

BOARD OF COUNTY COMMISSIONERS
SARPY COUNTY, NEBRASKA

APPROVE PRELIMINARY PLAT – PLAMBECK ADDITION REPLAT 1

WHEREAS, pursuant to Neb. Rev. Stat. § 23-104 (Reissue 2012), the County has the power to do all acts in relation to the concerns of the County necessary to the exercise of its corporate powers; and,

WHEREAS, pursuant to Neb. Rev. Stat. § 23-103 (Reissue 2012), the powers of the County as a body are exercised by the County Board of Commissioners (County Board); and,

WHEREAS, the County Board has the authority to adopt Subdivision Regulations, which shall have the force and effect of law pursuant to Neb. Rev. Stat. § 23-374 (Reissue 2012); and,

WHEREAS, said Subdivision Regulations require the County Board to approve applications for preliminary plats; and

WHEREAS, the applicant, LKM Investments, LLC applied for approval of a preliminary plat into a 3 lot subdivision with commercial development on approximately 3 acres and a multi-family residential development on the remaining property generally located at the southeast corner of 180th and Harrison ST and legally described as follows:

Lots 1 and 2 Plambeck Addition, Sarpy County, Nebraska.

WHEREAS, the Sarpy County Planning Department staff reviewed the application of the preliminary plat of a subdivision to be known as Plambeck Addition Replat 1, for compliance with the Subdivision Regulations; and

WHEREAS, the Planning Department staff made a recommendation of approval as noted in Exhibit A, attached hereto and incorporated by reference, which Exhibit A includes the Planning Department reports, the aerial map of the subject property and a copy of the preliminary plat of the subdivision to be known as Plambeck Addition Replat 1, as discussed at the January 21, 2014 Planning Commission meeting.

NOW, THEREFORE, BE IT RESOLVED BY THE SARPY COUNTY BOARD OF COMMISSIONERS THAT this County Board makes the following findings of fact:

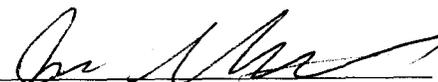
- I. A public hearing regarding the approval of the preliminary plat was held on October 15, 2013 and a public hearing regarding the approval of the preliminary plat as revised from the October application on January 21, 2014 before the Sarpy County Planning Commission. The Planning Commission provided their recommendation to the County Board.
- II. A public hearing regarding the approval of the preliminary plat was held by this County Board.

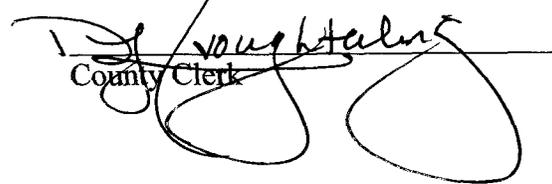
- III. Notice of each of the public hearings described above was published at least ten (10) days prior to each respective public hearing.
- IV. The Planning Department staff recommends approval of the preliminary plat discussed at the January 21, 2014 Planning Commission meeting.
- V. The proposed preliminary plat (revised from the initial application) of a subdivision to be known as Plambeck Addition Replat 1 is in conformity with the Zoning Regulations, the Subdivision Regulations and the Sarpy County Comprehensive Plan.

BE IT FURTHER RESOLVED THAT the preliminary plat of a subdivision heard at the January 21, 2014 Planning Commission meeting, to be known as Plambeck Addition Replat 1 and as further described in the attached Exhibit A is hereby approved subject to the following conditions:

- 1. Access to 180th Street from Lot 2 Plambeck Addition Replat 1 will be limited to right-in, right-out only.
- 2. Resolution of any Fire Department issues related to the hammerhead turn around on 178th Street.

The above Resolution was approved by a vote of the Sarpy County Board of Commissioners at a public meeting duly held in accordance with applicable law on the 11th day of February, 2014.


Sarpy County Board Chairman

Attest
SEAL 

County Clerk

Sarpy County Board of Commissioners
 Exhibit "A"
 Planning Department Report
 County Board Meeting Date: February 11, 2014

Subject	Type	By
Applications related to property generally located on the southeast corner of 180 th St. and Harrison St., currently described as Lots 1 and 2 Plambeck Addition <ul style="list-style-type: none"> • CZ 13-0008 Change of Zone: BG to RG-15 and BG • PP 14-0001 Revised Preliminary Plat – Plambeck Addition Replat 1 	Public Hearings & Resolutions	Bruce Fountain, AICP Director, Planning & Building Dept.

➤ **Summary and Purpose of Requests:**

- These applications are requesting approval of a change of zone on the property which is all currently zoned BG (General Business) to a combination of RG-15 (General Residential) and BG (General Business). The Preliminary Plat is for a proposed mixed-use development which includes multi-family residential and neighborhood commercial uses. The preliminary plat proposes a change from 2 existing lots to 3 lots.

➤ **Background and Analysis:**

- The detailed staff reports on these applications were presented to the Planning Commission at their October 15, 2013 and January 21, 2014 meetings and are attached for your information and review. The Planning Commission recommended approval of both applications at their October 15th meeting but due to some changes to the plat after that, the applicant brought a revised preliminary plat back to the Planning Commission on January 21st. The Planning Commission recommended approval of the revised preliminary plat as well.

➤ **Staff Recommendation:**

- Staff recommends **APPROVAL** of the Change of Zone application as it is in conformance with the Sarpy County Comprehensive Development Plan and the Sarpy County Zoning Regulations.
- Staff recommends **APPROVAL** of the Revised Preliminary Plat of a subdivision to be known as Plambeck Addition Replat 1, subject to the following items being addressed:
 - Comments/recommendations from the Sarpy County Public Works Department regarding traffic and street improvement issues must be addressed and followed.
 Staff makes this recommendation as the Revised Preliminary Plat, with conditions as noted, meets requirements of the Sarpy County Comprehensive Development Plan, Zoning Regulations, and Subdivision Regulations.

➤ **Planning Commission Recommendation:**

- On October 15, 2013, the Planning Commission voted to recommend **APPROVAL** of the Change of Zone and the Preliminary Plat for Plambeck Addition Replat 1.

MOTION: Whitfield moved, seconded by Lichter, to recommend approval of the Change of Zone of Lots 1 and 3 of the proposed Preliminary Plat to be known as Plambeck Addition Replat 1 from BG (General Business) to RG-15 with Lot 2 to remain zoned BG (General Business) for the subdivision to be known as Plambeck Addition Replat 1 as it is in conformance with the Sarpy County Comprehensive Development Plan and the Sarpy County Zoning Regulations. **Ballot:** Ayes – Bliss, Lichter, Stuart, Ackley, Whitfield, Mohr, Malmquist, Fenster, Torczon and Farrell. Nays – none. Abstain – None. Absent – Davis. **Motion carried.**

MOTION: Malmquist moved, seconded by Bliss to recommend approval of the preliminary plat of a subdivision to be known as Plambeck Addition Replat 1, subject to the following being addressed prior to final plat submittal: 1) the final Post Construction Storm water Plan must be submitted for the project

as well as submittal to the Permix Website for approval of grading permit; 2) Detailed information on the acreage in each interceptor sewer system district (Omaha and Gretna) must be provided at Final Plat in order to calculate connection fees; and 3) Comments/recommendations from the Sarpy County Public Works Department and Planning Department regarding traffic issues must be addressed and followed as outlined in III.B. Traffic and Access in the Recommendation Report. **Ballot:** Ayes – *Bliss, Lichter, Stuart, Ackley, Whitfield, Mohr, Malmquist, Fenster, Torczon and Farrell.* Nays – none. Abstain – None. Absent – *Davis.* **Motion carried.**

- On January 21, 2014, the Planning Commission voted to recommend **APPROVAL** of the Revised Preliminary Plat for Plambeck Addition Replat 1.

MOTION: Bliss moved, seconded by Lichter to recommend approval of the Revised Preliminary Plat of a subdivision to be known as Plambeck Addition Replat 1 with a right-in, right-out only access to 180th Street from Lot 2 and with the condition that the Fire Department issues be resolved. This recommendation is being made as the Preliminary Plat meets the requirements of the Sarpy County Comprehensive Development Plan, Zoning Regulations, and Subdivision Regulations. **Ballot:** Ayes – *Bliss, Lichter, Huddleston, Davis, Ackley, Whitfield, Malmquist, Fenster, Torczon and Farrell.* Nays – None. Abstain – None. Absent – *Mohr.* **Motion carried.**



SARPY COUNTY PLANNING & BUILDING DEPARTMENT

RECOMMENDATION REPORT

PRELIMINARY PLAT (PP 13-0009)

CHANGE OF ZONE (CZ 13-0008)

APPLICANT: LKM Investments, LLC

PROPOSED COMMERCIAL / MULTI-FAMILY RESIDENTIAL SUBDIVISION
TO BE KNOWN AS PLAMBECK ADDITION REPLAT 1

PLANNING COMMISSION HEARING OF: OCTOBER 15, 2013

I. GENERAL INFORMATION

A. APPLICANT:

LKM Investments, LLC
6214 California Street
Omaha, NE 68132

B. PROPERTY OWNERS:

Plambeck AG, LLC
5711 S. 118th Plaza
Omaha, NE 68137

C. **SUBJECT PROPERTY LOCATION:** Subject property is located on the southeast corner of 180th Street and Harrison Street.

D. **CURRENT LEGAL DESCRIPTION:** Lots 1, 2 Plambeck Addition

E. **SUBJECT PROPERTY SIZE:** approximately 17.795 acres

F. **EXISTING FUTURE LAND USE AND ZONING DESIGNATIONS:**

- Future Land Use Designations: Urban Residential
- Zoning: BG (General Business District)

G. **REQUESTED ACTION(S):** To approve a Preliminary Plat and rezoning of the subject property from BG (General Business District) to RG-15 (General Residential) and BG. The request would replat the property into 3 lots and rezone it to allow for commercial development on approximately 3 acres at the corner of 180th and Harrison Streets (Lot 2) and a multi-family residential development on the remainder of the property (Lots 1 & 3).

II. BACKGROUND INFORMATION

A. **EXISTING CONDITION OF SITE:** Farmstead with agricultural buildings and farmland.

B. **GENERAL VICINITY AND LAND USE**

- North: Millard Elementary School, day care center, pediatric dental office (City of Omaha's jurisdiction)

- South and East: Urban Residential Development – Hickory Ridge subdivision
- West: Urban Residential Development – Sunridge subdivision; Commercial Development – Sunridge Commercial Center

C. RELEVANT CASE INFORMATION:

- Property was originally platted as Plambeck Addition in 1993 which included 2 lots – one in the middle of the site along Harrison Street which included the farmstead and the second lot was the remainder of the farmland.
- Development will be served with utilities as follows: water by MUD, natural gas by MUD, sanitary sewer by City of Gretna and City of Omaha, and electrical power by OPPD.

D. APPLICABLE REGULATIONS:

- Sarpy County Comprehensive Development Plan
- Sarpy County Zoning Regulations:
 - Section 18, RG-15 – General Residential District
 - Section 20, BG – General Business District
 - Section 38, Stormwater Management Regulations
- Sarpy County Subdivision Regulations

III. GENERAL OVERVIEW:

- **Change of Zone**
 - Property is currently zoned BG (General Business)
 - Lots 1 and 3 (approx. 14 total acres) of the replat are proposed to be zoned RG-15 (General Residential). Lot 2 (approx. 3 acres) will remain zoned BG (General Business)
 - Proposed change of zoning request is consistent with the Future Land Use Map of the Sarpy County Comprehensive Plan.
 - The property was posted with signs indicating a pending zoning action and notification of the public hearing was sent out to property owners within 300 feet of the subject property. Notice of the public hearing was also published in area newspapers.
 - The developer/applicant attempted to arrange a neighborhood meeting with area residents but was told by a Hickory Ridge SID Board member that there was no neighborhood association, just a SID Board. Therefore, the applicant sent out a letter describing the proposed development to property owners within 300 feet of the project and giving his contact information should they have questions/concerns.
- **Preliminary Plat:**
 - Preliminary Plat consists of 3 lots to be zoned and developed as described above.
 - Lot sizes are: Lot 1 – approx. 11.26 acres; Lot 2 – approx. 3.17 acres; Lot 3 – approx. 3.36 acres.
 - An internal private drive is proposed which splits Lot 1 from Lots 2 and 3. The drive will connect to Harrison Street on the north and 180th Street on the west.
 - The existing farmstead improvements are to be removed by the current owner.

III. ANALYSIS / STAFF COMMENTS

A. COMPREHENSIVE PLAN:

- The Comprehensive Plan shows the area on the Future Land Use Map as Urban Residential. The proposed project will consist of multi-family residential and neighborhood commercial development which is consistent with the Comprehensive Plan.

B. TRAFFIC AND ACCESS:

- Proposed access points are as follows:
 - Full access on 180th Street @ Gertrude Street
 - Right in/Right out on 180th Street @ approximately 250' south of Harrison St.
 - $\frac{3}{4}$ access on Harrison Street @ 178th Street
- No access is proposed into adjacent residential areas.
- Any street or road improvements required along Harrison or 180th Streets will be the developer's responsibility and will be specified in the Subdivision Agreement.
- A Traffic Impact Analysis of the project on 180th and Harrison Streets has been completed by Felsburg, Holt & Ullevig Consultants (FHU) and is attached for your information.
- The Sarpy County Public Works Department has made the following recommendations regarding traffic improvements related to the project (see attached memos from Patrick Dowse, Sarpy Co. Engineering Manager):
 - An additional 10 feet of right-of-way should be dedicated for a distance of 300 feet fronting the east leg of Harrison Street and 300 feet fronting the south leg of 180th Street
 - The perceived free flow movement of the private drive connecting the Gertrude Street access to the 178th Street access may become a pass-through for motorists trying to short cut the intersection at Harrison and 180th Streets. Considerations should be made to discourage this type of traffic movement.
 - The developer and SID should work with the adjacent Hickory Ridge SID to remove the short section of 179th Street north of Edna Street in order to reduce unintended uses such as vehicle storage or loitering.
 - The proposed hammerhead at the end of 178th Street on the south edge of the development needs to be reviewed by the appropriate Fire Department to be sure of its acceptability for fire protection standards or ordinances.
 - The proposed Right in/Right Out (RIRO) access south of Harrison should not be allowed as no direct access to 180th Street was allowed previously for the commercial development to the west and in order to keep traffic moving safely through the corridor in conjunction with future improvements.
 - The traffic study should be reanalyzed by FHU to reflect the removal of the RIRO access to verify if a right-turn lane is warranted for the northbound 180th Street to eastbound Gertrude Street movement.
 - Per the FHU analysis, it is recommended that a right turn lane be constructed on Harrison Street for the eastbound to southbound movements onto 178th Street. A minimum storage length of 150 feet is required for this turn lane. Harrison Street falls under the City of Omaha Driveway Guide requirements which also call for the construction of this right-turn deceleration lane.

- The ¾ drive entrance on Harrison Street at 178th Street will be allowed at this time, but future conditions may require this to become a Right in/Right out only functioning access.
- Engineering drawings for the access at Gertrude Street to 180th Street and at 178th Street to Harrison Street should be provided so that the Public Works Department can review grades and verify the approaches are acceptable to County standards.

C. OTHER AGENCY REVIEW/COMMENTS: The applications were sent to area jurisdictional agencies or departments that may have an interest.

- Comments were received back from:
 - **Sarpy County Public Works** – See above recommendations under Traffic and Access as well as attached memos from Patrick Dowse.
 - **Papio Missouri River Natural Resource District** – Comments include the requirement of a post construction stormwater management plan, submittal of all documentation to the Papillion Creek Watershed Partnership Website (Omaha Permix) and payment of Watershed Management Fees. Please see copy of comments included in this packet.

IV. STAFF RECOMMENDATIONS:

- After reviewing the applications, staff submitted a letter to Olsson Associates (Engineer of Record) with a number of requested corrections/clarifications on August 20, 2013.
- Olsson Associates submitted an amended preliminary plat and a response to the staff letter on August 28, 2013 (see attached letter) addressing the majority of corrections/clarifications needed.
- The following items must still be addressed:
 - The final Post Construction Stormwater Plan must be submitted for the project as well as submittal to the Permix Website for approval of grading permit.
 - Detailed information on the acreage in each interceptor sewer system district (Omaha and Gretna) must be provided at Final Plat in order to calculate connection fees.
 - Comments/recommendations from the Sarpy County Public Works Department regarding traffic issues must be addressed and followed.
- Staff recommends **APPROVAL** of the proposed preliminary plat of a subdivision to be known as Plambeck Addition Replat 1, subject to the comments and conditions listed above being addressed as necessary. Staff makes this recommendation as the Preliminary Plat, with conditions as noted, meets requirements of the Sarpy County Comprehensive Development Plan, Zoning Regulations, and Subdivision Regulations.
- Staff recommends **APPROVAL** of the Change of Zone from BG (General Business) to RG-15 (General Residential) and BG (General Business) as proposed for the Plambeck Addition Replat 1 subdivision as it is in conformance with the Sarpy County Comprehensive Development Plan and the Sarpy County Zoning Regulations.

V. PLANNING COMMISSION RECOMMENDATION:

MOTION: Whitfield moved, seconded by Lichter, to recommend approval of the Change of Zone of Lots 1 and 3 of the proposed Preliminary Plat to be known as Plambeck Addition Replat 1 from BG (General Business) to RG-15 with Lot 2 to remain zoned BG (General Business) for the subdivision to be known as Plambeck Addition Replat 1 as it is in conformance with the Sarpy County Comprehensive Development Plan and the Sarpy County Zoning Regulations. **Ballot:** *Ayes – Bliss, Lichter, Stuart, Ackley, Whitfield, Mohr, Malmquist, Fenster, Torczon and Farrell. Nays – none. Abstain – None. Absent – Davis. Motion carried.*

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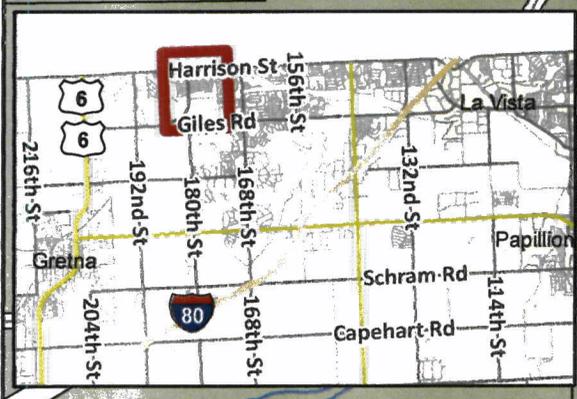
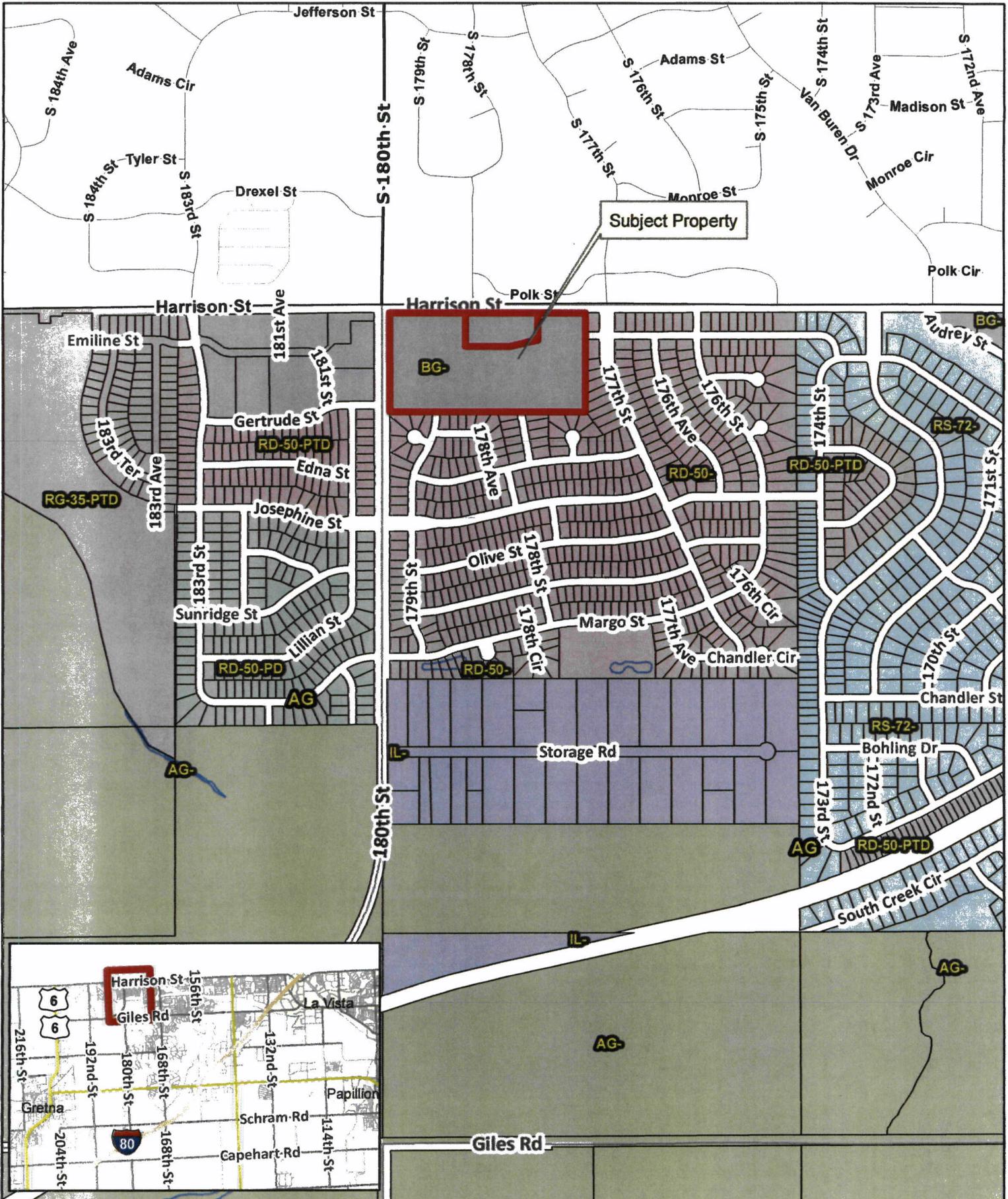
VI. ATTACHMENTS TO REPORT:

1. Current Zoning Map (showing subject property area)
2. Current Development Structure Plan – Figure 5.1 of Comprehensive Plan (showing subject property area)
3. Proposed Preliminary Plat as submitted
4. Conceptual Site Plan (for information only)
5. Letter from Staff to Applicant regarding review comments
6. Response letter from Applicant addressing review comments
7. Comments received from jurisdictional agencies or departments having an interest.
8. Traffic Impact Analysis prepared by Felsburg Holt & Ullevig
9. Preliminary Plat Application
10. Change of Zoning Application

VII. COPIES OF REPORT SENT TO:

1. LKM Investments (applicant)
2. Olsson Associates (applicant's engineer)
3. Public Upon Request

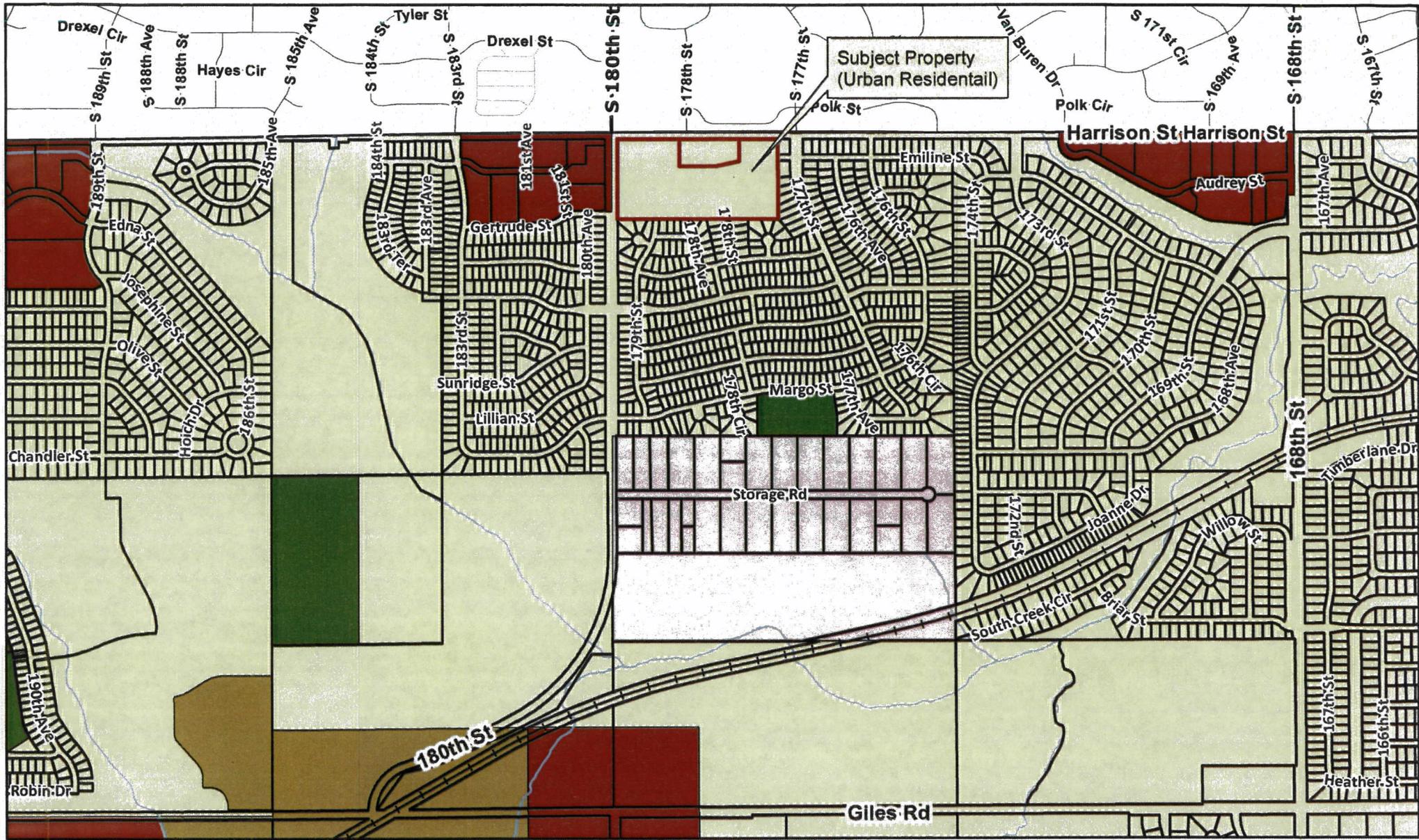
Report prepared by: Bruce Fountain, Director – Planning & Building Department



Vicinity Map - Zoning

SE 180th & Harrison St - Plambeck Addition Replat 1
 Change of Zone / Preliminary Plat





Current FLU - Sarpy Co

0 0.075 0.15 0.3 Miles



Comprehensive Development Plan
Figure 5.1: Development Structure Plan
 Sarpy County, Nebraska

Legend

- Highway Corridor Overlay
- Bellevue Future Growth
- Business Park
- Civic
- Conservation Residential
- Estate Residential
- Greenway
- Industrial
- Light Industrial/Storage
- Long Term Residential Growth
- Mixed Use
- Mixed Use Center
- New Richfield Village
- Park/School Site
- Plug Interchange Development
- Residential - Community Systems
- Urban Residential
- Urban Residential II
- Cross County Arterial
- City Limit
- City ETJ

PROPOSED ZONING

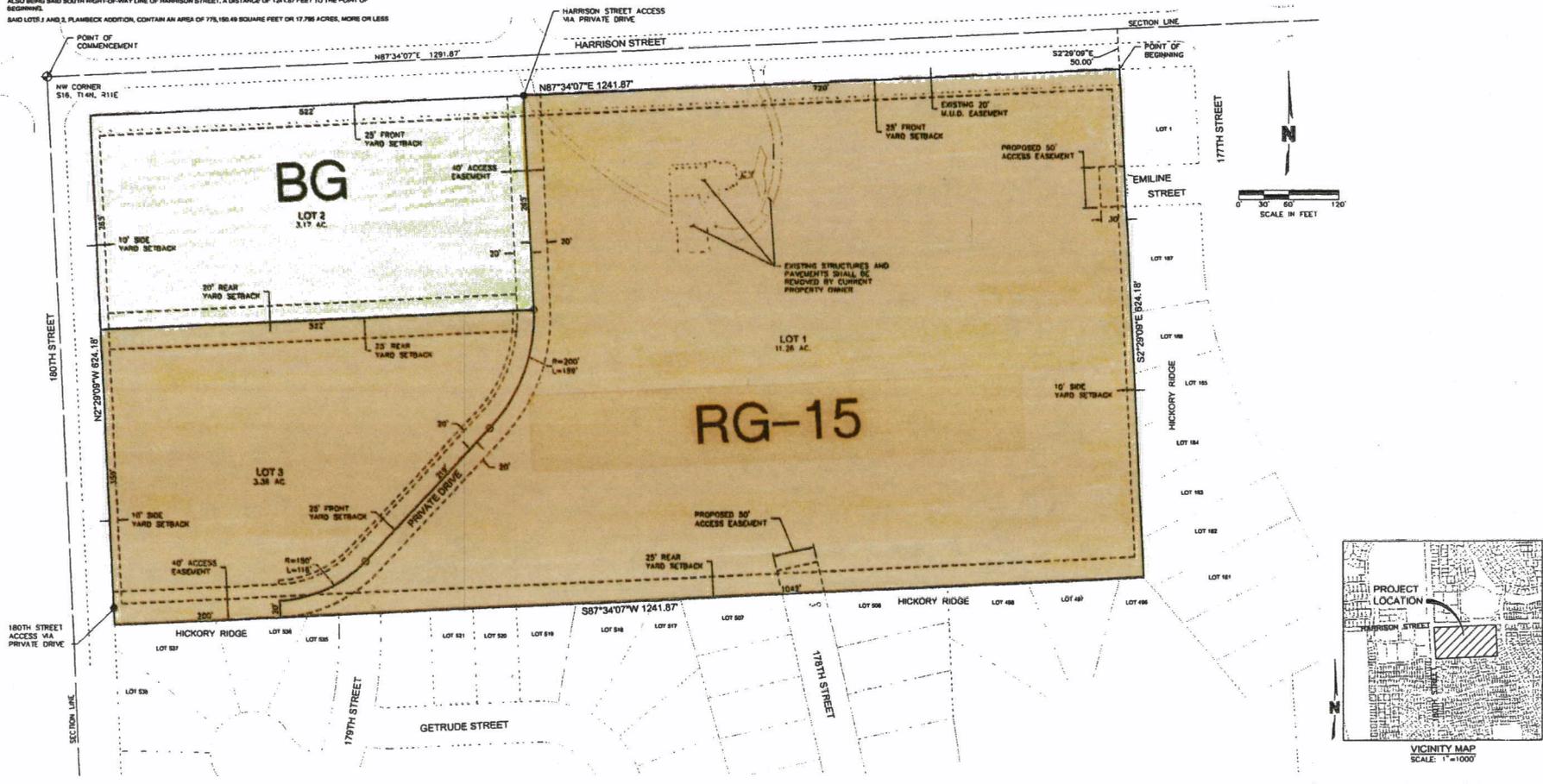
PLAMBECK ADDITION REPLAT 1

LOTS 1, 2, & 3

BEING A REPLATTING OF PLAMBECK ADDITION LOTS 1 AND 2, LOCATED IN THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 16, TOWNSHIP 14 NORTH, RANGE 11 EAST, OF THE 6TH P.M., SARPY COUNTY NEBRASKA

MEASURED LEGAL DESCRIPTION

LOTS 1 AND 2, PLAMBECK ADDITION, A SUBDIVISION LOCATED IN THE NW1/4 OF SECTION 16, TOWNSHIP 14 NORTH, RANGE 11 EAST OF THE 6TH P.M., SARPY COUNTY, NEBRASKA
 COMMENCING AT THE NORTHWEST CORNER OF SAID NW1/4 OF SECTION 16 THENCE EASTERLY ALONG THE NORTH LINE OF SAID NW1/4 ON AN ASSUMED BEARING OF N87°34'07"E, A DISTANCE OF 1291.87 FEET, THENCE S82°09'00"E, A DISTANCE OF 50.00 FEET TO THE NORTHEAST CORNER OF SAID LOT 2, PLAMBECK ADDITION, SAID CORNER ALSO BEING THE NORTHWEST CORNER OF LOT 1, HICKORY RIDGE, A SUBDIVISION LOCATED IN SAID NW1/4 OF SECTION 16, SAID CORNER ALSO BEING ON THE SOUTH RIGHT-OF-WAY LINE OF HARRISON STREET, SAID POINT ALSO BEING THE POINT OF BEGINNING, THENCE S82°09'00"E, A DISTANCE OF 50.00 FEET TO THE EAST LINE OF SAID LOT 2, PLAMBECK ADDITION, SAID LINE ALSO BEING THE WEST LINE OF SAID LOT 1, HICKORY RIDGE, SAID LINE ALSO BEING THE WEST LINE OF LOTS 182 THROUGH 187, SAID HICKORY RIDGE, A DISTANCE OF 84.18 FEET TO THE SOUTHWEST CORNER OF SAID LOT 2, PLAMBECK ADDITION, SAID CORNER ALSO BEING THE WEST CORNER OF SAID LOT 182, HICKORY RIDGE, SAID CORNER ALSO BEING THE NORTHEAST CORNER OF LOT 496, SAID HICKORY RIDGE, THENCE S87°34'07"W, A DISTANCE OF 1241.87 FEET TO THE WEST LINE OF SAID LOT 1, PLAMBECK ADDITION, SAID LINE ALSO BEING THE NORTH LINE OF LOTS 188 THROUGH 194, 802, 807, 817 THROUGH 822, AND 822 THROUGH 827, SAID HICKORY RIDGE, A DISTANCE OF 1241.87 FEET TO THE SOUTHWEST CORNER OF SAID LOT 2, PLAMBECK ADDITION, SAID CORNER ALSO BEING THE NORTHWEST CORNER OF SAID LOT 827, HICKORY RIDGE, SAID CORNER ALSO BEING ON THE EAST RIGHT-OF-WAY LINE OF 180TH STREET, THENCE WESTERLY ALONG THE WEST LINE OF SAID LOT 2, PLAMBECK ADDITION, SAID LINE ALSO BEING SAID EAST RIGHT-OF-WAY LINE OF 180TH STREET, A DISTANCE OF 84.18 FEET TO THE NORTHWEST CORNER OF SAID LOT 2, PLAMBECK ADDITION, SAID CORNER ALSO BEING THE POINT OF INTERSECTION OF SAID SOUTH RIGHT-OF-WAY LINE OF HARRISON STREET AND SAID EAST RIGHT-OF-WAY LINE OF 180TH STREET, THENCE N87°34'07"E ALONG THE NORTH LINE OF SAID LOT 2, PLAMBECK ADDITION, SAID LINE ALSO BEING THE NORTH LINE OF SAID LOT 1, PLAMBECK ADDITION, SAID LINE ALSO BEING SAID SOUTH RIGHT-OF-WAY LINE OF HARRISON STREET, A DISTANCE OF 1241.87 FEET TO THE POINT OF BEGINNING.
 SAID LOTS 1 AND 2, PLAMBECK ADDITION, CONTAIN AN AREA OF 778,180.49 SQUARE FEET OR 17.766 ACRES, MORE OR LESS.



SHEET INDEX	
C1.1	PRELIMINARY PLAT
C2.1	PRELIMINARY GRADING PLAN
C3.1	PRELIMINARY UTILITY PLAN

OLSSON ASSOCIATES
 P.L.L.C.
 2111 South 89th Street, Suite 202
 Omaha, NE 68128
 TEL: 402.341.1118
 FAX: 402.341.1208
 WWW.OLSSONASSOCIATES.COM

REV. NO.	DATE	REVISION DESCRIPTION

PRELIMINARY PLAT
 PROJECT TITLE
 180TH STREET AND HARRISON STREET
 2013

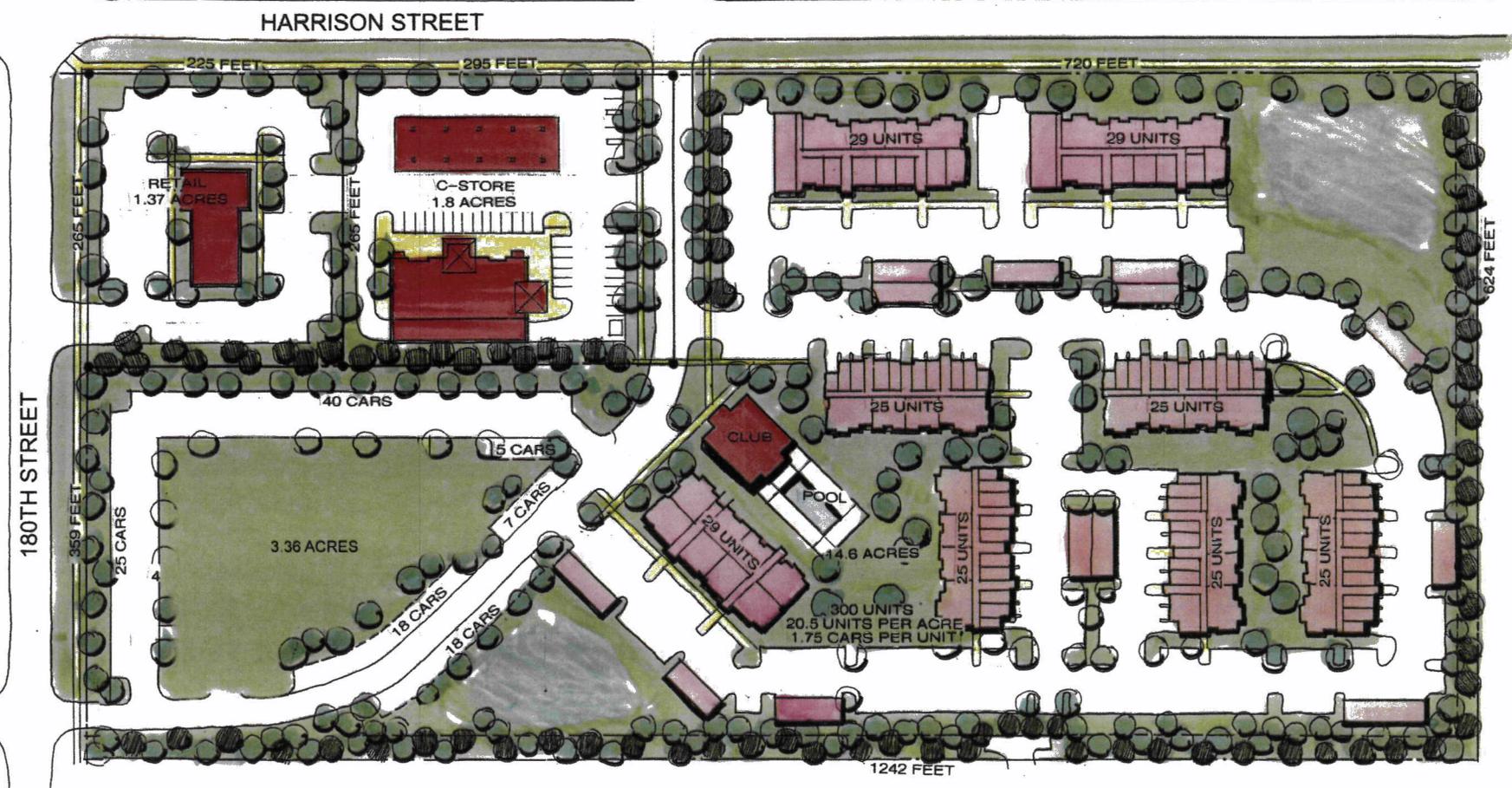
OMAHA, NEBRASKA



SHEET
 C1.1

FILE: P:\Projects\2013\177th\177th_Plat\177th_Plat.dwg
 DATE: 04/25/2013 11:11:00
 USER: jacob@olsson.com
 PLOT: 177th_Plat.dwg
 PLOT: 177th_Plat.dwg

CONCEPTUAL SITE PLAN





Sarpy County Planning & Building Department

Bruce Fountain, AICP, EDFP – Director

1210 Golden Gate Drive
Papillion, NE 68046
Phone: 402-593-1555
Fax: 402-593-1558
www.sarpy.com/planning

August 20, 2013

Justin Zetterman
Olsson Associates
2111 South 67th Street, Suite 200
Omaha NE 68106

RE: PLAMBECK ADDITION PRELIMINARY PLAT SUBMITTAL

The application for a Preliminary Plat for "Plambeck Addition" has been reviewed by the Planning Department staff and we have the following comments (applicable sections of the Sarpy County Subdivision Regulations):

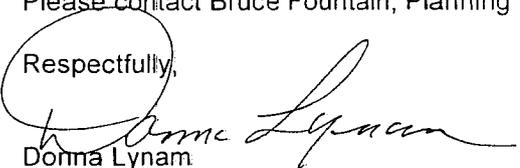
Preliminary Plat:

- Name of Subdivider needs to be included on the Preliminary Plat (6.2.2)
- Existing Structures within the platted area must be identified and shown (6.2.7)
- Setback lines for proposed zoning district (6.2.10)
- Section and half-section lines (6.2.11)
- Preliminary Drainage Plan (6.2.12)
- Draft Subdivision Agreement (6.2.13)
- Post construction Storm Water Management Plan (6.2.14)
- Profiles of existing ground surface and proposed street grades and typical cross section (6.2.15.13)
- Traffic Study on access to/from site
- Include "Private Roadway System" within the platted area (6.2.15.5)
- Delineation of what Sewer Service Area will be utilized for development
- Concerned that a 5 story structure is not consistent with development in the area
- Plans for existing streets from Hickory Ridge Subdivision that deadhead into this project
- Parking requirement: 2 parking spots per unit. We do not encourage including detached garages as required parking spots due to possible alternate use or lack of rental desires. (39.2.2)

Please note that additional comments may be generated from review by other governmental agencies. An additional letter will be sent if such additional comments are received. The staff of the Planning and Building Department would appreciate your response to the above issues at your earliest convenience to avoid any possible delays in the platting process. Please forward your response and or corrected documents to dlynam@sarpy.com.

Please contact Bruce Fountain, Planning Director, or myself at 402-593-1555 if you have any questions.

Respectfully,


Donna Lynam
Zoning Administrator/Code Enforcement
Sarpy County Planning

cc Bruce Fountain, Planning Director
Nicole O'Keefe, Deputy County Attorney
File



August 28, 2013

Sarpy County Planning & Building Department
ATTN: Donna Lynam
1210 Golden Gate Drive
Papillion, NE 68046

RE: Plambeck Addition Replat 1 Response Letter

Donna,

Thank you for taking the time to review this project. Below is a list describing how each comment has been addressed.

- LKM Investments, LLC has been added to the preliminary plat
- Existing structures have been added to the preliminary plat
- Setback lines have been added to the preliminary plat
- Section lines have been called out on the preliminary plat
- A preliminary drainage has been included as a part of the conceptual PCSMP. There will be no public storm sewers in this project.
- I am waiting for a copy of an existing subdivision agreement used by Sarpy County that I can modify.
- A conceptual PCSMP has been included in the submittal package
- There are no public streets within this project so no profiles have been submitted
- Traffic study requirement is being investigated with Public Works. Previous conversations had led us to believe that a study would not be required. There has been an access modification since that conversation. We will complete one if required and would be content to move forward with preliminary plat approval subject to an approved traffic study.
- Estimated location of the private road within the subdivision has been shown along with the locations where the private road will connect to Harrison Street and 180th Street have been added to the preliminary plat.
- A map showing the delineation of the Omaha and Gretna interceptor sewer systems that connect to this property has been included in this submittal package.
- The 5-story building previously shown on the preliminary site plan has been removed and the area is now designated as future multi-family and been placed within a separate lot.
- Plans for how to handle dead-end stub streets from Hickory Ridge are shown on C3.1 Preliminary Utilities Plan
- Preliminary site plan has been updated to show additional parking

Sincerely,

A handwritten signature in black ink, appearing to read 'Justin Zetterman', with a long horizontal flourish extending to the right.

Justin Zetterman, PE

08-23-13 PG 2 of 29 RCVD



September 3, 2013

Mr. Bruce Fountain, Director
Sarpy County Planning Department
1210 Golden Gate Drive
Papillion, Nebraska 68046

RE: Plambeck Addition Replat 1 – Preliminary Plat and Change of Zone Applications

Dear Mr. Fountain:

The District has reviewed the preliminary plat and change of zone applications for Plambeck Addition Replat 1, southeast of 180th Street and Harrison Street in Sarpy County. The District offers the following comments:

- A post construction stormwater management plan demonstrating on-site control of the first one-half inch of stormwater runoff and no-net increase in peak runoff from a 2-year storm event must be submitted for this project. An application and all supporting documentation must be submitted to the Omaha Permix website at <http://www.omahapermix.com/pcsmp/applicant/login.php>.
- A subdivision agreement was not provided for review; however, as stated in the Papillion Creek Watershed Partnership Interlocal Agreement adopted by the County in 2009, Watershed Management Fees are to be collected for all new development or significant redevelopment.

If you have any questions or concerns, I can be contacted at (402) 444-6222 or at llaster@papionrd.org.

Sincerely,

A handwritten signature in black ink, appearing to read "Lori Ann Laster", with a stylized flourish at the end.

Lori Ann Laster, CFM
Stormwater Management Engineer

Cc: Marlin Petermann, Amanda Grint, P-MRNRD

\\laster\My Documents\Permit-Zoning Reviews\Sarpy County\Reach 8-11\130903-Plambeck Addition Replat 1.doc
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SARPY COUNTY

Dennis L. Wilson, P.E., PhD
Sarpy County Engineer

PUBLIC WORKS DEPARTMENT
15100 South 84th Street • Papillion, NE 68046-2895
Phone (402) 537-6900 • FAX (402) 537-6955 • www.sarpy.com

MEMO

TO: Donna Lynam, Zoning Administrator / Code Enforcement

FROM: Patrick M. Dowse, P.E., Engineering Manager *PM*

DATE: August 30, 2013

RE: Change of Zone and Preliminary Plat – Plambeck Addition Replat 1

Sarpy County Public Works has reviewed the August 5, 2013 submittals by LKM Investments in regards to the Change of Zone and Preliminary Plat Applications for the above referenced parcel. After review, Public Works has the following comments:

CHANGE OF ZONE

Sarpy County Public Works has no objections to the proposed Change of Zone for the above referenced parcel.

PRELIMINARY PLAT

Harrison Street and 180th Street are major corridors and should require provisions for adequate Right-of-Way to allow for the ultimate build-out for the intersection, most likely consisting of a six lane section; two through lanes, two left turn lanes, and two opposing through lanes. Coupling this with pedestrian facilities, at a minimum, an additional ten feet of Right-of-Way should be dedicated for 300 feet fronting the east leg of Harrison Street, and 300 feet fronting the south leg of 180th Street.

178th Street Access will most likely not be a full access when future improvements are made to Harrison Street, and the access is scheduled on the Douglas County side to be a Right In – Right Out only (RIRO) in these future improvements. Discussions may take place to consider alternatives to the ¾ access, but full access will not remain as the access is closer than 1/8 mile (660 feet) to the major intersection of 180th Street, and full access will significantly impact traffic flow.

As the 178th Street access will be limited at some point, the access at Gertrude Street at 180th Street should remain as full access. The proposed access north of this access, approximately half way between Gertrude Street and Harrison Street should not be

allowed, as access this close to the major intersection, even as a RIRO, will significantly impact traffic on the major roadway.

A traffic study to determine the impacts to current and future traffic conditions should be carried out prior to the platting of this parcel. The C-Store and perceived density of this parcel make it apparent a traffic study is warranted.

The perceived free-flow movement of the drive connecting the Gertrude Street access to the 178th Street access may become a pass-through for motorists trying to short cut the intersection going from northbound 180th Street to eastbound Harrison Street. Considerations should be made to discourage this type of traffic movement.

The developer and the SID should consider working with the adjacent SID to remove the short section of 179th Street from Edna Street to the South Boundary of the development. Removing the section of road and vacating the Right-of-Way will reduce unintended uses such as vehicle storage or loitering.

The proposed hammerhead at the north end of 178th Street on the south edge of the development needs to be reviewed by the appropriate Fire Department in which the development resides to be sure of its acceptability for fire protection standards or ordinances.

Please include setback lines as set forth by the Preliminary Plat Requirement 6.2.10

Please let me know if you have any further questions.



SARPY COUNTY

Dennis L. Wilson, P.E., PhD
Sarpy County Engineer

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Phone (402) 537-6900 • FAX (402) 537-6955 • www.sarpy.com

MEMO

TO: Donna Lynam, Zoning Administrator / Code Enforcement

FROM: Patrick M. Dowse, P.E., Engineering Manager *PM*

DATE: October 8, 2013

RE: Change of Zone and Preliminary Plat – Plambeck Addition Replat 1

In addition to the August 30th, 2013 submittal, Public Works has the following comments:

PRELIMINARY PLAT

The Right-In-Right-Out access (RIRO) south of Harrison Street should not be allowed as the adjacent plat, Sunridge Replat Two, has within the NOTES section that no additional access was to be granted to Harrison Street or 180th Street other than the 181st Avenue access to Harrison Street and the Gertrude Street access to 180th Street for the lots in the northwest corner. The traffic study should be reanalyzed to reflect this change and to verify if a right-turn lane is warranted for the northbound 180th Street to eastbound Gertrude Street movement.

Per the Traffic Impact Analysis performed by Felsburg, Holt and Ullevig, it is recommended a right turn lane be constructed on Harrison Street for the eastbound to southbound movements onto 178th Street. Harrison Street also falls under the "City of Omaha Driveway Guide" requirements in which a right-turn deceleration lane shall be provided for all commercial driveways in which the street has a speed of 40 MPH or greater. A minimum storage length of 150 feet is required for this right-turn lane. Also, as per recommendations, the westbound approach of Gertrude Street, an exclusive left-turn lane and a shared through/right lane should be provided at the intersection.

Engineering drawings for the access at Gertrude Street to 180th Street and at 178th Street to Harrison Street should be provided, at a minimum within the public Right-of-Way, but preferably to the end of return of the accesses so that Public Works can review grades, to verify the approaches are acceptable to County standards.

Please let me know if you have any questions.

**180th & HARRISON
TRAFFIC IMPACT ANALYSIS**

Prepared for:

The Lund Company
450 Regency Parkway, Suite 220
Omaha, NE 68114

Prepared by:

Felsburg Holt & Ullevig
11422 Miracle Hills Drive, Suite 115
Omaha, NE 68154
402-445-4405

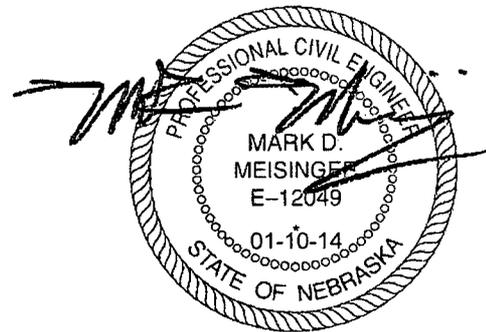
Project Manager: Mark Meisinger, PE, PTOE
Project Engineer: Adam Denney, EI

FHU Reference No. 13-270-01
January 2014

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I. INTRODUCTION

This is a traffic impact analysis (TIA) for the 180th & Harrison development located along Harrison Street between 177th Street and 180th Street in Omaha, Nebraska. Felsburg Holt & Ullevig (FHU) has recently completed data collection and analysis at some of the study intersections as part of the *Harrison Street Corridor Study* for Sarpy County, Douglas County, and the City of Omaha. The location of the development in relation to the surrounding roadway network is shown on **Figure 1**. The site plan for the proposed development is shown on **Figure 2**.

The 180th & Harrison development is a proposed mixed use development with an apartment complex, a gas station, and a retail pad site. The proposed development is located east of 180th Street, just south of Harrison Street. To the north of the site sits Georgia Wheeler Elementary School. The land to the south and east is mainly residential. The 180th & Harrison development is divided into two phases. This study evaluates two scenarios: Phase I and Phase II of the project. Phase I of the development is anticipated to be completed in 2014 and Phase II of the site is anticipated to be constructed by 2018.

The proposed development consists of approximately 300 apartment units, and 3.17 acres of retail space. The proposed retail sites include a 6,000 square foot (SF) convenience store with 10 fueling positions and a retail store of approximately 4,500 SF. Also included in the development are two water quality ponds.

Access to the site will be provided at three locations; a ¾ access at 178th Street onto Harrison Street, Gertrude Street onto 180th Street, and a right-in/right-out (RIRO Drive) access onto 180th Street approximately 250 feet south of Harrison Street.

Anticipated traffic operations with the proposed development have been evaluated at the following intersections:

- 180th Street & Gertrude Street
- 180th Street & Right-in/Right-out Drive
- 180th Street & Harrison Street
- 178th Street & Harrison Street (¾ access)
- 177th Street & Harrison Street

The analysis evaluates the following time periods:

- Existing (2013) morning and evening peak hours
- Initial build-out year (2014) for Phase I of the development for the AM and PM peak hours
- Full build-out year (2018) for Phase II of the development for the AM and PM peak hours

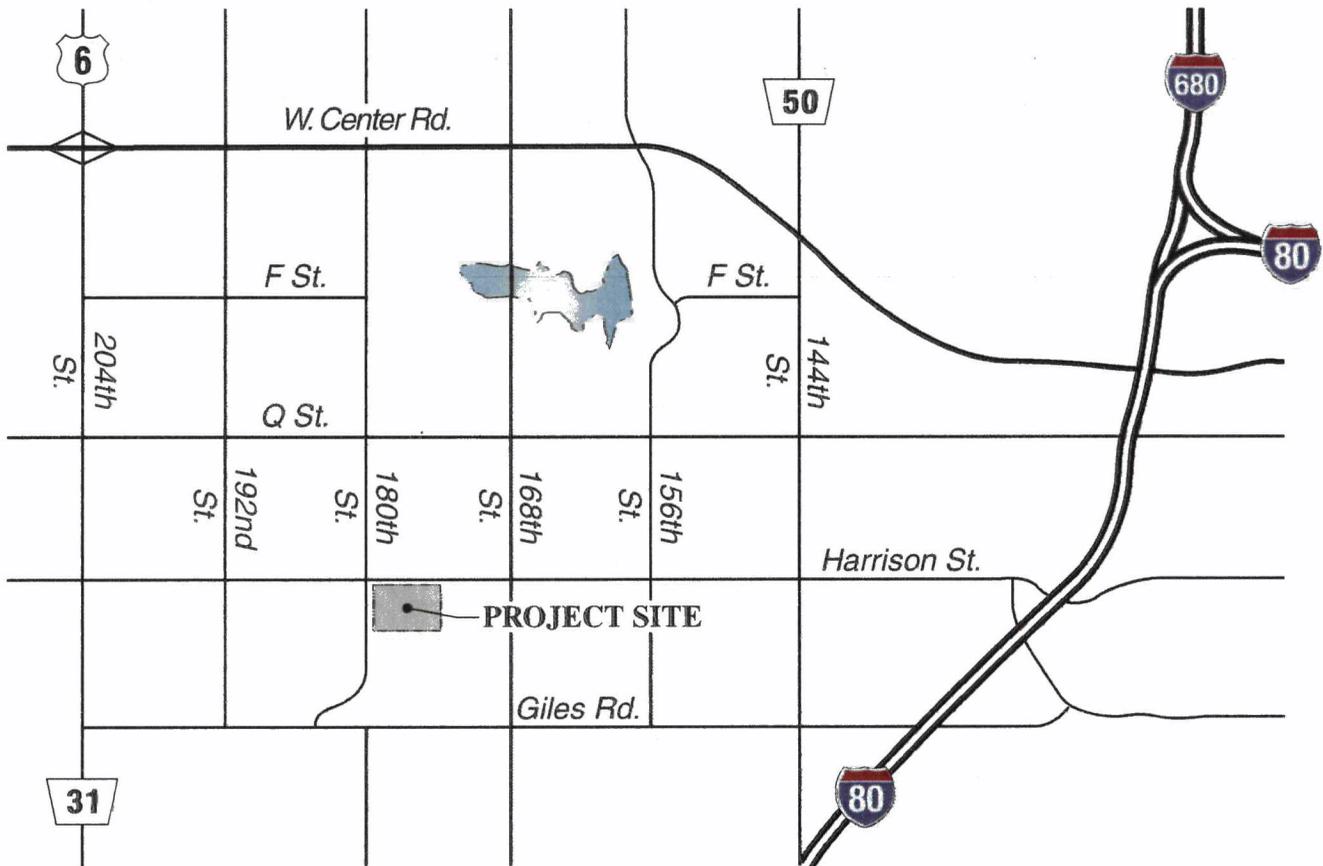


Figure 1
Vicinity Map

NORTH

II. EXISTING CONDITIONS

A. Surrounding Land Uses

The 180th & Harrison development is a proposed mixed use development with an apartment complex, a gas station, and a retail pad site. The proposed development is located east 180th Street just south of Harrison Street. To the north of the site sits Georgia Wheeler Elementary School. The land use surrounding the proposed development is residential to the east and south.

B. Roadway Network

The existing roadway system in the study area includes the following primary facilities:

Harrison Street runs east-west and is located on the Douglas County / Sarpy County line. Harrison Street is located approximately one mile south of Q Street and one mile north of Giles Road. In the study area, Harrison Street is a three-lane roadway. A traffic signal is provided at the arterial roadway intersection of Harrison Street with 180th Street and exclusive left-turn lanes are provided on all four approaches. The posted speed limit along Harrison Street in the study area is 45 mph.

180th Street runs north-south and is generally a three-lane roadway in the study area. The posted speed limit on 180th Street in the study area is 45 mph. At Gertrude Street and Harrison Street northbound and southbound exclusive left-turn lanes are provided.

178th Street runs north-south on the north side of the proposed development and is generally a two-lane roadway. 178th Street is the primary access point for Georgia Wheeler Elementary School to the north of the proposed site. The roadway in a school zone has a posted speed limit of 20 mph when children are presents.

177th Street runs north-south on the east side of the proposed development and is generally a two-lane roadway. To the north of Harrison Street, the roadway is in a school zone has a posted speed limit of 20 mph when children are presents. To the south, 177th Street has a posted speed limit of 25 mph.

Gertrude Street runs east-west west of 180th Street, paralleling Harrison Street. This will serve as the primary access off 180th Street to the site. The roadway is a two lane roadway with a posted speed limit of 25 mph.

C. 2013 Existing Traffic Volumes

Turning movement counts for the study area intersections were obtained from the *Harrison Street Corridor Study*. The AM peak hour was determined to be 7:00 AM to 8:00 AM, and the PM peak hour was 5:00 PM to 6:00 PM. Additional peak period turning movement counts were conducted by FHU for the 180th & Harrison development in September 2013 for both the AM and PM peak periods at the intersections of 180th Street with Gertrude Street and Harrison Street with 178th Street. Existing 2013 traffic volumes are summarized on **Figure 3**.

Traffic operations were analyzed for the study intersections using procedures documented in the *HCM 2010 Highway Capacity Manual*, Transportation Research Board, December 2010. From the analyses, a key measure or "level of service" rating of the traffic operational condition was obtained. In general, level of service (LOS) is a qualitative assessment of traffic operational conditions within a traffic stream in terms of the average stopped delay per vehicle at a controlled intersection. Levels of service are described by a letter designation of either A, B, C, D, E or F, with LOS A representing essentially uninterrupted flow, and LOS F representing a breakdown of traffic flow with noticeable congestion and delay. Unsignalized, or stop sign controlled, intersection capacity analyses produce LOS results for each movement which must yield to conflicting traffic at the intersection.

Table 1 summarizes LOS criteria for signalized and unsignalized (stop sign controlled) intersections.

Table 1. Level of Service (LOS) Criteria

Level of Service	Average Control Delay per Vehicle (sec/veh)	
	Signalized Intersections	Stop Sign Controlled Intersections
A	≤ 10	≤ 10
B	> 10 to 20	> 10 to 15
C	> 20 to 35	> 15 to 25
D	> 35 to 55	> 25 to 35
E	> 55 to 80	> 35 to 50
F	> 80	> 50

HCM 2010, Exhibit 18-4 & Exhibit 19-1

The Synchro traffic analysis software program was utilized to analyze traffic operations at the study intersections. **Figure 3** shows the lane geometry, traffic control, and levels of service for existing 2013 traffic conditions. The signalized intersection of Harrison Street with 180th Street currently operates at LOS C in the AM and PM peak periods.

At the unsignalized intersection of Harrison Street with 177th Street the northbound left-turn movement currently operates at LOS F in the AM peak hour and LOS E in the PM peak hour. The southbound left-turn movement currently operates at LOS F in both the AM and PM peak periods. The southbound through/right-turn movement currently operates at LOS D in the AM peak hour and LOS E in the PM peak hour. All other movements at the Harrison Street with 177th Street intersection currently operate at LOS C or better during the peak hours.

At the unsignalized intersection of Harrison Street with 178th Street the southbound left/right movement currently operates at LOS E in the AM peak hour and LOS D in the PM peak hour. All other movements at the Harrison Street with 178th Street intersection currently operate at LOS A during the peak hours.

Along 180th Street, all critical movements at the unsignalized intersections with Gertrude Street currently operate at LOS C or better in both the AM and PM peak hours. Capacity analysis worksheets for existing traffic conditions are included in the **Appendix**.

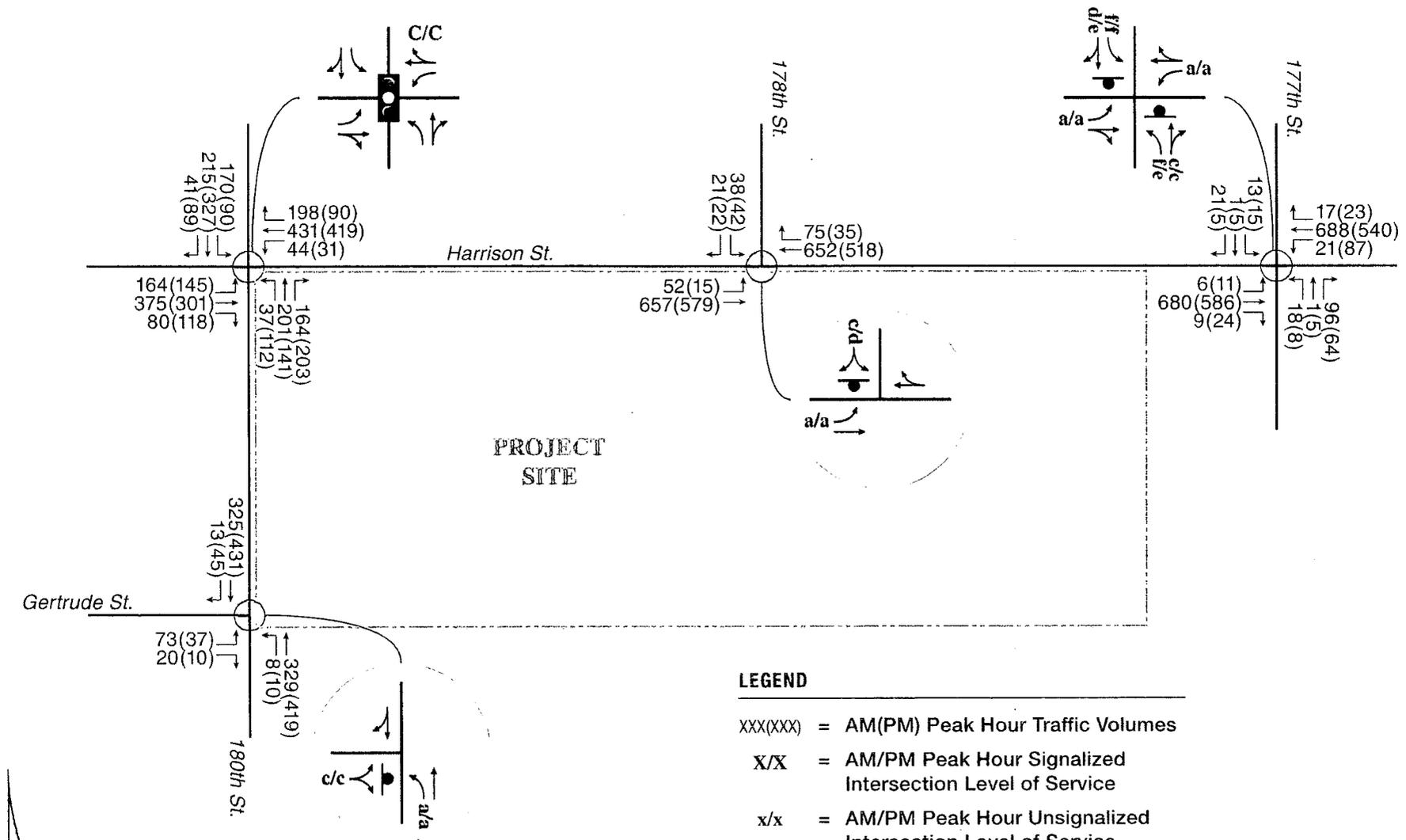


Figure 3
2013 Existing Traffic Conditions

III. TRAVEL DEMAND ANALYSIS

A. Site Trip Generation

Trip generation rates from the Institute of Transportation Engineers' (ITE) *Trip Generation*, Ninth Edition, 2012, were utilized to estimate the traffic generated by Phase I and full build-out of the development.

The proposed development consists of approximately 14.62 acres of land divided into two phases (Phase I and full build-out). In Phase I, 225 apartment units and a clubhouse are proposed along with a gas station and retail site. In the future full build-out, approximately 75 additional apartment units are proposed making a total of 300 total apartment units for the proposed site. The retail lot was analyzed using the Fast-Food Restaurant w/ Drive Thru (ITE Code 934) land use type and the gas station was analyzed using the Convenience Market w/ Gas Pumps (ITE Code 853) land use type. Both phases of the development were analyzed using the Apartment (ITE Code 220) land use type for the apartment complex. **Tables 2a and 2b** summarize the estimated vehicle-trips that would be generated by the proposed facility.

Table 2a. Phase I 180th & Harrison Site Trip Generation

Land Use Description	ITE Code	Size	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Apartment (Phase I Build-out)	220	25 DU	1,487	23	91	114	92	49	141
Convenience Market w/ Gas Pumps	853	6 KSF	5,074	132	132	264	179	179	358
Fast-Food Restaurant w/ Drive Thru	934	4.5 KSF	2,233	113	109	222	79	73	152
PHASE I PROJECT TOTAL			8,794	268	332	600	350	301	651

DU = dwelling units KSF = 1,000 square feet

As shown above, Phase I of the project will generate approximately 8,794 vehicle-trips per day with a total of 600 vehicle-trips during the AM peak hour and 651 vehicle-trips during the PM peak.

Table 2b. Phase II 180th & Harrison Site Trip Generation

Land Use Description	ITE Code	Size	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Apartment (Phase I Build-out)	220	25 DU	1,487	23	91	114	92	49	141
Convenience Market w/ Gas Pumps	853	6 KSF	5,074	132	132	264	179	179	358
Fast-Food Restaurant w/ Drive Thru	934	4.5 KSF	2,233	113	109	222	79	73	152
Apartment (Phase II Build-out)	220	75 DU	578	8	32	40	38	21	59
PHASE II PROJECT TOTAL			9,372	276	364	640	388	322	710

DU = dwelling units KSF = 1,000 square feet

With the addition of the 75 apartment units, the site will generate approximately 578 additional vehicle-trips per day with an additional 40 vehicle-trips during the AM peak hour and 59 vehicle-trips during the PM peak hour. This brings the total site-generated traffic for the 180th and Harrison development to 9,372 vehicle-trips per day with a total of 640 vehicle-trips during the AM peak hour and 710 vehicle-trips during the PM peak hour.

B. Trip Distribution and Traffic Assignment

The estimated distribution of site generated traffic was based upon existing traffic patterns and projected growth in the project area. The following distribution percentages were used to assign site generated vehicle-trips to the adjacent roadway network (AM%/PM%):

- 25%/20% oriented to the north via 180th Street
- 20%/25% oriented from the north via 180th Street
- 20%/20% oriented to/from the south via 180th Street
- 30%/30% oriented to the east via Harrison Street
- 30%/25% oriented from the east via Harrison Street
- 25%/30% oriented to the west via Harrison Street
- 30%/30% oriented from the west via Harrison Street

The trip distribution percentages identified above and traffic assignments for Phase I of the development are graphically shown on **Figure 4**. In addition, the trip distribution percentages and traffic assignments for the additional 75 apartment units for Phase II of the development are graphically shown on **Figure 5**. The site generated traffic volumes identified in **Tables 2a and 2b** were assigned to the study intersections according to these distribution patterns.

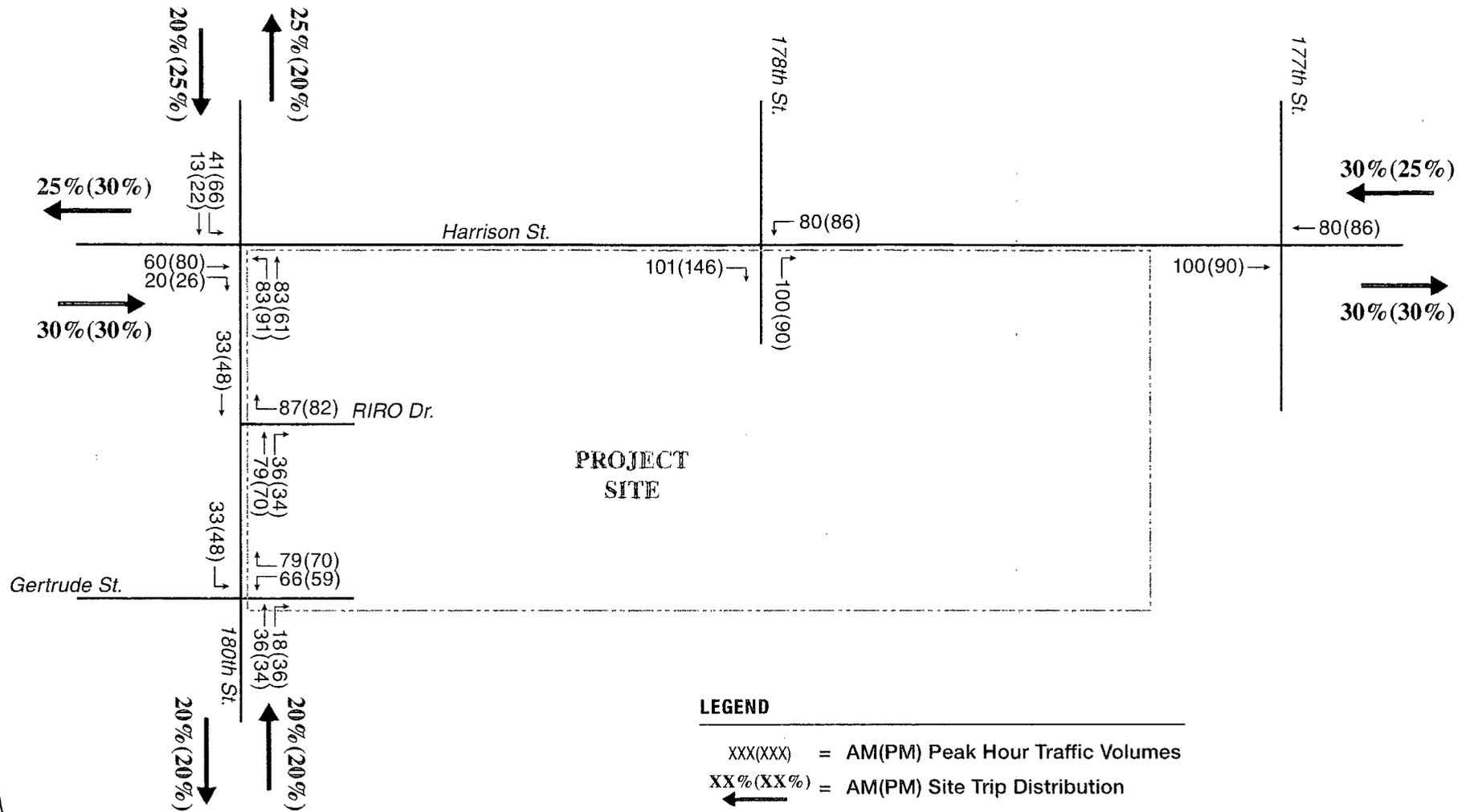


Figure 4
Phase I Site-Generated Traffic Volumes

NORTH

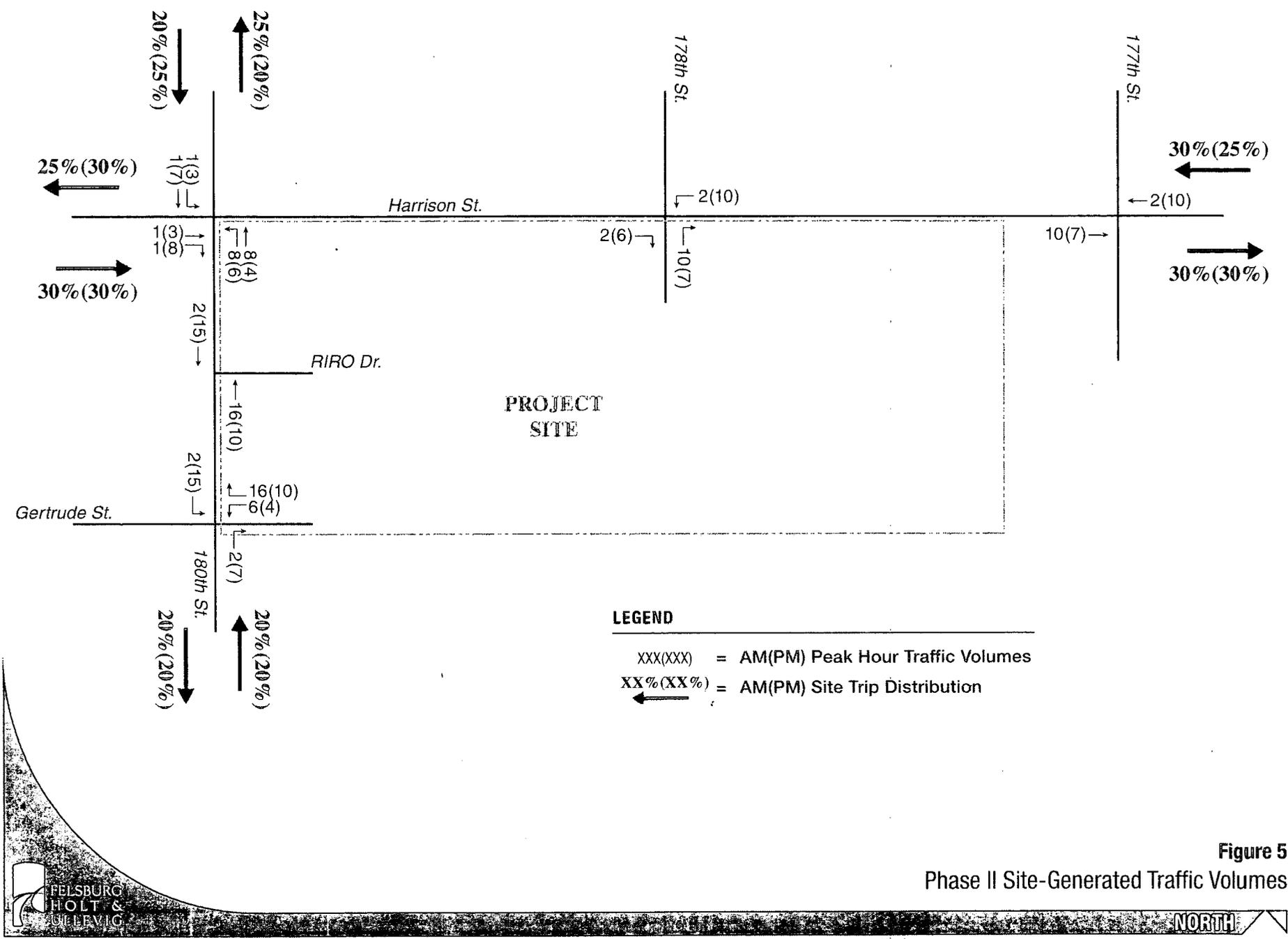


Figure 5
 Phase II Site-Generated Traffic Volumes



IV. BACKGROUND TRAFFIC CONDITIONS

A. Previous Studies

Currently, a corridor study is being completed by FHU for the Harrison Street Corridor from 144th Street to 204th Street (*Harrison Street Corridor Study*). The corridor study evaluates conditions in the existing year (2013), interim year (2018), and future year (2035) to determine traffic operations, recommend improvements, and improve safety on the Harrison Street Corridor. The goal of this study is to identify improvements and outline policies that should be implemented along the Harrison Street corridor to accommodate the future growth and travel within the study area. Stakeholders of the study include Sarpy County, Douglas County, the City of Omaha, and the Metropolitan Area Planning Agency (MAPA).

B. Future Roadway Improvements

One of the main purposes of the *Harrison Street Corridor Study* is to identify roadway improvements for the corridor. Based on the study, it is recommended that the following improvements be made in the study area of the 180th and Harrison development by 2018:

- Exclusive right-turn lanes should be constructed on all four approaches at the signalized intersection of Harrison Street with 180th Street.

By 2035, the following improvements are recommended from the *Harrison Street Corridor Study* for the study area of the 180th and Harrison development:

- At the intersection of Harrison Street with 180th Street, in addition to widening Harrison Street to a 4-lane roadway, it is recommended that 180th Street be widened to a 4-lane roadway as well. Other intersection improvements include auxiliary right-turn lanes on all approaches of the intersection in addition to the exclusive left-turn lanes.

C. Access Management Policies

Several access management policies were also recommended in the *Harrison Street Corridor Study* and will be adopted by the stakeholders. The policies included limiting the nearest full-movement access point to at least 1/8 mile (660 feet) from the nearest signalized intersection. In the 180th and Harrison development study area, the proposed RIRO Drive and 178th Street lie within the spacing requirements and should not be allowed full access. However, along 180th Street, Gertrude Street is located 660 feet south of Harrison Street and per the access policies, full access shall be allowed.

V. 2014 PHASE I TRAFFIC CONDITIONS

A. 2014 Phase I Traffic Volumes

It is anticipated that Phase I of the 180th & Harrison Development will be completed by the end of 2014. The Phase I site generated traffic in **Figure 4** was then added to the existing traffic volumes in **Figure 3** to develop the 2014 Phase I Build Traffic Volumes as shown in **Figure 6**.

In the AM peak hour, at the intersection of Harrison Street with 180th Street, the estimated site related approaching traffic volume is 300 vehicles per hour (vph) and the total approaching intersection volume is 2,420 vph. The site related traffic represents 12% of the total intersection volume in the AM peak hour.

In the PM peak hour, at the intersection of Harrison Street with 180th Street, the estimated site related approaching traffic volume is 346 vph and the total approaching intersection volume is 2,412 vph. The site related traffic represents 14% of the total intersection volume in the PM peak hour.

B. 2014 Phase I Traffic Operations

A review of unsignalized study intersection of 180th Street with Gertrude Street was performed to determine if MUTCD traffic signalization warrants 1 or 2 would be satisfied under 2014 Phase I build traffic volumes. This review indicated that traffic levels at the intersection of 180th Street with Gertrude Street would not satisfy warrants 1 or 2. It should be noted that a 100% right-turn reduction was applied to the traffic volumes.

Figure 6 illustrates anticipated traffic operations at the study intersections for the 2014 Phase I scenario. The following intersection improvements should be implemented at the study intersections by 2014:

- The signalized intersection of Harrison Street with 180th Street is anticipated to operate at LOS D in the AM peak hour and LOS C in the PM peak period. No additional improvements are needed by 2014.
- At the unsignalized intersection of Harrison Street with 177th Street, the northbound left-turn movement is anticipated to operate at LOS F in both the AM and PM peak periods. The southbound left-turn movement is anticipated to operate at LOS F in both the AM and PM peak periods. The southbound through/right movement is anticipated to operate at LOS D in the AM peak hour and LOS F in the PM peak hour. All other movements at the Harrison Street with 177th Street intersection are anticipated to operate at LOS D or better during the AM and PM peak hours.
- At the unsignalized intersection of Harrison Street with 178th Street access should be limited to 3/4 access with only right-turn being allowed on the northbound and southbound approaches. The northbound and southbound right-turn movements are anticipated to operate at LOS C or better in both the AM and PM peak periods. As part of the site improvements, along with restricting access, it is recommended that an eastbound right-turn lane be constructed.

- At the unsignalized intersection of 180th Street with RIRO Drive, the stop-controlled westbound right-turn is anticipated to operate at LOS B or better in the AM and PM peak periods.
- Along 180th Street, at the unsignalized intersection with Gertrude Street, the eastbound approach is anticipated to operate at LOS D in the AM peak period and LOS E in the PM peak period. All other critical movements are anticipated to operate at LOS D or better in both the AM and PM peak hours. Although MUTCD traffic signal warrants are not satisfied, it is recommended that traffic operations be monitored at the intersection of 180th Street with Gertrude Street to determine if future improvements are needed. As part of the site improvements, it is recommended that on the westbound approach, an exclusive left-turn lane and a shared through/right lane be provided at the intersection.

Capacity analysis worksheets for 2014 Phase I traffic conditions are included in the **Appendix**.

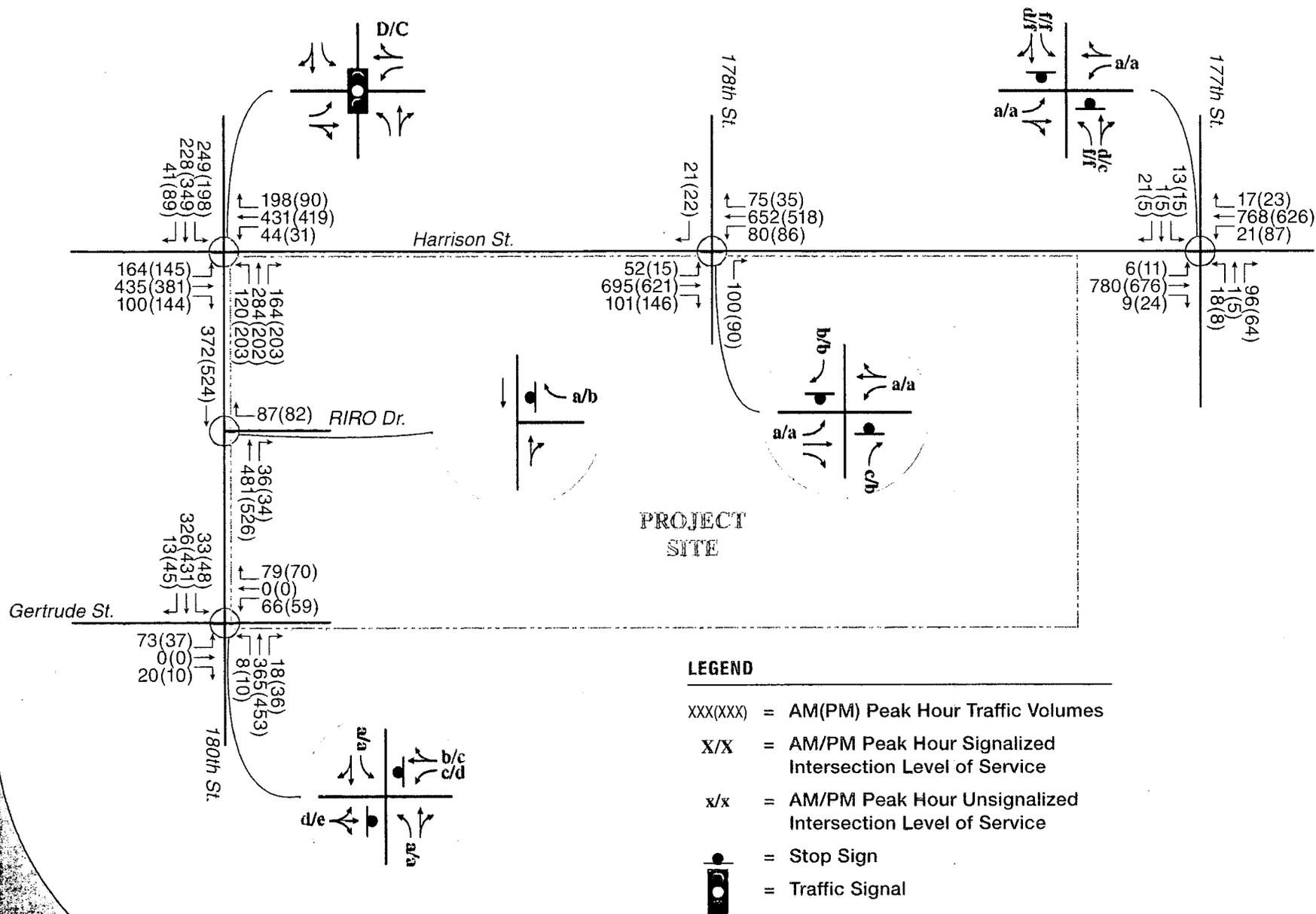


Figure 6
2014 Phase I Build Traffic Conditions

VI. 2018 FULL BUILD-OUT TRAFFIC CONDITIONS

A. 2018 Background Traffic Volumes

Turning volumes for 2018 background traffic conditions for the intersections of Harrison Street with 177th Street and 180th Street were obtained from the *Harrison Street Corridor Study*. Turning volumes for the intersections of Harrison Street with 178th Street and 180th Street with Gertrude Street were developed by applying a growth percentage of 4.5% as identified in the *Harrison Street Corridor Study*. The percentage was then applied to the side street volumes to obtain 2018 background traffic volumes for the intersections of Harrison Street with 178th Street and 180th Street with Gertrude Street.

B. 2018 Background Traffic Conditions

A review of unsignalized study intersection of 180th Street with Gertrude Street was performed to determine if MUTCD traffic signalization warrants 1 or 2 would be satisfied under 2018 background traffic volumes. This review indicated that traffic levels at the intersection of 180th Street with Gertrude Street would not satisfy warrants 1 or 2. It should be noted that a 100% right-turn reduction was applied to the traffic volumes.

Figure 7 illustrates anticipated traffic operations at the study intersections for the 2018 background scenario. The following summary of intersection operations at the study intersections by 2018 assumes no improvements are made from the existing lane configurations:

- The signalized intersection of Harrison Street with 180th Street is anticipated to operate at LOS F in the AM peak hour and LOS E in the PM peak period.
- At the unsignalized intersection of Harrison Street with 177th Street the northbound left-turn movement is anticipated to operate at LOS F in both the AM and PM peak periods. The northbound shared through/right-turn is anticipated to operate at LOS F in the AM peak hour and LOS D in the PM peak hour. The southbound left-turn and shared through/right-turn movements are anticipated to operate at LOS F in both the AM and PM peak periods. All other movements at the Harrison Street with 177th Street intersection are anticipated to operate at LOS B or better during the AM and PM peak hours.
- At the unsignalized intersection of Harrison Street with 178th Street the southbound left/through/right movement is anticipated to operate at LOS F in both the AM and PM peak periods. All other movements at the Harrison Street with 178th Street intersection are expected to operate at LOS B or better during the AM and PM peak hours.
- Along 180th Street, at the unsignalized intersection with Gertrude Street the eastbound approach is anticipated to operate at LOS E in both the AM and PM peak periods. All other critical movements are anticipated to operate at LOS A in both the AM and PM peak hours.

Capacity analysis worksheets for 2018 background traffic conditions scenario are included in the **Appendix**.

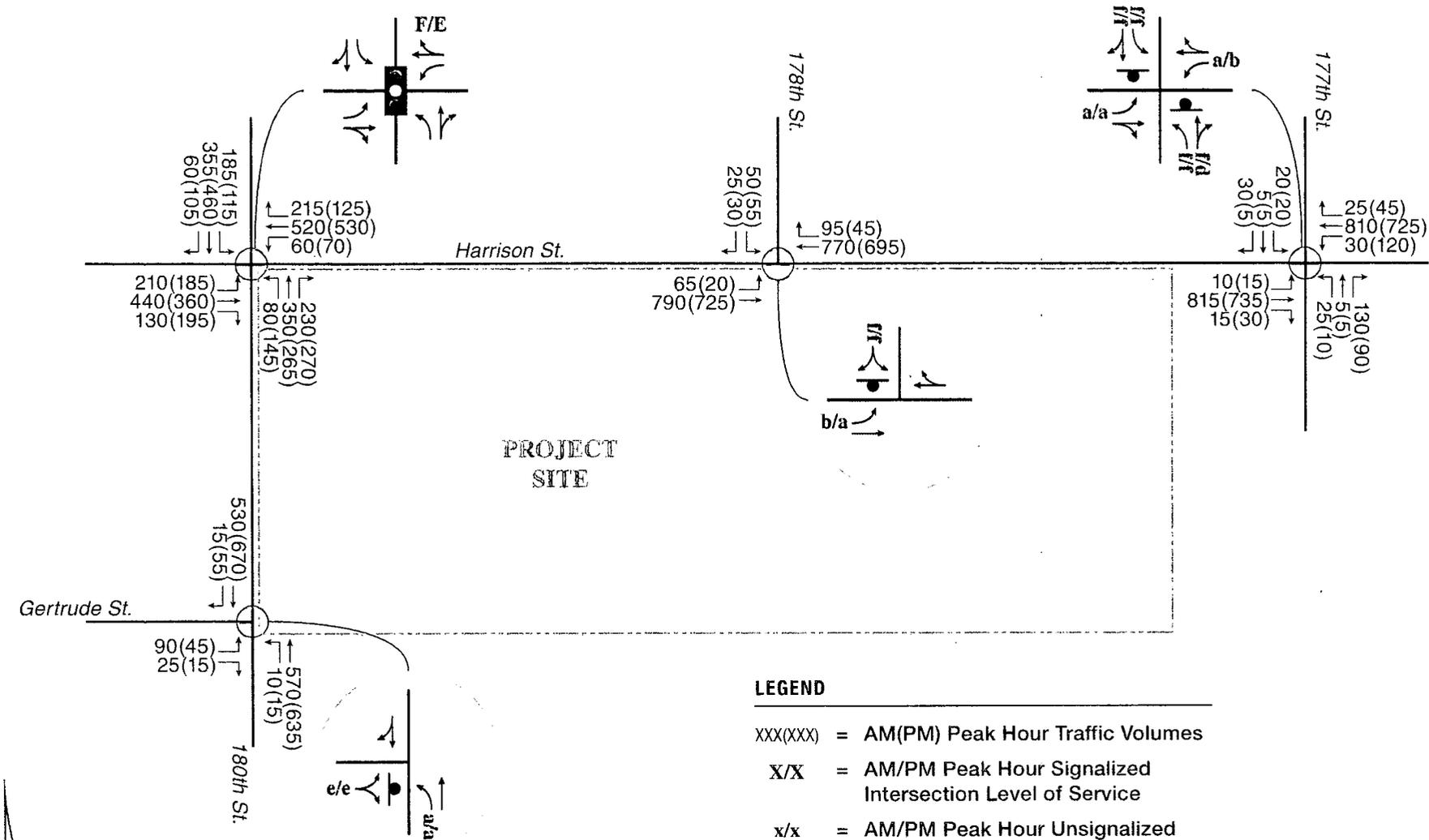


Figure 7
2018 Background Traffic Conditions

C. 2018 Phase II Build Traffic Volumes

It is anticipated that Phase II of the 180th & Harrison development will be completed in 2018. The Phase I generated traffic volumes on **Figure 4** and the Phase II generated traffic volumes in **Figure 5** were then added to the 2018 background traffic volumes in **Figure 7** to develop the 2018 Phase II Build Traffic Volumes as shown in **Figure 8**.

In the AM peak hour, at the intersection of Harrison Street with 180th Street, the estimated site related approaching traffic volume is 320 vehicles per hour (vph) and the total approaching intersection volume is 3,155 vph. The site related traffic represents 10% of the total intersection volume in the AM peak hour.

In the PM peak hour, at the intersection of Harrison Street with 180th Street, the estimated site related approaching traffic volume is 377 vph and the total approaching intersection volume is 3,202 vph. The site related traffic represents 12% of the total intersection volume in the PM peak hour.

D. 2018 Phase II Build Traffic Conditions

A review of the unsignalized study intersection of 180th Street with Gertrude Street was performed to determine if MUTCD traffic signalization warrants 1 or 2 would be satisfied with 2018 Phase II traffic volumes. This review indicated that traffic levels at the intersection of 180th Street with Gertrude Street would not satisfy warrants 1 or 2. It should be noted that a 100% right-turn reduction was applied to the traffic volumes.

Figure 8 illustrates anticipated traffic operations at the study intersections for the 2018 Phase II scenario. The following intersection improvements should be implemented at the study intersections by 2018 assuming all suggested improvements recommended for Phase I have been constructed:

- The signalized intersection of Harrison Street with 180th Street is anticipated to operate at LOS D in the AM peak hour and LOS C in the PM peak period. Per recommendations from the *Harrison Street Corridor Study*, exclusive right-turn lanes should be constructed on all four approaches at the signalized intersection of Harrison Street with 180th Street.
- At the unsignalized intersection of Harrison Street with 177th Street the northbound left-turn movement is anticipated to operate at LOS F in both the AM and PM peak periods. The northbound shared through/right-turn is anticipated to operate at LOS F in the AM peak hour and LOS E in the PM peak hour. The southbound left-turn and shared through/right-turn movements are anticipated to operate at LOS F in both the AM and PM peak periods.
- At the access controlled, unsignalized intersection of Harrison Street with 178th Street the northbound and southbound right-turn movements are anticipated to operate at LOS C or better in both the AM and PM peak periods.
- At the unsignalized intersection of 180th Street with RIRO Drive, the stop-controlled westbound right-turn is anticipated to operate at LOS C in the AM and PM peak periods.

- Along 180th Street, at the unsignalized intersection with Gertrude Street the eastbound approach and the westbound left-turn lane are anticipated to operate at LOS F in both the AM and PM peak periods. All other critical movements are anticipated to operate at LOS E or better in both the AM and PM peak hours.

Capacity analysis worksheets for 2018 Phase II traffic conditions scenario are included in the **Appendix**.

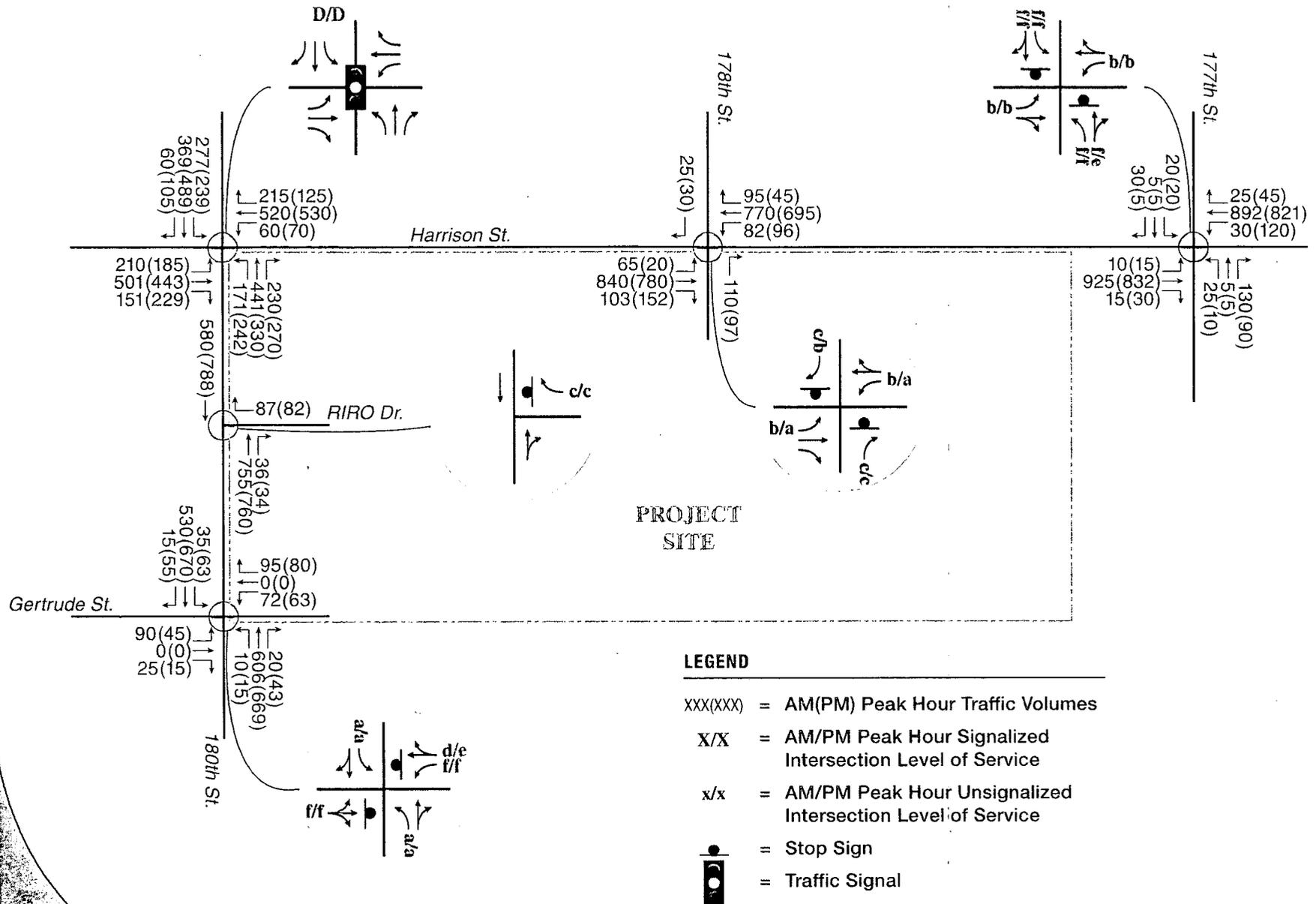


Figure 8
2018 Phase II Traffic Conditions

E. Auxiliary Turn Lane Lengths

As shown in the **Appendix**, NCHRP Report 279: Intersection Channelization Design Guide and the City of Omaha Driveway Guide were utilized to analyze traffic volumes at the intersections of Harrison Street with 178th Street and 180th Street with Gertrude Street and RIRO Drive to determine if auxiliary right-turn lanes would be warranted for the 2014 Phase I traffic conditions. NCHRP Report 279 guidelines are based upon three measures:

- Number of through lanes
- Total peak hour approach traffic volumes
- Right-turn traffic volumes

Harrison Street with 178th Street

In the AM peak hour, the estimated total volume of eastbound approaching traffic on Harrison Street is 848 vph with 101 right-turns at 178th Street. In the PM peak hour, the estimated total volume of approaching traffic on Harrison Street is 782 vph with 146 right-turns at 178th Street. Per the NCHRP Report 279 guidelines, this volume of right-turning traffic warrants the construction of a full-width auxiliary right-turn lane on the eastbound approach.

The City of Omaha Driveway Guide indicates that a right-turn deceleration lane shall be provided to the drive approach on all commercial driveways when the street has a speed limit of 40 mph or greater; Harrison Street has a posted speed limit of 45 mph. As such, an eastbound right-turn deceleration lane shall be constructed, per City standards. A minimum storage length of 150 feet should be provided, plus standard tapers.

180th Street with Gertrude Street

In the AM peak hour, the estimated total volume of northbound approaching traffic on 180th Street is 391 vph with 18 right-turns at Gertrude Street. In the PM peak hour, the estimated total volume of approaching traffic on 180th Street is 499 vph with 36 right-turns at Gertrude Street. Per the NCHRP Report 279 guidelines, this volume of right-turning traffic does not warrant the construction of a full-width auxiliary right-turn lane on the northbound approach.

180th Street with RIRO Drive

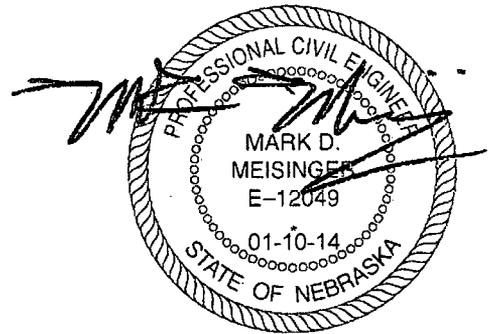
In the AM peak hour, the estimated total volume of northbound approaching traffic on 180th Street is 517 vph with 36 right-turns at RIRO Drive. In the PM peak hour, the estimated total volume of approaching traffic on 180th Street is 560 vph with 34 right-turns at RIRO Drive. Per the NCHRP Report 279 guidelines, this volume of right-turning traffic does not warrant the construction of a full-width auxiliary right-turn lane on the northbound approach.

VII. SUMMARY AND RECOMMENDATIONS

The purpose of this traffic analysis is to determine the anticipated traffic operations at the intersections in the study area associated with the proposed 180th & Harrison Development. Based on the results of this analysis, the following summarizes the key findings and recommendations of this study.

- For 2013 existing traffic conditions all critical traffic movements at the study intersections would be expected to operate at LOS E or better in the AM and PM peak hours with the exception of the northbound and southbound left-turns at the intersection of Harrison Street with 177th Street, which currently operate at LOS F in the AM and PM peak hours.
- Construction of Phase I of the development is anticipated to start in the 2014 and full build-out of Phase II for the proposed 180th & Harrison development is anticipated by 2018. Access to the 180th & Harrison development will be provided at one location onto Harrison Street via 178th Street and at two locations onto 180th Street via Gertrude Street and RIRO Drive. Access at 178th Street will be limited to 3/4 access. Full access shall be provided at 180th Street and Gertrude Street.
- Average trip rates documented in the ITE *Trip Generation* manual were used to estimate vehicle trips generated by the 180th & Harrison Development. It is estimated that in that Phase I of the project will generate approximately 8,794 vehicle-trips per day with a total of 600 vehicle-trips during the AM peak hour and 651 vehicle-trips during the PM peak. Upon completion of the development the site will generate approximately 9,372 vehicle-trips per day with a total of 640 vehicle-trips during the AM peak hour and 710 vehicle-trips during the PM peak hour.
- Traffic volumes at the intersection of 180th Street with Gertrude Street are not expected to satisfy MUTCD traffic signal warrants 1 or 2 with either 2014 Phase I or 2018 Phase II build traffic volumes. It is recommended that on the westbound approach, an exclusive left-turn lane and a shared through/right lane be provided at the intersection. A stop sign should be provided on the eastbound and westbound approaches.
- At the intersection of Harrison Street with 180th Street, exclusive left-turn lanes and a shared through/right turn lane are provided on all approaches. The signalized intersection of Harrison Street with 180th Street is expected to operate at LOS D or better for both peak hours with 2014 Phase I traffic volumes under the existing lane arrangements. In the future, per recommendations from the *Harrison Street Corridor Study*, by 2018 exclusive right-turn lanes should be provided on all approaches of the intersection. With the recommended improvements the intersection is anticipated to operate at LOS D in both the AM and PM peak periods with 2018 Phase II traffic volumes.
- Site generated traffic using the intersection of Harrison Street with 180th Street represents 12% and 14% of the total intersection volume for the AM and PM peak periods respectively with 2014 Phase I traffic volumes. With 2018 Phase II traffic volumes site generate traffic represents 10% and 12% of the total intersection volume.

- According to NCHRP 279 and the City of Omaha Driveway Guide, an eastbound right-turn lane is warranted at the intersection of Harrison with 178th Street and a required storage length of 150 feet should be provided.
- At the intersection of Harrison Street with 178th Street, with 2014 Phase I and 2018 Phase II traffic conditions, the northbound and southbound right-turn movements are anticipated to operate at LOS C or better in both the AM and PM peak periods.
- At the intersection of Harrison Street with 177th Street, under 2014 Phase I and 2018 Phase II traffic conditions, several northbound and southbound movements are anticipated to operate at LOS F in both the AM and PM peak periods. All other critical movements are anticipated to operate at LOS D or better.



APPENDIX

**NCHRP REPORT 279 RIGHT-TURN GUIDELINES
WARRANT ANALYSIS WORKSHEETS
CAPACITY ANALYSIS WORKSHEETS**

NCHRP REPORT 279 RIGHT-TURN GUIDELINES

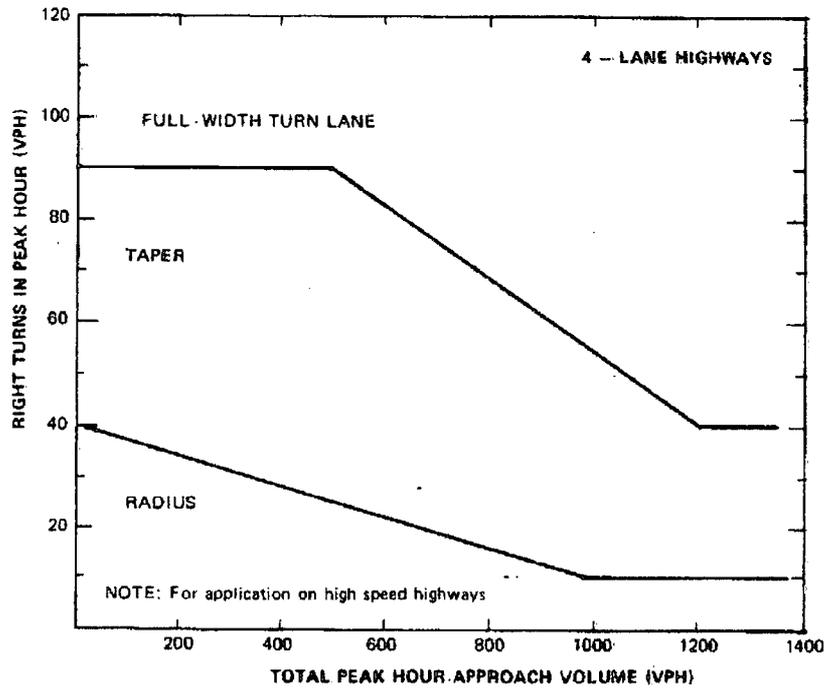
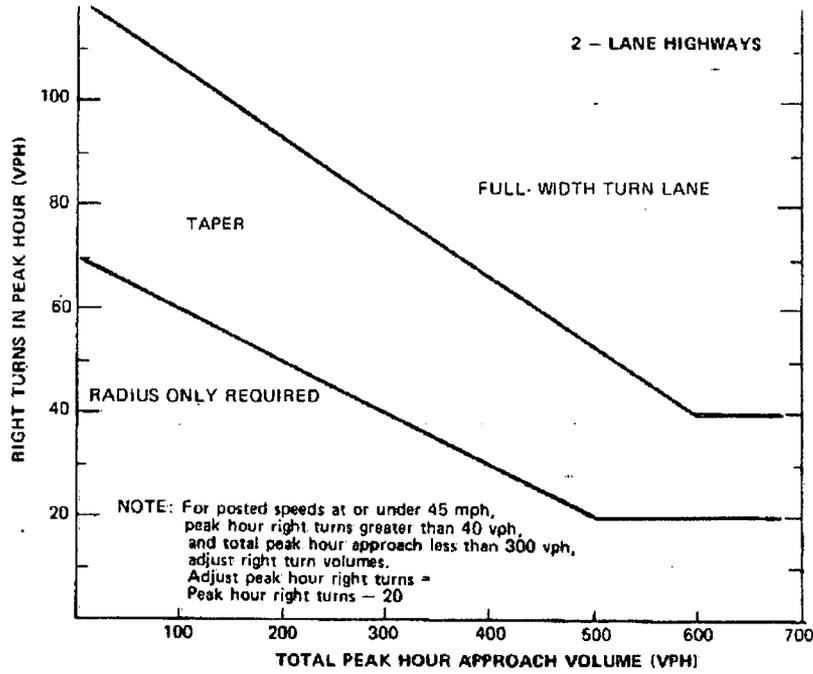
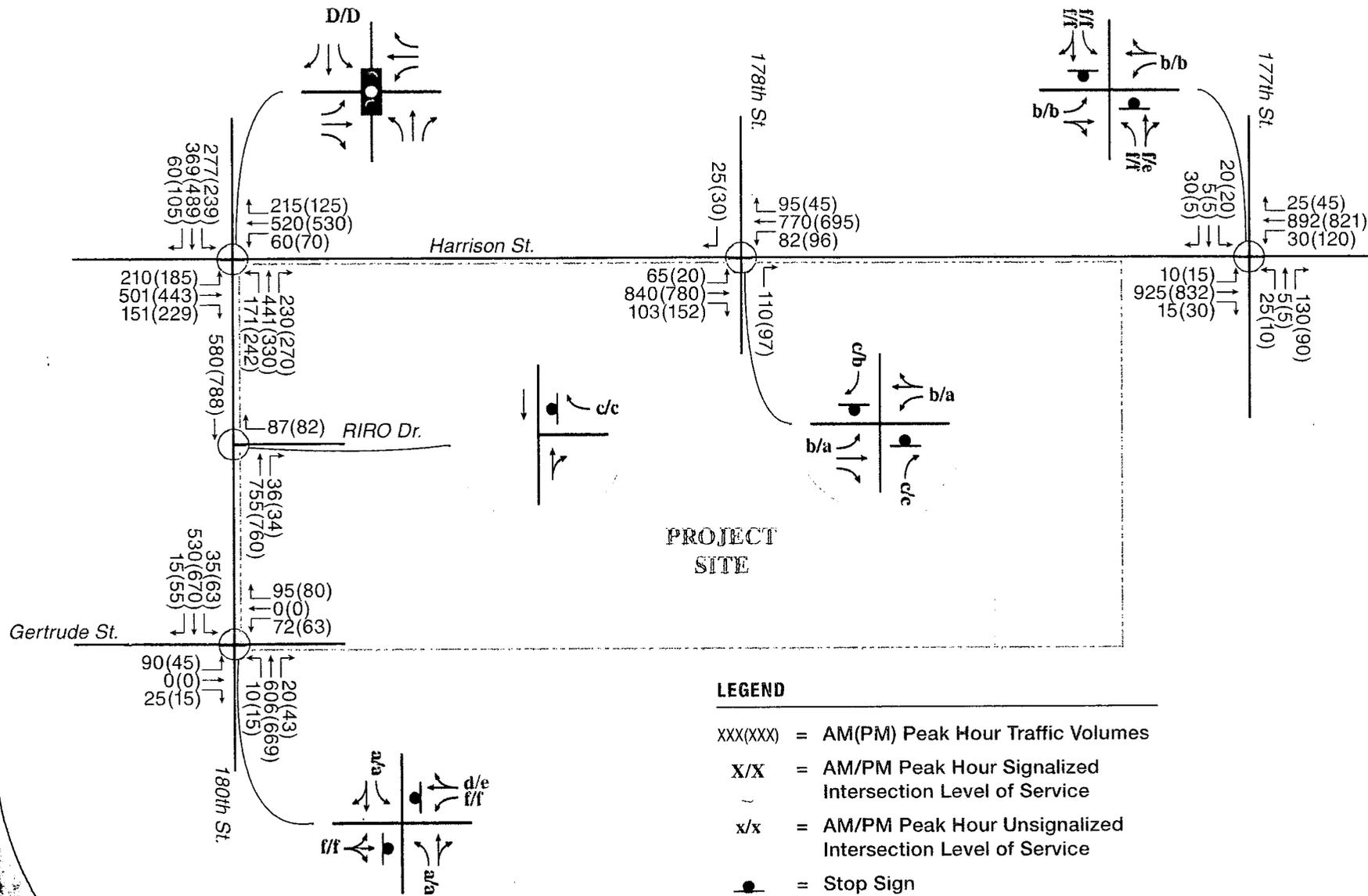


Figure 4-23. Traffic volume guidelines for design of right-turn lanes. (Source: Ref. 4-11)

WARRANT ANALYSIS WORKSHEETS



- LEGEND**
- XXX(XXX) = AM(PM) Peak Hour Traffic Volumes
 - X/X = AM/PM Peak Hour Signalized Intersection Level of Service
 - x/x = AM/PM Peak Hour Unsignalized Intersection Level of Service
 -  = Stop Sign
 -  = Traffic Signal

Figure 8
2018 Phase II Traffic Conditions



MUTCD Volume-based Warrant Evaluation - 2013 Existing Traffic (no RT's)
180th Street with Gertrude Street

Major Street: 180th Street
 Minor Street: Gertrude Street

Critical Approach Speed: 45 MPH
 Critical Approach Speed: 25 MPH



Classified as Urban Intersection (R)

WARRANT 1 - Condition A, Minimum Vehicular Volume

100 % Satisfied	YES	NO
80% Satisfied	YES	NO

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				Peak Hour	2nd Highest	3rd Highest	4th Highest	5th Highest	6th Highest	7th Highest	8th Highest
	U	R	U	R								
	1		2 or more									
Both Apprchs. Major Street	500 (400)	350 (280)	600 (480)	420 (336)	905	850	794	739	683	628	572	517
Highest Apprch. Minor Street	150 (120)	105 (84)	200 (160)	140 (112)	73	69	64	60	55	51	46	42

WARRANT 1, Condition B - Interruption of Continuous Traffic

100 % Satisfied	YES	NO
80% Satisfied	YES	NO

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				Peak Hour	2nd Highest	3rd Highest	4th Highest	5th Highest	6th Highest	7th Highest	8th Highest
	U	R	U	R								
	1		2 or more									
Both Apprchs. Major Street Highest	750 (600)	525 (420)	900 (720)	630 (504)	905	850	794	739	683	628	572	517
Highest Apprch. Minor Street	75 (60)	53 (42)	100 (80)	70 (56)	73	69	64	60	55	51	46	42

WARRANT 2 - Four Hour Volume

100 % Satisfied	YES	NO
-----------------	-----	----

	Peak Hour	2nd Highest	3rd Highest	4th Highest	
Both Apprchs. Major Street	905	850	794	739	180th Street
Highest Apprch. Minor Street	73	69	64	60	Gertrude Street

MUTCD Volume-based Warrant Evaluation - 2014 Phase I (no RT's)
180th Street with Gertrude Street

Major Street: 180th Street
 Minor Street: Gertrude Street

Critical Approach Speed: 45 MPH
 Critical Approach Speed: 25 MPH



Classified as Urban Intersection (R)

WARRANT 1 - Condition A, Minimum Vehicular Volume

100 % Satisfied	YES	NO
80% Satisfied	YES	NO

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				Peak Hour	2nd Highest	3rd Highest	4th Highest	5th Highest	6th Highest	7th Highest	8th Highest
	L	R	L	R								
	1		2 or more									
Both Apprchs. Major Street	500 (400)	350 (280)	600 (480)	420 (336)	1023	960	898	835	772	710	647	584
Highest Apprch. Minor Street	150 (120)	105 (84)	200 (160)	140 (112)	73	69	64	60	55	51	46	42

WARRANT 1, Condition B - Interruption of Continuous Traffic

100 % Satisfied	YES	NO
80% Satisfied	YES	NO

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				Peak Hour	2nd Highest	3rd Highest	4th Highest	5th Highest	6th Highest	7th Highest	8th Highest
	L	R	L	R								
	1		2 or more									
Both Apprchs. Major Street	750 (600)	525 (420)	900 (720)	630 (504)	1023	960	898	835	772	710	647	584
Highest Apprch. Minor Street	75 (60)	53 (42)	100 (80)	70 (56)	73	69	64	60	55	51	46	42

WARRANT 2 - Four Hour Volume

100 % Satisfied	YES	NO
-----------------	-----	----

	Peak Hour	2nd Highest	3rd Highest	4th Highest	
Both Apprchs. Major Street	1023	960	898	835	180th Street
Highest Apprch. Minor Street	73	69	64	60	Gertrude Street

MUTCD Volume-based Warrant Evaluation - 2018 Phase II (no RT's)
 180th Street with Gertrude Street

Major Street: 180th Street
 Minor Street: Gertrude Street

Critical Approach Speed: 45 MPH
 Critical Approach Speed: 25 MPH



Classified as Urban Intersection (R)

WARRANT 1 - Condition A, Minimum Vehicular Volume

100 % Satisfied	YES	NO
80% Satisfied	YES	NO

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				Peak Hour	2nd Highest	3rd Highest	4th Highest	5th Highest	6th Highest	7th Highest	8th Highest
	U	R	U	R								
	1		2 or more									
Both Approchs. Major Street	500 (400)	350 (280)	300 (480)	420 (336)	1515	1422	1329	1236	1144	1051	958	865
Highest Apprch. Minor Street	150 (120)	105 (84)	300 (160)	140 (112)	90	84	79	73	68	62	57	51

WARRANT 1, Condition B - Interruption of Continuous Traffic

100 % Satisfied	YES	NO
80% Satisfied	YES	NO

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				Peak Hour	2nd Highest	3rd Highest	4th Highest	5th Highest	6th Highest	7th Highest	8th Highest
	U	R	U	R								
	1		2 or more									
Both Approchs. Major Street	750 (600)	525 (420)	300 (720)	630 (504)	1515	1422	1329	1236	1144	1051	958	865
Highest Apprch. Minor Street	75 (60)	53 (42)	100 (80)	70 (56)	90	84	79	73	68	62	57	51

WARRANT 2 - Four Hour Volume

100 % Satisfied	YES	NO
-----------------	-----	----

	Peak Hour	2nd Highest	3rd Highest	4th Highest	
Both Approchs. Major Street	1515	1422	1329	1236	180th Street
Highest Apprch. Minor Street	90	84	79	73	Gertrude Street

CAPACITY ANALYSIS WORKSHEETS

Intersection:

Int Delay, s/veh 2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	6	680	9	21	688	17	18	1	96
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	160	-	-	230	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	739	10	23	748	18	20	1	104

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	766	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	847	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	847	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0.1	0.3	24.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	81	403	847	-	-	860	-	-	61	362
HCM Lane V/C Ratio	0.242	0.262	0.008	-	-	0.027	-	-	0.232	0.066
HCM Control Delay (s)	63.1	17.1	9.3	-	-	9.3	-	-	81	15.6
HCM Lane LOS	F	C	A	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.9	1	0	-	-	0.1	-	-	0.8	0.2

Intersection:

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	13	1	21
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	0	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	92	92	92
Heavy Vehicles, %	2	2	2
Mvmt Flow	14	1	23

Major/Minor	Minor2		
Conflicting Flow All	1613	1565	757
Stage 1	803	803	-
Stage 2	810	762	-
Critical Hdwy	7.12	6.52	6.22
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.318
Pot Cap-1 Maneuver	84	111	408
Stage 1	377	396	-
Stage 2	374	414	-
Platoon blocked, %			
Mov Cap-1 Maneuver	61	107	408
Mov Cap-2 Maneuver	61	107	-
Stage 1	374	385	-
Stage 2	277	411	-

Approach	SB
HCM Control Delay, s	39.9
HCM LOS	E

Minor Lane/Major Mvmt

Intersection

Int Delay, s/veh 2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	52	657	652	75	38	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	57	714	709	82	41	23

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	790	0	1576
Stage 1	-	-	749
Stage 2	-	-	827
Critical Hdwy	4.12	-	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	2.218	-	3.518
Pot Cap-1 Maneuver	830	-	121
Stage 1	-	-	467
Stage 2	-	-	430
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	830	-	113
Mov Cap-2 Maneuver	-	-	113
Stage 1	-	-	467
Stage 2	-	-	400

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	45
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	830	-	-	-	152
HCM Lane V/C Ratio	0.068	-	-	-	0.422
HCM Control Delay (s)	9.7	-	-	-	45
HCM Lane LOS	A	-	-	-	E
HCM 95th %tile Q(veh)	0.2	-	-	-	1.9

HCM 2010 Signalized Intersection Summary
 1801: 180th St & Harrison Street

180th & Harrison Street TIA
 1/10/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	164	375	80	44	431	198	37	201	164	170	215	41
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	190.0	186.3	186.3	190.0	186.3	186.3	190.0	186.3	186.3	190.0
Adj Flow Rate, veh/h	178	408	87	48	468	215	40	218	178	185	234	45
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	212	737	157	352	598	275	373	255	208	296	601	116
Arrive On Green	0.49	0.49	0.49	0.49	0.49	0.49	0.27	0.27	0.27	0.09	0.40	0.40
Sat Flow, veh/h	755	1489	318	899	1209	556	1096	950	776	1774	1519	292
Grp Volume(v), veh/h	178	0	495	48	0	683	40	0	396	185	0	279
Grp Sat Flow(s),veh/h/ln	755	0	1807	899	0	1765	1096	0	1726	1774	0	1811
Q Serve(g_s), s	16.0	0.0	17.3	3.6	0.0	29.0	2.5	0.0	19.8	6.5	0.0	10.0
Cycle Q Clear(g_c), s	45.0	0.0	17.3	20.9	0.0	29.0	2.5	0.0	19.8	6.5	0.0	10.0
Prop In Lane	1.00		0.18	1.00		0.31	1.00		0.45	1.00		0.16
Lane Grp Cap(c), veh/h	212	0	894	352	0	873	373	0	463	296	0	716
V/C Ratio(X)	0.84	0.00	0.55	0.14	0.00	0.78	0.11	0.00	0.86	0.63	0.00	0.39
Avail Cap(c_a), veh/h	212	0	894	352	0	873	440	0	569	460	0	995
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.5	0.0	16.0	23.3	0.0	19.0	25.3	0.0	31.6	22.5	0.0	19.7
Incr Delay (d2), s/veh	25.0	0.0	0.7	0.2	0.0	4.7	0.1	0.0	10.4	0.8	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	0.0	8.7	0.9	0.0	15.2	0.8	0.0	10.8	3.2	0.0	5.0
LnGrp Delay(d),s/veh	64.5	0.0	16.7	23.5	0.0	23.6	25.4	0.0	42.0	23.3	0.0	20.0
LnGrp LOS	E		B	C		C	C		D	C		B
Approach Vol, veh/h		673			731			436				464
Approach Delay, s/veh		29.4			23.6			40.5				21.3
Approach LOS		C			C			D				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		50.0		41.0		50.0	11.6	29.4				
Change Period (Y+Rc), s		5.0		5.0		5.0	3.0	5.0				
Max Green Setting (Gmax), s		45.0		50.0		45.0	17.0	30.0				
Max Q Clear Time (g_c+I1), s		47.0		12.0		31.0	8.5	21.8				
Green Ext Time (p_c), s		0.0		4.4		7.5	0.1	2.6				
Intersection Summary												
HCM 2010 Ctrl Delay			28.0									
HCM 2010 LOS			C									

Intersection:

Int Delay, s/veh 2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	11	586	24	87	540	23	8	5	64
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	160	-	-	230	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	637	26	95	587	25	9	5	70

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	612	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	967	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	967	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0.2	1.2	20.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	92	381	967	-	-	926	-	-	75	183
HCM Lane V/C Ratio	0.095	0.197	0.012	-	-	0.102	-	-	0.217	0.059
HCM Control Delay (s)	48.2	16.8	8.8	-	-	9.3	-	-	65.9	25.9
HCM Lane LOS	E	C	A	-	-	A	-	-	F	D
HCM 95th %tile Q(veh)	0.3	0.7	0	-	-	0.3	-	-	0.8	0.2

Intersection:

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	15	5	5
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	0	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	92	92	92
Heavy Vehicles, %	2	2	2
Mvmt Flow	16	5	5

Major/Minor	Minor2		
Conflicting Flow All	1500	1476	599
Stage 1	789	789	-
Stage 2	711	687	-
Critical Hdwy	7.12	6.52	6.22
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.318
Pot Cap-1 Maneuver	100	126	502
Stage 1	384	402	-
Stage 2	424	447	-
Platoon blocked, %			
Mov Cap-1 Maneuver	75	112	502
Mov Cap-2 Maneuver	75	112	-
Stage 1	379	361	-
Stage 2	352	441	-

Approach	SB
HCM Control Delay, s	49.9
HCM LOS	E

Minor Lane/Major Mvmt

Intersection:

Int Delay, s/veh 1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	15	579	518	35	42	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	629	563	38	46	24

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	601	0	1244
Stage 1	-	-	582
Stage 2	-	-	662
Critical Hdwy	4.12	-	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	2.218	-	3.518
Pot Cap-1 Maneuver	976	-	192
Stage 1	-	-	559
Stage 2	-	-	513
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	976	-	189
Mov Cap-2 Maneuver	-	-	189
Stage 1	-	-	559
Stage 2	-	-	505

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	25.9
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	976	-	-	-	241
HCM Lane V/C Ratio	0.017	-	-	-	0.289
HCM Control Delay (s)	8.8	-	-	-	25.9
HCM Lane LOS	A	-	-	-	D
HCM 95th %tile Q(veh)	0.1	-	-	-	1.2

HCM 2010 Signalized Intersection Summary
 1801: 180th St & Harrison Street

180th & Harrison Street TIA
 1/10/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	145	301	118	31	419	90	112	141	203	90	327	89
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	190.0	186.3	186.3	190.0	186.3	186.3	190.0	186.3	186.3	190.0
Adj Flow Rate, veh/h	158	327	128	34	455	98	122	153	221	98	355	97
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	304	608	238	371	708	153	270	203	294	291	552	151
Arrive On Green	0.48	0.48	0.48	0.48	0.48	0.48	0.29	0.29	0.29	0.06	0.39	0.39
Sat Flow, veh/h	852	1275	499	932	1486	320	935	690	997	1774	1410	385
Grp Volume(v), veh/h	158	0	455	34	0	553	122	0	374	98	0	452
Grp Sat Flow(s),veh/h/ln	852	0	1775	932	0	1806	935	0	1687	1774	0	1795
Q Serve(g_s), s	13.1	0.0	13.7	2.0	0.0	17.5	9.3	0.0	15.3	2.8	0.0	15.6
Cycle Q Clear(g_c), s	30.6	0.0	13.7	15.7	0.0	17.5	17.5	0.0	15.3	2.8	0.0	15.6
Prop In Lane	1.00		0.28	1.00		0.18	1.00		0.59	1.00		0.21
Lane Grp Cap(c), veh/h	304	0	846	371	0	861	270	0	497	291	0	703
V/C Ratio(X)	0.52	0.00	0.54	0.09	0.00	0.64	0.45	0.00	0.75	0.34	0.00	0.64
Avail Cap(c_a), veh/h	335	0	911	405	0	927	314	0	577	469	0	969
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.5	0.0	14.0	19.5	0.0	15.0	28.9	0.0	24.3	17.7	0.0	18.8
Incr Delay (d2), s/veh	1.4	0.0	0.5	0.1	0.0	1.4	1.2	0.0	4.7	0.3	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	0.0	6.8	0.5	0.0	8.9	2.5	0.0	7.7	1.4	0.0	7.9
LnGrp Delay(d),s/veh	27.9	0.0	14.5	19.6	0.0	16.4	30.1	0.0	29.0	17.9	0.0	19.8
LnGrp LOS	C		B	B		B	C		C	B		B
Approach Vol, veh/h		613			587			496			550	
Approach Delay, s/veh		18.0			16.6			29.2			19.4	
Approach LOS		B			B			C			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		41.2		34.8		41.2	7.4	27.4				
Change Period (Y+Rc), s		5.0		5.0		5.0	3.0	5.0				
Max Green Setting (Gmax), s		39.0		41.0		39.0	12.0	26.0				
Max Q Clear Time (g_c+l1), s		32.6		17.6		19.5	4.8	19.5				
Green Ext Time (p_c), s		3.6		5.8		7.2	0.1	2.9				
Intersection Summary												
HCM 2010 Ctrl Delay			20.5									
HCM 2010 LOS			C									

Intersection

Int Delay, s/veh 1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	37	10	10	419	431	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	40	11	11	455	468	49

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	970	493	517
Stage 1	493	-	-
Stage 2	477	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	281	576	1049
Stage 1	614	-	-
Stage 2	624	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	278	576	1049
Mov Cap-2 Maneuver	278	-	-
Stage 1	614	-	-
Stage 2	617	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.8	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1049	-	312	-	-
HCM Lane V/C Ratio	0.01	-	0.164	-	-
HCM Control Delay (s)	8.5	-	18.8	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

Intersection:

Int Delay, s/veh 3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	6	780	9	21	768	17	18	1	96
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	160	-	-	230	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	848	10	23	835	18	20	1	104

Major/Minor:	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	853	0	0	858	0
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	4.12	-	-	4.12	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218	-
Pot Cap-1 Maneuver	786	-	-	783	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	786	-	-	783	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0.1	0.3	31.4
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	59	347	786	-	-	783	-	-	42	313
HCM Lane V/C Ratio	0.332	0.304	0.008	-	-	0.029	-	-	0.336	0.076
HCM Control Delay (s)	93.7	19.8	9.6	-	-	9.7	-	-	129.2	17.5
HCM Lane LOS	F	C	A	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	1.2	1.3	0	-	-	0.1	-	-	1.1	0.2

Intersection:

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	13	1	21
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	0	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	92	92	92
Heavy Vehicles, %	2	2	2
Mvmt Flow	14	1	23

Major/Minor	Minor2		
Conflicting Flow All	1808	1761	844
Stage 1	890	890	-
Stage 2	918	871	-
Critical Hdwy	7.12	6.52	6.22
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.318
Pot Cap-1 Maneuver	61	84	363
Stage 1	337	361	-
Stage 2	326	368	-
Platoon blocked, %			
Mov Cap-1 Maneuver	42	81	363
Mov Cap-2 Maneuver	42	81	-
Stage 1	334	350	-
Stage 2	229	365	-

Approach	SB
HCM Control Delay, s	59
HCM LOS	F

Minor Lane/Major Mvmt

Intersection

Int Delay, s/veh 1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	52	695	101	80	652	75	0	0	100
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	100	-	125	150	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	57	755	110	87	709	82	0	0	109

Major/Minor	Major1	Major2	Minor1						
Conflicting Flow All	790	0	0	755	0	0	1791	1832	755
Stage 1	-	-	-	-	-	-	868	868	-
Stage 2	-	-	-	-	-	-	923	964	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	830	-	-	855	-	-	63	76	409
Stage 1	-	-	-	-	-	-	347	370	-
Stage 2	-	-	-	-	-	-	323	334	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	830	-	-	855	-	-	52	64	409
Mov Cap-2 Maneuver	-	-	-	-	-	-	52	64	-
Stage 1	-	-	-	-	-	-	323	345	-
Stage 2	-	-	-	-	-	-	274	300	-

Approach	EB	WB	NB
HCM Control Delay, s	0.6	1	17
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	409	830	-	-	855	-	-	412
HCM Lane V/C Ratio	0.266	0.068	-	-	0.102	-	-	0.055
HCM Control Delay (s)	17	9.7	-	-	9.7	-	-	14.3
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1.1	0.2	-	-	0.3	-	-	0.2

Intersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	0	0	21
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	0
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	92	92	92
Heavy Vehicles, %	2	2	2
Mvmt Flow	0	0	23

Major/Minor	Minor2		
Conflicting Flow All	1791	1791	749
Stage 1	923	923	-
Stage 2	868	868	-
Critical Hdwy	7.12	6.52	6.22
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.318
Pot Cap-1 Maneuver	63	81	412
Stage 1	323	349	-
Stage 2	347	370	-
Platoon blocked, %			
Mov Cap-1 Maneuver	40	68	412
Mov Cap-2 Maneuver	40	68	-
Stage 1	301	313	-
Stage 2	237	345	-

Approach	SB
HCM Control Delay, s	14.3
HCM LOS	B

Minor Lane/Major Mvmt

HCM 2010 Signalized Intersection Summary
 1801: 180th St & Harrison Street

180th & Harrison Street TIA
 1/10/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	164	435	100	44	431	198	120	284	164	249	228	41
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	190.0	186.3	186.3	190.0	186.3	186.3	190.0	186.3	186.3	190.0
Adj Flow Rate, veh/h	178	473	109	48	468	215	130	309	178	271	248	45
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	214	740	170	291	610	280	347	286	164	271	614	111
Arrive On Green	0.50	0.50	0.50	0.50	0.50	0.50	0.26	0.26	0.26	0.11	0.40	0.40
Sat Flow, veh/h	755	1465	338	829	1209	556	1082	1110	640	1774	1535	279
Grp Volume(v), veh/h	178	0	582	48	0	683	130	0	487	271	0	293
Grp Sat Flow(s),veh/h/ln	755	0	1803	829	0	1765	1082	0	1750	1774	0	1814
Q Serve(g_s), s	20.2	0.0	24.8	4.7	0.0	32.8	10.7	0.0	27.0	12.0	0.0	12.1
Cycle Q Clear(g_c), s	53.0	0.0	24.8	29.5	0.0	32.8	10.7	0.0	27.0	12.0	0.0	12.1
Prop In Lane	1.00		0.19	1.00		0.31	1.00		0.37	1.00		0.15
Lane Grp Cap(c), veh/h	214	0	910	291	0	891	347	0	450	271	0	725
V/C Ratio(X)	0.83	0.00	0.64	0.16	0.00	0.77	0.37	0.00	1.08	1.00	0.00	0.40
Avail Cap(c_a), veh/h	214	0	910	291	0	891	347	0	450	271	0	725
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.3	0.0	19.0	29.8	0.0	21.0	32.9	0.0	39.0	28.8	0.0	22.5
Incr Delay (d2), s/veh	23.7	0.0	1.5	0.3	0.0	4.1	0.7	0.0	66.4	54.3	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	0.0	12.7	1.1	0.0	16.9	3.2	0.0	21.3	11.9	0.0	6.1
LnGrp Delay(d),s/veh	68.0	0.0	20.5	30.1	0.0	25.1	33.6	0.0	105.4	83.1	0.0	22.9
LnGrp LOS	E		C	C		C	C		F	F		C
Approach Vol, veh/h		760			731			617				564
Approach Delay, s/veh		31.6			25.4			90.3				51.8
Approach LOS		C			C			F				D
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		58.0		47.0		58.0	15.0	32.0				
Change Period (Y+Rc), s		5.0		5.0		5.0	3.0	5.0				
Max Green Setting (Gmax), s		53.0		42.0		53.0	12.0	27.0				
Max Q Clear Time (g_c+I1), s		55.0		14.1		34.8	14.0	29.0				
Green Ext Time (p_c), s		0.0		5.6		9.3	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			47.7									
HCM 2010 LOS			D									

Intersection

Int Delay, s/veh 1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	0	87	481	36	0	372
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	95	523	39	0	404

Major/Minor	Minor1	Minor2	Major1	Major2
Conflicting Flow All	946	542	0	0
Stage 1	542	-	-	-
Stage 2	404	-	-	-
Critical Hdwy	6.42	6.22	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-
Follow-up Hdwy	3.518	3.318	-	2.218
Pot Cap-1 Maneuver	290	540	-	1009
Stage 1	583	-	-	-
Stage 2	674	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	290	540	-	1009
Mov Cap-2 Maneuver	290	-	-	-
Stage 1	583	-	-	-
Stage 2	674	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	540	1009	-
HCM Lane V/C Ratio	-	-	0.175	-	-
HCM Control Delay (s)	-	-	13.1	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.6	0	-

Intersection:

Int Delay, s/veh 5.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	73	0	20	66	0	79	8	365	18
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	79	0	22	72	0	86	9	397	20

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	900	867	361	868	864	407	368	0	0
Stage 1	433	433	-	424	424	-	-	-	-
Stage 2	467	434	-	444	440	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-
Pot Cap-1 Maneuver	259	291	684	273	292	644	1191	-	-
Stage 1	601	582	-	608	587	-	-	-	-
Stage 2	576	581	-	593	578	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	218	280	684	256	281	644	1191	-	-
Mov Cap-2 Maneuver	218	280	-	256	281	-	-	-	-
Stage 1	596	564	-	603	583	-	-	-	-
Stage 2	495	577	-	556	560	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	28.1	17.3	0.2
HCM LOS	D	C	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1191	-	-	255	256	644	1143	-	-
HCM Lane V/C Ratio	0.007	-	-	0.396	0.28	0.133	0.031	-	-
HCM Control Delay (s)	8	-	-	28.1	24.4	11.4	8.3	-	-
HCM Lane LOS	A	-	-	D	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.8	1.1	0.5	0.1	-	-

Intersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	33	326	13
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	100	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	92	92	92
Heavy Vehicles, %	2	2	2
Mvmt Flow	36	354	14

Major/Minor	Major2		
Conflicting Flow All	416	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1143	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1143	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	0.7
HCM LOS	

Minor Lane/Major Mvmt

Intersection

Int Delay, s/veh 3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	11	676	24	87	626	23	8	5	64
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	160	-	-	230	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	735	26	95	680	25	9	5	70

Major/Minor	Major1	Major2	Minor1						
Conflicting Flow All	705	0	0	761	0	0	1660	1667	748
Stage 1	-	-	-	-	-	-	772	772	-
Stage 2	-	-	-	-	-	-	888	895	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	893	-	-	851	-	-	78	96	412
Stage 1	-	-	-	-	-	-	392	409	-
Stage 2	-	-	-	-	-	-	338	359	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	893	-	-	851	-	-	66	84	412
Mov Cap-2 Maneuver	-	-	-	-	-	-	66	84	-
Stage 1	-	-	-	-	-	-	387	404	-
Stage 2	-	-	-	-	-	-	292	319	-

Approach	EB	WB	NB
HCM Control Delay, s	0.1	1.2	24.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	66	321	893	-	-	851	-	-	53	141
HCM Lane V/C Ratio	0.132	0.234	0.013	-	-	0.111	-	-	0.308	0.077
HCM Control Delay (s)	67.7	19.6	9.1	-	-	9.8	-	-	100.6	32.7
HCM Lane LOS	F	C	A	-	-	A	-	-	F	D
HCM 95th %tile Q(veh)	0.4	0.9	0	-	-	0.4	-	-	1.1	0.2

Intersection:

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	15	5	5
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	0	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	92	92	92
Heavy Vehicles, %	2	2	2
Mvmt Flow	16	5	5

Major/Minor	Minor2		
Conflicting Flow All	1691	1667	693
Stage 1	882	882	-
Stage 2	809	785	-
Critical Hdwy	7.12	6.52	6.22
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.318
Pot Cap-1 Maneuver	74	96	443
Stage 1	341	364	-
Stage 2	374	404	-
Platoon blocked, %			
Mov Cap-1 Maneuver	53	84	443
Mov Cap-2 Maneuver	53	84	-
Stage 1	336	323	-
Stage 2	303	399	-

Approach	SB
HCM Control Delay, s	73.4
HCM LOS	F

Minor Lane/Major Mvmt

Intersection

Int Delay, s/veh 1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	15	621	146	86	518	35	0	0	90
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	100	-	125	150	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	675	159	93	563	38	0	0	98

Major/Minor	Major1	Major2	Minor1						
Conflicting Flow All	601	0	0	675	0	0	1477	1496	675
Stage 1	-	-	-	-	-	-	708	708	-
Stage 2	-	-	-	-	-	-	769	788	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	976	-	-	916	-	-	104	123	454
Stage 1	-	-	-	-	-	-	426	438	-
Stage 2	-	-	-	-	-	-	394	402	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	976	-	-	916	-	-	90	109	454
Mov Cap-2 Maneuver	-	-	-	-	-	-	90	109	-
Stage 1	-	-	-	-	-	-	419	431	-
Stage 2	-	-	-	-	-	-	337	361	-

Approach	EB	WB	NB
HCM Control Delay, s	0.2	1.3	15.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	454	976	-	-	916	-	-	513
HCM Lane V/C Ratio	0.215	0.017	-	-	0.102	-	-	0.047
HCM Control Delay (s)	15.1	8.8	-	-	9.4	-	-	12.4
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.8	0.1	-	-	0.3	-	-	0.1

Intersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	0	0	22
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	0
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	92	92	92
Heavy Vehicles, %	2	2	2
Mvmt Flow	0	0	24

Major/Minor	Minor2		
Conflicting Flow All	1477	1477	582
Stage 1	769	769	-
Stage 2	708	708	-
Critical Hdwy	7.12	6.52	6.22
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.318
Pot Cap-1 Maneuver	104	126	513
Stage 1	394	411	-
Stage 2	426	438	-
Platoon blocked, %			
Mov Cap-1 Maneuver	74	111	513
Mov Cap-2 Maneuver	74	111	-
Stage 1	388	369	-
Stage 2	329	431	-

Approach	SB
HCM Control Delay, s	12.4
HCM LOS	B

Minor Lane/Major Mvmt

HCM 2010 Signalized Intersection Summary
 1801: 180th St & Harrison Street

180th & Harrison Street TIA
 1/10/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	145	381	144	31	419	90	203	202	203	198	349	89
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	190.0	186.3	186.3	190.0	186.3	186.3	190.0	186.3	186.3	190.0
Adj Flow Rate, veh/h	158	414	157	34	455	98	221	220	221	215	379	97
Adj No. of Lanes	1	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	258	578	219	240	666	144	296	255	257	318	625	160
Arrive On Green	0.45	0.45	0.45	0.45	0.45	0.45	0.30	0.30	0.30	0.10	0.44	0.44
Sat Flow, veh/h	852	1288	488	838	1486	320	914	854	858	1774	1432	366
Grp Volume(v), veh/h	158	0	571	34	0	553	221	0	441	215	0	476
Grp Sat Flow(s),veh/h/ln	852	0	1777	838	0	1806	914	0	1711	1774	0	1798
Q Serve(g_s), s	15.7	0.0	22.7	3.0	0.0	21.1	20.3	0.0	21.1	6.9	0.0	17.6
Cycle Q Clear(g_c), s	36.9	0.0	22.7	25.7	0.0	21.1	26.0	0.0	21.1	6.9	0.0	17.6
Prop In Lane	1.00		0.27	1.00		0.18	1.00		0.50	1.00		0.20
Lane Grp Cap(c), veh/h	258	0	797	240	0	810	296	0	512	318	0	785
V/C Ratio(X)	0.61	0.00	0.72	0.14	0.00	0.68	0.75	0.00	0.86	0.68	0.00	0.61
Avail Cap(c_a), veh/h	258	0	797	240	0	811	296	0	512	381	0	848
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.7	0.0	19.5	29.9	0.0	19.1	33.6	0.0	28.7	20.3	0.0	18.8
Incr Delay (d2), s/veh	4.3	0.0	3.1	0.3	0.0	2.4	9.8	0.0	14.0	2.3	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.0	11.8	0.7	0.0	11.0	6.1	0.0	11.9	3.5	0.0	9.0
LnGrp Delay(d),s/veh	38.0	0.0	22.6	30.2	0.0	21.4	43.5	0.0	42.7	22.6	0.0	19.9
LnGrp LOS	D		C	C		C	D		D	C		B
Approach Vol, veh/h		729			587			662				691
Approach Delay, s/veh		25.9			21.9			43.0				20.7
Approach LOS		C			C			D				C
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		44.0		42.9		44.0	11.9	31.0				
Change Period (Y+Rc), s		5.0		5.0		5.0	3.0	5.0				
Max Green Setting (Gmax), s		39.0		41.0		39.0	12.0	26.0				
Max Q Clear Time (g_c+I1), s		38.9		19.6		27.7	8.9	28.0				
Green Ext Time (p_c), s		0.1		7.0		6.0	0.1	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			27.9									
HCM 2010 LOS			C									

Intersection

Int Delay, s/veh 1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	0	82	526	34	0	524
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	89	572	37	0	570

Major/Minor	Minor1	Minor2	Major1	Major2
Conflicting Flow All	1160	590	0	0
Stage 1	590	-	-	-
Stage 2	570	-	-	-
Critical Hdwy	6.42	6.22	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-
Follow-up Hdwy	3.518	3.318	-	2.218
Pot Cap-1 Maneuver	216	508	-	970
Stage 1	554	-	-	-
Stage 2	566	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	216	508	-	970
Mov Cap-2 Maneuver	216	-	-	-
Stage 1	554	-	-	-
Stage 2	566	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	508	970	-
HCM Lane V/C Ratio	-	-	0.175	-	-
HCM Control Delay (s)	-	-	13.6	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.6	0	-

Intersection

Int Delay, s/veh 4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	37	0	10	59	0	70	10	453	36
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	40	0	11	64	0	76	11	492	39

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	1169	1150	493	1137	1156	512	517	0	0
Stage 1	597	597	-	534	534	-	-	-	-
Stage 2	572	553	-	603	622	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-
Pot Cap-1 Maneuver	170	198	576	179	197	562	1049	-	-
Stage 1	490	491	-	530	524	-	-	-	-
Stage 2	505	514	-	486	479	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	140	186	576	168	185	562	1049	-	-
Mov Cap-2 Maneuver	140	186	-	168	185	-	-	-	-
Stage 1	485	466	-	524	519	-	-	-	-
Stage 2	432	509	-	453	455	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	35.8	24.6	0.2
HCM LOS	E	C	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1049	-	-	167	168	562	1036	-	-
HCM Lane V/C Ratio	0.01	-	-	0.306	0.382	0.135	0.05	-	-
HCM Control Delay (s)	8.5	-	-	35.8	39.1	12.4	8.7	-	-
HCM Lane LOS	A	-	-	E	E	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.2	1.6	0.5	0.2	-	-

Intersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	48	431	45
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	100	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	92	92	92
Heavy Vehicles, %	2	2	2
Mvmt Flow	52	468	49

Major/Minor	Major2		
Conflicting Flow All	532	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1036	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1036	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	0.8
HCM LOS	

Minor Lane/Major Mvmt

Intersection	
Int Delay, s/veh	14.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	10	925	15	30	892	25	25	5	130
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	160	-	-	230	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	1005	16	33	970	27	27	5	141

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	997	0	0	1022	0
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	4.12	-	-	4.12	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218	-
Pot Cap-1 Maneuver	694	-	-	679	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	694	-	-	679	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0.1	0.3	84.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	30	245	694	-	-	679	-	-	15	174
HCM Lane V/C Ratio	0.906	0.599	0.016	-	-	0.048	-	-	1.449	0.219
HCM Control Delay (s)	\$ 326	39.5	10.3	-	-	10.6	-	-	\$ 754.4	31.4
HCM Lane LOS	F	E	B	-	-	B	-	-	F	D
HCM 95th %tile Q(veh)	3	3.5	0	-	-	0.2	-	-	3.3	0.8

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

Intersection:

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	20	5	30
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	0	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	92	92	92
Heavy Vehicles, %	2	2	2
Mvmt Flow	22	5	33

Major/Minor	Minor2		
Conflicting Flow All	2157	2091	983
Stage 1	1048	1048	-
Stage 2	1109	1043	-
Critical Hdwy	7.12	6.52	6.22
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.318
Pot Cap-1 Maneuver	34	52	302
Stage 1	275	305	-
Stage 2	254	306	-
Platoon blocked, %			
Mov Cap-1 Maneuver	~ 15	49	302
Mov Cap-2 Maneuver	~ 15	49	-
Stage 1	271	290	-
Stage 2	126	301	-

Approach	SB
HCM Control Delay, s	294.3
HCM LOS	F

Minor Lane/Major Mvmt

Intersection

Int Delay, s/veh 2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	65	840	103	82	770	95	0	0	110
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	100	-	125	150	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	71	913	112	89	837	103	0	0	120

Major/Minor	Major1	Major2	Minor1						
Conflicting Flow All	940	0	0	913	0	0	2121	2172	913
Stage 1	-	-	-	-	-	-	1054	1054	-
Stage 2	-	-	-	-	-	-	1067	1118	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	729	-	-	746	-	-	37	47	331
Stage 1	-	-	-	-	-	-	273	303	-
Stage 2	-	-	-	-	-	-	269	282	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	729	-	-	746	-	-	29	37	331
Mov Cap-2 Maneuver	-	-	-	-	-	-	29	37	-
Stage 1	-	-	-	-	-	-	246	273	-
Stage 2	-	-	-	-	-	-	218	248	-

Approach	EB	WB	NB
HCM Control Delay, s	0.7	0.9	21.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	331	729	-	-	746	-	-	342
HCM Lane V/C Ratio	0.361	0.097	-	-	0.119	-	-	0.079
HCM Control Delay (s)	21.9	10.5	-	-	10.5	-	-	16.4
HCM Lane LOS	C	B	-	-	B	-	-	C
HCM 95th %tile Q(veh)	1.6	0.3	-	-	0.4	-	-	0.3

Intersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	0	0	25
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	0
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	92	92	92
Heavy Vehicles, %	2	2	2
Mvmt Flow	0	0	27

Major/Minor	Minor2		
Conflicting Flow All	2121	2121	889
Stage 1	1067	1067	-
Stage 2	1054	1054	-
Critical Hdwy	7.12	6.52	6.22
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.318
Pot Cap-1 Maneuver	37	50	342
Stage 1	269	299	-
Stage 2	273	303	-
Platoon blocked, %			
Mov Cap-1 Maneuver	20	40	342
Mov Cap-2 Maneuver	20	40	-
Stage 1	243	263	-
Stage 2	157	273	-

Approach	SB
HCM Control Delay, s	16.4
HCM LOS	C

Minor Lane/Major Mvmt

HCM 2010 Signalized Intersection Summary
 1801: 180th St & Harrison Street

180th & Harrison Street TIA
 1/10/2014

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑	↗	↖	↑	↗
Volume (veh/h)	210	501	151	60	520	215	171	441	230	277	369	60
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3
Adj Flow Rate, veh/h	228	545	164	65	565	234	186	479	250	301	401	65
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	267	702	596	260	647	550	334	539	458	323	598	509
Arrive On Green	0.10	0.38	0.38	0.07	0.35	0.35	0.09	0.29	0.29	0.13	0.32	0.32
Sat Flow, veh/h	1774	1863	1583	1774	1863	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	228	545	164	65	565	234	186	479	250	301	401	65
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	11.0	35.1	9.8	3.0	38.7	15.4	9.9	33.5	18.1	16.3	25.4	4.0
Cycle Q Clear(g_c), s	11.0	35.1	9.8	3.0	38.7	15.4	9.9	33.5	18.1	16.3	25.4	4.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	267	702	596	260	647	550	334	539	458	323	598	509
V/C Ratio(X)	0.85	0.78	0.27	0.25	0.87	0.43	0.56	0.89	0.55	0.93	0.67	0.13
Avail Cap(c_a), veh/h	291	807	686	271	738	628	360	602	511	332	643	546
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.3	37.4	29.5	28.1	41.7	34.0	31.5	46.3	40.8	34.0	40.0	32.7
Incr Delay (d2), s/veh	20.0	4.2	0.2	0.5	10.3	0.5	1.6	14.1	1.0	31.3	2.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	18.8	4.3	1.5	21.8	6.8	5.0	19.3	8.0	14.0	13.4	1.7
LnGrp Delay(d),s/veh	51.3	41.6	29.8	28.6	51.9	34.6	33.1	60.4	41.8	65.3	42.5	32.8
LnGrp LOS	D	D	C	C	D	C	C	E	D	E	D	C
Approach Vol, veh/h		937			864			915			767	
Approach Delay, s/veh		41.9			45.5			49.8			50.6	
Approach LOS		D			D			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.1	56.3	17.0	48.8	18.1	52.3	21.3	44.4				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	3.0	5.0				
Max Green Setting (Gmax), s	10.0	59.0	14.0	47.0	15.0	54.0	19.0	44.0				
Max Q Clear Time (g_c+l1), s	5.0	37.1	11.9	27.4	13.0	40.7	18.3	35.5				
Green Ext Time (p_c), s	0.0	8.5	0.1	6.1	0.1	6.6	0.0	3.9				
Intersection Summary												
HCM 2010 Ctrl Delay			46.8									
HCM 2010 LOS			D									

Intersection

Int Delay, s/veh 1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	0	87	755	36	0	580
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	95	821	39	0	630

Major/Minor	Minor1	Minor2	Major1	Major2
Conflicting Flow All	1470	840	0	860
Stage 1	840	-	-	-
Stage 2	630	-	-	-
Critical Hdwy	6.42	6.22	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-
Follow-up Hdwy	3.518	3.318	-	2.218
Pot Cap-1 Maneuver	140	365	-	781
Stage 1	424	-	-	-
Stage 2	531	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	140	365	-	781
Mov Cap-2 Maneuver	140	-	-	-
Stage 1	424	-	-	-
Stage 2	531	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.3	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	365	781	-
HCM Lane V/C Ratio	-	-	0.259	-	-
HCM Control Delay (s)	-	-	18.3	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	1	0	-

Intersection

Int Delay, s/veh 25.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	90	0	45	72	0	95	10	606	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	98	0	49	78	0	103	11	659	22

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	1403	1362	584	1376	1359	670	592	0	0
Stage 1	660	660	-	691	691	-	-	-	-
Stage 2	743	702	-	685	668	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-
Pot Cap-1 Maneuver	117	148	512	122	149	457	984	-	-
Stage 1	452	460	-	435	446	-	-	-	-
Stage 2	407	440	-	438	456	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	~ 87	140	512	106	141	457	984	-	-
Mov Cap-2 Maneuver	~ 87	140	-	106	141	-	-	-	-
Stage 1	447	441	-	430	441	-	-	-	-
Stage 2	312	435	-	380	437	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	223.1	52.4	0.1
HCM LOS	F	F	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	984	-	-	120	106	457	912	-	-
HCM Lane V/C Ratio	0.011	-	-	1.223	0.738	0.226	0.042	-	-
HCM Control Delay (s)	8.7	-	-	223.1	101.5	15.2	9.1	-	-
HCM Lane LOS	A	-	-	F	F	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	9.3	4	0.9	0.1	-	-

Notes

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

Intersection:

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	35	530	15
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	100	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	92	92	92
Heavy Vehicles, %	2	2	2
Mvmt Flow	38	576	16

Major/Minor	Major2		
Conflicting Flow All	680	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	912	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	912	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	0.6
HCM LOS	

Minor Lane/Major Mvmt

Intersection

Int Delay, s/veh 9.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	15	832	30	120	821	45	10	5	90
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	160	-	-	230	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	904	33	130	892	49	11	5	98

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	941	0	0	937	0
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	4.12	-	-	4.12	-
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218	-
Pot Cap-1 Maneuver	729	-	-	731	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	729	-	-	731	-
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0.2	1.3	48.5
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	27	236	729	-	-	731	-	-	18	70
HCM Lane V/C Ratio	0.403	0.438	0.022	-	-	0.178	-	-	1.208	0.155
HCM Control Delay (s)	209.4	31.6	10.1	-	-	11	-	-	\$ 584.7	65.7
HCM Lane LOS	F	D	B	-	-	B	-	-	F	F
HCM 95th %tile Q(veh)	1.2	2.1	0.1	-	-	0.6	-	-	3.1	0.5

Notes

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

Intersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	20	5	5
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	0	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	92	92	92
Heavy Vehicles, %	2	2	2
Mvmt Flow	22	5	5

Major/Minor	Minor2		
Conflicting Flow All	2183	2148	917
Stage 1	1178	1178	-
Stage 2	1005	970	-
Critical Hdwy	7.12	6.52	6.22
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.318
Pot Cap-1 Maneuver	33	48	330
Stage 1	233	265	-
Stage 2	291	331	-
Platoon blocked, %			
Mov Cap-1 Maneuver	~ 18	39	330
Mov Cap-2 Maneuver	~ 18	39	-
Stage 1	228	218	-
Stage 2	196	324	-

Approach	SB
HCM Control Delay, s	\$ 411.7
HCM LOS	F

Minor Lane/Major Mvmt

Intersection:

Int Delay, s/veh 1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	20	780	152	96	695	45	0	0	97
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	100	-	125	150	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	848	165	104	755	49	0	0	105

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	804	848	1880
Stage 1	-	-	891
Stage 2	-	-	989
Critical Hdwy	4.12	4.12	7.12
Critical Hdwy Stg 1	-	-	6.12
Critical Hdwy Stg 2	-	-	6.12
Follow-up Hdwy	2.218	2.218	3.518
Pot Cap-1 Maneuver	820	790	54
Stage 1	-	-	337
Stage 2	-	-	297
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	820	790	44
Mov Cap-2 Maneuver	-	-	44
Stage 1	-	-	328
Stage 2	-	-	237

Approach	EB	WB	NB
HCM Control Delay, s	0.2	1.2	19
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	361	820	-	-	790	-	-	395
HCM Lane V/C Ratio	0.292	0.027	-	-	0.132	-	-	0.083
HCM Control Delay (s)	19	9.5	-	-	10.2	-	-	14.9
HCM Lane LOS	C	A	-	-	B	-	-	B
HCM 95th %tile Q(veh)	1.2	0.1	-	-	0.5	-	-	0.3

Intersection:

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	0	0	30
Conflicting Peds, #/hr	0	0	0
Sign Control	Stop	Stop	Stop
RT Channelized	-	-	None
Storage Length	-	-	0
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	92	92	92
Heavy Vehicles, %	2	2	2
Mvmt Flow	0	0	33

Major/Minor	Minor 2		
Conflicting Flow All	1880	1880	780
Stage 1	989	989	-
Stage 2	891	891	-
Critical Hdwy	7.12	6.52	6.22
Critical Hdwy Stg 1	6.12	5.52	-
Critical Hdwy Stg 2	6.12	5.52	-
Follow-up Hdwy	3.518	4.018	3.318
Pot Cap-1 Maneuver	54	71	395
Stage 1	297	325	-
Stage 2	337	361	-
Platoon blocked, %			
Mov Cap-1 Maneuver	34	60	395
Mov Cap-2 Maneuver	34	60	-
Stage 1	289	282	-
Stage 2	232	351	-

Approach	SB
HCM Control Delay, s	14.9
HCM LOS	B

Minor Lane/Major Mvmt

HCM 2010 Signalized Intersection Summary
 1801: 180th St & Harrison Street

180th & Harrison Street TIA
 1/10/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	185	443	229	70	530	125	242	330	270	239	489	105
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3	186.3
Adj Flow Rate, veh/h	201	482	249	76	576	136	263	359	293	260	532	114
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	228	647	550	271	637	541	288	607	516	388	574	488
Arrive On Green	0.08	0.35	0.35	0.07	0.34	0.34	0.12	0.33	0.33	0.11	0.31	0.31
Sat Flow, veh/h	1774	1863	1583	1774	1863	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	201	482	249	76	576	136	263	359	293	260	532	114
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	1863	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	9.6	29.4	15.7	3.4	37.9	8.0	12.9	20.7	19.7	12.8	35.6	6.9
Cycle Q Clear(g_c), s	9.6	29.4	15.7	3.4	37.9	8.0	12.9	20.7	19.7	12.8	35.6	6.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	228	647	550	271	637	541	288	607	516	388	574	488
V/C Ratio(X)	0.88	0.75	0.45	0.28	0.90	0.25	0.91	0.59	0.57	0.67	0.93	0.23
Avail Cap(c_a), veh/h	228	680	578	280	680	578	314	651	553	391	593	504
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.5	37.0	32.6	26.6	40.4	30.5	31.1	36.3	35.9	27.1	43.2	33.2
Incr Delay (d2), s/veh	30.1	4.3	0.6	0.6	15.1	0.2	28.2	1.3	1.2	3.6	20.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	15.9	6.9	1.7	22.2	3.5	8.5	10.9	8.8	6.6	21.6	3.0
LnGrp Delay(d),s/veh	61.6	41.3	33.2	27.2	55.4	30.8	59.3	37.5	37.1	30.7	63.8	33.5
LnGrp LOS	E	D	C	C	E	C	E	D	D	C	E	C
Approach Vol, veh/h		932			788			915			906	
Approach Delay, s/veh		43.5			48.5			43.6			50.5	
Approach LOS		D			D			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.3	49.7	20.1	44.7	15.0	49.1	17.8	47.0				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	3.0	5.0				
Max Green Setting (Gmax), s	10.0	47.0	17.0	41.0	10.0	47.0	15.0	45.0				
Max Q Clear Time (g_c+I1), s	5.4	31.4	14.9	37.6	11.6	39.9	14.8	22.7				
Green Ext Time (p_c), s	0.0	6.9	0.2	2.0	0.0	4.1	0.0	6.9				
Intersection Summary												
HCM 2010 Ctrl Delay			46.4									
HCM 2010 LOS			D									

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	0	82	760	34	0	788
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	89	826	37	0	857

Major/Minor	Minor1	Minor2	Major1	Major2
Conflicting Flow All	1702	845	0	0
Stage 1	845	-	-	-
Stage 2	857	-	-	-
Critical Hdwy	6.42	6.22	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-
Follow-up Hdwy	3.518	3.318	-	2.218
Pot Cap-1 Maneuver	101	363	-	779
Stage 1	421	-	-	-
Stage 2	416	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	101	363	-	779
Mov Cap-2 Maneuver	101	-	-	-
Stage 1	421	-	-	-
Stage 2	416	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	363	779	-
HCM Lane V/C Ratio	-	-	0.246	-	-
HCM Control Delay (s)	-	-	18.1	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	1	0	-

Intersection

Int Delay, s/veh 17.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR
Vol, veh/h	45	0	15	63	0	80	15	669	43
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2
Mvmt Flow	49	0	16	68	0	87	16	727	47

Major/Minor	Minor2			Minor1			Major1		
Conflicting Flow All	1722	1702	758	1686	1708	751	788	0	0
Stage 1	895	895	-	783	783	-	-	-	-
Stage 2	827	807	-	903	925	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-
Pot Cap-1 Maneuver	70	92	407	74	91	411	831	-	-
Stage 1	335	359	-	387	404	-	-	-	-
Stage 2	366	394	-	332	348	-	-	-	-
Platoon blocked, %									
Mov Cap-1 Maneuver	51	83	407	~ 66	82	411	831	-	-
Mov Cap-2 Maneuver	51	83	-	~ 66	82	-	-	-	-
Stage 1	329	330	-	380	396	-	-	-	-
Stage 2	283	386	-	293	320	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	219.3	109.4	0.2
HCM LOS	F	F	

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	831	-	-	65	66	411	842	-	-
HCM Lane V/C Ratio	0.02	-	-	1.003	1.038	0.212	0.081	-	-
HCM Control Delay (s)	9.4	-	-	219.3	227.8	16.1	9.7	-	-
HCM Lane LOS	A	-	-	F	F	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	5	5.2	0.8	0.3	-	-

Notes

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

Intersection

Int Delay, s/veh

Movement	SBL	SBT	SBR
Vol, veh/h	63	670	55
Conflicting Peds, #/hr	0	0	0
Sign Control	Free	Free	Free
RT Channelized	-	-	None
Storage Length	100	-	-
Veh in Median Storage, #	-	0	-
Grade, %	-	0	-
Peak Hour Factor	92	92	92
Heavy Vehicles, %	2	2	2
Mvmt Flow	68	728	60

Major/Minor	Major1	Major2	Minor
Conflicting Flow All	774	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	842	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	842	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SB
HCM Control Delay, s	0.8
HCM LOS	

Minor Lane/Major Mvmt



SARPY COUNTY PLANNING & BUILDING DEPT.

1210 GOLDEN GATE DRIVE PAPPILLION, NE 68046

PHONE: 402-593-1555 FAX: 402-593-1558

E-MAIL: PLANNING@SARPY.COM

PRELIMINARY PLAT APPLICATION

In order for your application to be considered **COMPLETE**, please answer all applicable questions and provide the following:

1. Completed Preliminary Plat Application
2. Non-Refundable Fee of \$200 made payable to Sarpy County Treasurer (additional fees may also be required to cover cost of mailing of public notifications)
3. Two (2) full sized, folded plat drawings
4. One (1) reduced size site plan drawing (8.5 x 11)
5. One (1) electronic copy of the plat drawing in PDF form
6. One (1) electronic copy in autoCAD format as required by the County GIS Section (for subdivisions of 20+ lots)
7. **Please review Sections 5 and 6 of the Sarpy County Subdivision Regulations for a complete list of Preliminary Plat process and submittal requirements.**

PLANNING STAFF USE ONLY:

APPLICATION #: PP 13-0009

DATE RECEIVED: 8-5-13

CP DESIGNATION: Urban Residential

CURRENT ZONING DESIGNATION: BG

PROPOSED ZONING DESIGNATION: BG + RG-15

APPLICATION FEE: \$ 200 RECEIPT NO. 922450

PUBLIC NOTIFICATION PROCESSING FEE: \$ _____ RECEIPT NO. _____

RECEIVED BY: _____

NOTES: _____

APPLICANT INFORMATION:

NAME: LKM Investments, LLC E-MAIL: mearl@lundco.com

ADDRESS: 6214 California Street CITY/STATE/ZIP: Omaha, NE 68132

MAILING ADDRESS: _____ CITY/STATE/ZIP: _____
(IF DIFFERENT)

PHONE: 402-548-4005 FAX: _____

PROPERTY OWNER INFORMATION: (If multiple owners, please attach separate sheet)

NAME: Plambeck AG, LLC E-MAIL: _____

ADDRESS: 5711 South 118th Plaza CITY/STATE/ZIP: Omaha, NE 68137

MAILING ADDRESS: _____ CITY/STATE/ZIP: _____
(IF DIFFERENT)

PHONE: 402-895-6803 FAX: _____

ENGINEERING/SURVEYING PROFESSIONAL'S INFORMATION:

NAME: Olsson Associates - Justin Zetterman, PE E-MAIL: jzetterman@olssonassociates.com

ADDRESS: 2111 South 67th Street, Suite 200 CITY/STATE/ZIP: Omaha, NE 68106

MAILING ADDRESS: _____ CITY/STATE/ZIP: _____
(IF DIFFERENT)

PHONE: 402-341-1116 FAX: 402-341-5895

PROJECT DESCRIPTION: Describe the project in detail, including physical features of the site, proposed improvements, proposed uses or business, operating hours, number of employees, anticipated customers, etc. – Attach additional sheets if necessary.

PLEASE NOTE: A detailed project description is essential to the reviewing process of this request.

The project consists of rezoning and replating 2 parcels of ground at 180th & Harrison Streets that are currently zoned BG. The new plat will consist of 3 lots with the lot at the NW corner of the property remaining zoned BG (approx. 3 acres). The expected users for this commercial property include a C-Store that will likely be open 24 hrs a day and either a neighborhood office building or restaurant. The hours for the office would likely be a typical 8:00 am to 5:00 pm with a restaurant likely open from 11:00 am to 10:00 pm. The customer base for all businesses would be from the local area around the development. The remaining 2 lots (approx. 14.6 acres) would be rezoned to RG-15 and developed with a multi-family residential project (apartments). The total number of units will likely be in the range of 275 to 300. All improvements to the property will be private as no public ROW is proposed within the confines of the plat.

PLAT INFORMATION: Complete each section in its entirety. If a question is not applicable to your project, please indicate this to show that each question has been carefully considered.

PLAT NAME: Plambeck Addition Replat 1

ASSESSOR'S PARCEL NUMBER: 011245867 ADDITIONAL PARCEL NUMBERS 011245859

GENERAL LOCATION: SE corner of 180th Street and Harrison Street
(example 189th & Giles Rd)

LEGAL DESCRIPTION: (Describe property to wit:) current: Lots 1 and 2, Plambeck Addition

SIZE OF PROPERTY: 17.795 acres CURRENT ZONING: BG REQUESTED ZONING: BG & RG-15

SOURCE OF UTILITY SERVICES: Water - MUD Sewer - City of Omaha \ City of Gretna
Gas - MUD Electric - OPPD

ADDITIONAL INFORMATION: Please use this space to provide any other information you feel is appropriate for Sarpy County to consider during review of your application. Attach extra sheets if necessary.

With this replat we are taking an existing 17.795 acres of commercially zoned property and reducing the commercial zoning to roughly 3 acres and converting the rest to a less intensive multi-family residential zoning. Connection issues and other traffic concerns are being worked out with the Sarpy County Public Works and Planning Departments.

PLEASE NOTE THE FOLLOWING PROCEDURES:

1. The Planning Department will review the application material along with other appropriate departments and/or agencies and provide a recommendation report to the Planning Commission and County Board.
2. The Planning Commission will hold a public hearing and make a recommendation to the County Board.
3. The County Board will hold a public hearing and make a final decision on the Preliminary Plat application.
4. All necessary agreements/drawings are to be recorded with the Sarpy County Register of Deeds, the cost of which will be borne by the applicant or the property owner.
5. If a Change of Zoning application is applied for concurrently with the Preliminary Plat, the conditional approval of the plat also allows for conditional approval of the rezoning request; however, the rezoning does NOT become official until the Final Plat is approved and filed with the Register of Deeds office.

The applicant (or authorized agent) has prepared this application and certifies that the facts stated herein and exhibits attached hereto are true and correct.

M. J. P. Egan
Applicant Signature

8/5/13
Date

I, the undersigned, understand a sign will be posted on my property and will remain until the public hearing process of the Planning Commission and County Board is complete. I further understand the Change of Zoning process as stated above and I authorize Sarpy County staff to enter the property for inspection related to the specific request during this process.

Don D. Plambeck
Owner Signature (or authorized agent)

8/5/13
Date

Owner Signature (or authorized agent)

Date



SARPY COUNTY PLANNING & BUILDING DEPT.

1210 GOLDEN GATE DRIVE PAPILLION, NE 68046

PHONE: 402-593-1555 FAX: 402-593-1558

E-MAIL: PLANNING@SARPY.COM

CHANGE OF ZONING APPLICATION

In order for your application to be considered **COMPLETE**, please answer all applicable questions and provide the following:

1. Completed Change of Zoning Application
2. Non-Refundable Fee of \$200 made payable to Sarpy County Treasurer (additional fees may also be required to cover cost of mailing of public notifications)
3. Copy of Deed on file with Register of Deeds or other acceptable proof of ownership
4. Two (2) site plan drawings (folded)
5. One (1) reduced size site plan drawing (8.5 x 11)
6. One (1) electronic copy of site plan drawing in PDF form
7. Site plan drawing should include the following (as applicable)
 - a. Legal description with site layout (1"=20')
 - b. Metes and bounds description with lot size
 - c. Floodplain/floodway boundaries
 - d. Existing easements
 - e. General location map (2 mile radius)
 - f. Elevations or other supporting materials
8. Detailed operational plans
9. **Please review Section 43 of the Sarpy County Zoning Regulations for a complete list of change of zoning process and submittal requirements.**

PLANNING STAFF USE ONLY:

APPLICATION #: CZ 13-0008

DATE RECEIVED: 8-5-13

CP DESIGNATION: Urban Residential

CURRENT ZONING DESIGNATION: BG

PROPOSED ZONING DESIGNATION: BG + RG-15

APPLICATION FEE: \$ 200 RECEIPT NO. 922450

PUBLIC NOTIFICATION
 PROCESSING FEE: \$ _____ RECEIPT NO. _____

RECEIVED BY: _____

NOTES: _____

APPLICATION FILING FEES (does NOT include public notification fee)

- Agricultural Zoning Districts (AG, AGD, AGR) - \$200
- Residential Zoning Districts (RS-100 through RMH) - \$200
- All other Zoning Districts - \$400

APPLICANT INFORMATION: CHECK BOX IF TEXT AMENDMENT APPLICATION

NAME: LKM Investments, LLC E-MAIL: mearl@lundco.com

ADDRESS: 6214 California Street CITY/STATE/ZIP: Omaha, NE 68132

MAILING ADDRESS: _____ CITY/STATE/ZIP: _____
(IF DIFFERENT)

PHONE: 402-548-4005 FAX: _____

PROPERTY OWNER INFORMATION: (If multiple owners, please attach separate sheet)

NAME: Plambeck AG, LLC E-MAIL: _____

ADDRESS: 5711 South 118th Plaza CITY/STATE/ZIP: Omaha, NE 68137

MAILING ADDRESS: _____ CITY/STATE/ZIP: _____
(IF DIFFERENT)

PHONE: 402-895-6803 FAX: _____

ENGINEERING/SURVEYING OR OTHER CONSULTING PROFESSIONAL'S INFORMATION:

NAME: Olsson Associates - Justin Zetterman, PE E-MAIL: jzetterman@olssonassociates.com

ADDRESS: 2111 South 67th Street, Suite 200 CITY/STATE/ZIP: Omaha, NE 68106

MAILING ADDRESS: _____ CITY/STATE/ZIP: _____
(IF DIFFERENT)

PHONE: 402-341-1116 FAX: 402-341-5895

PROJECT DESCRIPTION: (Describe the project in detail, including physical features of the site, proposed improvements, proposed uses or business, operating hours, number of employees, anticipated customers, etc. – Attach additional sheets if necessary.)

PLEASE NOTE: A detailed project description is essential to the reviewing process of this request.

This project consists of rezoning and replating two parcels of ground at 180th and Harrison Streets that are currently zoned BG. The new plat will consist of 3 lots with the one in the NW corner of the property remaining zoned BG (approx. 3 acres). The expected users for this commercial property include a C-Store that will likely be open 24 hours a day and either a neighborhood office building or restaurant. The hours for the office would likely be a typical 8:00 am to 5:00 pm with a restaurant likely open from 11:00 am to 10:00 pm. The customer base for all businesses would be from the local area around the development. The remaining lots (approx. 14.6 acres) would be rezoned to RG-15 and developed with a multi-family residential project (apartments). The total number of units will likely be in the range of 275 to 300. All improvements to the property will be private as no public ROW is proposed within the confines of the plat

PROJECT SITE INFORMATION: Complete each section in its entirety. If a question is not applicable to your project, please indicate this to show that each question has been carefully considered.

SUBDIVISION NAME: Current: Plambeck Addition Proposed: Plambeck Addition Replat 1

GENERAL LOCATION: SE corner of 180th Street and Harrison Street
(example 189th & Giles Rd)

ASSESSOR'S PARCEL NUMBER: 011245867 **ADDITIONAL PARCEL NUMBERS** 011245859

LEGAL DESCRIPTION: (Describe property to wit:) Current: Lots 1 and 2, Plambeck Addition

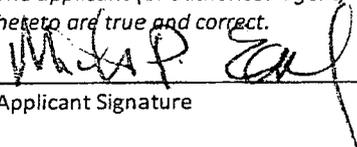
SIZE OF PROPERTY: _____ *acres* **CURRENT ZONING:** BG **REQUESTED ZONING:** BG & RG-15

SOURCE OF UTILITY SERVICES: **Water** - Metropolitan Utilities District **Sewer** - City of Omaha / City of Gretna
Gas - Metropolitan Utilities District **Electric** - OPPD

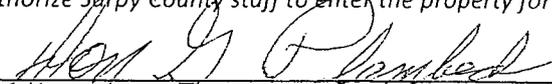
PLEASE NOTE THE FOLLOWING PROCEDURES:

1. The Planning Department will review the application material along with other appropriate departments and/or agencies and provide a recommendation report to the Planning Commission and County Board.
2. The Planning Commission will hold a public hearing and make a recommendation to the County Board.
3. The County Board will hold a public hearing and make a final decision on the Change of Zoning application.
4. Any necessary agreements will be recorded with the Sarpy County Register of Deeds, the cost of which will be borne by the applicant or the property owner.

The applicant (or authorized agent) has prepared this application and certifies that the facts stated herein and exhibits attached hereto are true and correct.

 8/5/13
Applicant Signature Date

I, the undersigned, understand a sign will be posted on my property and will remain until the public hearing process at the Planning Commission and County Board is complete. I further understand the Preliminary Plat process as stated above and I authorize Sarpy County staff to enter the property for inspection related to the specific request during this process.

 8/5/13
Owner Signature (or authorized agent) Date

Owner Signature (or authorized agent) Date

Change of Zone

PROPOSED ZONING

PLAMBECK ADDITION REPLAT 1

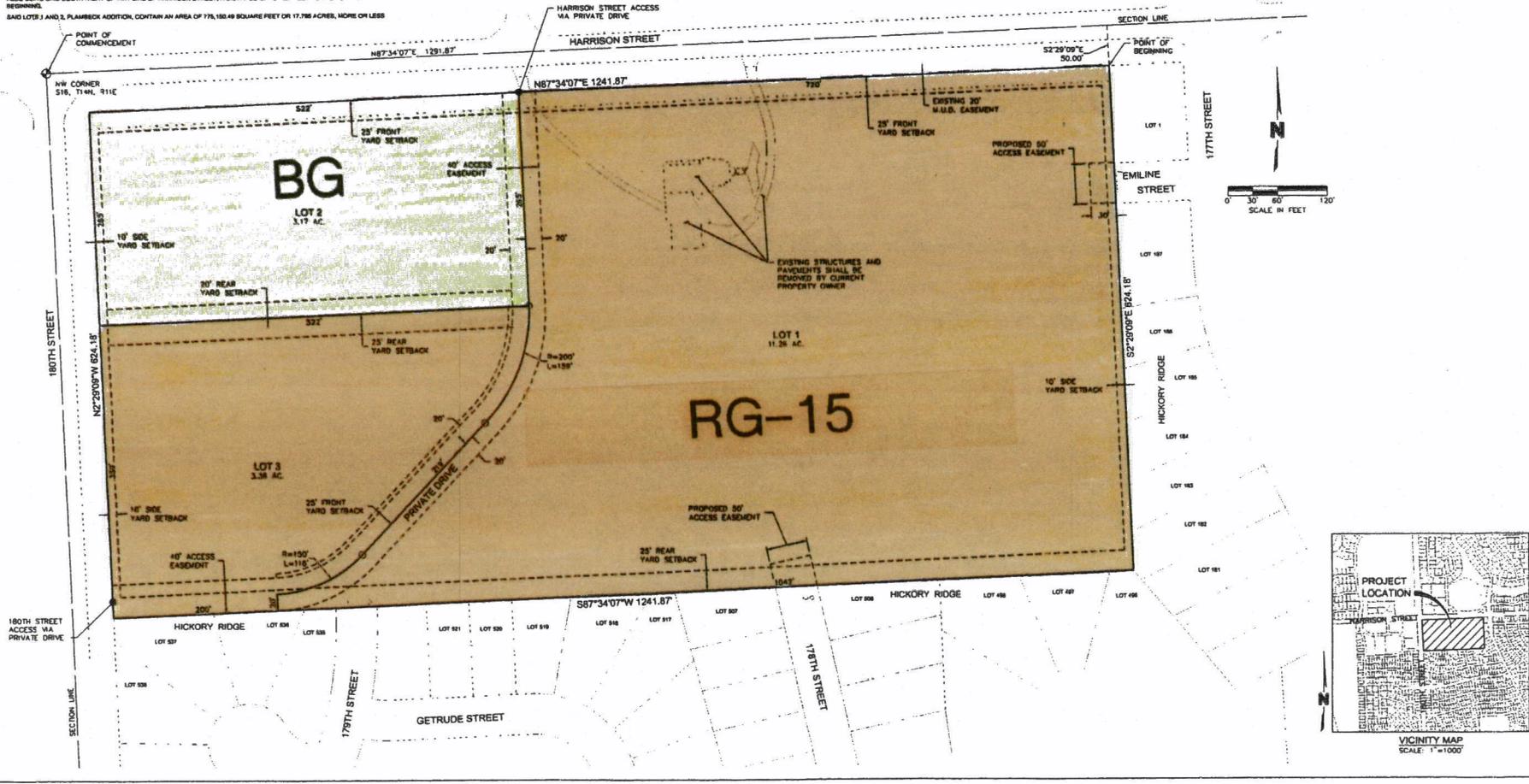
LOTS 1, 2, & 3

BEING A REPLATTING OF PLAMBECK ADDITION LOTS 1 AND 2, LOCATED IN THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 16, TOWNSHIP 14 NORTH, RANGE 11 EAST, OF THE 6TH P.M., SARPY COUNTY NEBRASKA

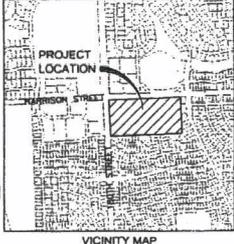
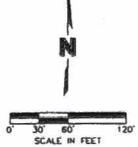
MEASURED LEGAL DESCRIPTION

LOTS 1 AND 2, PLAMBECK ADDITION, A SUBDIVISION LOCATED IN THE NW1/4 OF SECTION 16, TOWNSHIP 14 NORTH, RANGE 11 EAST OF THE 6TH P.M., SARPY COUNTY, NEBRASKA. COMMENCING AT THE NORTHWEST CORNER OF SAID NW1/4 OF SECTION 16 THENCE EASTERLY ALONG THE NORTH LINE OF SAID NW1/4 ON AN ASSUMED BEARING OF $N87^{\circ}34'07''E$, A DISTANCE OF 1241.87 FEET THENCE SOUTHWESTERLY A DISTANCE OF 30.28 FEET TO THE NORTHEAST CORNER OF SAID LOT 2, PLAMBECK ADDITION SAID CORNER ALSO BEING THE NORTHWEST CORNER OF LOT 1, HICKORY RIDGE, A SUBDIVISION LOCATED IN SAID NW1/4 OF SECTION 16, SAID CORNER ALSO BEING ON THE SOUTH RIGHT-OF-WAY LINE OF HARRISON STREET, SAID POINT ALSO BEING THE POINT OF BEGINNING THENCE SOUTHWESTERLY ALONG THE EAST LINE OF SAID LOT 2, PLAMBECK ADDITION, SAID LINE ALSO BEING THE WEST LINE OF SAID LOT 1, HICKORY RIDGE, SAID LINE ALSO BEING THE WEST LINE OF LOTS 182 THROUGH 185, SAID HICKORY RIDGE, A DISTANCE OF $84^{\circ}18'15''E$ TO THE SOUTHWEST CORNER OF SAID LOT 2, PLAMBECK ADDITION, SAID CORNER ALSO BEING A WEST CORNER OF SAID LOT 182, HICKORY RIDGE, SAID CORNER ALSO BEING THE NORTHEAST CORNER OF LOT 456, SAID HICKORY RIDGE, THENCE SOUTHWESTERLY ALONG THE SOUTH LINE OF SAID LOT 2, PLAMBECK ADDITION, SAID LINE ALSO BEING THE NORTH LINE OF LOTS 456 THROUGH 458, 601, 602, 603, 604 THROUGH 607, SAID HICKORY RIDGE, A DISTANCE OF 1241.87 FEET TO THE SOUTHWEST CORNER OF SAID LOT 2, PLAMBECK ADDITION, SAID CORNER ALSO BEING THE NORTHWEST CORNER OF SAID LOT 807, HICKORY RIDGE, SAID CORNER ALSO BEING ON THE EAST RIGHT-OF-WAY LINE OF 180TH STREET, THENCE WESTERLY ALONG THE WEST LINE OF SAID LOT 2, PLAMBECK ADDITION, SAID LINE ALSO BEING SAID EAST RIGHT-OF-WAY LINE OF 180TH STREET, A DISTANCE OF $84^{\circ}18'15''E$ TO THE NORTHWEST CORNER OF SAID LOT 2, PLAMBECK ADDITION, SAID CORNER ALSO BEING THE POINT OF INTERSECTION OF SAID SOUTH RIGHT-OF-WAY LINE OF HARRISON STREET AND SAID EAST RIGHT-OF-WAY LINE OF 180TH STREET, THENCE $N87^{\circ}34'07''E$ ALONG THE NORTH LINE OF SAID LOT 2, PLAMBECK ADDITION, SAID LINE ALSO BEING THE NORTH LINE OF SAID LOT 1, PLAMBECK ADDITION, SAID LINE ALSO BEING SAID SOUTH RIGHT-OF-WAY LINE OF HARRISON STREET, A DISTANCE OF 1241.87 FEET TO THE POINT OF BEGINNING.

SAID LOTS 1 AND 2, PLAMBECK ADDITION, CONTAIN AN AREA OF 176,160.49 SQUARE FEET OR 17.786 ACRES, MORE OR LESS.



SHEET INDEX	
C1.1	PRELIMINARY PLAT
C2.1	PRELIMINARY GRADING PLAN
C3.1	PRELIMINARY UTILITY PLAN



MOLSSON ASSOCIATES
 211 South 87th Street, Suite 208
 Omaha, NE 68114

REV. NO.	DATE	REVISION DESCRIPTION

PRELIMINARY PLAT
 PROJECT TITLE
 180TH STREET AND HARRISON STREET
 OMAHA, NEBRASKA
 2013
 SHEET
 C1.1

P:\Projects\013-170_LDP_VanHorn\013_170_P_1.dwg USER: mackay
 DATE: 04/20/2013 11:12:00 AM PLOT: 3170_P1A1.dwg
 PLOT: 04/20/2013 11:12:00 AM

Lot 2

Requested Zoning RG15

Existing Zoning BG

Acreage 14.62 AC

Units:

- (2) 25 unit buildings with attached garages 3 story
- 25 unit building with no attached garages 3 story
- (5) 25 unit building with integral garages 3 story
- 50 Unit Future Multi-Family Apartments

150 one bedroom units
263 cars provided

150 two bedroom units
300 cars provided

300 total units
563 car parking (including integral and remote garages)

- One story clubhouse and pool
- 20' wide minimum buffer to adjacent single family residential
- 1 tree per 40' buffer provided within buffer zone shown as crosshatched.

•Required screening trees shall be 6' tall BB varieties of spruce.





**SARPY COUNTY PLANNING
& BUILDING DEPARTMENT**

RECOMMENDATION REPORT

REVISED PRELIMINARY PLAT (PP 14-0001)

APPLICANT: LKM Investments, LLC

**PROPOSED COMMERCIAL / MULTI-FAMILY RESIDENTIAL SUBDIVISION
TO BE KNOWN AS PLAMBECK ADDITION REPLAT 1**

PLANNING COMMISSION HEARING OF: JANUARY 21, 2014

I. GENERAL INFORMATION

A. APPLICANT:

LKM Investments, LLC
6214 California Street
Omaha, NE 68132

B. PROPERTY OWNERS:

Plambeck AG, LLC
5711 S. 118th Plaza
Omaha, NE 68137

C. SUBJECT PROPERTY LOCATION: Subject property is located on the southeast corner of 180th Street and Harrison Street.

D. CURRENT LEGAL DESCRIPTION: Lots 1 and 2 Plambeck Addition as surveyed platted and recorded in Sarpy County, NE

E. SUBJECT PROPERTY SIZE: approximately 17.795 acres (total of existing plat)

F. EXISTING FUTURE LAND USE AND ZONING DESIGNATIONS:

- Future Land Use Designations: Urban Residential
- Current Zoning: BG (General Business District) – Planning Commission recommended approval of rezoning of Lots 1 & 3 of the proposed plat to RG-15 at their October 15, 2013 meeting. This zoning will become effective, if it is approved by the County Board, once the Final Plat is approved and recorded in the Register of Deeds Office.

G. REQUESTED ACTION(S): To approve a Revised Preliminary Plat to be known as Plambeck Addition Replat 1 – Lots 1, 2, & 3. The request would replat this property into 3 lots to allow for commercial development on approximately 3 acres at the corner of 180th and Harrison Streets (Lot 2) and a multi-family residential development on the remainder of the property (Lots 1 & 3). The original Preliminary Plat for this project was approved by the Planning Commission at their October 15, 2013 meeting following a public hearing on the application. Since that time, the developer has met with the County Public Works Department regarding access and street improvements that will be required and has updated the Preliminary Plat to reflect proposed changes as a result of those meetings. Those changes include:

1) allowing a right in – right out (RIRO) only access to 180th Street from Lot 2, along with a deceleration/right turn lane along 180th Street as required by the County Public Works Department; 2) a connection from the project to 179th Street to the south as discussed at the previous Planning Commission hearing; and, 3) showing the necessary right-of-way dedications and improvements on the preliminary plat.

II. BACKGROUND INFORMATION

A. EXISTING CONDITION OF SITE: Farmstead with agricultural buildings and farmland.

B. GENERAL VICINITY AND LAND USE

- North: Millard Elementary School, day care center, pediatric dental office (City of Omaha's jurisdiction)
- South and East: Urban Residential Development – Hickory Ridge subdivision
- West: Urban Residential Development – Sunridge subdivision; Commercial Development – Sunridge Commercial Center

C. RELEVANT CASE INFORMATION:

- Property was originally platted as Plambeck Addition in 1993 which included 2 lots – one in the middle of the site along Harrison Street which included the farmstead and the second lot was the remainder of the farmland.
- Development will be served with utilities as follows: water by MUD, natural gas by MUD, sanitary sewer by City of Gretna and City of Omaha, and electrical power by OPPD.

D. APPLICABLE REGULATIONS:

- Sarpy County Comprehensive Development Plan
- Sarpy County Zoning Regulations:
 - Section 18, RG-15 – General Residential District
 - Section 20, BG – General Business District
 - Section 38, Stormwater Management Regulations
- Sarpy County Subdivision Regulations

III. GENERAL OVERVIEW:

▪ Preliminary Plat:

- Preliminary Plat consists of 3 lots to be zoned and developed as described above.
- Lot sizes are: Lot 1 – approx. 11.26 acres; Lot 2 – approx. 3.05 acres; Lot 3 – approx. 3.35 acres.
- An internal private drive is proposed which splits Lot 1 from Lots 2 and 3. The drive will connect to Harrison Street on the north and 180th Street on the west.
- The existing farmstead improvements are to be removed by the current owner.

IV. ANALYSIS / STAFF COMMENTS

A. COMPREHENSIVE PLAN:

- The Comprehensive Plan shows the area on the Future Land Use Map as Urban Residential. The proposed project will consist of multi-family residential and small neighborhood commercial development which is consistent with the Comprehensive Plan.

B. TRAFFIC AND ACCESS:

- Proposed access points are as follows:
 - Full access on 180th Street @ Gertrude Street
 - Right in/Right out only access on 180th Street - approximately 250' south of Harrison St.
 - $\frac{3}{4}$ access on Harrison Street @ 178th Street
- A street connection to 179th Street to the south has been added as per the suggestion of several Planning Commissioners at the October 15, 2013 public hearing.
- Any street or road improvements required along Harrison or 180th Streets will be the developer's responsibility and will be specified in the Subdivision Agreement.
- An additional 10 feet of right-of-way has been shown to be dedicated for a distance of 300 feet fronting the east leg of Harrison Street and 300 feet fronting the south leg of 180th Street as per the County Public Works Department's previous recommendation.
- A Traffic Impact Analysis of the project on 180th and Harrison Streets has been completed by Felsburg, Holt & Ullevig Consultants (FHU) and is attached for your information.
- The Sarpy County Public Works Department has made the following recommendations regarding traffic improvements related to the project (see attached memo from Patrick Dowse, Sarpy Co. Engineering Manager):
 - The perceived free flow movement of the private drive connecting the Gertrude Street access to the 178th Street access may become a pass-through for motorists trying to short cut the intersection at Harrison and 180th Streets. Considerations should be made to discourage this type of traffic movement.
 - The proposed hammerhead at the end of 178th Street on the south edge of the development needs to be reviewed by the appropriate Fire Department to be sure of its acceptability for fire protection standards or ordinances. The proposed concept plan and plat was forwarded to the Omaha Fire Department, but no comments were received. The applicant is also trying to reach the Assistant Fire Chief to discuss the proposal. The hammerhead turnaround will have to be approved by the Fire Department prior to approval of the final plat by the County.
 - After additional discussions with the applicant, they have proposed constructing a right turn lane with a channelizing median for right-in right-out (RIRO) only movements for the access south of Harrison Street. As this turn lane will pull turning vehicles out of the main flow of traffic, and the right turn lane being constructed from NB 180th Street to EB Harrison Street will improve operations at the major intersection, this would be acceptable to Public Works
 - The future $\frac{3}{4}$ access at the intersection of 178th and Harrison Street was discussed with the Douglas County Engineer's Office, and was found to be agreeable with Douglas County. However, as Note #13 on the adjacent plat, Cinnamon Creek 2nd Addition (to the north in Douglas County) states, the access for 178th Street "WILL BE RIGHT-IN / RIGHT-OUT ONLY AT HARRISON STREET." This may require the adjacent plat to be amended to state a $\frac{3}{4}$ access will be allowed.

C. OTHER AGENCY REVIEW/COMMENTS: The application was previously sent to area jurisdictional agencies or departments that may have an interest.

- Comments were received back from:
 - **Sarpy County Public Works** – See above recommendations under Traffic and Access as well as attached memo from Patrick Dowse.
 - **Papio Missouri River Natural Resource District** – Comments included the requirement of a post construction stormwater management plan, submittal of all documentation to the Papillion Creek Watershed Partnership Website (Omaha Permix) and payment of Watershed Management Fees. Please see copy of comments included in this packet.

IV. STAFF RECOMMENDATIONS:

- Staff recommends **APPROVAL** of the Revised Preliminary Plat of a subdivision to be known as Plambeck Addition Replat 1, subject to the following items being addressed:
 - Comments/recommendations from the Sarpy County Public Works Department regarding traffic and street improvement issues must be addressed and followed.

Staff makes this recommendation as the Preliminary Plat, with conditions as noted, meets requirements of the Sarpy County Comprehensive Development Plan, Zoning Regulations, and Subdivision Regulations.

V. PLANNING COMMISSION RECOMMENDATION:

MOTION: Bliss moved, seconded by Lichter to recommend approval of the Revised Preliminary Plat of a subdivision to be known as Plambeck Addition Replat 1 with a right-in, right-out only access to 180th Street from Lot 2 and with the condition that the Fire Department issues be resolved. This recommendation is being made as the Preliminary Plat meets the requirements of the Sarpy County Comprehensive Development Plan, Zoning Regulations, and Subdivision Regulations. **Ballot:** Ayes – Bliss, Lichter, Huddleston, Davis, Ackley, Whitfield, Malmquist, Fenster, Torczon and Farrell. Nays – None. Abstain – None. Absent – Mohr. **Motion carried.**

VI. ATTACHMENTS TO REPORT:

1. Current Zoning Map (showing subject property area)
2. Proposed Zoning Map (showing zoning recommended for approval on October 15, 2013 by the Planning Commission).
3. Current Development Structure Plan – Figure 5.1 of Comprehensive Plan (showing subject property area)
4. Revised Preliminary Plat as submitted
5. Conceptual Site Plan (for information only)
6. Comments received from jurisdictional agencies or departments having an interest.
7. Revised Preliminary Plat Application
8. The Traffic Impact Analysis prepared by Felsburg Holt & Ullevig for this project was previously provided to the Planning Commission for the October 15, 2013 meeting and is being emailed again to the Commission for your information. If any Planning Commissioners would like another paper copy printed, please contact the Planning Department and we will get one to you.

VII. COPIES OF REPORT SENT TO:

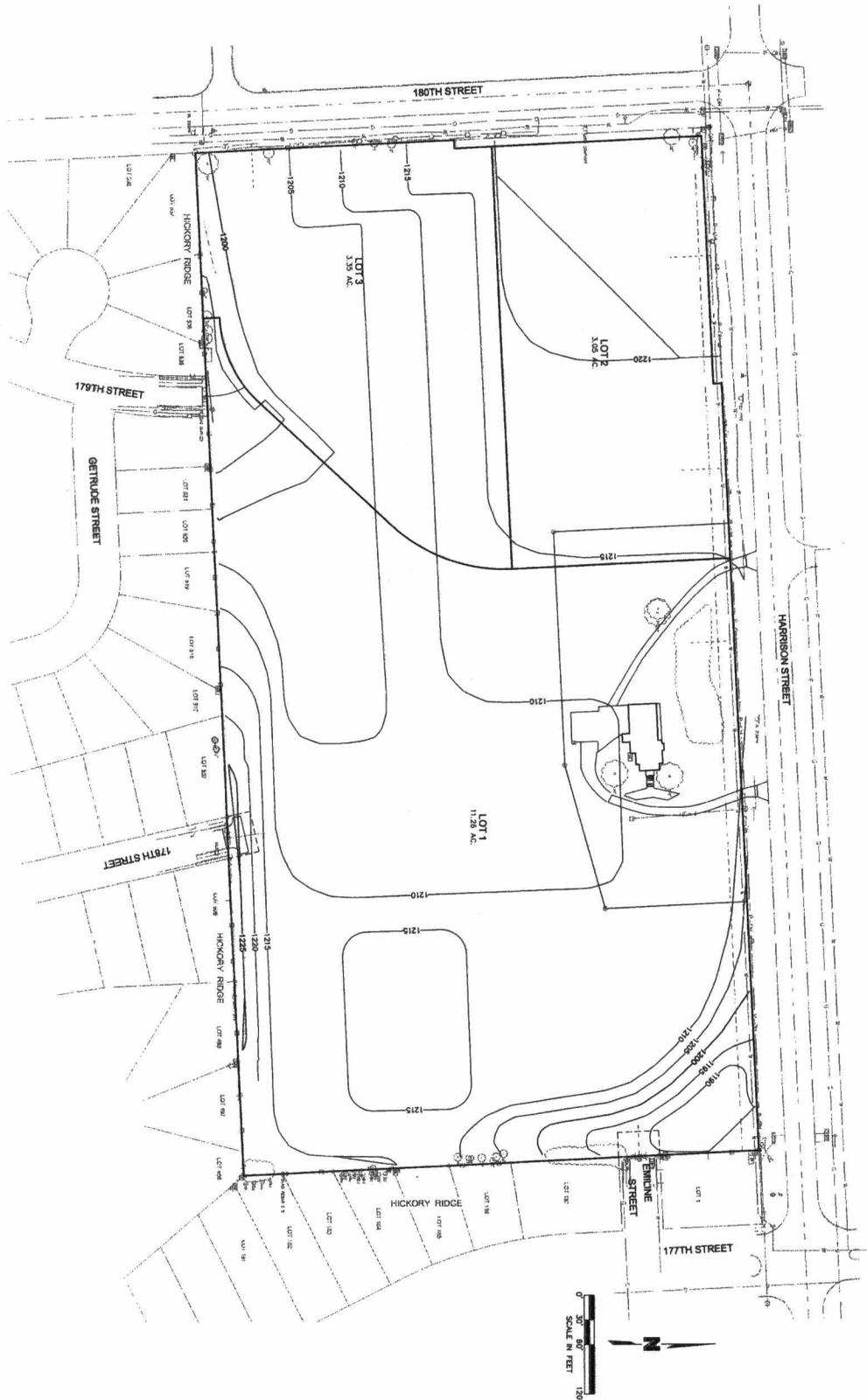
1. LKM Investments (applicant)
2. Olsson Associates (applicant's engineer)
3. Public Upon Request

Report prepared by: Bruce Fountain, Director – Planning & Building Department



Vicinity Map - Proposed Zoning (Approved by Planning Commission 10/15/2013)
 SE 180th & Harrison St - Plambeck Addition Replat 1
 Revised Preliminary Plat





SHEET
 02.1

PRELIMINARY GRADING PLAN
 REVISED PRELIMINARY PLAT
 PLAMBECK ADDITION - REPLAT 1
 180TH STREET AND HARRISON STREET

OMAHA, NEBRASKA

REV. NO.	DATE	REVISIONS DESCRIPTION

2013 REVISIONS

MOLSSON ASSOCIATES

2111 South 87th Street, Suite 200 TEL: 402.341.1116
 Omaha, NE 68114 FAX: 402.341.0556 www.ohrsonassociates.com

Lot 2

Requested Zoning RG15

Existing Zoning BG

Acreage 14.62 AC

Units:

- (2) 25 unit buildings with attached garages 3 story
- 25 unit building with no attached garages 3 story
- (5) 25 unit building with integral garages 3 story
- 50 Unit Future Multi-Family Apartments

125 one bedroom units
263 cars provided

125 two bedroom units
300 cars provided

250 total units
563 car parking (including integral and remote garages)

- One story clubhouse and pool
- 20' wide minimum buffer to adjacent single family residential
- 1 tree per 40' buffer provided within buffer zone shown as crosshatched.
- Required screening trees shall be 6' tall BB varieties of spruce.





SARPY COUNTY

Dennis L. Wilson, P.E., PhD
Sarpy County Engineer

PUBLIC WORKS DEPARTMENT
15100 South 84th Street • Papillion, NE 68046-2895
Phone (402) 537-6900 • FAX (402) 537-6955 • www.sarpy.com

MEMO

TO: Donna Lynam, Zoning Administrator / Code Enforcement

FROM: Patrick M. Dowse, P.E., Engineering Manager *pmo*

DATE: January 14, 2014

RE: Revised Preliminary Plat – Plambeck Addition Replat 1

Sarpy County Public Works has reviewed the revisions of the Revised Preliminary Plat, and has the following comments:

PRELIMINARY PLAT

After discussions with the developer, the developer has proposed constructing a right turn lane with a channelizing median for right-in right-out (RIRO) only movements for the access south of Harrison Street. As this turn lane will pull turning vehicles out of the main flow of traffic, and the right turn lane being constructed from NB 180th Street to EB Harrison Street will improve operations at the major intersection, this would be acceptable to Public Works

The future $\frac{3}{4}$ access at the intersection of 178th and Harrison Street was discussed with the Douglas County Engineer's Office, and was found to be agreeable with Douglas County. However, as Note #13 on the adjacent plat, Cinnamon Creek 2nd Addition states, the access for 178th Street "WILL BE RIGHT-IN / RIGHT-OUT ONLY AT HARRISON STREET." This may require the adjacent plat to be amended to state a $\frac{3}{4}$ access will be allowed.

As stated in previous comments, the perception of the ability of being able to "cut through" the development may result in higher traffic counts and speeds than what is anticipated on the access road that runs from 180th and Gertrude Streets to 178th and Harrison Streets. The developer may want to take steps to discourage this traffic movement.

Please let me know if you have any questions.



September 3, 2013

Mr. Bruce Fountain, Director
Sarpy County Planning Department
1210 Golden Gate Drive
Papillion, Nebraska 68046

RE: Plambeck Addition Replat 1 – Preliminary Plat and Change of Zone Applications

Dear Mr. Fountain:

The District has reviewed the preliminary plat and change of zone applications for Plambeck Addition Replat 1, southeast of 180th Street and Harrison Street in Sarpy County. The District offers the following comments:

- A post construction stormwater management plan demonstrating on-site control of the first one-half inch of stormwater runoff and no-net increase in peak runoff from a 2-year storm event must be submitted for this project. An application and all supporting documentation must be submitted to the Omaha Permix website at <http://www.omahapermix.com/pcsmp/applicant/login.php>.
- A subdivision agreement was not provided for review; however, as stated in the Papillion Creek Watershed Partnership Interlocal Agreement adopted by the County in 2009, Watershed Management Fees are to be collected for all new development or significant redevelopment.

If you have any questions or concerns, I can be contacted at (402) 444-6222 or at llaster@papionrd.org.

Sincerely,

A handwritten signature in black ink, appearing to read "Lori Ann Laster", with a stylized flourish at the end.

Lori Ann Laster, CFM
Stormwater Management Engineer

Cc: Marlin Petermann, Amanda Grint, P-MRNRD

AFFIDAVIT OF PUBLICATION

STATE OF NEBRASKA }
} SS.
County of Sarpy }

Being duly sworn, upon oath, Shon Barenklau deposes and says that he is the Publisher or Anne Lee deposes and says that he is the Business Manager of the Bellevue Leader, Papillion Times, Gretna Breeze and Springfield Monitor, legal newspapers of general circulation in Sarpy County, Nebraska, and published therein; that said newspaper has been established for more than one year last past; that it has a bona-fide paid subscription list of more than three hundred; that to this personal knowledge, the advertisement, a copy of which is hereto attached, was printed in the said newspaper once each week, the first insertion having been on:

Wednesday, January 29, 2014

Bellevue Leader
Gretna Breeze
Papillion Times
Springfield Monitor

And that said newspaper is a legal newspaper under the statutes of the State of Nebraska. The above facts are within my personal knowledge.

Handwritten signatures of Shon Barenklau and Anne Lee.

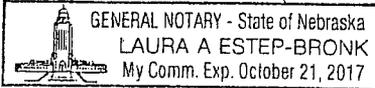
Shon Barenklau OR Anne Lee
Publisher Business Manager

Today's Date 01-28-2014

Signed in my presence and sworn to before me:

Handwritten signature of Notary Public.

Notary Public



Printer's Fee \$ 24.51
Customer Number: 40638
Order Number: 0001721183

NOTICE OF PUBLIC HEARING
SARPY COUNTY BOARD OF COMMISSIONERS
Notice is hereby given that a regular meeting of the Sarpy County Board of Commissioners will be held on Tuesday, February 11, 2014, at 3:00 P.M. in the Sarpy County Board Room, Sarpy County Administration Building, 1210 Golden Gate Drive, Papillion, NE.
Richard & Donna Krambeck have submitted an application for consideration of a Change of Zone from AG (Agricultural) to IL (Light Industrial) on property legally described as Tax Lot 8 in Section 35, Township 14N, Range 11E of the 6th P.M. Sarpy County, NE. Generally located northeast of 156th Street and Schram Road.
Richard & Donna Krambeck have submitted an application for consideration of a Change of Zone from AG (Agricultural) to IL (Light Industrial) on property legally described as the irregular south 14.9 feet and the west 999.76 feet located in the Northwest 1/4 of Section 35, Township 14N, Range 11E of the 6th P.M. Sarpy County, Nebraska. Generally located northeast of 156th Street and Schram Road.
Terry Hughes Tree Service/Hughes Mulch Products has submitted an application for consideration of a Special Use Permit to allow a tree care company and composting operation on Tax Lots 1 & 2 and Tax Lot 3 in Section 10, Township 13N, Range 11E of the 6th P.M., Sarpy County, NE. Generally located northwest of 156th and Fairview Road.
LKM Investments, LLC has submitted applications for consideration of a Change of Zone from BG (General Business District) to BG & RG-15 (General Residential District) and a Revised Preliminary Plat of a subdivision to be known as Plambeck Addition Replat 1 being a platting of Lots 1 and 2, Plambeck Addition as surveyed, platted and recorded in Sarpy County, NE. Generally located at the southeast corner of 180th & Harrison Streets.

An agenda for the meeting, kept continually current, is available for inspection at the Sarpy County Planning Department, Sarpy County Administration Bldg., 1210 Golden Gate Drive, Papillion, NE 68147-1721 183; 1/29

**NOTICE OF PUBLIC HEARING
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**THE DAILY RECORD
OF OMAHA**

**LYNDA K. HENNINGSEN, Publisher
PROOF OF PUBLICATION**

UNITED STATES OF AMERICA,
The State of Nebraska,
District of Nebraska,
County of Douglas,
City of Omaha, } ss.

J. BOYD

being duly sworn, deposes and says that she is

LEGAL EDITOR

of **THE DAILY RECORD**, of Omaha, a legal newspaper, printed and published daily in the English language, having a bona fide paid circulation in Douglas County in excess of 300 copies, printed in Omaha, in said County of Douglas, for more than fifty-two weeks last past; that the printed notice hereto attached was published in **THE DAILY RECORD**, of Omaha, on

January 29, 2014

That said Newspaper during that time was regularly published and in general circulation in the County of Douglas, and State of Nebraska.



GENERAL NOTARY - State of Nebraska
ELLEN FREEMAN
My Comm. Exp. Dec. 11, 2017

Publisher's Fee \$ 37.10
Additional Copies \$ _____
Total \$ 37.10

Subscribed in my presence and sworn to before me this 29th day of January 2014

[Signature]
Notary Public in and for Douglas County,
State of Nebraska