



**THE CITY OF
HARRISONVILLE**
WHERE TRADITION MEETS INNOVATION

**AGENDA
CITY OF HARRISONVILLE
PLANNING & ZONING COMMISSION
REGULAR MEETING
CITY HALL
SEPTEMBER 21, 2023
6:00 PM**

- 1. Call to Order**
 - A. Roll Call**
- 2. Approval of Minutes**
 - A. Planning & Zoning Commission - Regular Meeting - Aug 17, 2023 6:00 PM**
- 3. Agenda Items**
 - A. Appl. #FP-23-002--Final Plat for Harrisonville Commons, Lots 1-3 and Tract A PUBLIC HEARING**
 - B. Appl. #FP-23-002--Final Plat for Harrisonville Commons, Lots 1-3 and Tract A CONSIDERATION**
 - C. Appl. #RZ-23-003--Rezoning from M-1 to C-2 at Brickplant and Brookhart Roads PUBLIC HEARING**
 - D. Appl. #RZ-23-003--Rezoning from M-1 to C-2 at Brickplant and Brookhart Roads CONSIDERATION**
 - E. Code Amendments--Creation of Design Standards and Amendment to Section 405.550.A.3.a PUBLIC HEARING**
 - F. Code Amendments--Creation of Design Standards and Amendment to Section 405.550.A.3.a CONSIDERATION**
- 4. Discussion Items**
- 5. Adjourn**

Posted on City Hall Bulletin Board this 14th day of September, 2023.

Daniel Barnett, City Clerk



THE CITY OF HARRISONVILLE

WHERE TRADITION MEETS INNOVATION

DRAFT
MINUTES
CITY OF HARRISONVILLE
PLANNING & ZONING COMMISSION
REGULAR MEETING
CITY HALL
AUGUST 17, 2023
6:00 PM

1. Call to Order

The meeting was called to order at 6:01 PM by Chair Kevin Wood

Attendee Name	Organization	Title	Status	Arrived
Kevin Wood	Harrisonville	Chair	Present	
Chris Chiodini	Harrisonville	Vice Chair	Late	6:15 PM
Scott Milner	Harrisonville		Present	
Cheryl Bush	Harrisonville		Present	
Wilbert Crawford	Harrisonville		Present	
Mike Zaring	Harrisonville	Mayor	Present	
Brian Pulliam	Harrisonville		Present	
Paul Mensching	Harrisonville		Excused	
Milton Siegenthaler	Harrisonville		Present	

Also in attendance were Steve Warger, Applicant; Dave Doerhoff, Alderman Liaison; Christina Stanton, Community Development Director; and Jamie Martin, Recording Secretary.

2. Approval of Minutes

A. Planning & Zoning Commission - Regular Meeting - Jul 20, 2023 6:00 PM

With no changes or corrections, the minutes from the July 20, 2023, meeting were unanimously accepted.

Mayor Zaring told the Commission that Mr. Mensching took a job in Salina, Kansas and had to resign from the Commission as he is moving next week. He asked the Commissioners to let him know if they knew anyone interested in being on a Board or Commission.

RESULT:	ACCEPTED [UNANIMOUS]
MOVER:	Wilbert Crawford
SECONDER:	Brian Pulliam
AYES:	Wood, Milner, Bush, Crawford, Zaring, Pulliam, Siegenthaler

ABSENT: Chris Chiodini
EXCUSED: Paul Mensching

3. Agenda Items

A. Appl. #PP-23-002--Preliminary Plat for Harrisonville Commons, Lots 1 - 3 and Tract A

Director Stanton presented the Preliminary Plat for Harrisonville Commons. She reminded the Commission that the Preliminary Development Plan was presented at the July 20, 2023, meeting. The applicant is seeking approval of the proposed Preliminary Plat of Harrisonville Commons, Lots 1-3. She said that Oriole Street is proposed to extend through the site from E. Mechanic Street to E. Elm Street and will have required sidewalks on both sides. Director Stanton said that staff is recommending approval with the condition that the eastbound and westbound left turn lanes of 140' in length with 100' taper shall be constructed at the intersection of Oriole Street and MO-7, or E. Mechanic Street, as recommended in the Traffic Impact Analysis.

Brian Pulliam asked if there was a chance that a stoplight would be put in at the intersection on East Mechanic Street/MO-7. Steve Warger said that MODOT does not see a need for a stoplight based on the traffic study. There will be turn lanes in both directions on Mechanic Street.

Mr. Pulliam asked if there was going to be a sidewalk heading west. Mr. Warger said that is not planned as a detention basin will be there.

Mayor Zaring asked if there was confirmation from MODOT for the turn lanes. Mr. Warger said that the plans had been submitted and will be reviewed, then a permit would be issued.

Mayor Zaring asked about the traffic study being done again once school started. Mr. Warger said that they are looking into it, and that they have thought about speed bumps with crosswalks and crossing signs. Mayor Zaring mentioned that most Street Departments do not like speed bumps for multiple reasons.

Mayor Zaring asked about put two entrances into the complex off of MO-7 by dead ending Oriole Street. Mr. Warger said that MODOT would not approve that. Director Stanton said that a Traffic Engineer would say that we need the connectivity.

Kevin Wood suggested that four-way stops be placed on Elm Street at the entrances to the complex. Mr. Warger said that was a good idea and something to try.

Brian Pulliam made a motion to recommend approval to the Board of Alderman. Milton Siegenthaler seconded. The motion passed unanimously.

RESULT:	RECOMMENDED FOR BOARD APPROVAL [UNANIMOUS]
MOVER:	Brian Pulliam
SECONDER:	Milton Siegenthaler
AYES:	Wood, Chiodini, Milner, Bush, Crawford, Zaring, Pulliam, Siegenthaler
EXCUSED:	Paul Mensching

4. Discussion Items

Director Stanton told the Commission that the Final Plat for Harrisonville Commons should be on the Agenda for the meeting next month along with code changes that she has been working on for Design Standards and accessory structures on larger R-1 lots.

5. Adjourn

With nothing further to come before the Commission, Chris Chiodini made a motion to adjourn. Wilbert Crawford seconded. The meeting was adjourned at 6:19 PM.

Respectfully submitted,

Jamie Martin, Recording Secretary

Minutes Acceptance: Minutes of Aug 17, 2023 6:00 PM (Approval of Minutes)

STAFF REPORT

TO: Planning & Zoning Commission
FROM: Christina Stanton,
DATE: September 8, 2023
SUBJECT: Appl. #FP-23-002--Final Plat for Harrisonville Commons, Lots 1-3 and Tract A PUBLIC HEARING

Type of Item: *Final Plat*

A. Action Item (ID # 4619)

Appl. #FP-23-002--Final Plat for Harrisonville Commons, Lots 1-3 and Tract A

Attachments:

Harrisonville Commons FP 9-21-23 P&Z (PDF)

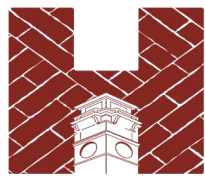
Final Plat Application 8.3.23 (PDF)

CA-23008_FINAL_PLAT-FINAL PLATv2 (PDF)

Traffic Impact Analysis 7-11-2023 (PDF)

Zoning Map (PDF)

Aerial Map (PDF)



THE CITY OF HARRISONVILLE

WHERE TRADITION MEETS INNOVATION

300 E. Pearl Street, P.O. Box 367 • Tel: 816-380-8900 • Fax: 816-380-8906 • Harrisonville, MO 64701

3.A.a

To: Board of Aldermen

From: Christina Stanton, AICP, Community Development Director

Date: September 21, 2023

Re: Appl. #FP-23-002--Final Plat for Harrisonville Commons, Lots 1 – 3 and Tract A located at 1800 E. Mechanic Street

GENERAL INFORMATION

Applicant: Donavan Jones

Requested Actions: Approval of Final Plat

Date of Application: August 9, 2023

PROPOSAL

Donavan Jones is seeking approval of the attached final plat of *Harrisonville Commons, Lots 1 – 3 and Tract A*.

The surrounding properties are currently zoned as follows:

- North (across Elm St.): G (Government), R-1 (Single-Family Residential) District, and C-O (Non-Retail Business) District—High School, single-family residential, and offices
- East: C-1 (Local Business) District—Offices
- South (across MO-7/Mechanic Street): C-2 (Service Business) District—Dollar General, gas station, Southland Shopping Center
- West: R-1 (Single-Family Residential) and R-2 (Two-Family Residential) Districts—Single-Family Residential

PREVIOUS ACTIONS

- August 21, 2023—The Board of Aldermen approved the Preliminary Plat by Resolution #2023-33.
- August 17, 2023—The Planning & Zoning Commission voted 8-0 to recommend approval of the Preliminary Plat to the Board of Aldermen.
- August 7, 2023—The Board of Aldermen heard the Preliminary Development Plan for this property and the ordinance for approval was read for the first time, with the second reading scheduled for the August 21, 2023, board meeting.
- July 20, 2023—The Planning & Zoning Commission heard the Preliminary Development Plan for this property and voted to recommend approval to the Board of Aldermen with the seven (7) conditions that were listed in staff's report.
- September 22, 2014—The Board of Aldermen approved an Ordinance (#3283) to allow for a Special Use Permit for the establishment of a nursing home and assisted living establishment located at 1800 E. Mechanic Street. This was for the project known as the Harrisonville Senior Living Village, which never came to fruition.

- September 22, 2014—The Board of Aldermen approved an Ordinance (#3282-14) to rezone the property located north of the intersection of Oriole and Mechanic Streets from Single-Family Residential (R-1) District to Planned Apartment (then R-4P, now RP-4) District. This was for the project known as the Harrisonville Senior Living Village, which never came to fruition however the zoning remains as established.
- May 13, 1991—The Board of Aldermen approved an Ordinance (#1825) which established new zoning districts and associated regulations. The subject property's zoning was changed from Low Density Single-Family Residential (R-1A) District (which no longer exists) to Single-Family Residential (R-1) District.
- August 16, 1978—The Board of Aldermen approved an Ordinance (#1194) which established new zoning districts and associated regulations. The subject property's zoning was changed from the previously established Residential District No. 2 to Low Density Single-Family Residential (R-1A) District.
- June 21, 1965—The Final Plat of *Johnson Estates, Lots 1-18* was recorded with the Cass County Recorder of Deed's Office.
- March 10, 1965—The Board of Aldermen approved an Ordinance (#646) determining the zoning classification of all properties annexed into the City since April 7, 1959. The subject property was established as Residential District No. 2.

KEY ISSUES

- Oriole Street will be extended through this property, as a public street, from E. Mechanic Street to E. Elm Street.

ANALYSIS

This final plat consisted of 3 lots and a tract for detention. Lots 1 and 2 are intended to serve the proposed Harrisonville Commons apartment complex that was shown in the Preliminary Development Plan. Lot 3 is intended to serve as the site of a senior (55+) living facility. Both sides of the extended Oriole Street will have the required sidewalk.

PROCEDURE

In accordance with Section 410.280.C: "Action by the Planning and Zoning Commission. The Planning and Zoning Commission shall recommend approval, conditional approval, or disapproval of the final plat. If the Planning and Zoning Commission recommends disapproval of the final plat, it shall advise the subdivider of the reasons for such recommendation. The Planning and Zoning Commission shall recommend approval of a final plat if it is:

1. Substantially the same as the approved preliminary plat;
2. There has been compliance with all conditions, restrictions and requirements of this Chapter and of all other applicable ordinances and design standards of the City;
3. There has been compliance with any condition that may have been attached to the approval of the preliminary plat or applicable zoning ordinance."

After staff's thorough review of the proposed final plat staff's professional opinion is that the final plat is in compliance with the design standards and Subdivision Regulations and staff is recommending that the Planning and Zoning Commission recommend conditional approval of the final plat as stated below.

STAFF RECOMMENDATION

Staff recommends approval of the requested final plat with the following condition:

1. Eastbound and westbound left turn lanes of 140' in length with a 100' taper shall be constructed at the intersection of Oriole Street and MO-7 as recommended in the Traffic Impact Analysis (TIA).

2. An updated Traffic Impact Analysis (TIA) accurately capturing traffic impacts from the nearby school, shall be provided and recommendations appropriately incorporated into the development plan, prior to final approval.

ATTACHMENTS

1. Application and Final Plat of *Harrisonville Commons, Lots 1 – 3 and Tract A*
2. Traffic Impact Analysis (TIA)
3. Zoning Map
4. Aerial Map



THE CITY OF HARRISONVILLE

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PLATTING APPLICATION

Application Type

- ☐ Preliminary Plat (Fee \$300.00 + \$5/per lot + \$65 Notice Fee)
☒ Final Plat (Fee \$150.00 + \$5.00/per lot + \$65 Notice Fee)
☐ *Minor Plat (Fee \$200.00)

*Staff-only approval required

Applicant and Owner Information

Applicant (Print): Donavan Jones Signature: [Signature]
 Company Name: Gardens of Harrisonville LLC
 Street Address: PO Box 616 City: Raymore State: MO Zip: 64083
 Phone: 816.797.6565 Email: donavan.jones@icloud.com

Property Owner Authorization (Provide contact information and signatures of all property owners.)

Property Owner Name (print): Gardens of Harrisonville LLC Signature: [Signature]
 Street Address: PO Box 616 City: Raymore State: MO Zip: 64083
 Phone: 816.797.6565 Email: donavan.jones@icloud.com

Firm Preparing Application: RL Buford

Contact: Lindsay Vogt
 Street Address: PO Box 14069 City: Parkville State: MO Zip: 64152
 Phone: 816.741.6152 Email: lindsay@rlbuford.com

*All correspondence should be sent to: Applicant ☒ Property Owner ☐ Firm ☒

Project Information

General Location or Address: 1800 E Mechanic St.
 Project Description: Multi Family Apartments
 Acres or Sq. Ft. 12.8
 Current Zoning: RP-4 Proposed Zoning: RP-4

For Office Use Only

Case No: _____ Filing Fee: Amount Paid \$ _____ Date Application Received: _____

Staff-only approval: _____ P&Z meeting: _____ BOA Meeting: _____



THE CITY OF HARRISONVILLE

WHERE TRADITION MEETS INNOVATION

PLATTING APPLICATION

Resources

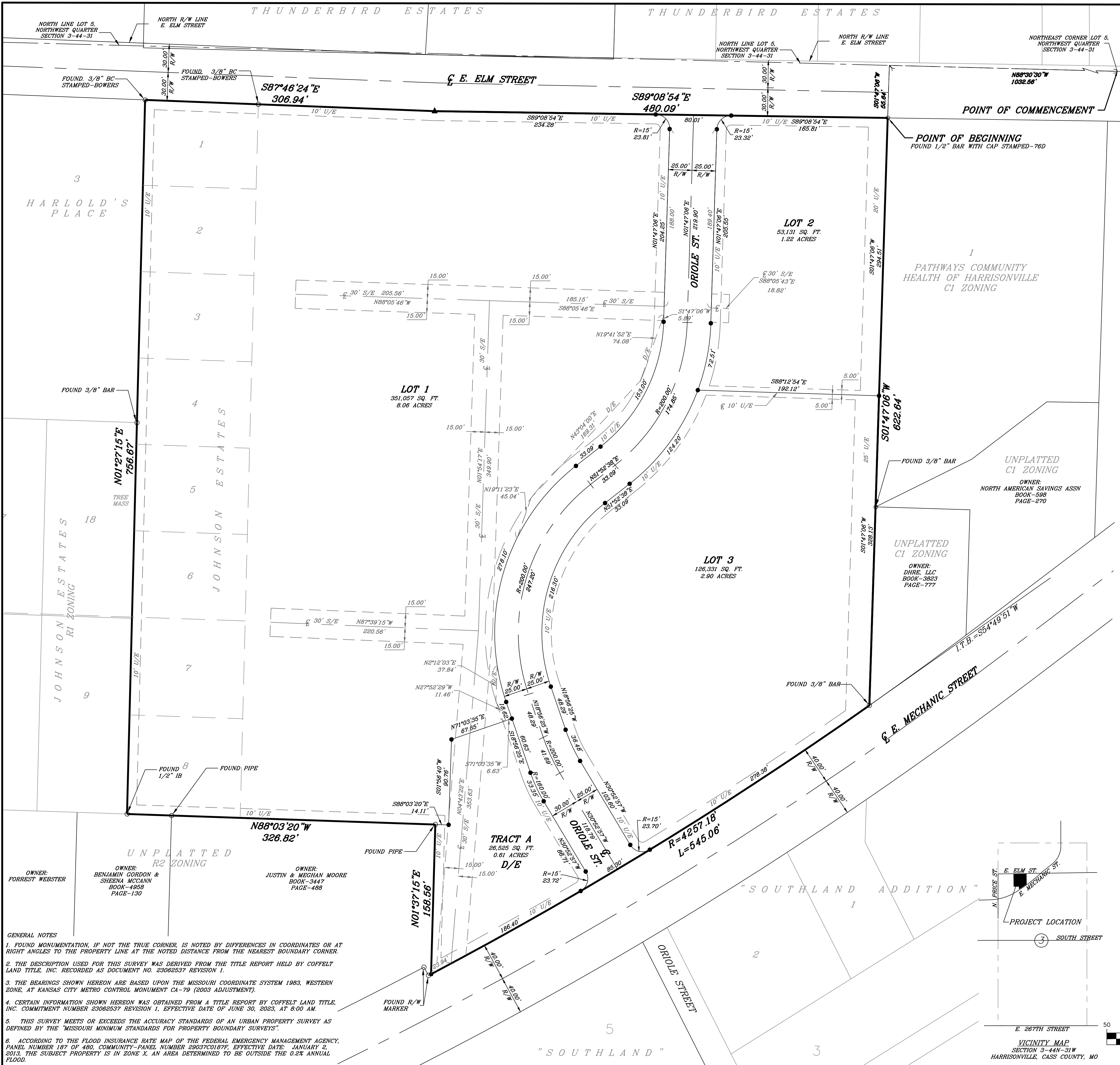
City Website	www.harrisonville.com
Zoning Map	https://www.harrisonville.com/DocumentCenter/View/9508/Zoning-Final-Draft?bidID=
Zoning Regulations	https://www.ecode.com/27908265
Subdivision Regulations	https://www.ecode.com/27909481
Cass County GIS Map	https://cassgis.integritygis.com/h5/index.html?viewer=cass

Contacts

City Hall, 300 E. Pearl St, Harrisonville, MO 64701	816-380-8900	
John Morris, Building Official	816-380-8917	jmorris@harrisonville.com
Christina Stanton, AICP, Community Development Director	816-380-8922	cstanton@harrisonville.com
Jamie Martin, Office Administrator	816-380-8958	jmartin@harrisonville.com
Public Works Department, 201 W. Chestnut, Harrisonville, MO 64701	816-380-8964	
Carl Brooks, P.E., CFM, Public Works Director		cbrooks@harrisonville.com
Ted Martin, P.E., CFM, City Engineer		tmartin@harrisonville.com

See Attached Platting Checklist

- ☐ Section 1. Submittal requirements
- ☐ Section 2. General information required for preliminary and final plats
- ☐ Section 3. Additional information required for preliminary plat
- ☐ Section 4. Additional information required for final plat



FINAL PLAT
HARRISONVILLE COMMONS PLAT,
LOTS 1-3 AND TRACT A
A DEVELOPMENT IN PART
OF THE NORTHWEST QUARTER OF
SECTION 3, TOWNSHIP 44 NORTH, RANGE 31 WEST
HARRISONVILLE, CASS COUNTY, MISSOURI

PROPERTY DESCRIPTION
CONTAINING 602,090 SQUARE FEET OR 13.82 ACRES

ALL THAT PART OF LOT 5 OF THE NORTHWEST QUARTER OF SECTION 3, TOWNSHIP 44 NORTH, RANGE 31 WEST AND ALL THE LOTS 1, 2, 3, 4, 5, 6, 7 AND 8, JOHNSON ESTATES, A SUBDIVISION OF LAND IN THE CITY OF HARRISONVILLE, CASS COUNTY, MISSOURI DESCRIBED AS FOLLOWS: COMMENCING AT THE NORTHWEST CORNER OF SAID LOT 5; THENCE N88°30'30"W, ALONG THE NORTH LINE OF SAID LOT 5, A DISTANCE OF 1032.56 FEET; THENCE S01°47'06"W, A DISTANCE OF 652.64 FEET TO A POINT ON THE SOUTHERLY RIGHT OF WAY LINE OF E. ELM STREET; SAID POINT ALSO BEING THE NORTHWEST CORNER OF LOT 1, PATHWAYS COMMUNITY HEALTH OF HARRISONVILLE, A SUBDIVISION OF LAND IN THE CITY OF HARRISONVILLE, CASS COUNTY, MISSOURI AND THE POINT OF BEGINNING OF THE TRACT OF LAND TO BE HEREIN DESCRIBED; THENCE CONTINUING S01°47'06"W ALONG THE WEST LINE OF SAID LOT 1 AND ITS SOUTHERLY PROLONGATION, A DISTANCE OF 622.64 FEET TO A POINT ON THE NORTHERLY RIGHT OF WAY LINE OF E. MECHANIC STREET; THENCE SOUTHWESTERLY ALONG SAID RIGHT OF WAY LINE, ALONG A CURVE TO THE RIGHT HAVING AN INITIAL TANGENT BEARING OF S54°49'51"W AND A RADIUS OF 4257.18 FEET, AN ARC DISTANCE OF 545.06 FEET; THENCE N01°27'15"E, A DISTANCE OF 158.56 FEET; THENCE N88°03'20"W, A DISTANCE OF 326.82 FEET TO A POINT ON THE EAST LINE OF JOHNSON ESTATES, A SUBDIVISION OF LAND IN THE CITY OF HARRISONVILLE, CASS COUNTY, MISSOURI; THENCE N01°27'15"E ALONG THE EAST LINE OF SAID JOHNSON ESTATES ALONG ITS NORTHERLY PROLONGATION, A DISTANCE OF 158.56 FEET TO A POINT ON THE SOUTHERLY RIGHT OF WAY LINE OF E. ELM STREET; THENCE S87°46'24"E ALONG SAID RIGHT OF WAY LINE, A DISTANCE OF 306.94 FEET; THENCE S88°08'54"E CONTINUING ALONG SAID RIGHT OF WAY LINE, A DISTANCE OF 480.09 FEET TO THE POINT OF BEGINNING.

PLAT DEDICATION:
THE UNDERSIGNED PROPRIETORS OF THE ABOVE DESCRIBED TRACT OF LAND HAVE CAUSED THE SAME TO BE DIVIDED IN THE MANNER SHOWN ON THE ACCOMPANYING PLAT, WHICH SUBDIVISION SHALL BE HEREAFTER KNOWN AS "HARRISONVILLE COMMONS, LOTS 1-3 & TRACT A".

MAINTENANCE OF TRACTS DEDICATION:
TRACT A IS RESERVED FOR STORM WATER DETENTION AND OWNED AND MAINTAINED BY THE PROPERTY OWNER'S ASSOCIATION.

STREET DEDICATION:
STREETS SHOWN HEREON AND NOT HERETOFORE DEDICATED FOR PUBLIC USE AS STREET RIGHT-OF-WAY ARE HEREBY DEDICATED.

EASEMENT DEDICATION:
AN EASEMENT IS HEREBY GRANTED TO THE CITY OF HARRISONVILLE, MISSOURI, TO ENTER UPON, LOCATE, CONSTRUCT, OPERATE, AND MAINTAIN OR TO AUTHORIZE THE LOCATION, CONSTRUCTION, OPERATION AND MAINTENANCE OF POLES, WIRES, ANCHORS, PIPES, CONDUITS, TRANSFORMERS, PEDESTALS, AND/OR STRUCTURES FOR WATER, GAS, ELECTRICITY, STORM SEWER, SANITARY SEWER, TELEPHONE, CABLE TELEVISION, SURFACE DRAINAGE, OR ANY OTHER NECESSARY PUBLIC UTILITY OR SERVICE, ANY OR ALL OF THEM UPON, OVER, UNDER AND ALONG THOSE AREAS OUTLINED AND/OR DESIGNATED ON THIS PLAT AS "UTILITY EASEMENT" OR "U/E" AND/OR WHERE AN EASEMENT IS DESIGNATED FOR A PARTICULAR PURPOSE, I.E., "DRAINAGE EASEMENT" OR "D/E", AND FURTHER, SUBJECT TO ADMINISTRATION AND REGULATION BY THE CITY, THE SUBORDINATE USE OF SUCH AREAS BY OTHER GOVERNMENTAL ENTITIES AND UTILITIES, FRANCHISED OR AUTHORIZED TO DO BUSINESS IN THE UNIFIED GOVERNMENT OF HARRISONVILLE, CASS COUNTY, MISSOURI.

IN WITNESS WHEREOF, 27 CAPITAL MANAGEMENT LLC HAS CAUSED THESE PRESENTS TO BE SIGNED THIS DAY ____ OF ____ 20__

DONAVAN JONES, MANAGING MEMBER

STATE OF)
) SS:
COUNTY OF)

ON THIS ____ DAY OF ____ 20__, BEFORE ME, A NOTARY PUBLIC WITHIN AND FOR SAID COUNTY AND STATE, PERSONALLY APPEARED DONAVAN JONES, MANAGING MEMBER OF 27 CAPITAL MANAGEMENT LLC, TO BE PERSONALLY KNOWN, WHO BEING BY ME DULY SWORN DID SAY THAT SAID INSTRUMENT WAS SIGNED BY THE FREE ACT AND DEED OF SAID COMPANY.

NOTARY PUBLIC _____ MY COMMISSION EXPIRES _____

PLANNING AND ZONING COMMISSION:
THIS PLAT OF "HARRISONVILLE COMMONS" HAS BEEN SUBMITTED TO AND APPROVED BY THE HARRISONVILLE PLANNING AND ZONING COMMISSION THIS ____ DAY OF ____ 20__

PLANNING AND ZONING COMMISSION CHAIRMAN _____

BOARD OF ALDERMEN:
THIS PLAT OF "HARRISONVILLE COMMONS" INCLUDING EASEMENTS AND RIGHTS-OF-WAY ACCEPTED BY THE BOARD OF ALDERMEN HAS BEEN SUBMITTED TO AND APPROVED BY THE BOARD OF ALDERMEN BY ORDINANCE NUMBER ____ DULY PASSED AND APPROVED BY THE MAYOR OF HARRISONVILLE, MISSOURI ON THE ____ DAY OF ____ 20__

MAYOR: _____
ATTEST: _____
CITY CLERK: _____
CITY ENGINEER OR PUBLIC WORKS DIRECTOR: _____
COMMUNITY DEVELOPMENT DIRECTOR: _____

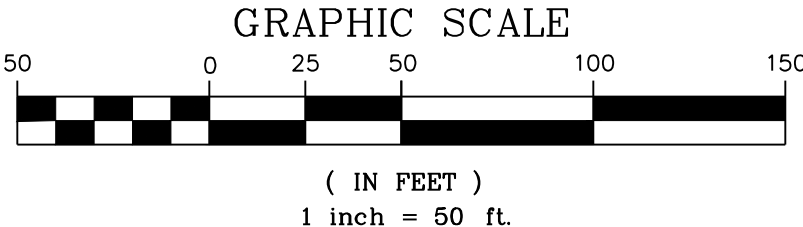
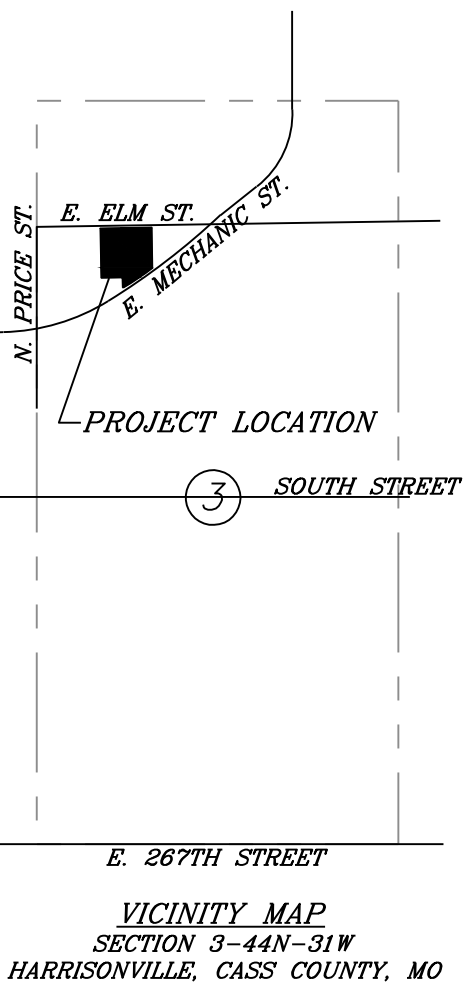
RECORDER OF DEEDS:
ENTERED ON TRANSFER RECORD THIS ____ DAY OF ____ 20__

DEPUTY COUNTY RECORDER OF DEEDS _____

LEGEND:

- SET 1/2" REBAR WITH PLASTIC CAP STAMPED "LS-20070000089"
 - ▲ SET 5/8" REBAR WITH PLASTIC CAP STAMPED "LS-20070000089"
 - ▲ SET "+" CUT IN CONCRETE
 - FOUND 1/2" MONUMENT AS NOTED
 - FOUND 5/8" MONUMENT AS NOTED
 - FOUND "+" CUT IN CONCRETE
 - (M) MEASURED BEARING OR DISTANCE
 - (P) PLATTED BEARING OR DISTANCE
 - (D) DESCRIBED BEARING OR DISTANCE
- IF VALUE IS NOT LABELED IT IS MEASURED (BETWEEN MONUMENTS) OR CALCULATED BASED ON MEASUREMENTS TO MONUMENTS

TRACT/LOT	DESCRIPTION	AREA
TRACT "A"	DETENTION	26,525 SQ. FT. OR 0.61 ACRES
RIGHT OF WAY	PUBLIC USE	45,046 SQ. FT. OR 1.03 ACRES
LOT 1	MULTI-FAMILY	351,057 SQ. FT. OR 8.06 ACRES
LOT 2	MULTI-FAMILY	53,131 SQ. FT. OR 1.22 ACRES
LOT 3	LIBRARY	126,331 SQ. FT. OR 2.90 ACRES



OWNER/APPLICANT:
HARRISONVILLE
COMMONS, LLC
PO BOX 616
RAYMOND, MO 64083
DONAVAN JONES
616-797-6565

ENGINEER:
RL BUFORD & ASSOC.
ENGINEERING, LLC.
201 MAIN ST.
PARKVILLE, MO 64152
STEVE WARGER
616-769-6132

SURVEYOR:
RL BUFORD & ASSOC., LLC
201 MAIN ST.
PARKVILLE, MO 64152
ROB YOUNG
616-741-6152



SURVEYOR'S CERTIFICATION
I HEREBY CERTIFY THAT I HAVE PREPARED THIS DRAWING FROM AN ACTUAL FIELD TOPOGRAPHIC SURVEY OF THE LAND SHOWN HEREON, AND THAT I AM A LICENSED SURVEYOR IN THE STATE OF MISSOURI. I DO NOT REPRESENT A BOUNDARY SURVEY AS NO CORNERS WERE EXPOSED OR SET AND THAT THE RESULTS OF SAID SURVEY ARE REPRESENTED HEREON TO THE BEST OF MY PROFESSIONAL KNOWLEDGE AND BELIEF.

ROBERT C. YOUNG, SURVEYOR
FELS-2007000089
DATE: 08/23/2023

IF THE SURVEYOR'S SEAL IS NOT SHOWN IN COLOR THEN THE SURVEY IS A COPY THAT SHOULD BE ASSUMED TO CONTAIN UNAUTHORIZED ALTERATIONS. THIS THE CERTIFICATION CONTAINED ON THIS DOCUMENT SHALL NOT APPLY.

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R.L. Buford & Associates, LLC
DEVELOPMENT CONSULTANTS
LAND SURVEYING
14089 PARKVILLE, MO 64152
TEL: (816) 741-6152
FAX: (816) 741-6152
P.O. BOX 14089, PARKVILLE, MO. 64152 (816) 741-6152

FOR HARRISONVILLE COMMONS, LLC
JOB NO. CA-23008
DATE: 08/23/2023
FIELD BOOK
DRAWN BY: B.E.N.
FINAL PLAT

GARDENS OF HARRIOSNVILLE

TRAFFIC IMPACT ANALYSIS

July 11, 2023

RECEIVED

JUL 11 2023

CITY OF HARRISONVILLE

Prepared For:
Warger Associates

Prepared By:
Priority Engineers, Inc.
PO Box 563
Garden City, MO 64747





July 11, 2023

Mr. Steve Warger

RE: Garden's of Harrisonville – Harrisonville, MO

Dear Mr. Warger,

In response to your request, Priority Engineers, Inc. has completed a traffic impact analysis for the above referenced project. The purpose of the analysis is to determine the potential traffic impacts associated with this development on the intersections and streets surrounding this site, primarily during the AM and PM peak hours. The following report documents our analysis and recommendations.

We appreciate the opportunity to work with you on this project. Please contact us with any questions or if you require additional information.

Sincerely,

PRIORITY ENGINEERS, INC.

A handwritten signature in black ink, appearing to read 'Kristin L. Skinner'.

Kristin L. Skinner, P.E., PTOE
President

Priority Engineers, Inc.
PO Box 563
Garden City, MO 64747
816.738.4400

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Left Turn Lane Guidelines for Two-Lane Roads less than or equal to 40mph
(MoDOT EPG 940.9.1)
Right Turn Lane Guidelines for Two-Lane Roadways (MoDOT EPG 940.9.8)
Peak Hour Signal Warrant (MO 7 & Oriole)

Figure 23

Figure 24

Figure 25

APPENDIX II

Peak Hour Traffic Counts
Synchro Report

1) INTRODUCTION

The purpose of this study is to examine the potential traffic impacts associated with the proposed Gardens of Harrisonville development. The site is to be constructed where the former Cass Regional Hospital building is located on the north side of Missouri Route 7 (Mechanic Street), opposite of Oriole Street.

The study area is shown in Figure 1. The site layout is shown in Figure 2.

2) EXISTING CONDITIONS

The existing site is currently a vacant building which previously was used as a hospital. The site is bordered to the south by Missouri Route 7. MO-7 is classified as a Minor Arterial by the Mid America Regional Council (MARC). MO-7 has a two-lane cross section with open drainage and a posted speed limit of 35 miles per hour. The site is bordered to the north by Elm Street. Elm Street has a posted speed limit of 35 miles per hour, but is posted as a school zone adjacent to this property from 6:30 AM to 4:00 PM. Elm Street has a two-lane cross section with curb and gutter and an enclosed drainage system. Elm Street is classified by MARC as a Local Road.

The site is bordered to the west by single family residential homes. To the northwest, is the Harrisonville Senior High School and the main entrance to the Cass Career Center. To the north, is a single family home with commercial development to the northeast. The remainder of the surrounding property is commercial in nature.

The property currently has two main access points and a third service entrance. The main entrance onto MO-7 is currently offset from Oriole Street by approximately 20' between centerlines. The entrance onto Elm Street is located approximately 175' east of the Cass Career Center Drive and 150' west of the single-family driveway. The service entrance roughly aligns with a residential driveway.

Peak Hour turning movement counts for the intersections of MO-7 and Oriole Street and Elm Street and the Cass Career Center Drive were collected on May 23rd and May 24th of this year. The AM Peak Hour was found to be from 7:00 to 8:00 and the PM Peak Hour was found to be from 4:30 to 5:30. The complete traffic counts are shown in Appendix II. The peak hour traffic volumes and existing lane configurations are shown in Figures 3-6.

3) PROPOSED DEVELOPMENT

The proposed development will contain 288 units of multifamily housing. The remaining space is expected to either be developed as a 40,000 square foot library, or an additional 80 units dedicated to senior adult housing.

The entrance onto MO-7 will be aligned with Oriole Street in conjunction with this development and Oriole Street will be continued north to Elm Street. Oriole Street will connect to Elm Street at approximately the same location as the existing service drive.

The proposed site plan is shown in Figure 2.

4) TRIP GENERATION

The vehicle trips generated by the proposed development were estimated using the Institute of Transportation Engineers' (ITE) Trip Generation, 11th Edition. Land Use (220) Multifamily Housing (Low-Rise) was selected for the 288 apartment units. The proposed development was analyzed with both a 40,000 square foot Library (Land Use 590) and with Senior Adult Housing – Multifamily (Land Use 252). The estimated AM and PM peak hour traffic volumes associated with each scenario are shown in Tables 1 and 2.

Table 1: Trip Generation (with Library)								
Land Use	Intensity	Daily	AM Peak			PM Peak		
			Total	In	Out	Total	In	Out
Multifamily Housing (Low-Rise)	288 Units	1921	112	27	85	144	91	53
Library	40,000 SF	2785	55	39	16	356	171	185
Total		4706	167	66	101	500	262	238

It is worth noting that the proposed library is significantly larger than the average 15,000 square feet listed in ITE data and it is likely that the library trips are overestimated.

Table 2: Trip Generation (with Senior Housing)								
Land Use	Intensity	Daily	AM Peak			PM Peak		
			Total	In	Out	Total	In	Out
Multifamily Housing (Low-Rise)	288 Units	1921	112	27	85	144	91	53
Senior Adult Housing - Multifamily	80 Units	256	16	5	11	20	11	9
Total		2177	128	32	96	164	102	62

5) TRIP DISTRIBUTION AND ASSIGNMENT

Trips generated by the proposed Gardens of Harrisonville Development were distributed based on existing traffic flows and a general analysis of the surrounding area. The trips were distributed onto the existing street system approximately as follows:

- 35 percent to and from the north via MO 7
- 50 percent to and from the south via MO 7
- 5 percent to and from the south via Oriole Street
- 5 percent to and from the east via Elm Street
- 5 percent to and from the west via Elm Street

The proposed traffic volumes for library scenario can be seen in Figures 7 and 8. The proposed traffic volumes for the senior housing scenario can be seen in Figures 11 and 12.

6) AUXILIARY LANES

Section 940 of the MoDOT Engineering Policy Guide (EPG) was consulted to determine the need for turn lanes at the intersection of MO-7 and Oriole Street. Based on the criteria of 940.9.1, a left turn lane will be warranted with either a library or with senior housing. Based on the criteria outlined in 940.9.8, a right turn lane will not be warranted with either development use.

An eastbound and westbound left turn lane has been included in the analysis of each of the proposed and future scenarios.

7) LEVEL OF SERVICE AND VOLUME/CAPACITY ANALYSES

Capacity analysis was used to quantify the impacts of the increased traffic on the intersections studied. The methodology outlined in the Highway Capacity Manual, 6th Edition, was used as a basis to perform the analysis for this study. Capacity analysis defines the quality of traffic operation for an intersection using a grading system called Level of Service (LOS). The LOS is defined in terms of average vehicle delay. Levels of service A through F have been established with A representing the best and F the worst.

Table 3: Level of Service Definitions		
Level of Service	Unsignalized Intersection	Signalized Intersection
A	< 10 Seconds	< 10 Seconds
B	< 15 Seconds	< 20 Seconds
C	< 25 Seconds	< 35 Seconds
D	< 35 Seconds	< 55 Seconds
E	< 50 Seconds	< 80 Seconds
F	≥ 50 Seconds	≥ 80 Seconds

The study intersections were evaluated using Synchro based on part on Highway Capacity Manual methods. The analysis reports are included in Appendix II.

Existing Conditions

The levels of service, lane configuration, and queue lengths for existing conditions are shown in Figures 5 and 6 in Appendix I. Currently, all stop-controlled movements are a level of service C or better in both the AM and the PM Peak Hours with a design queue of less than one vehicle except for northbound Oriole Street in the AM Peak Hour. In the existing AM Peak Hour, northbound Oriole Street has a level of service D and a design queue of 33'.

Existing + Proposed Development Conditions (with Library)

The levels of service, lane configuration, and queue lengths for existing conditions are shown in Figures 9 and 10 in Appendix I. The stop-controlled movements onto Elm Street are a level of service B or better in both the AM and the PM Peak Hours with a design queue of less than one vehicle. At the intersection of MO-7 & Oriole Street, the northbound movement is a level of service E in the AM Peak Hour with a design queue of 60', while the southbound movement is a level of service E with a design queue of 40' for the left/through lane and a level of service B

with less than one vehicle design queue for the southbound right turn lane. In the PM Peak Hour, the northbound movement at this intersection is a level of service E with a 50' design queue, while the southbound movement is a level of service F with a 125' design queue for the left/through lane and a level of service B with less than one vehicle queued for the right turn lane.

Existing + Proposed Development Conditions (with Senior Housing)

The levels of service, lane configuration, and queue lengths for existing conditions are shown in Figures 13 and 14 in Appendix I. The stop-controlled movements onto Elm Street are a level of service B or better in both the AM and the PM Peak Hours with a design queue of less than one vehicle. At the intersection of MO-7 & Oriole Street, the northbound movement is a level of service E in the AM Peak Hour with a design queue of 48', while the southbound movement is a level of service E with a design queue of 30' for the left/through lane and a level of service B with less than one vehicle design queue for the southbound right turn lane. In the PM Peak Hour, the northbound movement at this intersection is a level of service C with less than a one vehicle design queue, while the southbound movement is a level of service D with less than a one vehicle design queue for the left/through lane and a level of service B with less than one vehicle queued for the right turn lane.

8) FUTURE CONDITIONS

Mid America Regional Council (MARC) population growth projections were consulted when considering a future scenario. MARC anticipates Harrisonville to experience a 0.73% annual growth rate between 2020 and 2040.

A growth factor of 1% per year for 20 years was applied to the background traffic volumes and the intersections were reevaluated. The traffic volumes, levels of service, lane configuration, and queue lengths for the horizon year (2043) are shown in Figures 17-18 and 21-23 in Appendix I.

As traffic volumes on MO-7 increase, stop controlled movements will continue to experience low levels of service during peak hours. The maximum queue anticipated would be 180' for the southbound left/through lane onto MO-7 from the development if a library were constructed. Alternate routes to exit the site are available through Elm Street and the signalized intersection of MO-7 and Elm Street.

9) SIGNAL WARRANTS

Section 902.3.5 of the MoDOT Engineering Policy Guide (EPG) was consulted for the intersection of MO-7 with Oriole Street. It is important to note that Warrant Three, Peak Hour is normally intended to be used for instances where an unusually large amount of traffic is generated in a short amount of time such a factory or an office complex. In this instance, Warrant 3 is the only Warrant that could be evaluated with the available traffic data. A summary of this analysis is found in Figure 25. The peak hour signal warrant is only met in the PM Peak Hour if the library is constructed. It is probable that delays for the southbound left/through lane would encourage drivers to use the north exit from the development onto Elm Street and exit onto northbound MO 7 at the MO 7 and Elm Street signal.

10) SIGHT DISTANCE

Stopping sight distance and intersection sight distance were measured for the proposed entrances into the development. Intersection sight distance represents the distance and time required for the driver to make the decision to turn and to complete the turn without slowing oncoming traffic. Stopping sight distance represents the distance and time required to observe a two-foot-tall object in the roadway and to then safely come to a stop. Both Elm Street and MO-7 have a posted speed limit of 35. The measurements and calculations are illustrated in Table 4 below.

Table 4: Sight Distance Values				
	Measured Stopping Sight Distance	AASHTO Required Distance (40 mph design speed)	Measured Intersection Sight Distance	AASHTO Required Distance (40 mph design speed)
North Entrance onto Elm Street				
To the east	>600'	305'	>600'	445'
To the west	415'	305'	430'	385'
South Entrance onto MO-7 Street				
To the east	>600'	305'	>600'	385'
To the west	>600'	305'	>600'	445'

While acceptable sight distance is available at both entrances into the development, careful consideration should be given to sight distance obstructions when planning future landscaping and signing, as well as maintaining the vegetative growth within the right-of-way of MO-7.

11) ACCIDENT HISTORY

A review was made of the available accident data within the MSHP's STARS reporting database. The review was made for a five-year period between June 1, 2018 and June 1, 2023 for the study intersections. During this time period there was a single crash on Elm Street, a fixed object crash during daylight hours with property damage only.

For the study intersection on MO-7, both MO-7 and CST Mechanic ST were searched. Similarly for this intersection, crashes at either Hospital Drive or CST Oriole ST were included. In total there were eleven accidents during this five-year period. Eight of the crashes occurred in daylight hours with the remaining crashes occurring under dark lighted conditions. Only two of the crashes were of a personal injury severity with the remaining crashes being property damage only. Two of the crashes were involving a fixed object with the remaining crashes involving a motor vehicle in transit.

12) RECOMMENDATIONS & CONCLUSIONS

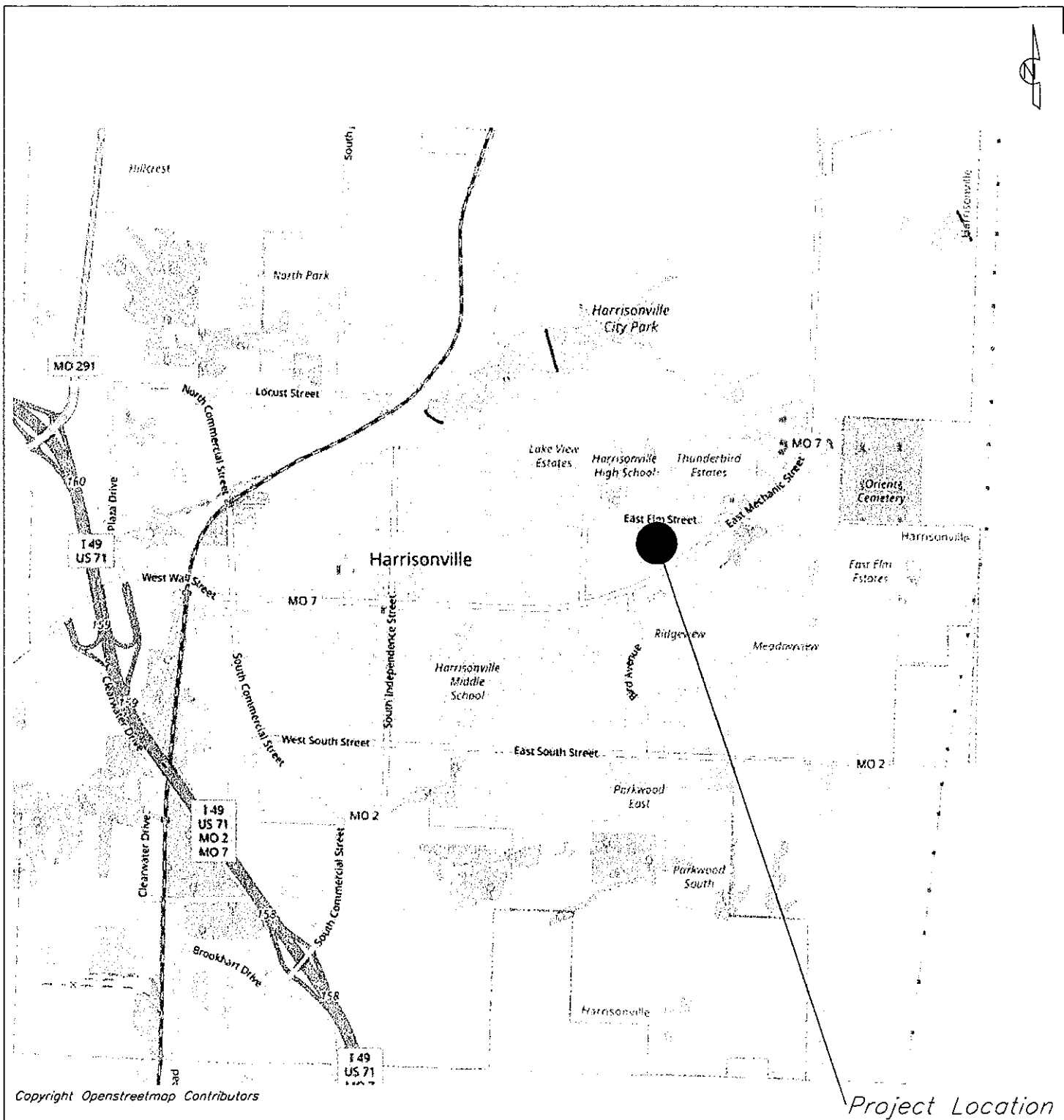
This study documents the impact of the proposed Gardens of Harrisonville development. This development includes a 40,000 square foot building which may be developed as a library. Alternatively, this same area within the site may be developed as 80 units of senior housing. Both possibilities were analyzed within this study.

The southern entrance into the site will be realigned with Oriole Street with this development. An eastbound left turn lane threshold is met with either development option. Eastbound and westbound left turn lanes should be constructed at the intersection of Oriole Street and MO-7. Each turn lane should be 140' in length with a 100' taper.

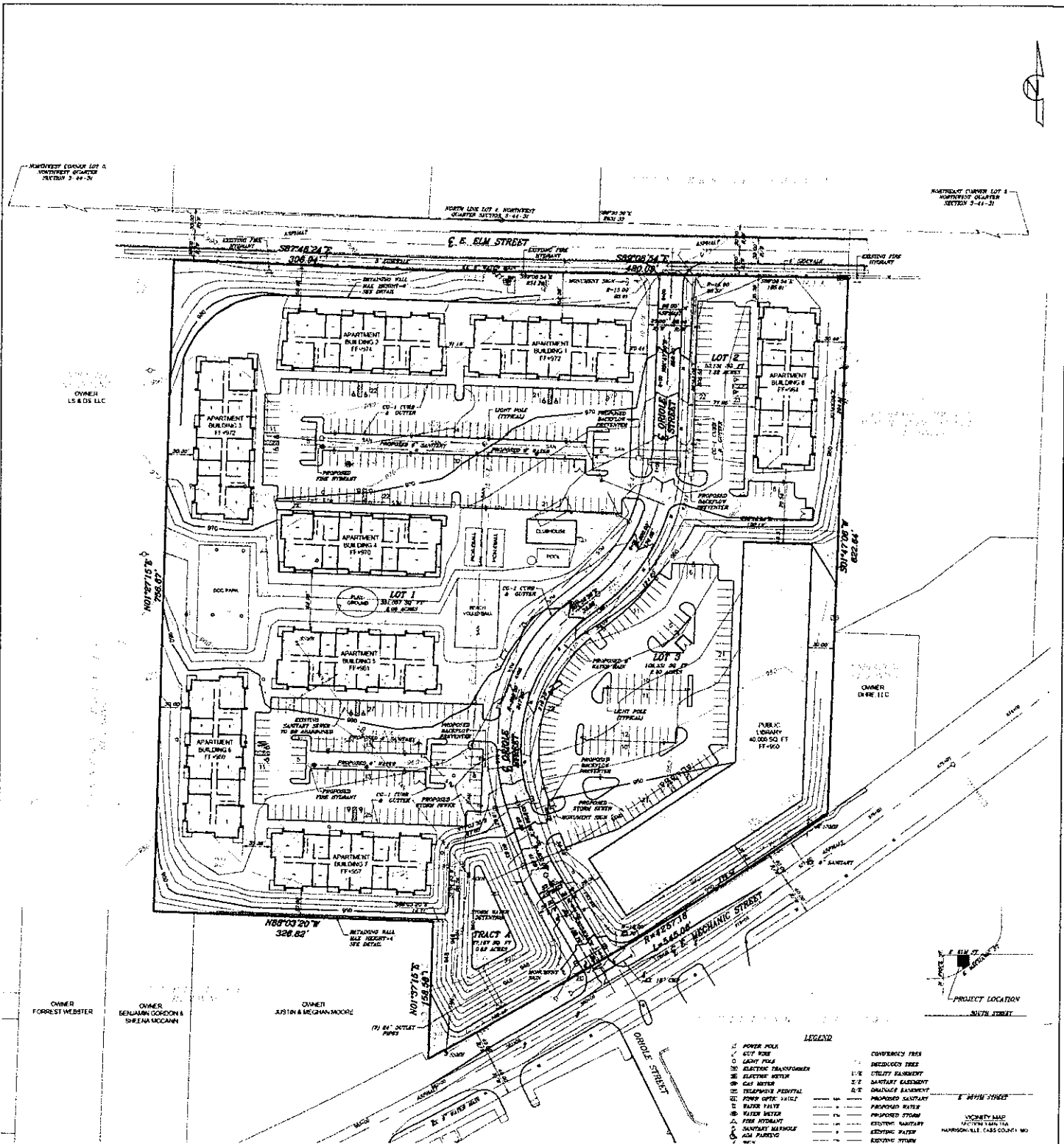
No additional traffic improvements are required as a result of this development.

APPENDIX I

Project Location	Figure 1
Site Plan	Figure 2
Existing AM Peak Hour Traffic Volumes	Figure 3
Existing PM Peak Hour Traffic Volumes	Figure 4
Existing AM Peak Hour Lane Configurations & Levels of Service	Figure 5
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Existing + Proposed Development (with Library) AM Peak Hour Traffic Volumes	Figure 7
Existing + Proposed Development (with Library) PM Peak Hour Traffic Volumes	Figure 8
Existing + Proposed Development (with Library) AM Peak Hour Lane Configurations & Levels of Service	Figure 9
Existing + Proposed Development (with Library) PM Peak Hour Lane Configurations & Levels of Service	Figure 10
Existing + Proposed Development (with Senior Housing) AM Peak Hour Traffic Volumes	Figure 11
Existing + Proposed Development (with Senior Housing) PM Peak Hour Traffic Volumes	Figure 12
Existing + Proposed Development (with Senior Housing) AM Peak Hour Lane Configurations & Levels of Service	Figure 13
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Left Turn Lane Guidelines for Two-Lane Roads less than or equal to 40mph (MoDOT EPG 940.9.1)	Figure 23
Right Turn Lane Guidelines for Two-Lane Roadways (MoDOT EPG 940.9.8)	Figure 24
Peak Hour Signal Warrant (MO 7 & Oriole)	Figure 25



Project Location	Gardens of Harrisonville Harrisonville, MO	No Scale	 Priority ENGINEERS
		Figure 1	



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Site Plan

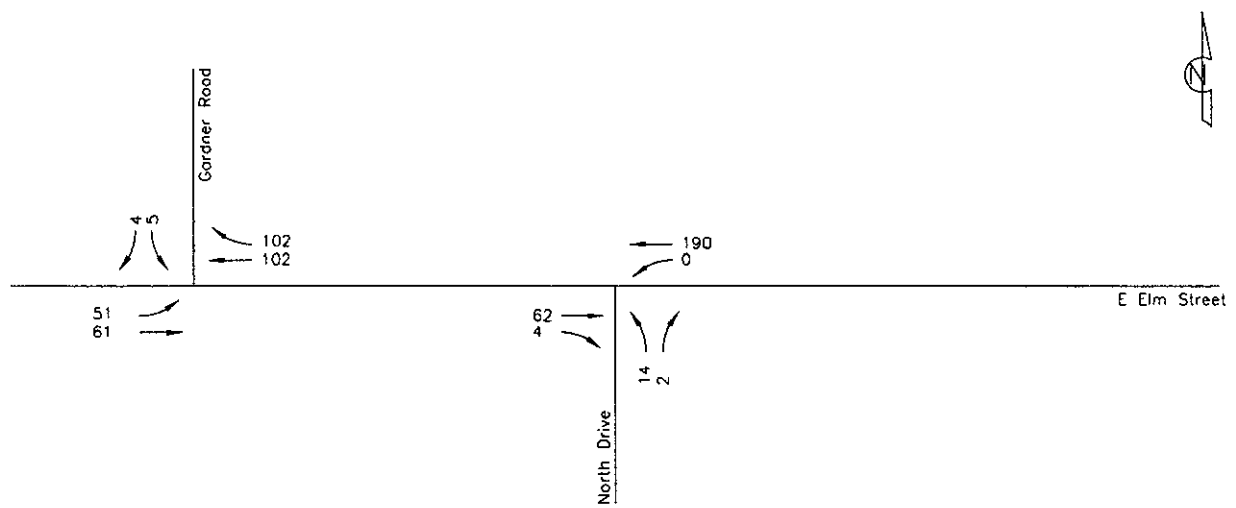
Gardens of
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Harrisonville, MO

No Scale

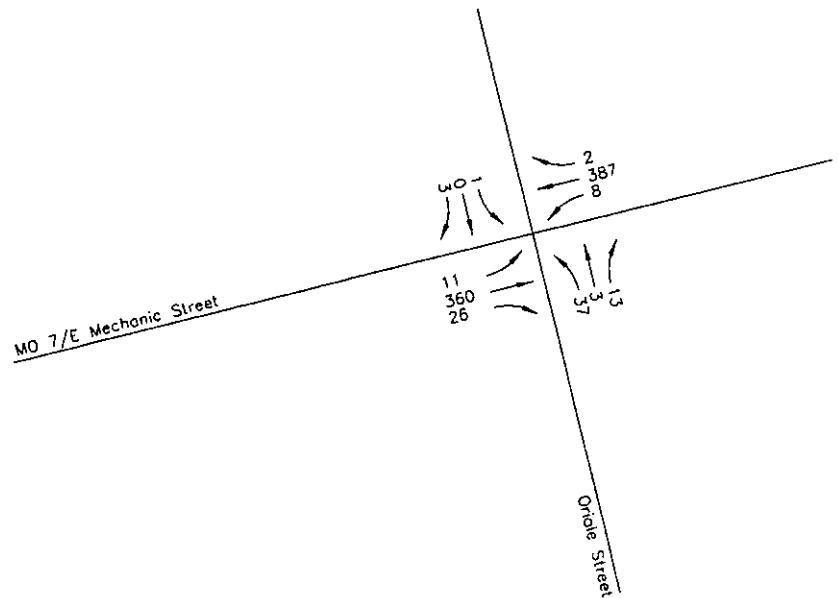
Figure 2



Priority
ENGINEERS



LEGEND
 / / / Total Volume

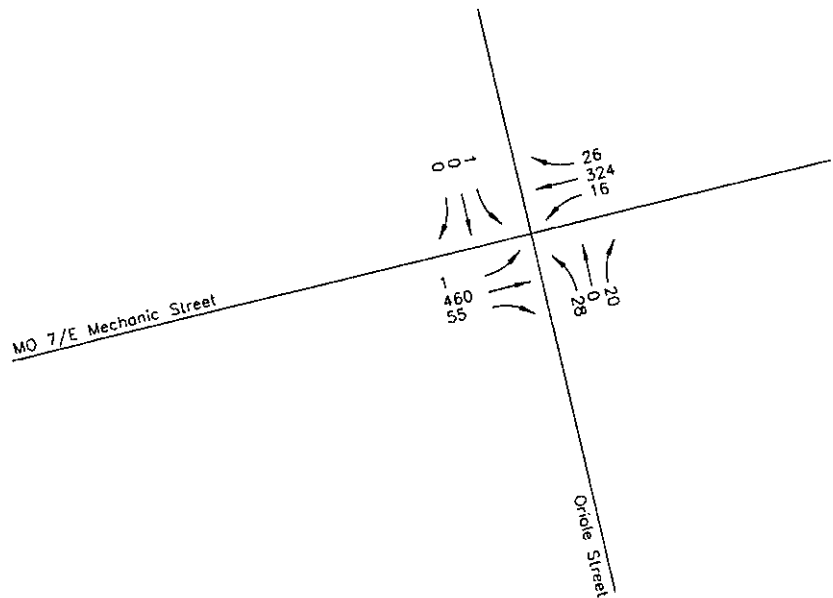
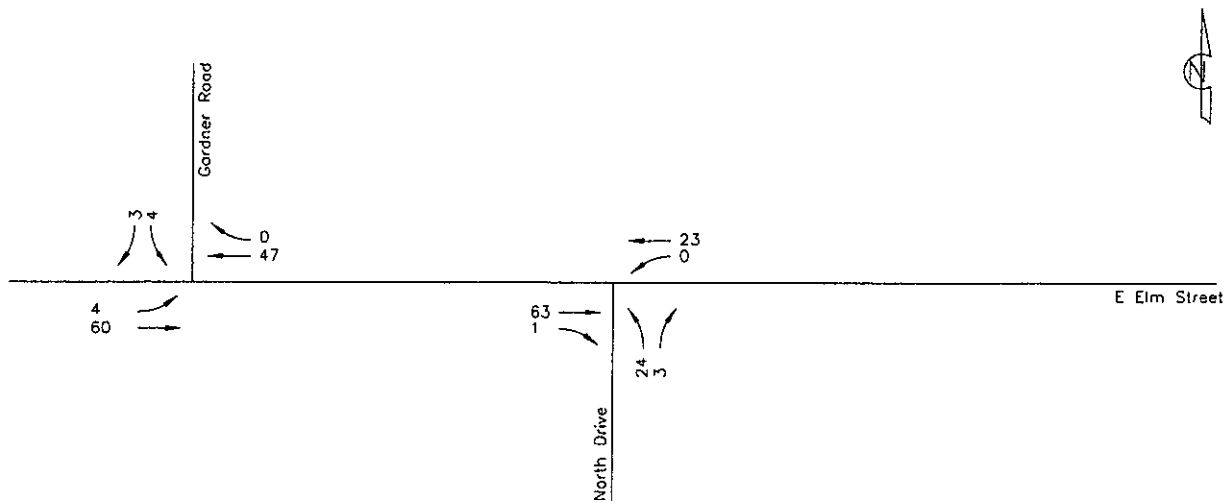


Existing AM Peak Hour
 Traffic Volumes

Gardens of
 Harrisonville
 Harrisonville, MO

No Scale
 Figure 3





LEGEND

 Total Volume

Existing PM Peak Hour
Traffic Volumes

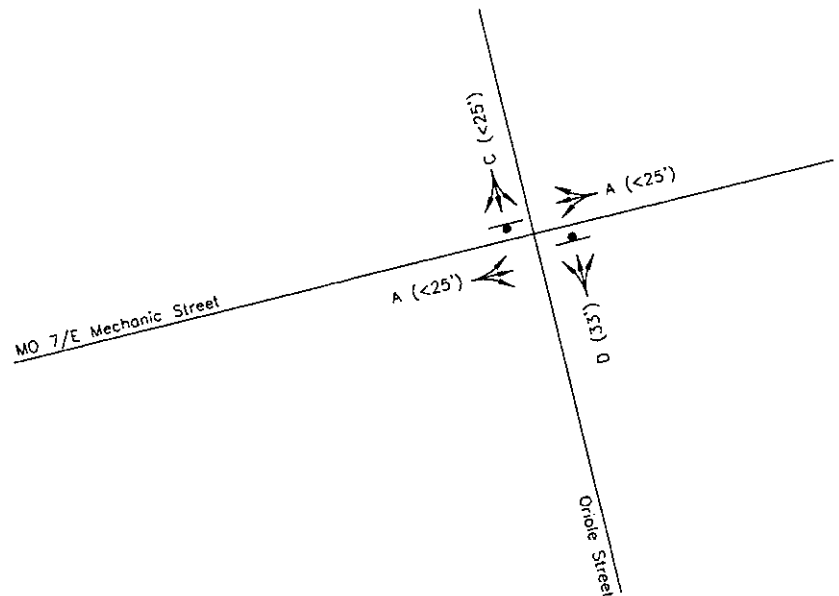
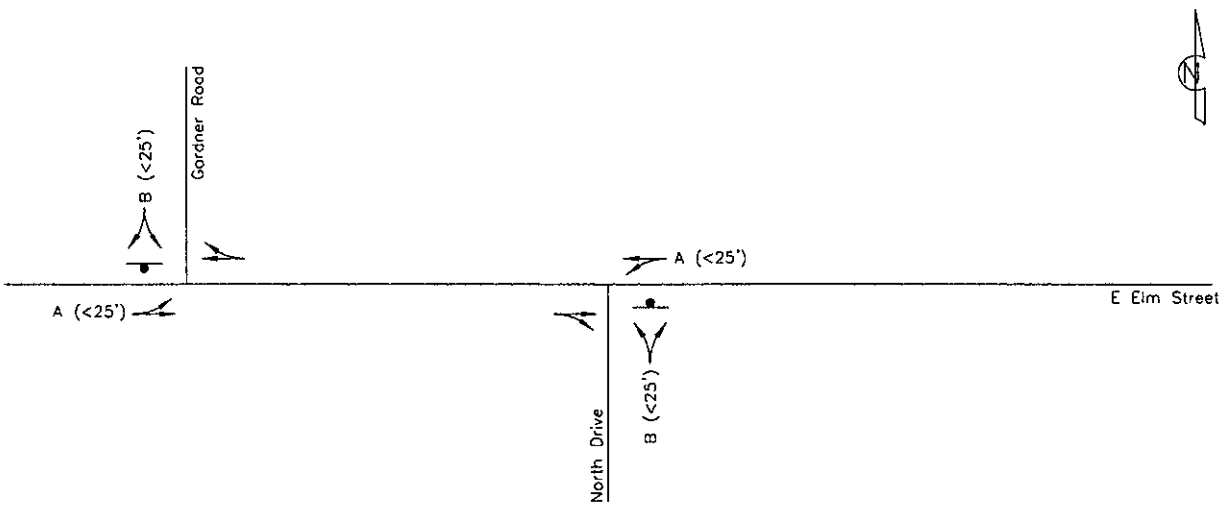
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 4



Priority
ENGINEERS



LEGEND

-  HCM LOS (95th Percentile Queue in Vehicles)
-  Stop Sign
-  Traffic Signal LOS

Existing AM Peak Hour
Lane Configurations &
Levels of Service

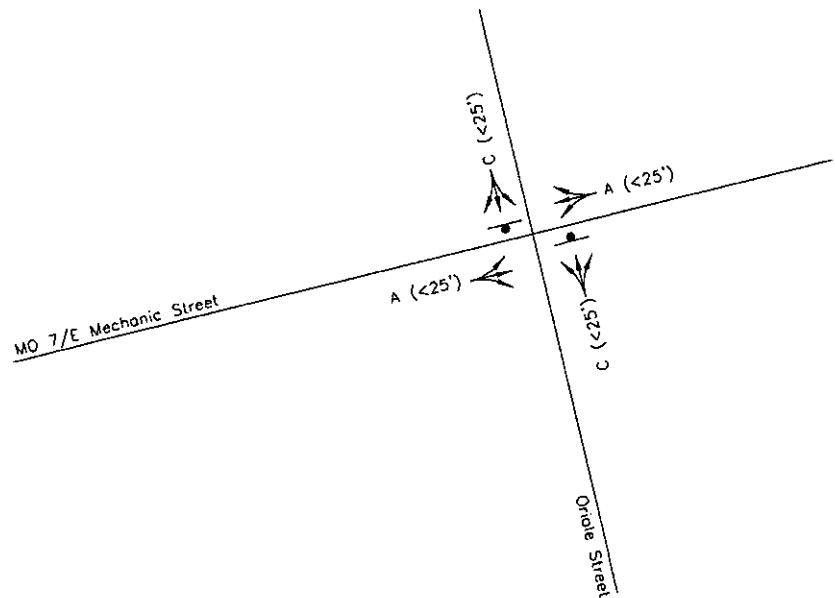
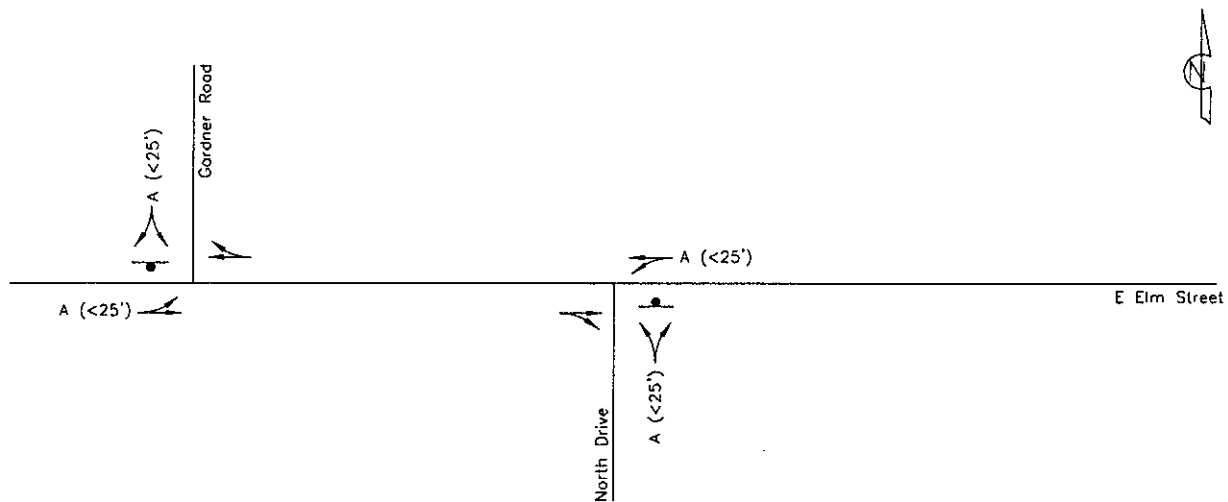
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 5



Priority
ENGINEERS



LEGEND

-  HCM LOS (95th Percentile Queue in Vehicles)
-  Stop Sign
-  Traffic Signal LOS

Existing PM Peak Hour
Lane Configurations &
Levels of Service

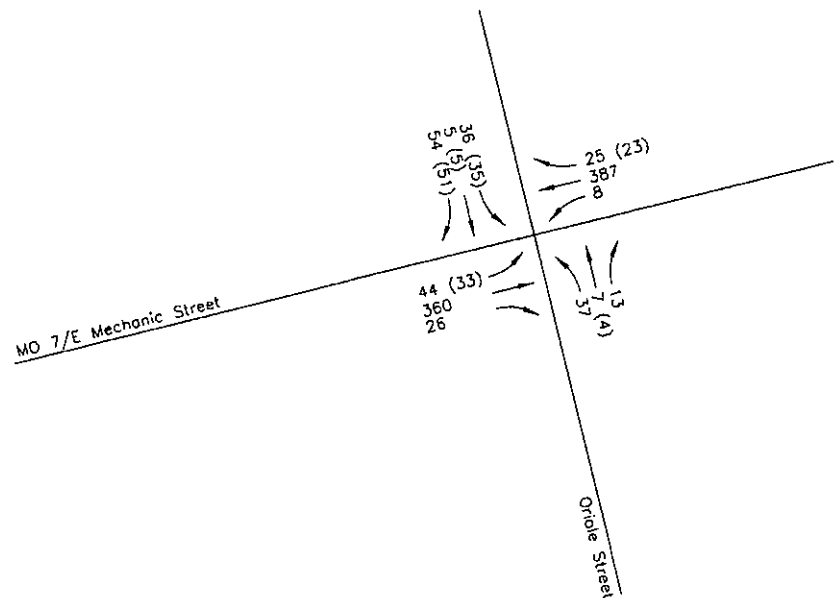
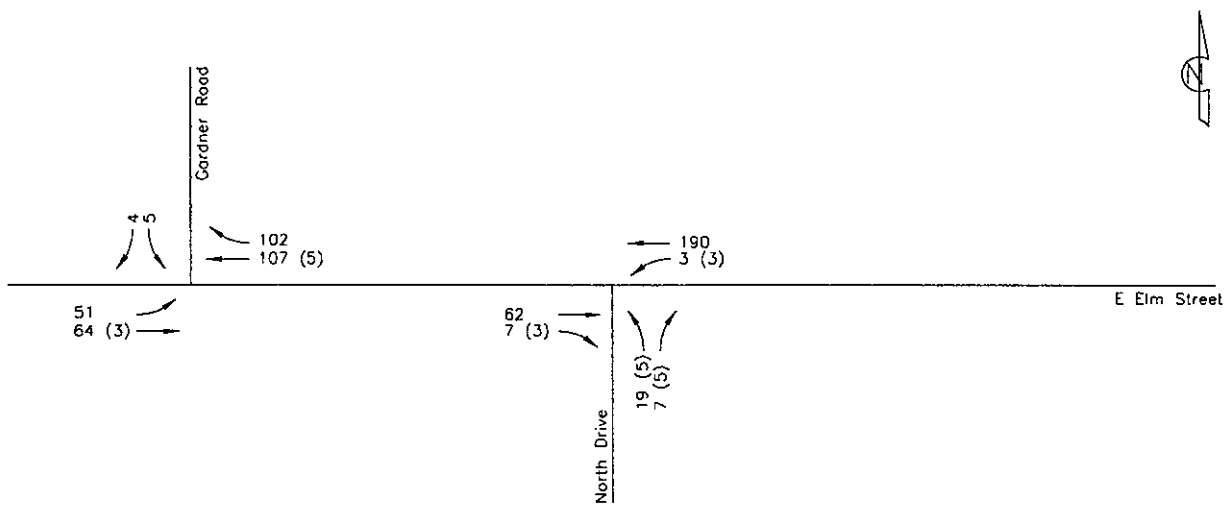
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 6



Priority
ENGINEERS



LEGEND

Total Volume (New Trips)

Existing + Proposed Development
(with Library)
AM Peak Hour Traffic Volumes

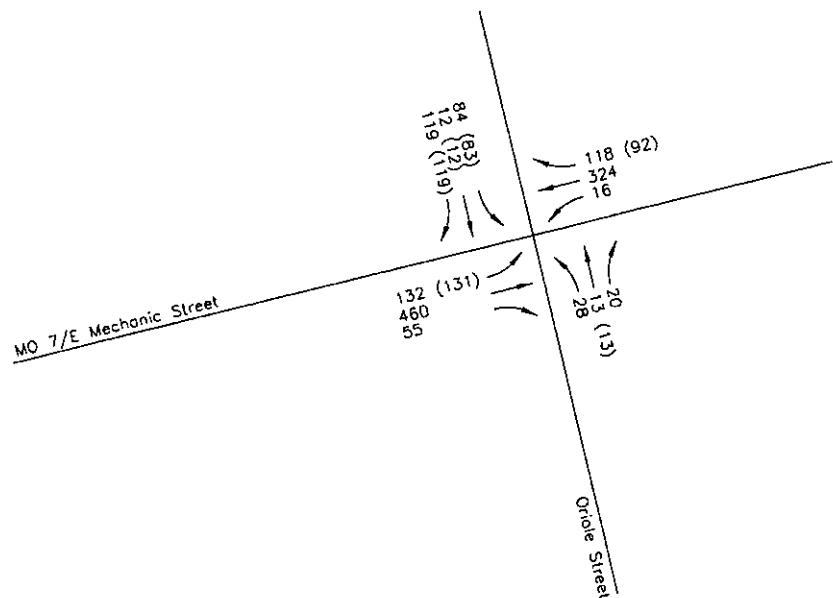
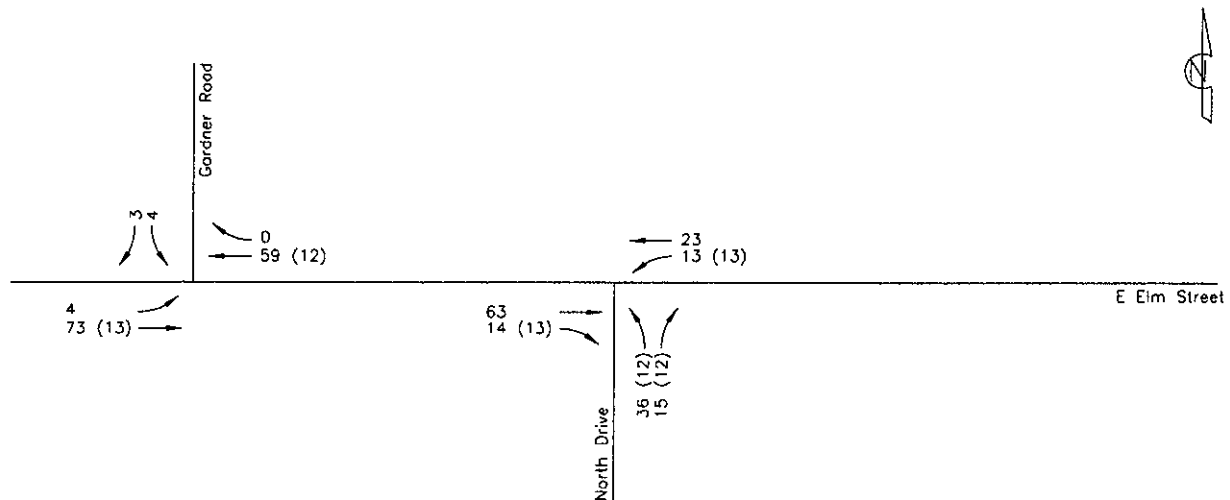
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 7



Priority
ENGINEERS



LEGEND

 Total Volume (New Trips)

Existing + Proposed Development
(with Library)
PM Peak Hour Traffic Volumes

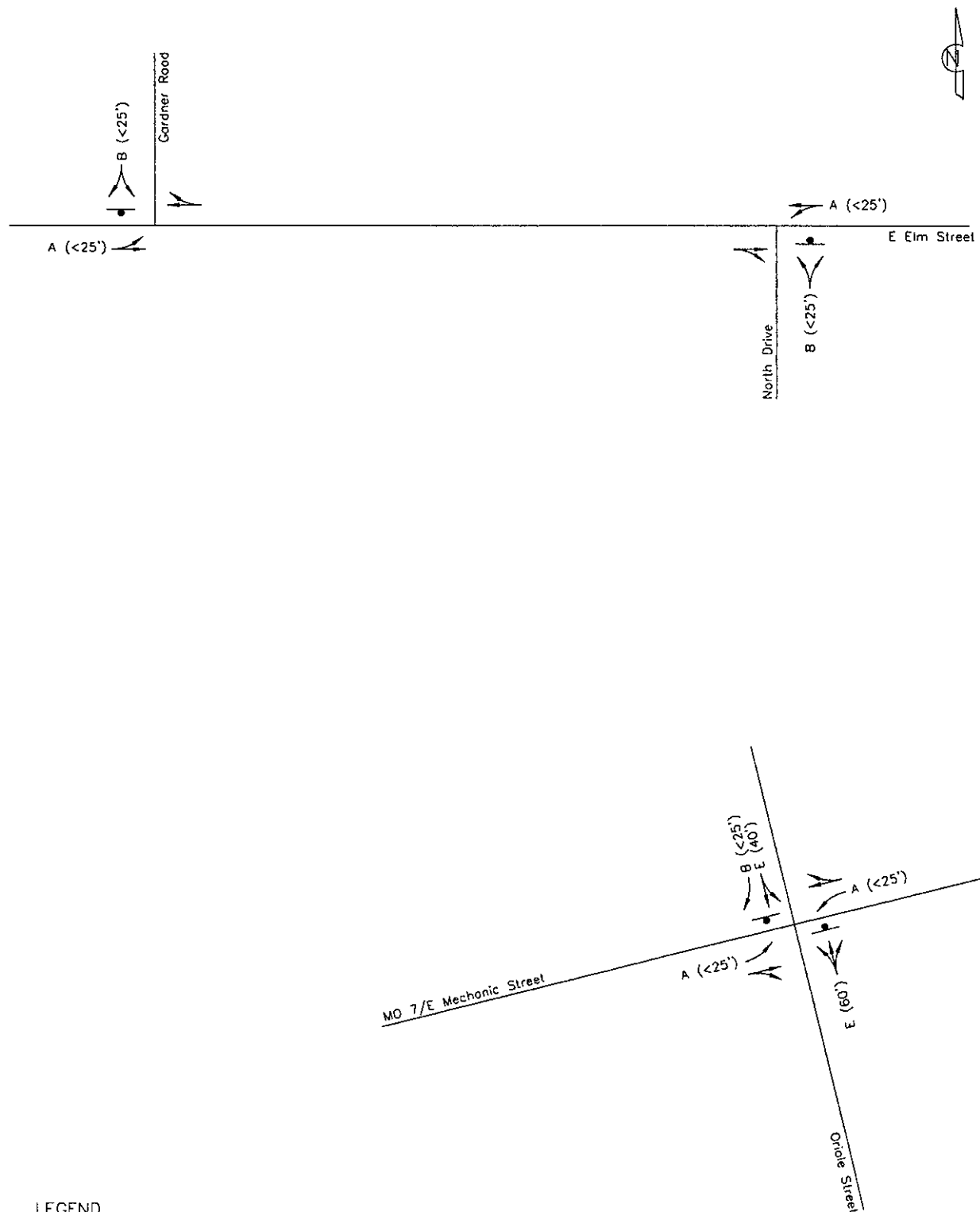
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 8



Priority
ENGINEERS



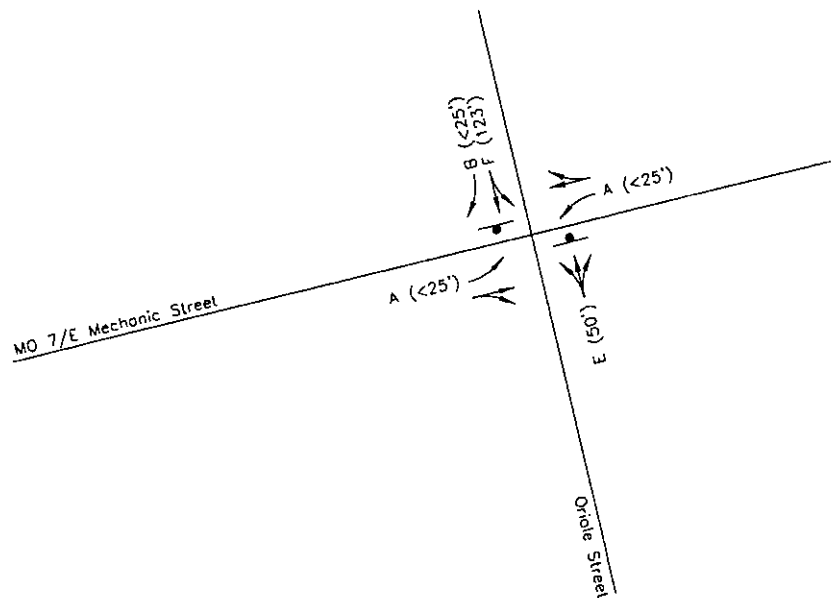
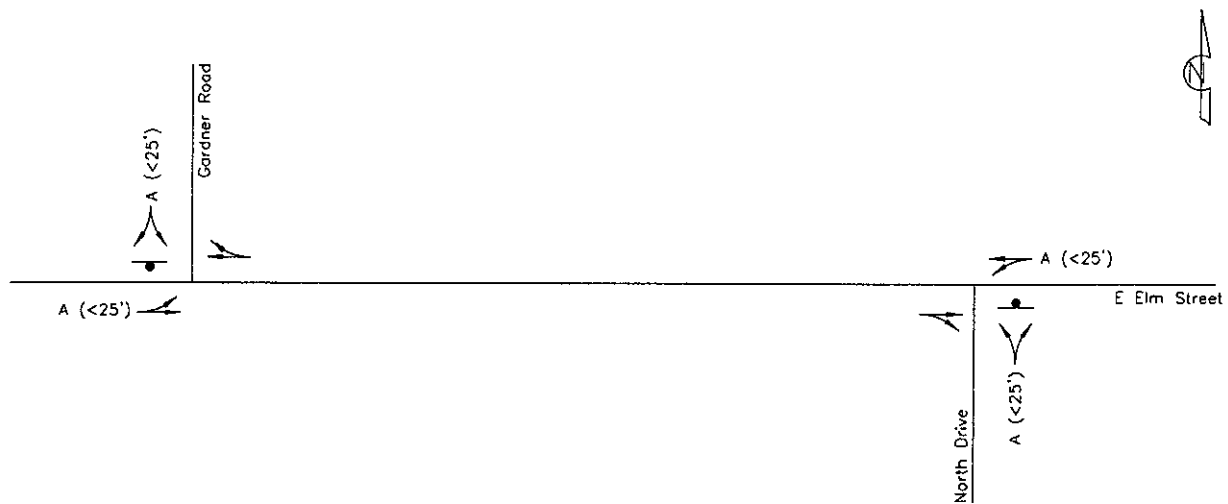
Existing + Proposed Development
(with Library)
AM Peak Hour Lane Configurations
& Levels of Service

Gardens of
Harrisonville
Harrisonville, MO

No Scale
Figure 9



priority
ENGINEERS



LEGEND

-  HCM LOS (95th Percentile Queue in Vehicles)
-  Stop Sign
-  Traffic Signal LOS

Existing + Proposed Development
(with Library)
PM Peak Hour Lane Configurations
& Levels of Service

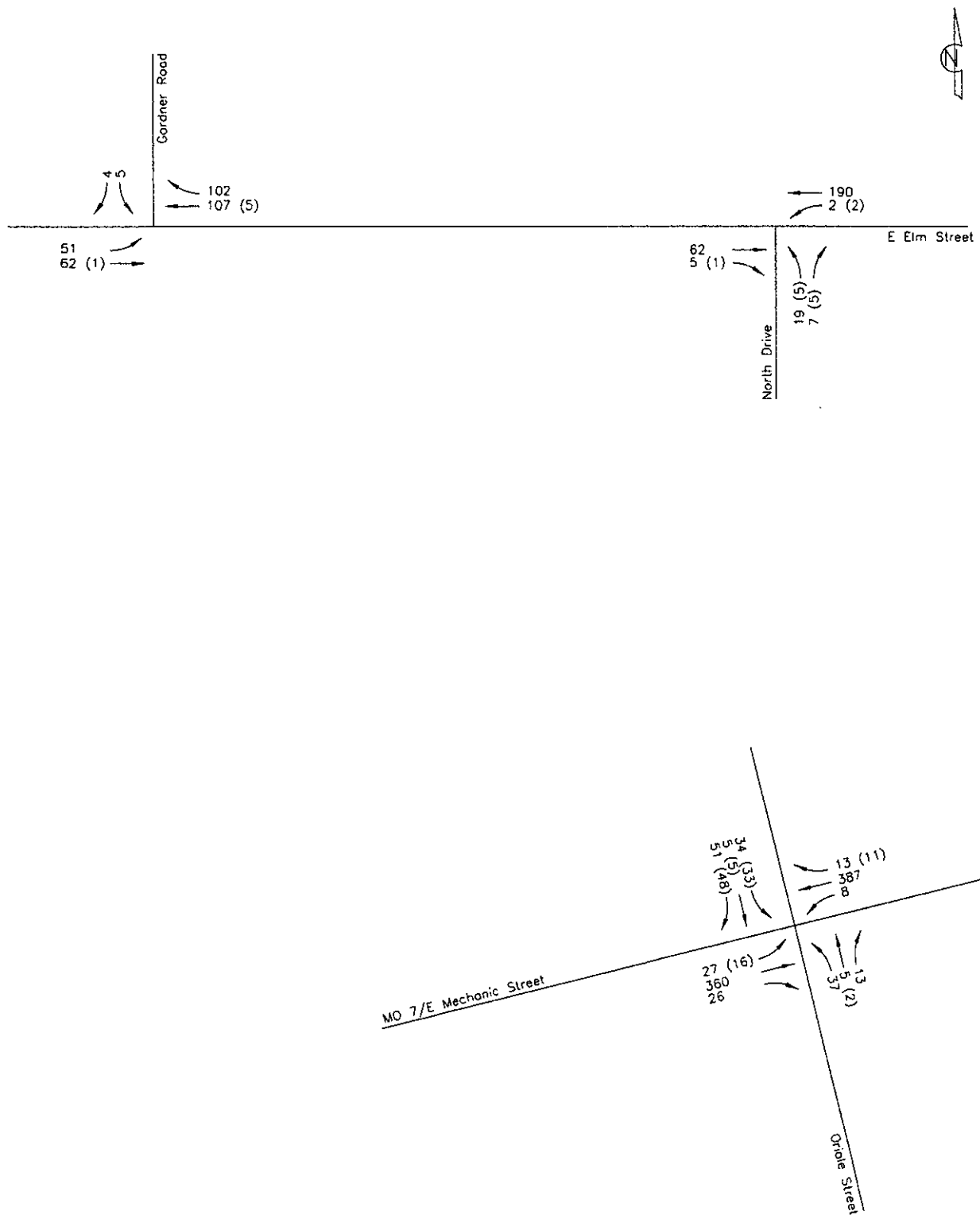
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 10



Priority
ENGINEERS



Existing + Proposed Development
 (with Senior Housing)
 AM Peak Hour Traffic Volumes

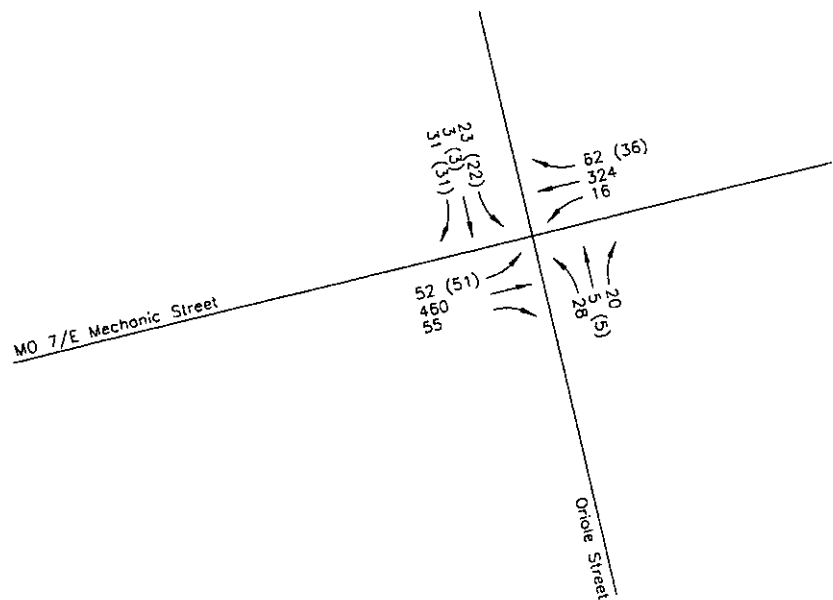
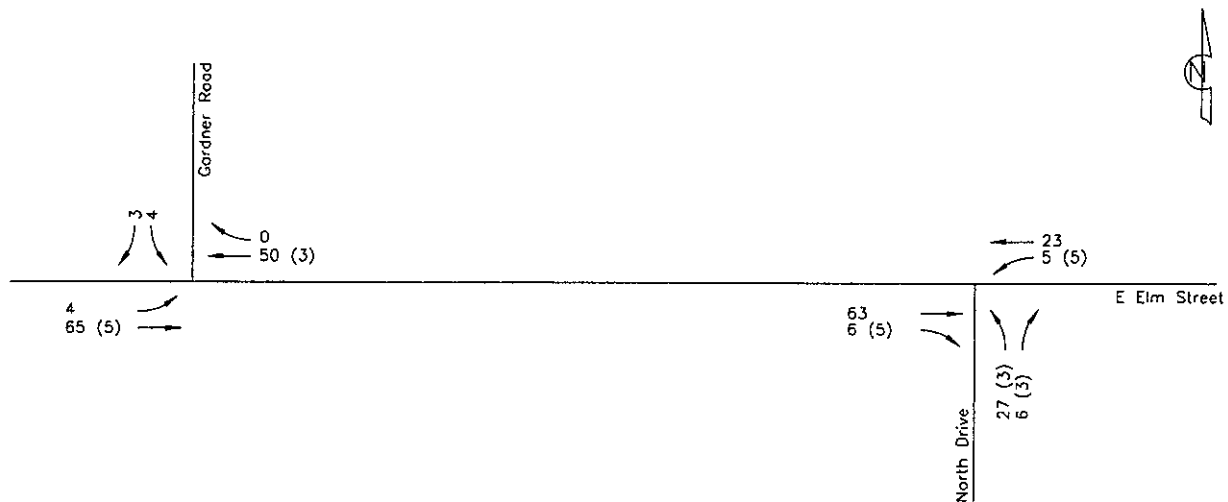
Gardens of
 Harrisonville
 Harrisonville, MO

No Scale

Figure 11



Priority
 ENGINEERS



LEGEND

 Total Volume (New Trips)

Existing + Proposed Development
(with Senior Housing)
PM Peak Hour Traffic Volumes

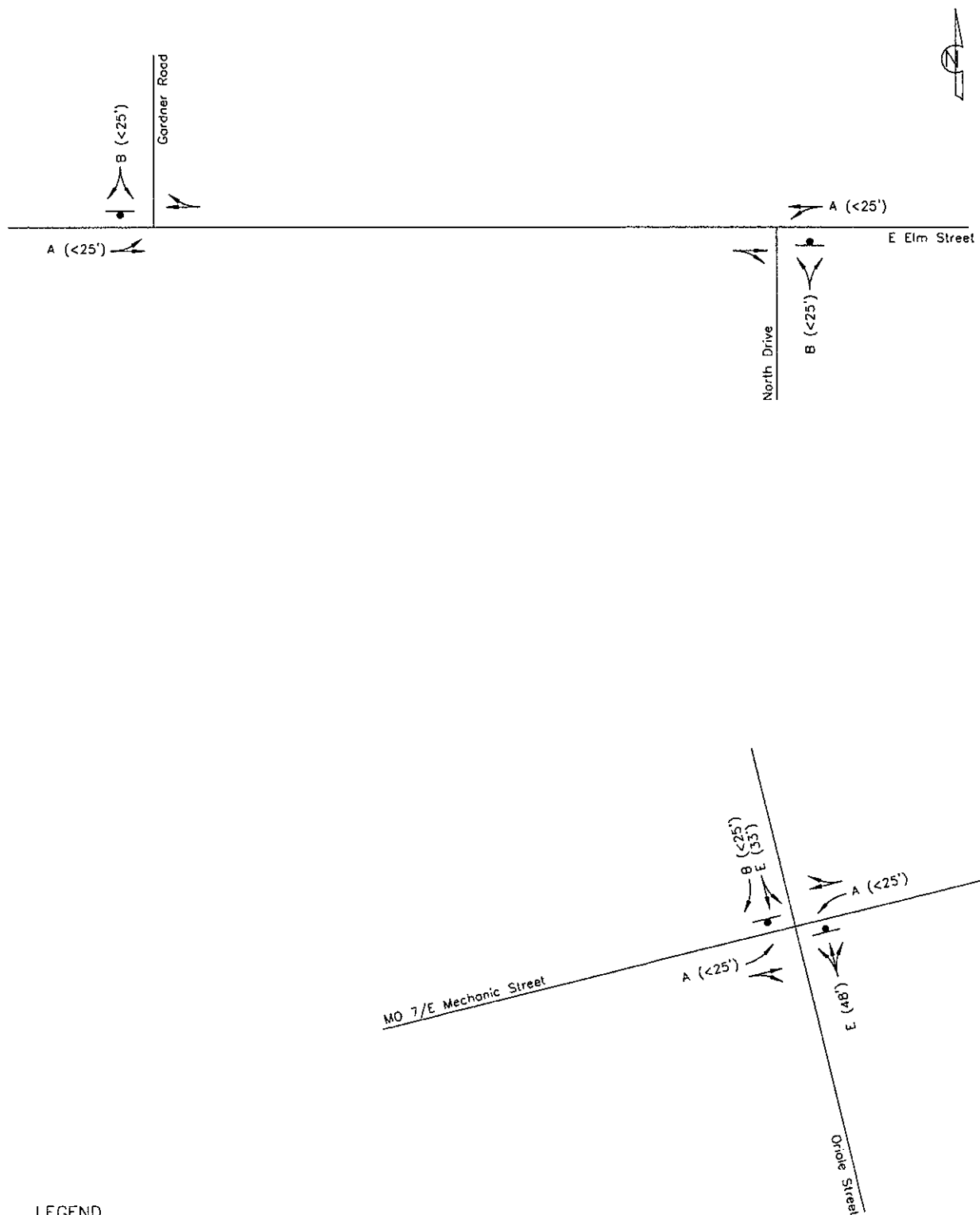
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 12



Priority
ENGINEERS



Existing + Proposed Development
(with Senior Housing)
AM Peak Hour Lane Configurations
& Levels of Service

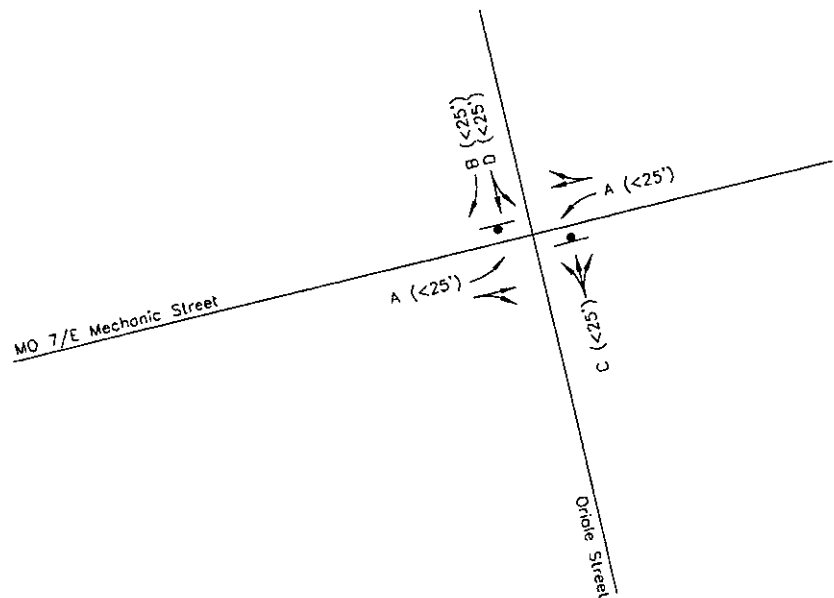
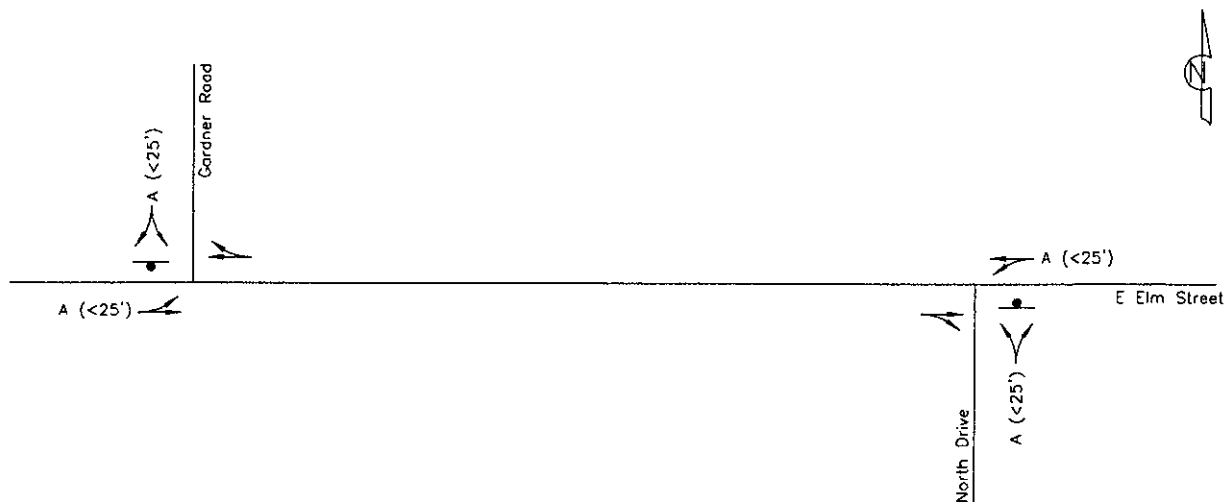
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 13



Priority
ENGINEERS



LEGEND

-  HCM LOS (95th Percentile Queue in Vehicles)
-  Stop Sign
-  Traffic Signal LOS

Existing + Proposed Development
(with Senior Housing)
PM Peak Hour Lane Configurations
& Levels of Service

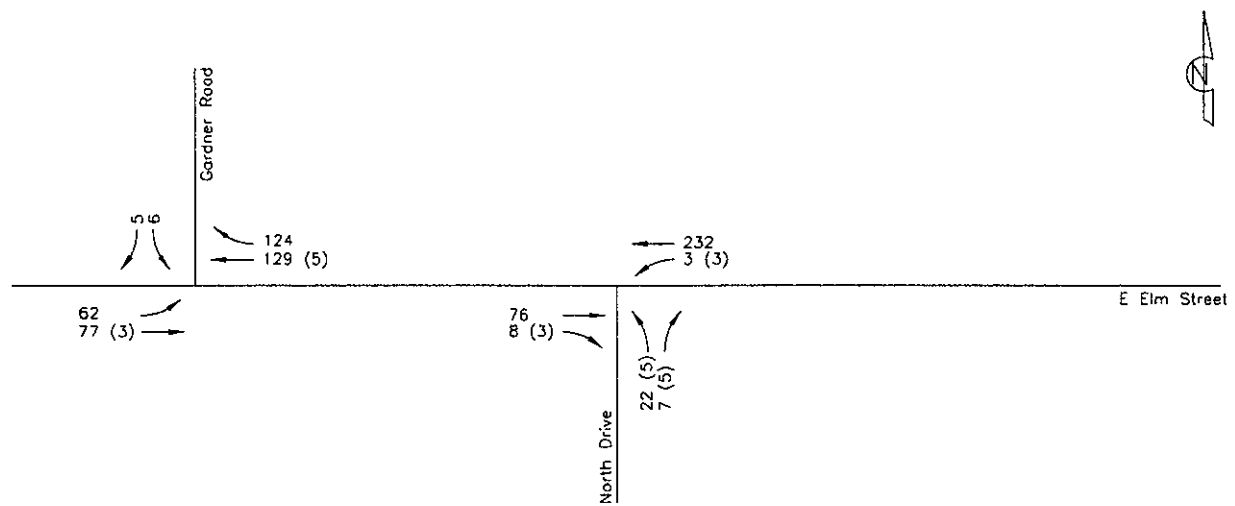
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 14



Priority
ENGINEERS



LEGEND

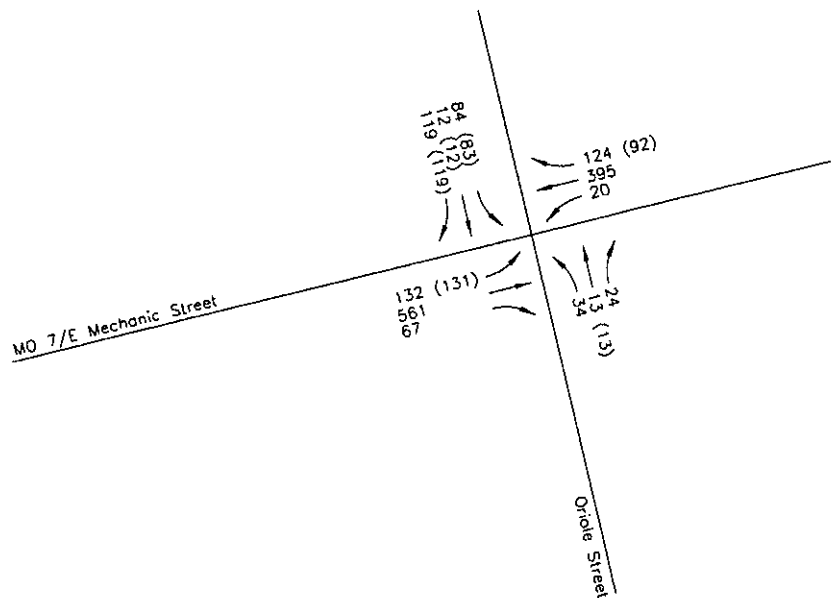
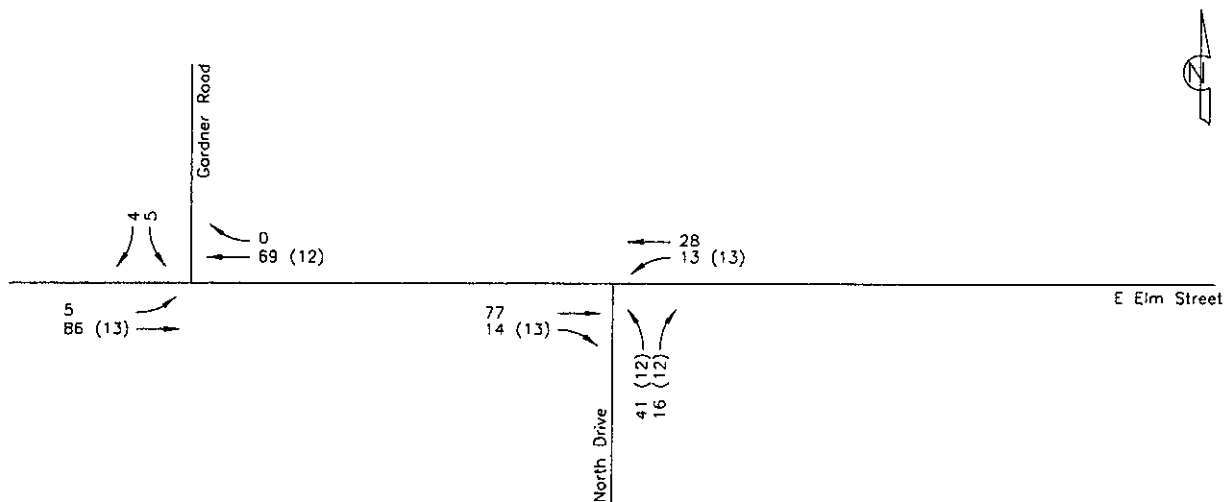
Total Volume (New Trips)

Future (2043)
 (with Library)
 AM Peak Hour Traffic Volumes

Gardens of
 Harrisonville
 Harrisonville, MO

No Scale
 Figure 15





LEGEND

 Total Volume (New Trips)

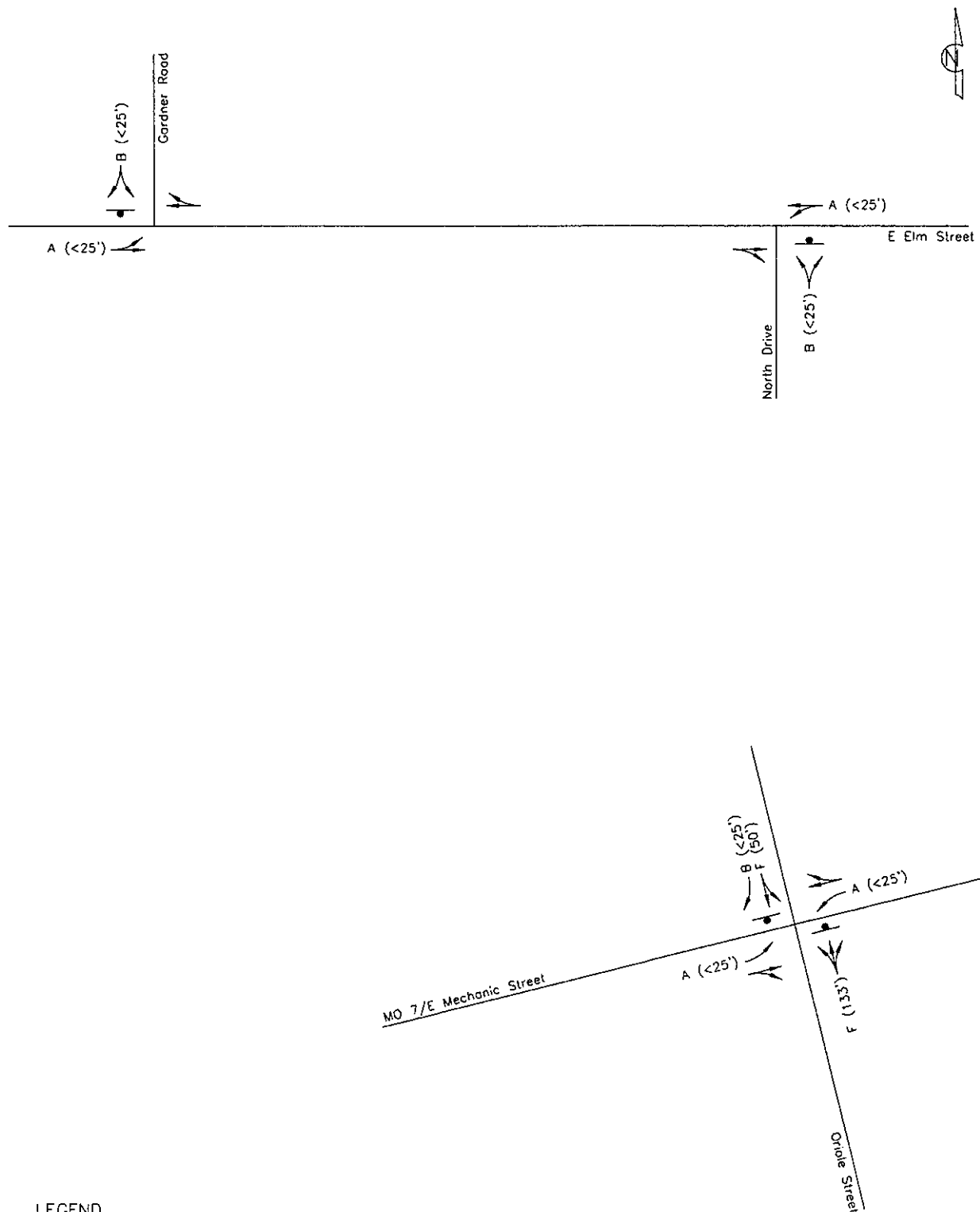
Future (2043)
(with Library)
PM Peak Hour Traffic Volumes

Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 16



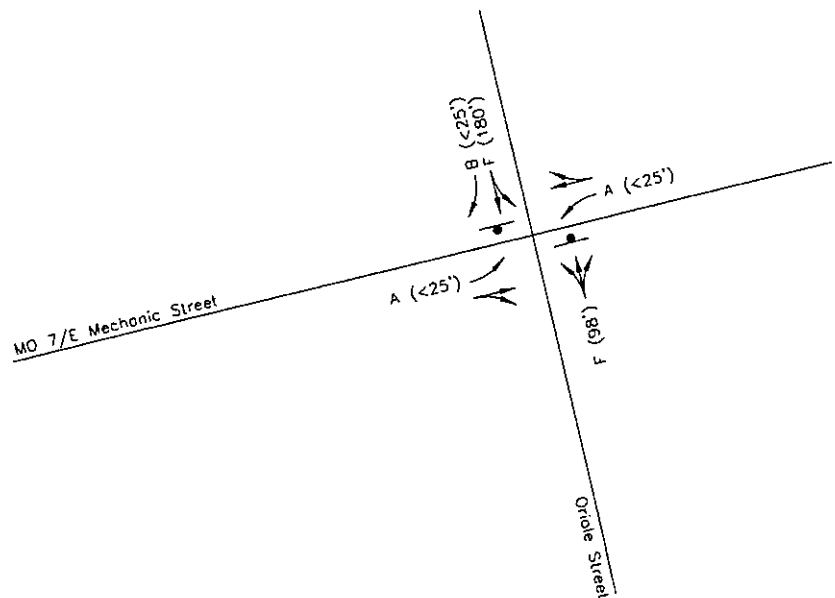
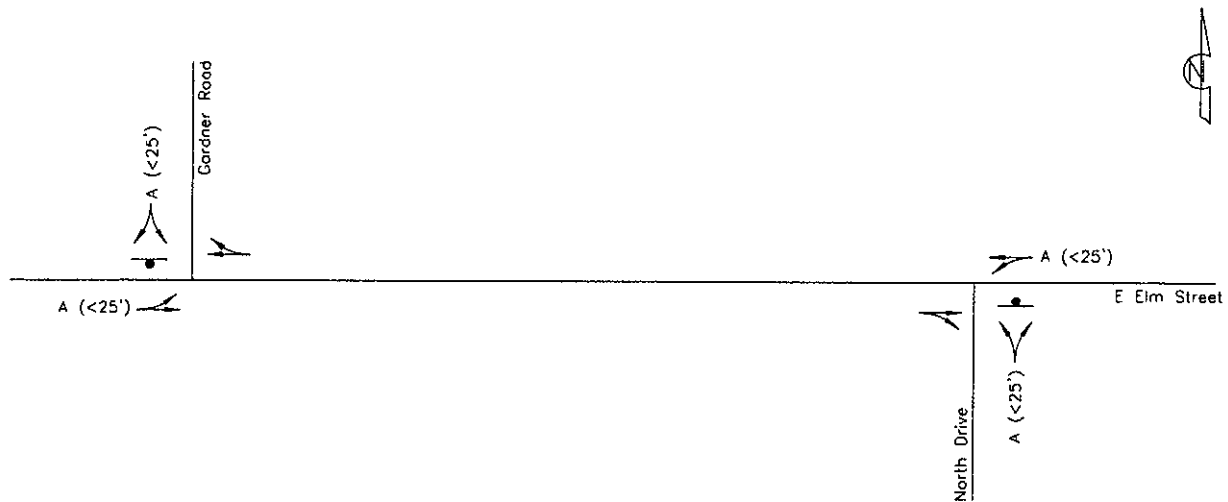


Future (2043)
(with Library)
AM Peak Hour Lane Configurations
& Levels of Service

Gardens of
Harrisonville
Harrisonville, MO

No Scale
Figure 17





LEGEND

- HCM LOS (95th Percentile Queue in Vehicles)
- ⬮ Stop Sign
- Ⓐ Traffic Signal LOS

Future (2043)
(with Library)
PM Peak Hour Lane Configurations
& Levels of Service

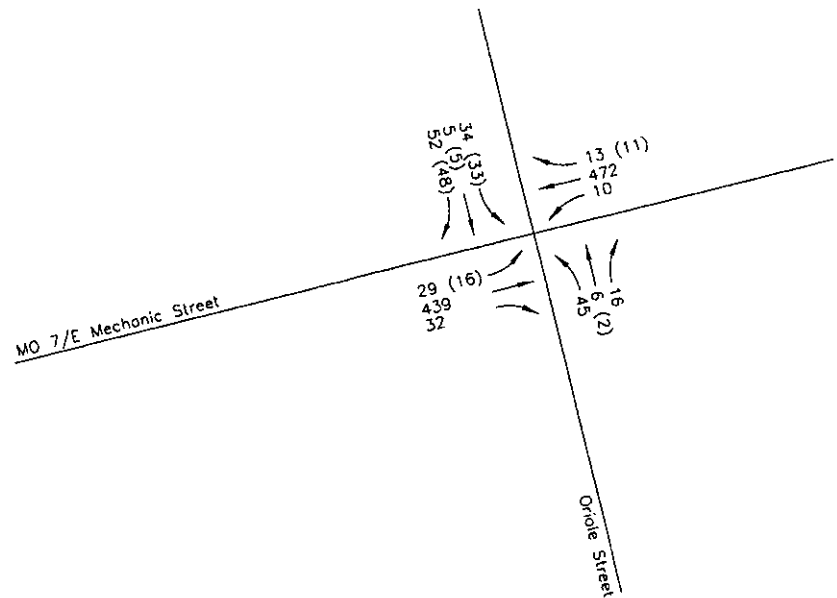
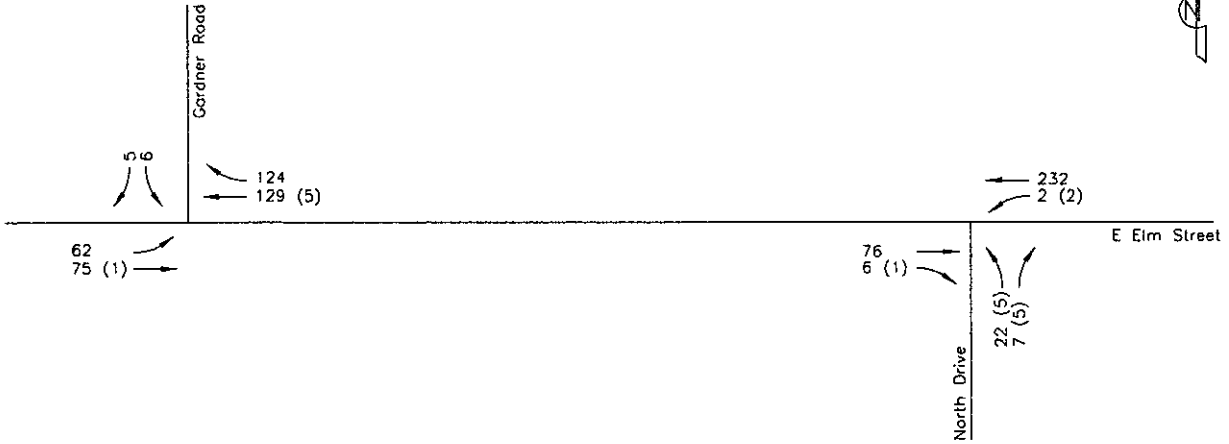
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 18



Priority
ENGINEERS



LEGEND

 Total Volume (New Trips)

Future (2043)
(with Senior Housing)
AM Peak Hour Traffic Volumes

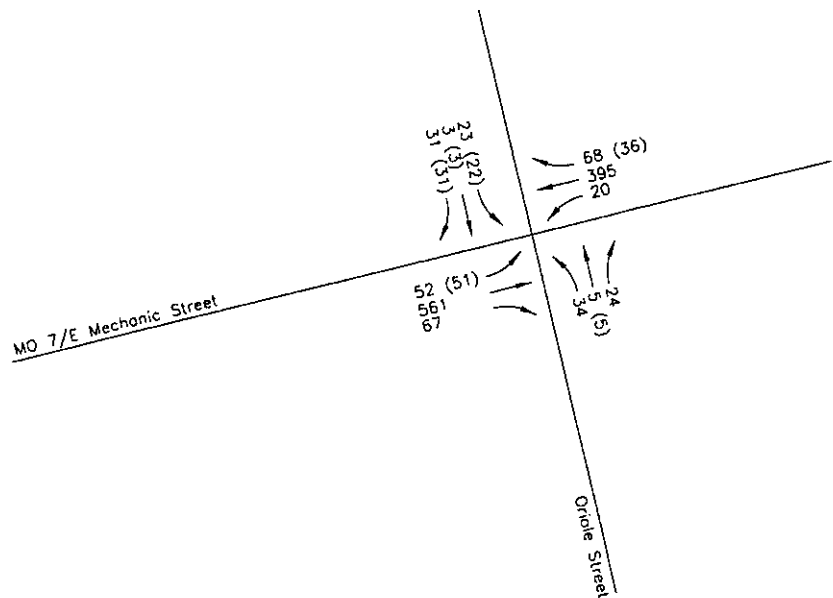
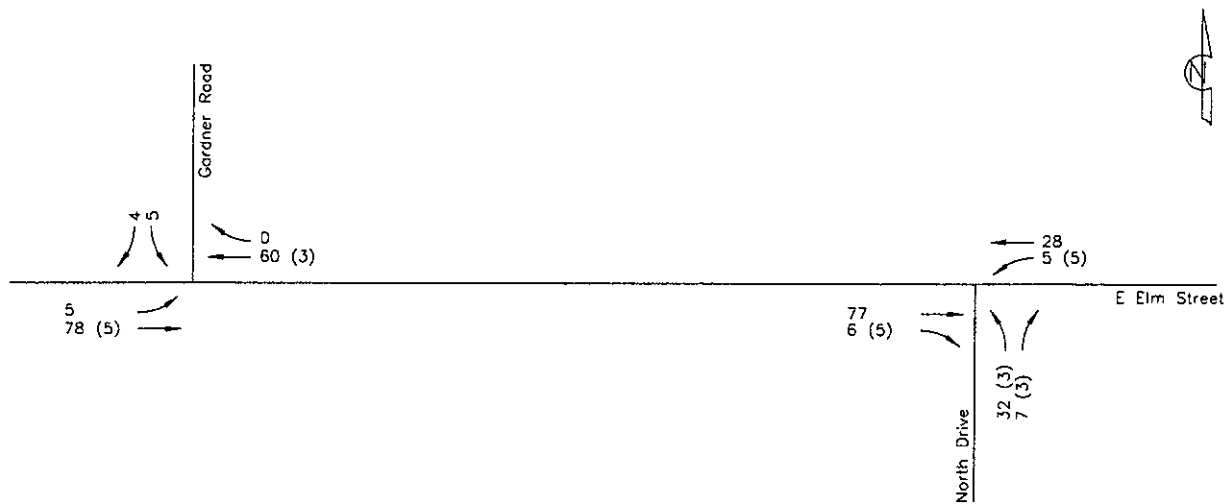
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 19



Priority
ENGINEERS



LEGEND

Total Volume (New Trips)

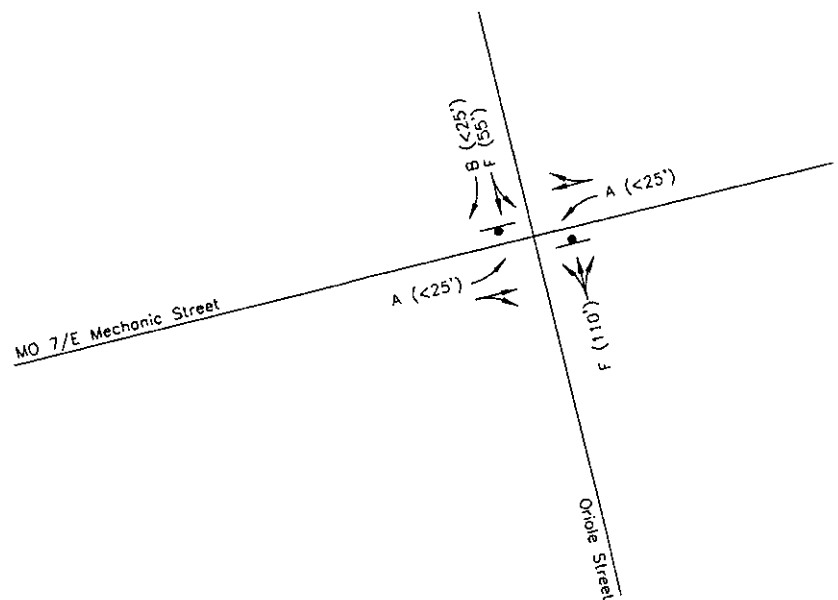
Future (2043)
 (with Senior Housing)
 PM Peak Hour Traffic Volumes

Gardens of
 Harrisonville
 Harrisonville, MO

No Scale

Figure 20





LEGEND

- HCM LOS (95th Percentile Queue in Vehicles)
- Stop Sign
- Traffic Signal LOS

Future (2043)
(with Senior Housing)
AM Peak Hour Lane Configurations
& Levels of Service

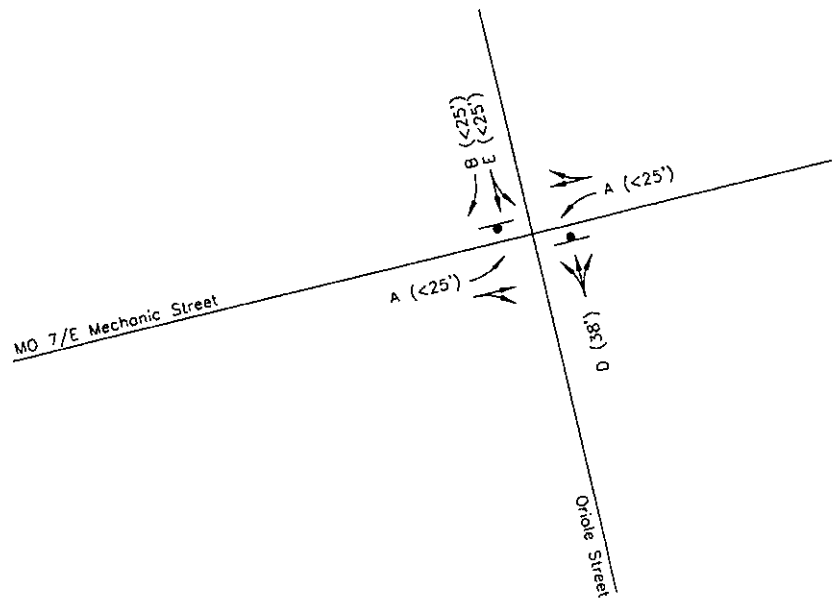
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 21



Priority
ENGINEERS



LEGEND

- HCM LOS (95th Percentile Queue in Vehicles)
- Stop Sign
- Ⓐ Traffic Signal LOS

Future (2043)
(with Senior Housing)
PM Peak Hour Lane Configurations
& Levels of Service

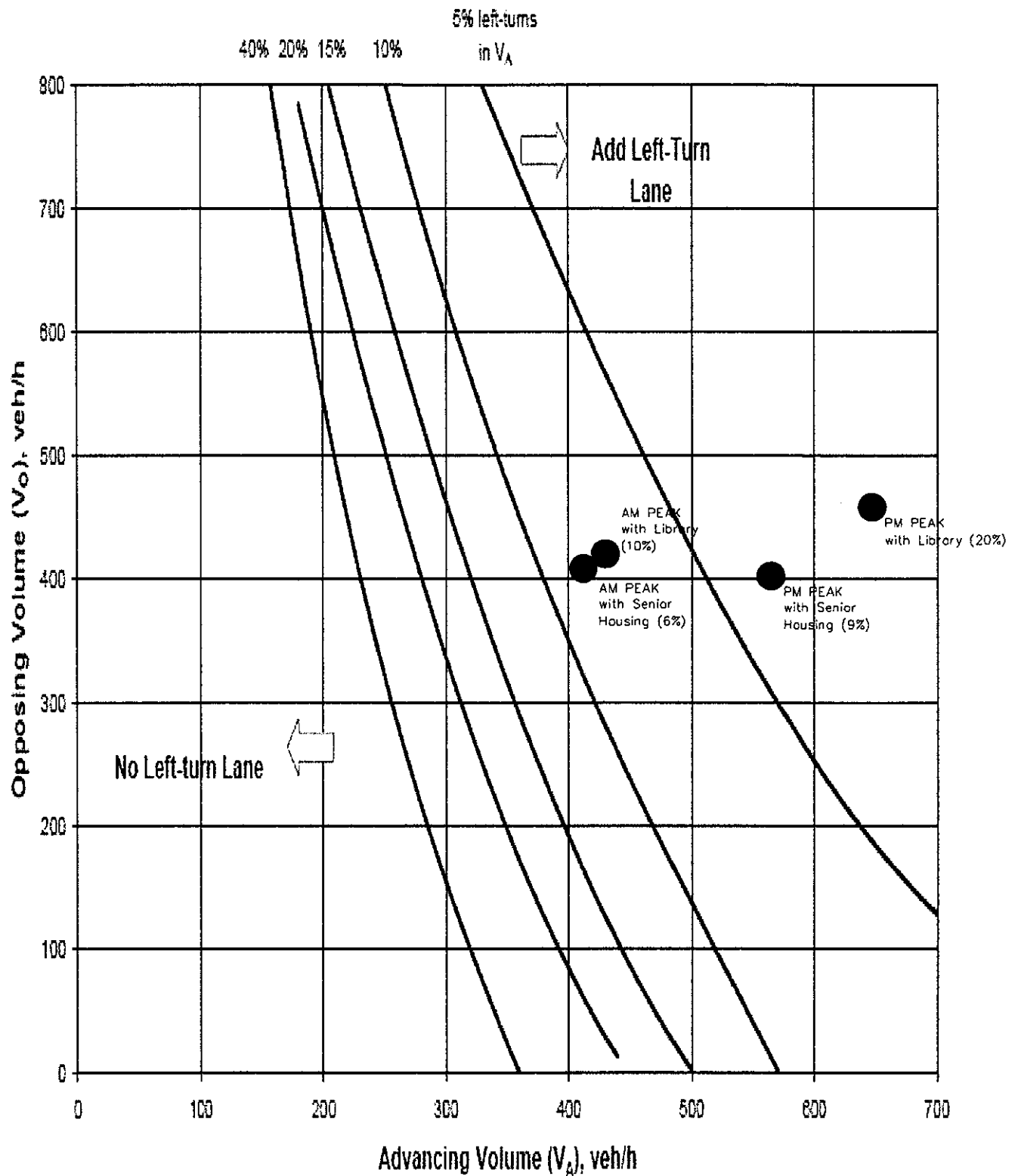
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 22



Priority
ENGINEERS



Left Turn Lane Guidelines for
Two-Lane Roads less than
or equal to 40mph
(MoDOT EPG 940.9.1)

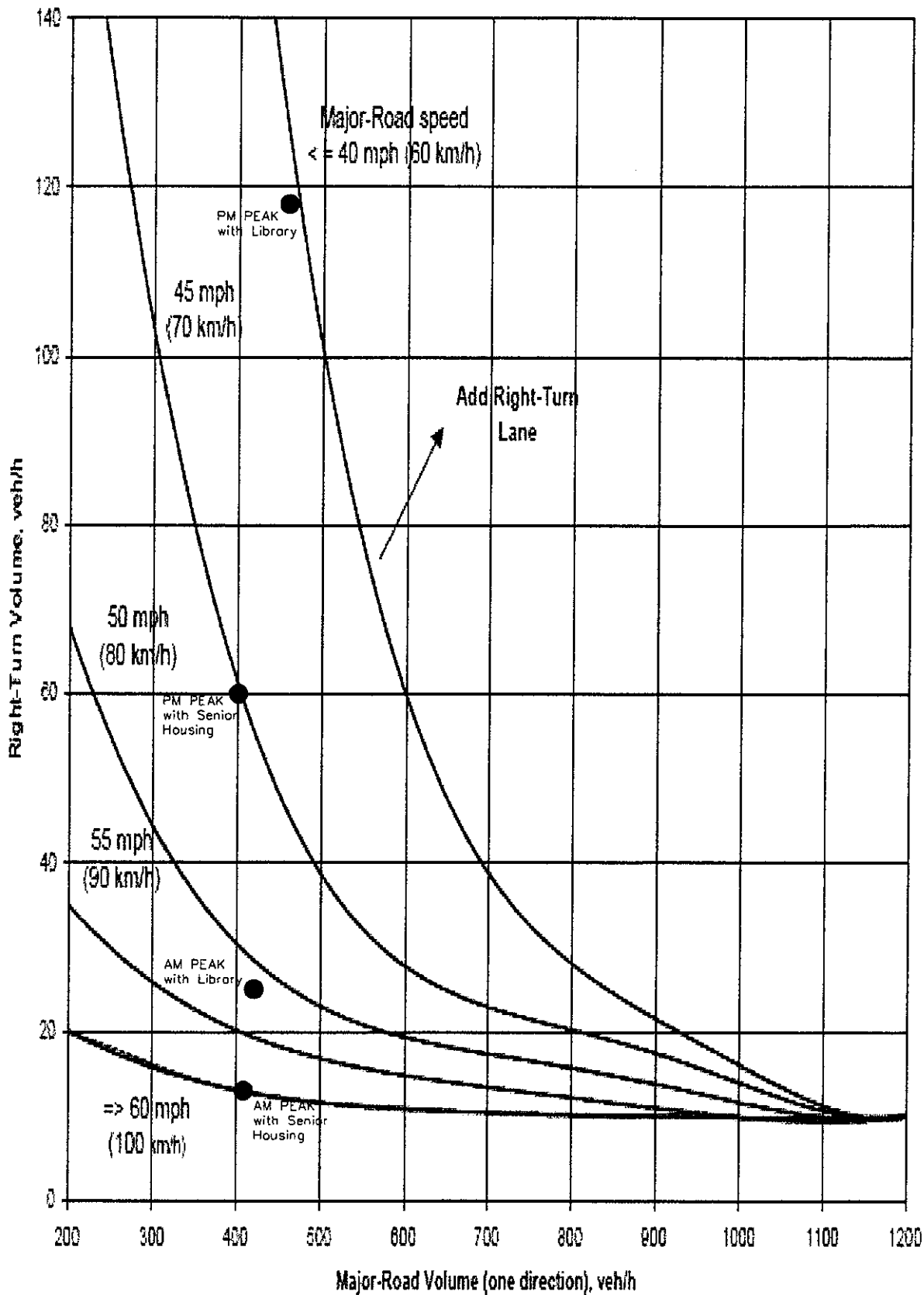
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 23



priority
ENGINEERS



Right Turn Lane Guidelines for
Two-Lane Roadways
(MoDOT EPG 940.9.8)

Gardens of
Harrisonville
Harrisonville, MO

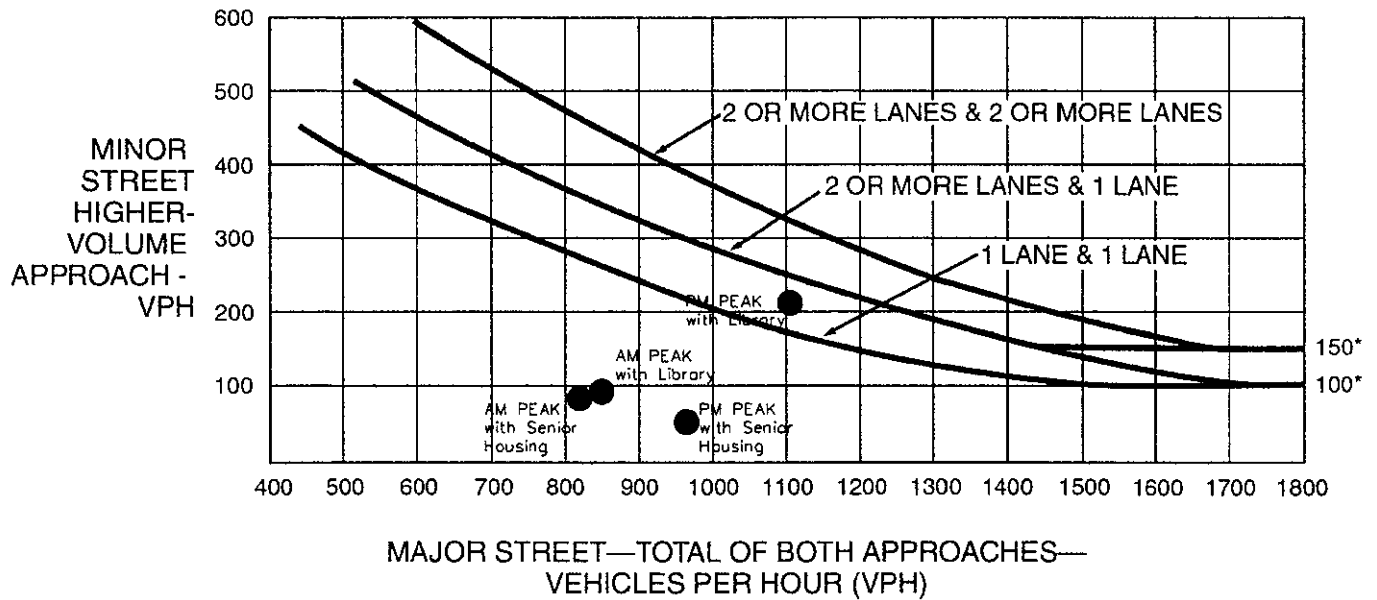
No Scale

Figure 24



Priority
ENGINEERS

Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Peak Hour Signal Warrant
(MO 7 & Oriole)

Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 25



Priority
ENGINEERS

APPENDIX II

Peak Hour Traffic Counts

Synchro Reports

Existing AM Peak Hour	Pages 1-3
Existing PM Peak Hour	Pages 4-6
Existing + Proposed Development (with Library) AM Peak Hour	Pages 7-9
Existing + Proposed Development (with Library) PM Peak Hour	Pages 10-12
Existing + Proposed Development (with Senior Housing) AM Peak Hour	Pages 13-15
Existing + Proposed Development (with Senior Housing) PM Peak Hour	Pages 16-18
Future (2043) (with Library) AM Peak Hour	Pages 19-21
Future (2043) (with Library) PM Peak Hour	Pages 22-24
Future (2043) (with Senior Housing) AM Peak Hour	Pages 25-27
Future (2043) (with Senior Housing) PM Peak Hour	Pages 28-30

Elm Street & Cass Career Center Drive

Start Time	Southbound			Westbound			Northbound			Eastbound			Totals	
	Left	Through	Right	Peds	Left	Through	Right	Peds	Bikes	Left	Through	Right		
7:00	2		1			24	21	2	0	1	17	4	0	74
7:15	0		0			36	53	1	0	8	12	24	2	137
7:30	0		1			26	23	1	1	2	18	20	1	96
7:45	3		2			18	5	0	0	0	4	13	0	43
8:00	1		1			13	0	0	0	2	3	5	1	26
8:15	2		1			5	3	0	0	0	2	10	1	24
8:30	1		2			15	1	0	0	0	4	6	0	29
8:45	0		1			8	0	0	0	0	2	17	0	28
Totals	5	0	4	0	0	102	102	4	1	11	51	61	3	350
Trucks	2					6						5		
Percentage														PHF: 0.64

Mechanic Street & Oriole Street

Start Time	Southbound			Westbound			Northbound			Eastbound			Totals	
	Left	Peds	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through		Right
7:00	1	0	105	0	12	0	4	2	79	4	0	0	0	207
7:15	5	1	118	1	11	2	5	8	128	6	0	0	3	288
7:30	1	0	78	1	9	1	3	1	73	7	1	1	0	176
7:45	1	0	86	0	5	0	1	0	80	9	0	0	0	182
8:00	2	0	96	0	10	2	4	0	62	2	0	0	1	169
8:15	1	0	82	0	10	0	3	0	65	5	0	0	0	167
8:30	5	0	117	0	8	0	2	0	97	9	0	0	0	238
8:45	4	0	114	0	11	0	3	0	84	5	0	0	0	221
Totals	8	1	387	2	37	3	13	11	360	26	1	1	0	853
Trucks	2		8		1				12					
Percentage			2%											PHF: 0.74

Elm Street & Cass Career Center Drive

Start Time	Southbound			Westbound			Northbound			Eastbound		
	Left	Peds	Right	Left	Through	Right	Left	Through	Right	Peds	Left	Through
16:00	2		2		11	3	0	0		0	1	15
16:15	1		2		12	0	0	1		1	2	11
16:30	3		0		16	0	0	2		2	0	37
16:45	1		1		11	0	0	0		4	0	12
17:00	0		0		8	0	0	0		0	3	16
17:15	0		2		12	0	0	0		0	0	10
17:30	0		2		21	0	1	0		3	1	22
17:45	2		0		20	1	2	3		0	1	13
Totals	4	0	3	0	47	0	0	5	0	0	4	60
Trucks					1							
Percentage					2%							

PHF= 0.81

Mechanic Street & Oriole Street

Start Time	Southbound			Westbound			Northbound			Eastbound		
	Left	Peds	Right	Left	Through	Right	Left	Through	Right	Peds	Left	Through
16:00	5	1	0	13	0	0	0	101	6	0	0	1
16:15	6	0	0	2	0	8	0	109	9	0	0	0
16:30	3	0	1	10	0	2	0	114	14	0	0	0
16:45	6	0	0	6	0	9	0	122	13	0	0	0
17:00	4	0	0	5	0	7	1	103	16	0	0	0
17:15	3	0	25	7	0	2	0	121	12	1	1	0
17:30	6	0	0	8	1	1	0	83	11	0	0	0
17:45	5	0	0	8	2	5	0	81	12	0	0	0
Totals	16	1	26	28	0	20	1	460	55	0	1	0
Trucks					6			5		1		
Percentage					2%			1%	2%			

PHF= 0.95

5: Elm Street & Cass Career Drive

Existing AM Peak Hour

Intersection

Int Delay, s/veh 1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	51	61	102	102	5	4
Future Vol, veh/h	51	61	102	102	5	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	64	64	64	64	64	64
Heavy Vehicles, %	2	8	6	3	40	2
Mvmt Flow	80	95	159	159	8	6

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	318	0	0 494 239
Stage 1	-	-	- 239 -
Stage 2	-	-	- 255 -
Critical Hdwy	4.12	-	- 6.8 6.22
Critical Hdwy Stg 1	-	-	- 5.8 -
Critical Hdwy Stg 2	-	-	- 5.8 -
Follow-up Hdwy	2.218	-	- 3.86 3.318
Pot Cap-1 Maneuver	1242	-	- 473 800
Stage 1	-	-	- 719 -
Stage 2	-	-	- 707 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1242	-	- 441 800
Mov Cap-2 Maneuver	-	-	- 441 -
Stage 1	-	-	- 670 -
Stage 2	-	-	- 707 -

Approach	EB	WB	SB
HCM Control Delay, s	3.7	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBL	SBR
Capacity (veh/h)	1242	-	-	-	-	551
HCM Lane V/C Ratio	0.064	-	-	-	-	0.026
HCM Control Delay (s)	8.1	0	-	-	-	11.7
HCM Lane LOS	A	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	-	0.1

6: Marshall Street & Elm Street

Existing AM Peak Hour

Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	1			1	1	
Traffic Vol, veh/h	62	4	0	190	14	2
Future Vol, veh/h	62	4	0	190	14	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	64	64	64	64	64	64
Heavy Vehicles, %	11	2	2	5	2	2
Mvmt Flow	97	6	0	297	22	3

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	103
Stage 1	-	-	100
Stage 2	-	-	297
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	-	1489	608
Stage 1	-	-	924
Stage 2	-	-	754
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1489	608
Mov Cap-2 Maneuver	-	-	608
Stage 1	-	-	924
Stage 2	-	-	754

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLt1	EBT	EBR	WBL	WBT
Capacity (veh/h)	637	-	-	1489	-
HCM Lane V/C Ratio	0.039	-	-	-	-
HCM Control Delay (s)	10.9	-	-	0	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

7: Oriole Street/Marshall Street & Mechanic Street

Existing AM Peak Hour

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Traffic Vol, veh/h	11	360	26	8	387	2	37	3	13	1	0	3
Future Vol, veh/h	11	360	26	8	387	2	37	3	13	1	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	2	3	2	2	2	2	3	2	2	2	2	2
Mvmt Flow	15	486	35	11	523	3	50	4	18	1	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	526	0	0	521	0	0	1083	1082	504	1092	1098	525
Stage 1	-	-	-	-	-	-	534	534	-	547	547	-
Stage 2	-	-	-	-	-	-	549	548	-	545	551	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.13	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.527	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1041	-	-	1045	-	-	194	217	568	192	213	552
Stage 1	-	-	-	-	-	-	528	524	-	521	517	-
Stage 2	-	-	-	-	-	-	518	517	-	523	515	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1041	-	-	1045	-	-	187	209	568	179	206	552
Mov Cap-2 Maneuver	-	-	-	-	-	-	187	209	-	179	206	-
Stage 1	-	-	-	-	-	-	517	514	-	511	509	-
Stage 2	-	-	-	-	-	-	506	509	-	493	505	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.2	28.3	15.1
HCM LOS	D	D	D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	225	1041	-	-	1045	-	-	363
HCM Lane V/C Ratio	0.318	0.014	-	-	0.01	-	-	0.015
HCM Control Delay (s)	28.3	8.5	0	-	8.5	0	-	15.1
HCM Lane LOS	D	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1.3	0	-	-	0	-	-	0

5: Elm Street & Cass Career Drive

Existing PM Peak Hour

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		↰	↱
Traffic Vol, veh/h	4	60	47	0	4	3
Future Vol, veh/h	4	60	47	0	4	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	74	58	0	5	4
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	58	0	0	142	58	
Stage 1	-	-	-	58	-	
Stage 2	-	-	-	84	-	
Critical Hdwy	4.12	-	-	6.42	6.22	
Critical Hdwy Stg 1	-	-	-	5.42	-	
Critical Hdwy Stg 2	-	-	-	5.42	-	
Follow-up Hdwy	2.218	-	-	3.518	3.318	
Pot Cap-1 Maneuver	1546	-	-	851	1008	
Stage 1	-	-	-	965	-	
Stage 2	-	-	-	939	-	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	1546	-	-	848	1008	
Mov Cap-2 Maneuver	-	-	-	848	-	
Stage 1	-	-	-	962	-	
Stage 2	-	-	-	939	-	
Approach	EB	WB	SB			
HCM Control Delay, s	0.5	0	9			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBL	SBR
Capacity (veh/h)	1546	-	-	-	910	
HCM Lane V/C Ratio	0.003	-	-	-	0.009	
HCM Control Delay (s)	7.3	0	-	-	9	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0	

6: Marshall Street & Elm Street

Existing PM Peak Hour

Intersection						
Int Delay, s/veh	2.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↱	
Traffic Vol, veh/h	63	1	0	23	24	3
Future Vol, veh/h	63	1	0	23	24	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	78	1	0	28	30	4

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	79
Stage 1	-	-	79
Stage 2	-	-	28
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	-	1519	891
Stage 1	-	-	944
Stage 2	-	-	995
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1519	891
Mov Cap-2 Maneuver	-	-	891
Stage 1	-	-	944
Stage 2	-	-	995

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	900	-	-	1519	-
HCM Lane V/C Ratio	0.037	-	-	-	-
HCM Control Delay (s)	9.2	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

7: Oriole Street/Marshall Street & Mechanic Street

Existing PM Peak Hour

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Traffic Vol, veh/h	1	460	55	16	324	26	28	0	20	1	0	0
Future Vol, veh/h	1	460	55	16	324	26	28	0	20	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	484	58	17	341	27	29	0	21	1	0	0

Major/Minor	Major:1		Major:2		Minor:1		Minor:2					
Conflicting Flow All	368	0	0	542	0	0	904	917	513	915	933	355
Stage 1	-	-	-	-	-	-	515	515	-	389	389	-
Stage 2	-	-	-	-	-	-	389	402	-	526	544	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2,218	-	-	2,218	-	-	3,518	4,018	3,318	3,518	4,018	3,318
Poi Cap-1 Maneuver	1191	-	-	1027	-	-	258	272	561	253	266	689
Stage 1	-	-	-	-	-	-	543	535	-	635	608	-
Stage 2	-	-	-	-	-	-	635	600	-	535	519	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1191	-	-	1027	-	-	254	266	561	239	260	689
Mov Cap-2 Maneuver	-	-	-	-	-	-	254	266	-	239	260	-
Stage 1	-	-	-	-	-	-	542	534	-	634	595	-
Stage 2	-	-	-	-	-	-	622	587	-	514	518	-

Approach	EB	WB	NE	SB
HCM Control Delay, s	0	0.4	17.9	20.1
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	329	1191	-	-	1027	-	-	239
HCM Lane V/C Ratio	0.154	0.001	-	-	0.016	-	-	0.004
HCM Control Delay (s)	17.9	8	0	-	8.6	0	-	20.1
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	0

5: Elm Street & Cass Career Drive

Existing + Proposed Development (with Library) AM Peak Hour

Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	51	64	107	102	5	4
Future Vol, veh/h	51	64	107	102	5	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	64	64	64	64	64	64
Heavy Vehicles, %	2	8	6	3	40	2
Mvmt Flow	80	100	167	159	8	6

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	326	0	0	507	247
Stage 1	-	-	-	247	-
Stage 2	-	-	-	260	-
Critical Hdwy	4.12	-	-	6.8	6.22
Critical Hdwy Stg 1	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	5.8	-
Follow-up Hdwy	2.218	-	-	3.86	3.318
Pot Cap-1 Maneuver	1234	-	-	464	792
Stage 1	-	-	-	713	-
Stage 2	-	-	-	703	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1234	-	-	432	792
Mov Cap-2 Maneuver	-	-	-	432	-
Stage 1	-	-	-	664	-
Stage 2	-	-	-	703	-

Approach	EB	WB	SB
HCM Control Delay, s	3.6	0	11.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBL	SBR
Capacity (veh/h)	1234	-	-	-	541	-
HCM Lane V/C Ratio	0.065	-	-	-	0.026	-
HCM Control Delay (s)	8.1	0	-	-	11.8	-
HCM Lane LOS	A	A	-	-	B	-
HCM 95th %tile Q(veh)	0.2	-	-	-	0.1	-

6: Marshall Street & Elm Street

Existing + Proposed Development (with Library) AM Peak Hour

Intersection						
Int Delay, s/veh	1					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	1			1	1	
Traffic Vol, veh/h	62	7	3	190	19	7
Future Vol, veh/h	62	7	3	190	19	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	64	64	64	64	64	64
Heavy Vehicles, %	11	2	2	5	2	2
Mvmt Flow	97	11	5	297	30	11

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	108
Stage 1	-	-	103
Stage 2	-	-	307
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	-	1483	598
Stage 1	-	-	921
Stage 2	-	-	746
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1483	596
Mov Cap-2 Maneuver	-	-	596
Stage 1	-	-	921
Stage 2	-	-	743

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	10.8
HCM LOS			B

Minor Lane/Major Mvmt	NBL11	EBT	EBR	WBL	WBT
Capacity (veh/h)	663	-	-	1483	-
HCM Lane V/C Ratio	0.061	-	-	0.003	-
HCM Control Delay (s)	10.8	-	-	7.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

7: Oriole Street/Marshall Street & Mechanic Street Existing + Proposed Development (with Library) AM Peak Hour

Intersection

Int Delay, s/veh 5.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	44	360	26	8	387	25	37	7	13	36	5	54
Future Vol, veh/h	44	360	26	8	387	25	37	7	13	36	5	54
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	140	-	-	140	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	2	3	2	2	2	2	3	2	2	2	2	2
Mvmt Flow	59	486	35	11	523	34	50	9	18	49	7	73

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	557	0	0	521	0	0	1224	1201	504	1197	1201	540
Stage 1	-	-	-	-	-	-	622	622	-	562	562	-
Stage 2	-	-	-	-	-	-	602	579	-	635	639	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.13	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.527	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1014	-	-	1045	-	-	155	185	568	163	185	542
Stage 1	-	-	-	-	-	-	473	479	-	512	510	-
Stage 2	-	-	-	-	-	-	485	501	-	467	470	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1014	-	-	1045	-	-	123	172	568	143	172	542
Mov Cap-2 Maneuver	-	-	-	-	-	-	123	172	-	143	172	-
Stage 1	-	-	-	-	-	-	446	451	-	482	504	-
Stage 2	-	-	-	-	-	-	410	495	-	417	443	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0.2	48.7	26.2
HCM LOS			E	D

Minor Lane/Major Mvmt	NBLn1	EBLn1	EBLn2	EBR	WBL	WBLn1	WBLn2	WBR	SBLn1	SBLn2
Capacity (veh/h)	156	1014	-	-	1045	-	-	146	542	
HCM Lane V/C Ratio	0.494	0.059	-	-	0.01	-	-	0.379	0.135	
HCM Control Delay (s)	48.7	8.8	-	-	8.5	-	-	44	12.7	
HCM Lane LOS	E	A	-	-	A	-	-	E	B	
HCM 95th %tile Q(veh)	2.4	0.2	-	-	0	-	-	1.6	0.5	

5: Elm Street & Cass Career Drive

Existing + Proposed Development (with Library) PM Peak Hour

Intersection						
Int Delay, s/veh	0.7					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	4	73	59	0	4	3
Future Vol, veh/h	4	73	59	0	4	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	90	73	0	5	4

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	73	0	0 173 73
Stage 1	-	-	- 73 -
Stage 2	-	-	- 100 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1527	-	- 817 989
Stage 1	-	-	- 950 -
Stage 2	-	-	- 924 -
Platoon blocked, %	-	-	- -
Mov Cap-1 Maneuver	1527	-	- 815 989
Mov Cap-2 Maneuver	-	-	- 815 -
Stage 1	-	-	- 947 -
Stage 2	-	-	- 924 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1527	-	-	-	881
HCM Lane V/C Ratio	0.003	-	-	-	0.01
HCM Control Delay (s)	7.4	0	-	-	9.1
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

6: Marshall Street & Elm Street

Existing + Proposed Development (with Library) PM Peak Hour

Intersection						
Int Delay, s/veh	3.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Traffic Vol, veh/h	63	14	13	23	36	15
Future Vol, veh/h	63	14	13	23	36	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	78	17	16	28	44	19

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	95
Stage 1	-	-	87
Stage 2	-	-	60
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	-	1499	845
Stage 1	-	-	936
Stage 2	-	-	963
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1499	836
Mov Cap-2 Maneuver	-	-	836
Stage 1	-	-	936
Stage 2	-	-	952

Approach	EB	WB	NB
HCM Control Delay, s	0	2.7	9.4
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	872	-	-	1499	-
HCM Lane V/C Ratio	0.072	-	-	0.011	-
HCM Control Delay (s)	9.4	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

7: Oriole Street/Marshall Street & Mechanic Street Existing + Proposed Development (with Library) PM Peak Hour

Intersection												
Int Delay, s/veh	11.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑		↰	↑		↰	↑		↰	↑	
Traffic Vol, veh/h	132	460	55	16	324	118	28	13	20	84	12	119
Future Vol, veh/h	132	460	55	16	324	118	28	13	20	84	12	119
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	140	-	-	140	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	139	484	58	17	341	124	29	14	21	88	13	125

Major/Minor	Major 1			Major 2			Minor 1			Minor 2		
Conflicting Flow All	465	0	0	542	0	0	1297	1290	513	1246	1257	403
Stage 1	-	-	-	-	-	-	791	791	-	437	437	-
Stage 2	-	-	-	-	-	-	506	499	-	809	820	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1096	-	-	1027	-	-	139	163	561	151	171	647
Stage 1	-	-	-	-	-	-	383	401	-	598	579	-
Stage 2	-	-	-	-	-	-	549	544	-	374	389	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1096	-	-	1027	-	-	94	140	561	120	147	647
Mov Cap-2 Maneuver	-	-	-	-	-	-	94	140	-	120	147	-
Stage 1	-	-	-	-	-	-	334	350	-	522	569	-
Stage 2	-	-	-	-	-	-	426	535	-	302	340	-

Approach	EB	WB	NE	SB
HCM Control Delay, s	1.8	0.3	49.2	53.7
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	143	1096	-	-	1027	-	-	123	647
HCM Lane V/C Ratio	0.449	0.127	-	-	0.016	-	-	0.822	0.194
HCM Control Delay (s)	49.2	8.8	-	-	8.6	-	-	105.6	11.9
HCM Lane LOS	E	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	2	0.4	-	-	0.1	-	-	4.9	0.7

5: Elm Street & Cass Career Drive

Existing + Proposed Development (with Senior Housing) AM Peak Hour

Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	51	62	107	102	5	4
Future Vol, veh/h	51	62	107	102	5	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	64	64	64	64	64	64
Heavy Vehicles, %	2	8	6	3	40	2
Mvmt Flow	80	97	167	159	8	6

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	326	0	0	504	247
Stage 1	-	-	-	247	-
Stage 2	-	-	-	257	-
Critical Hdwy	4.12	-	-	6.8	6.22
Critical Hdwy Stg 1	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	5.8	-
Follow-up Hdwy	2.218	-	-	3.86	3.318
Pot Cap-1 Maneuver	1234	-	-	466	792
Stage 1	-	-	-	713	-
Stage 2	-	-	-	705	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1234	-	-	434	792
Mov Cap-2 Maneuver	-	-	-	434	-
Stage 1	-	-	-	664	-
Stage 2	-	-	-	705	-

Approach	EB	WB	SB
HCM Control Delay, s	3.7	0	11.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBL	SBR
Capacity (veh/h)	1234	-	-	-	543	-
HCM Lane V/C Ratio	0.065	-	-	-	0.026	-
HCM Control Delay (s)	8.1	0	-	-	11.8	-
HCM Lane LOS	A	A	-	-	B	-
HCM 95th %tile Q(veh)	0.2	-	-	-	0.1	-

6: Marshall Street & Elm Street

Existing + Proposed Development (with Senior Housing) AM Peak Hour

Intersection

Int Delay, s/veh 1

Movement

	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	1			1	1	1
Traffic Vol, veh/h	62	5	2	190	19	7
Future Vol, veh/h	62	5	2	190	19	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	64	64	64	64	64	64
Heavy Vehicles, %	11	2	2	5	2	2
Mvmt Flow	97	8	3	297	30	11

Major/Minor

	Major1	Major2	Minor1
Conflicting Flow All	0	0	105
Stage 1	-	-	101
Stage 2	-	-	303
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	-	1486	603
Stage 1	-	-	923
Stage 2	-	-	749
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1486	602
Mov Cap-2 Maneuver	-	-	602
Stage 1	-	-	923
Stage 2	-	-	748

Approach

	EB	WB	NB
HCM Control Delay, s	0	0.1	10.7
HCM LOS			B

Minor Lane/Major Mvmt

	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	668	-	-	1486	-
HCM Lane V/C Ratio	0.061	-	-	0.002	-
HCM Control Delay (s)	10.7	-	-	7.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

7: Oriole Street/Marshall Street & Mechanic Street + Proposed Development (with Senior Housing) AM Peak Hour

Intersection

Int Delay, s/veh 4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SEB
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Traffic Vol, veh/h	27	360	26	8	387	13	37	5	13	34	5	51
Future Vol, veh/h	27	360	26	8	387	13	37	5	13	34	5	51
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	140	-	-	140	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	2	3	2	2	2	2	3	2	2	2	2	2
Mvmt Flow	36	486	35	11	523	18	50	7	18	46	7	69

Major/Minor	Major1		Major2	Minor1	Minor2							
Conflicting Flow All	541	0	0	521	0	0	1168	1139	504	1142	1147	532
Stage 1	-	-	-	-	-	-	576	576	-	554	554	-
Stage 2	-	-	-	-	-	-	592	563	-	588	593	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.13	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.527	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1028	-	-	1045	-	-	170	201	568	177	199	547
Stage 1	-	-	-	-	-	-	501	502	-	517	514	-
Stage 2	-	-	-	-	-	-	491	509	-	495	493	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1028	-	-	1045	-	-	140	192	568	161	190	547
Mov Cap-2 Maneuver	-	-	-	-	-	-	140	192	-	161	190	-
Stage 1	-	-	-	-	-	-	483	484	-	499	508	-
Stage 2	-	-	-	-	-	-	419	503	-	456	476	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	0.2	39.6	23.1
HCM LOS	E	E	E	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	176	1028	-	-	1045	-	-	164	547
HCM Lane V/C Ratio	0.422	0.035	-	-	0.01	-	-	0.321	0.126
HCM Control Delay (s)	39.6	8.6	-	-	8.5	-	-	37	12.5
HCM Lane LOS	E	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	1.9	0.1	-	-	0	-	-	1.3	0.4

5: Elm Street & Cass Career Drive

Existing + Proposed Development (with Senior Housing) PM Peak Hour

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		↰	↱
Traffic Vol, veh/h	4	65	50	0	4	3
Future Vol, veh/h	4	65	50	0	4	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	80	62	0	5	4
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	62	0	0	152	62	
Stage 1	-	-	-	62	-	
Stage 2	-	-	-	90	-	
Critical Hdwy	4.12	-	-	6.42	6.22	
Critical Hdwy Stg 1	-	-	-	5.42	-	
Critical Hdwy Stg 2	-	-	-	5.42	-	
Follow-up Hdwy	2.218	-	-	3.518	3.318	
Pot Cap-1 Maneuver	1541	-	-	840	1003	
Stage 1	-	-	-	961	-	
Stage 2	-	-	-	934	-	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	1541	-	-	837	1003	
Mov Cap-2 Maneuver	-	-	-	837	-	
Stage 1	-	-	-	958	-	
Stage 2	-	-	-	934	-	
Approach	EB	WB	SB			
HCM Control Delay, s	0.4	0	9			
HCM LOS			A			
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBL	SBR
Capacity (veh/h)	1541	-	-	-	901	
HCM Lane V/C Ratio	0.003	-	-	-	0.01	
HCM Control Delay (s)	7.3	0	-	-	9	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0	

6: Marshall Street & Elm Street

Existing + Proposed Development (with Senior Housing) PM Peak Hour

Intersection						
Int Delay, s/veh	2.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↱	
Traffic Vol, veh/h	63	6	5	23	27	6
Future Vol, veh/h	63	6	5	23	27	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	78	7	6	28	33	7

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	85
Stage 1	-	-	82
Stage 2	-	-	40
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	-	1512	873
Stage 1	-	-	941
Stage 2	-	-	982
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1512	870
Mov Cap-2 Maneuver	-	-	870
Stage 1	-	-	941
Stage 2	-	-	978

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	9.2
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	888	-	-	1512	-
HCM Lane V/C Ratio	0.046	-	-	0.004	-
HCM Control Delay (s)	9.2	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

7: Oriole Street/Marshall Street & Mechanic Street Feeding + Proposed Development (with Senior Housing) PM Peak Hour

Intersection

Int Delay, s/veh 2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑		↰	↑		↰	↑		↰	↑	
Traffic Vol, veh/h	52	460	55	16	324	62	28	5	20	23	3	31
Future Vol, veh/h	52	460	55	16	324	62	28	5	20	23	3	31
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	140	-	-	140	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	55	484	58	17	341	65	29	5	21	24	3	33

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	406	0	0	542	0	0	1049	1063	513	1044	1060	374
Stage 1	-	-	-	-	-	-	623	623	-	408	408	-
Stage 2	-	-	-	-	-	-	426	440	-	636	652	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1153	-	-	1027	-	-	205	223	561	207	224	672
Stage 1	-	-	-	-	-	-	474	478	-	620	597	-
Stage 2	-	-	-	-	-	-	606	578	-	466	464	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1153	-	-	1027	-	-	183	209	561	186	210	672
Mov Cap-2 Maneuver	-	-	-	-	-	-	183	209	-	186	210	-
Stage 1	-	-	-	-	-	-	451	455	-	590	587	-
Stage 2	-	-	-	-	-	-	564	568	-	422	442	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.3	23.6	18.3
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	249	1153	-	-	1027	-	-	188	672
HCM Lane V/C Ratio	0.224	0.047	-	-	0.016	-	-	0.146	0.049
HCM Control Delay (s)	23.6	8.3	-	-	8.6	-	-	27.4	10.6
HCM Lane LOS	C	A	-	-	A	-	-	D	B
HCM 95th %tile Q(veh)	0.8	0.1	-	-	0.1	-	-	0.5	0.2

5: Elm Street & Cass Career Drive

Future (2043) (with Library) AM Peak Hour

Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	62	77	129	124	6	5
Future Vol, veh/h	62	77	129	124	6	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	64	64	64	64	64	64
Heavy Vehicles, %	2	8	6	3	40	2
Mvmt Flow	97	120	202	194	9	8

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	396	0	0	613	299
Stage 1	-	-	-	299	-
Stage 2	-	-	-	314	-
Critical Hdwy	4.12	-	-	6.8	6.22
Critical Hdwy Stg 1	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	5.8	-
Follow-up Hdwy	2.218	-	-	3.86	3.318
Pot Cap-1 Maneuver	1163	-	-	400	741
Stage 1	-	-	-	673	-
Stage 2	-	-	-	662	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1163	-	-	364	741
Mov Cap-2 Maneuver	-	-	-	364	-
Stage 1	-	-	-	613	-
Stage 2	-	-	-	662	-

Approach	EB	WB	SB
HCM Control Delay, s	3.7	0	12.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBL	SBR
Capacity (veh/h)	1163	-	-	-	474	-
HCM Lane V/C Ratio	0.083	-	-	-	0.036	-
HCM Control Delay (s)	8.4	0	-	-	12.9	-
HCM Lane LOS	A	A	-	-	B	-
HCM 95th %tile Q(veh)	0.3	-	-	-	0.1	-

6: Marshall Street & Elm Street

Future (2043) (with Library) AM Peak Hour

Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	1			1	2	2
Traffic Vol, veh/h	76	8	3	232	22	7
Future Vol, veh/h	76	8	3	232	22	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	64	64	64	64	64	64
Heavy Vehicles, %	11	2	2	5	2	2
Mvmt Flow	119	13	5	363	34	11
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	132	0	499	126
Stage 1	-	-	-	-	126	-
Stage 2	-	-	-	-	373	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1453	-	531	924
Stage 1	-	-	-	-	900	-
Stage 2	-	-	-	-	696	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1453	-	529	924
Mov Cap-2 Maneuver	-	-	-	-	529	-
Stage 1	-	-	-	-	900	-
Stage 2	-	-	-	-	693	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0.1		11.6		
HCM LOS				B		
Minor Lane/Major Mvmt	NBLt	EBT	EBR	WBL	WBT	
Capacity (veh/h)	590	-	-	1453	-	
HCM Lane V/C Ratio	0.077	-	-	0.003	-	
HCM Control Delay (s)	11.6	-	-	7.5	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

7: Oriole Street/Marshall Street & Mechanic Street

Future (2043) (with Library) AM Peak Hour

Intersection												
Int Delay, s/veh	11.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Traffic Vol, veh/h	46	439	32	10	472	25	45	8	16	36	5	55
Future Vol, veh/h	46	439	32	10	472	25	45	8	16	36	5	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	140	-	-	140	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	2	3	2	2	2	2	3	2	2	2	2	2
Mvmt Flow	62	593	43	14	638	34	61	11	22	49	7	74

Major/Minor	Major 1			Major 2			Minor 1			Minor 2		
Conflicting Flow All	672	0	0	636	0	0	1463	1439	615	1438	1443	655
Stage 1	-	-	-	-	-	-	739	739	-	683	683	-
Stage 2	-	-	-	-	-	-	724	700	-	755	760	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.13	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.527	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	919	-	-	947	-	-	106	133	491	111	132	466
Stage 1	-	-	-	-	-	-	408	424	-	439	449	-
Stage 2	-	-	-	-	-	-	415	441	-	401	414	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	919	-	-	947	-	-	80	122	491	93	121	466
Mov Cap-2 Maneuver	-	-	-	-	-	-	80	122	-	93	121	-
Stage 1	-	-	-	-	-	-	381	396	-	410	442	-
Stage 2	-	-	-	-	-	-	338	434	-	348	386	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.2	136.8	44.2
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	104	919	-	-	947	-	-	96	466
HCM Lane V/C Ratio	0.897	0.068	-	-	0.014	-	-	0.577	0.159
HCM Control Delay (s)	136.8	9.2	-	-	8.9	-	-	84.4	14.2
HCM Lane LOS	F	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	5.3	0.2	-	-	0	-	-	2.7	0.6

5: Elm Street & Cass Career Drive

Future (2043) (with Library) PM Peak Hour

Intersection						
Int Delay, s/veh	0.7					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		↰	↱
Traffic Vol, veh/h	5	86	69	0	5	4
Future Vol, veh/h	5	86	69	0	5	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	106	85	0	6	5

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	85	0	0 203 85
Stage 1	-	-	- 85 -
Stage 2	-	-	- 118 -
Critical Hdwy	4.12	-	- 6.42 6.22
Critical Hdwy Stg 1	-	-	- 5.42 -
Critical Hdwy Stg 2	-	-	- 5.42 -
Follow-up Hdwy	2.218	-	- 3.518 3.318
Pot Cap-1 Maneuver	1512	-	- 786 974
Stage 1	-	-	- 938 -
Stage 2	-	-	- 907 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1512	-	- 783 974
Mov Cap-2 Maneuver	-	-	- 783 -
Stage 1	-	-	- 934 -
Stage 2	-	-	- 907 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBL	SBR
Capacity (veh/h)	1512	-	-	-	858	
HCM Lane V/C Ratio	0.004	-	-	-	0.013	
HCM Control Delay (s)	7.4	0	-	-	9.3	
HCM Lane LOS	A	A	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	0	

6: Marshall Street & Elm Street

Future (2043) (with Library) PM Peak Hour

Intersection

Int Delay, s/veh 3.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↱	
Traffic Vol, veh/h	77	14	13	28	41	16
Future Vol, veh/h	77	14	13	28	41	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	95	17	16	35	51	20

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	112
Stage 1	-	-	104
Stage 2	-	-	67
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	-	1478	819
Stage 1	-	-	920
Stage 2	-	-	956
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1478	810
Mov Cap-2 Maneuver	-	-	810
Stage 1	-	-	920
Stage 2	-	-	945

Approach	EB	WB	NB
HCM Control Delay, s	0	2.4	9.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	845	-	-	1478	-
HCM Lane V/C Ratio	0.083	-	-	0.011	-
HCM Control Delay (s)	9.6	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

7: Oriole Street/Marshall Street & Mechanic Street

Future (2043) (with Library) PM Peak Hour

Intersection												
Int Delay, s/veh	21.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	132	561	67	20	395	124	34	13	24	84	12	119
Future Vol, veh/h	132	561	67	20	395	124	34	13	24	84	12	119
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	140	-	-	140	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	139	591	71	21	416	131	36	14	25	88	13	125

Major/Minor	Major 1			Major 2			Minor 1			Minor 2		
Conflicting Flow All	547	0	0	662	0	0	1498	1494	627	1448	1464	482
Stage 1	-	-	-	-	-	-	905	905	-	524	524	-
Stage 2	-	-	-	-	-	-	593	589	-	924	940	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1022	-	-	927	-	-	101	123	484	109	128	584
Stage 1	-	-	-	-	-	-	331	355	-	537	530	-
Stage 2	-	-	-	-	-	-	492	495	-	323	342	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1022	-	-	927	-	-	64	104	484	~ 82	108	584
Mov Cap-2 Maneuver	-	-	-	-	-	-	64	104	-	~ 82	108	-
Stage 1	-	-	-	-	-	-	286	307	-	464	518	-
Stage 2	-	-	-	-	-	-	369	484	-	253	295	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.6	0.3	105.8	117.1
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Capacity (veh/h)	101	1022	-	-	927	-	-	85	584
HCM Lane V/C Ratio	0.74	0.136	-	-	0.023	-	-	1.189	0.214
HCM Control Delay (s)	105.8	9.1	-	-	9	-	-	246.3	12.8
HCM Lane LOS	F	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	3.9	0.5	-	-	0.1	-	-	7.2	0.8

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

5: Elm Street & Cass Career Drive

Future (2043) (with Senior Housing) AM Peak Hour

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	62	75	129	124	6	5
Future Vol, veh/h	62	75	129	124	6	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	64	64	64	64	64	64
Heavy Vehicles, %	2	8	6	3	40	2
Mvmt Flow	97	117	202	194	9	8

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	396	0	610
Stage 1	-	-	299
Stage 2	-	-	311
Critical Hdwy	4.12	-	6.8
Critical Hdwy Stg 1	-	-	5.8
Critical Hdwy Stg 2	-	-	5.8
Follow-up Hdwy	2.218	-	3.86
Pot Cap-1 Maneuver	1163	-	401
Stage 1	-	-	673
Stage 2	-	-	665
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1163	-	365
Mov Cap-2 Maneuver	-	-	365
Stage 1	-	-	613
Stage 2	-	-	665

Approach	EB	WB	SB
HCM Control Delay, s	3.8	0	12.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBL	SBR
Capacity (veh/h)	1163	-	-	-	474	-
HCM Lane V/C Ratio	0.083	-	-	-	0.036	-
HCM Control Delay (s)	8.4	0	-	-	12.9	-
HCM Lane LOS	A	A	-	-	B	-
HCM 95th %tile Q(veh)	0.3	-	-	-	0.1	-

6: Marshall Street & Elm Street

Future (2043) (with Senior Housing) AM Peak Hour

Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	1			1	1	
Traffic Vol, veh/h	76	6	2	232	22	7
Future Vol, veh/h	76	6	2	232	22	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	64	64	64	64	64	64
Heavy Vehicles, %	11	2	2	5	2	2
Mvmt Flow	119	9	3	363	34	11
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	128	0	493	124
Stage 1	-	-	-	-	124	-
Stage 2	-	-	-	-	369	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1458	-	535	927
Stage 1	-	-	-	-	902	-
Stage 2	-	-	-	-	699	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1458	-	533	927
Mov Cap-2 Maneuver	-	-	-	-	533	-
Stage 1	-	-	-	-	902	-
Stage 2	-	-	-	-	697	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.1		11.6	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn		EBT	EBR	WBL	WBT
Capacity (veh/h)	594		-	-	1458	-
HCM Lane V/C Ratio	0.076		-	-	0.002	-
HCM Control Delay (s)	11.6		-	-	7.5	0
HCM Lane LOS	B		-	-	A	A
HCM 95th %tile Q(veh)	0.2		-	-	0	-

7: Oriole Street/Marshall Street & Mechanic Street

Future (2043) (with Senior Housing) AM Peak Hour

Intersection												
Int Delay, s/veh	9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱		↰	↱	
Traffic Vol, veh/h	29	439	32	10	472	13	45	6	16	34	5	52
Future Vol, veh/h	29	439	32	10	472	13	45	6	16	34	5	52
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	140	-	-	140	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	74	74	74	74	74	74	74	74	74	74	74	74
Heavy Vehicles, %	2	3	2	2	2	2	3	2	2	2	2	2
Mvmt Flow	39	593	43	14	638	18	61	8	22	46	7	70

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	656	0	0	636	0	0	1407	1377	615	1383	1389	647
Stage 1	-	-	-	-	-	-	693	693	-	675	675	-
Stage 2	-	-	-	-	-	-	714	684	-	708	714	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.13	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.527	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	931	-	-	947	-	-	116	145	491	121	142	471
Stage 1	-	-	-	-	-	-	432	445	-	444	453	-
Stage 2	-	-	-	-	-	-	421	449	-	426	435	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	931	-	-	947	-	-	91	137	491	106	134	471
Mov Cap-2 Maneuver	-	-	-	-	-	-	91	137	-	106	134	-
Stage 1	-	-	-	-	-	-	414	426	-	425	446	-
Stage 2	-	-	-	-	-	-	348	442	-	383	417	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.2	100.2	36.2
HCM LOS	F	F	F	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	117	931	-	-	947	-	-	109	471
HCM Lane V/C Ratio	0.774	0.042	-	-	0.014	-	-	0.484	0.149
HCM Control Delay (s)	100.2	9	-	-	8.9	-	-	65.7	14
HCM Lane LOS	F	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	4.4	0.1	-	-	0	-	-	2.2	0.5

5: Elm Street & Cass Career Drive

Future (2043) (with Senior Housing) PM Peak Hour

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↱		↰	↱
Traffic Vol, veh/h	5	78	60	0	5	4
Future Vol, veh/h	5	78	60	0	5	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	96	74	0	6	5

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	74	0	182
Stage 1	-	-	74
Stage 2	-	-	108
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	1526	-	807
Stage 1	-	-	949
Stage 2	-	-	916
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1526	-	804
Mov Cap-2 Maneuver	-	-	804
Stage 1	-	-	945
Stage 2	-	-	916

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBL	SBR
Capacity (veh/h)	1526	-	-	-	877	-
HCM Lane V/C Ratio	0.004	-	-	-	0.013	-
HCM Control Delay (s)	7.4	0	-	-	9.2	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %ile Q(veh)	0	-	-	-	0	-

6: Marshall Street & Elm Street

Future (2043) (with Senior Housing) PM Peak Hour

Intersection						
Int Delay, s/veh	2.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Traffic Vol, veh/h	77	6	5	28	32	7
Future Vol, veh/h	77	6	5	28	32	7
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	95	7	6	35	40	9

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	102
Stage 1	-	-	99
Stage 2	-	-	47
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	-	1490	846
Stage 1	-	-	925
Stage 2	-	-	975
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	1490	843
Mov Cap-2 Maneuver	-	-	843
Stage 1	-	-	925
Stage 2	-	-	971

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	9.4
HCM LOS			A

Minor Lane/Major Mvmt	NBL1	EBT	EBR	WBL	WBT
Capacity (veh/h)	861	-	-	1490	-
HCM Lane V/C Ratio	0.056	-	-	0.004	-
HCM Control Delay (s)	9.4	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

7: Oriole Street/Marshall Street & Mechanic Street

Future (2043) (with Senior Housing) PM Peak Hour

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑		↰	↑			↰			↑	↰
Traffic Vol, veh/h	52	561	67	20	395	68	34	5	24	23	3	31
Future Vol, veh/h	52	561	67	20	395	68	34	5	24	23	3	31
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	140	-	-	140	-	-	-	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	55	591	71	21	416	72	36	5	25	24	3	33

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	488	0	0	662	0	0	1249	1267	627	1246	1266	452
Stage 1	-	-	-	-	-	-	737	737	-	494	494	-
Stage 2	-	-	-	-	-	-	512	530	-	752	772	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1075	-	-	927	-	-	150	169	484	151	169	608
Stage 1	-	-	-	-	-	-	410	425	-	557	546	-
Stage 2	-	-	-	-	-	-	545	527	-	402	409	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1075	-	-	927	-	-	132	157	484	132	157	608
Mov Cap-2 Maneuver	-	-	-	-	-	-	132	157	-	132	157	-
Stage 1	-	-	-	-	-	-	389	403	-	529	533	-
Stage 2	-	-	-	-	-	-	501	515	-	357	388	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.4	34.7	23.8
HCM LOS			D	C

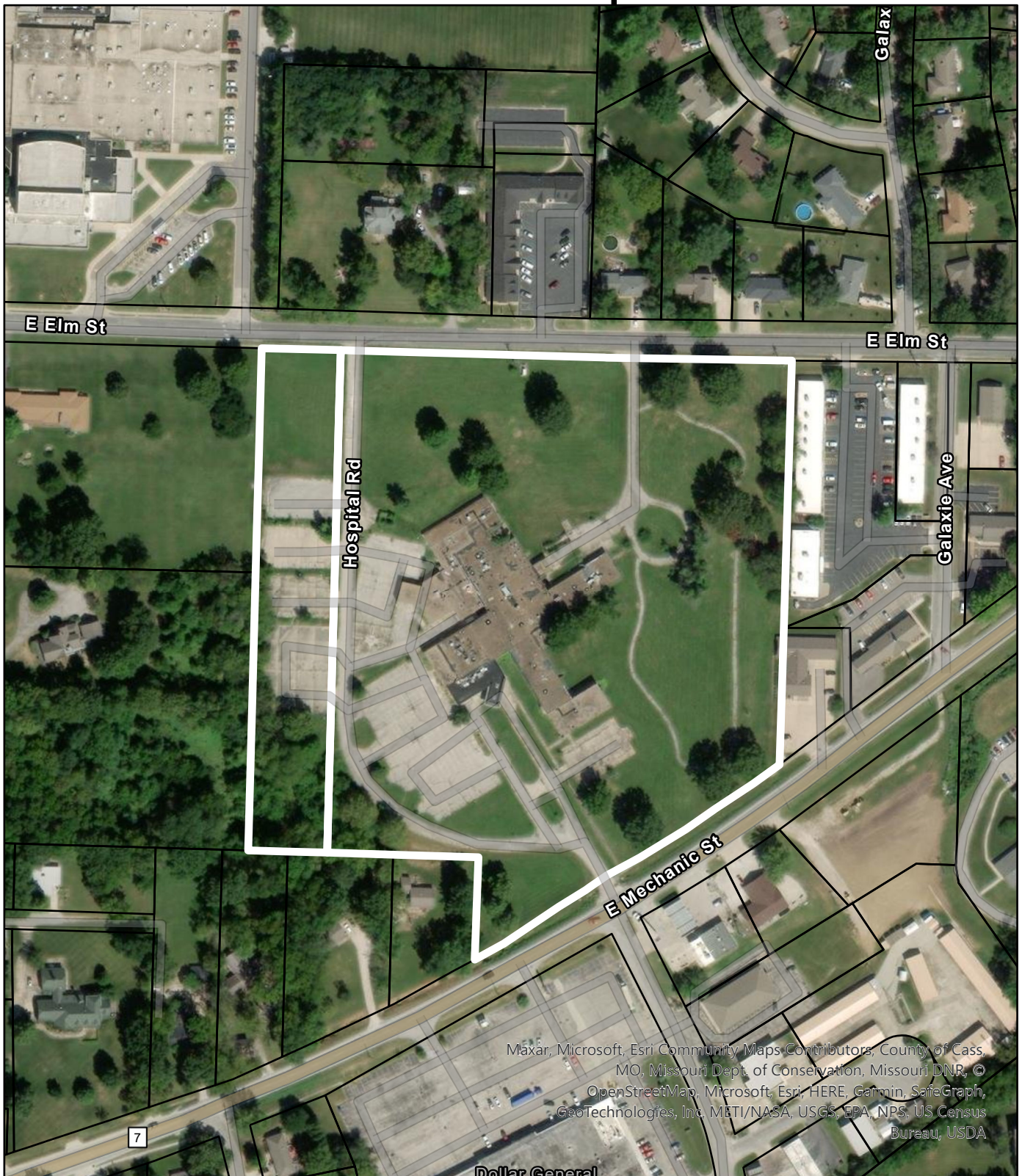
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	186	1075	-	-	927	-	-	134	608
HCM Lane V/C Ratio	0.357	0.051	-	-	0.023	-	-	0.204	0.054
HCM Control Delay (s)	34.7	8.5	-	-	9	-	-	38.6	11.3
HCM Lane LOS	D	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	1.5	0.2	-	-	0.1	-	-	0.7	0.2

Zoning Map



Attachment: Zoning Map (Appl. #FP-23-002--Final Plat for Harrisonville Commons, Lots 1-3 and Tract A PUBLIC HEARING)

Aerial Map



Attachment: Aerial Map (Appl. #FP-23-002--Final Plat for Harrisonville Commons, Lots 1-3 and Tract A PUBLIC HEARING)

0 190 380 760 US Feet



STAFF REPORT

TO: Planning & Zoning Commission

FROM: Christina Stanton,

DATE: September 14, 2023

SUBJECT: Appl. #FP-23-002--Final Plat for Harrisonville Commons, Lots 1-3 and Tract A
CONSIDERATION

Type of Item: *Approval*

B. Action Item (ID # 4629)

Appl. #FP-23-002--Final Plat for Harrisonville Commons, Lots 1-3 and Tract A
CONSIDERATION

STAFF REPORT

TO: Planning & Zoning Commission
FROM: Christina Stanton,
DATE: September 12, 2023
SUBJECT: Appl. #RZ-23-003--Rezoning from M-1 to C-2 at Brickplant and Brookhart Roads PUBLIC HEARING

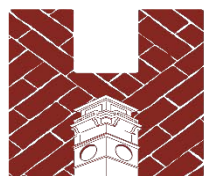
Type of Item: *Rezoning*

C. Action Item (ID # 4624)

Appl. #RZ-23-003--Rezoning from M-1 to C-2 at Brickplant and Brookhart Roads

Attachments:

- 1 Staff Rpt - Linder RZ 9-21-2023 (PDF)
- 2 Application (PDF)
- 3 Zoning Exhibits (PDF)
- 4 Ordinance #608 (PDF)
- 5 Ordinance #991 (PDF)
- 6 Zoning Map (PDF)
- 7 Aerial Map (PDF)



To: Planning and Zoning Commission

From: Christina Stanton, AICP, Community Development Director

Date: September 21, 2023

Re: Appl. #RZ-23-003 – REZONING from Light Industrial (M-1) District to Service Business (C-2) District on property located at 2401 and 2501 S. Brickplant Road and 1801 Brookhart Road

GENERAL INFORMATION

Applicant: Robert and Lisa Linder

Requested Actions: Approval of Requested Rezone from Light Industrial (M-1) District to Service Business (C-2) District

Date of Application: August 16, 2023

PROPOSAL

Mr. and Mrs. Linder are seeking approval of a requested Rezoning from Light Industrial (M-1) District to Service Business (C-2) District, with the intent to pursue proposed uses of a food truck court, hotel, restaurant, event center, RV park with dog park and walking trails, and RV/boat storage.

Please see the attached zoning and aerial maps.

The surrounding properties are currently zoned as follows:

North: M-1 (Light Industrial District)—Undeveloped property

East: M-1 (Light Industrial District) and C-2 (Service Business District)—Love's Travel Stop

South: M-1 (Light Industrial District) and C-2 (Service Business District)—Love's Travel Stop and Truck Wash and Stonegate Crematorium

West (across Brickplant Road): M-1 (Light Industrial District)—Fisher Residence

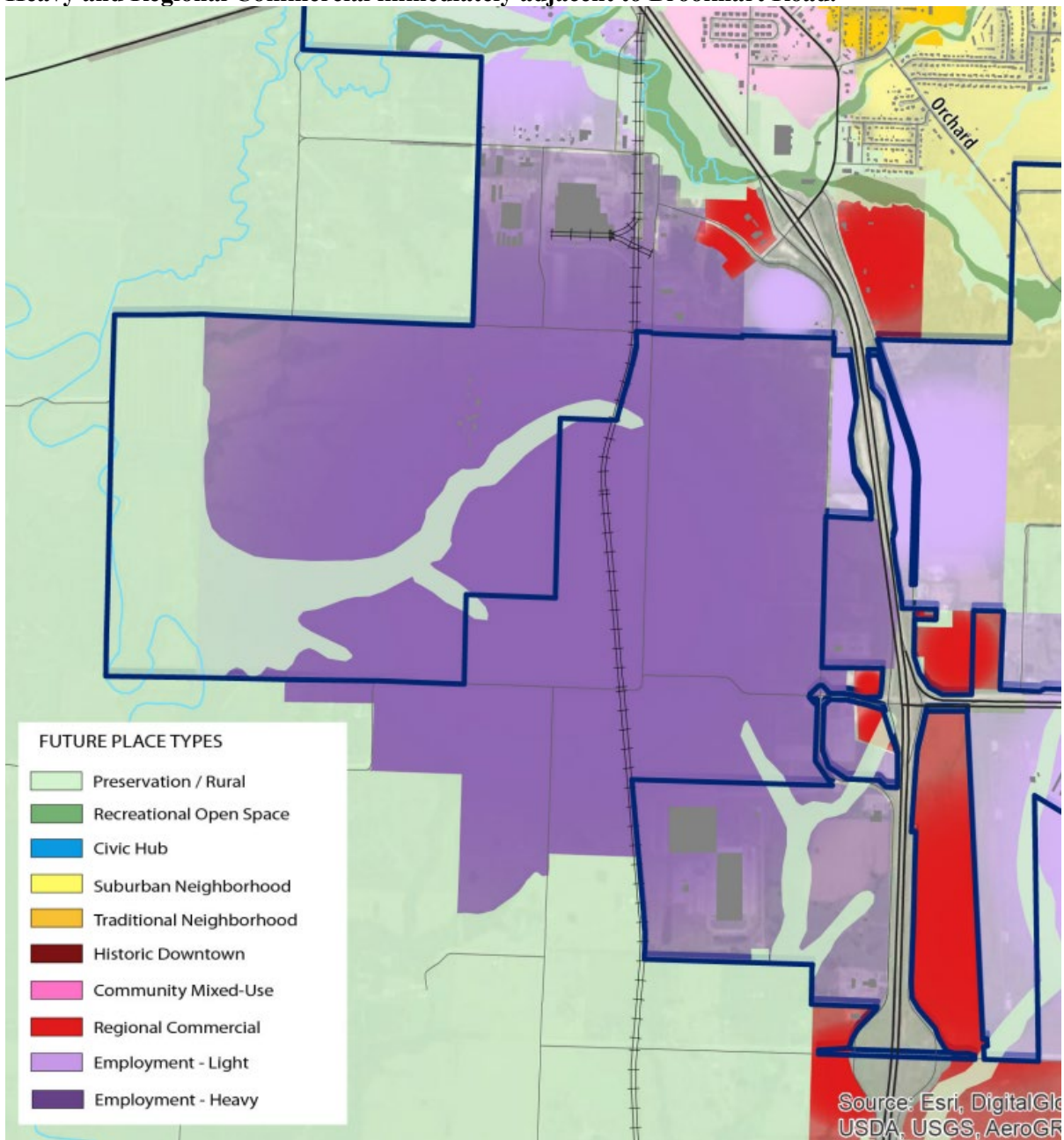
PREVIOUS ACTIONS

- March 14, 1963—The Board of Aldermen approved an Ordinance (#608) to annex certain adjacent territory. This annexation included 66 tracts of land. Staff is not certain if this annexation included the northern portion of this property, but based on conversations with a descendant of the prior property owner and historical research staff suspects that this may have been the ordinance that annexed the northern portion of the subject property (current day, 2401 and 2501 S. Brickplant Road).
- August 16, 1972—The Board of Aldermen approved an Ordinance (#991) to annex certain adjacent territory owned by Acme Brick Company, Anaconda Wire and Cable Company, and Pearson Investment Co., Inc.
- August 16, 1978—The Board of Aldermen approved an Ordinance (#1194) which established new zoning districts and associated regulations. The subject property's zoning was established as Light Industrial (M-1) District.

- April 6, 2023—Staff held a pre-application meeting with the property owners (Mr. and Mrs. Linder) to discuss proposed uses of a food truck court, hotel, restaurant, event center, RV park with dog park and walking trails, and RV/boat storage. Staff informed the property owners that the property would need to be rezoned from Light Industrial (M-1) District to Service Business (C-2) District for the proposed uses and that the uses of an RV park and/or RV/boat storage would require an approved Special Use Permit (SUP).

KEY ISSUES

- This property is currently zoned Light Industrial (M-1) District.
- The City's 2040 Comprehensive Plan shows the property and surrounding area as Preservation/Rural and Recreational Open Space within and around floodplain and Employment - Heavy and Regional Commercial immediately adjacent to Brookhart Road.



- The applicant is requesting to Rezone the property to Service Business (C-2) District Zoning. A large portion of the northern property is located within the floodplain as shown in the attached Aerial Map. This area was previously discussed during the pre-application meeting as proposed future RV park with dog park and walking trails (2401 S. Brickplant Road).

- The applicants desire to locate an event center on the smaller tract located off of Brickplant Road (2501 S. Brickplant Road).
- The applicants desire to locate a food truck court on the southernmost property off of Brookhart Road (1801 Brookhart Road).
- Additional pre-application meeting(s) may be needed as the property owners further develop their plans for the development of this property.

ANALYSIS

Zoning. The property is currently zoned Light Industrial (M-1) District. The applicant is proposing to rezone the property to Service Business (C-2) District. The proposed uses are appropriate uses for this District. The uses that are permitted by right will be able to be reviewed administratively, since this is not a planned district once the zoning is approved. However, those uses requiring a Special Use Permit (SUP) will have to go through that public hearing process prior to any Final Development Plan (FDP), Building Permit, or Right-of-Way Permit.

Comprehensive Plan. The City's 2040 Comprehensive Plan shows this area as "Preservation/Rural", "Recreational Open Space", "Regional Commercial", and "Employment Heavy".

- Preservation/Rural—This "place type represents areas in Harrisonville that are not expected to substantially develop or be annexed (if outside city limits) by the city over the next 20 years. These areas may include environmentally sensitive areas, such as floodways and woodlands. They also include certain agricultural areas outside city limits."
- Recreational Open Space—This "place type represents areas managed by Harrisonville for the purpose of providing quality public spaces, including park facilities, trails, and leisure activities for residents of all age groups and abilities."
- Regional Commercial—These are "areas of the city designated for highway-oriented commercial land use types...Appropriate uses in the Regional Commercial place type includes gas stations, general and drive-thru retail, regionally-serving-medium- and big-box retail, hotels/motels, vehicle rentals."
- Heavy Employment—These "areas are intended to support intense manufacturing, warehousing, and distribution uses which are not compatible with other place types in the community, and must be intentionally separated."

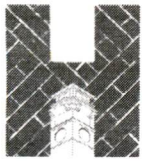
The northern portion of the subject property is predominantly comprised of the place types Preservation/Rural and Recreation Open Space. Properties abutting Brookhart Drive and immediately near the S. Commercial Street area are identified as Regional Commercial and the other properties in the area are identified as Heavy Employment. However, with the future extension of S. Commercial Street it is more logical for this immediate area to be the Regional Commercial place type, or zoned Service Business (C-2) District. Given the above information, the proposed future uses for this area are appropriate.

STAFF RECOMMENDATION

Staff recommends approval of the requested rezone from Light Industrial (M-1) District to Service Business (C-2) District.

ATTACHMENTS

Application
Zoning Exhibits
Ordinance #608
Ordinance #991
Zoning Map
Aerial Map



THE CITY OF HARRISONVILLE

WHERE TRADITION MEETS INNOVATION

LAND USE – ZONING APPLICATION

Application Type

- ☒ Rezoning (Fee \$300.00 + \$65 Notice Fee) ☐ Preliminary Development Plan (Fee \$300.00 + \$65 Notice Fee)
- ☐ Special Use Permit (Fee \$300.00 + \$65 Notice Fee) ☐ *Final Development Plan (Fee \$200.00)
- * Staff-only approval required

Applicant and Owner Information

Applicant (Print): Robert and Lisa Linder **Signature:** [Signature]

Company Name: _____

Street Address: 1201 E South St. City: Harrisonville State: MO Zip: 64701

Phone: 816 456 9273 / 816 258 2160 Email: JDELLINDER@GMAIL.COM

Robert LISA

Property Owner Authorization (Provide contact information and signatures of all property owners.)

★ **Property Owner Name (print):** Robert and Lisa Linder **Signature:** [Signature]

Street Address: 1201 E South St City: Harrisonville State: MO Zip: 64701

Phone: 816 258 2160 Email: JDELLINDER@gmail.com

more property owners back page.

Firm Preparing Application:

Contact: _____

Street Address: _____ City: _____ State: _____ Zip: _____

Phone: _____ Email: _____

*All correspondence should be sent to: **Applicant** _____ **Property Owner** _____ **Firm** _____

Project Information

General Location or Address: 23501 S Brickplant Rd Hulle, 1801 Brookhart Rd Lot 7 Hulle

Project Description: _____

Acres or Sq. Ft. @ 22.52 acres

Current Zoning: M-1 Proposed Zoning: C-2

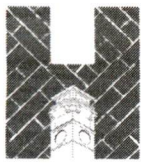
Items to be Submitted 30 Days Before Planning Commission Meeting

- ☒ 1) Application
- ☒ 2) Filing Fee – Payable to City of Harrisonville or contact the Community Development Office to pay by phone.
- ☒ 3) Site Plan drawn to scale and showing adjacent tracts within 185 ft. and current ownership. Four (4) copies of at least 8 1/2" x 11", and one (1) electronic copy emailed to the planner.
- ☒ 4) Email full legal description in WORD to planner (not assessor's abbreviated description).
- City Staff may modify submittal requirements as necessary.*

For Office Use Only

Case No: RZ-23-003 Filing Fee: Amount Paid \$ 3105.00 Date Application Received: 8/16/23

Staff-only approval: _____ P&Z meeting: 9/21/23 BOA Meeting: 10/2/23



THE CITY OF HARRISONVILLE

WHERE TRADITION MEETS INNOVATION

LAND USE – ZONING APPLICATION

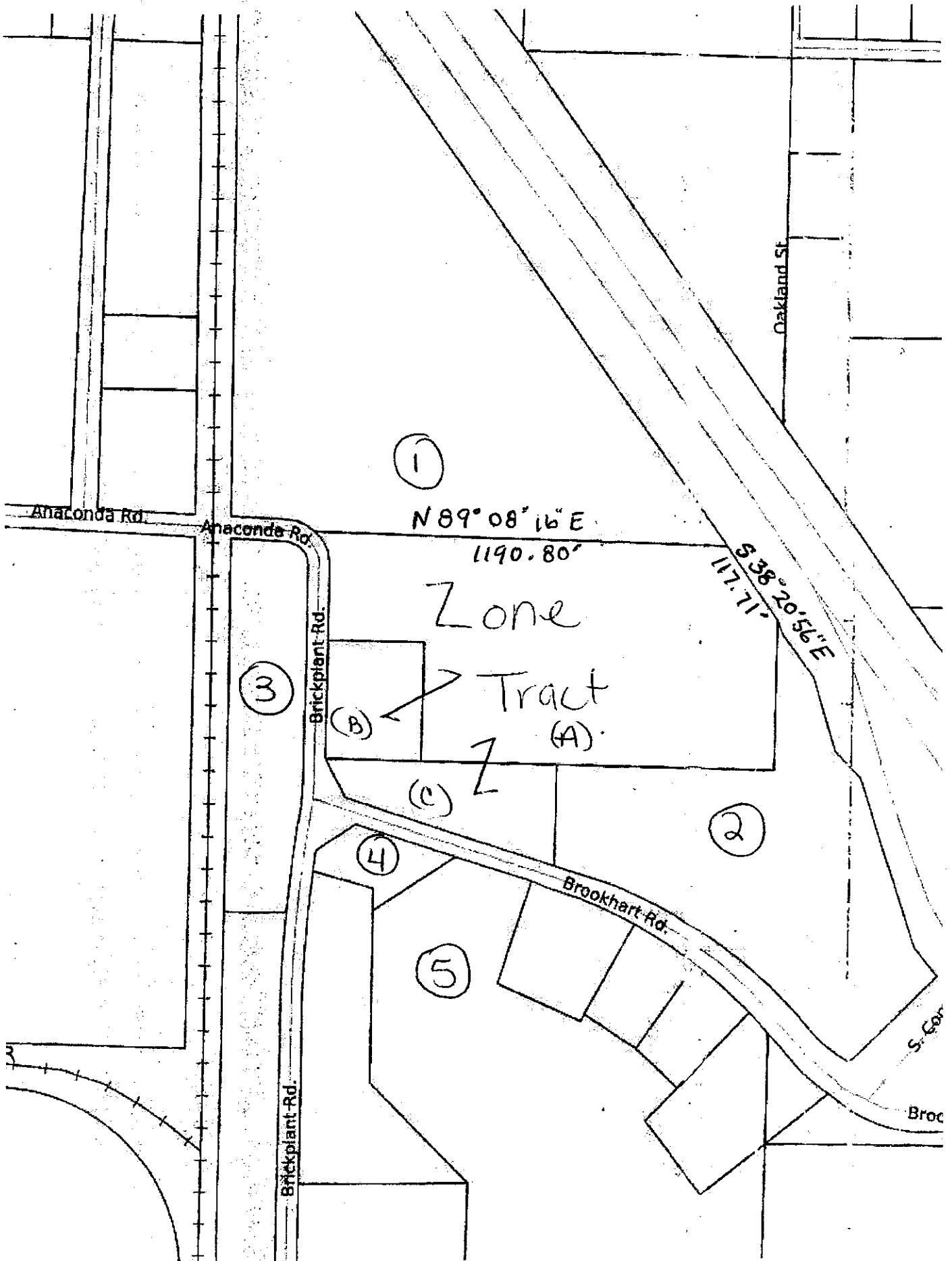
Resources

City Website	www.harrisonville.com
Zoning Map	https://www.harrisonville.com/DocumentCenter/View/9508/Zoning-Final-Draft?bidID=
Zoning Regulations	https://www.ecycle.com/27908265
Subdivision Regulations	https://www.ecycle.com/27909481
Cass County GIS Map	https://cassgis.integritygis.com/h5/index.html?viewer=cass

Contacts

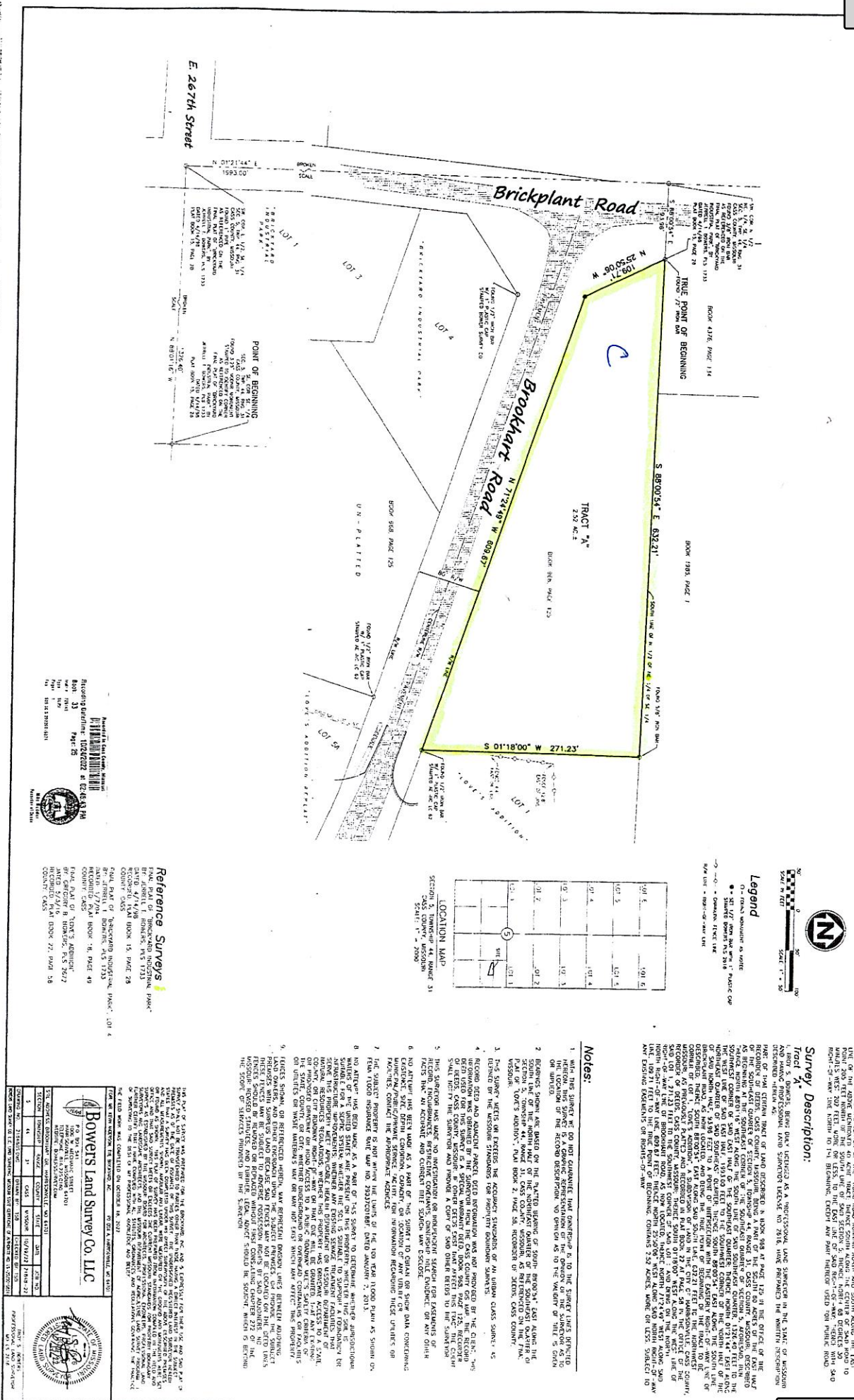
City Hall, 300 E. Pearl St, Harrisonville, MO 64701	816-380-8900	
John Morris, Building Official	816-380-8917	jmorris@harrisonville.com
Christina Stanton, AICP, Community Development Director	816-380-8922	cstanton@harrisonville.com
Jamie Martin, Office Administrator	816-380-8958	jmartin@harrisonville.com
Public Works Department, 201 W. Chestnut, Harrisonville, MO 64701	816-380-8964	
Carl Brooks, P.E., CFM, Public Works Director		cbrooks@harrisonville.com
Ted Martin, P.E., CFM, City Engineer		tmartin@harrisonville.com

Gilbert Linder Jr and Jana Linder
 41505 E State Rte N
 Creighton MO 64739
 jlinder3351@gmail.com
 816 456 1239 and 816 456 3351
 [Signature] Jana Linder





Final Survey



DO NOT REMOVE

Bill No. 608

ORDINANCE NO. 608

AN ORDINANCE PROVIDING FOR THE SUBMISSION TO THE QUALIFIED VOTERS OF HARRISONVILLE, MISSOURI, AT THE GENERAL ELECTION APRIL 2, 1963, A PROPOSITION FOR THE ANNEXATION OF CERTAIN UNINCORPORATED AREAS OF LAND TO THE CITY OF HARRISONVILLE, MISSOURI, AND TO CHANGE THE CITY LIMITS BOUNDARY LINES TO ENCLOSE SAID UNINCORPORATED AREAS OF LAND.

WHEREAS, the Board of Aldermen desire to test the sense of the qualified voters of Harrisonville on this proposition at the general election to be held April 2, 1963.

NOW, THEREFORE, be it ordained by the Board of Aldermen of the City of Harrisonville, Missouri, as follows:

Section 1. That at the general election to be held April 2, 1963, there shall be submitted to the qualified voters of said city a proposition to annex certain unincorporated areas of land to the city limits of Harrisonville, Missouri, and to change the city limits boundary lines to enclose said unincorporated areas of land. That the form of ballot to be used is attached and made a part of this ordinance; that the lands described by their legal description attached hereto are the premises to be annexed and the city limits boundary lines shall be changed to enclose said premises. That the legal description of said lands shall be posted in each voting booth.

Section 2. That the Acting City Clerk is hereby directed to prepare and cause to be printed ballots as herein provided, an exact copy of which is attached to this ordinance and marked "Exhibit A", and to prepare or procure the necessary poll books and tally sheets to be used at said election, and shall cause the same to be delivered to the judges of the general election.

Section 3. That the polling places for said election shall be as follows:

Ward No. 1 (East) - 300 East Pearl, City Hall.

Ward No. 2 (West) - 208 West Pearl, Cass County Jail.

Section 4. That notice of this proposition as herein provided to be voted on at the general election shall be given by posting a copy at not less than ten (10) public places at least fifteen (15) days before the day of said general election.

PASSED BY THE BOARD OF ALDERMEN this 14th day of March, 1963.

ATTEST:

Carl W. Stahl
Acting City Clerk

Approved by the Mayor this 14th day of March, 1963.

Arthur L. Byrke
Mayor

Arthur L. Byrke
Mayor and Ex-Officio President
of the Board of Aldermen

COUNCIL BILL NO. 206

ORDINANCE NO. 991

AN ORDINANCE DECLARING THE RESULTS OF THE SPECIAL ELECTION HELD IN THE CITY OF HARRISONVILLE ON AUGUST 8, 1972 IN REGARD TO THE FOLLOWING PROPOSITIONS PLACED UPON SAID BALLOT TO ANNEX CERTAIN PROPERTIES TO THE CORPORATE LIMITS OF THE CITY OF HARRISONVILLE,

WHEREAS, the City of Harrisonville on the 8th day of August, 1972 held its special election in regard to the annexation of certain properties to the city, and

WHEREAS, the votes have been cast, deposited, counted and announced pursuant to law, and ballots, poll books and tally sheets have been returned to the proper officials, and

WHEREAS, the Board of Aldermen has canvassed said election,

NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF ALDERMEN OF THE CITY OF HARRISONVILLE, MISSOURI AS FOLLOWS:

SECTION 1: That it is hereby found and determined that the vote at the special city election in regard to Proposition #1 which read as follows:

Shall the following described unincorporated area of land be annexed to the City of Harrisonville, Missouri, and the city limits boundary lines be changed to enclose said areas, the legal description of which is as follows:

The South 60 acres of the East half of the Southeast Quarter of Section 5, Township 44, Range 31; and

From the point of intersection of the South line of the Southwest Quarter of the Southeast Quarter of Section 5, Township 44, Range 31, and the East line of the right of way of the L. & S. Branch of the Missouri Pacific Railway, measured in a Northerly direction along the East line of said right of way, a distance of 570 feet for a place of beginning; thence in a Southeasterly direction along a curve line 20 feet North of and parallel with railroad spur to the center of the public road running North and South along the East line of the above mentioned 40 acre tract; thence South along the center of said road to a point 205 feet North of the South line of said Section 5; thence North 68 degrees 30 minutes West 202 feet, more or less, to the East line of said right of way; thence with said right of way line North to the beginning, except any part thereof used for public road.

Owned by ACME BRICK COMPANY, a Texas corporation.

DDH847

Attachment: 5 Ordinance #991 (Appl. #RZ-23-003--Rezoning from M-1 to C-2 at Brickplant and Brookhart Roads PUBLIC HEARING)

DDH847

The East half of the Southwest Quarter of Section 5, Township 44, Range 31, Cass County, Missouri, more particularly described as follows, to-wit: Beginning at the Southeast corner of the Southwest Quarter of said Section 5; thence West along the South line of said section, a distance of 1326.6 feet to the Southwest corner of the East half of the Southwest Quarter of said Section 5; thence North along the West line of the East half of the Southwest Quarter of said Section, a distance of 2665.47 feet to the Northwest corner of the East half of the Southwest Quarter of said Section 5; thence East along the North line of said Southwest Quarter, a distance of 1326.6 feet to the Northeast corner of the Southwest Quarter of said Section 5; thence South along the East line of the Southwest Quarter of said Section 5, a distance of 2665.47 feet to the point of beginning, and all that part of the West half of the Southeast Quarter of Section 5, Township 44, Range 31, lying West of the right of way of the Missouri Pacific Railroad, specifically described as follows: Beginning at the Southwest corner of the Southeast Quarter of said Section 5; thence North along the West line of the Southeast Quarter of Section 5, a distance of 2665.47 feet to the Northwest corner of the Southeast Quarter of Section 5; thence East along the North line of said Southeast Quarter a distance of 1001.8 feet to the West right of way line of the Missouri Pacific Railroad; thence South along the West right of way line of the Missouri Pacific Railroad, a distance of 2665.74 feet to the South line of said Section 5; thence West along the South line of said Section, a distance of 1,039.56 feet to the point of beginning, except therefrom the south 26 acres thereof.

The South 26 acres of the following premises: All that part of the West half of the Southeast Quarter of Section 5, Township 44, Range 31, lying West of the right of way of the Missouri Pacific Railroad, specifically described as follows: Beginning at the Southwest corner of the Southeast Quarter of said Section 5; thence North along the West line of the Southeast Quarter of said Section 5, a distance of 2665.47 feet to the Northwest corner of the Southeast Quarter of said Section 5; thence East along the North line of said Southeast Quarter a distance of 1001.8 feet to the West right of way along the West right of way line of the Missouri Pacific Railroad, a distance of 2665.74 feet to the South line of said Section 5; thence West along the South line of said Section, a distance of 1039.56 feet to the point of beginning; subject to easements of record.

Owned by ANACONDA WIRE AND CABLE COMPANY, a Delaware Corporation,
principal place of business: 605 Third Avenue, New York, New York.

ORDINANCE NO. 991 - Page 3

That the vote was as follows:

For the Annexation	<u>639</u>
Against the Annexation	<u>181</u>

It is therefore found, declared and determined that a majority of the qualified voters of said city voted at said election on said proposition, voting in favor of said proposition.

SECTION 2: That it is hereby found and determined that the vote at the special city election in regard to Proposition #2 which read as follows:

Shall the following described unincorporated area of land be annexed to the City of Harrisonville, Missouri, and the city limits boundary lines be changed to enclose said areas, the legal description of which is as follows:

The West Half of Lot 2 of the Northwest Quarter, and all that part of the West half of Lot 3 of the Northwest Quarter lying South and East of Center line of the M. K. & T. Railroad right of way (now abandoned), all in Section 5, Township 44, Range 31.

Owned by PEARSON INVESTMENT CO., INC.

That the vote was as follows:

For the Annexation	<u>643</u>
Against the Annexation	<u>201</u>

It is therefore found, declared and determined that a majority of the qualified voters of said city voted at said election on said proposition, voting in favor of said proposition.

SECTION 3: It is hereby declared the following described unincorporated areas of land are hereby annexed to the City of Harrisonville and the city limits boundary lines are hereby extended and changed to enclose said unincorporated area of land; that the description of lands hereby annexed are as follows:

The South 60 acres of the East half of the South-east Quarter of Section 5, Township 44, Range 31; and

From the point of intersection of the South line of the Southwest Quarter of the Southeast Quarter of Section 5, Township 44, Range 31, and the East line of the right of way of the L. & S. Branch of the Missouri Pacific Railway, measured in a Northerly direction along the East line of said right of way, a distance of 570 feet for a place of beginning; thence in a Southeasterly direction along a curve line 20 feet North of and parallel with railroad

DDH847

Attachment: 5 Ordinance #991 (Appl. #RZ-23-003--Rezoning from M-1 to C-2 at Brickplant and Brookhart Roads PUBLIC HEARING)

ORDINANCE NO. 991 - Page 4

DDH847

spur to the center of the public road running North and South along the East line of the above mentioned 40 acre tract; thence South along the center of said road to a point 205 feet North of the South line of said Section 5; thence North 68 degrees 30 minutes West 202 feet, more or less, to the East line of said right of way; thence with said right of way line North to the beginning, except any part thereof used for public road.

The East half of the Southwest Quarter of Section 5, Township 44, Range 31, Cass County, Missouri, more particularly described as follows, to-wit: Beginning at the Southeast corner of the Southwest Quarter of said Section 5; thence West along the South line of said section, a distance of 1326.6 feet to the Southwest corner of the East half of the Southwest Quarter of said Section 5; thence North along the West line of the East half of the Southwest Quarter of said Section, a distance of 2665.47 feet to the Northwest corner of the East half of the Southwest Quarter of said Section 5; thence East along the North line of said Southwest Quarter, a distance of 1326.6 feet to the Northeast corner of the Southwest Quarter of said Section 5; thence South along the East line of the Southwest Quarter of said Section 5, a distance of 2665.47 feet to the point of beginning, and all that part of the West half of the Southeast Quarter of Section 5, Township 44, Range 31, lying West of the right of way of the Missouri Pacific Railroad, specifically described as follows: Beginning at the Southwest corner of the Southeast Quarter of said Section 5; thence North along the West line of the Southeast Quarter of Section 5, a distance of 2665.47 feet to the Northwest corner of the Southeast Quarter of said Section 5; thence East along the North line of said Southeast Quarter a distance of 1001.8 feet to the West right of way line of the Missouri Pacific Railroad; thence South along the West right of way line of the Missouri Pacific Railroad, a distance of 2665.74 feet to the South line of said Section 5; thence West along the South line of said Section, a distance of 1,039.56 feet to the point of beginning, except therefrom the south 26 acres thereof.

The South 26 acres of the following premises: All that part of the West half of the Southeast Quarter of Section 5, Township 44, Range 31, lying West of the right of way of the Missouri Pacific Railroad, specifically described as follows: Beginning at the Southwest corner of the Southeast Quarter of said Section 5; thence North along the West line of the Southeast Quarter of said Section 5, a distance

Attachment: 5 Ordinance #991 (Appl. #RZ-23-003--Rezoning from M-1 to C-2 at Brickplant and Brookhart Roads PUBLIC HEARING)

ORDINANCE NO. 991 - Page 5

of 2665.47 feet to the Northwest corner of the Southeast Quarter of said Section 5; thence East along the North line of said Southeast Quarter a distance of 1001.8 feet to the West right of way line of the Missouri Pacific Railroad; thence South along the West right of way line of the Missouri Pacific Railroad, a distance of 2665.74 feet to the South line of said Section 5; thence West along the South line of said Section, a distance of 1039.56 feet to the point of beginning; subject to easements of record.

The West Half of Lot 2 of the Northwest Quarter, and all that part of the West half of Lot 3 of the Northwest Quarter lying South and East of Center line of the M. K. & T. Railroad right of way (now abandoned), all in Section 5, Township 44, Range 31.

SECTION 4: This ordinance shall be in full force and effect from and after date of its passage and approval.

Read three times and passed by the Board of Aldermen of the City of Harrisonville, this 16th day of August, 1972.

W. D. Rame
Mayor and Ex-Officio Chairman of
the Board of Aldermen

ATTEST:

Verda B. Day
City Clerk

APPROVED BY THE MAYOR THIS
16th day of August, 1972.

W. D. Rame
M A Y O R

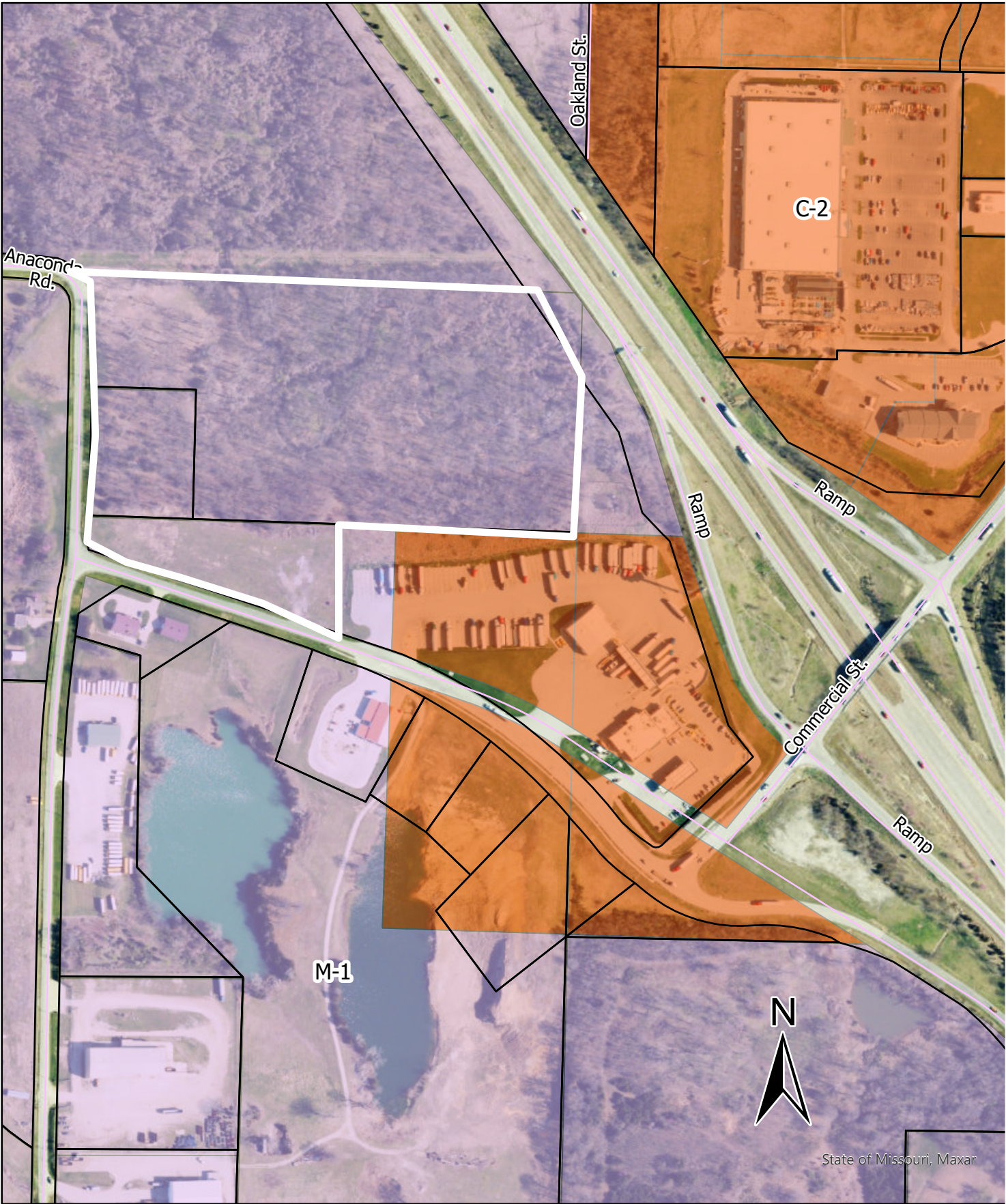
ATTEST:

Verda B. Day
City Clerk

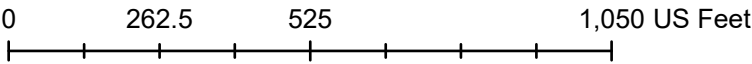
DDH847

Attachment: 5 Ordinance #991 (Appl. #RZ-23-003--Rezoning from M-1 to C-2 at Brickplant and Brookhart Roads PUBLIC HEARING)

Zoning Map

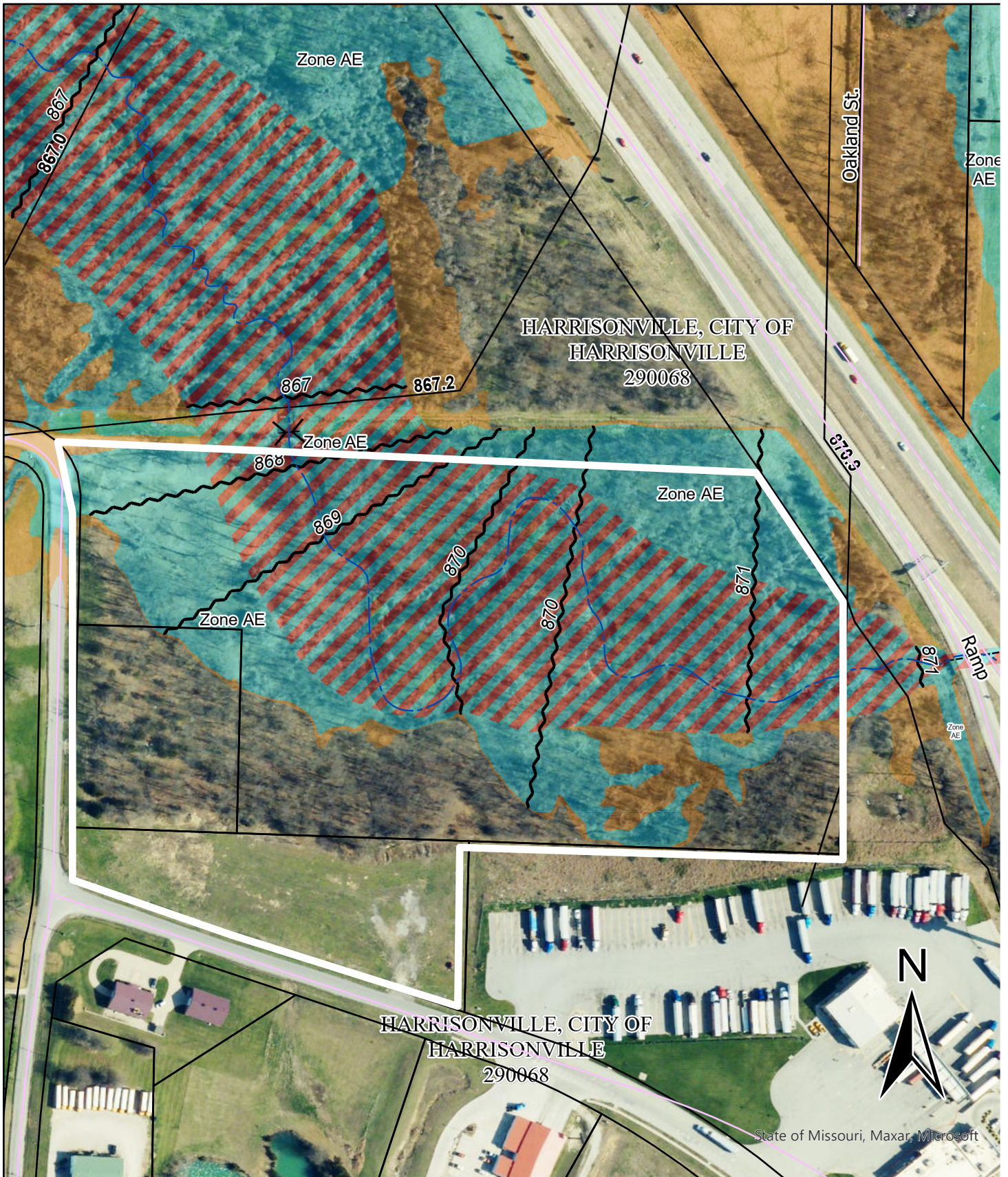


Attachment: 6 Zoning Map (Appl. #RZ-23-003--Rezoning from M-1 to C-2 at Brickplant and Brookhart Roads PUBLIC HEARING)



Aerial Map

3.C.g



Attachment: 7 Aerial Map (Appl. #RZ-23-003--Rezoning from M-1 to C-2 at Brickplant and Brookhart Roads PUBLIC HEARING)

STAFF REPORT

TO: Planning & Zoning Commission

FROM: Christina Stanton,

DATE: September 14, 2023

SUBJECT: Appl. #RZ-23-003--Rezoning from M-1 to C-2 at Brickplant and Brookhart Roads CONSIDERATION

Type of Item: *Approval*

D. Action Item (ID # 4630)

Appl. #RZ-23-003--Rezoning from M-1 to C-2 at Brickplant and Brookhart Roads
CONSIDERATION

STAFF REPORT

TO: Planning & Zoning Commission
FROM: Christina Stanton,
DATE: September 8, 2023
SUBJECT: Code Amendments--Creation of Design Standards and Amendment to
Section 405.550.A.3.a PUBLIC HEARING

Type of Item: *Public Hearing*

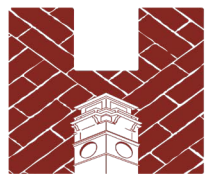
E. Action Item (ID # 4620)

Code Amendments--Creation of Design Standards and Amendment to Section 405.550.A.3.a

Attachments:

Various Code Changes 9-21-23 P&Z (PDF)

Design Standards Commentary and Mark-ups 8-22-2023 (PDF)



To: Planning & Zoning Commission

From: Christina Stanton, AICP, Community Development Director

Date: September 21, 2023

Re: Code Amendments—Creation of Design Standards and Amendment to Section 405.550.A.3.a

GENERAL INFORMATION

Applicant: N/A

Requested Actions: Consideration of Proposed Code Amendments

Date of Application: N/A

PROPOSAL

Currently the City's Code contains very little design standards. There are no standards pertaining to building materials, other than the recently adopted anti-monotony regulations. Current parking requirements are the least detailed in the County. Parking requirements are spread out in the various zoning districts and within Article XX—Supplementary Regulations. Landscaping is scarcely any better. There are a few more references to a landscape design or landscape plan, but very little actual standards exist.

There are a few requirements pertaining to the screening of parking spaces that contradict (Section 405.147.F.4.d, 405.177.F.4.d, and 405.565.D.2.e). Section 405.570.A.1.b contains the only actual landscape standard in the City's Code. Section 410.350.C.2 references the "Guidelines for Landscaping Along Arterial Roadways" which was adopted by Resolution #02-08 on April 15, 2002. There are a couple of issues with the adopted guidelines, such as the fact that they are guidelines and don't have any "teeth" to them and they are not on the website anywhere. Only a handful of sections of code even mention lighting; however, all but the section pertaining to a special use permit for Adult Use Facility do not contain any actual standards for lighting.

The proposed changes seek to rectify the lack of design standards and provide both staff and developers with a solid starting point. Staff reviewed the design standards (building materials, parking, landscaping, and lighting) of Grandview, Belton, Lee's Summit, KCMO, Peculiar, Pleasant Hill, and Raymore against our current regulations. When reviewing parking standards staff also consulted the ITE (Institute of Transportation Engineers) Parking Generation Manual.

Additionally, staff has considered that there are a number of larger lots existing that are zoned R-1 (Single-Family Residential) for which the current limit on detached accessory structures may not make logical sense. Staff has compared the lot size and existing number of structures for 56 lots that are currently zoned R-1 (Single-Family Residential) and over one (1) acre in size. Many of these lots are either surrounded by or adjacent to other smaller R-1 lots. After much consideration, staff has proposed to create an exception for R-1 properties of 1.5 acres in size or larger that would allow for one additional

PREVIOUS ACTIONS

- **August 21, 2023**—Proposed Code changes were presented to the Board of Aldermen for discussion in a work session.
- **October 17, 2022**—The Board of Aldermen approved Ordinance #3608, which amended language pertaining to which districts required a landscape plan. This language remains unaltered.
- **September 19, 2022**—The Board of Aldermen approved Ordinance #3602, which capped the number of detached accessory structures from “one (1) or more” to “two (2)”, corrected setback confusion pertaining to detached accessory structures, and added Accessory Dwelling Units as an allowed detached accessory structure in certain districts.
- **November 5, 2018**—The Board of Aldermen approved Ordinance #3451, which allowed detached accessory buildings in the C-1, CBD-1, C-2, and CBD-2 zoning districts; and Ordinance #3452, which amended language from Ordinance #3107 to allow greater use of gravel instead of concrete and asphalt. This language remains unaltered other than updates to code references.
- **October 19, 2009**—The Board of Aldermen approved Ordinance #3107, which amended various sections of Chapter 405 including language pertaining to parking and loading regulations.
- **April 15, 2002**—The Board of Aldermen approved Resolutions 02-7, 02-8, and 02-9 establishing administrative guidelines for “Access to Park, Greenway and Open Space Areas”, “Landscaping Along Arterial Roadways”, and “Street Improvements” (respectively). These resolutions stated it was intended for these “guidelines” to be made part of the Subdivision Regulations; however, since they were adopted as resolutions and not ordinances the codes were not updated and as guidelines they could only be recommendations or suggestions (not enforceable).
- **May 13, 1991**—The Board of Aldermen approved Zoning Ordinance #1825, which established most of our current zoning districts. This Zoning Ordinance removed “Gymnasiums, Tennis Courts and Similar Recreation Facilities not owned by the City of Harrisonville” from the listed parking uses and added “Commercial Facilities not Otherwise Classified”; “Office Building”; “Convention Hall, Lodge, Club, Museum, and Place of Amusement and Recreation”; “restaurants and Cafeterias”; and “Taverns or Clubs Serving Alcohol or Cereal Malt Beverage” to the listed parking uses.
- **August 16, 1978**—The Board of Aldermen approved Zoning Ordinance #1194, which established much of the Zoning and Subdivision Regulations as they are currently, including much of our current parking standards.

KEY ISSUES

- **Currently the Zoning Regulations:**
 - **Contain very little design standards:**
 - There are no standards pertaining to building materials except the recently adopted anti-monotony regulations;
 - Parking standards are very limited and in multiple locations (each zoning district currently contains its own parking standards and there are some listed under supplementary regulations);
 - There are vague references to landscape design or landscape plan, but very little actual standards exist in the City’s Municipal Code;
 - Although, there are a few requirements pertaining to the screening of parking spaces, but they are not consistent throughout the Code;
 - Additionally, the Subdivision Regulations reference the “Guidelines for Landscaping Along Arterial Roadways”, but this “Guideline” is not part of the Code, nor is it available on the City’s website;
 - There are no lighting standards in the City’s Municipal Code except for those few listed under Special Use Permit for an Adult Use Facility;
- The 2040 Comprehensive Plan contains the following recommendations:

- Review site development and infrastructure design standards to incentivize the use of green development practices and to ensure compliance with the MARC 2050 Climate Action Plan to mitigate effects of industry on the environment; and
 - MARC's 2050 Climate Action Plan contains a number of recommendations including adopting an ordinance to encourage trees, native landscaping, and stream buffering and updating planning/zoning regulations and engineering standards for stormwater management
- Review and consider adopting relevant portions of MARC's 2020 Model Ordinance for Tree Protection, Weed Management, and Native Plant Encouragement as a general stormwater management strategy.
 - MARC's 2020 Model Ordinance for Tree Protection, Weed Management, and Native Plant Encouragement contains a number of recommendations including encouraging native plants and green infrastructure to help management of stormwater, adopting an invasive plants ordinance, and adopting a tree protection ordinance
- The proposed Code changes seek to rectify the lack of design standards by creating a design standards section of code that will include:
 - Site and building design;
 - Building materials;
 - Parking;
 - Landscaping and screening; and
 - Lighting.
- These proposed changes include encouraging native plants to help manage stormwater and encourage the preservation of existing trees, especially those considered significant, and require buffering of riparian areas. Some future amendments may be needed to further strengthen the connection between landscaping and stormwater management, such as green infrastructure, or better address invasive species.
- Additionally, changes are proposed that remove redundancy and inconsistencies (such as the various parking standards under the individual zoning districts) and place all parking requirements in one section of code, with the exception of CBD-1 and CBD-2.
- Much of the existing language pertaining to the design and dimensions of parking are being left, Code references have been updated as needed.
- Much of the existing language under Section 405.570, Landscaping and Screening, has been moved into the new design standards and greatly expanded to include:
 - Contents of Landscaping Plan;
 - Minimum Landscaping Requirements such as...
 - Plant sizes,
 - Encouragement of preservation of existing plant materials and use of native plants,
 - Riparian protection buffer,
 - Interior (foundational and parking islands) landscaping,
 - Perimeter (street trees and screening of adjacent uses/districts) landscaping, and
 - Screening of trash enclosures and loading areas and mechanical equipment.
 - Installation and Maintenance
- Lighting standards, including:
 - When a lighting plan is required and what needs to be on the plan;
 - Minimum Lighting Requirements
 - Parking Lot Lighting;
 - Wall-Mounted Lighting;
 - Accent Lighting;
 - Canopy and Drive Thru Lighting; and
 - Outdoor Recreation Lighting.
- Created exception for R-1 zoned lots of 1.5 acres or larger in size to allow for an additional detached accessory structure provided setbacks and lot coverage requirements are met.

Staff Commentary and Mark-ups



THE CITY OF HARRISONVILLE

WHERE TRADITION MEETS INNOVATION

300 E. Pearl Street, P.O. Box 367 • Harrisonville, MO 64701 • Tel: 816-380-8900 • Fax: 816-380-8906

Existing Municipal Code in black.

Removals in red.

Additions in green.

Highlights = Discussion.

CS commentary in blue.

Staff Commentary

Currently the City's Code contains very little design standards. There are no standards pertaining to building materials, other than the recently adopted anti-monotony regulations. Current parking requirements are the least detailed in the County. Parking requirements are spread out in the various zoning districts and within Article XX—Supplementary Regulations. Landscaping is scarcely any better. There are a few more references to a landscape design or landscape plan, but very little actual standards exist.

There are a few requirements pertaining to the screening of parking spaces that contradict (Sections 405.147.F.4.d, 405.177.F.4.d, and 405.565.D.2.e). Section 405.570.A.1.b contains the only actual landscape standard in the City's Code. Section 410.350.C.2 references the "Guidelines for Landscaping Along Arterial Roadways" which was adopted by Resolution #02-08 on April 15, 2002. There are a couple of issues with the adopted guidelines, such as the fact that they are guidelines and don't have any "teeth" to them and they are not on the website anywhere. Only a handful of sections of code even mention lighting; however, all but the section pertaining to a special use permit for Adult Use Facility do not contain any actual standards for lighting.

The proposed changes seek to rectify the lack of design standards and provide both staff and developers with a solid starting point.

Chapter 405. Zoning Regulations

ARTICLE XX. Supplementary Regulations

Section 405.565. **Design Standards****Parking and Loading Regulations.**

- A. **Applicability.** The following regulations are applicable to the construction and exterior appearance of all commercial, office, industrial and multi-family developments hereafter erected, constructed, altered or repaired.
- B. **Purpose.** The purpose of the following regulations is to:
 - 1. Protect property values, enhance community appearance, and preserve neighborhood character.
 - 2. Encourage developers to create more attractive, efficient, and pedestrian-friendly living, shopping, and working environments.
 - 3. Increase beauty and quality of community life by improving the character of building exteriors and surroundings.



THE CITY OF HARRISONVILLE

WHERE TRADITION MEETS INNOVATION

300 E. Pearl Street, P.O. Box 367 • Harrisonville, MO 64701 • Tel: 816-380-8900 • Fax: 816-380-8906

4. Increase beauty and quality of employees' working and leisure-time experiences by improving the pedestrian environment and exterior building character in office, commercial, and industrial districts.
- C. Site and Building Design.
1. The form and proportion of buildings should be consistent with the scale, form, and proportion of other development within the immediate surrounding area.
 2. The rhythm of structural mass to voids, such as windows and glass doors, of a front façade should relate to the rhythms established by adjacent buildings.
 3. Care should be exercised to coordinate final grades and site arrangement with those of adjoining properties and streets.
 4. Buildings shall incorporate four (4) sided architecture. Horizontal and vertical elements shall extend completely around the building and utilize the same, compatible, or complimentary materials on all building facades.
 5. Consistent architectural design, including building materials and colors, should be carried throughout larger developments. Designs should provide visual interest and variety yet be consistent with the architectural character of the area.
 6. A façade consisting of a single undifferentiated plane with a single texture or color, excluding windows, doors or overhead doors, is prohibited.
- D. Building Materials.
1. Materials requiring low maintenance are recommended over high maintenance materials. For instance, materials with integral color are generally recommended over materials that require painting.
 2. High-quality materials that are durable, economically maintained, and will retain their appearance over time include, but are not limited to: brick, glass, stucco, natural and fabricated stone, treated wood, integrally-colored, textured or glazed concrete masonry units (CMUs), pre-stressed concrete systems, water-managed Exterior Insulated Finish Systems (E.I.F.S.), or similar durable and visually pleasing materials.
 3. Allowed building materials shall include:
 - a. Masonry. Brick, stone, concrete masonry units (CMUs) with split-face, fluted, scored or other rough texture finish. (Specifically excluding smooth finish CMU or concrete brick i.e. "Cherokee block", with the color and texture of clay brick.)
 - b. Concrete. Precast, exposed aggregate, cast in place, or tilt up panels provided a rough texture is present or to be added.
 - c. Stucco. Including E.I.F.S., Dryvit, but excluding pre-manufactured panels.
 - d. Structural Clay Tile. Excluding glazed surface finish.
 - e. Glass. Glass curtain walls, glass block, excluding mirror glass which reflects more than 40 percent of incident visible light.
 - f. Metal. Used only in an incidental role i.e., trim, architectural features, standing seam metal roofing or other architectural metal siding or roofing.
 4. Exterior building materials shall be continued down to within nine inches (9") of finished grade on any elevation. Exterior masonry materials shall be continued to the top of grade.
 5. If E.I.F.S. or wood is the primary material utilized on a building, the bottom three (3) feet of the building shall be constructed of brick, stone or other similar material.



THE CITY OF HARRISONVILLE

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6. The use of metal siding is permitted only in industrial districts and only for side and rear facades. The materials used on the front façade shall be incorporated into any façade visible from a public street to break up the monotony of those facades.
 7. The use of corrugated metal panels, with a depth of less than three-quarter inch or a thickness of less than the U.S. Standard 26-gauge, shall be prohibited.
 8. The use of unpainted panels, excluding panels made from copper, weathered steel, or stainless steel, shall be prohibited. The color finish of metal panels and exposed fasteners shall have extended durability with high resistance to fade and chalk.
 9. Corrugated metal facades shall be complemented with masonry, whether brick, stone, stucco or split-face block. Architectural metal panels may be an acceptable substitute for masonry.
- E. Parking.** Shall be required for all structures erected. For all buildings or structures hereafter erected, constructed, reconstructed, moved or altered except in District "CBD-1", off-street parking in the form of garages or open areas made available exclusively for that purpose shall be provided. Such parking spaces shall be located entirely on private property with no portion except the necessary drives extending into any street or other public way. Where an existing building or use has insufficient parking at the time of passage of this Section or any amendment thereto, said building may be enlarged or use intensified only if adequate parking is provided for the entire building and all uses on the property in accordance with the requirements of this Section. **Except for those uses listed below, parking spaces shall be provided as set out in Articles IV through XVII.** Parking shall be provided as specified below:

Minimum Parking Required by Use	
Use Category/Specific Use	Minimum Parking Spaces Required
Residential	
Assisted Living Facility	1/dwelling unit (DU)
Efficiency or Studio Unit	1/dwelling unit (DU)
Elderly/Disabled	1/dwelling unit (DU)
Loft Dwelling	1/dwelling unit (DU)
Manufactured Home Park	2/manufactured home
Multi-Family Dwelling	1.5/dwelling unit (DU)
Single-Family Dwelling	2/dwelling unit (DU)
Two-Family or Duplex Dwelling	2/dwelling unit (DU)
Institutional	
Auditorium/Public Assembly	1 for 4 seats allowed under maximum occupancy
Church, Synagogue, Place of Worship	1 for 3 seats, or 1 per 12 feet of pew, or 1/30 sqft. in the largest assembly room
Civic Clubs, Fraternal Lodges	4/1,000 sqft. of GFA
Community Center	2.5/1,000 sqft. of GFA
Hospital	1 per 3 beds + 1 per 2 staff or visiting doctors
Library, Museum, Cultural Exhibit	2.5/1,000 sqft. of GFA
Post Office	1/1,000 sqft. of GFA



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Public Safety Services (Fire, Police, Ambulance)	1/1,000 sqft. of GFA
School—Elementary, Junior High and Equivalent Parochial	2/classroom
School—High Schools, Colleges and Other Educational Institutions for Students of Driving Age	12/classroom + 1 for each 2 employees
Commercial	
Adult Business	2.5/1,000 sqft. of GFA
Amusement Center, Recreational Attraction, Roller Skating, or Ice-Skating Rink	6/1,000 sqft. of GFA
Animal Services (Boarding, Grooming, and Veterinary)	2.5/1,000 sqft., not including animal pen areas
Athletic Fields/Stadiums	1 for 4 seats
Automobile, Truck, Recreational Vehicle, Manufactured Home Sales/Rental/Service	2/1,000 sqft. of indoor sales area + 1/2,500 sqft. of outdoor display + 3/service bay
Automotive Supplies	3/1,000 sqft. of GFA
Bar	1/employee on maximum shift + 1 for each 4 seats or building capacity as determined by Building Code
Barber/Beauty Shop or Salon	3/employee on maximum shift
Boarding/Rooming House	1 per guest room + 1/employee on maximum shift
Body Shop	10/1,000 sqft. of GFA in the building, exclusive of basement storage areas, + 1 for each employee
Bowling Alley	5 for each lane
Car Wash	1/employee on maximum shift
Contractor's Supplies and Equipment, Sales and Service	2.5/1,000 sqft. of indoor sales area
Convenience Store/Gas Station	1/bay + 1/pump island, minimum 6 spaces
Crematorium	1 per 4 employees
Day Care Center	2.5/1,000 sqft. of GFA
Driving Range, Golf Course	1/tee; 4/green
Drug Store	2/1,000 sqft. of GFA
Financial Institution	4/1,000 sqft. of GFA
Funeral Home	1 per 3 seats + 1/30 sqft. of assembly area with no fixed seats
Furniture or Carpet Store	1.5/1,000 sqft. of GFA
Greenhouse, Nursery	1/employee on maximum shift + 4/1,000 sqft. of floor area accessible to the general public + 4/1,000 sqft. of general office space
Grocery Store/Specialty Market (Not a Supermarket)	4/1,000 sqft. of GFA



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Group Boarding Home	1.5/employee on maximum shift
Hardware/Paint Store	1/1,000 sqft. of GFA
Health Club or Fitness Center	4/1,000 sqft. of GFA
Home Improvement Superstore	3/1,000 sqft. of GFA
Hotel/Motel with Restaurant or Lounge Open to the Public	1.5/Room
Hotel/Motel with No Restaurant or Lounge; or with a Restaurant or Lounge provided for guests only	1/Room
Laundry/Dry Cleaning	1/employee on maximum shift + 4/1,000 sqft. of floor area accessible to the general public + 4/1,000 sqft. of general office space
Liquor Store	2/1,000 sqft. of GFA
Miniature Golf	15 for each 9 holes
Motor Vehicle Repair	1/bay + 1/pump island, minimum of 6 spaces
Nursing Home	1 per 3 beds + 4/1,000 sqft. of office space
Office, General and Professional	3/1,000 sqft. of GFA
Office, Medical/Dental	4/1,000 sqft. of GFA
Restaurant	10/1,000 sqft. of GFA
Retail Establishments Not Otherwise Listed	3/1,000 sqft. of GFA
Shopping Centers (Excluding Pad Sites): 25,000 – 399,999 sqft.	5/1,000 sqft. of GFA
Shopping Centers (Excluding Pad Sites): 400,000 – 599,999 sqft.	4.5/1,000 sqft. of GFA
Shopping Centers (Excluding Pad Sites): 600,000+ sqft.	4/1,000 sqft. of GFA
Supermarket	5/1,000 sqft. of GFA
Swimming Pool	1/30 sqft. of gross pool area
Theater	1 for each 4 seats + 1 for each employee on maximum shift
Industrial	
Freight Terminal	1/1,000 sqft. of GFA
Frozen Food Lockers	1/100 sqft. of service floor area
Manufacturing/Warehouse	1/1,000 sqft. of GFA + 4/1,000 sqft. of office space
Mini-Warehouse/Self Storage Facility	1/employee + a minimum of 4 customer spaces
Salvage Yard	1/10,000 sqft. of storage area + 1/employee
Vehicle Storage/Towing	1 per employee

For the following uses one (1) off-street parking space shall be provided for each:

A. Employee.



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- B. Two (2) employees.
- C. Guest room or two (2) guest beds.
- D. Three (3) beds or three (3) seats.
- E. Two (2) staff and visiting doctors.
- F. One hundred (100) square feet service floor area.
- G. One hundred fifty (150) square feet service floor area.
- H. Two hundred (200) square feet service floor area.
- I. As determined by Planning and Zoning Commission.
- J. Two (2) seats.
- K. Two hundred fifty (250) square feet service floor area.
- L. Fifty (50) square feet of service floor area.

Use	Key
Commercial facilities not otherwise classified	G
Churches, theaters, athletic fields and other seating facilities	D
Libraries	B, H
Fraternity or sorority houses, dormitories, hotels, motels and apartment hotels	B, C
Hospitals, sanitariums or homes for convalescent or aged	D, E
Armories or assembly halls	D
Office building	K
Mortuaries	B, D
Medical or dental clinics	F
Theaters	D
Frozen food lockers	F
Convention hall, lodge, club, museum and all places of amusement and recreation	I
Miniature golf courses	I
Restaurants and cafeterias	D
Taverns or clubs serving alcohol or cereal malt beverages	A, J

B. 1. Rules for Computing Parking Requirements.

a. **Multiple Uses.** When a building or development contains multiple uses, the off-street parking requirement shall be calculated for each individual use and the total parking requirement shall be the sum of the individual parking requirements unless the uses operate at different hours and are able to utilize shared parking.

b. **Uses Not Listed.** Any use not included in the parking requirements in this Chapter, the Director of Community Development shall establish the parking requirements either based upon a listed use deemed most similar to the proposed use or based upon industry standards. The Director may require the applicant to submit a parking study or other evidence to help determine the most appropriate parking standard for the proposed use. be assigned a parking requirement by the Planning and Zoning Commission.



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C.2. Dimensions Of Parking And Other Paved Areas. Parking stall dimensions shall be not less than nine (9) by twenty (20) feet plus the necessary space for maneuvering into and out of the space. For parking lots the minimum cross dimensions shall be as follows:

90° pattern	Single-loaded aisle — 42 feet Wheel stop to opposite curb
90° pattern	Double-loaded aisle — 60 feet Wheel stop to wheel stop
60° pattern	Single-loaded aisle — 40 feet Wheel stop to opposite curb
60° pattern	Double-loaded aisle — 56 feet Wheel stop to wheel stop
45° pattern	Single-loaded aisle — 34 feet Wheel stop to opposite curb
45° pattern	Double-loaded aisle — 47 feet Wheel stop to wheel stop
Parallel spaces	9 by 23 feet each space

Drives to parking areas, service areas, loading docks and other on-site facilities served by or serving motor vehicles shall not exceed thirty-five (35) feet in width measured at a point where drive curbs are generally parallel. Head-in parking, where vehicles use a part of a public street right-of-way for entering or backing from a parking space or where any part of the parked vehicle occupies street right-of-way, shall not be permitted.

D.3._Improvement Of Parking Areas.

1.(a) All parking areas and drives, except as specifically provided for in this Subsection **3(a) (D)(1)**, shall be ready for use upon occupying a building and shall be surfaced with a minimum of two (2) inches of hot-mix asphaltic concrete on a minimum four (4) inch compacted stone base or Portland cement concrete paving of equal strength (the "Hard Surface Requirement"). All such drives and off-street areas used by vehicles, except those serving single- and two-family dwellings, shall have curbs. The Director of Codes Administration may grant an extension by issuing a temporary certificate of occupancy when weather conditions are not satisfactory for placing paving materials. Exceptions to the Hard Surface Requirement are specified in Subsections **3(a)(1), (2), (3), and (4) (D)(1)(a, b, c and d)**, below. None of these exceptions herein shall relieve the owner, occupant or developer from the requirements of the Americans with Disabilities Act regulations, including hard surfaced parking areas for those with disabilities.

[Ord. No. 3452, 11-5-2018]

a._(1) Required Driveway Connection Condition For Any Exception To Apply. Gravel may be used in lieu of the Hard Surface Requirement for the exceptions described in Subsections **3(a)(2), (3), and (4) (D)(1)(b, c and d)** of this Subsection **3(a) (D)(1)**, providing that any driveway connection from the parking lot to the street is constructed to the standard of the Hard Surface Requirement for at least ten (10) feet in depth from the street for the width of the driveway. Driveways shall also mean Drives to parking areas.

b._(2) Exceptions For Non-residential Uses. Except as required in Subsection **3(a)(1) (D)(1)(a)**, above, existing gravel parking lots with a non-



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residential use may remain as gravel until a new principal use structure is constructed on the property at which time all parking areas shall meet the Hard Surface Requirement. This exception shall include a property with a previously approved Special Use Permit condition(s), provided the requirements in Subsection 3(a)(1) (D)(1)(a) are met.

c. (3) Exceptions For Residential Uses — Single-Family. Except as required in Subsection 3(a)(1) (D)(1)(a), above, driveways may be gravel for single-family residences that extend more than one hundred (100) feet from the street to the house or accessory structure. This exception shall not apply to zoning districts described in Subsection 3(a)(4) (D)(1)(d), below.

d. (4) Exceptions For Residential Uses "R-1B" and "R-2B." Except as required in Subsection 3(a)(1) (D)(1)(a), above, the following exceptions apply to zoning districts for the Single-Family "R-1B" Near Downtown Single-Family Neighborhood District and "R-2B" Near Downtown Two-Family Neighborhood District:

(1)(i) Existing gravel driveways are not required to be improved when a single-family home is removed and replaced with a new single-family home, and

(2)(ii) Single-family residences may have one (1) gravel parking space in the side or rear yard.

2.(b) No parking spaces shall be located within three (3) feet of an adjoining lot in a District "E" to "R-4" inclusive. Any lights used to illuminate the parking area shall be so arranged as to direct light away from any adjacent premises in a residential district. In addition, the following regulations shall apply:

a. (1) In Districts "E" to "R-4" inclusive, no parking shall be permitted in the required front yard or within ten (10) feet of a public street, except that parking of motor passenger cars shall be permitted in customary driveways of single- and two-family dwellings.

b. (2) In District "C-O", no parking area in a front yard shall extend closer than ten (10) feet to the right-of-way and no parking area in a side yard of a corner lot shall extend closer than four (4) feet to a street. In Districts "C-1" to "M-2", no parking area shall extend closer than four (4) feet to a right-of-way measured to the back of the curb of the parking area.

c. (3) All parking lots and drives leading thereto, except those serving single-family and two-family dwelling, shall have curbs and drainage facilities approved by the City Administrator. Where greater setback requirements do not prevail, the back of the curb of a paved parking area shall not be closer than four (4) feet to a property line, except that in a planned zoning district, the Planning and Zoning Commission and the Board of Aldermen may permit a lesser setback where similar development on an adjoining lot will produce a satisfactory relationship.

d. (4) The floor area designed and used exclusively for grain storage shall not be included in the parking calculation. Such parking spaces shall be on the premises or on other property within two hundred (200) feet of an employee entrance to the building being served. Each establishment shall also provide adequate loading space within a building or on the premises in such a way that all storage, standing and maneuvering of trucks and other service vehicles shall be off the public right-of-way.



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(5) A portion of the parking area required by this Chapter may remain unimproved until such time as the Board of Aldermen deems it must be improved to adequately serve current parking demand. A permit for construction of such delayed improvement may be issued only after the Planning and Zoning Commission and the Board of Aldermen are satisfied that the initial occupancy of the premises will be adequately served by the lesser number of spaces and only after approval by both bodies of a final development plan indicating clearly the location, pattern and circulation to and from the initial and the delayed parking spaces. The land area so delineated for future parking shall be brought to finished grade, be landscaped and shall not be used for building, storage, loading or other purposes.

e. (6) Screening and landscaping. All open automobile parking areas containing more than four (4) parking spaces shall be effectively screened on each side adjoining or fronting on any residential or institutional property by a wall or fence not less than five (5) feet high or more than six (6) feet high or a densely-planted compact hedge not less than five (5) feet in height.

F. Landscaping and Screening.

1. **When Required.** All plans submitted in support of a building permit application, except for single-family and two-family dwellings and excluding buildings in District "CBD -1," shall hereafter include a landscape plan and include screening where appropriate. All development plans shall include a landscaping plan.

2. **Contents of Landscaping Plan.** All landscaping plans shall include the following information:

- a. North arrow and scale not to exceed one-inch equals 50 feet;
- b. Topographic information and final grading adequate to identify and properly specify planting areas needing slope protection;
- c. The location and size of all utilities on the site;
- d. The location of all existing and proposed parking areas, sidewalks, and other paved surfaces;
- e. The location of all existing and proposed buildings and structures;
- f. The location of hose connections and other watering sources;
- g. The boundaries of each required buffer or landscape strip;
- h. The location and mature size of all landscape materials to meet the requirements of this Section, drawn to scale, and a planting schedule indicating plant names (common and scientific), quantities and size at planting;
- i. The location, size, and type of all above-ground and underground utilities and structures with proper notation, where appropriate, so as to identify any safety hazards to avoid during installation of landscaping;
- j. The location, size and common name of all existing plant materials to be retained; and
- k. The location and construction details, including a profile section, of each structure proposed to meet buffering requirements.

3. **Minimum Landscaping Requirements.** Landscaping shall be provided for the development or redevelopment of all commercial, industrial, multi-family, and institutional property as provided herein.



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a. General Requirements.

(1) **Planting Seasons.** Landscaping planted in fulfillment of these regulations shall only be planted during the spring (March 15 through June 15) or fall (September 15 through December 1). Planting at other times of the year may occur after receiving approval from the Community Development Director.

(2) **Minimum Plant Sizes.** The following are the required minimum plant sizes:

(i) Deciduous trees shall be two-inch (2") caliper as measured at a point six inches (6") above the ground or top of the root ball, at planting.

(ii) Evergreen trees shall be five feet (5') in height at planting.

(iii) Ornamental trees shall be one-inch (1") caliper as measured at a point six inches (6") above the ground or top of root ball, at planting.

(iv) Medium shrubs shall be 18- to 24-inch balled and burlapped or two-gallon container.

(v) Large shrubs shall be 24- to 30-inch balled and burlapped or five-gallon container.

(3) The preservation of existing plant material, when it meets the above minimum requirements and especially trees that are considered significant, is strongly encouraged. Significant trees may be given multiple credits.

(4) The use of native plant materials is strongly encouraged, especially in areas where drainage is a concern and in and around detention or retention areas.

(5) The *American Standard for Nursery Stock*, published by the American Association for Nurserymen, shall be the standard reference for the determination of plant standards. Publications of the University Extension, University of Missouri System, the Missouri Department of Conservation, and other authorities acceptable to the Director may also be used.

(6) All portions of the site not covered with paving or building shall be landscaped. Open areas not covered with other materials shall be covered with sod. Ground cover shall be utilized on all slopes in excess of 3:1 slope.

(7) **Shade trees** shall be planted on all projects and shall include such species as ash, sycamore, maple, oak or comparable trees suitable to the growing environment which prevails.

(8) No tree shall be planted within the sight triangle of a street or drive intersection or within ten feet (10') of a fire hydrant.

(9) Only trees ornamental trees (20 feet or less in height at maturity) may be planted under or within fifteen lateral feet (15') of any overhead utility wire.

(10) **Riparian Protection Buffer.** The riparian protection buffer is intended to protect the habitat, wetland, slopes, stream integrity, and features in the immediate vicinity of the riparian area. These



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areas are typically ecologically rich but sensitive habitats that also serve as critical buffers to sedimentation. The minimum total width of the riparian protection buffer shall be the width of the mapped floodplain, or where the floodplain is not mapped or is narrower than 100 feet, shall be 100 feet from the annual high water line (AHWL) on both sides. On residential properties, the minimum width of the riparian protection buffer may be reduced to 50 feet in some locations where the floodplain in that area is less than 50 feet wide, and if an average setback of 100 feet is maintained across the property as a whole.

(11) Prohibited Trees. The following trees are prohibited and cannot be used to satisfy the landscaping requirements: Box Elder Maple (*Acer Negundo*), Catalpa (*Catalpa Series*), Cottonwood (*Populus Deltoids*), American Elm (*Ulmus Americana*), Chinese Elm (*Ulmus Parvifolia*), Siberian Elm (*Ulmus Pumila*), Ginkgo (female only, *Ginkgo Biloba*), Honey Locust (except thornless varieties, *Gleditsia Triancanthos*), Silver Maple (*Acer Saccharinum*), Mimosa (*Albexia Julibrissin*), Red Mulberry (female only, *Morus Ruba*), Russian Olive (*Elaeagnus Angustifolia*), Bolleana Poplar (*Populus Alba "Pyramdalis"*), Lombardy Poplar (*Populus Nigra "Italica"*), Silver Poplar (*Populus Alba "Nivea"*), Osage-Orange (except thornless and seedless varieties, *Mulcura Pomifera*), Tree of Heaven (*Alanthus Altissima*).

b. Interior Landscaping. This includes all landscaping that is interior to the site, such as plantings around the building foundation and parking islands and other open spaces.

(1) Foundational Landscaping. A landscaped area a minimum of five (5) feet wide shall be provided along the foundation of all commercial and institutional buildings, excluding building entrances and loading areas. This landscaped area may count toward the required landscape area for the lot.

(2) Parking Islands. Landscape islands, strips or other planting areas shall be located within the parking lot and shall consist of at least five percent (5%) of the entire area devoted to parking spaces, aisles, and driveways. Every four (4) rows of parking shall include a landscape island of at least ten (10) feet in width. Industrially zoned properties shall be exempt from this requirement. A landscaping island shall be located at the end of every parking bay between the last parking space and an adjacent travel aisle or driveway. The island shall be no less than eight (8) feet wide for at least one-half the length of the adjacent parking space. The island shall be planted in trees, shrubs, grass or ground cover, except those areas that are mulched. Tree planting areas shall be no less than ten (10) feet in width. No tree shall be located less than four (4) feet from the back of curb.

c. Perimeter Landscaping. This includes all landscaping that is located within thirty (30) feet of the property lines, whether street trees or screening between adjacent uses.



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(1) Street Trees. Street trees shall be required at a rate of 1 tree per forty (40) linear foot along any property line that abuts a street or alley, excluding driveways.

(2) Screening of Adjacent Uses/Districts. Screening shall consist of screening fences, natural screening (earthen berms, shrubs, trees, bushes, etc.) or a combination of screening methods. The screening shall be constructed in such a manner that will protect the visual integrity, sound integrity and overall quality of the adjoining residential areas. The following table establishes which type of screen is required between adjacent uses/districts. To identify the type required, first identify the zoning of the subject lot (the new or expanded use). Then, identify the zoning of each adjacent lot. Types of screens are labeled L, M, and H (Low, Medium, and High). The types of screens are further described below.



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Zoning of Proposed Use or Expansion/Adjoining District	A	E	R-1	R-1B	R-1M	R-2	R-2B	R-3	R-4	C-O	C-1	CBD-1	CBD-2	C-2	M-1	M-2
Agriculture (A)	N/A	N/A	N/A	N/A	N/A	L	L	M	M	M	M	M	M	H	H	H
Estate (E)	N/A	N/A	N/A	N/A	N/A	L	L	M	M	M	M	M	M	H	H	H
Single-Family Residential (R-1)	N/A	N/A	N/A	N/A	N/A	L	L	M	M	M	M	M	M	H	H	H
Near Downtown Single-Family Neighborhood (R-1B)	N/A	N/A	N/A	N/A	N/A	L	L	M	M	M	M	M	M	H	H	H
Manufactured Home Park (R-1M)	N/A	N/A	N/A	N/A	N/A	L	L	M	M	M	M	M	M	H	H	H
Two-Family Residential (R-2)	L	L	L	L	L	N/A	M	M	M	M	M	M	M	H	H	H
Near Downtown Two-Family Neighborhood (R-2B)	L	L	L	L	L	N/A	M	M	M	M	M	M	M	H	H	H
Cluster or Garden Type Residential (R-3)	M	M	L	L	L	L	L	N/A	M	M	M	M	M	H	H	H
Medium Density Apartment (R-4)	M	M	H	H	H	M	M	M	N/A	M	M	M	M	H	H	H
Non-Retail Business (C-O)	M	M	M	M	M	M	M	M	M	N/A	M	L	L	H	H	H
Local Business (C-1)	M	M	M	M	M	M	M	M	M	L	N/A	L	L	L	M	M
Downtown Core Business (CBD-1)	M	M	M	M	M	M	M	M	M	L	L	N/A	L	L	M	H
Downtown Fringe Business (CBD-2)	M	M	M	M	M	M	M	M	M	L	L	L	N/A	L	M	H
Service Business (C-2)	H	H	H	H	H	H	H	H	H	H	M	L	L	N/A	M	M
Limited Industrial (M-1)	H	H	H	H	H	H	H	H	H	H	M	M	M	M	N/A	L
General Industrial (M-2)	H	H	H	H	H	H	H	H	H	H	M	H	H	M	L	N/A



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- (i) **Low Impact Screen.** An open screen between similar land uses. Open screens shall provide an attractive separation between land uses. A low impact landscape screen shall consist of one of the following options:

Screening Option	Required Quantity
A	
Shade Trees	1/500 sqft.
Ornamental Trees	1/750 sqft.
Evergreen Trees	1/500 sqft.
Shrubs	1/500 sqft.
B	
Shade Trees	1/1,000 sqft.
Ornamental Trees	1/500 sqft.
Evergreen Trees	1/500 sqft.
Shrubs	1/500 sqft.
C	
Shade Trees	1/750 sqft.
Ornamental Trees	1/750 sqft.
Evergreen Trees	1/750 sqft.
Shrubs	1/200 sqft.

- (ii) **Medium Impact Screen.** A landscape screen consisting of 70% semi-opaque screening between land uses which are dissimilar in character. Semi-opaque screening should partially block views from adjoining land uses and create a separation between the adjoining land uses. For medium impact screens, either a landscape screen or fencing is required. A medium impact screen shall meet one of the following options:

Screening Option	Required Quantity
A	
Shade Trees	1/500 sqft.
Ornamental Trees	1/750 sqft.
Evergreen Trees	1/300 sqft.
Shrubs	1/200 sqft.
B	
Shade Trees	1/1,000 sqft.
Ornamental Trees	1/500 sqft.
Evergreen Trees	1/300 sqft.
Shrubs	1/200 sqft.
C	
Shade Trees	1/750 sqft.
Ornamental Trees	0 sqft.
Evergreen Trees	1/200 sqft.
Shrubs	1/200 sqft.



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- (iii) **High Impact Screen.** A landscape screen consisting of 100% opaque screening between land uses, which are dissimilar in character. When the proposed plan is considered to have a high impact on surrounding properties or the adjacent property is considered to have an adverse impact, both of the following shall be installed within the 30-foot landscape area: (1) a six-foot high masonry wall or opaque vinyl fence, (2) and low impact screening shall be planted on both sides of the wall or fence.

d. Additional Screening.

(1) Trash Enclosures.

(i) All, new or substantially remodeled, multi-family residential projects, defined as any dwelling unit building with more than two (2) dwelling units, and non-residential projects, shall include, on a landscape plan, a detailed drawing of enclosure and screening methods to be used in connection with all garbage/trash receptacles, garbage collection areas, grease collectors, and trash compactors. For the purpose of this Subsection, "*substantially remodeled*" shall be defined as any project remodeling in which the valuation of the work involved is equal to or more than thirty percent (30%) of the current year's market value of the building per the County Assessor's office listing. For all remodeled projects which do not meet the threshold of thirty percent (30%) per the above, these properties shall be required to comply with the requirements of Section 240.050(G)(2) of the Municipal Code regarding installation of enclosures.

All garbage/trash receptacles, garbage collection areas, grease collectors, and trash compactors for all residential dwelling unit properties except for single-family and duplex properties and all non-residential uses must be permanently screened from view on all sides by a fence of one hundred percent (100%) opacity and a minimum height of six (6) feet.

Where commercial trash receptacles are used, such receptacles must be screened as follows: All screens for trash receptacles that are part of new construction projects must match the primary color and material of the structure served.

Doors accessing storage areas must remain closed at all times when not being accessed.

(ii) Existing trash receptacles of any size, visible from a public thoroughfare must be screened from view of the public way or thoroughfare in compliance with Municipal Code Section 204.050. The screen is to be a wall, solid fence, or natural barrier of a minimum of six (6) feet in height, on any side of the collection area which may be visible from a public way or thoroughfare adjacent to the collection area. Chain link and slat screening is only allowed in "M-1" and "M-2" zoning. The screen must be opaque.



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(iii) No trash receptacle may be located in a front or side yard unless located in an existing enclosure or if the existing developed site does not afford any other option; in such a case, the trash receptacle should be located in the side yard if possible and must comply with the screening requirements of this Section.

The City Administrator, based on the Community Development Department's site inspection and recommendation, will have the authority to grant an administrative variance where it is demonstrated that screening is impossible, or impractical, or would not serve the intent of this Section. After a request, in writing, for such relief, the City Administrator and the Community Development Department will notify the applicant of the determination, in writing, within thirty (30) days.

The wall, fence, or natural barrier shall be maintained in a neat, clean, sanitary, and proper mechanical condition at all times. Such maintenance, shall include, but is not limited to: replacing or repairing any missing or damaged boards, posts, concrete blocks or hinges, painted or stained wooden, metal, or concrete, and screening shall be maintained in a well-painted and stained condition, and removing and replacing any dead or diseased portions of a natural barrier.

The City may require specific maintenance if necessary to eliminate an unsightly or dangerous condition.

Temporary trash receptacles for special events, construction sites, parcel demolition or clean up, and similar, at the discretion of the Building Official or Code Enforcement Officer, are not required to comply with this Section.

(2) **Loading Areas.** All loading areas abutting a residential district shall be permanently screened from view along the abutting property line(s) by a high impact screen, as defined herein.

(3) **Mechanical Equipment.** Mechanical equipment may be either roof-mounted or ground-mounted and shall be screened as follows:

(i) **Roof-Mounted.** All roof-mounted mechanical equipment shall be screened entirely from view by using parapet walls at the same height as the mechanical units; or a solid screen around the equipment that is as tall as the tallest part of the equipment, with the screen an integral part of the building's architectural design; or the equipment setback from the roof's edge so that it is not visible from the public right-of-way.

(ii) **Ground-Mounted.** All ground-mounted mechanical equipment shall be screened entirely from view by a masonry wall, solid fence, or natural barrier (landscaping) up to a height of the units to be screened. All screens shall match the primary color and material of the primary structure.

e. **Installation.** The Building Inspector shall inspect all landscaping and no final certificate of occupancy shall be issued unless the landscaping is completely installed in compliance with the approved landscape plan.

(1) All landscaping shall be installed according to current accepted planting procedures.

(2) All plant materials shall be free from disease and installed in a fashion that ensures availability of sufficient soil and water to sustain health growth.



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(3) All trees shall be staked and include at least two inches (2") of organic mulch over the planting area.

(4) Landscape plant material suitable for planting shall be balled and burlapped or container grown. In all cases, a planting area that is at least twice the diameter of the root system or the container shall be prepared.

f. Maintenance.

(1) All landscaping materials shall be in good condition so as to present a healthy, neat and orderly appearance and shall be kept free from refuse and debris. This shall include, but not be limited to, mowing (of grass of twelve inches (12") or higher), edging, pruning, fertilizing, watering, weeding, and other activities common to the maintenance of landscaping.

(2) All landscaping shall be periodically trimmed so that it does not obstruct any public right-of-way.

(3) Diseased and dead landscape material and damaged non-living materials shall be replaced within 60 days of receipt of notice from the City by materials of equal size, density and appearance as originally required at the time of site plan approval.

(4) The owner, tenant and their agent, if any, shall be jointly and severally responsible for the maintenance of all landscaping. Lack of such maintenance and replacement shall be deemed a violation of plans approved pursuant to this Chapter.

G. Lighting.

1. Existing Outdoor Lighting Fixtures. Outdoor lighting fixtures lawfully existing prior to October 17, 2023, that do not conform to these provisions shall be deemed to be a lawful nonconforming use and may remain. A nonconforming lighting fixture that is changed to or replaced by a conforming lighting fixture shall no longer be deemed nonconforming, and thereafter such lighting fixture shall be maintained in accordance with these regulations.

2. When Plan Required. A photometric (lighting) plan shall be required for all new development, redevelopment, parking lot development or expansion where outdoor lighting is proposed or when otherwise required by the Director.

3. Plan Contents. The photometric plan shall be prepared by a lighting professional that is certified by the National Council on Qualifications for the Lighting Professions (NCQLP), or a State licensed professional engineer, architect, landscape architect or land surveyor and shall contain the following information:

a. Location and limits of the canopy or outdoor display area at a scale of not less than one inch equals 50 feet.

b. Location and height of:

(1) All underside canopy lighting for service stations and service station convenience stores, and

(2) All pole and building mounted light fixtures for outdoor display areas, and

(3) All pole lights fixtures for parking lots.

c. A photometric diagram showing predicted maintained lighting levels produced by the proposed lighting fixtures.

d. The photometric plan shall indicate footcandle levels on a ten-foot by ten-foot grid. When the scale of the plan, as determined by the Director, makes a ten-foot by ten-foot grid plot illegible, larger grid spacing may be permitted.

e. All photometric plans shall provide a breakdown indicating the maximum footcandle, minimum footcandle, and maximum average footcandles.

f. All photometric plans shall include all structure(s), parking spaces, building entrances, traffic areas (both vehicular and pedestrian), vegetation that might interfere



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with lighting, and adjacent uses that might be adversely impacted by the lighting. The plan shall contain a layout of all proposed fixtures by location, orientation, aiming direction, mounting height and type. The plan shall include all other exterior lighting (e.g., architectural, building entrance, landscape, flag, accent, etc.).

g. For projects abutting or adjacent to residential properties, a photometric plan providing the as-constructed lighting levels shall be provided to the Director prior to the issuance of a Final Certificate of Occupancy. The as-constructed photometric plan shall indicate the footcandle levels on a ten-foot by ten-foot grid.

4. Minimum Lighting Requirements.

a. Parking Lot Lighting

- (1) Fixtures. Parking lot lighting shall utilize flat lens fixtures with full cut-offs and be mounted to the parking lot light pole at 90 degrees (horizontal to the ground) and shall be non-adjustable.
- (2) Maximum Base Height. Concrete pedestals/bases shall not exceed three feet in height and shall be included in the maximum overall height.
- (3) Maximum Height. The maximum overall fixture height, measured to the top of the fixture from grade, shall be 30 feet.
- (4) Maximum Footcandles at Property Lines. The maximum maintained vertical footcandles at all property lines shall be 0.5 footcandles, measured at three (3) feet above the grade. Exceptions may only be allowed when the abutting property is not residential. Fixtures that project light or glare towards a street right-of-way shall not be permitted.
- (5) Maximum Average. The maximum average maintained footcandles for all parking lots shall be 3 footcandles.

b. Wall-Mounted Lighting.

- (1) Fixtures. All building-mounted lighting, excluding accent lighting, canopy lighting or emergency lighting, shall utilize a flat lens with full cut-offs.
- (2) Maximum Wattage. Wall-mounted fixtures shall be metal halide or LED and shall not exceed 150 watts.
- (3) Mounting Height. Wall-mounted fixtures shall be attached only to walls, and the top of the fixture shall not exceed the height of the parapet or roof, whichever is greater. For structures within 100 feet of a residential use and/or district, the mounting height of these fixtures shall not exceed 15 feet measured from the top of the fixture to grade.

c. Accent Lighting.

- (1) Definition. Accent lighting is defined as any lighting used to accent architectural features, fascia, landscaping, flags, art or other objects for architectural or landscape purposes.
- (2) Fixtures. Fixtures used for accent lighting shall be full cut-off or directionally shielded lighting fixtures that are aimed and controlled so that the directed light is substantially confined to the object intended to be illuminated to minimize glare, sky glow and light trespass. All lights shall terminate on opaque surfaces within the property.
- (3) Fixture Type Allowed. The following fixture types may be used as accent lighting:
 - (i) Neon and fluorescent tube lighting when recessed or contained in a cap or architectural reveal. A diffusing or refracting lens that covers the recess, cap or reveal shall be provided.
 - (ii) Floodlights;
 - (iii) Wall sconces or lanterns;
 - (iv) Recessed can lights; or



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(v) Any other fixture type that, in the opinion of the Director or designee, meets the intent of this section.

(4) Maximum Wattage. Fixture wattage shall not exceed 100 watts for incandescent, 26 watts for compact fluorescent, or 40 watts for other lighting sources.

d. Canopy and Drive Thru Lighting.

(1) Canopy and drive thru lighting shall be adequate to facilitate the activities taking place in such locations and shall not be used to attract attention to the business.

(2) Any facility utilizing a canopy or drive-thru area such as banks, service stations, convenience stores, car washes, etc., shall comply with the following requirements:

(i) Canopy light fixtures shall be recessed so that the lens cover is flush with the bottom surface (i.e., ceiling) of the canopy.

(ii) Indirect lighting may be used where light is beamed upward lighting the underside of the canopy. Such fixtures shall be shielded such that direct illumination is focused exclusively on the underside of the canopy. The underside of the canopy shall be finished with a surface treatment that minimizes the potential of glare.

(iii) Lights shall not be mounted on the top or sides (fascias) of the canopy, and the canopy sides or fascias shall not be illuminated except when approved as part of a preliminary development plan or separate sign permit.

(3) Areas under the service station canopy shall be illuminated so that the minimum lighting level is at least 10.0 footcandles and no more than 30.0 footcandles.

(4) Automatic teller machines (ATMs). The lighting around freestanding ATMs shall be a minimum of 5.0 footcandles and not to exceed 16.0 footcandles, measured within a ten-foot radius from the ATM or 4.0 footcandles within a 30-foot radius.

e. Outdoor Recreation Lighting.

(1) Lighting of outdoor recreational facilities (public or private), such as, but not limited to, football fields, soccer fields, baseball fields, softball fields, tennis courts, special event or show areas, shall meet the conditions in this section.

(2) Where playing fields or other special activity areas are to be illuminated, lighting fixtures shall be mounted, aimed and shielded so that their beams fall within the primary playing area and immediate surroundings.

(3) The main lighting of the facility shall be turned off no more than 60 minutes after the end of an activity or event. A low-level lighting system shall be installed to facilitate patrons leaving the facility, cleanup, nighttime maintenance, etc.

(4) The maximum mounted heights for recreational lighting shall be in accordance with the following:

(i) Football Fields—70 feet;

(ii) Soccer Fields—70 feet;

(iii) Baseball/Softball Fields (250 feet or greater)—70 feet;

(iv) Baseball/Softball Fields (less than 250 feet)—60 feet;

(v) Little League Fields—60 feet;

(vi) Basketball Courts—20 feet;

(vii) Tennis Courts—30 feet;

(viii) Swimming Pools—20 feet;

(ix) Tracks—20 feet;



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- (x) Horseshoe Courts—30 feet;
- (xi) Skate Parks—30 feet;
- (xii) Volleyball Courts—30 feet;
- (xiii) Other recreational activities shall be determined on a case-by-case basis by the Director after consultation with the City's Parks and Recreation Department and/or industry standards. In no circumstances shall heights exceed 30 feet.
- (5) The average maintained lighting levels for recreational uses, other than professional sports teams, shall not exceed the following:
 - (i) Eighty (80.0) footcandles in the infield and fifty (50.0) footcandles in the outfield for baseball/softball/little league fields. The maximum lighting level to average lighting level ratio shall not exceed 2.0:1.
 - (ii) Eighty (80.0) footcandles for football/soccer/tennis courts. The maximum lighting level to average lighting level ratio shall not exceed 2.0:1.
 - (iii) Fifty (50.0) footcandles for basketball courts/tracks. The maximum lighting level to average lighting level ratio shall not exceed 2.0:1.
 - (iv) Twenty (20.0) footcandles for swimming pools. The maximum lighting level to average lighting level ratio shall not exceed 2.0:1.
 - (v) Other lighting levels shall be in accordance with IESNA, Illuminating Engineering Society of North America standards.
- (6) All light fixtures/light poles shall be set back a minimum of one foot for every foot in height from any residential property line and/or right-of-way.
- (7) Lighting levels shall not exceed 0.5 footcandles at any common property line with residential district and/or use.

Add to Section 405.030.B: Definitions and Rules of Construction **Significant Tree**

A tree in fair or better condition that has been determined to be of a high value by a knowledgeable person because of its species, size, age or other professional criteria.

1. A tree is considered in fair or better condition if:
 - a. It's life expectancy is greater than 15 years;
 - b. It has a relatively sound and solid trunk with no extensive decay or insect infestation.
2. Hardwood trees such as oaks and hickories that are of a 12-inch caliper or more and soft-wood trees such as pines and cedars, which are 16 feet in height or more, and small hardwoods such as dogwoods, redbuds or sourwoods with calipers of 6-inches or more shall be considered significant trees due to size.

Section 405.570. Landscaping and Screening.

[Ord. No. 1825, 5-13-1991]

A. All plans submitted in support of a building permit application, except for single-family and two-family dwellings and excluding buildings in District "CBD -1," shall hereafter include a landscape plan and include screening where appropriate. Districts "R-4," "C-O," "C-1," "C-2," "M-1," and "M-2" shall provide proper screening when abutting Districts "E," "R-1," "R-1M," "R-2," and "R-3." Screening shall consist of screening fences, natural screening (earthen berms, shrubs, trees, bushes, etc.) or a combination of screening methods. The screening shall be constructed in such a manner that will protect the visual integrity, sound integrity and overall quality of the adjoining residential areas. All land areas which are to be paved or not covered by buildings shall be brought to finished grade, planted with grass or other ground cover and receive trees and shrubs in reasonable quantity and size except that where a planting area between paved areas is six (6) feet or less in width, ornamental rock or other similar ground cover may be permitted by



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the City Administrator. That area between the curb of the public street and the property line shall likewise be brought to finish grade and grass and shade trees installed. In no case may this area be paved or covered with materials other than grass except at approved driveways which shall be paved.

1. Purpose.

a. The purpose of such landscaping is to provide greenery to visually soften paved areas and buildings, provide shade, give maximum absorption of surface water and generally enhance the quality and appearance over the entire area of the project.

b. Shade trees shall be planted on all projects and shall include such species as ash, sycamore, maple, oak or comparable trees suitable to the growing environment which prevails. Shade trees shall be of two (2) to two and one-half (2½) inch trunk diameter or greater, measured one (1) foot above the ground.

2. Trash enclosure required.

[Ord. No. 3604, 9-19-2022; Ord. No. 3608, 10-17-2022]

a. All, new or substantially remodeled, multi-family residential projects, defined as any dwelling unit building with more than two (2) dwelling units, and non-residential projects, shall include, on a landscape plan, a detailed drawing of enclosure and screening methods to be used in connection with all garbage/trash receptacles, garbage collection areas, grease collectors, and trash compactors. For the purpose of this Subsection, "substantially remodeled" shall be defined as any project remodeling in which the valuation of the work involved is equal to or more than thirty percent (30%) of the current year's market value of the building per the County Assessor's office listing. For all remodeled projects which do not meet the threshold of thirty percent (30%) per the above, these properties shall be required to comply with the requirements of Section 240.050(G)(2) of the Municipal Code regarding installation of enclosures.

All garbage/trash receptacles, garbage collection areas, grease collectors, and trash compactors for all residential dwelling unit properties except for single-family and duplex properties and all non-residential uses must be permanently screened from view on all sides by a fence of one hundred percent (100%) opacity and a minimum height of six (6) feet.

Where commercial trash receptacles are used, such receptacles must be screened as follows: All screens for trash receptacles that are part of new construction projects must match the primary color and material of the structure served.

Doors accessing storage areas must remain closed at all times when not being accessed.

b. Existing trash receptacles of any size, visible from a public thoroughfare must be screened from view of the public way or thoroughfare in compliance with Municipal Code Section 204.050. The screen is to be a wall, solid fence, or natural barrier of a minimum of six (6) feet in height, on any side of the collection area which may be visible from a public way or thoroughfare adjacent to the collection area.

Chain link and slat screening is only allowed in "M-1" and "M-2" zoning. The screen must be opaque.

c. No trash receptacle may be located in a front or side yard unless located in an existing enclosure or if the existing developed site does not afford any other option; in such a case, the trash receptacle should be located in the side yard if possible and must comply with the screening requirements of this Section.

The City Administrator, based on the Community Development Department's site inspection and recommendation, will have the authority to grant an administrative variance where it is demonstrated that screening is impossible, or impractical, or would not serve the intent of this Section. After a request, in writing, for such relief, the City Administrator and the Community Development Department will notify the applicant of the determination, in writing, within thirty (30) days.

The wall, fence, or natural barrier shall be maintained in a neat, clean, sanitary, and proper mechanical condition at all times. Such maintenance, shall include, but is not limited to: replacing or repairing any missing or damaged boards, posts, concrete blocks or hinges, painted or stained



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wooden, metal, or concrete, and screening shall be maintained in a well-painted and stained condition, and removing and replacing any dead or diseased portions of a natural barrier.

The City may require specific maintenance if necessary to eliminate an unsightly or dangerous condition.

Temporary trash receptacles for special events, construction sites, parcel demolition or clean up, and similar, at the discretion of the Building Official or Code Enforcement Officer, are not required to comply with this Section.

3. Landscaping and screening.

a. All landscaping and screening shall be in place prior to issuance of final occupancy permit. All plant materials and screen fences shall be maintained, kept in a healthy and attractive state and dead plants replaced promptly. Lack of such maintenance and replacement shall be deemed a violation of plans approved pursuant to this Chapter.

b. All landscape plans shall be submitted to the City Administrator for review and approval as to adequacy prior to the issuance of a building or land use permit. In case of disapproval of a permit for reasons of unacceptable landscape planning, the applicant may appeal the decision to the Planning and Zoning Commission for review and final decision.

Section 405.145 Parking Regulations.

Two (2) off-street parking spaces shall be provided for each single-family dwelling, at least one (1) of which shall be in a garage or carport.

Section 405.147.D: Parking Regulations. Two (2) off-street parking spaces shall be provided for each single-family dwelling, at least one (1) of which shall be in a garage or carport.

Section 405.147.F.4.d: Any parking area over eight (8) spaces shall be screened from adjacent property by a combination of fences and landscape screens.

Section 405.175 Parking Regulations.

Not less than two (2) off-street parking spaces shall be provided on the premises for each family dwelling unit.

Section 405.177.D: Parking Regulations. Two (2) off-street parking spaces shall be provided for each single-family dwelling, at least one (1) of which shall be in a garage or carport.

Section 405.177.F.4.d: Any parking area over eight (8) spaces shall be screened from adjacent property by a combination of fences and landscape screens.

Section 405.190 Parking Regulations.

Two (2) off-street parking spaces shall be provided for each dwelling unit.

Section 405.210 Parking Regulations.

Two (2) off-street parking spaces shall be provided on the premises for each two (2) or more bedroom dwelling unit and one (1) space for each unit having one (1) bedroom.

Section 405.235 Parking Regulations.

Five (5) off-street parking spaces in the side or rear yard shall be provided for each one thousand (1,000) square feet of floor area.

Section 405.265 Parking Regulations.

Five (5) off-street parking spaces shall be provided on the premises for each one thousand (1,000) square feet of floor area.



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Section 405.290 Parking Regulations.

[Ord. No. 1825, 5-13-1991]

No off-street parking is required in this district. (CBD-1)

Section 405.310 Parking Regulations.

[Ord. No. 1825, 5-13-1991]

No off-street parking is required in this district, except that residences shall provide at least two (2) off-street parking spaces per unit. (CBD-2)

Section 405.330 Parking Regulations.

Five (5) off-street parking spaces shall be provided on the premises for each one thousand (1,000) square feet of floor area.

Section 405.500 Parking and Loading Regulations.

Each industrial establishment shall provide sufficient off-street parking space for all employees, customers, visitors and others who may spend time at the establishment during working hours. Not less than one (1) space for each five hundred (500) square feet of total floor area shall be provided except that in grain storage structures the floor area designed and used exclusively for grain storage shall not be included in this calculation. Such parking spaces shall be on the premises or on other property within two hundred (200) feet of an employee entrance to the building being served. Each establishment shall also provide adequate loading space within a building or on the premises in such a way that all storage, standing and maneuvering of trucks and other service vehicles shall be off the public right-of-way.

Section 405.520 Parking and Loading Regulations.

Each industrial establishment shall provide sufficient off-street parking space for all employees, customers, visitors and others who may spend time at the establishment during working hours. Not less than one (1) space for each five hundred (500) square feet of total floor area shall be provided except that in grain storage structures the floor area designed and used exclusively for grain storage shall not be included in this calculation. Such parking spaces shall be on the premises or on other property within two hundred (200) feet of an employee entrance to the building being served. Each establishment shall also provide adequate loading space within a building or on the premises in such a way that all storage, standing and maneuvering of trucks and other service vehicles shall be off the public right-of-way.

Section 405.525.C.1.c(1): Off-street parking at a rate of one (1) space per employee plus two (2) additional spaces for guests.

Section 405.525.E: Parking requirements for special uses shall be recommended by the Planning and Zoning Commission and approved by the Board of Aldermen. The following shall be taken into consideration when reviewing and approving parking requirements.

1. The use of the facility.
2. The square footage of the building.
3. The surrounding land uses and zoning districts.
4. The relationship to streets.
5. The topography of the site.

Section 405.525.F: Where appropriate, the parking regulations of the underlying zoning district or the most analogous zoning district shall be followed.

Section 405.550.A.3.a: For any "R-1," "R-1B," "R-1M," "R-2," or "R-2B" zoned lot, two (2) detached accessory building(s) may be permitted, one (1) of the two (2) may be an accessory dwelling unit



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for any "R-1", or "R-1B". **Except that properties zoned R-1 of 1.5-acre or larger in size may have one additional detached accessory structure provided all setbacks are met and the lot coverage requirement is not exceeded.** For any "R-3" or "R-4" zoned lot, one (1) or more detached accessory buildings may be permitted. Accessory structures are permitted as long as said structure complies with the standards outlined within the Zoning Code of Ordinances for the City of Harrisonville ("Code"), as enacted from time to time. A detached accessory building shall be located not less than eight (8) feet from any side or rear lot line and no closer to the front of the building than eight (8) feet. Accessory buildings required to be supported by a concrete foundation shall not be located within a dedicated easement of any kind. The accessory building shall be complementary with construction type, style and color of the primary structure. In the case of corner lots, accessory buildings shall be set back not less than the distance required for residences from side streets. Lot coverage for the house and any accessory structure shall not exceed thirty-five percent (35%). All accessory structures are to be approved by the Director of Community Development, **or the Housing and Zoning Specialist**. Any appeals shall be directed to the Board of Aldermen and that action shall be final.

Section 410.350.C.2: A landscape plan for all areas along the fifty (50) foot buffer strip shall be submitted to and approved by the Community Development Department. The landscape plan shall be submitted with the preliminary plat. Improvements indicated on the landscape plan shall be established by the developer prior to the issuance of building permits or certificates of occupancy. All landscaping must be established according to the Guidelines for Landscaping Along Arterial Roadways.

Section 410.430: In both residential and commercial developments, accessways for pedestrian and maintenance purposes shall be provided by the developer to greenways, parks and open space areas. **according to the Guidelines for Access to Park, Greenway and Open Space Areas.**

Section 410.490.J.8: Administrative guidelines. The Community Development Director is authorized, as deemed necessary, to prepare administrative guidelines to augment, implement and provide further details and examples of methods and manners of complying with the minimum design standards of this Section and to assist City staff, the Planning and Zoning Commission and the Board of Aldermen in evaluating whether a proposed subdivision complies with the minimum design standards.

The initial administrative guidelines to accompany the subdivision ordinance shall be the administrative guidelines established by resolution of the Board of Aldermen initially upon adoption of this Chapter and thereafter as provided for in this Chapter.

STAFF REPORT

TO: Planning & Zoning Commission

FROM: Christina Stanton,

DATE: September 14, 2023

**SUBJECT: Code Amendments--Creation of Design Standards and Amendment to
Section 405.550.A.3.a CONSIDERATION**

Type of Item: *Approval*

F. Action Item (ID # 4631)

Code Amendments--Creation of Design Standards and Amendment to Section 405.550.A.3.a
CONSIDERATION