CITY OF PARK RIDGE
505 BUTLER PLACE
PARK RIDGE, IL 60068
TEL: 847/ 318-5291
FAX: 847/ 318-6411
TDD:847/ 318-5252
URL:http://www.parkridge.us

DEPARTMENT OF COMMUNITY
PRESERVATION AND DEVELOPMENT

Date: October 25, 2016

To: Planning and Zoning Commission

From: Jon Branham, Senior Planner

Subject: Special Use for Expansion of a Parking Structure
1775 Dempster Street
Zoning Case Number: SU-16-07

Introduction

Advocate Health & Hospitals Corporation, applicant, requests a special use for an expansion to a parking structure in the H-TZ-2 Hospital Transition Zone 2 District at 1775 Dempster Street, in accordance with the special use provisions in Section 4.5 and Section 4.6 of the Zoning Ordinance.

Notification requirements for this application have been satisfied. A legal notice for the public hearing was published in a local newspaper, a sign was posted on the property and neighboring property owners were notified via mail.

The following chart summarizes the land use, zoning district classification and Comprehensive Plan designation for the subject and surrounding properties.

Location	Current Use	Zoning	Comprehensive Plan
Subject Property	Hospital Parking	H-TZ-2	Public & Institutional
North	Hospital Parking	H-TZ-1	Public & Institutional
East	Hospital Facilities / Parking	H-CZ / H-TZ-2	Public & Institutional
South	Hospital Facilities	H-TZ-2	Public & Institutional
West	High School Sports Fields	R-2	Public & Institutional

Information Submitted by the Applicant

The applicant requests a special use for an expansion to an existing parking structure at the property. A special use is required for a modification in the H-TZ-2 Hospital Transition District, per the threshold requirements outlined in Section 9.5.C.3 of the Zoning Ordinance. The proposal would add two levels of parking to the existing four-level facility, creating an additional 272 parking spaces. This facility serves the parking needs for the main hospital, Parkside Center, and the Center of Advanced Care.

Desman Design Management, the architect for the applicant, prepared plans dated September 9, 2016 and Gewalt Hamilton, Inc., engineer for the applicant, prepared an existing conditions report, dated September 8, 2016. Gewalt Hamilton Associates, Inc. also prepared a traffic impact study dated September 8, 2016.

The applicant, provided a statement summarizing the proposal and identifying that the proposed special use would satisfy the findings of fact for special uses.

Staff Analysis
Staff reviewed the proposal in accordance with the Comprehensive Plan and the Zoning Ordinance.

Comprehensive Plan
The City's 1996 Comprehensive Plan identifies the property as Public & Institutional. The continued use of the parking structure for the hospital use is consistent with the Public & Institutional designation.

H-TZ-2 District Purpose Statement
Hospital Transition Zone 2 (H-TZ-2) is intended to serve as a secondary buffer against neighboring residential uses. The H-TZ-2 Sub-District allows for some freestanding smaller-scale medical-related uses with individual yard requirements for each structure.

H-TZ-2 District Standards
Staff reviewed the site plans for the proposed project with regard to the bulk standards in Section 9.2, Table 6 of the Zoning Ordinance. The applicant is proposing a height of 71 feet for the parking structure addition, instead of the permitted 50 feet (Section 9.3, Table 7). This would be an exception to the special use request. All other setback and bulk requirements have been met.

Parking Structure Standards
Section 10.3.N of the Zoning Ordinance states:

1. Parking structures located in the B-1 or B-2 Districts or the U-Core Sub-District of the B-4 District shall include commercial uses along at least fifty percent (50%) of the length of a façade adjacent to a public right-of-way.

2. Where no storefronts are required as per Paragraph (a) above, a landscaped yard a minimum of ten (10) feet in width shall be provided adjacent to a public right-of-way.

The parking structure is existing and is expanding vertically. Item #1 is not applicable and item #2 has already been achieved as it is located more than ten feet from the Dempster Street, Vernon Avenue, and Luther Lane right-of-ways.

Traffic Circulation, Utilities and Stormwater Drainage
The Engineering Division, in its memorandum dated October 21, 2016, reviewed the plans submitted by the applicant and offered preliminary review comments (see the attached memorandum). The plans are in general compliance with site and civil engineering requirements and Planning & Zoning Commission approval is recommended. The plans will require final review during the building permit process.

Off-Street Parking
Off-street parking required for the hospital use is identified as one space per two beds, plus 2 per 3 employees (largest shift). There are no expansion plans for the hospital nor the addition of any employees at this time. The applicant is proposing 272 additional parking spaces to the existing 535-space structure, which would contain a total of 807 spaces after completion. The applicant has identified that the parking module width will be 54 feet, 6 inches, which is less than the required 58 feet (Section 12.8.A.1), which would be another exception to the special use request. The applicant indicated that this width is consistent with the approval received in 2003 when the structure was initially constructed. The applicant has stated that all other parking design requirements have been met.

Landscaping and Screening
The applicant should meet all landscaping and screening requirements, as stated in Section 13, but it does not appear that any landscaping will be impacted by the addition.

Exterior Lighting
The applicant is proposing lights at 18 feet in height on the top level of the parking structure. The maximum height permitted is 16 feet, but the Planning & Zoning Commission may grant a pole or mount of up to 24 feet (Section 11.3.D.1). Any new lighting would also need to meet the standards for exterior lighting as described in Section 11.3 of the Zoning Ordinance.

Appearance Commission
The plans would be required to receive final design approval from the Appearance Commission.

Other Department Reviews
The site will need to meet any requirements offered by other City Departments. The applicant will need to meet all applicable building codes and requirements of the Fire Department.

Conditions on Special Uses
The Planning and Zoning Commission may recommend, and the City Council may impose, such conditions and restrictions upon the establishment, location, construction, maintenance and operation of the special use as may be deemed necessary for the protection of the public interest (Section 4.6.D.3.a).

Exceptions to Special Use Criteria
Section 4.6.D.3.b states that the Planning and Zoning Commission may recommend and the City Council may approve "exceptions" to the zoning district requirements where the special use is to be located to achieve the objectives of the zoning district and the special use, and to mitigate the impact of the special use on neighboring properties. However, no exceptions shall be recommended by the Planning and Zoning Commission to the City Council unless the Commission has made separate findings of fact, based upon the evidence as presented at public hearing, to support each of the applicable standards for special use in accordance with Paragraph E (Findings of Fact).

Commission Review and Action
The Commission should discuss the proposed parking structure expansion and decide if it is appropriate for the site and area. The Commission should review the standards for special uses in Section 4.6.E and determine if the applicant satisfies the standards.

The Commission may decided to recommend approval, recommend approval with conditions, or recommend denial to the City Council:

A special use for an expansion to a parking structure in the H-TZ-2 Hospital Transition District, at 1775 Dempster Street, Zoning Case Number SU-16-07, subject to:

1. Allowing an exception for a 71-foot building height for the parking structure, instead of the required 50-foot height;

2. Allowing a parking module width of 54 feet, 6 inches, instead of the required 58 feet.

3. Meeting the requirements for parking structures as outlined in Section 10.3.N.

4. Meeting all landscaping and screening requirements in Section 13 of the Zoning Ordinance, if applicable;

5. Allowing light poles of 18 feet in height, instead of the required 16 feet. All other exterior light requirements should be met, per Section 11.3 of the Zoning Ordinance;

6. Final building design and site layout must be approved by the Appearance Commission;

7. Ensuring that the applicant satisfies all comments by the City Engineer;

8. The applicant must satisfy any requirements that may be offered by the other City Departments, including the Fire Department.

The special use would proceed to City Council for final review.

Attachments

CITY OF PARK RIDGE
505 BUTLER PLACE
PARK RIDGE, IL 60068
TEL: 847/ 318-5228
FAX: 847/ 318-5562
TDD: 847/ 318-5252
URL:http://www.parkridge.us

PRELIMINARY PLAN REVIEW

DATE: October 21, 2016

TO: Jon Branham, City Planner

CC: James A. Brown, Director of Community Preservation & Development
Wayne Zingsheim, Director of Public Works
Sarah Mitchell, P.E., C.F.M., City Engineer

FROM: Efren Solis, Civil Engineer

RE: Advocate Health & Hospitals Corporation
1925 W. Dempster Street
West Parking Facility Vertical Expansion
Preliminary Engineering Review

The Engineering Division has conducted a review of the above referenced project. This review is based on the Application for Special Use dated 09/08/16. The Engineering Division finds the project generally acceptable and recommends approval by the Planning and Zoning Commission. Our comments are as follows:

General Comments

1. This is a preliminary review. When this project is re-submitted for City permit review, the Engineering Division will conduct a detailed review of the plans. That review will produce a list of additional comments that will need to be addressed by the Developer/Engineer.

2. An MWRD permit is required for this project. The permit or a letter of determination from the MWRD must be obtained before the City of Park Ridge permit is issued.

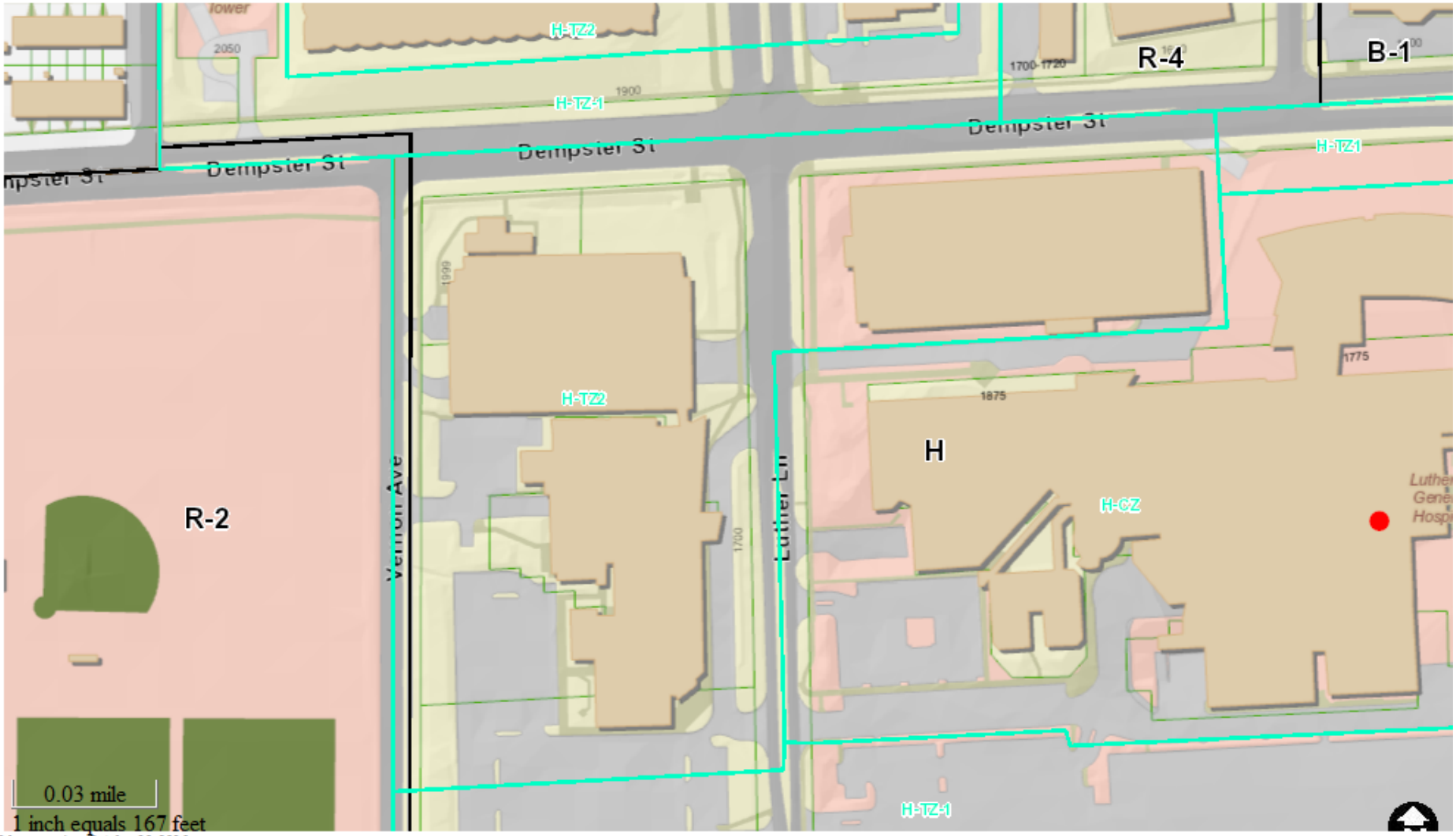
3. The Developer/Engineer must verify if IEPA permits are required for this project. If it is determined that the final design requires IEPA permitting, these permits must be obtained before the City of Park Ridge permit is issued.

4. Confirm that the existing stormwater detention is not affected in any way and that there will not be any stormwater system modifications. Provide the existing stormwater detention calculations including the required and provided volumes, restrictor size, and release rate calculation. Also, provide the existing engineering plans and details for the existing site and stormwater detention system as required per city ordinance.

5. Site as-built plans will need to be submitted to the City of Park Ridge at the conclusion of the project.

GIS consortium MapOffice™

1775 Dempster St



Map created on October 19, 2016.

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Zoning Special Purpose

Zoning Ordinances

- ☐ B-1, Retail and Office District
- ☐ B-2, General Commercial District
- ☐ B-3, General Commercial Wholesale and Service District
- ☐ B-4, Uptown Business District
- ☐ EB, Educational Boarding Purpose District
- ☐ H, Hospital Special Purpose District
- ☐ O, Office District
- ☐ OS, Open Space Special Purpose District
- ☐ P, Parking Special Purpose District
- ☐ R-1, Single Family Residential District
- ☐ R-2, Single Family Residential District
- ☐ R-3, Two Family Residential District
- ☐ R-4, Multifamily Residential District
- ☐ R-5, Multifamily Residential District

GIS consortium MapOffice™

1775 Demspter St

Map created on October 19, 2016.

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SECTION 9. SPECIAL PURPOSE DISTRICTS

9.1 SPECIAL PURPOSE DISTRICTS PURPOSE
9.2 PERMITTED AND SPECIAL USES
9.3 YARD AND BULK REGULATIONS
9.4 GENERAL STANDARDS OF APPLICABILITY
9.5 MODIFICATIONS WITHIN HOSPITAL SPECIAL PURPOSE DISTRICT

9.1 SPECIAL PURPOSE DISTRICTS PURPOSE

A. Purpose of OS Open Space Special Purpose District

The Open Space Special Purpose District (OS) is intended to provide and protect publicly and privately owned open space, natural areas, and passive and active recreation facilities that serve the City and surrounding region.

B. Purpose of H Hospital Special Purpose District

The Hospital Special Purpose District (H) is intended to address the special needs and impacts of a large-scale, multi-functional hospital and medical campus. The Hospital District is divided into three sub-districts – Hospital Transition Zone 1, Hospital Transition Zone 2 and Hospital Core Zone. These sub-districts progressively increase in intensity of use and bulk. This progression is intended to mitigate the impacts of a hospital campus on adjacent residential uses.

1. Hospital Core Zone

Hospital Core Zone (H-CZ) is intended to accommodate the main hospital structure and related uses. This sub-district is the most intense within the H District.

2. Hospital Transition Zone 1

Hospital Transition Zone 1 (H-TZ-1) is intended to serve as the immediate transition between neighboring residential uses. It is primarily a landscaped transition yard, though surface parking lots may be allowed as a special use. No principal structures are permitted in this sub-district.

3. Hospital Transition Zone 2

Hospital Transition Zone 2 (H-TZ-2) is intended to serve as a secondary buffer against neighboring residential uses. The H-TZ-2 Sub-District allows for some freestanding smaller-scale medical-related uses with individual yard requirements for each structure.

C. Purpose of EB Educational Boarding Special Purpose District

The Educational Boarding Special Purpose District (EB) is intended to address the special needs and impacts of a large-scale, educational facility and campus that includes boarding facilities for students. The Educational Boarding District is divided into two sub-districts – EB Transition Zone and EB Core Zone.

1. **Educational Boarding Core Zone**

   Educational Boarding Core Zone (EB-CZ) is intended to accommodate a large-scale educational facility, including classrooms and dorms, and related uses such as parking and outdoor recreation.

2. **Educational Boarding Transition Zone**

   Educational Boarding Transition Zone (EB-TZ) is intended to serve as the buffer with respect to neighboring residential uses and provides a landscaped transition yard between the facility and the abutting residential uses. No principal structures are permitted in this sub-district.

D. Purpose of S Sexually-Oriented Business Special Purpose District

The Sexually-Oriented Business Special Purpose District (S) is intended to provide a limited area in which to operate a sexually-oriented business. The S District is a floating zone, which will not be designated on the Zoning Map until an application is made and a recommendation is made by action of the Planning and Zoning Commission and approved by the City Council. An S District is the only zoning district in which a sexually-oriented business may be operated.

E. Purpose of P Parking Special Purpose District

The Parking District (P) is intended to create an area adjacent to the existing B-1 District for off-street parking that must be designed to be compatible with adjacent residential areas. The parking areas are to be used solely for off-street parking lots by passenger vehicles incidental to a principal use. The district is intended to serve as parking for an adjacent use, or uses, which has previously been developed without adequate off-street parking facilities.

9.2 PERMITTED AND SPECIAL USES

Table 6: Special Purpose Districts Permitted and Special Uses lists permitted and special uses for the special purpose districts. A "P" indicates that a use is considered permitted within that district. An "S" indicates that a use is considered a special use in that district and must obtain special use approval as required in Section 4.6 (Special Use). No letter (i.e., a blank space), or the absence of the use from the table, indicates that use is not permitted within that district.

CITY OF PARK RIDGE, ILLINOIS
TABLE 6: SPECIAL PURPOSE DISTRICTS PERMITTED AND SPECIAL USES

P = Permitted Use S = Special Use

Use[1]	Special Purpose Districts								Specific Use Standards
	OS	H			EB		S[2]	P	
		H-CZ	H-TZ-1	H-TZ-2	EB-CZ	EB-TZ			
RESIDENTIAL USES									
Assisted Living Facility		S		S					See Section 10.3.A
Independent Living Facility		S		S					See Section 10.3.A
Nursing Home		S		S					See Section 10.3.A
Temporary overnight shelters[5]	S	S	S	S					See Section 10.3.R
GOVERNMENT AND EDUCATIONAL USES									

CITY OF PARK RIDGE, ILLINOIS
TABLE 6: SPECIAL PURPOSE DISTRICTS PERMITTED AND SPECIAL USES

P = Permitted Use S = Special Use

Use[1]	Special Purpose Districts								Specific Use Standards
	OS	H			EB		S[2]	P	
		H-CZ	H-TZ-1	H-TZ-2	EB-CZ	EB-TZ			
Educational Facility, Primary/Secondary (With Residential)					S				
Educational/Residential Boarding Campus					S				
Educational/Residential Boarding Campus					S[6]				
SERVICE AND OFFICE USES									
Classrooms with Laboratory Facilities (Medical-Related)		P		S					
Day Care Center, Adult or Child		P		S					See Section 10.3.D
Helistop		S							
Health/Fitness Center		P							
Hospital		P							
Medical/Dental Clinic		P		P					
Medical Support Facilities		P							
Office, Professional (Hospital-Related)		P		P					
Physical Therapy Office		P		P					
Rehabilitation Facility (Residential)		S							
Research and Development Facility (Hospital-Related)		P		P					
Restaurant (includes hospital cafeteria)		P		P					
PARKING USES									
Parking Lot (Principal Use)		P	S	P	P	S		P	See Section 10.3.N
Parking Structure (Principal Use)		P		P	P	S			See Section 10.3.N
RETAIL USES									
Retail Goods Establishment (Hospital-Related)[3]		P		P					
Sexually-Oriented Business							S		See Section 10.3.P
OPEN SPACE USES									
Cemetery	P								
Country Club	P								
Driving Range	P								
Forest Preserve	P								
Golf Course	P								
Park (Principal Use), including Park District Recreational Buildings	P								
OTHER									
Wireless Telecommunications Antenna	S,P[4]	S,P[4]	S,P[4]	S,P[4]	S,P[4]	S,P[4]	S,P[4]	S,P[4]	See Section 10.3.R
Wireless Telecommunications Facility	S	S	S	S	S	S	S	S	See Section 10.3.R
Wireless Telecommunications Tower	S	S	S	S	S	S	S	S	See Section 10.3.R

FOOTNOTES: TABLE 6

[1] The terms in this column ("Use") are defined in Section 17 (Generic Use Definitions).
[2] In addition to sexually-oriented businesses, all uses that are listed as permitted uses in the B-3 District are considered permitted uses in the S District. All uses considered special uses in the B-1 District are considered special uses in the S District. See Table 4: Commercial Districts Permitted and Special Uses for the commercial district uses.
[3] Hospital-related retail goods establishments include such uses as gift shops and medical supply sales establishments.
[4] Only wireless telecommunications antennas that comply with the stealth design standards of Section 10.3.R.10 shall be considered permitted uses.
[5] Ordinance 2008-83, 11/17/2008
[6] Ordinance 2011-88, 12/19/2011

9.3 YARD AND BULK REGULATIONS

Table 7: Special Purpose Districts Yard and Bulk Regulations establishes yard and bulk regulations for the special purpose districts.

CITY OF PARK RIDGE, ILLINOIS
TABLE 7: SPECIAL PURPOSE DISTRICTS YARD AND BULK REGULATIONS

BULK REGULATION	OS[1]
MAXIMUM BUILDING HEIGHT[5]	35 ft
MINIMUM YARDS	
Front Yard	20 ft
Interior Side Yard	10 ft
Corner Side Yard	15 ft
Rear Yard	25 ft

CITY OF PARK RIDGE, ILLINOIS
TABLE 7: SPECIAL PURPOSE DISTRICTS YARD AND BULK REGULATIONS

BULK REGULATION	H[2]		
	H-CZ	H-TZ-1[3]	H-TZ-2[1]
MINIMUM DISTRICT SIZE	10 acres for entire H District		
MAXIMUM BUILDING HEIGHT[5]	165 ft	n/a	50 ft
MINIMUM YARDS			
Front Yard	None	20 ft (See Section 9.6)	10 ft
Interior Side Yard	None	20 ft[4] (See Section 9.6)	10 ft
Corner Side Yard	None	20 ft (See Section 9.6)	10 ft
Rear Yard	None	20 ft[4] (See Section 9.6)	10 ft

CITY OF PARK RIDGE, ILLINOIS TABLE 7: SPECIAL PURPOSE DISTRICTS YARD AND BULK REGULATIONS		
BULK REGULATION	EB	
	EB-CZ[1]	EB-TZ[3]
MAXIMUM BUILDING HEIGHT[5]	45 ft	n/a
MAXIMUM LOT COVERAGE	30%	n/a
MINIMUM OPEN SPACE	40%	n/a
MINIMUM YARDS		
Front Yard	10 ft	35 ft (See Section 9.6)
Interior Side Yard	10 ft	40 ft (See Section 9.6)
Corner Side Yard	10 ft	35 ft (See Section 9.6)
Rear Yard	10 ft	40 ft (See Section 9.6)

CITY OF PARK RIDGE, ILLINOIS TABLE 7: SPECIAL PURPOSE DISTRICTS YARD AND BULK REGULATIONS	
BULK REGULATION	S
MAXIMUM BUILDING HEIGHT[5]	35 ft
FLOATING ZONE MAPPING LOCATION	May be designated only within existing B-3 District
MINIMUM YARDS	
Front Yard	10 ft
Interior Side Yard	10 ft
Corner Side Yard	10 ft
Rear Yard	20 ft

CITY OF PARK RIDGE, ILLINOIS TABLE 7: SPECIAL PURPOSE DISTRICTS YARD AND BULK REGULATIONS	
BULK REGULATION	P
MAXIMUM BUILDING HEIGHT[5]	No structures; parking lot at existing grade
MAXIMUM LOT COVERAGE	90%
MINIMUM LOT AREA	6,500sf
MINIMUM YARDS	
Front Yard	10 ft
Interior Side Yard	4 ft
Corner Side Yard	10 ft
Rear Yard	4 ft

FOOTNOTES: TABLE 7

[1] In the OS District and the H-TZ-2 and EB-CZ Sub-Districts, yard regulations only apply to structures.
[2] Modifications within the H District are subject to the provisions of Section 9.5 of this Section.
[3] Any surface parking lots located within the H-TZ-1 Sub-District must meet landscaping and screening requirements of Section 13.8 (Parking Lot Landscaping) and 13.9 (Parking Lot Perimeter Landscaping). The H-TZ-1 and EB-TZ Sub-Districts shall provide screening as required by Section 13 (Landscaping and Screening).
[4] Interior and rear yard requirements for the H-TZ-1 Sub-District are applicable only when the sub-district boundary is directly adjacent to a residential district.
[5] All appurtenances must meet building height requirements.

9.4 GENERAL STANDARDS OF APPLICABILITY

A. Temporary Uses

See Section 10.4 (Temporary Uses) for standards governing temporary uses.

B. Accessory Buildings, Structures, and Uses

See Section 11.4 (Accessory Buildings, Structures and Uses) for standards covering accessory buildings, structures and uses. Attached garages shall not be considered an accessory structure but shall be subject to the requirements of Section 11.4.F.2 (Attached Garages).

C. Permitted Encroachments

See Section 11.5 (Permitted Encroachments) for standards governing encroachments.

D. Environmental Performance Standards

See Section 11.6 (Environmental Performance Standards) for standards governing environmental performance standards.

E. Off-Street Parking and Loading

See Section 12 (Off-Street Parking and Loading) for standards governing off-street parking and loading.

F. Landscaping and Screening

See Section 13 (Landscaping and Screening) for standards governing landscaping and screening.

G. Signs

See Section 14 (Signs) for standards governing signs.

9.5 MODIFICATIONS WITHIN HOSPITAL SPECIAL PURPOSE DISTRICT

Any changes within any sub-district within the Hospital District shall be subject to the following provisions:

A. Use Change

A use change within the Hospital District, whether a permitted or special use, which does not require any exterior changes, shall be subject to the following provisions:

1. When a use change occurs within the Hospital District to a use designated as permitted within Table 6: Special Purpose Districts Permitted and Special Uses, such use change shall be subject to an administrative site plan review (Section 4.5).

2. When a use change occurs within the Hospital District to a use designated as a special use within Table 6: Special Purpose Districts Permitted and Special Uses, such use change shall be subject to the special use procedures of this Ordinance (Section 4.6).

B. Interior Building Modifications

Any interior remodeling, which does not affect any exterior portion of the structure or increase the bulk of the building or structure in any manner, shall be subject to an administrative site plan review (Section 4.5) prior to approval of a building permit.

C. Additions and New Construction

1. All additions and new construction in any part of the Hospital District shall be subject to site plan review (Section 4.5) prior to approval of a building permit. This shall not include normal maintenance and incidental repair or replacement, which is subject to Paragraph D below.

2. Any additions to a structure used for a special use, or for new construction of a special use, as designated within Table 6: Special Purpose Districts Permitted and Special Uses, shall be subject to the special use procedures of this Ordinance (Section 4.6).

3. If any addition or new construction meets certain bulk thresholds as described below, such additional or new construction shall be shall be subject to the special use procedures of this Ordinance (Section 4.6), regardless of whether the use is considered permitted or special use as designated within Table 6: Special Purpose Districts Permitted and Special Uses. The thresholds are as follows:

a. Any addition that increases the bulk of an existing structure by ten percent (10%) or ten-thousand (10,000) square feet, whichever is less.

b. Any new construction of twenty-thousand (20,000) square feet or more.

c. Any new addition that increases building height, or any new construction, over fifty (50) feet or four (4) stories, whichever is less. This is applicable regardless of the increase in bulk as described in Paragraphs a or b above.

d. Any reconfiguration of circulation with the Hospital Core Zone Sub-District, which affects drop-off and pick-up areas for both patients of the hospital and supplies, such as emergency room drop-off areas and loading docks, regardless of size. This shall not include temporary changes in the location of drop-off and pick-up areas due to on-site construction. Temporary changes in location shall not require a special use approval.

As stated in Paragraph 1 above, additions and new construction that are below these thresholds shall be subject to site plan review (Section 4.5) prior to approval of a building permit.

D. Maintenance and Repair of Structures

Normal maintenance and incidental repair or replacement on any building or structure within the Hospital District, including repair of surface parking lots, shall be subject to an administrative site plan review (Section 4.5). Normal maintenance and incidental repair or replacement shall not create an increase in the bulk of the building or structure in any manner.

Advocate Health and
Hospitals Corporation

Applicant

Application for Special Use

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Perspective of Existing and Proposed
Building Elevations and Floor Plans
Site Plan
Roof Light Pole Diagram
Traffic & Parking Analysis
Photos of Existing Views

TAB 1

Special Use Application

City of Park Ridge

Community Preservation and Development Department . 505 Butler Place . Park Ridge, IL . 60068
Phone: (847) 318-5291 . Fax: (847) 318-6411 . www.parkridge.us

Case Number: _____

Subject Property Information:

Address: 1925 W. Dempster Street Zoning District: H-TZ-2

Legal Description (can attach separate sheet): (See the legal description attached hereto as Exhibit "A").

Applicant Information:

Name: Advocate Health and Hospitals Corporation Phone: 847-723-2210

Address: 1775 W. Dempster Street, Park Ridge, IL 60068 E-mail: roberto.orozco@advocatehealth.com

Owner Information:

Name: Advocate Health and Hospitals Corporation Phone: 847-723-2210

Address: 1775 W. Dempster Street, Park Ridge, IL 60068

Summary of Proposed Special Use (refer to Section 4.6 of the Zoning Ordinance): The proposed special use is a two-level vertical expansion to the existing four-level West Parking Facility at Advocate Lutheran General Hospital. The new levels will add 272 parking spaces to the West Parking Facility and increase the total number of parking spaces at this facility to 807.

I hereby certify, as the undersigned applicant, that the above statements and attached documentation are true and correct to the best of my knowledge.

Signature of Applicant: Roberto Orozco
Planning and Design Manager
Advocate Lutheran General Hospital

Date: 9/8/2016

Revised 12/2008

GREEN SECURELINK CHAIN AND GREEN DIAMOND DISAPPEAR WHEN COPIED. HEAT SENSITIVE RED LOCK DISAPPEARS WHEN HEATED

49367

O'HALLORAN KOSOFF GEITNER & COOK, LLC
ATTORNEYS AT LAW
OPERATING ACCOUNT
650 DUNDEE ROAD, FOURTH FLOOR
NORTHBROOK, ILLINOIS 60062-2799
(847) 291-0200

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9/6/2016

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City of Park Ridge
505 Butler Place
Park Ridge, IL 60068

MEMO 1925 W. Dempster St.
Park Ridge, IL 60068/11928-4

AUTHORIZED SIGNATURE

⑈049367⑈ ⑆071000486⑆ 128175⑈

O'HALLORAN KOSOFF GEITNER & COOK, LLC/OPERATING ACCOUNT

49367

City of Park Ridge $500.00 MMA

1925 W. Dempster St.
Park Ridge, IL
11928-4

O'HALLORAN KOSOFF GEITNER & COOK, LLC/OPERATING ACCOUNT

49367

PRODUCT SSLT103 USE WITH 91663 ENVELOPE Deluxe Corporation 1-800-328-0304 or www.deluxe.com/shop

TAB 2

O'HALLORAN KOSOFF GEITNER & COOK, LLC
ATTORNEYS AT LAW
EDENS CORPORATE CENTER
650 DUNDEE ROAD, FOURTH FLOOR
NORTHBROOK, ILLINOIS 60062
PHONE (847) 291-0200
DIRECT DIAL (847) 291-0203
FAX (847) 291-9230

Sender's email:
manderson@okgc.com
www.okgc.com

Mr. Jim Testin, Zoning Administrator
Planning and Zoning Commission
City of Park Ridge
505 Butler Place
Park Ridge, Illinois 60068

September 9, 2016

Re: Advocate Health and Hospitals Corporation, Petitioner
Application for Special Use, Two Level Vertical Expansion of West Parking Facility

Dear Mr. Testin:

Enclosed is an Application for Special Use (the "Application") for your transmittal to the Planning and Zoning Commission of the City of Park Ridge (the "Plan Commission") for a public hearing pursuant to the provisions of the Zoning Ordinance of the City of Park Ridge (the "Zoning Ordinance"). Advocate Health and Hospitals Corporation (the "Petitioner") is seeking permission to add two levels of parking and approximately 272 additional parking spaces to the West Parking Facility located at 1925 W. Dempster Street (the "Parking Facility").

The Petitioner is seeking several exceptions to the requirements of the Hospital Transition Zone 2 (H-TZ-2) and the Zoning Ordinance, including the following: 1) the building height of the Parking Facility will be approximately 71 feet above the street sidewalk which exceeds the maximum building height of 50 feet in the H-TZ-2 Zoning District; 2) the parking module width will be 54 feet 6 inches with 9 foot wide parking stalls which is less than the required parking module width of 58 feet but the parking stalls will be wider than the required 8 foot 6 inch required width (please note that this parking module width was approved by the City of Park Ridge in 2003 when the Parking Facility was originally approved); and 3) the maximum height of the light poles on the roof of the Parking Facility will be 18 feet which exceeds the 16 foot height limitation for non-residential zoning districts under the Zoning Ordinance.

The Zoning Ordinance provides that the Plan Commission has authority to recommend approval of the Special Use sought by the Petitioner to the City Council of the City of Park Ridge (the "City Council") after appropriate findings of fact that are based upon evidence to be presented at the required public hearing. In that regard, we have enclosed the Petitioner's

Statement in Support of Application for Special Use for your information and transmittal to the Plan Commission and then to the City Council.

We understand that you will provide for publication of the required legal notice in an appropriate Park Ridge newspaper at least fifteen (15) days prior to the date of the public hearing before the Plan Commission. We have been advised that the public hearing on the Application is tentatively scheduled to take place at 7:00 p.m. on Tuesday, October 11, 2016, in the City Council Chambers located at 505 Butler Place in Park Ridge, Illinois.

We have enclosed our firm's check in the amount of $500.00 which represents payment of the $400.00 filing fee, the $100.00 zoning sign fee. We are prepared to send a notice of the public hearing to the property owners within two hundred fifty (250) feet of the subject property, as required by the Zoning Ordinance. Please advise us when such notice should be mailed to such property owners.

Respectfully submitted,

O'Halloran, Kosoff, Geitner & Cook, P.C.,
Attorneys for Advocate Health and Hospitals Corporation

By: _____
Mark M. Anderson

MMA:
Enclosures
cc: Mr. Roberto Orozco
Mr. Pier Panicali
Mr. Phil Hutchison
Mr. Mike Shrake
Mr. Jonathan Past
Mr. Donald Matthews

TAB 3

DESMAN
Design Management

ARCHITECTS
STRUCTURAL ENGINEERS
PLANNERS
PARKING CONSULTANTS
RESTORATION ENGINEERS
GREEN PARKING CONSULTING

September 9, 2016

City of Park Ridge
Planning and Zoning Commission
505 Butler Place
Park Ridge, IL 60048-4182

Re: Application for Special Use
Advocate Lutheran General Hospital – West Parking Facility Vertical Expansion

Dear Commission Member:

Thank you for reviewing our Special Use application for the proposed two- level vertical expansion to the existing four-level West Parking Facility at Advocate Lutheran General Hospital. We are applying for a Special Use because the addition increases the bulk of the existing structure by over 10, 000 square feet as established in section 9.5, C, 3, a. The vertical expansion adds 96,000 square feet to the existing 198,700 square foot facility.

I am enclosing our site plan which shows the West Parking Facility located north of the existing Center for Advanced Care and south of the existing Cancer Survivorship Center. The site is directly south of Dempster Street, between Vernon Avenue and Luther Lane. The property is zoned Hospital Transition Zone 2 (H-TZ-2).

We respectfully request the Commission to approve exceptions to the building height, parking bay dimensions and the light pole heights of the proposed expansion.

Height Exception:

Zoning Ordinance Section 9.3, Table 7 establishes the maximum building height to be 50 feet. Existing buildings on the hospital south campus such as the main Hospital, the Parkside Center, etc., are over this limit.

Attached are drawings A201 and A202 which show the proposed building elevations. We are proposing that the height of the main exterior roof parapets to be a maximum of 61 feet above the street sidewalk along all three street frontages (67 feet on the south façade facing the Center for Advanced Care), and the stair and elevator tower roof parapets to be approximately 71 feet above the street sidewalk. The proposed height of the expansion will allow the new floors to meet the 7’-6” vertical clearance required by City of Park Ridge Zoning Ordinance (reference Section 12.8, A, 2).

20 N. CLARK STREET, 4th FLOOR, CHICAGO, IL 60602 www.DESMAN.com PHONE 312.263.8400 FAX 312.263.8406
BOSTON CHICAGO CLEVELAND DENVER FT. LAUDERDALE HARTFORD NEW YORK PITTSBURGH WASHINGTON D.C.

Parking Bay Exception:

Zoning Ordinance Section 12.8, Figure 11 requires for 60 degree parking with 8'-6" wide stalls, a parking module width of 58'-0". This bay width is overly generous for the level of comfort required and is substantially over national parking standards. We are proposing that the parking module be reduced to 54'-6" (See attached drawings A101, A102 and A103).

Attached is a copy of pertinent sections of the "Guidelines for Parking Geometrics" dated 2011 published by the National Parking Association (NPA). It should be noted that on page 13, NPA recommends stall widths of 8'-9" to 9'-0" for moderate to higher turnover visitor parking such as medical visitors.

In addition, Figure 3 on page 14 recommends for 60 degree parking, module of 54'-0" for a high level of comfort.

The paragraph above Figure 3 states:

> "The high level would be used in suburban settings with high turnover and infrequent users. Adding more than three feet results in excessive aisle width not utilized by parkers, thus resulting in wasted space."

DESMAN requests a zoning exception to the required parking module width of 58'-0" with the understanding that we will use 9'-0" wide parking stalls which exceeds the minimum stall width requirements by zoning. Our proposed parking module and stall width are at the highest level of user comfort recommended by NPA.

These parking exceptions were approved by the Planning and Zoning Commission in 2003 and are already incorporated into the West Parking Facility. If these same exceptions are not approved for the vertical expansion, it will create extreme hardship because the expansion required vertical extension of the existing structural columns and bearing walls.

Light Fixture Mounting Height Exception:

The Zoning Ordinance does not specifically address the roof lighting for a multi-level parking facility. However Section 11.3, D, 1 indicates that lighting fixtures shall not exceed sixteen (16) feet in height in Non-Residential districts.

DESMAN recommends placing the light poles on interior columns at roof level as shown on the attached A301. The light fixtures would be mounted a maximum of 18'-0" above the roof of the parking facility. The fixtures will be metal halide with a severe cut-off illumination pattern and would result in less than one-half footcandles of light at the exterior parapets.

The proposed special use will not require changes to the existing off-street parking and loading facilities plan, existing landscape, screening and open space plan, existing utilities and storm water drainage plans nor existing exterior sign plans.

We respectfully request the Commission to approve the special use and exceptions to the building height, parking bay dimensions and the light pole heights. Parking is a permitted use as the site is zoned H-TZ-2, and the added parking is necessary to satisfy the parking demand of the hospital.

We submit that the establishment, maintenance and operation of the special use, in the specific location proposed, will not endanger the public health, safety, morals or general welfare of any portion of the community. In fact, the proposed expansion should improve the health and welfare of the community by providing much needed patient and visitor parking in close proximity to Advocate Lutheran General Hospital and its related health care facilities.

We also submit that the proposed special use is compatible with the existing parking facility, adjacent properties and other property within the immediate vicinity and the special use, in the specific location proposed, is consistent with the spirit and intent of the Zoning Ordinance and the Comprehensive Plan.

Thank you for your consideration.

Sincerely,

DESMAN

Philip Hutchison
RA, Associate

Guidelines for Parking Geometrics

A Publication of the National Parking Association's Parking Consultants Council

Parking Geometrics Committee:
Mary S. Smith, Principal Author and Chair
Matthew Feagins
Dewey Hemba
David N. LoCoco
Christian R. Luz
David R. Marshall

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Foreword

This publication is produced by The National Parking Association (NPA), the nation's leading parking trade group advancing the interests of the private and public sector in parking technology, sustainable mobility, certification, advocacy, research and education. Founded in 1951, NPA represents all facets of the parking industry.

NPA thanks the architects, engineers, designers and parking consultants who comprise its Parking Consultants Council (PCC) for their expertise and insight in developing this publication.

PCC members provide the following services to the industry:

- Parking, Planning and Surveys
- Economic Feasibility
- Functional Planning
- Environmental Impact Statements and Studies
- Architect/Engineer Services
- Parking Control Systems and Graphics
- Design/Construct Services
- Private/Public Financing
- Research Activities
- Expert Witnesses and Traffic Studies

Guidelines for Parking Geometrics is written for parking and transportation professionals involved in the planning, design, construction, operation, management or approval of parking facilities. It should not be considered as inclusive of technical requirements or industry standards. The material contained herein is a result of the diverse opinions of various consultants involved in the design and planning of parking facilities. It is for informational and discussion purposes only and is not to be considered as legal advice. Neither the National Parking Association nor the Parking Consultants Council assume any responsibility for damages arising from the use or application of material in this report.

For additional NPA publications, go to the Resource Center at www.NPApark.org or call **1-800-647-PARK.**

This publication is dedicated to the memory of Richard S. Beebe (1930-2010), one of the founders of the Parking Consultants Council. Dick was a principal author or significant contributor to many PCC publications, including virtually all those addressing parking dimensions. He will be sorely missed.

Introduction

This report is intended to serve as a guide to those involved in the planning, design, construction, operation, management or approval of parking facilities. This would include persons associated with municipalities; hospitals; colleges; universities; airports; other government agencies; developers and others responsible for the provision and/or supervision of parking spaces for public use.

Preparation of this report has been undertaken by the Parking Consultants Council of the National Parking Association to provide a basis for the review of recent developments in parking stall layout standards. The principal objective of these guidelines is to provide uniformity in those design policies affecting parking stall layouts in typical situations. It is the intent of the Parking Consultants Council to distribute this report to various professional associations, trade organizations and government agencies involved in various aspects of vehicular parking and to seek adoption of these recommendations as a national consensus guideline for parking stall layouts and dimensions.

The Guidelines for Parking Geometrics that follow supersede the previous edition published by NPA in April 2002.

Historical Development

Parking stall layouts have historically been influenced by the size of the automobile. Parking designers have found it helpful to select a theoretical vehicle size and then determine the stall, aisle and other dimensions to accommodate the needs of this “design vehicle.” Parking stall widths increased from 8’4” in the late 1950s and early 1960s to as wide as 10’0” in the early 1970s. At that time, the design vehicle for parking facilities was 7’ by 19’.

Parking modules, the out-to-out dimension of two parked vehicles and the drive aisle between, have also followed vehicle sizes. In the 1960s, a 60’0” module was common for 90-degree parking. As vehicle sizes reached their zenith in the early 1970s, that module increased to 62’0” to 64’0”. However the Arab Oil embargo of 1973 lead to the implementation of Corporate Average Fuel Efficiency (CAFE) standards by the Federal Government. The initial response was the importation of very small cars, resulting in vehicle sizes being very polarized, that is, very large and very small cars.

The Small Car Only (SCO) stall was invented to take advantage of the difference as it was difficult for large cars to maneuver into SCO stalls which typically were 7’6” x 15’0”. Some municipalities allowed 50% or more of the stalls in parking facility to be SCO. American manufacturers then began to downsize large cars and develop larger small cars more to the taste of Americans. The typical stall widths declined to 9’ and the module returned to 60’.

In the 1980s, the pendulum representing car sizes was “hanging in the middle” of the market, with more than two-thirds of the market closely clustered around the border between small and large. There was further a trend to reduce stall widths back to 8’6” as well as reduce modules due to the downsizing of large cars, but at the same time many began to question the viability of SCO stalls.

In the 1990s the pendulum swung back somewhat toward larger vehicles, albeit not nearly as large as the vehicles of the 1960s. Also, the increasing use of pickups, vans and sport utility vehicles (designated Light Trucks by the Federal Government and denoted LTs herein) for personal, everyday transportation caused many to once again revisit the question of appropriate parking dimensions. Sales of LTs peaked at 55% in 2005. However, increases in gas prices and concerns regarding reliance on foreign oil, global warming and other environmental issues, converged into a shift to a new vehicle type, known as crossovers. These vehicles have both SUV and car-like qualities, but are classified as LTs by the Federal Government. From a parking perspective, they are as wide as SUVs and large pickups, but shorter. The 9’ stall width then became more common again.

It is clear, historically, that manufacturers will figure out how to give Americans the larger cars they want. In 2004, an EPA study lamented that all improvements in fuel efficiency since 1981, when manufacturers met the initial CAFE standard, have gone towards increasing size and performance, rather than towards better fuel efficiency. In the summer of 2008, gas prices spiked to $4/gallon and there was a clear shift in sales to smaller vehicles. By fall, gas prices fell, and the overall percentage of small vehicles in 2008 sales was actually a little lower than in 2006 or 2007. (For further discussion of trends in vehicle sizes, see the Appendices A-C.) The Cash for Clunkers Program in the summer of 2009 resulted in a lot of trade-ins of older SUVs and pickups but annual sales data indicates that many of the replacement vehicles were crossovers, rather than cars. In 2010, there was a surprising shift back towards light trucks from cars, with all categories within LT increasing far more than cars when compared to 2009 sales.

In 2011, new CAFE standards will take effect, with a projected increase in fuel efficiency overall of 40% by 2015, as well as specific requirements to reduce emitted greenhouse gases. The rules, however, set average fuel efficiency standards for vehicle segments, measured by "footprint", the area circumscribed by the points at which the tires meet the ground. Because of this, a simple shift to smaller cars for any one manufacturer will result in a higher required average efficiency for that fleet. Therefore, manufacturers are being forced to improve fuel efficiency of all vehicles, including subcompact cars. Some of the major gains in fuel efficiency will result from alternative fuels, such as hybrid electric/gas and plug-in electric vehicles, as well as diesel engines in pickups and large SUVs, rather than **primarily** from vehicle downsizing as occurred in the late 1970s. It is therefore very difficult to determine if vehicle sizes will decline **significantly** as a result of the new CAFE standards.

The obvious reason for adjusting parking dimensions to vehicle size is economics. The measure of efficiency of a parking design is the square foot of lot or floor area per parking stall. Forty years ago, the rule of thumb for an efficient design was approximately 325 to 350 sq ft per stall. As downsized parking dimensions and SCO stall layouts came into common practice, 300 sq ft per parking space became a realistic goal, and some designs with extensive SCO stalls achieved efficiencies of 270 sq ft per space or better. *Today, new designs typically average around 325 sq ft per space*.

Economics is not the only reason, however, for tailoring parking stall sizes to vehicle sizes. At many land uses, there will be as much or more square footage of parking as there is in the building which generates the need for parking. A reduction in land area or building square footage devoted to parking allows other important land planning goals such as increased density or conversely, increased open space to be achieved. One of the most important strategies of "smart growth" planning is to reduce parking areas to the minimum necessary, to facilitate better connections between land uses and reduce vehicular trips. And above all, concerns for sustainability are driving smarter parking development. Our natural environment is certainly enhanced by minimizing vehicular pavement area. Also, with a decreased pavement area devoted to parking, available resources can be allocated to more sustainable design details.

As of this writing there has only been a minor change in the size of vehicles from the 2002 edition of this publication; this change only affects stall lengths and modules, despite some fairly significant shifts in the popularity of pickups, SUVs and crossovers. It is not yet possible to project what vehicle sizes will be in 2015 much less beyond. As the average age of vehicles on the road in the US is approaching ten years, the dimensions recommended in this document should be appropriate through the end of the "teens". This document has been updated and published, however, to assist communities who may still have outdated dimensions from the 1970s in zoning ordinances. We are confident that vehicles will not get any bigger, much less return to the dimensions of the 1970s; we are equally confident that we will not see 50% small cars again, at least in the foreseeable future.

Definition of Design Vehicle

One generally accepted approach to selecting the design vehicle is to use the dimensions of the 85th percentile vehicle in the range of vehicles from smallest (0 percentile) to largest (100th percentile).[1] Using the 50th percentile vehicle size would be mathematically correct as a median; however, a higher percentile gives a more conservative and more spacious approach to parking stall design. This provides adequate space for the random parking of any vehicle mix. The use of the 85th percentile vehicle also parallels the design principle of traffic engineering in which roadways are designed for the 85th percentile peak traffic volume. Designing for the absolute highest volume means that 99% of the time there is excess capacity. Similarly, use of the 85th percentile in parking design provides a balance between comfort and economy.

In 1983, the design vehicle was determined using R. L. Polk data on all vehicles registered in the US.[2] Since that time, design vehicles have been based on sales in each calendar year, for small cars, large cars and all cars, using data published annually by *Automotive News*. It should be noted that the actual 85th percentile vehicle changes a little every year; it is not appropriate to change the design vehicle with every minor change in the 85th percentile vehicle among sales. Since 1987, the 85th percentile vehicles for LTs have also been monitored and a composite design vehicle considering both cars and LTs has also been determined. As discussed in Appendix B, the impact of LTs on the size of vehicles commonly found in public parking facilities was negligible prior to that time. In 1987, the composite vehicle was the same length but 2" wider than the design vehicle for cars alone; in 2010, the composite vehicle is 6" wider and 9" longer than the car, showing the overall impact of LTs on the vehicle mix.

The PCC has adopted the definition of vehicles by classes developed by Roti and Bolden[3], as further discussed in Appendix A. This approach facilitates a better understanding of vehicle trends than either manufacturer labels (compact, intermediate, etc.) or simply "small" and "large," the stratification most other studies employ. Small vehicles comprise vehicle classes 5-7 while large vehicles comprise classes 8-11. Generally, small vehicles will not exceed 5'9" by 15'0" under this definition. The 85th percentile vehicles in selected years are presented in Figure 1, on the following page.

In 1983, when 36% of cars on the road were classified as small, the 85th percentile vehicle among all cars was 6'3" by 17'2". By 1993, large cars had become significantly smaller, resulting in an 85th percentile vehicle for all cars of 6'1 by 16'8". This held through 1998. Since then, the 85th percentile for cars has gotten shorter, reaching 16'4" in 2010. Conversely, the 85th percentile for small cars is actually longer than in 2003; large cars have declined in length, while increasing a little in width. Overall, the 85th percentile vehicle for cars has been the same width (6'1") for almost 20 years, but its length has decreased to 16'4". It is very interesting however that over that same period, the 85th percentile vehicle for small cars has gotten larger, and the 85th percentile vehicle for large cars has gotten smaller, indeed significantly shorter down from 18' in 1987 to 16'4 in 2010.

It is interesting to note that the 85th percentile vehicles for each of the LT segments are all wider than that for cars and have been very consistent in width since first evaluated in 1987. The length has increased in that period. The exception to the stability of size among LTs is crossovers; at the introduction of the first crossovers in 1996, 80% of crossovers met our definition of small; in 2010 only 4.4% of crossovers were small. This parallels the significant decline in sales of small LTs overall (from 41.9% in 1987 to only 3.5% in 2010), even as the overall number of LTs has grown. The 85th percentile vehicle for SUVs is considerably shorter than the ones for vans and pickups, and the 85th percentile crossovers is yet shorter. As a result, the overall 85th percentile vehicle, including both

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[1] Smith, Mary, 1985. "Parking Standards" Parking Vol. 24 No 4 (July August): 55-60
[2] Ibid
[3] Parking Standards Design Associates, A Parking Standards Report March 10, 1971.

cars and LTs is 3” wider but only 1” longer than that (for cars only) in 1983. Again this is the 85th percentile vehicle in the range of all cars, pickups, vans, sport utility and crossover vehicles.

Figure 1: 85th Percentile Vehicles

	On the Road, 1983 Smith 1985	**1987 Sales** PCC 1989	**1993 Sales**	**1998 Sales**	**2003 Sales**	**2010 Sales**
Small Cars	5'7" X 14'8"	5'8" X 14'8"	5'8" X 14'9"	5'8” X 15'2"	5’8” X 14’10”	5’9” X 15’0”
Large Cars	6'7" X 18'4"	6'6" X 18'0"	6'2" X 17'0"	6'3" X 16'9"	6’2” X 16’8”	6’1 X 16’8”
All Cars	6'3" X 17'2"	6'2" X 17'0"	6'1" X 16'8"	6'1” X 16'8"	6’1” X 16’6”	6’1” 16’4”
% Small Cars	36.0%	52.1%	42.0%	33.9%	32.8%	29.8%
Pickups		6'7" X 17'6"		6'8" X 18'9	6’8” X 18’11”	6’8” 18’8”
Vans		6'8" X 17'8"		6'8" X 18'3"	6’8” X 18’8”	6’7” X 18’8”
Sport Utility		6'7" X 15'4"		6'7" X 17'1"	6’7” X 17’2”	6’6” X 17’3”
Crossovers		Not Applicable		6’0” X 15’0”	6’4” X 15’8”	6’7” X 16’0”
% Small		41.9%		12.1%	6.7%	3.5%
Composite	(Cars + LT)	6'4" X 17'0"		6'7" X 17'1"	6’7” X 17’2”	6’7” X 17’1”
% Small		48.8%		23.6%	19.0%	17.1%

Category	**85th Percentile Vehicle (2010 models)**
Small Cars	Subaru Impreza
Large Cars	Chevrolet Impala
All Cars	Cadillac STS
Pickups	Chevrolet Sierra 2500
Vans	Chevrolet Express G 2500
Sport Utility	Ford Expedition
Crossovers	Acura MDX
Composite (cars + LTVU)	Chevrolet Traverse

Source: Walker Parking Consultants Analysis of *Automotive News* Market Data, 1984-2010.

As it seems likely that vehicles will get a little smaller in the next few years, the PCC has reduced the length of its design vehicle by 2” to reflect the change in the 85th percentile vehicle from 2002 to 2010. Therefore, the design vehicle adopted by the Parking Consultants Council is 6’7’ x 17’1”.

Parking Geometrics Guidelines

The critical elements of the dimension question are the allowance for width of the stall relative to width of vehicle and the ease of both accessing the vehicle by pedestrians, and maneuvering the vehicle into and out of the parking stall. For the latter, there is an interrelationship between the aisle and stall width. Within reasonable limits, the wider the aisle, the narrower the stall may be, and vice versa, with the same comfort of turning movement. In fact, standards dating to the 1950s have tied modules (the combined dimension of two rows of parked vehicles and the aisle between) to stall widths, decreasing the former as the latter increase.

When designing basic parking geometry for any type of parking facility (surface lot or structured parking), it is important to account for fundamental parking criteria. Some of these criteria include: site location, site dimensions, site constraints (trees, power poles, buildings, etc.), surrounding streets, traffic flow, parking demand generators, local zoning and landscaping mandates, and surface conditions.

Most importantly, parking dimensions should be customized to the needs of the users. It is obvious that stalls with high turnover rates, such as at convenience stores, should have greater clearances than in low turnover situations. Likewise, where there are likely to be more elderly people and/or individuals under stress, such as visitors and out-patients at hospitals, a more comfortable design may be more appropriate than might be used at a facility serving employees or fans at a football game. A self-park structure in a downtown location in a large city can be designed with tighter, less generous dimensions than a structure located in an up-scale suburban mall or in a smaller, rural community. It is also important to note that vehicle sizes no longer vary as much by region and locality as they did in the past. Sport utility vehicles are just as popular in California and Hawaii as in rural areas and the Snowbelt. The only region where there appear to be significant differences in vehicle sizes is the southwest, where there is a disproportionate number of large pickups.

For our purposes, user types may be divided into two principal groups, “long-term” (parking duration of three hours or more) and “short-term” (less than three hours).

Long-Term Parking

Long-term parking is usually associated with all-day, employee parking. Employee parking facilities do not need to provide the same level of comfort as a short-term parking facility because they typically have a lower turnover rate of parking stalls – once, perhaps twice per day. The employee user quickly becomes familiar with the parking facility and usually parks in the same general location most days. In addition, at peak arrival periods, users tend to park every other stall, allowing late arriving parkers to fill the intervening stalls. Speed of operation during peak arrivals is thus provided without generous dimensions. These factors allow the parking layout to have a tighter configuration than that of a short-term facility.

There are other types of long term parkers with a variety of user concerns. Event parkers usually park for three to five hours, and the location will turn over only one time. Event parkers are often unfamiliar with the parking facility. In many cases, large venue event parking locations are “loaded” with the assistance of parking attendants. Fast loading techniques, sometimes called “directed-parking”, are most frequently employed whereby vehicles are directed to drive across the lot and nearly straight into stalls. Event-type parking thus does not require excessively wide drive aisles since the vehicles basically use the entire parking lot as the drive aisle. During exiting, of course, reasonable aisles are required. However, the controlling factor on speed of a “dump” is generally the merging onto the public streets; stall and aisle width is not a critical issue. Again, the size of the overall site as well as the parking surface condition dictates the actual parking bay dimensions and geometry. Other types of long-term parkers include hotel guests and multi-day parkers at airports. Although often less familiar, the extremely low turnover again argues for a narrower stall width. (This assumes that users do not have to drag their luggage between the vehicles to reach the airport).

Short-Term Parking

Short-term parking facilities require a greater level of parking ease and convenience because these facilities usually serve a patron whose trip purpose is of short duration, and who is perhaps unfamiliar with the parking facility. It is desirable to create an “easy-in/easy-out” parking layout to maximize the turnover of the parking stall within the location. Faster turnover means greater numbers of people are served through better utilization of parking stalls. Among other things, congestion is reduced by getting vehicles into and out of stalls more quickly.

Stall Dimensions

It has generally been found that a stall that is wide enough for comfortable door opening will be acceptable for vehicle maneuvering if the associated aisle is properly sized. As a result, parking stall widths have generally been based on required door opening clearances.

Door opening clearances (distance between vehicles) should range from 20 inches in low turnover situations to as much as 30 inches in very high turnover situations.[2] Combining these dimensions with the current composite design vehicle of 6'7" width results in a range of stall widths of 8'3" to 9'1". Due to the inconvenience of the latter dimension, and the common acceptance of 9'0" as a comfortable stall width, we limit our upper end recommendation to 9'0". Figure 2 presents guidelines for appropriate stall width.

The turnover or type of user does not affect the length of the stall. Many drivers, in fact, do not generally fully pull into a stall. Where the restraint on parking module is a wall, studies have found the **average** clear dimension from the front of the vehicle to the restraint is generally about 0'9". Adding 9" to the design vehicle length results in a stall length of 17'10".

Figure 2: Recommended Stall Widths

Typical Parking Characteristics	Recommended Parking Stall Width
Minimum Level of Comfort: Low turnover for employees, students, etc	8'3" to 8'6"
Medium Level of Comfort: Low to moderate turnover visitor stalls (office visitor parking, long term parking at airports, etc.)	8'6" to 8'9"
High Level of Comfort: Moderate to higher turnover visitor parking: retail, medical visitors; short term parking at airports, etc.	8'9" to 9'0"

In sum, parking stall width guidelines should consider the type of parker. We believe it is quite feasible that zoning requirements can be presented in a manner that will be flexible enough to allow efficient parking layouts while at the same time addressing the needs of the user as well as the concerns of the local officials. For example, dimensions for "customer" or public parking may be given in a table in an ordinance. However, for uses which are "predominately long term" or employee only parking, a specific reduction in stall width and/or module can be permitted by that same ordinance via a footnote to the table, with further clarification in a simple text sentence. An example of such language would be:

> Stalls shall be 9'0" wide except that 8'6" stalls may be employed for the following uses as defined herein: residential, industrial, general business offices, data processing/ telemarketing/operations offices, utility, and student or faculty/staff parking at hospitals and educational use campuses.

Module Dimensions

Parking designers in the U.S. use the term "module" for the combined dimension of two parked vehicles and the aisle between. To determine recommended modules, all vehicles parked in the facility are assumed to be design vehicles. The recommended size of the design aisle is then predicated on the turning movement of a design vehicle into a vacant stall, with design vehicles

parked on both sides and across the aisle. Trial and error originally determined parking modules. However, Edmund Ricker developed a series of equations, which modeled the movement of a vehicle into a parking stall[4]. Over the years these equations have been modified to better simulate the module/stall relationship.[5] Even so, field observations indicate that these equations are conservative, but they do help in determining relative aisle sizes for a similar level of comfort at various angles and the appropriate change in aisles and modules as vehicle sizes change. The combination of these equations and practical experience has resulted in the development of a set of module dimensions that provides an acceptable minimum level of comfort for the turning movement.

The "minimum" modules would be provided in very urban settings, with low turnover or valet parking, and where users are accustomed to and expect minimum geometrics. The high level would be provided in suburban settings, with high turnover, and infrequent users. Adding more than three feet results in an excessive aisle width not utilized by parkers, thus resulting in wasted space. Figure 3 presents recommended parking modules.

Figure 3: Recommended Parking Modules

Design Vehicle: 6'7" x 17'1"

	Module Width		
Angle of Parking (degrees)	**Minimum Level of Comfort**	**Medium Level of Comfort**	**High Level of Comfort**
45	46'6"	48'0"	49'6"
50	48'0"	49'6"	51'0"
55	49'6"	51'0"	52'6"
60	51'0"	52'6"	54'0"
65	52'6"	54'0"	55'6"
70	53'6"	55'0"	56'6"
75	54'6"	56'0"	57'6"
90	58'6"	60'0"	61'6"

The modules recommended in Figure 3 assume parking lot conditions without physical restrictions. When a positive vehicle restraint is not provided, such as in a shopping center parking lot, vehicles occasionally pull into the stall too far, impacting the aisle width in the adjacent module. This can be a particular problem in the "Snow Belt" when stall markings are obscured. Conversely, in parking structures, the walls or other vehicle barriers and protection from snow cover result in more accurate parking positions. Therefore, in parking structures or when a curb, wall or other physical guide/restraint is provided at most if not all stalls, the aisle width (and therefore the resulting module) can be reduced by one foot.

As noted previously, there is a relationship between the stall and module such that a wider stall width can have a tighter module for the same comfort of turn into stalls. A common rule of thumb is that for each additional inch of stall width, the module can be reduced three inches to maintain a similar level of comfort of turn into the stall.[6] Generally speaking, we prefer to keep modules as small as possible and hold stall (including door opening clearance) widths wider, because the public is more appreciative of a comfortable stall width with a modest decrease in maneuverability into the stall

[4] Edmund Ricker, 1948. *Traffic Design of Parking Garages.* First edition, 1948; Second Edition, 1957. Westport CT: Eno Foundation for Transportation. (Note: the Eno Foundation is now located in Washington DC.)
[5] Parking Standards Design Associates, A Parking Standards Report March 10, 1971.

[6] Smith, Mary, 1985. "Parking Standards" Parking Vol. 24 No 4 (July August): 55-60

module as compared to a wider module and narrower stall. Also, comfortable stall widths moderate the impact of small increases in vehicle sizes in the shorter term. The PCC does recommend that while the smaller module/larger stall width relationship be used to hold **equal** comfort for different stall widths, designers and localities should be afforded the freedom to choose a combination of minimum stall width /minimum modules or more comfortable stall widths and modules to meet the needs of any given circumstance.

The basic module presented in Figure 3, is a "wall-to-wall" or "out-to-out" dimension. A variety of other conditions may exist. Appendix D Figure D-1 presents common terminology and dimensional relationships for parking layout while Figure D-2 provides additional dimensions commonly needed in parking design.

Aisles

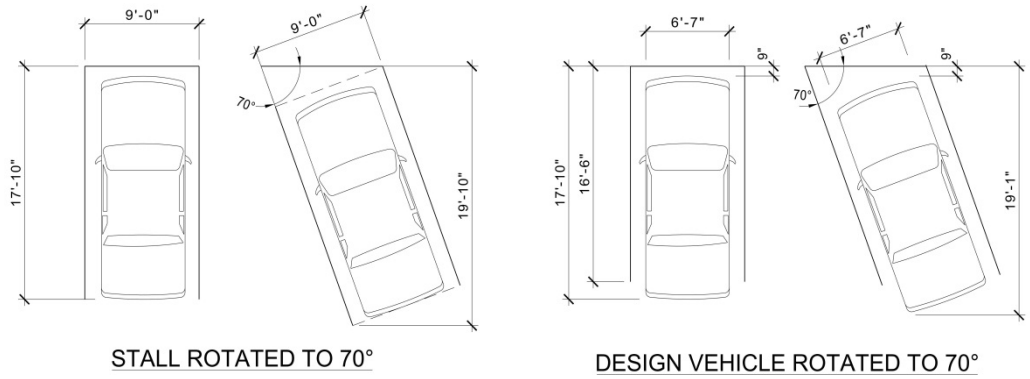
For at least forty years[7], it has been recommended that stall and aisle geometry for parking facilities should be based on rotation of the design vehicle to the desired angle rather than rotation of the stall dimensions.

In practical terms, the aisle is that space left when two vehicles are parked directly opposite each other. The real controlling factor on the aisle, and consequently on the comfort of the design, is the dimension between curbs, walls or other parking stall guides…which fundamentally is determined by the module constructed (adjusted by overhang of curb or wheel stop), not the nominal aisle.

The rotation of a stall to a particular angle is a theoretical exercise with no practical embodiment in the field. Some have argued that rotating the stall indicates the length of stripe required. A study by the British equivalent of the Transportation Research Board[8] clearly demonstrated that stopping the stripe short of the farthest corner of the vehicle encourages the parker to pull further into the stall than if the stripe extends out to the far corner of the rotated stall. Based on the British study, the PCC recommends stopping stall striping 16'6" measured perpendicular from the wall.

Rotating the stall to layout angled parking further results in a stripe line that extends beyond the far corner of the parked vehicle which then encourages drivers to park even more poorly. See Figure 4.

Figure 4: Rotation of Design Vehicle Vs Rotation of Stall



[7] Highway Research Board, Parking Principles, HRB Special Report 125, Washington D.C. Highway Research Board, 1971.
[8] Ellson, P B et al, 1969. *Parking: effect of stall markings on the positioning of parked cars*, RRL Rep LR 289, Crowthorne, Berkshire, UK: Road Research Laboratory (now Transport and Road Research Laboratory.)

For a 9’ x 17’10” stall rotated to 70 degrees, the dimension to the far corner of the stall rotated is 9” greater than the dimension of the design vehicle rotated. This misrepresents the aisle actually available to parkers and through traffic, and often results in a module that is 2x9”=1’6” wider than intended. With the increasing concern for sustainable design, this 1’6” extra strip of paving is pure waste. This effect does not occur with 90 degree parking, and often results in angled parking having an overly generous aisle; this, in turn, effectively discourages the use of angled parking because it will not be as efficient.

In particular, zoning ordinances that show only stall dimensions and minimum aisle often don’t allow anomalies to be noticed, such as the module for 60 degree, angled parking with one way traffic is greater than the module for 90 degree parking with two-way traffic, which clearly doesn’t make sense.

Stall/Aisle Encroachments

It is common in parking structures for columns to extend beyond the face of the bumper wall or vehicle restraint, and therefore into the module. Encroachments also occur in parking lots at light poles. The probability of having two design vehicles parked opposite each other at the column encroachment is less than 7 occurrences per 1000 (7/1000). This is because 84% of the anticipated vehicles using the stall are smaller than the design vehicle and because columns usually encroach into at most 30% of the stalls in any facility. Further, with appropriate minimum aisle widths, vehicles can still pass through; there is only a problem if a third design vehicle tries to park in one of the next stalls beyond. The probability of this happening is 1/1000. The actual probability is even lower, as many of the vehicles larger than the 85th percentile are extended length pickup trucks and vans, which are used for commercial purposes and infrequently parked in public facility.

Further, drivers of those vehicles are aware of the length of their vehicle, and would generally avoid parking at an encroaching column, particularly if there is a long vehicle parked opposite, unless it is one of the last available stalls in the facility. This can certainly be tolerated in any parking facility.

Therefore, it is recommended that columns, light poles, or other appurtenances be allowed to encroach into the module affecting up to 30% of the parking stalls. The encroachment should be limited to:

- a maximum combined reduction of 2’0” (i.e., 6” into stalls in one side of the aisle and 1’6” the other side) below the modules recommended in Figure 3; or
- 1’0” below the module if the 1’0” credit is taken for having vehicle restraints at every stall.

Column encroachments into the width of a stall are occasionally used in short span designs on the theory that if the column is clear of the door swing zone, the stall width is maintained. However, the turning movement into the stall may be constrained by the column; the clear space for turning into a typical stall between two design vehicles in the two adjacent stalls is the stall width plus at least 20”. To maintain the same clear space for turning movement into each stall, the stalls adjacent to walls, columns, or other obstructions should be widened at least 10”, not including the column dimension. See Figure 5.

Where circumstances require tight geometrics in short-span situations, every effort should be made to keep the columns at the back of the stalls in the zone 3-5 ft from the edge of the drive aisle to avoid interfering with door openings.

Conclusion

The sales of small vehicles dropped significantly in the 1990s when there was a general, slow upsizing of the American passenger vehicle. Towards the end of that decade there was a significant shift to large light trucks; the impact of that trend on parking dimensions has been moderated in the last few years by the popularity of crossovers. However, when the 85th percentile vehicle among sales is studied, it has been remarkably stable for more than a decade.

Despite recent assertions by the media that vehicles are getting smaller, when one compares 2010 sales with either 2004 when SUV sales were at their peak, or 2007 just before the recession, the shift in sales in 2010, was from SUVs and pickups to crossovers, not cars, and because the overall sales of all vehicles are down due to the economy, there has not been a significant change in the design vehicle.

In the near term, it is expected that new CAFE rules may reduce vehicle size a little in the next few years, but we believe individual consumers will choose vehicles that represent incremental shifts from one class to the next smallest, rather than a significant shift to very small cars. Historically, it is clear that manufacturers will figure out how to give Americans the large vehicles they want.

A rational approach to parking stall and module sizing can and does support moderate module dimensions for one-size fits all designs. Large numbers of SCO stalls are no longer a viable parking design alternative, although it is still appropriate to use SCO stalls in remnants of space. It is time for municipalities and others to overhaul their parking ordinances. Requiring excessively generous parking geometrics wastes resources, land and money, and conflicts with other community interests such as increased green space and reduced storm water run-off.

Where SCO stalls are permitted, overly generous standard stall dimensions virtually force owners to use SCO stalls to achieve an economical design. Also, requiring excessive dimensions for standard stalls makes it very difficult for those owners or operators with existing SCO stalls to restripe to a reasonable design without an unacceptable loss of stalls.

Appendix A - Definition of Vehicle Size

The first and foremost problem in defining vehicle sizes is that they change over time. Manufacturers' labels are the least reliable method of defining what is, or is not, a small vehicle. The "compact" car in most of the period between 1965 and 1980 was larger than the intermediate or midsize car of today. None of the pickups labeled "compact" on the market today should be parked in the traditional SCO stall; the Nissan Frontier "compact" pickup is 6'1" by 17'1—as long as the US design vehicle! And while "compact" SUVs are shorter than compact pickups, they are also too wide for SCO stalls; for example, the Acura MDX is 6'7" wide.

To define stalls as serving "compact" vs "standard" or "small" vs "large" vehicles is to chase an ever-moving target.

For the purposes of establishing a uniform and readily adaptable terminology, all automobiles and light trucks (LTs) which include pickups, SUVs, vans and crossover vehicles have been classified by the area of the body of the vehicle, expressed in sq. ft or sq. meter. This leads to the assignment of vehicles to one of seven classes, as follows:

	Square Meters		Square Feet			
Class 5:	up to 5.99	sq m	up to		64.57 sq ft	
Class 6:	6.00 to 6.99	sq m	64.58	to	75.34 sq ft	
Class 7:	7.00 to 7.99	sq m	75.34	to	86.10 sq ft	Small Vehicles
Class 8:	8.00 to 8.99	sq m	86.11	to	96.76 sq ft	Large Vehicles
Class 9:	9.00 to 9.99	sq m	96.77	to	107.63 sq ft	
Class 10:	10.00 to 10.99	sq m	107.64	to	118.39 sq ft	
Class 11:	11.00 to 11.99	sq m	118.40	to	129.06 sq ft	

When this system was first proposed by Roti and Bolden[9], the square meter area was found to provide a realistic model for the definition of small and large vehicles, as well as to provide more detail regarding the change in vehicle sizes over time.

The Smart for Two should actually be in Class 4; at 5'1" by 8'10" the area is 4.2 sq m. In fact, there is no vehicle currently marketed in the US that otherwise qualifies as a Class 5; the next larger vehicle from the Smart is the Mini Cooper, which is solidly in Class 6. Rather than add another class for one vehicle, Class 5 has been redefined as any vehicle less than 5.99 sq m.

The three smallest Classes, 5, 6 and 7, are considered small cars and the four largest, 8 through 11, are considered large cars. The selection of the breaking point between Class 7 and 8 as the boundary between "small" and "large" was consistent with the generally accepted definition of small cars for parking design at the time the PCC adopted this approach.

For the most part, vehicles in Classes 5 through 7 have a length of less than 15'0" and a width less than 5'9". For reference, the largest car in the small car group in 2010 is the Toyota Corolla while the smallest large car is the Hyundai Elantra.

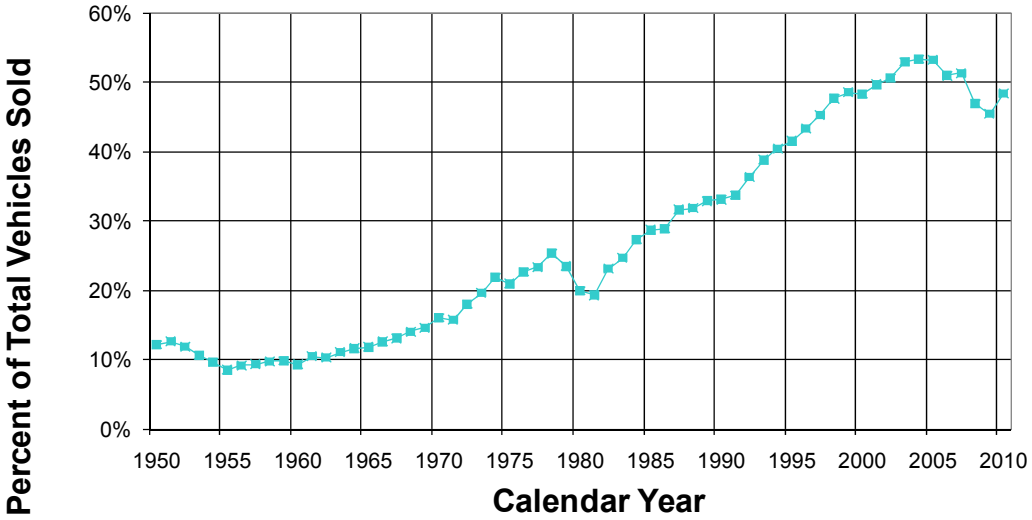
[9] *Parking Standards Design Associates*, A Parking Standards Report March 10, 1971.

Appendix B – Vehicle Sales Trends

An important facet to understanding the impact of changing vehicle sizes on parking design is sales of the individual models and the overall mix of vehicles on the road. Until the late 1980s, studies of car sizes for determination of parking geometrics did not consider the use of light trucks (LT), which includes pickups, vans, sport utility vehicles (SUV) and crossovers as personal, everyday transportation.

The federal government has always had different fuel mileage (aka Corporate Average Fuel Efficiency or CAFE) and safety standards for LT than for cars and therefore sales are reported separately. At least through the 1970s, most of the light trucks sold were used for commercial or mostly recreational (hunting and camping) purposes and were very infrequently parked in the typical public parking facility. (Of course, some cars are also sold for commercial purposes and are rarely parked in public facilities.) LTs and cars combine to provide the range of passenger vehicles that impact parking dimensions. Today, LTs may represent about half the vehicles parked in a public facility. See Figure B-1 for a comparison of market share by cars and LTs.

Figure B-1: Light Truck Market Share

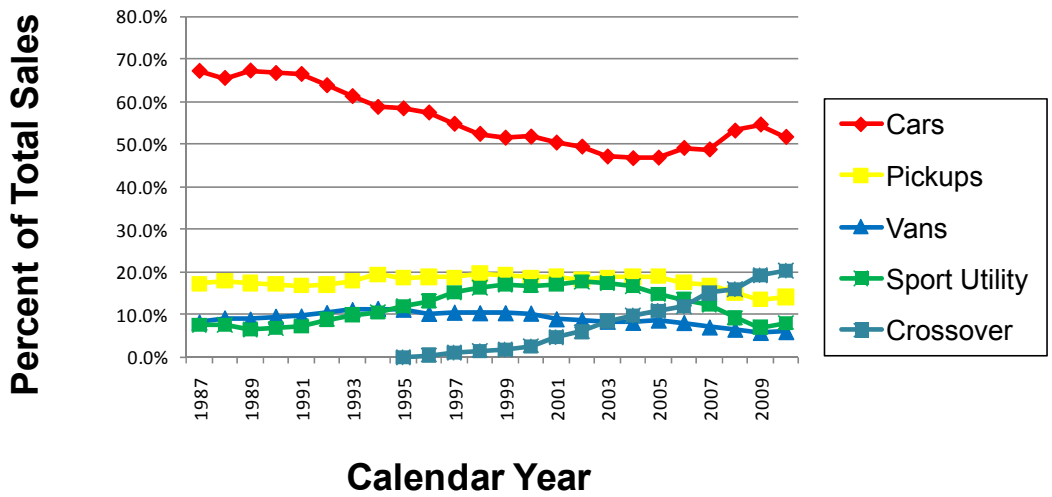


Source: Walker Parking Consultants Analysis of *Automotive News* Data, 1950-2010.

In the 1950s, LTs constituted about 10% of passenger vehicles sold. In the 1960s LTs sales began creeping up, hitting 15% by 1970. Sales growth then accelerated to 20% by 1975 and 25% by 1978. There was then a decline back to the 20% level in 1980/81. The rate of growth of LT sales then picked up rapidly, reaching 25% by 1983, 30% by '87, 35% in '92 and 40% in 1994. By 2001, LTs were approaching 50% of the total market. LT sales peaked at 53% from 2004-6 but have since dropped back below 50%. However there is once again an uptick in 2010.

What accounts for market share of LTs? The minivan, introduced in 1983 by Chrysler, rendered the old family station wagon (among the largest of all passenger cars) an endangered and nearly extinct species. One of the motivations for development of the minivan was that it qualified as a smaller LT, helping the manufacturers meet the then-new CAFE rules; sales of station wagons made meeting CAFE rules for cars more difficult. As car prices increased through the 1980s, many families found smaller pick-up trucks to be a viable second vehicle—that is, economical to own for commuting by one spouse and handy to have around for hauling. Then, in the mid-90s, the sport utility vehicle (SUV) began to steal market share from many classifications, from sporty cars to family sedans, as well as minivans, as seen in Figure B-2.

Figure B-2: Sales by Vehicle Type



Source: Walker Parking Consultants Analysis of *Automotive News* Data, 1987-2010.

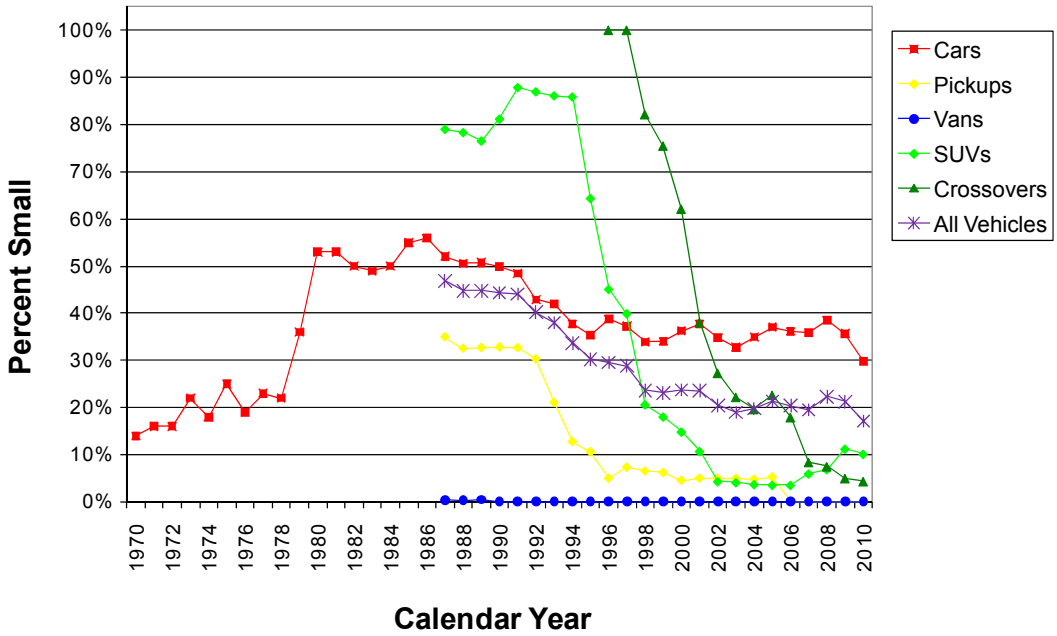
The typical SUV became much larger through the 1990s, partially because smaller SUV models were replaced by crossovers; these are vehicles with some SUV characteristics built on a car chassis instead of a truck one; thus they tend to ride and handle like cars rather than trucks. But most are counted as LTs; again, as with the minivan, they then don't have to meet the higher CAFE mileage and safety requirements for "cars."

In any event, crossovers also took market share from cars through about 2004. Then, the "soccer moms" lured into Expeditions and Suburbans by their carrying capacity also began moving down to crossovers. *Although many in the environmental community were ecstatic about the significant decline in pickup and SUV sales since 2008, the impact on market share is not as profound because the sales of all vehicle types declined an average of 20% in each successive year with the recession that began to affect auto sales in 2008:*

Changes in vehicles sales from	07 to 08	08 to 09	09 to 10	07 to 10	04 to 10
Cars	-11%	-19%	5%	-24%	-25%
Crossovers	-13%	-5%	17%	-4%	41%
SUV	-39%	-40%	27%	-53%	-67%
Pickups	-27%	-30%	16%	-40%	-49%
Vans	-24%	-30%	15%	-39%	-50%
All vehicles	-18%	-21%	11%	-28%	-32%

The market share of cars and crossovers benefited almost equally from high gas prices in 2008, but when gas prices declined in 2009, crossovers gained the most market share, including during the Cash For Clunkers program. And with an overall increase in sales of 11% in 2010 (versus 2009), car sales were only up 5% while increases in SUVs and pickups exceeded 20%. Still, with the overall reduced market size (down 28% since 2007, SUV sales are down 53% while pickups and vans were down 40% and 39%, respectively. Car sales are down 24% and crossovers have nearly returned to 2007 levels.

Figure C-2: Small Vehicle Sales by Type



SUVs traditionally were very small, at or above 80% small through 1994. However, the increase in market share of SUVs since 1995 has been at the larger end of the market, pulling the percent classified as small down drastically, to below 25% in just four years.

Part of that change is that smaller SUV models were replaced by crossovers, which are SUV-like, but built on car platforms. The first vehicle classified as a crossover by *Automotive News* was the Toyota RAV 4, introduced in 1996. It qualified as small; hence, crossovers were 100% small until more vehicles entered this market segment. However, over time, larger crossovers became popular, causing a decline in "small" crossovers to less than 5% by 2010. It is interesting however that manufacturers have started to offer more small SUVs again in 2009-10 while small vehicle sales in all other groups as well as overall, continued to decline.

There has never been a significant number of vans qualifying as small, although quite a number are just across the border in Class 8. Pickup trucks generally followed car sizes, albeit about 10% smaller until 1993, when there was a definite movement away from the small pick-ups. The restyling of the Dodge Ram led this charge. Subsequently, the true compact pickup has all but disappeared from the market place; only recently have a few midsize pickups (albeit labeled as compact) reappeared in the market. Since 2006, no pickup sold in the US qualified as small.

The percentage of small vehicles of all types followed the pattern of cars but was pulled down 3 to 4% through 1995. However, as both sales and size of LTs increased, the gap between the percent small for cars and the percent small of all vehicles widened to nearly 15%. As a result, the percentage of small vehicles overall dropped to the low 20s through 2001, and has hovered around 20% through 2009. However the drop to 17.1%, though small, is rather surprising given all the media discussions of fuel economy, electric cars, etc. In fact, the new Chevy Volt and Nissan Leaf straddle the border between small and large. The Volt is among the smallest Class 8 vehicles and the Leaf is among the largest Class 7 vehicles.

Overall and despite the significant changes in sales, size and type of LTs since 1995, the overall percent of small vehicles used for personal transportation has been relatively stable since 1998. And in turn, the design vehicle used for parking dimensions has similarly been remarkably stable.

Appendix D – Dimensional Details

One of the main reasons that zoning ordinances are overly simplified is that those involved want to avoid having to use trigonometry to determine the appropriate dimensions. However, overly simplified requirements often allow errors to slip through. The following dimensions would make it easier for designers to layout parking and for local officials to determine that the design meets the local requirements.

Figure D-1: Parking Layout Considerations

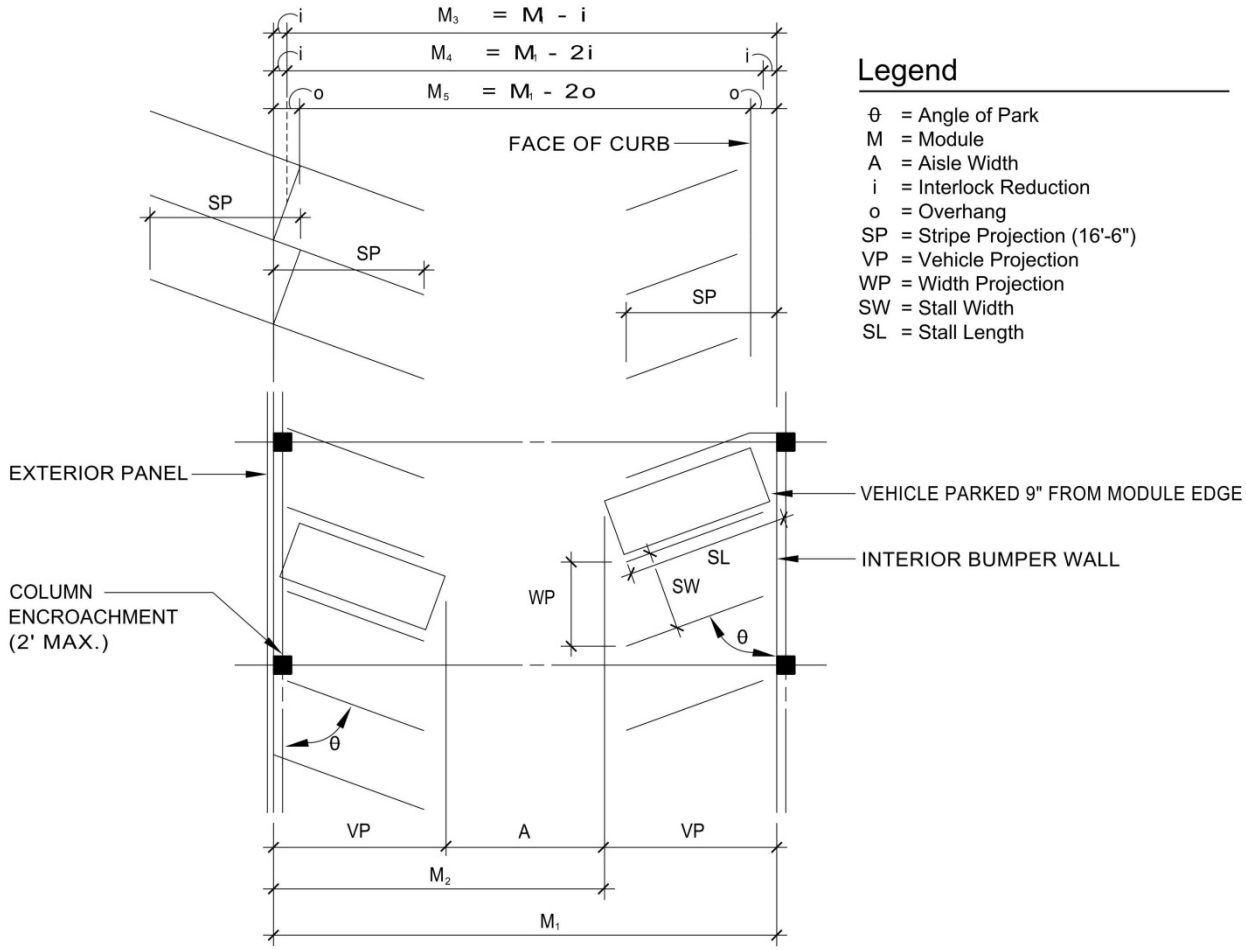


Figure D-2: Common Parking Dimensions

Angle (deg)	Minimum Module	Veh Proj	*Aisle Width*	Single Loaded Module	Wall to Int'lock (8'6")	Int'lck to Int'lck (8'6")	Curb To Curb	Over-hang	8'3" stalls		8'6" stalls		8'9" stalls		9'0" stalls	
									Width Proj	Int'lck	Width Proj	Int'lck	Width Proj	Int'lck	Width Proj	Int'lck
	M_1	VP	A	M_2	M_3	M_4	M_5	o	WP	i	WP	i	WP	i	WP	i
30	41'0"	15'0"	11'0"	26'0"	37'4"	33'8"	38'6"	1'3"	16'6"	3'7"	17'0"	3'8"	17'6"	3'9"	18'0"	3'11"
35	42'10"	1511"	11'0"	26'10"	39'4"	35'10"	40'0"	1'5"	13'5"	3'5"	14'10"	3'6"	15'3"	3'7"	15'8"	3'8"
40	44'6"	16'9"	11'0"	27'9"	41'3"	38'0"	41'4"	1'7"	12'10"	3'2"	13'3"	3'3"	13'8"	3'4"	14'0"	3'5"
45	46'6"	17'6"	11'6"	29'0"	43'6"	40'6"	43'0"	1'9"	11'8"	2'11"	12'0"	3'0"	12'4"	3'1"	12'9"	3'2"
50	48'0"	18'1"	11'10"	29'11"	45'3"	42'6"	44'2"	1'11"	10'9"	2'8"	11'1"	2'9"	11'5"	2'10"	11'9"	2'11"
55	49'6"	18'6"	12'6"	31'0"	47'1"	44'8"	45'4"	2'1"	10'1"	2'4"	10'5"	2'5"	10'8"	2'6"	11'0"	2'7"
60	51'0"	18'10"	13'4"	32'2"	48'10"	46'8"	46'8"	2'2"	9'6"	2'1"	9'10"	2'2"	10'1"	2'2"	10'5"	2'3"
65	52'6"	19'0"	14'6"	33'6"	50'8"	48'10"	48'6"	2'3"	9'1"	1'9"	9'5"	1'10"	9'8"	1'10"	9'11"	1'11"
70	53'6"	19'1"	15'4"	34'5"	52'1"	50'8"	48'10"	2'4"	8'9"	1'5"	9'1"	1'5"	9'4"	1'6"	9'7"	1'6"
75	54'6"	18'11"	16'8"	35'7"	53'5"	52'4"	49'8"	2'5"	8'6"	1'1"	8'10"	1'1"	9'1"	1'2"	9'4"	1'2"
90	58'6"	17'10"	22'10"	40'8"	58'6"	58'6"	53'6"	2'6"	8'3"	0'0"	8'6"	0'0"	8'9"	0'0"	9'0"	0'0"

Notes

1. Deduct 1 ft from aisle, and corresponding module, for parking in structures or where guides or curbs are provided at least 30% of the stalls.
2. Add 1'6" to module for medium level of comfort, i.e., employee parking in suburban locations. Add 3' for high turnover and/or high level of comfort.
3. Add min 10" to stall width where adjacent to walls, columns and other obstructions to door opening and/or turning movement.
4. Add min 10" to stall width for stalls next to curbs and islands to reduce trip hazard.
5. Light poles and columns may protrude into parking module a maximum of 2 ft combined as long as cols do not impact more than 30% of the stalls. For example, either a one ft encroachment on both sides of the aisle, or a 2 ft encroachment on one side only, is acceptable.
6. Interlock reductions may not be taken where encroachment by columns, light poles or other obstructions affects more than 30% of the stalls.
7. Aisles and corresponding modules are for two-way traffic for 90 degree parking and one- way traffic for angled parking between 30 and 75 deg.
8. For equal level of comfort of turn into the stall, 3" can be deducted from the module for each 1" additional stall width (maximum of 9'0" stall width.)
9. Parallel parking stall length is 23'0".
10. All dimensions rounded to the nearest inch.

Angles between 75 and 90 degrees are generally not recommended because the aisle becomes wide enough that many vehicles can back out and go the wrong way in a one-way design. The movement is tighter than that in these recommendations, but is achievable, particularly by smaller vehicles. Moreover, with the trigonometry of the rotated design vehicle, the overall module is nearly the same as required for 90 degree parking. If a site is appropriate for that module, it is usually better to just employ 90 degree parking with two-way traffic rather than 80 or 85 degree parking. Angles of less than 60 degrees are rarely used because they result in very inefficient parking, i.e., significantly more overall square feet of parking area per space is required for the same number of stalls. Figure D-2 however does include angles down to 30 degrees.

A “single-loaded” bay has parking only on one side of the aisle; thus $M_1=M_2-Vp$.

Interlocked parking is another common condition in which stalls in adjacent bays are perfectly aligned nose to tail. Each stall overhangs a dimension known as the “interlock” dimension into the adjacent stall. This dimension varies according to stall width; “interlock reductions” (i) are shown for the basic stall widths of 8’3”, 8’6”, 8’9” and 9’0”.

The module can be reduced by one interlock dimension for each row of stalls in that module that are interlocked. For example, in an exterior bay, the stalls may be against a wall and not interlocked, but on the opposite side, they are interlocked.

The dimension of that adjusted module is then $M_1-I = M_3$. If the stalls on both sides are interlocked, the adjusted module is $M_1-2i = M_4$.

Also shown is the “width projection” (WP) which is the “running distance” of the stall parallel to the edge of the module, reflecting the trigonometry of a stall of that dimension rotated to that angle.

Where curbs are provided they should be designed to reflect the overhang of most vehicles, which is 2’6” from a hard stop against a curb for a vehicle parked at 90 degrees. Rotating the parked vehicle results in the overhang (O) shown in Figure D-2.

The curb-to-curb dimension for a module with curbs on both sides is then $M_1-2o = M_5$.

In this case larger is not better; when the curb is larger, most vehicles park farther from the module edge, resulting in a reduction of the aisle available to other users. If a greater overhang is to be provided, it is important that the aisle width be increased proportionately.

TAB 4

EXHIBIT A

LGH

COMMITMENT FOR TITLE INSURANCE

Chicago Title Insurance Company

Providing Title Related Services Since 1847

CHICAGO TITLE INSURANCE COMPANY, a Missouri corporation, herein called the Company, for a valuable consideration, hereby commits to issue its policy or policies of title insurance, as identified in Schedule A (which policy or policies cover title risks and are subject to the Exclusions from Coverage and the Conditions and Stipulations as contained in said policy/ies) in favor of the proposed Insured named in Schedule A, as owner or mortgagee of the estate or interest in the land described or referred to in Schedule A, upon payment of the premiums and charges therefor, all subject to the provisions of Schedules A and B hereof and to the Commitment Conditions and Stipulations which are hereby incorporated by reference and made a part of the Commitment. A complete copy of the Commitment Conditions and Stipulations is available upon request and such include, but are not limited to, the proposed Insured's obligation to disclose, in writing, knowledge of any additional defects, liens, encumbrances, adverse claims or other matters which are not contained in the Commitment; provisions that the Company's liability shall in no event exceed the amount of the policy/ies as stated in Schedule A hereof, must be based on the terms of this Commitment, shall be only to the proposed Insured and shall be only for actual loss incurred in good faith reliance on this Commitment; and provisions relating to the General Exceptions, to which the policy/ies will be subject unless the same are disposed of to the satisfaction of the Company.

This Commitment shall be effective only when the identity of the proposed Insured and the amount of the policy or policies committed for have been inserted in Schedule A hereof by the Company, either at the time of the issuance of this Commitment or by issuance of a revised Commitment.

This Commitment is preliminary to the issuance of such policy or policies of title insurance and all liability and obligations hereunder shall cease and terminate six months after the effective date hereof or when the policy or policies committed for shall issue, whichever first occurs, provided that the failure to issue such policy or policies is not the fault of the Company.

This Commitment is based upon a search and examination of Company records and/or public records by the Company. Utilization of the information contained herein by an entity other than the Company or a member of the Chicago Title and Trust Family of Title Insurers for the purpose of issuing a title commitment or policy or policies shall be considered a violation of the proprietary rights of the Company of its search and examination work product.

This Commitment shall not be valid or binding until signed by an authorized signatory.

Issued By:

CHICAGO TITLE INSURANCE COMPANY
1725 S. NAPERVILLE RD
WHEATON, IL 60187

Refer Inquiries To:

(630)871-3500

CHICAGO TITLE INSURANCE COMPANY
CORPORATE SEAL

CHICAGO TITLE INSURANCE COMPANY

By

Authorized Signatory

Commitment No.: 1410 008284162 UL

CHICAGO TITLE INSURANCE COMPANY

COMMITMENT FOR TITLE INSURANCE
SCHEDULE A

YOUR REFERENCE: ADVOCATE LUTHERAN GENERAL HOSPITAL ORDER NO.: 1410 008284162 UL

EFFECTIVE DATE: AUGUST 2, 2007

1. POLICY OR POLICIES TO BE ISSUED:

LOAN POLICY: ALTA LOAN 1992
AMOUNT: $10,000.00
PROPOSED INSURED: TO COME

2. THE ESTATE OR INTEREST IN THE LAND DESCRIBED OR REFERRED TO IN THIS COMMITMENT AND COVERED HEREIN IS A FEE SIMPLE UNLESS OTHERWISE NOTED.

3. TITLE TO SAID ESTATE OR INTEREST IN SAID LAND IS AT THE EFFECTIVE DATE VESTED IN:

ADVOCATE HEALTH AND HOSPITALS CORPORATION

4. MORTGAGE OR TRUST DEED TO BE INSURED:

TO COME.

5. THE LAND REFERRED TO IN THIS COMMITMENT IS DESCRIBED AS FOLLOWS:

PARCEL 1:

LOT 1
(EXCEPT THAT PORTION OF LOT 1 DESCRIBED AS BEGINNING AT THE INTERSECTION OF THE SOUTH LINE OF SAID LOT 1 WITH A LINE 93 FEET EASTERLY OF, AS MEASURED AT RIGHT ANGLES TO AND PARALLEL WITH THE WEST LINE OF SAID LOT 1; THENCE NORTHERLY ALONG SAID PARALLEL LINE A DISTANCE OF 75.81 FEET; THENCE WESTERLY, AT RIGHT ANGLES TO THE LAST DESCRIBED LINE, A DISTANCE OF 73 FEET; THENCE NORTHERLY, AT RIGHT ANGLES TO THE LAST DESCRIBED LINE AND PARALLEL WITH THE WEST LINE OF SAID LOT 1, A DISTANCE OF 120 FEET; THENCE EASTERLY, AT RIGHT ANGLES TO THE LAST DESCRIBED LINE, A DISTANCE OF 120 FEET; THENCE SOUTHERLY, AT RIGHT ANGLES TO THE LAST DESCRIBED LINE, A DISTANCE OF 120 FEET; THENCE WESTERLY, AT RIGHT ANGLES TO THE LAST DESCRIBED LINE, A DISTANCE OF 27 FEET; THENCE SOUTHERLY, AT RIGHT ANGLES TO THE LAST DESCRIBED LINE AND PARALLEL WITH THE WEST LINE OF SAID LOT 1, A DISTANCE OF 74.67 FEET, MORE OR LESS, TO A POINT ON THE SOUTH LINE OF SAID LOT 1; THENCE WESTERLY, ALONG THE SOUTH LINE OF SAID LOT 1, A DISTANCE OF 20.03 FEET, MORE OR LESS, TO THE PLACE OF BEGINNING;

ALSO EXCEPT THAT PART OF LOT 1 BOUNDED BY A LINE DESCRIBED AS FOLLOWS: BEGINNING AT A POINT ON THE SOUTH LINE OF SAID LOT ONE WHICH IS 185.0 FEET WEST, AS MEASURED ALONG SAID LOT LINE, OF THE SOUTHEAST CORNER OF SAID LOT ONE; THENCE CONTINUING WEST ALONG THE SOUTH LINE OF SAID LOT ONE, NORTH 90 DEGREES 00 MINUTES 00 SECONDS WEST 160.0 FEET; THENCE NORTH 44 DEGREES 03 MINUTES 39 SECONDS EAST, 43.14 FEET, THENCE NORTH 90 DEGREES 00 MINUTES 00 SECONDS EAST, 75.0 FEET; THENCE SOUTH 60 DEGREES 35 MINUTES 34 SECONDS EAST 63.13 FEET TO THE PLACE OF BEGINNING

ALSO EXCEPT THAT PART OF LOT 1 COMMENCING AT THE NORTHWEST CORNER OF LOT 1; THENCE ON AN ASSUMED BEARING OF SOUTH 88 DEGREES 30 MINUTES 38 SECONDS EAST ALONG THE NORTH LINE OF SAID LOT 1 A DISTANCE OF 375.08 FEET TO THE POINT OF BEGINNING; THENCE CONTINUING SOUTH 88 DEGREES 30 MINUTES 38 SECONDS EAST ALONG SAID NORTH LINE 78.29 FEET; THENCE SOUTH 22 DEGREES 03 MINUTES 25 SECONDS WEST 47.22 FEET; THENCE NORTH 88 DEGREES 30 MINUTES 38 SECONDS WEST 45.64 FEET; THENCE NORTH 03 DEGREES 09 MINUTES 27 SECONDS WEST 15.55 FEET; THENCE NORTH 25 DEGREES 46 MINUTES 53 SECONDS WEST 32.31 FEET TO THE POINT OF BEGINNING),

IN FIRST ADDITION TO LUTHERAN GENERAL HOSPITAL SUBDIVISION, BEING A SUBDIVISION OF PART OF THE SOUTHEAST 1/4 OF SECTION 15, TOWNSHIP 41 NORTH, RANGE 12, EAST OF THE THIRD PRINCIPAL MERIDIAN, IN COOK COUNTY, ILLINOIS.

PARCEL 2:

LOT 1 IN CHURCH SUBDIVISION NO. 1, BEING A SUBDIVISION OF PART OF LOTS 1 AND 2 IN HENRY C. SENNE'S ESTATE DIVISION OF THE NORTH 1/2 OF THE NORTHEAST 1/4 AND THE NORTH 55 RODS OF THE EAST 1/2 OF THE NORTHWEST 1/4 OF SECTION 22, TOWNSHIP 41 NORTH, RANGE 12, EAST OF THE THIRD PRINCIPAL MERIDIAN, IN COOK COUNTY, ILLINOIS.

PARCEL 3:

LOT 1 IN SANITARIUM SUBDIVISION OF THE WEST 220 FEET OF THE NORTH 225 FEET OF LOT 2 IN HENRY C. SENNES ESTATE DIVISION OF THE NORTH 1/2 OF THE NORTHEAST 1/4 AND THE NORTH 55 RODS OF THE EAST 1/2 OF THE NORTHWEST 1/4 OF SECTION 22, TOWNSHIP 41 NORTH, RANGE 12, EAST OF THE THIRD PRINCIPAL MERIDIAN, IN COOK COUNTY, ILLINOIS.

PARCEL 4:

THAT PART OF LOT 1 IN LUTHERAN GENERAL HOSPITAL SUBDIVISION NO. 1, BEING A RESUBDIVISION OF PARTS OF LOTS 1 AND 2 IN HENRY C. SENNE'S ESTATE DIVISION OF THE NORTH HALF OF THE NORTHEAST QUARTER AND OF THE NORTH 55 RODS OF THE EAST HALF OF THE NORTHWEST QUARTER OF SECTION 22, TOWNSHIP 41 NORTH, RANGE 12, EAST OF THE THIRD PRINCIPAL MERIDIAN, THE PLAT OF WHICH WAS RECORDED JANUARY 26, 1968 AS DOCUMENT 20389600 BOUNDED BY A LINE DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHEAST CORNER OF SAID LOT 1; THENCE WEST ALONG THE NORTH LINE OF SAID LOT 1, BEING ALSO THE SOUTH LINE OF DEMPSTER STREET, 271.68 FEET; THENCE SOUTH AT RIGHT ANGLES TO THE NORTH LINE OF SAID LOT 1, A DISTANCE OF 199.37 FEET FOR A POINT OF BEGINNING FO THE TRACT OF LAND TO BE DESCRIBED; THENCE NORTH 90 DEGREES EAST, THE NORTH LINE OF SAID LOT 1 HAVING AN ASSUMED BEARING OF NORTH 90 DEGREES 00 MINUTES 00 SECONDS EAST, 63.75 FEET; THENCE SOUTH 00 DEGREES EAST, 31.83 FEET; THENCE NORTH 90 DEGREES EAST 35.67 FEET; THENCE SOUTH 00 DEGREES EAST 16.33 FEET; THENCE NORTH 90 DEGREES WEST, 35.67 FEET; THENCE SOUTH 00 DEGREES EAST, 16.33 FEET; THENCE NORTH 90 DEGREES EAST 35.67 FEET; THENCE SOUTH 00 DEGREES EAST, 52.0 FEET; THENCE NORTH 90 DEGREES EAST 92.70 FEET; THENCE NORTH 00 DEGREES EAST, 7.50 FEET; THENCE NORTH 90 DEGREES EAST, 16.0 FEET; THENCE SOUTH 00 DEGREES EAST, 7.50 FEET; THENCE NORTH 90 DEGREES EAST, 25.0 FEET; THENCE SOUTH 00 DEGREES EAST, 46.33 FEET; THENCE NORTH 90 DEGREES WEST, 24.25 FEET; THENCE SOUTH 00 DEGREES EAST, 202.50 FEET; THENCE NORTH 90 DEGREES WEST, 52.50 FEET ; THENCE NORTH 00 DEGREES EAST, 194.00 FEET; THENCE NORTH 90 DEGREES WEST 120.70 FEET; THENCE NORTH 00 DEGREES EAST, 23.70 FEET; THENCE NORTH 90 DEGREES WEST 120.70; THENCE NORTH 00 DEGREES EAST, 23.70 FEET; THENCE NORTH 90 DEGREES WEST 75.0 FEET; THENCE SOUTH 00 DEGREES EAST, 46.0 FEET; THENCE NORTH 90 DEGREES EAST, 36.0 FEET; THENCE SOUTH 00 DEGREES EAST, 50.0 FEET; THENCE SOUTH 42 DEGREES 54 MINUTES 07 SECONDS WEST, 52.34 FEET; THENCE SOUTH 00 DEGREES EAST, 118.0 FEET; THENCE NORTH 90 DEGREES WEST, 37.50 FEET; THENCE NORTH 00 DEGREES EAST, 38.0 FEET; THENCE NORTH 90 DEGREES WEST, 37.0 FEET; THENCE SOUTH 00 DEGREES EAST, 114.0 FEET; THENCE NORTH 90 DEGREES WEST, 46.0 FEET; THENCE NORTH 00 DEGREES EAST, 10.0 FEET; THENCE NORTH 90 DEGREES WEST, 65.0 FEET; THENCE NORTH 00 DEGREES EAST, 18.50 FEET; THENCE NORTH 90 DEGREES 18.50 FEET; THENCE NORTH 00 DEGREES EAST, 6.50 FEET; THENCE NORTH 90 DEGREES WEST, 23.50 FEET; THENCE NORTH 00 DEGREES EAST, 55.00 FEET; THENCE NORTH 90 DEGREES WEST, 138.50 FEET; THENCE NORTH 00 DEGREES EAST, 27.0 FEET; THENCE NORTH 90 DEGREES EAST, 26.80 FEET; THENCE NORTH 00 DEGREES EAST, 78.33 FEET; THENCE NORTH 90 DEGREES WEST, 137.50 FEET; THENCE NORTH 00 DEGREES EAST, 45.25 FEET; THENCE NORTH 90 DEGREES EAST, 72.65 FEET; THENCE NORTH DEGREES EAST, 18.50 FEET; THENCE NORTH 90 DEGREES EAST, 3.0 FEET; THENCE NORTH 90 DEGREES EAST, 54.80 FEET; THENCE NORTH 90 DEGREES EAST, 0.68 FEET; THENCE NORTH 00 DEGREES EAST, 37.50 FEET; THENCE NORTH 90 DEGREES EAST, 407.0 FEET; THENCE NORTH 00 DEGREES EAST, 29.75 FEET TO THE PLACE OF BEGINNING IN COOK COUNTY, ILLINOIS.

PARCEL 5:

THAT PART OF LOT 2 IN LUTHERAN GENERAL HOSPITAL SUBDIVISION NO. 1 BEING A RESUBDIVISION OF PARTS OF LOTS 1 AND 2 IN HENRY C. SENNE'S ESTATE DIVISION OF THE NORTH HALF OF THE NORTHEAST QUARTER AND OF THE NORTH 55 RODS OF THE EAST HALF OF THE NORTHWEST QUARTER OF SECTION 22, TOWNSHIP 41 NORTH, RANGE 12, EAST OF THE THIRD PRINCIPAL MERIDIAN, THE PLAT OF WHICH WAS RECORDED JANUARY 26, 1968 AS DOCUMENT 20389600 BOUNDED BY A LINE DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF SAID LOT 2; THENCE WEST ALONG THE SOUTH LINE OF SAID LOT 2, 113.26 FEET; THENCE NORTH 01 DEGREES 56 MINUTES 09 SECONDS EAST ALONG A LINE PARALLEL WITH THE EAST LINE OF SAID LOT 2, THE NORTH AND SOUTH LINES OF SAID LOT 2 HAVING ASSUMED BEARINGS OF NORTH 90 DEGREES 00 MINUTES 00 SECONDS EAST, A DISTANCE OF 89.05 FEET FOR A PLACE OF BEGINNING OF THE TRACT OF LAND TO BE DESCRIBED; THENCE NORTH 88 DEGREES 03 MINUTES 51 SECONDS WEST, 70.50 FEET; THENCE NORTH 01 DEGREES 56 MINUTES 09 SECONDS EAST, 12.0 FEET; THENCE NORTH 88 DEGREES 03 MINUTES 51 SECONDS WEST, 36.0 FEET; THENCE NORTH 01 DEGREES 56 MINUTES 09 SECONDS EAST, 20.0 FEET; THENCE SOUTH 88 DEGREES 03 MINUTES 51 SECONDS EAST, 36.0 FEET; THENCE NORTH 01 DEGREES 56 MINUTES 09 SECONDS EAST, 56.50 FEET; THENCE NORTH 88 DEGREES 03 MINUTES 51 SECONDS WEST, 100.0 FEET; THENCE SOUTH 01 DEGREES 56 MINUTES 09 SECONDS WEST, 26.0 FEET; THENCE NORTH 88 DEGREES 03 MINUTES 51 SECONDS WEST, 36.50; THENCE NORTH 01 DEGREES 56 MINUTES 09 SECONDS EAST, 87.0 FEET; THENCE SOUTH 88 DEGREES 03 MINUTES 51 SECONDS EAST, 147.0 FEET; THENCE NORTH 01 DEGREES 56 MINUTES 09 SECONDS EAST, 88.50 FEET; THENCE SOUTH 88 DEGREES 03 MINUTES 51 SECONDS EAST, 60.0 FEET; THENCE SOUTH 01 DEGREES 56 MINUTES 09 SECONDS WEST, 84.50 FEET; THENCE SOUTH 88 DEGREES 03 MINUTES 51 SECONDS EAST, 42.67 FEET; THENCE SOUTH 01 DEGREES 56 MINUTES 09 SECONDS WEST, 19.75 FEET; THENCE SOUTH 01 DEGREES 56 MINUTES 09 SECONDS WEST, 19.75 FEET; THENCE SOUTH 88 DEGREES 03 MINUTES 51 SECONDS EAST, 19.75 FEET; THENCE SOUTH 01 DEGREES 56 MINUTES 09 SECONDS WEST, 29.50 FEET; THENCE NORTH 88 DEGREES 03 MINUTES 51 SECONDS WEST, 19.75 FEET; THENCE SOUTH 01 DEGREES 56 MINUTES 09 SECONDS WEST, 19.75 FEET; THENCE NORTH 88 DEGREES 03 MINUTES 51 SECONDS WEST, 42.67 FEET; THENCE SOUTH 01 DEGREES 56 MINUTES 09 SECONDS WEST, 84.50 FEET TO THE POINT OF BEGINNING, ALL IN COOK COUNTY, ILLINOIS.

PARCEL 6:

THAT PART OF LOT 1 IN LUTHERAN GENERAL HOSPITAL SUBDIVISION NO. 1 BEING A RESUBDIVISION OF PARTS OF LOTS 1 AND 2 IN HENRY C. SENNE'S ESTATE DIVISION OF THE NORTH HALF OF THE NORTHEAST QUARTER AND OF THE NORTH 55 RODS OF THE EAST HALF OF THE NORTHWEST QUARTER OF SECTION 22, TOWNSHIP 41 NORTH, RANGE 12, EAST OF THE THIRD PRINCIPAL MERIDIAN, THE PLAT OF WHICH WAS RECORDED JANUARY 26, 1968 AS DOCUMENT 20389600 BOUNDED BY A LINE DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTH WEST CORNER OF SAID LOT 1; THENCE EAST ALONG THE NORTH LINE OF SAID LOT 1 BEING ALSO THE SOUTH LINE OF DEMPSTER STREET, A DISTANCE OF 493.0 FEET; THENCE SOUTH ALONG A LINE DRAWN AT RIGHT ANGLES TO THE NORTH LINE OF SAID LOT 1, A DISTANCE OF 206.0 FEET; THENCE WEST ALONG A LINE DRAWN PARALLEL WITH THE NORTH LINE OF SAID LOT 1; A DISTANCE OF 499.96 FEET TO A POINT ON THE WEST LINE OF SAID LOT 1, THENCE NORTHERLY ALONG THE WEST LINE OF SAID LOT 1 BEING ALSO THE EAST LINE OF LUTHER LANE, A DISTANCE OF 206.12 FEET TO THE NORTH WEST CORNER OF SAID LOT 1 AND THE PLACE OF BEGINNING, IN COOK COUNTY, ILLINOIS

PARCEL 7:

EASEMENT FOR INGRESS AND EGRESS AND PASSAGE FOR THE BENEFIT OF PARCEL 1 AS CREATED BY GRANT OF EASEMENT RECORDED JUNE 30, 1983 AS DOCUMENT 26666881 ON SUCH ROADWAYS, DRIVEWAYS, OR ENTRANCEWAYS AS MAY FROM TIME TO TIME BE ESTABLISHED AND MAINTAINED BY GRANTOR.

ORDER NO.: 1410 008284162 UL

1. WE SHOULD BE FURNISHED A PROPERLY EXECUTED ALTA STATEMENT.

2. NOTE FOR INFORMATION: THE COVERAGE AFFORDED BY THIS COMMITMENT AND ANY POLICY ISSUED PURSUANT HERETO SHALL NOT COMMENCE PRIOR TO THE DATE ON WHICH ALL CHARGES PROPERLY BILLED BY THE COMPANY HAVE BEEN FULLY PAID.

AA 3.

1. TAXES FOR THE YEAR(S) 1994, 1999, 2006 AND 2007
2007 TAXES ARE NOT YET DUE OR PAYABLE.

1A. NOTE: 2006 FIRST INSTALLMENT WAS DUE MARCH 01, 2007
NOTE: 2006 FINAL INSTALLMENT NOT YET DUE OR PAYABLE

PERM TAX#	PCL	YEAR	1ST INST	STAT
09-15-402-009-0000	1 OF 8	2006	NOT BILLED	
09-22-200-012-0000	2 OF 8	2006	NOT BILLED	
09-22-200-015-0000	3 OF 8	2006	NOT BILLED	
09-22-200-029-0000	4 OF 8	2006	NOT BILLED	
09-22-200-030-0000	5 OF 8	2006	$22,425.11	PAID
09-22-200-031-0000	6 OF 8	2006	NOT BILLED	
09-22-200-033-0000	7 OF 8	2006	NOT BILLED	
09-22-200-034-0000	8 OF 8	2006	$25,571.04	PAID

* *

PERM TAX# 09-15-402-009-0000 PCL 1 OF 8 VOLUME 088

3A THE GENERAL TAXES AS SHOWN BELOW ARE MARKED EXEMPT ON THE

COLLECTOR'S WARRANTS.

YEAR(S): 2005 AND PRIOR

UNLESS SATISFACTORY EVIDENCE IS SUBMITTED TO SUBSTANTIATE SAID EXEMPTION OUR POLICY, IF AND WHEN ISSUED, WILL BE SUBJECT TO SAID TAXES.

PERM TAX# 09-22-200-012-0000 PCL 2 OF 8 YEAR 1994 VOLUME 088

2A THE GENERAL TAXES AS SHOWN BELOW

YEAR	AMOUNT
1994	$ 18,143.71

THE FIRST ESTIMATED INSTALLMENT IS NOT BILLED.
THE FINAL INSTALLMENT AMOUNTING TO $ 18,143.71 IS UNPAID.

NOTE: 1994 MARKED SALE IN ERROR.

3B THE GENERAL TAXES AS SHOWN BELOW ARE MARKED EXEMPT ON THE COLLECTOR'S WARRANTS.

YEAR(S): 2005

UNLESS SATISFACTORY EVIDENCE IS SUBMITTED TO SUBSTANTIATE SAID EXEMPTION OUR POLICY, IF AND WHEN ISSUED, WILL BE SUBJECT TO SAID TAXES.

PERM TAX# 09-22-200-015-0000 PCL 3 OF 8 VOLUME 088

3C THE GENERAL TAXES AS SHOWN BELOW ARE MARKED EXEMPT ON THE COLLECTOR'S WARRANTS.

YEAR(S): 2005 AND PRIOR

UNLESS SATISFACTORY EVIDENCE IS SUBMITTED TO SUBSTANTIATE SAID EXEMPTION OUR POLICY, IF AND WHEN ISSUED, WILL BE SUBJECT TO SAID TAXES.

PERM TAX# 09-22-200-029-0000 PCL 4 OF 8 VOLUME 088

3D THE GENERAL TAXES AS SHOWN BELOW ARE MARKED EXEMPT ON THE

COLLECTOR'S WARRANTS.

YEAR(S): 2005 AND PRIOR

UNLESS SATISFACTORY EVIDENCE IS SUBMITTED TO SUBSTANTIATE SAID EXEMPTION OUR POLICY, IF AND WHEN ISSUED, WILL BE SUBJECT TO SAID TAXES.

PERM TAX# 09-22-200-030-0000 PCL 5 OF 8 YEAR 1999 VOLUME 088

2B THE GENERAL TAXES AS SHOWN BELOW

YEAR	AMOUNT
1999	$ 214,119.95

THE FIRST ESTIMATED INSTALLMENT AMOUNTING TO $ 104,696.34 IS PAID. THE FINAL INSTALLMENT AMOUNTING TO $ 109,423.61 IS UNPAID.

NOTE: ACQUIRED BY ADVOCATE HEALTH CARE NETWORK DOCKET NUMBER 99-16-1826 UNDER CHAPTER 120 SECTIONS 508A AND 600. TOTAL EXEMPTION. COMPLAINT NUMBER E88469-001.

PERM TAX# 09-22-200-031-0000 PCL 6 OF 8 VOLUME 088

3E THE GENERAL TAXES AS SHOWN BELOW ARE MARKED EXEMPT ON THE COLLECTOR'S WARRANTS.

YEAR(S): 2005 AND PRIOR

UNLESS SATISFACTORY EVIDENCE IS SUBMITTED TO SUBSTANTIATE SAID EXEMPTION OUR POLICY, IF AND WHEN ISSUED, WILL BE SUBJECT TO SAID TAXES.

PERM TAX# 09-22-200-033-0000 PCL 7 OF 8 VOLUME 088

3F THE GENERAL TAXES AS SHOWN BELOW ARE MARKED EXEMPT ON THE COLLECTOR'S WARRANTS.

YEAR(S): 2005 AND PRIOR

UNLESS SATISFACTORY EVIDENCE IS SUBMITTED TO SUBSTANTIATE SAID EXEMPTION OUR POLICY, IF AND WHEN ISSUED, WILL BE SUBJECT TO SAID TAXES.

PERM TAX# 09-22-200-034-0000 PCL 8 OF 8 YEAR 1999 VOLUME 088

2C THE GENERAL TAXES AS SHOWN BELOW

YEAR	AMOUNT
1999	$ 409,085.98

THE FIRST ESTIMATED INSTALLMENT AMOUNTING TO $ 198,484.04 IS PAID. THE FINAL INSTALLMENT AMOUNTING TO $ 210,601.94 IS UNPAID.

NOTE: COMPLAINT NUMBER E88468-001.

Z 4. MECHANICS LIEN CLAIM IN FAVOR OF AIR PRODUCTS EQUIPMENT CO. AGAINST KRAUSE CONSTRUCTION SERVICES, INC., ADVOCATE LUTHERAN GENERAL HOSPITAL AND ORTIZ MECHANICAL CONTRACTORS, INC. RECORDED MARCH 20, 2006 AS DOCUMENT NUMBER 0607918134 IN THE AMOUNT OF $4,034.63.

(AFFECTS PARCEL 1)

B 5. BECAUSE OF PROCEDURES INSTITUTED BY THE COOK COUNTY TREASURER, THE COMPANY REQUESTS THAT ORIGINAL TAX BILLS BE FURNISHED WHENEVER THE COMPANY IS REQUESTED TO PAY TAXES. IF ORIGINAL TAX BILLS ARE NOT FURNISHED, THE COMPANY WILL COLLECT ADDITIONAL FEES FOR EACH TAX NUMBER TO PAY CHARGES IMPOSED BY THE COOK COUNTY TREASURER FOR THE PRODUCTION OF DUPLICATE TAX BILLS. FURTHER, BECAUSE OF DELAYS BY THE COOK COUNTY TREASURER IN PRODUCING DUPLICATE TAX BILLS, THE COMPANY WILL HOLD BACK FROM CLOSING ADDITIONAL FUNDS TO PAY

INTEREST THAT WILL ACCRUE BECAUSE OF THE TREASURER'S PROCEDURES.

C 6. WE SHOULD BE FURNISHED A CERTIFIED COPY OF THE DIRECTORS' RESOLUTIONS AUTHORIZING THE CONVEYANCE OR MORTGAGE TO BE INSURED. SAID RESOLUTIONS SHOULD EVIDENCE THE AUTHORITY OF THE PERSONS EXECUTING THE CONVEYANCE OR MORTGAGE. IF THEY DO NOT, A CERTIFIED COPY OF THE CORPORATE BY-LAWS ALSO SHOULD BE FURNISHED.

IF SAID CONVEYANCE OR MORTGAGE COMPRISES ALL OR SUBSTANTIALLY ALL THE CORPORATION'S ASSETS, WE ALSO SHOULD BE FURNISHED A CERTIFIED COPY OF THE SHAREHOLDER/MEMBER RESOLUTIONS WHICH AUTHORIZE SAID CONVEYANCE OR MORTGAGE. THIS COMMITMENT IS SUBJECT TO SUCH FURTHER EXCEPTIONS, IF ANY, AS MAY BE DEEMED NECESSARY AFTER OUR REVIEW OF THESE MATERIALS.

D 7. EXISTING UNRECORDED LEASES AND ALL RIGHTS THEREUNDER OF THE LESSEES AND OF ANY PERSON OR PARTY CLAIMING BY, THROUGH OR UNDER THE LESSEES.

E 8. WE SHOULD BE FURNISHED A STATEMENT THAT THERE IS NO PROPERTY MANAGER EMPLOYED TO MANAGE THE LAND, OR, IN THE ALTERNATIVE, A FINAL LIEN WAIVER FROM ANY SUCH PROPERTY MANAGER.

P 9. THE APPLICATION STATES THAT TITLE TO THE LAND IS NOW VESTED IN ADVOCATE HEALTH & HOSPITALS CORPORATION, AN ILLINOIS NOT-FOR-PROFIT CORPORATION. THIS SHOULD BE EXPLAINED.

0 10. NOTE: THE LAND DESCRIBED IN SCHEDULE A EITHER IS UNSUBDIVIDED PROPERTY OR CONSTITUTES PART OF A SUBDIVIDED LOT. AS A RESULT, A PLAT ACT AFFIDAVIT SHOULD ACCOMPANY ANY CONVEYANCE TO BE RECORDED. IN THE ALTERNATIVE, COMPLIANCE SHOULD BE HAD WITH THE PROVISIONS OF THE PLAT ACT (765 ILCS 205/1 ET SEQ.).

F 11. MUNICIPAL REAL ESTATE TRANSFER TAX STAMPS (OR PROOF OF EXEMPTION) MUST ACCOMPANY ANY CONVEYANCE AND CERTAIN OTHER TRANSFERS OF PROPERTY LOCATED IN PARK RIDGE. PLEASE CONTACT SAID MUNICIPALITY PRIOR TO CLOSING FOR ITS SPECIFIC REQUIREMENTS, WHICH MAY INCLUDE THE PAYMENT OF FEES, AN INSPECTION OR OTHER APPROVALS.

N 12. PURSUANT TO YOUR REQUEST THAT WE INSURE A MORTGAGE SECURING REIMBURSEMENT PURSUANT TO AN INDUSTRIAL REVENUE BOND CONTEMPLATED FOR THE DESCRIBED PREMISES, WE SHOULD BE FURNISHED THE FOLLOWING DOCUMENTATION PRIOR TO CLOSING:

1. A BOND COUNSEL'S OPINION LETTER UPON WHICH WE MAY RELY THAT REFLECTS AN EXAMINATION HAS BEEN MADE OF THE BOND ISSUE AND USE OF THE PROCEEDS THEREOF, AND THE PERTINENT REGULATORY AND STATUTORY AUTHORITY AND OTHER DOCUMENTATION NECESSARY FOR THE VALIDITY OF THE BOND ISSUE.

2. A LEGAL OPINION LETTER FROM BORROWER'S COUNSEL UPON WHICH WE MAY RELY THAT THE MORTGAGE EVIDENCING THE BOND ISSUE AND ASSIGNMENT TO AN INSTITUTIONAL LENDER WILL CREATE A FIRST LIEN; IS PROPER; IS EXEMPT FROM SECURITIES LAWS;

AND THAT OTHER CONDITIONS HAVE BEEN MET FOR THE ISSUER AND OTHER PARTIES TO ESTABLISH AN ENFORCEABLE LIEN.

3. IF THERE WILL BE A LEASE AGREEMENT MADE AS SECURITY FOR THE BOND, WE SHOULD HAVE OPINION OF THE LESSEE'S LEGAL COUNSEL THAT THE DOCUMENTS WHEN EXECUTED WILL BE BINDING AND ENFORCEABLE.

4. IF THE PROCEEDS OF THE BOND ARE TO BE USED FOR THE CONSTRUCTION OF IMPROVEMENTS ON THE LAND AND THE BOND PROCEEDS WILL BE ADMINISTERED THROUGH A DISBURSING AGENT, WE SHOULD BE NOTIFIED OF THAT FACT AND THIS REPORT IS SUBJECT TO ADDITIONAL EXCEPTIONS AS MAY BE DEEMED NECESSARY.

G 13. RIGHTS OF THE UNITED STATES OF AMERICA TO RECOVER ANY PUBLIC FUNDS ADVANCED UNDER THE PROVISIONS OF ONE OR MORE OF THE VARIOUS FEDERAL STATUTES RELATING TO HEALTH CARE.

H 14. EASEMENT OVER THE SOUTH 12 FEET OF THE LAND GRANTING THE PERPETUAL RIGHT, PERMISSION AND AUTHORITY TO CONSTRUCT, INSTALL, RELOCATE, USE, OPERATE, MAINTAIN, REPLACE AND REMOVE WATER MAINS AND APPURTENANCES FOR THE TRANSMISSION AND DISTRIBUTION OF PORTABLE WATER, WITH RIGHT OF ACCESS THERETO, AS CONTAINED IN GRANT FROM LUTHERAN GENERAL AND DEACONESS HOSPITALS TO DOMESTIC UTILITY SERVICES COMPANY RECORDED JUNE 10, 1974 AS DOCUMENT 22743470 AND AS SHOWN ON THE PLAT OF RESUBDIVISION RECORDED OCTOBER 8, 1976 AS DOCUMENT 23667635.

(AFFECTS PARCEL 1)

I 15. NOTE: APPENDED TO THE PLAT OF SUBDIVISION DATED SEPTEMBER 24, 1976 AND RECORDED OCTOBER 8, 1976 AS DOCUMENT 23667635 IS A LETTER DATED OCTOBER 5, 1976 FROM THE DIRECTOR, DIVISION OF WATER RESOURCES, ILLINOIS DEPARTMENT OF TRANSPORTATION THAT BASED UPON DATA AVAILABLE TO THE DEPARTMENT IT HAS BEEN DETERMINED THAT A LARGE PORTION OF THE SUBDIVISION IS SUBJECT TO FLOOD RISKS.

(AFFECTS PARCEL 1)

J 16. EASEMENT FOR THE INSTALLATION AND MAINTENANCE OF A SEWER LINE AND/OR WATER LINES BUT WITH PERMISSION GRANTED TO GRANTEE TO USE THE SURFACE OF THE GROUND ABOVE SAID EASEMENT FOR A DRIVEWAY OR FOR PARKING OF AUTOMOBILES OR BOTH, CONTAINED IN THE WARRANTY DEED DATED OCTOBER 1, 1956 AND RECORDED NOVEMBER 2, 1956 AS DOCUMENT 16744952 FROM SHORELINE BUILDERS COMPANY, A CORPORATION OF ILLINOIS, TO WIEBOLT STORES INCORPORATED, AND AS SHOWN ON PLAT OF SAID SUBDIVISION RECORDED OCTOBER 8, 1976 AS DOCUMENT 23667635, AND THE TERMS AND PROVISIONS CONTAINED THEREIN.

(AFFECTS THE EAST 15 FEET OF THE LAND)

(AFFECTS PARCEL 1)

K 17. PRIVATE PARKING ENFORCEMENT CONTRACT RENEWAL RECORDED AS DOCUMENT 97318360.

(AFFECTS PARCEL 1)

L 18. ENVIRONMENTAL DISCLOSURE DOCUMENT FOR TRANSFER OF REAL PROPERTY RECORDED FEBRUARY 26, 1999 AS DOCUMENT 99193074.

(AFFECTS PARCEL 1)

M 19. RIGHTS OF THE PUBLIC, THE STATE OF ILLINOIS AND THE MUNICIPALITY IN AND TO THAT PART OF THE LAND, IF ANY, TAKEN OR USED FOR ROAD PURPOSES.

(AFFECTS PARCEL 1)

Q 20. EASEMENT FOR PUBLIC UTILITIES OVER THE WESTERLY 5 FEET OF LOT 1 OF THE LAND AS SHOWN ON THE PLAT OF CHURCH SUBDIVISION NO. 1 RECORDED OCTOBER 6, 1960 AS DOCUMENT 17983750.

(AFFECTS PARCEL 2)

R 21. GRANT MADE BY THE COSMOPOLITAN NATIONAL BANK OF CHICAGO, A NATIONAL BANKING ASSOCIATION, AS TRUSTEE UNDER TRUST AGREEMENT DATED JULY 28, 1958 AND KNOWN AS TRUST NUMBER 7829 TO THE COMMONWEALTH EDISON COMPANY AND MIDDLE STATES TELEPHONE COMPANY OF ILLINOIS, CORPORATIONS OF ILLINOIS, RECORDED NOVEMBER 23, 1960 AS DOCUMENT 18024059, GRANTING THE RIGHT TO INSTALL AND MAINTAIN ALL EQUIPMENT FOR THE PURPOSE OF SERVING THE LAND AND OTHER PROPERTY WITH TELEPHONE AND ELECTRIC SERVICE, WITH RIGHT OF ACCESS THERETO IN, UPON UNDER AND ALONG THE NORTH 5 FEET OF THE LAND.

(AFFECTS PARCEL 2)

S 22. COVENANTS AND RESTRICTIONS (BUT OMITTING ANY SUCH COVENANT OR RESTRICTION BASED ON RACE, COLOR, RELIGION, SEX, HANDICAP, FAMILIAL STATUS OR NATIONAL ORIGIN UNLESS AND ONLY TO THE EXTENT THAT SAID COVENANT (A) IS EXEMPT UNDER CHAPTER 42, SECTION 3607 OF THE UNITED STATES CODE OR (B) RELATES TO HANDICAP BUT DOES NOT DISCRIMINATE AGAINST HANDICAPPED PERSONS), CONTAINED IN DEED DATED OCTOBER 15, 1959 AS DOCUMENT 17705122 FROM LUTHERAN GENERAL DEACONESS HOSPITALS, A NOT FOR PROFIT CORPORATION, TO THE SUBURBAN COOK COUNTY TUBERCULOSIS SANITARIUM DISTRICT THAT LAND SHALL REVERT TO GRANTORS IN THE EVENT THAT SAID LAND SHALL NOT BE USED OR OCCUPIED FOR THE PURPOSES OF THE GRANTEES AS ESTABLISHED BY LAW, SUBJECT TO THE CONDITIONS THEREIN CONTAINED.

NOTE: SAID INSTRUMENT CONTAINS A PROVISION FOR FORFEITURE OR REVERSION OF TITLE IN CASE OF BREACH OF CONDITION.

(AFFECTS PARCEL 3)

T 23. PUBLIC UTILITIES EASEMENT OVER THE EAST 5 FEET OF THE LAND AS DISCLOSED BY PLAT OF SANITARIUM SUBDIVISION RECORDED DECEMBER 29, 1959 AS DOCUMENT 17744663.

(AFFECTS PARCEL 3)

U 24. EASEMENTS IN FAVOR OF THE COMMONWEALTH EDISON COMPANY FOR POLE LINES, WIRES, CONDUIT AND INCIDENTAL PURPOSES AS CONTAINED IN DOCUMENT RECORDED AS DOCUMENT 26267797.

(AFFECTS PARCEL 4)

V 25. EASEMENT FOR UNDERGROUND PEDESTRAIN PASSAGE BY TUNNEL OR AS PART OF ANY BUILDING ERECTED ON LOT 1 AND FOR UTILITIES WITHIN OR WITHOUT SAID TUNNEL OR BUILDING FOR THE USE AND BENEFIT OF LOT 2 AS SHOWN ON PLAT OF LUTHERAN GENERAL HOSPITAL SUBDIVISION NO. 1 RECORDED AS DOCUMENT 20389600.

(AFFECTS PARCELS 4, 5, 6 AND 7)

W 26. NOTHING IN THIS COMMITMENT OR OUR POLICY WHEN ISSUED SHOULD BE CONSTRUED AS INSURING THE EXACT LOCATION OF THE EASEMENT DESCRIBED AS PARCEL 7.

(AFFECTS PARCEL 7)

X 27. (A) TERMS, PROVISIONS, AND CONDITIONS RELATING TO THE EASEMENT DESCRIBED AS PARCEL 7 CONTAINED IN THE INSTRUMENT CREATING SAID EASEMENT.

(B) RIGHTS OF THE ADJOINING OWNER OR OWNERS TO THE CONCURRENT USE OF SAID EASEMENT.

(AFFECTS PARCEL 7)

Y 28. NOTE FOR INFORMATION (ENDORSEMENT REQUESTS):

ALL ENDORSEMENT REQUESTS SHOULD BE MADE PRIOR TO CLOSING TO ALLOW AMPLE TIME FOR THE COMPANY TO EXAMINE REQUIRED DOCUMENTATION.

(THIS NOTE WILL BE WAIVED FOR POLICY).

** END **

TAB 5

Applicant Disclosure Statement (Section 2-24-1)

Name of Applicant: Advocate Health and Hospitals Corporation

Subject Property Information:
Address: 1925 W. Dempster Street, Park Ridge, Illinois 60068

P.I.N.: 09-022-200-012-0000; 09-022-200-016-0000, 09-22-200-030-0000; and 09-22-200-032-0000

Name and business address of any and all current holders of legal or beneficial title to the subject property (attach additional sheets if necessary):

Advocate Health and Hospitals Corporation, 1775 W. Dempster Street, Park Ridge, Illinois 60068

If there is a pending contract for the sale of the subject property, list the purchasing party's name:

N/A

List any entities, other than a natural person, that hold legal or beneficial title and that have a greater than 3% interest in the entity:

N/A

For each entity listed above that, list every director, officer and manager of the entity:

N/A

For each entity listed above that is a limited partnership or limited liability company, list the name of every limited or general partner or member:

N/A

For each limited partner or general partner that is a corporate entity, list the name of every person who holds a greater than 3% interest in the corporation:

N/A

I acknowledge that I have read and understand the requirements of Article 2, Chapter 24 of the Park Ridge Municipal Code ("Code"). I understand that as the applicant, I am required to keep all of the information on this form current and updated until the City Council takes final action on my request. I also understand that if I fail to comply with this requirement, the City Council may declare the action it has taken with respect to my request null and void. In addition, the City Council may direct the initiation of legal action for a violation of the Code and may seek the penalties set forth in Section 2-24-4 of the Code, including daily monetary fines. I understand that this disclosure statement will be open for public inspection and posted on the City's website prior to any meeting when my request will be acted upon. I understand that if the subject property is assigned, transferred or if an agreement is entered into to transfer any right, interest, or permit within one year of the City Council's final action, there will be a rebuttable presumption that the assignee or transferee had constructive control of the subject property at the time of my application. The penalty discussed above will be imposed for any failure to disclose any such assignee or transferee.

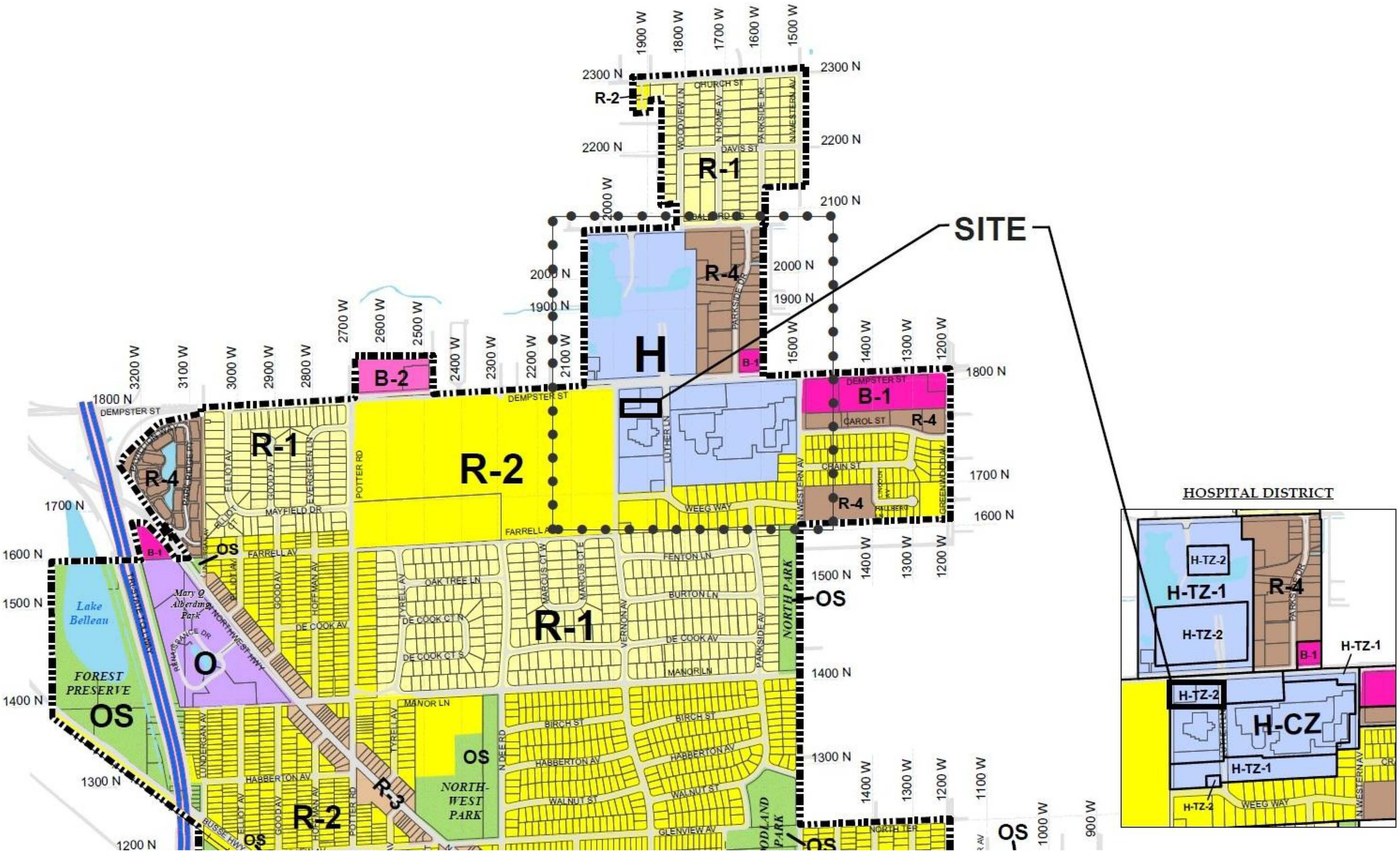
I, the undersigned applicant, hereby certify that above statements are true and correct to the best of my knowledge.

Signature of Applicant Roberto Orozco,
Planning and Design Manager
Advocate Lutheran General Hospital

September 9, 2016
Date

Revised 5-29-08

TAB 6



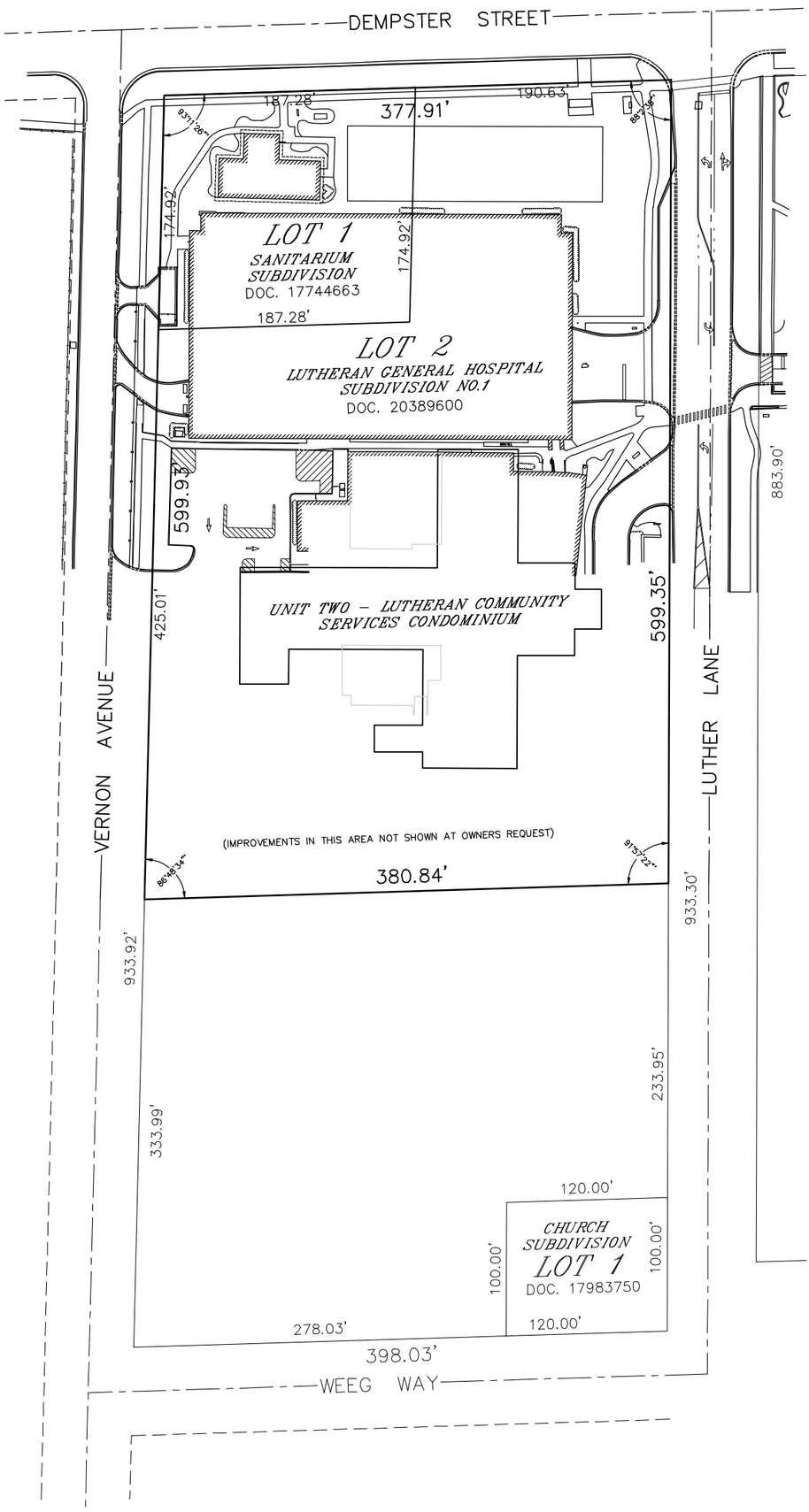
Advocate Lutheran General Hospital – West Parking Facility Expansion

Advocate
Lutheran General Hospital
Lutheran General Children's Hospital

DESMAN
Design Management

TAB 7

Plat of Survey



N

GRAPHIC SCALE

50 0 25 50

(IN FEET)
1 inch = 50 ft.

Legal Description

LOT ONE IN SANITARIUM SUBDIVISION OF THE WEST 200.0 FEET, MEASURED AT RIGHT ANGLES TO THE WEST LINE THEREOF, OF THE NORTH 225.0 FEET, MEASURED ON THE EAST LINE AND WEST LINE THEREOF, OF LOT 2 IN HENRY C. SENNE'S ESTATE DIVISION OF THE NORTH HALF OF THE NORTHEAST QUARTER AND THE NORTH 55 RODS OF THE EAST HALF OF THE NORTHWEST QUARTER OF SECTION 22, TOWNSHIP 41 NORTH, RANGE 12 EAST OF THE THIRD PRINCIPAL MERIDIAN, IN COOK COUNTY, ILLINOIS.

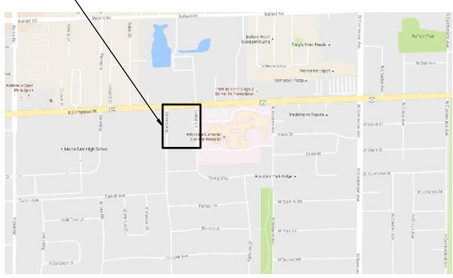
ALSO
LOT 2 IN LUTHERAN GENERAL HOSPITAL SUBDIVISION NO.1, (EXCEPT UNIT NUMBER TWO IN THE LUTHERAN COMMUNITY SERVICES CONDOMINIUM AS DELINEATED ON A SURVEY OF THE FOLLOWING DESCRIBED REAL ESTATE: THOSE PARTS OF LOTS 1 AND 2 IN THE LUTHERAN GENERAL HOSPITAL SUBDIVISION, NUMBER ONE, BEING A SUBDIVISION OF PARTS OF LOTS 1 AND 2 IN HENRY C. SENNE'S ESTATE DIVISION OF THE NORTH HALF OF THE NORTHEAST QUARTER AND OF THE NORTH 55 RODS OF THE EAST HALF OF THE NORTHWEST QUARTER OF SECTION 22, TOWNSHIP 41 NORTH, RANGE 12 EAST OF THE THIRD PRINCIPAL MERIDIAN, THE PLAT OF WHICH WAS RECORDED JANUARY 26, 1968 AS DOCUMENT NO. 20389600, WHICH SURVEY OF THE LUTHERAN COMMUNITY SERVICES CONDOMINIUM IS ATTACHED AS EXHIBIT 'A' TO THE DECLARATION OF CONDOMINIUM RECORDED AS DOCUMENT NO. 26148266 TOGETHER WITH ITS UNDIVIDED PERCENTAGE INTEREST IN THE COMMON ELEMENTS THEREOF, IN COOK COUNTY, ILLINOIS) BEING A RESUBDIVISION OF PARTS OF LOTS 1 AND 2 IN HENRY C. SENNE'S ESTATE DIVISION OF THE NORTH HALF OF THE NORTHEAST QUARTER AND OF THE NORTH 55 RODS OF THE EAST HALF OF THE NORTHWEST QUARTER OF SECTION 22, TOWNSHIP 41 NORTH, RANGE 12 EAST OF THE THIRD PRINCIPAL MERIDIAN, IN COOK COUNTY ILLINOIS.

ALSO
UNIT NUMBER TWO IN THE LUTHERAN COMMUNITY SERVICES CONDOMINIUM AS DELINEATED ON A SURVEY OF THE FOLLOWING DESCRIBED REAL ESTATE: THOSE PARTS OF LOTS 1 AND 2 IN THE LUTHERAN GENERAL HOSPITAL SUBDIVISION, NUMBER ONE, BEING A SUBDIVISION OF PARTS OF LOTS 1 AND 2 IN HENRY C. SENNE'S ESTATE DIVISION OF THE NORTH HALF OF THE NORTHEAST QUARTER AND OF THE NORTH 55 RODS OF THE EAST HALF OF THE NORTHWEST QUARTER OF SECTION 22, TOWNSHIP 41 NORTH, RANGE 12 EAST OF THE THIRD PRINCIPAL MERIDIAN, THE PLAT OF WHICH WAS RECORDED JANUARY 26, 1968 AS DOCUMENT NO. 20389600, WHICH SURVEY OF THE LUTHERAN COMMUNITY SERVICES CONDOMINIUM IS ATTACHED AS EXHIBIT 'A' TO THE DECLARATION OF CONDOMINIUM RECORDED AS DOCUMENT NO. 26148266 TOGETHER WITH ITS UNDIVIDED PERCENTAGE INTEREST IN THE COMMON ELEMENTS THEREOF, IN COOK COUNTY, ILLINOIS.

Total Area
230240.817 sq ft
5.286 Acres

Location Map

SURVEY AREA



STANDARD SYMBOLS

EXISTING	FEATURE
BM/TBM	BENCHMARK
	CONCRETE R.O.W. MONUMENT
	R.O.W. LINE
	STORM SEWER
	STORM SEWER MANHOLE
	CATCH BASIN
	INLET
C.O.	CLEAN OUT
	SANITARY SEWER
	SANITARY SEWER MANHOLE
	WATER VAULT
	VALVE BOX
W	WATERMAIN
	FIRE HYDRANT
GAS	GAS MANHOLE
GAS	GAS VALVE
G	GAS MAIN
T	TELEPHONE LINES
IBT	IBT BOX
IBT	IBT MANHOLE
E	ELECTRIC LINES
ELEC.	ELECTRIC MANHOLE
	UTILITY POLE
	SIGN
	LIGHT STANDARD
X X X X	FENCE
10"ø	TREE
	SHRUB
857	CONTOUR LINE
x 854.7	SPOT GRADE
	HEADWALL
	FLARED END SECTION
	CULVERT
	SWALE
	PROPERTY PIN

State of Illinois)
County of Lake) S.S.

Gewalt Hamilton Associates Inc. hereby certifies that the property described in the above caption was surveyed under its direction, and that the plat drawn hereon represents said survey.

Dated this 8th. day of September 2016.

Gewalt Hamilton Associates, Inc.
Professional Design Firm License No. 184-000922

Jonathan F. Past
Illinois Professional Land Surveyor No. 3341
License Expires November 30, 2016.

STATE OF ILLINOIS · Vernon Hills · JONATHAN F. PAST · 035-003341 · PROFESSIONAL LAND SURVEYOR

Prepared for: Advocate Health Care

Note:
See Existing Conditions Drawing by Gewalt Hamilton Associates, Inc. for in depth location of permanent features and topography

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GHA GEWALT HAMILTON ASSOCIATES, INC.
625 Forest Edge Drive ▪ Vernon Hills, IL 60061
TEL 847.478.9700 ▪ FAX 847.478.9701

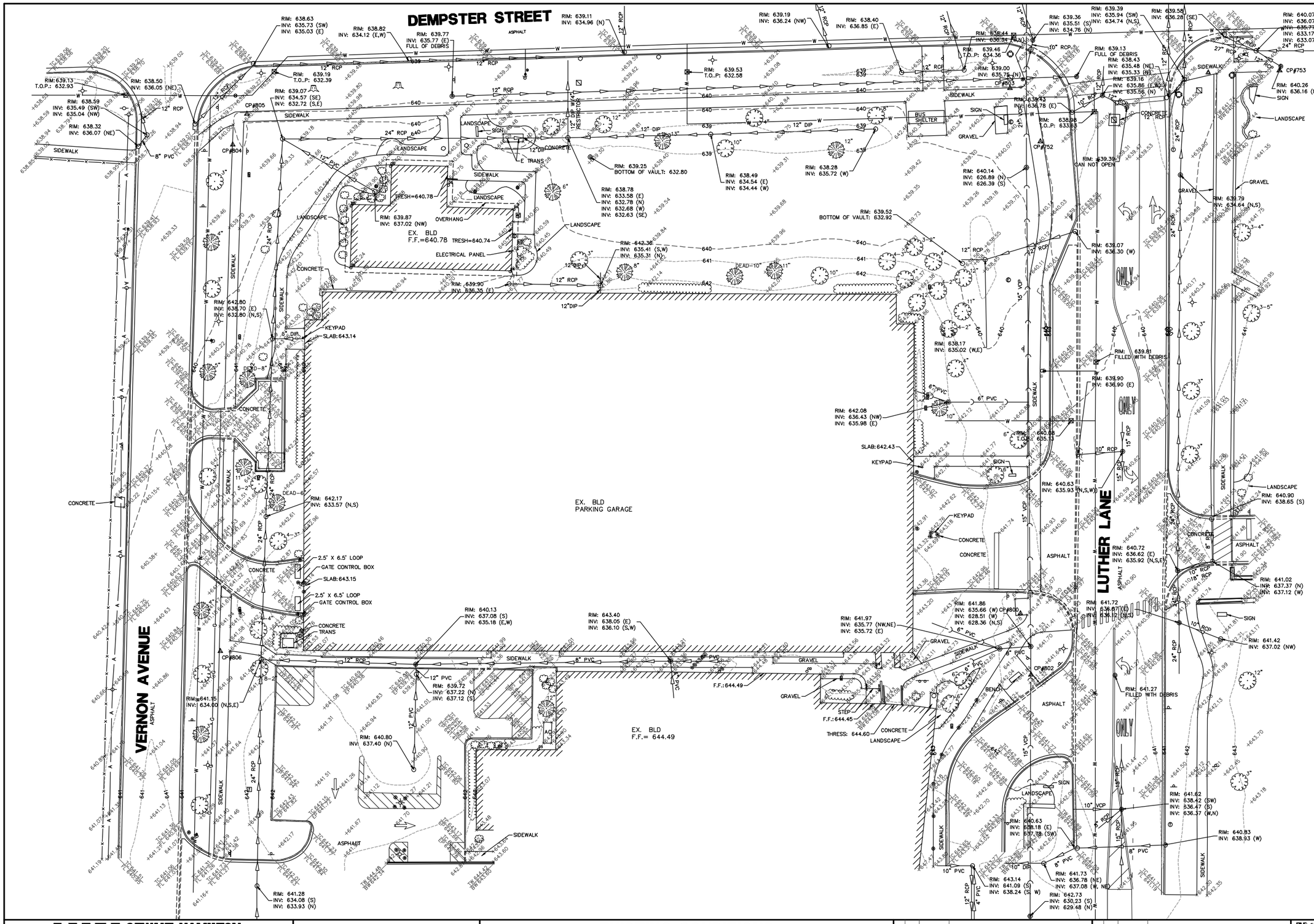
PLAT OF SURVEY

ADVOCATE LUTHERAN GENERAL HOSPITAL
CENTER FOR ADVANCED CARE
PARK RIDGE, ILLINOIS

NO.	BY	DATE	REVISION

DRAWN BY: CSB
CHECKED BY: JFP
DATE: 09/08/16
GHA PROJECT #: 5154.300
SCALE: 1":50'
SHEET NUMBER: 1 OF 1 SHEETS

FILE: 5154.300_DRAFT BND.dwg



GEWALT HAMILTON ASSOCIATES, INC.
625 Forest Edge Drive ■ Vernon Hills, IL. 60061
TEL 847.478.9700 ■ FAX 847.478.9701

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EXISTING CONDITIONS

ADVOCATE LUTHERAN GENERAL HOSPITAL
CENTER FOR ADVANCED CARE
PARK RIDGE, ILLINOIS

NO.	BY	DATE	REVISION

FILE: 5154.300_EX.dwg	
DRAWN BY: CSB	GHA PROJECT #: 5154.300
DATE: 09/08/16	
CHECKED BY: JFP	SCALE: 1":20"
DATE: 09/08/16	

SHEET NUMBER: 1 OF 1 SHEETS

TAB 8

Existing Building - View from Dempster Street

A201
September 9, 2016

Advocate Lutheran General Hospital - West Parking Facility Expansion

1775 Dempster St, Park Ridge, IL 60068

Advocate
Lutheran General Hospital
Lutheran General Children's Hospital

DESMAN
Design Management

Proposed Expansion - View from Dempster Street

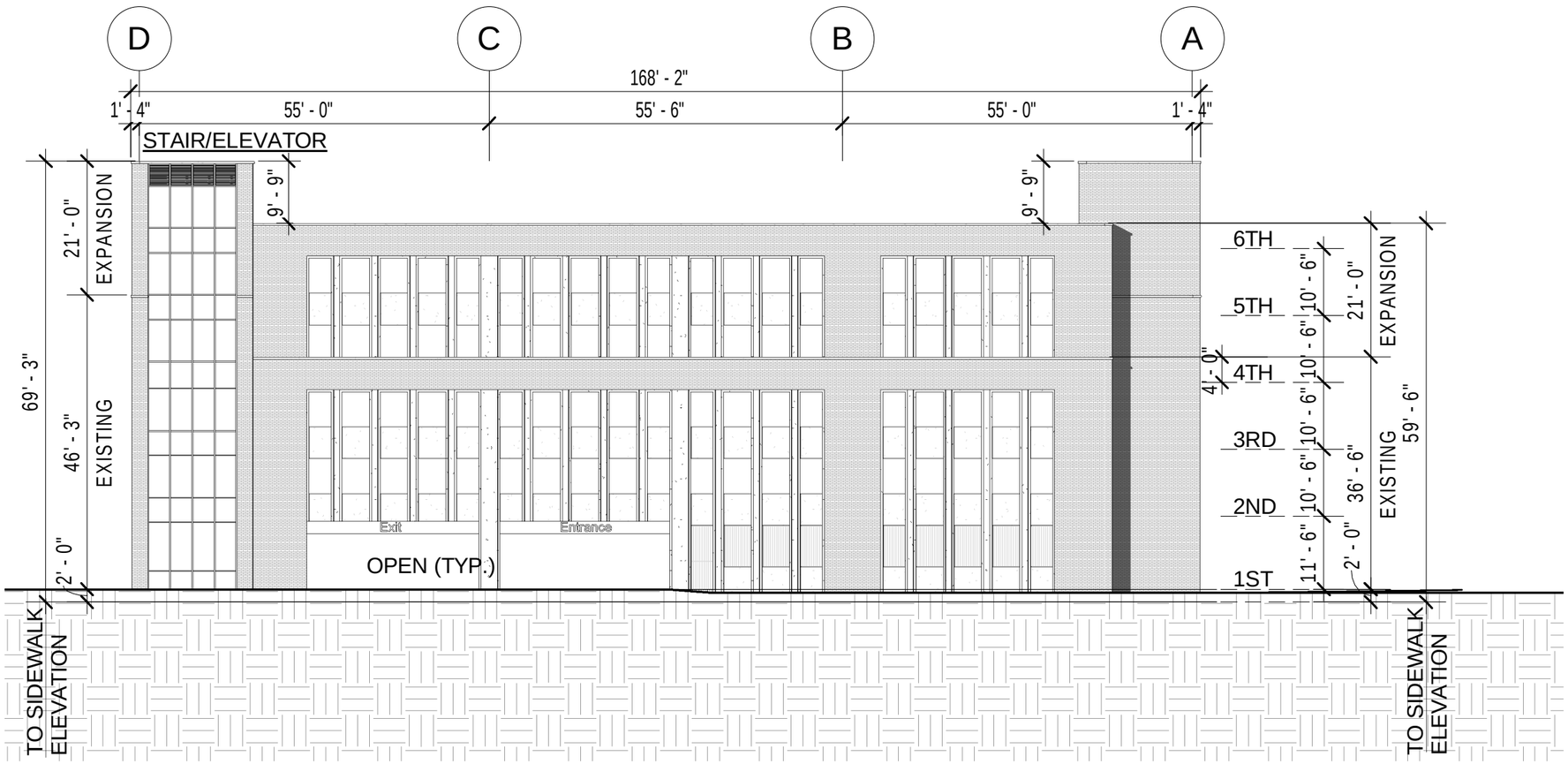
A202
September 9, 2016

Advocate Lutheran General Hospital - West Parking Facility Expansion

1775 Dempster St, Park Ridge, IL 60068

Advocate
Lutheran General Hospital
Lutheran General Children's Hospital

DESMAN
Design Management



1
A203
EAST ELEVATION - LUTHER LANE
SCALE: 1" = 20'-0"

A203
September 9, 2016

Advocate Lutheran General Hospital - West Parking Facility Expansion

1775 Dempster St, Park Ridge, IL 60068

Advocate
Lutheran General Hospital
Lutheran General Children's Hospital

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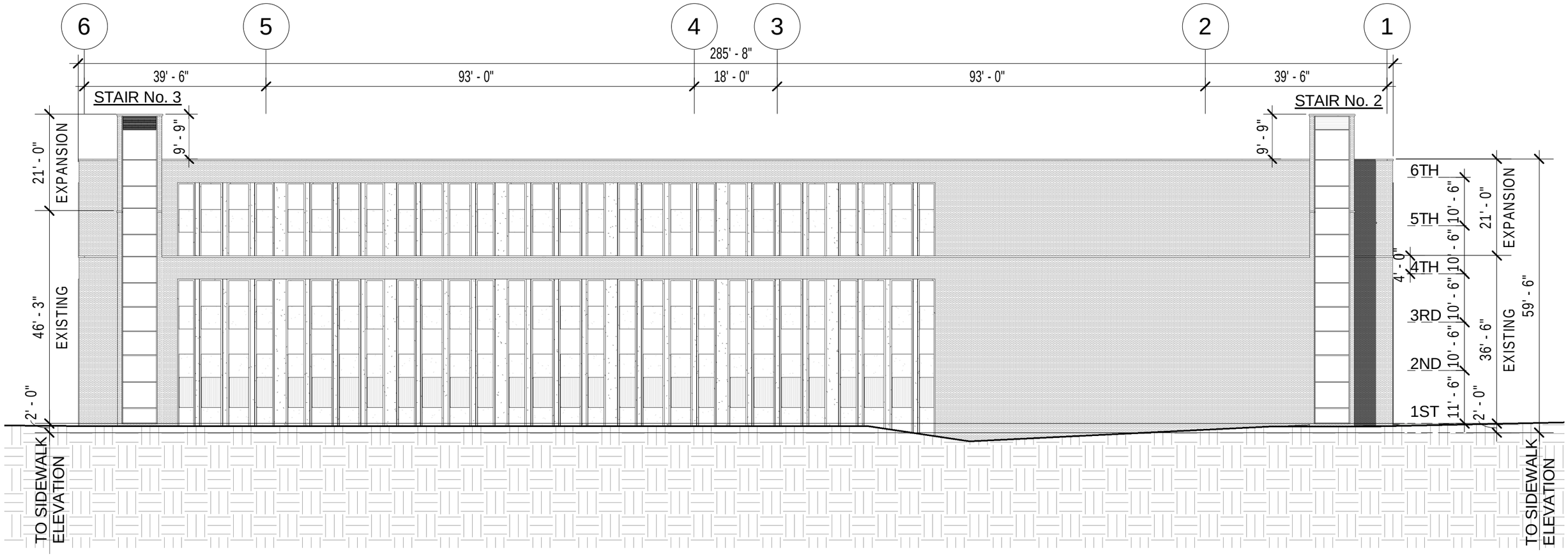
Design Management



1 / A204 NORTH ELEVATION - DEMPSTER STREET

SCALE: 1" = 20'-0"

A204

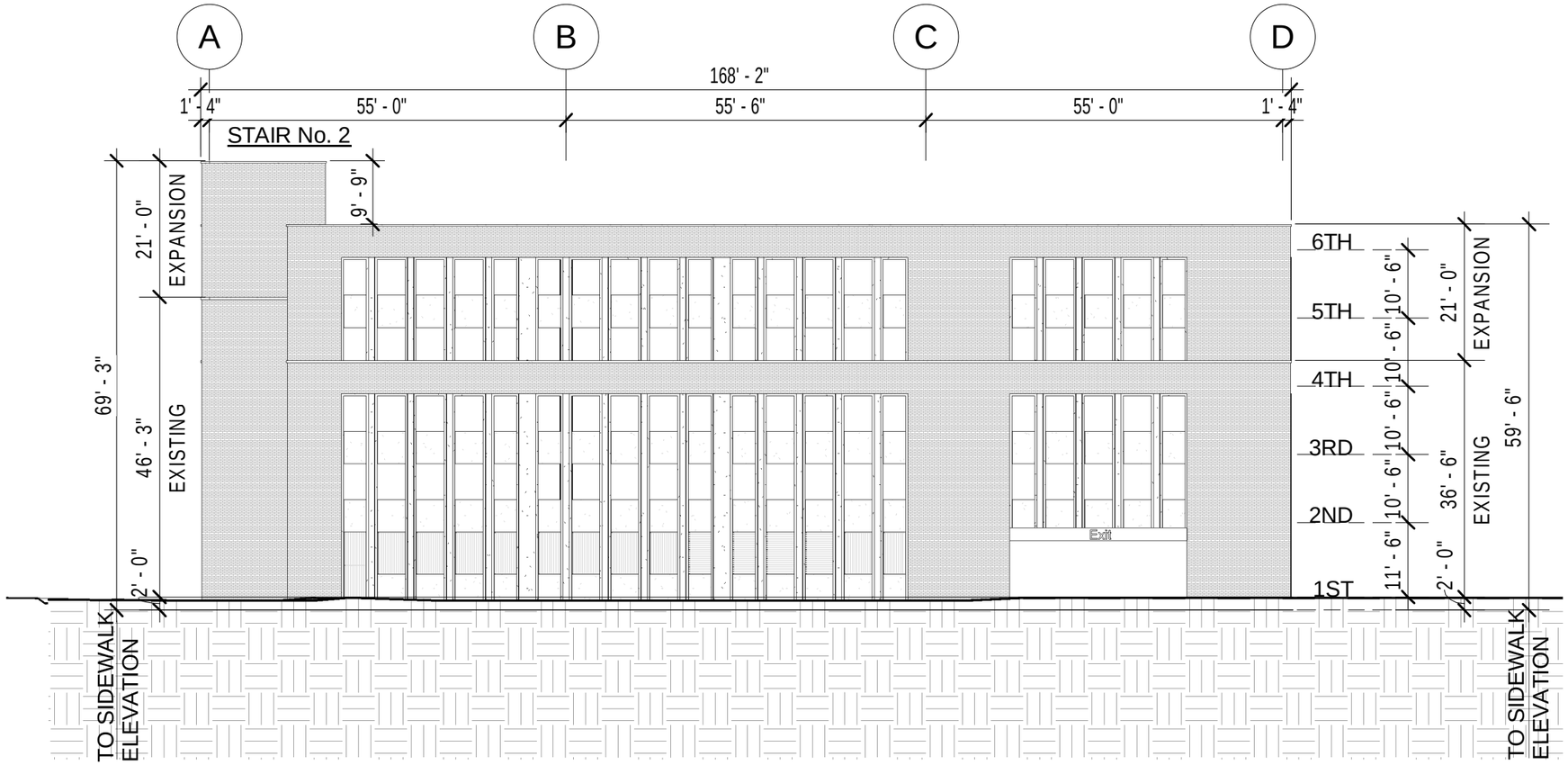
September 9, 2016

Advocate Lutheran General Hospital - West Parking Facility Expansion

1775 Dempster St, Park Ridge, IL 60068

Advocate Lutheran General Hospital
Lutheran General Children's Hospital

DESMAN Design Management



1 A205 WEST ELEVATION - VERNON AVENUE

SCALE: 1" = 20'-0"

A205
September 9, 2016

Advocate Lutheran General Hospital - West Parking Facility Expansion

1775 Dempster St, Park Ridge, IL 60068

Advocate Lutheran General Hospital
Lutheran General Children's Hospital

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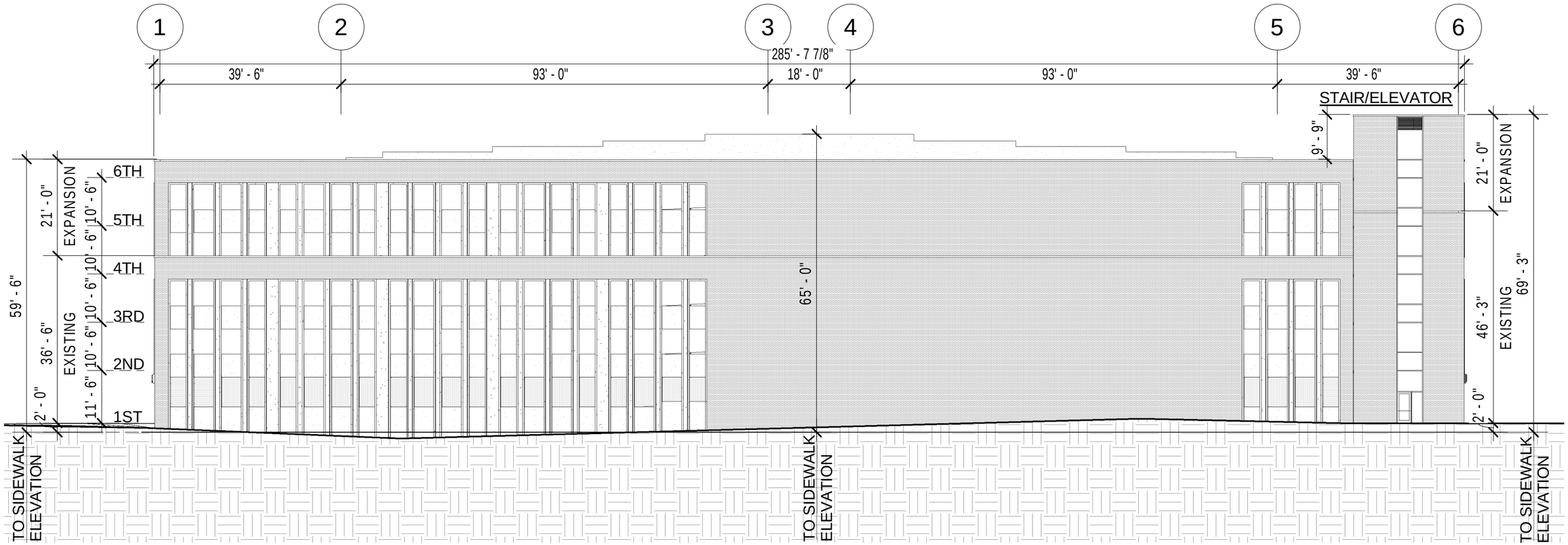


1
A206

SOUTH ELEVATION - ADJACENT TO CENTER FOR ADVANCED CARE

SCALE: 1" = 20'-0"

A206
September 9, 2016

Advocate Lutheran General Hospital - West Parking Facility Expansion

1775 Dempster St, Park Ridge, IL 60068

Advocate
Lutheran General Hospital
Lutheran General Children's Hospital

DESMAN
Design Management

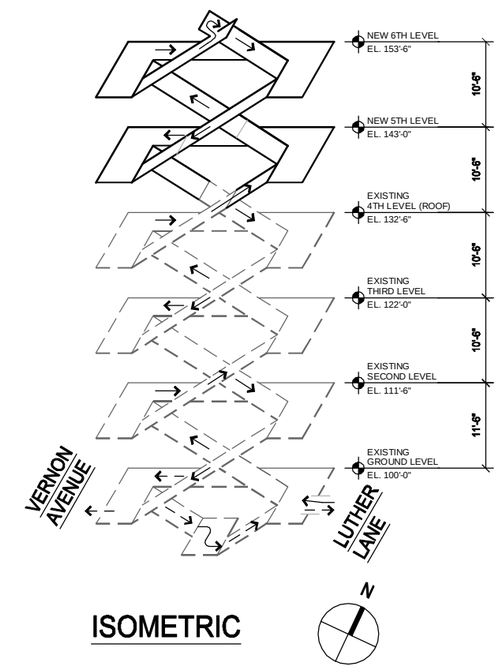
Parking Summary

Level	9'-0" Wide	ADA	Total Parking	Floor Area GSF
Existing Ground	95	12	107	48,000
Existing 2nd	136	0	136	48,000
Existing 3rd	136	0	136	48,000
Existing 4th (Roof)	136	0	136	48,000
Existing 4th Partial (Crossover)	20	0	20	6,700
Existing Total	**523**	**12**	**535**	**198,700**

Parking Expansion:

New 5th	116	0	116	41,300
New 6th (Roof)	136	0	136	48,000
New 6th Partial (Crossover)	20	0	20	6,700
Expansion Total	**272**	**0**	**272**	**96,000**

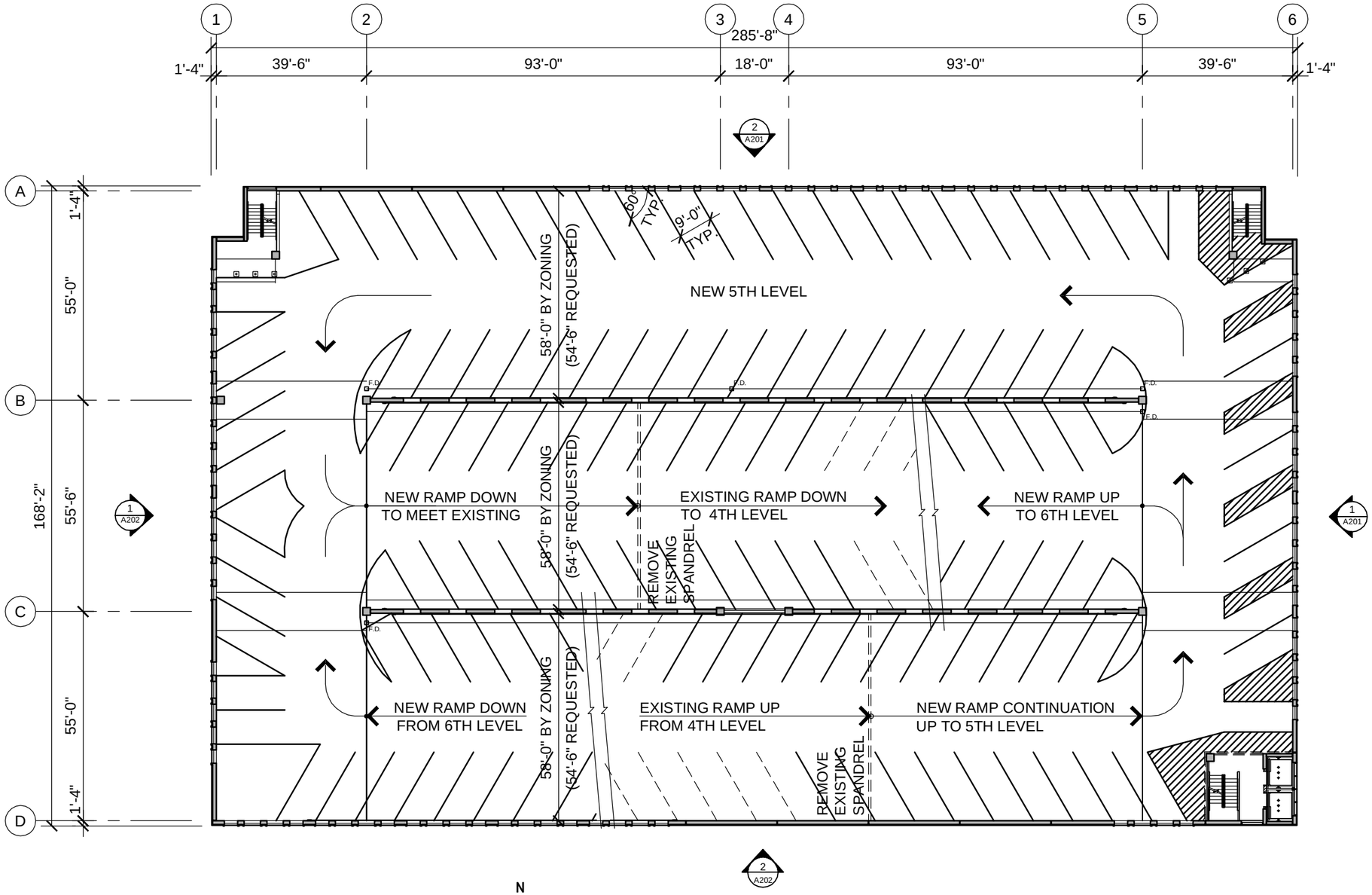
Grand Total	**795**	**12**	**807**	**294,700**



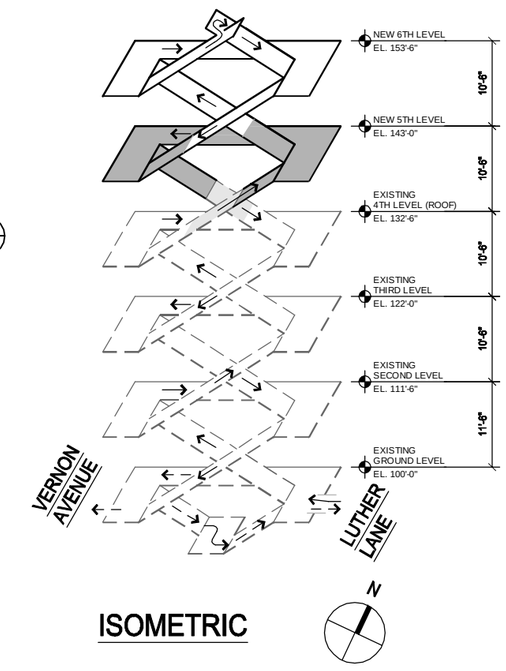
ISOMETRIC

A100

September 9, 2016



NEW 5TH LEVEL PLAN



ISOMETRIC

A101

September 9, 2016

Advocate Lutheran General Hospital - West Parking Facility Expansion

1775 Dempster St, Park Ridge, IL 60068

Advocate
Lutheran General Hospital
Lutheran General Children's Hospital

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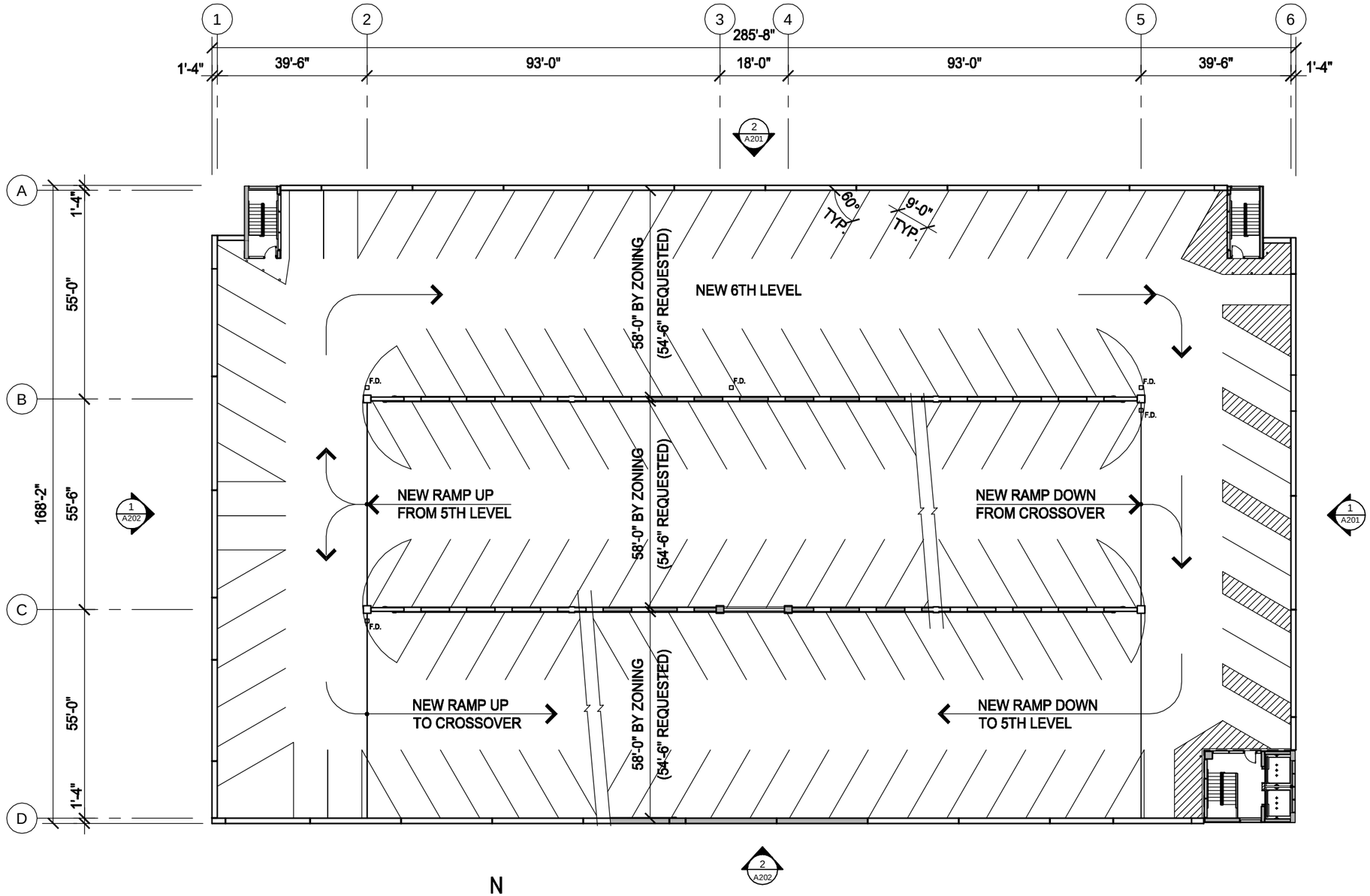
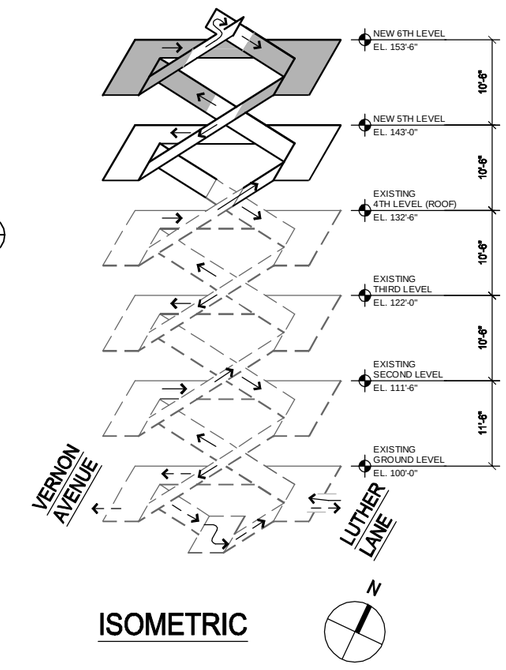


NEW 6TH LEVEL PLAN

N



ISOMETRIC

A102

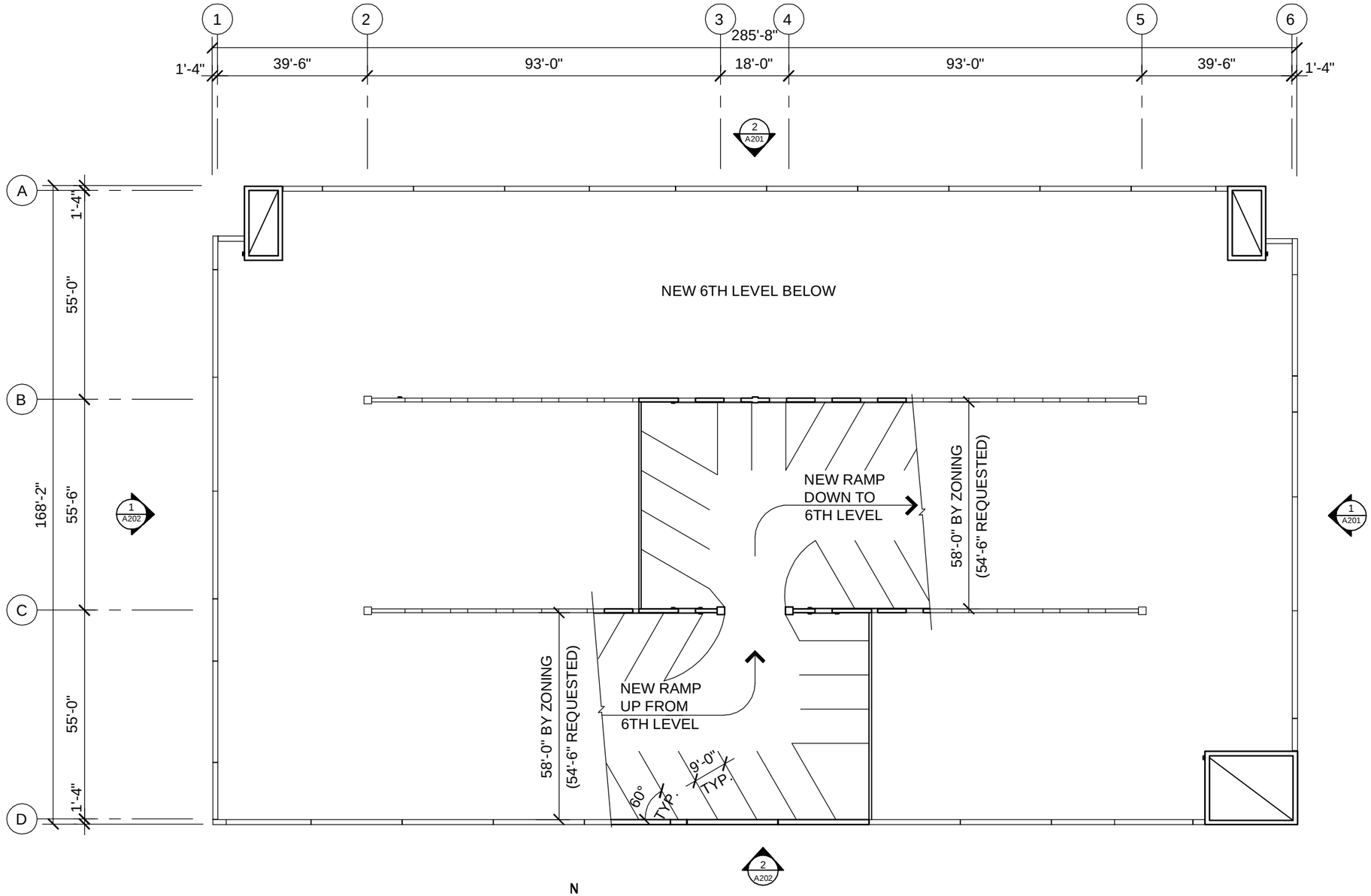
September 9, 2016

Advocate Lutheran General Hospital - West Parking Facility Expansion

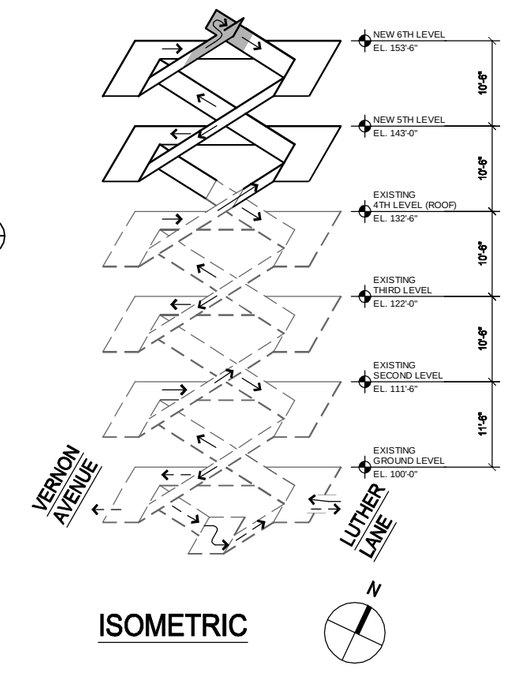
1775 Dempster St, Park Ridge, IL 60068

Advocate Lutheran General Hospital
Lutheran General Children's Hospital

DESMAN Design Management



NEW TOP CROSSOVER PLAN



ISOMETRIC

A103

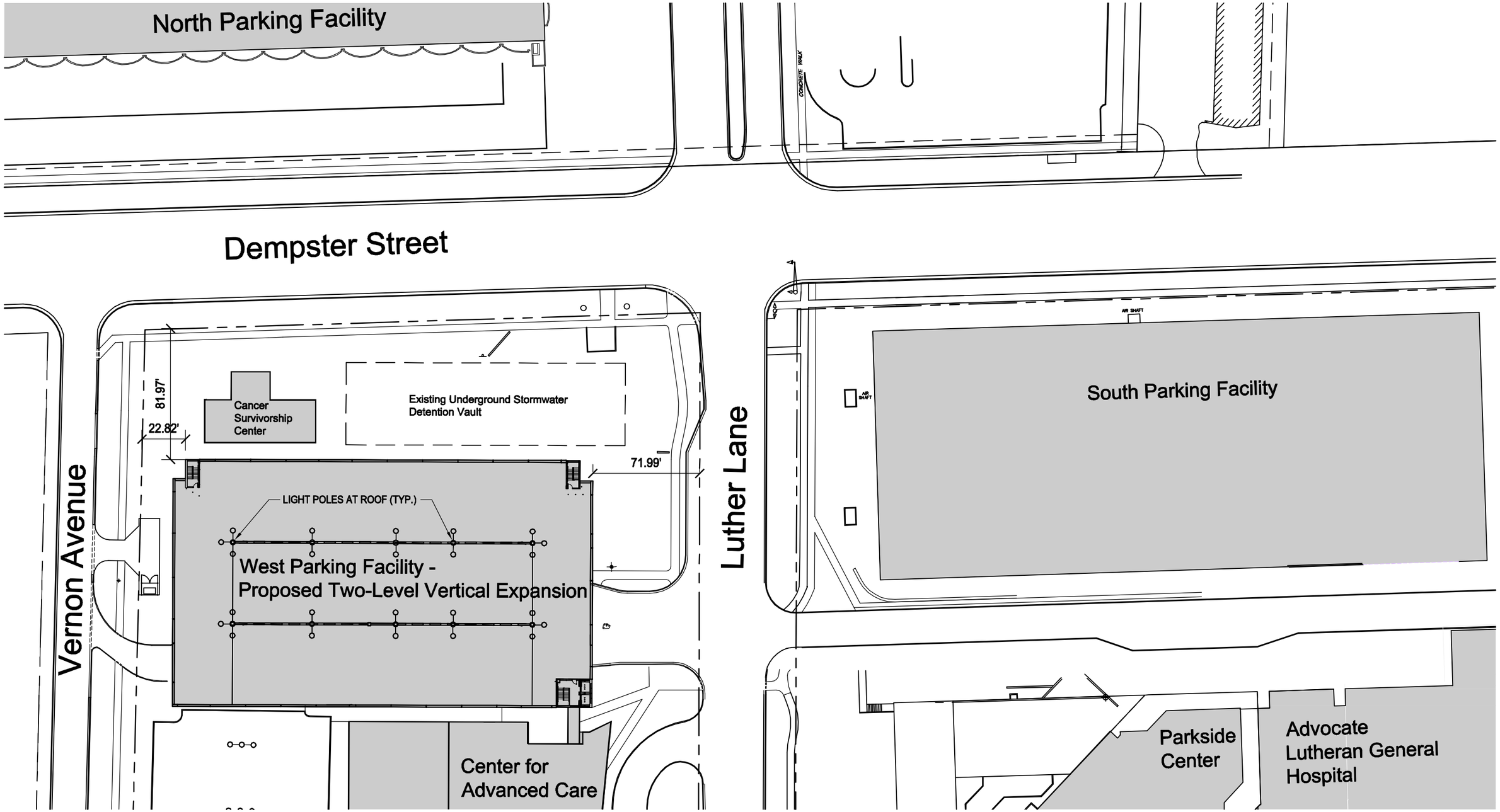
September 9, 2016

Advocate Lutheran General Hospital - West Parking Facility Expansion

1775 Dempster St, Park Ridge, IL 60068

Advocate Lutheran General Hospital
Lutheran General Children's Hospital

DESMAN Design Management



SITE PLAN

C100

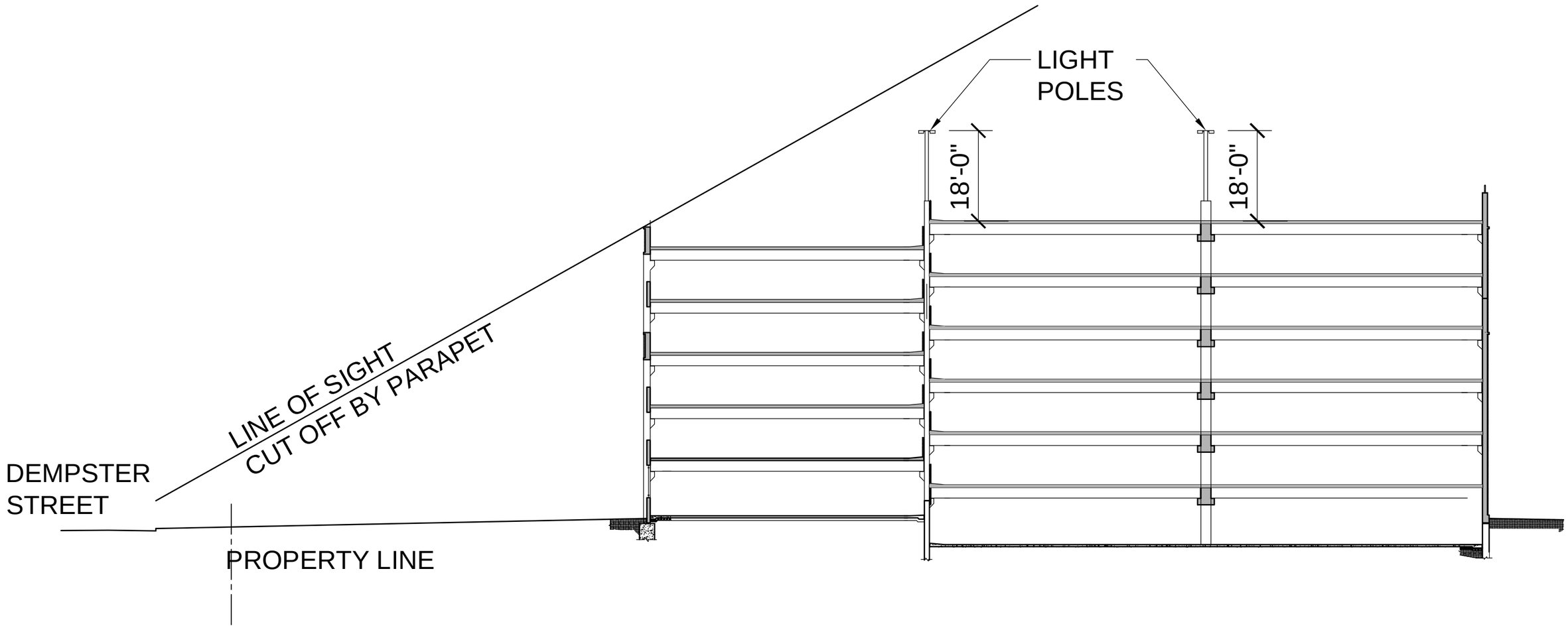
September 9, 2016

Advocate Lutheran General Hospital - West Parking Facility Expansion

1775 Dempster St, Park Ridge, IL 60068

Advocate Lutheran General Hospital
Lutheran General Children's Hospital

DESMAN Design Management



BUILDING SECTION LOOKING EAST

A301

September 9, 2016

Advocate Lutheran General Hospital - West Parking Facility Expansion

1775 Dempster St, Park Ridge, IL 60068

Advocate
Lutheran General Hospital
Lutheran General Children's Hospital

DESMAN
Design Management

GEWALT HAMILTON ASSOCIATES, INC.
CONSULTING ENGINEERS
625 Forest Edge Drive, Vernon Hills, IL 60061
Tel 847.478.9700 ▪ Fax 847.478.9701
www.gha-engineers.com

Memorandum

To: Pier Panicali –DESMAN

Copy: Roberto Orozco – Advocate Health
Vytas Zemaitaitis – Advocate Lutheran General Hospital
Don Matthews – GHA

From: Daniel P. Brinkman, PE, PTOE

Date: September 8, 2016

Subject: Traffic and Parking Analyses
Center for Advanced Care Garage - Expansion
SWC Luther Lane at US Rte 14 (Dempster Street)
Park Ridge, Illinois

Project Context and Summary Statement

Advocate Lutheran General Hospital (ALGH) has commenced preliminary studies to add two additional levels (272 standard spaces) to the Center for Advanced Care (CAC) parking garage. While there is not a specific component of the hospital building that is being expanded to generate the additional parking spaces, the City of Park Ridge is requiring a traffic and parking analysis of the expanded garage as part of the Special Use Application.

The following is intended to flow from a review of existing and previously observed conditions and operations at the ALGH campus, to an estimate of additional traffic volumes and a presentation of preliminary recommendations. Briefly summarizing:

Based on our observations and analyses, Gewalt Hamilton Associates, Inc. (GHA) estimates that the additional parking spaces in the CAC garage could generate approximately 160 new trips (combined inbound and outbound) during the Peak Hours depending upon occupancy.

Exhibits and *Appendices* referenced below are conveniently located at the end of this document.

Exhibit 1 – Existing Traffic Volumes

Exhibit 1 summarizes the current weekday traffic counts at the intersections of Dempster Street with Vernon Avenue and Luther Lane, as well as along Luther Lane at the CAC garage access. These volumes were collected by GHA on May 19, 2016. The Morning Peak Hour occurred between 8:00-9:00 AM and the Evening Peak Hour occurred between 4:00 and 5:00 PM.

Appendix A contains summary printouts of the traffic data.

Exhibit 2 – Parking Observations

Exhibit 2 tabulates two previous parking occupancy counts of the CAC garage conducted prior to the Emergency Department expansion and a third occupancy observation conducted in June 2016.

As can be seen, occupancy of the CAC garage has increased since the 2013 observations, in some cases significantly. Furthermore, between the hours of 10:00 AM and 3:00 PM during our most recent observation, the CAC garage occupancy was at or exceeded the "design" goal of 90% occupancy.

Exhibit 3 – Project Traffic Characteristics

Exhibit 3 Part A tabulates historic traffic counts in and out of the CAC garage with the parking occupancy during the same peak hours to generate an estimated trip rate per occupied space in the garage. Traditionally one would estimate a traffic increase based on some known expanded use or parameter (e.g. more beds or increased treatment square footage) however no similar published data is available for parking garages.

Using the two previous observations from 2013 and the 2016 observation, GHA determined an average trip per space ratio for the Morning and Evening Peak Hours. These calculated ratios were used to estimate future traffic volumes accessing the CAC garage.

Part B of *Exhibit 3* calculates the estimated new traffic from the additional spaces occupied in the garage if it achieved the current observed peak occupancy of 71% during the AM traffic Peak and 82% during the PM traffic Peak.

Part C of *Exhibit 3* calculates the estimated total traffic entering and exiting the garage if it achieved the current observed peak occupancy of 71% during the AM traffic Peak and 82% during the PM traffic Peak.

Exhibit 4 – New Traffic

Exhibits 4 illustrates the new traffic assignments calculated in Part B of *Exhibit 3* and assigned to the current access system and roadway network.

Exhibit 5 – Projected Traffic

Exhibits 5 illustrates the total traffic assignments calculated in Part C of *Exhibit 3* and assigned to the current access system and roadway network.

Exhibit 6 – Intersection Capacity Analyses

Capacity analyses were performed at the key US Rte 14 (Dempster Street) intersection with Luther Lane. The analysis parameters are listed in Exhibit 6 – Part A, as published in the Transportation research Board's (TRB) 2010 Highway Capacity Manual (HCM 2010). At signalized intersections, Level of Service (LOS) "reports" traffic operations using the letter designations "A" (best) through "F" (worst) and measures the "control delay" per vehicle in seconds. LOS C is often referred to as intersection "design" guideline and LOS D is usually considered as providing the lower threshold of "acceptable" operations. LOS E and F are usually considered "unacceptable".

As can be seen, the additional traffic associated with the expanded parking garage will result in additional delays experienced by primarily northbound Luther Lane traffic. And while the Luther Lane approaches already experience longer than desirable delays and queues, the additional traffic does not result in a further deterioration of the Level of Service of the individual movements or the overall intersection as a whole.

Two key components that result in the substandard operations and delays for the Luther Lane approaches are 1) Dempster Street receives the majority of the signal cycle green time as IDOT focuses on moving the regional traffic and 2) the protected only left turn operations for Luther Lane further restrict the ability to clear the approaches by only allowing left turns to occur during the "green arrow" phase.

For comparison we have considered the impacts of allowing protected / permitted left turns from Luther Lane, which does result in some improvement for the total traffic assignment and in the evening Peak Hour even results in an improvement over the current operations with the additional traffic. However, we are aware of the history associated with the conversion of the signal to protected only turns given the high volume of pedestrian activity in the vicinity.

Appendix B contains summary printouts from the Highway Capacity Software.

Conclusion

An expansion of the CAC Garage is expected to generate additional traffic during the key Morning and Evening Peak Hours. Assuming the observed occupancy during the traffic Peak Hours continues as the garage is expanded approximately 160 additional trips could be expected in and out (combined) of the garage during the peak hours. While this additional volume of traffic will increase congestion along Luther Lane and at the key Luther Lane and Dempster Street intersection no significant changes in operations are expected.

Exhibits

1. Existing Traffic
2. Parking Observations
3. Project Traffic Calculations
4. New Traffic
5. Projected Traffic
6. Intersection Capacity Analysis

Appendices

A. Traffic Data Summary
B. Highway Capacity Software printouts

5154.100 ALGH CAC Garage Traffic - 090816.docx

TECHNICAL ADDENDUM

GHA GEWALT HAMILTON ASSOCIATES, INC.

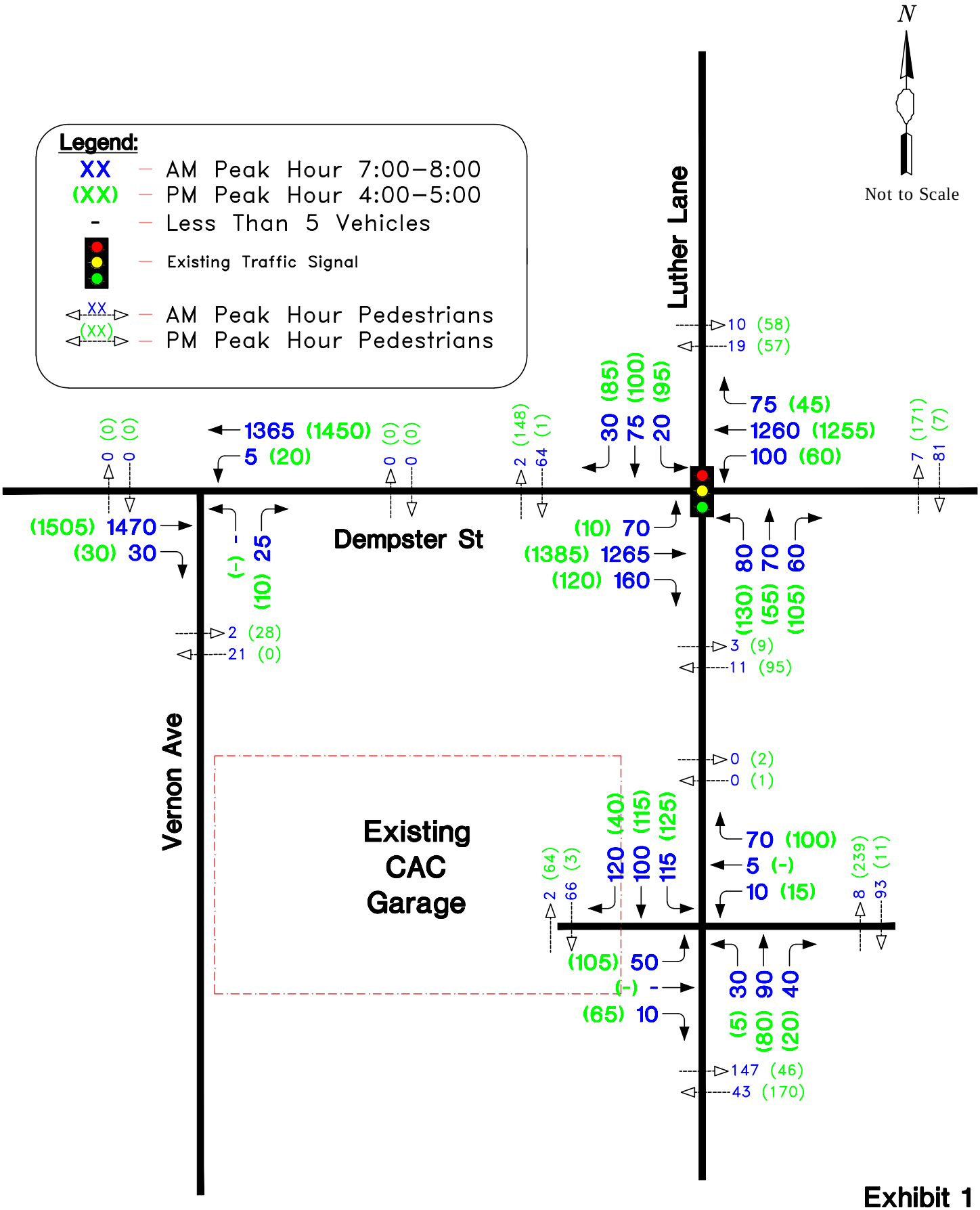


Exhibit 1
Existing Traffic
Source: GHA May 2016

GEWALT HAMILTON ASSOCIATES, INC.

Exhibit 2
Parking Observations
Lutheran General Hospital, West Garage Parking Summary

A. Wednesday March 20, 2013	Spaces Available	6:00 AM	7:00AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00PM	5:00 PM	6:00 PM
Regular	**492**	83	199	203	277	307	330	325	346	363	371	295	222	211
Handicap	**43**	9	11	12	13	14	18	7	9	16	20	10	5	6
Total =	**535**	92	210	215	290	321	348	332	355	379	391	305	227	217
	%Use	17%	39%	40%	54%	60%	65%	62%	66%	71%	73%	57%	42%	41%
B. Tuesday April 30, 2013														
Regular	**492**	205	205	250	354	350	347	313	343	331	302	252	199	211
Handicap	**42**	4	10	16	25	35	23	26	24	17	14	7	8	11
Reserved Dr. Abern	**1**	1	1	1	1	1	1	0	1	1	1	1	1	1
Total =	**535**	210	216	267	380	386	371	339	368	349	317	260	208	223
	%Use	39%	40%	50%	71%	72%	69%	63%	69%	65%	59%	49%	39%	42%
C. Wednesday June 22, 2016														
Regular	496			365	420	445	484	479	476	483	478	442	426	
Handicap	40			17	32	32	33	34	34	32	32	20	19	
Cancer Patients	6			1	4	6	5	5	4	1	1	1	1	
Total =	542			383	456	483	522	518	514	516	511	463	446	
	%Use			71%	84%	89%	96%	96%	95%	95%	94%	85%	82%	

GHA GEWALT HAMILTON ASSOCIATES, INC.

Exhibit 3

Project Traffic Characteristics

ALGH CAC Garage Expansion - Park Ridge, Illinois

Part A. Traffic Observations

Observations	ITE Code	Units	Morning Peak Hour In	Morning Peak Hour Out	Morning Peak Hour Sum	Evening Peak Hour In	Evening Peak Hour Out	Evening Peak Hour Sum
March 20, 2013		210	90	60	150			
		227				55	75	130
	Trips Per Occupied Space =		0.43	0.29	0.71	0.24	0.33	0.57
April 30, 2013		216	90	60	150			
		208				55	75	130
	Trips Per Occupied Space =		0.42	0.28	0.69	0.26	0.36	0.63
June 22, 2016		383	155	60	215			
		446				45	170	215
	Trips Per Occupied Space =		0.40	0.16	0.56	0.10	0.38	0.48
Average Trips per Occupied Space =			**0.42**	**0.24**	**0.66**	**0.20**	**0.36**	**0.56**

Source: GHA Observations

Part B. Traffic Generation Calculations

Projected New Traffic Generated

Peak Morning Occupancy 71%	195	85	80	165			
Peak Afternoon Occupancy 82%	221				90	70	160

Part C. Traffic Projections

Projected Total Traffic Generated (2016 + New)

Peak Morning Occupancy 71%	578	240	140	380			
Peak Afternoon Occupancy 82%	667				135	240	375

GEWALT HAMILTON ASSOCIATES, INC.

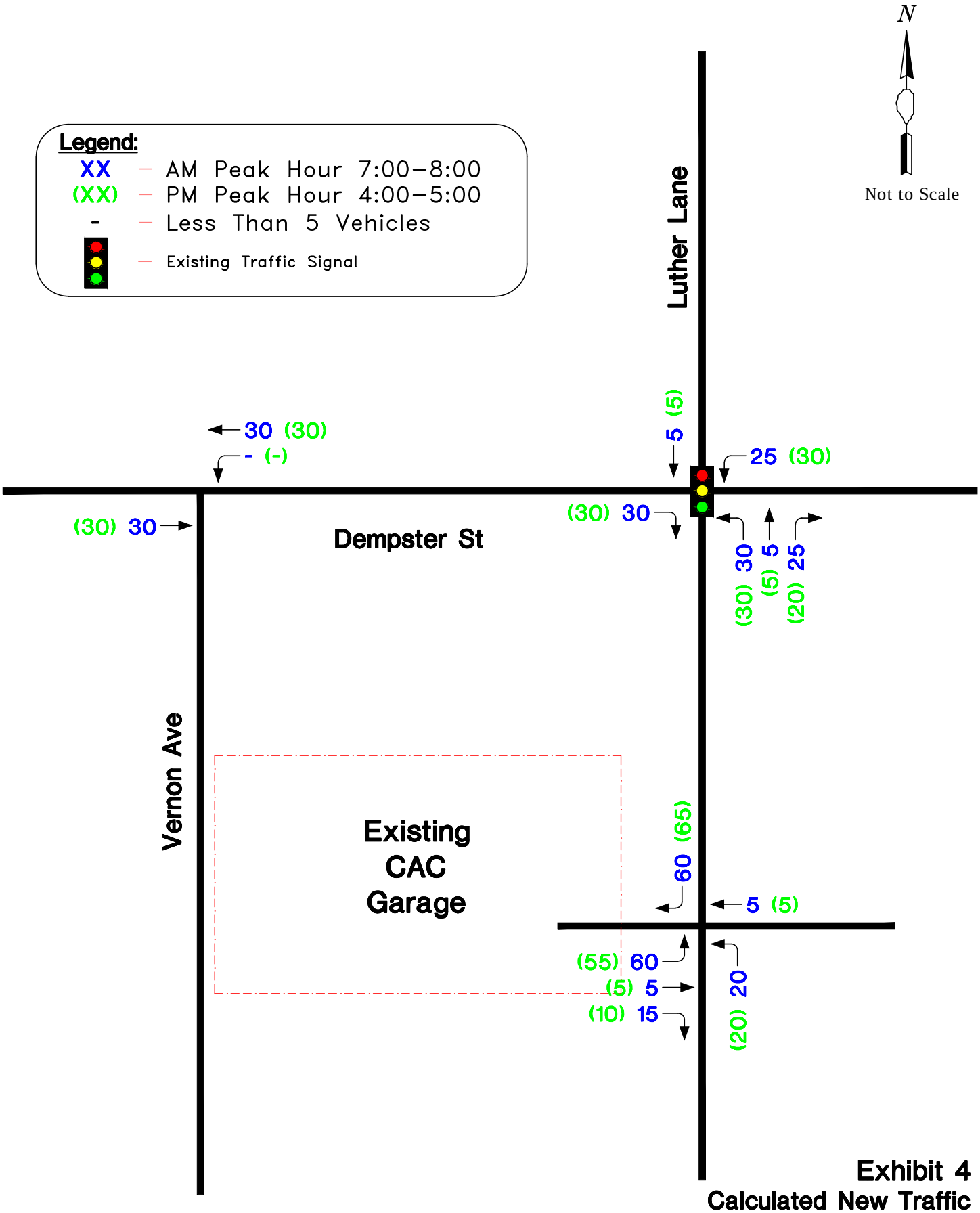


Exhibit 4
Calculated New Traffic
AM Capacity - 71%
PM Capacity - 82%

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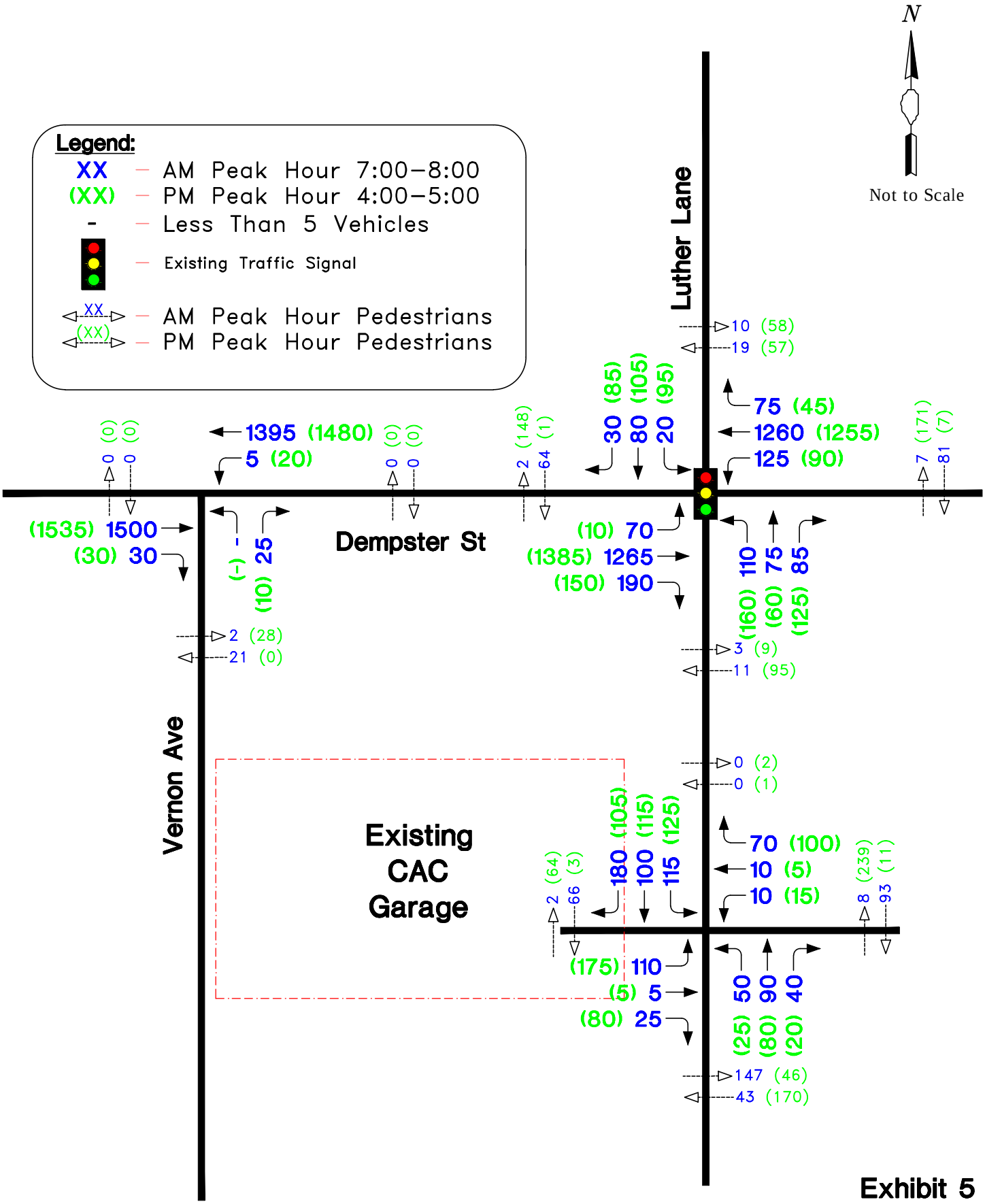


Exhibit 5
Projected Total Traffic
AM Capacity - 71%
PM Capacity - 82%

GEWALT HAMILTON ASSOCIATES, INC.

Exhibit 6
Intersection Capacity Analyses
Proposed CAC Garage Expansion Luther Lane: Park Ridge, IL

Part A. Parameters - Type of Traffic Control *(Source: 2010 Highway Capacity Manual)*

I. Traffic Signals

LOS	Delay (sec / veh)	Description
A	≤ 10	All signal phases clear waiting vehicles without delay
B	>10 and ≤ 20	Minimal delay experienced on select signal phases
C	>20 and ≤ 35	Some delay experienced on several phases; often used as design criteria
D	>35 and ≤ 55	Usually considered as the acceptable delay standard
E	>55 and ≤ 80	Very long delays experienced during the peak hours
F	>80	Unacceptable delays experienced throughout the peak hours

II. Stop Sign

LOS	Delay (sec / veh)
A	≤ 10
B	>10 and ≤ 15
C	>15 and ≤ 25
D	>25 and ≤ 35
E	>35 and ≤ 50
F	>50

Part B. Results

	Roadway Conditions	LOS Per Movement Group By Approach (> = Shared Lane; - = Non Critical or not Allowed Movement; TRT - Shared Through/Right lane (with an additonal Through lane))											Intersection / Approach	
		Eastbound			Westbound			Northbound		Southbound			Delay (sec / veh)	LOS
1. IL 14 (Dempster St) at Luther Lane	**Traffic Signal**	LT	TH	TRT	LT	TH	TRT	LT	TRT	LT	TH	RT	**Intersection Delay**	
A. Weekday Morning Peak Hour														
Current Traffic (See Exhibit 1)	• Current	A	A	A	A	A	A	F	E	F	E	E	10.9	B
	Queue Length (cars)	*1.0*	*4.0*	*6.4*	*1.5*	*3.2*	*4.3*	*6.1*	*8.2*	*1.8*	*5.0*	*1.8*		
	Queue Length (feet)	25	100	160	37.5	80	108	153	205	45	125	45		
Total Traffic (See Exhibit 5)	• Current	A	A	A	A	A	A	F	E	F	E	E	13.9	B
	Queue Length (cars)	*1.1*	*6.1*	*8.9*	*2.0*	*4.5*	*5.6*	*9.0*	*9.6*	*1.8*	*5.3*	*1.8*		
	Queue Length (feet)	27.5	153	223	50	113	140	225	240	45	133	45		
	• Protected / Permitted LT	A	A	A	A	A	A	D	E	E	E	D	11.9	B
	Queue Length (cars)	*1.1*	*5.9*	*8.7*	*2.0*	*4.3*	*5.4*	*6.3*	*9.7*	*1.2*	*5.3*	*1.8*		
	Queue Length (feet)	27.5	148	218	50	108	135	158	243	30	133	45		
B. Weekday Evening Peak Hour														
Current Traffic (See Exhibit 1)	• Current	A	A	A	B	A	A	F	E	F	E	E	21.9	C
	Queue Length (cars)	*0.2*	*8.1*	*9.9*	*1.2*	*5.4*	*6.5*	*13.8*	*11.2*	*8.6*	*7.0*	*5.9*		
	Queue Length (feet)	5	203	248	30	135	163	345	280	215	175	148		
Total Traffic (See Exhibit 5)	• Current	B	A	B	B	A	A	F	E	F	E	E	29.2	C
	Queue Length (cars)	*0.2*	*10.2*	*13.7*	*1.9*	*6.6*	*7.4*	*19.1*	*12.5*	*8.6*	*7.1*	*5.7*		
	Queue Length (feet)	5	255	343	47.5	165	185	478	313	215	178	143		
	LT	A	A	B	B	A	A	E	E	E	E	E	17.9	B
	Queue Length (cars)	*0.2*	*9.6*	*12.7*	*1.9*	*6.1*	*6.9*	*2.2*	*12.5*	*6.1*	*7.2*	*6.8*		
	Queue Length (feet)	5	240	318	47.5	153	173	55	313	153	180	170		

GEWALT HAMILTON ASSOCIATES, INC.

APPENDICES

A. Traffic Data Summary
B. Highway Capacity Software printouts

APPENDIX A

Traffic Data Summaries

GEWALT HAMILTON ASSOCIATES, INC.

5154.900 Park Ridge
Dempster St. & Luther Ln.
12-hr
GHA MIO

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

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

Count Name: Dempster and Luther
Site Code:
Start Date: 05/18/2016
Page No: 1

Turning Movement Data

Start Time	Luther Ln. Southbound						Demspter St. Westbound						Luther Ln. Northbound						Demspter St. Eastbound						
	U-Turn	Left	Thru	Right	Peds	App. Total	U-Turn	Left	Thru	Right	Peds	App. Total	U-Turn	Left	Thru	Right	Peds	App. Total	U-Turn	Left	Thru	Right	Peds	App. Total	Int. Total
6:00 AM	0	0	6	0	5	6	0	8	127	16	22	151	0	4	9	0	1	13	0	36	243	14	7	293	463
6:15 AM	0	0	4	0	13	4	0	15	167	35	64	217	0	2	19	5	1	26	0	44	267	30	34	341	588
6:30 AM	0	3	16	0	31	19	0	7	184	64	108	255	0	15	24	5	2	44	0	49	297	26	44	372	690
6:45 AM	0	0	25	0	64	25	0	18	205	42	173	265	0	6	37	1	2	44	0	47	302	50	65	399	733
Hourly Total	0	3	51	0	113	54	0	48	683	157	367	888	0	27	89	11	6	127	0	176	1109	120	150	1405	2474
7:00 AM	0	0	9	0	19	9	0	19	236	29	51	284	0	6	20	5	1	31	0	22	292	26	27	340	664
7:15 AM	0	2	17	5	10	24	0	21	325	28	28	374	0	15	15	7	1	37	0	23	283	24	19	330	765
7:30 AM	0	2	17	6	15	25	0	22	265	18	37	305	0	27	43	15	1	85	0	22	307	31	23	360	775
7:45 AM	0	1	17	2	31	20	0	21	250	26	67	297	0	26	29	14	1	69	0	29	304	24	27	357	743
Hourly Total	0	5	60	13	75	78	0	83	1076	101	183	1260	0	74	107	41	4	222	0	96	1186	105	96	1387	2947
8:00 AM	0	0	11	6	23	17	0	30	284	17	21	331	0	22	22	13	0	57	0	22	286	32	23	340	745
8:15 AM	0	6	20	9	24	35	0	18	328	25	27	371	0	26	19	20	5	65	0	14	330	46	25	390	861
8:30 AM	0	6	27	14	13	47	0	21	326	14	19	361	0	16	16	12	5	44	0	22	313	35	10	370	822
8:45 AM	0	7	17	3	17	27	0	31	322	17	21	370	0	15	14	14	4	43	0	14	334	44	8	392	832
Hourly Total	0	19	75	32	77	126	0	100	1260	73	88	1433	0	79	71	59	14	209	0	72	1263	157	66	1492	3260
9:00 AM	0	2	16	1	9	19	0	29	232	13	8	274	0	13	8	7	1	28	0	9	295	37	5	341	662
9:15 AM	0	4	12	0	10	16	0	34	229	16	12	279	0	21	11	15	4	47	0	10	272	51	4	333	675
9:30 AM	0	10	10	2	3	22	0	27	252	9	7	288	0	9	10	14	1	33	0	11	287	69	8	367	710
9:45 AM	0	5	13	3	12	21	0	32	210	11	13	253	0	29	10	19	2	58	0	10	267	57	5	334	666
Hourly Total	0	21	51	6	34	78	0	122	923	49	40	1094	0	72	39	55	8	166	0	40	1121	214	22	1375	2713
10:00 AM	0	2	9	6	6	17	0	28	201	9	8	238	0	24	19	11	0	54	0	4	270	35	3	309	618
10:15 AM	0	4	10	1	10	15	0	22	201	10	8	233	0	17	6	31	0	54	0	11	226	41	5	278	580
10:30 AM	1	6	6	2	6	15	0	22	255	11	9	288	0	24	13	22	1	59	0	11	266	48	7	325	687
10:45 AM	0	5	16	7	20	28	0	30	216	10	21	256	0	30	18	24	1	72	0	9	274	49	8	332	688
Hourly Total	1	17	41	16	42	75	0	102	873	40	46	1015	0	95	56	88	2	239	0	35	1036	173	23	1244	2573
11:00 AM	0	4	10	7	3	21	0	22	249	6	14	277	0	17	15	23	0	55	0	7	207	29	1	243	596
11:15 AM	0	8	10	3	3	21	0	16	231	8	12	255	0	28	12	28	2	68	0	3	250	38	6	291	635
11:30 AM	0	5	9	1	6	15	0	29	242	9	12	280	0	21	9	35	3	65	0	5	271	34	6	310	670
11:45 AM	0	7	7	5	2	19	0	29	258	7	12	294	0	37	11	38	1	86	0	3	256	41	4	300	699
Hourly Total	0	24	36	16	14	76	0	96	980	30	50	1106	0	103	47	124	6	274	0	18	984	142	17	1144	2600
12:00 PM	0	6	8	3	8	17	0	26	261	10	11	297	0	29	10	33	3	72	0	3	285	26	6	314	700
12:15 PM	0	3	7	6	5	16	0	21	302	13	15	336	0	30	7	34	2	71	0	1	282	32	3	315	738
12:30 PM	0	7	5	7	4	19	0	26	298	10	9	334	0	21	7	20	2	48	0	2	281	37	6	320	721
12:45 PM	0	7	9	3	8	19	0	19	295	4	16	318	0	23	16	17	0	56	0	4	252	51	2	307	700
Hourly Total	0	23	29	19	25	71	0	92	1156	37	51	1285	0	103	40	104	7	247	0	10	1100	146	17	1256	2859
1:00 PM	0	9	8	8	5	25	0	23	296	12	19	331	0	33	20	24	7	77	0	5	279	45	8	329	762
1:15 PM	0	11	6	5	4	22	0	17	281	13	11	311	0	34	16	28	0	78	0	3	255	37	5	295	706
1:30 PM	0	10	7	6	10	23	0	23	258	12	24	293	0	30	11	24	2	65	0	8	266	37	6	311	692
1:45 PM	0	10	14	6	7	30	0	28	259	11	19	298	0	34	9	24	5	67	0	6	262	46	6	314	709
Hourly Total	0	40	35	25	26	100	0	91	1094	48	73	1233	0	131	56	100	14	287	0	22	1062	165	25	1249	2869

2:00 PM	0	17	9	10	5	36	0	30	284	15	30	329	0	34	20	18	9	72	0	9	285	38	12	332	769
2:15 PM	0	15	16	14	7	45	0	29	298	16	46	343	0	32	10	26	9	68	0	9	277	34	16	320	776
2:30 PM	0	15	17	11	10	43	0	41	318	20	48	379	0	29	10	27	7	66	0	15	313	46	10	374	862
2:45 PM	0	16	18	18	12	52	0	35	340	15	43	390	0	29	19	34	12	82	0	18	277	39	19	334	858
Hourly Total	0	63	60	53	34	176	0	135	1240	66	167	1441	0	124	59	105	37	288	0	51	1152	157	57	1360	3265
3:00 PM	0	15	20	27	25	62	0	32	346	13	61	391	0	32	12	22	18	66	0	3	263	33	46	299	818
3:15 PM	0	14	23	23	19	60	0	24	325	13	40	362	0	18	21	21	21	60	0	6	333	28	32	367	849
3:30 PM	0	25	47	50	33	122	0	25	295	6	139	326	0	28	19	24	42	71	0	9	317	26	62	352	871
3:45 PM	0	29	36	41	23	106	0	27	287	8	62	322	0	24	15	21	44	60	0	5	291	34	48	330	818
Hourly Total	0	83	126	141	100	350	0	108	1253	40	302	1401	0	102	67	88	125	257	0	23	1204	121	188	1348	3356
4:00 PM	0	27	28	23	11	78	0	13	333	14	44	360	0	35	12	22	36	69	0	5	334	33	49	372	879
4:15 PM	0	26	19	22	11	67	0	17	303	9	37	329	0	30	18	33	23	81	0	3	334	26	34	363	840
4:30 PM	0	25	32	20	26	77	0	17	299	15	51	331	0	36	13	28	24	77	0	1	308	30	35	339	824
4:45 PM	0	18	22	19	19	59	0	13	301	8	46	322	0	27	11	23	21	61	0	1	409	28	31	438	880
Hourly Total	0	96	101	84	67	281	0	60	1236	46	178	1342	0	128	54	106	104	288	0	10	1385	117	149	1512	3423
5:00 PM	0	17	19	25	19	61	0	16	276	14	37	306	0	30	21	30	28	81	0	1	307	14	39	322	770
5:15 PM	0	15	28	23	18	66	0	16	303	8	24	327	0	19	12	26	16	57	0	0	282	23	28	305	755
5:30 PM	0	18	14	22	7	54	0	22	322	6	17	350	0	23	10	17	18	50	0	1	310	24	23	335	789
5:45 PM	0	16	17	18	10	51	0	13	299	13	29	325	0	28	17	15	9	60	0	2	275	18	14	295	731
Hourly Total	0	66	78	88	54	232	0	67	1200	41	107	1308	0	100	60	88	71	248	0	4	1174	79	104	1257	3045
Grand Total	1	460	743	493	661	1697	0	1104	12974	728	1652	14806	0	1138	745	969	398	2852	0	557	13776	1696	914	16029	35384
Approach %	0.1	27.1	43.8	29.1	-	-	0.0	7.5	87.6	4.9	-	-	0.0	39.9	26.1	34.0	-	-	0.0	3.5	85.9	10.6	-	-	-
Total %	0.0	1.3	2.1	1.4	-	4.8	0.0	3.1	36.7	2.1	-	41.8	0.0	3.2	2.1	2.7	-	8.1	0.0	1.6	38.9	4.8	-	45.3	-
Lights	1	443	665	491	-	1600	0	1091	12330	721	-	14142	0	1117	643	964	-	2724	0	557	13041	1671	-	15269	33735
% Lights	100.0	96.3	89.5	99.6	-	94.3	-	98.8	95.0	99.0	-	95.5	-	98.2	86.3	99.5	-	95.5	-	100.0	94.7	98.5	-	95.3	95.3
Mediums	0	17	78	2	-	97	0	13	427	7	-	447	0	19	102	5	-	126	0	0	474	23	-	497	1167
% Mediums	0.0	3.7	10.5	0.4	-	5.7	-	1.2	3.3	1.0	-	3.0	-	1.7	13.7	0.5	-	4.4	-	0.0	3.4	1.4	-	3.1	3.3
Articulated Trucks	0	0	0	0	-	0	0	0	217	0	-	217	0	2	0	0	-	2	0	0	261	2	-	263	482
% Articulated Trucks	0.0	0.0	0.0	0.0	-	0.0	-	0.0	1.7	0.0	-	1.5	-	0.2	0.0	0.0	-	0.1	-	0.0	1.9	0.1	-	1.6	1.4
Pedestrians	-	-	-	-	661	-	-	-	-	-	1652	-	-	-	-	-	398	-	-	-	-	-	914	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

5154.900 Park Ridge
Luther Ln. & Parking Garage
12-hr
GHA MIO

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

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

Count Name: Luther Ln. and Garage
Site Code:
Start Date: 05/18/2016
Page No: 1

Turning Movement Data

Start Time	Luther Ln. Southbound						Street Westbound						Luther Ln. Northbound						Garage Eastbound						
	U-Turn	Left	Thru	Right	Peds	App. Total	U-Turn	Left	Thru	Right	Peds	App. Total	U-Turn	Left	Thru	Right	Peds	App. Total	U-Turn	Left	Thru	Right	Peds	App. Total	Int. Total
6:00 AM	0	14	8	9	0	31	0	3	0	2	29	5	0	0	12	3	16	15	0	1	0	0	7	1	52
6:15 AM	0	23	12	13	0	48	0	2	0	5	69	7	0	1	22	1	35	24	0	1	0	0	31	1	80
6:30 AM	0	20	18	9	0	47	0	4	0	15	110	19	0	2	26	5	59	33	0	2	0	0	49	2	101
6:45 AM	0	36	25	29	0	90	0	3	0	8	169	11	0	7	33	7	100	47	0	2	1	1	66	4	152
Hourly Total	0	93	63	60	0	216	0	12	0	30	377	42	0	10	93	16	210	119	0	6	1	1	153	8	385
7:00 AM	0	22	25	21	0	68	0	2	1	6	55	9	0	6	21	5	38	32	0	3	0	0	20	3	112
7:15 AM	0	22	19	22	0	63	0	0	1	13	36	14	0	7	17	2	52	26	0	8	3	0	17	11	114
7:30 AM	0	23	17	27	0	67	0	3	2	37	30	42	0	7	27	3	58	37	0	22	2	0	23	24	170
7:45 AM	0	27	21	23	0	71	0	5	1	30	64	36	0	10	22	3	65	35	0	21	0	0	20	21	163
Hourly Total	0	94	82	93	0	269	0	10	5	86	185	101	0	30	87	13	213	130	0	54	5	0	80	59	559
8:00 AM	0	27	18	29	0	74	0	3	0	16	33	19	0	9	23	10	49	42	0	16	0	4	26	20	155
8:15 AM	0	30	33	23	0	86	0	1	2	30	31	33	0	6	23	6	53	35	0	13	1	2	25	16	170
8:30 AM	0	26	29	32	0	87	0	2	1	11	16	14	0	4	17	10	44	31	0	14	0	1	11	15	147
8:45 AM	0	32	26	37	0	95	0	4	3	16	21	23	0	10	20	12	44	42	0	9	0	3	6	12	172
Hourly Total	0	115	106	121	0	342	0	10	6	73	101	89	0	29	83	38	190	150	0	52	1	10	68	63	644
9:00 AM	0	37	20	26	0	83	0	0	3	10	11	13	0	12	8	5	45	25	0	8	3	1	9	12	133
9:15 AM	1	44	11	43	0	99	0	0	4	15	17	19	1	11	15	5	36	32	0	14	0	5	5	19	169
9:30 AM	0	43	23	39	1	105	0	2	2	10	9	14	0	6	10	8	59	24	0	15	1	7	12	23	166
9:45 AM	0	44	17	40	0	101	0	2	6	24	18	32	0	7	11	5	74	23	0	28	2	5	9	35	191
Hourly Total	1	168	71	148	1	388	0	4	15	59	55	78	1	36	44	23	214	104	0	65	6	18	35	89	659
10:00 AM	0	22	17	33	2	72	1	2	3	17	12	23	0	8	21	11	50	40	0	12	0	1	4	13	148
10:15 AM	0	37	11	31	0	79	0	4	5	16	10	25	0	3	17	5	58	25	0	22	0	0	9	22	151
10:30 AM	0	31	17	31	1	79	0	3	11	22	17	36	0	7	11	10	79	28	0	30	0	3	12	33	176
10:45 AM	1	41	16	46	0	104	0	8	6	17	26	31	0	4	15	11	77	30	0	35	0	5	12	40	205
Hourly Total	1	131	61	141	3	334	1	17	25	72	65	115	0	22	64	37	264	123	0	99	0	9	37	108	680
11:00 AM	0	25	15	22	0	62	0	5	6	19	15	30	0	7	12	9	68	28	0	24	2	4	10	30	150
11:15 AM	0	33	13	19	1	65	0	4	2	19	13	25	0	2	12	3	60	17	0	37	0	9	8	46	153
11:30 AM	1	36	14	24	0	75	0	1	2	13	18	16	0	8	15	7	59	30	0	36	0	3	8	39	160
11:45 AM	0	33	13	21	0	67	0	7	2	29	15	38	0	2	20	10	70	32	0	38	1	4	16	43	180
Hourly Total	1	127	55	86	1	269	0	17	12	80	61	109	0	19	59	29	257	107	0	135	3	20	42	158	643
12:00 PM	0	26	20	15	0	61	0	3	0	10	14	13	0	3	23	4	56	30	0	37	3	10	7	50	154
12:15 PM	0	23	19	18	1	60	1	1	1	26	17	29	0	6	12	4	59	22	0	34	1	2	11	37	148
12:30 PM	0	24	18	23	1	65	0	2	2	10	13	14	0	5	13	6	49	24	0	28	0	5	8	33	136
12:45 PM	1	32	17	29	2	79	1	6	1	20	26	28	0	5	16	7	70	28	0	20	2	2	9	24	159
Hourly Total	1	105	74	85	4	265	2	12	4	66	70	84	0	19	64	21	234	104	0	119	6	19	35	144	597
1:00 PM	0	29	20	23	0	72	0	2	1	25	22	28	0	5	29	7	68	41	0	27	0	5	6	32	173
1:15 PM	0	33	13	15	1	61	1	3	2	24	16	30	0	6	26	10	64	42	0	25	2	4	19	31	164
1:30 PM	0	33	17	19	0	69	0	1	4	28	25	33	0	1	17	7	58	25	0	22	1	1	8	24	151
1:45 PM	1	36	15	36	3	88	0	3	1	17	26	21	0	3	19	8	46	30	0	27	0	1	11	28	167
Hourly Total	1	131	65	93	4	290	1	9	8	94	89	112	0	15	91	32	236	138	0	101	3	11	44	115	655

2:00 PM	0	33	20	26	1	79	1	2	3	35	39	41	0	6	23	4	62	33	0	18	0	7	6	25	178
2:15 PM	0	30	17	29	1	76	0	0	6	23	52	29	0	4	12	7	67	23	0	26	0	4	10	30	158
2:30 PM	0	42	18	41	0	101	0	0	2	18	56	20	0	8	27	3	91	38	0	31	0	5	12	36	195
2:45 PM	0	42	23	28	1	93	0	0	2	27	63	29	0	6	21	10	109	37	0	27	0	6	30	33	192
Hourly Total	0	147	78	124	3	349	1	2	13	103	210	119	0	24	83	24	329	131	0	102	0	22	58	124	723
3:00 PM	0	41	30	16	0	87	0	1	2	17	70	20	0	1	22	6	67	29	0	31	4	6	16	41	177
3:15 PM	0	31	24	16	0	71	0	1	1	13	61	15	0	4	19	6	66	29	0	26	0	4	21	30	145
3:30 PM	0	46	40	10	0	96	0	8	1	26	152	35	0	5	21	9	73	35	0	25	1	12	34	38	204
3:45 PM	0	39	45	16	0	100	0	2	0	23	91	25	0	3	13	7	64	23	0	24	0	12	19	36	184
Hourly Total	0	157	139	58	0	354	0	12	4	79	374	95	0	13	75	28	270	116	0	106	5	34	90	145	710
4:00 PM	0	31	32	12	1	75	0	2	1	30	72	33	0	3	16	5	68	24	0	25	0	12	16	37	169
4:15 PM	0	30	24	6	2	60	0	1	0	24	55	25	0	3	26	5	51	34	0	24	0	12	24	36	155
4:30 PM	0	33	34	11	0	78	1	7	0	23	70	31	0	1	24	4	47	29	0	35	0	10	13	45	183
4:45 PM	0	30	29	9	0	68	1	3	1	20	53	25	0	0	16	7	50	23	0	22	0	5	13	27	143
Hourly Total	0	124	119	38	3	281	2	13	2	97	250	114	0	7	82	21	216	110	0	106	0	39	66	145	650
5:00 PM	0	22	26	9	0	57	0	4	1	28	70	33	0	3	27	7	49	37	0	25	2	14	16	41	168
5:15 PM	0	29	26	8	0	63	0	6	2	16	44	24	0	3	19	4	40	26	0	19	6	1	22	26	139
5:30 PM	1	27	28	16	0	72	0	4	0	13	37	17	0	4	17	5	42	26	0	15	0	3	11	18	133
5:45 PM	0	21	21	5	0	47	1	6	0	29	29	36	0	2	26	5	31	33	0	10	0	4	10	14	130
Hourly Total	1	99	101	38	0	239	1	20	3	86	180	110	0	12	89	21	162	122	0	69	8	22	59	99	570
Grand Total	6	1491	1014	1085	19	3596	8	138	97	925	2017	1168	1	236	914	303	2795	1454	0	1014	38	205	767	1257	7475
Approach %	0.2	41.5	28.2	30.2	-	-	0.7	11.8	8.3	79.2	-	-	0.1	16.2	62.9	20.8	-	-	0.0	80.7	3.0	16.3	-	-	-
Total %	0.1	19.9	13.6	14.5	-	48.1	0.1	1.8	1.3	12.4	-	15.6	0.0	3.2	12.2	4.1	-	19.5	0.0	13.6	0.5	2.7	-	16.8	-
Lights	5	1411	970	1085	-	3471	8	137	97	924	-	1166	1	236	787	298	-	1322	0	1014	38	205	-	1257	7216
% Lights	83.3	94.6	95.7	100.0	-	96.5	100.0	99.3	100.0	99.9	-	99.8	100.0	100.0	86.1	98.3	-	90.9	-	100.0	100.0	100.0	-	100.0	96.5
Mediums	1	80	41	0	-	122	0	1	0	1	-	2	0	0	125	5	-	130	0	0	0	0	-	0	254
% Mediums	16.7	5.4	4.0	0.0	-	3.4	0.0	0.7	0.0	0.1	-	0.2	0.0	0.0	13.7	1.7	-	8.9	-	0.0	0.0	0.0	-	0.0	3.4
Articulated Trucks	0	0	3	0	-	3	0	0	0	0	-	0	0	0	2	0	-	2	0	0	0	0	-	0	5
% Articulated Trucks	0.0	0.0	0.3	0.0	-	0.1	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.2	0.0	-	0.1	-	0.0	0.0	0.0	-	0.0	0.1
Pedestrians	-	-	-	-	19	-	-	-	-	-	2017	-	-	-	-	-	2795	-	-	-	-	-	767	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

5154.900 Park Ridge
Dempster St. & Vernon Ave.
12-hr
GHA MIO

Gewalt Hamilton Associates Inc.
625 Forest Edge Drive

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

Count Name: Dempster and Vernon
Site Code:
Start Date: 05/18/2016
Page No: 1

Turning Movement Data

Start Time	Demspter St. Westbound					Vernon Ave. Northbound					Demspter St. Eastbound					
	U-Turn	Left	Thru	Peds	App. Total	U-Turn	Left	Right	Peds	App. Total	U-Turn	Thru	Right	Peds	App. Total	Int. Total
6:00 AM	0	1	126	0	127	0	1	6	1	7	0	287	8	0	295	429
6:15 AM	0	6	168	0	174	0	1	1	0	2	0	347	13	0	360	536
6:30 AM	0	1	194	0	195	1	0	5	0	6	0	372	6	0	378	579
6:45 AM	0	0	220	0	220	0	0	3	0	3	0	413	17	0	430	653
Hourly Total	0	8	708	0	716	1	2	15	1	18	0	1419	44	0	1463	2197
7:00 AM	0	3	244	0	247	0	0	2	1	2	0	329	8	0	337	586
7:15 AM	0	2	357	0	359	0	0	5	1	5	0	332	3	0	335	699
7:30 AM	0	2	307	0	309	0	0	3	0	3	0	370	8	0	378	690
7:45 AM	0	1	311	0	312	0	0	3	1	3	0	366	5	0	371	686
Hourly Total	0	8	1219	0	1227	0	0	13	3	13	0	1397	24	0	1421	2661
8:00 AM	0	0	323	0	323	0	0	2	2	2	0	347	9	0	356	681
8:15 AM	0	3	367	0	370	0	0	4	10	4	0	389	7	0	396	770
8:30 AM	0	3	355	0	358	0	0	8	9	8	0	367	7	0	374	740
8:45 AM	0	0	337	0	337	0	3	3	2	6	0	397	6	0	403	746
Hourly Total	0	6	1382	0	1388	0	3	17	23	20	0	1500	29	0	1529	2937
9:00 AM	0	2	242	0	244	0	1	10	2	11	0	318	5	0	323	578
9:15 AM	0	2	249	0	251	0	3	4	0	7	0	344	5	0	349	607
9:30 AM	0	1	268	0	269	0	0	5	1	5	0	355	3	0	358	632
9:45 AM	0	4	237	0	241	0	0	6	1	6	0	343	3	0	346	593
Hourly Total	0	9	996	0	1005	0	4	25	4	29	0	1360	16	0	1376	2410
10:00 AM	0	4	232	0	236	0	0	4	3	4	0	306	8	0	314	554
10:15 AM	0	3	216	0	219	0	2	3	1	5	0	292	5	0	297	521
10:30 AM	0	3	285	0	288	0	1	6	2	7	0	340	4	0	344	639
10:45 AM	0	2	252	0	254	0	0	5	0	5	0	337	7	0	344	603
Hourly Total	0	12	985	0	997	0	3	18	6	21	0	1275	24	0	1299	2317
11:00 AM	0	5	273	0	278	0	0	2	2	2	0	251	2	0	253	533
11:15 AM	0	3	257	0	260	0	2	2	0	4	0	286	2	0	288	552
11:30 AM	0	6	261	0	267	0	1	3	1	4	0	317	2	0	319	590
11:45 AM	0	3	297	0	300	0	0	3	1	3	0	304	2	0	306	609
Hourly Total	0	17	1088	0	1105	0	3	10	4	13	0	1158	8	0	1166	2284
12:00 PM	0	4	291	0	295	0	2	1	0	3	1	305	0	0	306	604
12:15 PM	0	2	340	0	342	0	0	5	1	5	0	310	5	0	315	662
12:30 PM	0	3	332	0	335	0	0	5	1	5	0	302	2	0	304	644
12:45 PM	1	4	327	0	332	0	1	5	0	6	0	299	3	0	302	640
Hourly Total	1	13	1290	0	1304	0	3	16	2	19	1	1216	10	0	1227	2550
1:00 PM	0	5	333	0	338	0	1	3	2	4	0	332	2	0	334	676
1:15 PM	0	4	313	0	317	0	0	7	0	7	0	298	3	0	301	625
1:30 PM	0	1	290	0	291	0	2	3	0	5	0	313	3	0	316	612
1:45 PM	0	1	305	0	306	0	0	4	2	4	0	309	3	0	312	622
Hourly Total	0	11	1241	0	1252	0	3	17	4	20	0	1252	11	0	1263	2535
2:00 PM	0	3	320	0	323	0	2	6	0	8	0	325	4	0	329	660

2:15 PM	0	2	359	0	361	0	1	1	0	2	0	333	1	0	334	697
2:30 PM	0	3	359	0	362	0	0	6	2	6	0	348	2	0	350	718
2:45 PM	1	1	387	0	389	0	1	3	0	4	0	328	11	0	339	732
Hourly Total	1	9	1425	0	1435	0	4	16	2	20	0	1334	18	0	1352	2807
3:00 PM	0	5	396	0	401	0	0	7	2	7	0	290	4	0	294	702
3:15 PM	0	1	362	0	363	0	1	4	16	5	0	385	5	0	390	758
3:30 PM	0	3	374	0	377	0	2	5	11	7	0	355	10	0	365	749
3:45 PM	0	5	346	0	351	0	0	6	3	6	0	327	9	0	336	693
Hourly Total	0	14	1478	0	1492	0	3	22	32	25	0	1357	28	0	1385	2902
4:00 PM	0	8	409	0	417	0	0	4	2	4	0	347	8	0	355	776
4:15 PM	0	5	364	0	369	0	0	3	1	3	0	351	9	0	360	732
4:30 PM	0	4	356	0	360	0	0	1	3	1	0	325	3	0	328	689
4:45 PM	0	1	363	0	364	0	1	4	2	5	0	403	11	0	414	783
Hourly Total	0	18	1492	0	1510	0	1	12	8	13	0	1426	31	0	1457	2980
5:00 PM	0	4	318	0	322	0	2	3	0	5	0	311	4	0	315	642
5:15 PM	0	7	342	0	349	0	2	2	0	4	0	303	4	0	307	660
5:30 PM	0	9	364	0	373	0	0	7	1	7	0	336	2	0	338	718
5:45 PM	0	8	339	0	347	0	0	10	3	10	0	282	3	1	285	642
Hourly Total	0	28	1363	0	1391	0	4	22	4	26	0	1232	13	1	1245	2662
Grand Total	2	153	14667	0	14822	1	33	203	93	237	1	15926	256	1	16183	31242
Approach %	0.0	1.0	99.0	-	-	0.4	13.9	85.7	-	-	0.0	98.4	1.6	-	-	-
Total %	0.0	0.5	46.9	-	47.4	0.0	0.1	0.6	-	0.8	0.0	51.0	0.8	-	51.8	-
Lights	2	151	13991	-	14144	1	33	197	-	231	1	15145	252	-	15398	29773
% Lights	100.0	98.7	95.4	-	95.4	100.0	100.0	97.0	-	97.5	100.0	95.1	98.4	-	95.1	95.3
Mediums	0	2	458	-	460	0	0	6	-	6	0	518	4	-	522	988
% Mediums	0.0	1.3	3.1	-	3.1	0.0	0.0	3.0	-	2.5	0.0	3.3	1.6	-	3.2	3.2
Articulated Trucks	0	0	218	-	218	0	0	0	-	0	0	263	0	-	263	481
% Articulated Trucks	0.0	0.0	1.5	-	1.5	0.0	0.0	0.0	-	0.0	0.0	1.7	0.0	-	1.6	1.5
Pedestrians	-	-	-	0	-	-	-	-	93	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-

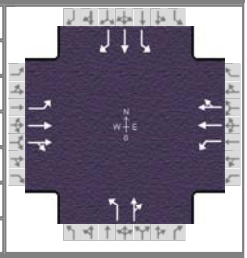
APPENDIX B

Highway Capacity Software Printouts

GEWALT HAMILTON ASSOCIATES, INC.

HCS 2010 Signalized Intersection Input Data

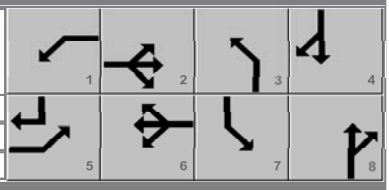
General Information				Intersection Information	
Agency	GHA			Duration, h	0.25
Analyst	DPB	Analysis Date	Jun 6, 2016	Area Type	Other
Jurisdiction	IDOT	Time Period	AM PEAK	PHF	0.95
Urban Street	Dempster	Analysis Year	2016	Analysis Period	1> 7:00
Intersection	Dempster at Luther	File Name	DEM-LUT AME.xus		
Project Description	ALGH CAC Garage				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	70	1265	160	100	1260	75	80	70	60	20	75	30

Signal Information			
Cycle, s	130.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	3.5	0.9	90.6	1.9	1.3	8.7
Yellow	3.5	0.0	4.5	3.5	3.5	4.5
Red	0.0	0.0	1.5	1.0	1.0	0.0



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	70	1265	160	100	1260	75	80	70	60	20	75	30
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	3		2	3		2	2		2	2	2
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	4	3	3	4	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	12.0
Turn Bay Length, ft	75	0		175	0		95	0		100	0	250
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	35	35	35	35	35	35	35	35	35	35	35	35

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	13.0	62.4	14.3	63.7	14.3	39.0	14.3	39.0
Yellow Change Interval (*Y*), s	3.5	4.5	3.5	4.5	3.5	4.5	3.5	4.5
Red Clearance Interval (R_c), s	0.0	1.5	0.0	1.5	1.0	0.0	1.0	0.0
Minimum Green (G_{min}), s	3	15	3	15	3	8	3	8
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Passage (*PT*), s	3.0	7.0	3.0	7.0	3.0	4.0	3.0	4.0
Recall Mode	Off	Min	Off	Min	Off	Off	Off	Off
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Walk (*Walk*), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Clearance Time (*PC*), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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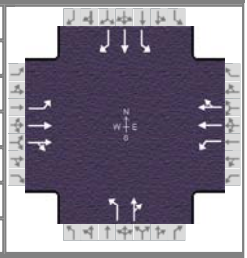
HCS 2010 Signalized Intersection Results Summary

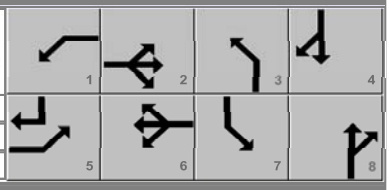
General Information				Intersection Information	
Agency	GHA			Duration, h	0.25
Analyst	DPB	Analysis Date	Jun 6, 2016	Area Type	Other
Jurisdiction	IDOT	Time Period	AM PEAK	PHF	0.95
Urban Street	Dempster	Analysis Year	2016	Analysis Period	1> 7:00
Intersection	Dempster at Luther	File Name	DEM-LUT AME.xus		
Project Description	ALGH CAC Garage				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	70	1265	160	100	1260	75	80	70	60	20	75	30

Signal Information			
Cycle, s	130.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	3.5	0.9	90.6	1.9	1.3	8.7
Yellow	3.5	0.0	4.5	3.5	3.5	4.5
Red	0.0	0.0	1.5	1.0	1.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	4.0	2.0	4.0	2.0	3.0
Phase Duration, s	7.0	96.6	7.9	97.6	12.2	19.0	6.4	13.2
Change Period, ($Y+R_c$), s	3.5	6.0	3.5	6.0	4.5	4.5	4.5	4.5
Max Allow Headway (*MAH*), s	4.0	0.0	4.0	0.0	4.0	5.1	4.0	5.1
Queue Clearance Time (g_s), s	3.6		4.2		8.1	12.0	3.5	7.4
Green Extension Time (g_e), s	0.2	0.0	0.3	0.0	0.0	1.3	0.0	1.3
Phase Call Probability	0.93		0.98		0.95	1.00	0.53	1.00
Max Out Probability	0.00		0.00		1.00	0.00	0.03	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	74	761	739	105	708	697	84	137		21	79	32
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1774	1845	1772	1774	1845	1808	1774	1720		1774	1863	1579
Queue Service Time (g_s), s	1.6	8.4	14.1	2.2	6.2	8.8	6.1	10.0		1.5	5.4	2.4
Cycle Queue Clearance Time (g_c), s	1.6	8.4	14.1	2.2	6.2	8.8	6.1	10.0		1.5	5.4	2.4
Green Ratio (*g/C*)	0.72	0.70	0.70	0.73	0.70	0.70	0.06	0.11		0.01	0.07	0.09
Capacity (*c*), veh/h	340	1286	1235	321	1299	1273	106	192		26	125	148
Volume-to-Capacity Ratio (*X*)	0.217	0.591	0.598	0.328	0.545	0.547	0.798	0.711		0.816	0.633	0.213
Available Capacity (c_a), veh/h	802	1286	1235	788	1299	1273	134	561		134	524	487
Back of Queue (*Q*), veh/ln (95 th percentile)	1.0	4.0	6.4	1.4	3.2	4.3	6.1	8.2		1.8	5.0	1.8
Queue Storage Ratio (*RQ*) (95 th percentile)	0.34	0.00	0.00	0.20	0.00	0.00	1.63	0.00		0.46	0.00	0.18
Uniform Delay (d_1), s/veh	5.6	1.7	3.3	6.1	1.4	2.1	60.4	55.7		63.9	59.1	54.5
Incremental Delay (d_2), s/veh	0.3	2.0	2.1	0.6	1.6	1.7	22.6	6.7		43.8	7.3	1.0
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh	5.9	3.7	5.4	6.7	3.0	3.8	83.0	62.4		107.7	66.4	55.5
Level of Service (LOS)	A	A	A	A	A	A	F	E		F	E	E
Approach Delay, s/veh / LOS	4.6	A		3.6	A		70.3	E		70.4	E	
Intersection Delay, s/veh / LOS	10.9						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.2	B	2.4	B	2.9	C	2.9	C
Bicycle LOS Score / LOS	1.8	A	1.7	A	0.9	A	0.7	A

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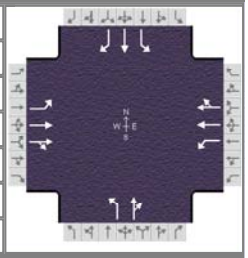
HCS 2010 Signalized Intersection Intermediate Values

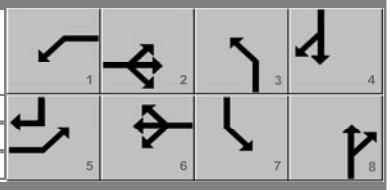
General Information				Intersection Information	
Agency	GHA			Duration, h	0.25
Analyst	DPB	Analysis Date	Jun 6, 2016	Area Type	Other
Jurisdiction	IDOT	Time Period	AM PEAK	PHF	0.95
Urban Street	Dempster	Analysis Year	2016	Analysis Period	1> 7:00
Intersection	Dempster at Luther	File Name	DEM-LUT AME.xus		
Project Description	ALGH CAC Garage				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	70	1265	160	100	1260	75	80	70	60	20	75	30

Signal Information			
Cycle, s	130.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	3.5	0.9	90.6	1.9	1.3	8.7
Yellow	3.5	0.0	4.5	3.5	3.5	4.5
Red	0.0	0.0	1.5	1.0	1.0	0.0



	EB			WB			NB			SB		
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicle Adjustment Factor (f_{HV})	0.980	0.971	1.000	0.980	0.971	1.000	0.980	0.980	1.000	0.980	0.980	0.980
Approach Grade Adjustment Factor (f_g)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Work Zone Adjustment Factor (f_{wz})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})	0.952	0.000		0.952	0.000		0.952	0.000		0.952	0.000	
Right-Turn Adjustment Factor (f_{RT})		0.961			0.980			0.923			0.000	
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})	1.000			1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})			1.000			1.000			1.000			1.000
Movement Saturation Flow Rate (s), veh/h	1774	3213		1774	3448		1774	926		1774	1863	
Proportion of Vehicles Arriving on Green (P)	0.03	0.93	0.70	0.03	0.94	0.70	0.06	0.11	0.11	0.01	0.07	0.07
Incremental Delay Factor (k)	0.11	0.50	0.50	0.11	0.50	0.50	0.21	0.15		0.11	0.15	0.15

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)	3.5	6.0	3.5	6.0	4.5	4.5	4.5	4.5
Green Ratio (g/C)	0.72	0.70	0.73	0.70	0.06	0.11	0.01	0.07
Permitted Saturation Flow Rate (s_p), veh/h/ln	382	0	348	0	0	0	0	0
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								
Permitted Effective Green Time (g_p), s	90.6	0.0	90.6	0.0	0.0	0.0	0.0	0.0
Permitted Service Time (g_u), s	80.8	0.0	76.5	0.0	0.0	0.0	0.0	0.0
Permitted Queue Service Time (g_{ps}), s	2.4		6.1					
Time to First Blockage (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage (g_{fs}), s								
Protected Right Saturation Flow (s_R), veh/h/ln								1579
Protected Right Effective Green Time (g_R), s								3.5

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	1.557	0.00	1.710	0.00	2.107	0.00	2.107	0.00
Pedestrian F_s / F_{delay}	0.000	0.072	0.000	0.070	0.000	0.158	0.000	0.162
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b	1394.45	5.96	1408.69	5.68	223.77	51.27	133.87	56.59
Bicycle F_w / F_v	-3.64	1.30	-3.64	1.25	-3.64	0.36	-3.64	0.22

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--- Messages ---

WARNING: Since queue spillover from turn lanes and spillback into upstream intersections is not accounted for in the HCM procedures, use of a simulation tool may be advised in situations where the Queue Storage Ratio exceeds 1.0.

--- Comments ---

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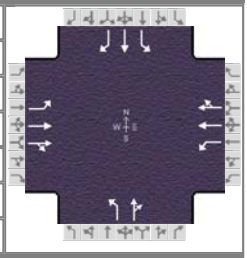
HCS 2010 Signalized Intersection Input Data

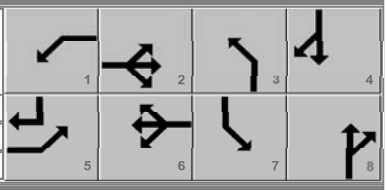
General Information				Intersection Information	
Agency	GHA			Duration, h	0.25
Analyst	DPB	Analysis Date	Aug 24, 2016	Area Type	Other
Jurisdiction	IDOT	Time Period	AM PEAK	PHF	0.95
Urban Street	Dempster	Analysis Year	TOTAL	Analysis Period	1> 7:00
Intersection	Dempster at Luther	File Name	DEM-LUT AMT.xus		
Project Description	ALGH CAC Garage				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	70	1265	190	125	1260	75	110	75	85	20	80	30

Signal Information			
Cycle, s	130.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	3.6	1.7	87.1	1.9	3.4	9.3
Yellow	3.5	0.0	4.5	3.5	3.5	4.5
Red	0.0	0.0	1.5	1.0	1.0	0.0



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	70	1265	190	125	1260	75	110	75	85	20	80	30
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	3		2	3		2	2		2	2	2
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	4	3	3	4	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	12.0
Turn Bay Length, ft	75	0		175	0		95	0		100	0	250
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	35	35	35	35	35	35	35	35	35	35	35	35

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	13.0	62.4	14.3	63.7	14.3	39.0	14.3	39.0
Yellow Change Interval (*Y*), s	3.5	4.5	3.5	4.5	3.5	4.5	3.5	4.5
Red Clearance Interval (R_c), s	0.0	1.5	0.0	1.5	1.0	0.0	1.0	0.0
Minimum Green (G_{min}), s	3	15	3	15	3	8	3	8
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Passage (*PT*), s	3.0	7.0	3.0	7.0	3.0	4.0	3.0	4.0
Recall Mode	Off	Min	Off	Min	Off	Off	Off	Off
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Walk (*Walk*), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Clearance Time (*PC*), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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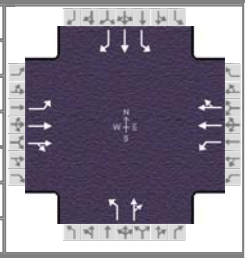
HCS 2010 Signalized Intersection Results Summary

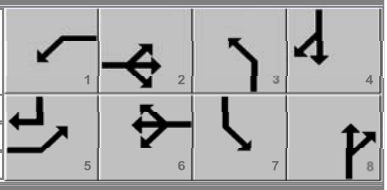
General Information				Intersection Information	
Agency	GHA			Duration, h	0.25
Analyst	DPB	Analysis Date	Aug 24, 2016	Area Type	Other
Jurisdiction	IDOT	Time Period	AM PEAK	PHF	0.95
Urban Street	Dempster	Analysis Year	TOTAL	Analysis Period	1> 7:00
Intersection	Dempster at Luther	File Name	DEM-LUT AMT.xus		
Project Description	ALGH CAC Garage				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	70	1265	190	125	1260	75	110	75	85	20	80	30

Signal Information			
Cycle, s	130.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	3.6	1.7	87.1	1.9	3.4	9.3
Yellow	3.5	0.0	4.5	3.5	3.5	4.5
Red	0.0	0.0	1.5	1.0	1.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	4.0	2.0	4.0	2.0	3.0
Phase Duration, s	7.1	93.1	8.9	94.8	14.3	21.7	6.4	13.8
Change Period, ($Y+R_c$), s	3.5	6.0	3.5	6.0	4.5	4.5	4.5	4.5
Max Allow Headway (MAH), s	4.0	0.0	4.0	0.0	4.0	5.1	4.0	5.1
Queue Clearance Time (g_s), s	3.7		5.0		10.4	14.4	3.5	7.7
Green Extension Time (g_e), s	0.2	0.0	0.4	0.0	0.0	1.6	0.0	1.5
Phase Call Probability	0.93		0.99		0.98	1.00	0.53	1.00
Max Out Probability	0.00		0.00		1.00	0.00	0.03	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	74	778	754	132	708	697	116	168		21	84	32
Adjusted Saturation Flow Rate (s), veh/h/ln	1774	1845	1761	1774	1845	1808	1774	1700		1774	1863	1579
Queue Service Time (g_s), s	1.7	13.4	19.8	3.0	9.1	11.5	8.4	12.4		1.5	5.7	2.4
Cycle Queue Clearance Time (g_c), s	1.7	13.4	19.8	3.0	9.1	11.5	8.4	12.4		1.5	5.7	2.4
Green Ratio (g/C)	0.70	0.67	0.67	0.71	0.68	0.68	0.08	0.13		0.01	0.07	0.10
Capacity (c), veh/h	326	1236	1179	303	1260	1235	134	225		26	133	157
Volume-to-Capacity Ratio (X)	0.226	0.629	0.639	0.434	0.562	0.564	0.866	0.750		0.816	0.635	0.202
Available Capacity (c_a), veh/h	750	1236	1179	722	1260	1235	134	555		134	494	463
Back of Queue (Q), veh/ln (95 th percentile)	1.1	6.1	8.9	2.0	4.5	5.6	9.0	9.6		1.8	5.3	1.8
Queue Storage Ratio (RQ) (95 th percentile)	0.38	0.00	0.00	0.29	0.00	0.00	2.42	0.00		0.46	0.00	0.18
Uniform Delay (d_1), s/veh	6.9	3.0	5.2	8.3	2.2	3.0	59.4	54.3		63.9	58.7	53.8
Incremental Delay (d_2), s/veh	0.3	2.4	2.7	1.0	1.8	1.9	40.9	7.0		43.8	7.0	0.9
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Control Delay (d), s/veh	7.2	5.4	7.9	9.3	4.1	4.9	100.3	61.3		107.7	65.7	54.7
Level of Service (LOS)	A	A	A	A	A	A	F	E		F	E	D
Approach Delay, s/veh / LOS	6.7	A		4.9	A		77.2	E		69.6	E	
Intersection Delay, s/veh / LOS	13.9						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.2	B	2.4	B	2.9	C	2.9	C
Bicycle LOS Score / LOS	1.8	A	1.8	A	1.0	A	0.7	A

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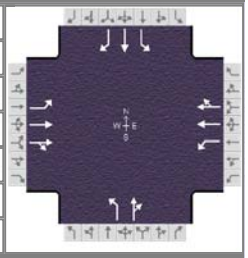
HCS 2010 Signalized Intersection Intermediate Values

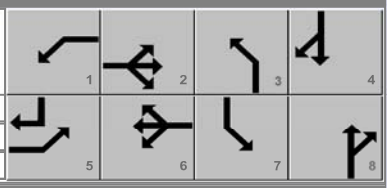
General Information				Intersection Information	
Agency	GHA			Duration, h	0.25
Analyst	DPB	Analysis Date	Aug 24, 2016	Area Type	Other
Jurisdiction	IDOT	Time Period	AM PEAK	PHF	0.95
Urban Street	Dempster	Analysis Year	TOTAL	Analysis Period	1> 7:00
Intersection	Dempster at Luther	File Name	DEM-LUT AMT.xus		
Project Description	ALGH CAC Garage				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	70	1265	190	125	1260	75	110	75	85	20	80	30

Signal Information			
Cycle, s	130.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	3.6	1.7	87.1	1.9	3.4	9.3
Yellow	3.5	0.0	4.5	3.5	3.5	4.5
Red	0.0	0.0	1.5	1.0	1.0	0.0



	EB			WB			NB			SB		
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicle Adjustment Factor (f_{HV})	0.980	0.971	1.000	0.980	0.971	1.000	0.980	0.980	1.000	0.980	0.980	0.980
Approach Grade Adjustment Factor (f_g)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Work Zone Adjustment Factor (f_{wz})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})	0.952	0.000		0.952	0.000		0.952	0.000		0.952	0.000	
Right-Turn Adjustment Factor (f_{RT})		0.954			0.980			0.913			0.000	
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})	1.000			1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})			1.000			1.000			1.000			1.000
Movement Saturation Flow Rate (s), veh/h	1774	3138		1774	3448		1774	797		1774	1863	
Proportion of Vehicles Arriving on Green (P)	0.03	0.89	0.67	0.04	0.91	0.68	0.08	0.13	0.13	0.01	0.07	0.07
Incremental Delay Factor (k)	0.11	0.50	0.50	0.11	0.50	0.50	0.39	0.15		0.11	0.15	0.15

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)	3.5	6.0	3.5	6.0	4.5	4.5	4.5	4.5
Green Ratio (g/C)	0.70	0.67	0.71	0.68	0.08	0.13	0.01	0.07
Permitted Saturation Flow Rate (s_p), veh/h/ln	382	0	338	0	0	0	0	0
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								
Permitted Effective Green Time (g_p), s	87.1	0.0	87.3	0.0	0.0	0.0	0.0	0.0
Permitted Service Time (g_u), s	75.3	0.0	67.2	0.0	0.0	0.0	0.0	0.0
Permitted Queue Service Time (g_{ps}), s	2.8		12.8					
Time to First Blockage (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage (g_{fs}), s								
Protected Right Saturation Flow (s_R), veh/h/ln								1579
Protected Right Effective Green Time (g_R), s								3.6

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	1.557	0.00	1.710	0.00	2.107	0.00	2.107	0.00
Pedestrian F_s / F_{delay}	0.000	0.079	0.000	0.075	0.000	0.156	0.000	0.161
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b	1339.77	7.08	1366.27	6.53	264.16	48.96	142.46	56.07
Bicycle F_w / F_v	-3.64	1.32	-3.64	1.27	-3.64	0.47	-3.64	0.23

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--- Messages ---

WARNING: Since queue spillover from turn lanes and spillback into upstream intersections is not accounted for in the HCM procedures, use of a simulation tool may be advised in situations where the Queue Storage Ratio exceeds 1.0.

--- Comments ---

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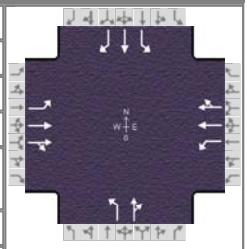
HCS 2010 Signalized Intersection Input Data

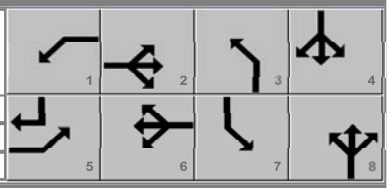
General Information				Intersection Information	
Agency	GHA			Duration, h	0.25
Analyst	DPB	Analysis Date	Aug 24, 2016	Area Type	Other
Jurisdiction	IDOT	Time Period	AM PEAK	PHF	0.95
Urban Street	Dempster	Analysis Year	TOTAL PROT/ PERM	Analysis Period	1> 7:00
Intersection	Dempster at Luther	File Name	DEM-LUT AMT 2.xus		
Project Description	ALGH CAC Garage				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	70	1265	190	125	1260	75	110	75	85	20	80	30

Signal Information			
Cycle, s	130.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	3.6	1.7	87.4	1.8	3.2	9.3
Yellow	3.5	0.0	4.5	3.5	3.5	4.5
Red	0.0	0.0	1.5	1.0	1.0	0.0



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	70	1265	190	125	1260	75	110	75	85	20	80	30
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	3		2	3		2	2		2	2	2
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	4	3	3	4	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	12.0
Turn Bay Length, ft	75	0		175	0		95	0		100	0	250
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	35	35	35	35	35	35	35	35	35	35	35	35

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	13.0	62.4	14.3	63.7	14.3	39.0	14.3	39.0
Yellow Change Interval (*Y*), s	3.5	4.5	3.5	4.5	3.5	4.5	3.5	4.5
Red Clearance Interval (R_c), s	0.0	1.5	0.0	1.5	1.0	0.0	1.0	0.0
Minimum Green (G_{min}), s	3	15	3	15	3	8	3	8
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Passage (*PT*), s	3.0	7.0	3.0	7.0	3.0	4.0	3.0	4.0
Recall Mode	Off	Min	Off	Min	Off	Off	Off	Off
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Walk (*Walk*), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Clearance Time (*PC*), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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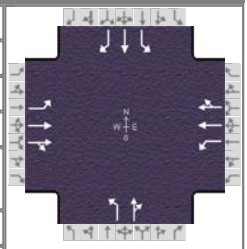
HCS 2010 Signalized Intersection Results Summary

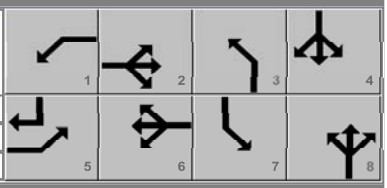
General Information				Intersection Information	
Agency	GHA			Duration, h	0.25
Analyst	DPB	Analysis Date	Aug 24, 2016	Area Type	Other
Jurisdiction	IDOT	Time Period	AM PEAK	PHF	0.95
Urban Street	Dempster	Analysis Year	TOTAL PROT/ PERM	Analysis Period	1> 7:00
Intersection	Dempster at Luther	File Name	DEM-LUT AMT 2.xus		
Project Description	ALGH CAC Garage				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	70	1265	190	125	1260	75	110	75	85	20	80	30

Signal Information			
Cycle, s	130.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	3.6	1.7	87.4	1.8	3.2	9.3
Yellow	3.5	0.0	4.5	3.5	3.5	4.5
Red	0.0	0.0	1.5	1.0	1.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	3.0
Phase Duration, s	7.1	93.4	8.8	95.1	14.0	21.4	6.3	13.8
Change Period, ($Y+R_c$), s	3.5	6.0	3.5	6.0	4.5	4.5	4.5	4.5
Max Allow Headway (*MAH*), s	4.0	0.0	4.0	0.0	4.0	5.1	4.0	5.1
Queue Clearance Time (g_s), s	3.7		5.0		9.6	14.4	3.4	7.7
Green Extension Time (g_e), s	0.2	0.0	0.4	0.0	0.0	1.6	0.0	1.5
Phase Call Probability	0.93		0.99		0.98	1.00	0.53	1.00
Max Out Probability	0.00		0.00		1.00	0.00	0.02	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	74	778	754	132	708	697	116	168		21	84	32
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1774	1845	1761	1774	1845	1808	1774	1700		1774	1863	1579
Queue Service Time (g_s), s	1.7	12.9	19.4	3.0	8.8	11.2	7.6	12.4		1.4	5.7	2.4
Cycle Queue Clearance Time (g_c), s	1.7	12.9	19.4	3.0	8.8	11.2	7.6	12.4		1.4	5.7	2.4
Green Ratio (*g/C*)	0.70	0.67	0.67	0.72	0.69	0.69	0.16	0.13		0.09	0.07	0.10
Capacity (*c*), veh/h	328	1240	1184	305	1265	1239	221	221		104	133	156
Volume-to-Capacity Ratio (*X*)	0.225	0.627	0.637	0.432	0.560	0.562	0.525	0.761		0.203	0.634	0.202
Available Capacity (c_a), veh/h	757	1240	1184	728	1265	1239	225	555		212	499	467
Back of Queue (*Q*), veh/ln (95 th percentile)	1.1	5.9	8.7	2.0	4.3	5.4	6.3	9.7		1.2	5.3	1.8
Queue Storage Ratio (*RQ*) (95 th percentile)	0.38	0.00	0.00	0.29	0.00	0.00	1.69	0.00		0.30	0.00	0.18
Uniform Delay (d_1), s/veh	6.7	2.9	5.0	8.1	2.1	2.9	49.4	54.6		55.2	58.7	53.8
Incremental Delay (d_2), s/veh	0.3	2.4	2.6	1.0	1.8	1.8	2.1	7.5		1.0	7.0	0.9
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh	7.1	5.3	7.7	9.1	3.9	4.8	51.5	62.1		56.2	65.7	54.7
Level of Service (LOS)	A	A	A	A	A	A	D	E		E	E	D
Approach Delay, s/veh / LOS	6.5	A		4.7	A		57.8	E		61.7	E	
Intersection Delay, s/veh / LOS	11.9						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.2	B	2.4	B	2.9	C	2.9	C
Bicycle LOS Score / LOS	1.8	A	1.8	A	1.0	A	0.7	A

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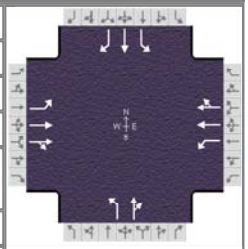
HCS 2010 Signalized Intersection Intermediate Values

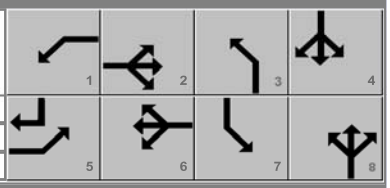
General Information				Intersection Information	
Agency	GHA			Duration, h	0.25
Analyst	DPB	Analysis Date	Aug 24, 2016	Area Type	Other
Jurisdiction	IDOT	Time Period	AM PEAK	PHF	0.95
Urban Street	Dempster	Analysis Year	TOTAL PROT/ PERM	Analysis Period	1> 7:00
Intersection	Dempster at Luther	File Name	DEM-LUT AMT 2.xus		
Project Description	ALGH CAC Garage				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	70	1265	190	125	1260	75	110	75	85	20	80	30

Signal Information			
Cycle, s	130.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	3.6	1.7	87.4	1.8	3.2	9.3
Yellow	3.5	0.0	4.5	3.5	3.5	4.5
Red	0.0	0.0	1.5	1.0	1.0	0.0



	EB			WB			NB			SB		
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicle Adjustment Factor (f_{HV})	0.980	0.971	1.000	0.980	0.971	1.000	0.980	0.980	1.000	0.980	0.980	0.980
Approach Grade Adjustment Factor (f_g)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Work Zone Adjustment Factor (f_{wz})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})	0.952	0.000		0.952	0.000		0.952	0.000		0.952	0.000	
Right-Turn Adjustment Factor (f_{RT})		0.954			0.980			0.913			0.000	
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})	1.000			1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})			1.000			1.000			1.000			1.000
Movement Saturation Flow Rate (s), veh/h	1774	3138		1774	3448		1774	797		1774	1863	
Proportion of Vehicles Arriving on Green (P)	0.03	0.90	0.67	0.04	0.91	0.69	0.07	0.13	0.13	0.01	0.07	0.07
Incremental Delay Factor (k)	0.11	0.50	0.50	0.11	0.50	0.50	0.12	0.15		0.11	0.15	0.15

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)	3.5	6.0	3.5	6.0	4.5	4.5	4.5	4.5
Green Ratio (g/C)	0.70	0.67	0.72	0.69	0.16	0.13	0.09	0.07
Permitted Saturation Flow Rate (s_p), veh/h/ln	382	0	338	0	1308	0	1212	0
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								
Permitted Effective Green Time (g_p), s	87.4	0.0	87.6	0.0	11.3	0.0	9.3	0.0
Permitted Service Time (g_u), s	75.9	0.0	68.0	0.0	3.6	0.0	2.5	0.0
Permitted Queue Service Time (g_{ps}), s	2.8		12.5		0.7		0.1	
Time to First Blockage (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage (g_{fs}), s								
Protected Right Saturation Flow (s_R), veh/h/ln								1579
Protected Right Effective Green Time (g_R), s								3.6

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	1.557	0.00	1.710	0.00	2.107	0.00	2.107	0.00
Pedestrian F_s / F_{delay}	0.000	0.078	0.000	0.075	0.000	0.156	0.000	0.161
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b	1344.90	6.97	1371.23	6.42	260.29	49.18	142.51	56.07
Bicycle F_w / F_v	-3.64	1.32	-3.64	1.27	-3.64	0.47	-3.64	0.23

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--- Messages ---

WARNING: Since queue spillover from turn lanes and spillback into upstream intersections is not accounted for in the HCM procedures, use of a simulation tool may be advised in situations where the Queue Storage Ratio exceeds 1.0.

--- Comments ---

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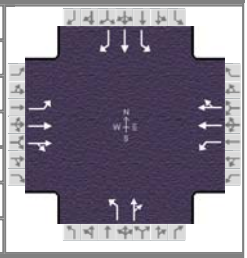
HCS 2010 Signalized Intersection Input Data

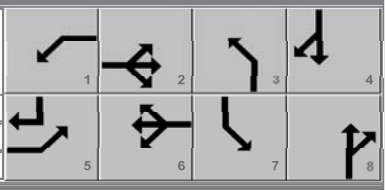
General Information				Intersection Information	
Agency	GHA			Duration, h	0.25
Analyst	DPB	Analysis Date	Jun 6, 2016	Area Type	Other
Jurisdiction	IDOT	Time Period	PM PEAK	PHF	0.95
Urban Street	Dempster	Analysis Year	2016	Analysis Period	1> 7:00
Intersection	Dempster at Luther	File Name	DEM-LUT PME.xus		
Project Description	ALGH CAC Garage				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	10	1385	120	60	1255	45	130	55	105	95	100	85

Signal Information			
Cycle, s	150.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	1.1	2.5	99.1	10.2	0.3	18.3
Yellow	3.5	0.0	4.5	3.5	0.0	4.5
Red	0.0	0.0	1.5	1.0	0.0	0.0



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	10	1385	120	60	1255	45	130	55	105	95	100	85
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	3		2	3		2	2		2	2	2
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	4	3	3	4	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	12.0
Turn Bay Length, ft	75	0		175	0		95	0		100	0	250
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	35	35	35	35	35	35	35	35	35	35	35	35

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	13.5	82.5	13.5	82.5	15.0	39.0	15.0	39.0
Yellow Change Interval (*Y*), s	3.5	4.5	3.5	4.5	3.5	4.5	3.5	4.5
Red Clearance Interval (R_c), s	0.0	1.5	0.0	1.5	1.0	0.0	1.0	0.0
Minimum Green (G_{min}), s	3	15	3	15	3	8	3	8
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Passage (*PT*), s	3.0	7.0	3.0	7.0	3.0	4.0	3.0	4.0
Recall Mode	Off	Min	Off	Min	Off	Off	Off	Off
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Walk (*Walk*), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Clearance Time (*PC*), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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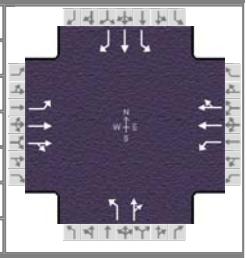
HCS 2010 Signalized Intersection Results Summary

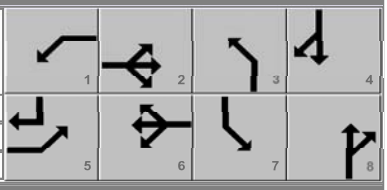
General Information				Intersection Information	
Agency	GHA			Duration, h	0.25
Analyst	DPB	Analysis Date	Jun 6, 2016	Area Type	Other
Jurisdiction	IDOT	Time Period	PM PEAK	PHF	0.95
Urban Street	Dempster	Analysis Year	2016	Analysis Period	1> 7:00
Intersection	Dempster at Luther	File Name	DEM-LUT PME.xus		
Project Description	ALGH CAC Garage				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	10	1385	120	60	1255	45	130	55	105	95	100	85

Signal Information			
Cycle, s	150.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	1.1	2.5	99.1	10.2	0.3	18.3
Yellow	3.5	0.0	4.5	3.5	0.0	4.5
Red	0.0	0.0	1.5	1.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	4.0	2.0	4.0	2.0	3.0
Phase Duration, s	4.6	105.1	7.1	107.6	15.0	23.1	14.7	22.8
Change Period, ($Y+R_c$), s	3.5	6.0	3.5	6.0	4.5	4.5	4.5	4.5
Max Allow Headway (MAH), s	4.0	0.0	4.0	0.0	4.0	5.1	4.0	5.1
Queue Clearance Time (g_s), s	2.3		3.7		12.5	16.8	10.4	9.9
Green Extension Time (g_e), s	0.0	0.0	0.1	0.0	0.0	1.8	0.0	2.0
Phase Call Probability	0.36		0.93		1.00	1.00	0.98	1.00
Max Out Probability	0.00		0.00		1.00	0.01	1.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	11	799	785	63	688	681	137	168		100	105	89
Adjusted Saturation Flow Rate (s), veh/h/ln	1774	1845	1793	1774	1845	1822	1774	1666		1774	1863	1579
Queue Service Time (g_s), s	0.3	18.3	23.1	1.7	10.7	12.3	10.5	14.8		8.4	7.9	7.8
Cycle Queue Clearance Time (g_c), s	0.3	18.3	23.1	1.7	10.7	12.3	10.5	14.8		8.4	7.9	7.8
Green Ratio (g/C)	0.67	0.66	0.66	0.69	0.68	0.68	0.07	0.12		0.07	0.12	0.13
Capacity (c), veh/h	291	1219	1185	253	1250	1234	124	207		121	227	204
Volume-to-Capacity Ratio (X)	0.036	0.655	0.663	0.250	0.550	0.551	1.102	0.815		0.829	0.463	0.439
Available Capacity (c_a), veh/h	588	1219	1185	521	1250	1234	124	387		124	428	374
Back of Queue (Q), veh/ln (95 th percentile)	0.2	8.1	9.9	1.2	5.4	6.2	13.8	11.2		8.6	7.0	5.9
Queue Storage Ratio (RQ) (95 th percentile)	0.07	0.00	0.00	0.18	0.00	0.00	3.70	0.00		2.18	0.00	0.60
Uniform Delay (d_1), s/veh	8.8	4.1	5.7	9.8	2.9	3.4	69.8	64.0		69.0	61.3	60.3
Incremental Delay (d_2), s/veh	0.1	2.8	2.9	0.5	1.7	1.8	110.8	10.5		34.7	2.1	2.1
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Control Delay (d), s/veh	8.9	6.9	8.6	10.3	4.6	5.2	180.5	74.5		103.8	63.4	62.4
Level of Service (LOS)	A	A	A	B	A	A	F	E		F	E	E
Approach Delay, s/veh / LOS	7.8	A		5.1	A		122.0	F		76.8	E	
Intersection Delay, s/veh / LOS	21.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.2	B	2.4	B	2.9	C	2.9	C
Bicycle LOS Score / LOS	1.8	A	1.7	A	1.0	A	1.0	A

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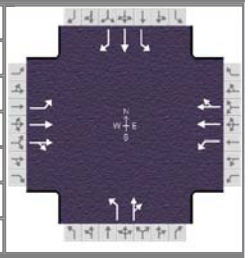
HCS 2010 Signalized Intersection Intermediate Values

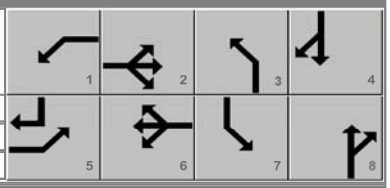
General Information				Intersection Information	
Agency	GHA			Duration, h	0.25
Analyst	DPB	Analysis Date	Jun 6, 2016	Area Type	Other
Jurisdiction	IDOT	Time Period	PM PEAK	PHF	0.95
Urban Street	Dempster	Analysis Year	2016	Analysis Period	1> 7:00
Intersection	Dempster at Luther	File Name	DEM-LUT PME.xus		
Project Description	ALGH CAC Garage				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	10	1385	120	60	1255	45	130	55	105	95	100	85

Signal Information			
Cycle, s	150.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	1.1	2.5	99.1	10.2	0.3	18.3
Yellow	3.5	0.0	4.5	3.5	0.0	4.5
Red	0.0	0.0	1.5	1.0	0.0	0.0



	EB			WB			NB			SB		
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicle Adjustment Factor (f_{HV})	0.980	0.971	1.000	0.980	0.971	1.000	0.980	0.980	1.000	0.980	0.980	0.980
Approach Grade Adjustment Factor (f_g)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Work Zone Adjustment Factor (f_{wz})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})	0.952	0.000		0.952	0.000		0.952	0.000		0.952	0.000	
Right-Turn Adjustment Factor (f_{RT})		0.972			0.988			0.894			0.000	
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})	1.000			1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})			1.000			1.000			1.000			1.000
Movement Saturation Flow Rate (*s*), veh/h	1774	3349		1774	3540		1774	573		1774	1863	
Proportion of Vehicles Arriving on Green (*P*)	0.01	0.88	0.66	0.02	0.90	0.68	0.07	0.12	0.12	0.07	0.12	0.12
Incremental Delay Factor (*k*)	0.11	0.50	0.50	0.11	0.50	0.50	0.50	0.15		0.35	0.15	0.15

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)	3.5	6.0	3.5	6.0	4.5	4.5	4.5	4.5
Green Ratio (*g/C*)	0.67	0.66	0.69	0.68	0.07	0.12	0.07	0.12
Permitted Saturation Flow Rate (s_p), veh/h/ln	395	0	321	0	0	0	0	0
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								
Permitted Effective Green Time (g_p), s	99.1	0.0	100.1	0.0	0.0	0.0	0.0	0.0
Permitted Service Time (g_u), s	87.3	0.0	76.0	0.0	0.0	0.0	0.0	0.0
Permitted Queue Service Time (g_{ps}), s	0.3		5.9					
Time to First Blockage (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage (g_{fs}), s								
Protected Right Saturation Flow (s_R), veh/h/ln								1579
Protected Right Effective Green Time (g_R), s								1.1

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	1.557	0.00	1.710	0.00	2.107	0.00	2.107	0.00
Pedestrian F_s / F_{delay}	0.000	0.086	0.000	0.082	0.000	0.163	0.000	0.163
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b	1321.59	8.63	1355.05	7.80	248.16	57.54	244.08	57.81
Bicycle F_w / F_v	-3.64	1.32	-3.64	1.18	-3.64	0.50	-3.64	0.49

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--- Messages ---

WARNING: Since queue spillover from turn lanes and spillback into upstream intersections is not accounted for in the HCM procedures, use of a simulation tool may be advised in situations where the Queue Storage Ratio exceeds 1.0.

--- Comments ---

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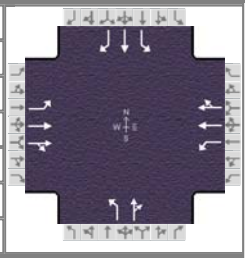
HCS 2010 Signalized Intersection Input Data

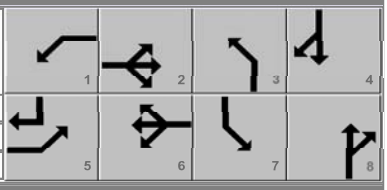
General Information				Intersection Information	
Agency	GHA			Duration, h	0.25
Analyst	DPB	Analysis Date	Aug 24, 2016	Area Type	Other
Jurisdiction	IDOT	Time Period	PM PEAK	PHF	0.95
Urban Street	Dempster	Analysis Year	TOTAL	Analysis Period	1> 7:00
Intersection	Dempster at Luther	File Name	DEM-LUT PMt.xus		
Project Description	ALGH CAC Garage				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	10	1385	150	90	1255	45	160	60	125	95	105	85

Signal Information			
Cycle, s	150.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	1.1	0.3	95.4	10.2	0.3	20.7
Yellow	3.5	3.5	4.5	3.5	0.0	4.5
Red	0.0	0.0	1.5	1.0	0.0	0.0



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	10	1385	150	90	1255	45	160	60	125	95	105	85
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	3		2	3		2	2		2	2	2
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	4	3	3	4	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	12.0
Turn Bay Length, ft	75	0		175	0		95	0		100	0	250
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	35	35	35	35	35	35	35	35	35	35	35	35

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	13.5	82.5	13.5	82.5	15.0	39.0	15.0	39.0
Yellow Change Interval (*Y*), s	3.5	4.5	3.5	4.5	3.5	4.5	3.5	4.5
Red Clearance Interval (R_c), s	0.0	1.5	0.0	1.5	1.0	0.0	1.0	0.0
Minimum Green (G_{min}), s	3	15	3	15	3	8	3	8
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Passage (*PT*), s	3.0	7.0	3.0	7.0	3.0	4.0	3.0	4.0
Recall Mode	Off	Min	Off	Min	Off	Off	Off	Off
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Walk (*Walk*), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Clearance Time (*PC*), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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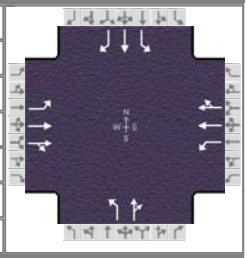
HCS 2010 Signalized Intersection Results Summary

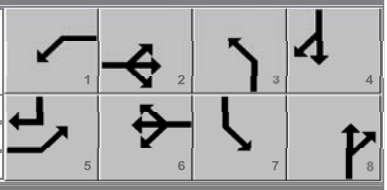
General Information				Intersection Information	
Agency	GHA			Duration, h	0.25
Analyst	DPB	Analysis Date	Aug 24, 2016	Area Type	Other
Jurisdiction	IDOT	Time Period	PM PEAK	PHF	0.95
Urban Street	Dempster	Analysis Year	TOTAL	Analysis Period	1> 7:00
Intersection	Dempster at Luther	File Name	DEM-LUT PMt.xus		
Project Description	ALGH CAC Garage				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	10	1385	150	90	1255	45	160	60	125	95	105	85

Signal Information			
Cycle, s	150.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	1.1	0.3	95.4	10.2	0.3	20.7
Yellow	3.5	3.5	4.5	3.5	0.0	4.5
Red	0.0	0.0	1.5	1.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	4.0	2.0	4.0	2.0	3.0
Phase Duration, s	4.6	101.4	8.3	105.2	15.0	25.5	14.7	25.2
Change Period, ($Y+R_c$), s	3.5	6.0	3.5	6.0	4.5	4.5	4.5	4.5
Max Allow Headway (MAH), s	4.0	0.0	4.0	0.0	4.0	5.1	4.0	5.1
Queue Clearance Time (g_s), s	2.3		4.7		12.5	19.1	10.4	10.2
Green Extension Time (g_e), s	0.0	0.0	0.2	0.0	0.0	1.9	0.0	2.2
Phase Call Probability	0.36		0.98		1.00	1.00	0.98	1.00
Max Out Probability	0.00		0.00		1.00	0.03	1.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (v), veh/h	11	816	800	95	688	681	168	195		100	111	89
Adjusted Saturation Flow Rate (s), veh/h/ln	1774	1845	1781	1774	1845	1822	1774	1661		1774	1863	1579
Queue Service Time (g_s), s	0.3	24.5	30.3	2.7	13.2	14.7	10.5	17.1		8.4	8.2	7.7
Cycle Queue Clearance Time (g_c), s	0.3	24.5	30.3	2.7	13.2	14.7	10.5	17.1		8.4	8.2	7.7
Green Ratio (g/C)	0.64	0.64	0.64	0.68	0.66	0.66	0.07	0.14		0.07	0.14	0.15
Capacity (c), veh/h	278	1174	1133	240	1220	1205	124	233		121	258	230
Volume-to-Capacity Ratio (X)	0.038	0.695	0.706	0.394	0.564	0.565	1.356	0.836		0.829	0.429	0.390
Available Capacity (c_a), veh/h	546	1174	1133	464	1220	1205	124	385		124	428	374
Back of Queue (Q), veh/ln (95 th percentile)	0.2	10.2	13.7	1.9	6.6	7.4	19.1	12.5		8.6	7.1	5.7
Queue Storage Ratio (RQ) (95 th percentile)	0.08	0.00	0.00	0.28	0.00	0.00	5.11	0.00		2.18	0.00	0.58
Uniform Delay (d_1), s/veh	10.2	6.0	8.2	13.0	3.8	4.4	69.8	62.8		69.0	59.2	58.1
Incremental Delay (d_2), s/veh	0.1	3.4	3.7	1.0	1.9	1.9	203.7	10.8		34.7	1.6	1.5
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Control Delay (d), s/veh	10.2	9.4	11.9	14.1	5.7	6.3	273.5	73.6		103.8	60.8	59.6
Level of Service (LOS)	B	A	B	B	A	A	F	E		F	E	E
Approach Delay, s/veh / LOS	10.7	B		6.5	A		166.3	F		74.8	E	
Intersection Delay, s/veh / LOS	29.2						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.2	B	2.4	B	2.9	C	2.9	C
Bicycle LOS Score / LOS	1.8	A	1.7	A	1.1	A	1.0	A

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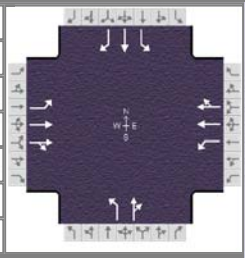
HCS 2010 Signalized Intersection Intermediate Values

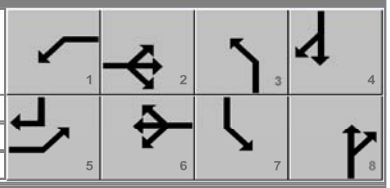
General Information				Intersection Information	
Agency	GHA			Duration, h	0.25
Analyst	DPB	Analysis Date	Aug 24, 2016	Area Type	Other
Jurisdiction	IDOT	Time Period	PM PEAK	PHF	0.95
Urban Street	Dempster	Analysis Year	TOTAL	Analysis Period	1> 7:00
Intersection	Dempster at Luther	File Name	DEM-LUT PMt.xus		
Project Description	ALGH CAC Garage				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	10	1385	150	90	1255	45	160	60	125	95	105	85

Signal Information			
Cycle, s	150.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	1.1	0.3	95.4	10.2	0.3	20.7
Yellow	3.5	3.5	4.5	3.5	0.0	4.5
Red	0.0	0.0	1.5	1.0	0.0	0.0



	EB			WB			NB			SB		
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicle Adjustment Factor (f_{HV})	0.980	0.971	1.000	0.980	0.971	1.000	0.980	0.980	1.000	0.980	0.980	0.980
Approach Grade Adjustment Factor (f_g)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Work Zone Adjustment Factor (f_{wz})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})	0.952	0.000		0.952	0.000		0.952	0.000		0.952	0.000	
Right-Turn Adjustment Factor (f_{RT})		0.966			0.988			0.892			0.000	
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})	1.000			1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})			1.000			1.000			1.000			1.000
Movement Saturation Flow Rate (s), veh/h	1774	3274		1774	3540		1774	539		1774	1863	
Proportion of Vehicles Arriving on Green (P)	0.01	0.85	0.64	0.03	0.88	0.66	0.07	0.14	0.14	0.07	0.14	0.14
Incremental Delay Factor (k)	0.11	0.50	0.50	0.11	0.50	0.50	0.50	0.16		0.35	0.15	0.15

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)	3.5	6.0	3.5	6.0	4.5	4.5	4.5	4.5
Green Ratio (g/C)	0.64	0.64	0.68	0.66	0.07	0.14	0.07	0.14
Permitted Saturation Flow Rate (s_p), veh/h/ln	395	0	312	0	0	0	0	0
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								
Permitted Effective Green Time (g_p), s	95.4	0.0	97.4	0.0	0.0	0.0	0.0	0.0
Permitted Service Time (g_u), s	82.5	0.0	65.1	0.0	0.0	0.0	0.0	0.0
Permitted Queue Service Time (g_{ps}), s	0.4		14.1					
Time to First Blockage (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage (g_{fs}), s								
Protected Right Saturation Flow (s_R), veh/h/ln								1579
Protected Right Effective Green Time (g_R), s								1.1

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	1.557	0.00	1.710	0.00	2.107	0.00	2.107	0.00
Pedestrian F_s / F_{delay}	0.000	0.092	0.000	0.086	0.000	0.161	0.000	0.161
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b	1272.44	9.93	1322.56	8.60	280.64	55.43	276.56	55.69
Bicycle F_w / F_v	-3.64	1.34	-3.64	1.21	-3.64	0.60	-3.64	0.50

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--- Messages ---

WARNING: If demand exceeds capacity, a multiple-period analysis should be conducted.

WARNING: Since queue spillover from turn lanes and spillback into upstream intersections is not accounted for in the HCM procedures, use of a simulation tool may be advised in situations where the Queue Storage Ratio exceeds 1.0.

--- Comments ---

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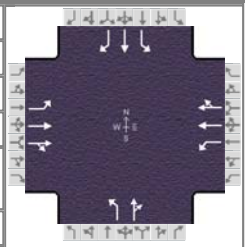
HCS 2010 Signalized Intersection Input Data

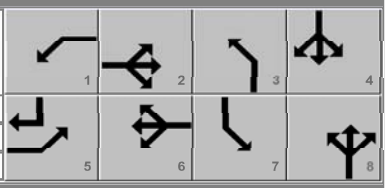
General Information				Intersection Information	
Agency	GHA			Duration, h	0.25
Analyst	DPB	Analysis Date	Aug 24, 2016	Area Type	Other
Jurisdiction	IDOT	Time Period	PM PEAK	PHF	0.95
Urban Street	Dempster	Analysis Year	TOTAL PROT/ PERM	Analysis Period	1> 7:00
Intersection	Dempster at Luther	File Name	DEM-LUT PMT 2.xus		
Project Description	ALGH CAC Garage				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	10	1385	150	90	1255	45	160	60	125	95	105	85

Signal Information			
Cycle, s	150.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	1.1	0.2	96.5	9.1	1.4	19.7
Yellow	3.5	3.5	4.5	3.5	0.0	4.5
Red	0.0	0.0	1.5	1.0	0.0	0.0



Traffic Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	10	1385	150	90	1255	45	160	60	125	95	105	85
Initial Queue (Q_b), veh/h	0	0	0	0	0	0	0	0	0	0	0	0
Base Saturation Flow Rate (s_o), veh/h	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Parking (N_m), man/h		None			None			None			None	
Heavy Vehicles (P_{HV}), %	2	3		2	3		2	2		2	2	2
Ped / Bike / RTOR, /h	0	0	0	0	0	0	0	0	0	0	0	0
Buses (N_b), buses/h	0	0	0	0	0	0	0	0	0	0	0	0
Arrival Type (*AT*)	3	4	3	3	4	3	3	3	3	3	3	3
Upstream Filtering (*I*)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Width (*W*), ft	12.0	12.0		12.0	12.0		12.0	12.0		12.0	12.0	12.0
Turn Bay Length, ft	75	0		175	0		95	0		100	0	250
Grade (*Pg*), %		0			0			0			0	
Speed Limit, mi/h	35	35	35	35	35	35	35	35	35	35	35	35

Phase Information	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Maximum Green (G_{max}) or Phase Split, s	13.5	82.5	13.5	82.5	15.0	39.0	15.0	39.0
Yellow Change Interval (*Y*), s	3.5	4.5	3.5	4.5	3.5	4.5	3.5	4.5
Red Clearance Interval (R_c), s	0.0	1.5	0.0	1.5	1.0	0.0	1.0	0.0
Minimum Green (G_{min}), s	3	15	3	15	3	8	3	8
Start-Up Lost Time (*lt*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Extension of Effective Green (*e*), s	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Passage (*PT*), s	3.0	7.0	3.0	7.0	3.0	4.0	3.0	4.0
Recall Mode	Off	Min	Off	Min	Off	Off	Off	Off
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Walk (*Walk*), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Clearance Time (*PC*), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Multimodal Information	EB			WB			NB			SB		
85th % Speed / Rest in Walk / Corner Radius	0	No	25	0	No	25	0	No	25	0	No	25
Walkway / Crosswalk Width / Length, ft	9.0	12	0	9.0	12	0	9.0	12	0	9.0	12	0
Street Width / Island / Curb	0	0	No	0	0	No	0	0	No	0	0	No
Width Outside / Bike Lane / Shoulder, ft	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0	12	5.0	2.0
Pedestrian Signal / Occupied Parking	No	0.50		No	0.50		No	0.50		No	0.50	

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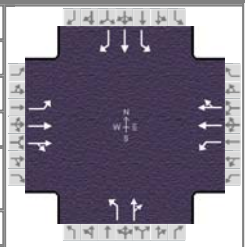
HCS 2010 Signalized Intersection Results Summary

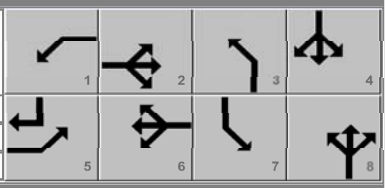
General Information				Intersection Information	
Agency	GHA			Duration, h	0.25
Analyst	DPB	Analysis Date	Aug 24, 2016	Area Type	Other
Jurisdiction	IDOT	Time Period	PM PEAK	PHF	0.95
Urban Street	Dempster	Analysis Year	TOTAL PROT/ PERM	Analysis Period	1> 7:00
Intersection	Dempster at Luther	File Name	DEM-LUT PMT 2.xus		
Project Description	ALGH CAC Garage				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	10	1385	150	90	1255	45	160	60	125	95	105	85

Signal Information			
Cycle, s	150.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	1.1	0.2	96.5	9.1	1.4	19.7
Yellow	3.5	3.5	4.5	3.5	0.0	4.5
Red	0.0	0.0	1.5	1.0	0.0	0.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	4.0	1.1	4.0	1.1	4.0	1.1	3.0
Phase Duration, s	4.6	102.5	8.3	106.2	15.0	25.6	13.6	24.2
Change Period, ($Y+R_c$), s	3.5	6.0	3.5	6.0	4.5	4.5	4.5	4.5
Max Allow Headway (*MAH*), s	4.0	0.0	4.0	0.0	4.0	5.1	4.0	5.1
Queue Clearance Time (g_s), s	2.3		4.6		12.5	19.1	9.2	10.2
Green Extension Time (g_e), s	0.0	0.0	0.2	0.0	0.0	2.0	0.0	2.2
Phase Call Probability	0.36		0.98		1.00	1.00	0.98	1.00
Max Out Probability	0.00		0.00		1.00	0.02	1.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	11	816	800	95	688	681	168	195		100	111	89
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1774	1845	1781	1774	1845	1822	1774	1661		1774	1863	1579
Queue Service Time (g_s), s	0.3	23.0	28.8	2.6	12.1	13.7	10.5	17.1		7.2	8.2	7.8
Cycle Queue Clearance Time (g_c), s	0.3	23.0	28.8	2.6	12.1	13.7	10.5	17.1		7.2	8.2	7.8
Green Ratio (*g/C*)	0.65	0.64	0.64	0.69	0.67	0.67	0.20	0.14		0.19	0.13	0.14
Capacity (*c*), veh/h	283	1187	1146	245	1232	1217	270	234		171	245	219
Volume-to-Capacity Ratio (*X*)	0.037	0.687	0.698	0.387	0.558	0.559	0.624	0.834		0.583	0.451	0.409
Available Capacity (c_a), veh/h	564	1187	1146	482	1232	1217	270	397		188	428	374
Back of Queue (*Q*), veh/ln (95 th percentile)	0.2	9.6	12.7	1.9	6.1	6.9	2.2	12.5		6.1	7.2	5.8
Queue Storage Ratio (*RQ*) (95 th percentile)	0.08	0.00	0.00	0.27	0.00	0.00	0.59	0.00		1.56	0.00	0.59
Uniform Delay (d_1), s/veh	9.7	5.4	7.6	12.2	3.4	4.0	54.4	62.7		53.0	60.1	59.0
Incremental Delay (d_2), s/veh	0.1	3.3	3.5	1.0	1.8	1.9	4.4	10.4		3.8	1.8	1.7
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Control Delay (*d*), s/veh	9.8	8.7	11.1	13.2	5.2	5.8	58.8	73.2		56.9	62.0	60.7
Level of Service (LOS)	A	A	B	B	A	A	E	E		E	E	E
Approach Delay, s/veh / LOS	9.9	A		6.0	A		66.5	E		59.9	E	
Intersection Delay, s/veh / LOS	17.9						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.2	B	2.4	B	2.9	C	2.9	C
Bicycle LOS Score / LOS	1.8	A	1.7	A	1.1	A	1.0	A

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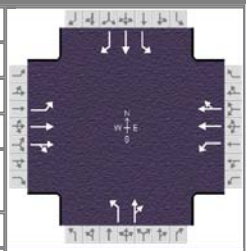
HCS 2010 Signalized Intersection Intermediate Values

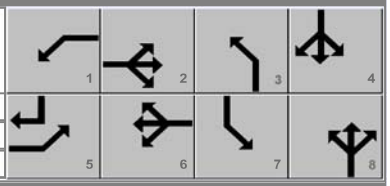
General Information				Intersection Information	
Agency	GHA			Duration, h	0.25
Analyst	DPB	Analysis Date	Aug 24, 2016	Area Type	Other
Jurisdiction	IDOT	Time Period	PM PEAK	PHF	0.95
Urban Street	Dempster	Analysis Year	TOTAL PROT/ PERM	Analysis Period	1> 7:00
Intersection	Dempster at Luther	File Name	DEM-LUT PMT 2.xus		
Project Description	ALGH CAC Garage				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	10	1385	150	90	1255	45	160	60	125	95	105	85

Signal Information			
Cycle, s	150.0	Reference Phase	2
Offset, s	0	Reference Point	Begin
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	1.1	0.2	96.5	9.1	1.4	19.7
Yellow	3.5	3.5	4.5	3.5	0.0	4.5
Red	0.0	0.0	1.5	1.0	0.0	0.0



	EB			WB			NB			SB		
Saturation Flow / Delay	L	T	R	L	T	R	L	T	R	L	T	R
Lane Width Adjustment Factor (f_w)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Heavy Vehicle Adjustment Factor (f_{HV})	0.980	0.971	1.000	0.980	0.971	1.000	0.980	0.980	1.000	0.980	0.980	0.980
Approach Grade Adjustment Factor (f_g)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Parking Activity Adjustment Factor (f_p)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Bus Blockage Adjustment Factor (f_{bb})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Area Type Adjustment Factor (f_a)	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Lane Utilization Adjustment Factor (f_{LU})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Work Zone Adjustment Factor (f_{wz})	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Left-Turn Adjustment Factor (f_{LT})	0.952	0.000		0.952	0.000		0.952	0.000		0.952	0.000	
Right-Turn Adjustment Factor (f_{RT})		0.966			0.988			0.892			0.000	
Left-Turn Pedestrian Adjustment Factor (f_{Lpb})	1.000			1.000			1.000			1.000		
Right-Turn Ped-Bike Adjustment Factor (f_{Rpb})			1.000			1.000			1.000			1.000
Movement Saturation Flow Rate (s), veh/h	1774	3274		1774	3540		1774	539		1774	1863	
Proportion of Vehicles Arriving on Green (P)	0.01	0.86	0.64	0.03	0.89	0.67	0.07	0.14	0.14	0.06	0.13	0.13
Incremental Delay Factor (k)	0.11	0.50	0.50	0.11	0.50	0.50	0.20	0.15		0.13	0.15	0.15

Signal Timing / Movement Groups	EBL	EBT/R	WBL	WBT/R	NBL	NBT/R	SBL	SBT/R
Lost Time (t_L)	3.5	6.0	3.5	6.0	4.5	4.5	4.5	4.5
Green Ratio (g/C)	0.65	0.64	0.69	0.67	0.20	0.14	0.19	0.13
Permitted Saturation Flow Rate (s_p), veh/h/ln	395	0	312	0	1277	0	1183	0
Shared Saturation Flow Rate (s_{sh}), veh/h/ln								
Permitted Effective Green Time (g_p), s	96.5	0.0	98.5	0.0	19.7	0.0	19.7	0.0
Permitted Service Time (g_u), s	84.5	0.0	67.7	0.0	11.5	0.0	2.0	0.0
Permitted Queue Service Time (g_{ps}), s	0.3		13.5		4.2		1.6	
Time to First Blockage (g_f), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Service Time Before Blockage (g_{fs}), s								
Protected Right Saturation Flow (s_R), veh/h/ln								1579
Protected Right Effective Green Time (g_R), s								1.1

Multimodal	EB		WB		NB		SB	
Pedestrian F_w / F_v	1.557	0.00	1.710	0.00	2.107	0.00	2.107	0.00
Pedestrian F_s / F_{delay}	0.000	0.090	0.000	0.085	0.000	0.161	0.000	0.162
Pedestrian M_{corner} / M_{cw}								
Bicycle c_b / d_b	1286.81	9.54	1336.26	8.26	281.25	55.39	262.86	56.58
Bicycle F_w / F_v	-3.64	1.34	-3.64	1.21	-3.64	0.60	-3.64	0.50

--- Messages ---

WARNING: Since queue spillover from turn lanes and spillback into upstream intersections is not accounted for in the HCM procedures, use of a simulation tool may be advised in situations where the Queue Storage Ratio exceeds 1.0.

--- Comments ---

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Existing View from Luther Lane - Looking Northwest

Advocate Lutheran General Hospital – West Parking Facility Expansion

Advocate
Lutheran General Hospital
Lutheran General Children's Hospital

DESMAN
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Existing View from Luther Lane – at Connection to Center for Advanced Care

Existing View from the corner of Dempster Street and Luther Lane - Looking Southwest

Existing View from the corner of Dempster Street and Vernon Avenue - Looking Southeast

Advocate Lutheran General Hospital – West Parking Facility Expansion

Advocate
Lutheran General Hospital
Lutheran General Children's Hospital

DESMAN
Design Management

Existing View from Vernon Avenue - Looking Northeast

Advocate Lutheran General Hospital – West Parking Facility Expansion

Advocate
Lutheran General Hospital
Lutheran General Children's Hospital

DESMAN
Design Management

Existing View from Vernon Avenue - Looking Northeast

Advocate Lutheran General Hospital – West Parking Facility Expansion

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