	3.0	4.5	3.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.5	1.5	1.0	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	6.0	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	13.8	10.1	19.9	13.8	10.1	7.7	27.6	27.6	6.1	22.1
Actuated g/C Ratio	0.26	0.19	0.38	0.26	0.19	0.15	0.52	0.52	0.12	0.42
v/c Ratio	0.15	0.17	0.17	0.12	0.42	0.47	0.27	0.06	0.20	0.15
Control Delay	13.5	21.6	3.4	13.1	21.3	31.1	14.8	0.1	28.1	15.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	21.6	3.4	13.1	21.3	31.1	14.8	0.1	28.1	15.8
LOS	B	C	A	B	C	C	B	A	C	B
Approach Delay		10.9			19.4		17.4			17.7
Approach LOS		B			B		B			B

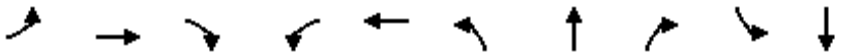
Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 52.8	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 16.5	Intersection LOS: B
Intersection Capacity Utilization 46.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: Main Street & Crystal Lake Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Protected Phases	7	4	5	3	8	5	2		1	6
Permitted Phases	4		4	8				2		
Minimum Initial (s)	5.0	8.0	5.0	5.0	8.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	24.0	24.0	9.5	24.0
Total Split (s)	9.5	24.0	12.0	9.5	24.0	12.0	26.6	26.6	9.9	24.5
Total Split (%)	13.6%	34.3%	17.1%	13.6%	34.3%	17.1%	38.0%	38.0%	14.1%	35.0%
Maximum Green (s)	5.5	18.0	8.0	5.5	18.0	8.0	20.6	20.6	5.9	18.5
Yellow Time (s)	3.0	4.5	3.0	3.0	4.5	3.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.5	1.5	1.0	1.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	Min	Min	None	Min
Walk Time (s)		7.0			7.0		7.0	7.0		7.0
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)		0			0		0	0		0
90th %ile Green (s)	5.5	13.9	8.0	5.5	13.9	8.0	18.7	18.7	5.9	16.6
90th %ile Term Code	Max	Hold	Max	Max	Gap	Max	Gap	Gap	Max	Hold
70th %ile Green (s)	5.5	10.9	8.0	5.5	10.9	8.0	17.1	17.1	5.9	15.0
70th %ile Term Code	Max	Hold	Max	Max	Gap	Max	Hold	Hold	Max	Min
50th %ile Green (s)	5.5	9.3	8.0	5.5	9.3	8.0	27.0	27.0	0.0	15.0
50th %ile Term Code	Max	Hold	Max	Max	Gap	Max	Hold	Hold	Skip	Min
30th %ile Green (s)	0.0	8.0	7.6	0.0	8.0	7.6	26.6	26.6	0.0	15.0
30th %ile Term Code	Skip	Hold	Gap	Skip	Min	Gap	Hold	Hold	Skip	Min
10th %ile Green (s)	0.0	0.0	0.0	0.0	0.0	0.0	30.0	30.0	0.0	30.0
10th %ile Term Code	Skip	Skip	Skip	Skip	Skip	Skip	Dwell	Dwell	Skip	Dwell

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 52.8
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 64
70th %ile Actuated Cycle: 59.4
50th %ile Actuated Cycle: 57.8
30th %ile Actuated Cycle: 46.6
10th %ile Actuated Cycle: 36



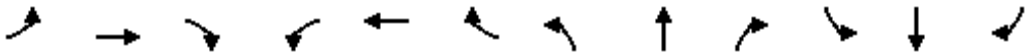
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	53	63	107	47	155	119	269	55	40	217
v/c Ratio	0.15	0.17	0.17	0.12	0.42	0.47	0.27	0.06	0.20	0.15
Control Delay	13.5	21.6	3.4	13.1	21.3	31.1	14.8	0.1	28.1	15.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	21.6	3.4	13.1	21.3	31.1	14.8	0.1	28.1	15.8
Queue Length 50th (ft)	12	19	0	10	39	39	54	0	13	28
Queue Length 95th (ft)	13	47	15	20	76	#92	148	0	22	53
Internal Link Dist (ft)		337			171		585			311
Turn Bay Length (ft)	165		175			500		70	115	
Base Capacity (vph)	358	686	655	394	653	276	1046	907	203	1588
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	0.15	0.09	0.16	0.12	0.24	0.43	0.26	0.06	0.20	0.14

Intersection Summary

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

Total Traffic Conditions (Phase I Development)

Saturday and Sunday Peak Hours



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	2000	1900	1900	1900	1900	1900	2000	1900	1900	1900	1900
Lane Width (ft)	10	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		1%			-3%			0%			0%	
Storage Length (ft)	165		175	0		150	500		70	115		115
Storage Lanes	1		1	1		1	0		1	1		1
Taper Length (ft)	145			260			25			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt			0.850		0.937				0.850		0.982	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	1924	1508	1771	1747	0	1745	1933	1531	1745	3397	0
Flt Permitted	0.589			0.653			0.950			0.950		
Satd. Flow (perm)	1039	1924	1508	1217	1747	0	1745	1933	1531	1745	3397	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			121		50				171		21	
Link Speed (mph)		30			30			35			30	
Link Distance (ft)		417			251			665			391	
Travel Time (s)		9.5			5.7			13.0			8.9	

Intersection Summary	
Area Type:	Other

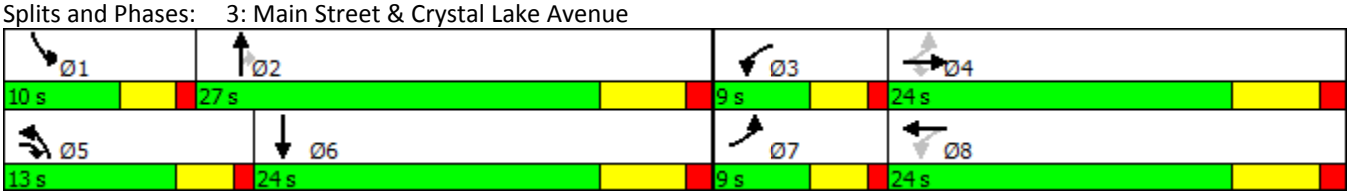
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	20	60	85	30	100	70	135	295	35	25	170	20
Future Volume (vph)	20	60	85	30	100	70	135	295	35	25	170	20
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.50	0.78	0.70	0.64	0.72	0.70	0.76	0.92	0.64	0.46	0.88	0.75
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	3%	0%	0%	0%	0%	0%	2%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	40	77	121	47	139	100	178	321	55	54	193	27
Shared Lane Traffic (%)												
Lane Group Flow (vph)	40	77	121	47	239	0	178	321	55	54	220	0

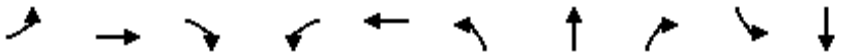
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	20	60	85	30	100	135	295	35	25	170
Future Volume (vph)	20	60	85	30	100	135	295	35	25	170
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	5	3	8	5	2		1	6
Permitted Phases	4		4	8				2		
Detector Phase	7	4	5	3	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	8.0	5.0	5.0	8.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	9.0	24.0	9.0	9.0	24.0	9.0	24.0	24.0	9.0	24.0
Total Split (s)	9.0	24.0	13.0	9.0	24.0	13.0	27.0	27.0	10.0	24.0
Total Split (%)	12.9%	34.3%	18.6%	12.9%	34.3%	18.6%	38.6%	38.6%	14.3%	34.3%
Yellow Time (s)	3.0	4.5	3.0	3.0	4.5	3.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.5	1.5	1.0	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	6.0	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	16.0	11.2	26.2	16.8	13.0	8.9	23.4	23.4	6.0	15.8
Actuated g/C Ratio	0.28	0.20	0.46	0.29	0.23	0.16	0.41	0.41	0.10	0.28
v/c Ratio	0.12	0.20	0.16	0.12	0.55	0.65	0.41	0.08	0.30	0.23
Control Delay	13.4	21.8	3.0	13.4	21.2	39.9	18.2	0.2	31.8	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	21.8	3.0	13.4	21.2	39.9	18.2	0.2	31.8	17.1
LOS	B	C	A	B	C	D	B	A	C	B
Approach Delay		10.8			19.9		23.4			20.0
Approach LOS		B			B		C			C

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 57.2	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 19.8	Intersection LOS: B
Intersection Capacity Utilization 49.9%	ICU Level of Service A
Analysis Period (min) 15	

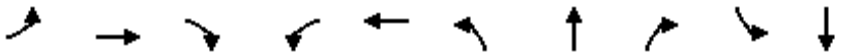
Splits and Phases: 3: Main Street & Crystal Lake Avenue





Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Protected Phases	7	4	5	3	8	5	2		1	6
Permitted Phases	4		4	8				2		
Minimum Initial (s)	5.0	8.0	5.0	5.0	8.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	9.0	24.0	9.0	9.0	24.0	9.0	24.0	24.0	9.0	24.0
Total Split (s)	9.0	24.0	13.0	9.0	24.0	13.0	27.0	27.0	10.0	24.0
Total Split (%)	12.9%	34.3%	18.6%	12.9%	34.3%	18.6%	38.6%	38.6%	14.3%	34.3%
Maximum Green (s)	5.0	18.0	9.0	5.0	18.0	9.0	21.0	21.0	6.0	18.0
Yellow Time (s)	3.0	4.5	3.0	3.0	4.5	3.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.5	1.5	1.0	1.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	Min	Min	None	Min
Walk Time (s)		7.0			7.0		7.0	7.0		7.0
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)		0			0		0	0		0
90th %ile Green (s)	5.0	18.0	9.0	5.0	18.0	9.0	21.0	21.0	6.0	18.0
90th %ile Term Code	Max	Hold	Max	Max	Max	Max	Max	Max	Max	Hold
70th %ile Green (s)	5.0	14.3	9.0	5.0	14.3	9.0	18.0	18.0	6.0	15.0
70th %ile Term Code	Max	Hold	Max	Max	Gap	Max	Hold	Hold	Max	Min
50th %ile Green (s)	0.0	8.0	9.0	5.0	17.0	9.0	18.0	18.0	6.0	15.0
50th %ile Term Code	Skip	Min	Max	Max	Hold	Max	Hold	Hold	Max	Min
30th %ile Green (s)	0.0	9.0	9.0	0.0	9.0	9.0	28.0	28.0	0.0	15.0
30th %ile Term Code	Skip	Hold	Max	Skip	Gap	Max	Hold	Hold	Skip	Min
10th %ile Green (s)	0.0	8.0	7.9	0.0	8.0	7.9	26.9	26.9	0.0	15.0
10th %ile Term Code	Skip	Hold	Gap	Skip	Min	Gap	Hold	Hold	Skip	Min

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 57.2
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 70
70th %ile Actuated Cycle: 63.3
50th %ile Actuated Cycle: 57
30th %ile Actuated Cycle: 49
10th %ile Actuated Cycle: 46.9



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	40	77	121	47	239	178	321	55	54	220
v/c Ratio	0.12	0.20	0.16	0.12	0.55	0.65	0.41	0.08	0.30	0.23
Control Delay	13.4	21.8	3.0	13.4	21.2	39.9	18.2	0.2	31.8	17.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	21.8	3.0	13.4	21.2	39.9	18.2	0.2	31.8	17.1
Queue Length 50th (ft)	9	24	0	11	50	58	88	0	17	27
Queue Length 95th (ft)	15	49	12	21	96	#131	190	0	27	60
Internal Link Dist (ft)		337			171		585			311
Turn Bay Length (ft)	165		175			500		70	115	
Base Capacity (vph)	346	618	764	406	595	280	829	754	187	1107
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	0.12	0.12	0.16	0.12	0.40	0.64	0.39	0.07	0.29	0.20

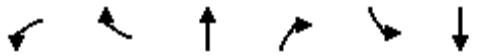
Intersection Summary

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



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	11	11
Grade (%)	0%		0%			0%
Storage Length (ft)	200	0		0	0	
Storage Lanes	1	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850	0.996			
Flt Protected	0.950					0.998
Satd. Flow (prot)	1805	1615	3476	0	0	3449
Flt Permitted	0.950					0.998
Satd. Flow (perm)	1805	1615	3476	0	0	3449
Link Speed (mph)	15		35			35
Link Distance (ft)	734		239			665
Travel Time (s)	33.4		4.7			13.0

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	45	15	450	5	5	280
Future Volume (vph)	45	15	450	5	5	280
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.46	0.46	0.86	0.38	0.50	0.88
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	98	33	523	13	10	318
Shared Lane Traffic (%)						
Lane Group Flow (vph)	98	33	536	0	0	328

Intersection Summary

Intersection	
Int Delay, s/veh	2.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	45	15	450	5	5	280
Future Vol, veh/h	45	15	450	5	5	280
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	46	46	86	38	50	88
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	98	33	523	13	10	318

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	709	268	0	0	536	0
Stage 1	530	-	-	-	-	-
Stage 2	179	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	373	736	-	-	1042	-
Stage 1	560	-	-	-	-	-
Stage 2	840	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	369	736	-	-	1042	-
Mov Cap-2 Maneuver	369	-	-	-	-	-
Stage 1	560	-	-	-	-	-
Stage 2	830	-	-	-	-	-

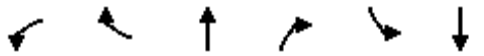
Approach	WB	NB	SB
HCM Control Delay, s	16.2	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	369	736	1042	-
HCM Lane V/C Ratio	-	-	0.265	0.044	0.01	-
HCM Control Delay (s)	-	-	18.2	10.1	8.5	0
HCM Lane LOS	-	-	C	B	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0.1	0	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Grade (%)	0%		0%			0%
Storage Length (ft)	250	0		0	0	
Storage Lanes	1	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850	0.989			
Flt Protected	0.950					0.999
Satd. Flow (prot)	1745	1561	3451	0	0	3452
Flt Permitted	0.950					0.999
Satd. Flow (perm)	1745	1561	3451	0	0	3452
Link Speed (mph)	30		35			35
Link Distance (ft)	737		362			239
Travel Time (s)	16.8		7.1			4.7

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	75	60	395	15	5	320
Future Volume (vph)	75	60	395	15	5	320
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.46	0.46	0.95	0.45	0.50	0.78
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	163	130	416	33	10	410
Shared Lane Traffic (%)						
Lane Group Flow (vph)	163	130	449	0	0	420

Intersection Summary

Intersection	
Int Delay, s/veh	4.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	75	60	395	15	5	320
Future Vol, veh/h	75	60	395	15	5	320
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	250	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	46	46	95	45	50	78
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	163	130	416	33	10	410

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	657	225	0	0	449	0
Stage 1	432	-	-	-	-	-
Stage 2	225	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	402	784	-	-	1122	-
Stage 1	628	-	-	-	-	-
Stage 2	797	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	397	784	-	-	1122	-
Mov Cap-2 Maneuver	397	-	-	-	-	-
Stage 1	628	-	-	-	-	-
Stage 2	787	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.9	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	397	784	1122	-
HCM Lane V/C Ratio	-	-	0.411	0.166	0.009	-
HCM Control Delay (s)	-	-	20.2	10.5	8.2	0
HCM Lane LOS	-	-	C	B	A	A
HCM 95th %tile Q(veh)	-	-	2	0.6	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	100
Storage Lanes		0	0		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.991					0.850
Flt Protected				0.994	0.950	
Satd. Flow (prot)	1866	0	0	1889	1805	1615
Flt Permitted				0.994	0.950	
Satd. Flow (perm)	1866	0	0	1889	1805	1615
Link Speed (mph)	30			30	30	
Link Distance (ft)	343			437	310	
Travel Time (s)	7.8			9.9	7.0	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	115	5	15	185	15	25
Future Volume (vph)	115	5	15	185	15	25
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.78	0.46	0.45	0.73	0.46	0.46
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	147	11	33	253	33	54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	158	0	0	286	33	54

Intersection Summary

Intersection						
Int Delay, s/veh	2.2					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	115	5	15	185	15	25
Future Vol, veh/h	115	5	15	185	15	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	46	45	73	46	46
Heavy Vehicles, %	1	0	0	0	0	0
Mvmt Flow	147	11	33	253	33	54

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	158	0	473	153
Stage 1	-	-	-	-	153	-
Stage 2	-	-	-	-	320	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1434	-	553	898
Stage 1	-	-	-	-	880	-
Stage 2	-	-	-	-	741	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1434	-	538	898
Mov Cap-2 Maneuver	-	-	-	-	538	-
Stage 1	-	-	-	-	880	-
Stage 2	-	-	-	-	721	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	10.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	538	898	-	-	1434	-
HCM Lane V/C Ratio	0.061	0.061	-	-	0.023	-
HCM Control Delay (s)	12.1	9.3	-	-	7.6	0
HCM Lane LOS	B	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	0.2	-	-	0.1	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	100
Storage Lanes		0	0		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.991					0.850
Flt Protected					0.950	
Satd. Flow (prot)	1803	0	0	1837	1745	1561
Flt Permitted					0.950	
Satd. Flow (perm)	1803	0	0	1837	1745	1561
Link Speed (mph)	30			30	30	
Link Distance (ft)	437			616	365	
Travel Time (s)	9.9			14.0	8.3	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	135	5	0	175	25	95
Future Volume (vph)	135	5	0	175	25	95
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.90	0.46	0.95	0.80	0.46	0.46
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	150	11	0	219	54	207
Shared Lane Traffic (%)						
Lane Group Flow (vph)	161	0	0	219	54	207

Intersection Summary

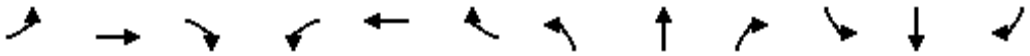
Intersection						
Int Delay, s/veh	4.2					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	135	5	0	175	25	95
Future Vol, veh/h	135	5	0	175	25	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	46	95	80	46	46
Heavy Vehicles, %	1	0	0	0	0	0
Mvmt Flow	150	11	0	219	54	207

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	161	0	374	155
Stage 1	-	-	-	-	155	-
Stage 2	-	-	-	-	219	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1430	-	631	896
Stage 1	-	-	-	-	878	-
Stage 2	-	-	-	-	822	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1430	-	631	896
Mov Cap-2 Maneuver	-	-	-	-	631	-
Stage 1	-	-	-	-	878	-
Stage 2	-	-	-	-	822	-

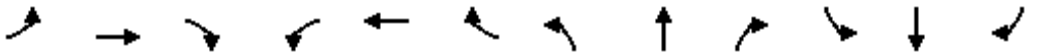
Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	631	896	-	-	1430	-
HCM Lane V/C Ratio	0.086	0.23	-	-	-	-
HCM Control Delay (s)	11.2	10.2	-	-	0	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	0.9	-	-	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	2000	1900	1900	1900	1900	1900	2000	1900	1900	1900	1900
Lane Width (ft)	10	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		1%			-3%			0%			0%	
Storage Length (ft)	165		175	0		150	500		70	115		115
Storage Lanes	1		1	1		1	0		1	1		1
Taper Length (ft)	145			260			25			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor												
Frt			0.850		0.955				0.850		0.980	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1676	1924	1508	1771	1780	0	1745	1933	1531	1745	3391	0
Flt Permitted	0.587			0.383			0.950			0.950		
Satd. Flow (perm)	1036	1924	1508	714	1780	0	1745	1933	1531	1745	3391	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			154		30				171		24	
Link Speed (mph)		30			30			35			30	
Link Distance (ft)		417			251			665			391	
Travel Time (s)		9.5			5.7			13.0			8.9	

Intersection Summary	
Area Type:	Other



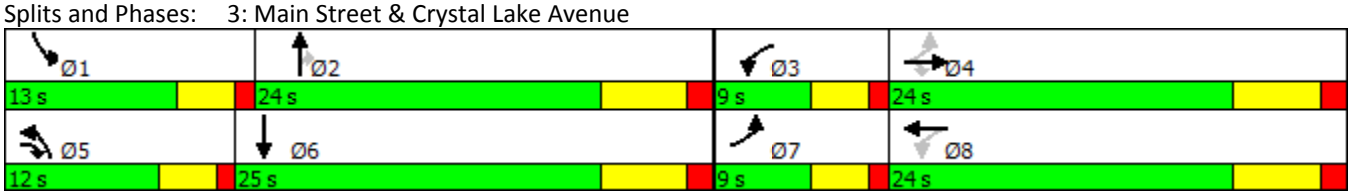
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	15	195	240	95	155	70	185	400	60	95	445	70
Future Volume (vph)	15	195	240	95	155	70	185	400	60	95	445	70
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.67	0.78	0.83	0.79	0.82	0.97	0.89	0.84	0.47	0.75	0.75
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	3%	0%	0%	0%	0%	0%	2%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	18	291	308	114	196	85	191	449	71	202	593	93
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	291	308	114	281	0	191	449	71	202	686	0

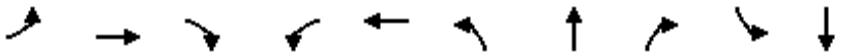
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	15	195	240	95	155	185	400	60	95	445
Future Volume (vph)	15	195	240	95	155	185	400	60	95	445
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	Prot	NA	Perm	Prot	NA
Protected Phases	7	4	5	3	8	5	2		1	6
Permitted Phases	4		4	8				2		
Detector Phase	7	4	5	3	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	8.0	5.0	5.0	8.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	9.0	24.0	9.0	9.0	24.0	9.0	24.0	24.0	9.0	24.0
Total Split (s)	9.0	24.0	12.0	9.0	24.0	12.0	24.0	24.0	13.0	25.0
Total Split (%)	12.9%	34.3%	17.1%	12.9%	34.3%	17.1%	34.3%	34.3%	18.6%	35.7%
Yellow Time (s)	3.0	4.5	3.0	3.0	4.5	3.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.5	1.5	1.0	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	6.0	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	20.1	14.3	28.5	22.4	19.4	8.2	17.6	17.6	9.2	18.6
Actuated g/C Ratio	0.31	0.22	0.44	0.35	0.30	0.13	0.27	0.27	0.14	0.29
v/c Ratio	0.05	0.68	0.41	0.34	0.50	0.86	0.85	0.13	0.81	0.69
Control Delay	12.8	32.1	8.2	16.4	20.2	67.7	41.6	0.5	57.1	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	32.1	8.2	16.4	20.2	67.7	41.6	0.5	57.1	24.8
LOS	B	C	A	B	C	E	D	A	E	C
Approach Delay		19.6			19.1		44.5			32.1
Approach LOS		B			B		D			C

Intersection Summary	
Cycle Length: 70	
Actuated Cycle Length: 64.1	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 30.6	Intersection LOS: C
Intersection Capacity Utilization 58.5%	ICU Level of Service B
Analysis Period (min) 15	

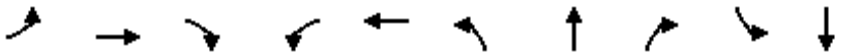
Splits and Phases: 3: Main Street & Crystal Lake Avenue





Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Protected Phases	7	4	5	3	8	5	2		1	6
Permitted Phases	4		4	8				2		
Minimum Initial (s)	5.0	8.0	5.0	5.0	8.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	9.0	24.0	9.0	9.0	24.0	9.0	24.0	24.0	9.0	24.0
Total Split (s)	9.0	24.0	12.0	9.0	24.0	12.0	24.0	24.0	13.0	25.0
Total Split (%)	12.9%	34.3%	17.1%	12.9%	34.3%	17.1%	34.3%	34.3%	18.6%	35.7%
Maximum Green (s)	5.0	18.0	8.0	5.0	18.0	8.0	18.0	18.0	9.0	19.0
Yellow Time (s)	3.0	4.5	3.0	3.0	4.5	3.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.5	1.5	1.0	1.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	Min	Min	None	Min
Walk Time (s)		7.0			7.0		7.0	7.0		7.0
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)		0			0		0	0		0
90th %ile Green (s)	5.0	18.0	8.0	5.0	18.0	8.0	18.0	18.0	9.0	19.0
90th %ile Term Code	Max	Max	Max	Max	Max	Max	Max	Max	Max	Max
70th %ile Green (s)	0.0	17.8	8.0	5.0	26.8	8.0	18.0	18.0	9.0	19.0
70th %ile Term Code	Skip	Gap	Max	Max	Hold	Max	Max	Max	Max	Max
50th %ile Green (s)	0.0	15.2	8.0	5.0	24.2	8.0	18.0	18.0	9.0	19.0
50th %ile Term Code	Skip	Gap	Max	Max	Hold	Max	Max	Max	Max	Hold
30th %ile Green (s)	0.0	12.7	8.0	5.0	21.7	8.0	18.0	18.0	9.0	19.0
30th %ile Term Code	Skip	Gap	Max	Max	Hold	Max	Max	Max	Max	Hold
10th %ile Green (s)	0.0	8.7	8.0	0.0	8.7	8.0	15.0	15.0	9.0	16.0
10th %ile Term Code	Skip	Gap	Max	Skip	Hold	Max	Min	Min	Max	Hold

Intersection Summary
Cycle Length: 70
Actuated Cycle Length: 64.1
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 70
70th %ile Actuated Cycle: 69.8
50th %ile Actuated Cycle: 67.2
30th %ile Actuated Cycle: 64.7
10th %ile Actuated Cycle: 48.7



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	18	291	308	114	281	191	449	71	202	686
v/c Ratio	0.05	0.68	0.41	0.34	0.50	0.86	0.85	0.13	0.81	0.69
Control Delay	12.8	32.1	8.2	16.4	20.2	67.7	41.6	0.5	57.1	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	32.1	8.2	16.4	20.2	67.7	41.6	0.5	57.1	24.8
Queue Length 50th (ft)	4	109	38	30	75	79	175	0	83	127
Queue Length 95th (ft)	15	127	66	55	140	#201	#343	0	74	151
Internal Link Dist (ft)		337			171		585			311
Turn Bay Length (ft)	165		175			500		70	115	
Base Capacity (vph)	375	550	756	333	627	221	553	560	249	1040
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	0.05	0.53	0.41	0.34	0.45	0.86	0.81	0.13	0.81	0.66

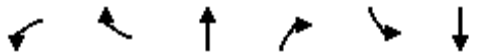
Intersection Summary

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



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	11	11	11	11
Grade (%)	0%		0%			0%
Storage Length (ft)	200	0		0	0	
Storage Lanes	1	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850	0.984			
Flt Protected	0.950					0.997
Satd. Flow (prot)	1805	1615	3434	0	0	3447
Flt Permitted	0.950					0.997
Satd. Flow (perm)	1805	1615	3434	0	0	3447
Link Speed (mph)	15		35			35
Link Distance (ft)	851		239			665
Travel Time (s)	38.7		4.7			13.0

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	85	20	625	45	30	750
Future Volume (vph)	85	20	625	45	30	750
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.58	0.58	0.93	0.54	0.54	0.81
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	147	34	672	83	56	926
Shared Lane Traffic (%)						
Lane Group Flow (vph)	147	34	755	0	0	982

Intersection Summary

Intersection	
Int Delay, s/veh	13

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	85	20	625	45	30	750
Future Vol, veh/h	85	20	625	45	30	750
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	58	58	93	54	54	81
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	147	34	672	83	56	926

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1288	378	0	0	755	0
Stage 1	714	-	-	-	-	-
Stage 2	574	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	158	625	-	-	865	-
Stage 1	452	-	-	-	-	-
Stage 2	532	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 137	625	-	-	865	-
Mov Cap-2 Maneuver	~ 137	-	-	-	-	-
Stage 1	452	-	-	-	-	-
Stage 2	461	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	132	0	1.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	137	625	865	-
HCM Lane V/C Ratio	-	-	1.07	0.055	0.064	-
HCM Control Delay (s)	-	-	160.5	11.1	9.4	0.6
HCM Lane LOS	-	-	F	B	A	A
HCM 95th %tile Q(veh)	-	-	8	0.2	0.2	-

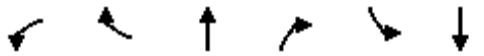
Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Grade (%)	0%		0%			0%
Storage Length (ft)	250	0		0	0	
Storage Lanes	1	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850	0.946			
Flt Protected	0.950					0.995
Satd. Flow (prot)	1745	1561	3301	0	0	3441
Flt Permitted	0.950					0.995
Satd. Flow (perm)	1745	1561	3301	0	0	3441
Link Speed (mph)	30		35			35
Link Distance (ft)	923		362			239
Travel Time (s)	21.0		7.1			4.7

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	130	120	550	195	60	775
Future Volume (vph)	130	120	550	195	60	775
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.58	0.58	0.91	0.58	0.58	0.86
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	224	207	604	336	103	901
Shared Lane Traffic (%)						
Lane Group Flow (vph)	224	207	940	0	0	1004

Intersection Summary

Intersection	
Int Delay, s/veh	73.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	130	120	550	195	60	775
Future Vol, veh/h	130	120	550	195	60	775
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	250	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	58	58	91	58	58	86
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	224	207	604	336	103	901

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1429	470	0	0	941	0
Stage 1	772	-	-	-	-	-
Stage 2	657	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	~ 128	545	-	-	737	-
Stage 1	422	-	-	-	-	-
Stage 2	483	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 92	545	-	-	737	-
Mov Cap-2 Maneuver	~ 92	-	-	-	-	-
Stage 1	422	-	-	-	-	-
Stage 2	348	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	$ 398.1	0	2.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	92	545	737	-
HCM Lane V/C Ratio	-	-	2.436	0.38	0.14	-
HCM Control Delay (s)	-	-	$ 751.1	15.6	10.7	1.2
HCM Lane LOS	-	-	F	C	B	A
HCM 95th %tile Q(veh)	-	-	20.6	1.8	0.5	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	100
Storage Lanes		0	0		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.979					0.850
Flt Protected				0.975	0.950	
Satd. Flow (prot)	1845	0	0	1852	1805	1615
Flt Permitted				0.975	0.950	
Satd. Flow (perm)	1845	0	0	1852	1805	1615
Link Speed (mph)	30			30	30	
Link Distance (ft)	343			437	327	
Travel Time (s)	7.8			9.9	7.4	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	305	45	235	300	20	45
Future Volume (vph)	305	45	235	300	20	45
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.72	0.58	0.58	0.78	0.58	0.58
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	424	78	405	385	34	78
Shared Lane Traffic (%)						
Lane Group Flow (vph)	502	0	0	790	34	78

Intersection Summary

Intersection	
Int Delay, s/veh	7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	305	45	235	300	20	45
Future Vol, veh/h	305	45	235	300	20	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	72	58	58	78	58	58
Heavy Vehicles, %	1	0	0	0	0	0
Mvmt Flow	424	78	405	385	34	78

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	501	0	1657	462
Stage 1	-	-	-	-	462	-
Stage 2	-	-	-	-	1195	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1074	-	109	604
Stage 1	-	-	-	-	638	-
Stage 2	-	-	-	-	290	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1074	-	57	604
Mov Cap-2 Maneuver	-	-	-	-	57	-
Stage 1	-	-	-	-	638	-
Stage 2	-	-	-	-	151	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.3	50.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	57	604	-	-	1074	-
HCM Lane V/C Ratio	0.605	0.128	-	-	0.377	-
HCM Control Delay (s)	137.7	11.8	-	-	10.4	0
HCM Lane LOS	F	B	-	-	B	A
HCM 95th %tile Q(veh)	2.5	0.4	-	-	1.8	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	100
Storage Lanes		0	0		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.952					0.850
Flt Protected					0.950	
Satd. Flow (prot)	1737	0	0	1837	1745	1561
Flt Permitted					0.950	
Satd. Flow (perm)	1737	0	0	1837	1745	1561
Link Speed (mph)	30			30	30	
Link Distance (ft)	437			616	329	
Travel Time (s)	9.9			14.0	7.5	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	255	95	0	490	45	160
Future Volume (vph)	255	95	0	490	45	160
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.86	0.58	0.95	0.78	0.58	0.58
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	297	164	0	628	78	276
Shared Lane Traffic (%)						
Lane Group Flow (vph)	461	0	0	628	78	276

Intersection Summary

Intersection	
Int Delay, s/veh	3.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	255	95	0	490	45	160
Future Vol, veh/h	255	95	0	490	45	160
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	58	95	78	58	58
Heavy Vehicles, %	1	0	0	0	0	0
Mvmt Flow	297	164	0	628	78	276

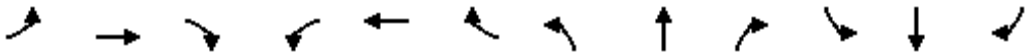
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	460	0	1006	378
Stage 1	-	-	-	-	378	-
Stage 2	-	-	-	-	628	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1112	-	270	673
Stage 1	-	-	-	-	697	-
Stage 2	-	-	-	-	536	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1112	-	270	673
Mov Cap-2 Maneuver	-	-	-	-	270	-
Stage 1	-	-	-	-	697	-
Stage 2	-	-	-	-	536	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	16.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	270	673	-	-	1112	-
HCM Lane V/C Ratio	0.287	0.41	-	-	-	-
HCM Control Delay (s)	23.6	14	-	-	0	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	1.2	2	-	-	0	-

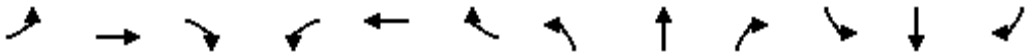
Total Traffic Conditions (Full Build-Out Development)

Saturday and Sunday Peak Hours



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	2000	1900	1900	1900	1900	1900	2000	1900	1900	1900	1900
Lane Width (ft)	10	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		-1%			-3%			0%			-1%	
Storage Length (ft)	146		146	378		0	294		117	115		100
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	193			155			155			135		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	0.98		0.96	0.97	0.98		0.97				0.99	
Frt			0.850		0.938				0.850		0.988	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1524	1749	1371	1594	1546	0	1570	3306	1378	1578	3072	0
Flt Permitted	0.502			0.700			0.486			0.548		
Satd. Flow (perm)	790	1749	1312	1142	1546	0	777	3306	1378	910	3072	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			129		39				126		9	
Link Speed (mph)		30			30			35			30	
Link Distance (ft)		417			676			665			276	
Travel Time (s)		9.5			15.4			13.0			6.3	

Intersection Summary	
Area Type:	CBD



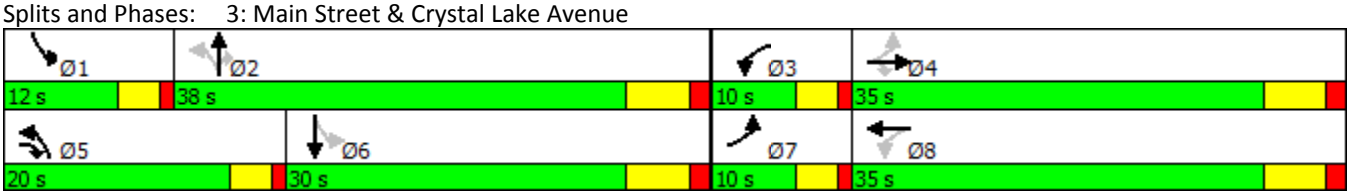
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	20	65	90	30	105	75	145	315	40	25	185	15
Future Volume (vph)	20	65	90	30	105	75	145	315	40	25	185	15
Confl. Peds. (#/hr)	20		20	20		20	20					20
Confl. Bikes (#/hr)												
Peak Hour Factor	0.48	0.74	0.70	0.63	0.72	0.72	0.77	0.93	0.65	0.38	0.80	0.75
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	3%	0%	0%	0%	0%	0%	2%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	42	88	129	48	146	104	188	339	62	66	231	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	88	129	48	250	0	188	339	62	66	251	0

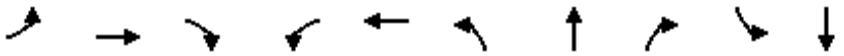
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	20	65	90	30	105	145	315	40	25	185
Future Volume (vph)	20	65	90	30	105	145	315	40	25	185
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	5	3	8	5	2		1	6
Permitted Phases	4		4	8		2		2	6	
Detector Phase	7	4	5	3	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	8.0	5.0	5.0	8.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	24.0	24.0	9.5	24.0
Total Split (s)	10.0	35.0	20.0	10.0	35.0	20.0	38.0	38.0	12.0	30.0
Total Split (%)	10.5%	36.8%	21.1%	10.5%	36.8%	21.1%	40.0%	40.0%	12.6%	31.6%
Yellow Time (s)	3.0	4.5	3.0	3.0	4.5	3.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.5	1.5	1.0	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	6.0	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	19.5	14.2	27.6	19.5	14.2	33.2	25.0	25.0	24.7	15.7
Actuated g/C Ratio	0.31	0.23	0.44	0.31	0.23	0.53	0.40	0.40	0.39	0.25
v/c Ratio	0.13	0.22	0.20	0.12	0.66	0.34	0.26	0.10	0.15	0.33
Control Delay	14.2	22.8	2.7	14.0	28.7	12.6	18.1	0.6	12.0	23.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.2	22.8	2.7	14.0	28.7	12.6	18.1	0.6	12.0	23.7
LOS	B	C	A	B	C	B	B	A	B	C
Approach Delay		11.4			26.4		14.5			21.3
Approach LOS		B			C		B			C

Intersection Summary	
Cycle Length: 95	
Actuated Cycle Length: 63.1	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 17.8	Intersection LOS: B
Intersection Capacity Utilization 54.4%	ICU Level of Service A
Analysis Period (min) 15	

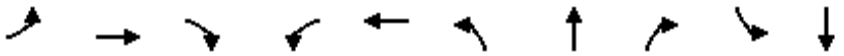
Splits and Phases: 3: Main Street & Crystal Lake Avenue





Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Protected Phases	7	4	5	3	8	5	2		1	6
Permitted Phases	4		4	8		2		2	6	
Minimum Initial (s)	5.0	8.0	5.0	5.0	8.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	24.0	24.0	9.5	24.0
Total Split (s)	10.0	35.0	20.0	10.0	35.0	20.0	38.0	38.0	12.0	30.0
Total Split (%)	10.5%	36.8%	21.1%	10.5%	36.8%	21.1%	40.0%	40.0%	12.6%	31.6%
Maximum Green (s)	6.0	29.0	16.0	6.0	29.0	16.0	32.0	32.0	8.0	24.0
Yellow Time (s)	3.0	4.5	3.0	3.0	4.5	3.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.5	1.5	1.0	1.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	Min	Min	None	Min
Walk Time (s)		7.0			7.0		7.0	7.0		7.0
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)		0			0		0	0		0
90th %ile Green (s)	6.0	22.7	16.0	6.0	22.7	16.0	23.0	23.0	8.0	15.0
90th %ile Term Code	Max	Hold	Max	Max	Gap	Max	Hold	Hold	Max	Min
70th %ile Green (s)	6.0	17.5	13.4	6.0	17.5	13.4	20.5	20.5	7.9	15.0
70th %ile Term Code	Max	Hold	Gap	Max	Gap	Gap	Hold	Hold	Gap	Min
50th %ile Green (s)	6.0	14.5	11.1	6.0	14.5	11.1	19.1	19.1	7.0	15.0
50th %ile Term Code	Max	Hold	Gap	Max	Gap	Gap	Hold	Hold	Gap	Min
30th %ile Green (s)	0.0	10.7	9.3	0.0	10.7	9.3	28.3	28.3	0.0	15.0
30th %ile Term Code	Skip	Hold	Gap	Skip	Gap	Gap	Hold	Hold	Skip	Min
10th %ile Green (s)	0.0	8.0	7.2	0.0	8.0	7.2	26.2	26.2	0.0	15.0
10th %ile Term Code	Skip	Hold	Gap	Skip	Min	Gap	Hold	Hold	Skip	Min

Intersection Summary
Cycle Length: 95
Actuated Cycle Length: 63.1
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 79.7
70th %ile Actuated Cycle: 71.9
50th %ile Actuated Cycle: 66.6
30th %ile Actuated Cycle: 51
10th %ile Actuated Cycle: 46.2



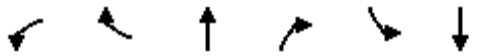
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	42	88	129	48	250	188	339	62	66	251
v/c Ratio	0.13	0.22	0.20	0.12	0.66	0.34	0.26	0.10	0.15	0.33
Control Delay	14.2	22.8	2.7	14.0	28.7	12.6	18.1	0.6	12.0	23.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.2	22.8	2.7	14.0	28.7	12.6	18.1	0.6	12.0	23.7
Queue Length 50th (ft)	10	30	0	12	79	42	57	0	14	43
Queue Length 95th (ft)	16	55	10	23	116	80	106	0	16	80
Internal Link Dist (ft)		337			596		585			196
Turn Bay Length (ft)	146		146	378		294		117	115	
Base Capacity (vph)	316	839	764	397	761	618	1750	788	464	1225
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	0.13	0.10	0.17	0.12	0.33	0.30	0.19	0.08	0.14	0.20

Intersection Summary



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	2000
Lane Width (ft)	11	11	11	11	11	11
Grade (%)	0%		0%			0%
Storage Length (ft)	200	0		0	125	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				155	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.997			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1745	1561	3479	0	1745	3637
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1745	1561	3479	0	1745	3637
Link Speed (mph)	15		35			35
Link Distance (ft)	846		239			665
Travel Time (s)	38.5		4.7			13.0

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	45	15	485	5	5	300
Future Volume (vph)	45	15	485	5	5	300
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.46	0.46	0.87	0.38	0.50	0.88
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	98	33	557	13	10	341
Shared Lane Traffic (%)						
Lane Group Flow (vph)	98	33	570	0	10	341

Intersection Summary

Intersection	
Int Delay, s/veh	2.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	45	15	485	5	5	300
Future Vol, veh/h	45	15	485	5	5	300
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	-	-	125	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	46	46	87	38	50	88
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	98	33	557	13	10	341

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	754	285	0	0	571	0
Stage 1	564	-	-	-	-	-
Stage 2	190	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	349	718	-	-	1012	-
Stage 1	539	-	-	-	-	-
Stage 2	829	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	346	718	-	-	1012	-
Mov Cap-2 Maneuver	346	-	-	-	-	-
Stage 1	539	-	-	-	-	-
Stage 2	821	-	-	-	-	-

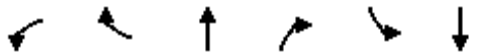
Approach	WB	NB	SB
HCM Control Delay, s	17.2	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	346	718	1012	-
HCM Lane V/C Ratio	-	-	0.283	0.045	0.01	-
HCM Control Delay (s)	-	-	19.5	10.3	8.6	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	1.1	0.1	0	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	2000	1900	1900	2000
Lane Width (ft)	11	11	11	11	11	11
Grade (%)	0%		0%			0%
Storage Length (ft)	250	0		145	150	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1745	1561	3673	1561	1745	3637
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1745	1561	3673	1561	1745	3637
Link Speed (mph)	30		35			35
Link Distance (ft)	851		896			239
Travel Time (s)	19.3		17.5			4.7

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	75	60	430	15	5	340
Future Volume (vph)	75	60	430	15	5	340
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.46	0.46	0.95	0.45	0.50	0.78
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	163	130	453	33	10	436
Shared Lane Traffic (%)						
Lane Group Flow (vph)	163	130	453	33	10	436

Intersection Summary

Intersection	
Int Delay, s/veh	4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	75	60	430	15	5	340
Future Vol, veh/h	75	60	430	15	5	340
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	250	0	-	145	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	46	46	95	45	50	78
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	163	130	453	33	10	436

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	691	226	0	0	453	0
Stage 1	453	-	-	-	-	-
Stage 2	238	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	383	783	-	-	1118	-
Stage 1	613	-	-	-	-	-
Stage 2	785	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	380	783	-	-	1118	-
Mov Cap-2 Maneuver	380	-	-	-	-	-
Stage 1	613	-	-	-	-	-
Stage 2	778	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.6	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	380	783	1118	-
HCM Lane V/C Ratio	-	-	0.429	0.167	0.009	-
HCM Control Delay (s)	-	-	21.4	10.5	8.2	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	2.1	0.6	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	2000	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	145		0	100
Storage Lanes		0	1		1	1
Taper Length (ft)			175		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.991					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1865	0	1805	2000	1805	1615
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	1865	0	1805	2000	1805	1615
Link Speed (mph)	30			30	30	
Link Distance (ft)	676			355	326	
Travel Time (s)	15.4			8.1	7.4	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	125	5	15	195	15	25
Future Volume (vph)	125	5	15	195	15	25
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.78	0.46	0.45	0.73	0.46	0.46
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	160	11	33	267	33	54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	171	0	33	267	33	54

Intersection Summary

Intersection	
Int Delay, s/veh	2.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	125	5	15	195	15	25
Future Vol, veh/h	125	5	15	195	15	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	145	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	46	45	73	46	46
Heavy Vehicles, %	1	0	0	0	0	0
Mvmt Flow	160	11	33	267	33	54

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	171	0	500	166
Stage 1	-	-	-	-	166	-
Stage 2	-	-	-	-	334	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1418	-	534	884
Stage 1	-	-	-	-	868	-
Stage 2	-	-	-	-	730	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1418	-	522	884
Mov Cap-2 Maneuver	-	-	-	-	522	-
Stage 1	-	-	-	-	868	-
Stage 2	-	-	-	-	713	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	522	884	-	-	1418	-
HCM Lane V/C Ratio	0.062	0.061	-	-	0.024	-
HCM Control Delay (s)	12.4	9.3	-	-	7.6	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0.2	0.2	-	-	0.1	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Grade (%)	0%			0%	0%	
Storage Length (ft)		145	0		0	100
Storage Lanes		1	0		1	1
Taper Length (ft)			25		175	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected					0.950	
Satd. Flow (prot)	1818	1561	0	1837	1745	1561
Flt Permitted					0.950	
Satd. Flow (perm)	1818	1561	0	1837	1745	1561
Link Speed (mph)	30			30	30	
Link Distance (ft)	355			616	487	
Travel Time (s)	8.1			14.0	11.1	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	145	5	0	185	25	95
Future Volume (vph)	145	5	0	185	25	95
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.85	0.46	0.25	0.80	0.46	0.46
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	171	11	0	231	54	207
Shared Lane Traffic (%)						
Lane Group Flow (vph)	171	11	0	231	54	207

Intersection Summary

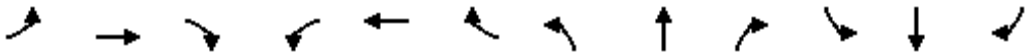
Intersection	
Int Delay, s/veh	4.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	145	5	0	185	25	95
Future Vol, veh/h	145	5	0	185	25	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	145	-	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	46	25	80	46	46
Heavy Vehicles, %	1	0	0	0	0	0
Mvmt Flow	171	11	0	231	54	207

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	171	0	402	171
Stage 1	-	-	-	-	171	-
Stage 2	-	-	-	-	231	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1418	-	608	878
Stage 1	-	-	-	-	864	-
Stage 2	-	-	-	-	812	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1418	-	608	878
Mov Cap-2 Maneuver	-	-	-	-	608	-
Stage 1	-	-	-	-	864	-
Stage 2	-	-	-	-	812	-

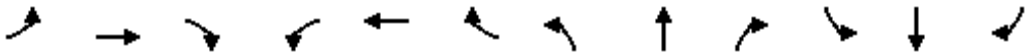
Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	608	878	-	-	1418	-
HCM Lane V/C Ratio	0.089	0.235	-	-	-	-
HCM Control Delay (s)	11.5	10.4	-	-	0	-
HCM Lane LOS	B	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	0.9	-	-	0	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	2000	1900	1900	1900	1900	1900	2000	1900	1900	1900	1900
Lane Width (ft)	10	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		-1%			-3%			0%			-1%	
Storage Length (ft)	146		146	378		0	294		117	115		100
Storage Lanes	1		1	1		0	1		1	1		1
Taper Length (ft)	193			155			155			135		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	0.95
Ped Bike Factor	0.99		0.96	0.98	0.98		0.99				1.00	
Frt			0.850		0.940				0.850		0.996	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1524	1749	1371	1594	1550	0	1570	3306	1378	1578	3107	0
Flt Permitted	0.369			0.373			0.208			0.442		
Satd. Flow (perm)	584	1749	1312	616	1550	0	339	3306	1378	734	3107	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			122		35				126		3	
Link Speed (mph)		30			30			35			30	
Link Distance (ft)		417			676			669			276	
Travel Time (s)		9.5			15.4			13.0			6.3	

Intersection Summary	
Area Type:	CBD



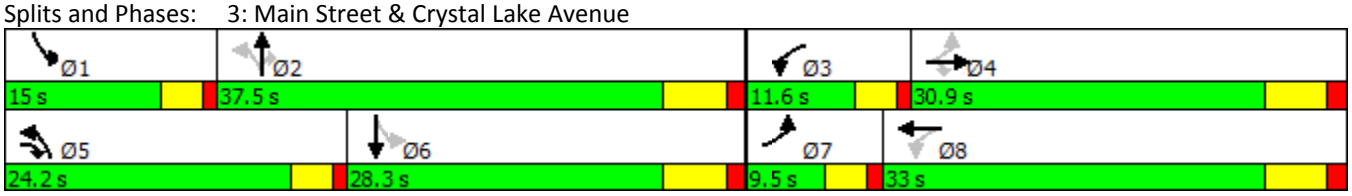
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	15	205	260	100	165	75	195	425	65	95	475	10
Future Volume (vph)	15	205	260	100	165	75	195	425	65	95	475	10
Confl. Peds. (#/hr)	20		20	20		20	20					20
Confl. Bikes (#/hr)												
Peak Hour Factor	0.80	0.75	0.75	0.85	0.71	0.49	0.61	0.76	0.72	0.59	0.79	0.56
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	3%	0%	0%	0%	0%	0%	2%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	19	273	347	118	232	153	320	559	90	161	601	18
Shared Lane Traffic (%)												
Lane Group Flow (vph)	19	273	347	118	385	0	320	559	90	161	619	0

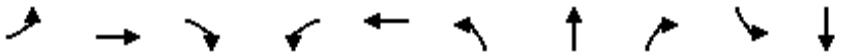
Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	15	205	260	100	165	195	425	65	95	475
Future Volume (vph)	15	205	260	100	165	195	425	65	95	475
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4	5	3	8	5	2		1	6
Permitted Phases	4		4	8		2		2	6	
Detector Phase	7	4	5	3	8	5	2	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	8.0	5.0	5.0	8.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	24.0	24.0	9.5	24.0
Total Split (s)	9.5	30.9	24.2	11.6	33.0	24.2	37.5	37.5	15.0	28.3
Total Split (%)	10.0%	32.5%	25.5%	12.2%	34.7%	25.5%	39.5%	39.5%	15.8%	29.8%
Yellow Time (s)	3.0	4.5	3.0	3.0	4.5	3.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.5	1.5	1.0	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	4.0	4.0	6.0	4.0	6.0	6.0	4.0	6.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	None	Min	Min	None	Min
Act Effct Green (s)	25.6	19.4	39.1	29.5	24.8	44.1	28.4	28.4	31.9	20.3
Actuated g/C Ratio	0.31	0.23	0.47	0.36	0.30	0.53	0.34	0.34	0.39	0.25
v/c Ratio	0.08	0.66	0.50	0.38	0.79	0.72	0.49	0.16	0.42	0.81
Control Delay	18.3	39.1	11.2	22.3	38.9	25.6	24.4	2.6	16.5	40.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.3	39.1	11.2	22.3	38.9	25.6	24.4	2.6	16.5	40.6
LOS	B	D	B	C	D	C	C	A	B	D
Approach Delay		23.3			35.0		22.8			35.6
Approach LOS		C			C		C			D

Intersection Summary	
Cycle Length: 95	
Actuated Cycle Length: 82.6	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 28.5	Intersection LOS: C
Intersection Capacity Utilization 63.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Main Street & Crystal Lake Avenue





Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Protected Phases	7	4	5	3	8	5	2		1	6
Permitted Phases	4		4	8		2		2	6	
Minimum Initial (s)	5.0	8.0	5.0	5.0	8.0	5.0	15.0	15.0	5.0	15.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	24.0	24.0	9.5	24.0
Total Split (s)	9.5	30.9	24.2	11.6	33.0	24.2	37.5	37.5	15.0	28.3
Total Split (%)	10.0%	32.5%	25.5%	12.2%	34.7%	25.5%	39.5%	39.5%	15.8%	29.8%
Maximum Green (s)	5.5	24.9	20.2	7.6	27.0	20.2	31.5	31.5	11.0	22.3
Yellow Time (s)	3.0	4.5	3.0	3.0	4.5	3.0	4.5	4.5	3.0	4.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.5	1.5	1.0	1.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?										
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Minimum Gap (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Mode	None	None	None	None	None	None	Min	Min	None	Min
Walk Time (s)		7.0			7.0		7.0	7.0		7.0
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0
Pedestrian Calls (#/hr)		0			0		0	0		0
90th %ile Green (s)	5.5	24.9	20.2	7.6	27.0	20.2	31.5	31.5	11.0	22.3
90th %ile Term Code	Max	Max	Max	Max	Max	Max	Hold	Hold	Max	Max
70th %ile Green (s)	5.5	24.9	20.2	7.6	27.0	20.2	31.5	31.5	11.0	22.3
70th %ile Term Code	Max	Hold	Max	Max	Max	Max	Hold	Hold	Max	Max
50th %ile Green (s)	0.0	18.7	20.2	7.6	30.3	20.2	32.4	32.4	10.1	22.3
50th %ile Term Code	Skip	Gap	Max	Max	Hold	Max	Hold	Hold	Gap	Max
30th %ile Green (s)	0.0	15.1	16.3	7.6	26.7	16.3	26.8	26.8	8.5	19.0
30th %ile Term Code	Skip	Gap	Gap	Max	Hold	Gap	Hold	Hold	Gap	Gap
10th %ile Green (s)	0.0	14.0	11.3	0.0	14.0	11.3	19.6	19.6	6.7	15.0
10th %ile Term Code	Skip	Hold	Gap	Skip	Gap	Gap	Hold	Hold	Gap	Min

Intersection Summary
Cycle Length: 95
Actuated Cycle Length: 82.6
Control Type: Actuated-Uncoordinated
90th %ile Actuated Cycle: 95
70th %ile Actuated Cycle: 95
50th %ile Actuated Cycle: 88.8
30th %ile Actuated Cycle: 78
10th %ile Actuated Cycle: 56.3

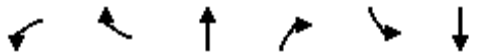
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	19	273	347	118	385	320	559	90	161	619
v/c Ratio	0.08	0.66	0.50	0.38	0.79	0.72	0.49	0.16	0.42	0.81
Control Delay	18.3	39.1	11.2	22.3	38.9	25.6	24.4	2.6	16.5	40.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.3	39.1	11.2	22.3	38.9	25.6	24.4	2.6	16.5	40.6
Queue Length 50th (ft)	7	144	73	45	168	96	123	0	43	170
Queue Length 95th (ft)	18	181	97	78	221	107	155	3	54	214
Internal Link Dist (ft)		337			596		589			196
Turn Bay Length (ft)	146		146	378		294		117	115	
Base Capacity (vph)	246	547	749	313	560	493	1316	624	417	873
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	0.08	0.50	0.46	0.38	0.69	0.65	0.42	0.14	0.39	0.71

Intersection Summary



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	2000
Lane Width (ft)	11	11	11	11	11	11
Grade (%)	0%		0%			0%
Storage Length (ft)	200	0		0	125	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				155	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95
Ped Bike Factor						
Frt		0.850	0.988			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1745	1561	3448	0	1745	3637
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1745	1561	3448	0	1745	3637
Link Speed (mph)	15		35			35
Link Distance (ft)	855		234			669
Travel Time (s)	38.9		4.6			13.0

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	85	20	665	45	30	805
Future Volume (vph)	85	20	665	45	30	805
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.58	0.58	0.77	0.58	0.58	0.80
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	147	34	864	78	52	1006
Shared Lane Traffic (%)						
Lane Group Flow (vph)	147	34	942	0	52	1006

Intersection Summary

Intersection	
Int Delay, s/veh	20.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	85	20	665	45	30	805
Future Vol, veh/h	85	20	665	45	30	805
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	200	0	-	-	125	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	58	58	77	58	58	80
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	147	34	864	78	52	1006

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1509	471	0	0	941	0
Stage 1	902	-	-	-	-	-
Stage 2	607	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	~ 113	545	-	-	737	-
Stage 1	361	-	-	-	-	-
Stage 2	512	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 105	545	-	-	737	-
Mov Cap-2 Maneuver	~ 105	-	-	-	-	-
Stage 1	361	-	-	-	-	-
Stage 2	476	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	245.2	0	0.5
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	105	545	737	-
HCM Lane V/C Ratio	-	-	1.396	0.063	0.07	-
HCM Control Delay (s)	-	-	300	12.1	10.3	-
HCM Lane LOS	-	-	F	B	B	-
HCM 95th %tile Q(veh)	-	-	10.5	0.2	0.2	-

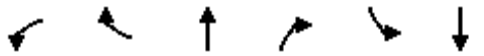
Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	2000	1900	1900	2000
Lane Width (ft)	11	11	11	11	11	11
Grade (%)	0%		0%			0%
Storage Length (ft)	250	0		125	150	
Storage Lanes	1	1		1	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.850		0.850		
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1745	1561	3673	1561	1745	3637
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1745	1561	3673	1561	1745	3637
Link Speed (mph)	30		35			35
Link Distance (ft)	844		896			234
Travel Time (s)	19.2		17.5			4.6

Intersection Summary	
Area Type:	Other



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Volume (vph)	130	120	590	195	60	830
Future Volume (vph)	130	120	590	195	60	830
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.58	0.58	0.91	0.58	0.58	0.86
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%		0%			0%
Adj. Flow (vph)	224	207	648	336	103	965
Shared Lane Traffic (%)						
Lane Group Flow (vph)	224	207	648	336	103	965

Intersection Summary

Intersection	
Int Delay, s/veh	38.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Traffic Vol, veh/h	130	120	590	195	60	830
Future Vol, veh/h	130	120	590	195	60	830
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	250	0	-	125	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	58	58	91	58	58	86
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	224	207	648	336	103	965

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1337	324	0	0	648	0
Stage 1	648	-	-	-	-	-
Stage 2	689	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	~ 147	678	-	-	947	-
Stage 1	488	-	-	-	-	-
Stage 2	465	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	~ 131	678	-	-	947	-
Mov Cap-2 Maneuver	~ 131	-	-	-	-	-
Stage 1	488	-	-	-	-	-
Stage 2	414	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	218.6	0	0.9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	131	678	947	-
HCM Lane V/C Ratio	-	-	1.711	0.305	0.109	-
HCM Control Delay (s)	-	-	$ 408.7	12.6	9.3	-
HCM Lane LOS	-	-	F	B	A	-
HCM 95th %tile Q(veh)	-	-	16.7	1.3	0.4	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	2000	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	145		0	100
Storage Lanes		0	1		1	1
Taper Length (ft)			175		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.980					0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1846	0	1805	2000	1805	1615
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	1846	0	1805	2000	1805	1615
Link Speed (mph)	30			30	30	
Link Distance (ft)	676			355	319	
Travel Time (s)	15.4			8.1	7.3	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	320	45	235	320	20	45
Future Volume (vph)	320	45	235	320	20	45
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.72	0.58	0.58	0.78	0.58	0.58
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	444	78	405	410	34	78
Shared Lane Traffic (%)						
Lane Group Flow (vph)	522	0	405	410	34	78

Intersection Summary

Intersection	
Int Delay, s/veh	6.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	320	45	235	320	20	45
Future Vol, veh/h	320	45	235	320	20	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	145	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	72	58	58	78	58	58
Heavy Vehicles, %	1	0	0	0	0	0
Mvmt Flow	444	78	405	410	34	78

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	522	0	1704	483
Stage 1	-	-	-	-	483	-
Stage 2	-	-	-	-	1221	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1055	-	102	588
Stage 1	-	-	-	-	625	-
Stage 2	-	-	-	-	281	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1055	-	63	588
Mov Cap-2 Maneuver	-	-	-	-	63	-
Stage 1	-	-	-	-	625	-
Stage 2	-	-	-	-	173	-

Approach	EB	WB	NB
HCM Control Delay, s	0	5.2	44.3
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	63	588	-	-	1055	-
HCM Lane V/C Ratio	0.547	0.132	-	-	0.384	-
HCM Control Delay (s)	116.7	12.1	-	-	10.5	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	2.2	0.5	-	-	1.8	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Grade (%)	0%			0%	0%	
Storage Length (ft)		125	0		0	100
Storage Lanes		1	0		1	1
Taper Length (ft)			25		175	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850				0.850
Flt Protected					0.950	
Satd. Flow (prot)	1818	1561	0	1837	1745	1561
Flt Permitted					0.950	
Satd. Flow (perm)	1818	1561	0	1837	1745	1561
Link Speed (mph)	30			30	30	
Link Distance (ft)	355			616	312	
Travel Time (s)	8.1			14.0	7.1	

Intersection Summary	
Area Type:	Other

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Volume (vph)	270	95	0	510	45	160
Future Volume (vph)	270	95	0	510	45	160
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.86	0.58	0.25	0.78	0.58	0.58
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Adj. Flow (vph)	314	164	0	654	78	276
Shared Lane Traffic (%)						
Lane Group Flow (vph)	314	164	0	654	78	276

Intersection Summary

Intersection	
Int Delay, s/veh	3.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	270	95	0	510	45	160
Future Vol, veh/h	270	95	0	510	45	160
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	125	-	-	0	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	58	25	78	58	58
Heavy Vehicles, %	1	0	0	0	0	0
Mvmt Flow	314	164	0	654	78	276

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	314	0	968	314
Stage 1	-	-	-	-	314	-
Stage 2	-	-	-	-	654	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1258	-	284	731
Stage 1	-	-	-	-	745	-
Stage 2	-	-	-	-	521	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1258	-	284	731
Mov Cap-2 Maneuver	-	-	-	-	284	-
Stage 1	-	-	-	-	745	-
Stage 2	-	-	-	-	521	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	284	731	-	-	1258	-
HCM Lane V/C Ratio	0.273	0.377	-	-	-	-
HCM Control Delay (s)	22.4	12.9	-	-	0	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	1.1	1.8	-	-	0	-

APPENDIX E

IDOT Right Turn Lane Charts

36-3 AUXILIARY TURN LANES

When turning maneuvers for left- and right-turning vehicles occur from the through travel lanes, it typically disrupts the flow of through traffic. This is especially true on high-volume highways. To minimize potential conflicts and to improve the level of service and safety, the use of turn lanes may be warranted for intersections.

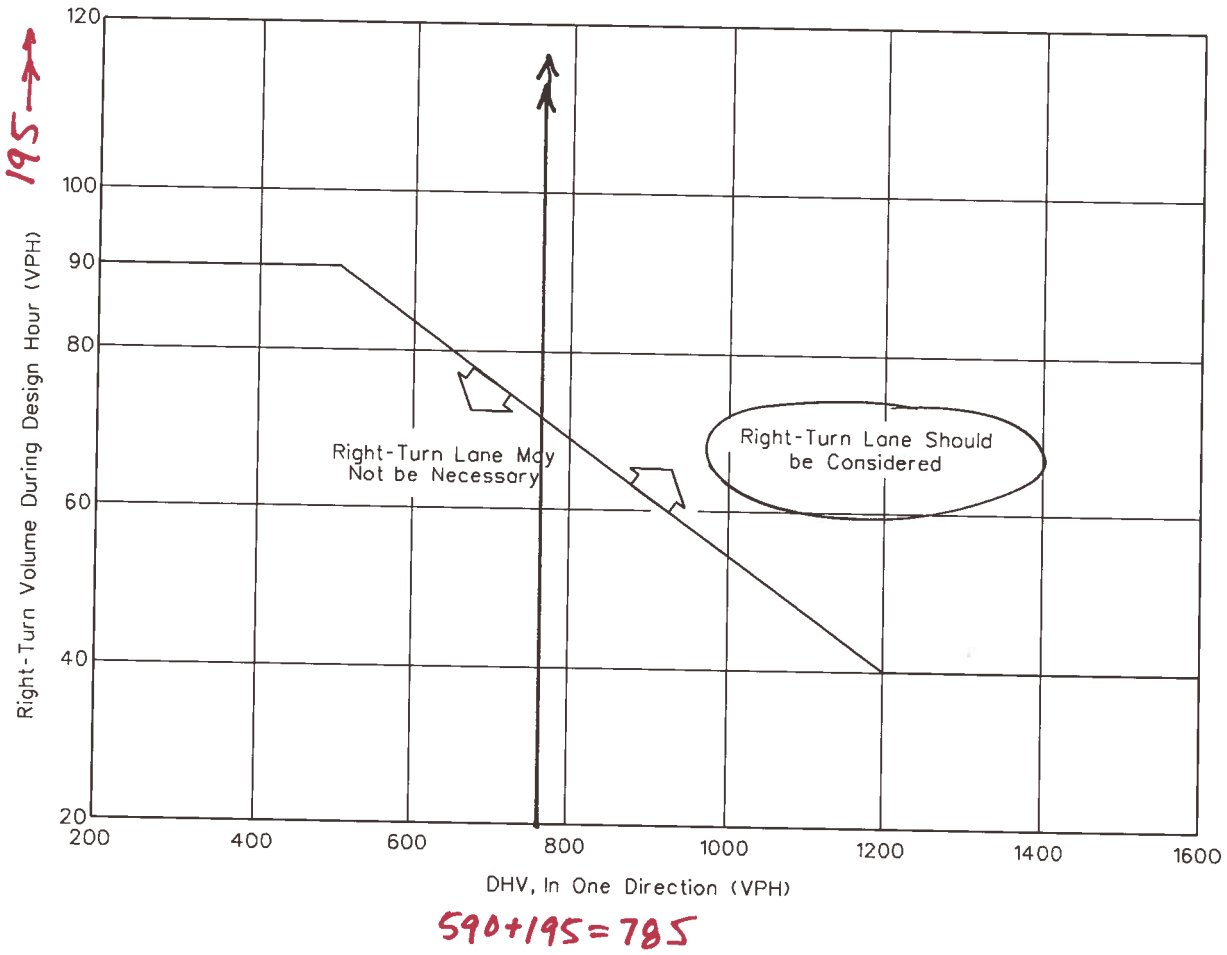
36-3.01 Turn Lane Guidelines

36-3.01(a) Right-Turn Lanes

The use of right-turn lanes at intersections can significantly improve operations. Consider using an exclusive right-turn lane:

Access #1

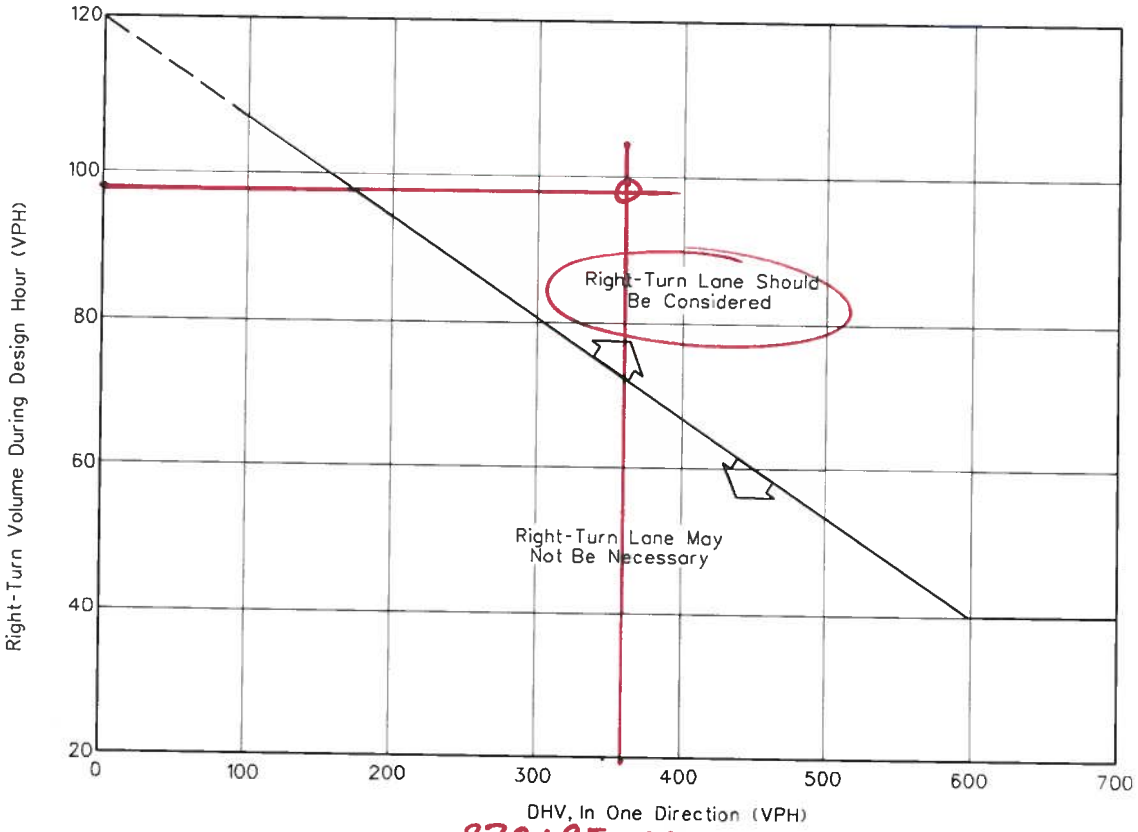
- no at any unsignalized intersection on a two-lane urban or rural highway that satisfies the criteria in Figure 36-3.A;
- no at any unsignalized intersection on a high-speed, four-lane urban or rural highway that satisfies the criteria in Figure 36-3.B;
- no on expressways at all public road intersections where the current ADT on the side road is greater than 250;
- no at any intersection where a capacity analysis determines a right-turn lane is necessary to meet the level-of-service criteria;
- no at any signalized intersections where the right-turning volume is greater than 150 vph and where there is greater than 300 vphpl on the mainline;
- no for uniformity of intersection design along the highway if other intersections have right-turn lanes;
- no at any intersection where the mainline is curved to the left and where the mainline curve requires superelevation;
- no at railroad crossings where the railroad is located close to the intersection and a right-turn lane would be desirable to efficiently move through traffic on the parallel roadway; or
- ~ at any intersection where the crash experience, existing traffic operations, sight distance restrictions (e.g., intersection beyond a crest vertical curve), or engineering judgment indicates a significant conflict related to right-turning vehicles.



Note: For speeds less than 50 mph (80 km/h), see Section 36-3.01(a).

GUIDELINES FOR RIGHT-TURN LANES AT UNSIGNALIZED INTERSECTION ON FOUR-LANE HIGHWAYS
(Design Speed of 50 mph (80 km/h) or Greater)

Figure 36-3.B



Note: For highways with a design speed below 50 mph (80 km/h), with a DHV in one direction of less than 300, and where right turns are greater than 40, an adjustment should be used. To read the vertical axis of the chart, subtract 20 from the actual number of right turns.

Example

Given:	Design Speed	=	35 mph (60 km/h)
	DHV (in one direction)	=	250 vph
	Right Turns	=	100 vph

Problem: Determine if a right-turn lane is warranted.

Solution: To read the vertical axis, use 100 - 20 = 80 vph. The figure indicates that right-turn lane is not necessary, unless other factors (e.g., high crash rate) indicate a lane is needed.

GUIDELINES FOR RIGHT-TURN LANES AT UNSIGNALIZED INTERSECTIONS ON TWO-LANE HIGHWAYS

Figure 36-3.A

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APPENDIX F

Site Circulation Analysis

1 MASTER SITE / PARKING PLAN
1" = 50'-0"

WILLOW CRYSTAL LAKE

date 03/17/2016
revised

drawn by Author
checked by Checker

BLDD ARCHITECTS

Design Firm Registration #184-000723

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MASTER SITE / PARKING PLAN

WILLOW CREEK COMMUNITY CHURCH
PHASE 1
101 S. MAIN ST. | CRYSTAL LAKE, IL

sheet
DD004

project 152RI08.400

DESIGN DEVELOPMENT

SITE / PARKING PLAN - PHASE 1
1" = 50'-0"

WILLOW CRYSTAL LAKE

date 03/17/2016
revised

drawn by ADM
checked by RCD

BLDD ARCHITECTS

Design Firm Registration #184-000723

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PHASE 1 SITE / PARKING PLAN

WILLOW CREEK COMMUNITY CHURCH
PHASE 1
101 S. MAIN ST. | CRYSTAL LAKE, IL

sheet
DD003

project 152RI08.400

DESIGN DEVELOPMENT