#2017-38
Mercyhealth Hospital
Project Review for Planning and Zoning Commission

Meeting Dates: December 6, 2017 public introduction meeting and
January 3, 2018 public hearing

Requests:
1. Preliminary Planned Unit Development for a micro-hospital and medical center.
2. Special Use Permit for a hospital and accessory uses including helipad.
3. Deferral to bury existing overhead utility lines until an area wide program is established.

Location: 875 Route 31

Acreage: 16.39 acres

Existing Zoning: O PUD Office

Surrounding Properties:
North: B-2 PUD General Commercial
South: M Manufacturing
East: M Manufacturing
West: M Manufacturing

Staff Contact: Elizabeth Maxwell (815.356.3615)

Background:

- Mercy Alliance has owned this property for several years and in 2005 received preliminary PUD approval for a hospital and medical center on this site, which was never built.
- Mercy has received a new Certificate of Need approval from the State of Illinois and is proceeding back through the zoning process. They are requesting approval of a Preliminary Planned Unit Development and Special Use Permit to allow the hospital, related medical offices and helipad.
- The previously approved 2005 site plan showed Raymond Drive realigned through the site to connect with Tek Drive at Route 31. There are many benefits to allow for the realignment of Raymond Drive with this approval, as detailed later in this report.

Land Use Analysis:
ZONING

- The site is currently zoned O PUD Office. Hospitals are a special use in the O zoning district. The accessory medical offices and helipad uses are supporting uses to the hospital.
- The Comprehensive Land Use Plan designates this area as Commercial. The proposed office use is an acceptable business use in the Commercial land use district.
- The petitioner is requesting the Special Use Permit to allow the hospital and accessory uses.

SITE PLAN

- The site is situated between Route 31 and Three Oaks Road and Raymond Drive.
- The hospital is located along the west side of the site on the northern half of the property with parking around the building.
- Internal circulation around the building is provided through the parking lot and a dedicated drive aisle in both the front and rear of the site.
- The helipad is located at the northeast corner of the site, due to the required flight path this is the only feasible location.

TRAFFIC STUDY

- The traffic study is an evaluation of the access points, on-site traffic, existing and future traffic and surrounding off-site intersections. The petition is subject to the recommendations of the traffic study and would need to comply with the necessary improvements.
- A possible future traffic signal at the Tek Drive and Route 31 intersection is only possible if Raymond Drive is realigned to meet up with Tek Dr. This future possible signal makes good planning sense to accommodate the future traffic of redevelopment in the area. Right-of-way for the realigned Raymond Drive on Mercy's site is being required as reflected in the conditions of approval.
- The traffic study also recommends other improvements to the site and off-site to allow for safe traffic movement in to and out of the site. A summary of the recommendations follows:

1) Contribution to a number of areawide traffic improvements that need to be made (dedicated northbound right-turn lane, second dedicated westbound left-turn lane at Rt 31/Three Oaks Rd., traffic signal at Three Oaks/Lutter/Sands Rd intersection, etc.)
2) A single inbound lane and two outbound lanes (one dedicated left-turn lane and one dedicated right-turn lane) should be provided for the access onto Raymond Drive.
3) A dedicated westbound left-turn lane and dedicated eastbound right-turn lane should be provided at the Three Oaks Road access. Both turn lanes should provide a 175-foot storage lane with a 145-foot taper.
4) A single inbound lane and outbound lane (one dedicated right-turn lane) should be provided for the Three Oaks Road driveway.
5) Minor-leg stop control should be posted for outbound traffic at both access points.
6) The realignment of Raymond Drive such that it forms the east leg of the existing IL

31/Tek Drive intersection. While there are no current plans for the realignment of Raymond Drive, the site layout for the subject development should be designed so as to not preclude this potential realignment, which is key to future operations and potential signalization.

PARKING

- The site is providing a total of 322 parking spaces, which includes 32 accessible spaces.
- Parking for a hospital is based on 2 spaces per patient bed and 1 space per 300 gross square feet of administrative areas. The petitioners have provided an analysis of their parking needs, breaking out the use into three categories, hospital, medical office and outpatient care. This parking analysis is attached.

ELEVATIONS

- The building is designed with a variety of projections and stacked layers to create a distinct visual appearance.
- The building uses a variety of materials including, brick, stone, corrugated metal panels and ACM wall panels.
- Materials are natural in color.
- The building has illuminated canopies at each entrance and a 10-foot projecting eyebrow style canopy over the main entrance.
- Staff has reviewed the elevations based on the criteria listed in the Design Standards. The project meets 6 of the 10 criteria, with 2 areas being deemed not applicable. Six of 10 are required to be considered meeting the design standards, meeting the requirements for architecture. The full design criteria standards are attached to this report.

LANDSCAPE PLAN

- The petitioners have provided a preliminary landscape plan. The plan illustrates the following improvements:
    - Foundation base landscape around the building to soften the impact of the building meeting the ground.
    - Perimeter landscape around the site and parking areas. Additional landscape is required to screen the parking lot, which has been reflected in the conditions of approval.
    - Larger interior parking lot landscape areas that create areas for a variety of trees and shrubs to be planted creating a more sustainable landscape design.

SIGNAGE

- Mercy indicates a monument sign and several directional signs. The building elevations indicate signage. No signage details were submitted and all signs must meet the requirements of the UDO.

Findings of fact:

Preliminary Planned Unit Development/Special Use Permit

The petitioner is requesting approval of a Preliminary Planned Unit Development/Special Use Permit to allow the construction of a micro hospital, its associated helipad and a medical center. A Planned Unit Development is a Special Use and Special Uses require separate review because of their potential to impact surrounding properties and the orderly development of the City.

Section 2-400 B General Standards for all special uses in the Unified Ordinance establishes standards for all special uses in Crystal Lake. Briefly, the criteria are as follows:

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

2. The use will not be detrimental to area property values.
   ☐ *Meets* ☐ *Does not meet*

3. The use will comply with the zoning districts regulations.
   ☐ *Meets* ☐ *Does not meet*

4. The use will not negatively impact traffic circulation.
   ☐ *Meets* ☐ *Does not meet*

5. The use will not negatively impact public utilities or municipal service delivery systems. If required, the use will contribute financially to the upgrading of public utilities and municipal service delivery systems.
   ☐ *Meets* ☐ *Does not meet*

6. The use will not negatively impact the environment or be unsightly.
   ☐ *Meets* ☐ *Does not meet*

7. The use, where possible will preserve existing mature vegetation, and provide landscaping and architecture, which is aesthetically pleasing, compatible or complementary to surrounding properties and acceptable by community standards.
   ☐ *Meets* ☐ *Does not meet*

8. The use will meet requirements of all regulating governmental agencies.
   ☐ *Meets* ☐ *Does not meet*

9. The use will conform to any conditions approved as part of the issued Special Use Permit.
   ☐ *Meets* ☐ *Does not meet*

10. The use will conform to the regulations established for specific special uses, where applicable.
    ☐ *Meets* ☐ *Does not meet*

In addition PUDs must also meet the standards in Section 4-500 C. Development Standards and 4-500 D. 1 Additional standards for Planned Unit Developments Commercial PUDs.

1. Implements the vision and land use policies of the Comprehensive Plan.
   ☐ Meets ☐ Does not meet

2. Shall not result in substantial adverse effect on adjacent property, natural resources, infrastructure, public sites or other matter of public health, safety and welfare.
   ☐ Meets ☐ Does not meet

3. PUDs must provide transitional uses to blend with adjacent development.
   ☐ Meets ☐ Does not meet

4. PUD phases must be logically sequenced.
   ☐ Meets ☐ Does not meet

5. The density and intensity of a PUD shall be in accordance with the Comprehensive Plan.
   ☐ Meets ☐ Does not meet

6. All dimensional standards shall be listed within the PUD plan if they do not meet the Ordinance minimum standards.
   ☐ Meets ☐ Does not meet

7. The responsible parties for all on-site and other required public improvements shall be established and a utility plan indicating all proposed easements shall be provided.
   ☐ Meets ☐ Does not meet

8. Any private infrastructure shall comply with the city standards.
   ☐ Meets ☐ Does not meet

9. The PUD plan shall establish the responsibility of the applicant/developer.
   ☐ Meets ☐ Does not meet

10. A bond or letter of credit shall be posted to cover required fees or public improvements.
    ☐ Meets ☐ Does not meet

Planned Unit Development Variation
The purpose of Planned Unit Developments is to encourage and allow more creative and imaginative design of land developments than is possible under district zoning regulations. Planned Unit Developments are, therefore, intended to allow substantial flexibility in planning and designing a proposal. This flexibility is often in the form of relief from compliance with conventional zoning ordinance site and design requirements which may otherwise require individual requests and applications for zoning variations.

Ideally, this flexibility results in a development that is better planned, contains more amenities,

and is ultimately more desirable than one that would have been produced through compliance with typical zoning ordinance and subdivision controls.

Therefore more lenient site requirements may be granted where the Planned Unit Development contains features not normally required of traditional developments. Although a formal variation request is not required to be made in conjunction with a Planned Unit Development, Staff identifies those aspects of the Planned Unit Development which effectively result in variations from UDO requirements. If the evidence is not found to justify these variations from the UDO that fact shall be reported to the City Council with a recommendation that the variations from the UDO which are proposed as part of the Planned Development be lessened or denied.

The Planned Unit Development proposed by the Petitioner includes the following variations from the UDO:

1) Article 3-200 Height and Stories Variation.
   A) To permit the building at 62 feet in height, a variation of 34 feet from the permitted 28 foot height limitation in this district. This variation is for the highest portion of the building from a point at the depressed level of the loading docks. The main portion of the emergency room is approximately 35 feet in height and the office building/clinic portion is approximately 52 feet in height.
   B) To permit a three-story building with the penthouse portion; whereas only two-stories are permitted.

2) Deferral from the burial of overhead utility lines until an area-wide program is established.

Due to the unique nature of this use, the variations are appropriate.

Comprehensive Land Use Plan 2020 Vision Summary Review:

The Comprehensive Plan designates the subject property as Commercial, which allows for existing and future commercial and business uses. The following goal is applicable to this request:

Land Use – Commercial

Goal: Maintain a dynamic and sustainable base of commercial uses that provides a solid tax base, goods, services and jobs to the city as well as the surrounding region through coordination in the Unified Development Ordinance, Comprehensive Land Use Plan and Economic Development Strategic Plan.

Community Facilities – Public Facilities

Goal: Support the specific needs and goals of public facilities to ensure cooperation between public and city facilities for the health, safety and needs of the community.

This can be accomplished with the following supporting actions:

Supporting Action: Support the needs of health care facility providers.

Success Indicator: The total number of health care facilities within the City limits.

Recommended Conditions:

If a motion to recommend approval of the petitioner's request is made it should be with the following conditions:

1. Approved plans, reflecting staff and advisory board recommendations, as approved by the City Council:
   A. Application (MercyHealth, received 10/27/17)
   B. Site Development Plan Set [Sheets C-100, C-200, C-300, C-301, C-302, C-400, C-500, L-100, A-6] (Fehr Graham, dated 11/22/17, received 11/22/17)
   C. Elevations (AECOM, undated, received 12/20/17)
   D. Traffic Study (Kimley Horn, dated December 2017)

2. Site Plan
   A. The designated fire lane needs to be 26 feet in width.
   B. Provide sidewalk around the site. Work with staff on the appropriate location and future connections to adjacent properties.
   C. Right-of-way for Raymond Drive, laid out to line up with Tek Drive, shall be dedicated for a possible future connection and traffic signal on Route 31. A Plat of Dedication is required to be prepared and submitted to the City.
   D. All municipal utilities are required to be in a Municipal Utility Easement (MUE). A Plat of Easement is required to be provided to the City.
   E. A Development Agreement is a requirement of Final PUD. Work with staff to finalize the stipulations in the agreement.

3. Landscape Plan
   A. The planting beds shall contain shrubs, grasses and flowers.
   B. Add shrubs in the western landscape area adjacent to the clinic parking to screen parking spaces from Route 31.
   C. In order to provide additional screening of the parking lot, the perimeter of the western drive aisle shall contain a variety of evergreen and deciduous shrubs.

4. Signs
   A. All signage must meet the UDO requirements.
   B. No signs can be placed within 10 feet of the future dedication of right-of-way along Three Oaks Road.
   C. For Final PUD submittal, work with staff on a directional sign program.

5. Provide the following plans with the Final PUD submittal:
   A. Floor plan illustrating square footage of all proposed spaces with the label of their use.
   B. Landscape plan illustrating materials, quantities, size and planting details.
   C. Revised engineering and site sheets to meet all of the recommended conditions.

6. Submit the IDOT approval for the helipad.

7. The project plans for Final PUD must incorporate the recommendations contained in the traffic study. In addition, the site plan shall be reworked and no permanent obstructions created to allow for the future realignment of Raymond Drive so that it lines up with Tek Drive. The petitioner shall pay their fair share of the potential future traffic signal at the Rt 31/Raymond/Tek Drive intersection.

8. The petitioner hereby agrees to pay their proportionate fair share of the roadway improvements identified in the traffic study and dedicate adequate right-of-way (without compensation) for these improvements. Cost participation for off-site improvements will be decided upon determination of the scope and completion of the cost estimates.

9. In the future, when Raymond Drive is realigned to connect to Tek Drive at Route 31, Mercyhealth shall create and submit a plat of vacation for that section of Raymond Drive that would be abandoned with the realignment.

10. The petitioner shall address all of the review comments and requirements of the Fire Rescue, Police, Public Works, and Community Development Departments in addition to those of the City's stormwater and traffic consultants.

Design Criteria Review for Mercy Petition #2017-38

The UDO specifies specific design criteria for new development. There are 10 criteria groups and the site must meet a minimum of 6 of those. Staff has reviewed the proposed development against the standards listed and has made a determination that the project meets 6 of 10 of the criteria. The results are as follows:

1. Building Form

☐ *Meets* ☐ *Does not meet* ☒ *Not Applicable*

[must meet a-d to meet this criteria]

a. In developments with multiple structures, recurring forms and materials should be used to tie the development together, while establishing an overall hierarchy of buildings for visual interest and to aid in orientation.

☐ *Meets* ☐ *Does not meet* ☒ *Not Applicable*

This is a stand-alone building not a shopping center. This criterion was written for retail centers.

b. Where a shopping street is to be created, structures should be built with minimal retail storefront setbacks at internal roadways and plazas to create a pedestrian oriented "street wall." Structures in this alignment should include inviting storefront windows, easily identifiable entrances, and prominent display areas.

☐ *Meets* ☐ *Does not meet* ☒ *Not Applicable*

A "shopping street" per se is not being created as this is not a retail development.

c. Where compatible with adjoining uses and designed to minimize the appearance of building bulk and mass, taller buildings may be acceptable. Compatibility can be accomplished through upper story setbacks, changes in building materials, and the articulation of building details. The City Council may grant variations to the maximum allowable building height where they feel that compatibility with surrounding uses has been achieved.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The building does have some setbacks so as to not feel too imposing. A height variation is requested.

d. Along storefronts and at building entrances, generous walkways should be provided that establish a comfortable pedestrian zone adjacent to storefronts and allow for the addition of planters or green areas.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The building is designed with a large sidewalk area in front with clear entryways.

2. Building Massing and Articulation

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

[must meet a-e to meet this criteria]

a. The apparent mass and bulk of a large building should be reduced by structural articulation, windows or other architectural and functional elements and by landscaping. Structural articulation can include breaking the plane of the building by off sets (horizontal and vertical), insets for entryways or balconies, step backs, and consideration of alternative roof structures.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The building is designed with a variety of wall planes that provide interest and reduction in the appearance of mass of the structure.

b. Long front facades must demonstrate a rhythm and articulation of "storefront" modules, to lend a pedestrian scale to the development.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The design of the building has a small unique atrium connection between the emergency services building and office/clinic portion of the building. This allows for pedestrians to feel comfortable adjacent to the entrance.

c. Building forms should be articulated by varying roof heights and wall planes. Upper-story setbacks and false second stories can be utilized to add visual interest. Long, unbroken volumes and large, unarticulated wall and roof planes are not permitted.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

This is demonstrated with the varying heights of the parapet roof and the projections.

d. All facades shall incorporate wall offsets in the form of projections and/or recesses in the facade plane, a minimum of every 50 feet of frontage that has a differential in horizontal plane of at least two feet.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The façade has multiple projections and curved walls.

e. Where gable, hip or mansard roofs are used they shall be scaled to the face of the building so as not to dominate the elevation nor be so small as to appear disproportionate.

☐ *Meets* ☐ *Does not meet* ☒ *Not Applicable*

3. Rooflines and Parapets

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

[must meet four of the options to meet this criteria]

a. Roof lines should be varied in height and long horizontal roof lines should be broken up.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The parapet roof has varying heights and a step back before the mechanical screening wall.

b. Large expanses of roof shall be avoided. Visual diversity can be achieved by varying the roof line and/or the addition of dormers. Diversity can also be achieved by staggering the facade of the building thereby breaking up an otherwise potentially monotonous roof and front facade as well as reduce the visual mass of the building.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The emergency portion of the building has a lower roof height than the office/clinic portion.

c. Pitched roofs shall have overhangs. Eaves should project at least 12 inches beyond the facade line.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

There is not a pitched roof, but the eyebrow style canopy projects 10 feet over the entrance and provides

d. Specialized architectural details are encouraged on both flat and pitched roofs, to the extent compatible with the building's overall architectural style. Examples of such features include, but are not limited to, the following: Crenellation (flat roofs), Finials (pitched roofs), Dormers (pitched roofs), Cupolas.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The building has been designed with a light silver band at the top to give the wall a finished appearance.

e. Parapet walls should have a defined top, framing the building facade. A narrow piece of metal flashing or stone cap is considered inadequate to create this distinction. Brick patterns, deeper stone caps with an overhang and shadow line, and contrasting color for flashing are examples of treatments which may be considered to meet this guideline.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

A variety of materials including brick veneer, metal panels and ACM panels extend to the top creating the visual diversity at the top of the building.

f. Parapets should not appear to be "tacked on." Parapets should provide sufficient articulation of detail such as precast treatments, continuous banding, projecting cornices or corner details.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The parapet roof structure is part of the overall building.

g. Faux-pitched roofs (through the use of parapets) are discouraged except to the extent minimally necessary to shield roof-based mechanical equipment.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The metal screening has been designed to be a part of the building's design.

h. If mansard roofs are utilized, they will wrap around the entire building perimeter.

☐ *Meets* ☐ *Does not meet* ☒ *Not Applicable*

4. Building Materials

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

[must meet a-f to meet this criteria]

a. The primary building material (accounting for at least 60% of the facade area) for any new construction shall be traditional masonry building materials like brick or stone utilizing traditional construction techniques. These materials shall be used on all sides of the building expressing consistent architectural character and detail.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The building is a combination of brick, stone, metal, ACM and glass. The natural appearance of the materials is being retained.

b. Exterior insulation finish systems (EIFS)/Drivit® is not permitted as the primary building material, but permitted as an accent material.

☒ *Meets* ☐ *Does not meet* ☒ *Not Applicable*

A small area behind the building will be EIFS and metal.

c. Stucco, consisting of three-coat Portland cement is permitted on approximately 25% of the building, preferably limited to areas more than 10 feet above the adjacent ground or paved surface.

☐ *Meets* ☐ *Does not meet* ☒ *Not Applicable*

d. The use of metal as a primary building material shall be permitted only where appropriate to the architectural style of the building and when exceptional building design warrants the use of the material. When used, metals will have an anodized, painted or powder coated finish in muted, non-bright colors that are aesthetically pleasing. The use of unfinished, exposed metals is not permitted.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The metal are accent panels and add to the architectural design of the structure.

e. Stone, simulated stone, terra cotta, wood and metal are recommended as accent

materials. Metal may be used for gutters, downspouts, railings, trim, grills, panels and flashing.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The building uses a combination of materials.

f. Where transitions in material are made, the transition will not occur at an outside corner edge. All materials on the front will turn the corner and carry over to the side elevation to a point at which the corner looks solidly finished. Material changes at the outside corners of structures give an impression of thinness and artificiality and should be avoided.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The materials wrap around any corners.

5. Roof Materials

☐ *Meets* ☐ *Does not meet* ☒ *Not Applicable*

[must meet a-e to meet this criteria]

These criteria were written more for retail or office buildings with a traditional residential feel. The roof materials do not apply.

a. Slate, wood shingle, shake or close substitutes shall be preferred roof materials. Where asphalt shingles are used, "Architectural" shingles must be used.

☐ *Meets* ☐ *Does not meet* ☒ *Not Applicable*

b. Clay or ceramic roof tiles are appropriate when complementary with the overall facade design in color, tone, and architectural style.

☐ *Meets* ☐ *Does not meet* ☒ *Not Applicable*

c. Polished, glossy, shiny or reflective surfaces are not permitted.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

d. Where metal surfaces are used, the finish and color of the metal surface shall be approved by staff.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

e. Skylights are discouraged, except when subtly integrated into the roof design or where they are integral to active or passive solar energy system designs.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

6. Building Colors

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

[must meet a-e to meet this criteria]

a. Colors should be muted and complement each other. While complementary colors for different elements are encouraged, a multitude of varying colors on each facade is not permitted.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The façade uses classic style, lines and colors.

b. The natural color of the material should be maintained wherever possible. Where materials are painted, a neutral color should be chosen.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

All natural colors are being used. The stone is mined from Minnesota.

c. Contrasting trim colors should be used to highlight architectural elements such as window and door surrounds. Harsh, jarring contrasts should be avoided, except where true to the architectural style of the building.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The designers have gone with a medium silver trim color and architectural elements transition around the façade appropriately.

d. Applied elements such as awnings, light fixtures, downspouts, railings and signage should coordinate with, rather than dominate the color scheme of the building. The elements may be the same color as the background wall, a contrasting shade of the same color, or a more distinctive contrasting color. The important thing is to blend with the building's color palette.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

Decorative elements will be decorative and blend, not dominate.

e. Primary, fluorescent or neon colors are not permitted for use as accent colors, including awning body color.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

No primary, florescent or neon colors.

7. Building Fenestration

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

[must meet a-d to meet criteria]

a. Buildings should meet the ground with a solid base treatment that creates a visual transition from sidewalk to building wall. Glass storefront wall systems that extend to the ground are not permitted.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The glass windows meet the ground with a 16-inch cast stone sill that absorbs the water and also allows for a heat conducting tube to feed heat to the windows.

b. In larger developments (over 20,000 square feet), a variety of window sizes and styles should be utilized to create interest.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

There are a variety of windows including a full glass wall at the main entrance.

c. Monotonous grids of repeated windows should be avoided. The window pattern should add variety and interest to the architecture.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The windows add to the design and style of the building and do not appear repetitious.

d. Wood or dark anodized window framing is encouraged to add depth and richness to the appearance of the building.

☐ *Meets* ☒ *Does not meet* ☐ *Not Applicable*

All trim is medium grey.

8. Entrance Design

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

[must meet a-e to meet criteria]

a. Recessed or projected entries and articulation in storefront mass is required. Recesses or projections shall be at least 12 inches.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The front entry has a vestibule that projects out from the front, a drive under canopy and an eyebrow canopy that projects 10 feet.

b. Entrances should be highlighted by a change in the wall plane. Wall articulation around the door and projecting beyond the door is recommended.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The section of the building from the emergency room will curve away from the visitor and the curve of the wall goes towards the clinic building providing a break in the wall plane.

c. A projecting element above the entrance is recommended to highlight the entrance.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

There is a 10 foot projecting eyebrow canopy and the drive-under canopy, both highlight the entryway.

d. Entrances should be highlighted by implementation of architectural elements such as flanked columns or decorative fixtures.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The entryway is framed by the adjacent portions of the emergency center on the left and office/clinic building on the right.

e. Varied paving textures and/or elevation changes are recommended techniques to define entrances.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The developers are planning a colored scored concrete at the entrance.

9. Canopy/Awning Design

☐ *Meets* ☐ *Does not meet* ☒ *Not Applicable*

[must meet a-f to meet criteria]

This is not a typical retail building which lends itself to small awnings over the windows.

a. Awnings should not be wrapped around buildings in continuous bands.

☐ *Meets* ☐ *Does not meet* ☒ *Not Applicable*

b. Awnings should only be placed on top of doors, on top of windows, or within vertical elements when the facade of a building is divided into distinct structural bays.

☐ *Meets* ☐ *Does not meet* ☒ *Not Applicable*

c. When awnings are lit externally with direct lighting, architecturally interesting fixtures, such as goosenecks shall be utilized.

☐ *Meets* ☐ *Does not meet* ☒ *Not Applicable*

d. Awning colors should complement the overall building color scheme. Colors should coordinate with, rather than dominate, the color scheme for the building. Awnings may be the same color as the background wall, a contrasting shade of the same color, or, a more distinctive contrasting color. Bold Primary, Fluorescent or Neon colors are not permitted as the awning body color.

☐ *Meets* ☐ *Does not meet* ☒ *Not Applicable*

e. Plexiglas, glossy vinyl and canvas awnings are not permitted. Metal, matte finish vinyl, fabric and treated canvas awnings are required.

☐ *Meets* ☐ *Does not meet* ☒ *Not Applicable*

f. The use of fan/umbrella shaped awnings is not permitted.

☐ *Meets* ☐ *Does not meet* ☒ *Not Applicable*

10. Overall Façade Design

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

a. Building facades should be organized to have a clear base, middle, and top.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The building is well organized.

b. Changes in vertical and horizontal planes should be used to provide relief from a box like appearance.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

There are multiple sections of relief both vertical and horizontal.

c. On facades longer than 100 feet, the use of pilasters is recommended to create the appearance of smaller "bays.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The building is designed with a variety of window bays, projections, entry features, etc. to create a welcoming appearance.

d. Vertical elements such as towers can be used to accent horizontal massing and provide visual interest, especially on corner buildings.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The exterior materials including the brick rise up the walls drawing your eye upwards.

e. Details such as wall surfaces constructed with patterns, changes in materials, building popouts, columns, and recessed areas should be used to create shadow patterns and depth on the wall surfaces.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

There are a variety of materials on the building including brick, stone, and metal.

f. Blank walls on facades visible from public or private rights-of-way will not be permitted. Consider utilizing windows, wall articulation, arcades, changes in materials, or other features.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

There are no blank walls.

g. Minor surface detailing should not be substituted for distinctive building massing. Minor surface detailing includes score lines or changes in color rather than a change or

relief in the wall plane.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

The building has distinctive architecture and design.

h. Downspouts shall blend with the architecture or act as an accent, not a dominant feature. Coordinate downspouts with horizontal features (like banding or coursing), and vertical elements (like pilasters, columns, and corners). Downspouts shall not be the only relief feature in a wall.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

Downspouts have not been shown, but will be hidden within columns or walls of the building.

i. False fronts and false roof structures applied to generic buildings are not appropriate. Facade treatments should be applied to all sides of a structure and be integral to the overall massing of the building.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

No false fronts.

j. Applied veneer "movie set" storefronts, token panels of brick on building fronts and blank masonry walls on the rear of buildings are not permitted.

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

k. Drive through elements should be architecturally integrated into the building, rather than appearing to be applied or "stuck on" to the building.

☐ *Meets* ☐ *Does not meet* ☒ *Not Applicable*

l. Ornamentation should be avoided except as an enhancement of the overall facade design and ornamental details should complement the surrounding facade in color and material.

☒ *Meets* ☒ *Does not meet* ☐ *Not Applicable*

No tacked on ornamentation.

m. Ornamentation should not be used as a substitute for quality architectural facade design.

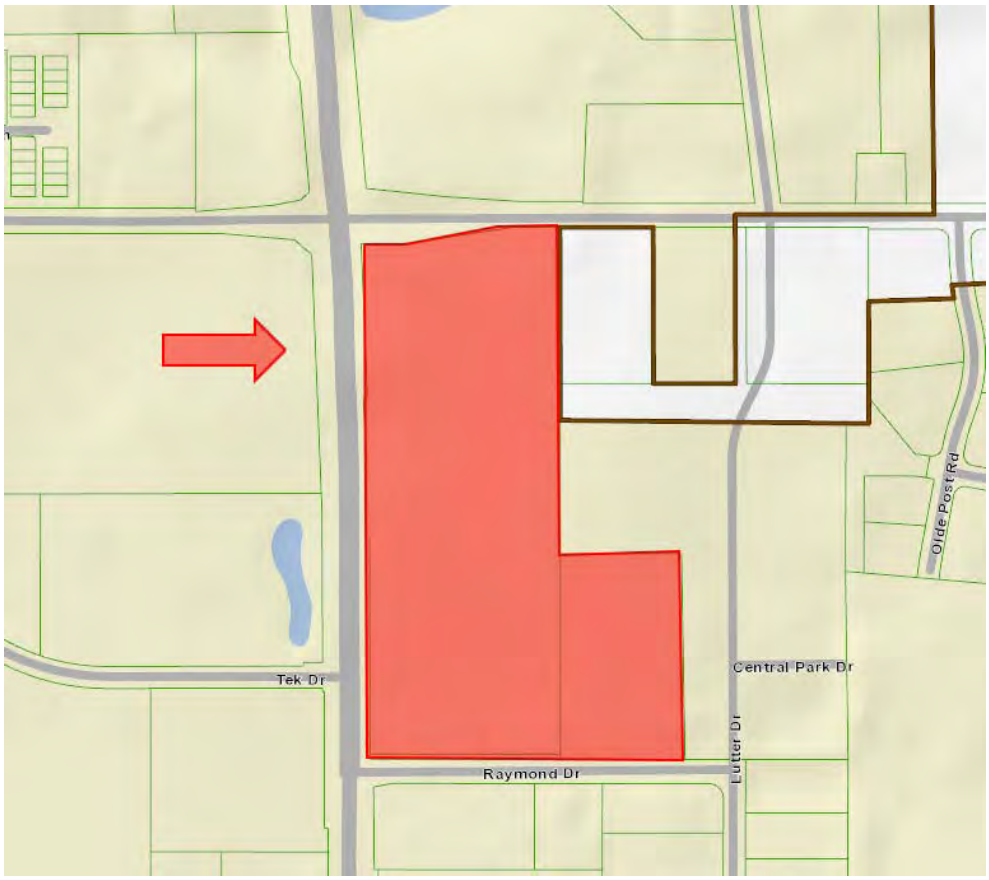
☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

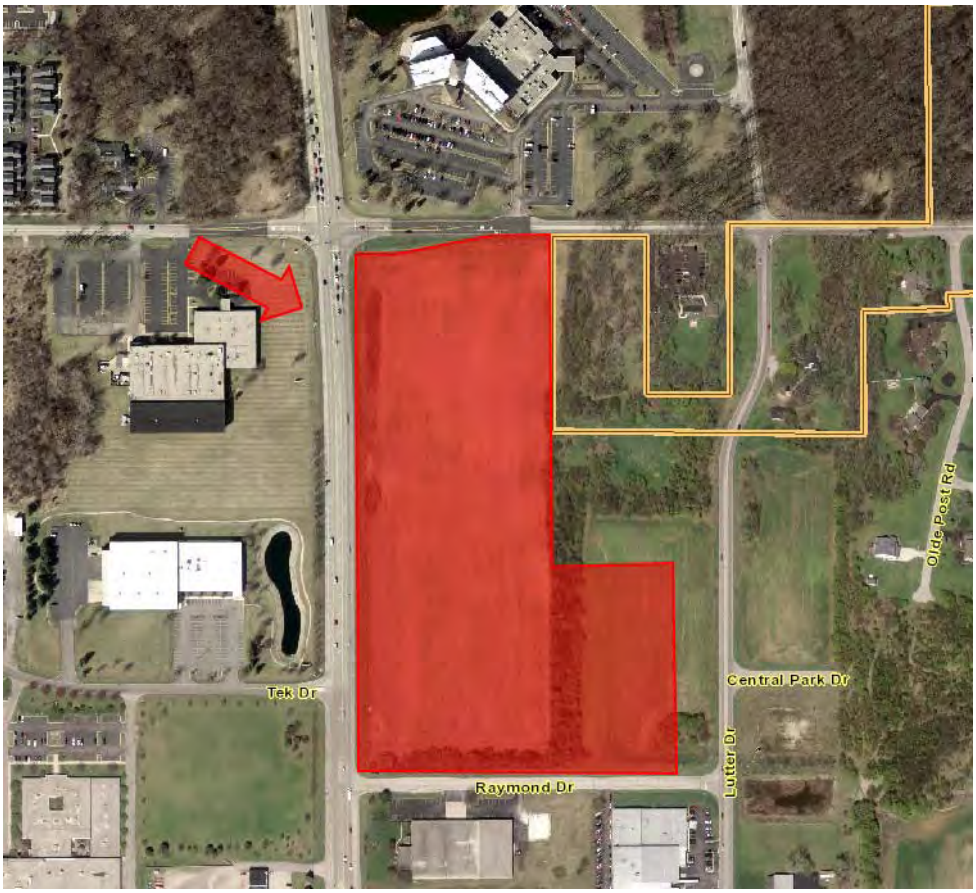
n. New construction and renovated building designs should reflect local, unique and traditional designs rather than chain or franchise designs. Franchise architecture is a building design that is trademarked, branded, or easily identified with a particular chain or corporation and is ubiquitous in nature. Some typical issues and negative impacts often associated with national chain or commercial franchise designs include:

- Large logos and/or colors used over large expanses of a building;
- Branded buildings are difficult to reuse if vacated by the primary business promoting vacancies and blight;
- Buildings lack architectural elements and design consistent with local community's architectural composition, character, vernacular, and historic context

☒ *Meets* ☐ *Does not meet* ☐ *Not Applicable*

2017-38 Mercyhealth Crystal Lake – 875LT S. Route 31





City of Crystal Lake
Development Application

Office Use Only
File # 2017-0038

Project Title: Mercyhealth Crystal Lake

RECEIVED
OCT 27 2017
BY

Action Requested

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

Petitioner Information

Name: Mercyhealth
Address: 1000 Mineral Point Avenue
Janesville, Wisconsin 53548
Phone: 608-756-6000
Fax:
E-mail: jbenning@mhemail.org

Owner Information (if different)

Name:
Address:
Phone:
Fax:
E-mail:

Property Information

Project Description: Proposed hospital/clinic with paved parking lots, landscaping, storm water detention and utilities.

Project Address/Location: Southeast corner of Illinois Route 31 and Three Oaks Road, Crystal Lake, Illinois. 875 LT S. Route 31

PIN Number(s): 19-10-400-010, 19-10-401-009

Development Team

Please include address, phone, fax and e-mail

Developer: Joanna Benning; Mercyhealth; 1000 Mineral Point Avenue; Janesville, WI 53548; 608-756-6000; jbenning@mhemail.org

Architect: Matt Sanders; AECOM; 800 LaSalle Avenue, Suite 500; Minneapolis, MN 55402; 612-376-2125; matt.sanders@aecom.com

Attorney: Paul Van Den Heuvel; Mercyhealth; 1000 Mineral Point Avenue; Janesville, WI 53548; 608-756-6158; pvandenheuvel@mhemail.org

Engineer: Vaughn Lewis; Fehr Graham; 200 Prairie Street, Suite 208; Rockford, IL 61107; 815-394-4700; vlewis@fehr-graham.com

Landscape Architect: Rebecca de Boer; Ken Saiki Design, Inc.; 303 S. Paterson Street; Suite 1; Madison, WI 53703; 608-251-3600; rdeboer@ksd-la.com

Planner: Matt Sanders; AECOM; 800 LaSalle Avenue, Suite 500; Minneapolis, MN 55402; 612-376-2125; matt.sanders@aecom.com

Surveyor: Dan Kasten; Fehr Graham; 200 Prairie Street, Suite 208; Rockford, IL 61107; 815-394-4700; dkasten@fehr-graham.com

Other: _____

Signatures

_____

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.

Joanna Benning October 27, 2017

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.

PUBLIC NOTICE

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

IN THE MATTER OF THE PETITION OF
Mercy Health Corporation
Mercy Crystal Lake Hospital
and Medical Center, Inc.

2017-38

LEGAL NOTICE

Notice is hereby given in compliance with the Unified Development Ordinance (UDO) of the City of Crystal Lake, Illinois that a public hearing will be held before the Planning and Zoning Commission on the application by Mercy Health Corporation and Mercy Crystal Lake Hospital and Medical Center, Inc., seeking a Preliminary Planned Unit Development and Special Use Permit for a Hospital with helipad at 875 S. Route 31, Crystal Lake, Illinois. PINs: 19-10-400-010 and 19-10-401-007.

This application is filed for the purpose of seeking a Preliminary Planned Unit Development and Special Use Permit for a Hospital with helipod pursuant to Articles 2-300 and Article 9-200 with Variations from Article 3-200 height and stories, for the distance between residentiolly zoned property and the helipad Article 2-400, the deferrol of burying power lines Article 5 Subdivision as well as any other variations as necessary to approve the plans as presented to approve this development. Plans for this project can be viewed ot the Crystal Lake Community Development Department at City Hall.

A public hearing before the Planning and Zoning Commission on this request will be held at 7:30 p.m. on Wednesday, Januory 3, 2018, at the Crystal Lake City Hall, 100 West Woodstock Street, ot which time and place any person determining to be heard may be present.

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

(Published in the Northwest Herald on December 18, 2017)1490265

PRELIMINARY P.U.D.
MERCYHEALTH CRYSTAL LAKE
CRYSTAL LAKE, ILLINOIS - McHENRY COUNTY

SHEET LIST TABLE	
SHEET NUMBER	SHEET TITLE
C-100	COVER SHEET
C-200	SITE SURVEY
C-300	SITE PLAN
C-301	SITE PLAN - SOUTH END
C-302	SITE PLAN - NORTH END
C-400	GRADING & DRAINAGE PLAN
C-500	UTILITY PLAN
L-100	LANDSCAPE OVERVIEW PLAN
A-6	EXTERIOR ELEVATIONS

ILLINOIS COORDINATE SYSTEM
NAD 83 - EAST ZONE

BM1 = RAILROAD SPIKE IN POWER POLE, 82' WEST OF NE PROPERTY CORNER
N 2,022,360.99, E 997,410.15, ELEV 909.78
BM2 = FOUND IRON PIN WITH ALUMINUM CAP 602' N OF SW PROPERTY CORNER
N 2,021,531.18, E 997,000.22, ELEV 725.91

LOCATION MAP

UTILITIES

UTILITY TYPE	COMMON NAME
WATER & SEWER	CITY OF CRYSTAL LAKE
ELECTRIC	COMED
TELEPHONE	MCI
GAS	NICOR
CABLE	COMCAST

(CONTRACTOR TO BE RESPONSIBLE FOR ANY ADJUSTMENTS TO BE MADE.)

PROPERTY INFORMATION

16.222 ACRES
PIN NO. 19-100-400-010
ZONED O-PUD
ALGONQUIN TOWNSHIP
OWNER: MERCY HEALTH SYSTEM CORPORATION

J.U.L.I.E.
Know what's below. Call before you dig.
OR CALL (800) 892-0123

FEHR GRAHAM
ENGINEERING & ENVIRONMENTAL
ILLINOIS IOWA WISCONSIN
ILLINOIS PROFESSIONAL DESIGN FIRM NUMBER: 184003525

2017 38
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FG JOB NUMBER: 17-713
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ILLINOIS DESIGN FIRM NO. 184-003525
ILLINOIS IOWA WISCONSIN

AECOM
AECOM Services of Illinois, Inc.
303 East Wacker Drive, Suite 1400
Chicago, Illinois 60601

PROJECT
MERCYHEALTH CRYSTAL LAKE
Crystal Lake, Il

CLIENT
Mercyhealth™
www.mercyrockford.org

ARCHITECT / ENGINEERS
AECOM Services of Illinois, Inc.
IL Design Firm Reg No. 184-001654
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Minneapolis, Minnesota 55402
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www.fehr-graham.com

LANDSCAPE ARCHITECTS
Ken Saiki Design, Inc.
303 S. Paterson, Suite One
Madison, Wisconsin 53703
P:608-251-3600
www.ksd-la.com

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NOT FOR CONSTRUCTION

LICENSED PROFESSIONAL ENGINEER OF ILLINOIS
VAUGHN R. LEWIS
062-061904
EXPIRES 11/30/19

11-22-2017
SIGNATURE DATE

KEY PLAN

KEY PLAN
PUD ISSUE
22 NOVEMBER 2017

ISSUE/REVISION

NO.	DATE	DESCRIPTION

PROJECT NUMBER
60319436

SHEET TITLE
COVER SHEET

SHEET NUMBER
C-100

Approved:
Checked:
Designer:
Project Management Initials:
ARCH E1 30" x 42"
Last Plotted: 11/21/17
Filename: G:\CAD\17\17-713\17-713 PUD.dwg, Cover
Printed on ___% Post-Consumer Recycled Content Paper

FLOOD ZONE NOTE

THE PROPERTY SHOWN HEREON IS LOCATED IN ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) AS DESIGNATED UPON THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAP FOR MCHENRY COUNTY, ILLINOIS AND INCORPORATED AREAS, MAP NUMBER 17111C0335J, EFFECTIVE DATE NOVEMBER 16, 2006 OF THE FEDERAL EMERGENCY MANAGEMENT AGENCY.

LEGAL DESCRIPTION

THE NORTH 1464.54 FEET OF THE WEST 580.14 FEET OF THE SOUTHEAST QUARTER OF SECTION 10, (EXCEPTING THEREFROM THAT PART TAKEN FOR STATE ROUTE 31 AND THREE OAKS ROAD), ALL IN TOWNSHIP 43 NORTH, RANGE 8 EAST OF THE THIRD PRINCIPAL MERIDIAN, IN MCHENRY COUNTY, ILLINOIS.

ILLINOIS COORDINATE SYSTEM
NAD 83 – EAST ZONE

50 0 50 100 150 FEET

TEK DRIVE

"EXISTING CONCRETE CURB & GUTTER"

ILLINOIS ROUTE 31

CENTERLINE F.A.P. 336 – IL. RTE. 31

EXISTING CONCRETE PAVEMENT

WEST LINE OF THE S.E. 1/4 SEC. 10-44-8

EDGE OF CONCRETE SHOULDER

CONCRETE CURB & GUTTER

42" TREE

24" DIA.

INV = 887.47

N 00°06'58" W 601.68'

EXISTING R.O.W PER DOC. NO. 2000R0022638

CP3
BM2

N 89°52'08" W
10.05'

N 00°11'08" W 132.78'

L = 180.43'
R = 9873.53'
CB = N 00°40'33" W
CL = 180.43'

N 88°06'56" E
20.14'

EXISTING R.O.W. PER DOC. NO. 2000R0022638

L = 479.14'
R = 9893.53'
CB = N 02°34'37" W
CL = 479.09'

N 88°38'34" E
103.34'

SIGN

80'

30'

BUILDING SETBACK

RAYMOND DRIVE

S 89°45'32" W 500.44'

16.22 ACRES

PREMISES CONVEYED TO MERCY HEALTH SYSTEM CORPORATION
BY WARRANTY DEED RECORDED AS DOC. NO. 2003R0164423
PIN NO. 19-10-400-010

BUILDING SETBACK LINE

EXISTING R.O.W. PER PLAT OF HIGHWAYS DOC. NO. 910111

N 83°00'44" E 302.08'

THREE OAKS ROAD

NORTH LINE OF THE S.E. 1/4 SEC. 10-43-8

SANITARY MH
RIM = 906.60
INV OUT = 893.74 W 8"
INV IN = 893.76 E 8"

SANITARY MH
RIM = 908.42
INV = 894.56 8"

PROPOSED RIGHT OF WAY LINE

234.76'

50'

SANITARY MH
RIM = 908.16
INV OUT = 893.94 W 8"
INV IN = 894.04 N 8"

BM1
CP2

104.32'

N 89°54'03" E

CP1

20'

BUILDING SETBACK

DRIP LINE (TYPICAL)

12' PUBLIC UTILITY EASEMENT

12'

8"

EXISTING BITUMINOUS PAVEMENT

N 00°19'39" W 1429.65'

EAST LINE OF THE NORTH 1464.54' OF THE WEST 580.14' OF THE S.E. 1/4 OF SEC. 10-43-8

MERCY ALLIANCE INC.
PIN NO. 19-10-401-009

MERCY ALLIANCE INC.
PIN NO. 19-10-401-008

MERCY ALLIANCE INC.
PIN NO.
19-10-401-010

PREMISES CONVEYED TO MERCY HEALTH SYSTEM CORPORATION
BY TRUSTEE'S DEED RECORDED AS DOC. NO. 2006R0051219
PIN NO. 19-10-400-011

LUTTER ROAD

LEGEND

- EXISTING STAKE FOUND
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- CENTERLINE
- OVERHEAD UTILITY LINE
- 1 FOOT CONTOUR LINE
- FENCE LINE
- UNDERGROUND ELECTRIC
- GAS LINE
- TELEPHONE LINE
- CONCRETE SURFACE
- BITUMINOUS SURFACE
- DECIDUOUS TREE
- CONIFER TREE
- SANITARY MANHOLE
- SANITARY PIPE
- WATER VALVE
- WATER PIPE
- WATER SERVICE
- LIGHT POLE
- UTILITY POLE
- SIGN
- TRAFFIC SIGNAL
- HANDHOLE
- TELEPHONE PEDESTAL

DATUM INFORMATION

VERTICAL CONTROL: NAVD 88

HORIZONTAL CONTROL: ILLINOIS EAST NAD 83

CONTROL POINT INFORMATION

CP1 = IRON REBAR
N=997469.73, E=2022431.628, ELEV=911.66

CP2 = RAILROAD SPIKE
N=997410, E=2022361, ELEV=909.78

CP3 = ALUM DISK
N=997000.221, E=2021531.181, ELEV=900.17

CP4 = MAG NAIL
N=997491.256, E=2020870.926, ELEV=888.40

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ILLINOIS DESIGN FIRM NO. 184-003525

FG JOB NUMBER: 17-713

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WISCONSIN

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Approved:
Checked:
Designer:
Project Management Initials:

AECOM
AECOM Services of Illinois, Inc.
303 East Wacker Drive, Suite 1400
Chicago, Illinois 60601

PROJECT

MERCYHEALTH CRYSTAL LAKE

Southeast corner Illinois Route 31 & Three Oaks Road,Crystal Lake, IL

CLIENT

Mercyhealth
www.mercyrockford.org

ARCHITECT / ENGINEERS

AECOM Services of Illinois, Inc.
IL Design Firm Reg No. 184-001654
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www.ksd-la.com

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LICENSED PROFESSIONAL ENGINEER OF ILLINOIS
VAUGHN R. LEWIS
062-061904
EXPIRES 11/30/19

11-22-2017
SIGNATURE DATE

KEY PLAN

KEY PLAN

PUD ISSUE
22 NOVEMBER 2017

ISSUE/REVISION

NO.	DATE	DESCRIPTION

PROJECT NUMBER

60319436

SHEET TITLE

SITE SURVEY
PART OF THE S.E. 1/4 OF SECTION 10, T. 43 N., R. 8 E. OF THE THIRD P.M.

SHEET NUMBER

C-200

LEGEND

- EXISTING STAKE FOUND
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- CENTERLINE
- OU — OVERHEAD UTILITY LINE
- 755 — 1 FOOT CONTOUR LINE
- X — FENCE LINE
- UE — EXISTING UNDERGROUND ELECTRIC
- G — EXISTING GAS LINE
- T — EXISTING TELEPHONE LINE
- EXISTING CONCRETE SURFACE
- EXISTING BITUMINOUS SURFACE
- DECIDUOUS TREE
- CONIFER TREE
- SANITARY MANHOLE
- SAN — SANITARY PIPE
- WATER VALVE
- W — WATER PIPE
- WSV — WATER SERVICE
- LIGHT POLE
- UTILITY POLE
- SIGN
- TRAFFIC SIGNAL
- HANDHOLE
- TELEPHONE PEDESTAL

N W E S

50 0 50 100 150 FEET

TEK DRIVE
EXISTING CONCRETE CURB & GUTTER
ILLINOIS ROUTE 31
CENTERLINE F.A.P. 336 - IL. RTE. 31
EXISTING CONCRETE PAVEMENT
WEST LINE OF THE S.E. 1/4 SEC. 10-44-8
EDGE OF CONCRETE SHOULDER
CONCRETE CURB & GUTTER
24" DIA.
INV = 887.47
SIGN
80'
FUTURE REALIGNMENT OF RAYMOND DRIVE
BUILDING SETBACK
30'
FIRE LANE
PROPOSED BUILDING
PROPOSED PAVEMENT, TYPICAL
DRIP LINE (TYPICAL)
RAYMOND DRIVE
BUILDING SETBACK LINE
THREE OAKS ROAD
NORTH LINE OF THE S.E. 1/4 SEC. 10-43-8
PROPOSED CONCRETE SIDEWALK, TYPICAL
12' PUBLIC UTILITY EASEMENT
EXISTING BITUMINOUS PAVEMENT
EAST LINE OF THE NORTH 1464.54' OF THE WEST 580.14' OF THE S.E. 1/4 OF SEC. 10-43-8
LUTTER ROAD

AECOM
AECOM Services of Illinois, Inc.
303 East Wacker Drive, Suite 1400
Chicago, Illinois 60601

PROJECT

MERCYHEALTH CRYSTAL LAKE

Southeast Corner Illinois Route 31 & Three Oaks Road,Crystal Lake, Il

CLIENT

Mercyhealth
www.mercyrockford.org

ARCHITECT / ENGINEERS

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VAUGHN R. LEWIS
062-061904
EXPIRES 11/30/19

11-22-2017
SIGNATURE DATE

KEY PLAN

KEY PLAN

PUD ISSUE
22 NOVEMBER 2017

ISSUE/REVISION

NO.	DATE	DESCRIPTION

PROJECT NUMBER

60319436

SHEET TITLE

SITE PLAN

SHEET NUMBER

C-300

FG JOB NUMBER: 17-713

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ENGINEERING & ENVIRONMENTAL
ILLINOIS DESIGN FIRM NO. 184-003525

ILLINOIS
IOWA
WISCONSIN

Last Plotted: 11/21/17
Filename: G:\C3D\17\17-713\17-713 PUD.dwg, SITE

LEGEND

- EXISTING STAKE FOUND
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- CENTERLINE
- OU — OVERHEAD UTILITY LINE
- 755 — 1 FOOT CONTOUR LINE
- X — FENCE LINE
- UC — EXISTING UNDERGROUND ELECTRIC
- G — EXISTING GAS LINE
- T — EXISTING TELEPHONE LINE
- EXISTING CONCRETE SURFACE
- EXISTING BITUMINOUS SURFACE
- DECIDUOUS TREE
- CONIFER TREE
- SANITARY MANHOLE
- SAN — SANITARY PIPE
- WATER VALVE
- W — WATER PIPE
- WSV — WATER SERVICE
- LIGHT POLE
- UTILITY POLE
- SIGN
- TRAFFIC SIGNAL
- HANDHOLE
- TELEPHONE PEDESTAL

30 0 30 60 90 FEET

TEK DRIVE

ILLINOIS ROUTE 38

WEST LINE OF THE S.E. 1/4 SEC. 10-44-8

CENTERLINE F.A.P. 336 - IL. RTE. 31

SOUTH RIGHT-OF-WAY LINE OF ILLINOIS ROUTE 31

60'

30'

72'

30'

BUILDING SETBACK

46.5'

30'

RAYMOND DRIVE

FUTURE REALIGNMENT OF RAYMOND DRIVE

EAST RIGHT-OF-WAY LINE OF RAYMOND DRIVE

PROPOSED PAVEMENT, TYPICAL

FIRE LANE

26'

29 STALLS @ 9' = 261'

TYPICAL REGULAR STALL DIMENSIONS

19'

9'

24'

4 STALLS @ 9' = 36'

13 STALLS @ 9' = 117'

13 STALLS @ 9' = 117'

5 HC STALLS @ 18' = 90'

5 HC STALLS @ 18' = 90'

18' TYPICAL HANDICAP STALL DIMENSIONS

11 STALLS @ 9' = 99'

10 STALLS @ 9' = 90'

11 STALLS @ 9' = 99'

10 STALLS @ 9' = 90'

11 STALLS @ 9' = 99'

10 STALLS @ 9' = 90'

11 STALLS @ 9' = 99'

10 STALLS @ 9' = 90'

5 HC STALLS @ 18' = 90'

27 STALLS @ 9' = 243'

1 STALL @ 9'

MECHANICAL YARD WITH SCREENING

PROPOSED BUILDING

MATCH LINE SEE SHEET C-302

LOADING/SERVICE AREA

M6.18 CONCRETE CURB & GUTTER, TYPICAL

RAYMOND DRIVE

FIRE LANE

42.8'

28.8'

20'

BUILDING SETBACK

12'

12' PUBLIC UTILITY EASEMENT

EAST LINE OF THE NORTH 1464.54' OF THE WEST 580.14' OF THE S.E. 1/4 OF SEC. 10-43-8

14'

40'

FG JOB NUMBER: 17-713

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ILLINOIS DESIGN FIRM NO. 184-003525

ILLINOIS
IOWA
WISCONSIN

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VAUGHN R. LEWIS
062-061904
EXPIRES 11/30/19

11-22-2017
SIGNATURE DATE

KEY PLAN

KEY PLAN

PUD ISSUE
22 NOVEMBER 2017

ISSUE/REVISION

NO.	DATE	DESCRIPTION

PROJECT NUMBER

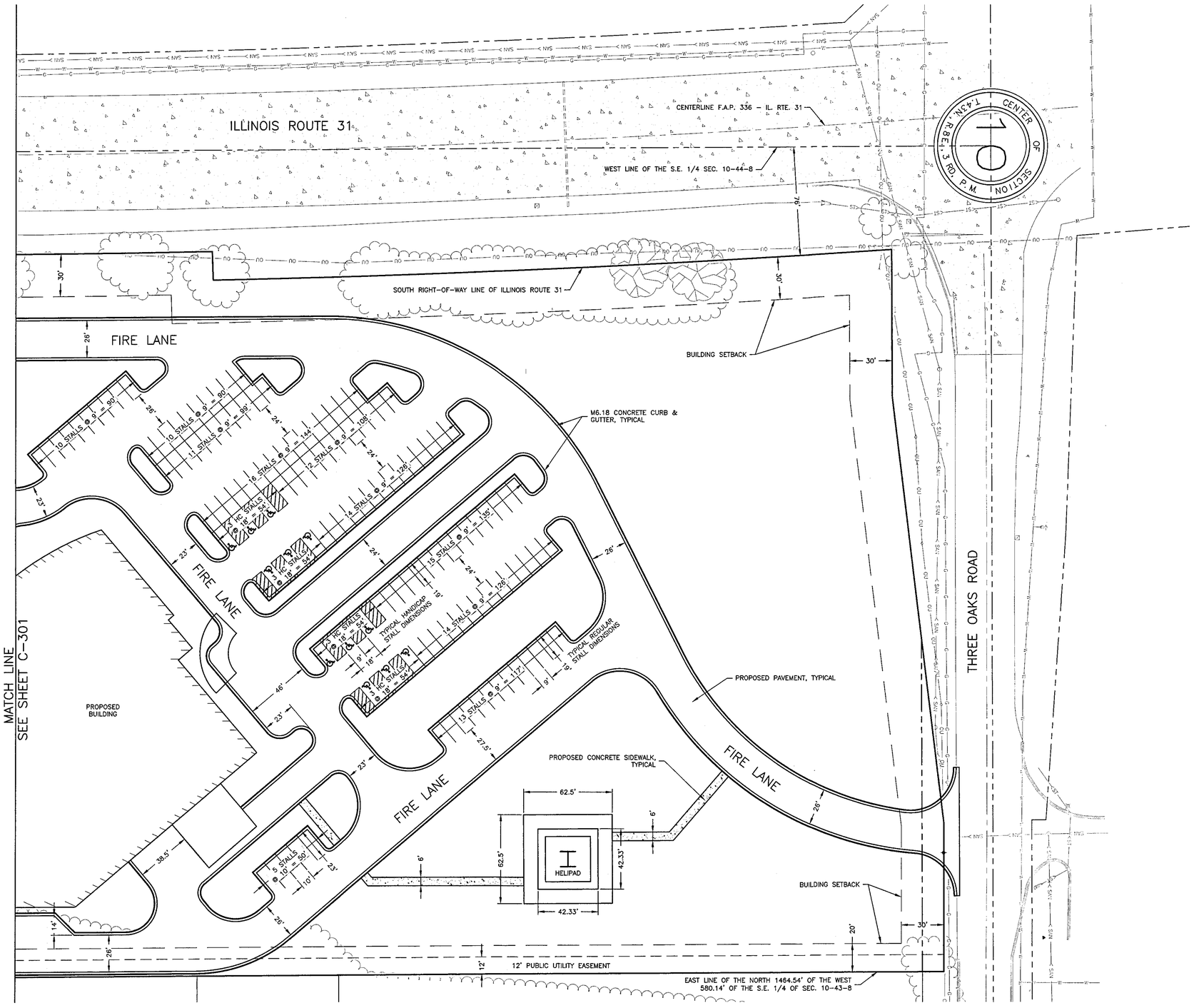
60319436

SHEET TITLE

SITE PLAN

SHEET NUMBER

C-301



AECOM
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Chicago, Illinois 60601

PROJECT

MERCYHEALTH CRYSTAL LAKE

Southeast Corner Illinois Route 31 & Three Oaks Road,Crystal Lake, Il

CLIENT

Mercyhealth

www.mercyrockford.org

ARCHITECT / ENGINEERS

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22 NOVEMBER 2017

ISSUE/REVISION

NO.	DATE	DESCRIPTION

PROJECT NUMBER

60319436

SHEET TITLE

SITE PLAN

SHEET NUMBER

C-302

FG JOB NUMBER: 17-713

FEHR GRAHAM
ENGINEERING & ENVIRONMENTAL
ILLINOIS DESIGN FIRM NO. 184-003525

ILLINOIS
IOWA
WISCONSIN

Last Plotted: 11/21/17
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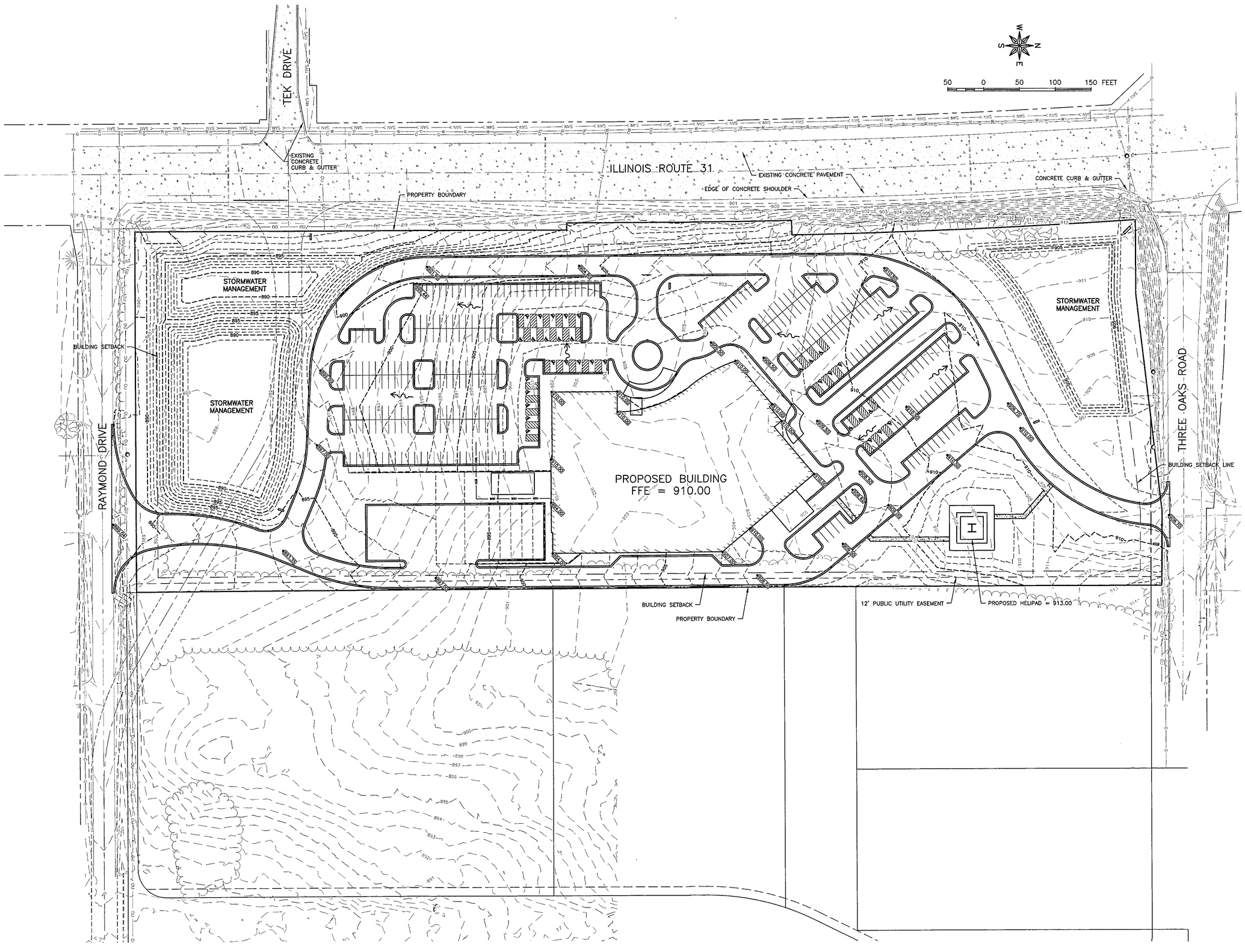
Checked:
Designer:
Project Management Initials:



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KEY PLAN

PUD ISSUE
22 NOVEMBER 2017

ISSUE/REVISION

NO.	DATE	DESCRIPTION

PROJECT NUMBER

60319436

SHEET TITLE

GRADING & DRAINAGE PLAN

SHEET NUMBER

C-400

FE JOB NUMBER 17-713

FEHR GRAHAM
ENGINEERING & ENVIRONMENTAL
ILLINOIS DESIGN FIRM NO. 184-003525

ILLINOIS
IOWA
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Approved:
Checked:
Designer:
Project Management Initials:
ARCH E1 30" x 42"

Last Plotted: 11/22/17
Filename: G:\C3D\717-713\17-713 PUD Grading.dwg, GRADE AND DRAIN

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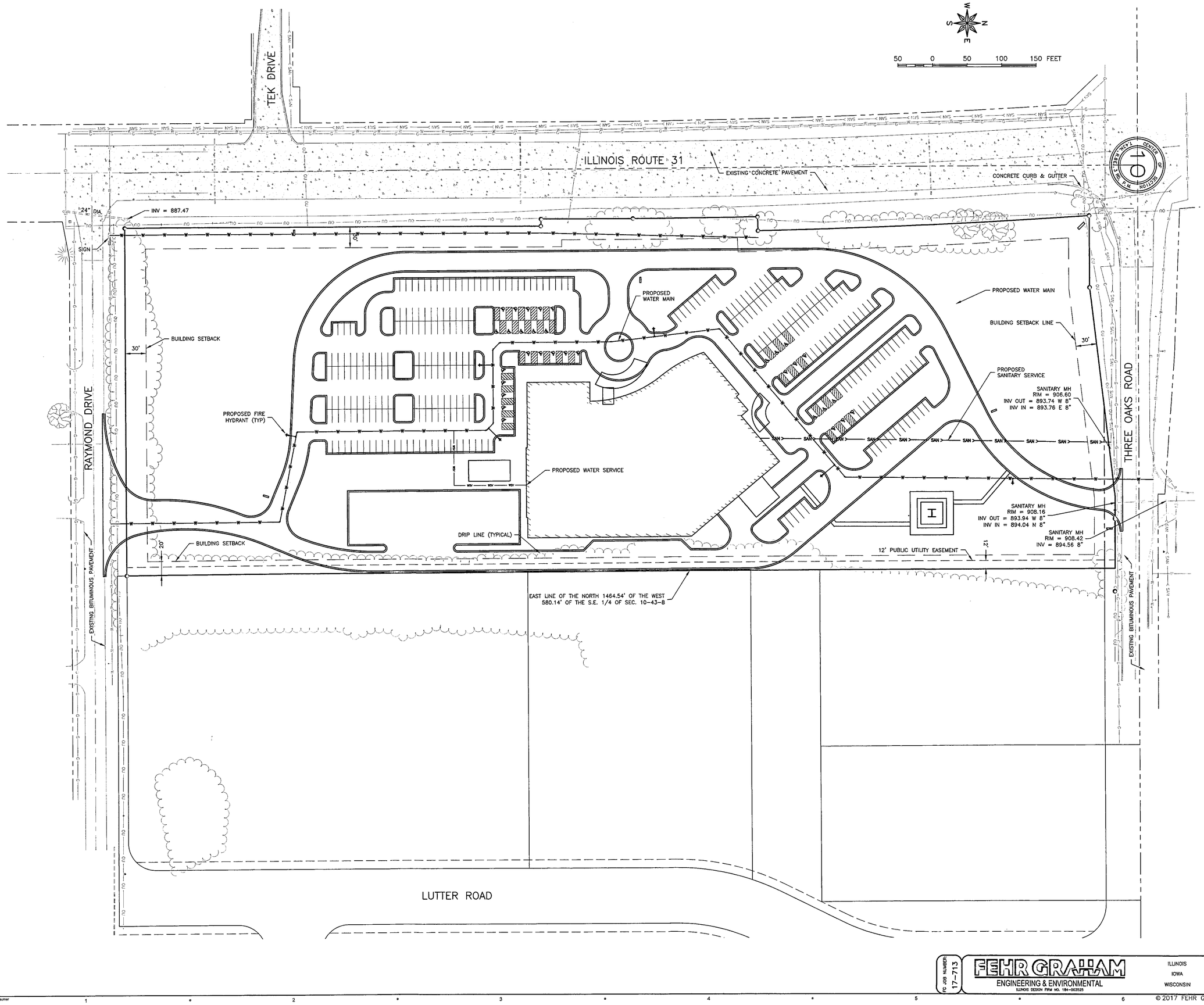

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303 East Wacker Drive, Suite 1400
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PROJECT

MERCYHEALTH CRYSTAL LAKE

Southeast Corner Illinois Route 31 & Three Oaks Road, Crystal Lake, Il

CLIENT

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ARCHITECT / ENGINEERS

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22 NOVEMBER 2017

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60319436

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UTILITY PLAN

SHEET NUMBER

C-500

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FEHR GRAHAM JOB NUMBER 17-713

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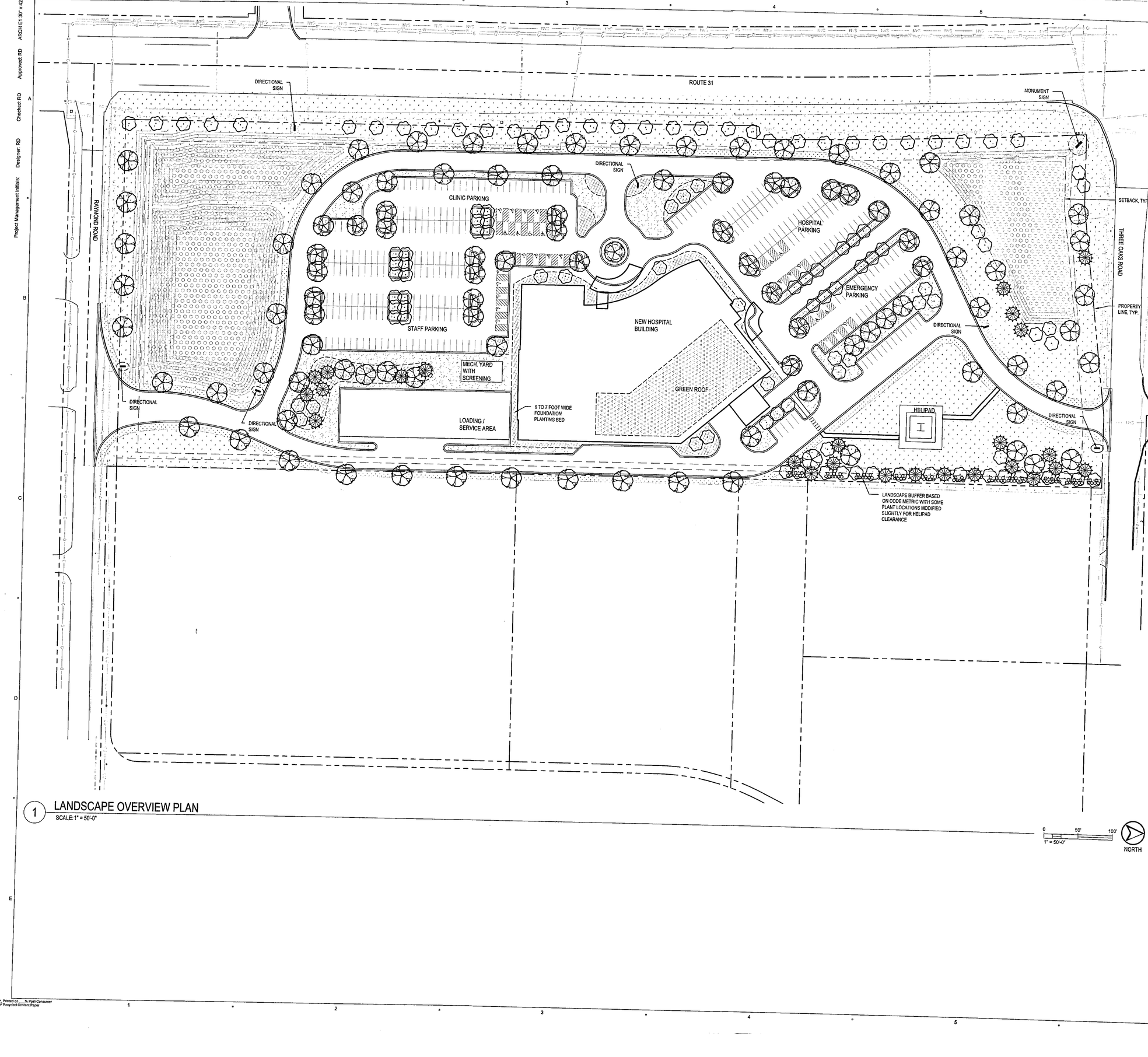

1 LANDSCAPE OVERVIEW PLAN
SCALE: 1" = 50'-0"

Project Management Initials: Designer: RD Checked: RD Approved: RD ARCH E1 30" x 42"

AECOM Services of Illinois, Inc.
303 East Wacker Drive, Suite 1400
Chicago, Illinois 60601

PROJECT

MERCYHEALTH CRYSTAL LAKE

Southeast Corner of Illinois Route 31 & Three Oaks Road, Crystal Lake, IL

CLIENT

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KEN SAIKI
167-006269
SIGNATURE 11/21/2017 DATE
167-006269 LICENSE # 30/11/2018 EXPIRATION DATE

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22 NOVEMBER 2017

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NO.	DATE	DESCRIPTION

PROJECT NUMBER

60319436

SHEET TITLE

Landscape Overview Plan

SHEET NUMBER

L-100

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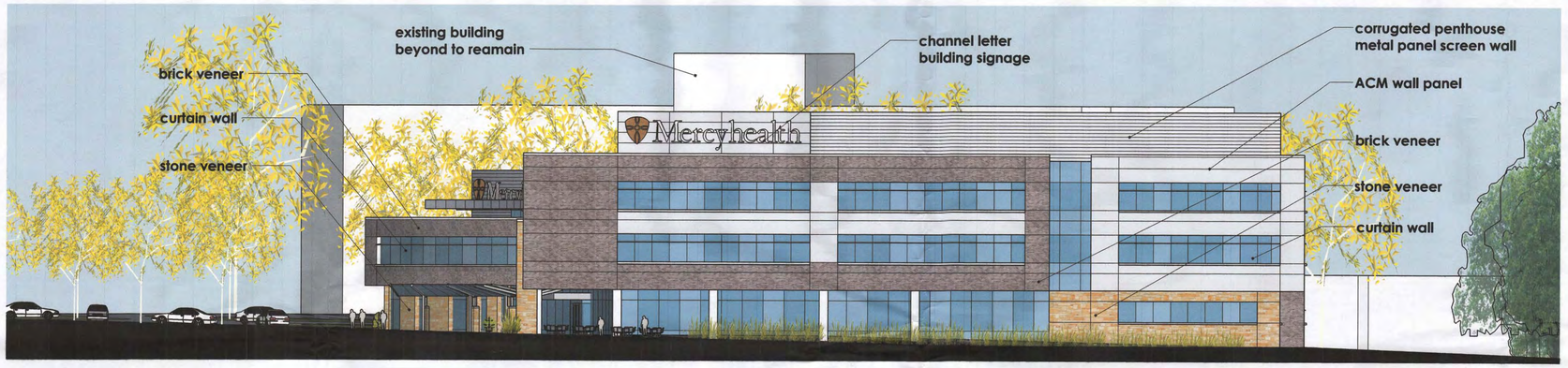

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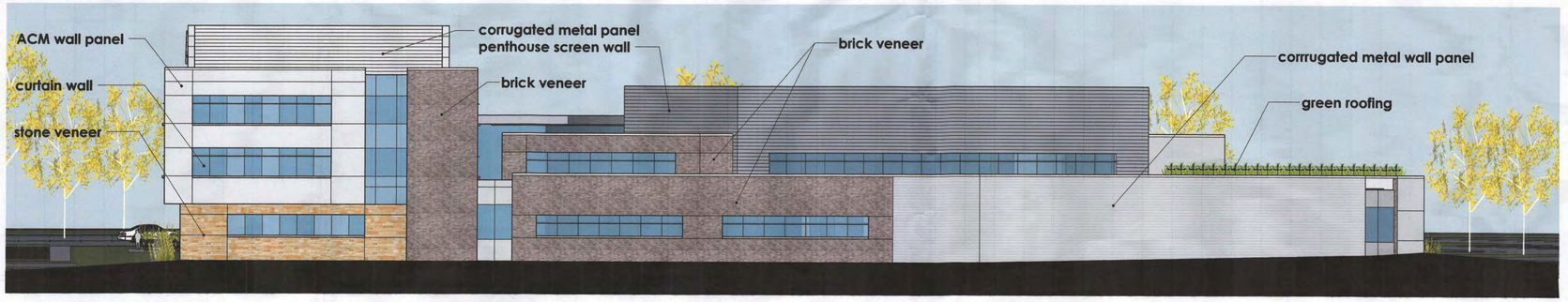

exterior elevation - east

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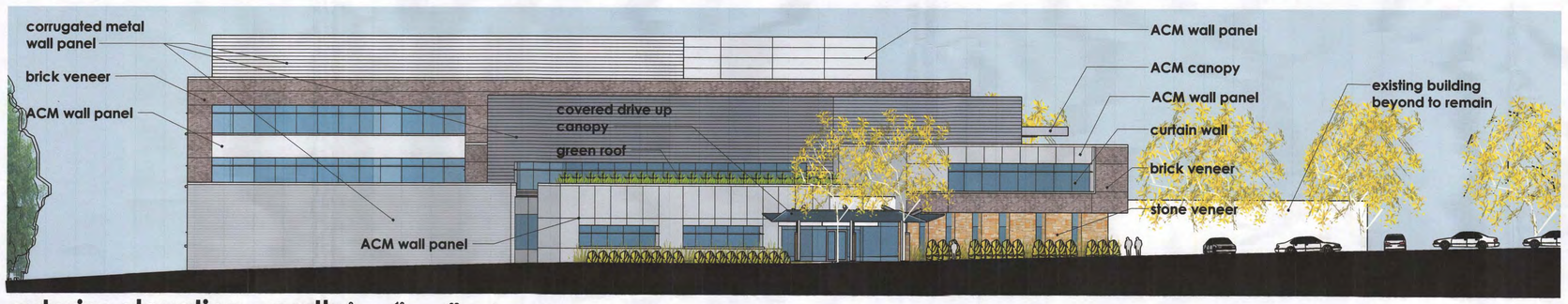

exterior elevation - north

0 16 32

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PROJECT

MERCYHEALTH CRYSTAL LAKE

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NO.	DATE	DESCRIPTION

PROJECT NUMBER

60319436

SHEET TITLE

EXTERIOR ELEVATIONS

SHEET NUMBER

A - 6

Renderings

Mercyhealth™

Mercyhealth Riverside Campus

Exterior Design

Received 12-20-17

AECOM

Renderings

Renderings – Entrance Design

Renderings – Entrance Design

Renderings – Overall Campus

Renderings – Main Entrance View

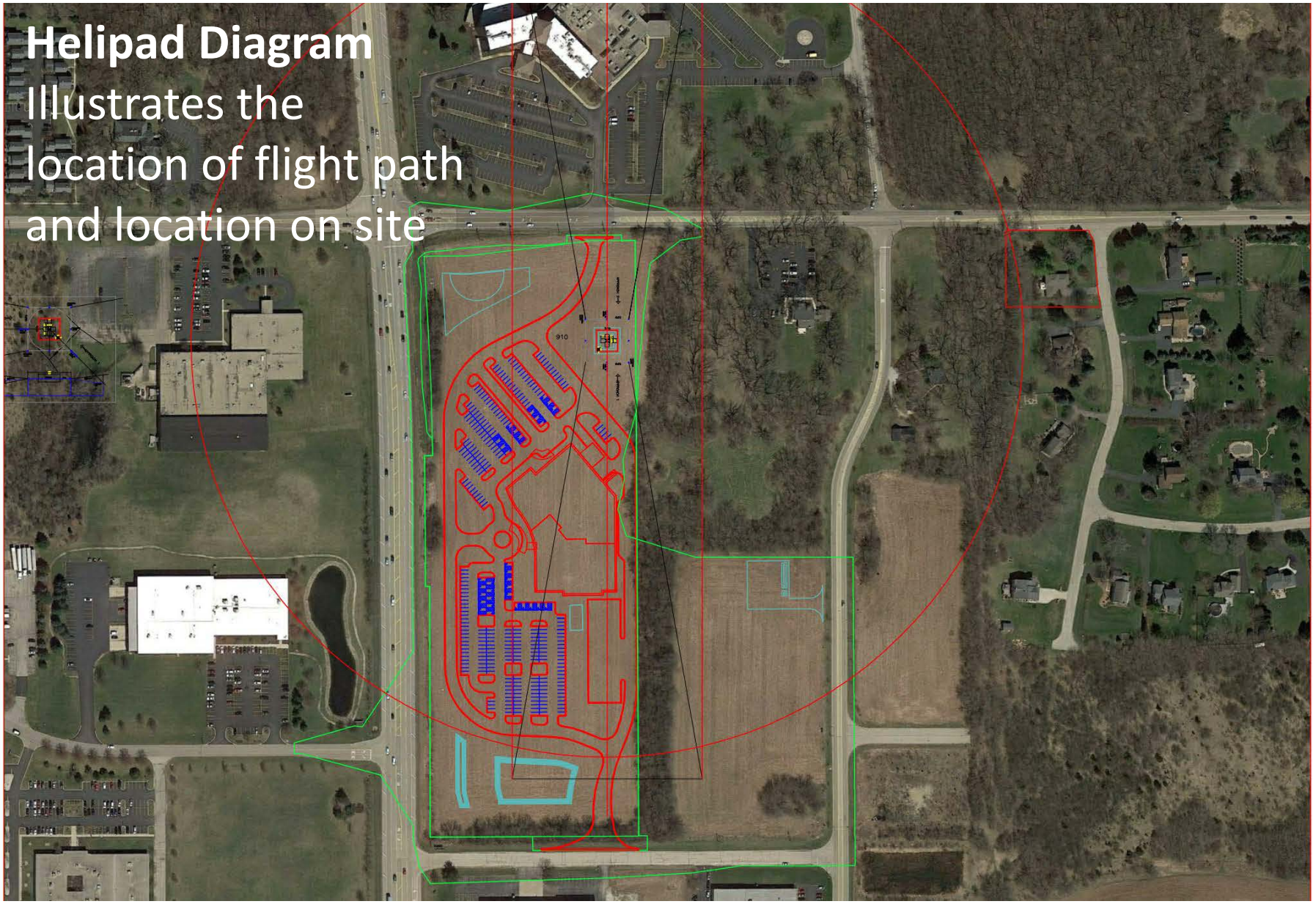
Renderings – Main Entrance View

Renderings – Main Entrance View

Mercyhealth Crystal Lake Parking Count Evaluation

CATEGORY			
Offices	Program		Parking Count
Offices	Offices of Physicians	1 per 150 sf GFA	
	Physician Clinics	16800	112
	PT/OT Services	3000	20
	Infusion	3400	23
			155
Medical Uses	Program		Parking Count
Medical Facilities	Outpatient Care Center	7 per 1000 sf GFA	
	Emergency	6800	45
	Surgery	12000	80
			125
Medical Facilities	Program	1 per 300 GFA Administrative Areas	Parking Count
Hospitals	Administration	3000	10
	Admitting	800	3
			13
Medical Facilities	Program	2 per Patient Bed	Parking Count
Hospitals	Med/Surg Beds	11	22
	Critical Care Beds	2	4
			26
TOTAL			**319**

Helipad Diagram
Illustrates the location of flight path and location on site



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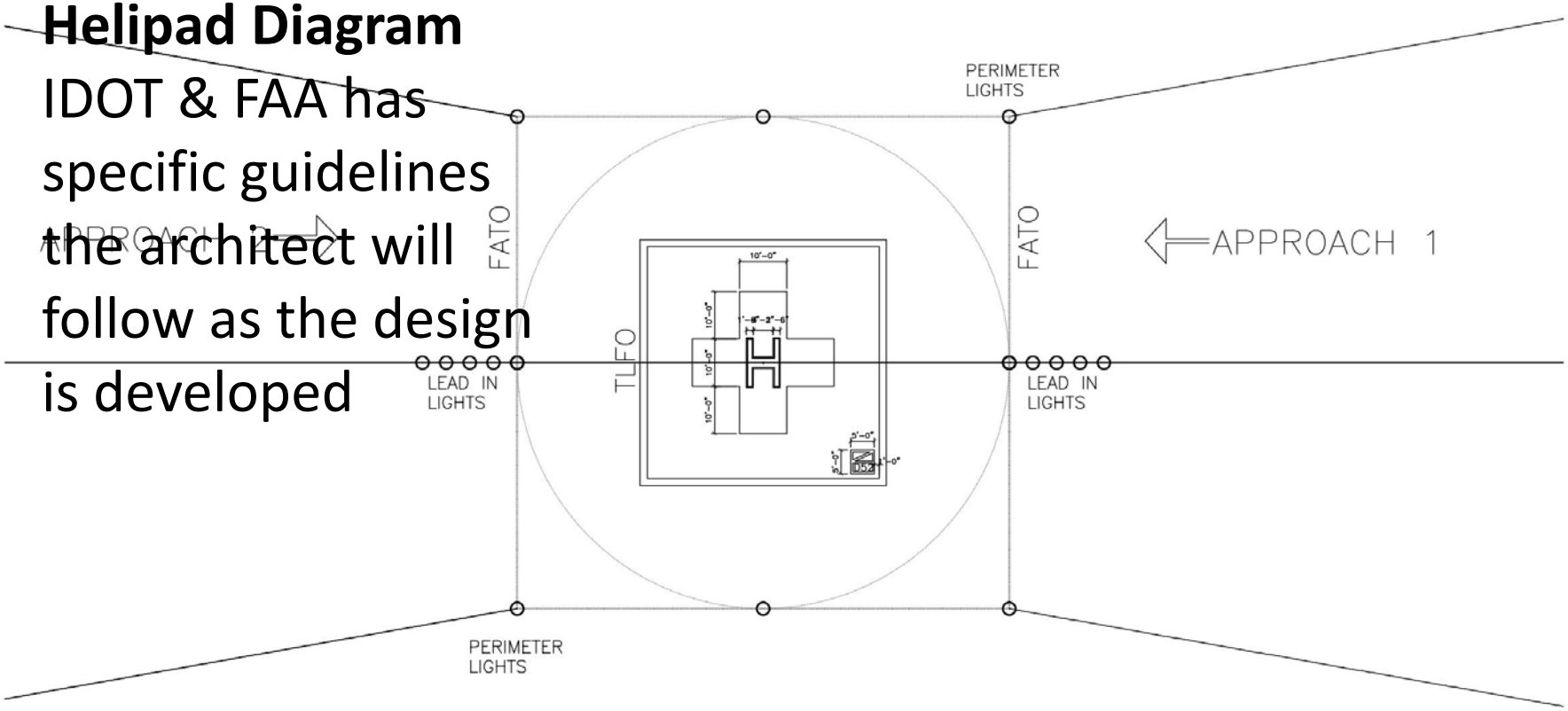
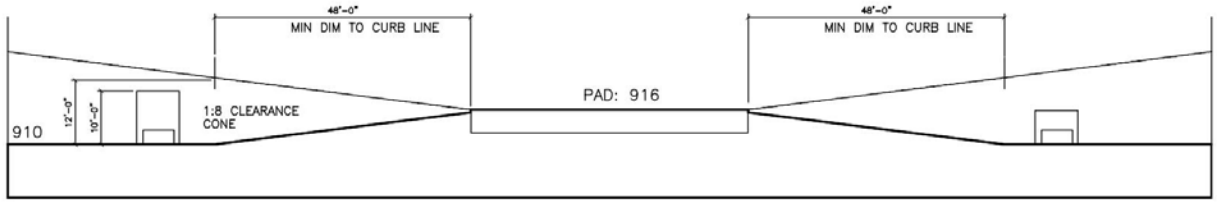
Helipad Diagram

IDOT & FAA has specific guidelines the architect will follow as the design is developed





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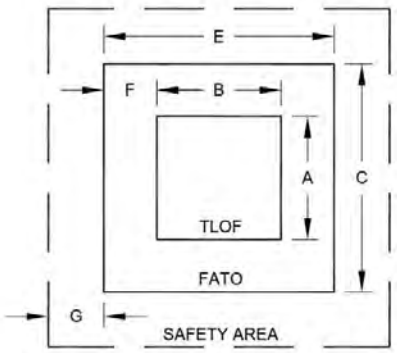
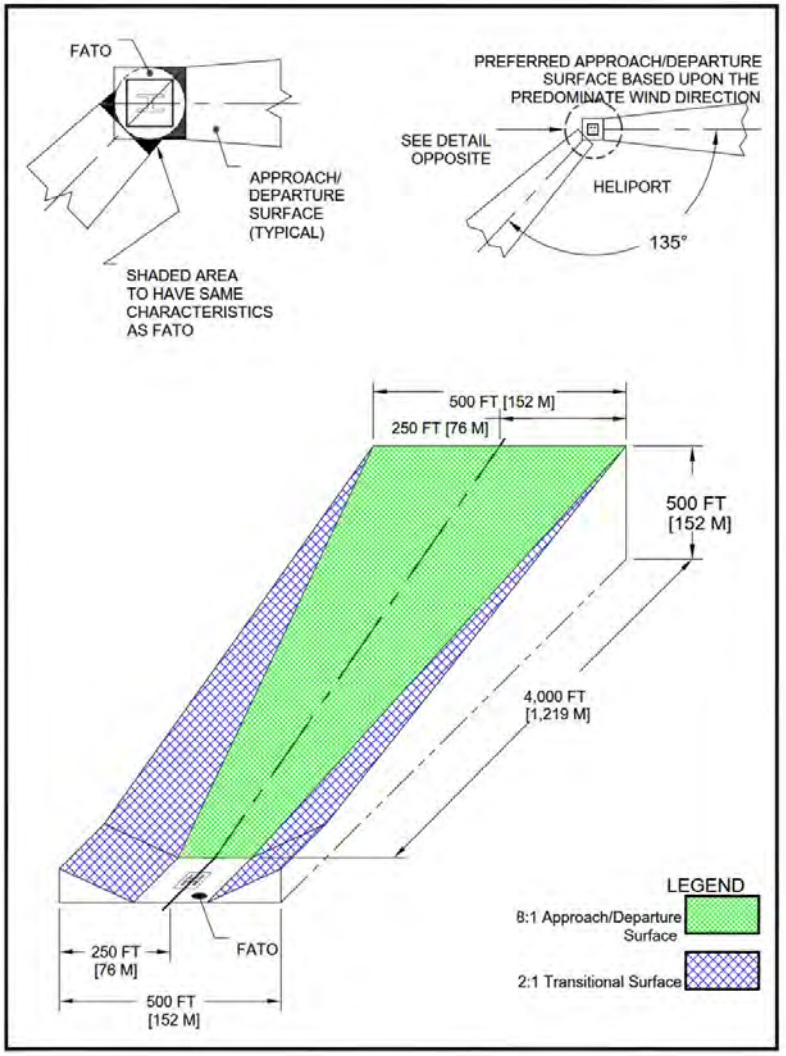


DIM	ITEM	VALUE	NOTES
A	Minimum TLOF Length	1 RD	
B	Minimum TLOF Width	1 RD	
C	Minimum FATO Length	1 ½ D	See Paragraph 207.a.(1) and Figure 2-5 for adjustments of elevations above 1000'
E	Minimum FATO Width	1 ½ D	
F	Minimum Separation Between the Perimeters of the TLOF and FATO	¾ D - ½ RD	
G	Minimum Safety Area Width	See Table 2-1	

Note: For a circular TLOF and FATO, dimensions A, B, C and E refer to diameters.

Figure 2–2. TLOF/FATO Safety Area Relationships and Minimum Dimensions: General Aviation



Helipad Diagram

IDOT & FAA has specific guidelines the architect will follow as the design is developed

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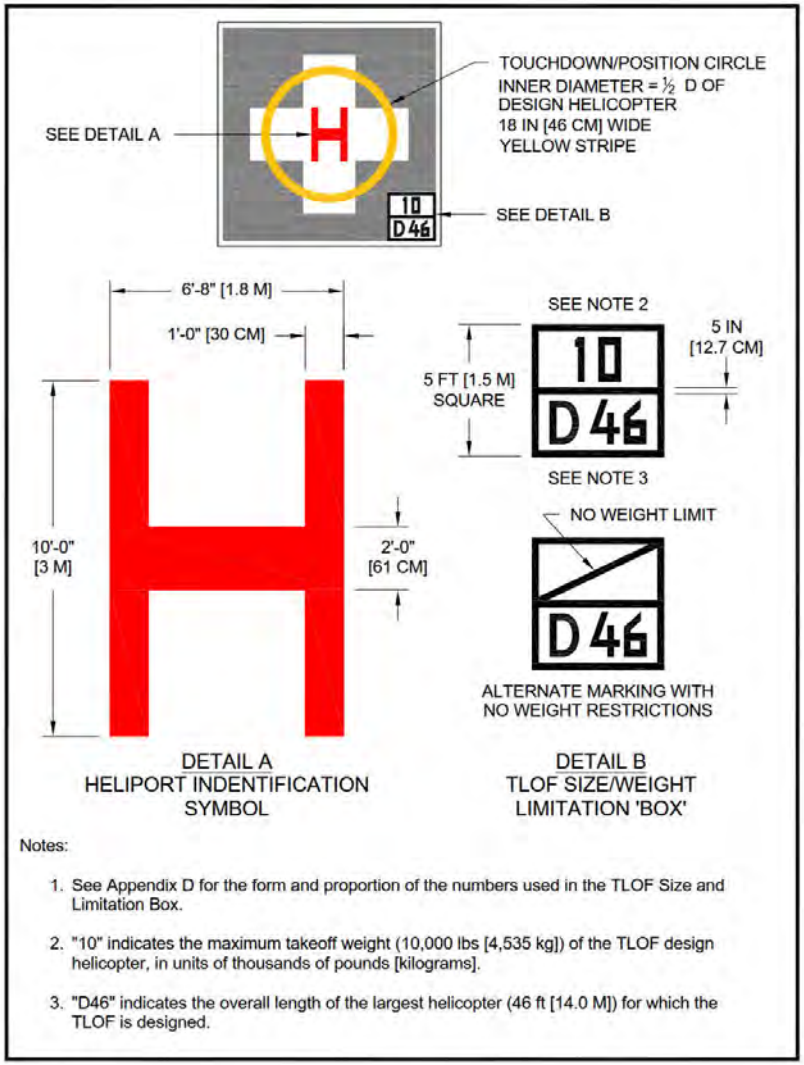
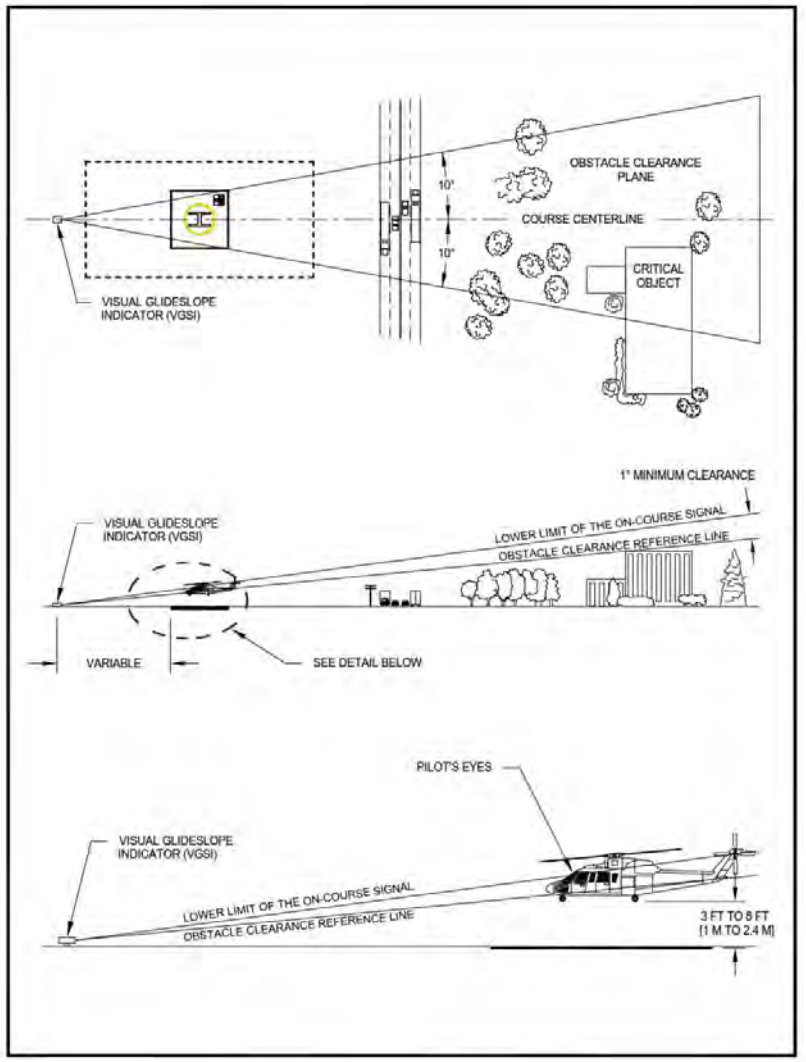


Notes:

1. See Appendix D for the form and proportion of the numbers used in the TLOF Size and Limitation Box.
2. "10" indicates the maximum takeoff weight (10,000 lbs [4,535 kg]) of the TLOF design helicopter, in units of thousands of pounds [kilograms].
3. "D46" indicates the overall length of the largest helicopter (46 ft [14.0 M]) for which the TLOF is designed.

AC 150/5390-2C 4/24/2012



MERCY HOSPITAL CRYSTAL LAKE

Traffic Study

Crystal Lake, Illinois

December 2017

Prepared for:

CITY OF CRYSTAL LAKE

TABLE OF CONTENTS

TABLES

EXHIBITS

EXECUTIVE SUMMARY

Kimley-Horn and Associates, Inc., (Kimley-Horn) was retained by the City of Crystal Lake to perform a traffic impact study for the development of a site located on the southeast quadrant of the intersection of IL Route 31 (IL 31) and Three Oaks Road in Crystal Lake, Illinois. The proposed plan includes a 111,346 square-foot microhospital with an accompanying 36,222 square-foot clinic. Employee information obtained from Mercy Health indicated the microhospital will operate with 275 employees and the clinic will operate with 75 employees. The proposed development will be served by one full-access and one three-quarter driveway. Access A will be a full-access driveway and is located on the south side of the site on Raymond Drive. Access B will be a three-quarter access driveway and is located on the north side of the site on Three Oaks Road and is proposed to align with the existing Holiday Inn driveway.

Based on a review of the existing traffic conditions, several improvements are warranted at study area intersections:

- IL 31/Three Oaks Road
  - Dual westbound left-turn lanes
  - Dedicated northbound right-turn lane
- Three Oaks Road/Lutter Drive/Sands Road
  - Installation of a traffic signal

Although these improvements are warranted under existing conditions, it is anticipated that traffic operations at these intersections will worsen with the addition of site-generated traffic. As part of this study, site-generated traffic projections were calculated for the proposed uses. **Table 1** below shows the percent increase in existing traffic at each study area intersection due to the development of the proposed microhospital.

Table 1. Site-Generated Percent Increase in Existing Traffic Volume

Intersection	Total Intersection Traffic Volume – PM Peak Hour (vehicles per hour)		Percent Increase
	Existing	Existing + Microhospital	
IL 31/Three Oaks Road	4,100	4,240	3.4%
IL 31/Tek Drive	3,545	3,650	3.0%
IL 31/Raymond Drive	3,535	3,670	3.8%
IL 31/James R Rakow Road/Central Park Drive	4,180	4,320	3.3%
Lutter Drive/Raymond Drive	440	540	22.7%
Lutter Drive/Central Park Drive	1,115	1,215	9.0%
Three Oaks Road/Holiday Inn Driveway	1,170	1,265	8.1%
Three Oaks Road/Lutter Drive/Sands Road	1,610	1,660	3.1%

Results from the signal warrant analysis performed for the intersection of IL 31/Raymond Drive indicated a traffic signal is not warranted, even with the addition of site-generated traffic shown above. It is anticipated, however, that as the currently undeveloped parcels located east of the proposed site

are developed in the future, safety and operational concerns will necessitate the realignment of Raymond Drive with the IL 31/Tek Drive intersection. The site layout for the subject development should be designed so as to not preclude this potential realignment.

The proposed Access A intersection with Raymond Drive is expected to operate at an acceptable level of service during the peak hours. A single inbound lane and two outbound lanes (one dedicated left-turn lane and one dedicated right-turn lane) are recommended, with minor-leg stop control posted for outbound traffic.

Access B will operate as a three-quarter access (left-in/right-in/right-out). Due to the volume of traffic on Three Oaks Road, a westbound left-turn lane is recommended with a 175-foot storage lane and 145-foot taper at the intersection with the Holiday Inn driveway and the proposed access. Additionally, an eastbound right-turn lane is recommended with a 175-foot storage lane and 145-foot taper. Minor-leg stop control should be posted for outbound traffic. A single inbound lane is recommended.

1. INTRODUCTION

A traffic impact study was performed for the development of a site in Crystal Lake, Illinois. The proposed site is located on the southeast quadrant of the IL Route 31 (IL 31)/Three Oaks Road intersection and is currently undeveloped. The proposed development plan includes a 111,346 square-foot microhospital with an accompanying 36,222 square-foot clinic. The proposed development will be served by one full-access driveway on Raymond Drive and one three-quarter access (left-in/right-in/right-out) on Three Oaks Road, which is proposed to align with the existing Holiday Inn driveway. An aerial view of the study location and the surrounding roadway network is presented in **Exhibit 1**.

As a part of this study, the existing street network was analyzed to determine the current operations at the study intersections. To assess the impact of the proposed development, background traffic growth, traffic from other approved developments, and site-generated traffic were added to existing traffic volumes. This report presents and documents Kimley-Horn's data collection, summarizes the evaluation of traffic conditions on the surrounding roadways, identifies recommendations to address operational issues, and details the potential impact of site-generated traffic on the adjacent roadway network.

Kimley»Horn

EXHIBIT 1

SITE LOCATION MAP

2. EXISTING CONDITIONS

Kimley-Horn conducted a field visit to collect relevant information pertaining to existing land uses in the surrounding area, the adjacent street system, current traffic volumes and operating conditions, lane configurations and traffic controls at study intersections, and other key roadway characteristics. This section of the report details information on these existing conditions.

2.1 Area Connectivity & Land Uses

The subject site is currently undeveloped and is bound by Three Oaks Road on the north, Raymond Drive on the south, and IL 31 on the west. Near the subject site, properties fronting IL 31 and Raymond Drive are developed with industrial uses. The Holiday Inn-Crystal Lake is located immediately north of the subject site. West and east of the property, Three Oaks Road and James R Rakow Road provide access to residential neighborhoods, including multi-family and single-family residences. South of the site, there are commercial/retail land uses that include a car dealership, Walmart, and restaurants. Immediately east of the commercial land uses are undeveloped parcels.

IL 31 provides primary north-south connectivity within the site vicinity, with access to US 14 via a full access interchange approximately 0.5 miles north of the subject site.

2.2 Existing Roadway Characteristics

The subject site is primarily served by IL 31 and Three Oaks Road. The following intersections were analyzed for this study:

- IL 31/Three Oaks Road
- IL 31/Tek Drive
- IL 31/Raymond Drive
- IL 31/James R Rakow Road/Central Park Road
- Three Oaks Road/Holiday Inn Driveway
- Three Oaks Road/Lutter Drive/Sands Road
- Raymond Drive/Lutter Drive
- Central Park Drive/Lutter Drive

Existing characteristics for the study area roadways are summarized below.

Illinois Route 31 (IL 31) is a north-south roadway classified as a principal arterial north of James R Rakow Road/Central Park Drive by the Illinois Department of Transportation (IDOT). South of James R Rakow Road/Central Park Drive, IL 31 is classified as a minor arterial. Additionally, IDOT classifies IL 31 as a Strategic Regional Arterial (SRA) roadway. The SRA system was established by IDOT to promote mobility on key routes throughout the Chicago area by applying various strategies, such as access control and limited signalization. At its signalized intersection with Three Oaks Road, IL 31 provides a dedicated left-turn lane, a dedicated through lane and a shared through/right-turn lane in both the northbound and southbound directions. At its unsignalized intersection with Tek Drive, IL 31 provides a dedicated left-turn lane and two through lanes in the northbound direction and one through lane and one shared through/right-turn lane in the southbound direction. At its unsignalized

intersection with Raymond Drive, IL 31 provides two dedicated through lanes and a dedicated right-turn lane in the northbound direction; it also provides a dedicated left-turn lane and two dedicated through lanes in the southbound direction. At its signalized intersection with James R Rakow Road/Central Park Drive, IL 31 provides two dedicated left-turn lanes, two through lanes, and a free-flow, channelized right-turn lane in the southbound direction and one dedicated left-turn lane, two through lanes, and one dedicated right-turn lane in the northbound direction. IL 31 is under the jurisdiction of IDOT. A 50 mile per hour (MPH) speed limit is posted on IL 31 north of James R Rakow Road/Central Park Drive. A 45 MPH speed limit is posted on IL 31 south of James R Rakow Road/Central Park Drive.

Three Oaks Road is an east-west roadway classified as a minor arterial by IDOT east of IL 31 and as a major collector west of IL 31. At its signalized intersection with IL 31, Three Oaks Road provides a dedicated left-turn lane and a shared through/right-turn lane in both the eastbound and westbound directions. At its unsignalized intersection with the Holiday Inn driveway, Three Oaks Road provides a two-way left-turn lane and a dedicated through lane in the eastbound direction and a shared through/right-turn lane in the westbound direction. At its unsignalized intersection with Lutter Drive, Three Oaks Road provides a dedicated left-turn lane and a shared through/right-turn lane in both the eastbound and westbound directions. Three Oaks Road is under the jurisdiction of the City of Crystal Lake east of IL 31 and under the jurisdiction of the Township of Algonquin west of IL 31. A 35 MPH speed limit is posted on Three Oaks Road in the vicinity of the subject site.

Lutter Drive/Sands Road is a north-south roadway classified as a local roadway by IDOT. This roadway is designated as Sands Road north of Three Oaks Road and Lutter Drive south of Three Oaks Road. At its minor-leg stop-controlled intersection with Three Oaks Road, Lutter Drive provides a dedicated left-turn lane and a shared through/right-turn lane in the northbound direction, and Sands Road provides a shared left-turn/through/right-turn lane in the southbound direction. At its unsignalized intersection with Raymond Drive, Lutter Drive provides a shared through/left-turn lane in the northbound direction and a shared through/right-turn lane in the southbound direction. In between Three Oaks Road and Central Park Drive, Lutter Drive provides a striped center median. Although it is not striped as a two-way left-turn lane, some motorists may utilize this median to complete left-turn movements from Lutter Drive onto side streets and driveways. At its minor-leg stop-controlled intersection with Central Park Drive, Lutter Drive provides a dedicated left-turn lane and a shared through/right-turn lane in both the northbound and southbound directions. Lutter Drive is under the jurisdiction of the City of Crystal Lake. A 30 MPH speed-limit is posted on Lutter Drive in the vicinity of the subject site.

Tek Drive is an east-west roadway classified as a local roadway by IDOT. At its minor-leg stop controlled intersection with IL 31, Tek Drive provides a one left-turn lane and one right-turn lane. Tek Drive is under the jurisdiction of the City of Crystal Lake. No speed limit is posted on Tek Drive; a speed limit of 30 MPH was assumed for the purposes of this analysis.

Raymond Drive is an east-west roadway classified as a local roadway by IDOT. At its minor-leg stop-controlled intersection with IL 31, Raymond Drive provides a shared left-turn/right-turn lane in the westbound direction. At its minor-leg stop-controlled intersection with Lutter Drive, Raymond Drive provides a shared left-turn/right-turn lane in the eastbound direction. Since a speed limit is not posted

on Raymond Drive, a 30 MPH speed limit is assumed for this study. Raymond Drive is under the jurisdiction of the City of Crystal Lake.

James R Rakow Road/Central Park Drive is an east-west roadway located approximately 1,100 feet south of the proposed development. This roadway is designated as James R Rakow Road west of IL 31 and as Central Park Drive east of IL 31. IDOT classifies James R Rakow Road as a principal arterial and Central Park Drive as a local roadway. At its signalized intersection with IL 31, James R Rakow Road provides two left-turn lanes, two through lanes, and one right-turn lane in the eastbound direction. Central Park Drive provides two left-turn lanes, one through lane, and one right-turn lane in the westbound direction. At its unsignalized intersection with Lutter Drive, Central Park Drive provides one left-turn lane, one through lane, and one right-turn lane in the eastbound direction and one left-turn lane and a shared through/right-turn lane in the westbound direction. A 35 MPH speed limit is posted on James R Rakow Road. No speed limit is posted on Central Park Drive; a speed limit of 30 MPH was assumed for the purposes of this analysis. James R Rakow Road is under the jurisdiction of McHenry County, and Central Park Drive is under the jurisdiction of the City of Crystal Lake.

2.3 Data Collection

Turning movement count data was collected on Thursday, October 12, 2017 at the study intersections noted in Section 2.2. Data collection took place during the following peak periods:

- Weekday morning: 7:00 to 9:00 AM
- Weekday evening: 4:00 to 6:00 PM

This data indicates that peak traffic volumes occur within the study area on weekdays from 6:45 to 7:45 AM and from 4:30 to 5:30 PM. As shown on **Exhibit 2**, IL 31 experiences similar traffic volumes in the northbound and southbound directions during the morning and evening peak hours. Three Oaks Drive experiences a slightly higher volume of traffic in the eastbound direction during the morning peak hour. During the evening peak hour, there is a higher volume of traffic in the westbound direction, reflecting a commuter pattern. Existing traffic volumes also indicate a commuter pattern at IL 31/James R Rakow Road/Central Park Drive. There is a high volume of traffic making an eastbound left-turn in the morning, with a corresponding high volume of traffic making a southbound right-turn in the evening.

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EXHIBIT 2

EXISTING (YEAR 2017) TRAFFIC VOLUMES

2.4 Existing Capacity Analysis

Per IDOT guidelines, Synchro capacity software was used to evaluate existing operational conditions at the study intersections during the weekday peak hours. The capacity of an intersection quantifies its ability to accommodate traffic volumes and is expressed in terms of level of service (LOS), measured in average delay per vehicle. LOS grades range from A to F, with LOS A as the highest (best traffic flow and least delay), LOS E as saturated or at-capacity conditions, and LOS F as the lowest (oversaturated conditions). The lowest LOS grade typically accepted by jurisdictional transportation agencies in Northeastern Illinois is LOS D, and a minimum LOS C is required for through movements on Strategic Regional Arterial (SRA) routes like IL 31.

The LOS grades shown below, which are provided in the Transportation Research Board's *Highway Capacity Manual* (HCM), quantify and categorize the driver's discomfort, frustration, fuel consumption, and travel times experienced as a result of intersection control and the resulting traffic queuing. A detailed description of each LOS rating can be found in **Table 2.1**.

Table 2.1. Level of Service Grading Descriptions[1]

Level of Service	Description
A	Minimal control delay; traffic operates at primarily free-flow conditions; unimpeded movement within traffic stream.
B	Minor control delay at signalized intersections; traffic operates at a fairly unimpeded level with slightly restricted movement within traffic stream.
C	Moderate control delay; movement within traffic stream more restricted than at LOS B; formation of queues contributes to lower average travel speeds.
D	Considerable control delay that may be substantially increased by small increases in flow; average travel speeds continue to decrease.
E	High control delay; average travel speed no more than 33 percent of free flow speed.
F	Extremely high control delay; extensive queuing and high volumes create exceedingly restricted traffic flow.

1 - Highway Capacity Manual 2010

The range of control delay for each rating (as detailed in the HCM) is shown in **Table 2.2**. Because signalized intersections are expected to carry a larger volume of vehicles and stopping is required during red time, higher delays are tolerated for the corresponding LOS ratings.

Table 2.2. Level of Service Grading Criteria[1]

Level of Service	Average Control Delay (s/veh) at:	
	Unsignalized Intersections	Signalized Intersections
A	0 – 10	0 – 10
B	> 10 – 15	> 10 – 20
C	> 15 – 25	> 20 – 35
D	> 25 – 35	> 35 – 55
E	> 35 – 50	> 55 – 80
F[2]	> 50	> 80

1 - Highway Capacity Manual 2010
2 - All movements with a Volume to Capacity (v/C) ratio greater than 1 receive a rating of LOS F.

Based on these standards, capacity results were identified for the study intersections under existing conditions. In order to evaluate existing traffic operations, signal timing information provided by IDOT was utilized for the IL 31/Three Oaks Road and IL 31/James R Rakow Road/Central Park Drive intersections. Per IDOT requirements, right-turn on red (RTOR) movements were excluded from the capacity analysis.

The results of the capacity analysis for existing conditions are summarized in **Table 2.3**. In this table, operation on each approach is quantified according to the average delay per vehicle and the corresponding LOS. Where an approach operates at LOS D or better but an individual movement operates at LOS E or F, this is indicated with a footnote. Overall intersection operations are also reported for the signalized intersections of IL 31/Three Oaks Road and IL 31/James R Rakow Road/Central Park Road. The results are based on Synchro's HCM 2010 reports.

Table 2.3. Existing (Year 2017) Levels of Service

Intersection	AM Peak		PM Peak	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS
IL 31/Three Oaks Road ★				
Northbound	4	A	67	E
Southbound	18	B	41	D
Eastbound	79	E	83	F
Westbound	64	E	57	E
Intersection	*21*	*C*	*56*	*E*
IL 31/Tek Drive △				
Northbound (Left)	16	C	19	C
Eastbound	73	F	>120	F
IL 31/Raymond Drive △				
Southbound (Left)	13	B	16	C
Westbound	26	D	37	E
IL 31/James R Rakow Road/Central Park Drive ★				
Northbound	24	C[1]	33	C[1]
Southbound	27	C[2]	35-	C[2]
Eastbound	56	E	59	E
Westbound	72	E	66	E
Intersection	*39*	*D*	*45*	*D*
Lutter Drive/Raymond Drive △				
Northbound	8	A	8	A
Eastbound	9	A	10-	A
Lutter Drive/Central Park Drive △				
Northbound	15+	C	33	D[2]
Southbound	13	B	15-	B
Eastbound (Left)	8	A	8	A
Westbound (Left)	7	A	7	A
Three Oaks Road/Holiday Inn Driveway △				
Southbound	14	B	16	C
Eastbound (Left)	9	A	10-	A

★ – Signalized Intersection △ – Minor-Leg Stop-Controlled Intersection

[1]Left-turn movement operates at LOS F.

[2]Left-turn movement operates at LOS E.

Table 2.3. Existing (Year 2017) Levels of Service **(cont'd.)**

Intersection	AM Peak		PM Peak	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS
Three Oaks Road/Lutter Drive/Sands Road △				
Northbound	18	C	24	C[1]
Southbound	33	D	>120	F
Eastbound (Left)	8	A	10-	A
Westbound (Left)	9	A	9	A

★ – Signalized Intersection △ – Minor-Leg Stop-Controlled Intersection

[1]Left-turn movement operates at LOS F.

[2]Left-turn movement operates at LOS E.

The signalized intersection of IL 31/Three Oaks Road is shown to operate at an overall LOS C during the weekday morning peak hour and LOS E during the evening peak hour, with multiple approaches operating at LOS E or F. The high delay is largely a function of the relatively long cycle length (140 seconds during the morning and evening peak hours) and the priority given to the north-south traffic on IL 31. As a result, long periods of green time are allocated to the north-south movements, and the minor street approaches receive relatively short green times. Additionally, capacity results showed the 95th percentile queue for the westbound left-turn lane exceeds the existing 100-foot storage during both the morning and evening peak hours. The 95th percentile queue is approximately 315 feet during the morning peak hour and approximately 470 feet during the evening peak hour. Similar queuing was noted during field observations.

The stop-controlled eastbound approach at the intersection of IL 31/Tek Drive operates at LOS F during both peak hours. This is likely attributed to the heavy through volume on IL 31, which makes it difficult for eastbound turning vehicles to find a gap in mainline traffic.

At the intersection of IL 31/Raymond Drive, the stop-controlled westbound approach operates at LOS D during the morning peak hour and LOS E during the evening peak hour. Similar to the eastbound approach at IL 31/Tek Drive, this is likely attributed to side street vehicles experiencing difficulty finding a gap in mainline through traffic.

The intersection of IL 31/James R Rakow Road/Central Park Drive operates at an overall LOS D during both the morning and evening peak hours. While the northbound approach operates well at LOS C during both peak hours, the northbound left-turn movement operates at LOS F. Similarly, the southbound approach operates well during the morning and evening peak hours at LOS C, but the left-turn movement operates at LOS E during both peak hours. This is likely a function of the relatively long cycle length (140 seconds) and the short green time (approximately 10 seconds) allocated to this movement. Similar to other signalized intersections, the minor street approaches (eastbound and westbound) experience relatively high delay and operate at LOS E during both peak hours. This is likely a result of minor street approaches receiving shorter green times due to the priority given to IL 31.

The southbound approach at the intersection of Three Oaks Road/Lutter Drive/Sands Road is shown to operate at LOS D during the morning peak hour and LOS F during the evening peak hour. In

addition, the northbound left-turn movement operates at LOS F during the evening peak hour. The traffic volumes for these movements are minor but are opposed by heavy mainline through volume on Three Oaks Road.

The approaches and movements at the intersections of Lutter Drive/Raymond Drive, Lutter Drive/Central Park Drive, and Three Oaks Road/Holiday Inn Driveway operate acceptably during both peak hours.

3. FUTURE CONDITIONS

This section of the report outlines the proposed site plan, summarizes site-specific traffic characteristics, and develops future traffic projections for analysis.

3.1 Development Characteristics & Site Access

The proposed development includes a 111,346 square-foot microhospital with an accompanying 36,222 square-foot clinic. Employee counts obtained from Mercy Health indicated there will be 275 employees for the microhospital and 75 employees for the clinic. The proposed development will be served by two accesses, designated as Access A and Access B. Access A will be a full-access driveway located on the south side of the site on Raymond Drive. Access B will be located on the north side of the site on Three Oaks Road. Access B will operate as a three-quarter access (left-in/right-in/right-out).

3.2 Trip Generation

In order to calculate trips generated by the proposed development, data was referenced from the Institute of Transportation Engineers (ITE) manual titled *Trip Generation, 10th Edition*. Where available, the trip generation equation for each ITE Land Use Code (LUC) corresponding to a proposed use was used; where a trip generation equation was not provided by ITE, the average rate was used as shown in **Table 3.1**. While there is a clinic land use provided in the ITE data, the number of studies is very low. Given the anticipated operations of the clinic, it was assumed to function similarly to a medical office building. Copies of the ITE data are provided in the appendix.

Table 3.1. ITE Trip Generation Data by Land Use

ITE Land Use	Unit	Weekday		
		Daily	AM Peak	PM Peak
Hospital (LUC 610)	Per 1,000 sq. ft.	T = 5.88(X) + 2723.70 50% in/50% out	T = 0.74(X) + 126.36 68% in/32% out	T = 0.84(X) + 100.56 32% in/68% out
Medical Office Building (LUC 720)	Per 1,000 sq. ft.	T = 38.42(X) – 87.62 50% in/50% out	Ln(T) = 0.89Ln(X) + 1.31 78% in/22% out	T = 3.39(X) + 2.02 28% in/72% out

T = trips X = 1,000 square feet

These peak hour trips were rounded to the nearest multiple of five for the purposes of this analysis. Projected site traffic volumes are summarized in **Table 3.2**

Table 3.2. Site-Generated Traffic Projections

Land Use	Unit	Weekday						
		Daily	AM Peak			PM Peak		
			In	Out	Total	In	Out	Total
Hospital (LUC 610)	111,346 sq. ft.	3,380	145	65	210	60	135	195
Medical Office Building (LUC 720)	36,222 sq. ft.	1,300	70	20	90	35	90	125
Total		4,680	215	85	300	95	225	320

3.3 Directional Distribution

The estimated distribution of site-generated traffic on the surrounding roadway network as it approaches and departs the site is a function of several variables, such as the nature of surrounding land uses, prevailing traffic volumes/patterns, and the ease with which motorists can travel various sections of the area roadway network. The anticipated directional distribution of vehicle trips is presented in **Table 3.3.**

Table 3.3. Directional Distribution Percentages

Traveling to/from:	Portion of Primary Trips & Pass-By Trips
North via IL 31	35%
South via IL 31	20%
East via Three Oaks Road	15%
West via Three Oaks Road	5%
West via James R Rakow Road	25%
Total	100%

Using the site-generated traffic projections and estimated trip distribution presented in Tables 3.2 and 3.3, site trips were assigned to the network as shown in **Exhibit 3**. It should be noted that due to existing levels of delay at the westbound approach at the intersection of IL 31/Raymond Drive, it was assumed outbound traffic destined to the south via IL 31 and the west via James R Rakow Road will avoid making a westbound left-turn at IL 31/Raymond Drive. Instead, this outbound traffic was assigned to southbound Lutter Drive to Central Park Drive to reach the intersection of IL 31/James R Rakow Road/Central Park Drive. To evaluate the increase in existing traffic at the study area intersections due to the development of the proposed site, **Table 3.4** presents the percent increase in total intersection volume for the evening peak hour with the site-generated traffic projections and estimated trip distribution.

Table 3.4. Site-Generated Percent Increase in Existing Traffic Volume

Intersection	Total Intersection Traffic Volume – PM Peak Hour (vehicles per hour)		Percent Increase
	Existing	Existing + Microhospital	
IL 31/Three Oaks Road	4,100	4,240	3.4%
IL 31/Tek Drive	3,545	3,650	3.0%
IL 31/Raymond Drive	3,535	3,670	3.8%
IL 31/James R Rakow Road/Central Park Drive	4,180	4,320	3.3%
Lutter Drive/Raymond Drive	440	540	22.7%
Lutter Drive/Central Park Drive	1,115	1,215	9.0%
Three Oaks Road/Holiday Inn Driveway	1,170	1,265	8.1%
Three Oaks Road/Lutter Drive/Sands Road	1,610	1,660	3.1%

3.4 Future Capacity Analysis

The proposed development is expected to be constructed by the year 2018; Kimley-Horn therefore evaluated future traffic conditions for Build + 5 Years (Year 2023) under both No-Build and Build conditions. Based on information received from the Chicago Metropolitan Agency for Planning (CMAP), IL 31 is expected to experience traffic growth at a compounded rate of approximately 0.94 percent per year (north of James R Rakow Road) and 2.21 percent per year (south of James R Rakow Road) through Year 2040 in the vicinity of the subject site. Traffic on James R Rakow Road is expected to grow at a compounded rate of approximately 0.18 percent per year through 2040. Additionally, traffic on Central Park Drive is expected to grow at a compounded rate of approximately 2.70 percent per year through 2040. Lastly, traffic on Three Oaks Road is expected to grow at the compounded rate of approximately 0.33 percent per year through 2040. For purposes of this analysis, growth rates were applied to existing traffic volumes for six years through Year 2023. An official letter from CMAP documenting the projected Year 2040 traffic volume on IL 31, James R Rakow Road, Central Park Drive, and Three Oaks Road is included in the appendix.

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EXHIBIT 3
SITE TRIP ASSIGNMENT

Future No-Build Traffic Projections

In addition to general background traffic growth, trip projections for known area developments that were previously proposed or are approved but not yet constructed were added to develop Future (2023) No-Build traffic projections. A list of these developments and the referenced study for each is below:

- Proposed Sage Products Campus Expansion, prepared September 2016 by James J. Benes and Associates, Inc. (*Approved*)
- Speedway Gas Station, prepared April 2016 by TranSystems (*Previously Proposed*)

The site trip assignments for each development listed above are included in the appendix. Future (2023) No-Build scenario traffic volumes are presented in **Exhibit 4**.

Based on traffic generated by the proposed Speedway gas station, a southbound right-turn lane is warranted at the intersection of IL 31/Tek Drive and was recommended as part of the study for that development. Therefore, a dedicated southbound right-turn lane was assumed to be installed with the construction of the Speedway gas station and was included in the analysis for Future (2023) No-Build and Build scenarios.

The Proposed Sage Products Campus Expansion study indicated a significant portion of site-generated trips would travel on Three Oaks Road. Using the trip assignment and distribution from this study, the percent increase over existing traffic volumes during the evening peak hour for the intersection of IL 31/Three Oaks Road is approximately 1.7% and approximately 4.4% for the intersection of Three Oaks Road/Lutter Drive/Sands Road.

Based on the anticipated traffic volumes and assumed improvements described above, the results of the capacity analysis for Future (2023) No-Build conditions are summarized in **Table 3.5**.

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EXHIBIT 4

NO-BUILD (YEAR 2023) TRAFFIC PROJECTIONS

Table 3.5. Future (Year 2023) No-Build Levels of Service

Intersection	AM Peak		PM Peak	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS
IL 31/Three Oaks Road ★				
Northbound	17	B	108	F
Southbound	22	C	49	D[2]
Eastbound	79	E	83	F
Westbound	70	E	73	E
Intersection	*28*	*C*	*79*	*E*
IL 31/Tek Drive △				
Northbound (Left)	18	C	26	D
Eastbound	>120	F	>120	F
IL 31/Raymond Drive △				
Southbound (Left)	14	B	17	C
Westbound	32	D	44	E
IL 31/James R Rakow Road/Central Park Drive ★				
Northbound	26	C[1]	36	D[1]
Southbound	29	C[2]	38	D[2]
Eastbound	56	E	59	E
Westbound	71	E	69	E
Intersection	*40*	*D*	*47*	*D*
Lutter Drive/Raymond Drive △				
Northbound	7	A	8	A
Eastbound	9	A	10-	A
Lutter Drive/Central Park Drive △				
Northbound	17	C	66	F
Southbound	13	B	17	C
Eastbound (Left)	8	A	8	A
Westbound (Left)	7	A	7	A
Three Oaks Road/Holiday Inn Driveway △				
Southbound	14	B	17	C
Eastbound (Left)	9	A	10-	A

★ – Signalized Intersection △ – Minor-Leg Stop-Controlled Intersection

[1]Left-turn movement operates at LOS F.

[2]Left-turn movement operates at LOS E.

Table 3.5. Future (Year 2023) No-Build Levels of Service **(cont'd.)**

Intersection	AM Peak		PM Peak	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS
Three Oaks Road/Lutter Drive/Sands Road △				
Northbound	23	C[2]	30	D[1]
Southbound	48	E	>120	F
Eastbound (Left)	9	A	10-	A
Westbound (Left)	9	A	9	A

★ – Signalized Intersection △ – Minor-Leg Stop-Controlled Intersection

[1]Left-turn movement operates at LOS F.

[2]Left-turn movement operates at LOS E.

With the increased background traffic volume within the study area, most of the approaches at the study intersections are expected to experience slight increases in delay but operate at the same LOS as existing conditions.

The delay at the northbound and westbound approaches at the IL 31/Three Oaks Road intersection is exacerbated under Future (2023) No-Build conditions, with the northbound approach worsening from LOS E to F during the evening peak hour. Furthermore, the overall intersection is projected to experience an increase in delay during both peak hours. Based on existing traffic volumes and Future (2023) No-Build traffic projections, a northbound right-turn lane was evaluated for the intersection of IL 31/Three Oaks Road per Chapter 36 of the IDOT *Bureau of Design and Environment (BDE) Manual*. Volume guidance indicates a right-turn lane should be considered at any signalized intersection where the right-turning volume is greater than 150 vehicles per hour and where there is greater than 300 vehicles per hour per lane on the mainline. Volumes for the northbound right-turn movement meet these thresholds under Existing and Future (2023) No-Build conditions. Additionally, based on existing traffic volumes, a second dedicated westbound left-turn lane is warranted at this intersection. At this time, however, there are no known plans to provide turn lane improvements at this intersection. Therefore, neither of these improvements were included in the analysis for the Future (2023) No-Build and Build scenarios. It is expected that the additional capacity would improve operations for the northbound and westbound approaches as well as the overall intersection.

While the eastbound approach at the intersection of IL 31/Tek Drive operates at LOS F during both peak hours under existing conditions, the delay is projected to increase significantly under Future (2023) No-Build conditions. This is a result of the additional traffic at this approach from the previously proposed Speedway gas station on the southwest quadrant of this intersection. Additionally, the northbound left-turn movement is projected to operate at LOS D during the evening peak hour. This movement operates at LOS C under existing conditions. The traffic study for the Speedway gas station recommended the installation of a traffic signal at this intersection; however, IDOT has indicated that the projected traffic volumes do not meet signal warrants.

The northbound and southbound approaches at the intersection of IL 31/James R Rakow Road/ Central Park Drive are projected to experience slight increases in delay, which results in a decline in LOS from C to D during the evening peak hour. Additionally, the northbound approach at Lutter Drive/

Central Park Drive is anticipated to worsen from LOS D to LOS F under Future (2023) No-Build conditions.

Delay at the minor-street approaches at the intersection of Three Oaks Road/Lutter Drive/Sands Road increases under Future (2023) No-Build conditions. The LOS at the southbound approach worsens from LOS D to LOS E during the morning peak hour. Additionally, the northbound approach is anticipated to operate at LOS D during the evening peak hour. Based on existing traffic volumes and operations at this intersection, a signal warrant analysis was completed. As detailed later in Section 3.5, a traffic signal is warranted for this intersection under Existing (2017) conditions and subsequently for Future (2023) No-Build and Build conditions. Although a traffic signal is warranted, there are no known plans for others to install a traffic signal at this intersection. It is expected that the installation of the warranted traffic signal at this intersection would alleviate this minor-street delay and result in acceptable traffic operations.

Future Build Traffic Projections

Total traffic projections for Year 2023 were calculated by adding site trips (Exhibit 3) to the Future (2023) No-Build traffic volumes (Exhibit 4). Traffic projections for the Future (2023) Build scenario are illustrated in **Exhibit 5**.

Based on projected site traffic volumes, an eastbound right-turn lane was evaluated for Three Oaks Road at the proposed Access B per Chapter 36 of the IDOT *BDE Manual.* Volume guidance for unsignalized intersections on two-lane highways indicates a right-turn lane should be considered at this location. Based on the *BDE Manual* guidance, an eastbound right-turn lane at Access B is recommended and was included in the analysis of Future (2023) Build conditions.

In addition, a westbound left-turn lane was evaluated for Three Oaks Road at the proposed Access B per the IDOT *BDE Manual*. Guidance provided for left-turn lanes at unsignalized intersections on two-lane highways with a design speed of 40 miles per hour indicates that a left-turn is warranted for the proposed Access B. Therefore, a westbound left-turn lane is recommended and was included in the analysis of Future (2023) Build conditions.

Similar to Access B, a westbound right-turn lane and eastbound left-turn lane were evaluated for Raymond Drive at the proposed Access A. Guidance in the IDOT *BDE Manual* indicates no turn lanes are warranted at this intersection. Traffic volumes are minimal on Raymond Drive, and the capacity analysis for this intersection shows little delay for the eastbound and westbound approaches. Therefore, an eastbound left-turn lane and a westbound right-turn lane were not included in the analysis of Future (2023) Build conditions.

At Access A and Access B, a single inbound lane is recommended. At Access A, the outbound approach should provide a dedicated left-turn lane and dedicated right-turn lane. Access B will operate as a three-quarter access (left-in/right-in/right-out) and provide one outbound right-turn lane. Based on these assumptions, future capacity results for Future (2023) Build conditions are provided in **Table 3.6**.

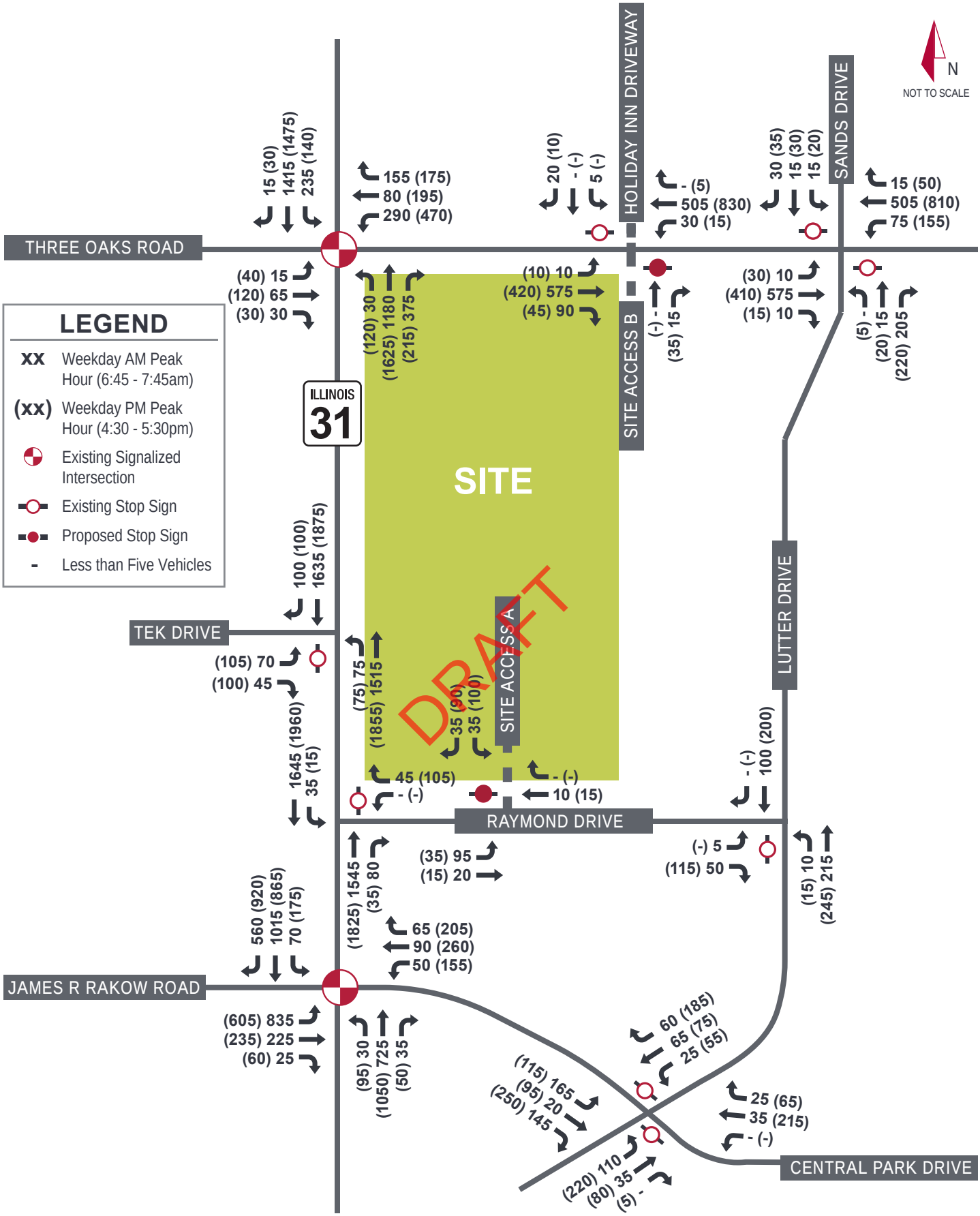


EXHIBIT 5

BUILD (YEAR 2023) TRAFFIC PROJECTIONS

Kimley»Horn

Table 3.6. Future (Year 2023) Build Levels of Service

Intersection	AM Peak		PM Peak	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS
IL 31/Three Oaks Road ★				
Northbound	22	C	>120	F
Southbound	33	C[1]	53	D[2]
Eastbound	79	E	84	F
Westbound	69	E	72	E
Intersection	*35*	*C*	*97*	*F*
IL 31/Tek Drive △				
Northbound (Left)	18	C	26	D
Eastbound	>120	F	>120	F
IL 31/Raymond Drive △				
Southbound (Left)	15+	C	18	C
Westbound	24	C	41	E
IL 31/James R Rakow Road/Central Park Drive ★				
Northbound	28	C[1]	37	D[1]
Southbound	31	C[2]	38	D[2]
Eastbound	57	E	60	E
Westbound	74	E	89	F
Intersection	*42*	*D*	*51*	*D*
Lutter Drive/Raymond Drive △				
Northbound	7	A	8	A
Eastbound	9	A	10+	B
Lutter Drive/Central Park Drive △				
Northbound	18	C	>120	F
Southbound	12	B	17	C
Eastbound (Left)	8	A	8	A
Westbound (Left)	7	A	7	A
Raymond Drive/Access A △				
Southbound	10-	A	9	A
Eastbound	7	A	7	A

★ – Signalized Intersection △ – Minor-Leg Stop-Controlled Intersection

[1]Left-turn movement operates at LOS F.

[2]Left-turn movement operates at LOS E.

Table 3.6. Future (Year 2023) Build Levels of Service

Intersection	AM Peak		PM Peak	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS
Three Oaks Road/Holiday Inn Driveway/Access B △				
Northbound (Right)	13	B	11	B
Southbound	17	C	19	C
Eastbound (Left)	9	A	10-	A
Westbound (Left)	9	A	8	A
Three Oaks Road/Lutter Drive/Sands Road △				
Northbound	24	C[2]	34	D[1]
Southbound	54	F	>120	F
Eastbound (Left)	9	A	10+	B
Westbound (Left)	9	A	9	A

★ – Signalized Intersection △ – Minor-Leg Stop-Controlled Intersection

[1]Left-turn movement operates at LOS F.

[2]Left-turn movement operates at LOS E.

With the addition of site traffic, most approaches and movements at the study area intersections are expected to continue to operate similar to Future (2023) No-Build conditions.

Operations at the intersection of IL 31/Three Oaks Road are anticipated to continue to decline under Future (2023) Build conditions. The northbound approach is projected to worsen from LOS B to LOS C during the morning peak hour. Additionally, the overall intersection is projected to worsen from LOS E to LOS F during the evening peak hour. As described in the Future (2023) No-Build capacity analysis results, a dedicated northbound right-turn lane and a second dedicated westbound left-turn lane are warranted at this intersection under Existing conditions but have not been included in this analysis since there are no known plans to install these improvements. It is expected that the additional capacity would improve operations for the northbound and westbound approaches as well as the overall intersection.

With the additional of site traffic, the westbound approach at the intersection of IL 31/Raymond Drive is anticipated to experience levels of delay similar to No-Build conditions.

During the morning peak hour, the intersection of IL 31/James R Rakow Road/Central Park Drive is projected to operate at LOS D overall, the same as Future (2023) No-Build conditions. The westbound approach, however, is anticipated to operate at LOS F. This approach is projected to operate at LOS E under Future (2023) No-Build conditions.

Although no site traffic has been assigned to the northbound or southbound approaches at the intersection of Three Oaks Road/Lutter Drive/Sands Road, it is anticipated that the delay at these approaches will increase slightly under Future (2023) Build conditions due to the addition of site traffic in the eastbound and westbound directions. The delay on the southbound approach is anticipated to increase by six seconds during the morning peak hour, resulting in LOS F. As described in the Future (2023) No-Build capacity analysis results and detailed in Section 3.5 below, a traffic signal is

warranted for this intersection under Existing (2017) conditions but has not been included in this analysis since there are no known plans to install a traffic signal at this intersection. It is expected that the installation of the warranted traffic signal would alleviate the minor-street delay and result in acceptable traffic operations.

The inbound and outbound movements are projected to operate with minimal delay at both Access A and B.

3.5 Signal Warrant Analysis

As noted in Section 3.4, signal warrant analyses were completed for Existing (2017), Future (2023) No-Build, and Future (2023) conditions for the intersections of IL 31/Raymond Drive and Three Oaks Road/Lutter Drive/Sands Road. Traffic volumes at this intersection were compared to criteria provided in the *Manual on Uniform Traffic Control Devices* (MUTCD) to determine whether a traffic signal may be warranted.

Signal warrant analyses were performed according to criteria set by the MUTCD for Warrant 1 (Eight-Hour Warrant), Condition A (Minimum Vehicular Volume) and Condition B (Interruption of Continuous Traffic). Warrant 1 can be satisfied by meeting any one of three conditions: Condition A (Minimum Vehicular Volume), Condition B (Interruption of Continuous Traffic), or a combined Condition A & B that has reduced volume thresholds that must be met for both conditions in order to warrant a signal. This warrant is typically evaluated with at least eight hours of traffic count data for an intersection. For the Existing (2017) and Future (2023) No-Build conditions, eight-hour traffic volumes were used for the intersection of Three Oaks Road/Lutter Drive/Sands Road. Because only peak hour projections can be formulated for the proposed development, typical IDOT practice allows a signal warrant to instead be evaluated by reducing evening peak hour volumes to 55 percent of their projected total to represent the minimum volume during a given eight-hour period. For Future (2023) Build conditions, this 55 percent reduction was used. Minor-street right-turning volumes were also reduced at the intersections in accordance with Pagone's Theorem, per IDOT requirements.

IL 31 is designated as an SRA by IDOT; therefore, the signal warrant analysis for the intersection of IL 31/Raymond Drive only considered Warrant 1, per IDOT requirements. At the intersection of Three Oaks Road/Lutter Drive, the signal warrant analysis also considered Warrant 2 (Four-Hour Vehicular Volume) and Warrant 3 (Peak Hour) in addition to Warrant 1.

Tables 3.7 and **3.8** summarize the signal warrant analyses conducted for IL 31/Raymond Drive and Three Oaks Road/Lutter Drive, respectively. The full results from the signal warrants are provided in the Appendix.

Table 3.7. Traffic Signal Warrant Analysis – IL 31/Raymond Drive

	MUTCD Criteria		Hours Met	Hours Required	Meets Warrant?
	Major Street	Higher-Volume Minor-Leg Approach			
Two-Lane Major Street/One-Lane Minor Street					
Existing (2017)					
Warrant 1A	600	150	0	8	No
Warrant 1B	900	100	0	8	No
Combination					
Warrant 1A	480	120	0	8	No
Warrant 1B	720	80	0	8	
Future (2023) No-Build					
Warrant 1A	600	150	0	8	No
Warrant 1B	900	100	0	8	No
Combination					
Warrant 1A	480	120	0	8	No
Warrant 1B	720	80	0	8	
Future (2023) Build					
Warrant 1A	600	150	0	8	No
Warrant 1B	900	100	0	8	No
Combination					
Warrant 1A	480	120	0	8	No
Warrant 1B	720	80	0	8	

Table 3.8. Traffic Signal Warrant Analysis – Three Oaks Road/Lutter Drive/Sands Road

	MUTCD Criteria		Hours Met	Hours Required	Meets Warrant?
	Major Street	Higher-Volume Minor-Leg Approach			
One-Lane Major Street/One-Lane Minor Street					
Existing (2017)					
Warrant 1A	500	150	0	8	No
Warrant 1B	750	75	7	8	No
Combination					
Warrant 1A	400	120	2	8	No
Warrant 1B	600	60	11	8	
Warrant 2	MUTCD Figure 4C-1	MUTCD Figure 4C-1	4	4	Yes
Warrant 3	MUTCD Figure 4C-3	MUTCD Figure 4C-3	0	1	No
Future (2023) No-Build					
Warrant 1A	500	150	0	8	No
Warrant 1B	750	75	8	8	Yes
Combination					
Warrant 1A	400	120	2	8	No
Warrant 1B	600	60	11	8	
Warrant 2	MUTCD Figure 4C-1	MUTCD Figure 4C-1	4	4	Yes
Warrant 3	MUTCD Figure 4C-3	MUTCD Figure 4C-3	0	1	No
Future (2023) Build					
Warrant 1A	500	150	0	8	No
Warrant 1B	750	75	8	8	Yes
Combination					
Warrant 1A	400	120	2	8	No
Warrant 1B	600	60	11	8	
Warrant 2	MUTCD Figure 4C-1	MUTCD Figure 4C-1	4	4	Yes
Warrant 3	MUTCD Figure 4C-3	MUTCD Figure 4C-3	0	1	No

As shown above, signal warrants are met at the intersection of Three Oaks Road/Lutter Drive/Sands Road for Existing (2017), Future (2023) No-Build, and Future (2023) Build conditions. Signal warrant volume thresholds, however, are not met at the intersection of IL 31/Raymond Drive under any scenario even with the addition of site-related traffic.

4. RECOMMENDATIONS & CONCLUSION

Based on an evaluation of existing traffic conditions, several improvements within the study area are warranted. These improvements include a dedicated northbound right-turn lane and a second dedicated westbound left-turn lane at the intersection of IL 31/Three Oaks Road. Additionally, a traffic signal is warranted at the intersection of Three Oaks Road/Lutter Drive/Sands Road. As previously identified, the proposed site will add traffic to each of the study area intersections. The percent increase in traffic at each study area intersection is shown in **Table 4.1**.

Table 4.1. Site-Generated Percent Increase in Existing Traffic Volume

Intersection	Total Intersection Traffic Volume – PM Peak Hour (vehicles per hour)		Percent Increase
	Existing	Existing + Microhospital	
IL 31/Three Oaks Road	4,100	4,240	3.4%
IL 31/Tek Drive	3,545	3,650	3.0%
IL 31/Raymond Drive	3,535	3,670	3.8%
IL 31/James R Rakow Road/Central Park Drive	4,180	4,320	3.3%
Lutter Drive/Raymond Drive	440	540	22.7%
Lutter Drive/Central Park Drive	1,115	1,215	9.0%
Three Oaks Road/Holiday Inn Driveway	1,170	1,265	8.1%
Three Oaks Road/Lutter Drive/Sands Road	1,610	1,660	3.1%

Based on a review of future traffic conditions, several recommendations are identified for the study area upon construction and occupancy of the subject site:

- A single inbound lane and two outbound lanes (one dedicated left-turn lane and one dedicated right-turn lane) should be provided for Access A to Raymond Drive.
- A dedicated westbound left-turn lane and dedicated eastbound right-turn lane should be provided along Three Oaks Road at Access B. Both turn lanes should provide a 175-foot storage lane with a 145-foot taper.
- A single inbound lane and outbound lane (one dedicated right-turn lane) should be provided for Access B to Three Oaks Road.
- Minor-leg stop control should be posted for outbound traffic at Access A and B.

It is anticipated that as the currently undeveloped parcels located east of the proposed site are developed in the future, safety and operational concerns will necessitate the realignment of Raymond Drive such that it forms the east leg of the existing IL 31/Tek Drive intersection. While there are no current plans for the realignment of Raymond Drive, the site layout for the subject development should be designed so as to not preclude this potential realignment, which is key to future operations and potential signalization.

Regardless of the final configuration of the intersection geometrics, several additional items should be taken into consideration when preparing site and roadway improvement plans for the subject development. If alterations to the site plan or land use should occur, changes to the analysis provided within this traffic impact study may be needed.

APPENDIX

Conceptual Site Plan

Traffic Count Data

Data from the ITE manual *Trip Generation, 10th Edition*

CMAP Year 2040 Traffic Projections

Trip Assignment for Background Studies

Existing (2017) Synchro Capacity Reports

Future (2023) No-Build Synchro Capacity Reports

Future (2023) Build Synchro Capacity Reports

Traffic Signal Warrants

CONCEPTUAL SITE PLAN

LEGEND

- EXISTING STAKE FOUND
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- CENTERLINE
- OU — OVERHEAD UTILITY LINE
- 755 — 1 FOOT CONTOUR LINE
- X — FENCE LINE
- UE — EXISTING UNDERGROUND ELECTRIC
- G — EXISTING GAS LINE
- T — EXISTING TELEPHONE LINE
- EXISTING CONCRETE SURFACE
- EXISTING BITUMINOUS SURFACE
- DECIDUOUS TREE
- CONIFER TREE
- SANITARY MANHOLE
- SAN — SANITARY PIPE
- WATER VALVE
- W — WATER PIPE
- WSV — WATER SERVICE
- LIGHT POLE
- UTILITY POLE
- SIGN
- TRAFFIC SIGNAL
- HANDHOLE
- TELEPHONE PEDESTAL

50 0 50 100 150 FEET

TEK DRIVE

EXISTING CONCRETE CURB & GUTTER

ILLINOIS ROUTE 31

CENTERLINE F.A.P. 336 – IL. RTE. 31

EXISTING CONCRETE PAVEMENT

EDGE OF CONCRETE SHOULDER

WEST LINE OF THE S.E. 1/4 SEC. 10-44-8

CONCRETE CURB & GUTTER

SECTION 10 CENTER OF SECTION T.43N.-R.8E.-3 P.M.

24" DIA.

INV = 887.47

SIGN

80'

30'

60'

70'

BM2

TOTAL 75 SPACES

BUILDING SETBACK

MAIN ENTRANCE

TOTAL 75 SPACES

BUILDING SETBACK LINE

TOTAL 50 SPACES

ED ENTRANCE

HOSPITAL BEDS

PREMISES CONVEYED TO MERCY HEALTH SYSTEM CORPORATION BY WARRANTY DEED RECORDED AS DOC. NO. 2003R0164423 PIN NO. 19-10-400-010

CLINIC

HOSPITAL D & T

AMBULANCE GARAGE

TOTAL 150 SPACES

SERVICE

DRIP LINE (TYPICAL)

20'

BUILDING SETBACK

SANITARY MH
RIM = 906.60
INV OUT = 893.74 W 8"
INV IN = 893.76 E 8"

SANITARY MH
RIM = 908.42
INV = 894.56 S

SANITARY MH
RIM = 908.16
INV OUT = 893.94 W 8"
INV IN = 894.04 N 8"

BM1

12' PUBLIC UTILITY EASEMENT

12'

RAYMOND DRIVE

EXISTING BITUMINOUS PAVEMENT

THREE OAKS ROAD

NORTH LINE OF THE S.E. 1/4 SEC. 10-43-8

EXISTING BITUMINOUS PAVEMENT

50'

EAST LINE OF THE NORTH 1464.54' OF THE WEST 580.14' OF THE S.E. 1/4 OF SEC. 10-43-8

MERCY ALLIANCE INC.
PIN NO. 19-10-401-009

MERCY ALLIANCE INC.
PIN NO. 19-10-401-008

MERCY ALLIANCE INC.
PIN NO.
19-10-401-010

PREMISES CONVEYED TO MERCY HEALTH SYSTEM CORPORATION BY TRUSTEE'S DEED RECORDED AS DOC. NO. 2006R0051219
PIN NO. 19-10-400-011

FEHR GRAHAM
ENGINEERING & ENVIRONMENTAL
ILLINOIS DESIGN FIRM NO. 184-003525

ILLINOIS
IOWA
WISCONSIN

PLOT DATE: 10/3/17

OWNER/DEVELOPER:
MERCYHEALTH
2400 NORTH ROCKTON AVENUE
ROCKFORD, ILLINOIS 61103

PROJECT AND LOCATION:
MERCYHEALTH CRYSTAL LAKE
HOSPITAL CAMPUS
CRYSTAL LAKE, ILLINOIS 60014

DRAWN BY: JMP
APPROVED BY: DLK
DATE: 10/03/2017
SCALE: AS NOTED

REVISIONS

REV. NO.	DESCRIPTION	DATE

DRAWING: SITE PLAN

SET TYPE: PRELIMINARY

G:\C3D\17\17-713\17-713 PUD.dwg, SITE

JOB NUMBER: 17-713

SHEET NUMBER: 3 of 5

TRAFFIC COUNT DATA

Study Name 01 IL 31 & Three Oaks
Date Thursday, October 12, 2017

Report Summary

		Eastbound						Westbound						Northbound						Southbound								Crosswalk	
Time Period	Class.	U	L	T	R	I	O	U	L	T	R	I	O	U	L	T	R	I	O	U	L	T	R	I	O	Total		s on Crc	destria	Total
AM Peak Period	Lights	0	13	49	28	90	114	0	259	79	137	475	473	0	21	945	278	1244	1501	0	146	1214	14	1374	1095	3183	W	0	0	0
Specified Period	%	0%	100%	98%	100%	99%	97%	0%	94%	99%	97%	96%	97%	0%	91%	94%	97%	94%	95%	0%	96%	95%	100%	95%	94%	95%		0%	0%	
6:00 AM - 9:00 AM	Mediums	0	0	1	0	1	3	0	14	1	3	18	10	0	2	29	7	38	40	0	2	26	0	28	32	85	E	0	0	0
One Hour Peak	%	0%	0%	2%	0%	1%	3%	0%	5%	1%	2%	4%	2%	0%	9%	3%	2%	3%	3%	0%	1%	2%	0%	2%	3%	3%		0%	0%	
6:45 AM - 7:45 AM	Articulated Trucks	0	0	0	0	0	0	0	2	0	1	3	7	0	0	34	3	37	35	0	4	33	0	37	35	77	S	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	1%	1%	0%	0%	3%	1%	3%	2%	0%	3%	3%	0%	3%	3%	2%		0%	0%	
	Total	**0**	**13**	**50**	**28**	**91**	**117**	**0**	**275**	**80**	**141**	**496**	**490**	**0**	**23**	**1008**	**288**	**1319**	**1576**	**0**	**152**	**1273**	**14**	**1439**	**1162**	**3345**	N	0	0	0
	PHF	0	0.46	0.74	0.58	0.81	0.79	0	0.86	0.83	0.64	0.91	0.85	0	0.72	0.92	0.89	0.91	0.96	0	0.83	0.92	0.7	0.95	0.98	0.99		0%	0%	
	HV%	0%	0%	2%	0%	1%	3%	0%	6%	1%	3%	4%	3%	0%	9%	6%	3%	6%	5%	0%	4%	5%	0%	5%	6%	5%		**0**	**0**	**0**
	Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
PM Peak Period	Lights	0	38	117	29	184	310	0	422	176	133	731	411	0	105	1376	191	1672	1729	0	103	1278	29	1410	1547	3997	W	0	0	0
Specified Period	%	0%	100%	99%	97%	99%	99%	0%	99%	98%	98%	99%	98%	0%	100%	98%	97%	98%	97%	0%	99%	97%	100%	97%	98%	98%		0%	0%	
3:00 PM - 6:00 PM	Mediums	0	0	1	0	1	3	0	4	3	1	8	6	0	0	25	4	29	22	0	1	18	0	19	26	57	E	0	0	0
One Hour Peak	%	0%	0%	1%	0%	1%	1%	0%	1%	2%	1%	1%	1%	0%	0%	2%	2%	2%	1%	0%	1%	1%	0%	1%	2%	1%		0%	0%	
4:30 PM - 5:30 PM	Articulated Trucks	0	0	0	1	1	0	0	1	0	1	2	1	0	0	8	1	9	27	0	0	25	0	25	9	37	S	0	0	0
	%	0%	0%	0%	3%	1%	0%	0%	0%	0%	1%	0%	0%	0%	0%	1%	1%	1%	2%	0%	0%	2%	0%	2%	1%	1%		0%	0%	
	Total	**0**	**38**	**118**	**30**	**186**	**313**	**0**	**427**	**179**	**135**	**741**	**418**	**0**	**105**	**1409**	**196**	**1710**	**1778**	**0**	**104**	**1321**	**29**	**1454**	**1582**	**4091**	N	0	0	0
	PHF	0	0.59	0.67	0.75	0.75	0.89	0	0.87	0.82	0.78	0.84	0.92	0	0.77	0.97	0.91	0.98	0.89	0	0.87	0.86	0.6	0.87	0.98	0.96		0%	0%	
	HV%	0%	0%	1%	3%	1%	1%	0%	1%	2%	1%	1%	2%	0%	0%	2%	3%	2%	3%	0%	1%	3%	0%	3%	2%	2%		**0**	**0**	**0**
	Bicycles on Road	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1				

Study Name 02 IL 31 & Holiday Inn Access
Date Thursday, October 12, 2017

Report Summary

		Eastbound					Westbound					Southbound							Crosswalk		
Time Period	Class.	U	L	T	I	O	U	T	R	I	O	U	L	R	I	O	Total		s on Cr	destria	Total
AM Peak Period	Lights	0	9	483	492	473	0	452	1	453	490	0	7	21	28	10	973	W	0	0	0
Specified Period	%	0%	90%	97%	97%	96%	0%	96%	100%	96%	97%	0%	100%	95%	97%	91%	96%		0%	0%	
6:00 AM - 9:00 AM	Mediums	0	1	9	10	17	0	16	0	16	9	0	0	1	1	1	27	E	0	0	0
One Hour Peak	%	0%	10%	2%	2%	3%	0%	3%	0%	3%	2%	0%	0%	5%	3%	9%	3%		0%	0%	
6:45 AM - 7:45 AM	Articulated Trucks	0	0	5	5	4	0	4	0	4	5	0	0	0	0	0	9	N	0	0	0
	%	0%	0%	1%	1%	1%	0%	1%	0%	1%	1%	0%	0%	0%	0%	0%	1%		0%	0%	
	Total	**0**	**10**	**498**	**508**	**494**	**0**	**472**	**1**	**473**	**505**	**0**	**7**	**22**	**29**	**11**	**1010**		**0**	**0**	**0**
	PHF	0	0.5	0.88	0.89	0.89	0	0.89	0.25	0.9	0.88	0	0.44	0.92	0.72	0.55	0.9				
	HV%	0%	10%	3%	3%	4%	0%	4%	0%	4%	3%	0%	0%	5%	3%	9%	4%				
	Bicycles on Road	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	1				
PM Peak Period	Lights	0	9	398	407	749	0	738	4	742	400	0	2	11	13	13	1162	W	0	0	0
Specified Period	%	0%	90%	98%	98%	99%	0%	99%	100%	99%	98%	0%	100%	92%	93%	93%	98%		0%	0%	
3:00 PM - 6:00 PM	Mediums	0	1	5	6	7	0	6	0	6	5	0	0	1	1	1	13	E	0	0	0
One Hour Peak	%	0%	10%	1%	1%	1%	0%	1%	0%	1%	1%	0%	0%	8%	7%	7%	1%		0%	0%	
4:30 PM - 5:30 PM	Articulated Trucks	0	0	2	2	2	0	2	0	2	2	0	0	0	0	0	4	N	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	0%	
	Total	**0**	**10**	**405**	**415**	**759**	**0**	**747**	**4**	**751**	**407**	**0**	**2**	**12**	**14**	**14**	**1180**		**0**	**0**	**0**
	PHF	0	0.5	0.91	0.93	0.89	0	0.9	0.5	0.89	0.91	0	0.5	0.6	0.58	0.7	0.9				
	HV%	0%	10%	2%	2%	1%	0%	1%	0%	1%	2%	0%	0%	8%	7%	7%	1%				
	Bicycles on Road	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	1				

Study Name 03 Three Oaks & Lutter
Date Thursday, October 12, 2017

Report Summary

		Eastbound						Westbound						Northbound						Southbound								Crosswalk		
Time Period	**Class.**	**U**	**L**	**T**	**R**	**I**	**O**	**U**	**L**	**T**	**R**	**I**	**O**	**U**	**L**	**T**	**R**	**I**	**O**	**U**	**L**	**T**	**R**	**I**	**O**	**Total**		**s on Crc**	**destria**	**Total**
AM Peak Period	Lights	0	12	468	9	489	453	0	61	426	12	499	668	0	1	13	183	197	85	0	17	15	26	58	37	1243	W	0	0	0
Specified Period	%	0%	100%	97%	100%	97%	96%	0%	97%	96%	92%	96%	97%	0%	100%	100%	97%	98%	98%	0%	100%	100%	90%	95%	97%	97%		0%	0%	
6:00 AM - 9:00 AM	Mediums	0	0	10	0	10	16	0	1	15	1	17	14	0	0	0	4	4	1	0	0	0	1	1	1	32	E	0	0	0
One Hour Peak	%	0%	0%	2%	0%	2%	3%	0%	2%	3%	8%	3%	2%	0%	0%	0%	2%	2%	1%	0%	0%	0%	3%	2%	3%	2%		0%	0%	
6:45 AM - 7:45 AM	Articulated Trucks	0	0	3	0	3	4	0	1	2	0	3	4	0	0	0	1	1	1	0	0	0	2	2	0	9	S	0	0	0
	%	0%	0%	1%	0%	1%	1%	0%	2%	0%	0%	1%	1%	0%	0%	0%	1%	0%	1%	0%	0%	0%	7%	3%	0%	1%		0%	0%	
	Total	**0**	**12**	**481**	**9**	**502**	**473**	**0**	**63**	**443**	**13**	**519**	**686**	**0**	**1**	**13**	**188**	**202**	**87**	**0**	**17**	**15**	**29**	**61**	**38**	**1284**	N	0	1	1
	PHF	0	0.75	0.87	0.56	0.89	0.88	0	0.93	0.89	0.65	0.92	0.88	0	0.25	0.54	0.82	0.86	0.84	0	0.71	0.75	0.72	0.76	0.79	0.91		0%	100%	
	HV%	0%	0%	3%	0%	3%	4%	0%	3%	4%	8%	4%	3%	0%	0%	0%	3%	2%	2%	0%	0%	0%	10%	5%	3%	3%		**0**	**1**	**1**
	Bicycles on Road	0	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1				
PM Peak Period	Lights	0	28	356	15	399	735	0	141	694	48	883	578	0	5	20	201	226	184	0	21	28	36	85	96	1593	W	0	0	0
Specified Period	%	0%	97%	99%	94%	98%	99%	0%	100%	99%	96%	99%	99%	0%	100%	100%	100%	100%	99%	0%	100%	100%	97%	99%	97%	99%		0%	0%	
3:00 PM - 6:00 PM	Mediums	0	1	3	1	5	5	0	0	5	0	5	4	0	0	0	1	1	1	0	0	0	0	0	1	11	E	0	0	0
One Hour Peak	%	0%	3%	1%	6%	1%	1%	0%	0%	1%	0%	1%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%	1%		0%	0%	
4:30 PM - 5:30 PM	Articulated Trucks	0	0	2	0	2	6	0	0	5	2	7	2	0	0	0	0	0	0	0	0	0	1	1	2	10	S	0	0	0
	%	0%	0%	1%	0%	0%	1%	0%	0%	1%	4%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	1%	2%	1%		0%	0%	
	Total	**0**	**29**	**361**	**16**	**406**	**746**	**0**	**141**	**704**	**50**	**895**	**584**	**0**	**5**	**20**	**202**	**227**	**185**	**0**	**21**	**28**	**37**	**86**	**99**	**1614**	N	0	0	0
	PHF	0	0.56	0.88	0.57	0.87	0.89	0	0.98	0.88	0.54	0.87	0.87	0	0.62	0.62	0.8	0.78	0.94	0	0.58	0.7	0.77	0.83	0.65	0.87		0%	0%	
	HV%	0%	3%	1%	6%	2%	1%	0%	0%	1%	4%	1%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	3%	1%	3%	1%		**0**	**0**	**0**
	Bicycles on Road	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1				

Study Name 04 IL 31 & Tek
Date Thursday, October 12, 2017

Report Summary

		Eastbound					Northbound					Southbound							Crosswalk		
Time Period	Class.	U	L	R	I	O	U	L	T	I	O	U	T	R	I	O	Total		s on Cr	edestria	Total
AM Peak Period	Lights	0	5	11	16	52	0	21	1294	1315	1523	0	1512	31	1543	1299	2874	W	0	0	0
Specified Period	%	0%	100%	100%	100%	95%	0%	95%	95%	95%	96%	0%	96%	94%	95%	95%	95%		0%	0%	
6:00 AM - 9:00 AM	Mediums	0	0	0	0	2	0	0	41	41	35	0	35	2	37	41	78	S	0	0	0
One Hour Peak	%	0%	0%	0%	0%	4%	0%	0%	3%	3%	2%	0%	2%	6%	2%	3%	3%		0%	0%	
6:45 AM - 7:45 AM	Articulated Trucks	0	0	0	0	1	0	1	31	32	36	0	36	0	36	31	68	N	0	0	0
	%	0%	0%	0%	0%	2%	0%	5%	2%	2%	2%	0%	2%	0%	2%	2%	2%		0%	0%	
	Total	**0**	**5**	**11**	**16**	**55**	**0**	**22**	**1366**	**1388**	**1594**	**0**	**1583**	**33**	**1616**	**1371**	**3020**		**0**	**0**	**0**
	PHF	0	0.31	0.92	0.57	0.81	0	0.79	0.9	0.9	0.93	0	0.93	0.82	0.92	0.9	0.97				
	HV%	0%	0%	0%	0%	5%	0%	5%	5%	5%	4%	0%	4%	6%	5%	5%	5%				
	Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
PM Peak Period	Lights	0	12	43	55	18	0	14	1645	1659	1784	0	1741	4	1745	1657	3459	W	0	0	0
Specified Period	%	0%	100%	96%	96%	86%	0%	88%	98%	98%	97%	0%	97%	80%	97%	98%	97%		0%	0%	
3:00 PM - 6:00 PM	Mediums	0	0	1	1	2	0	1	26	27	18	0	17	1	18	26	46	S	0	0	0
One Hour Peak	%	0%	0%	2%	2%	10%	0%	6%	2%	2%	1%	0%	1%	20%	1%	2%	1%		0%	0%	
4:30 PM - 5:30 PM	Articulated Trucks	0	0	1	1	1	0	1	10	11	33	0	32	0	32	10	44	N	0	0	0
	%	0%	0%	2%	2%	5%	0%	6%	1%	1%	2%	0%	2%	0%	2%	1%	1%		0%	0%	
	Total	**0**	**12**	**45**	**57**	**21**	**0**	**16**	**1681**	**1697**	**1835**	**0**	**1790**	**5**	**1795**	**1693**	**3549**		**0**	**0**	**0**
	PHF	0	0.5	0.47	0.48	0.52	0	0.5	0.97	0.97	0.95	0	0.94	0.62	0.94	0.97	0.98				
	HV%	0%	0%	4%	4%	14%	0%	13%	2%	2%	3%	0%	3%	20%	3%	2%	3%				
	Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

Study Name 05 IL 31 & Raymond
Date Thursday, October 12, 2017

Report Summary

		Westbound					Northbound					Southbound						Crosswalk		
Time Period	Class.	U	L	R	I	O	U	T	R	I	O	U	L	T	I	O	Total		s on Cr	edestria	Total
AM Peak Period	Lights	0	0	6	6	23	0	1346	2	1348	1504	0	21	1504	1525	1352	2879	E	0	0	0
Specified Period	%	0%	0%	100%	100%	100%	0%	95%	100%	95%	95%	0%	100%	95%	95%	95%	95%		0%	0%	
6:00 AM - 9:00 AM	Mediums	0	0	0	0	0	0	37	0	37	40	0	0	40	40	37	77	S	0	0	0
One Hour Peak	%	0%	0%	0%	0%	0%	0%	3%	0%	3%	3%	0%	0%	3%	3%	3%	3%		0%	0%	
6:45 AM - 7:45 AM	Articulated Trucks	0	0	0	0	0	0	37	0	37	33	0	0	33	33	37	70	N	0	0	0
	%	0%	0%	0%	0%	0%	0%	3%	0%	3%	2%	0%	0%	2%	2%	3%	2%		0%	0%	
	Total	**0**	**0**	**6**	**6**	**23**	**0**	**1420**	**2**	**1422**	**1577**	**0**	**21**	**1577**	**1598**	**1426**	**3026**		**0**	**0**	**0**
	PHF	0	0	0.38	0.38	0.64	0	0.86	0.25	0.86	0.95	0	0.58	0.95	0.94	0.86	0.97				
	HV%	0%	0%	0%	0%	0%	0%	5%	0%	5%	5%	0%	0%	5%	5%	5%	5%				
	Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
PM Peak Period	Lights	0	1	11	12	8	0	1641	0	1641	1785	0	8	1784	1792	1652	3445	E	0	0	0
Specified Period	%	0%	100%	85%	86%	100%	0%	98%	0%	98%	98%	0%	100%	98%	98%	98%	98%		0%	0%	
3:00 PM - 6:00 PM	Mediums	0	0	1	1	0	0	24	0	24	16	0	0	16	16	25	41	S	0	0	0
One Hour Peak	%	0%	0%	8%	7%	0%	0%	1%	0%	1%	1%	0%	0%	1%	1%	1%	1%		0%	0%	
4:30 PM - 5:30 PM	Articulated Trucks	0	0	1	1	0	0	9	0	9	28	0	0	28	28	10	38	N	0	0	0
	%	0%	0%	8%	7%	0%	0%	1%	0%	1%	2%	0%	0%	2%	2%	1%	1%		0%	0%	
	Total	**0**	**1**	**13**	**14**	**8**	**0**	**1674**	**0**	**1674**	**1829**	**0**	**8**	**1828**	**1836**	**1687**	**3524**		**0**	**0**	**0**
	PHF	0	0.25	0.65	0.7	0.5	0	0.95	0	0.95	0.93	0	0.5	0.93	0.93	0.95	0.98				
	HV%	0%	0%	15%	14%	0%	0%	2%	0%	2%	2%	0%	0%	2%	2%	2%	2%				
	Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

Study Name Raymond & Lutter
Date Thursday, October 12, 2017

Report Summary

		Eastbound					Northbound					Southbound							Crosswalk		
Time Period	Class.	U	L	R	I	O	U	L	T	I	O	U	T	R	I	O	Total		s on Cr	edestria	Total
Peak 1	Lights	0	2	21	23	9	0	8	201	209	104	0	83	1	84	203	316	W	0	0	0
Specified Period	%	0%	67%	100%	96%	90%	0%	89%	98%	98%	99%	0%	99%	100%	99%	98%	98%		0%	0%	
6:00 AM - 9:00 AM	Mediums	0	1	0	1	1	0	1	3	4	1	0	1	0	1	4	6	S	0	0	0
One Hour Peak	%	0%	33%	0%	4%	10%	0%	11%	1%	2%	1%	0%	1%	0%	1%	2%	2%		0%	0%	
6:45 AM - 7:45 AM	Articulated Trucks	0	0	0	0	0	0	0	1	1	0	0	0	0	0	1	1	N	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	0%	
	Total	**0**	**3**	**21**	**24**	**10**	**0**	**9**	**205**	**214**	**105**	**0**	**84**	**1**	**85**	**208**	**323**		**0**	**0**	**0**
	PHF	0	0.75	0.66	0.67	0.5	0	0.45	0.85	0.82	0.77	0	0.81	0.25	0.82	0.87	0.91				
	HV%	0%	33%	0%	4%	10%	0%	11%	2%	2%	1%	0%	1%	0%	1%	2%	2%				
	Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Peak 2	Lights	0	4	14	18	10	0	10	224	234	194	0	180	0	180	228	432	W	0	0	0
Specified Period	%	0%	100%	93%	95%	83%	0%	83%	100%	99%	99%	0%	99%	0%	99%	100%	99%		0%	0%	
3:00 PM - 6:15 PM	Mediums	0	0	0	0	1	0	1	0	1	1	0	1	0	1	0	2	S	0	0	0
One Hour Peak	%	0%	0%	0%	0%	8%	0%	8%	0%	0%	1%	0%	1%	0%	1%	0%	0%		0%	0%	
4:30 PM - 5:30 PM	Articulated Trucks	0	0	1	1	1	0	1	0	1	1	0	0	0	0	0	2	N	0	0	0
	%	0%	0%	7%	5%	8%	0%	8%	0%	0%	1%	0%	0%	0%	0%	0%	0%		0%	0%	
	Total	**0**	**4**	**15**	**19**	**12**	**0**	**12**	**224**	**236**	**196**	**0**	**181**	**0**	**181**	**228**	**436**		**0**	**0**	**0**
	PHF	0	0.31	0.32	0.32	0.6	0	0.6	0.84	0.85	0.88	0	0.96	0	0.96	0.82	0.85				
	HV%	0%	0%	7%	5%	17%	0%	17%	0%	1%	1%	0%	1%	0%	1%	0%	1%				
	Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

Study Name IL 31 & Central Park
Date Thursday, October 12, 2017

Report Summary

		Eastbound						Westbound						Northbound						Southbound								Crosswalk	
Time Period	Class.	U	L	T	R	I	O	U	L	T	R	I	O	U	L	T	R	I	O	U	L	T	R	I	O	Total		s on Cr	edestria Total
Peak 1	Lights	0	746	219	22	987	589	0	32	58	50	140	300	0	23	506	23	552	955	0	58	901	508	1467	1302	3146	W	0	0 0
Specified Period	%	0%	97%	98%	88%	97%	96%	0%	100%	98%	91%	96%	97%	0%	88%	92%	96%	92%	95%	0%	92%	95%	96%	95%	95%	95%		0%	0%
6:00 AM - 9:00 AM	Mediums	0	11	3	2	16	15	0	0	1	5	6	8	0	1	19	1	21	19	0	4	17	13	34	35	77	E	0	0 0
One Hour Peak	%	0%	1%	1%	8%	2%	2%	0%	0%	2%	9%	4%	3%	0%	4%	3%	4%	3%	2%	0%	6%	2%	2%	2%	3%	2%		0%	0%
6:45 AM - 7:45 AM	Articulated Trucks	0	13	1	1	15	11	0	0	0	0	0	2	0	2	26	0	28	30	0	1	29	9	39	39	82	S	0	0 0
	%	0%	2%	0%	4%	1%	2%	0%	0%	0%	0%	0%	1%	0%	8%	5%	0%	5%	3%	0%	2%	3%	2%	3%	3%	2%		0%	0%
	Total	**0**	**770**	**223**	**25**	**1018**	**615**	**0**	**32**	**59**	**55**	**146**	**310**	**0**	**26**	**551**	**24**	**601**	**1004**	**0**	**63**	**947**	**530**	**1540**	**1376**	**3305**	N	0	0 0
	PHF	0	0.85	0.78	0.59	0.87	0.88	0	0.68	0.81	0.83	0.87	0.79	0	0.62	0.87	0.58	0.88	0.82	0	0.78	0.81	0.88	0.89	0.92	0.96		0%	0%
	HV%	0%	3%	2%	12%	3%	4%	0%	0%	2%	9%	4%	3%	0%	12%	8%	4%	8%	5%	0%	8%	5%	4%	5%	5%	5%		**0**	**0 0**
	Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Peak 2	Lights	0	540	213	55	808	1132	0	95	182	174	451	414	2	86	896	41	1025	927	0	160	775	864	1799	1610	4083	W	0	0 0
Specified Period	%	0%	97%	100%	90%	97%	98%	0%	100%	99%	100%	100%	100%	100%	100%	98%	100%	98%	96%	0%	99%	97%	98%	97%	98%	98%		0%	0%
3:00 PM - 6:00 PM	Mediums	0	11	0	1	12	9	0	0	1	0	1	1	0	0	15	0	15	8	0	1	7	8	16	26	44	E	0	0 0
One Hour Peak	%	0%	2%	0%	2%	1%	1%	0%	0%	1%	0%	0%	0%	0%	0%	2%	0%	1%	1%	0%	1%	1%	1%	1%	2%	1%		0%	0%
4:30 PM - 5:30 PM	Articulated Trucks	0	5	0	5	10	11	0	0	0	0	0	0	0	0	6	0	6	26	0	0	21	11	32	11	48	S	0	0 0
	%	0%	1%	0%	8%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	3%	0%	0%	3%	1%	2%	1%	1%		0%	0%
	Total	**0**	**556**	**213**	**61**	**830**	**1152**	**0**	**95**	**183**	**174**	**452**	**415**	**2**	**86**	**917**	**41**	**1046**	**961**	**0**	**161**	**803**	**883**	**1847**	**1647**	**4175**	N	0	0 0
	PHF	0	0.87	0.88	0.8	0.88	0.95	0	0.63	0.81	0.94	0.88	0.91	0.5	0.59	0.93	0.73	0.96	0.9	0	0.93	0.87	0.96	0.92	0.94	0.98		0%	0%
	HV%	0%	3%	0%	10%	3%	2%	0%	0%	1%	0%	0%	0%	0%	0%	2%	0%	2%	4%	0%	1%	3%	2%	3%	2%	2%		**0**	**0 0**
	Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			

Study Name Central Park & Lutter
Date Thursday, October 12, 2017

Report Summary

		Eastbound						Westbound						Northbound						Southbound								Crosswalk		
Time Period	Class.	U	L	T	R	I	O	U	L	T	R	I	O	U	L	T	R	I	O	U	L	T	R	I	O	Total		s on Cr	edestria	Total
Peak 1	Lights	0	162	12	122	296	142	0	0	27	20	47	29	0	96	37	0	133	170	0	17	48	19	84	219	560	W	0	0	0
Specified Period	%	0%	97%	75%	99%	97%	97%	0%	0%	87%	91%	89%	85%	0%	100%	100%	0%	100%	99%	0%	94%	100%	95%	98%	97%	97%		0%	0%	
6:00 AM - 9:00 AM	Mediums	0	5	2	1	8	5	0	0	4	1	5	3	0	0	0	0	0	1	0	1	0	1	2	6	15	E	0	0	0
One Hour Peak	%	0%	3%	13%	1%	3%	3%	0%	0%	13%	5%	9%	9%	0%	0%	0%	0%	0%	1%	0%	6%	0%	5%	2%	3%	3%		0%	0%	
6:45 AM - 7:45 AM	Articulated Trucks	0	0	2	0	2	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	1	3	S	0	0	0
	%	0%	0%	13%	0%	1%	0%	0%	0%	0%	5%	2%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%		0%	0%	
	Total	**0**	**167**	**16**	**123**	**306**	**147**	**0**	**0**	**31**	**22**	**53**	**34**	**0**	**96**	**37**	**0**	**133**	**171**	**0**	**18**	**48**	**20**	**86**	**226**	**578**	N	0	0	0
	PHF	0	0.88	0.64	0.77	0.81	0.87	0	0	0.62	0.92	0.71	0.72	0	0.85	0.75	0.25	0.91	0.84	0	0.59	0.85	0.59	0.82	0.87	0.9		0%	0%	
	HV%	0%	3%	25%	1%	3%	3%	0%	0%	13%	9%	11%	15%	0%	0%	0%	0%	0%	1%	0%	6%	0%	5%	2%	3%	3%		**0**	**0**	**0**
	Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Peak 2	Lights	0	111	80	227	418	453	0	0	182	58	240	143	0	184	71	7	262	303	0	56	76	87	219	240	1139	W	0	0	0
Specified Period	%	0%	99%	100%	100%	100%	100%	0%	0%	100%	100%	100%	100%	0%	100%	100%	100%	100%	100%	0%	100%	100%	99%	100%	100%	100%		0%	0%	
3:00 PM - 6:15 PM	Mediums	0	1	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	3	E	0	2	2
One Hour Peak	%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%		0%	100%	
4:30 PM - 5:30 PM	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	S	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	0%	
	Total	**0**	**112**	**80**	**228**	**420**	**454**	**0**	**0**	**182**	**58**	**240**	**143**	**0**	**184**	**71**	**7**	**262**	**304**	**0**	**56**	**76**	**88**	**220**	**241**	**1142**	N	0	0	0
	PHF	0	0.76	0.91	0.96	0.89	0.87	0	0	0.89	0.78	0.97	0.92	0	0.8	0.6	0.75	0.78	0.93	0	0.91	0.78	0.76	0.96	0.87	0.96		0%	0%	
	HV%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%		**0**	**2**	**2**
	Bicycles on Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

DATA FROM THE ITE MANUAL TRIP GENERATION, 10TH EDITION

Land Use: 610
Hospital

Description

A hospital is any institution where medical or surgical care and overnight accommodations are provided to non-ambulatory and ambulatory patients. However, the term “hospital” does not refer to medical clinics (facilities that provide diagnoses and outpatient care only) or nursing homes (facilities devoted to the care of persons unable to care for themselves), which are covered elsewhere in this report. Clinic (Land Use 630) and free-standing emergency room (Land Use 650) are related uses.

Additional Data

Time-of-day distribution data for this land use are presented in Appendix A. For the four general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:30 and 8:30 a.m. and 12:00 and 1:00 p.m., respectively.

The average numbers of person trips per vehicle trip at the four general urban/suburban sites at which both person trip and vehicle trip data were collected were as follows:

- 1.60 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.60 during Weekday, AM Peak Hour of Generator
- 1.72 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 1.66 during Weekday, PM Peak Hour of Generator

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), California, New Jersey, New York, Pennsylvania, Texas, and Washington.

Specialized Land Use Data

A 2008 study provided data on a research hospital in Baltimore, Maryland (source 749). The trip generation characteristics of this site differed from sites included in this land use; therefore, trip generation information for this site is presented here and was excluded from the data plots. The site gross floor area is 2.8 million square feet and the number of employees is 5,500. The number of vehicle trips during the weekday, AM peak hour for adjacent street traffic was 1,168. The number of vehicle trips during the weekday, PM peak hour for adjacent street traffic was 1,080.

Source Numbers

112, 186, 253, 262, 423, 429, 533, 573, 591, 601, 630, 719, 749, 878, 901, 904, 908, 909, 971

Hospital
(610)

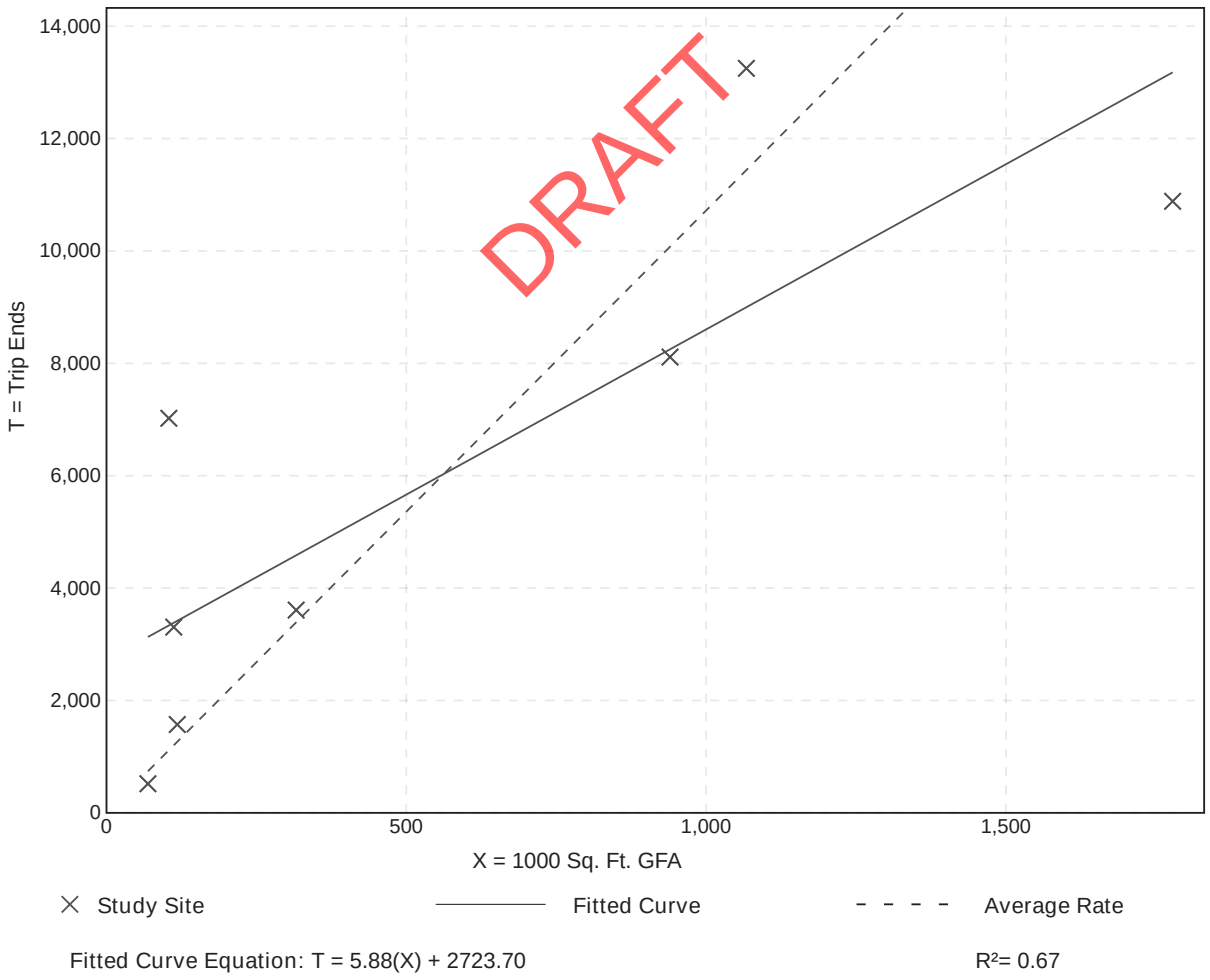
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 8
1000 Sq. Ft. GFA: 563
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
10.72	6.12 - 67.52	10.34

Data Plot and Equation



Fitted Curve Equation: T = 5.88(X) + 2723.70

R^2= 0.67

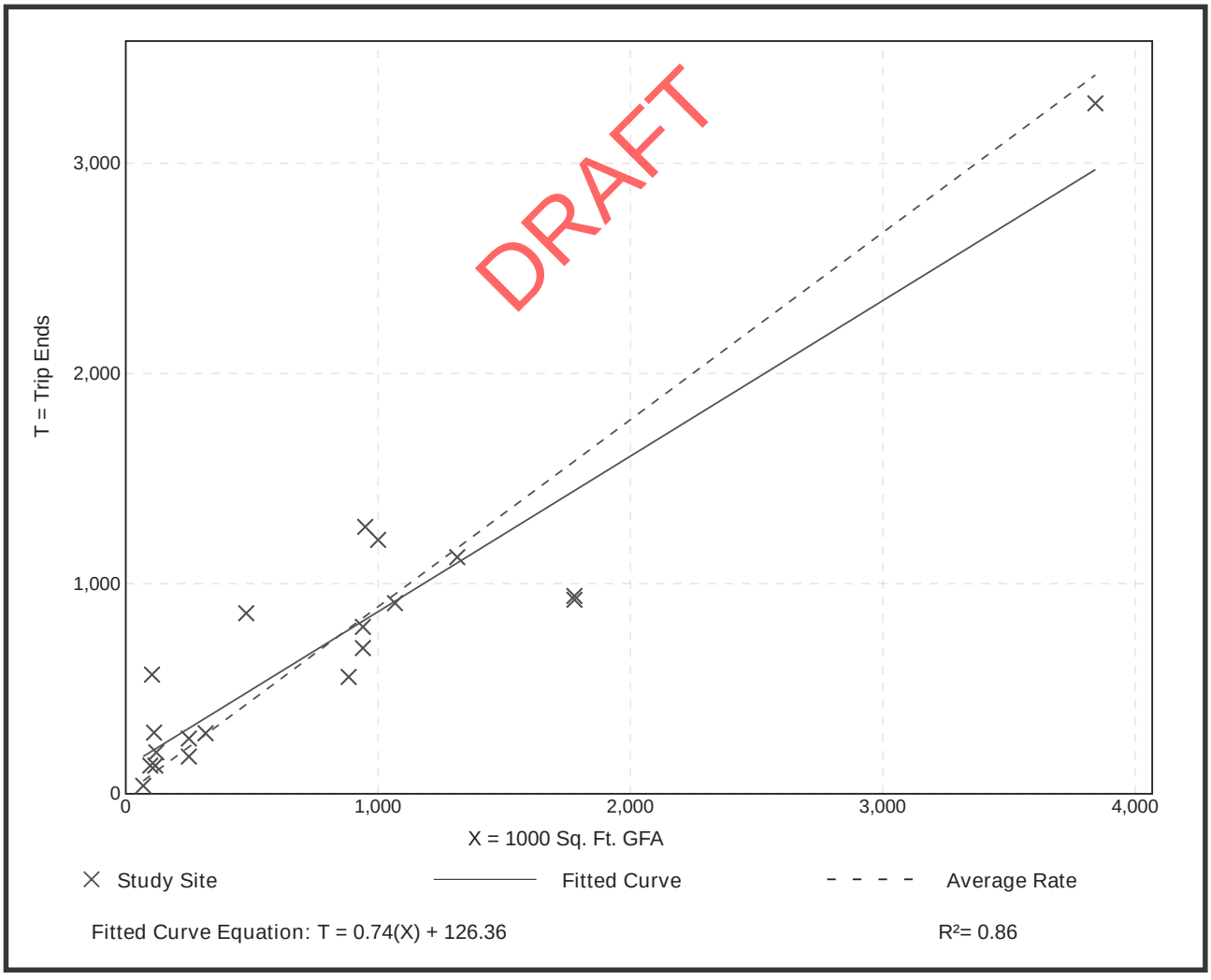
Hospital
(610)

Vehicle Trip Ends vs:	1000 Sq. Ft. GFA
On a:	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.
Setting/Location:	General Urban/Suburban
Number of Studies:	20
1000 Sq. Ft. GFA:	820
Directional Distribution:	68% entering, 32% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.89	0.52 - 5.45	0.50

Data Plot and Equation



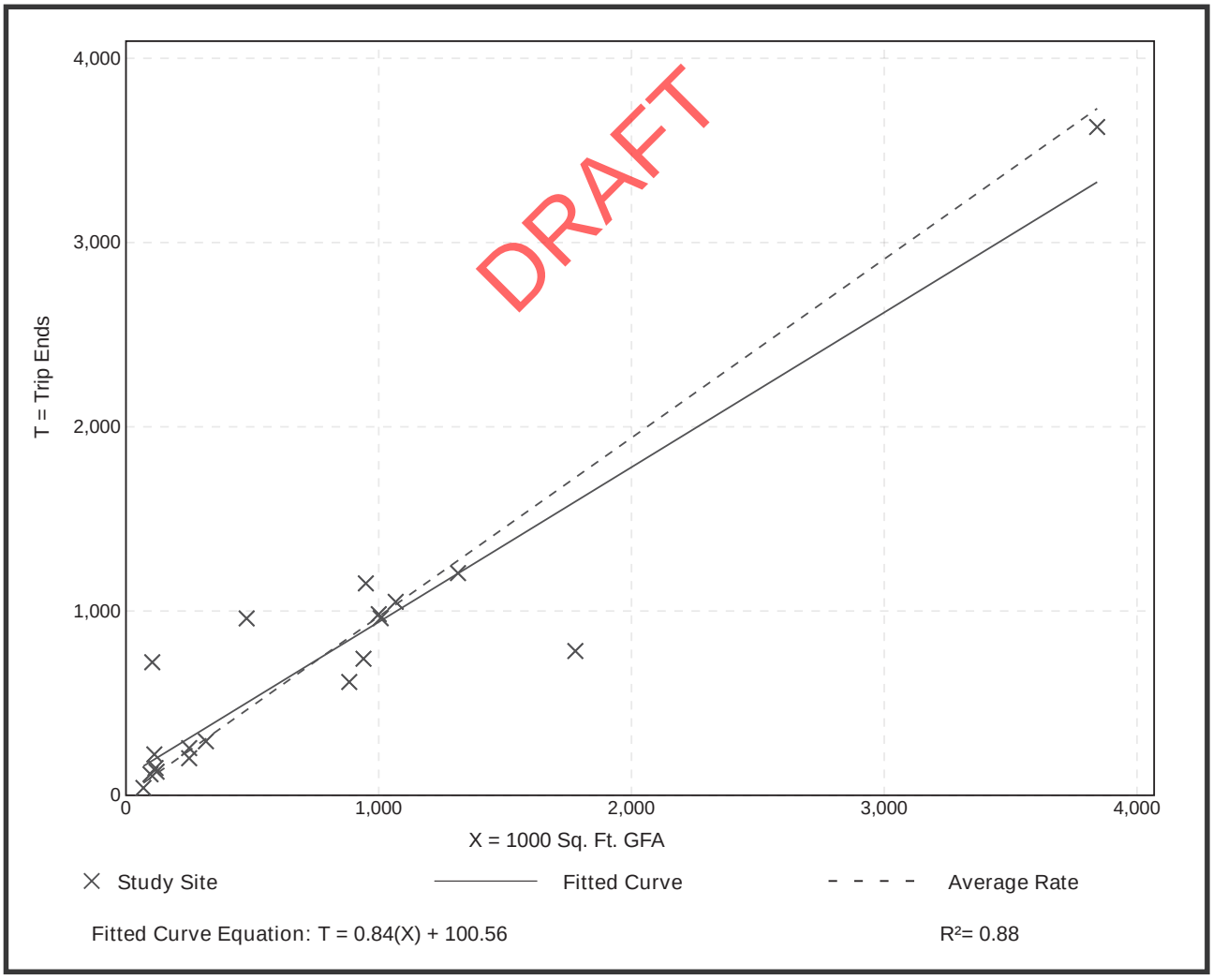
Hospital
(610)

Vehicle Trip Ends vs:	1000 Sq. Ft. GFA
On a:	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.
Setting/Location:	General Urban/Suburban
Number of Studies:	19
1000 Sq. Ft. GFA:	773
Directional Distribution:	32% entering, 68% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.97	0.44 - 6.94	0.60

Data Plot and Equation



Land Use: 720
Medical-Dental Office Building

Description

A medical-dental office building is a facility that provides diagnoses and outpatient care on a routine basis but is unable to provide prolonged in-house medical and surgical care. One or more private physicians or dentists generally operate this type of facility. Clinic (Land Use 630) is a related use.

Additional Data

Time-of-day distribution data for this land use for a weekday, Saturday, and Sunday are presented in Appendix A. For the 19 general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 9:30 and 10:30 a.m. and 2:15 and 3:15 p.m., respectively.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), California, Connecticut, Kentucky, Maryland, Minnesota, New Jersey, New York, Ohio, Oregon, Pennsylvania, South Dakota, Texas, Virginia, Washington, and Wisconsin.

Source Numbers

104, 109, 120, 157, 184, 209, 211, 253, 287, 294, 295, 304, 357, 384, 404, 407, 423, 444, 509, 601, 715, 867, 879, 901, 902, 908, 959, 972

Medical-Dental Office Building
(720)

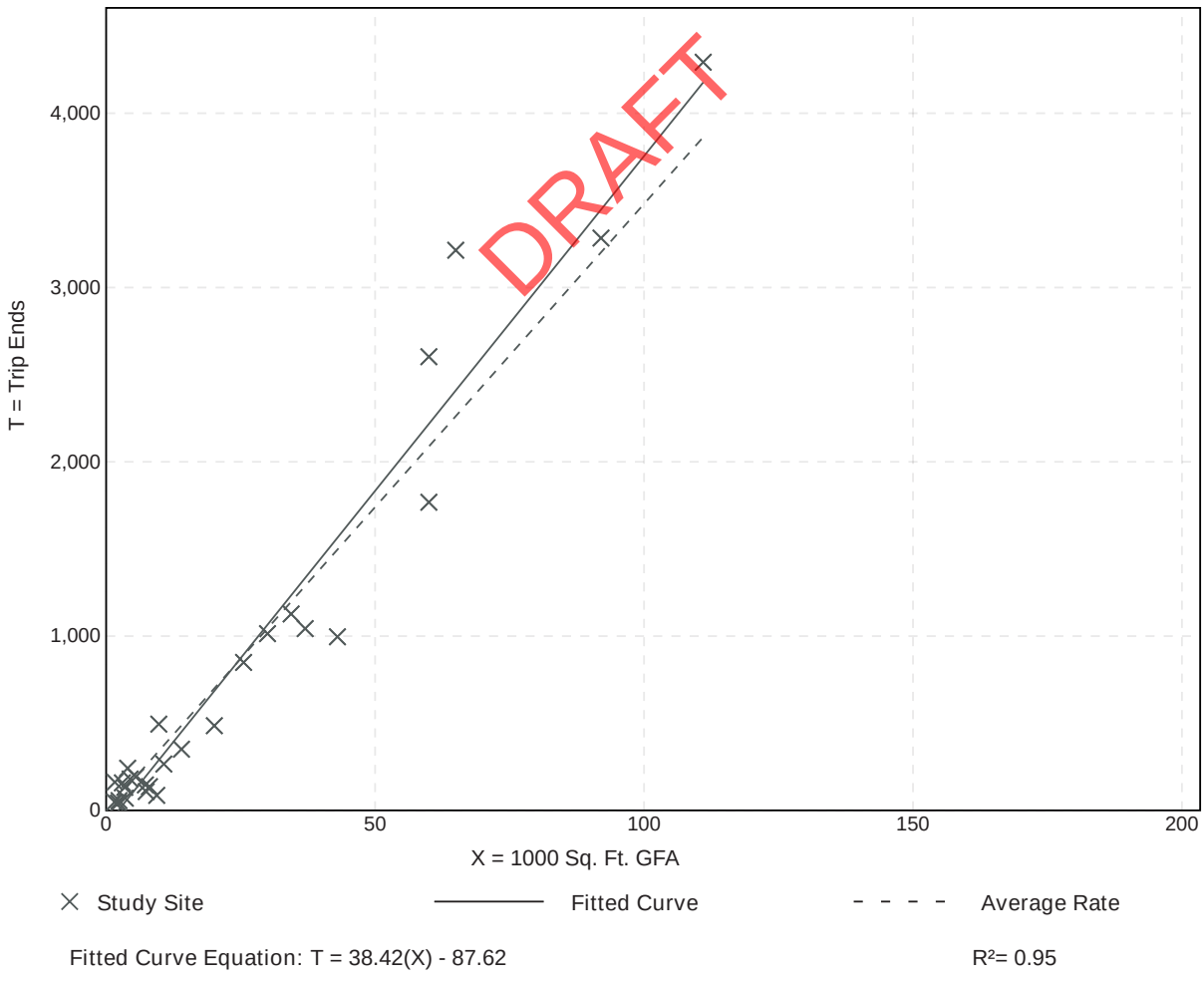
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 28
1000 Sq. Ft. GFA: 24
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
34.80	9.14 - 100.75	9.79

Data Plot and Equation



Fitted Curve Equation: T = 38.42(X) - 87.62

R^2= 0.95

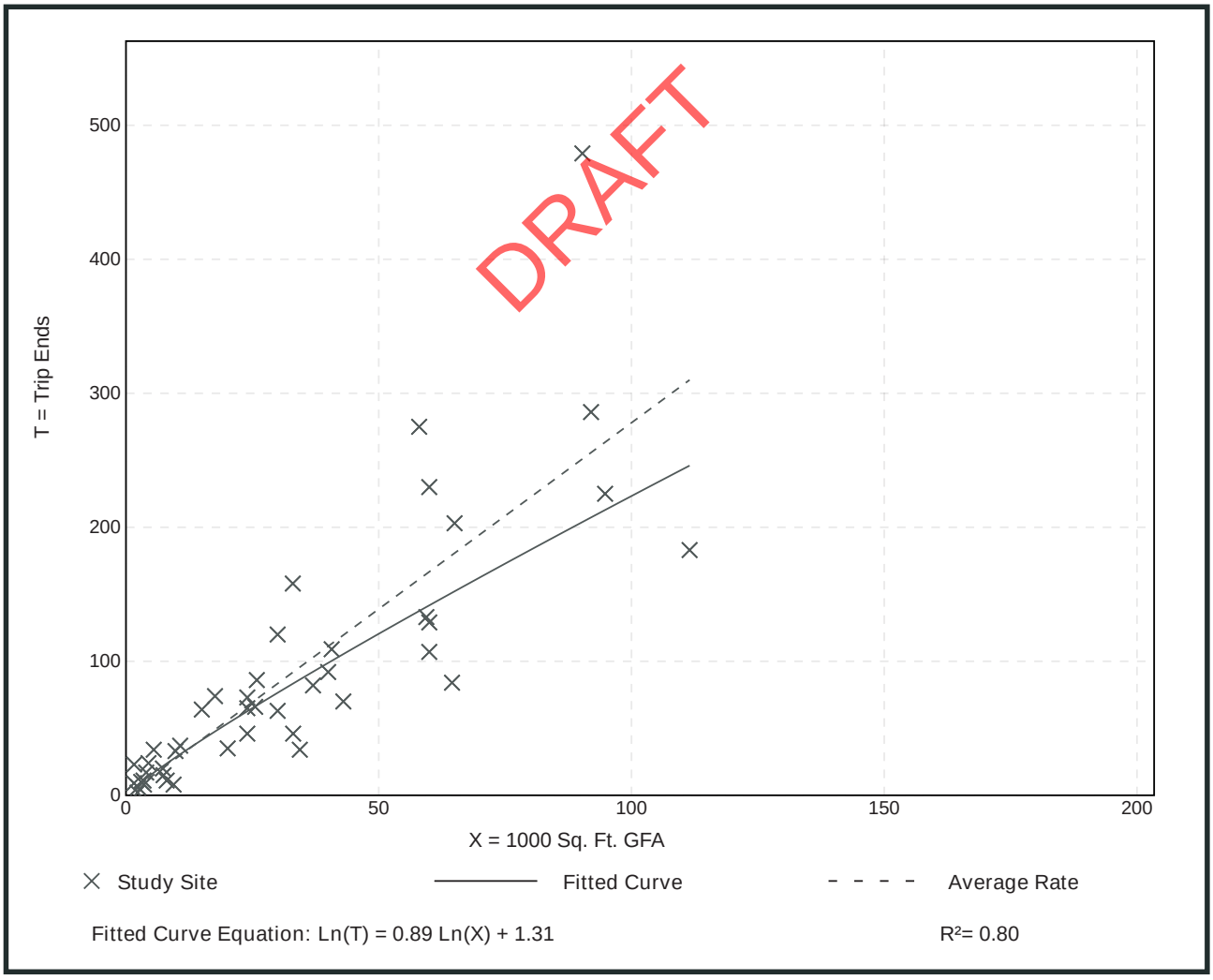
Medical-Dental Office Building
(720)

Vehicle Trip Ends vs:	1000 Sq. Ft. GFA
On a:	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m.
Setting/Location:	General Urban/Suburban
Number of Studies:	44
1000 Sq. Ft. GFA:	32
Directional Distribution:	78% entering, 22% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
2.78	0.85 - 14.30	1.28

Data Plot and Equation



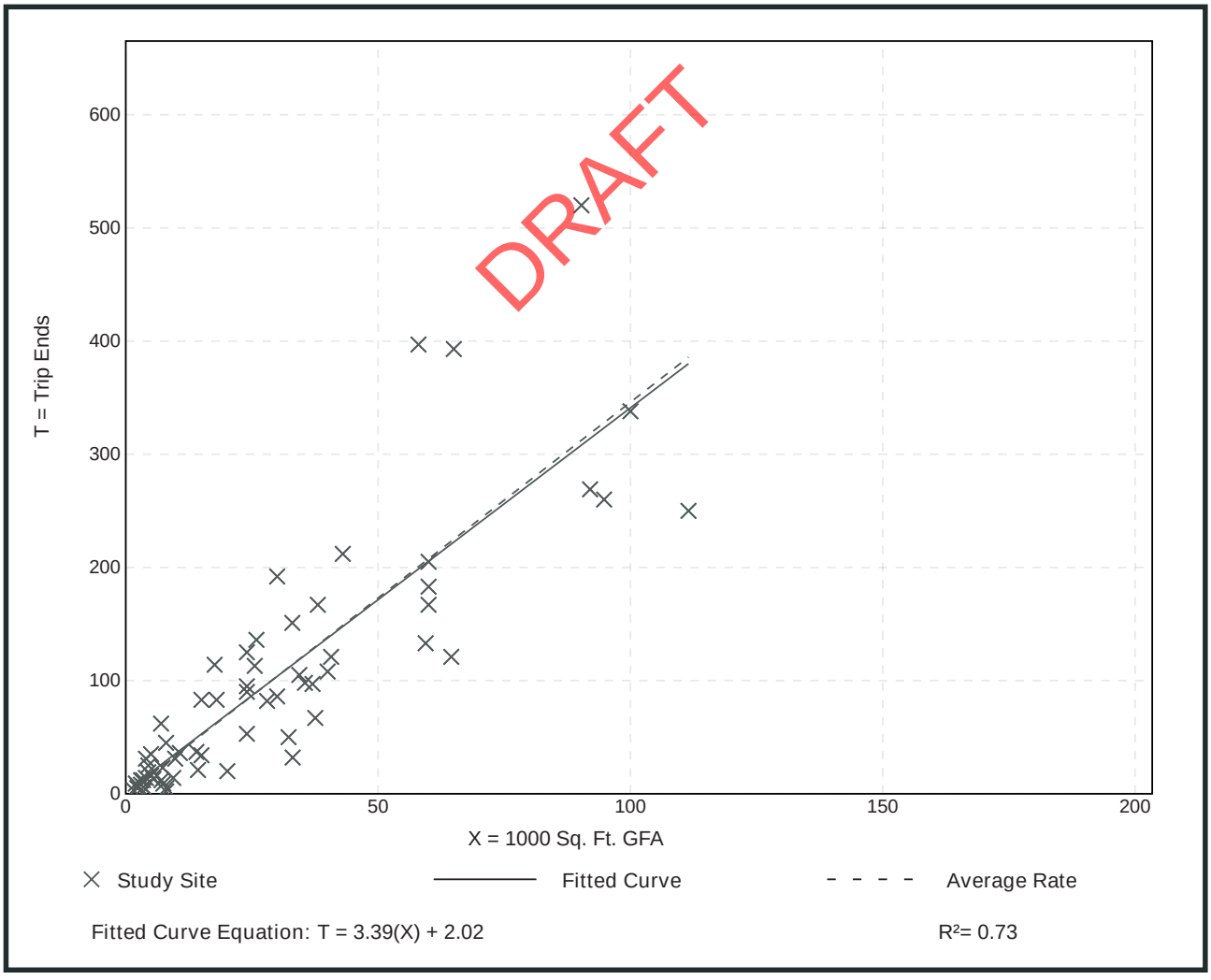
Medical-Dental Office Building
(720)

Vehicle Trip Ends vs:	1000 Sq. Ft. GFA
On a:	Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m.
Setting/Location:	General Urban/Suburban
Number of Studies:	65
1000 Sq. Ft. GFA:	28
Directional Distribution:	28% entering, 72% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.46	0.25 - 8.86	1.58

Data Plot and Equation



Fitted Curve Equation: T = 3.39(X) + 2.02

R^2= 0.73

CMAP YEAR 2040 TRAFFIC PROJECTIONS

Chicago Metropolitan
Agency for Planning

233 South Wacker Drive
Suite 800
Chicago, Illinois 60606

312 454 0400
www.cmap.illinois.gov

October 19, 2017

Emma Albers, P.E.
Kimley-Horn
1001 Warrenville Road
Suite 350
Lisle, IL 60532

Subject: IL 31 @ Three Oaks Road
IDOT

Dear Ms. Albers:

In response to a request made on your behalf and dated October 19, 2017, we have developed year 2040 average daily traffic (ADT) projections for the subject location.

ROAD SEGMENT	Current ADT	Year 2040 ADT
IL 31 S of Three Oaks Rd	36,100	45,200
Three Oaks Rd E of IL 31	12,900	14,100

Traffic projections are developed using existing ADT data provided in the request letter and the results from the March 2017 CMAP Travel Demand Analysis. The regional travel model uses CMAP 2040 socioeconomic projections and assumes the implementation of the GO TO 2040 Comprehensive Regional Plan for the Northeastern Illinois area.

If you have any questions, please call me at (312) 386-8806.

Sincerely,

Jose Rodriguez, PTP, AICP
Senior Planner, Research & Analysis

cc: Quigley (IDOT)
S:\AdminGroups\ResearchAnalysis\TrafficForecasts_CY2017\CrystalLake\mc-10-17\mc-10-17.docx

Chicago Metropolitan
Agency for Planning

233 South Wacker Drive
Suite 800
Chicago, Illinois 60606

312 454 0400
www.cmap.illinois.gov

December 14, 2017

Emma Albers, P.E.
Transportation Engineer
Kimley-Horn
1001 Warrenville Road
Suite 350
Lisle, IL 60532

Subject: ***IL 31 @ James R. Rakow Road***
IDOT

Dear Ms. Albers:

In response to a request made on your behalf and dated December 13, 2017, we have developed year 2040 average daily traffic (ADT) projections for the subject location.

ROAD SEGMENT	Current ADT	Year 2040 ADT
IL 31 south of James R. Rakow Rd	20,400	34,500
James R. Rakow Rd west of IL 31	21,900	23,000
Central Park Dr east of IL 31	1,000	2,000

Traffic projections are developed using existing ADT data provided in the request letter and the results from the October 2017 CMAP Travel Demand Analysis. The regional travel model uses CMAP 2040 socioeconomic projections and assumes the implementation of the GO TO 2040 Comprehensive Regional Plan for the Northeastern Illinois area.

If you have any questions, please call me at (312) 386-8806.

Sincerely,

Jose Rodriguez, PTP, AICP
Senior Planner, Research & Analysis

cc: Quigley (IDOT)
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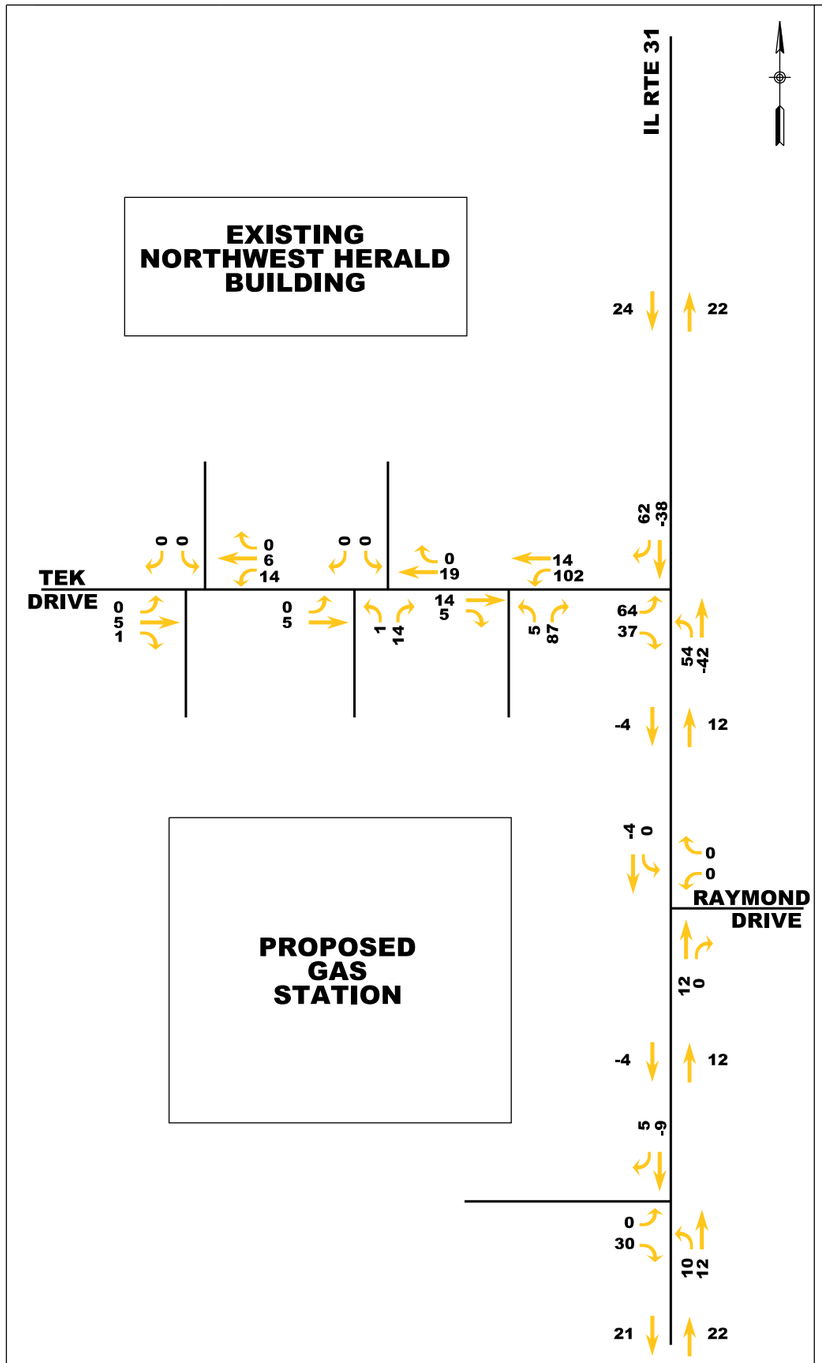
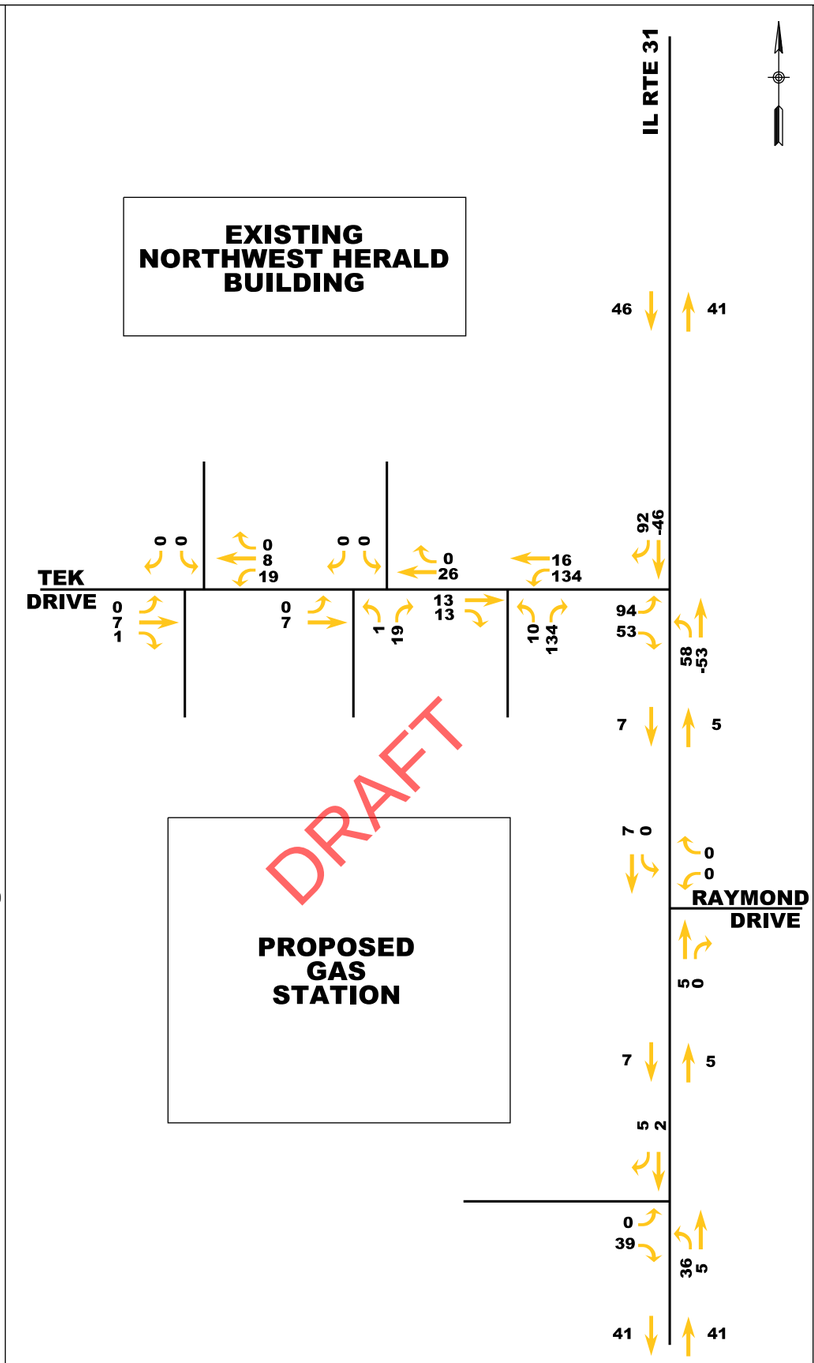
TRIP ASSIGNMENT FOR BACKGROUND STUDIES

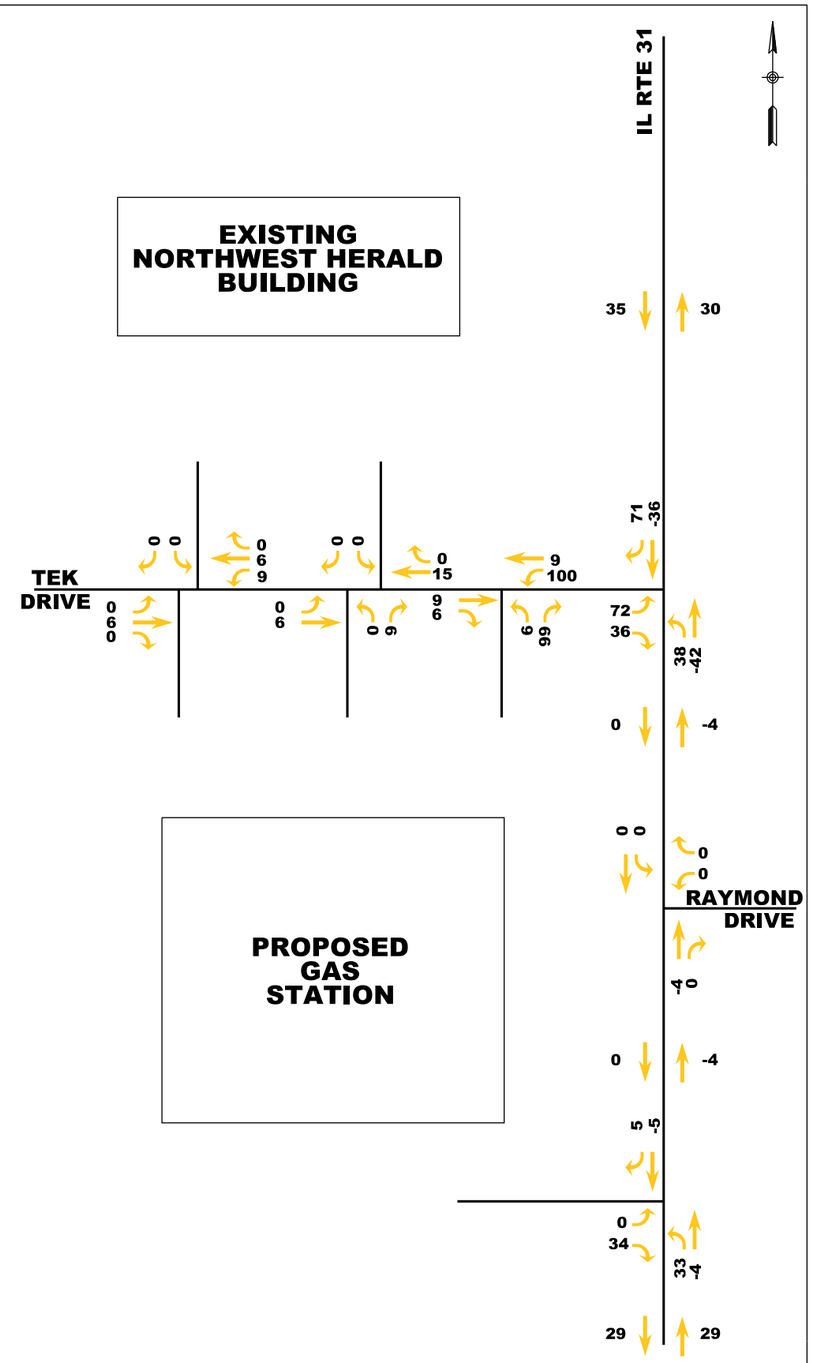
FILE: $FILE$ - $TIME$
DATE: $DATE$
USER: $USER$



A.M. PEAK



P.M. PEAK



SATURDAY PEAK

SPEEDWAY GAS STATION
TRAFFIC IMPACT STUDY

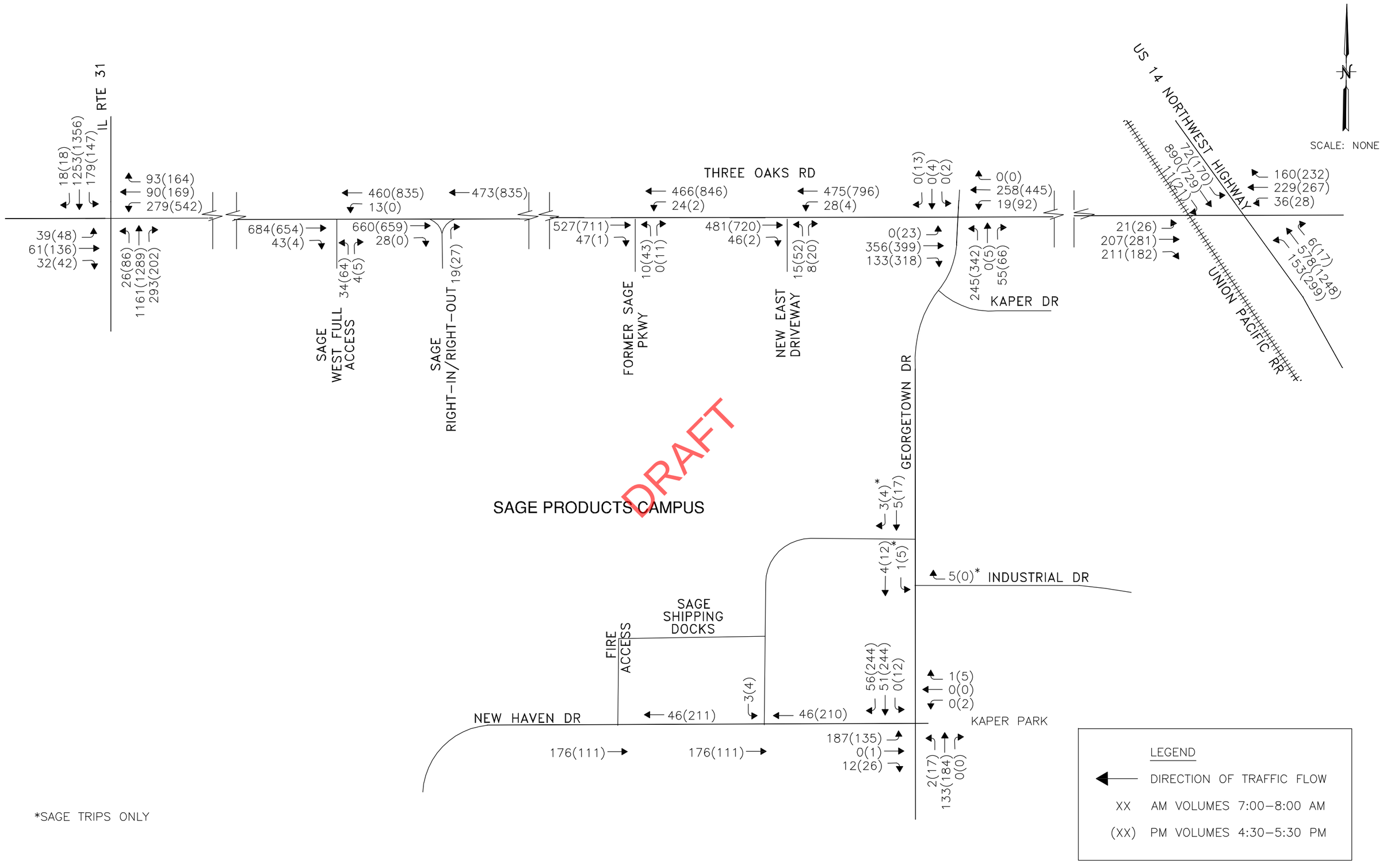
EXHIBIT A-5

Proposed Peak Hour Facility Traffic

NOT TO SCALE

DATE: MARCH 2016

TranSystems



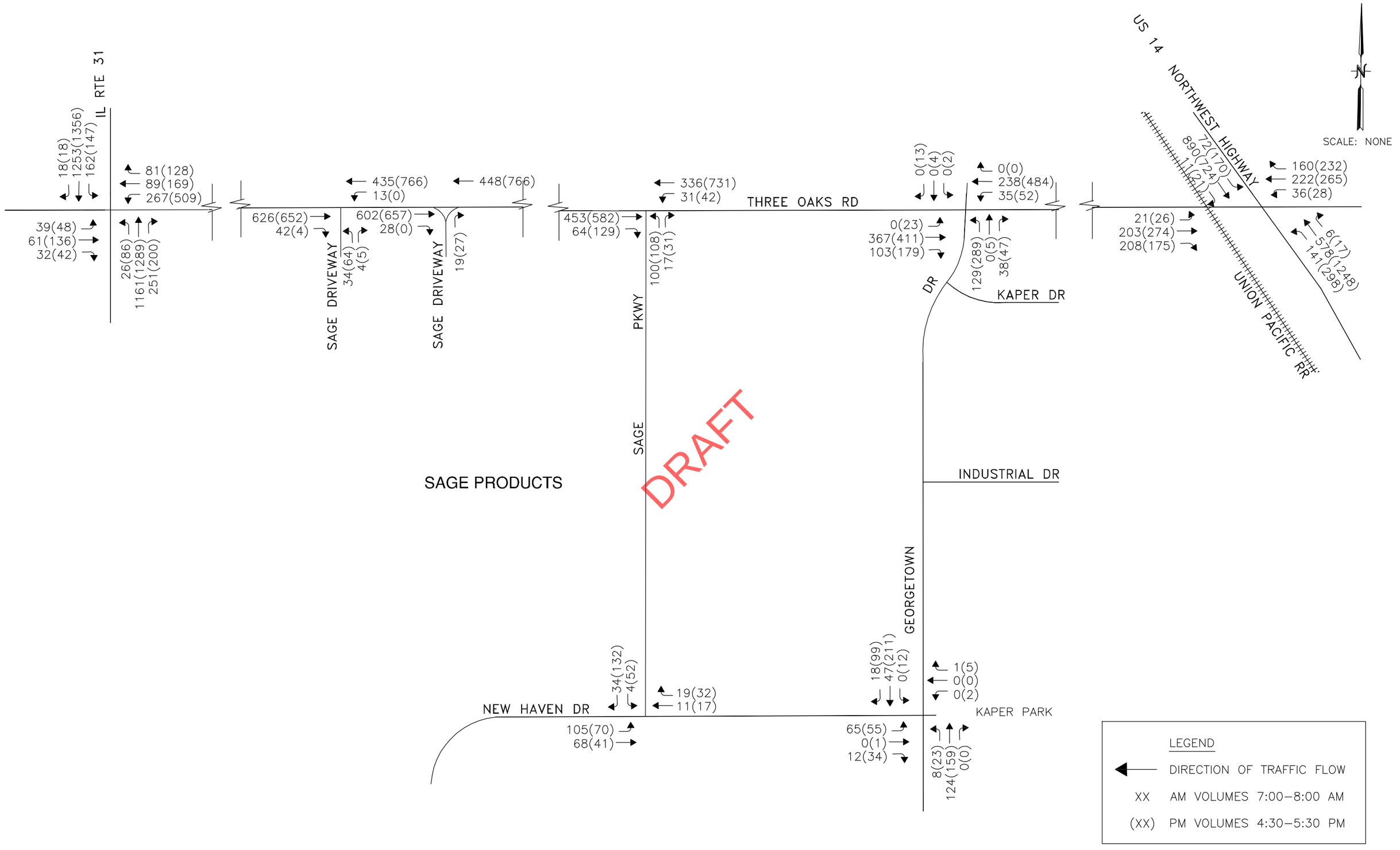
JAMES J. BENES & ASSOCIATES, INC.
950 Warrenville Road, Suite 101, Lisle, Illinois 60532
Tel. (630) 719-7570 · Fax (630) 719-7589

DESIGNED — TA	REVISED —	
DRAWN — SMP	REVISED —	
CHECKED — TA	REVISED —	
DATE — —	REVISED —	

VILLAGE OF CARY

2021 SAGE FULL BUILD OUT
TOTAL TRAFFIC

EXHIBIT 8



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950 Warrenville Road, Suite 101, Lisle, Illinois 60532
Tel. (630) 719-7570 · Fax (630) 719-7589

DESIGNED	TA	REVISED	
DRAWN	SMP	REVISED	
CHECKED	TA	REVISED	
DATE	–	REVISED	

VILLAGE OF CARY

PROJECTED 2021
NO SAGE EXPANSION

EXHIBIT 9

EXISTING (2017) SYNCHRO CAPACITY REPORTS

Weekday Morning Peak Hour

Weekday Evening Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	55	30	275	80	140	25	1055	295	155	1295	15
Future Volume (veh/h)	15	55	30	275	80	140	25	1055	295	155	1295	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1792	1851	1900	1743	1804	1900	1827	1810	1900
Adj Flow Rate, veh/h	16	58	32	289	84	147	26	1111	311	163	1363	16
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	6	2	2	9	6	6	4	5	5
Cap, veh/h	148	77	42	336	128	224	217	1571	435	357	2190	26
Arrive On Green	0.01	0.07	0.07	0.15	0.21	0.21	0.03	1.00	1.00	0.05	0.63	0.63
Sat Flow, veh/h	1774	1130	623	1707	605	1059	1660	2652	735	1740	3482	41
Grp Volume(v), veh/h	16	0	90	289	0	231	26	714	708	163	673	706
Grp Sat Flow(s),veh/h/ln	1774	0	1753	1707	0	1664	1660	1713	1674	1740	1720	1803
Q Serve(g_s), s	1.2	0.0	7.1	21.5	0.0	17.8	0.9	0.0	0.0	5.0	33.4	33.4
Cycle Q Clear(g_c), s	1.2	0.0	7.1	21.5	0.0	17.8	0.9	0.0	0.0	5.0	33.4	33.4
Prop In Lane	1.00		0.36	1.00		0.64	1.00		0.44	1.00		0.02
Lane Grp Cap(c), veh/h	148	0	119	336	0	351	217	1015	992	357	1082	1134
V/C Ratio(X)	0.11	0.00	0.75	0.86	0.00	0.66	0.12	0.70	0.71	0.46	0.62	0.62
Avail Cap(c_a), veh/h	250	0	200	336	0	351	307	1015	992	388	1082	1134
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.0	0.0	64.1	49.7	0.0	50.6	13.9	0.0	0.0	9.1	15.8	15.8
Incr Delay (d2), s/veh	0.3	0.0	18.4	19.8	0.0	6.0	0.2	4.1	4.4	0.9	2.7	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	4.0	2.8	0.0	8.8	0.4	1.1	1.2	2.4	16.5	17.3
LnGrp Delay(d),s/veh	60.3	0.0	82.5	69.5	0.0	56.6	14.2	4.1	4.4	10.0	18.5	18.4
LnGrp LOS	E		F	E		E	B	A	A	B	B	B
Approach Vol, veh/h		106			520			1448			1542	
Approach Delay, s/veh		79.1			63.7			4.4			17.6	
Approach LOS		E			E			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	88.9	25.0	15.5	5.4	94.1	5.0	35.6
Change Period (Y+Rc), s	3.5	6.0	3.5	6.0	3.5	6.0	3.5	6.0
Max Green Setting (Gmax), s	9.5	74.0	21.5	16.0	9.5	74.0	9.5	28.0
Max Q Clear Time (g_c+I1), s	7.0	2.0	23.5	9.1	2.9	35.4	3.2	19.8
Green Ext Time (p_c), s	0.1	70.8	0.0	0.5	0.0	38.2	0.0	1.9

Intersection Summary	
HCM 2010 Ctrl Delay	20.7
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	495	475	1	5	20
Future Vol, veh/h	10	495	475	1	5	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	190	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	10	3	4	2	2	5
Mvmt Flow	11	521	500	1	5	21

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	501	0	-	0	1043	501
Stage 1	-	-	-	-	501	-
Stage 2	-	-	-	-	542	-
Critical Hdwy	4.2	-	-	-	6.42	6.25
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.29	-	-	-	3.518	3.345
Pot Cap-1 Maneuver	1023	-	-	-	254	564
Stage 1	-	-	-	-	609	-
Stage 2	-	-	-	-	583	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1023	-	-	-	251	564
Mov Cap-2 Maneuver	-	-	-	-	251	-
Stage 1	-	-	-	-	609	-
Stage 2	-	-	-	-	577	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	13.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1023	-	-	-	451
HCM Lane V/C Ratio	0.01	-	-	-	0.058
HCM Control Delay (s)	8.6	-	-	-	13.5
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	480	10	65	445	15	1	15	190	15	15	30
Future Vol, veh/h	10	480	10	65	445	15	1	15	190	15	15	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	110	-	-	115	-	-	215	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	3	2	3	4	8	2	2	3	2	2	10
Mvmt Flow	11	505	11	68	468	16	1	16	200	16	16	32

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	484	0	0	516	0	0	1169	1153	511	1252	1150	476
Stage 1	-	-	-	-	-	-	532	532	-	613	613	-
Stage 2	-	-	-	-	-	-	637	621	-	639	537	-
Critical Hdwy	4.12	-	-	4.13	-	-	7.12	6.52	6.23	7.12	6.52	6.3
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.227	-	-	3.518	4.018	3.327	3.518	4.018	3.39
Pot Cap-1 Maneuver	1079	-	-	1045	-	-	170	197	561	149	198	573
Stage 1	-	-	-	-	-	-	531	526	-	480	483	-
Stage 2	-	-	-	-	-	-	465	479	-	464	523	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1079	-	-	1045	-	-	142	182	561	84	183	573
Mov Cap-2 Maneuver	-	-	-	-	-	-	142	182	-	84	183	-
Stage 1	-	-	-	-	-	-	526	521	-	475	452	-
Stage 2	-	-	-	-	-	-	396	448	-	287	518	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.1	18.2	32.7
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	142	487	1079	-	-	1045	-	-	192
HCM Lane V/C Ratio	0.007	0.443	0.01	-	-	0.065	-	-	0.329
HCM Control Delay (s)	30.5	18.1	8.4	-	-	8.7	-	-	32.7
HCM Lane LOS	D	C	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	0	2.2	0	-	-	0.2	-	-	1.4

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	10	20	1370	1565	35
Future Vol, veh/h	5	10	20	1370	1565	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	60	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	5	5	4	6
Mvmt Flow	5	11	21	1442	1647	37

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2429	842	1684	0	-	0
Stage 1	1666	-	-	-	-	-
Stage 2	763	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.2	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.25	-	-	-
Pot Cap-1 Maneuver	27	308	363	-	-	-
Stage 1	139	-	-	-	-	-
Stage 2	421	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	25	308	363	-	-	-
Mov Cap-2 Maneuver	25	-	-	-	-	-
Stage 1	139	-	-	-	-	-
Stage 2	397	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	72.7	0.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	363	-	25	308	-	-
HCM Lane V/C Ratio	0.058	-	0.211	0.034	-	-
HCM Control Delay (s)	15.5	-	184	17.1	-	-
HCM Lane LOS	C	-	F	C	-	-
HCM 95th %tile Q(veh)	0.2	-	0.6	0.1	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	10	1380	2	20	1555
Future Vol, veh/h	1	10	1380	2	20	1555
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	560	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	1	11	1453	2	21	1637

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2314	726	0	0	1453	0
Stage 1	1453	-	-	-	-	-
Stage 2	861	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	32	367	-	-	462	-
Stage 1	181	-	-	-	-	-
Stage 2	374	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	31	367	-	-	462	-
Mov Cap-2 Maneuver	31	-	-	-	-	-
Stage 1	181	-	-	-	-	-
Stage 2	357	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	25.8	0	0.2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	185	462	-
HCM Lane V/C Ratio	-	-	0.063	0.046	-
HCM Control Delay (s)	-	-	25.8	13.2	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	15	10	200	90	1
Future Vol, veh/h	5	15	10	200	90	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	33	2	11	2	2	2
Mvmt Flow	5	16	11	211	95	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	327	95	96	0	-	0
Stage 1	95	-	-	-	-	-
Stage 2	232	-	-	-	-	-
Critical Hdwy	6.73	6.22	4.21	-	-	-
Critical Hdwy Stg 1	5.73	-	-	-	-	-
Critical Hdwy Stg 2	5.73	-	-	-	-	-
Follow-up Hdwy	3.797	3.318	2.299	-	-	-
Pot Cap-1 Maneuver	608	962	1443	-	-	-
Stage 1	857	-	-	-	-	-
Stage 2	739	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	603	962	1443	-	-	-
Mov Cap-2 Maneuver	603	-	-	-	-	-
Stage 1	857	-	-	-	-	-
Stage 2	732	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1443	-	837	-	-
HCM Lane V/C Ratio	0.007	-	0.025	-	-
HCM Control Delay (s)	7.5	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	770	215	25	30	60	55	25	555	25	60	960	535
Future Volume (veh/h)	770	215	25	30	60	55	25	555	25	60	960	535
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1961	1696	1863	1961	1743	1764	1852	1900	1759	1905	1900
Adj Flow Rate, veh/h	811	226	26	32	63	58	26	584	26	63	1011	0
Adj No. of Lanes	2	2	1	2	1	1	1	2	1	2	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	2	12	2	2	9	12	8	4	8	5	4
Cap, veh/h	885	1110	457	58	108	128	32	1774	842	100	1868	834
Arrive On Green	0.26	0.30	0.30	0.02	0.06	0.06	0.02	0.50	0.50	0.03	0.52	0.00
Sat Flow, veh/h	3408	3725	1442	3442	1961	1482	1680	3519	1615	3250	3619	1615
Grp Volume(v), veh/h	811	226	26	32	63	58	26	584	26	63	1011	0
Grp Sat Flow(s),veh/h/ln	1704	1863	1442	1721	1961	1482	1680	1759	1615	1625	1810	1615
Q Serve(g_s), s	32.4	6.3	1.8	1.3	4.4	5.2	2.2	13.8	1.1	2.7	26.3	0.0
Cycle Q Clear(g_c), s	32.4	6.3	1.8	1.3	4.4	5.2	2.2	13.8	1.1	2.7	26.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	885	1110	457	58	108	128	32	1774	842	100	1868	834
V/C Ratio(X)	0.92	0.20	0.06	0.55	0.58	0.45	0.82	0.33	0.03	0.63	0.54	0.00
Avail Cap(c_a), veh/h	1010	1110	457	381	182	183	126	1774	842	244	1868	834
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	50.3	36.7	33.3	68.3	64.6	60.8	68.4	20.6	16.3	67.0	22.7	0.0
Incr Delay (d2), s/veh	11.7	0.2	0.1	7.8	10.1	5.3	37.4	0.5	0.1	6.3	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.6	3.3	0.7	0.7	2.7	2.3	1.3	6.9	0.5	1.3	13.4	0.0
LnGrp Delay(d),s/veh	62.1	36.9	33.4	76.1	74.7	66.2	105.9	21.1	16.4	73.3	23.9	0.0
LnGrp LOS	E	D	C	E	E	E	F	C	B	E	C	
Approach Vol, veh/h		1063			153			636			1074	
Approach Delay, s/veh		56.0			71.8			24.4			26.8	
Approach LOS		E			E			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.8	76.6	6.9	47.7	7.2	78.3	40.9	13.7
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Max Green Setting (Gmax), s	10.5	54.0	15.5	39.0	10.5	54.0	41.5	13.0
Max Q Clear Time (g_c+I1), s	4.7	15.8	3.3	8.3	4.2	28.3	34.4	7.2
Green Ext Time (p_c), s	0.1	32.4	0.0	4.2	0.0	22.8	2.0	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	39.2
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	7.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	155	15	130	1	30	20	95	35	1	25	60	20
Future Vol, veh/h	155	15	130	1	30	20	95	35	1	25	60	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	0	110	-	-	65	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	25	2	2	13	9	2	2	2	6	2	5
Mvmt Flow	163	16	137	1	32	21	100	37	1	26	63	21

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	53	0	0	16	0	0	428	397	16	405	386	42
Stage 1	-	-	-	-	-	-	342	342	-	44	44	-
Stage 2	-	-	-	-	-	-	86	55	-	361	342	-
Critical Hdwy	4.13	-	-	4.12	-	-	7.12	6.52	6.22	7.16	6.52	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.16	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.16	5.52	-
Follow-up Hdwy	2.227	-	-	2.218	-	-	3.518	4.018	3.318	3.554	4.018	3.345
Pot Cap-1 Maneuver	1546	-	-	1602	-	-	537	540	1063	549	548	1020
Stage 1	-	-	-	-	-	-	673	638	-	960	858	-
Stage 2	-	-	-	-	-	-	922	849	-	649	638	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1546	-	-	1602	-	-	436	483	1063	475	490	1020
Mov Cap-2 Maneuver	-	-	-	-	-	-	436	483	-	475	490	-
Stage 1	-	-	-	-	-	-	602	571	-	859	857	-
Stage 2	-	-	-	-	-	-	836	848	-	543	571	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.9	0.1	15	12.6
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	436	490	1546	-	-	1602	-	-	475	563
HCM Lane V/C Ratio	0.229	0.077	0.106	-	-	0.001	-	-	0.055	0.15
HCM Control Delay (s)	15.7	13	7.6	-	-	7.2	-	-	13	12.5
HCM Lane LOS	C	B	A	-	-	A	-	-	B	B
HCM 95th %tile Q(veh)	0.9	0.2	0.4	-	-	0	-	-	0.2	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	115	30	425	190	135	105	1390	195	105	1340	30
Future Volume (veh/h)	40	115	30	425	190	135	105	1390	195	105	1340	30
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1859	1900	1863	1863	1900	1863	1861	1900	1863	1845	1900
Adj Flow Rate, veh/h	42	121	32	447	200	142	111	1463	205	111	1411	32
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	3	3
Cap, veh/h	206	142	38	483	308	219	183	1517	210	137	1705	39
Arrive On Green	0.03	0.10	0.10	0.23	0.30	0.30	0.03	0.33	0.33	0.05	0.49	0.49
Sat Flow, veh/h	1774	1418	375	1774	1015	721	1774	3120	432	1774	3504	79
Grp Volume(v), veh/h	42	0	153	447	0	342	111	821	847	111	705	738
Grp Sat Flow(s),veh/h/ln	1774	0	1793	1774	0	1736	1774	1767	1784	1774	1753	1831
Q Serve(g_s), s	3.0	0.0	11.8	30.8	0.0	23.9	4.3	63.7	65.7	4.4	48.4	48.5
Cycle Q Clear(g_c), s	3.0	0.0	11.8	30.8	0.0	23.9	4.3	63.7	65.7	4.4	48.4	48.5
Prop In Lane	1.00		0.21	1.00		0.42	1.00		0.24	1.00		0.04
Lane Grp Cap(c), veh/h	206	0	180	483	0	527	183	860	868	137	853	891
V/C Ratio(X)	0.20	0.00	0.85	0.92	0.00	0.65	0.61	0.96	0.98	0.81	0.83	0.83
Avail Cap(c_a), veh/h	326	0	205	483	0	527	223	860	868	177	853	891
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.4	0.0	61.9	40.8	0.0	42.3	28.9	45.7	46.4	32.9	30.9	30.9
Incr Delay (d2), s/veh	0.5	0.0	28.9	23.7	0.0	3.8	3.2	21.6	25.2	19.0	9.0	8.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	7.3	18.1	0.0	12.1	2.3	36.3	38.5	2.9	25.4	26.6
LnGrp Delay(d),s/veh	54.9	0.0	90.8	64.5	0.0	46.1	32.1	67.3	71.6	51.9	39.9	39.7
LnGrp LOS	D		F	E		D	C	E	E	D	D	D
Approach Vol, veh/h		195			789			1779			1554	
Approach Delay, s/veh		83.1			56.5			67.1			40.6	
Approach LOS		F			E			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	74.1	36.0	20.1	9.8	74.1	7.5	48.5
Change Period (Y+Rc), s	3.5	6.0	3.5	6.0	3.5	6.0	3.5	6.0
Max Green Setting (Gmax), s	9.5	63.0	32.5	16.0	9.5	63.0	13.5	35.0
Max Q Clear Time (g_c+I1), s	6.4	67.7	32.8	13.8	6.3	50.5	5.0	25.9
Green Ext Time (p_c), s	0.1	0.0	0.0	0.3	0.1	12.5	0.0	3.3

Intersection Summary	
HCM 2010 Ctrl Delay	56.4
HCM 2010 LOS	E

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	405	740	5	2	10
Future Vol, veh/h	10	405	740	5	2	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	190	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	10	2	2	2	2	8
Mvmt Flow	11	426	779	5	2	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	784	0	-	0	1229	782
Stage 1	-	-	-	-	782	-
Stage 2	-	-	-	-	447	-
Critical Hdwy	4.2	-	-	-	6.42	6.28
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.29	-	-	-	3.518	3.372
Pot Cap-1 Maneuver	800	-	-	-	196	385
Stage 1	-	-	-	-	451	-
Stage 2	-	-	-	-	644	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	800	-	-	-	193	385
Mov Cap-2 Maneuver	-	-	-	-	193	-
Stage 1	-	-	-	-	451	-
Stage 2	-	-	-	-	635	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	16.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	800	-	-	-	330
HCM Lane V/C Ratio	0.013	-	-	-	0.038
HCM Control Delay (s)	9.6	-	-	-	16.3
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	12.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	360	15	140	705	50	5	20	200	20	30	35
Future Vol, veh/h	30	360	15	140	705	50	5	20	200	20	30	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	110	-	-	115	-	-	215	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	2	6	2	2	4	2	2	2	2	2	3
Mvmt Flow	32	379	16	147	742	53	5	21	211	21	32	37

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	795	0	0	395	0	0	1547	1539	387	1629	1521	768
Stage 1	-	-	-	-	-	-	450	450	-	1063	1063	-
Stage 2	-	-	-	-	-	-	1097	1089	-	566	458	-
Critical Hdwy	4.13	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.227	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.327
Pot Cap-1 Maneuver	822	-	-	1164	-	-	93	116	661	82	118	400
Stage 1	-	-	-	-	-	-	589	572	-	270	300	-
Stage 2	-	-	-	-	-	-	258	291	-	509	567	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	822	-	-	1164	-	-	56	97	661	41	99	400
Mov Cap-2 Maneuver	-	-	-	-	-	-	56	97	-	41	99	-
Stage 1	-	-	-	-	-	-	566	550	-	259	262	-
Stage 2	-	-	-	-	-	-	180	254	-	321	545	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	1.3	23.8	150
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	56	432	822	-	-	1164	-	-	97
HCM Lane V/C Ratio	0.094	0.536	0.038	-	-	0.127	-	-	0.922
HCM Control Delay (s)	75.8	22.6	9.6	-	-	8.5	-	-	150
HCM Lane LOS	F	C	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.3	3.1	0.1	-	-	0.4	-	-	5.3

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	45	15	1680	1790	5
Future Vol, veh/h	10	45	15	1680	1790	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	60	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	4	13	2	3	20
Mvmt Flow	11	47	16	1768	1884	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2803	945	1889	0	-	0
Stage 1	1887	-	-	-	-	-
Stage 2	916	-	-	-	-	-
Critical Hdwy	6.84	6.98	4.36	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.34	2.33	-	-	-
Pot Cap-1 Maneuver	15	259	272	-	-	-
Stage 1	105	-	-	-	-	-
Stage 2	350	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	14	259	272	-	-	-
Mov Cap-2 Maneuver	14	-	-	-	-	-
Stage 1	105	-	-	-	-	-
Stage 2	329	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	110.1	0.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	272	-	14	259	-	-
HCM Lane V/C Ratio	0.058	-	0.752	0.183	-	-
HCM Control Delay (s)	19	-	$ 506.5	22	-	-
HCM Lane LOS	C	-	F	C	-	-
HCM 95th %tile Q(veh)	0.2	-	1.8	0.7	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	15	1680	5	10	1825
Future Vol, veh/h	1	15	1680	5	10	1825
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	560	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	15	2	2	2	2
Mvmt Flow	1	16	1768	5	11	1921

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2750	884	0	0	1768	0
Stage 1	1768	-	-	-	-	-
Stage 2	982	-	-	-	-	-
Critical Hdwy	6.84	7.2	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.45	-	-	2.22	-
Pot Cap-1 Maneuver	16	264	-	-	349	-
Stage 1	122	-	-	-	-	-
Stage 2	323	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	15	264	-	-	349	-
Mov Cap-2 Maneuver	15	-	-	-	-	-
Stage 1	122	-	-	-	-	-
Stage 2	313	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	36.8	0	0.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	130	349	-
HCM Lane V/C Ratio	-	-	0.13	0.03	-
HCM Control Delay (s)	-	-	36.8	15.6	-
HCM Lane LOS	-	-	E	C	-
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	15	15	225	185	1
Future Vol, veh/h	1	15	15	225	185	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	7	17	2	2	2
Mvmt Flow	1	16	16	237	195	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	463	195	196	0	-	0
Stage 1	195	-	-	-	-	-
Stage 2	268	-	-	-	-	-
Critical Hdwy	6.42	6.27	4.27	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.363	2.353	-	-	-
Pot Cap-1 Maneuver	557	834	1292	-	-	-
Stage 1	838	-	-	-	-	-
Stage 2	777	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	549	834	1292	-	-	-
Mov Cap-2 Maneuver	549	-	-	-	-	-
Stage 1	838	-	-	-	-	-
Stage 2	766	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1292	-	808	-	-
HCM Lane V/C Ratio	0.012	-	0.021	-	-
HCM Control Delay (s)	7.8	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	575	215	60	95	175	175	85	935	40	160	790	875
Future Volume (veh/h)	575	215	60	95	175	175	85	935	40	160	790	875
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1961	1727	1863	1961	1863	1937	1961	1937	1863	1942	1937
Adj Flow Rate, veh/h	605	226	63	100	184	184	89	984	42	168	832	0
Adj No. of Lanes	2	2	1	2	1	1	1	2	1	2	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	2	10	2	2	2	2	2	2	2	3	2
Cap, veh/h	665	1034	496	148	246	298	111	1739	839	216	1732	773
Arrive On Green	0.20	0.28	0.28	0.04	0.13	0.13	0.06	0.47	0.47	0.06	0.47	0.00
Sat Flow, veh/h	3408	3725	1468	3442	1961	1583	1845	3725	1647	3442	3689	1647
Grp Volume(v), veh/h	605	226	63	100	184	184	89	984	42	168	832	0
Grp Sat Flow(s),veh/h/ln	1704	1863	1468	1721	1961	1583	1845	1863	1647	1721	1845	1647
Q Serve(g_s), s	24.3	6.5	4.2	4.0	12.7	14.9	6.7	26.8	1.8	6.7	21.6	0.0
Cycle Q Clear(g_c), s	24.3	6.5	4.2	4.0	12.7	14.9	6.7	26.8	1.8	6.7	21.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	665	1034	496	148	246	298	111	1739	839	216	1732	773
V/C Ratio(X)	0.91	0.22	0.13	0.68	0.75	0.62	0.80	0.57	0.05	0.78	0.48	0.00
Avail Cap(c_a), veh/h	743	1034	496	332	266	314	138	1739	839	258	1732	773
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	55.1	38.9	32.1	66.0	59.1	52.2	65.0	27.1	17.3	64.6	25.4	0.0
Incr Delay (d2), s/veh	14.4	0.2	0.2	5.3	13.0	5.2	23.0	1.3	0.1	11.7	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.8	3.4	1.7	2.0	7.8	7.0	4.1	14.1	0.8	3.5	11.2	0.0
LnGrp Delay(d),s/veh	69.5	39.1	32.3	71.3	72.1	57.4	87.9	28.4	17.4	76.3	26.4	0.0
LnGrp LOS	E	D	C	E	E	E	F	C	B	E	C	
Approach Vol, veh/h		894			468			1115			1000	
Approach Delay, s/veh		59.2			66.2			32.7			34.8	
Approach LOS		E			E			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.3	71.3	10.5	44.8	12.9	71.7	31.8	23.6
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Max Green Setting (Gmax), s	10.5	59.0	13.5	36.0	10.5	59.0	30.5	19.0
Max Q Clear Time (g_c+I1), s	8.7	28.8	6.0	8.5	8.7	23.6	26.3	16.9
Green Ext Time (p_c), s	0.1	27.8	0.1	7.1	0.0	32.2	1.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	44.6
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	11.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	110	80	225	1	180	60	185	70	5	50	70	80
Future Vol, veh/h	110	80	225	1	180	60	185	70	5	50	70	80
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	0	110	-	-	65	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	116	84	237	1	189	63	195	74	5	53	74	84

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	253	0	0	84	0	0	618	571	84	578	539	221
Stage 1	-	-	-	-	-	-	316	316	-	223	223	-
Stage 2	-	-	-	-	-	-	302	255	-	355	316	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1312	-	-	1513	-	-	402	431	975	427	449	819
Stage 1	-	-	-	-	-	-	695	655	-	780	719	-
Stage 2	-	-	-	-	-	-	707	696	-	662	655	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1312	-	-	1513	-	-	290	393	975	340	409	819
Mov Cap-2 Maneuver	-	-	-	-	-	-	290	393	-	340	409	-
Stage 1	-	-	-	-	-	-	634	597	-	711	719	-
Stage 2	-	-	-	-	-	-	569	696	-	526	597	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.1	0	32.7	14.9
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	290	409	1312	-	-	1513	-	-	340	558
HCM Lane V/C Ratio	0.672	0.193	0.088	-	-	0.001	-	-	0.155	0.283
HCM Control Delay (s)	39.5	15.9	8	-	-	7.4	-	-	17.5	14
HCM Lane LOS	E	C	A	-	-	A	-	-	C	B
HCM 95th %tile Q(veh)	4.5	0.7	0.3	-	-	0	-	-	0.5	1.2

FUTURE (2023) NO-BUILD SYNCHRO CAPACITY REPORTS

Weekday Morning Peak Hour

Weekday Evening Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	55	30	290	80	155	25	1150	355	175	1400	15
Future Volume (veh/h)	15	55	30	290	80	155	25	1150	355	175	1400	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1792	1851	1900	1743	1805	1900	1827	1810	1900
Adj Flow Rate, veh/h	16	58	32	305	84	163	26	1211	374	184	1474	16
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	6	2	2	9	6	6	4	5	5
Cap, veh/h	147	77	42	336	119	231	192	1524	461	243	2192	24
Arrive On Green	0.01	0.07	0.07	0.15	0.21	0.21	0.02	0.78	0.78	0.06	0.63	0.63
Sat Flow, veh/h	1774	1130	623	1707	564	1094	1660	2595	785	1740	3485	38
Grp Volume(v), veh/h	16	0	90	305	0	247	26	792	793	184	727	763
Grp Sat Flow(s),veh/h/ln	1774	0	1753	1707	0	1658	1660	1714	1666	1740	1720	1803
Q Serve(g_s), s	1.2	0.0	7.1	21.5	0.0	19.3	0.9	36.7	39.8	5.7	38.0	38.1
Cycle Q Clear(g_c), s	1.2	0.0	7.1	21.5	0.0	19.3	0.9	36.7	39.8	5.7	38.0	38.1
Prop In Lane	1.00		0.36	1.00		0.66	1.00		0.47	1.00		0.02
Lane Grp Cap(c), veh/h	147	0	119	336	0	350	192	1007	978	243	1082	1134
V/C Ratio(X)	0.11	0.00	0.75	0.91	0.00	0.71	0.14	0.79	0.81	0.76	0.67	0.67
Avail Cap(c_a), veh/h	249	0	200	336	0	350	282	1007	978	265	1082	1134
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.0	0.0	64.1	50.8	0.0	51.2	15.3	10.3	10.7	23.6	16.7	16.7
Incr Delay (d2), s/veh	0.3	0.0	18.4	27.4	0.0	8.0	0.3	6.2	7.3	10.9	3.3	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	4.0	4.2	0.0	9.6	0.4	18.5	19.6	5.0	19.0	19.9
LnGrp Delay(d),s/veh	60.3	0.0	82.5	78.2	0.0	59.1	15.6	16.5	18.0	34.5	20.0	19.9
LnGrp LOS	E		F	E		E	B	B	B	C	C	B
Approach Vol, veh/h		106			552			1611			1674	
Approach Delay, s/veh		79.1			69.7			17.2			21.6	
Approach LOS		E			E			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.3	88.2	25.0	15.5	5.4	94.1	5.0	35.6
Change Period (Y+Rc), s	3.5	6.0	3.5	6.0	3.5	6.0	3.5	6.0
Max Green Setting (Gmax), s	9.5	74.0	21.5	16.0	9.5	74.0	9.5	28.0
Max Q Clear Time (g_c+I1), s	7.7	41.8	23.5	9.1	2.9	40.1	3.2	21.3
Green Ext Time (p_c), s	0.1	32.1	0.0	0.5	0.0	33.8	0.0	1.7

Intersection Summary	
HCM 2010 Ctrl Delay	28.1
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	575	505	1	5	20
Future Vol, veh/h	10	575	505	1	5	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	190	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	10	3	4	2	2	5
Mvmt Flow	11	605	532	1	5	21

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	533	0	-	0	1158	532
Stage 1	-	-	-	-	532	-
Stage 2	-	-	-	-	626	-
Critical Hdwy	4.2	-	-	-	6.42	6.25
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.29	-	-	-	3.518	3.345
Pot Cap-1 Maneuver	995	-	-	-	217	542
Stage 1	-	-	-	-	589	-
Stage 2	-	-	-	-	533	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	995	-	-	-	215	542
Mov Cap-2 Maneuver	-	-	-	-	215	-
Stage 1	-	-	-	-	589	-
Stage 2	-	-	-	-	527	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	14.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	995	-	-	-	416
HCM Lane V/C Ratio	0.011	-	-	-	0.063
HCM Control Delay (s)	8.7	-	-	-	14.2
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	560	10	75	475	15	1	15	205	15	15	30
Future Vol, veh/h	10	560	10	75	475	15	1	15	205	15	15	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	110	-	-	115	-	-	215	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	3	2	3	4	8	2	2	3	2	2	10
Mvmt Flow	11	589	11	79	500	16	1	16	216	16	16	32

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	516	0	0	600	0	0	1305	1290	595	1398	1287	508
Stage 1	-	-	-	-	-	-	616	616	-	666	666	-
Stage 2	-	-	-	-	-	-	689	674	-	732	621	-
Critical Hdwy	4.12	-	-	4.13	-	-	7.12	6.52	6.23	7.12	6.52	6.3
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.227	-	-	3.518	4.018	3.327	3.518	4.018	3.39
Pot Cap-1 Maneuver	1050	-	-	972	-	-	137	163	502	118	164	549
Stage 1	-	-	-	-	-	-	478	482	-	449	457	-
Stage 2	-	-	-	-	-	-	436	454	-	413	479	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1050	-	-	972	-	-	111	148	502	58	149	549
Mov Cap-2 Maneuver	-	-	-	-	-	-	111	148	-	58	149	-
Stage 1	-	-	-	-	-	-	473	477	-	444	420	-
Stage 2	-	-	-	-	-	-	363	417	-	225	474	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.2	22.7	47.7
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	111	432	1050	-	-	972	-	-	145
HCM Lane V/C Ratio	0.009	0.536	0.01	-	-	0.081	-	-	0.436
HCM Control Delay (s)	37.7	22.6	8.5	-	-	9	-	-	47.7
HCM Lane LOS	E	C	A	-	-	A	-	-	E
HCM 95th %tile Q(veh)	0	3.1	0	-	-	0.3	-	-	1.9

Intersection	
Int Delay, s/veh	47.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	70	45	75	1460	1620	100
Future Vol, veh/h	70	45	75	1460	1620	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	60	-	-	265
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	5	5	5	5
Mvmt Flow	74	47	79	1537	1705	105

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2631	853	1705	0	-	0
Stage 1	1705	-	-	-	-	-
Stage 2	926	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.2	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.25	-	-	-
Pot Cap-1 Maneuver	~ 19	302	356	-	-	-
Stage 1	132	-	-	-	-	-
Stage 2	346	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 15	302	356	-	-	-
Mov Cap-2 Maneuver	~ 15	-	-	-	-	-
Stage 1	132	-	-	-	-	-
Stage 2	269	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 1387.9	0.9	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	356	-	15	302	-	-
HCM Lane V/C Ratio	0.222	-	4.912	0.157	-	-
HCM Control Delay (s)	18	-	$ 2267.8	19.1	-	-
HCM Lane LOS	C	-	F	C	-	-
HCM 95th %tile Q(veh)	0.8	-	10.1	0.5	-	-

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

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	10	1525	1	20	1645
Future Vol, veh/h	1	10	1525	1	20	1645
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	560	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	11	1605	1	21	1732

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2513	803	0	0	1605	0
Stage 1	1605	-	-	-	-	-
Stage 2	908	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	23	326	-	-	403	-
Stage 1	150	-	-	-	-	-
Stage 2	354	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	22	326	-	-	403	-
Mov Cap-2 Maneuver	22	-	-	-	-	-
Stage 1	150	-	-	-	-	-
Stage 2	336	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	32.2	0	0.2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	144	403	-
HCM Lane V/C Ratio	-	-	0.08	0.052	-
HCM Control Delay (s)	-	-	32.2	14.4	-
HCM Lane LOS	-	-	D	B	-
HCM 95th %tile Q(veh)	-	-	0.3	0.2	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	15	10	215	100	1
Future Vol, veh/h	5	15	10	215	100	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	16	11	226	105	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	353	106	106	0	-	0
Stage 1	106	-	-	-	-	-
Stage 2	247	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	645	948	1485	-	-	-
Stage 1	918	-	-	-	-	-
Stage 2	794	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	640	948	1485	-	-	-
Mov Cap-2 Maneuver	640	-	-	-	-	-
Stage 1	918	-	-	-	-	-
Stage 2	788	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1485	-	846	-	-
HCM Lane V/C Ratio	0.007	-	0.025	-	-
HCM Control Delay (s)	7.4	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	780	225	25	35	70	65	30	680	35	70	1015	560
Future Volume (veh/h)	780	225	25	35	70	65	30	680	35	70	1015	560
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1961	1696	1863	1961	1743	1764	1852	1900	1759	1905	1900
Adj Flow Rate, veh/h	821	237	26	37	74	68	32	716	37	74	1068	0
Adj No. of Lanes	2	2	1	2	1	1	1	2	1	2	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	2	12	2	2	9	12	8	4	8	5	4
Cap, veh/h	894	1135	473	66	121	143	40	1728	824	114	1818	811
Arrive On Green	0.26	0.30	0.30	0.02	0.06	0.06	0.02	0.49	0.49	0.04	0.50	0.00
Sat Flow, veh/h	3408	3725	1442	3442	1961	1482	1680	3519	1615	3250	3619	1615
Grp Volume(v), veh/h	821	237	26	37	74	68	32	716	37	74	1068	0
Grp Sat Flow(s),veh/h/ln	1704	1863	1442	1721	1961	1482	1680	1759	1615	1625	1810	1615
Q Serve(g_s), s	32.8	6.6	1.7	1.5	5.2	6.1	2.7	18.2	1.6	3.1	29.2	0.0
Cycle Q Clear(g_c), s	32.8	6.6	1.7	1.5	5.2	6.1	2.7	18.2	1.6	3.1	29.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	894	1135	473	66	121	143	40	1728	824	114	1818	811
V/C Ratio(X)	0.92	0.21	0.05	0.56	0.61	0.47	0.80	0.41	0.04	0.65	0.59	0.00
Avail Cap(c_a), veh/h	1010	1135	473	381	182	190	126	1728	824	244	1818	811
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	50.2	36.2	32.2	68.1	64.1	59.9	68.0	22.8	17.2	66.7	24.6	0.0
Incr Delay (d2), s/veh	12.1	0.2	0.1	7.1	10.3	5.1	29.7	0.7	0.1	6.0	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.9	3.4	0.7	0.8	3.1	2.7	1.6	9.0	0.7	1.5	14.9	0.0
LnGrp Delay(d),s/veh	62.2	36.3	32.3	75.2	74.4	65.0	97.7	23.5	17.3	72.7	26.0	0.0
LnGrp LOS	E	D	C	E	E	E	F	C	B	E	C	
Approach Vol, veh/h		1084			179			785			1142	
Approach Delay, s/veh		55.9			71.0			26.2			29.0	
Approach LOS		E			E			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.4	74.7	7.2	48.6	7.8	76.3	41.2	14.6
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Max Green Setting (Gmax), s	10.5	54.0	15.5	39.0	10.5	54.0	41.5	13.0
Max Q Clear Time (g_c+I1), s	5.1	20.2	3.5	8.6	4.7	31.2	34.8	8.1
Green Ext Time (p_c), s	0.1	30.7	0.0	4.6	0.0	21.3	1.9	0.5

Intersection Summary	
HCM 2010 Ctrl Delay	39.8
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	165	20	145	1	35	25	110	35	1	25	65	25
Future Vol, veh/h	165	20	145	1	35	25	110	35	1	25	65	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	0	110	-	-	65	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	25	2	2	13	9	2	2	2	6	2	5
Mvmt Flow	174	21	153	1	37	26	116	37	1	26	68	26

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	63	0	0	21	0	0	467	433	21	439	420	50
Stage 1	-	-	-	-	-	-	368	368	-	52	52	-
Stage 2	-	-	-	-	-	-	99	65	-	387	368	-
Critical Hdwy	4.13	-	-	4.12	-	-	7.12	6.52	6.22	7.16	6.52	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.16	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.16	5.52	-
Follow-up Hdwy	2.227	-	-	2.218	-	-	3.518	4.018	3.318	3.554	4.018	3.345
Pot Cap-1 Maneuver	1533	-	-	1595	-	-	506	516	1056	521	525	1010
Stage 1	-	-	-	-	-	-	652	621	-	951	852	-
Stage 2	-	-	-	-	-	-	907	841	-	629	621	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1533	-	-	1595	-	-	400	457	1056	446	465	1010
Mov Cap-2 Maneuver	-	-	-	-	-	-	400	457	-	446	465	-
Stage 1	-	-	-	-	-	-	578	551	-	843	851	-
Stage 2	-	-	-	-	-	-	812	840	-	520	551	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.8	0.1	16.6	13.1
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	400	464	1533	-	-	1595	-	-	446	547
HCM Lane V/C Ratio	0.289	0.082	0.113	-	-	0.001	-	-	0.059	0.173
HCM Control Delay (s)	17.6	13.4	7.6	-	-	7.3	-	-	13.6	13
HCM Lane LOS	C	B	A	-	-	A	-	-	B	B
HCM 95th %tile Q(veh)	1.2	0.3	0.4	-	-	0	-	-	0.2	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	115	30	470	195	175	110	1545	205	110	1470	30
Future Volume (veh/h)	40	115	30	470	195	175	110	1545	205	110	1470	30
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1859	1900	1863	1863	1900	1863	1861	1900	1863	1845	1900
Adj Flow Rate, veh/h	42	121	32	495	205	184	116	1626	216	116	1547	32
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	3	3
Cap, veh/h	202	142	38	483	275	247	160	1517	198	139	1704	35
Arrive On Green	0.03	0.10	0.10	0.23	0.30	0.30	0.02	0.16	0.16	0.05	0.49	0.49
Sat Flow, veh/h	1774	1418	375	1774	906	813	1774	3145	411	1774	3512	73
Grp Volume(v), veh/h	42	0	153	495	0	389	116	901	941	116	771	808
Grp Sat Flow(s),veh/h/ln	1774	0	1793	1774	0	1719	1774	1768	1788	1774	1753	1832
Q Serve(g_s), s	3.0	0.0	11.8	32.5	0.0	28.5	4.6	67.5	67.5	5.0	56.6	56.9
Cycle Q Clear(g_c), s	3.0	0.0	11.8	32.5	0.0	28.5	4.6	67.5	67.5	5.0	56.6	56.9
Prop In Lane	1.00		0.21	1.00		0.47	1.00		0.23	1.00		0.04
Lane Grp Cap(c), veh/h	202	0	180	483	0	522	160	852	862	139	850	889
V/C Ratio(X)	0.21	0.00	0.85	1.02	0.00	0.74	0.73	1.06	1.09	0.83	0.91	0.91
Avail Cap(c_a), veh/h	322	0	205	483	0	522	197	852	862	172	850	889
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.4	0.0	61.9	42.4	0.0	43.8	32.8	58.9	58.9	35.4	33.1	33.2
Incr Delay (d2), s/veh	0.5	0.0	28.9	47.1	0.0	6.9	9.8	47.1	58.6	23.9	15.1	14.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	7.3	9.1	0.0	14.5	2.7	44.2	47.5	5.3	30.8	32.4
LnGrp Delay(d),s/veh	54.9	0.0	90.9	89.6	0.0	50.7	42.6	106.0	117.4	59.3	48.3	48.1
LnGrp LOS	D		F	F		D	D	F	F	E	D	D
Approach Vol, veh/h		195			884			1958			1695	
Approach Delay, s/veh		83.1			72.5			107.7			48.9	
Approach LOS		F			E			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	73.5	36.0	20.1	10.0	73.9	7.5	48.5
Change Period (Y+Rc), s	3.5	6.0	3.5	6.0	3.5	6.0	3.5	6.0
Max Green Setting (Gmax), s	9.5	63.0	32.5	16.0	9.5	63.0	13.5	35.0
Max Q Clear Time (g_c+I1), s	7.0	69.5	34.5	13.8	6.6	58.9	5.0	30.5
Green Ext Time (p_c), s	0.1	0.0	0.0	0.3	0.1	4.1	0.0	2.1

Intersection Summary	
HCM 2010 Ctrl Delay	79.1
HCM 2010 LOS	E

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	420	830	5	1	10
Future Vol, veh/h	10	420	830	5	1	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	190	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	10	2	2	2	2	8
Mvmt Flow	11	442	874	5	1	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	879	0	-	0	1339	876
Stage 1	-	-	-	-	876	-
Stage 2	-	-	-	-	463	-
Critical Hdwy	4.2	-	-	-	6.42	6.28
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.29	-	-	-	3.518	3.372
Pot Cap-1 Maneuver	736	-	-	-	168	339
Stage 1	-	-	-	-	407	-
Stage 2	-	-	-	-	634	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	736	-	-	-	165	339
Mov Cap-2 Maneuver	-	-	-	-	165	-
Stage 1	-	-	-	-	407	-
Stage 2	-	-	-	-	625	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	17.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	736	-	-	-	309
HCM Lane V/C Ratio	0.014	-	-	-	0.037
HCM Control Delay (s)	10	-	-	-	17.1
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	19

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	375	15	155	795	50	5	20	220	20	30	35
Future Vol, veh/h	30	375	15	155	795	50	5	20	220	20	30	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	110	-	-	115	-	-	215	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	2	6	2	2	4	2	2	2	2	2	3
Mvmt Flow	32	395	16	163	837	53	5	21	232	21	32	37

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	889	0	0	411	0	0	1690	1682	403	1781	1663	863
Stage 1	-	-	-	-	-	-	466	466	-	1189	1189	-
Stage 2	-	-	-	-	-	-	1224	1216	-	592	474	-
Critical Hdwy	4.13	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.227	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.327
Pot Cap-1 Maneuver	758	-	-	1148	-	-	74	94	647	64	97	353
Stage 1	-	-	-	-	-	-	577	562	-	229	261	-
Stage 2	-	-	-	-	-	-	219	254	-	493	558	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	758	-	-	1148	-	-	40	77	647	28	80	353
Mov Cap-2 Maneuver	-	-	-	-	-	-	40	77	-	28	80	-
Stage 1	-	-	-	-	-	-	553	538	-	219	224	-
Stage 2	-	-	-	-	-	-	145	218	-	291	534	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	1.3	29.8	285.5
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	40	400	758	-	-	1148	-	-	72
HCM Lane V/C Ratio	0.132	0.632	0.042	-	-	0.142	-	-	1.243
HCM Control Delay (s)	108.2	28.2	10	-	-	8.7	-	-	285.5
HCM Lane LOS	F	D	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.4	4.2	0.1	-	-	0.5	-	-	7

Intersection	
Int Delay, s/veh	202.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	105	100	75	1755	1870	100
Future Vol, veh/h	105	100	75	1755	1870	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	60	-	-	265
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	4	13	2	3	20
Mvmt Flow	111	105	79	1847	1968	105

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	3050	984	1968	0	-	0
Stage 1	1968	-	-	-	-	-
Stage 2	1082	-	-	-	-	-
Critical Hdwy	6.84	6.98	4.36	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.34	2.33	-	-	-
Pot Cap-1 Maneuver	~ 10	244	252	-	-	-
Stage 1	~ 95	-	-	-	-	-
Stage 2	287	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 7	244	252	-	-	-
Mov Cap-2 Maneuver	~ 7	-	-	-	-	-
Stage 1	~ 95	-	-	-	-	-
Stage 2	197	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 3950.8	1.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	252	-	7	244	-	-
HCM Lane V/C Ratio	0.313	-	15.789	0.431	-	-
HCM Control Delay (s)	25.7	-	$ 7684.5	30.5	-	-
HCM Lane LOS	D	-	F	D	-	-
HCM 95th %tile Q(veh)	1.3	-	15.6	2	-	-

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

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	15	1815	5	10	1960
Future Vol, veh/h	1	15	1815	5	10	1960
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	560	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	16	1911	5	11	2063

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2964	955	0	0	1911	0
Stage 1	1911	-	-	-	-	-
Stage 2	1053	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	11	259	-	-	307	-
Stage 1	102	-	-	-	-	-
Stage 2	297	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	11	259	-	-	307	-
Mov Cap-2 Maneuver	11	-	-	-	-	-
Stage 1	102	-	-	-	-	-
Stage 2	286	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	44.4	0	0.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	108	307	-
HCM Lane V/C Ratio	-	-	0.156	0.034	-
HCM Control Delay (s)	-	-	44.4	17.1	-
HCM Lane LOS	-	-	E	C	-
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	15	15	245	200	1
Future Vol, veh/h	1	15	15	245	200	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	16	16	258	211	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	500	211	212	0	-	0
Stage 1	211	-	-	-	-	-
Stage 2	289	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	530	829	1358	-	-	-
Stage 1	824	-	-	-	-	-
Stage 2	760	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	523	829	1358	-	-	-
Mov Cap-2 Maneuver	523	-	-	-	-	-
Stage 1	824	-	-	-	-	-
Stage 2	749	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1358	-	800	-	-
HCM Lane V/C Ratio	0.012	-	0.021	-	-
HCM Control Delay (s)	7.7	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	580	235	60	110	205	205	95	1035	50	175	865	920
Future Volume (veh/h)	580	235	60	110	205	205	95	1035	50	175	865	920
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1961	1727	1863	1961	1863	1937	1961	1937	1863	1942	1937
Adj Flow Rate, veh/h	611	247	63	116	216	216	100	1089	53	184	911	0
Adj No. of Lanes	2	2	1	2	1	1	1	2	1	2	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	2	10	2	2	2	2	2	2	2	3	2
Cap, veh/h	670	1059	515	166	266	322	123	1678	821	232	1665	743
Arrive On Green	0.20	0.28	0.28	0.05	0.14	0.14	0.07	0.45	0.45	0.07	0.45	0.00
Sat Flow, veh/h	3408	3725	1468	3442	1961	1583	1845	3725	1647	3442	3689	1647
Grp Volume(v), veh/h	611	247	63	116	216	216	100	1089	53	184	911	0
Grp Sat Flow(s),veh/h/ln	1704	1863	1468	1721	1961	1583	1845	1863	1647	1721	1845	1647
Q Serve(g_s), s	24.6	7.1	4.1	4.6	15.0	17.6	7.5	31.8	2.3	7.4	25.2	0.0
Cycle Q Clear(g_c), s	24.6	7.1	4.1	4.6	15.0	17.6	7.5	31.8	2.3	7.4	25.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	670	1059	515	166	266	322	123	1678	821	232	1665	743
V/C Ratio(X)	0.91	0.23	0.12	0.70	0.81	0.67	0.81	0.65	0.06	0.79	0.55	0.00
Avail Cap(c_a), veh/h	743	1059	515	332	266	322	138	1678	821	258	1665	743
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	55.1	38.4	30.8	65.6	58.8	51.5	64.5	29.9	18.2	64.3	28.0	0.0
Incr Delay (d2), s/veh	14.7	0.2	0.2	5.3	19.0	7.1	27.4	2.0	0.2	14.3	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.9	3.7	1.7	2.3	9.5	8.3	4.8	16.8	1.1	4.0	13.1	0.0
LnGrp Delay(d),s/veh	69.7	38.7	31.1	70.9	77.8	58.6	91.9	31.8	18.3	78.6	29.3	0.0
LnGrp LOS	E	D	C	E	E	E	F	C	B	E	C	
Approach Vol, veh/h		921			548			1242			1095	
Approach Delay, s/veh		58.8			68.7			36.1			37.6	
Approach LOS		E			E			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.9	69.1	11.2	45.8	13.8	69.2	32.0	25.0
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Max Green Setting (Gmax), s	10.5	59.0	13.5	36.0	10.5	59.0	30.5	19.0
Max Q Clear Time (g_c+I1), s	9.4	33.8	6.6	9.1	9.5	27.2	26.6	19.6
Green Ext Time (p_c), s	0.1	24.1	0.2	8.1	0.0	30.1	0.9	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	46.7
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	19.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	115	95	250	1	215	65	220	80	5	55	75	85
Future Vol, veh/h	115	95	250	1	215	65	220	80	5	55	75	85
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	0	110	-	-	65	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	121	100	263	1	226	68	232	84	5	58	79	89

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	295	0	0	100	0	0	689	639	100	650	605	261
Stage 1	-	-	-	-	-	-	342	342	-	263	263	-
Stage 2	-	-	-	-	-	-	347	297	-	387	342	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1266	-	-	1493	-	-	360	394	956	382	412	778
Stage 1	-	-	-	-	-	-	673	638	-	742	691	-
Stage 2	-	-	-	-	-	-	669	668	-	637	638	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1266	-	-	1493	-	-	248	356	956	289	372	778
Mov Cap-2 Maneuver	-	-	-	-	-	-	248	356	-	289	372	-
Stage 1	-	-	-	-	-	-	609	577	-	671	691	-
Stage 2	-	-	-	-	-	-	524	668	-	489	577	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2	0	65.6	16.7
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	248	370	1266	-	-	1493	-	-	289	515
HCM Lane V/C Ratio	0.934	0.242	0.096	-	-	0.001	-	-	0.2	0.327
HCM Control Delay (s)	84.1	17.8	8.1	-	-	7.4	-	-	20.6	15.4
HCM Lane LOS	F	C	A	-	-	A	-	-	C	C
HCM 95th %tile Q(veh)	8.3	0.9	0.3	-	-	0	-	-	0.7	1.4

FUTURE (2023) BUILD SYNCHRO CAPACITY REPORTS

Weekday Morning Peak Hour

Weekday Evening Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	65	30	290	80	155	30	1180	375	235	1415	15
Future Volume (veh/h)	15	65	30	290	80	155	30	1180	375	235	1415	15
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1792	1851	1900	1743	1805	1900	1827	1810	1900
Adj Flow Rate, veh/h	16	68	32	305	84	163	32	1242	395	247	1489	16
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	6	2	2	9	6	6	4	5	5
Cap, veh/h	153	88	41	336	122	237	188	1468	456	236	2165	23
Arrive On Green	0.01	0.07	0.07	0.15	0.22	0.22	0.02	0.76	0.76	0.07	0.62	0.62
Sat Flow, veh/h	1774	1199	564	1707	564	1094	1660	2578	800	1740	3486	37
Grp Volume(v), veh/h	16	0	100	305	0	247	32	816	821	247	734	771
Grp Sat Flow(s),veh/h/ln	1774	0	1763	1707	0	1658	1660	1715	1664	1740	1720	1803
Q Serve(g_s), s	1.2	0.0	7.8	21.5	0.0	19.2	1.1	44.0	48.8	9.5	39.5	39.6
Cycle Q Clear(g_c), s	1.2	0.0	7.8	21.5	0.0	19.2	1.1	44.0	48.8	9.5	39.5	39.6
Prop In Lane	1.00		0.32	1.00		0.66	1.00		0.48	1.00		0.02
Lane Grp Cap(c), veh/h	153	0	129	336	0	359	188	976	947	236	1068	1120
V/C Ratio(X)	0.10	0.00	0.77	0.91	0.00	0.69	0.17	0.84	0.87	1.05	0.69	0.69
Avail Cap(c_a), veh/h	255	0	202	336	0	359	274	976	947	236	1068	1120
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.3	0.0	63.7	50.1	0.0	50.5	16.3	12.6	13.2	34.2	17.5	17.5
Incr Delay (d2), s/veh	0.3	0.0	18.5	27.5	0.0	7.0	0.4	8.4	10.5	72.0	3.6	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	4.5	4.2	0.0	9.5	0.5	22.5	24.7	13.8	19.6	20.6
LnGrp Delay(d),s/veh	59.6	0.0	82.2	77.6	0.0	57.5	16.7	21.1	23.8	106.2	21.1	21.0
LnGrp LOS	E		F	E		E	B	C	C	F	C	C
Approach Vol, veh/h		116			552			1669			1752	
Approach Delay, s/veh		79.1			68.6			22.3			33.1	
Approach LOS		E			E			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	85.7	25.0	16.3	5.7	93.0	5.0	36.3
Change Period (Y+Rc), s	3.5	6.0	3.5	6.0	3.5	6.0	3.5	6.0
Max Green Setting (Gmax), s	9.5	74.0	21.5	16.0	9.5	74.0	9.5	28.0
Max Q Clear Time (g_c+I1), s	11.5	50.8	23.5	9.8	3.1	41.6	3.2	21.2
Green Ext Time (p_c), s	0.0	23.1	0.0	0.5	0.0	32.3	0.0	1.8

Intersection Summary	
HCM 2010 Ctrl Delay	34.8
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	575	90	30	505	1	0	0	15	5	1	20
Future Vol, veh/h	10	575	90	30	505	1	0	0	15	5	1	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	190	-	145	145	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	10	3	2	2	4	2	2	2	2	2	2	5
Mvmt Flow	11	605	95	32	532	1	0	0	16	5	1	21

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	533	0	0	605	0	0	-	-	605	1221	1221	532
Stage 1	-	-	-	-	-	-	-	-	-	595	595	-
Stage 2	-	-	-	-	-	-	-	-	-	626	626	-
Critical Hdwy	4.2	-	-	4.12	-	-	-	-	6.22	7.12	6.52	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	6.12	5.52	-
Follow-up Hdwy	2.29	-	-	2.218	-	-	-	-	3.318	3.518	4.018	3.345
Pot Cap-1 Maneuver	995	-	-	973	-	-	0	0	498	157	180	542
Stage 1	-	-	-	-	-	-	0	0	-	491	492	-
Stage 2	-	-	-	-	-	-	0	0	-	472	477	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	995	-	-	973	-	-	-	-	498	147	172	542
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	147	172	-
Stage 1	-	-	-	-	-	-	-	-	-	486	476	-
Stage 2	-	-	-	-	-	-	-	-	-	452	472	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.5	12.5	16.6
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	498	995	-	-	973	-	-	339
HCM Lane V/C Ratio	0.032	0.011	-	-	0.032	-	-	0.081
HCM Control Delay (s)	12.5	8.7	-	-	8.8	-	-	16.6
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-	-	0.3

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	575	10	75	505	15	1	15	205	15	15	30
Future Vol, veh/h	10	575	10	75	505	15	1	15	205	15	15	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	110	-	-	115	-	-	215	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	3	2	3	4	8	2	2	3	2	2	10
Mvmt Flow	11	605	11	79	532	16	1	16	216	16	16	32

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	547	0	0	616	0	0	1353	1337	611	1444	1334	539
Stage 1	-	-	-	-	-	-	632	632	-	697	697	-
Stage 2	-	-	-	-	-	-	721	705	-	747	637	-
Critical Hdwy	4.12	-	-	4.13	-	-	7.12	6.52	6.23	7.12	6.52	6.3
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.227	-	-	3.518	4.018	3.327	3.518	4.018	3.39
Pot Cap-1 Maneuver	1022	-	-	959	-	-	127	153	492	110	154	527
Stage 1	-	-	-	-	-	-	468	474	-	431	443	-
Stage 2	-	-	-	-	-	-	419	439	-	405	471	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1022	-	-	959	-	-	102	139	492	52	140	527
Mov Cap-2 Maneuver	-	-	-	-	-	-	102	139	-	52	140	-
Stage 1	-	-	-	-	-	-	463	469	-	426	407	-
Stage 2	-	-	-	-	-	-	347	403	-	217	466	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.1	23.8	54.4
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	102	419	1022	-	-	959	-	-	133
HCM Lane V/C Ratio	0.01	0.553	0.01	-	-	0.082	-	-	0.475
HCM Control Delay (s)	40.7	23.7	8.6	-	-	9.1	-	-	54.4
HCM Lane LOS	E	C	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0	3.3	0	-	-	0.3	-	-	2.2

Intersection	
Int Delay, s/veh	50.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	70	45	75	1515	1635	100
Future Vol, veh/h	70	45	75	1515	1635	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	60	-	-	265
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	5	5	5	5
Mvmt Flow	74	47	79	1595	1721	105

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2676	861	1721	0	-	0
Stage 1	1721	-	-	-	-	-
Stage 2	955	-	-	-	-	-
Critical Hdwy	6.84	6.94	4.2	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.25	-	-	-
Pot Cap-1 Maneuver	~ 18	299	351	-	-	-
Stage 1	130	-	-	-	-	-
Stage 2	334	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 14	299	351	-	-	-
Mov Cap-2 Maneuver	~ 14	-	-	-	-	-
Stage 1	130	-	-	-	-	-
Stage 2	259	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 1503.7	0.9	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	351	-	14	299	-	-
HCM Lane V/C Ratio	0.225	-	5.263	0.158	-	-
HCM Control Delay (s)	18.2	-	$ 2457.9	19.3	-	-
HCM Lane LOS	C	-	F	C	-	-
HCM 95th %tile Q(veh)	0.8	-	10.2	0.6	-	-

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

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	45	1545	80	35	1645
Future Vol, veh/h	1	45	1545	80	35	1645
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	560	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	47	1626	84	37	1732

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2565	813	0	0	1626	0
Stage 1	1626	-	-	-	-	-
Stage 2	939	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	21	322	-	-	396	-
Stage 1	146	-	-	-	-	-
Stage 2	341	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	19	322	-	-	396	-
Mov Cap-2 Maneuver	19	-	-	-	-	-
Stage 1	146	-	-	-	-	-
Stage 2	309	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.9	0	0.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	239	396	-
HCM Lane V/C Ratio	-	-	0.203	0.093	-
HCM Control Delay (s)	-	-	23.9	15	-
HCM Lane LOS	-	-	C	C	-
HCM 95th %tile Q(veh)	-	-	0.7	0.3	-

Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	95	20	10	1	35	35
Future Vol, veh/h	95	20	10	1	35	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	115	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	100	21	11	1	37	37

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	12	0	-	0	232	11
Stage 1	-	-	-	-	11	-
Stage 2	-	-	-	-	221	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1607	-	-	-	756	1070
Stage 1	-	-	-	-	1012	-
Stage 2	-	-	-	-	816	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1607	-	-	-	708	1070
Mov Cap-2 Maneuver	-	-	-	-	708	-
Stage 1	-	-	-	-	1012	-
Stage 2	-	-	-	-	765	-

Approach	EB	WB	SB
HCM Control Delay, s	6.1	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1607	-	-	-	708	1070
HCM Lane V/C Ratio	0.062	-	-	-	0.052	0.034
HCM Control Delay (s)	7.4	0	-	-	10.4	8.5
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.2	0.1

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	50	10	215	100	1
Future Vol, veh/h	5	50	10	215	100	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	53	11	226	105	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	353	106	106	0	-	0
Stage 1	106	-	-	-	-	-
Stage 2	247	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	645	948	1485	-	-	-
Stage 1	918	-	-	-	-	-
Stage 2	794	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	640	948	1485	-	-	-
Mov Cap-2 Maneuver	640	-	-	-	-	-
Stage 1	918	-	-	-	-	-
Stage 2	788	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1485	-	908	-	-
HCM Lane V/C Ratio	0.007	-	0.064	-	-
HCM Control Delay (s)	7.4	0	9.2	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	835	225	25	50	90	65	30	725	35	70	1015	560
Future Volume (veh/h)	835	225	25	50	90	65	30	725	35	70	1015	560
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1961	1696	1863	1961	1743	1764	1852	1900	1759	1905	1900
Adj Flow Rate, veh/h	879	237	26	53	95	68	32	763	37	74	1068	0
Adj No. of Lanes	2	2	1	2	1	1	1	2	1	2	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	2	12	2	2	9	12	8	4	8	5	4
Cap, veh/h	943	1178	490	90	129	150	40	1662	805	114	1751	781
Arrive On Green	0.28	0.32	0.32	0.03	0.07	0.07	0.02	0.47	0.47	0.04	0.48	0.00
Sat Flow, veh/h	3408	3725	1442	3442	1961	1482	1680	3519	1615	3250	3619	1615
Grp Volume(v), veh/h	879	237	26	53	95	68	32	763	37	74	1068	0
Grp Sat Flow(s),veh/h/ln	1704	1863	1442	1721	1961	1482	1680	1759	1615	1625	1810	1615
Q Serve(g_s), s	35.2	6.5	1.7	2.1	6.7	6.1	2.7	20.5	1.6	3.1	30.3	0.0
Cycle Q Clear(g_c), s	35.2	6.5	1.7	2.1	6.7	6.1	2.7	20.5	1.6	3.1	30.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	943	1178	490	90	129	150	40	1662	805	114	1751	781
V/C Ratio(X)	0.93	0.20	0.05	0.59	0.74	0.45	0.80	0.46	0.05	0.65	0.61	0.00
Avail Cap(c_a), veh/h	1010	1178	490	381	182	190	126	1662	805	244	1751	781
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.4	34.9	31.1	67.4	64.2	59.3	68.0	24.9	18.0	66.7	26.5	0.0
Incr Delay (d2), s/veh	14.3	0.2	0.1	5.9	16.6	4.6	29.7	0.9	0.1	6.0	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.5	3.4	0.7	1.1	4.2	2.7	1.6	10.2	0.8	1.5	15.5	0.0
LnGrp Delay(d),s/veh	63.6	35.1	31.1	73.4	80.8	63.9	97.7	25.8	18.1	72.7	28.1	0.0
LnGrp LOS	E	D	C	E	F	E	F	C	B	E	C	
Approach Vol, veh/h		1142			216			832			1142	
Approach Delay, s/veh		57.0			73.6			28.2			31.0	
Approach LOS		E			E			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.4	72.1	8.2	50.3	7.8	73.7	43.2	15.2
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Max Green Setting (Gmax), s	10.5	54.0	15.5	39.0	10.5	54.0	41.5	13.0
Max Q Clear Time (g_c+I1), s	5.1	22.5	4.1	8.5	4.7	32.3	37.2	8.7
Green Ext Time (p_c), s	0.1	29.1	0.1	4.8	0.0	20.5	1.5	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	42.0
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	8.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	165	20	145	1	35	25	110	35	1	25	65	60
Future Vol, veh/h	165	20	145	1	35	25	110	35	1	25	65	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	0	110	-	-	65	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	25	2	2	13	9	2	2	2	6	2	5
Mvmt Flow	174	21	153	1	37	26	116	37	1	26	68	63

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	63	0	0	21	0	0	486	433	21	439	420	50
Stage 1	-	-	-	-	-	-	368	368	-	52	52	-
Stage 2	-	-	-	-	-	-	118	65	-	387	368	-
Critical Hdwy	4.13	-	-	4.12	-	-	7.12	6.52	6.22	7.16	6.52	6.25
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.16	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.16	5.52	-
Follow-up Hdwy	2.227	-	-	2.218	-	-	3.518	4.018	3.318	3.554	4.018	3.345
Pot Cap-1 Maneuver	1533	-	-	1595	-	-	492	516	1056	521	525	1010
Stage 1	-	-	-	-	-	-	652	621	-	951	852	-
Stage 2	-	-	-	-	-	-	887	841	-	629	621	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1533	-	-	1595	-	-	374	457	1056	446	465	1010
Mov Cap-2 Maneuver	-	-	-	-	-	-	374	457	-	446	465	-
Stage 1	-	-	-	-	-	-	578	551	-	843	851	-
Stage 2	-	-	-	-	-	-	764	840	-	520	551	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.8	0.1	17.5	12.4
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	374	464	1533	-	-	1595	-	-	446	628
HCM Lane V/C Ratio	0.31	0.082	0.113	-	-	0.001	-	-	0.059	0.21
HCM Control Delay (s)	18.9	13.4	7.6	-	-	7.3	-	-	13.6	12.2
HCM Lane LOS	C	B	A	-	-	A	-	-	B	B
HCM 95th %tile Q(veh)	1.3	0.3	0.4	-	-	0	-	-	0.2	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	120	30	470	195	175	120	1625	215	140	1475	30
Future Volume (veh/h)	40	120	30	470	195	175	120	1625	215	140	1475	30
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1859	1900	1863	1863	1900	1863	1861	1900	1863	1845	1900
Adj Flow Rate, veh/h	42	126	32	495	205	184	126	1711	226	147	1553	32
Adj No. of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	3	3
Cap, veh/h	204	147	37	483	277	249	162	1457	188	170	1681	35
Arrive On Green	0.03	0.10	0.10	0.23	0.31	0.31	0.02	0.15	0.15	0.07	0.48	0.48
Sat Flow, veh/h	1774	1431	364	1774	906	813	1774	3149	407	1774	3513	72
Grp Volume(v), veh/h	42	0	158	495	0	389	126	944	993	147	774	811
Grp Sat Flow(s),veh/h/ln	1774	0	1795	1774	0	1719	1774	1768	1789	1774	1753	1832
Q Serve(g_s), s	2.9	0.0	12.1	32.5	0.0	28.4	5.1	64.8	64.8	7.4	57.7	58.0
Cycle Q Clear(g_c), s	2.9	0.0	12.1	32.5	0.0	28.4	5.1	64.8	64.8	7.4	57.7	58.0
Prop In Lane	1.00		0.20	1.00		0.47	1.00		0.23	1.00		0.04
Lane Grp Cap(c), veh/h	204	0	184	483	0	527	162	818	827	170	839	877
V/C Ratio(X)	0.21	0.00	0.86	1.02	0.00	0.74	0.78	1.15	1.20	0.87	0.92	0.93
Avail Cap(c_a), veh/h	324	0	205	483	0	527	192	818	827	172	839	877
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.1	0.0	61.8	42.1	0.0	43.5	33.2	59.3	59.3	40.3	34.1	34.2
Incr Delay (d2), s/veh	0.5	0.0	30.0	47.4	0.0	6.6	15.3	83.3	101.6	33.8	17.2	16.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	7.5	9.1	0.0	14.5	3.2	50.7	55.5	7.2	31.9	33.4
LnGrp Delay(d),s/veh	54.6	0.0	91.8	89.5	0.0	50.1	48.5	142.6	160.9	74.1	51.3	51.1
LnGrp LOS	D		F	F		D	D	F	F	E	D	D
Approach Vol, veh/h		200			884			2063			1732	
Approach Delay, s/veh		84.0			72.2			145.7			53.1	
Approach LOS		F			E			F			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.9	70.8	36.0	20.4	10.6	73.0	7.5	48.9
Change Period (Y+Rc), s	3.5	6.0	3.5	6.0	3.5	6.0	3.5	6.0
Max Green Setting (Gmax), s	9.5	63.0	32.5	16.0	9.5	63.0	13.5	35.0
Max Q Clear Time (g_c+I1), s	9.4	66.8	34.5	14.1	7.1	60.0	4.9	30.4
Green Ext Time (p_c), s	0.0	0.0	0.0	0.3	0.1	3.0	0.0	2.1

Intersection Summary	
HCM 2010 Ctrl Delay	97.0
HCM 2010 LOS	F

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	420	45	15	830	5	0	0	35	1	1	10
Future Vol, veh/h	10	420	45	15	830	5	0	0	35	1	1	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	190	-	145	145	-	-	-	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	10	2	2	2	2	2	2	2	2	2	2	8
Mvmt Flow	11	442	47	16	874	5	0	0	37	1	1	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	879	0	0	442	0	0	-	-	442	1371	1371	876
Stage 1	-	-	-	-	-	-	-	-	-	908	908	-
Stage 2	-	-	-	-	-	-	-	-	-	463	463	-
Critical Hdwy	4.2	-	-	4.12	-	-	-	-	6.22	7.12	6.52	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	6.12	5.52	-
Follow-up Hdwy	2.29	-	-	2.218	-	-	-	-	3.318	3.518	4.018	3.372
Pot Cap-1 Maneuver	736	-	-	1118	-	-	0	0	615	123	146	339
Stage 1	-	-	-	-	-	-	0	0	-	330	354	-
Stage 2	-	-	-	-	-	-	0	0	-	579	564	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	736	-	-	1118	-	-	-	-	615	113	142	339
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	113	142	-
Stage 1	-	-	-	-	-	-	-	-	-	325	349	-
Stage 2	-	-	-	-	-	-	-	-	-	536	556	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.1	11.2	19.3
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	615	736	-	-	1118	-	-	264
HCM Lane V/C Ratio	0.06	0.014	-	-	0.014	-	-	0.048
HCM Control Delay (s)	11.2	10	-	-	8.3	-	-	19.3
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	21.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	410	15	155	810	50	5	20	220	20	30	35
Future Vol, veh/h	30	410	15	155	810	50	5	20	220	20	30	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	110	-	-	115	-	-	215	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	2	6	2	2	4	2	2	2	2	2	3
Mvmt Flow	32	432	16	163	853	53	5	21	232	21	32	37

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	905	0	0	447	0	0	1742	1735	439	1834	1716	879
Stage 1	-	-	-	-	-	-	503	503	-	1205	1205	-
Stage 2	-	-	-	-	-	-	1239	1232	-	629	511	-
Critical Hdwy	4.13	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.227	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.327
Pot Cap-1 Maneuver	747	-	-	1113	-	-	68	88	618	59	90	345
Stage 1	-	-	-	-	-	-	551	541	-	225	257	-
Stage 2	-	-	-	-	-	-	215	249	-	470	537	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	747	-	-	1113	-	-	35	72	618	25	74	345
Mov Cap-2 Maneuver	-	-	-	-	-	-	35	72	-	25	74	-
Stage 1	-	-	-	-	-	-	527	518	-	215	219	-
Stage 2	-	-	-	-	-	-	140	213	-	270	514	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	1.3	33.5	$ 348.8
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	35	379	747	-	-	1113	-	-	65
HCM Lane V/C Ratio	0.15	0.667	0.042	-	-	0.147	-	-	1.377
HCM Control Delay (s)	125.3	31.6	10	-	-	8.8	-	-	$ 348.8
HCM Lane LOS	F	D	B	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.5	4.6	0.1	-	-	0.5	-	-	7.5

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

Intersection	
Int Delay, s/veh	232

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	105	100	75	1855	1875	100
Future Vol, veh/h	105	100	75	1855	1875	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	50	60	-	-	265
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	4	13	2	3	20
Mvmt Flow	111	105	79	1953	1974	105

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	3108	987	1974	0	-	0
Stage 1	1974	-	-	-	-	-
Stage 2	1134	-	-	-	-	-
Critical Hdwy	6.84	6.98	4.36	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.34	2.33	-	-	-
Pot Cap-1 Maneuver	~ 9	243	251	-	-	-
Stage 1	~ 94	-	-	-	-	-
Stage 2	269	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 6	243	251	-	-	-
Mov Cap-2 Maneuver	~ 6	-	-	-	-	-
Stage 1	~ 94	-	-	-	-	-
Stage 2	184	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 4642.4	1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	251	-	6	243	-	-
HCM Lane V/C Ratio	0.315	-	18.421	0.433	-	-
HCM Control Delay (s)	25.8	-	$ 9034.5	30.7	-	-
HCM Lane LOS	D	-	F	D	-	-
HCM 95th %tile Q(veh)	1.3	-	15.7	2	-	-

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

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	105	1825	35	15	1960
Future Vol, veh/h	1	105	1825	35	15	1960
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	560	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	111	1921	37	16	2063

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2984	961	0	0	1921	0
Stage 1	1921	-	-	-	-	-
Stage 2	1063	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	11	256	-	-	304	-
Stage 1	101	-	-	-	-	-
Stage 2	293	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	10	256	-	-	304	-
Mov Cap-2 Maneuver	10	-	-	-	-	-
Stage 1	101	-	-	-	-	-
Stage 2	278	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	40.7	0	0.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	208	304	-
HCM Lane V/C Ratio	-	-	0.536	0.052	-
HCM Control Delay (s)	-	-	40.7	17.5	-
HCM Lane LOS	-	-	E	C	-
HCM 95th %tile Q(veh)	-	-	2.8	0.2	-

Intersection	
Int Delay, s/veh	7.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	35	15	15	1	100	90
Future Vol, veh/h	35	15	15	1	100	90
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	115	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	37	16	16	1	105	95

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	17	0	-	0	105	16
Stage 1	-	-	-	-	16	-
Stage 2	-	-	-	-	89	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1600	-	-	-	893	1063
Stage 1	-	-	-	-	1007	-
Stage 2	-	-	-	-	934	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1600	-	-	-	872	1063
Mov Cap-2 Maneuver	-	-	-	-	872	-
Stage 1	-	-	-	-	1007	-
Stage 2	-	-	-	-	913	-

Approach	EB	WB	SB
HCM Control Delay, s	5.1	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1600	-	-	-	872	1063
HCM Lane V/C Ratio	0.023	-	-	-	0.121	0.089
HCM Control Delay (s)	7.3	0	-	-	9.7	8.7
HCM Lane LOS	A	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4	0.3

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	115	15	245	200	1
Future Vol, veh/h	1	115	15	245	200	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	121	16	258	211	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	500	211	212	0	-	0
Stage 1	211	-	-	-	-	-
Stage 2	289	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	530	829	1358	-	-	-
Stage 1	824	-	-	-	-	-
Stage 2	760	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	523	829	1358	-	-	-
Mov Cap-2 Maneuver	523	-	-	-	-	-
Stage 1	824	-	-	-	-	-
Stage 2	749	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.1	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1358	-	825	-	-
HCM Lane V/C Ratio	0.012	-	0.148	-	-
HCM Control Delay (s)	7.7	0	10.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	605	235	60	155	260	205	95	1050	50	175	865	920
Future Volume (veh/h)	605	235	60	155	260	205	95	1050	50	175	865	920
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1845	1961	1727	1863	1961	1863	1937	1961	1937	1863	1942	1937
Adj Flow Rate, veh/h	637	247	63	163	274	216	100	1105	53	184	911	0
Adj No. of Lanes	2	2	1	2	1	1	1	2	1	2	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	2	10	2	2	2	2	2	2	2	3	2
Cap, veh/h	692	1030	504	214	266	322	123	1654	834	232	1641	732
Arrive On Green	0.20	0.28	0.28	0.06	0.14	0.14	0.07	0.44	0.44	0.07	0.44	0.00
Sat Flow, veh/h	3408	3725	1468	3442	1961	1583	1845	3725	1647	3442	3689	1647
Grp Volume(v), veh/h	637	247	63	163	274	216	100	1105	53	184	911	0
Grp Sat Flow(s),veh/h/ln	1704	1863	1468	1721	1961	1583	1845	1863	1647	1721	1845	1647
Q Serve(g_s), s	25.6	7.2	4.1	6.5	19.0	17.6	7.5	32.8	2.3	7.4	25.5	0.0
Cycle Q Clear(g_c), s	25.6	7.2	4.1	6.5	19.0	17.6	7.5	32.8	2.3	7.4	25.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	692	1030	504	214	266	322	123	1654	834	232	1641	732
V/C Ratio(X)	0.92	0.24	0.13	0.76	1.03	0.67	0.81	0.67	0.06	0.79	0.56	0.00
Avail Cap(c_a), veh/h	743	1030	504	332	266	322	138	1654	834	258	1641	732
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	54.7	39.2	31.6	64.6	60.5	51.5	64.5	30.8	17.6	64.3	28.7	0.0
Incr Delay (d2), s/veh	16.2	0.3	0.2	5.5	63.1	7.1	27.4	2.2	0.1	14.3	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.7	3.7	1.7	3.3	14.9	8.3	4.8	17.4	1.1	4.0	13.2	0.0
LnGrp Delay(d),s/veh	70.8	39.5	31.8	70.1	123.6	58.6	91.9	32.9	17.8	78.6	30.0	0.0
LnGrp LOS	E	D	C	E	F	E	F	C	B	E	C	
Approach Vol, veh/h		947			653			1258			1095	
Approach Delay, s/veh		60.1			88.7			37.0			38.2	
Approach LOS		E			F			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.9	68.2	13.2	44.7	13.8	68.3	32.9	25.0
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Max Green Setting (Gmax), s	10.5	59.0	13.5	36.0	10.5	59.0	30.5	19.0
Max Q Clear Time (g_c+I1), s	9.4	34.8	8.5	9.2	9.5	27.5	27.6	21.0
Green Ext Time (p_c), s	0.1	23.2	0.2	8.9	0.0	29.9	0.8	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	51.4
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	34.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	115	95	250	1	215	65	220	80	5	55	75	185
Future Vol, veh/h	115	95	250	1	215	65	220	80	5	55	75	185
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	0	110	-	-	65	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	121	100	263	1	226	68	232	84	5	58	79	195

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	295	0	0	100	0	0	741	639	100	650	605	261
Stage 1	-	-	-	-	-	-	342	342	-	263	263	-
Stage 2	-	-	-	-	-	-	399	297	-	387	342	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1266	-	-	1493	-	-	332	394	956	382	412	778
Stage 1	-	-	-	-	-	-	673	638	-	742	691	-
Stage 2	-	-	-	-	-	-	627	668	-	637	638	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1266	-	-	1493	-	-	~ 193	356	956	289	372	778
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 193	356	-	289	372	-
Stage 1	-	-	-	-	-	-	609	577	-	671	691	-
Stage 2	-	-	-	-	-	-	416	668	-	489	577	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2	0	133.8	17
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	193	370	1266	-	-	1493	-	-	289	592
HCM Lane V/C Ratio	1.2	0.242	0.096	-	-	0.001	-	-	0.2	0.462
HCM Control Delay (s)	178.6	17.8	8.1	-	-	7.4	-	-	20.6	16.2
HCM Lane LOS	F	C	A	-	-	A	-	-	C	C
HCM 95th %tile Q(veh)	12	0.9	0.3	-	-	0	-	-	0.7	2.4

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

TRAFFIC SIGNAL WARRANTS

IL 31/Raymond Drive

Three Oaks Road/Lutter Drive/Sands Road

Mercy Health Microhospital - Crystal Lake
TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: IL 31 at Raymond Drive

COUNT DATE: 12-Oct-17

INTERSECTION CONDITION: Existing

MAJOR STREET: IL 31

OF APPROACH LANES: 2

MINOR STREET: Raymond Drive

OF APPROACH LANES: 1

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): N

	MAJOR ST / BOTH APPROACHES	HIGHEST HOUR MINOR ST / HIGHEST APPROACH	WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant						WARRANT 2	WARRANT 3
									CONDITION A			CONDITION B				
			MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES →			600	150		900	100		480	120		720	80			
06:00 AM TO 07:00 AM	2,573	4	Y			Y			Y			Y				
07:00 AM TO 08:00 AM	2,951	1	Y			Y			Y			Y				
08:00 AM TO 09:00 AM	2,461	1	Y			Y			Y			Y				
09:00 AM TO 10:00 AM	1,971	2	Y			Y			Y			Y				
10:00 AM TO 11:00 AM	1,866	2	Y			Y			Y			Y				
11:00 AM TO 12:00 PM	1,933	5	Y			Y			Y			Y				
12:00 PM TO 01:00 PM	2,110	3	Y			Y			Y			Y				
01:00 PM TO 02:00 PM	2,178	5	Y			Y			Y			Y				
02:00 PM TO 03:00 PM	2,467	5	Y			Y			Y			Y				
03:00 PM TO 04:00 PM	2,467	5	Y			Y			Y			Y				
04:00 PM TO 05:00 PM	3,440	5	Y			Y			Y			Y				
05:00 PM TO 06:00 PM	3,317	3	Y			Y			Y			Y				
06:00 PM TO 07:00 PM	0	0														
07:00 PM TO 08:00 PM	0	0														
08:00 PM TO 09:00 PM	0	0														
09:00 PM TO 10:00 PM	0	0														
	29,734	41			**0**			**0**			**0**				**0**	**0**
			8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS OF BOTH COND. A AND COND. B NEEDED						4 HRS NEEDED	1 HR NEEDED
			NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant

Condition A : Minimum Vehicular Volume

Condition B : Interruption of Continuous Traffic

Combination : Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant

WARRANT 3 -- Peak Hour Warrant

Mercy Health Microhospital - Crystal Lake
TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: IL 31 at Raymond Drive

COUNT DATE: 12-Oct-17

INTERSECTION CONDITION: Future (2023) No-Build

MAJOR STREET: IL 31 # OF APPROACH LANES: 2

MINOR STREET: Raymond Drive # OF APPROACH LANES: 1

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): N

	MAJOR ST BOTH APPROACHES	HIGHEST HOUR MINOR ST HIGHEST APPROACH	WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant						WARRANT 2	WARRANT 3
									CONDITION A			CONDITION B				
			MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES →			600	150		900	100		480	120		720	80			
06:00 AM TO 07:00 AM	2,722	4	Y			Y			Y			Y				
07:00 AM TO 08:00 AM	3,121	1	Y			Y			Y			Y				
08:00 AM TO 09:00 AM	2,603	1	Y			Y			Y			Y				
09:00 AM TO 10:00 AM	2,084	2	Y			Y			Y			Y				
10:00 AM TO 11:00 AM	1,974	2	Y			Y			Y			Y				
11:00 AM TO 12:00 PM	2,045	5	Y			Y			Y			Y				
12:00 PM TO 01:00 PM	2,232	3	Y			Y			Y			Y				
01:00 PM TO 02:00 PM	2,303	5	Y			Y			Y			Y				
02:00 PM TO 03:00 PM	2,609	5	Y			Y			Y			Y				
03:00 PM TO 04:00 PM	2,609	5	Y			Y			Y			Y				
04:00 PM TO 05:00 PM	3,639	5	Y			Y			Y			Y				
05:00 PM TO 06:00 PM	3,509	3	Y			Y			Y			Y				
06:00 PM TO 07:00 PM	0	0														
07:00 PM TO 08:00 PM	0	0														
08:00 PM TO 09:00 PM	0	0														
09:00 PM TO 10:00 PM	0	0														
	31,450	41			**0**			**0**			**0**				**0**	**0**
			8 HOURS NEEDED **NOT SATISFIED**			8 HOURS NEEDED **NOT SATISFIED**			8 HOURS OF BOTH COND. A AND COND. B NEEDED **NOT SATISFIED**						4 HRS NEEDED **NOT SATISFIED**	1 HR NEEDED **NOT SATISFIED**

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant

Condition A : Minimum Vehicular Volume

Condition B : Interruption of Continuous Traffic

Combination : Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant

WARRANT 3 -- Peak Hour Warrant

Mercy Health Microhospital - Crystal Lake
TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: IL 31 at Raymond Drive

COUNT DATE: 12-Oct-17

INTERSECTION CONDITION: Future (2023) Build

MAJOR STREET: IL 31

OF APPROACH LANES: 2

MINOR STREET: Raymond Drive

OF APPROACH LANES: 1

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): N

	MAJOR ST BOTH APPROACHES	HIGHEST HOUR MINOR ST HIGHEST APPROACH	WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant						WARRANT 2	WARRANT 3
									CONDITION A			CONDITION B				
			MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES →			600	150		900	100		480	120		720	80			
06:00 AM TO 07:00 AM	2,785	22	Y			Y			Y			Y				
07:00 AM TO 08:00 AM	3,236	21	Y			Y			Y			Y				
08:00 AM TO 09:00 AM	2,666	21	Y			Y			Y			Y				
09:00 AM TO 10:00 AM	2,147	22	Y			Y			Y			Y				
10:00 AM TO 11:00 AM	2,037	22	Y			Y			Y			Y				
11:00 AM TO 12:00 PM	2,108	25	Y			Y			Y			Y				
12:00 PM TO 01:00 PM	2,295	23	Y			Y			Y			Y				
01:00 PM TO 02:00 PM	2,366	25	Y			Y			Y			Y				
02:00 PM TO 03:00 PM	2,672	25	Y			Y			Y			Y				
03:00 PM TO 04:00 PM	2,672	25	Y			Y			Y			Y				
04:00 PM TO 05:00 PM	3,702	41	Y			Y			Y			Y				
05:00 PM TO 06:00 PM	3,569	23	Y			Y			Y			Y				
06:00 PM TO 07:00 PM	0	0														
07:00 PM TO 08:00 PM	0	0														
08:00 PM TO 09:00 PM	0	0														
09:00 PM TO 10:00 PM	0	0														
	32,255	295			**0**			**0**			**0**				**0**	**0**
			8 HOURS NEEDED **NOT SATISFIED**			8 HOURS NEEDED **NOT SATISFIED**			8 HOURS OF BOTH COND. A AND COND. B NEEDED **NOT SATISFIED**						4 HRS NEEDED **NOT SATISFIED**	1 HR NEEDED **NOT SATISFIED**

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant

Condition A : Minimum Vehicular Volume

Condition B : Interruption of Continuous Traffic

Combination : Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant

WARRANT 3 -- Peak Hour Warrant

Mercy Health Microhospital - Crystal Lake
TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: Three Oaks at Lutter Drive

COUNT DATE: 12-Oct-17

INTERSECTION CONDITION: Existing

MAJOR STREET: Three Oaks

OF APPROACH LANES: 1

MINOR STREET: Lutter Drive

OF APPROACH LANES: 1

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): N

	MAJOR ST BOTH APPROACHES	HIGHEST HOUR MINOR ST HIGHEST APPROACH	WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant						WARRANT 2	WARRANT 3
									CONDITION A			CONDITION B				
			MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES →			500	150		750	75		400	120		600	60			
06:00 AM TO 07:00 AM	818	55	Y			Y			Y			Y				
07:00 AM TO 08:00 AM	968	87	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
08:00 AM TO 09:00 AM	855	63	Y			Y			Y			Y	Y	**Y**		
09:00 AM TO 10:00 AM	662	67	Y						Y			Y	Y	**Y**		
10:00 AM TO 11:00 AM	644	78	Y						Y			Y	Y	**Y**		
11:00 AM TO 12:00 PM	748	85	Y						Y			Y	Y	**Y**		
12:00 PM TO 01:00 PM	846	98	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
01:00 PM TO 02:00 PM	776	102	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
02:00 PM TO 03:00 PM	1,014	126	Y			Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	**Y**	
03:00 PM TO 04:00 PM	1,014	126	Y			Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	**Y**	
04:00 PM TO 05:00 PM	1,263	112	Y			Y	Y	**Y**	Y			Y	Y	**Y**	**Y**	
05:00 PM TO 06:00 PM	1,219	113	Y			Y	Y	**Y**	Y			Y	Y	**Y**	**Y**	
06:00 PM TO 07:00 PM	0	0														
07:00 PM TO 08:00 PM	0	0														
08:00 PM TO 09:00 PM	0	0														
09:00 PM TO 10:00 PM	0	0														
	10,827	1,112			**0**			**7**			**2**			**11**	**4**	**0**
			8 HOURS NEEDED **NOT SATISFIED**			8 HOURS NEEDED **NOT SATISFIED**			8 HOURS OF BOTH COND. A AND COND. B NEEDED **NOT SATISFIED**						4 HRS NEEDED **SATISFIED**	1 HR NEEDED **NOT SATISFIED**

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant
- Condition A : Minimum Vehicular Volume
- Condition B : Interruption of Continuous Traffic
- Combination : Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant

WARRANT 3 -- Peak Hour Warrant

Mercy Health Microhospital - Crystal Lake
TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: Three Oaks at Lutter Drive

COUNT DATE: 12-Oct-17

INTERSECTION CONDITION: Future (2023) No-Build

MAJOR STREET: Three Oaks

OF APPROACH LANES: 1

MINOR STREET: Lutter Drive

OF APPROACH LANES: 1

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): N

	MAJOR ST / BOTH APPROACHES	HIGHEST HOUR MINOR ST / HIGHEST APPROACH	WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant						WARRANT 2	WARRANT 3
									CONDITION A			CONDITION B				
			MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES →			500	150		750	75		400	120		600	60			
06:00 AM TO 07:00 AM	834	55	Y			Y			Y			Y				
07:00 AM TO 08:00 AM	986	87	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
08:00 AM TO 09:00 AM	870	63	Y			Y			Y			Y	Y	**Y**		
09:00 AM TO 10:00 AM	675	67	Y						Y			Y	Y	**Y**		
10:00 AM TO 11:00 AM	656	79	Y						Y			Y	Y	**Y**		
11:00 AM TO 12:00 PM	762	85	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
12:00 PM TO 01:00 PM	861	98	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
01:00 PM TO 02:00 PM	790	102	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
02:00 PM TO 03:00 PM	1,032	127	Y			Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	**Y**	
03:00 PM TO 04:00 PM	1,032	127	Y			Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	**Y**	
04:00 PM TO 05:00 PM	1,287	112	Y			Y	Y	**Y**	Y			Y	Y	**Y**	**Y**	
05:00 PM TO 06:00 PM	1,242	114	Y			Y	Y	**Y**	Y			Y	Y	**Y**	**Y**	
06:00 PM TO 07:00 PM	0	0														
07:00 PM TO 08:00 PM	0	0														
08:00 PM TO 09:00 PM	0	0														
09:00 PM TO 10:00 PM	0	0														
	11,027	1,116			**0**			**8**			**2**			**11**	**4**	**0**
			8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS OF BOTH COND. A AND COND. B NEEDED						4 HRS NEEDED	1 HR NEEDED
			NOT SATISFIED			**SATISFIED**			**NOT SATISFIED**						**SATISFIED**	**NOT SATISFIED**

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant
- Condition A : Minimum Vehicular Volume
- Condition B : Interruption of Continuous Traffic
- Combination : Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant

WARRANT 3 -- Peak Hour Warrant

Mercy Health Microhospital - Crystal Lake
TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

INTERSECTION NAME: Three Oaks at Lutter Drive

COUNT DATE: 12-Oct-17

INTERSECTION CONDITION: Future (2023) Build

MAJOR STREET: Three Oaks # OF APPROACH LANES: 1

MINOR STREET: Lutter Drive # OF APPROACH LANES: 1

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

85TH PERCENTILE SPEED GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): N

	MAJOR ST / BOTH APPROACHES	HIGHEST HOUR MINOR ST / HIGHEST APPROACH	WARRANT 1, Condition A			WARRANT 1, Condition B			WARRANT 1, Combination Warrant						WARRANT 2	WARRANT 3
									CONDITION A			CONDITION B				
			MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES →			500	150		750	75		400	120		600	60			
06:00 AM TO 07:00 AM	879	55	Y			Y			Y			Y				
07:00 AM TO 08:00 AM	1,014	87	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
08:00 AM TO 09:00 AM	898	63	Y			Y			Y			Y	Y	**Y**		
09:00 AM TO 10:00 AM	703	67	Y						Y			Y	Y	**Y**		
10:00 AM TO 11:00 AM	684	79	Y						Y			Y	Y	**Y**		
11:00 AM TO 12:00 PM	790	85	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
12:00 PM TO 01:00 PM	889	98	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
01:00 PM TO 02:00 PM	818	102	Y			Y	Y	**Y**	Y			Y	Y	**Y**		
02:00 PM TO 03:00 PM	1,060	127	Y			Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	**Y**	
03:00 PM TO 04:00 PM	1,060	127	Y			Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	**Y**	
04:00 PM TO 05:00 PM	1,337	112	Y			Y	Y	**Y**	Y			Y	Y	**Y**	**Y**	
05:00 PM TO 06:00 PM	1,270	114	Y			Y	Y	**Y**	Y			Y	Y	**Y**	**Y**	
06:00 PM TO 07:00 PM	0	0														
07:00 PM TO 08:00 PM	0	0														
08:00 PM TO 09:00 PM	0	0														
09:00 PM TO 10:00 PM	0	0														
	11,402	1,116			**0**			**8**			**2**			**11**	**4**	**0**
			8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS OF BOTH COND. A AND COND. B NEEDED						4 HRS NEEDED	1 HR NEEDED
			NOT SATISFIED			**SATISFIED**			**NOT SATISFIED**						**SATISFIED**	**NOT SATISFIED**

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant

Condition A : Minimum Vehicular Volume

Condition B : Interruption of Continuous Traffic

Combination : Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant

WARRANT 3 -- Peak Hour Warrant

Kimley»Horn

1001 Warrenville Road | Suite 350 | Lisle, IL | 60532
630-487-5550

VILLAGE OF Cary
EST. 1893

December 14, 2017

Mr. Thomas Hayden
Planning and Zoning Commission Chairman
City of Crystal Lake
100 W. Main Street
Crystal Lake, Illinois 60014

Re: Proposed Crystal Lake Mercy Health Hospital and Medical Center

Dear Mr. Hayden:

It is our understanding that the City of Crystal Lake Planning and Zoning Commission will be conducting a public hearing on January 3, 2018 for the proposed Mercy Health micro-hospital and medical office building at the southeast corner of Three Oaks Road and Route 31. It is also understood that a traffic study and discussions regarding the proposed hospital's impacts to the surrounding roadway network, including Three Oaks Road, will also be presented at the public hearing.

Located just a half mile west of our corporate boundary, the new hospital and medical center would provide both Crystal Lake and Cary residents with an important resource that enhances both of our communities, including health services for the area's growing senior population. The new micro-hospital is proposed along two major roadways in the most densely populated part of McHenry County, with Three Oaks Road providing direct and convenient access to/from the busy US Route 14 and IL Route 31 corridors.

If approved by the City of Crystal Lake, it is presumed that the project would include the necessary infrastructure improvements that are vital to accommodate the significant amount of projected medical service, outpatient, and emergency room visits that this new facility would generate, including, but not limited to:

1. Improvements to the IL Route 31 @ Three Oaks Road intersection, such as additional auxiliary turn lanes on the eastern approach to accommodate existing and projected traffic volumes.
2. Elimination of the short gaps that exist in the bikeway and pedestrian network alongside Three Oaks Road and IL Route 31 between the proposed hospital site and the existing paths. These missing trails would also connect the hospital to a planned Cary Park District trail connection to the south through Hoffman Park.

With these off-site improvements, the Village of Cary is highly supportive of the proposed project.

Respectfully,
The Village of Cary

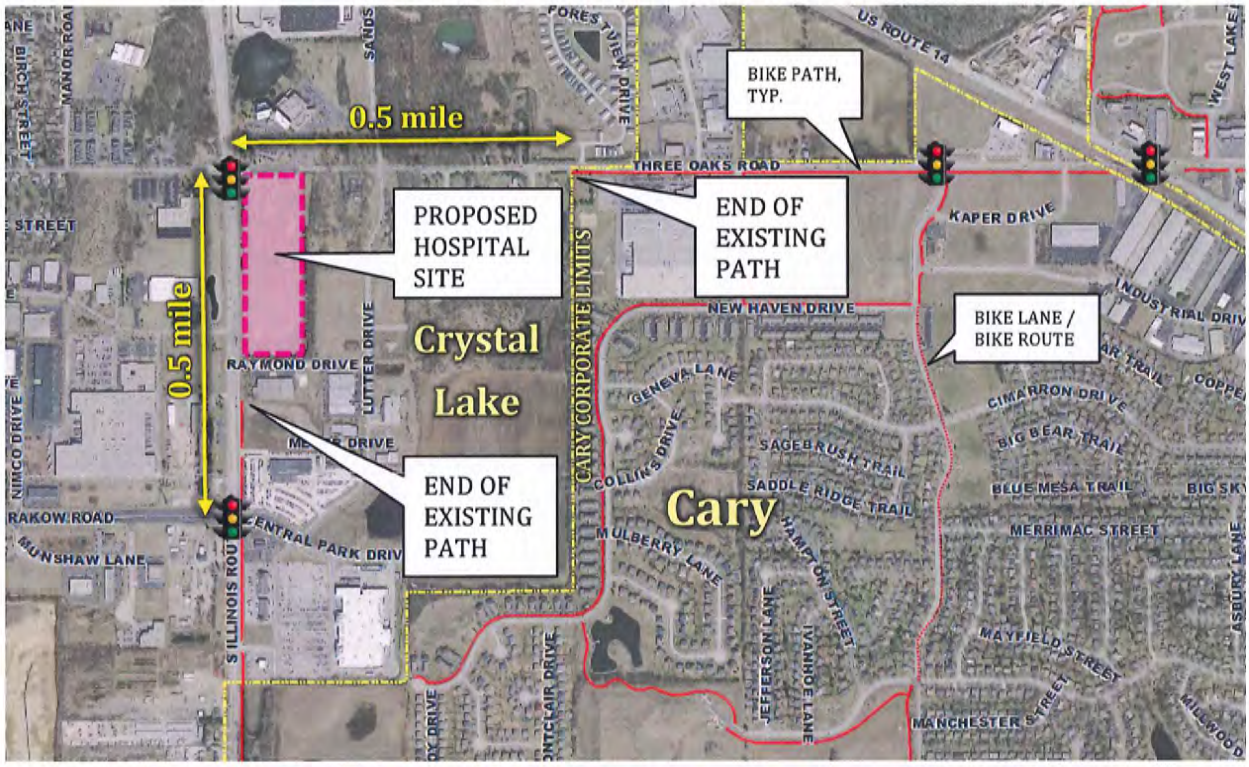
Mark R. Kownick
Mayor

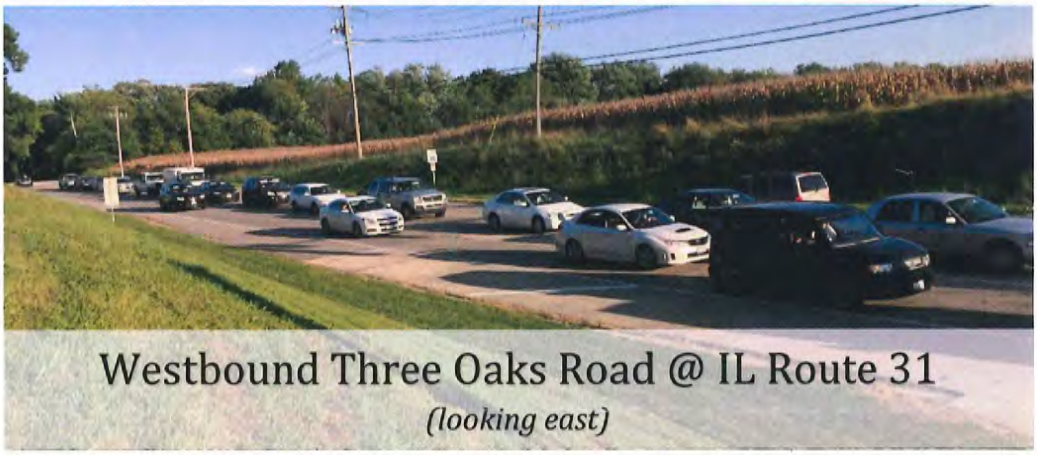
cc: The Honorable Aaron Shepley, Mayor
Michelle Rentzsch - Director of Community Development, City of Crystal Lake
Lisa Heaven-Baum – Acting Bureau Chief of Traffic Operations, Illinois Department of Transportation District 1
Village of Cary Board of Trustees

655 VILLAGE HALL DRIVE
CARY, ILLINOIS 60013-2599
847.639.0003 FAX 847.639.2761
INFO@CARYILLINOIS.COM
WWW.CARYILLINOIS.COM

Proposed Mercy Health Micro-hospital and Medical Office Building Project

LOCATION MAP & PHOTOS

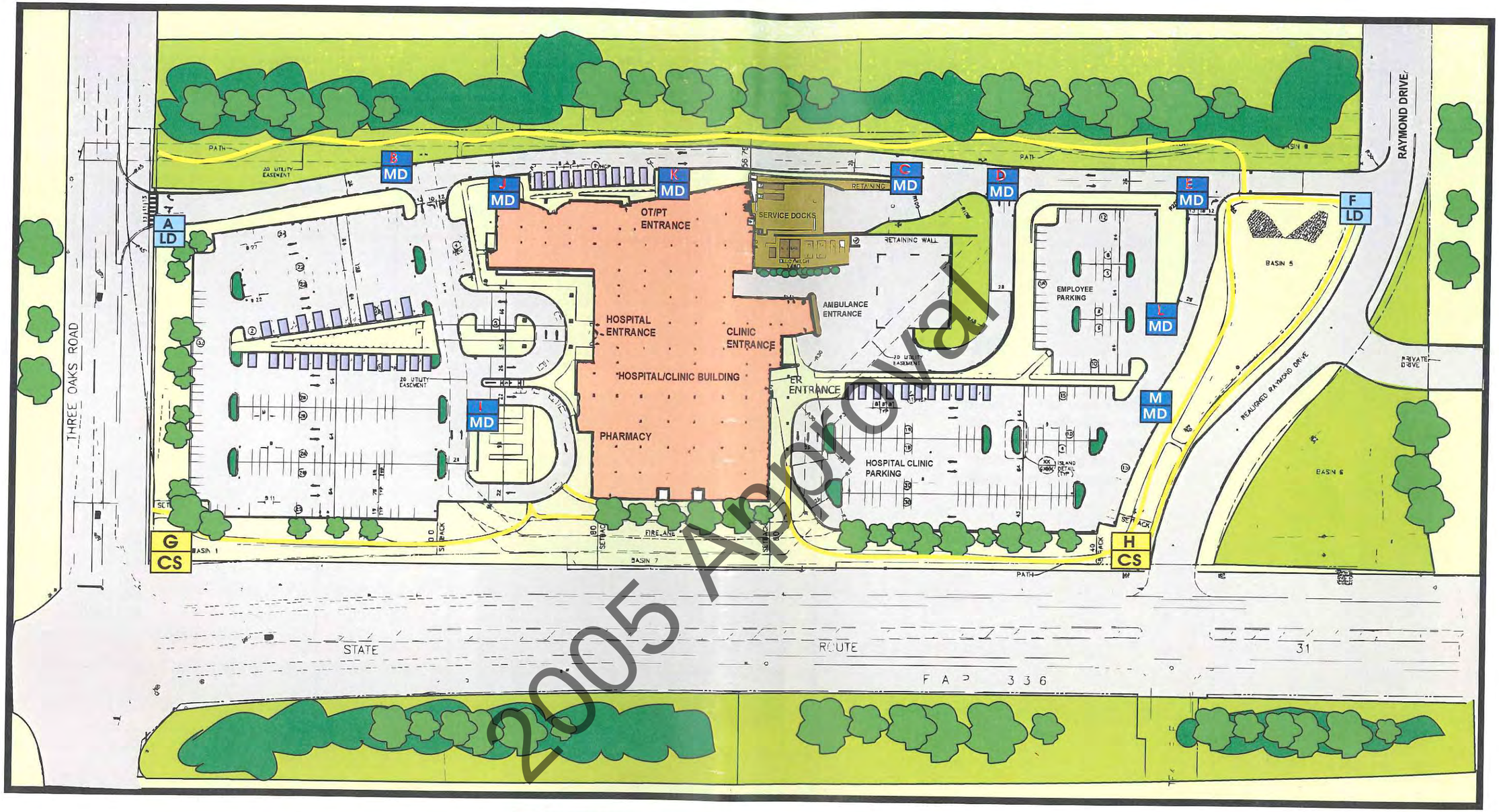




Westbound Three Oaks Road @ IL Route 31

(looking east)

Three Oaks Road Path @ Village Limits



MERCY CRYSTAL LAKE
HOSPITAL & MEDICAL CENTER

LEGEND

Keys:

- A LD -Large Directional
- A MD -Medium Directional
- A CS -Cube Sign

FINAL DEVELOPMENT PROJECT REVIEW (MVR)

November 3, 2004

TITLE
#2004-53 Mercy Hospital and Medical Center

PETITIONER
Mercy Health System Corporation

REQUESTS
1. Preliminary PUD for a hospital and medical center.
2. Special Use Permits for an institutional use for a hospital; a heliport; and internally illuminated signage in the Office district.
3. Rezoning upon annexation of a 0.16 acre strip of land to the "O-PUD" Office Planned Unit Development district.
4. Zoning Ordinance Variations from:
   A) Section 4.4-10 Maximum building height of 25 feet and 2 stories to allow 46 feet and 3 stories.
   B) Section 5.3-3.6E Landscaping requirements for parking lots of over 200 spaces.
   C) Section 5.3-3.6D Required interior landscape island for every ten parking spaces.
5. Vacation and dedication of realigned Raymond Drive.

LOCATION
Southeast corner of Route 31 and Three Oaks Road, north of Raymond Drive

SIZE
16.39 acres

ZONING, LAND USE AND COMPREHENSIVE PLAN

Location	Zoning	Use	Comprehensive Plan
P.I.Q.	OPUD, (A-1)	Vacant land	Commerce
North	B-3	Holiday Inn	Commerce
South	M	Food Warming Equipment	Industry
East	(County), M-L, M	Office, residential, vacant	Office, Industry
West	M	Rita Corporation	Industry

DEPARTMENTAL REVIEW
Building
1. Submit specification sheets on type of exterior lights to be utilized.
2. No landscaping is permitted in the Municipal Utility Easements (MUEs).
3. Signage review:
   A) A site plan that indicates all easements and property lines should be submitted for review. Signs may not be erected on easements and freestanding signs must be located a minimum of 10 feet from the property line. Corner sight lines must also be maintained.

B) Wall sign – the proposed wall sign is 280 square feet in area. The Sign Ordinance allows a maximum of 75 square feet.
C) Directional signs are not to exceed 4 square feet in area and 3 feet 6 inches in height and contain no advertising such as the business name or logo. The proposed directional signs exceed the size, height and advertising requirements.
D) Please provide more information on the illuminated white lexan peak of the directional signs. The lenses should not be transparent.
E) Main ID freestanding sign –

- One only sign per lot is allowed; two signs are proposed.
- Maximum height is 16 feet; the signs are 17 feet in height.
- Maximum sign area is 60 square feet, double sided; sign H is 81.8 square feet and three sided and sign G is 97.3 square feet and three sided.
- Electronic message centers are prohibited; sign G has an electronic message center.
- Sign base is to be 30% of the width of the sign; sign bases are 100% the sign width.

F) Provide information on the illuminated peak of the sign. The material should not be transparent.
G) The proposed parking lot signs may not display the corporate logo ad handicapped parking signs shall meet the State standards, including the "fine" sign.

Engineering
1) A traffic impact study has been completed by the City's consultant for the proposed site and should be referenced for recommendations for off-site improvements, internal circulation, and access.

2) Cost participation for off-site improvements will be decided upon determination of the scope and completion of the cost estimates.

3) A plat of dedication/vacation with easements (utility, drainage, public sidewalk/path, etc) is required for the proposed site and the realignment of Raymond Drive – verify dedications are according to City Ordinance requirements.

4) Illinois Department of Transportation (IDOT) coordination and permit approval is required for access changes to Illinois Route 31, drainage discharge to the ditch in State right-of-way, utility work, sanitary sewer jacking, and pedestrian signal addition.

5) Proposed paths, sanitary sewer, and water main should extend to the limits of the site per City Ordinance.

6) If Raymond Drive is a public roadway, full improvements for a *Secondary Thoroughfare* will be required per City Ordinance (use appropriate pavement section, sidewalk, lighting, drainage, street trees, and right-of-way width).

7) The handicap accessible parking located along the eastern side of the building (near rehab and physical therapy units) may be a safety problem due to the emergency vehicles and traffic on the internal roadway – suggest replacing these stalls with short-term parking for pick-up/drop-off parallel to the roadway to improve safety.

8) Storage volumes should account for on-site detention needs, existing depressional storage, and runoff from area tributary to Raymond Drive – note that it is necessary to provide for storage of 150% of the storage volume for the 100-year, 24-hour storm and dewater within 72 hours.

9) The proposed infiltration basins may not function properly during the winter frost – dry wells or deep stone column drains may be possible solutions.

10) The basins along Illinois Route 31 appear to be too close to the right-of-way line (especially if IDOT needs to expand Illinois Route 31 or add right-turn lanes in the future) - IDOT requires an offset of 10' plus 1.5 times the depth of the pond from State right-of-way.

11) Due to drainage problems downstream of the site, this development should consider maintaining all discharge on-site and avoid an outlet to the Illinois Route 31 ditch with appropriate infiltration measures in the retention basins – *restricted rate* has been discussed but associated *volume* needs to be addressed as well.

12) The overhead electrical lines at the east side of IL Route 31 and south side of Three Oaks Road should be buried as part of this project (per City Code) – appropriate utility easements and maintenance agreements need to be established.

13) Lighting levels in the parking lots appear to be low – address need for lighting along Raymond Drive, Three Oaks Road, site entrance intersections, and improved illumination (dusk/dawn) in the parking lots.

Fire/Rescue
Comments pending.

Police
No comments.

Utilities
The fire hydrant on north side of building and the valves for fire and domestic service must be in an MUE. Do not place tree by hydrant or valves on north side of building. A standard maintenance agreement will be needed for all improvements within an M.U.E. providing access for repairs to the City and defining responsibility for repairs and restoration work. The existing water main along Raymond Drive will need to be relocated as part of that realignment to provide access and avoid cover and department access problems with it located below detention basin #6. A 20' MUE must be provided for the relocated water main, along with the area of Raymond Drive to be vacated and the main should be relocated to a reasonable level area free of existing/proposed monuments signs, fixtures and significant landscaping since these are not permitted within an MUE.

A Phase II Storm Water permit is required. There is NOT an MUE for the 8" sanitary service line from the building to Raymond Dr.; it is assumed that this will be private operation and maintenance. The existing sanitary manholes (3-4) along the south side of Three Oaks Road are located on the edge of the embankment, the frames will need to be protected from being moved, covered (buried), or damaged.

Planning
The property in question is the land at the southeast corner of Route 31 and Three Oaks Road, north of Raymond Drive, and is comprised of two parcels. The larger 16.2 parcel was annexed and zoned "O-PUD" Office Planned Unit Development on August 15, 2000. A smaller 0.16 acre

parcel, was inadvertently left out of the earlier annexation and is proposed now for rezoning upon annexation and included on the development plans. The land is vacant with a number of trees along the east and south property lines.

The annexation agreement contains a provision that states, ".... with the approval of a condition to be included in the final planned unit development for the height of the building to be constructed on the premises to be not more than 42 feet in height in accordance with the building elevation plan dated June 16, 2000." It would appear that the annexation agreement would need to be amended in a couple of respects: the proposed height of 46 feet, the revised site plan and access limitations.

PRELIMINARY PLANNED UNIT DEVELOPMENT/SPECIAL USE PERMITS

The petitioner is requesting Preliminary PUD approval and three special use permits for a hospital medical clinic facility. Special uses require separate review because of their potential to impact surrounding properties and the orderly development of the City. The petitioner is requesting three special use permits, an institutional use for a hospital; a heliport; and internally illuminated signage in the Office district.

The Zoning Ordinance defines an Institutional Use as "A use or facility, which provides a public service which benefits the members of the community. Institutional uses may include facilities such as, but not limited to, educational and public recreational buildings, nursing homes, hospitals, religious establishments, and governmental facilities."

Section 6.3 of the Zoning Ordinance establishes standards for all special uses in Crystal Lake. Briefly, the criteria are as follows:

1. The use is necessary or desirable, at the proposed location, to provide a service or facility which will further the public convenience and general welfare.
2. The use will not be detrimental to area property values.
3. The use will comply with the zoning districts regulations.
4. The use will not negatively impact traffic circulation.
5. The use will not negatively impact public utilities or municipal service delivery systems.
6. The use will not negatively impact the environment or be unsightly.
7. The use, where possible will preserve existing mature vegetation, and provide landscaping and architecture which is aesthetically pleasing, compatible or complementary to surrounding properties and acceptable by community standards.
8. The use will meet requirements of all regulating governmental agencies.
9. The use will conform to any conditions approved as part of the issued Special Use Permit.
10. The use will conform to the regulations established for specific special uses, where applicable.

Additionally, Special Use Permits for Institutional Uses must document compliance with the criteria found in Section 6.5-7 of the Zoning Ordinance. These use specific criteria are:

1. Provide an assessment that the use is beneficial to the public good and the general welfare of the community in relation to the proposed location.

   The petitioner will provide this assessment at the public meetings as part of their presentation.

2. Provide a traffic impact study as determined by the Zoning Administrator and a plan for on-site circulation with an off-street parking lot facility design meeting the provisions of Section 5.3-5 Design Capacity Requirements.

   A traffic impact study has been prepared by HLR and its results are summarized in this report.

   A site plan has been provided that illustrates the off-street parking for the site.

3. Provide information as to the impact of the use on the existing municipal utility service systems.

   It appears that this use would not have a significant impact on the municipal utility service systems.

4. Provide environmental impact statements as determined by the Zoning Administrator from a qualified expert in the related field that the use will not affect air, water, or soil quality.

   It is the responsibility of the petitioner to provide a statement where applicable.

5. Provide a site plan; adequate screening to residential properties; site lighting; a sign design plan; a landscaping plan; and building elevations.

   Site, lighting, signage, and landscaping plans and building elevations have been provided.

6. Provide written evidence that the use meets the standards and requirements of jurisdictions other than the City as well as applicable City Ordinances.

   It is the responsibility of the petitioner to provide documentation where applicable.

SITE PLAN

The proposed plans indicate a site that would be substantially graded to level off the hilly area at the corner of the property and push that material to the south in an effort to level the site. The site would still be 4 to 6 above the pavement of Route 31. A private north-south roadway links Three Oaks Road with the realigned Raymond Drive. As suggested in the traffic study that was completed when this property was annexed in 2000, Raymond Drive is shown realigned with Tek Drive on the west side of Route 31. Large parking fields are shown on the north side of the building, the hospital entrance, and on the south side of the building, the clinic entrance.

For a hospital use, the Zoning Ordinance requires one parking space for every hospital bed plus 1 space for every 2 employees on a maximum shift. Also, the medical clinic would be required to provide 8 parking spaces for every 1,000 net square feet of office space. The site plan indicates 500 parking spaces, which has been calculated to meet the Zoning Ordinance requirements.

ARCHITECTURE

The architectural plans propose a building with precast panels, large fields of glass and atrium elements and metal standing seam roofs along the roofline. The precast panels would be beige with the bottom section covered in a stone material, to break up the massing of the building.

SIGNAGE

Wall signage

The Sign Ordinance permits a total of 150 square feet of wall signage with no single sign exceeding 75 square feet in area. A single wall sign is proposed, which based on the dimensions provided on the plans, would be 280 square feet in area. If a scaled plan is provided, the actual dimensions of the wall sign could be calculated and it appears it would be less than 280 square feet in area.

Freestanding signage

The Sign Ordinance permits a single freestanding sign, not to exceed 16 feet in height, 60 square feet in area, with a sign base not to exceed 30% the width of the sign. Two 17 feet tall, 81.8 and 97.3 square foot *three*-sided freestanding signs with sign bases that are 100% the width of the sign are indicated. Given the additional height of the property where the one main ID sign is indicated, it would be actually four feet taller, at approximately 21 feet in height. The two signs total up to 537.3 square feet of signage, instead of the 120 total square feet permitted by Ordinance, or 417.3 additional square feet of signage.

Directional signage

The Sign Ordinance allows for directional signage that is 4 square feet in area and no taller than 3.5 feet in height, containing no advertising, logos or promotional information. The proposed directional signage substantially exceeds these requirements in all regards. Directional signage would be an important element of this use, to insure that customers can easily find where they need to go. It is suggested that the petitioner should work with staff at Final PUD to develop a directional signage program that is much more conservative but meets the need for direction.

Parking lot signage

The parking lot signage is generally acceptable, however, the company name and logo would need to be removed.

TRAFFIC STUDY

Listed below are the recommendations that were developed as a result of the traffic study.

Based on the analysis conducted and a field review of the site and adjacent roadways, the proposed development will not place such a substantial burden on the existing roadways to

necessitate additional through lanes. However, there are several recommendations for intersection improvements and comments relating to the site plan that should be considered.

Access to State Highway IL-31

- Realignment of Raymond Drive opposite of Tek Drive as depicted in the site plan should be a requirement of approval for this development. Offset intersections result in both operational and safety problems. It would not be desirable to leave these intersections in their current configuration and add additional development traffic.

- An access permit from the Illinois Department of Transportation (IDOT) will be required for the proposed realignment of the Raymond Drive/ Tek Drive/IL-31 intersection. Preliminary correspondence from IDOT indicates that they support the concept of a re-aligned intersection of Raymond Drive opposite Tek Drive.

- IDOT requirements state that all detention/retention facilities must be offset from the right-of-way at a distance equal to 10 feet plus one and one-half times the depth of the pond. This may require relocation or adjustments to several of the detention areas.

- Exclusive left-turn and right-turn lanes should be constructed at the IL-31/Raymond Drive/Tek Drive intersection. The existing continuous median on IL-31 can be re-striped to accommodate the left-turn lane.

- Because of its 24-hour operation, the presence of a clinic on-site, and the combination of existing traffic at the IL-31/Raymond Drive and IL-31/Tek Drive intersections, future traffic may be high enough to satisfy IDOT SRA traffic signal warrants. Under such a scenario, the volume of site traffic shown exiting onto Three Oaks Road would decrease as mentioned in the report. Adequate right-of-way at the IL-31/Raymond Drive/Tek Drive intersection should be dedicated to accommodate traffic signals and a commitment should be obtained from Mercy Health Systems to fund their "fair share" of a future signal.

If alternative indirect access is provided as properties to the south develop further, the need for a potential traffic signal at the IL-31/Raymond Drive/Tek Drive intersection would likely decrease as traffic would be distributed over a larger network of streets.

- The realigned Raymond Drive should be improved to City of Crystal Lake collector road standards for roadway width, pavement structure, cross-section requirements (curb and gutter, sidewalks) and right-of-way width. The cross-section should provide for exclusive left-turn lanes and a combined through/ right-turn lane on both Raymond Drive and Tek Drive. There may be a need to increase the taper on the existing right-turn lane on Tek Drive approaching the IL-31 intersection since this will become the future through/right-turn lane. A minimum stacking distance (turn lane storage) of 250 feet and 115 feet should be provided for the westbound and eastbound left-turn lanes. This stacking distance is based on the stop sign controlled intersection analysis. Because of the proximity of the site entrance on Raymond Drive to the IL-31 intersection, "back-to-

back" left-turn lanes (continuous three-lane cross-section) should be provided on Raymond Drive.

Three Oaks Road Access

- The Three Oaks Road access should include construction of an exclusive westbound left-turn lane and an eastbound right-turn lane on Three Oaks Road at the access driveway. The width of the inbound lane should be increased to 14-15 feet or the entrance return radii increased to better accommodate truck traffic. The outbound right-turn lane can be decreased to 12 feet.

- A sight-distance (visibility) survey should be conducted for the Three Oaks Road access drive based on the proposed grading plan. The existing topography of the site to the east along Three Oaks Road suggests that with some grading, sight-distance to the east could be improved. Sight-distance along IL-31 at the existing Tek Drive intersection appears adequate. It should be verified by Crystal Lake staff that the elevation difference of the property at the southeast corner of the IL-31/Three Oaks Road intersection would be decreased as part of the site grading.

- The proposed sidewalk along Three Oaks Road will require the dedication of additional right-of-way or an easement provided on private property. IDOT will likely require modification of the traffic signals at the IL-31/Three Oaks Road intersection to provide pedestrian signals.

IL-31/Three Oaks Road Intersection

- The existing and estimated short-term traffic growth analysis of this intersection indicates the need for a northbound right-turn lane on IL-31 as well as a westbound right-turn lane on Three Oaks Road. The proposed development will increase traffic at this intersection and thereby further increase the need for these additional turn lanes. Previous traffic studies for this intersection have further suggested the need for dual left-turn lanes on Three Oaks Road at IL-31. Based on HLR's analysis in this traffic study the following statements are offered for consideration:

    1. The need for a westbound to northbound right-turn is primarily attributable to existing traffic. During the critical evening peak hour, it is estimated that MHS site traffic will account for approximately 21% of this movement. Construction of a westbound right-turn lane will aid "right-turn on red" movements, but will not appreciably improve intersection operations as the critical movement is the westbound to southbound left-turn.

    2. Improvement of the intersection to provide for a westbound dual-left-turn lane would not appreciably improve intersection operations under the "existing plus development traffic". Dual left-turn movements operate under protected only signal phasing (left-turn on arrow only). Since there is very little opposing traffic on Three Oaks Road, there is significant capacity from gaps in opposing traffic allowing for a large volume of left-turn movements to be made under the green ball signal phasing that would not

be available under dual-left-turn lanes. This condition and the need for dual left-turn lanes may change if other adjacent properties develop in the future.

As mentioned above, if a traffic signal was to be approved by IDOT at the IL-31/Raymond Drive/Tek Drive intersection, the impacts to the IL-31/Three Oaks Road intersection would be reduced (decreased left-turn lane storage.)

3. There is an existing need to provide for a northbound right-turn lane on IL-31 at Three Oaks Road. It is estimated that the MHS development will account for approximately 6% of this movement. However, it should be noted that without a northbound right-turn lane the overall northbound queue (length of stopped traffic) on IL-31 during some periods of the evening peak hour could extend past and block the IL-31/Raymond Drive intersection under both the "existing + background traffic" and "existing + background + MHS traffic" scenarios. Therefore the benefit to MHS and safe traffic operations is potentially greater that the percentage of traffic. MHS and City of Crystal Lake engineering staff should verify that there is adequate room to construct this right-turn lane without affecting stormwater basin 1 and that there is adequate right-of-way at the corner. Dedication of additional right-of-way may be required at the corner and for a distance to the south.

- The potential for additional improvements as the area develops may necessitate additional right-of-way along IL-31. As mentioned above, IDOT detention basin offset requirements may require relocation of modifications to basins 1 and 7 on the site plan. Basin 7 is of particular concern since this portion of the property extends into the IL-31 right-of-way more than the rest of the frontage and would likely be needed for future improvements to IL-31.

Internal Circulation Comments

Circulation of the site was reviewed for access by emergency vehicles and service vehicles. In addition general parking and site circulation patterns were reviewed. The following comments are provided relating to internal traffic flow:

- The inbound lanes into the north and south parking lot should be a minimum of 14 feet wide.

- The Fire Department should be consulted for any comments relating to emergency access particularly the type of pavement or grass/paver structure for the fire lane in front of the building along IL-31.

- Queuing (stacking) of vehicles for the proposed pharmacy is adequate based on the size of the facility. In addition, it is likely that most pharmacy patrons will also be patients of the clinic/hospital and will obtain their prescriptions internally to the building.

- The pick-up drop-off driveway loop at the north entrance to the facility should be striped for a separate travel lane and separate parking/drop-off lane. It should not be

striped to accommodate 2-lanes of circulating traffic. Similarly, striping at the emergency room entrance should be clarified.

- City of Crystal Lake ordinances govern how much parking is required for the proposed development. As a check, Institute of Transportation Engineer's parking generation rates were reviewed based on a separate hospital and separate clinic. ITE rates indicate the proposed uses would generate an estimated demand for approximately 365 spaces. The site plan reviewed for this study shows approximately 447 regular spaces and an additional 47 handicap spaces. This is adequate based on the ITE rates. ITE rates are derived from field studies of actual parking demand.

- Adequate provisions for pedestrian and bicycle access should be provided both internally on the site and externally along the south side Three Oaks Road.

REZONING UPON ANNEXATION

The petitioner is seeking to rezone upon annexation the 0.16 acres strip that is immediately north of Raymond Drive. This parcel was inadvertently excluded from the rezoning and annexation that occurred in 2000 for the remainder of the Mercy site. The Comprehensive Land Use Plan designates this parcel as Commerce and the requested "O-PUD" Office Planned Unit Development district zoning would be appropriate with this designation as well as the surrounding zoning classifications.

ZONING VARIATIONS

Building height

Section 4.4-10 of the Zoning Ordinance provides for a maximum building height of 25 feet and 2 stories in the "O" Office district. The proposed building is 46 feet in height and contains 3 stories, necessitating a variation of 21 feet and 1 story.

Landscaping for parking lots over 200 spaces

Section 5.3-3.6E of the Zoning Ordinance provides special landscaping requirements for parking lots of over 200 spaces. The northern parking lot exceeds 200 parking spaces but does not provide for the landscaping detailed in the ordinance, specifically, a continuous 8 foot wide landscape strip, planted with shrubs or trees, or large planting islands (over 600 square feet) at the ends of parking rows. This has not been provided on the landscape plan.

Interior landscape islands

Section 5.3-3.6(D) of the Zoning Ordinance requires interior 8-foot wide landscape islands in every row of parking for every 10 spaces. The two parking lots on the south side of the building do not provide for this landscaping, although could be provided for given the extra parking that has been provided.

COMMENTS AND CONCLUSIONS

REZONING UPON ANNEXATION– To be reviewed by the Zoning Board of Appeals, the Plan Commission and acted upon by the City Council.

The petitioner's request before the Zoning Board of Appeals, the Plan Commission and the City Council would rezone upon annexation the 0.16 acres located immediately north of Raymond Drive to the "O-PUD" Office Planned Unit Development district.

ZONING VARIATIONS- To be reviewed by the Zoning Board of Appeals, the Plan Commission and acted upon by the City Council.

The granting of a variation rests upon the petitioner proving practical difficulty or hardship caused by the Zoning Ordinance requirements as they relate to the property. It is the responsibility of the petitioner to prove hardship at the Plan Commission public hearing.

Before recommending any variation, the Plan Commission shall first determine and record its findings that the evidence justifies the conclusions that the variation:

1. Will not impair an adequate amount of light and air to adjacent properties;
2. Will not unreasonably diminish the value of adjacent property;
3. Will not unreasonably increase the congestion in the public streets or otherwise endanger public safety; and
4. Is in harmony with the general purpose and intents of the Zoning Ordinance.

Where the evidence is not found to justify such conditions, that fact shall be reported to the City Council with a recommendation that the variation be denied. If the Plan Commission and City Council find hardship, the variations could be approved as a condition of the Special Use Permit for an Institutional Use.

PRELIMINARY PLANNED UNIT DEVELOPMENT/SPECIAL USE PERMITS – To be reviewed by the Zoning Board of Appeals, the Plan Commission and acted upon by the City Council.

The petitioner's request before the Zoning Board of Appeals, the Plan Commission and the City Council for a Preliminary Planned Unit Development for a hospital and medical center and Special Use Permits for an institutional use, a heliport and internally illuminated signage in an Office district for the 16.39 acres located at the southeast corner of Route 31 and Three Oaks Road, north of Raymond Drive, could be based upon the following conditions:

1. Approved plans, reflecting staff and advisory board recommendations, as approved by the City Council:
    A. Site plan (hga, dated 8/12/04)
    B. Architectural plans (hga, dated 8/12/04)
    C. Lighting plans (hga, dated 8/12/04)
    D. Traffic study (HLR, dated 10/04)

E. Landscape plan (hga, dated 8/12/04)
F. Signage package (Babcock, received 8/28/04)

2. Site plan
A) Provide sidewalks along Route 31 and both side of the realigned Raymond Drive.
B) Bury the aerial utility lines along Route 31 and Three Oaks Road.
C) Indicate the location of any trash receptacles and how they would be screened.

3. Architectural plans
A) Indicate how all roof top units will be screened, in accordance with the Zoning Ordinance requirements.

4. Landscape plan
A) Provide a landscape plan exhibit that illustrates the location of all easements and proposed signage locations to resolve any conflicts.
B) The tree survey provided should be amended to include the condition of the trees surveyed and an analysis of the required mitigation, if applicable, as required by the Tree Preservation Ordinance.
C) Explain the size notation for the shrubs on sheet L100.
D) Provide street trees at 40 foot spacing along Three Oaks Road, Route 31 and the realigned Raymond Drive.
E) Although the parking lot will be for the most part higher that the adjacent roadways, evergreen screening should provided for the areas that would still be visible from the road.
F) Provide details of the native grasses, wildflowers, perennials, and groundcovers at Final PUD for review and approval.
G) Provide for more substantial foundation plantings to help break up the large expanses of wall elevation.
H) Additional screening of the service areas should be provided where the retaining walls do not provide adequate cover.

5. Sign plan
A) The freestanding and wall signage for the property shall meet the requirements of the Sign Ordinance.
B) At Final PUD, work with staff on a directional sign program for the property.

6. The petitioner shall revise their plans for Final PUD to address the recommendations contained in the traffic study and hereby agree to dedicate adequate right-of-way and pay their fair share of the potential future traffic signal at the IL-31/Raymond Drive/Tek Drive intersection.

7. The following Zoning Variations are hereby granted:
A) Section 4.4-10 Maximum building height of 25 feet and 2 stories to allow 46 feet and 3 stories.
B) Section 5.3-3.6E Landscaping requirements for parking lots of over 200 spaces.

C) Section 5.3-3.6D Required interior landscape island for every ten parking spaces.

8. Provide the City with the FAA approval for the heliport.

9. The petitioner shall address all the review comments of the Building, Engineering, Fire/Rescue, Police, Utilities, HLR – City's traffic consultant, and the Planning Departments.

ROADWAY VACATION - To be reviewed and acted upon by the City Council.

The petitioner's request before the City Council would vacate a section of Raymond Drive as indicated on the Preliminary PUD submittals and rededicate the section to align with Tek Drive on the west side of Route 31.

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ORDINANCE NO. _5900_____
FILE NO. __440____

AN ORDINANCE GRANTING SPECIAL USE PERMITS
AND A VARIATION FOR MERCY HEALTH SYSTEM

WHEREAS, pursuant to the terms of a Petition (File #2004-53) before the Crystal Lake Zoning Board of Appeals, the Petitioner has requested the granting of a Special Use Permits for an institutional use for a hospital; a heliport; and internally illuminated signage in the Office district; and Variations from: A. Section 4.4-10 Maximum building height of 25 feet and 2 stories to allow 46 feet and 3 stories; B. Section 5.3-3.6E Landscaping requirements for parking lots of over 200 spaces; C. Section 5.3-3.6D required interior landscape island for every ten parking spaces for Mercy Health Care; and

WHEREAS, it is in the best interests of the CITY OF CRYSTAL LAKE that the Special Use Permits and a Variation be granted as requested in said Petition.

BE IT ORDAINED BY THE MAYOR AND CITY COUNCIL OF THE CITY OF CRYSTAL LAKE, McHENRY COUNTY, ILLINOIS, as follows:

Section I: That Special Use Permits for an institutional use for a hospital; a heliport; and internally illuminated signage in the Office district; and Variation from: A. Section 4.4-10 Maximum building height of 25 feet and 2 stories to allow 46 feet and 3 stories are hereby granted.

at the property located at the southeast corner of Route 31 and Three Oaks Road, City of Crystal Lake, and legally described as follows:

PARCEL 1: The North 1464.54 feet of the West 580.14 feet of the Southeast Quarter of Section 10, Township 43 North, Range 8 East of the Third Principal Meridian (excepting therefrom that part taken for highway purposes by Illinois State Route 31 and Three Oaks Road). Parcel containing 16.2265 acres, more or less, in McHenry County, Illinois.

PARCEL 2: That part of the Southeast Quarter of Section 10, Township 43 North, Range 8 East of the Third Principal Meridian, described as follows: Commencing at the Southwest corner of said Southeast Quarter; thence North 0 degrees 18 minutes 36 seconds West along the West line of said Southeast Quarter, 1162.55 feet to the Southwest corner of lands conveyed from Brink to Bishop, as per the document thereof recorded January 24, 1871 in Book 47 of Deeds, Page 471 in McHenry County, Illinois; thence North 89 degrees 45 minutes 04 seconds East along the South line of said lands, 79.66 feet to a point on the Easterly right of way line of State Route 31, for a point of beginning; thence continuing North 89 degrees 45 minutes 04 seconds East along said South line of lands conveyed from Brink to Bishop, 500.18 feet to the Southeast corner of said lands; thence South 0 degrees 18 minutes 36 seconds East, 14.15 feet to a point on the North

right of way line of Raymond Drive; thence South 89 degrees 44 minutes 47 seconds West along said North right of way line of Raymond Drive, 500.22 feet; thence North 0 degrees 08 minutes 12 seconds West along said Easterly right of way line of State Route 31 for a distance of 14.19 feet to the point of beginning. Parcel containing 0.1627 acres, more or less, in McHenry County, Illinois.

Section II: That the Special Use Permit be granted with the following conditions:

1. Approved plans, reflecting staff and advisory board recommendations, as approved by the City Council:
   A. Site plan (hga, dated 8/12/04)
   B. Architectural plans (hga, dated 8/12/04)
   C. Lighting plans (hga, dated 8/12/04)
   D. Traffic study (HLR, dated 10/04)
   E. Landscape plan (hga, dated 8/12/04)
   F. Signage package (Babcock, received 8/28/04)

2. Site plan
   A. Provide sidewalks along Route 31 and both side of the realigned Raymond Drive.
   B. Bury the aerial utility lines along Route 31 and Three Oaks Road.
   C. Indicate the location of any trash receptacles and how they would be screened.

3. Architectural plans
   A. Indicate how all roof top units will be screened, in accordance with the Zoning Ordinance requirements.
   B. Add a transitional feature between the stone and precast and a coping detail at the top of the building.

4. Landscape plan
   A. Provide a landscape plan exhibit that illustrates the location of all easements and proposed signage locations to resolve any conflicts.
   B. The tree survey provided should be amended to include the condition of the trees surveyed and an analysis of the required mitigation, if applicable, as required by the Tree Preservation Ordinance.
   C. Explain the size notation for the shrubs on sheet L100.
   D. Provide street trees at 40 foot spacing along Three Oaks Road, Route 31 and the realigned Raymond Drive.
   E. Although the parking lot will be for the most part higher that the adjacent roadways, evergreen screening should provided for the areas that would still be visible from the road.
   F. Provide details of the native grasses, wildflowers, perennials, and groundcovers at Final PUD for review and approval.
   G. Provide for more substantial foundation plantings to help break up the large expanses of wall elevation.

H. Additional screening of the service areas should be provided where the retaining walls do not provide adequate cover.

5. Sign plan
A Common Sign Plan shall be presented at Final PUD to include the changes recommended at the City Council meeting for Preliminary.

6. The petitioner shall revise their plans for Final PUD to address the recommendations contained in the traffic study and hereby agree to dedicate adequate right-of-way and pay their fair share of the potential future traffic signal at the IL-31/Raymond Drive/Tek Drive intersection.

7. The following Zoning Variation is hereby granted:
A. Section 4.4-10 Maximum building height of 25 feet and 2 stories to allow 46 feet and 3 stories.

8. Provide the City with the FAA approval for the heliport.

9. The petitioner shall address all the review comments of the Building, Engineering, Fire/Rescue, Police, Utilities, HLR – City's traffic consultant, and the Planning Departments.

10. Approval is based upon compliance with the Annexation Agreement.

11. The City Council finds that the petitioner meets all of the Standards of Section 6.3 of the Zoning Ordinance with respect to the requirements of the Special Use Permit.

Section III: That the City Clerk be and is hereby directed to amend the official zoning map of the City of Crystal Lake and all pertinent records of the City of Crystal Lake to show the granting of a Variation in accordance with the provisions of this Ordinance, as provided by law.

Section IV: That this Ordinance shall be in full force and effect from and after its passage and approval as provided by law.

DATED this 1st day of February, 2005.

_____
MAYOR PRO TEMPORE

ATTEST:

_____
CITY CLERK

January 7, 2005

THE HONORABLE MAYOR
AND CITY COUNCIL

RE: 2004-53 MERCY HOSPITAL – SE ROUTE 31 & THREE OAKS RD.

Council Members:

The Plan Commission considered the above referenced petition at their January 5, 2005 meeting at which a quorum consisting of members Deemer, Esposito, Greenman, Hess, Hopkins, Schofield, and Vause were present. Members Cabay and McDonough were absent.

Mrs. Schofield moved to approve Preliminary Planned Unit Development for a hospital and medical center, Special Use Permits for an institutional use, a heliport and internally illuminated signage in an Office district, and Zoning Ordinance Variations from Section 4.4-10 Maximum building height of 25 feet and 2 stories to allow 46 feet and 3 stories for the 16.39 acres located at the southeast corner of Route 31 and Three Oaks Road, north of Raymond Drive, with the following conditions:

1. Approved plans, reflecting staff and advisory board recommendations, as approved by the City Council:
   A. Site plan (hga, dated 8/12/04)
   B. Architectural plans (hga, dated 8/12/04)
   C. Lighting plans (hga, dated 8/12/04)
   D. Traffic study (HLR, dated 10/04)
   E. Landscape plan (hga, dated 8/12/04)
   F. Signage package (Babcock, received 8/28/04)

2. Site plan
   A. Provide sidewalks along Route 31 and both side of the realigned Raymond Drive.
   B. Bury the aerial utility lines along Route 31 and Three Oaks Road.
   C. Indicate the location of any trash receptacles and how they would be screened.

3. Architectural plans
   A. Indicate how all roof top units will be screened, in accordance with the Zoning Ordinance requirements.
   B. Add a transitional feature between the stone and precast and a coping detail at the top of the building.

4. Landscape plan

A. Provide a landscape plan exhibit that illustrates the location of all easements and proposed signage locations to resolve any conflicts.
B. The tree survey provided should be amended to include the condition of the trees surveyed and an analysis of the required mitigation, if applicable, as required by the Tree Preservation Ordinance.
C. Explain the size notation for the shrubs on sheet L100.
D. Provide street trees at 40 foot spacing along Three Oaks Road, Route 31 and the realigned Raymond Drive.
E. Although the parking lot will be for the most part higher that the adjacent roadways, evergreen screening should provided for the areas that would still be visible from the road.
F. Provide details of the native grasses, wildflowers, perennials, and groundcovers at Final PUD for review and approval.
G. Provide for more substantial foundation plantings to help break up the large expanses of wall elevation.
H. Additional screening of the service areas should be provided where the retaining walls do not provide adequate cover.

5. Sign plan
A. ~~The freestanding and wall signage for the property shall meet the requirements of the Sign Ordinance~~. A Common Sign Plan shall be presented at Final PUD. Include one (1) freestanding sign eliminating the message board with a height of 16 feet with details to be worked out with Staff. The wall signage shall meet the maximum of 150 square feet.
B. At Final PUD, work with staff on a directional sign program for the property including the removal of the logo and name from all directional signs.

6. The petitioner shall revise their plans for Final PUD to address the recommendations contained in the traffic study and hereby agree to dedicate adequate right-of-way and pay their fair share of the potential future traffic signal at the IL-31/Raymond Drive/Tek Drive intersection.

7. The following Zoning Variations are hereby granted:
A. Section 4.4-10 Maximum building height of 25 feet and 2 stories to allow 46 feet and 3 stories.
~~B. Section 5.3-3.6E Landscaping requirements for parking lots of over 200 spaces.~~
~~C. Section 5.3-3.6D Required interior landscape island for every ten parking spaces~~.

8. Provide the City with the FAA approval for the heliport.

9. The petitioner shall address all the review comments of the Building, Engineering, Fire/Rescue, Police, Utilities, HLR – City's traffic consultant, and the Planning Departments.

10. Approval is based upon compliance with the Annexation Agreement.

11. The Commission finds that the petitioner meets all of the Standards of Section 6.3 of the Zoning Ordinance with respect to the requirements of the Special Use Permit.

Mr. Esposito seconded the motion. On roll call, all members present voted aye. Motion passed.

Mrs. Schofield moved to approve the rezoning upon annexation for the 0.16 acres located immediately north of Raymond Drive to the "O-PUD" Office Planned Unit Development district. Mr. Esposito seconded the motion. On roll call, all members present voted aye. Motion passed.

CRYSTAL LAKE PLAN COMMISSION

Dirk Vause
Vice Chair

DV/shd

cc: LISA WAGGNER
4 N WALKUP AVE
CRYSTAL LAKE IL 60014

December 2, 2004

THE HONORABLE MAYOR
AND CITY COUNCIL

RE: 2004-53 MERCY HEALTH HOSPITAL – SE ROUTE 31 & THREE OAKS RD.

Council Members:

The Zoning Board of Appeals considered the above referenced petition at their December 1, 2004 meeting at which a quorum consisting of members Batastini, Jouron, Skluzacek, Wickham, and Hayden were present.

Mr. Wickham moved to approve the rezoning upon annexation for the 0.16 acres located immediately north of Raymond Drive to the "O-PUD" Office Planned Unit Development district and Preliminary Planned Unit Development for a hospital and medical center and Special Use Permits for an institutional use, a heliport and internally illuminated signage in an Office district for the 16.39 acres located at the southeast corner of Route 31 and Three Oaks Road, north of Raymond Drive, with the following conditions:

1. Approved plans, reflecting staff and advisory board recommendations, as approved by the City Council:
   A. Site plan (hga, dated 8/12/04)
   B. Architectural plans (hga, dated 8/12/04)
   C. Lighting plans (hga, dated 8/12/04)
   D. Traffic study (HLR, dated 10/04)
   E. Landscape plan (hga, dated 8/12/04)
   F. Signage package (Babcock, received 8/28/04)

2. Site plan
   A. Provide sidewalks along Route 31 and both side of the realigned Raymond Drive.
   B. Bury the aerial utility lines along Route 31 and Three Oaks Road.
   C. Indicate the location of any trash receptacles and how they would be screened.

3. Architectural plans
   A. Indicate how all roof top units will be screened, in accordance with the Zoning Ordinance requirements.

4. Landscape plan
   A. Provide a landscape plan exhibit that illustrates the location of all easements and proposed signage locations to resolve any conflicts.
   B. The tree survey provided should be amended to include the condition of the trees surveyed and an analysis of the required mitigation, if applicable, as required by the Tree Preservation Ordinance.
   C. Explain the size notation for the shrubs on sheet L100.
   D. Provide street trees at 40 foot spacing along Three Oaks Road, Route 31 and the realigned Raymond Drive.

E. Although the parking lot will be for the most part higher that the adjacent roadways, evergreen screening should provided for the areas that would still be visible from the road.
F. Provide details of the native grasses, wildflowers, perennials, and groundcovers at Final PUD for review and approval.
G. Provide for more substantial foundation plantings to help break up the large expanses of wall elevation.
H. Additional screening of the service areas should be provided where the retaining walls do not provide adequate cover.

5. Sign plan
   A. The freestanding and wall signage for the property shall meet the requirements of the Sign Ordinance.
   B. At Final PUD, work with staff on a directional sign program for the property.

6. The petitioner shall revise their plans for Final PUD to address the recommendations contained in the traffic study and hereby agree to dedicate adequate right-of-way and pay their fair share of the potential future traffic signal at the IL-31/Raymond Drive/Tek Drive intersection.

7. The following Zoning Variations are hereby granted:
   A. Section 4.4-10 Maximum building height of 25 feet and 2 stories to allow 46 feet and 3 stories.
   ~~B. Section 5.3-3.6E Landscaping requirements for parking lots of over 200 spaces.~~
   ~~C. Section 5.3-3.6D Required interior landscape island for every ten parking spaces~~.

8. Provide the City with the FAA approval for the heliport.

9. The petitioner shall address all the review comments of the Building, Engineering, Fire/Rescue, Police, Utilities, HLR – City's traffic consultant, and the Planning Departments.

Mr. Jouron seconded the motion. On roll call, members Jouron, Skluzacek, and Wickham voted aye. Members Batastini and Hayden voted no. Motion passed.

Sincerely,

Tom Hayden, Chair
Crystal Lake Zoning Board of Appeals

TH/shd

cc: LISA WAGGNER
4 N WALKUP AVE
CRYSTAL LAKE IL 60014