



THE CITY OF
HARRISONVILLE
WHERE TRADITION MEETS INNOVATION

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

1. **Call to Order**
 - A. **Roll Call**
2. **Approval of Minutes**
 - A. **Planning & Zoning Commission - Regular Meeting - Jul 20, 2023 6:00 PM**
3. **Agenda Items**
 - A. **Appl. #PP-23-002--Preliminary Plat for Harrisonville Commons, Lots 1 - 3 and Tract A**
4. **Discussion Items**
5. **Adjourn**

Posted on City Hall Bulletin Board this 11th day of August, 2023.

Daniel Barnett

Daniel Barnett, City Clerk



THE CITY OF HARRISONVILLE

WHERE TRADITION MEETS INNOVATION

DRAFT
MINUTES
CITY OF HARRISONVILLE
PLANNING & ZONING COMMISSION
REGULAR MEETING
CITY HALL
JULY 20, 2023
6:00 PM

1. Call to Order

The meeting was called to order at 6:00 PM by Kevin Wood

Attendee Name	Organization	Title	Status	Arrived
Kevin Wood	Harrisonville		Present	
Chris Chiodini	Harrisonville	Chair	Present	
Scott Milner	Harrisonville		Present	
Cheryl Bush	Harrisonville	Board Member	Present	
Wilbert Crawford	Harrisonville		Present	
Mike Zaring	Harrisonville	Mayor	Absent	
Brian Pulliam	Harrisonville		Absent	
Paul Mensching	Harrisonville		Absent	
Milton Siegenthaler	Harrisonville		Present	

Also in attendance were Donovan Jones and Steve Warger, Applicants; Christina Stanton, Community Development Director; and Jamie Martin, Recording Secretary.

2. Approval of Minutes

A. Planning & Zoning Commission - Regular Meeting - Jun 15, 2023 6:00 PM

With no additions or corrections, the minutes from the June 15, 2023, meeting were unanimously accepted.

RESULT:	ACCEPTED [UNANIMOUS]
MOVER:	Chris Chiodini, Chair
SECONDER:	Wilbert Crawford
AYES:	Wood, Chiodini, Milner, Bush, Crawford, Siegenthaler
ABSENT:	Mike Zaring, Brian Pulliam, Paul Mensching

3. Agenda Items

A. Appl. #PREDEV-23-001--Prelim. Devel. Plan for Multi-Family and a Senior Living Facility - Public Hearing

Director Stanton presented the Preliminary Development Plan application for multi-family and senior living complex at 1800 E. Mechanic Street from R.L. Buford. The proposed preliminary development plan for Lot 1 and Lot 2 consists of eight 3-story apartment buildings with a total of 288 units with 96 of them being 2 bedrooms, 96 being 1 bedrooms, and 96 being studio apartments. The complex will have amenities including: a clubhouse, pool, two pickleball courts, beach volleyball, playground, and a dog park. Lot 3 is proposed as a 40,000 square foot, 80 unit senior living facility. Director Stanton said that the current zoning is RP-4, Planned Medium Density Apartment District. She said that the proposed apartment complex and senior living facility are appropriate uses for the district, but since the current structure is going to be demolished and a different use being constructed, the preliminary plan is necessary. Director Stanton said that planned districts are to provide for and encourage latitude and flexibility. However, there are standards that have to be met. One of these standards are parking requirements. She said that the multi-family portion of the proposed development is 51 space short of the required parking. The applicant is proposing to remedy this by allowing shared parking between the apartments and the senior living facility. There is a slight discrepancy between the Preliminary Development Plan, 78, and the Traffic Impact Analysis' 80 number of units for the senior living facility. Depending on which is correct, the number of spaces available for shared parking is between 50 and 52. She said that Staff has concerns that the apartment complex could be developed and the senior living facility might not be developed or might be stalled; or that Lot 3 may be sold to another entity and a condition has been added for this. Director Stanton also said that the 2040 Comprehensive Plan shows this area as "Community Mixed Use". This place type is intended to include a "broad range of retail, service, office, and residential uses together in a town center format". A broader look at the existing nearby commercial uses, the use of the property as multi-family and senior living facility is compatible with the City's vision of this area being "Community Mixed Use".

Staff recommends approval of the proposed Preliminary Development Plan for the 288 apartment units and the 40,000 square foot Senior living facility with the following conditions: A) A Preliminary Plat and Final Plat shall be submitted, reviewed, and approved prior to the issuance of any development related permits, including building or infrastructure. B) Easements shall be provided as required by Municipal Code. C) The subdivision name shall "not duplicate or closely approximate the name of any existing subdivision" in accordance with Sections 410.270.A.1 and 410.290.F.1, which the Applicant has changed the name to Harrisonville Commons. D) Parking shall be installed on Lot 3 prior to the development of Lot 3 if the Board of Aldermen deems it necessary to meet the demands of the apartment buildings. E) Eastbound and westbound left turn lanes on 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. F) The engineers design and the owners shall construct the site's storm drainage in a manner that will not adversely impact the adjacent and downstream residents. The developer is working with engineers on this currently. G) No more than twelve percent of the total number of housing units shall be "affordable units". Affordable units are defined as units rented to those with a state, or federal, government housing subsidy or voucher, which was approved by ordinance at the Board of Aldermen meeting on July 17, based on housing studies.

Steve Warger, R.L. Buford, spoke to the Commission. He said that he wanted to address the conditions in the Staff Report. He said that he understands that the parking stalls are a little short because they were including more amenities. He asked for an exception to the parking condition, stating that they put an agreement in place if Lot 3 were to be sold. He also said the plans for the turn lanes on MO-7 have been submitted to MODOT, not finalized, but in process. He also addressed the condition for stormwater. He said he has spoke with the City Engineer about a drainage study with before conditions, and that they have been working together on this.

Chris Chiodini voiced his concerns about the traffic on Elm Street coming from the schools. Mr. Chiodini asked if the traffic study included traffic patterns to and from the high school and the impact on buses? Mr. Warger said that the traffic study was handled

when school was in session .

Mr. Chiodini said that being shy on parking spaces could be a potential problem because families more often than not have multiple vehicles. Mr. Chiodini also mentioned that there have been major storms that have caused serious flooding south of the development site and that this is a major concern. Mr. Warger said that they are looking into ways to help relieve some of these issues.

Donovan Jones, Developer, told the Commission that he is planning on holding this property long term. He said that the worry with drainage is a concern of his also and he is a horticulturist, that is why he has included a lot of green space.

Kevin Wood asked to know more about the senior living facility. Mr. Jones said that it would be 55 years and older.

Mr. Wood asked it would be a care facility. Mr. Jones said no it would just be senior living.

Chris Chiodini asked if the structures would be maintenance free. Mr. Jones said that he intends to use aluminum stairs and balconies so they will be maintenance free, he will be using concrete board that will be stained on the buildings to also be maintenance free, and that he will be using 30 year roofs.

Mr. Chiodini asked Mr. Jones if he had a dollar amount per square foot estimate for the rent on these apartments. Mr. Jones said he is having a hard time finding comps in the area as most of the apartments in Harrisonville were built in the 70's. He did say that he is hoping they would range from \$835.00 to \$1,200.00 for a 3 bedroom.

Mr. Jones told the Commission that he has been working with the City's Economic Development Director on different tax credits and those are in process.

Mr. Jones added that the road from the school is a concern of his also, as it is a concern for his potential residents safety. He said he will most likely use speed bumps to help with people speeding through the complex.

Chris Chiodini asked Mr. Jones about other projects he has done. He listed several and said that he worked on them as a sub-contractor.

Director Stanton told the Commission that the speed limit on Elm Street is in the process of changing from 35 MPH to 25 MPH.

The Public Hearing was closed at 6:30 PM.

B. Appl. #PREDEV-23-001- Prelim. Devel. Plan for Multi-Family and a Senior Living Facility - Consideration

Chris Chiodini made a motion to recommend approval of the Preliminary Development Plan to the Board of Aldermen with all 7 conditions presented in the Staff Report. Cheryl Bush seconded the motion.

A roll call vote was taken. The motion passed unanimously.

RESULT:	RECOMMENDED FOR BOARD APPROVAL [UNANIMOUS]
MOVER:	Chris Chiodini, Chair
SECONDER:	Cheryl Bush, Board Member
AYES:	Wood, Chiodini, Milner, Bush, Crawford, Siegenthaler
ABSENT:	Mike Zaring, Brian Pulliam, Paul Mensching

4. Discussion Items

Director Stanton told the Commission that this Preliminary Plat will go before the Board of Aldermen in August. She also said that she is currently working on some more code changes that will come to Commission before going to the Board in the near future. There was some discussion about the application at the previous meeting not being approved by the Board of Zoning Adjustments, and this will hopefully be one of the changes in codes pertaining to larger lots and design standards. Director Stanton said that the City's parking standards have not changed since 1978, and that this is another change that will be coming.

5. Adjourn

With nothing further to come before the Commission, Chris Chiodini made a motion to adjourn. Wilbert Crawford seconded. The meeting adjourned at 6:41 PM.

Respectfully submitted,

Jamie Martin, Recording Secretary

Minutes Acceptance: Minutes of Jul 20, 2023 6:00 PM (Approval of Minutes)

STAFF REPORT

TO: Planning & Zoning Commission
FROM: Christina Stanton,
DATE: August 10, 2023
SUBJECT: Appl. #PP-23-002--Preliminary Plat for Harrisonville Commons, Lots 1 - 3 and Tract A

Type of Item: *Preliminary Plat*

A. Action Item (ID # 4601)

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

Attachments:

Harrisonville Commons PP 8-17-23 P&Z (PDF)

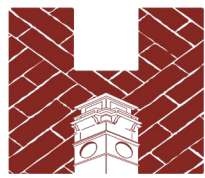
Application (PDF)

CA-23008_PRELIM_PLAT-PRELIM PLAT (PDF)

Traffic Impact Analysis 7-11-2023 (PDF)

Zoning Map (PDF)

Aerial Map (PDF)



To: Planning & Zoning Commission

From: Christina Stanton, AICP, Community Development Director

Date: August 17, 2023

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

GENERAL INFORMATION

Applicant: Donovan Jones

Requested Actions: Approval of Preliminary Plat

Date of Application: July 11, 2023

PROPOSAL

Donavan Jones is seeking approval of the attached preliminary 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 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 preliminary 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 side of the extended Oriole Street will have the required sidewalk.

PROCEDURE

In accordance with Section 410.260.F.1: "The Planning and Zoning Commission shall determine, based on the evidence before it, whether the preliminary plat meets the design standards and requirements of these Subdivision Regulations and conforms to the requirements of the zoning regulations and other applicable provisions of the policies and standards of the City of Harrisonville." Subparts a, b, and c state the action the Planning and Zoning Commission is to take if the preliminary plat complies with all requirements, if the preliminary plat is in general compliance but not complete compliance, and if the preliminary plat is not in compliance with all requirements (respectively). After staff's thorough review of the proposed preliminary plat staff's professional opinion is that the preliminary plat is in compliance with the design standards and Subdivision Regulations and is recommending that the Planning and Zoning Commission recommend conditional acceptance of the preliminary plat as stated below.

STAFF RECOMMENDATION

Staff recommends approval of the requested preliminary 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).

ATTACHMENTS

1. Application and Preliminary 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: Donavan Jones
 Company Name: Gardens of Harrisonville, LLC
 Street Address: Po Box 616 City: Raymore State: MO Zip: 64083
 Phone: 816-797-6565 Email: donavanjones@icloud.com

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

Property Owner Name (print): Gardens of Harrisonville, LLC
 Street Address: Po Box 616 City: Raymore State: MO Zip: 64083
 Phone: 816-797-6565 Email: donavanjones@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: 1600 E Mechanic St.
 Project Description: Multifamily Apartments
 Acres or Sq. Ft. 12.8
 Current Zoning: RP-4 Proposed Zoning: RP-4

For Office Use Only

Case No: PP-23-002 Filing Fee: Amount Paid \$ \$380.00 Date Application Received: 7/11/23
 Staff-only approval: N/A P&Z meeting: 8/17/23 BOA Meeting: 8/21/23



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

Attachment: Traffic Impact Analysis 7-11-2023 (Appl. #PP-23-002--Preliminary Plat for Harrisonville Commons, Lots 1 - 3 and Tract A)

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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

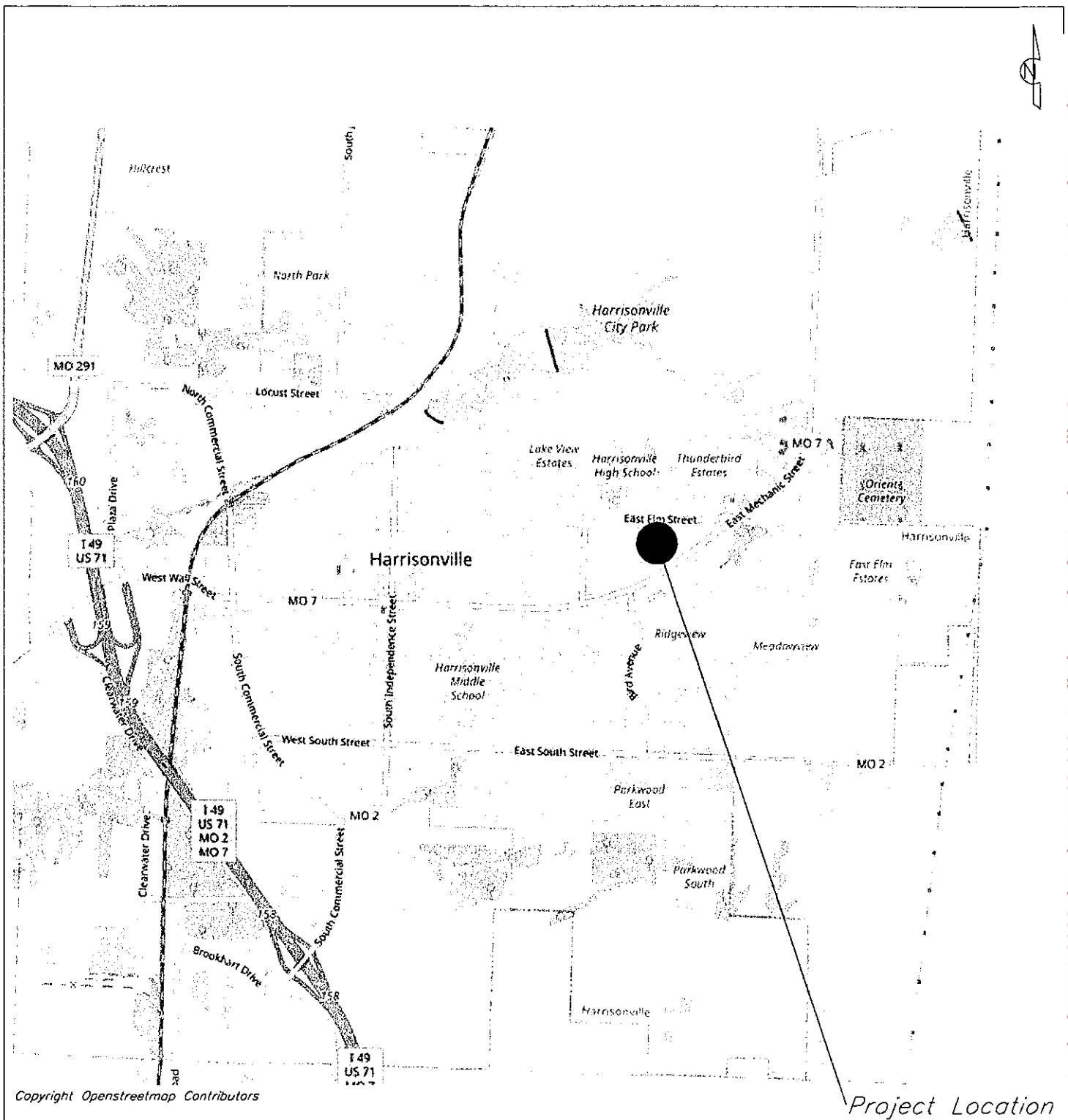
This study documents the impact of the proposed Gardens of Harrisonville development. This development includes a 40,000 square foot building which may be developed as a library. Alternatively, this same area within the site may be developed as 80 units of senior housing. Both possibilities were analyzed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

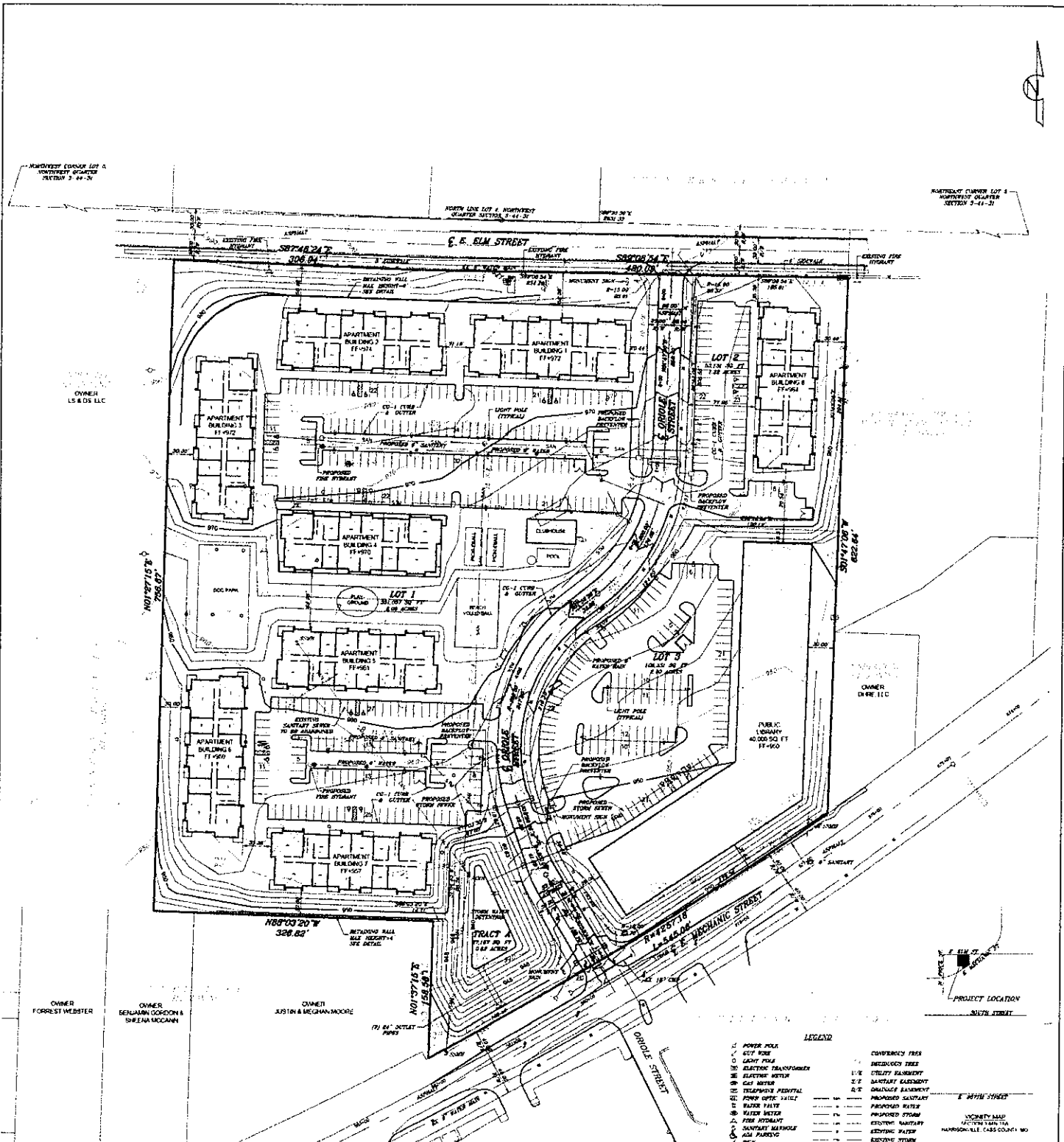
APPENDIX I

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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) PM Peak Hour Lane Configurations & Levels of Service	Figure 10
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Project Location

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



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Site Plan

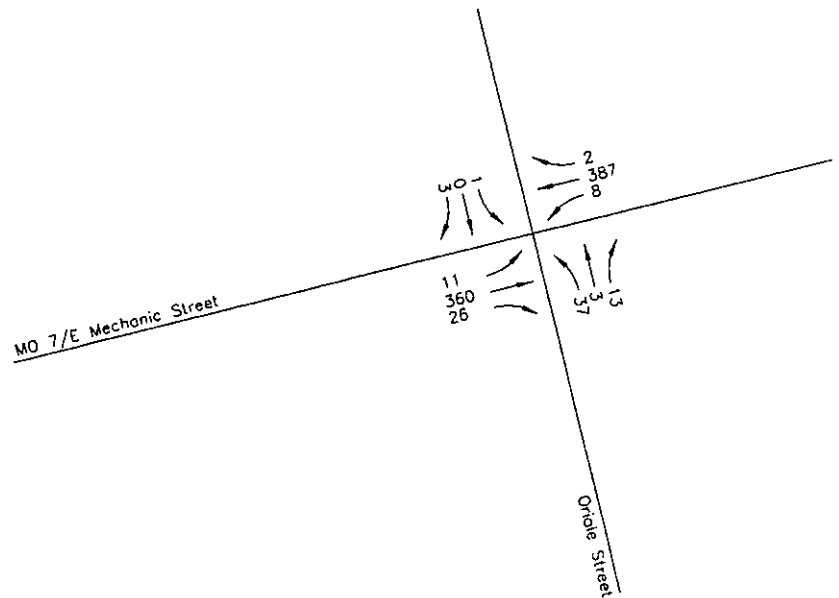
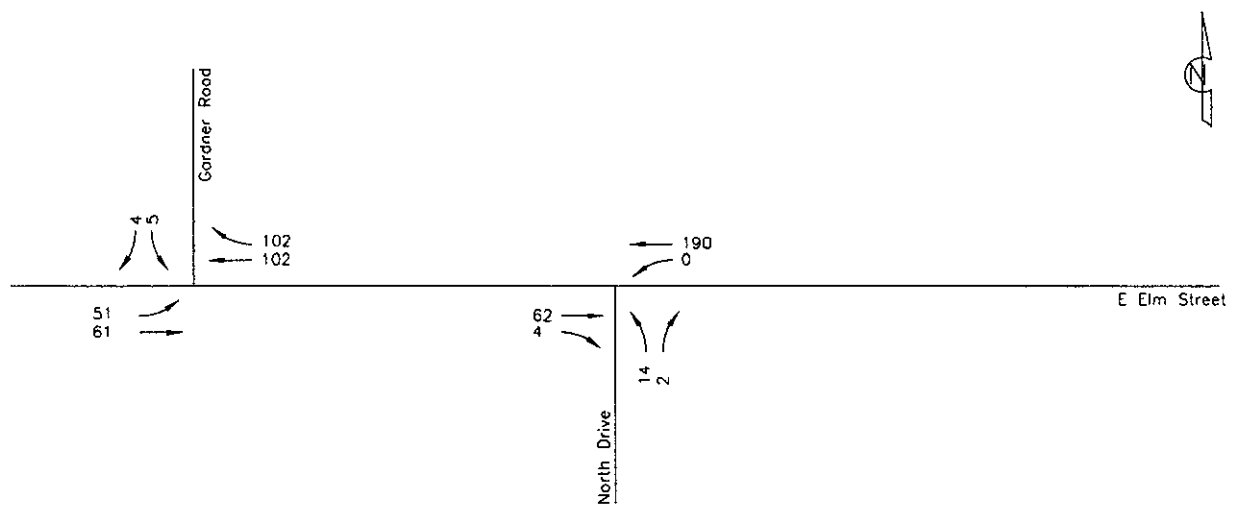
Gardens of
 Harrisonville
 Harrisonville, MO

No Scale

Figure 2



Priority
 ENGINEERS



LEGEND
 Total Volume

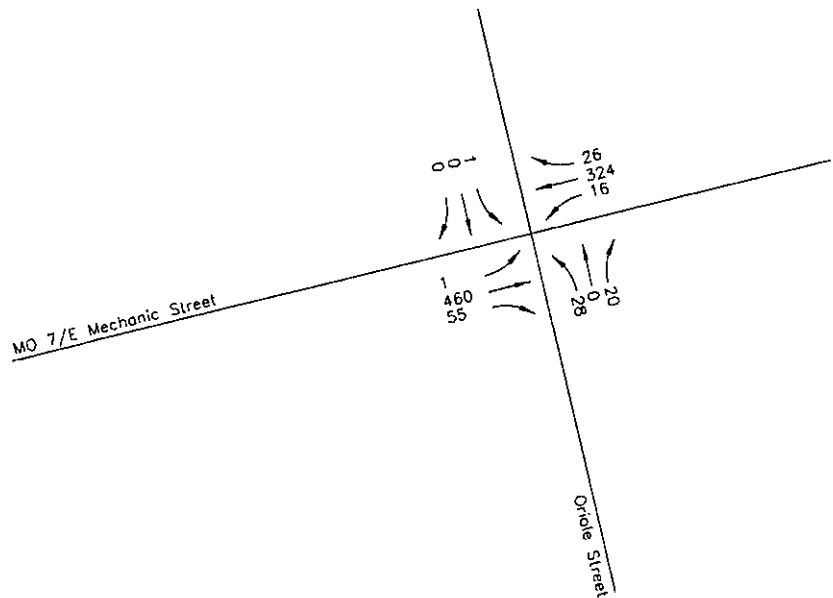
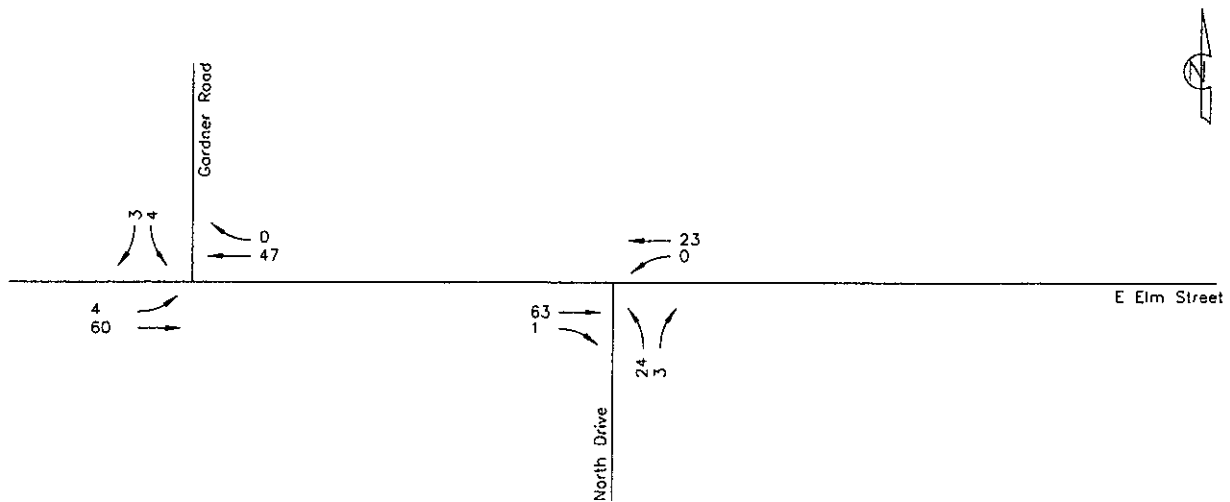
Existing AM Peak Hour
 Traffic Volumes

Gardens of
 Harrisonville
 Harrisonville, MO

No Scale
 Figure 3



Priority
 ENGINEERS



LEGEND

 Total Volume

Existing PM Peak Hour
Traffic Volumes

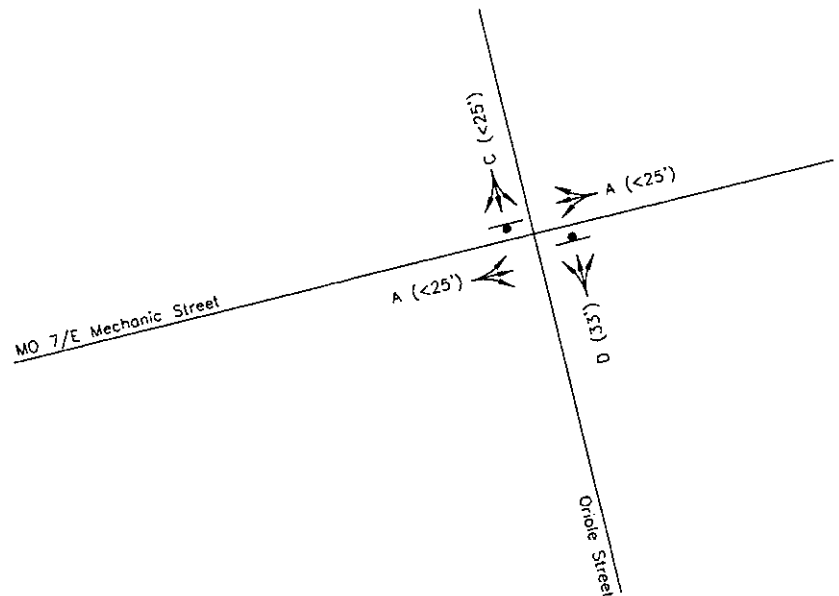
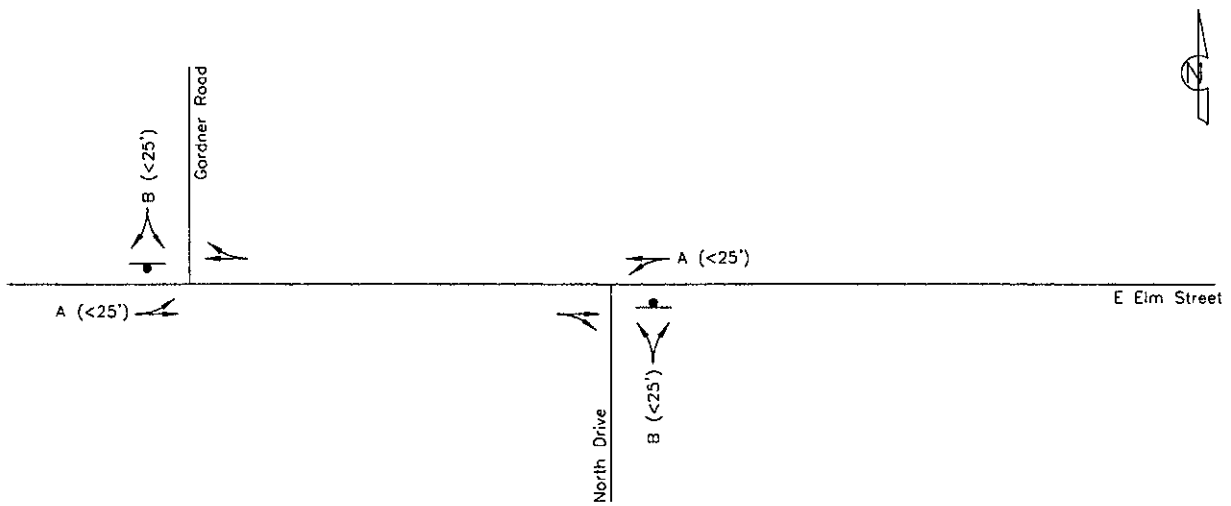
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 4



Priority
ENGINEERS



LEGEND

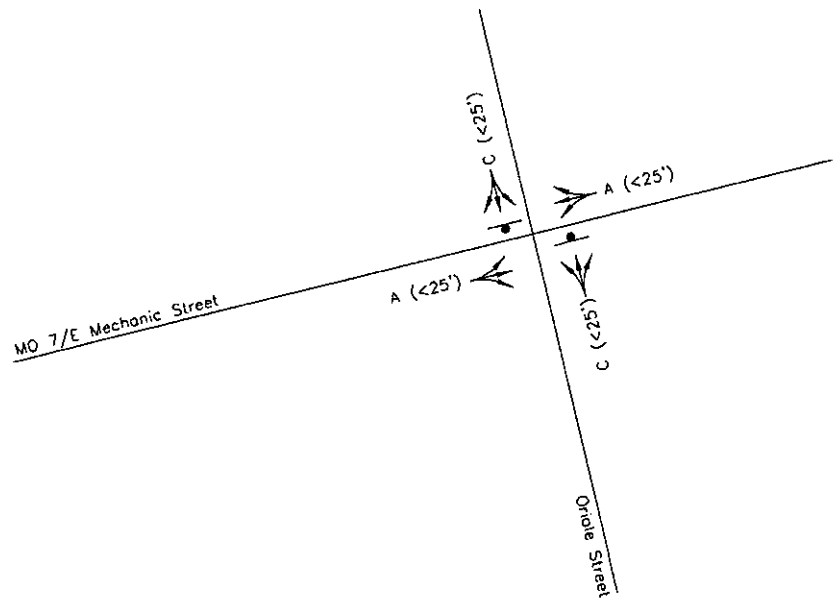
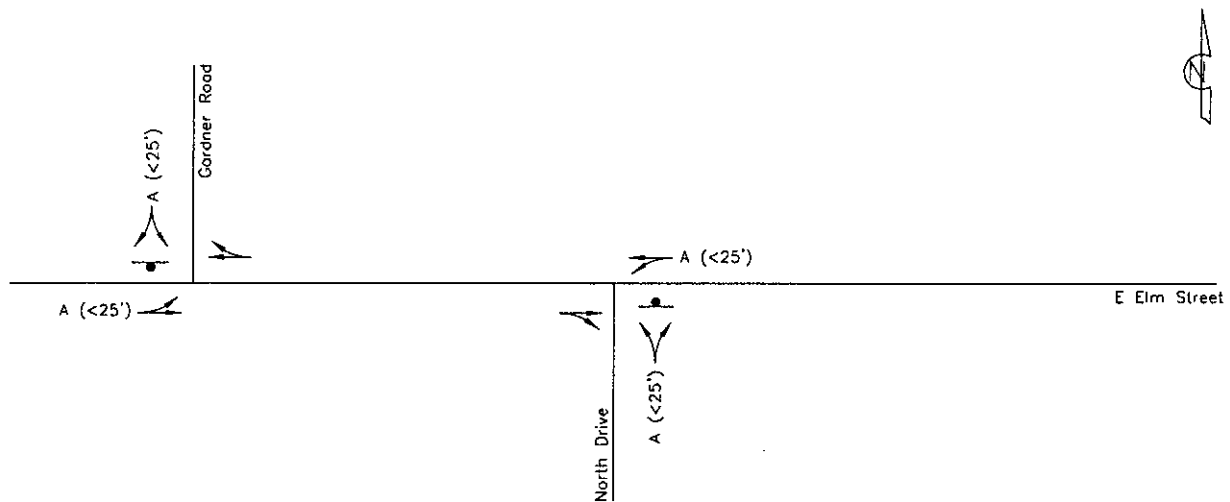
-  HCM LOS (95th Percentile Queue in Vehicles)
-  Stop Sign
-  Traffic Signal LOS

Existing AM Peak Hour
Lane Configurations &
Levels of Service

Gardens of
Harrisonville
Harrisonville, MO

No Scale
Figure 5





LEGEND

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

Existing PM Peak Hour
Lane Configurations &
Levels of Service

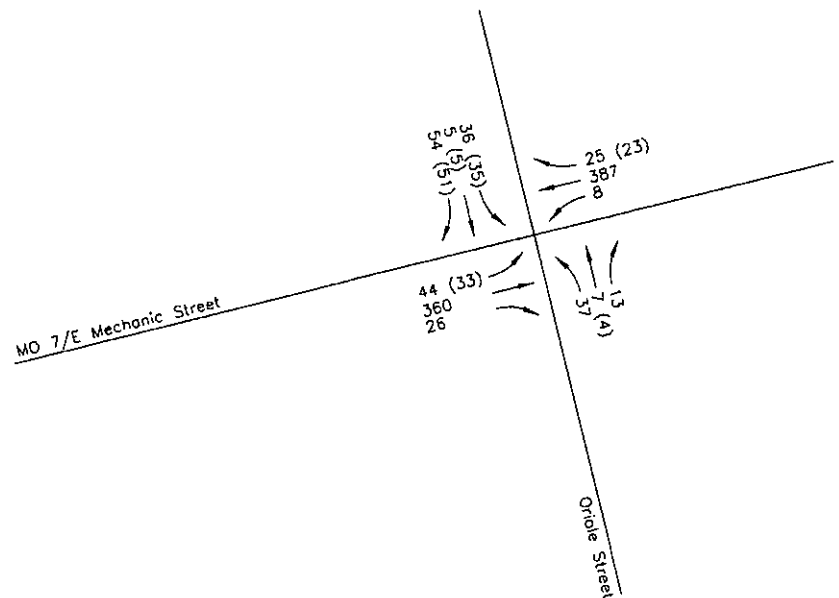
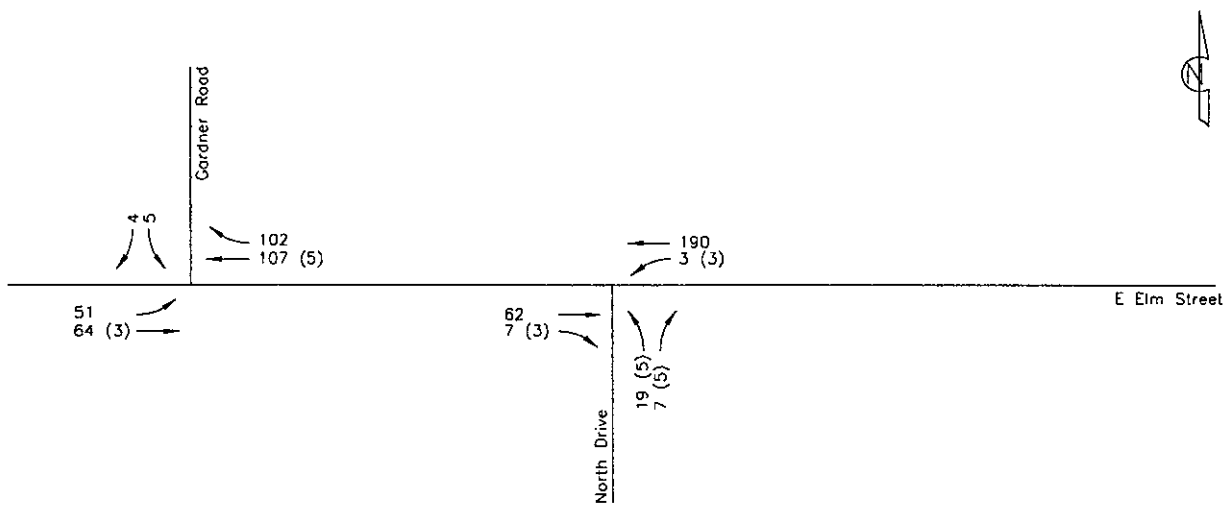
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 6



Priority
ENGINEERS



LEGEND

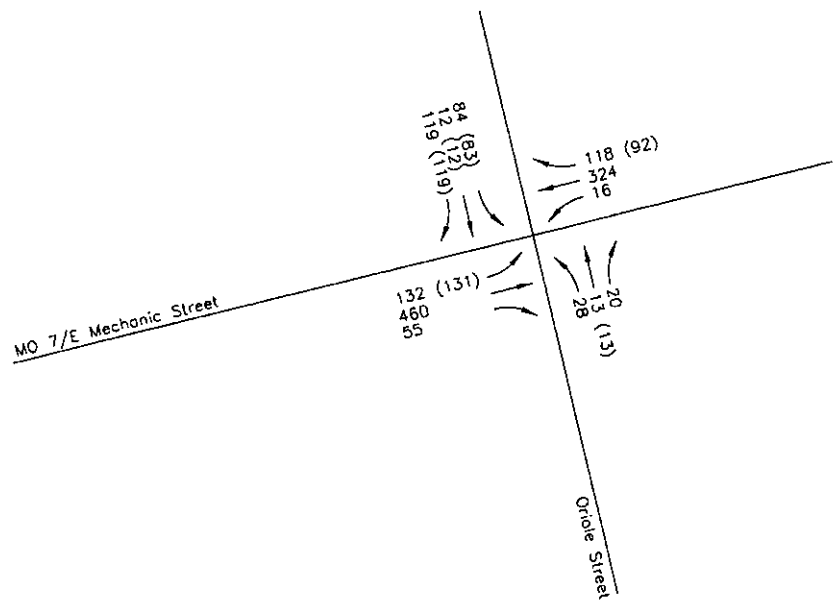
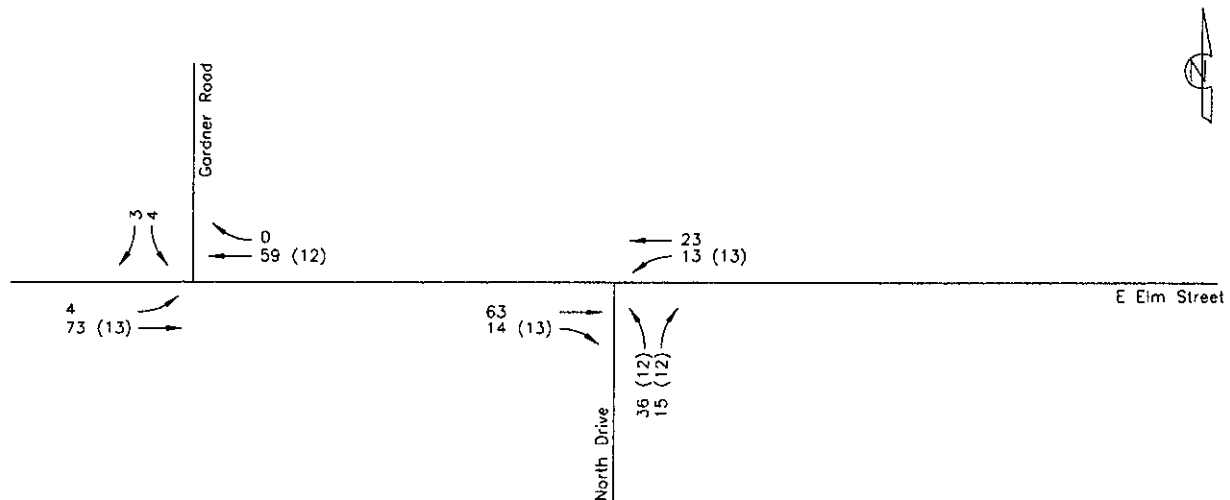
 Total Volume (New Trips)

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

Gardens of
Harrisonville
Harrisonville, MO

No Scale
Figure 7





LEGEND

 Total Volume (New Trips)

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

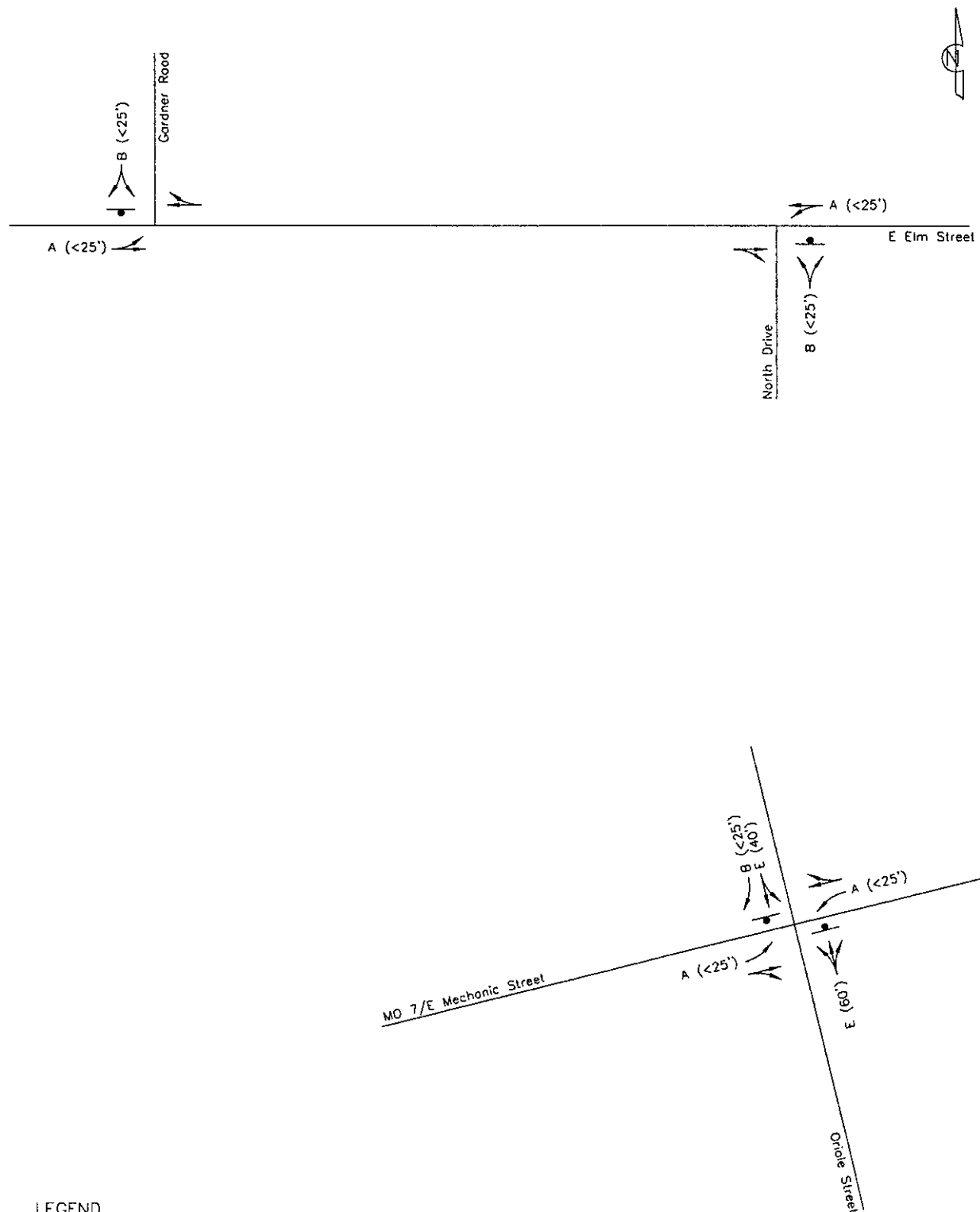
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 8



Priority
ENGINEERS



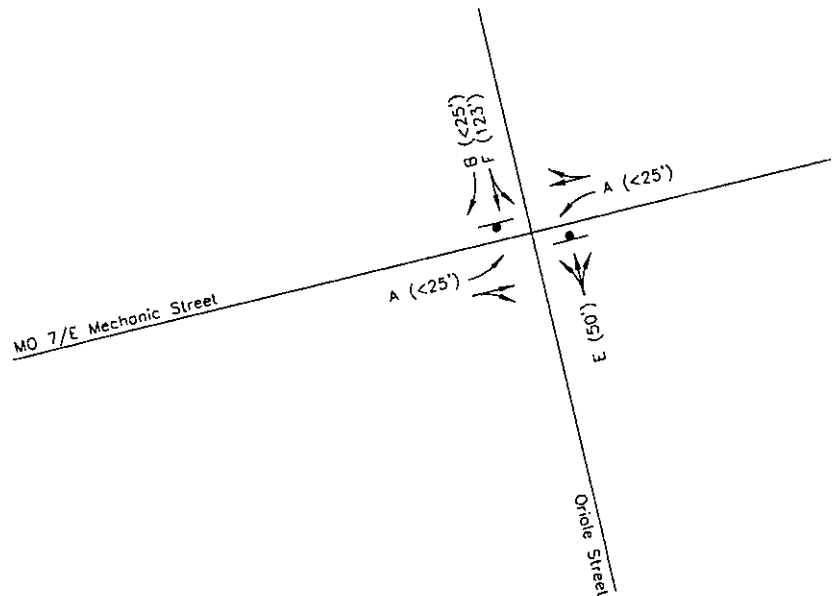
Existing + Proposed Development
(with Library)
AM Peak Hour Lane Configurations
& Levels of Service

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

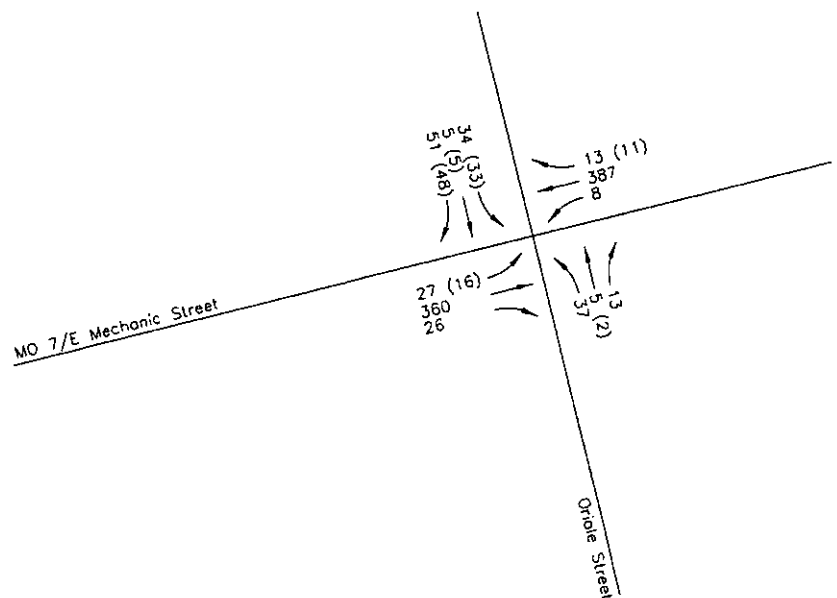
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 10



Priority
ENGINEERS



LEGEND

Total Volume (New Trips)

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

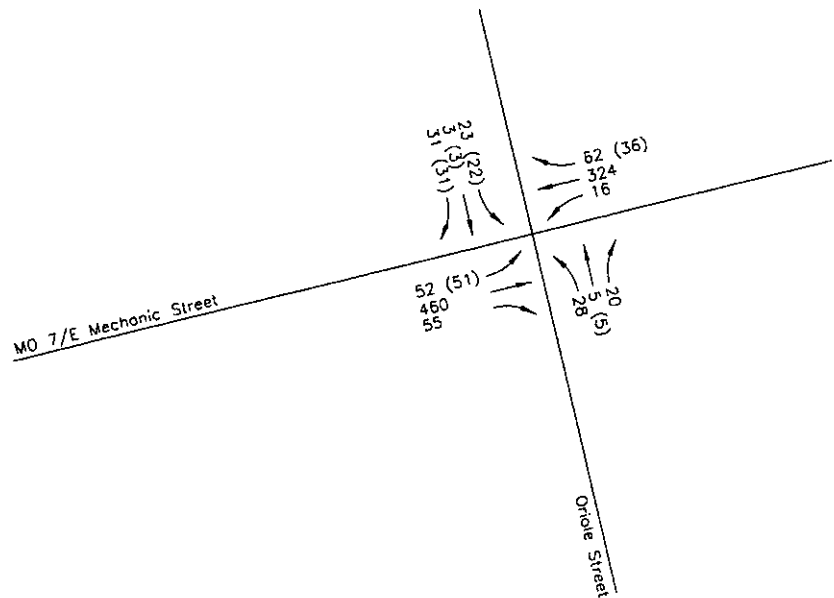
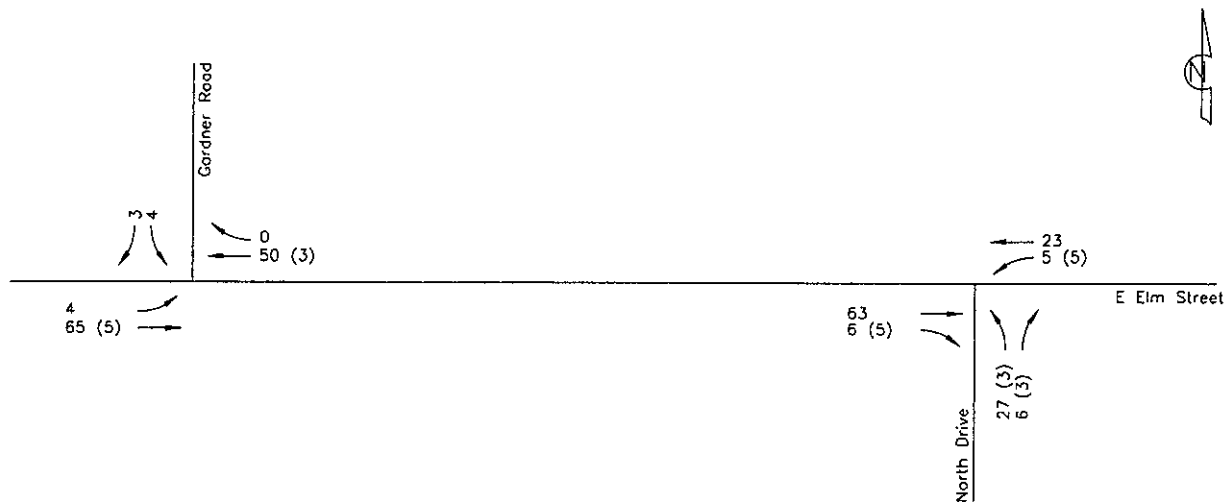
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 11



Priority
ENGINEERS



LEGEND

 Total Volume (New Trips)

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

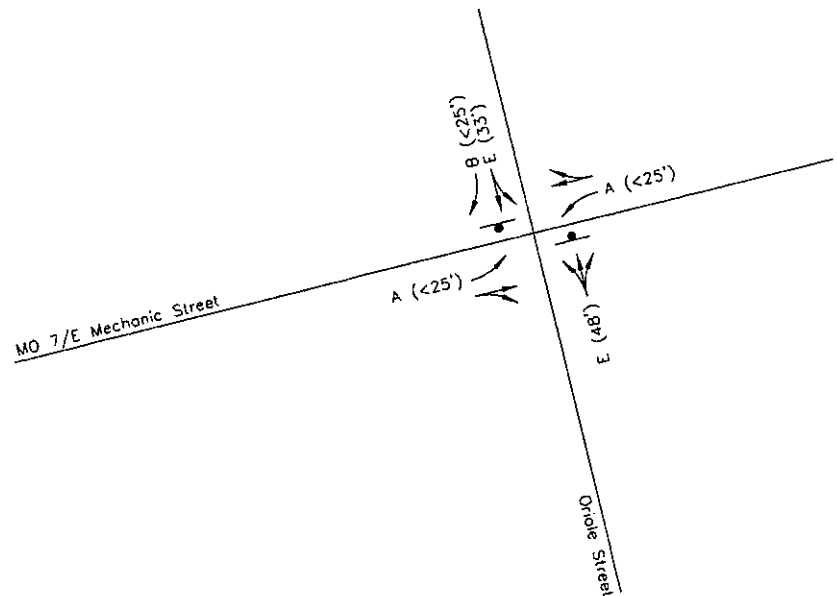
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 12



Priority
ENGINEERS



LEGEND

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

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

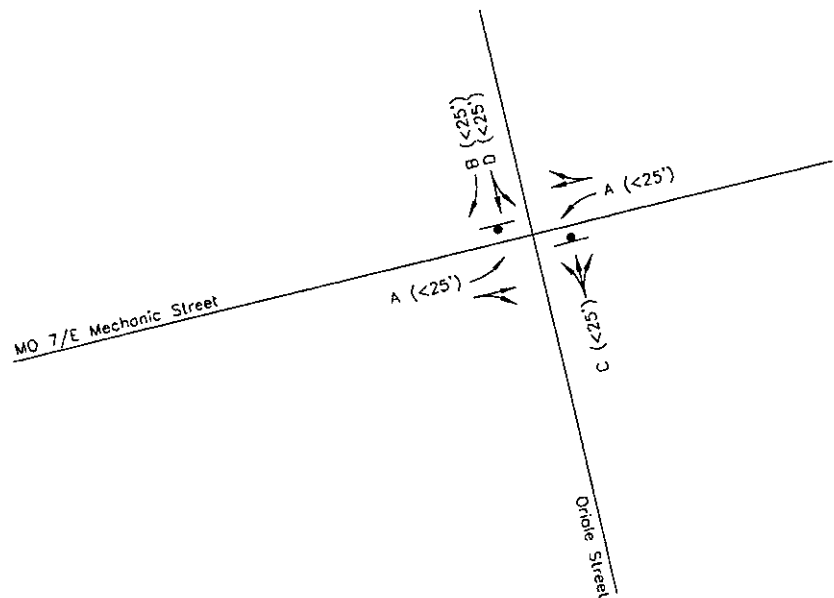
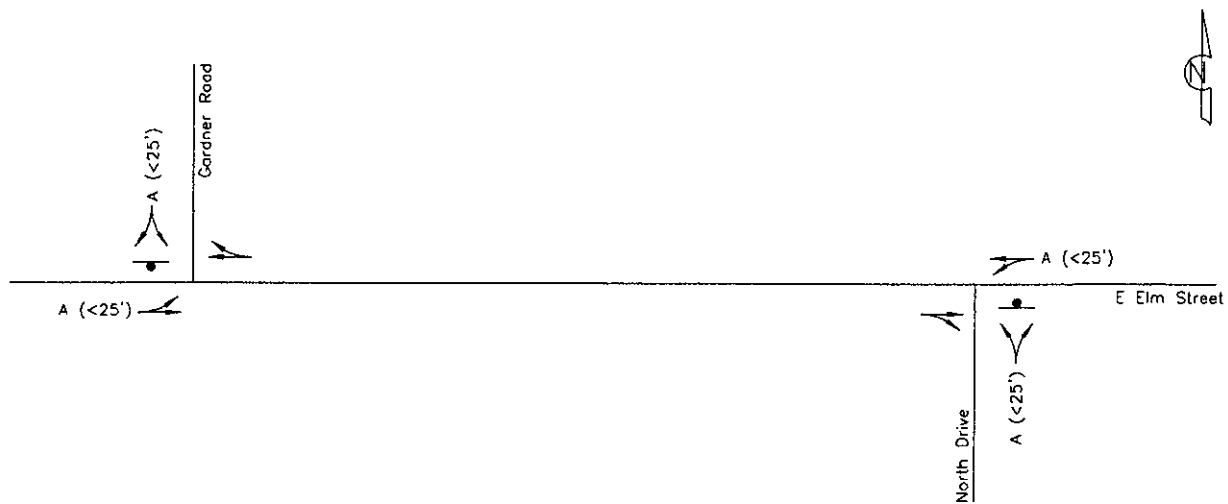
Gardens of
Harrisonville
Harrisonville, MO

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

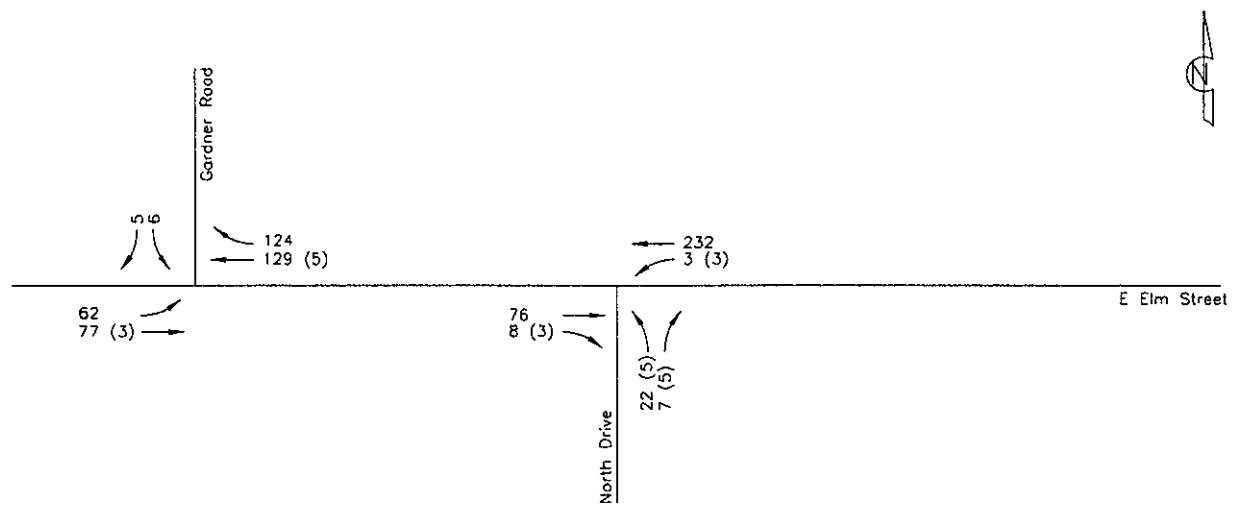
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 14



Priority
ENGINEERS



LEGEND

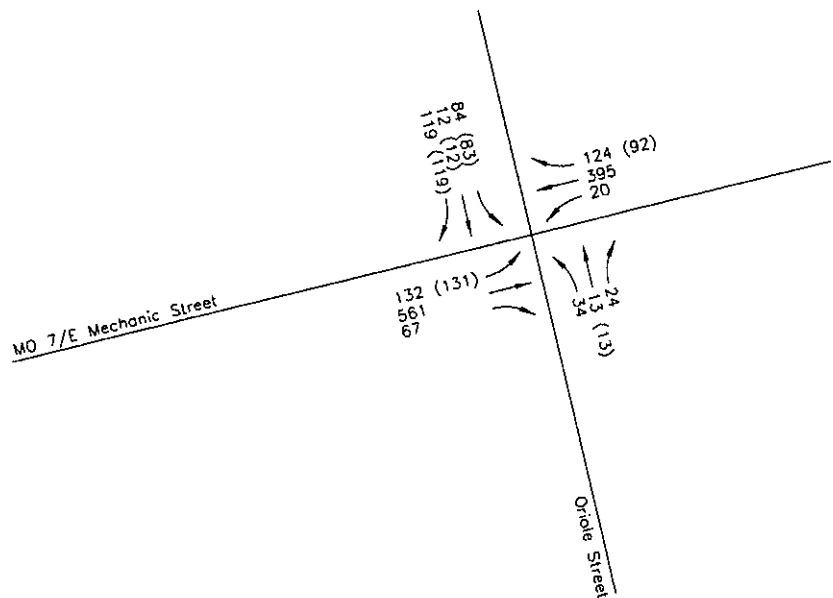
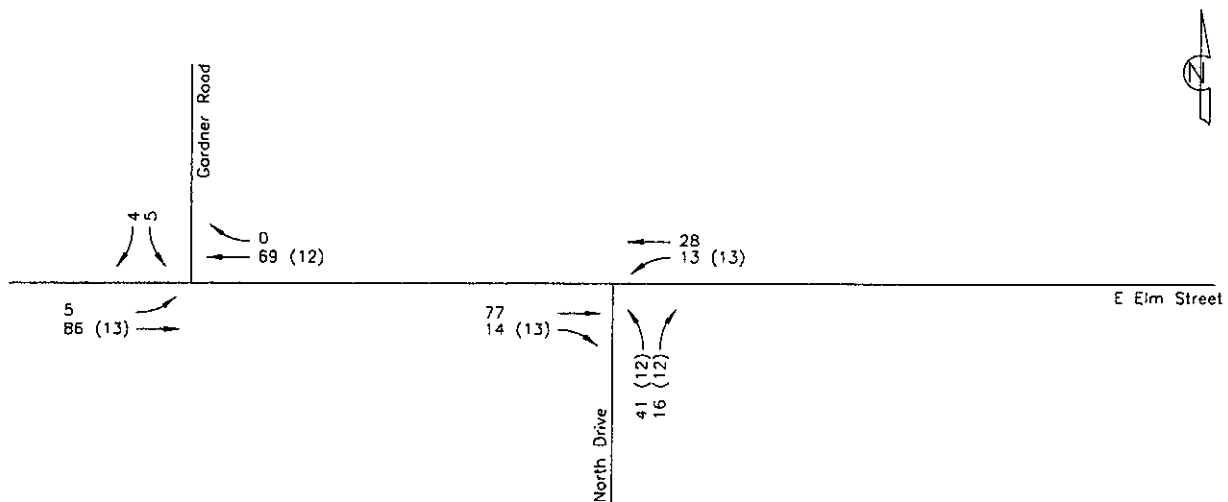
➤ Total Volume (New Trips)

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

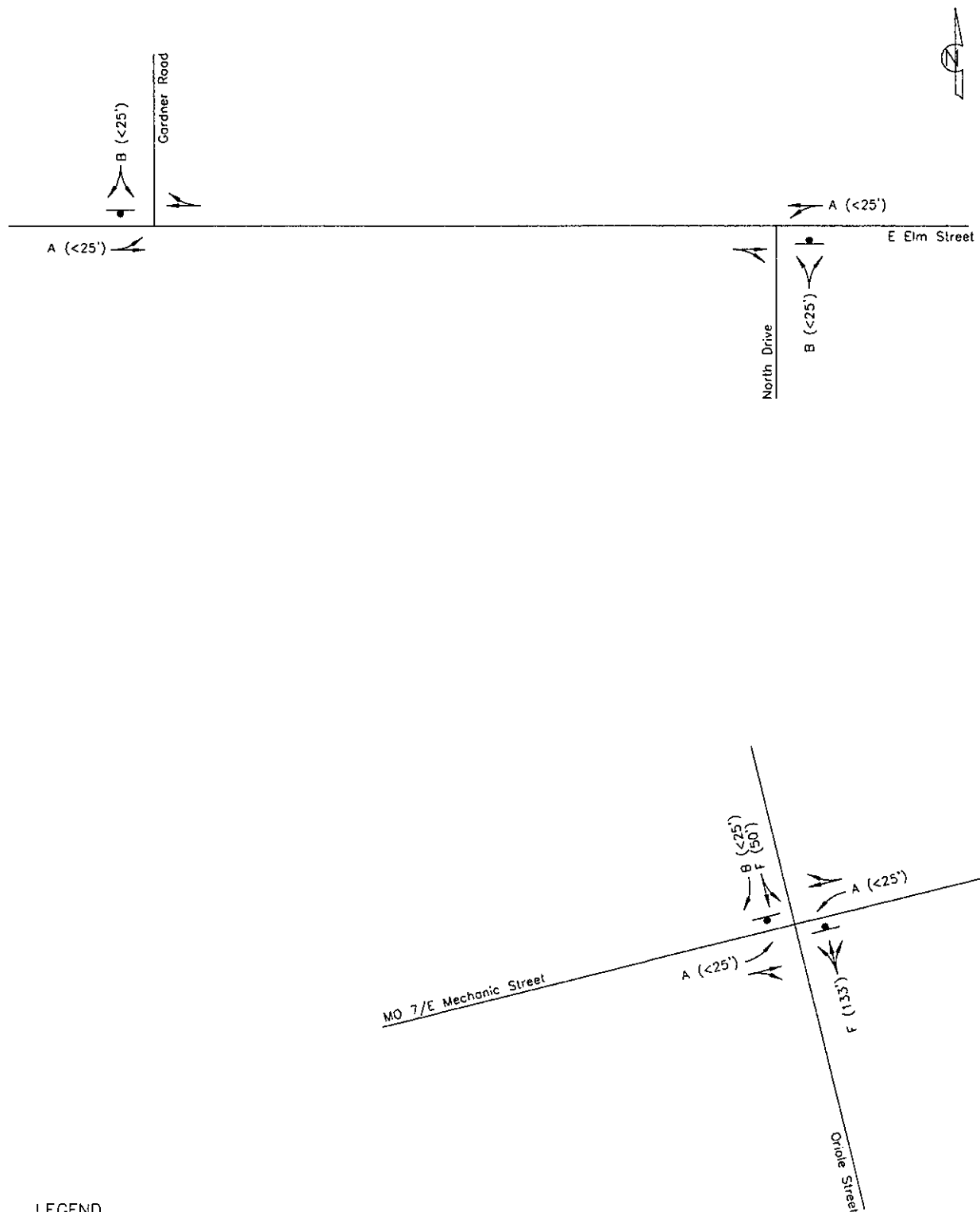
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 16



Priority
ENGINEERS



LEGEND

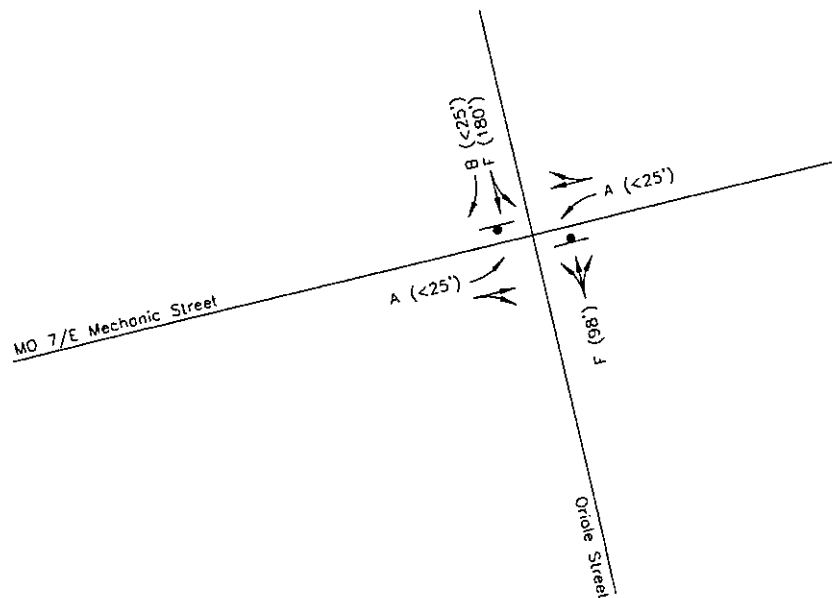
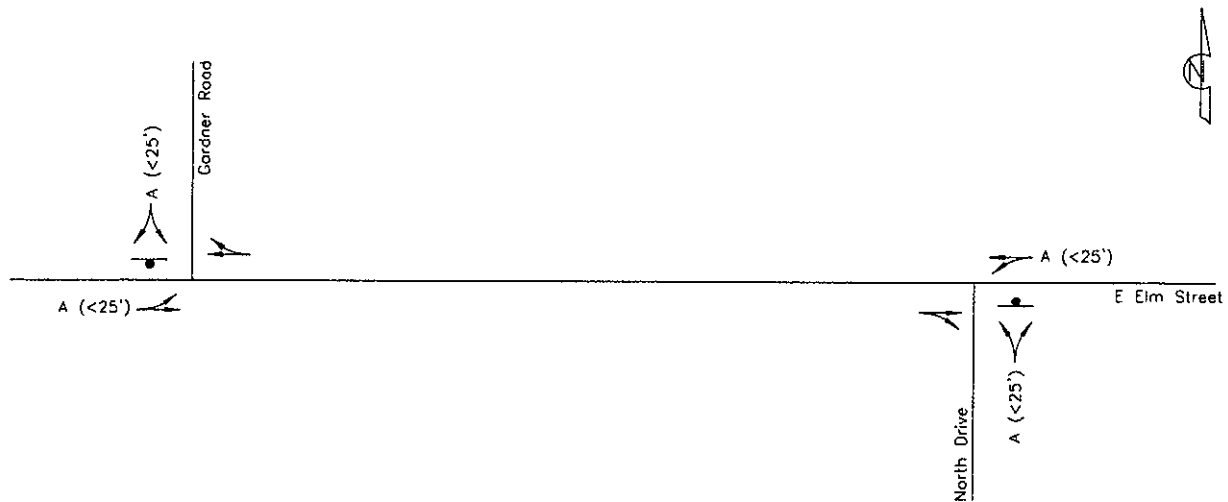
- HCM LOS (95th Percentile Queue in Vehicles)
- Stop Sign
- Traffic Signal LOS

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

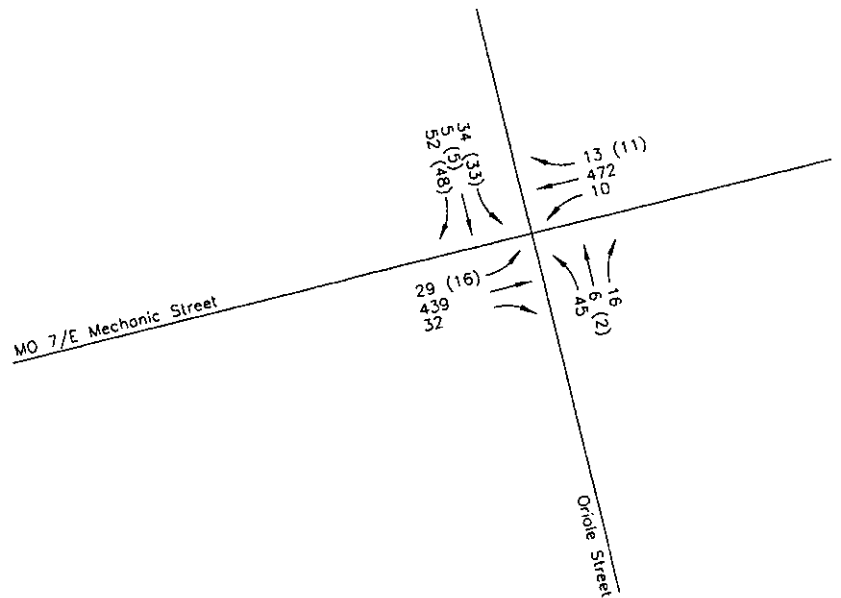
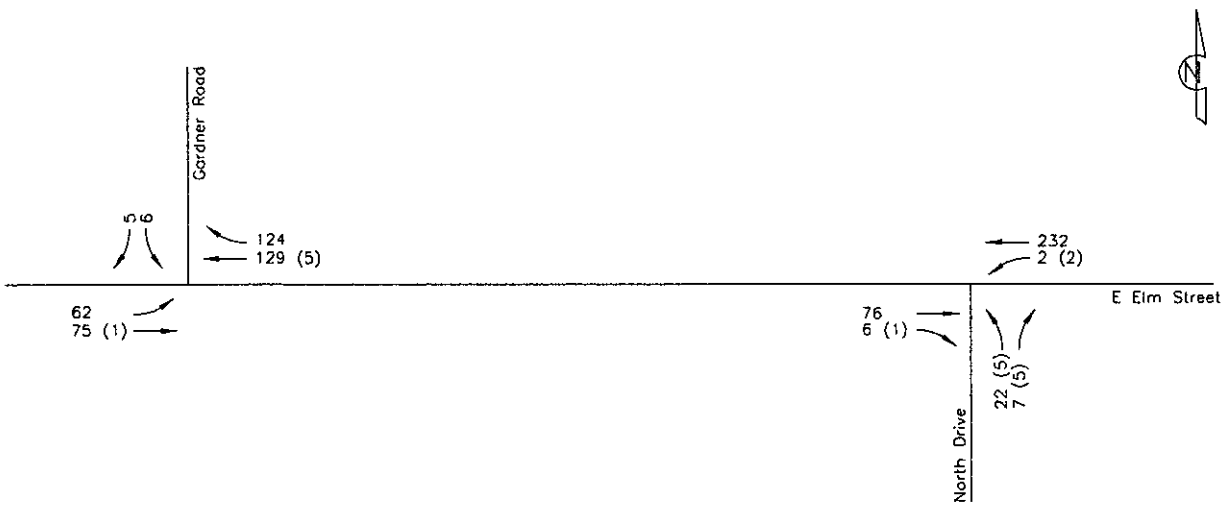
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 18



Priority
ENGINEERS



LEGEND

 Total Volume (New Trips)

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

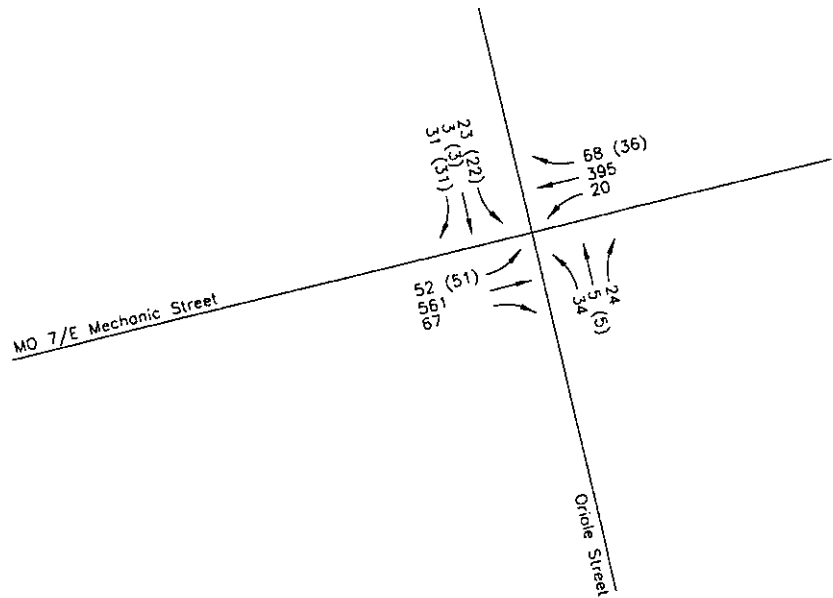
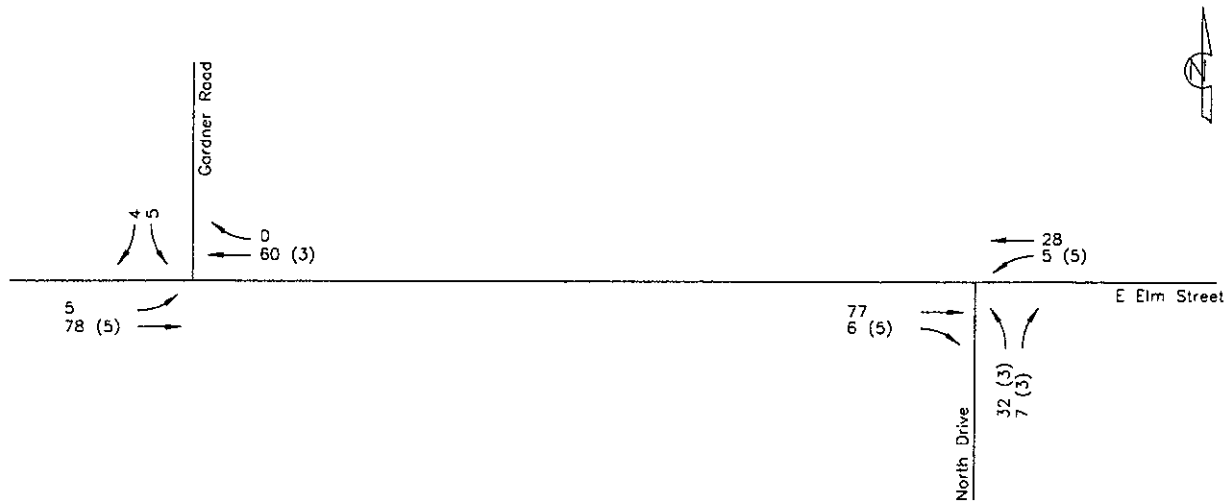
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 19



Priority
ENGINEERS



LEGEND

Total Volume (New Trips)

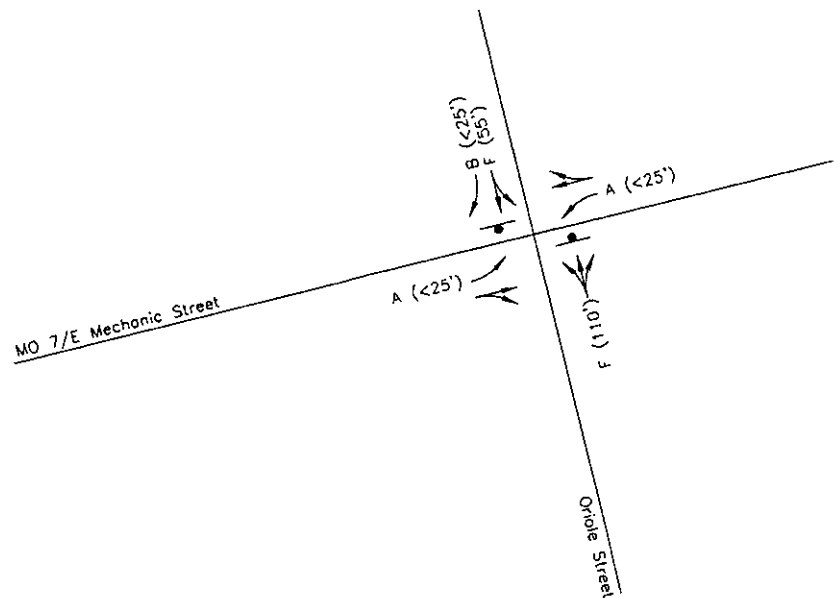
Future (2043)
 (with Senior Housing)
 PM Peak Hour Traffic Volumes

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

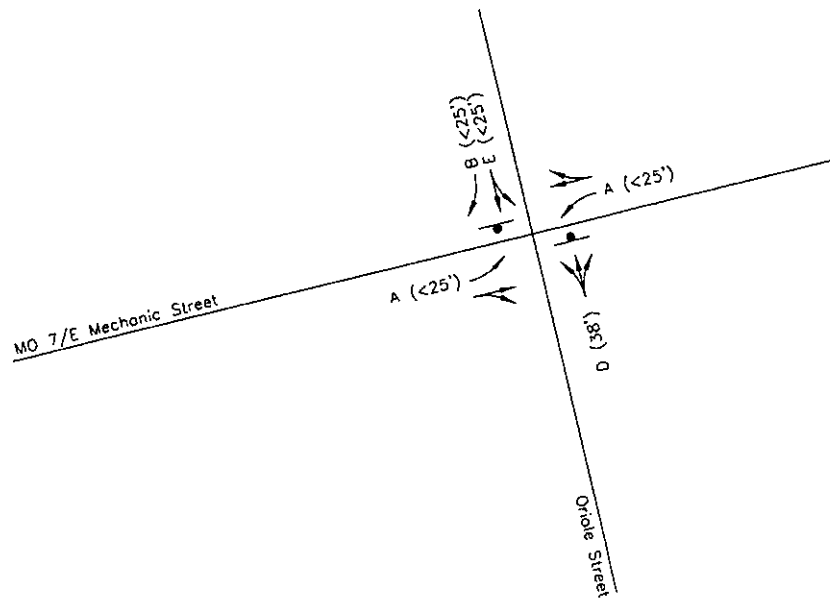
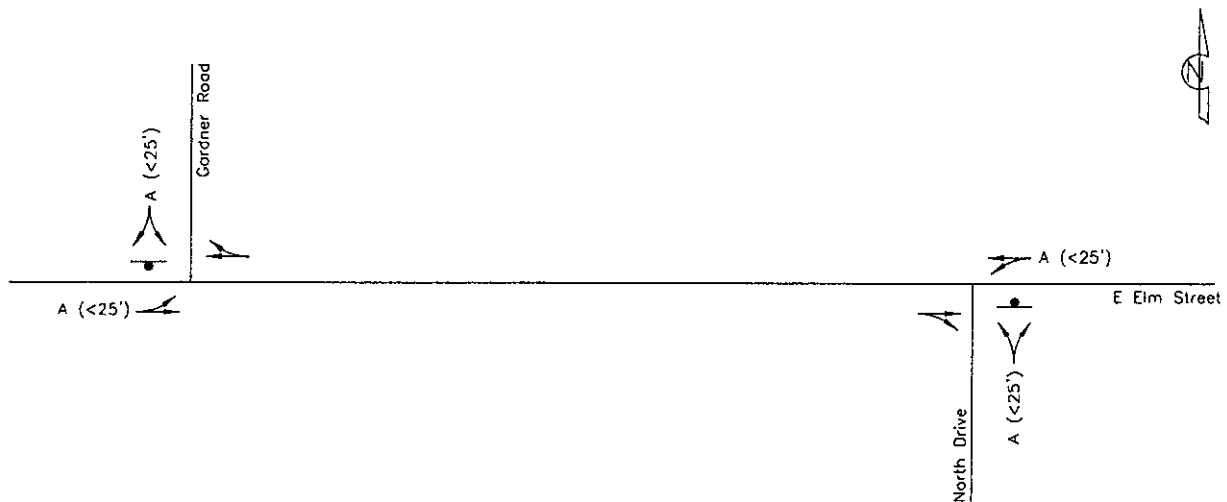
Gardens of
Harrisonville
Harrisonville, MO

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

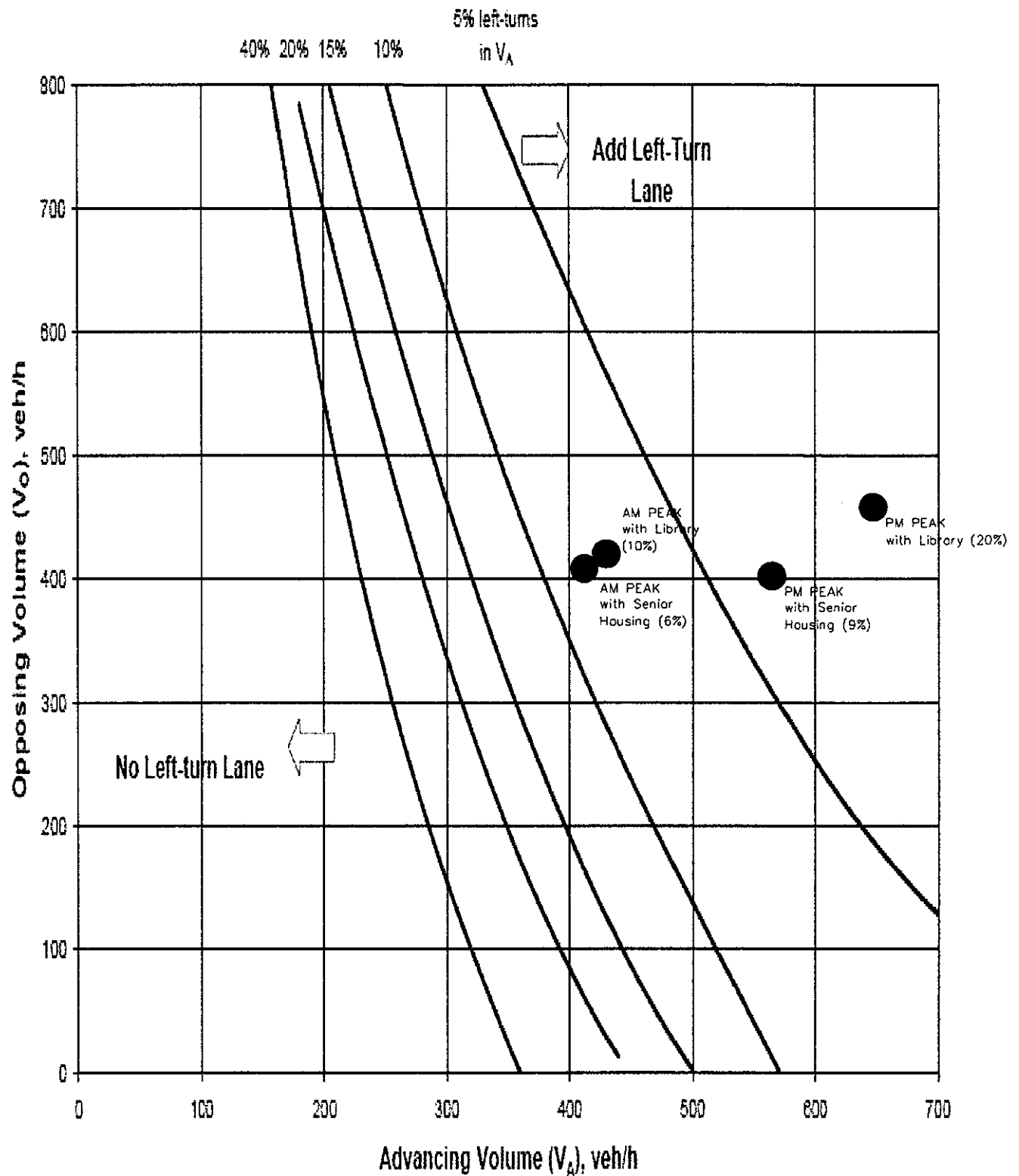
Gardens of
Harrisonville
Harrisonville, MO

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)

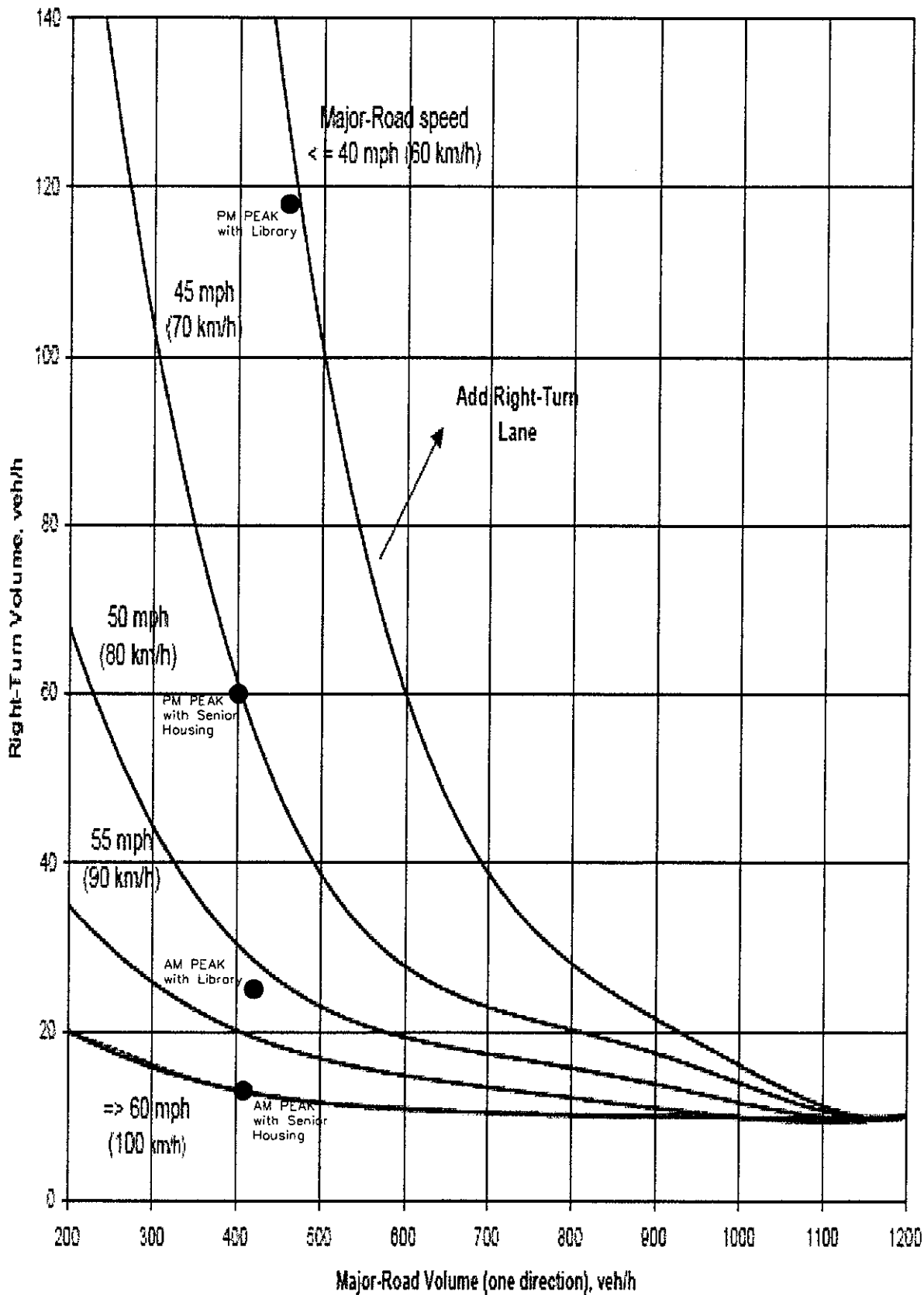
Gardens of
Harrisonville
Harrisonville, MO

No Scale

Figure 23



priority
ENGINEERS



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

Gardens of
Harrisonville
Harrisonville, MO

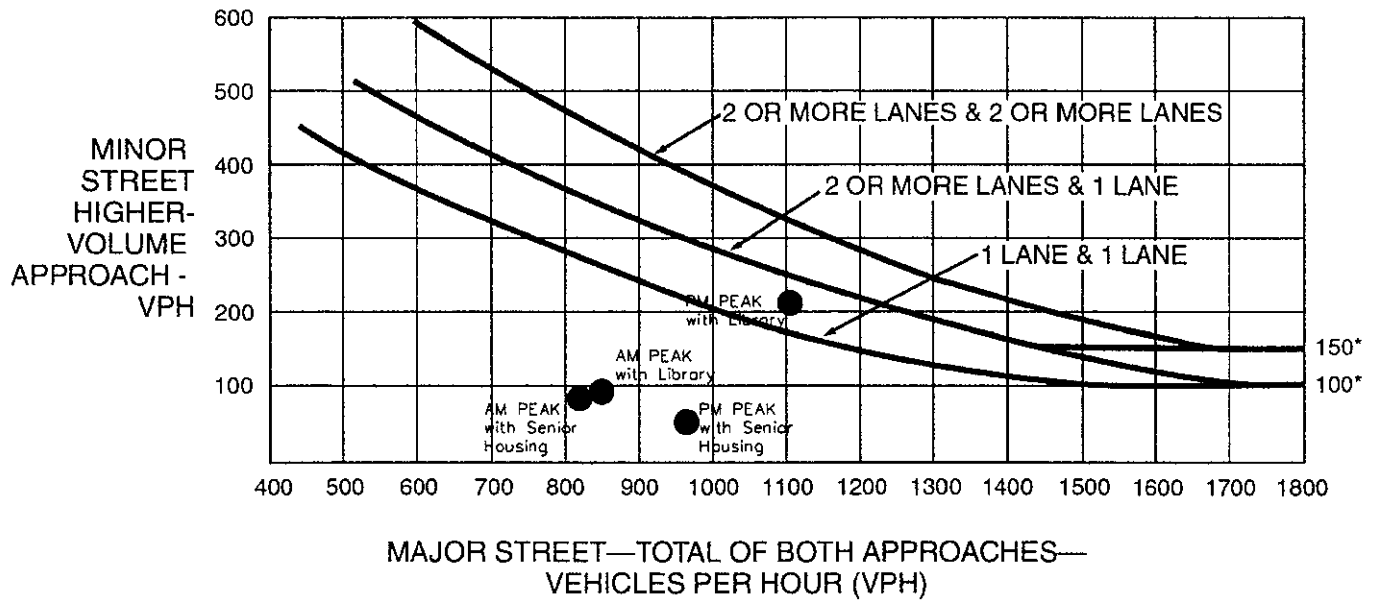
No Scale

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		38	53	53	1	0	8	12	24	2	137
7:30	0	1	1		26	23	1	1	2	2	18	20	1	96
7:45	3		2		18	5	5	0	0	0	4	13	0	43
8:00	1	1	1		13	0	0	0	0	2	3	5	1	26
8:15	2	5	3		5	3	3	0	0	0	2	10	1	302
8:30	1		2		15	1	1	0	0	0	4	6	0	189
8:45	0		1		8	0	0	0	0	0	2	17	0	122
Totals	5	0	4	0	102	102	102	4	1	11	51	61	3	350
Trucks	2				6		3					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	0	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	1	1	0	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	1	0	169
8:15	1	0	82	0	10	0	3	0	65	5	0	0	1	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			Totals
	Peds	Left	Through	Right	Left	Through	Right	Peds	Left	Through	Right	Totals	
16:00	2	2	11	3	2	0	0	0	1	15	1	37	
16:15	1	2	12	0	1	0	0	2	2	11	0	31	
16:30	3	0	16	0	2	0	0	4	0	12	0	37	
16:45	1	1	11	0	0	0	0	0	3	16	0	32	137
17:00	0	0	8	0	3	0	0	0	0	10	0	21	121
17:15	0	2	12	0	0	0	0	3	1	22	0	40	1027
17:30	0	2	21	0	0	1	0	0	1	13	0	38	1062
17:45	2	0	20	1	3	2	0	3	0	9	0	40	1019
Totals		4	0	3	0	47	0	5	4	60	0	130	991
Trucks						1							
Percentage						2%							

PHF= 0.81

Mechanic Street & Oriole Street

Start Time	Southbound			Westbound			Northbound			Eastbound			Totals
	Peds	Left	Through	Right	Peds	Left	Through	Right	Peds	Left	Through	Right	Totals
16:00	1	5	79	0	0	0	101	6	0	0	0	1	206
16:15	0	6	86	0	0	0	109	9	0	0	0	0	220
16:30	0	3	92	1	0	0	114	14	0	0	0	0	236
16:45	0	6	75	0	0	0	122	13	0	0	0	0	231
17:00	0	4	83	0	0	1	103	16	0	0	0	0	893
17:15	0	3	74	25	1	0	121	12	1	1	0	0	219
17:30	0	6	82	0	0	0	83	11	0	0	0	0	246
17:45	0	5	82	0	0	0	81	12	0	0	0	0	192
Totals		16	324	26	1	1	460	55	0	1	0	0	932
Trucks			6				5						
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	-	-	-
Stage 2	-	-	-
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	NBLT	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	Minor2	
Conflicting Flow All	0	0	79	107	79
Stage 1	-	-	-	79	-
Stage 2	-	-	-	28	-
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	-	-	1519	891	981
Stage 1	-	-	-	944	-
Stage 2	-	-	-	995	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1519	891	981
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 %ile 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	SEB
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	E	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	0	147	87
Stage 1	-	-	-	-	87	-
Stage 2	-	-	-	-	60	-
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	-	-	1499	-	845	971
Stage 1	-	-	-	-	936	-
Stage 2	-	-	-	-	963	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1499	-	836	971
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	NB	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	
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	Minor2		
Conflicting Flow All	0	0	105	0	404	101
Stage 1	-	-	-	-	101	-
Stage 2	-	-	-	-	303	-
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	-	-	1486	-	603	954
Stage 1	-	-	-	-	923	-
Stage 2	-	-	-	-	749	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1486	-	602	954
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	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	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	0	122	82
Stage 1	-	-	-	-	82	-
Stage 2	-	-	-	-	40	-
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	-	873	978
Stage 1	-	-	-	-	941	-
Stage 2	-	-	-	-	982	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1512	-	870	978
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	
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	Major1			Major2			Minor1			Minor2		
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	F	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	203
Stage 1	-	-	85
Stage 2	-	-	118
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	-	786
Stage 1	-	-	938
Stage 2	-	-	907
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1512	-	783
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
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	Minor2	Minor3
Conflicting Flow All	0	0	112	0	171
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
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 %tile 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

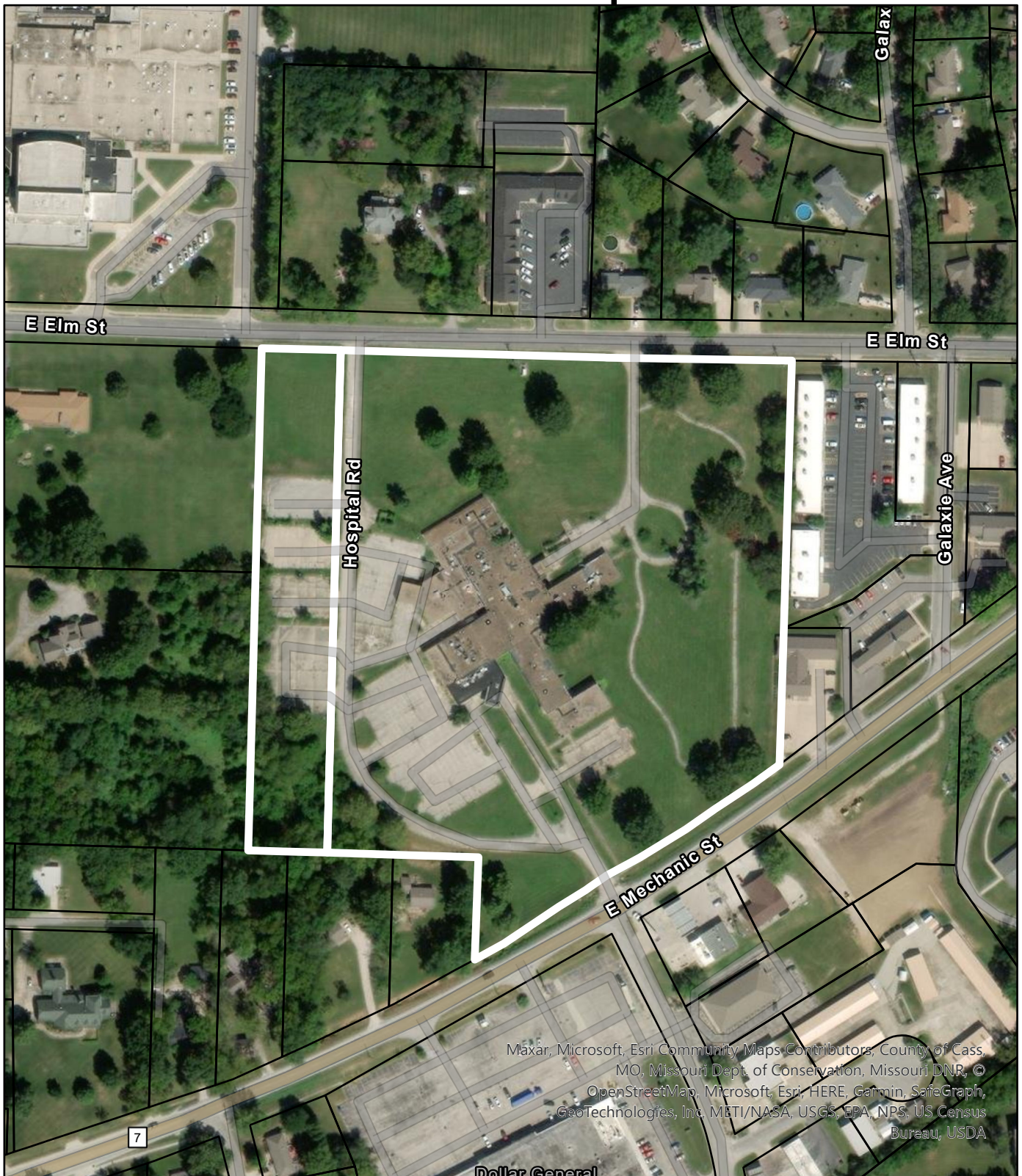
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	186	1075	-	-	927	-	-	134	608
HCM Lane V/C Ratio	0.357	0.051	-	-	0.023	-	-	0.204	0.054
HCM Control Delay (s)	34.7	8.5	-	-	9	-	-	38.6	11.3
HCM Lane LOS	D	A	-	-	A	-	-	E	B
HCM 95th %tile Q(veh)	1.5	0.2	-	-	0.1	-	-	0.7	0.2

Zoning Map



Attachment: Zoning Map (Appl. #PP-23-002--Preliminary Plat for Harrisonville Commons, Lots 1 - 3 and Tract A)

Aerial Map



Attachment: Aerial Map (Appl. #PP-23-002--Preliminary Plat for Harrisonville Commons, Lots 1 - 3 and Tract A)

0 190 380 760 US Feet

