#2019-182
Faith Lutheran HS and ILC buildings –Multi-Family – Preliminary/Final PUD, Rezoning, and Density Variation
Project Review for Planning and Zoning Commission

Meeting Date: December 4, 2019 and December 9, 2019

Requests:

1. Preliminary and Final Planned Unit Development for 36 apartment units.
2. Comprehensive Land Use Plan Amendment from Urban Residential to High Density Residential.
3. Rezoning from R-2 and R-3a to R-3B Multi-Family Residential.
4. PUD Variations:
   a. From the maximum permitted density of 9 units/acre to allow 13.8 dwelling units/acre, a variation of 4.8 units/acre.
   b. From the requirement to bury the overhead utility lines along Church Street, and
   c. From the requirement to install parkway trees along Maple and Church Streets.

Location: 174 McHenry Avenue

Acreage: Approximately 2.46 acres

Zoning: R-2 Single Family and R-3a Two Family

Surrounding Properties:

North:	R-2 Single Family
South:	R-3a Two Family
East:	R-2 Single Family and R-3a Two Family
West:	R-1 Single Family

Staff Contact: Elizabeth Maxwell (815.356.3615)

Background:

- The site is the former Immanuel Lutheran church, school and buildings. The school was sold to Faith Lutheran High School, which operated it until last year. The Immanuel Lutheran Church still holds services in the old church building on Saturday evenings for a

small group. The Immanuel Lutheran School is now located off Pathway Court, this is also where they are holding their Sunday morning services

- The petitioner is planning interior renovations to the high school building and the residential buildings and church to create apartment units. 36 apartments with a mix of studio, one-bedroom, and two-bedroom units would be offered.
- The petitioner needs a Comprehensive Land Use Amendment, Rezoning, Density Variation and Preliminary/Final Planned Unit Development approval.

Development Analysis:

Land Use/Zoning

- The site is currently zoned R-2 Single Family and R-3a Two Family. The main portion of the site is R-2 Single Family residential.
- The current land use is Urban Residential.

General

- The project is proposing 36 units with 28 in the main school building and the additional 8 in the other 3 existing buildings.
- The request would require a Comprehensive Lane Use Map Amendment to High Density Residential and a Rezoning to R-3B PUD.
- The R-3B zoning district permits 9 units to the net acre. The project is proposed at 13.8 units to the acre. The developer would need a density variation or to acquire density in an alternate way.
- Density can be obtained in three alternative ways without needing a variation.
    - Density can be obtained by adding inclusionary units (below market rate) to the mix of the product. This method is not recommended for this site due to the numerous existing below market rate units in the vicinity.
    - Projects which provide inclusionary units can also get additional density by also adding "green" design elements into the project.
    - Density can be obtained by purchasing development rights from another parcel that is less suitable for development. This could be a site in the northwest area that contains natural features like wetlands that would be better to be preserved.

Site Layout

- The site would remain largely unchanged. The petitioner would use the existing surface parking lot and residential driveways for the residents' parking needs.
- There are four buildings that would have the interiors renovated to accommodate residential units. The main building is the Faith Lutheran School. There are also two residential structures for the church and the main church building.
- The existing driveways, one off Church Street and three off Maple Street would remain.

Landscape Plan

- The site contains some existing landscape materials. There are landscape areas around the buildings considered foundation base landscape. Also, there are trees along McHenry Avenue and in front of the structures.
- To provide additional screening to the neighbors, staff has added a condition that shrubs and trees be planted along Maple Street.

Traffic Study

- The petitioner engaged Gewalt Hamilton Associates to complete the traffic study, which analyzed the current traffic counts on McHenry Avenue, Church Street and Maple Street. The consultant also compared the data from trip generation for a church and high school to residential apartments. A review of the site will also look at the sidewalk connections and the mid-block crossing.
- The petitioner will need to comply with the traffic engineer's findings.

Parking

- The site requires 70 parking spaces (1 space per studio units + 1.5 spaces per 1 bedroom units + 2 per 2/3/4 bedroom units + 0.25 guest spaces per total units).
- The site provides 84 parking spaces. There are also an additional 25 on-street parking spaces.
- In 1965, the church was granted permission to have diagonal parking on Church Street in the City's right-of-way for the church's use. This pavement needs repair and the perpetual maintenance persists with this property. The petitioner is responsible for maintaining these areas.

Building Elevations

- The petitioner is planning to do major interior renovations, but leave the exterior facades relatively unchanged besides some general maintenance.
- Any proposed major alterations to the exterior facades would require a Final Planned Unit Development Amendment.

Findings of fact:

Comprehensive Land Use Plan Amendment

The comprehensive plan is put into place to help the City sustain a prosperous and economically balanced community through the combination of all the plan elements including land use decisions, economic development, housing, transportation options, development and preserving the unique areas, parks and recreation, environmental resources, historic preservation and community facilities. As amendments are proposed they are reviewed to ensure a proper balance is maintained and the new designation would fit with the surrounding area.

Rezoning

- The property is currently zoned R-2 Single Family and R-3a Two Family Residential.
- The property would be rezoned to R-3B Multi-Family Residential. The Multi-Family zoning criteria are:
  - ✓ General: This district allows the highest density of residential development. It encourages a wide range of housing types, especially multifamily development, even though single-family detached and two-family dwellings are also allowed, to meet the diverse housing needs of City residents. The intent is to provide a higher density housing in areas immediately around the historic downtown, areas near commercial zoning or areas near transit stops where increased density and in-fill development are desirable.
  - ✓ Character: This district is characterized by residential buildings that cover a large percentage of the lot, are taller and spaced closely enough to create a sense of vertical enclosure.
  - ✓ Uses: This district is for higher density residential neighborhoods that meet the community's housing needs, particularly for higher density and in-fill housing development. Single-family and two-family dwellings are also permitted. Complementary uses such as certain civic and recreational uses are permitted, but are subject to restrictions set forth in this Ordinance.

Criteria for Rezoning

(a) The existing uses and zoning of nearby property.
☐ *Meets* ☐ *Does not meet*

(b) The extent to which property values are diminished by a particular zoning classification or restriction.
☐ *Meets* ☐ *Does not meet*

(c) The extent to which the destruction of property value of a petitioner property owner promotes the health, safety, morals or general welfare of the public.
☐ *Meets* ☐ *Does not meet*

(d) The relative gain to the public as opposed to the hardship imposed on a petitioning property owner.
☐ *Meets* ☐ *Does not meet*

(e) The suitability of the subject property for its zoned purposes.
☐ *Meets* ☐ *Does not meet*

(f) The length of time the property has been vacant as zoned, considered in the context of land development in the area.
☐ *Meets* ☐ *Does not meet*

(g) The Comprehensive Plan designation and the current applicability of that designation.
☐ *Meets* ☐ *Does not meet*

(h) The evidence or lack of evidence, of community need for the use proposed.
☐ *Meets* ☐ *Does not meet*

Preliminary/Final Planned Unit Development
The petitioner is requesting approval of a Preliminary and Final Planned Unit Development to allow the construction of a multi-family apartment development. A Planned Unit Development is a Special Use and Special Uses require separate review because of their potential to impact surrounding properties and the orderly development of the City.

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

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

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

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

2. Shall not result in substantial adverse effect on adjacent property, natural resources, infrastructure, public sites or other matter of public health, safety and welfare.
   ☐ Meets ☐ Does not meet
3. PUDs must provide transitional uses to blend with adjacent development.
   ☐ Meets ☐ Does not meet
4. PUD phases must be logically sequenced.
   ☐ Meets ☐ Does not meet
5. The density and intensity of a PUD shall be in accordance with the Comprehensive Plan.
   ☐ Meets ☐ Does not meet
6. All dimensional standards shall be listed within the PUD plan if they do not meet the Ordinance minimum standards.
   ☐ Meets ☐ Does not meet
7. The responsible parties for all on-site and other required public improvements shall be established and a utility plan indicating all proposed easements shall be provided.
   ☐ Meets ☐ Does not meet
8. Any private infrastructure shall comply with the city standards.
   ☐ Meets ☐ Does not meet
9. The PUD plan shall establish the responsibility of the applicant/developer.
   ☐ Meets ☐ Does not meet
10. A bond or letter of credit shall be posted to cover required fees or public improvements.
    ☐ Meets ☐ Does not meet

Planned Unit Development Variations

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

Ideally, this flexibility results in a development that is better planned, contains more amenities, and is ultimately more desirable than one that would have been produced through compliance with typical zoning ordinance and subdivision controls.

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

The Planned Unit Development proposed by the Petitioner includes a density variation, a variation from the burial of utility lines and from the requirement to plant street trees.

1) Article 3-200 Dimensional Standards from the maximum net density of 9 dwelling units per acre to allow 13.8 dwelling units per acre.

To properly subdivide the interior space into marketable apartment units, there are more units than what the zoning district allows. This is not a new ground-up development, but an infill project and part of the hardship is being able to use the space of the existing buildings.

2) Article 5-200 F Required Land Improvements

a. 5-200 F 1. Public Utilities: from the requirement to bury the existing overhead utility lines along Church Street
b. 5-200 F 3 Landscaping: from the requirement to plant parkway trees along Maple and Church Streets.

The existing overhead utility lines run along Church Street. To require the burial for this development would require the installation of new poles for transformers to get the lines underground and then back up. The benefit would only be for about 250 feet.

The parking areas along Maple and Church Streets use the space traditionally allocated for parkway trees. There is some opportunity along Maple Street for some landscape materials. There is a condition of approval for the petitioner to add some landscape along Maple Street.

Comprehensive Land Use Plan 2030 Summary Review:

The Comprehensive Plan designates the subject property as Urban Residential. The petitioner is requesting an amendment to High Density Residential. The High Density Residential land use allows for existing and future higher density residential developments including, townhomes, condos and apartments. The following goal is applicable to this request:

Land Use – Residential

Goal: Encourage a diversity of high quality housing in appropriate locations throughout the city that supports a variety of lifestyles and invigorates community character.

This can be accomplished with the following supporting actions:

Supporting Action: Encourage a diversity of housing types throughout the city, which satisfy wide-range needs for all persons regardless of age, race, religion, national origin, physical ability and economic level for existing and future city residents.

Success Indicator: Approval of multi-family residential developments.

Supporting Action: Provide for a reasonable rate of residential growth especially infill growth and mixed-use development which take advantage of existing city services.

Recommended Conditions:

If a motion to recommend approval of the petitioner's request is made, the following conditions are recommended:

1. Approved plans, reflecting staff and advisory board recommendations, as approved by the City Council:
   A. Application (Ieremciuc, received 11/15/19)
   B. Site Development Plan Set [Site Plan, Landscape Plan, Site Photos, and Floor Plans] (Joseph A Meyer, dated 11/19/19, received 11/18/19)
   C. Traffic Study (GHA, Inc., dated 11-26-19)

2. Site Plan
   A. Remove the freestanding signs from the property.
   B. Provide a trash enclosure area that meets the UDO requirements; location and design to be reviewed and approved by staff.
   C. Repair and maintain the on-street parking spaces along Church Street and Maple Street.
   D. The curb ramps along McHenry Avenue shall be removed along with any striping and signage.
   E. The accessible stalls at the corner of Church Street and McHenry Avenue shall be moved to the west so the cars are not backing into McHenry Avenue.

3. Landscape Plan
   A. Provide landscape screening materials along Maple Street in the parkway and to the east of the two parking areas, which consists of evergreen and deciduous shrubs and trees to screen the parking area from the adjacent residential areas, where practical.
   B. Work with staff to replace dead and dying foundation landscape material with refreshed landscape materials.

4. Traffic Study
   A. To the extent possible, moves in and out of units should occur during off-peak hours.
   B. Provide bicycle parking on-site that is easily accessible.
   C. Remove the signing and pavement markings (school zone speed limits and crossings) along both Maple Street and McHenry Avenue provided in connection with the former school use on the site.

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

6. No major changes can be made to the exterior of the building without first obtaining a Final PUD Amendment approval.

7. The following variations are granted:
   A. From the requirement to bury the existing overhead utility line along Church Street.
   B. From the requirement to plant parkway trees along Church Street.
   C. From the maximum net density of 9 dwelling units per acre to allow 13.8 dwelling units per acre.

PLN-2019-182 174 McHenry Avenue - Rezone, Preliminary & Final Planned Unit Development





CITY OF CRYSTAL LAKE
DEVELOPMENT APPLICATION

Please type or print legibly

OFFICE USE ONLY
CASE #

PROJECT TITLE: Church Street Apartments

ACTION REQUESTED:

_____ Annexation	_X_ Preliminary PUD
_____ Comprehensive Plan Amendment	_____ Preliminary Plat of Subdivision
_____ Conceptual PUD Review	_X_ Rezoning
_____ Final PUD	_____ Special Use Permit
_____ Final PUD Amendment	_X_ Variation
_____ Final Plat of Subdivision	_____ Other

Petitioner Information:

NAME: George Ieremciuc

ADDRESS: 660 E Liberty #100

Wauconda Il 60084

PHONE: 847 909 3838

FAX:

E-MAIL: tnpi@comcast.net

Owner Information:(if different)

NAME: Faith Lutheran School

ADDRESS: 174 McHenry Ave

Crystal Lake, IL

PHONE: 815·404·9348

FAX:

E-MAIL: boardoffaithlhs.org

Property Information:

Project Description: Original Immanuel Lutheran School Church and other buildings to be converted to Apartments this requires a new zoning classification to R-4 and approval of a PUD with a density variation

Project Address/Location: Northwest Corner of McHenry and Church Street

PIN Number(s): 19-05-131-013, 023, 024, 025, 027, 031, 032, & 033

Development Team:

Developer: True North Properties , Inc see petitioner

Architect: Joseph A Meyer 135 park Ave. Barrington Il 60010 847 382 0200

Attorney: Joseph Gottemoller of Madsen, Sugden & Gottemoller, (815)459-5152, (FAX 815-459-0290)

Engineer:

Landscape Architect:

Planner:

Surveyor:

Other:

Signatures:

x George Jeremciuc x [signature] 11.15.19

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

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

Kurt Funderburg/FLHS Board Treasurer [signature] 11/12/19

OWNER: Print and Sign Name Date

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

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

IN THE MATTER OF THE APPLICATION OF TRUE NORTH PROPERTIES, INC BUYER FOR REZONING, DENSITY VARIATION PRELIMINARY AND FINAL PUD

2019 – 182

Notice is hereby given in compliance with the Unified Development Ordinance (UDO) of the City of Crystal Lake, Illinois, that a public hearing will be held before the Planning and Zoning Commission upon the application by True North Properties, Inc Buyer of property owned by Faith Lutheran High School for the reclassification of zoning, a density variation and the approval of a preliminary and Final Planned Unit Development for the property commonly known as the old Immanuel Lutheran School, Church and outbuildings. The buildings are located generally at the Northwest corner of the intersection of McHenry Avenue and Church Street. The property index numbers are 19-05-131-013, 19-05-131-023, 19-05-131-024, 19-05-131-025, 19-05-131-027, 19-05-131-031, 19-05-131-032 and 19-05-131-033.

The application is filed for the purpose of changing the underlying zoning classification to R-3b with a density variation to allow 13.3 units per acre along with the approval of a preliminary and final PUD. The Petitioner intends to construct a total of 36 apartment units in four different buildings located on the property. All of the apartments will be within the existing buildings on the property. Plans for this project can be viewed at the City of Crystal Lake Planning and Economic Development Department at City Hall.

A public hearing before the Planning and Zoning Commission on the request will be held at 7:30 p.m. on Monday, December 9, 2019, at the Crystal Lake City Hall, 100 West Woodstock Street, at which time and place any person determining to be heard may be present.

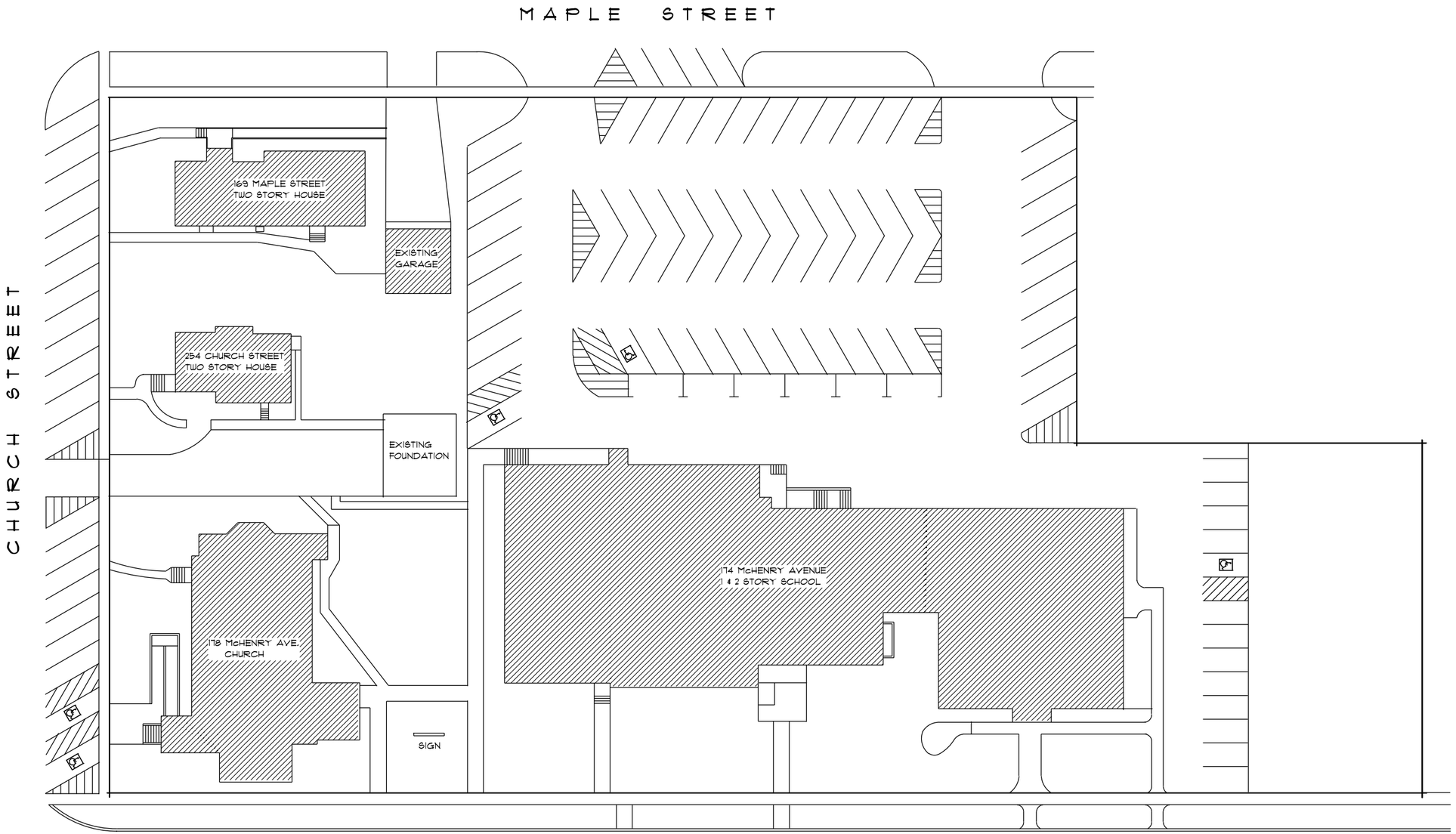
Tom Hayden, Chairperson
Planning and Zoning Commission
City of Crystal Lake

(Published in the Northwest Herald November 21, 2019) 1726255



CHURCH STREET APARTMENTS

174 McHENRY AVENUE, CRYSTAL LAKE, ILLINOIS



CHURCH STREET APARTMENTS

CRYSTAL LAKE, ILLINOIS

APARTMENT UNITS

169 MAPLE STREET	2 UNITS
254 CHURCH STREET	2 UNITS
178 McHENRY AVENUE	5 UNITS
174 McHENRY AVENUE	28 UNITS
TOTAL # OF UNITS	36 UNITS

PARKING STALLS

81) ON-SITE PARKING
3) ON-SITE ADA PARKING
19) OFF-STREET PARKING
2) OFF-STREET ADA PARKING

TOTALS

100) PARKINGING STALLS
5) ADA PARKING STALLS
EACH UNIT = 2.91 PARKING STALLS

ACREAGE

113,810 SQ. FT. OR 2.612 ACRES
13.8 PEOPLE PER ACRE

JOSEPH A. MEYER
62-23325
LICENSED
PROFESSIONAL
ENGINEER
ILLINOIS

JOSEPH A. MEYER
STRUCTURAL & PROFESSIONAL ENGINEER
135 PARK AVE. BARRINGTON IL. 60010 847-382-0200

APARTMENT COMPLEX FOR:
TRUE NORTH PROPERTIES, INC.
McHENRY AVENUE & CHURCH STREET CRYSTAL LAKE ILLINOIS

DATE
NOV 16, 2019

REVISION

JOB #

SHEET #
CS

MAPLE STREET

CHURCH STREET

McHENRY AVENUE

EXISTING LANDSCAPE PLAN

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DATE
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L1





NORTH



EAST



SOUTH



WEST

JOSEPH A. MEYER
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169 MAPLE STREET

DATE
NOV 19, 2019

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NORTH



EAST



SOUTH



WEST

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254 CHURCH STREET

DATE
NOV 19, 2019

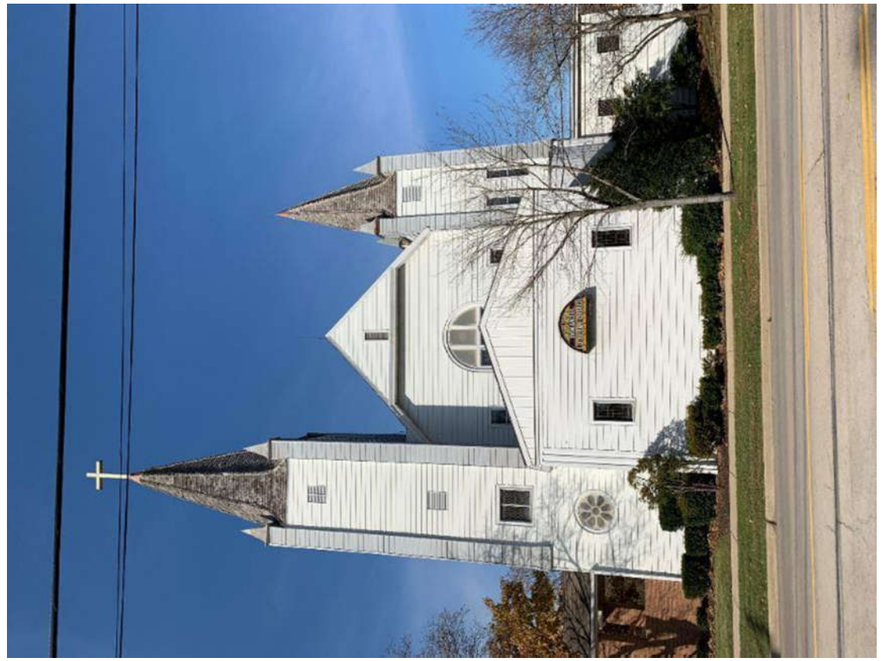
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NORTH



EAST



SOUTH



WEST

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178 McHENRY AVENUE

DATE
NOV 19, 2019

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P3



NORTH



EAST



SOUTH



WEST

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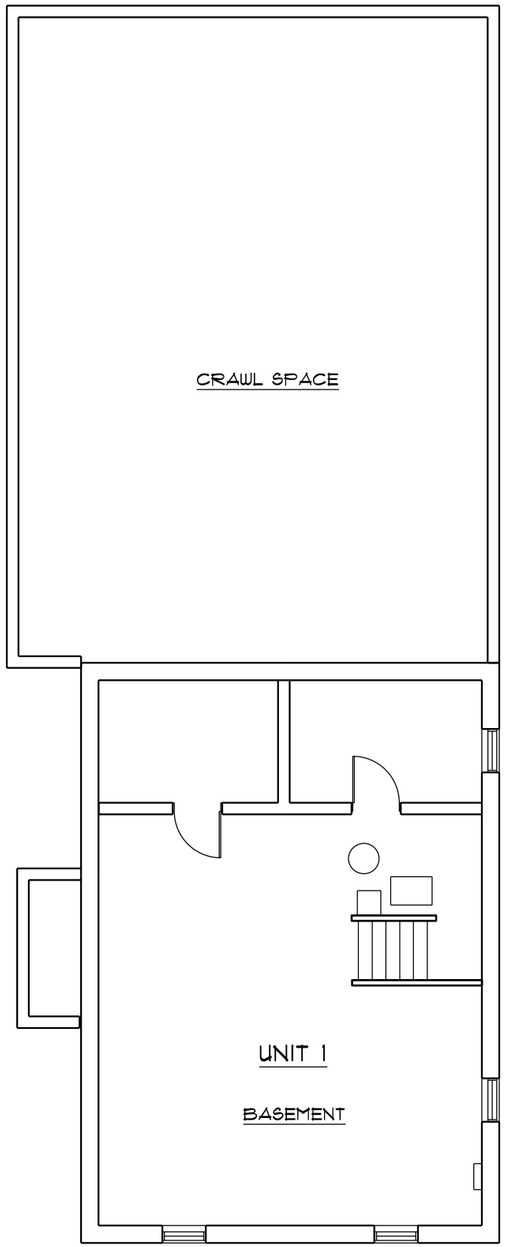
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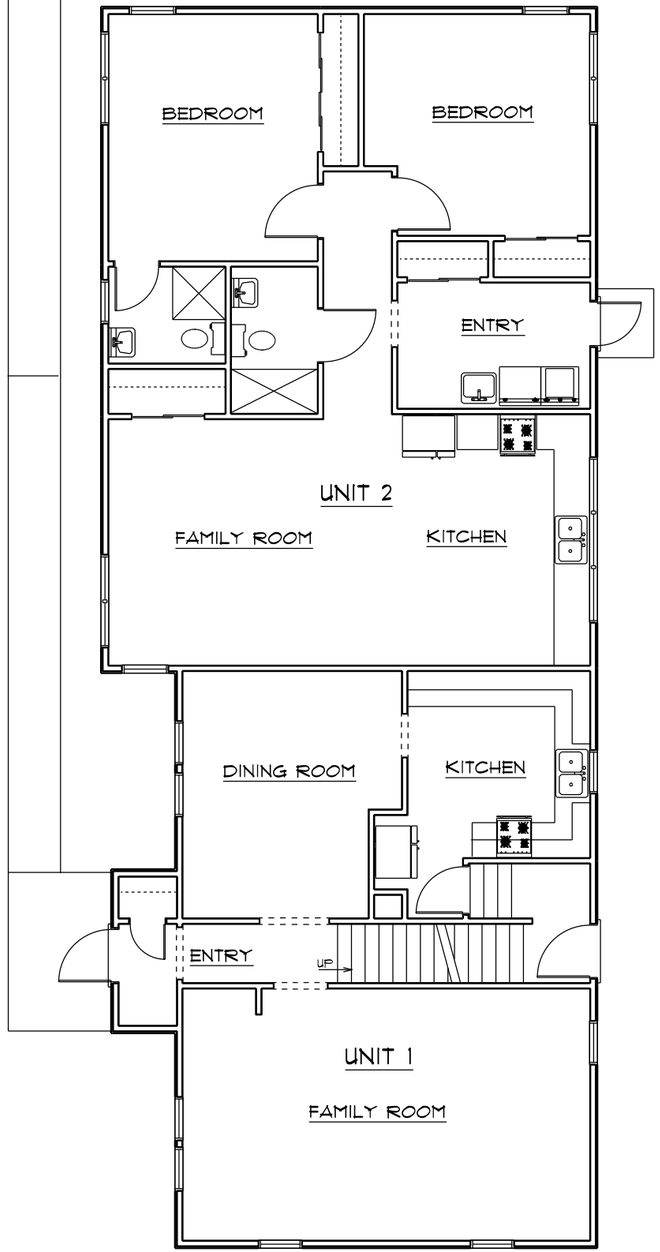
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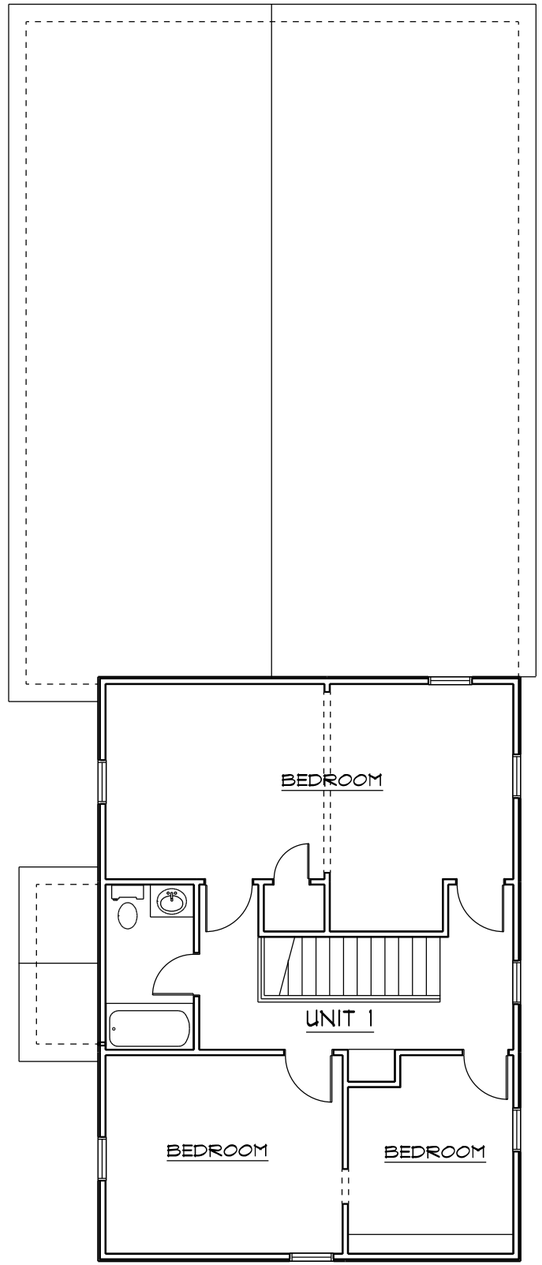
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BASEMENT PLAN



FIRST FLOOR



SECOND FLOOR

169 MAPLE STREET

UNIT 1 3 BED - 1 BATH 1650 SQ. FT.

UNIT 2 2 BED - 2 BATH 1080 SQ. FT.

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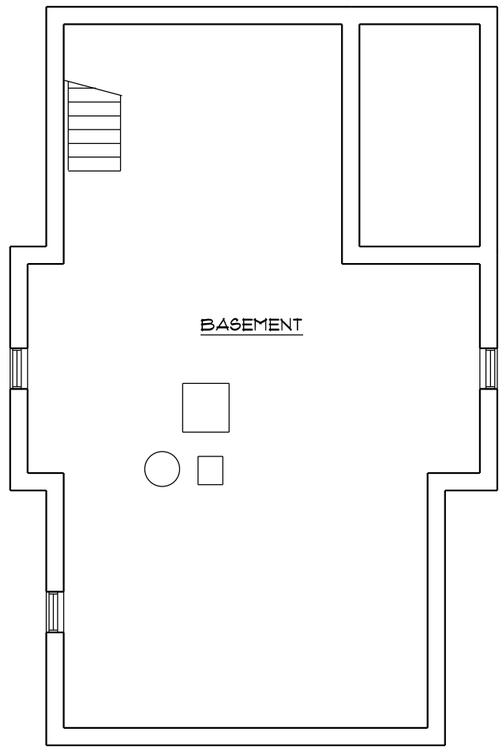
APARTMENT COMPLEX FOR:
TRUE NORTH PROPERTIES, INC.
MCHENRY AVENUE & CHURCH STREET CRYSTAL LAKE ILLINOIS

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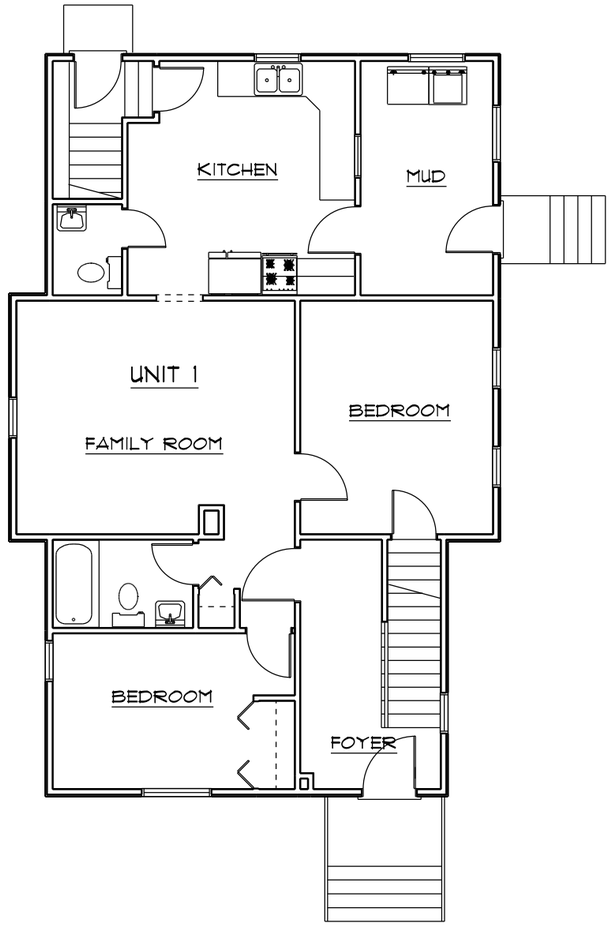
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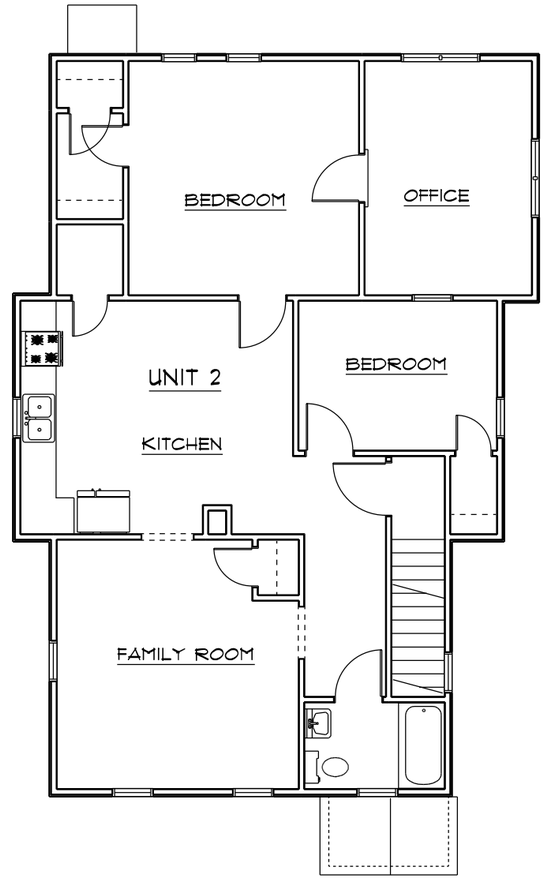
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BASEMENT PLAN



FIRST FLOOR



SECOND FLOOR

254 CHURCH STREET

UNIT 1 2 BED - 2.5 BATH 960 SQ. FT.

UNIT 2 2 BED - 1 BATH 1050 SQ FT.

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081-002641
LICENSED
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ENGINEER
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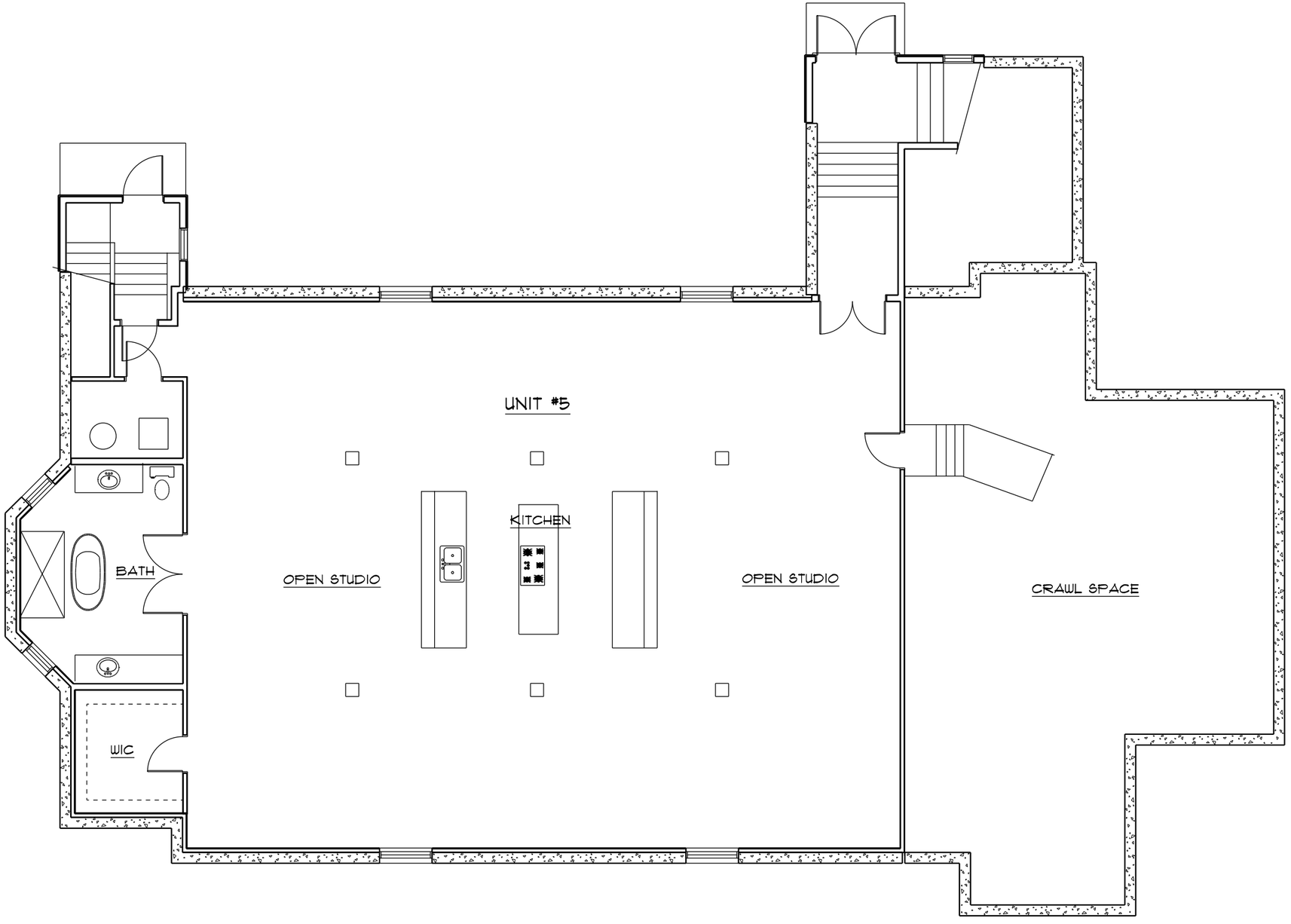
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NOV 16, 2019

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A2



LOWER LEVEL PLAN

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APARTMENT COMPLEX FOR:
TRUE NORTH PROPERTIES, INC.
McHENRY AVENUE & CHURCH STREET CRYSTAL LAKE ILLINOIS

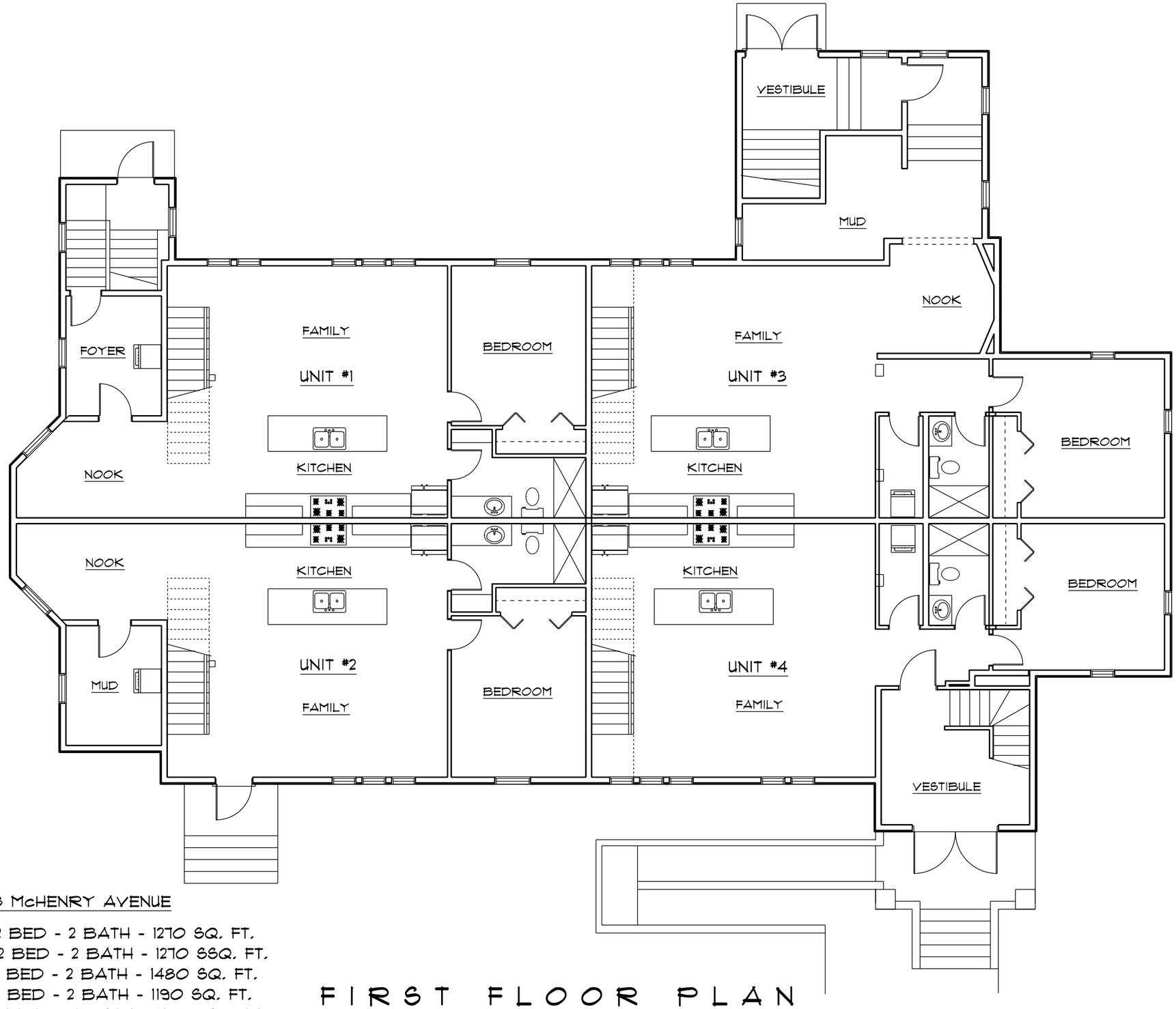
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A3

JOSEPH A. MEYER 081-002641 LICENSED STRUCTURAL ENGINEER OF ILLINOIS BARRINGTON, IL



178 McHENRY AVENUE

UNIT 1 2 BED - 2 BATH - 1270 SQ. FT.
UNIT 2 2 BED - 2 BATH - 1270 SSQ. FT.
UNIT 3 2 BED - 2 BATH - 1480 SQ. FT.
UNIT 4 2 BED - 2 BATH - 1190 SQ. FT.
UNIT 5 STUDIO - 1 BATH - 2500 SQ. FT.

FIRST FLOOR PLAN

JOSEPH A. MEYER
STRUCTURAL & PROFESSIONAL ENGINEER
135 PARK AVE. BARRINGTON IL. 60010 847-382-0200

APARTMENT COMPLEX FOR:
TRUE NORTH PROPERTIES, INC.
McHENRY AVENUE & CHURCH STREET CRYSTAL LAKE ILLINOIS

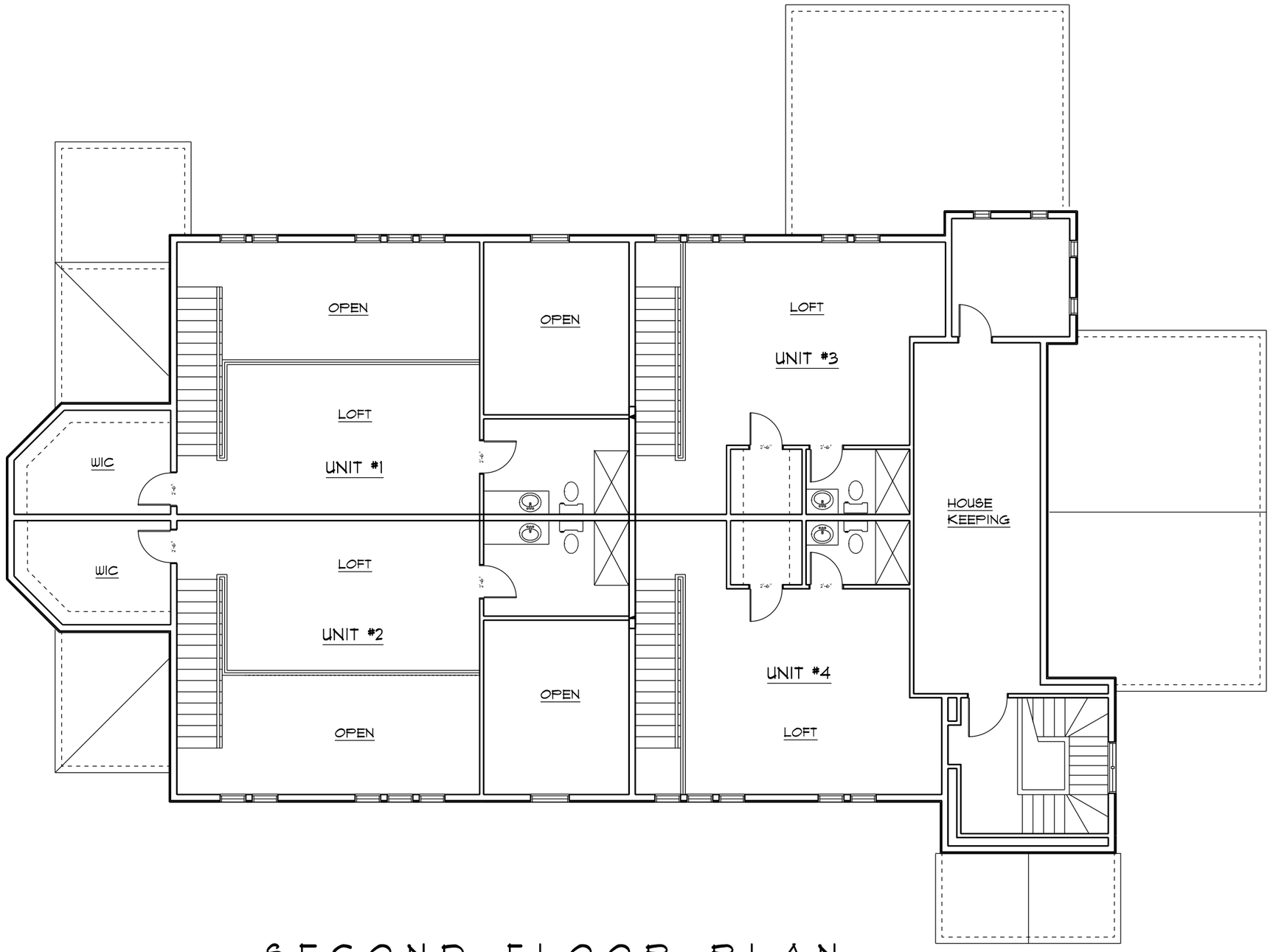
DATE
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JOSEPH A. MEYER 081-002641 LICENSED STRUCTURAL ENGINEER OF ILLINOIS BARRINGTON IL



SECOND FLOOR PLAN

JOSEPH A. MEYER
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TRUE NORTH PROPERTIES, INC.
McHENRY AVENUE & CHURCH STREET CRYSTAL LAKE ILLINOIS

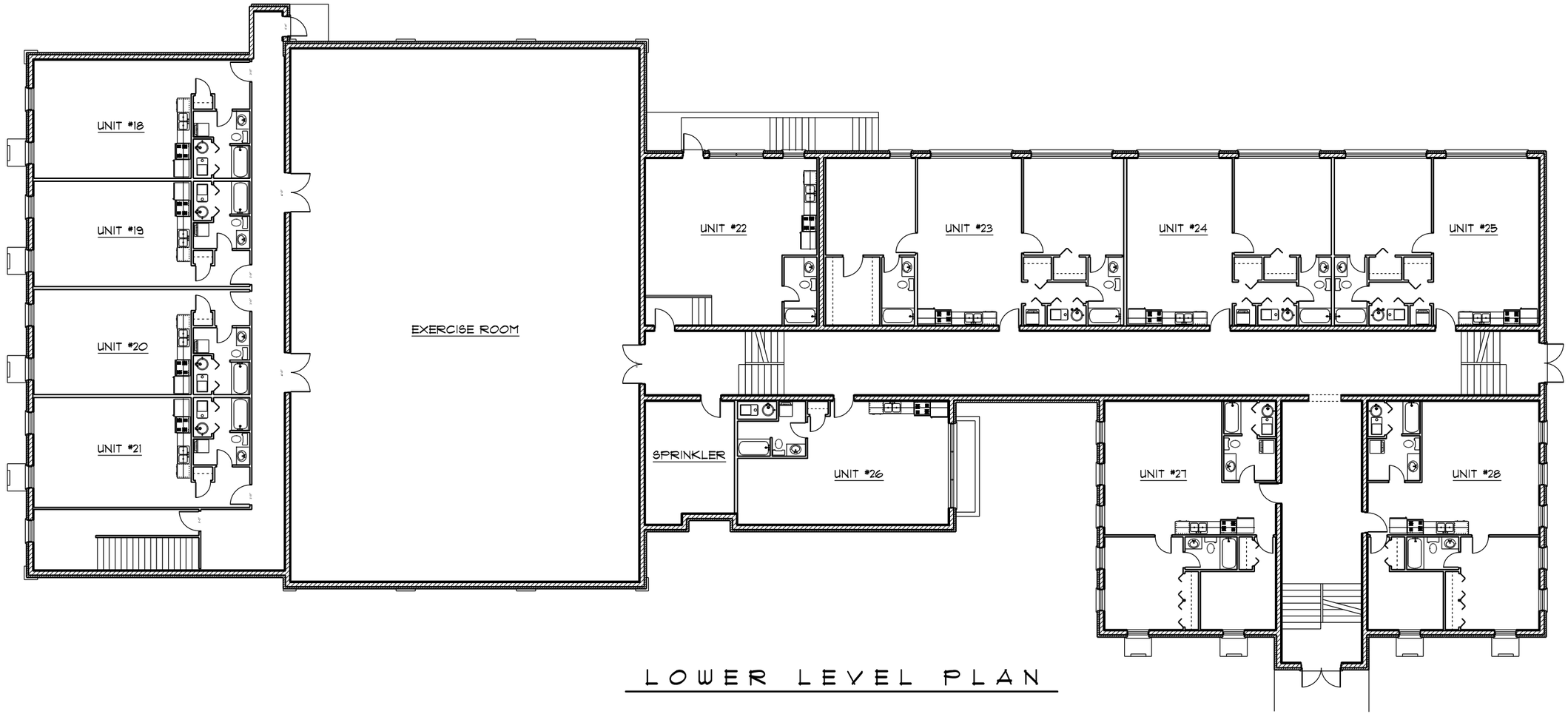
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JOSEPH A. MEYER
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STRUCTURAL
ENGINEER
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LOWER LEVEL PLAN

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APARTMENT COMPLEX FOR:
TRUE NORTH PROPERTIES, INC.
McHENRY AVENUE & CHURCH STREET CRYSTAL LAKE ILLINOIS

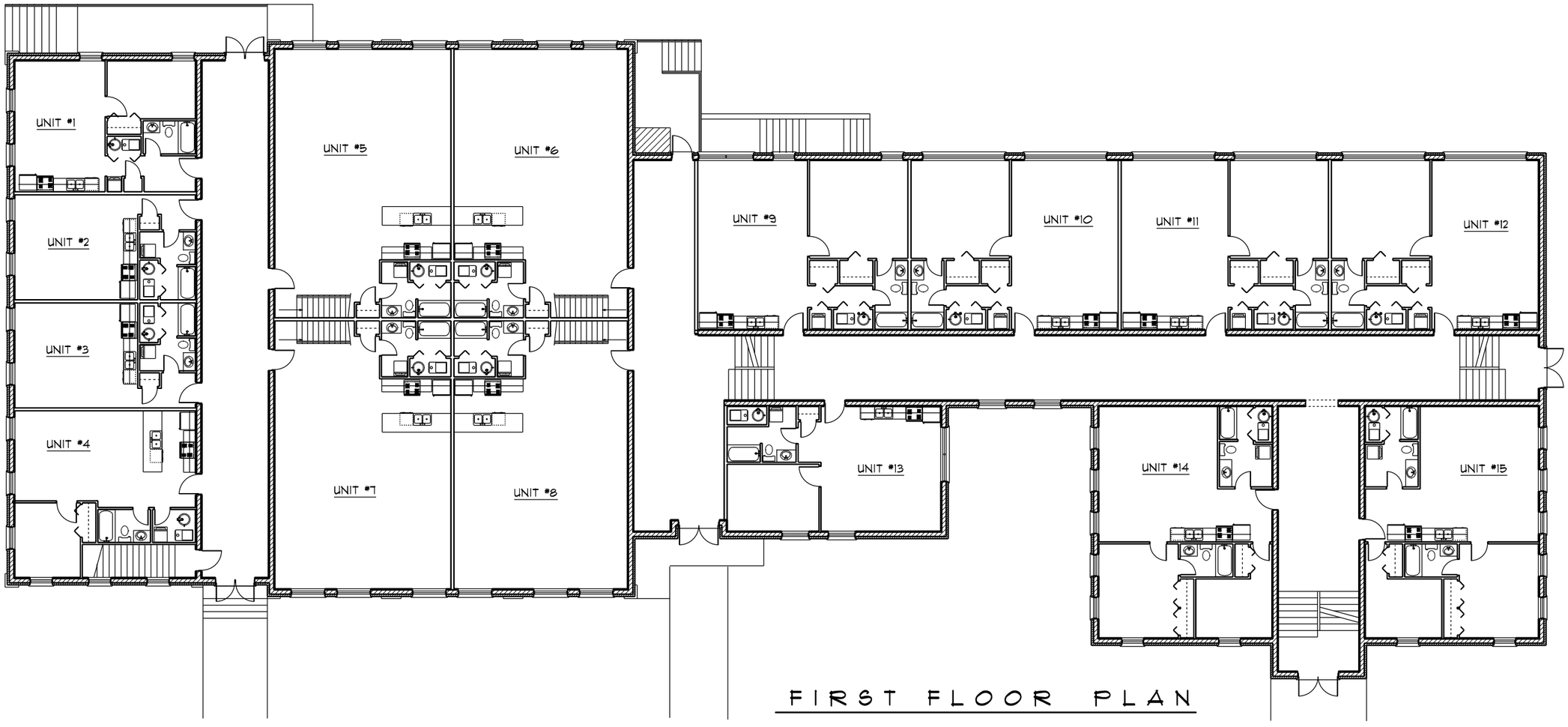
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BARRINGTON, IL



FIRST FLOOR PLAN

174 McHENRY AVENUE

UNIT 1 1 BED - 1 BATH - 538 SQ. FT.
UNIT 2 STUDIO - 1 BATH - 440 SQ. FT.
UNIT 3 STUDIO - 1 BATH - 457 SQ. FT.
UNIT 4 1 BED - 1 BATH - 609 SQ. FT.
UNIT 5 2 BED - 2 BATH - 1890 SQ. FT.
UNIT 6 2 BED - 2 BATH - 1890 SQ. FT.
UNIT 7 2 BED - 2 BATH - 1890 SQ. FT.
UNIT 8 2 BED - 2 BATH - 1890 SQ. FT.
UNIT 9 1 BED - 1 BATH - 830 SQ. FT.
UNIT 10 1 BED - 1 BATH - 815 SQ. FT.
UNIT 11 1 BED - 1 BATH - 830 SQ. FT.
UNIT 12 1 BED - 1 BATH - 815 SQ. FT.
UNIT 13 1 BED - 1 BATH - 623 SQ. FT.
UNIT 14 2 B2D - 2 BATH - 938 SQ. FT.
UNIT 15 2 BED - 2 BATH - 938 SQ. FT.
UNIT 16 2 BED - 2 BATH - 1171 SQ. FT.
UNIT 17 2 BED - 2 BATH - 938 SQ. FT.
UNIT 18 STUDIO - 1 BATH - 630 SQ. FT.
UNIT 19 STUDIO - 1 BATH - 543 SQ. FT.
UNIT 20 STUDIO - 1 BATH - 543 SQ. FT.
UNIT 21 STUDIO - 1 BATH - 543 SQ. FT.
UNIT 22 STUDIO - 1 BATH - 690 SQ. FT.
UNIT 23 2 BED - 2 BATH - 1205 SQ. FT.
UNIT 24 1 BED - 1 BATH - 881 SQ. FT.
UNIT 25 1 BED - 1 BATH - 800 SQ. FT.
UNIT 26 STUDIO - 1 BATH - 603 SQ. FT.
UNIT 27 2 BED - 2 BATH - 890 SQ. FT.
UNIT 28 2 BED - 2 BATH - 890 SQ. FT.

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APARTMENT COMPLEX FOR:
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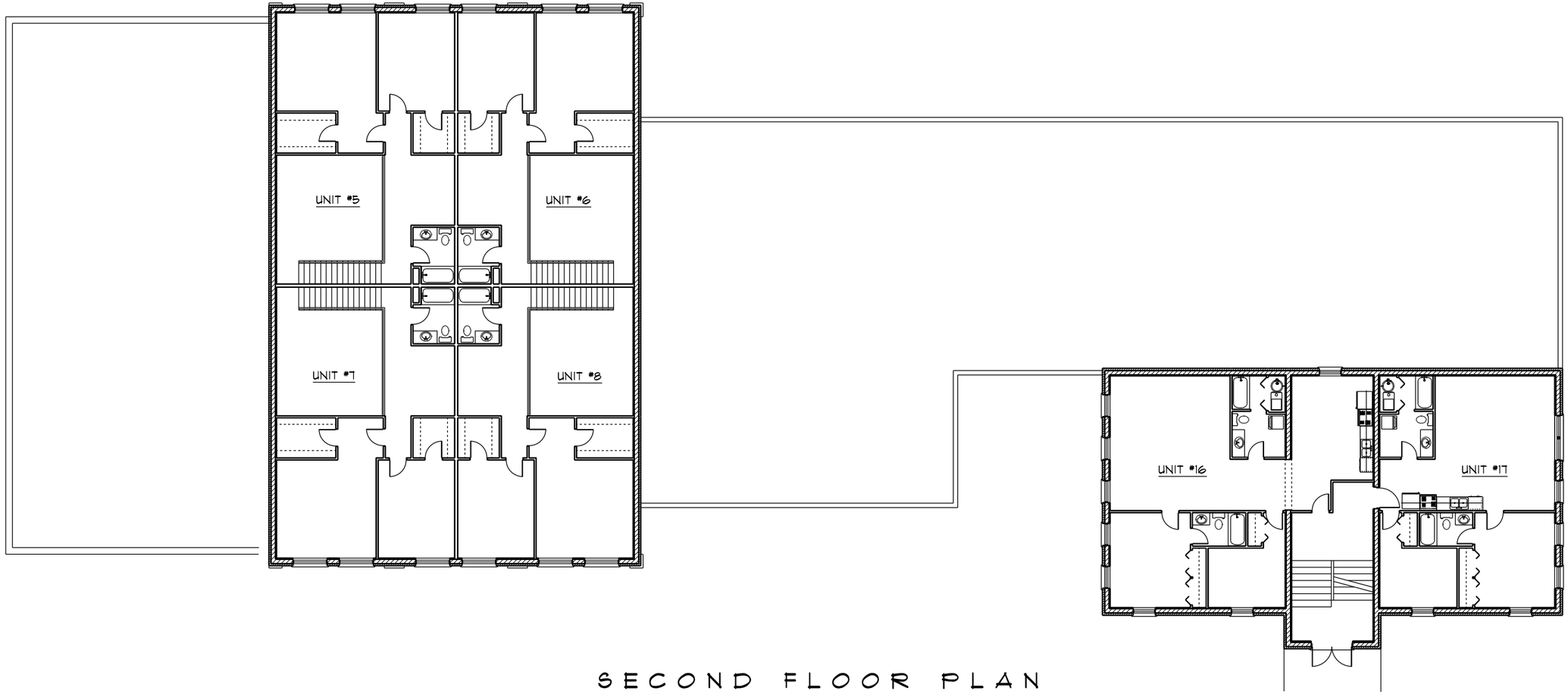
DATE
NOV 16, 2019

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JOSEPH A. MEYER 081-002641 LICENSED STRUCTURAL ENGINEER OF ILLINOIS BARRINGTON IL



SECOND FLOOR PLAN

JOSEPH A. MEYER
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APARTMENT COMPLEX FOR:
TRUE NORTH PROPERTIES, INC.
McHENRY AVENUE & CHURCH STREET CRYSTAL LAKE ILLINOIS

DATE
NOV 16, 2018

REVISION

JOB #

SHEET #
A8

JOSEPH A. MEYER
081-002541
LICENSED
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BARRINGTON, IL

Memorandum

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

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

From: Lynn M. Means, P.E., PTOE
Senior Transportation Engineer

Date: November 26, 2019

Subject: Church Street Apartments
174 McHenry Avenue
Crystal Lake, Illinois

Part I. Introduction and Project Context

Gewalt Hamilton Associates, Inc. (GHA) has conducted a Traffic and Parking Summary for the proposed residential development located at 174 McHenry Avenue in Crystal Lake, Illinois. The site is located on the northwest corner of McHenry Avenue and Church Street and contains the former Faith Lutheran High School and the Immanuel Lutheran Church buildings. The site is served by 109 parking spaces, including 5 accessible spaces: 84 off-street parking spaces, accessed via Maple Street, and 21 angled on-street parking spaces on Church Street and 4 angled on-street parking spaces on Maple Street.

As currently proposed, the project includes the redevelopment of the existing buildings to contain a total of 40 apartments (4 efficiency; 18, 1-bedroom; and 18, 2-bedroom). Access to the site will be maintained via the existing driveways on Maple Street, along with maintaining the existing parking supply.

The following provides a summary of site traffic characteristics and the analysis conducted, which includes a qualitative analysis of the development's impact on the surrounding roadway network and parking analysis. *Exhibits* and *Appendices* referenced are in the Technical Addendum at the end of this document.

Part II. Background Information

Site Location Map and Roadway Inventory

Exhibit 1 provides a location map and ***Exhibit*** 2 provides a photo inventory of the site vicinity. Pertinent comments to the adjacent roadways include:

- Land uses surrounding the site are predominately residential. St. Mary's Episcopal Church is located to the south of the site. Husmann Elementary School, the Crystal Lake Public Library and Crystal Lake Central High School are located approximately 0.5-miles northeast of the site on/or near Franklin Street. Commercial uses are located along US Route 14 (Virginia Street), approximately 0.3-miles southwest of the site. The site is also conveniently located to downtown Crystal Lake, approximately 1-mile northeast of the site.
- ***McHenry Avenue*** is a north-south major collector roadway, providing a three-lane cross section (one travel lane in each direction and a center lane for left-turns) in the site vicinity. It borders the site to the east. McHenry Avenue is under the jurisdiction of the City of Crystal Lake and has a posted speed limit of 30 miles per hour (mph) and a weight limit of 12 tons. In the vicinity of the site, a 20-mph school zone speed limit is

also posted (in connection with the former Faith Lutheran High School use on site), as well as north of the site, near Franklin Street. Parking is prohibited along both the east and west sides of McHenry Avenue.

- ***Church Street*** is an east-west, two-lane local roadway, extending between McHenry Avenue and Pomeroy Avenue. It borders the site to the south. It operates under Stop sign control at its intersection with McHenry Avenue. Church Street is under the jurisdiction of the City of Crystal Lake.
- ***Maple Street*** is a north-south local roadway, providing a two-lane cross section (one-travel lane in each direction. It borders the site to the west. Maple Street operates under Stop sign control at its intersection with Church Street. Maple Street is under the jurisdiction of the City of Crystal Lake. In the vicinity of the site, a 20-mph school zone speed limit is posted (in connection with the former Faith Lutheran High School use on site. Parking is restricted on both the east and west sides of the street to 2-hours between the hours of 7AM to 3PM on Monday through Friday.
- The site is also well served by pedestrian accommodations. A sidewalk is provided along both sides of McHenry Avenue, Church Street and Maple Street in the site vicinity. A crosswalk is striped on the west leg of the McHenry Avenue intersection with Church Street and the south leg of the Maple Street intersection with Church Street.
- Metra provides commuter rail service along the Union Pacific Northwest (UP-NW) Line that begins in Harvard/McHenry and ends at Ogilvie Center in Chicago. The Crystal Lake Station is located on Woodstock Street approximately 1.1-miles northeast of the site.

Existing Traffic

Exhibit 3 summarizes the existing weekday morning and evening peak hour traffic volumes. Peak period count data along McHenry Avenue was obtained from the Illinois Department of Transportation (IDOT)'s Traffic Count Database System from year 2017. Based on these counts, the weekday morning peak hour occurred from 7:00 to 8:00 AM and the weekday evening peak hour occurred from 4:00 to 5:00 PM. ***Exhibit 3*** also provides the Annual Average Daily Traffic (AADT) along McHenry Avenue (year 2017) obtained from IDOT's website: www.gettingaroundillinois.com.

Summaries of the IDOT traffic counts can be found in ***Appendix A***. *Note: the traffic volumes presented in Appendix A represent "raw", unadjusted data. These volumes are adjusted based on day of week and month of year factors, resulting in an AADT which is lower than the total.*

Part III. Traffic Evaluation

Proposed Plan

Exhibit 4 presents the preliminary Site Plan prepared by Joseph A. Meyer, Structural and Professional Engineer, dated September 18, 2019. As currently proposed, the development consists of redeveloping the site to include 40 apartments (4 efficiency; 18, 1-bedroom; and 18, 2-bedroom). The development will be served by 109 parking spaces, including 5 accessible spaces.

Trip Generation and Directional Distribution

Trip generation rates published by the Institute of Transportation Engineers (ITE) in the 10th Edition of the Manual *Trip Generation* were used to determine the anticipated traffic from the proposed residential use (see ***Appendix B***). The number of vehicle trips anticipated is displayed in ***Table 1*** and includes all traffic attributed to the proposed residential development (residents, visitors, deliveries, etc.).

Table 1: Estimated Trip Generation

Land Use / Size	ITE Land Use Code	Weekday							Saturday				Sunday			
		AM Peak Hr[1]			PM Peak Hr[2]			Daily	Peak Hr[3]			Daily	Peak Hr[3]			Daily
		In	Out	Total	In	Out	Total	Total	In	Out	Total	Total	In	Out	Total	Total
Apartments / 40-Units	220	5	15	20	16	10	26	294	14	14	28	326	13	13	26	252

[1] One hour between 7:00 and 9:00 AM.
[2] One hour between 4:00 and 6:00 PM.
[3] The hour with the highest volume of traffic (combined entering & exiting); may occur in the AM or PM.

As shown in Table 1, it is expected that the proposed residential development will generate approximately 250 to 325 total trips (combined entering and exiting) on a daily basis. During the peak hours, the development is expected to generate approximately 20 to 28 bi-directional vehicle trips (combined entering and exiting).

The anticipated trip distribution of site traffic is summarized in ***Table 2***. This was based on current travel patterns, the operational characteristics of the street system and site access.

Table 2: Trip Distribution

Route & Direction	Percent Route (To/From)
McHenry Avenue	
North of Church Street	20%
South of Church Street	40%
Church Street	
West of Maple Street	20%
Maple Street	
North of Site Access	20%
Total	**100%**

Site Traffic Assignments

Exhibit 5 illustrates the site traffic assignments for the site vehicle trips, which are based on the traffic characteristics summarized in Tables 1 and 2 and assigned to the area roadways.

Traffic Increases

As shown on *Exhibit 5*, the total (including both entering and exiting traffic) peak hour vehicle trips between 2 and 11, are expected on the roadways leading beyond the study area, or one additional vehicle every 6 to 30 minutes. On a daily basis, volume increases of 50 to 130 vehicles (total both entering and exiting) are expected on the study area roadways. This represents less than a 1 percent increase on McHenry Avenue.

Accordingly, the amount of site-generated traffic is expected to have minimal effects on the operations of the external street network.

Site Traffic Comparison

The site formerly contained an approximately 38,000 square high school, approximately 9,125 square-foot church and 2 single-family houses (church buildings). Therefore, a comparison was made between what the site would generate if it were operating as the former uses versus proposed site use. The trip generations for the former site uses were estimated, again, using rates contained in the ITE *Trip Generation Manual*. A summary of this trip generation comparison is provided in ***Table 3***.

Table 3: Trip Generation Comparison

Land Use / Size	ITE Land Use Code	Weekday							Saturday				Sunday			
		AM Peak Hr[1]			PM Peak Hr[2]			Daily	Peak Hr[3]			Daily	Peak Hr[3]			Daily
		In	Out	Total	In	Out	Total	Total	In	Out	Total	Total	In	Out	Total	Total
Previous Site Use																
High School / 38,080 SF	530	94	39	133	25	57	82	536	--	--	--	--	--	--	--	--
Church / 9,125 SF	560	2	1	3	2	2	4	64	15	10	25	56	44	47	91	252
2 Homes[4]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Previous Use Trips		*96*	*40*	*136*	*27*	*59*	*86*	*600*	*15*	*10*	*25*	*56*	*44*	*47*	*91*	*252*
Proposed Use																
Apartments / 40-Units[5]	220	5	15	20	16	10	26	294	14	14	28	326	13	13	26	252
Net Change in Site Trip[6]		***-91***	***-25***	***-116***	***-11***	***-49***	***-60***	***-306***	***-1***	***4***	***3***	***270***	***-31***	***-34***	***-65***	***0***

[1] One hour between 7:00 and 9:00 AM.
[2] One hour between 4:00 and 6:00 PM.
[3] The hour with the highest volume of traffic (combined entering & exiting); may occur in the AM or PM.
[4] The two homes (church buildings) were assumed as ancillary uses to the church – not a significant traffic generator/source of traffic.
[5] From Table 1.
[6] Proposed use less previous site use.

As shown in Table 3, it is anticipated the proposed residential use would generate 116 fewer trips during the weekday AM peak hour and 60 fewer trips during the weekday PM peak hour than the former site uses (church and high school). On a weekday daily basis, the proposed development would generate approximately 300 fewer trips than the former site uses.

On a Saturday, the proposed site is anticipated to generate 3 more trips during the peak hour and over 250 more on a daily basis. On a Sunday, the proposed residential use is anticipated to generate 65 fewer trips during the peak hour and the same as the former church/school uses on a daily basis.

Part IV. Parking Evaluation

Parking Demand Requirements

Based on the parking requirements outlined in the City of Crystal Lake of Ordinance (Section 4-200), 67 parking spaces are required for the proposed site. The City's parking requirements are summarized in ***Table 4***.

Table 4: City Parking Requirements

Use	Size		Parking Requirement	Parking Spaces	
				Required	Provided [A]
Multi-Family Dwelling	4 Efficiency	40 Units	1.0 spaces for each dwelling	4	67	**109**
	18, 1-Bedroom		1.5 spaces for each dwelling	27	
	18, 2-bedroom		2.0 spaces for each dwelling	36	

[A] Eighty-four (84) off-street spaces, plus 25 angled parking on-street (21 on Church Street and 4 on Maple Street). Additional parking is also available in driveways/paved areas on-site.

Parking Demand Projections

The Institute of Transportation Engineers (ITE) *Parking Generation, 5th Edition* publication provides a compilation of parking demand surveys from across the country for a wide variety of land uses. ITE LUC 220, Multifamily Housing (Low-Rise) was referenced for the proposed development (see ***Appendix C***). Using the ITE data, ***Table 5*** presents a summary of the projected peak parking demand for the proposed development on a weekday and weekend, based on two independent variables – number of units and bedrooms.

Table 4: Projected Peak Parking Demand: ITE – Parking Generation

Land Use	ITE LUC	Size	Average Peak Parking Demand				85th Percentile Parking Demand			
			Weekday		Weekend		Weekday		Weekend	
			Rate/Unit	Spaces	Rate/Unit	Spaces	Rate/Unit	Spaces	Rate/Unit	Spaces
Multi-Family Housing	220	40 Units	1.21	48	1.31	52	1.52	61	***1.61***	***64***
		58 Bedrooms	0.66	38	0.80	46	0.86	50	0.88	51

As shown in Table 5, projected peak parking demand for the proposed development is anticipated to be 64 spaces, which is consistent with City Code requirements (67 spaces).

The proposed development will provide a total of 84 off-street parking spaces within the surface parking lot, plus 25 off-street angled parking spaces (21 along Church Street and 4 along Maple Street), for a total of 109 parking spaces serving the site. Additional parking spaces are also available within the driveways/paved areas on-site. Accordingly, the proposed parking supply will be adequate to accommodate the projected parking demand for the proposed development.

Part V. Recommendations and Conclusions

A traffic and parking analysis were performed for the proposed Church Street Apartments development located at 174 McHenry Avenue in Crystal Lake, Illinois. Overall, the development is anticipated to have little effect on the operations of the area roadway network. And, based on the parking analysis, it can be concluded the proposed parking supply is adequate to accommodate the anticipated parking demand for the proposed use.

In addition, the following recommendations should be considered to facilitate traffic both on and off site:

- To the extent feasible, move ins/outs should occur during off-peak hours.
- Provide bicycle parking on site that is easily accessible.
- Remove the signing and pavement markings (school zone speed limits and crossings) along both Maple Street and McHenry Avenue provided in connection with the former school use on the site.

Part VI. Technical Addendum

The following *Exhibits* and *Appendices* were previously referenced. They provide technical support for our observations, findings and recommendations discussed in the text.

Exhibits

1. Location Map
2. Photo Inventory
3. Existing Traffic
4. Site Plan
5. Site Traffic

Appendices

A. IDOT Traffic Count Summaries
B. ITE Trip Generation Excerpts
C. ITE Parking Generation Excerpts

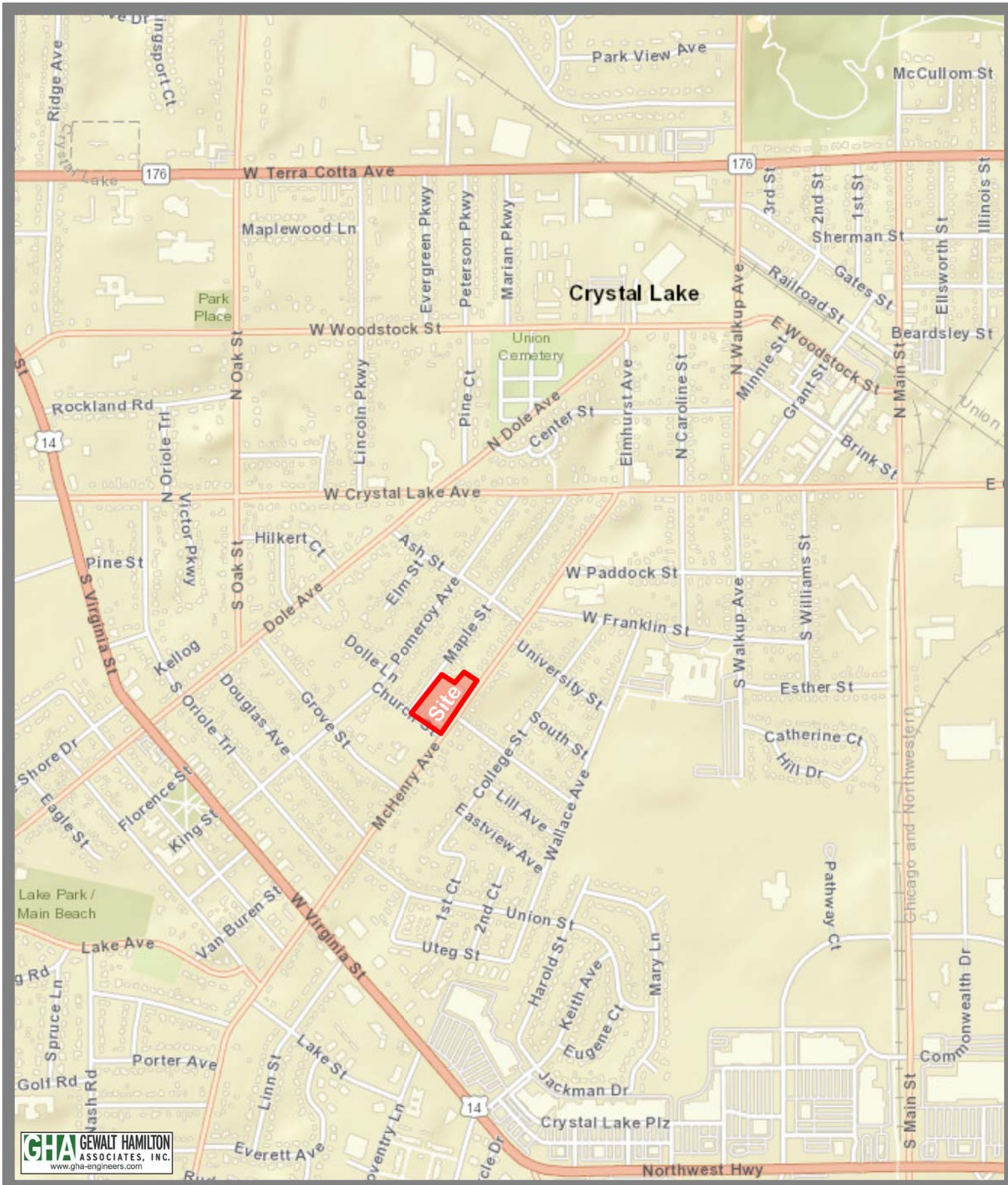
5423.906_Church Street Apartments_Crystal Lake.11.26.19

Technical Addendum

GHA GEWALT HAMILTON ASSOCIATES, INC.

Exhibits

GHA GEWALT HAMILTON ASSOCIATES, INC.



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1 inch = 1,000 Feet

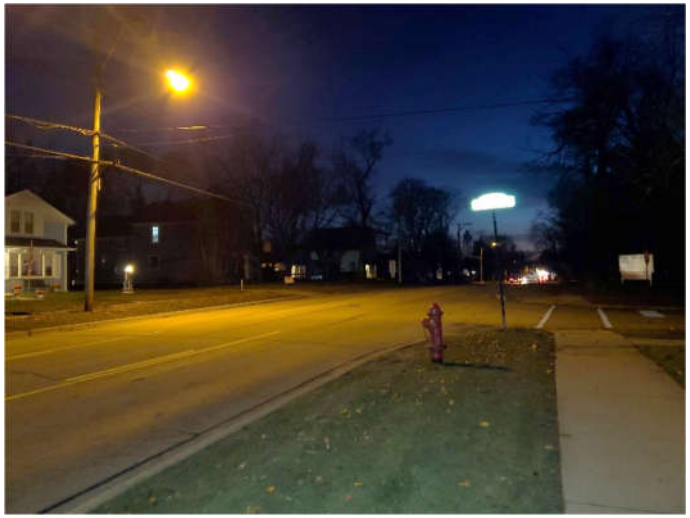
Exhibit 1 - Location Map

Proposed Church Street Apartments
174 McHenry Avenue, Crystal Lake, IL

Map Center: 88.32766°W 42.2376°N



Looking east along Church St, west of McHenry Ave



Looking south along McHenry Ave, north of Church St



Looking north along McHenry Ave, south of Church St



Looking west along Church St, east of Maple St

GHA GEWALT HAMILTON ASSOCIATES, INC.

Exhibit 2
Photo Inventory



Looking north from St. Mary's access at Church St/Maple St



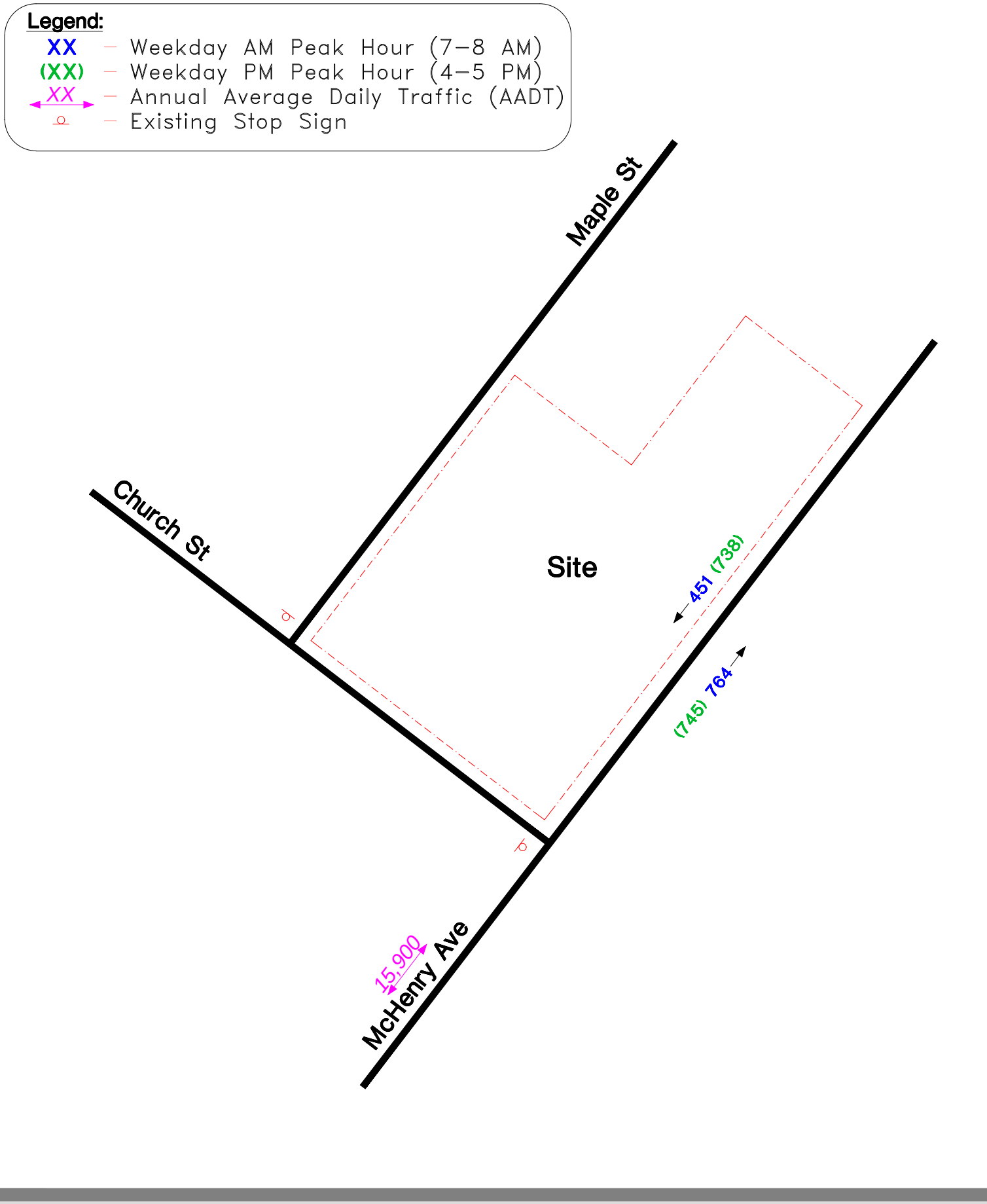
Looking northeast at site from Church St/Maple St



Looking south on Maple St, north of Church St



Looking south on Maple St at north site access



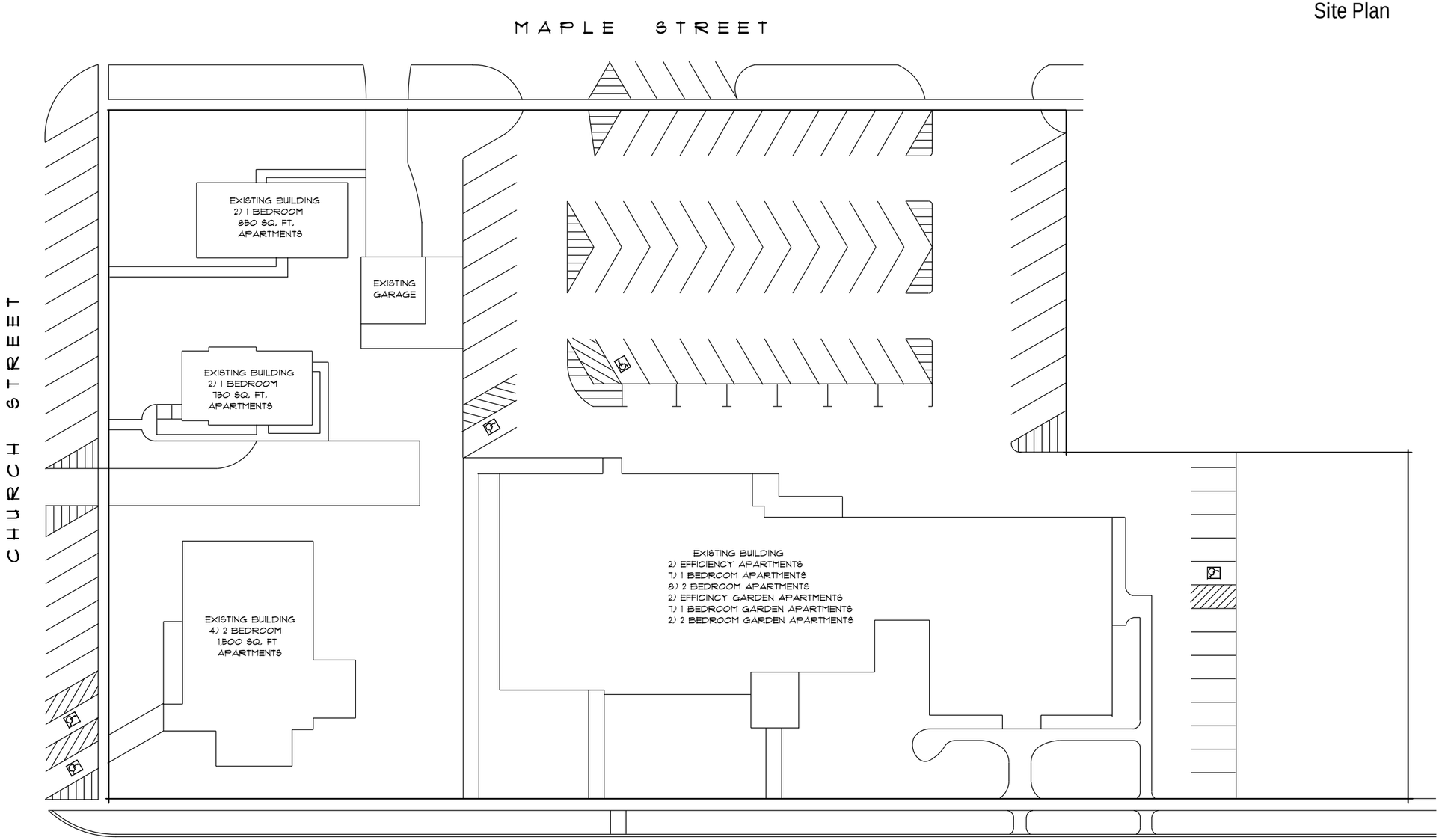
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Not to Scale

Exhibit 3
Existing Traffic
Sources: IDOT 2017

Exhibit 4
Site Plan



CHURCH STREET APARTMENTS

CRYSTAL LAKE, ILLINOIS

APARTMENTS

4) EFFICENCY APARTMENTS
18) 1 BEDROOM APARMTENTS
18) 2 BEDROOM APARTMENTS

PARKING STALLS

81) ON-SITE PARKING
3) ON-SITE ADA PARKING
19) OFF-STREET PARKING
2) OFF-STREET ADA PARKING

TOTALS

100) PARKINGING STALLS
5) ADA PARKING STALLS
EACH APARTMENT = 2.625 PARKING STALLS
EACH BEDROOM = 1.81 PARKING STALLS

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ILLINOIS

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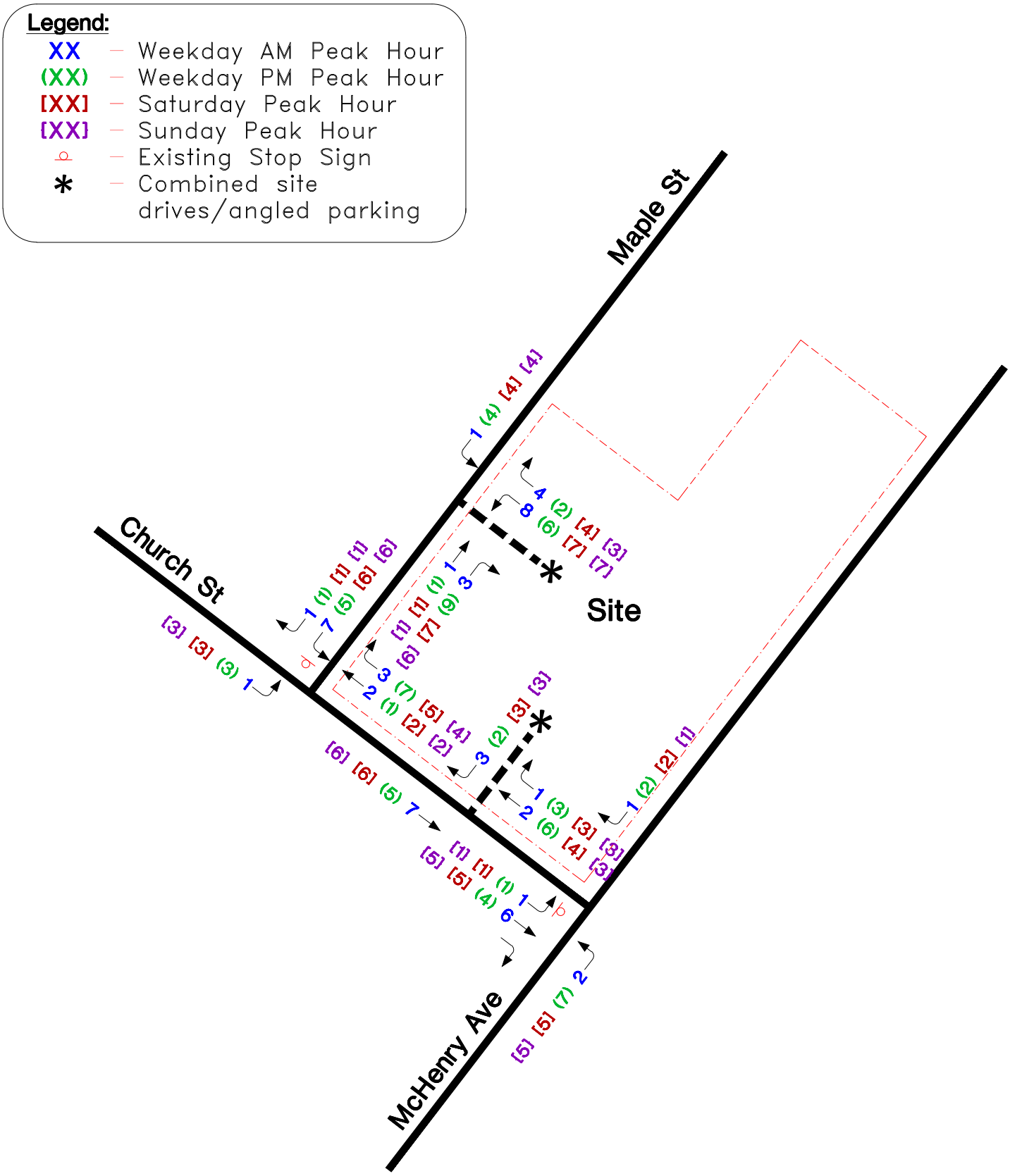
APARTMENT COMPLEX FOR:
TRUE NORTH PROPERTIES, INC.
McHENRY AVENUE & CHURCH STREET CRYSTAL LAKE ILLINOIS

DATE
SEPT 18, 2019

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JOB #

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CS



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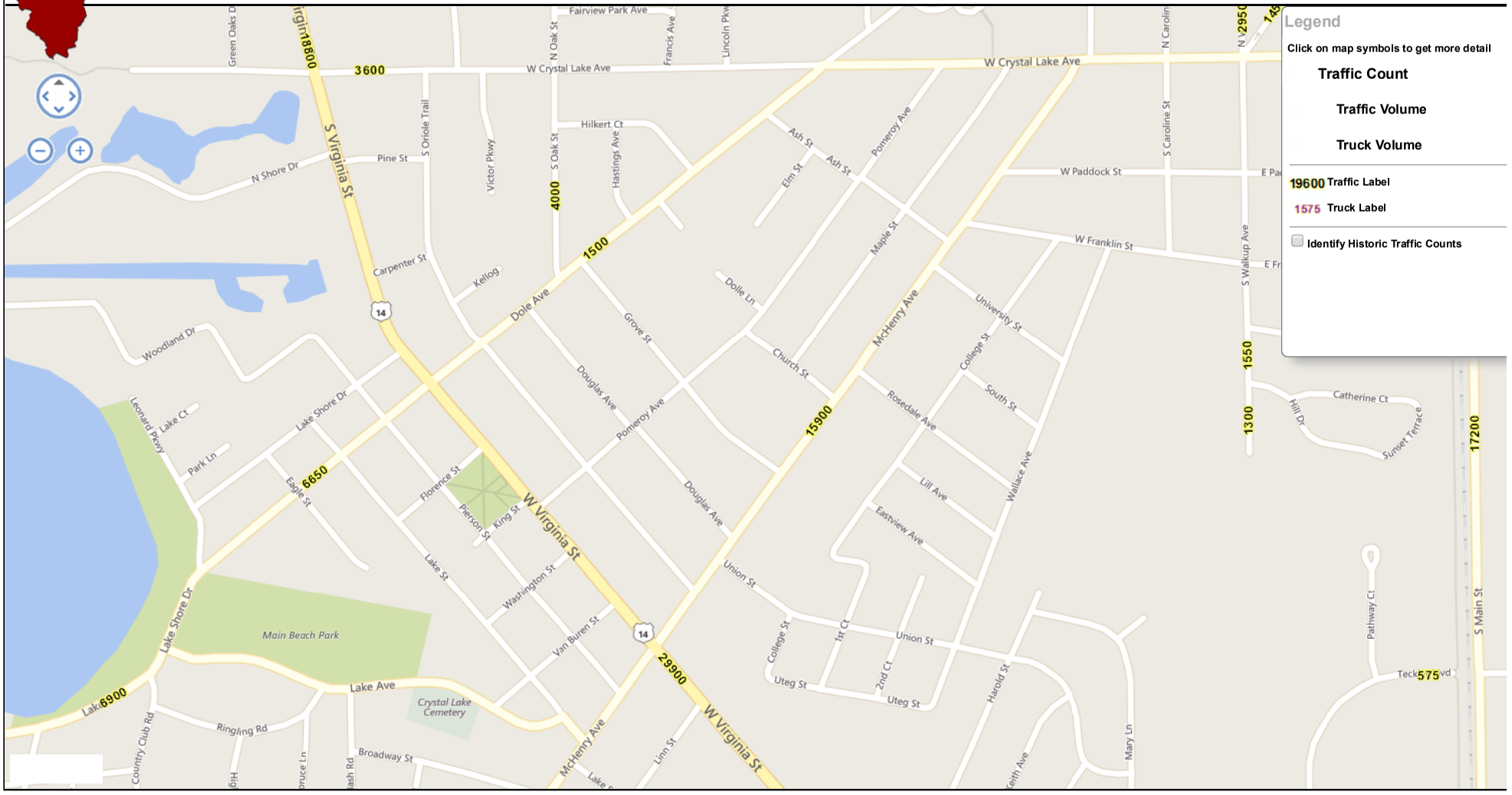
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Not to Scale

Exhibit 5
Site Traffic

Appendix A
IDOT Traffic Count Summaries

GHA GEWALT HAMILTON ASSOCIATES, INC.



Illinois Department of Transportation 2300 S. Dirksen Parkway Springfield, IL 62764 - Contact

Disclaimer

The Illinois Department of Transportation and the State of Illinois hereby give notice to all users that these maps and the data included hereon, lack the accuracy required for site-specific uses. Since all boundaries and all data are based on information derived from multiple sources within and outside the Illinois Department of Trans

representation, guarantee, or warrant, either express or implied, regarding the accuracy of these maps or the data furnished thereon, including, but not limited to, the condition of this product, this product's merchantability, or this product's fitness for any particular purpose or use.

Volume Count Report

LOCATION INFO	
Location ID	056 3586
Type	LINK
Fnct'l Class	4
Located On	Woodstock St
From Road	Walkup Rd
To Road	FAP 336A
Direction	2-WAY
County	McHenry
Community	CRYSTAL LAKE
MPO ID	
HPMS ID	
Agency	Illinois DOT

COUNT DATA INFO	
Count Status	Accepted
Start Date	Mon 5/15/2017
End Date	Tue 5/16/2017
Start Time	2:00:00 PM
End Time	2:00:00 PM
Direction	2-WAY
Notes	
Station	WOODSTOCK ST
Study	
Speed Limit	
Description	
Sensor Type	
Source	CombineVolumeCountsIncremental
Latitude,Longitude	

INTERVAL:60-MIN	
Time	**Hourly Count**
0:00-1:00	94
1:00-2:00	53
2:00-3:00	31
3:00-4:00	35
4:00-5:00	116
5:00-6:00	335
6:00-7:00	789
7:00-8:00	1,215
8:00-9:00	1,061
9:00-10:00	884
10:00-11:00	897
11:00-12:00	1,021
12:00-13:00	1,064
13:00-14:00	1,092
14:00-15:00	1,102
15:00-16:00	1,443
16:00-17:00	1,483
17:00-18:00	1,373
18:00-19:00	1,302
19:00-20:00	907
20:00-21:00	759
21:00-22:00	460
22:00-23:00	274
23:00-24:00	131
Total	17,921
AM Peak	07:00-08:00 1,215
PM Peak	16:00-17:00 1,483

Volume Count Report

LOCATION INFO	
Location ID	056 3586_NB
Type	LINK
Fnct'l Class	4
Located On	Woodstock St
From Road	Walkup Rd
To Road	FAP 336A
Direction	NB
County	McHenry
Community	CRYSTAL LAKE
MPO ID	
HPMS ID	
Agency	Illinois DOT

COUNT DATA INFO	
Count Status	Accepted
Start Date	Mon 5/15/2017
End Date	Tue 5/16/2017
Start Time	2:00:00 PM
End Time	2:00:00 PM
Direction	NB
Notes	
Station	WOODSTOCK ST
Study	
Speed Limit	
Description	
Sensor Type	
Source	CombineVolumeCountsIncremental
Latitude,Longitude	

INTERVAL:60-MIN	
Time	**Hourly Count**
0:00-1:00	40
1:00-2:00	22
2:00-3:00	12
3:00-4:00	17
4:00-5:00	67
5:00-6:00	201
6:00-7:00	459
7:00-8:00	764
8:00-9:00	592
9:00-10:00	452
10:00-11:00	446
11:00-12:00	530
12:00-13:00	540
13:00-14:00	567
14:00-15:00	589
15:00-16:00	680
16:00-17:00	745
17:00-18:00	633
18:00-19:00	646
19:00-20:00	389
20:00-21:00	334
21:00-22:00	221
22:00-23:00	139
23:00-24:00	63
Total	9,148
AM Peak	07:00-08:00 764
PM Peak	16:00-17:00 745

Volume Count Report

LOCATION INFO	
Location ID	056 3586_SB
Type	LINK
Fnct'l Class	4
Located On	Woodstock St
From Road	Walkup Rd
To Road	FAP 336A
Direction	SB
County	McHenry
Community	CRYSTAL LAKE
MPO ID	
HPMS ID	
Agency	Illinois DOT

COUNT DATA INFO	
Count Status	Accepted
Start Date	Mon 5/15/2017
End Date	Tue 5/16/2017
Start Time	2:00:00 PM
End Time	2:00:00 PM
Direction	SB
Notes	
Station	WOODSTOCK ST
Study	
Speed Limit	
Description	
Sensor Type	
Source	CombineVolumeCountsIncremental
Latitude,Longitude	

INTERVAL:60-MIN	
Time	**Hourly Count**
0:00-1:00	54
1:00-2:00	31
2:00-3:00	19
3:00-4:00	18
4:00-5:00	49
5:00-6:00	134
6:00-7:00	330
7:00-8:00	451
8:00-9:00	469
9:00-10:00	432
10:00-11:00	451
11:00-12:00	491
12:00-13:00	524
13:00-14:00	525
14:00-15:00	513
15:00-16:00	763
16:00-17:00	738
17:00-18:00	740
18:00-19:00	656
19:00-20:00	518
20:00-21:00	425
21:00-22:00	239
22:00-23:00	135
23:00-24:00	68
Total	8,773
AM Peak	11:00-12:00 491
PM Peak	15:00-16:00 763

Appendix B
ITE Trip Generation Excerpts

GHA GEWALT HAMILTON ASSOCIATES, INC.

Multifamily Housing (Low-Rise)
(220)

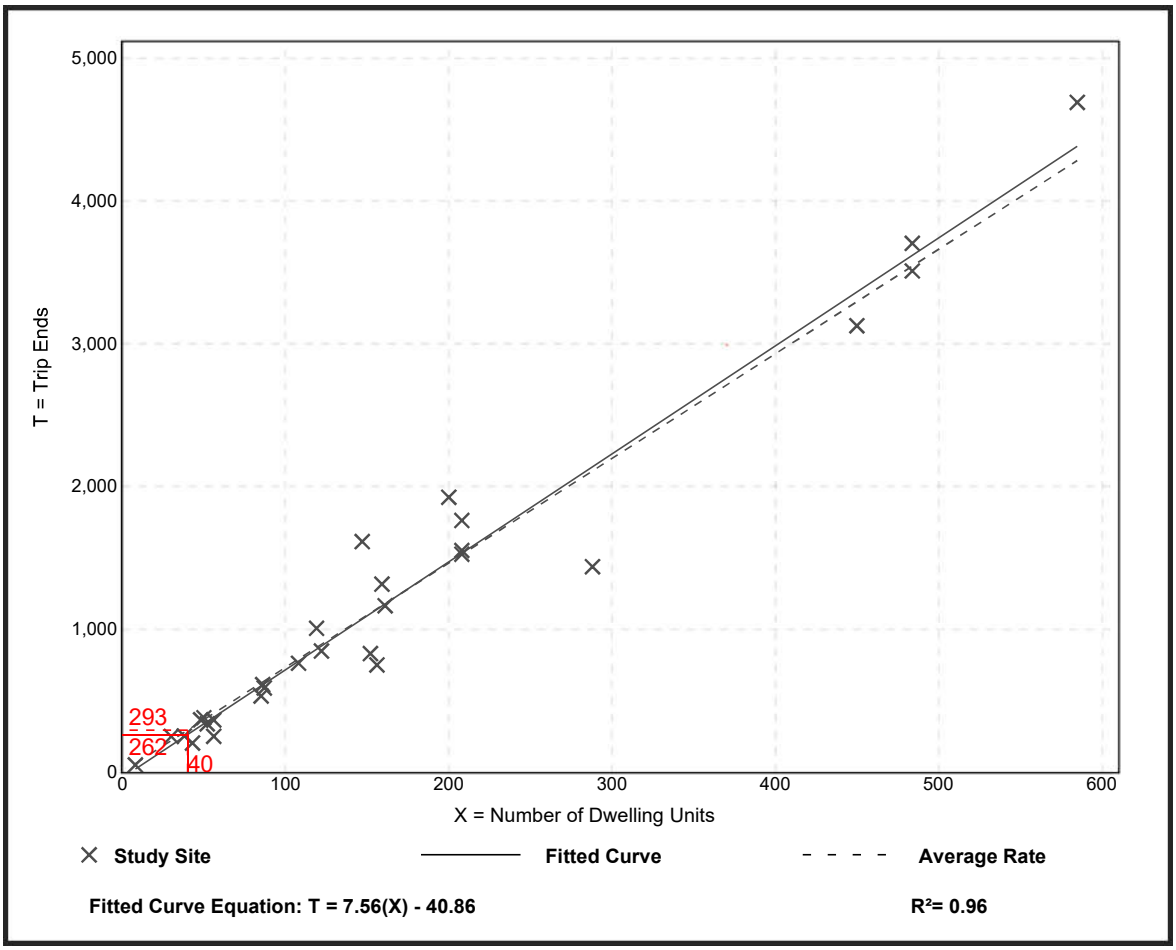
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 29
Avg. Num. of Dwelling Units: 168
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
7.32	4.45 - 10.97	1.31

Data Plot and Equation



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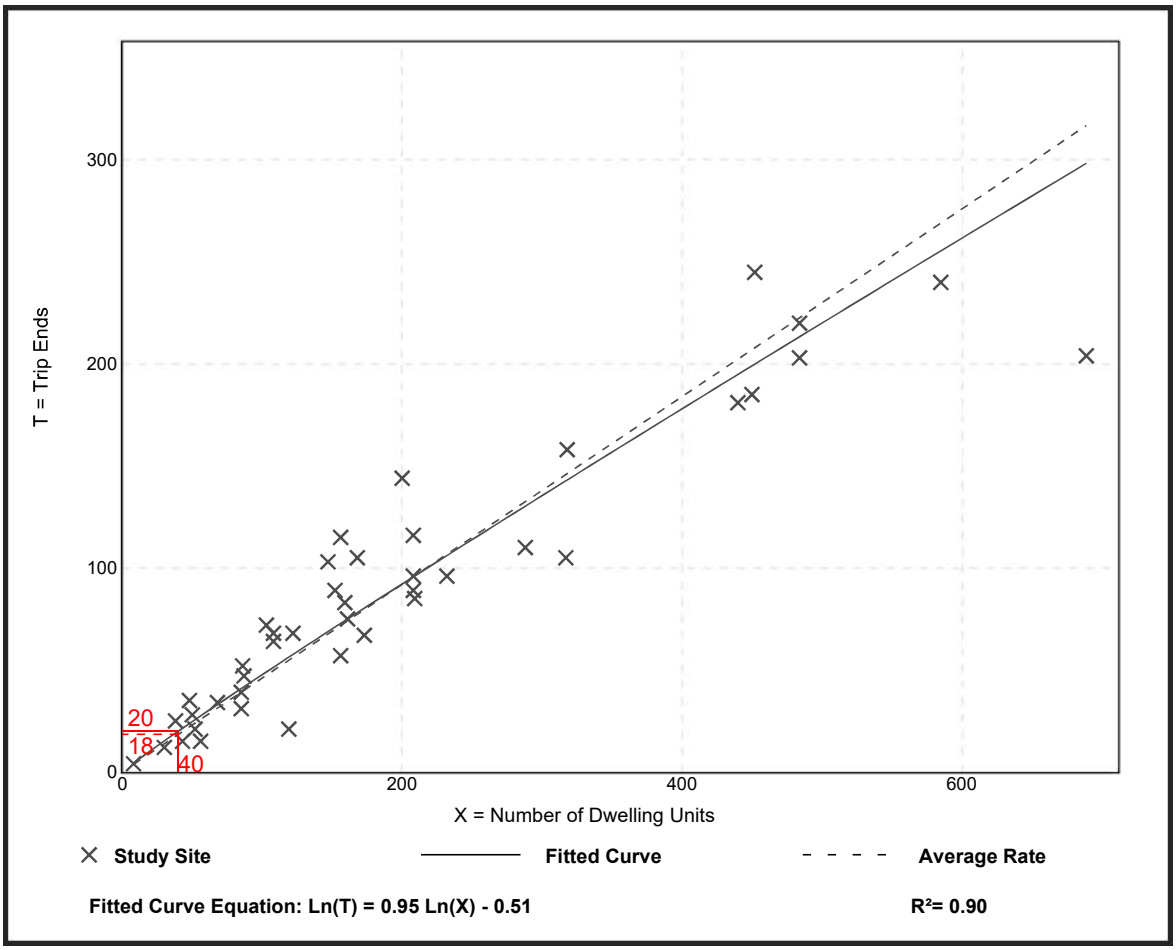
Multifamily Housing (Low-Rise)
(220)

Vehicle Trip Ends vs:	**Dwelling Units**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 7 and 9 a.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	42
Avg. Num. of Dwelling Units:	199
Directional Distribution:	23% entering, 77% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.46	0.18 - 0.74	0.12

Data Plot and Equation



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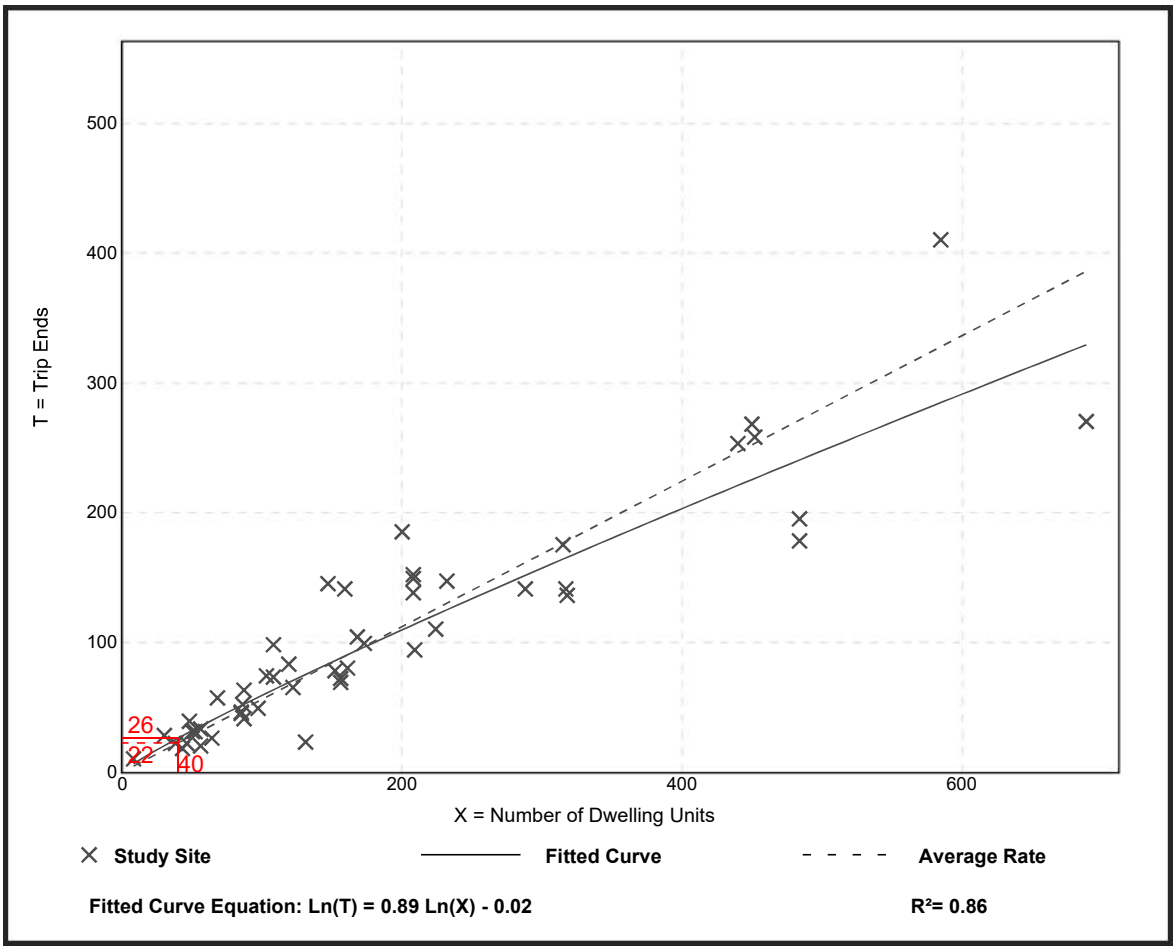
Multifamily Housing (Low-Rise)
(220)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 50
Avg. Num. of Dwelling Units: 187
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.56	0.18 - 1.25	0.16

Data Plot and Equation



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Multifamily Housing (Low-Rise)
(220)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Saturday**

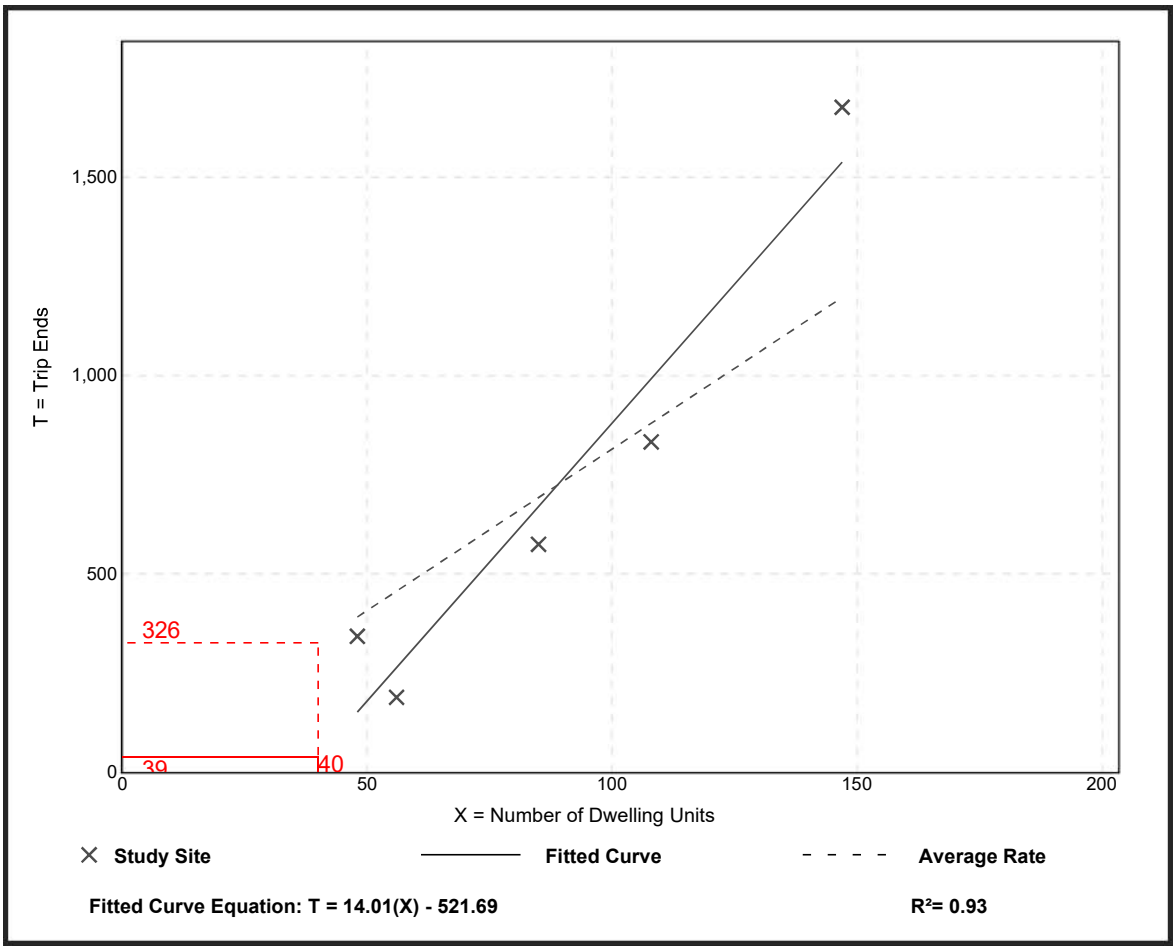
Setting/Location: **General Urban/Suburban**
Number of Studies: 5
Avg. Num. of Dwelling Units: 89
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
8.14	3.36 - 11.40	2.94

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: T = 14.01(X) - 521.69

R^2= 0.93

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Multifamily Housing (Low-Rise)
(220)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Saturday, Peak Hour of Generator**

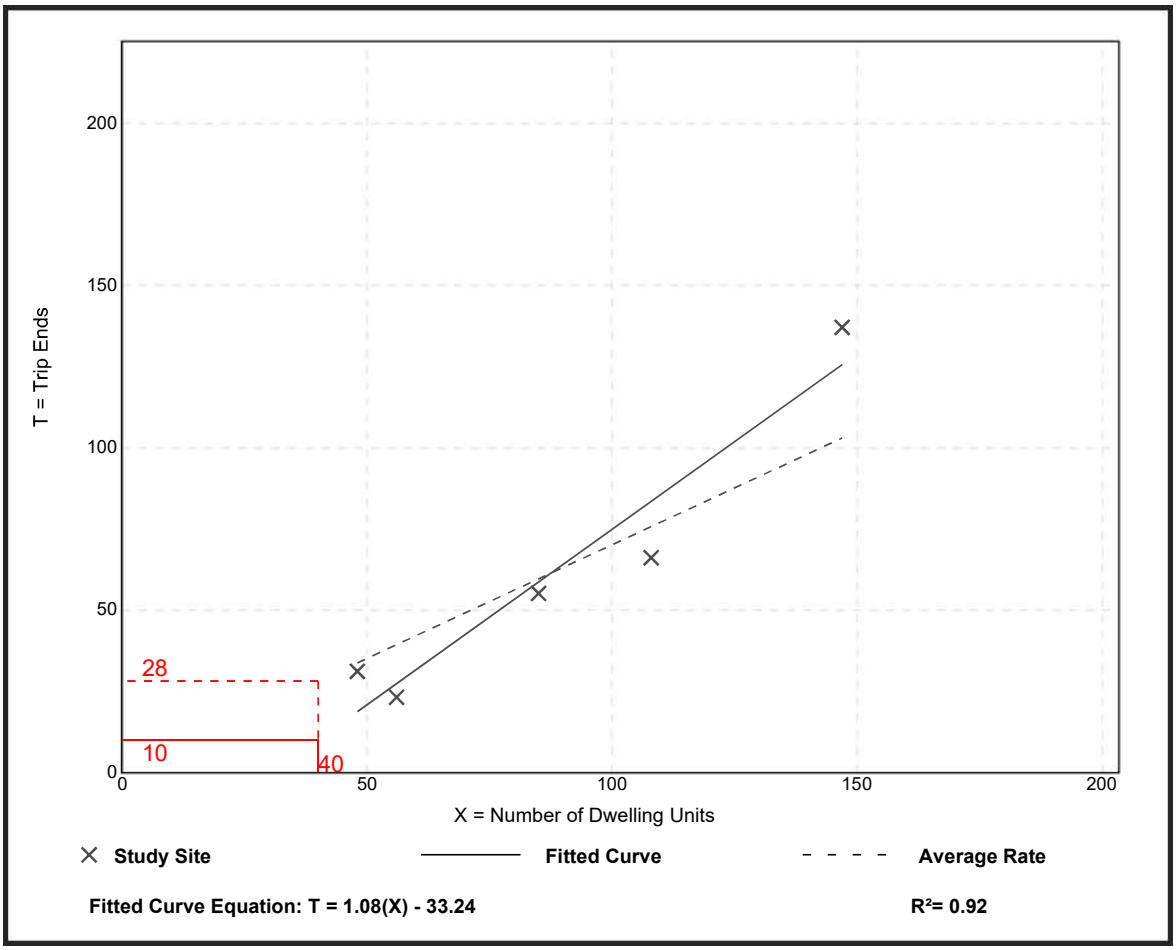
Setting/Location: **General Urban/Suburban**
Number of Studies: 5
Avg. Num. of Dwelling Units: 89
Directional Distribution: Not Available

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.41 - 0.93	0.20

Data Plot and Equation

Caution – Small Sample Size



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Multifamily Housing (Low-Rise)
(220)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Sunday**

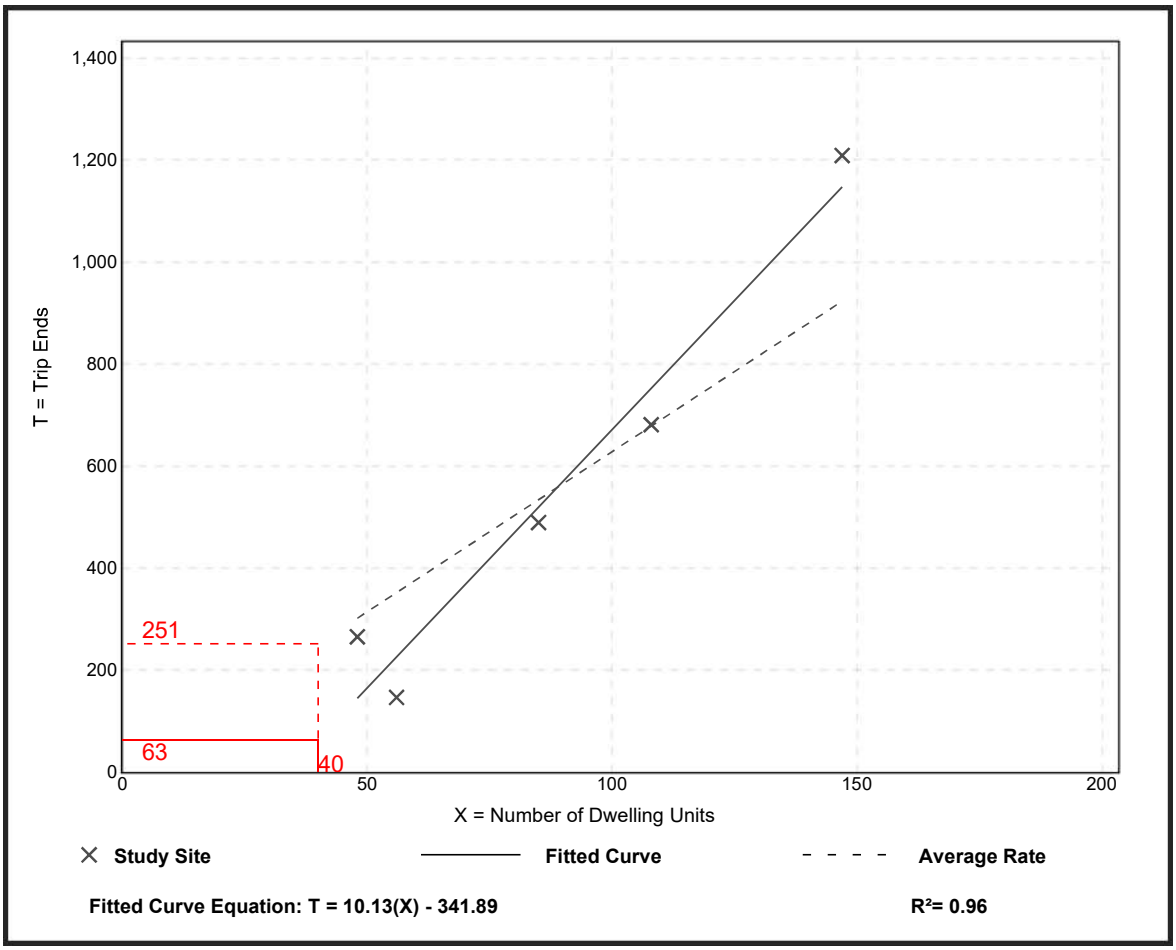
Setting/Location: **General Urban/Suburban**
Number of Studies: 5
Avg. Num. of Dwelling Units: 89
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
6.28	2.61 - 8.22	1.96

Data Plot and Equation

Caution – Small Sample Size



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Multifamily Housing (Low-Rise)
(220)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Sunday, Peak Hour of Generator**

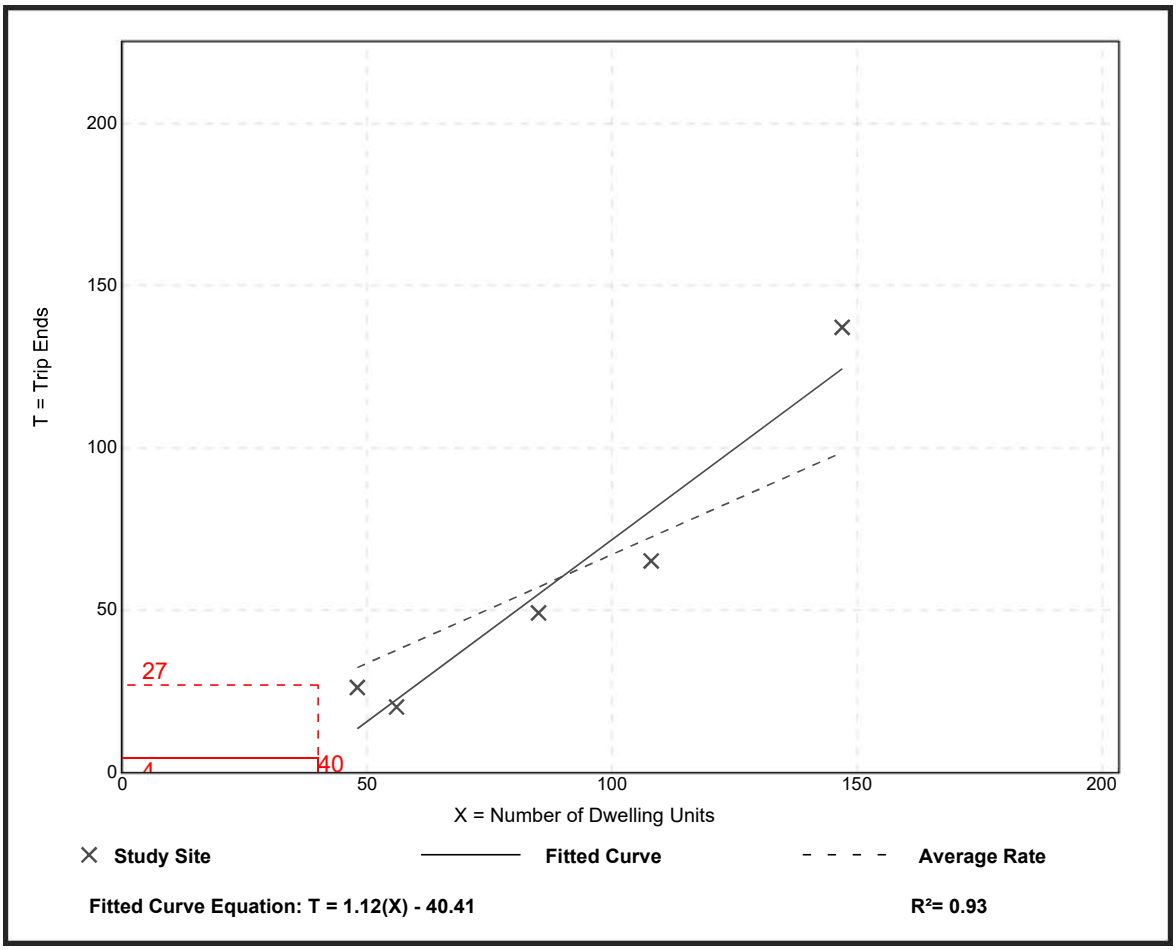
Setting/Location: **General Urban/Suburban**
Number of Studies: 5
Avg. Num. of Dwelling Units: 89
Directional Distribution: Not Available

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.67	0.36 - 0.93	0.22

Data Plot and Equation

Caution – Small Sample Size



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Appendix C
ITE Parking Generation Excerpts

GHA GEWALT HAMILTON ASSOCIATES, INC.

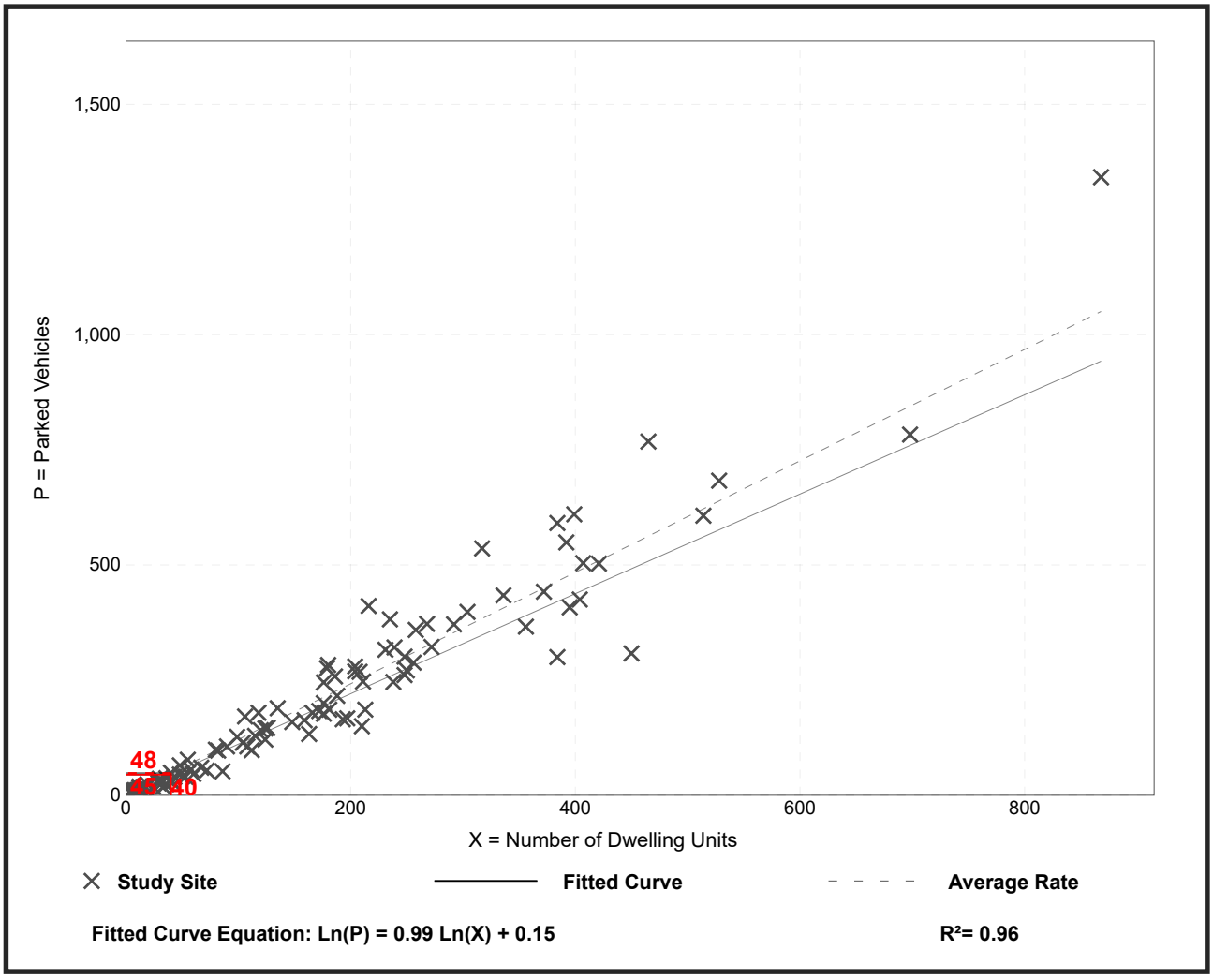
Multifamily Housing (Low-Rise)
(220)

Peak Period Parking Demand vs: **Dwelling Units**
On a: **Weekday (Monday - Friday)**
Setting/Location: **General Urban/Suburban (no nearby rail transit)**
Peak Period of Parking Demand: **11:00 p.m. - 6:00 a.m.**
Number of Studies: 119
Avg. Num. of Dwelling Units: 156

Peak Period Parking Demand per Dwelling Unit

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
1.21	0.58 - 2.50	1.03 / 1.52	1.16 - 1.26	0.27 (22%)

Data Plot and Equation



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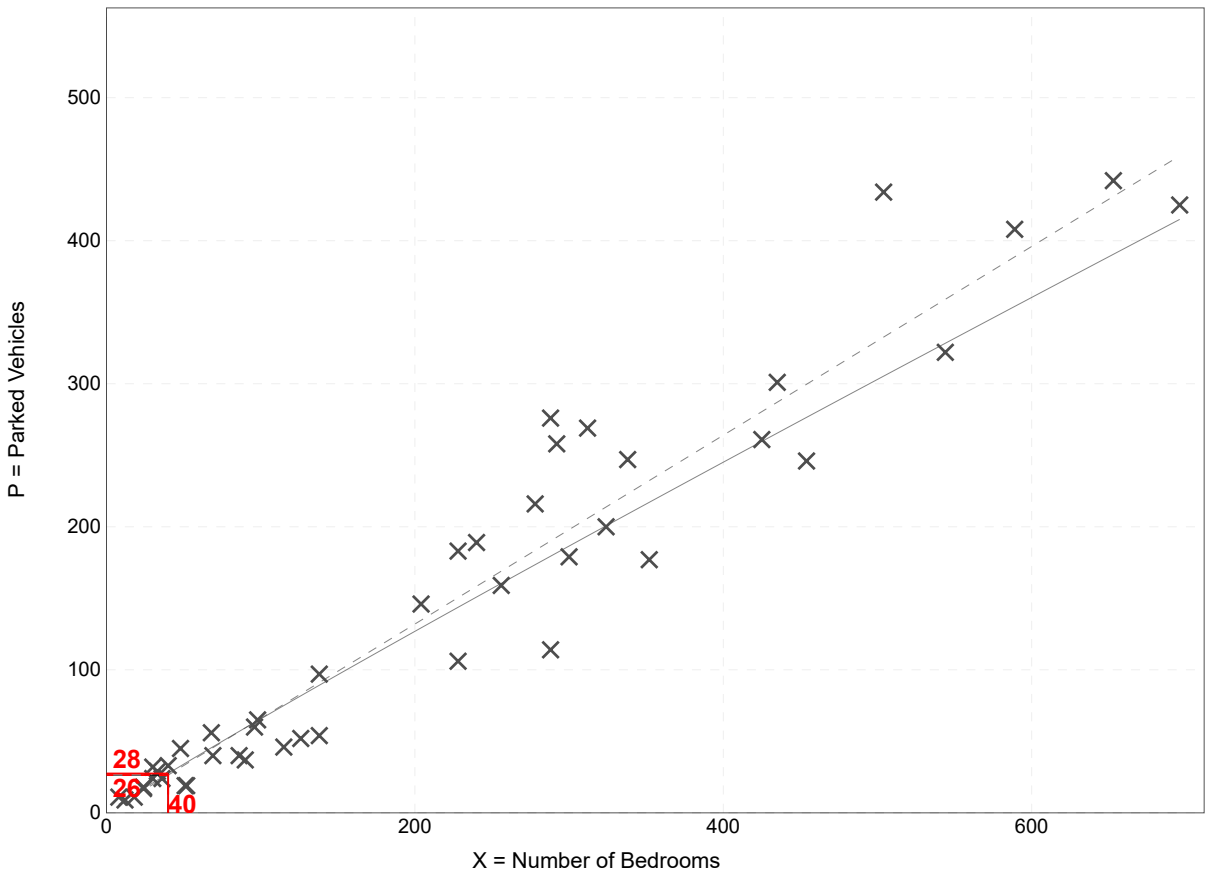
Multifamily Housing (Low-Rise)
(220)

Peak Period Parking Demand vs: **Bedrooms**
On a: **Weekday (Monday - Friday)**
Setting/Location: **General Urban/Suburban (no nearby rail transit)**
Peak Period of Parking Demand: **11:00 p.m. - 6:00 a.m.**
Number of Studies: 45
Avg. Num. of Bedrooms: 215

Peak Period Parking Demand per Bedroom

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
0.66	0.37 - 1.38	0.61 / 0.86	0.62 - 0.70	0.15 (23%)

Data Plot and Equation



Fitted Curve Equation: Ln(P) = 0.95 Ln(X) - 0.19 **R^2= 0.93**

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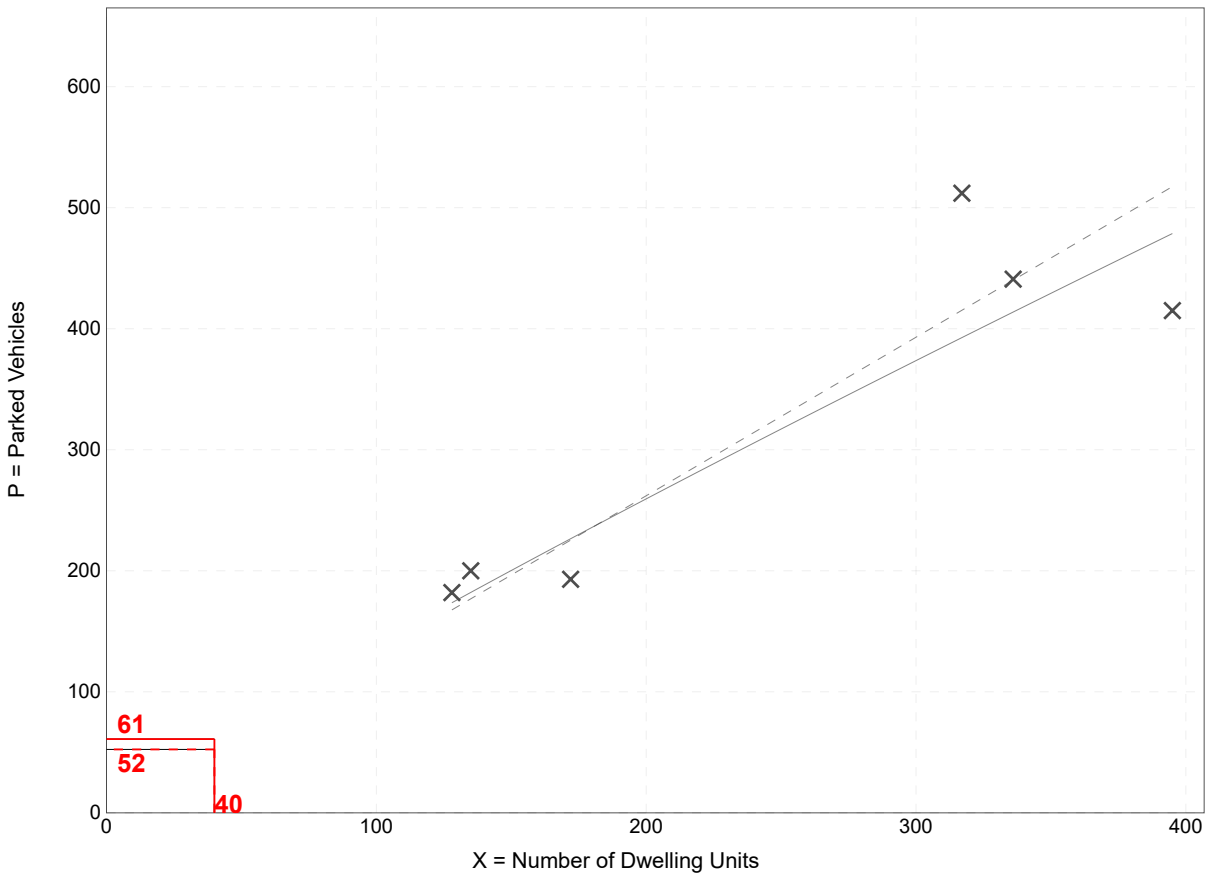
Multifamily Housing (Low-Rise)
(220)

Peak Period Parking Demand vs: **Dwelling Units**
On a: **Saturday**
Setting/Location: **General Urban/Suburban (no nearby rail transit)**
Peak Period of Parking Demand: **11:00 p.m. - 7:00 a.m.**
Number of Studies: 6
Avg. Num. of Dwelling Units: 247

Peak Period Parking Demand per Dwelling Unit

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
1.31	1.05 - 1.62	1.18 / 1.61	***	0.23 (18%)

Data Plot and Equation



Fitted Curve Equation: Ln(P) = 0.90 Ln(X) + 0.79 **R^2= 0.89**

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Multifamily Housing (Low-Rise)
(220)

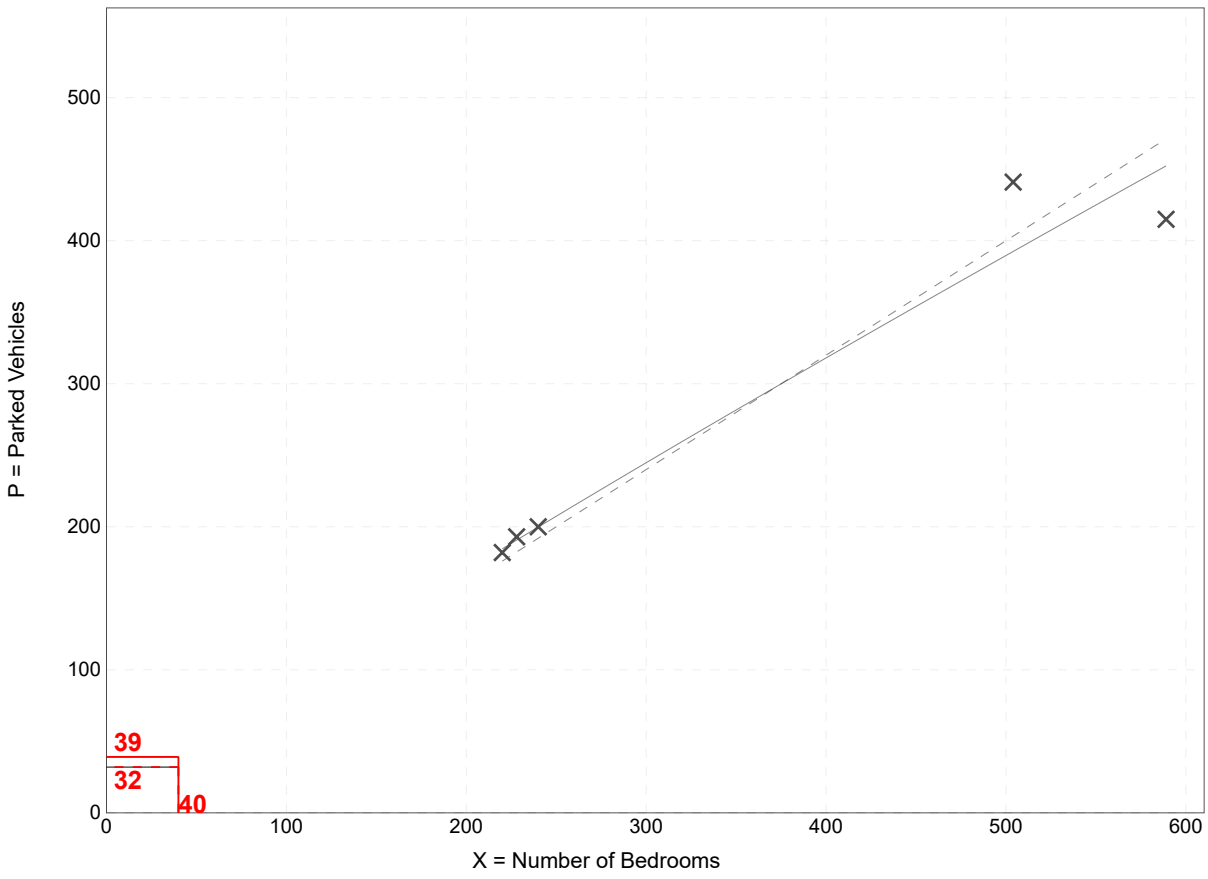
Peak Period Parking Demand vs: **Bedrooms**
On a: **Saturday**
Setting/Location: **General Urban/Suburban (no nearby rail transit)**
Peak Period of Parking Demand: **11:00 p.m. - 7:00 a.m.**
Number of Studies: 5
Avg. Num. of Bedrooms: 356

Peak Period Parking Demand per Bedroom

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
0.80	0.70 - 0.88	0.82 / 0.88	***	0.08 (10%)

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Ln(P) = 0.91 Ln(X) + 0.31

R^2= 0.97

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