TRANSPORTATION ANALYSIS REPORT
US Route 6
Huron, Erie County, Ohio

December 12, 2012

Prepared for:
The City of Huron
417 Main Street
Huron, OH 44839

Providing Practical Experience
Technical Excellence and
Client Responsiveness

TMS Engineers, Inc.
Transportation Management Services
4547 Hudson Drive • Stow, Ohio 44224
Tel: (330) 686-6402 • Fax: (330) 686-6417
Email: Mail@TMSEngineers.com
Web site: http:// www.TMSEngineers.com

TRANSPORTATION ANALYSIS REPORT

US ROUTE 6
HURON, ERIE COUNTY, OHIO

DECEMBER 12, 2012

Prepared For:

THE CITY OF HURON
417 MAIN STREET
HURON, OH 44839

Prepared By:

TMS ENGINEERS, INC.
4547 HUDSON DRIVE
STOW, OHIO 44224

TABLE OF CONTENTS

TABLE OF CONTENTS

LIST OF FIGURES

APPENDIX

A. **Traffic Count Data**

B. **Growth Rate Worksheets**

C. **Traffic Signal Warrant Worksheets**

D. **Capacity Analysis Worksheets - 2012 Existing Conditions**

E. **Capacity Analysis Worksheets - 2012 Existing Conditions w/ Stop Sign Control**

F. **Capacity Analysis Worksheets - 2012 Existing Saturday Conditions**

G. **Capacity Analysis Worksheets - 2014 No-Build Conditions**

H. **Capacity Analysis Worksheets - 2034 No-Build Conditions**

I. **Speed Zone Data**

J. **Proposed Road Diet Plan View**

K. **Capacity Analysis Worksheets - 2014 Road Diet Conditions**

L. **Capacity Analysis Worksheets - 2034 Road Diet Conditions**

M. **Capacity Analysis Worksheets - 2034 Road Diet Conditions w/ Improvements**

N. **ODOT Turn Lane Design Criteria**

O. **Roundabout Capacity Analysis**

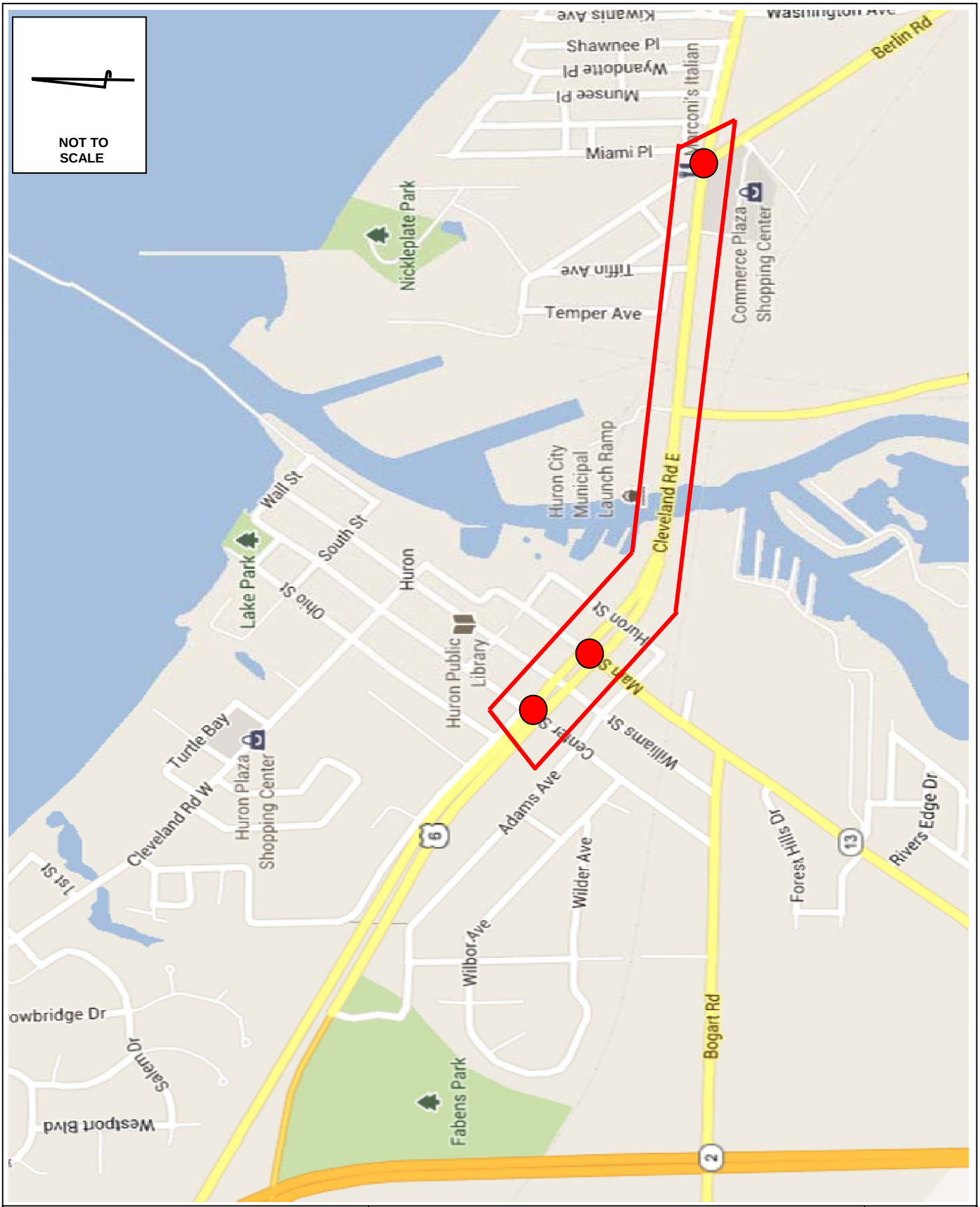
1. INTRODUCTION

1.1 Purpose of Report

This Transportation Analysis Report has been prepared at the request of the City of Huron for US Route 6 (US 6) in the City of Huron, Erie County, Ohio. US 6 is primarily an east west route that traverses the state. Center Street is the west termini and Berlin Road is the east termini for the study area. **Figure 1, Page 2** shows the location of the corridor and the existing signalized intersections under study.

This study will primarily divide the study area into two sections the first section will be from Berlin Road to just west of River Road. This area of the corridor will primarily be analyzed to determine the impact of implementing a road diet through the conversion of the existing four-lane section to a three-lane section.

The second portion of the study area will consist of the area between Huron Road to the east and Center Street to the west. This area of the corridor will be analyzed to determine the efficiency of the existing and future traffic control operations in the corridor.



TMS Engineers, Inc. Transportation Management Services 4547 Hudson Drive Stow, Ohio 44224 www.TMSEngineers.com	US Route 6 Huron, Ohio Transportation Study	Location Map	Figure 1 Page 2

1.2 Study Objectives

This study is structured for the following purposes;

- to adequately assess the existing traffic conditions and to identify traffic congestion problems,
- to investigate the feasibility of implementing a “road diet” along US 6,
- to assess the necessity of the existing traffic control methods within the corridor,
- and to provide a technically sound basis to identify and provide geometric or operation improvements related to anticipated problems.

This study documents the methodologies, findings and conclusions of the analysis, including the basis for all assumptions, traffic parameters utilized and conclusions reached.

The traffic impacts will be determined by comparing the existing intersection levels-of-service before the construction of the development to the anticipated intersection levels-of-service after the opening of the development. Levels-of-service for the study area intersections and access driveway will be calculated using the computerized version of the Transportation Research Board's **Highway Capacity Manual, HCM2010 (HCS2010, Release 6.1)**.

2. AREA CONDITIONS

2.1 Transportation Network Study Area

The study area is the US 6 corridor from Center Street to Berlin Road. The following intersections will be included in the analysis of the corridor (* Signalized Intersection):

1. US Route 6 & Center Street*
2. US Route 6 & Williams Street
3. US Route 6 & Main Street*
4. US Route 6 & Huron Street
5. US Route 6 & River Road
6. US Route 6 & Tiffin Avenue
7. US Route 6 & West Plaza Access Driveway
8. US Route 6 & East Plaza Access Driveway
9. US Route 6 & Berlin Road*

Study Area Roadways

US Route 6 is a four-lane roadway which northwest to southeast orientation in the study area. For the purposes of this study and the analysis contained within it US Route 6 will be considered an east-west roadway. The posted speed limit along US Route 6 in the study area is 35 miles per hour. The land use along US Route 6 in the study area consists mainly of commercial and retail land uses. US Route 6 becomes a divided roadway at Huron Street with a large median separating the eastbound and westbound traffic. US Route 6 had an Ohio Department of Transportation reported average daily traffic (ADT) of approximately 12,180 vehicles per day at Main Street and an ADT of 4,440 vehicles per day at Berlin Road in 2010. This data can be seen on ODOT's traffic count web site at the following address:

http://www.dot.state.oh.us/techservsite/offceorg/traffmonit/CountInformation/

Berlin Road is a two-lane roadway which has an overall northwest to southeast orientation in the study area. For the purposes of this study and the analysis contained within it Berlin Road will be considered an east-west roadway. Berlin Road has an average daily traffic (ADT) of approximately 1,560 vehicles per day in the study area based on traffic data collected for this report. The land use along Berlin Road is mainly residential in the study area. Berlin Road has a posted speed limit of 25 miles per hour.

Tiffin Avenue is a two-lane roadway which has an overall north to south orientation in the study area. Tiffin Avenue has an average daily traffic (ADT) of approximately 830 vehicles per day in the study area based on traffic data collected for this report. The land use along Tiffin Avenue is mainly residential in the study area. Tiffin Avenue has a posted speed limit of 25 miles per hour.

River Road is a two-lane roadway which has an overall north to south orientation in the study area. River Road has an average daily traffic (ADT) of approximately 1,600 vehicles per day in the study area based on traffic data collected for this report. The land use along River Road is mainly residential in the study area. River Road has a posted speed limit of 35 miles per hour.

Huron Street is a two-lane roadway which has an overall southwest to northeast orientation in the study area. For the purposes of this study and the analysis contained within it Huron Street will be considered a north-south roadway. Huron Street has an average daily traffic (ADT) of approximately 1,190 vehicles per day in the study area based on traffic data collected for this report. The land use along Huron Street is mainly commercial in the study area. Huron Street has a posted speed limit of 25 miles per hour.

Main Street is a two-lane roadway which has an overall southwest to northeast orientation in the study area. For the purposes of this study and the analysis contained within it Main Street will be considered a north-south roadway. Main Street has an average daily traffic (ADT) of approximately 3,890 vehicles per day in the study area based on traffic data collected for this report. The land use along Main Street is mainly commercial in the study area. Huron Street has a posted speed limit of 25 miles per hour.

Williams Street is a two-lane roadway which has an overall southwest to northeast orientation in the study area. For the purposes of this study and the analysis contained within it Williams Street will be considered a north-south roadway. Williams Street has an average daily traffic (ADT) of approximately 1,030 vehicles per day in the study area based on traffic data collected for this report. The land use along Williams Street is mainly residential in the study area. Williams Street has a posted speed limit of 25 miles per hour.

Center Street is a two-lane roadway which has an overall southwest to northeast orientation in the study area. For the purposes of this study and the analysis contained within it Center Street will be considered a north-south roadway. Center Street has an average daily traffic (ADT) of approximately 910 vehicles per day in the study area based on traffic data collected for this report. The land use along Center Street is mainly residential in the study area. Center Street has a posted speed limit of 25 miles per hour.

Functional Classification

The Ohio Department of Transportation functionally classifies roadways to help define a roadway's characteristics as well as identify roadways that are eligible for federal funds. Functional classification is the grouping of roads, streets, and highways in a hierarchy based on the type of highway service they provide. Generally, streets and highways perform two types of service. They provide either traffic mobility or land access and can be ranked in terms of the proportion of service they provide. The functional classification of the roadways in the study area can be seen on ODOT's website at:

http://www.dot.state.oh.us/planning/Functional%20Class/2004FuncClass/District03/Erie.pdf

The following table lists the roadways that have an assigned functional classification as determined by ODOT and local government entities. Roadways that are not listed as having a functional classification can be assigned into one of two categories for the purpose of this report. The first category is a local roadway and the second category is that of an access drive.

FUNCTIONAL CLASSIFICATION

ROADWAY	*CLASSIFICATION*
US Route 6 (East of Main Street)	Urban Minor Arterial
US Route 6 (West of Main Street)	Urban Principal Arterial
Berlin Road (South of US 6)	Urban Collector
Berlin Road (North of US 6)	Urban Local Roadway
Tiffin Avenue	Urban Local Roadway
River Road	Urban Collector
Huron Street	Urban Local Roadway
Main Street (North of US 6)	Urban Collector
Main Street (South of US 6)	Urban Principal Arterial
Williams Street (North of US 6)	Urban Minor Arterial
Williams Street (South of US 6)	Urban Local Roadway
Center Street	Urban Collector

Study Area Intersections

The following sections will detail existing conditions at the intersections located within the corridor.

US Route 6 & Berlin Road

The intersection of US Route 6 and Berlin Road is a four-leg intersection. The intersection is controlled by a traffic signal with a two phase pre-timed operation. The phasing sequence for the intersection includes the following: Phase One - all eastbound and westbound movements and Phase Two - all northbound and southbound movements. There are no pedestrian signals at the intersection. There are no exclusive turn lanes on Berlin Road. There are exclusive left turn lanes and an exclusive eastbound right turn lane on US Route 6.

US Route 6 & Tiffin Avenue

The intersection of US Route 6 and Tiffin Avenue is a three-leg intersection. The intersection is controlled by a stop sign on the Tiffin Avenue approach. The US Route 6 approaches are not stopped. There are no exclusive turn lanes at the intersection.

US Route 6 & River Road

The intersection of US Route 6 and River Road is a four-leg intersection. The north approach of the intersection is the access drive to the City of Huron boat ramps. The intersection is controlled by stop signs on the River Road and access drive approaches. The US Route 6 approaches are not stopped. There are no exclusive turn lanes on US 6 or River Road. There is an exclusive southbound right turn lane on the access driveway approach.

US Route 6 & Huron Street

The intersection of US Route 6 and Huron Street is a four-leg intersection with a median dividing the eastbound and westbound US Route 6 traffic. The intersection is controlled by stop signs on the Huron Street approaches. The US Route 6 approaches operate under free flow conditions. There are no exclusive turn lanes at this intersection.

US Route 6 & Main Street

The intersection of US Route 6 and Main Street is a four-leg intersection with a median dividing the eastbound and westbound US Route 6 traffic. The intersection is controlled by two traffic signal installations that control each direction of US Route 6 traffic at Main Street. The intersections are controlled by a traffic signal with a two phase pre-timed operation. The phasing sequence for the intersection includes the following: Phase One - all eastbound or westbound movements and Phase Two - all northbound or southbound movements. There are pedestrian signals at the intersection that operate as part of the pre-timed settings as there are no pushbuttons for pedestrian activation. There is an exclusive westbound right turn lane at the intersection.

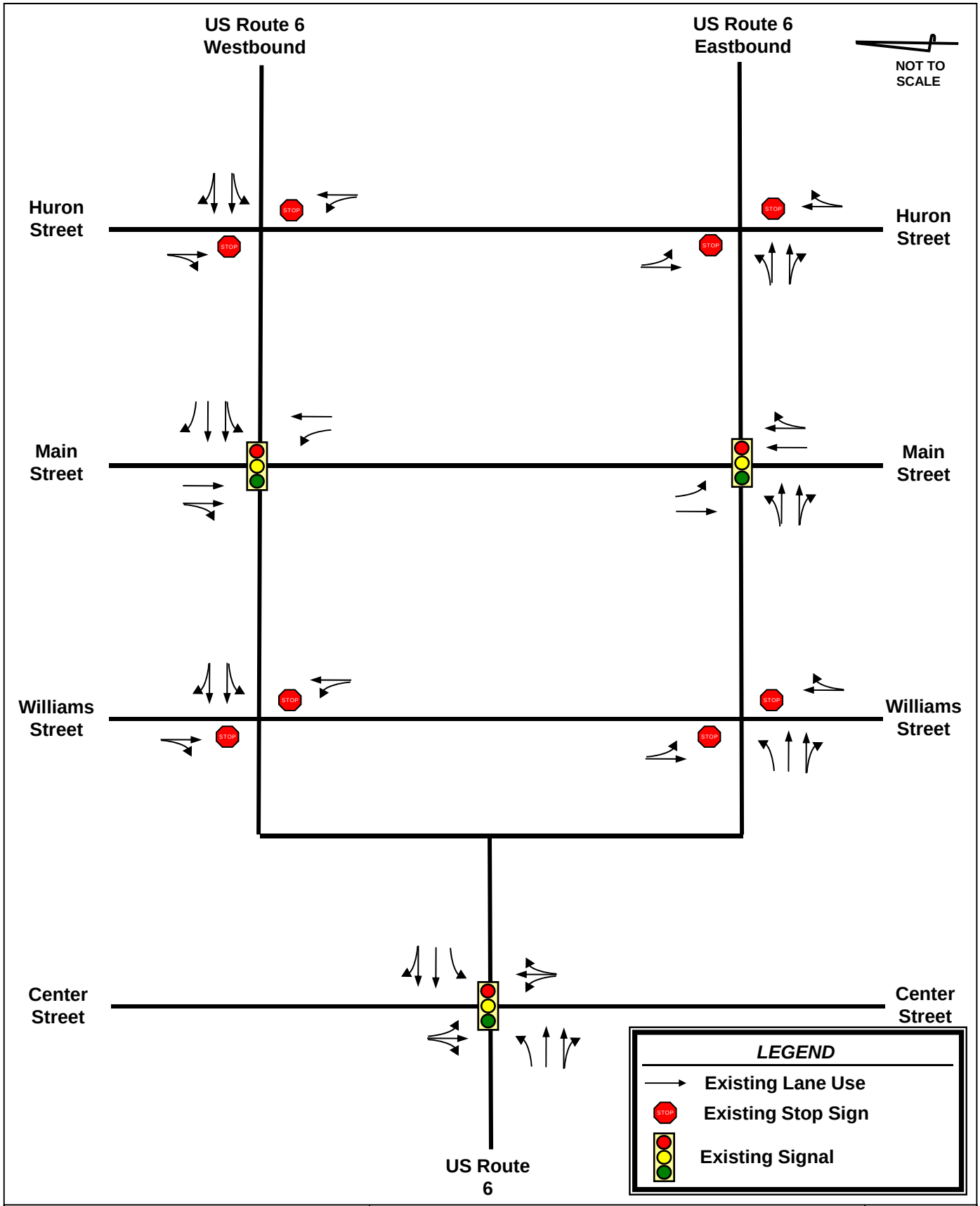
US Route 6 & Williams Street

The intersection of US Route 6 and Williams Street is a four-leg intersection with a median dividing the eastbound and westbound US Route 6 traffic. The intersection is controlled by stop signs and yield signs on the Williams Street approaches. There is an exclusive eastbound left turn on US Route 6 at the intersection. There are no exclusive turn lanes on Williams Street.

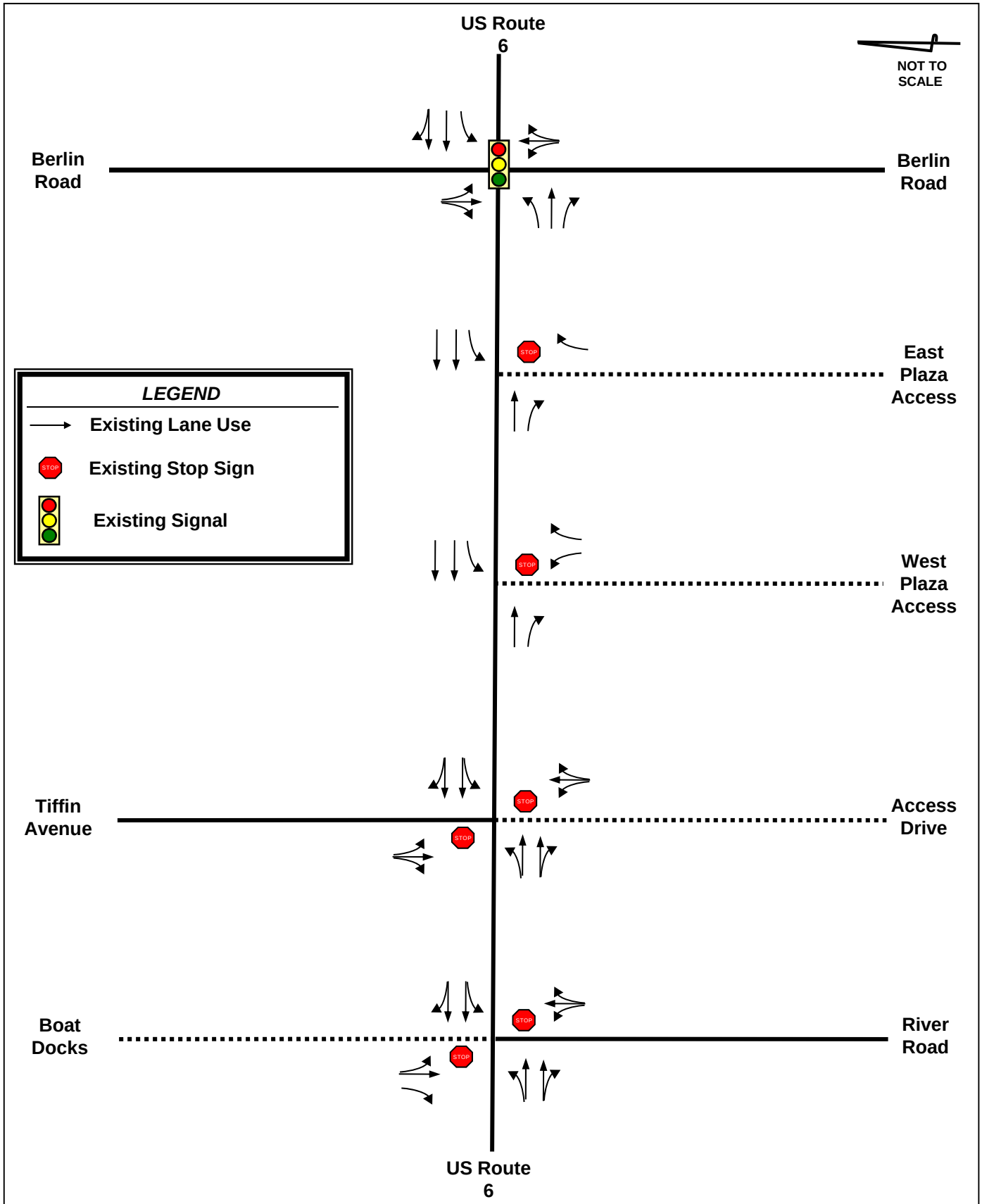
US Route 6 & Center Street

The intersection of US Route 6 and Center Street is a four-leg intersection with a median dividing the eastbound and westbound US 6 traffic. The intersection is controlled by a traffic signal installation. The intersection is controlled by a traffic signal with a three phase operation. The phasing sequence for the intersection includes the following: Phase One - all eastbound movements, Phase Two - all westbound movements, and Phase Three - all northbound or southbound movements. There are pedestrian signals and pushbuttons at the intersection. There is are exclusive left turn lanes on US 6 at the intersection. There are no exclusive turn lanes on Center Street.

Figure 2, Page 10 shows the lane use and traffic control conditions based upon the existing conditions at the study area intersections.



TMS Engineers, Inc. Transportation Management Services 4547 Hudson Drive Stow, Ohio 44224 www.TMSEngineers.com	US Route 6 Huron, Ohio Transportation Study	Existing Conditions	Figure 2A Page 10A



TMS Engineers, Inc. Transportation Management Services 4547 Hudson Drive Stow, Ohio 44224 www.TMSEngineers.com	US Route 6 Huron, Ohio Transportation Study	Existing Conditions	Figure 2B Page 10B

2.2 Traffic

Nine hour, weekday turning movement count data was collected for the following nine locations along US Route 6.

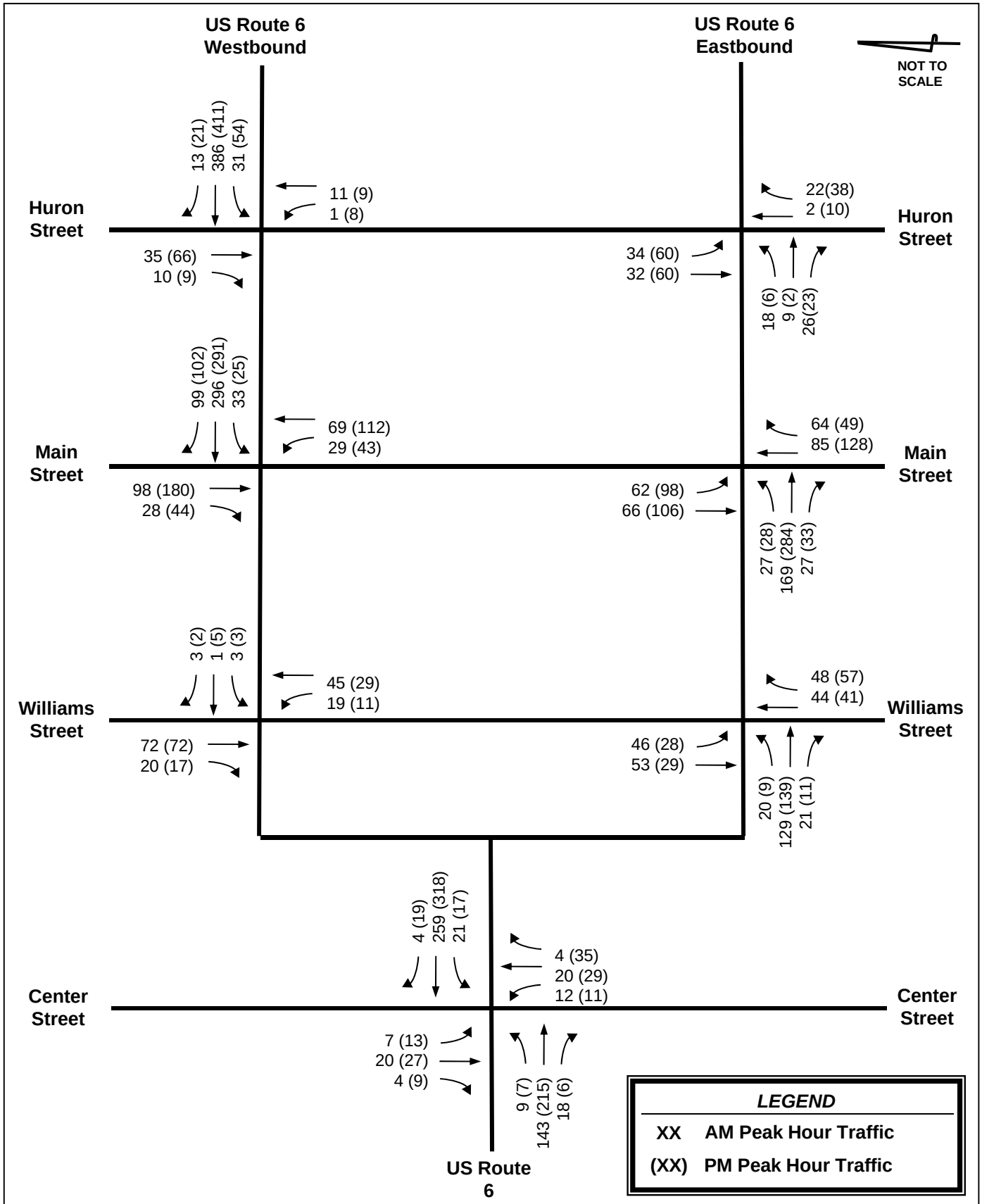
1. US Route 6 & Center Street
2. US Route 6 & Williams Street
3. US Route 6 & Main Street
4. US Route 6 & Huron Street
5. US Route 6 & River Road
6. US Route 6 & Tiffin Avenue
7. US Route 6 & West Plaza Access Driveway
8. US Route 6 & East Plaza Access Driveway
9. US Route 6 & Berlin Road

The surveys were taken between Tuesday, September 25, 2012 and Saturday, October 2, 2012, respectively. The traffic counts were conducted in fifteen (15) minute intervals between the hours of 7 AM - 10 AM, 11 AM - 2 PM, and 3 PM - 6 PM, then hourly totals were calculated. Vehicle classification to determine the extent of trucks and buses was also performed. Average daily traffic was calculated for each of the study roads using expansion factors to account for daily and seasonal variations according to the recommendations and latest data from the Ohio Department of Transportation. Copies of the intersection turn movement counts can be seen in **Appendix A**. It should be noted that additional traffic count samples were taken on a Saturday at River Road and Main Street to determine the impact of weekend traffic and event traffic the increase the use of the local marinas and boat docks.

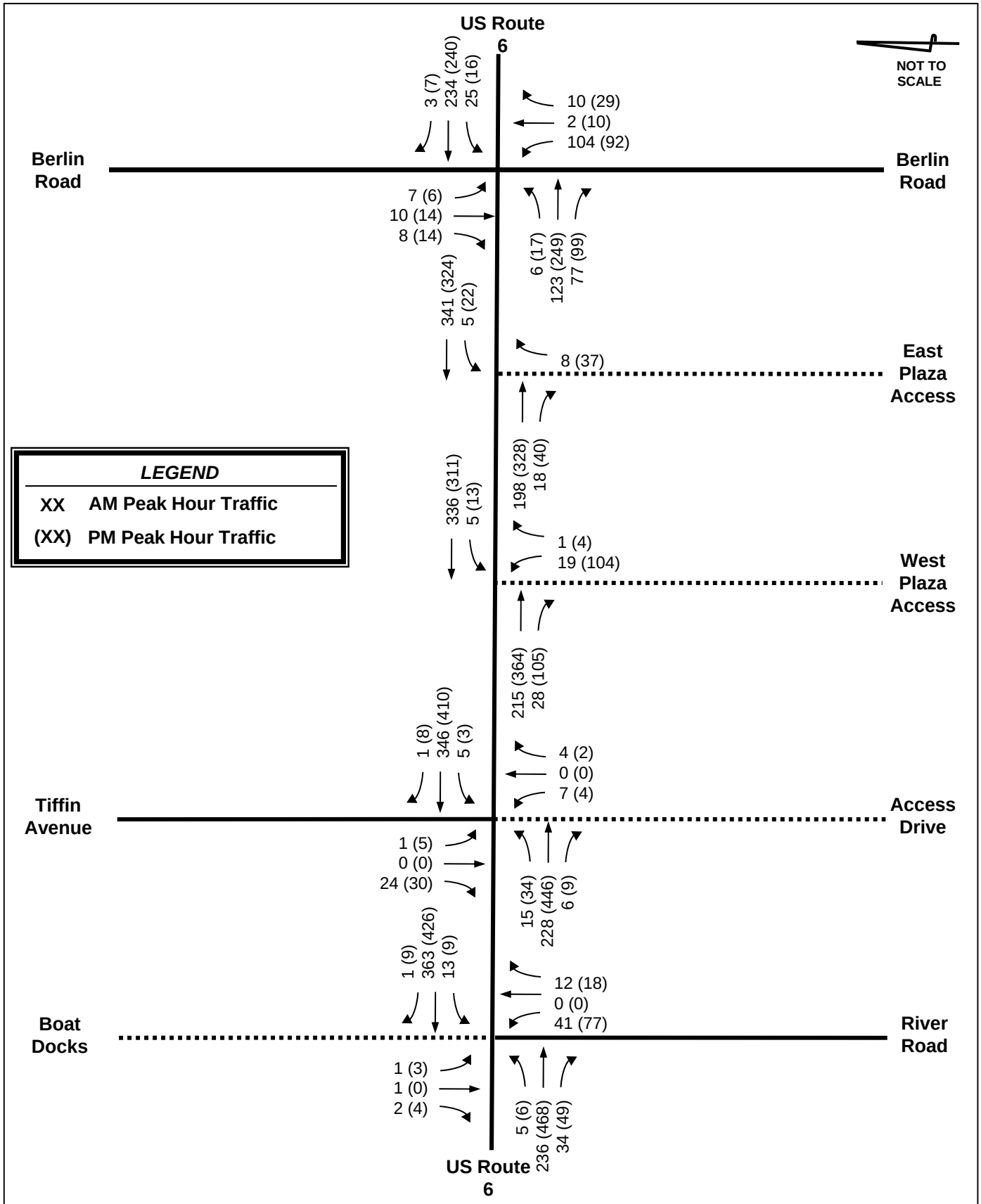
From the data, the weekday AM peak hour of traffic was determined to be 8:00 AM to 9:00 AM and the PM peak hour of traffic was found to be 3:00 PM to 4:00 PM. Since the existing peak hour traffic volumes experience directional traffic flow, both peak periods will be analyzed.

There were minor differences between the entering and exiting volumes at the adjacent locations where the traffic count data was collected. The US Route 6 traffic volumes in the study area have been "balanced" to account for this difference in entering and exiting volumes at the adjacent count locations.

The balanced 2012 existing AM and PM peak hour traffic volumes can be seen in **Figure 3, Page 12**.



TMS Engineers, Inc. Transportation Management Services 4547 Hudson Drive Stow, Ohio 44224 www.TMSEngineers.com	US Route 6 Huron, Ohio Transportation Study	2012 Weekday Traffic Volumes	Figure 3A Page 12A



TMS Engineers, Inc. Transportation Management Services 4547 Hudson Drive Stow, Ohio 44224 www.TMSEngineers.com	US Route 6 Huron, Ohio Transportation Study	2012 Weekday Traffic Volumes	Figure 3B Page 12B

2.3 Future Traffic Volumes

Design of new roadways or improvements to existing roadways should not usually be based on current traffic volumes alone, but should consider future traffic volumes expected to make use of the facilities. Roadways should be designed to accommodate the traffic volume that is likely to occur within the design life of the facility. In a practical sense, this design volume should be a value that can be estimated with reasonable accuracy. It is believed that the maximum design period is in the range of 15 to 24 years. Therefore, a period of twenty years is widely used as a basis for design. Traffic cannot usually be forecasted accurately beyond this period on a specific facility because of probable changes in the general regional economy, population, and land development along the roadway.

Arterial and collector roadways like those found in the study area carry a predominate amount of through traffic due to their functional characteristics. Arterial streets usually carry more through traffic than collectors. This through traffic component generally increases as regional growth occurs. Therefore it is anticipated that existing traffic on these streets will increase in future years.

Based upon sound engineering practice and the likelihood of traffic growth due to the functional characteristics of the roadways any recommended improvements for these intersections should adequately handle the transportation needs of the intersections for twenty years from the opening of the project. Therefore, roadway improvements will be recommended based on the ability of the roadway to adequately handle the anticipated twenty-year traffic volumes.

Opening year and twenty year design hour traffic volumes will be necessary for all analysis and design. The year 2014 will be used for the opening year analysis and the year 2034 will be used for the twenty year analysis. Therefore it is necessary to estimate the historical growth rates in order to establish the future traffic on the study area roadways due to non-site related conditions.

The ODOT traffic count website was consulted to determine past historical trends along US Route 6. Traffic counts were obtained from 1992, 1999, 2001, 2004, 2006, and 2010 at three locations within the study area. The following table shows the traffic counts obtained from the ODOT website:

HISTORICAL ADT TRAFFIC VOLUMES

US Route 6

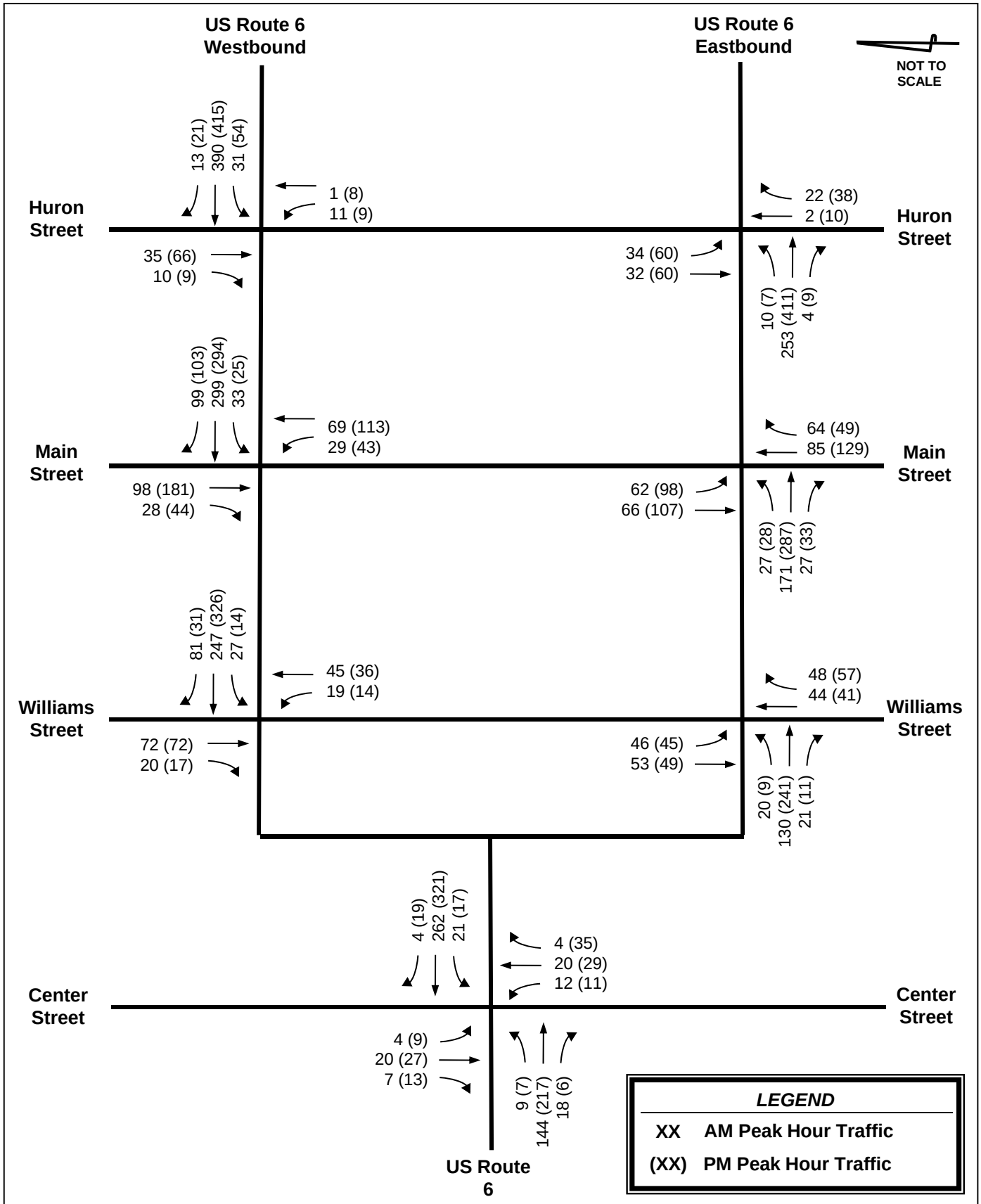
LOCATION	1992	1999	2001	2004	2006	2010
@ State Route 2	7330	6350	6650	7290	6770	7500
@ Main Street	10430	14460	12330	12550	11170	12180
@ Berlin Road	3620	5070	4520	5190	3870	4440

A trend line analysis was performed for both locations and is included in **Appendix B**. To provide a conservative estimate of anticipated traffic volumes in 2014 and 2034, an annual growth rate of 0.50% will be applied US Route 6 and 0.25% to all remaining roadways classified above and local roadway. No growth rate will be applied to access driveways or local roadways. This growth rate was determined based upon historical trends in the ODOT traffic count data. The following table shows the growth rate and factors for each of the study area roadways:

GROWTH RATES

ROADWAY	GROWTH RATE (Annual Growth)	2014 GROWTH FACTOR	2034 GROWTH FACTOR
US Route 6	0.5%	1.01	1.11
Berlin Road (South of US 6)	0.25%	1.005	1.055
River Road	0.25%	1.005	1.055
Main Street	0.25%	1.005	1.055
Williams Street	0.25%	1.005	1.055
Center Street	0.25%	1.005	1.055
All Remaining Roads & Drives	0.00%	0.00	0.00

The estimated future 2014 traffic volumes are shown graphically in **Figure 4, Page 15** while the estimated future 2034 twenty year traffic volumes are shown in **Figure 5, Page 16**. The 2014 and 2034 traffic volumes have become unbalanced as a result of the varying growth factors that have been applied. The traffic volumes seen in **Figure 4** and **Figure 5** have been balanced based on the previously described procedures.

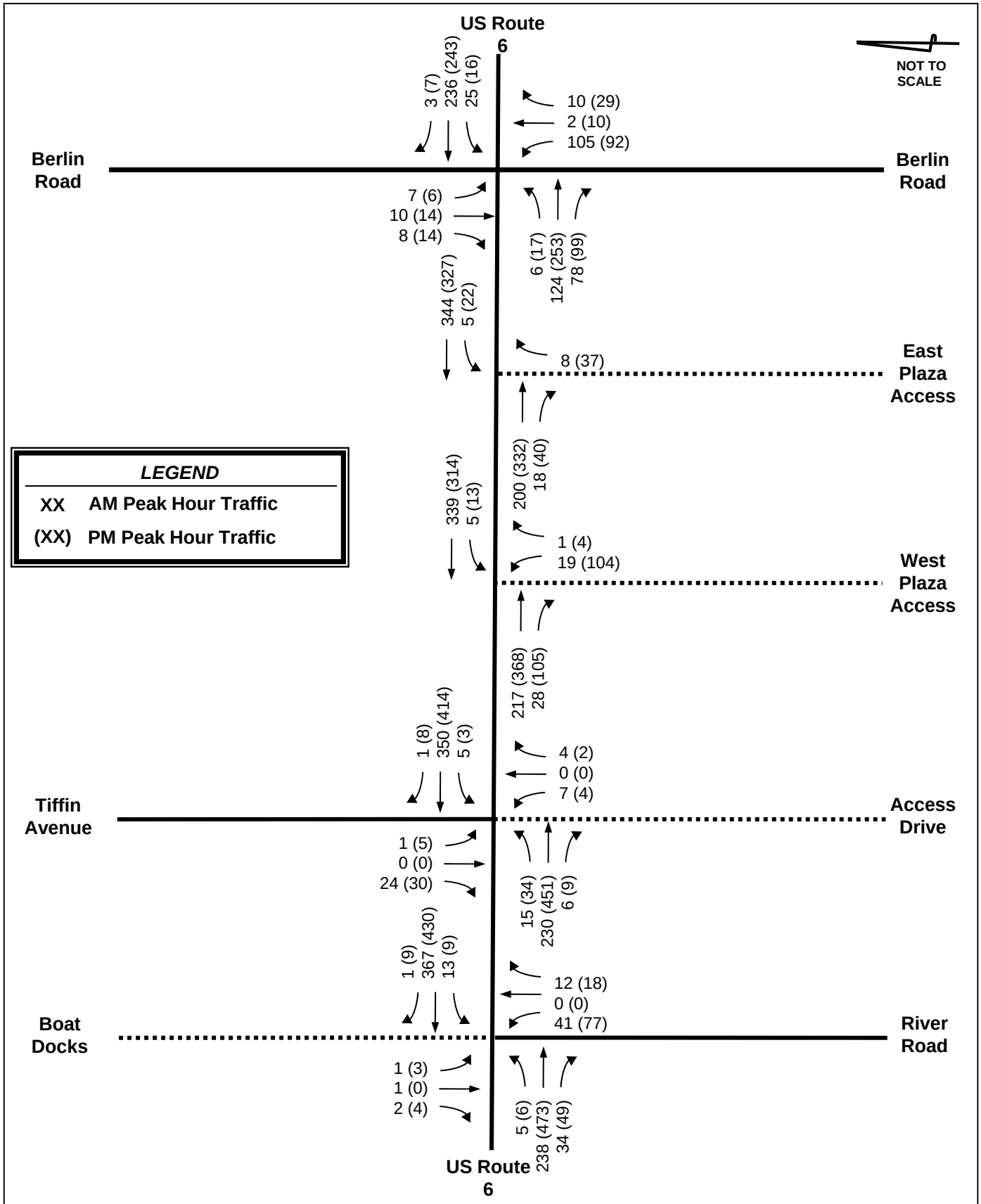


TMS Engineers, Inc.
Transportation Management Services
4547 Hudson Drive Stow, Ohio 44224
www.TMSEngineers.com

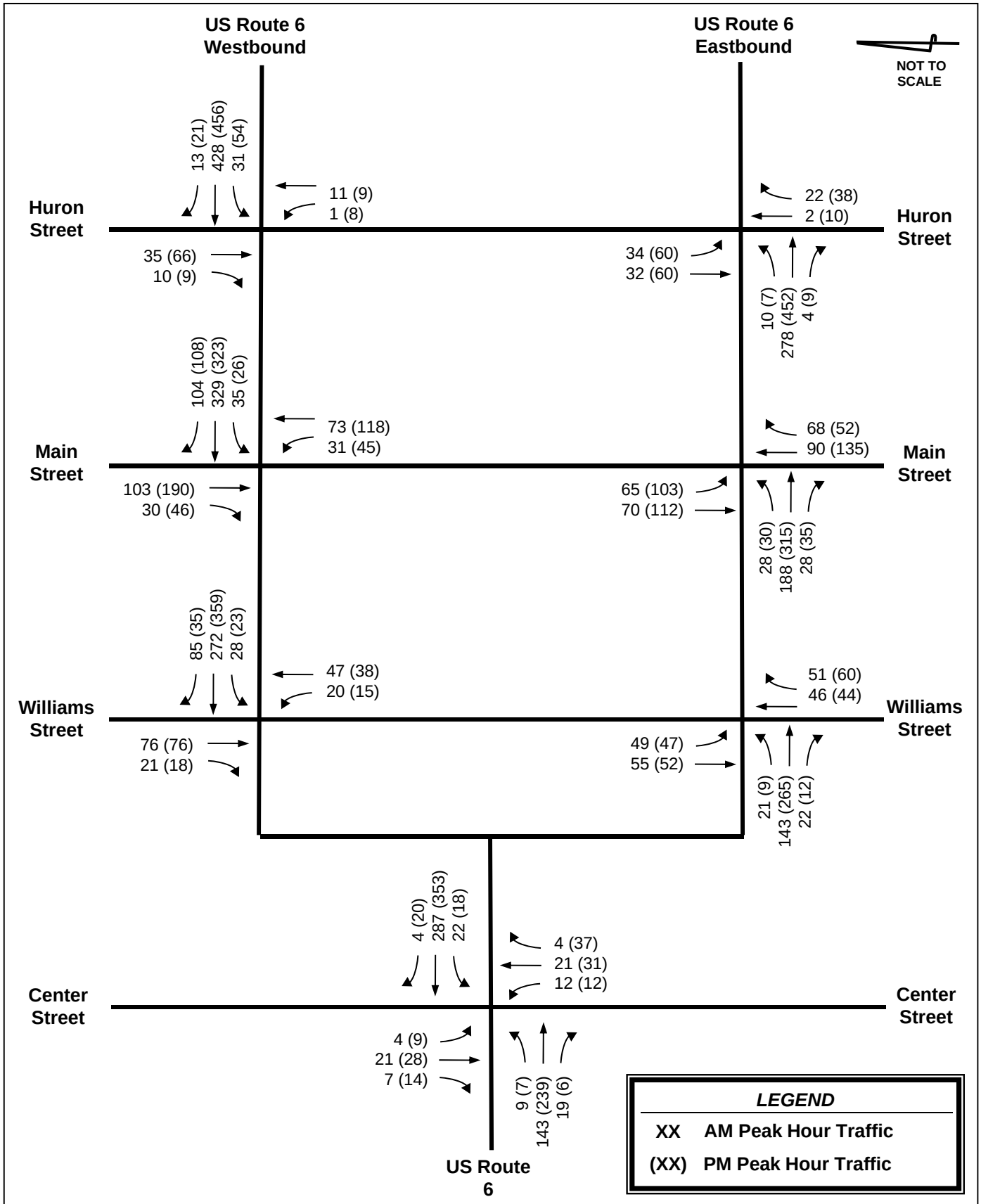
US Route 6
Huron, Ohio
Transportation Study

2014 Weekday
Traffic Volumes

Figure 4A



TMS Engineers, Inc. Transportation Management Services 4547 Hudson Drive Stow, Ohio 44224 www.TMSEngineers.com	US Route 6 Huron, Ohio Transportation Study	2014 Weekday Traffic Volumes	Figure 4B Page 15B

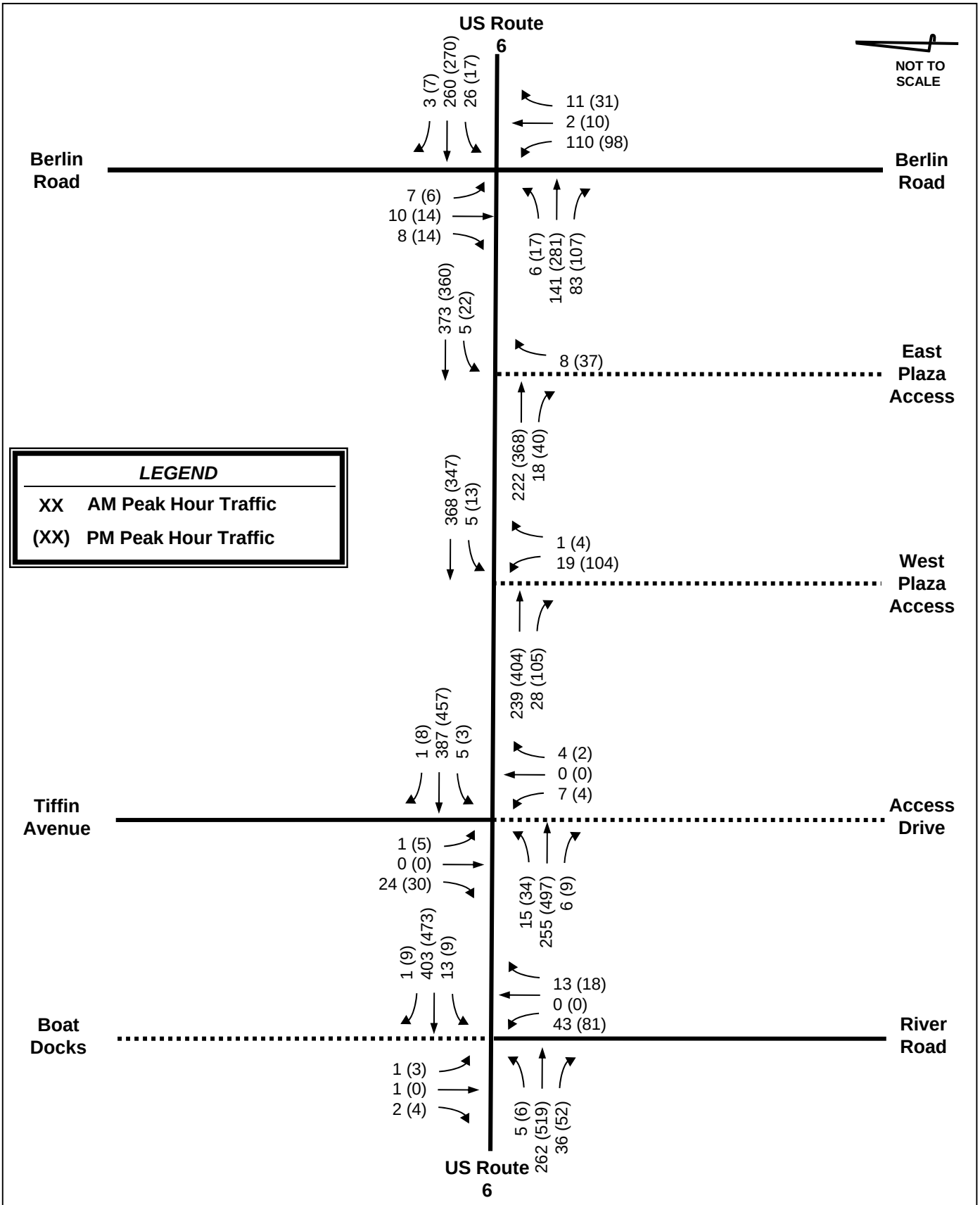


TMS Engineers, Inc.
Transportation Management Services
4547 Hudson Drive Stow, Ohio 44224
www.TMSEngineers.com

US Route 6
Huron, Ohio
Transportation Study

2034 Weekday
Traffic Volumes

Figure 5A



TMS Engineers, Inc. Transportation Management Services 4547 Hudson Drive Stow, Ohio 44224 www.TMSEngineers.com	US Route 6 Huron, Ohio Transportation Study	2034 Weekday Traffic Volumes	Figure 5B Page 16B

3. TRAFFIC SIGNAL WARRANT ANALYSIS

3.1 Traffic Signal Control

A properly placed traffic signal can improve the safety and efficiency of flow through an intersection. An unnecessary signal can be the source of danger and annoyance to all who use the intersection including pedestrians, bicyclists, and motorists. It can also increase air pollution and cause driver frustration if there is not much traffic on the minor street.

When determining whether or not a traffic signal is necessary at a specific location, an evaluation of the candidate location (called a signal warrant study) is conducted to determine the answers to the following questions:

1. How much traffic is there on the intersecting streets?
2. Are high levels of traffic consistent throughout the day or just during a few hours?
3. Is there a significant amount of pedestrian traffic?
4. Is the street a wide, high speed, and busy thoroughfare?
5. Are school children crossing the street?
6. Will a signal improve the flow of traffic or cause gridlock with other nearby signals?

The signal warrant study collects all of the relevant data at a location that is being considered for a traffic signal. Once the data is collected, it is compared to criteria that has been established by extensive research and experience and documented in the latest edition of the **Ohio Manual of Uniform Traffic Control Devices** (**OMUTCD**). The **Ohio Revised Code** requires that an engineering signal warrant study must be performed to determine whether installation of a traffic signal is justified at a particular location.

The results of the signal warrant analysis do not necessarily justify installation or removal of a traffic signal. Other, more appropriate solutions should be considered prior to considering installation of a traffic signal. Spacing between signals is always a major concern beyond the basic warranting analysis and should be carefully reviewed before deciding on installation of a new signal.

It should be noted that traffic signals do not prevent motor vehicle crashes. Engineering studies have shown that in many instances, total intersection crashes increase after a traffic signal is installed. Certain types of crashes are susceptible to correction by installation of traffic signals, however, overall the number of crashes generally increase.

3.2 Traffic Signal Warrants

The OMUTCD provides eight (8) sets of criteria, called warrants. The warrants are;

Warrant 1 - Eight Hour Vehicular Volume
This warrant has three conditions. The Minimum Vehicular Volume, Condition A, is intended for application where a large volume of intersecting traffic is the principal reason to consider installing a traffic signal. The Interruption of Continuous Traffic, Condition B, is intended for application where the traffic volume of a major street is so heavy that traffic on a minor intersecting street suffers excessive delay or conflict in entering or crossing the major street. The third condition is a combination of Condition A and Condition B in which 80% of each condition must be satisfied.

Warrant 2 - Four Hour Vehicular Volume
This warrant addresses the need for signalization based on situations existing for less than eight hours and is based upon a sliding scale or combined volume. Fours hours of volume must be met.

Warrant 3 - Peak Hour Vehicular Volume
This warrant is intended for use at a location where traffic conditions are such for a minimum of one hour of an average day, the minor street suffers undue delay when entering or crossing the major street. This warrant is only applied in unusual cases. Such cases include, but are not limited to, office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short time.

Warrant 4 - Pedestrian Volume
This warrant is intended for applications where the traffic volume on a major street is so heavy that pedestrians experience excessive delay in crossing the major street.

Warrant 5 - School Crossing
This warrant is intended for application where the fact that school children cross the major street is the principal reason to consider installing a traffic signal.

Warrant 6 - Coordinated Signal System

This warrant is used when progressive movement of traffic in a coordinated signal system sometimes necessitates installing a traffic signal at intersections where they would not otherwise be needed in order to maintain proper platooning of vehicles.

Warrant 7 - Crash Experience

This warrant is intended for application where the severity and frequency of crashes are the principal reason to consider installing a traffic signal.

Warrant 8 - Roadway Network

This warrant is used at the intersection of two major routes where installing a traffic signal may encourage concentration and organization of traffic flow on a roadway network.

3.3 Traffic Signal Warrant Analysis

The existing traffic conditions at the signalized intersections along US Route 6 were analyzed and compared to the criteria established by the **Ohio Manual of Uniform Traffic Control Devices** and professional engineering judgement in order to determine if traffic signal control is justified. This is required by the **Ohio Revised Code**. All of the data collected and determined for this study was analyzed and compared to the thresholds established by the criteria from the **OMUTCD**. Once an intersection was determined to meet warrant criteria no further analysis of the remaining signal warrants were carried out. The following table shows the results of the signal warrant analysis. Copies of the signal warrant analysis worksheets can be seen in **Appendix C**.

TRAFFIC SIGNAL WARRANT ANALYSIS

US Route 6

US Route 6 @	TRAFFIC SIGNAL WARRANTS							
	1	2	3	4	5	6	7	8
Berlin Road	NO	NO	na	NO	NO	NO	NO	NO
Main Street	NO	**YES**	na	---	---	---	---	---
Center Street	NO	NO	na	NO	NO	NO	NO	NO

Based upon the evaluation of the warrants established by the **Ohio Manual of Uniform Traffic Control Devices**, we conclude that the existing traffic signals at the intersections of US Route 6 at Berlin Road and Center Street are not justified as required by the **Ohio Revised Code** based upon the existing 2012 traffic conditions. The existing traffic signals at US Route 6 and Main Street are justified as required by the **Ohio Revised Code** based upon the existing traffic conditions.

4. TRAFFIC ANALYSIS

4.1 Capacity and LOS at Study Intersections

Intersection capacity analyses were performed at the study intersections using the procedures outlined in the computerized version of the Transportation Research Board's **Highway Capacity Manual, HCM2010 (HCS2010, Release 6.1)**. The capacity analyses were performed in order to estimate the maximum amount of traffic that can be accommodated by a roadway facility while maintaining recommended operational qualities. The AM and PM design hour volumes were analyzed to determine the level-of-service (LOS) at the study area intersections.

The capacity analysis procedures provide a calculated "average vehicle delay", which is based on traffic volumes, number of lanes, type of traffic control, channelization, grade, and percentage of large vehicles in the traffic stream at each intersection. The average delay calculated at an intersection is then assigned a "grade" or level-of-service (LOS) ranging from LOS A, the best, to LOS F, the worst based upon driver expectation. The intersection LOS "grades" as defined by the Transportation Research Board are as follows:

INTERSECTION LOS

LOS	UNSIGNALIZED AVERAGE DELAY PER VEHICLE (sec)	SIGNALIZED AVERAGE DELAY PER VEHICLE (sec)
A	≤ 10.0	≤ 10.0
B	10.1 to 15.0	10.1 to 20.0
C	15.1 to 25.0	21.1 to 35.0
D	25.1 to 35.0	35.1 to 55.0
E	35.1 to 50.0	55.1 to 80.0
F	> 50	> 80

The capacity analysis procedures and the resulting level of service grades and delays are a recognized traffic engineering standard for measuring the efficiency of intersection operations by such organizations as the Institute of Transportation Engineers, American Association of State Highway and Transportation Officials, and the Ohio Department of Transportation.

Existing Conditions - 2012 Capacity Analysis

Analyses were performed for the current 2012 conditions under the Existing scenario. These analyses will be used to identify existing capacity and/or operational deficiencies. All analysis will assume that the signal timing would be optimized to balance critical lane delays at the signalized intersections. The traffic volumes used in this analysis can be seen in **Figure 3**. Copies of the capacity worksheets are included in **Appendix D**. The results of the 2012 Existing analysis are shown in the following table.

2012 LEVELS OF SERVICE

(Existing Conditions - River Road to Berlin Road)

LOCATION	MOVEMENT	2012 AM PEAK LOS (DELAY)	2012 PM PEAK LOS (DELAY)
US 6 & Berlin Road*	Intersection	B (15.4)	B (15.2)
	Eastbound	B (15.0)	B (15.0)
	Westbound	B (15.2)	B (14.1)
	Northbound	B (16.5)	B (17.7)
	Southbound	B (14.3)	B (15.8)
US 6 & East Plaza Access	Westbound	A (7.7)	A (8.2)
	Northbound	A (9.4)	B (10.6)
US 6 & West Plaza Access	Westbound	A (7.8)	A (8.5)
	Northbound	B (11.7)	C (17.4)
US 6 & Tiffin Avenue	Eastbound	A (8.1)	A (8.4)
	Westbound	A (7.8)	A (8.4)
	Northbound	B (11.9)	C (16.7)
	Southbound	A (9.7)	B (11.2)
US 6 & River Road	Eastbound	A (8.1)	A (8.3)
	Westbound	A (7.9)	A (8.6)
	Northbound	B (13.3)	C (22.4)
	Southbound	B (12.0)	B (14.1)

(XX.X) = Average vehicle delay in seconds per vehicle

*** Signalized Intersection**

2012 LEVELS OF SERVICE

(Existing Conditions - Huron Street to Center Street)

LOCATION	MOVEMENT	2012 AM PEAK LOS (DELAY)	2012 PM PEAK LOS (DELAY)
US 6 WB & Huron Street	Westbound	A (7.3)	A (7.3)
	Northbound	B (12.8)	B (13.5)
	Southbound	B (12.7)	C (15.0)
US 6 EB & Huron Street	Eastbound	A (7.2)	A (7.2)
	Northbound	A (9.2)	B (10.4)
	Southbound	B (10.8)	B (13.2)
US 6 WB & Main Street*	Intersection	B (15.3)	B (15.5)
	Westbound	B (15.6)	B (16.1)
	Northbound	B (15.0)	B (15.0)
	Southbound	B (14.6)	B (14.5)
US 6 EB & Main Street*	Intersection	B (15.1)	B (15.8)
	Eastbound	B (15.0)	B (16.7)
	Northbound	B (15.0)	B (14.3)
	Southbound	B (15.6)	B (15.5)
US 6 WB & Williams Street	Westbound	A (7.3)	A (7.2)
	Northbound	B (12.5)	B (12.6)
	Southbound	B (12.2)	B (12.7)
US 6 EB & Williams Street	Eastbound	A (7.2)	A (7.2)
	Northbound	A (10.0)	B (10.5)
	Southbound	B (11.0)	B (11.5)
US 6 & Center Street*	Intersection	C (24.8)	C (25.5)
	Eastbound	C (24.7)	C (25.5)
	Westbound	C (24.8)	C (25.5)
	Northbound	C (25.1)	C (25.8)
	Southbound	C (24.9)	C (25.1)

(XX.X) = Average vehicle delay in seconds per vehicle

*** Signalized Intersection**

The analysis of the study area intersections indicates that they are operating with acceptable levels-of-service under the 2012 existing conditions during the AM and PM peak hour.

It was previously discussed that the intersections of US 6 at Center Street and Berlin Road do not warrant traffic signal control. An unsignalized capacity analysis will performed for each intersection to determine the impact of replacing the traffic signal control with stop sign control. Each intersection will be analyzed as a two-way stop sign controlled intersection with the US 6 approaches operating under free flow conditions. The minor streets (Center Street & Berlin Road) will be stop controlled.

The following tables show the capacity analysis results with intersections under stop sign control. Copies of the capacity worksheets are included in **Appendix E**.

2012 LEVELS OF SERVICE

(Proposed Stop Sign Control)

LOCATION	MOVEMENT	SAT AM PEAK LOS (DELAY)	2012 PM PEAK LOS (DELAY)
US 6 & Center Street	Eastbound	A (7.8)	A (8.0)
	Westbound	A (7.6)	A (7.8)
	Northbound	B (12.7)	B (12.9)
	Southbound	B (12.5)	B (14.1)
US 6 & Berlin Road	Eastbound	A (7.8)	A (7.8)
	Westbound	A (7.7)	A (8.1)
	Northbound	B (12.8)	C(15.6)
	Southbound	B (12.2)	B(13.6)

(XX.X) = Average vehicle delay in seconds per vehicle

The table indicates that the intersections are expected to operate with acceptable levels-of-service under the proposed stop sign control during the 2012 AM and PM peak hours.

Existing Conditions - Saturday Conditions

Analyses were also performed for the 2012 Saturday volumes under the existing roadway conditions. These analyses will be used to determine any additional existing capacity and/or operational deficiencies as compared to the weekday peak hours. The analysis assumed that the signal timing would be optimized to balance critical lane delays at traffic signal controlled intersections. The results of the 2034 existing conditions Twenty Year analysis are shown in the following tables. The traffic volumes used in this analysis can be seen highlighted in **Appendix A**. Copies of the capacity worksheets are included in **Appendix F**.

2012 LEVELS OF SERVICE

(Saturday Conditions)

LOCATION	MOVEMENT	SAT AM PEAK LOS (DELAY)	SAT PEAK LOS (DELAY)
US 6 WB & Main Street*	Intersection	B (14.4)	B (15.6)
	Westbound	B (14.6)	B (16.2)
	Northbound	B (14.3)	B (15.1)
	Southbound	B (14.1)	B (14.7)
US 6 EB & Main Street*	Intersection	B (14.4)	B (15.3)
	Eastbound	B (14.7)	B (16.3)
	Northbound	B (14.0)	B (14.0)
	Southbound	B (14.4)	B (15.2)
US 6 & River Road	Eastbound	A (7.6)	A (8.4)
	Westbound	A (7.5)	A (8.3)
	Northbound	B (10.6)	C (17.9)
	Southbound	A (9.6)	B (11.1)

(XX.X) = Average vehicle delay in seconds per vehicle

*** Signalized Intersection**

The results indicate that the intersections under study based on Saturday conditions are currently operating with acceptable levels-of-service.

A review of the Saturday traffic volumes and level-of-service results reveal conditions very similar to the weekday peak hour conditions. The weekday peak hour conditions are a conservative representation of the traffic conditions within the corridor and will be used for all further analysis.

Existing Conditions - 2014 Opening Year Volumes

Analyses were performed for the 2014 Opening Year volumes under the existing roadway conditions as previously analyzed in the Existing Conditions section. It should be noted that recommendations from the previous section will be carried into this analysis. These analyses will be used to identify existing capacity and/or operational deficiencies. The analysis assumed that the signal timing would be optimized to balance critical lane delays at traffic signal controlled intersections. The results of the 2014 existing conditions Opening year analysis are shown in the following tables. The traffic volumes used in this analysis can be seen in **Figure 4**. Copies of the capacity worksheets are included in **Appendix G**.

2014 LEVELS OF SERVICE

(No-Build Conditions - River Road to Berlin Road)

LOCATION	MOVEMENT	2014 AM PEAK LOS (DELAY)	2014 PM PEAK LOS (DELAY)
US 6 & Berlin Road	Eastbound	A (7.8)	A (7.8)
	Westbound	A (7.7)	A (8.1)
	Northbound	B (12.8)	C (15.7)
	Southbound	B (12.2)	B (13.7)
US 6 & East Plaza Access	Westbound	A (7.7)	A (8.2)
	Northbound	A (9.4)	B (10.6)
US 6 & West Plaza Access	Westbound	A (7.8)	A (8.5)
	Northbound	B (11.8)	C (17.4)
US 6 & Tiffin Avenue	Eastbound	A (8.1)	A (8.4)
	Westbound	A (7.8)	A (8.4)
	Northbound	B (12.0)	C (16.8)
	Southbound	A (9.8)	B (11.3)
US 6 & River Road	Eastbound	A (8.1)	A (8.3)
	Westbound	A (7.9)	A (8.6)
	Northbound	B (13.3)	C (22.7)
	Southbound	B (12.1)	B (14.2)

(XX.X) = Average vehicle delay in seconds per vehicle

*** Signalized Intersection**

2014 LEVELS OF SERVICE

(No-Build Conditions - Huron Street to Center Street)

LOCATION	MOVEMENT	2014 AM PEAK LOS (DELAY)	2014 PM PEAK LOS (DELAY)
US 6 WB & Huron Street	Westbound	A (7.3)	A (7.3)
	Northbound	B (12.9)	B (13.5)
	Southbound	B (12.8)	C (15.1)
US 6 EB & Huron Street	Eastbound	A (7.2)	A (7.2)
	Northbound	A (9.2)	B (10.4)
	Southbound	B (10.8)	B (13.3)
US 6 WB & Main Street*	Intersection	B (15.1)	B (15.5)
	Westbound	B (15.0)	B (16.1)
	Northbound	B (15.5)	B (15.1)
	Southbound	B (15.2)	B (14.6)
US 6 EB & Main Street*	Intersection	B (15.1)	B (15.8)
	Eastbound	B (15.0)	B (16.7)
	Northbound	B (15.0)	B (14.3)
	Southbound	B (15.6)	B (15.5)
US 6 WB & Williams Street	Westbound	A (7.3)	A (7.2)
	Northbound	B (12.5)	B (12.6)
	Southbound	B (12.2)	B (12.8)
US 6 EB & Williams Street	Eastbound	A (7.2)	A (7.2)
	Northbound	B (10.0)	B (10.5)
	Southbound	B (11.0)	B (11.5)
US 6 & Center Street	Eastbound	A (7.9)	A (8.1)
	Westbound	A (7.6)	A (7.8)
	Northbound	B (12.8)	B (12.9)
	Southbound	B (12.6)	B (14.2)

(XX.X) = Average vehicle delay in seconds per vehicle

*** Signalized Intersection**

The analysis of the study area intersections under the 2014 No-Build conditions indicates that they are expected to operate with acceptable levels-of-service under the anticipated 2014 conditions during the AM and PM peak hour.

Existing Conditions - 2034 Twenty Year Volumes

Analyses were performed for the 2034 Twenty Year volumes under the existing roadway conditions as previously analyzed in the previous sections. These analyses will be used to identify existing capacity and/or operational deficiencies. The analysis assumed that the signal timing would be optimized to balance critical lane delays at traffic signal controlled intersections. The results of the 2034 existing conditions Twenty Year analysis are shown in the following tables. The traffic volumes used in this analysis can be seen in **Figure 5**. Copies of the capacity worksheets are included in **Appendix H**.

2034 LEVELS OF SERVICE

(No-Build Conditions - River Road to Berlin Road)

LOCATION	MOVEMENT	2034 AM PEAK LOS (DELAY)	2034 PM PEAK LOS (DELAY)
US 6 & Berlin Road	Eastbound	A (7.8)	A (7.9)
	Westbound	A (7.8)	A (8.2)
	Northbound	B (13.5)	C (17.3)
	Southbound	B (12.7)	B (14.5)
US 6 & East Plaza Access	Westbound	A (7.8)	A (8.3)
	Northbound	A (9.6)	B (10.9)
US 6 & West Plaza Access	Westbound	A (7.8)	A (8.6)
	Northbound	B (12.2)	C (19.1)
US 6 & Tiffin Avenue	Eastbound	A (8.2)	A (8.5)
	Westbound	A (7.8)	A (8.6)
	Northbound	B (12.5)	C (18.3)
	Southbound	A (9.9)	B (11.7)
US 6 & River Road	Eastbound	A (8.2)	A (8.5)
	Westbound	A (7.9)	A (8.8)
	Northbound	B (14.0)	D (26.3)
	Southbound	B (12.6)	C (15.2)

(XX.X) = Average vehicle delay in seconds per vehicle

2034 LEVELS OF SERVICE

(No-Build Conditions - Huron Street to Center Street)

LOCATION	MOVEMENT	2034 AM PEAK LOS (DELAY)	2034 PM PEAK LOS (DELAY)
US 6 WB & Huron Street	Westbound	A (7.3)	A (7.3)
	Northbound	B (13.3)	B (14.0)
	Southbound	B (13.2)	C (15.8)
US 6 EB & Huron Street	Eastbound	A (7.2)	A (7.2)
	Northbound	A (9.3)	B (10.6)
	Southbound	B (11.0)	B (13.8)
US 6 WB & Main Street*	Intersection	B (15.4)	B (15.6)
	Westbound	B (15.6)	B (16.3)
	Northbound	B (15.1)	B (15.1)
	Southbound	B (14.8)	B (14.6)
US 6 EB & Main Street*	Intersection	B (15.2)	B (16.0)
	Eastbound	B (15.8)	B (16.9)
	Northbound	B (14.4)	B (14.4)
	Southbound	B (15.0)	B (15.7)
US 6 WB & Williams Street	Westbound	A (7.3)	A (7.3)
	Northbound	B (13.0)	B (13.1)
	Southbound	B (12.7)	B (13.3)
US 6 EB & Williams Street	Eastbound	A (7.2)	A (7.2)
	Northbound	B (10.1)	B (10.7)
	Southbound	B (11.2)	B (11.9)
US 6 & Center Street	Eastbound	A (7.9)	A (8.1)
	Westbound	A (7.7)	A (7.8)
	Northbound	B (13.3)	B (13.7)
	Southbound	B (13.1)	B (15.0)

(XX.X) = Average vehicle delay in seconds per vehicle

*** Signalized Intersection**

The tables indicate that intersections and approaches are expected to operate with acceptable levels-of-service under the existing conditions for expected peak hour 2034 volumes.

4.2 Speed Zone Analysis

A pneumatic tube traffic data recorder was placed on US Route 6 just east of River Road to obtain vehicular volume and speed data. The traffic data was collected continuously from Wednesday, October 3, 2012 through Wednesday, October 10, 2012. The data was then broken down into results that provided the 15TH, 50TH, 85TH, and 95TH percentile speeds. The percentile data indicates at what percentage vehicles are traveling at or below a certain speed. The data also included the 10 mile per hour pace speed. The pace speed is the ten mile per hour range with the greatest concentration of the observed vehicles within it. The data also provided the mean speed or average speed for all vehicles observed during the observation period.

The following table shows the results of the data collection for eastbound, westbound, and the total two-way flow for US Route 6. A copy of the field data worksheets can be seen in **Appendix I**.

US ROUTE 6 SPEED ANALYSIS

	NORTHBOUND	SOUTHBOUND	COMBINED
15TH Percentile	19 mph	18 mph	19 mph
50TH Percentile	38 mph	39 mph	39 mph
85TH Percentile	44 mph	45 mph	44 mph
95TH Percentile	48 mph	48 mph	48 mph
Pace Speed	36 - 45 mph	36 - 45 mph	36 - 45 mph
% in Pace	63.8%	59.5%	61.6%
Average Speed	35 mph	35 mph	35 mph

Vehicular speeds were recorded for 65,187 vehicles over the seven day period. It was determined the 85th percentile speed was 44 miles per hour. This indicates that only 15% of the vehicles (9,778 vehicles) were traveling at a speed greater than 44 miles per hour.

The ten mile per hour pace speed was determined to be from 36 miles per hour to 45 miles per hour. There were 40,185 vehicles in this ten mile per hour. This accounts for 62% percent of the vehicle speeds that were recorded.

5. ROAD DIET

5.1 Definition

A road diet is a technique used to reduce the number of travel lanes along a particular roadway in an attempt to improve the functionality. One of the most common applications of a road diet is the conversion of a four-lane roadway (two travel lanes in each direction) to a three-lane roadway (one travel lane in each direction and a center turn-lane). The center turn-lane gives the ability to provide left-turn lanes at intersections and the additional pavement made available by the lane reduction can be converted into bicycle lanes on either side of the roadway. Four-lane roadways that are ideal candidates for a road diet will generally carry up to 18,000 vehicles per day.

5.2 Purpose

The general purpose of a road diet is to improve safety along a particular roadway. Four-lane roadways, in particular, significantly discourage mobility and access of transit users, bicyclists, and pedestrians. Transit users and pedestrians have a more difficult time crossing a four-lane sections as there are fewer adequate gaps. Cyclists are found to avoid four-lane roadways as they tend to be too narrow to ride comfortably. Instead of walking or riding, individuals find it easier to just drive as they add to the daily traffic and increase congestion over time. In addition to more vehicles, four-lane roadways were found to create higher speeds. With more laneage, drivers tend to drive faster than normal and will seek to match speeds of other drivers in adjacent lanes. Higher speeds and the lack of turn-lanes along such roadways increase the probability of accidents as volumes rise during peak hours. Studies have shown that road diets do have the ability to improve safety while serving similar (or higher) daily traffic volumes following a lane reduction.

5.3 Implementation

US Route 6, a four-lane facility, currently has a cross section that ranges from approximately 46 feet to 52 feet throughout the study area. The proposed road diet would reduce the four lanes to three lanes just east of Huron Street to Berlin Road, providing one travel lane in each direction and a center turn lane, as mentioned previously. Continuing to use twelve foot lanes will create a new cross-section of thirty-six feet. The remaining cross section would allow for approximately 8 foot bicycle lanes. The center lane will provide a left-turn lane at each of the intersections and access driveways within the study area where none currently exist. Analysis will be performed in the following sections to determine the feasibility of the road diet. A plan view of the proposed road diet can be see in **Appendix J**.

5.4 Road Diet Capacity Analysis - 2014 Conditions

Analyses were performed for the expected 2014 traffic volumes under the proposed road diet conditions. These analyses will be used to compare to the existing roadway conditions under and identify any potential deficiencies that will result from the reduced number of travel lanes. It should be noted that the proposed road diet only includes those intersections east of Huron Street.

The results of the analysis are shown in the following table. Copies of the capacity worksheets are included in **Appendix K**.

2014 LEVELS OF SERVICE
(Proposed Build Conditions)

LOCATION	MOVEMENT	2014 AM PEAK LOS (DELAY)	2014 PM PEAK LOS (DELAY)
US 6 & Berlin Road	Eastbound	A (7.8)	A (7.8)
	Westbound	A (7.7)	A (8.1)
	Northbound	C (15.4)	C (19.5)
	Southbound	B (12.3)	B (13.8)
US 6 & East Plaza Access	Westbound	A (7.7)	A (8.2)
	Northbound	A (8.9)	A (9.5)
US 6 & West Plaza Access	Westbound	A (7.8)	A (8.5)
	Northbound	B (13.9)	C (22.9)
US 6 & Tiffin Avenue	Eastbound	A (8.1)	A (8.4)
	Westbound	A (7.8)	A (8.4)
	Northbound	B (13.7)	C (20.3)
	Southbound	B (11.0)	B (13.4)
US 6 & River Road	Eastbound	A (8.1)	A (8.3)
	Westbound	A (7.9)	A (8.6)
	Northbound	C (15.9)	D (32.8)
	Southbound	B (13.1)	C (17.3)

(XX.X) = Average vehicle delay in seconds per vehicle

The analysis indicates that the all intersections within the study area are expected to operate at acceptable levels-of-service with the 2014 traffic volumes under the proposed roadway conditions during the weekday AM and PM peak hours. The intersections and all approaches are anticipated to operate with a LOS “D” or better.

4.4 Road Diet Capacity Analysis - 2034 Conditions

Analyses were performed for the expected 2034 traffic volumes under the proposed road diet conditions. These analyses will be used to compare to the existing roadway conditions under and identify any potential deficiencies that will result from the reduced number of travel lanes. It should be noted that the proposed road diet only includes those intersections east of Huron Street. The intersection of US Route 6 and Berlin Road was previously analyzed and determined to operate adequately as a single lane roundabout. A single lane roundabout can be accommodated with the proposed road diet. This analysis will determine if the intersection of US Route 6 and Berlin Road can adequately function under the road diet conditions as a stop sign controlled intersection.

The results of the analysis are shown in the following table. Copies of the capacity worksheets are included in **Appendix L**.

2034 LEVELS OF SERVICE

(Proposed Build Conditions)

LOCATION	MOVEMENT	2034 AM PEAK LOS (DELAY)	2034 PM PEAK LOS (DELAY)
US 6 & Berlin Road*	Eastbound	A (7.8)	A (7.9)
	Westbound	A (7.8)	A (8.2)
	Northbound	C (16.8)	C(22.8)
	Southbound	B (12.8)	B (14.7)
US 6 & East Plaza Access	Westbound	A (7.8)	A (8.3)
	Northbound	A (9.0)	A (9.6)
US 6 & West Plaza Access	Westbound	A (7.8)	A (8.6)
	Northbound	B (14.7)	D (26.5)
US 6 & Tiffin Avenue	Eastbound	A (8.2)	A (8.5)
	Westbound	A (7.8)	A (8.5)
	Northbound	B (14.6)	C (22.6)
	Southbound	B (11.4)	B (14.3)
US 6 & River Road	Eastbound	A (8.2)	A (8.5)
	Westbound	A (7.9)	A (8.8)
	Northbound	C (17.1)	E (41.4)
	Southbound	B (13.8)	C (19.0)

(XX.X) = Average vehicle delay in seconds per vehicle

*** Signalized Intersection**

The analysis indicates that the all intersections within the study area are expected to operate at acceptable levels-of-service with the 2034 traffic volumes under the proposed roadway conditions during the weekday AM and PM peak hours except the intersection of US Route 6 and River Road.

The northbound approach at US Route 6 and River Road is expected to operate with an LOS E during the PM peak hour. This poor level-of-service can be attributed to a lack of adequate gaps in the US Route 6 through traffic stream for the Rover Road northbound left turn traffic.

In order to determine what mitigation would be necessary to improve the northbound approach level-of-service at the intersection of US Route 6 and River Road, certain improvements were tested with further capacity analyses.

It was determined that the addition of turn lanes would not improve the intersection levels-of-service. The intersection was determined to require traffic signal control. The following tables shows the capacity analysis results with the recommended traffic control improvements. The analyses assumed that the signal timing would be optimized to balance critical lane delays. Copies of the capacity worksheets are included in **Appendix M**.

2034 LEVELS OF SERVICE

(Proposed Traffic Signal Control)

LOCATION	MOVEMENT	2034 AM PEAK LOS (DELAY)	2034 PM PEAK LOS (DELAY)
US 6 & River Road	Intersection	B (15.3)	B (16.9)
	Eastbound	B (14.1)	B (17.4)
	Westbound	B (15.7)	B (15.2)
	Northbound	B (18.7)	C (22.1)
	Southbound	B (17.7)	B (19.5)

(XX.X) = Average vehicle delay in seconds per vehicle

The tables indicate that the intersection is expected to operate with acceptable levels-of-service under traffic signal control.

Traffic Signal Warrant Analysis

The 2034 build conditions at the intersection of US Route 6 and River Road were determined to require some form of mitigation to improve the northbound approach level-of-service. It was determined that traffic signal control could accomplish this. Therefore an analysis of the 2034 traffic volumes under the proposed build conditions is necessary for this intersection.

The 2034 traffic volumes under the proposed build conditions were analyzed and compared to the criteria established by the **Ohio Manual of Uniform Traffic Control Devices** and professional engineering judgement to determine if traffic signal control is warranted at the intersection. This is required by the **Ohio Revised Code**. All of the data collected and determined for this study was analyzed and compared to the thresholds established by the criteria from the **OMUTCD**. Warrants 1-2 were evaluated for this analysis.

In order to determine if the 2034 anticipated build conditions are expected to meet one of these warrants, the eighth highest hourly traffic volumes were estimated to be compared against the thresholds for Warrant 1. The fourth highest hourly traffic volumes were estimated to be compared against the thresholds for Warrant 2. The eight and fourth highest hourly volumes were determined by multiplying the peak hour volumes established for the 2034 build conditions (**Figure 5**) by a factor determined from the Ohio Department of Transportation's Hourly Percentages by Vehicle Type chart. These factors can be seen at ODOT's website at:

http://www.dot.state.oh.us/techservsite/availpro/Traffic_Survey/HrlyVehTpe/hrlyvehicle.htm

Also, if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, or the speed limit exceeds 40 miles per hour the minimum threshold is reduced to 70% levels. Based on the population of the City Huron at the time of the 2011 census the intersection does meet the criteria for reducing the minimum threshold volumes to the 70% levels.

Warrant 1 consists of three conditions of which only one needs to be satisfied. The three conditions are based upon the number of approach lanes at the intersection and the minimum volume that must occur for any eight hours. A copy of the traffic signal warrant worksheet for Warrant 1 can be seen in **Appendix C**.

Warrant #1 - Condition A

There are not at least 8 hours anticipated to meet the minimum threshold for both the main street and the side street. Therefore, Condition A of Warrant 1 is not satisfied for the 2034 build conditions.

Warrant #1 - Condition B

There are not at least 8 hours anticipated to meet the minimum threshold for both the main street and the side street. Therefore, Condition B of Warrant 1 is not satisfied for the 2034 build conditions.

Warrant #1 - Combination of Conditions A & B

There are not at least 8 hours anticipated to meet the minimum threshold for both the main street and the side street. Therefore, Combination of Condition A & B of Warrant 1 is not satisfied for the 2034 build conditions.

Warrant #2 - Four Hour Vehicular Volume

In order to meet Warrant 2, the four highest hours of traffic volumes must be plotted on a graph from the **Ohio Manual of Uniform Traffic Control Devices (OMUTCD)** and the resulting intersection of the main street volume to the side street volume must be greater than the thresholds established by the graph. The Warrant 2 graphs can be seen in **Appendix C**.

There are at least 4 hours expected to meet the minimum boundary thresholds indicated on the graph for the intersection of US Route 6 and River Road under the 2034 build conditions. Therefore, Warrant 2 is satisfied for the 2034 build conditions.

Based upon the evaluation of the warrants established by the **Ohio Manual of Uniform Traffic Control Devices**, we conclude that a traffic signal is justified as required by the **Ohio Revised Code** based upon the expected 2034 build conditions at the intersection US Route 6 and River Road.

5.6 Turning Lane Analysis

The recommended left turn lanes along the section of US Route 6 where the road diet id proposed were analyzed to determine the necessary storage length in order to accommodate the future traffic. The analysis was performed in accordance with the procedure recommended by the Ohio Department of Transportation in their **Location and Design Manual, Volume 1, Section 401**. The ODOT criteria and procedures are furnished in **Appendix N**. The following tables shows the results of the analysis based upon 2034 future traffic volumes. It should be noted that the recommended maximum left turn lane length is 600 feet.

US Route 6 & River Road
Turn Lane Analysis - Stop Sign Control

Movement Direction	DHV	No. of Lanes	Cycles / Hour	Average Veh/ Cycle/ Lane	Design Speed (mph)	Fig. 401-10 Storage Length (ft)	Fig. 401-9 Condition[1]			Backup Length (ft)	Turn Lane Length (ft)[1]
							A	B	C		
EB L	6	1	60	0.10	40	50		125	161		**161***
WB L	14	1	60	0.23	40	50		125	161		**161***

*Includes 50' Diverging Taper
** Maximum Length

US Route 6 & River Road
Turn Lane Analysis - Traffic Signal Control

Movement Direction	DHV	No. of Lanes	Cycles / Hour	Average Veh/ Cycle/ Lane	Design Speed (mph)	Fig. 401-10 Storage Length (ft)	Fig. 401-9 Condition[1]			Backup Length (ft)	Turn Lane Length (ft)[1]
							A	B	C		
EB L	6	1	60	0.10	40	50		125	161		**375***
EB T&RT	571	1	60	9.52	40	375				375	
WB L	14	1	60	0.23	40	50		125	161		**325***
WB T&RT	482	1	60	8.03	40	325				325	

*Includes 50' Diverging Taper
** Maximum Length

US Route 6 & Tiffin Avenue
Turn Lane Analysis - Stop Sign Control

Movement Direction	DHV	No. of Lanes	Cycles / Hour	Average Veh/ Cycle/ Lane	Design Speed (mph)	Fig. 401-10 Storage Length (ft)	Fig. 401-9 Condition[1]			Backup Length (ft)	Turn Lane Length (ft)[1]
							A	B	C		
EB L	34	1	60	0.57	40	50		125	161		**161***

*Includes 50' Diverging Taper
** Maximum Length

US Route 6 & West Plaza Access Driveway
Turn Lane Analysis - Stop Sign Control

Movement Direction	DHV	No. of Lanes	Cycles / Hour	Average Veh/ Cycle/ Lane	Design Speed (mph)	Fig. 401-10 Storage Length (ft)	Fig. 401-9 Condition[1]			Backup Length (ft)	Turn Lane Length (ft)[1]
							A	B	C		
WB L	13	1	60	0.22	40	50		125	161		**161***

*Includes 50' Diverging Taper
** Maximum Length

US Route 6 & East Plaza Access Driveway
Turn Lane Analysis - Stop Sign Control

Movement Direction	DHV	No. of Lanes	Cycles / Hour	Average Veh/ Cycle/ Lane	Design Speed (mph)	Fig. 401-10 Storage Length (ft)	Fig. 401-9 Condition[1]			Backup Length (ft)	Turn Lane Length (ft)[1]
							A	B	C		
WB L	22	1	60	0.37	40	50		125	161		**161***

*Includes 50' Diverging Taper
** Maximum Length

US Route 6 & Berlin Road

Turn Lane Analysis - Stop Sign Control

Movement Direction	DHV	No. of Lanes	Cycles / Hour	Average Veh/ Cycle/ Lane	Design Speed (mph)	Fig. 401-10 Storage Length (ft)	Fig. 401-9 Condition[1]			Backup Length (ft)	Turn Lane Length (ft)[1]
							A	B	C		
EB L	17	1	60	0.28	40	50		125	161		**161***
WB L	26	1	60	0.43	40	50		125	161		**161***

*Includes 50' Diverging Taper
** Maximum Length

6. INTERSECTION LOS COMPARISON ANALYSIS

6.1 2014 Comparative Analysis - Existing vs. Proposed Conditions

A comparison was performed to show the incremental effects on the capacity of the study intersections due to the proposed lane diets for US Route 6 between Huron Street and Berlin Road. The comparison table does not include recommended improvements for poor delay so as to provide a direct comparison of the impact of constructing the proposed road diets. The following tables show a comparison of the 2014 Existing versus Proposed conditions for the AM and PM peak hours.

AM PEAK HOUR COMPARISON TABLE

(2014 Existing Conditions vs. 2014 Proposed Conditions)

LOCATION	MOVEMENT	EXISTING LOS (DELAY)	PROPOSED LOS (DELAY)	DIFFERENCE +/-
US 6 & Berlin Road	Eastbound	A (7.8)	A (7.8)	0.0
	Westbound	A (7.7)	A (7.7)	0.0
	Northbound	B (12.8)	C (15.4)	+2.6
	Southbound	B (12.2)	B (12.3)	+0.1
US 6 & East Plaza Access	Westbound	A (7.7)	A (7.7)	0.0
	Northbound	A (9.4)	A (8.9)	-0.5
US 6 & West Plaza Access	Westbound	A (7.8)	A (7.8)	0.0
	Northbound	B (11.8)	B (13.9)	+2.1
US 6 & Tiffin Avenue	Eastbound	A (8.1)	A (8.1)	0.0
	Westbound	A (7.8)	A (7.8)	0.0
	Northbound	B (12.0)	B (13.7)	+1.7
	Southbound	A (9.8)	B (11.0)	+1.2
US 6 & River Road	Eastbound	A (8.1)	A (8.1)	0.0
	Westbound	A (7.9)	A (7.9)	0.0
	Northbound	B (13.3)	C (15.9)	+2.6
	Southbound	B (12.1)	B (13.1)	+1.0

(XX.X) = Average vehicle delay in seconds per vehicle

PM PEAK HOUR COMPARISON TABLE

(2014 Existing Conditions vs. 2014 Proposed Conditions)

LOCATION	MOVEMENT	EXISTING LOS (DELAY)	PROPOSED LOS (DELAY)	DIFFERENCE +/-
US 6 & Berlin Road	Eastbound	A (7.8)	A (7.8)	0.0
	Westbound	A (8.1)	A (8.1)	0.0
	Northbound	C (15.7)	C (19.5)	+3.8
	Southbound	B (13.7)	B (13.8)	+0.1
US 6 & East Plaza Access	Westbound	A (8.2)	A (8.2)	0.0
	Northbound	B (10.6)	A (9.5)	-1.1
US 6 & West Plaza Access	Westbound	A (8.5)	A (8.5)	0.0
	Northbound	C (17.4)	C (22.9)	+5.5
US 6 & Tiffin Avenue	Eastbound	A (8.4)	A (8.4)	0.0
	Westbound	A (8.4)	A (8.4)	0.0
	Northbound	C (16.8)	C (20.3)	+3.5
	Southbound	B (11.3)	B (13.4)	+2.1
US 6 & River Road	Eastbound	A (8.3)	A (8.3)	0.0
	Westbound	A (8.6)	A (8.6)	0.0
	Northbound	C (22.7)	D (32.8)	+10.1
	Southbound	B (14.2)	C (17.3)	+3.1

(XX.X) = Average vehicle delay in seconds per vehicle

The AM and PM peak hour comparisons indicate that the study intersections and approaches are expected to be only minimally affected by the proposed road diet. During the AM peak hour the greatest increase in delay experienced is 2.6 seconds. During the PM peak hour the greatest expected increase in delay experienced is 10.1 seconds.

No approach or intersection is degraded by more than one level-of-service under the 2014 conditions.. The increases in delay are minimal and changes in levels-of-service can be attributed to the reduction in the number of available through lanes in the study area.

The 2034 AM and PM peak hour comparisons indicate that the study intersections and approaches are expected to be only minimally affected by the proposed road diet.

6.2 2034 Comparative Analysis - Existing vs. Proposed Conditions

A comparison was performed to show the incremental effects on the capacity of the study intersections due to the proposed lane diets for US Route 6 between Huron Street and Berlin Road. The comparison table includes all recommended improvements for poor delay. The following tables show a comparison of the 2034 Existing versus Proposed conditions for the AM and PM peak hours.

AM PEAK HOUR COMPARISON TABLE

(2034 Existing Conditions vs. 2034 Proposed Conditions)

LOCATION	MOVEMENT	EXISTING LOS (DELAY)	PROPOSED LOS (DELAY)	DIFFERENCE +/-
US 6 & Berlin Road	Eastbound	A (7.8)	A (7.8)	0.0
	Westbound	A (7.8)	A (7.8)	0.0
	Northbound	B (13.5)	C (16.8)	+3.3
	Southbound	B (12.7)	B (12.8)	+0.1
US 6 & East Plaza Access	Westbound	A (7.8)	A (7.8)	0.0
	Northbound	A (9.6)	A (9.0)	-0.6
US 6 & West Plaza Access	Westbound	A (7.8)	A (7.8)	0.0
	Northbound	B (12.2)	B (14.7)	+2.5
US 6 & Tiffin Avenue	Eastbound	A (8.2)	A (8.2)	0.0
	Westbound	A (7.8)	A (7.8)	0.0
	Northbound	B (12.5)	B (14.6)	+2.1
	Southbound	A (9.9)	B (11.4)	+1.5
US 6 & River Road	Eastbound	A (8.2)	A (8.2)	0.0
	Westbound	A (7.9)	A (7.9)	0.0
	Northbound	B (14.0)	C (17.1)	+3.1
	Southbound	B (12.6)	B (13.8)	+1.2

(XX.X) = Average vehicle delay in seconds per vehicle

PM PEAK HOUR COMPARISON TABLE

(2034 Existing Conditions vs. 2034 Proposed Conditions)

LOCATION	MOVEMENT	EXISTING LOS (DELAY)	PROPOSED LOS (DELAY)	DIFFERENCE +/-
US 6 & Berlin Road	Eastbound	A (7.9)	A (7.9)	0.0
	Westbound	A (8.2)	A (8.2)	0.0
	Northbound	C (17.3)	C(22.8)	+5.5
	Southbound	B (14.5)	B (14.7)	+0.2
US 6 & East Plaza Access	Westbound	A (8.3)	A (8.3)	0.0
	Northbound	B (10.9)	A (9.6)	-1.3
US 6 & West Plaza Access	Westbound	A (8.6)	A (8.6)	0.0
	Northbound	C (19.1)	D (26.5)	+7.4
US 6 & Tiffin Avenue	Eastbound	A (8.5)	A (8.5)	0.0
	Westbound	A (8.6)	A (8.5)	0.0
	Northbound	C (18.3)	C (22.6)	+4.3
	Southbound	B (11.7)	B (14.3)	+2.6
US 6 & River Road	Eastbound	A (8.5)	A (8.5)	0.0
	Westbound	A (8.8)	A (8.8)	0.0
	Northbound	D (26.3)	E (41.4)	+15.1
	Southbound	C (15.2)	C (19.0)	+3.8

(XX.X) = Average vehicle delay in seconds per vehicle

The AM and PM peak hour comparisons indicate that the study intersections and approaches are expected to be only minimally affected by the proposed road diet. During the AM peak hour the greatest increase in delay experienced is 3.3 seconds. During the PM peak hour the greatest expected increase in delay experienced is 15.1 seconds.

No approach or intersection is degraded by more than one level-of-service under the 2014 conditions.. The increases in delay are minimal and changes in levels-of-service can be attributed to the reduction in the number of available through lanes in the study area.

The 2034 AM and PM peak hour comparisons indicate that the study intersections and approaches are expected to be only minimally affected by the proposed road diet.

7. ROUNDABOUT ANALYSIS

7.1 Roundabout Control

The intersection of US Route 6 and Berlin Road is currently controlled by a traffic signal, however previous analysis determined that the intersection does not warrant traffic control. The intersection of US Route 6 and River Road was determined to require traffic signal control under the 2034 Build conditions. The roundabout method of traffic control is being considered for its ability to create a more efficient operation and its additional safety benefits as compared to a traditional perpendicular four-way stop sign controlled intersection.

A roundabout may also provide environmental benefits if the vehicle delay and the number and duration of stops as compared to the alternative can be reduced. The intersection is currently under four-way stop sign control. This control type requires all vehicles on these approaches to come to a complete stop. Even when there are heavy volumes, vehicles at a roundabout typically continue to advance slowly in moving queues rather than coming to a complete stop. This may also help to reduce noise and air quality impacts an fuel consumption significantly by reducing the number of acceleration/deceleration cycles and time spent idling.

It has also been shown that there are inherent safety benefits to the use of a roundabout at an intersection. A study by the *Insurance Institute for Highway Safety* indicates that roundabouts reduce crashes by approximately 75% at intersections where stop signs or traffic signals were previously used for traffic control. The reduction in crashes can be attributed to several factors:

- The number of possible conflict points between vehicles decreases from 32 at a four-way intersection, to eight at a roundabout. By reducing the number of conflict points, roundabouts also reduce the number of collisions.

- Vehicle speeds at roundabouts are much lower, generally less than 25 mph. Lower speeds mean shorter braking distances and longer decision making time. Therefore, even if someone makes a mistake a collision is easier to avoid.

- Decision making is simplified. A driver about to enter has one decision: " Is there a vehicle circulating in the roundabout and blocking my path?' If not, the driver enters. If there is, the driver waits for a gap.

- If a collision does occur at a roundabout, the force of the impact is much lower due to the lower speed and the low angle of impact. No one can “run the stop sign” and cause a right angle collision. Nor can a left-turning driver make a mistake in selecting a gap in the approaching through traffic, with the resulting head-on or right angle crash.

The guidelines and recommendations found in the **“Roundabouts: An Informational Guide, FHWA-RD-00-67,”** publication put forth by the U.S. Department of Transportation and the Federal Highway Administration were used to analyze the appropriateness of a roundabout at the intersection of US Route 6 and Berlin Road.

7.2 Roundabout Analysis - 2014 and 2034 Future Conditions

Average daily traffic guidelines can be found in **Section 1.6.1** of the Guide the detail recommended the typical daily service of various roundabouts. Based on the proposed roadway conditions the analysis will consider the use of an urban single lane roundabout. A maximum daily service volume of 20,000 vehicles per day (vpd) for an urban single lane roundabout is recommended.

The intersection has an existing 2012 ADT of approximately 8,632 vpd, an estimated 2014 ADT of 8,710 vpd, and an estimated 2034 ADT of 9,480 vpd, which are below the 20,000 vpd guideline. This ADT guideline can be found in **Section 1.6.1** of the Guide. Therefore, a roundabout can be considered as a possible option for the intersection of US Route 6 and Berlin Road.

7.3 Roundabout Capacity Analysis

Analyses were performed for the 2014 Opening Year and 2034 Twenty Year volumes to determine if a single lane roundabout would be operate adequately at US Route 6 and Berlin Road. The results of the 2014 and 2034 existing conditions Twenty Year analysis are shown in the following tables. The traffic volumes used in this analysis can be seen in **Figures 4 and 5**. Copies of the capacity worksheets are included in **Appendix O**.

2014 LEVELS OF SERVICE

(Proposed Roundabout)

LOCATION	MOVEMENT	2014 AM PEAK LOS (DELAY)	2014 PM PEAK LOS (DELAY)
US 6 & Berlin Road	Intersection	A (6.1)	A (7.1)
	Eastbound	A (5.6)	A (7.6)
	Westbound	A (7.0)	A (7.0)
	Northbound	A (5.1)	A (6.3)
	Southbound	A (5.3)	A (5.4)

(XX.X) = Average vehicle delay in seconds per vehicle

2034 LEVELS OF SERVICE

(Proposed Roundabout)

LOCATION	MOVEMENT	2034 AM PEAK LOS (DELAY)	2034 PM PEAK LOS (DELAY)
US 6 & Berlin Road	Intersection	A (6.4)	A (7.3)
	Eastbound	A (5.9)	A (8.2)
	Westbound	A (7.4)	A (7.5)
	Northbound	A (5.3)	A (6.7)
	Southbound	A (5.5)	A (5.6)
US 6 & River Road	Intersection	A (9.8)	B (10.7)
	Eastbound	A (6.8)	B (11.1)
	Westbound	A (6.2)	B (10.8)
	Northbound	B (12.6)	A (8.1)
	Southbound	A (3.5)	A (6.3)

(XX.X) = Average vehicle delay in seconds per vehicle

The results of the analysis indicate that a single-lane roundabout is expected to operate with acceptable levels-of-service for the AM and PM peak hours under both the anticipated 2014 and 2034 traffic volumes at each intersection. Therefore, roundabout control should be expected to adequately serve the traffic volumes at the intersections of US Route 6 at Berlin Road and River Road.

Roundabout control should be considered a viable alternative to the traditional traffic control methods of signal control at US Route 6 and River and stop sign control at US Route 6 and Berlin Road.

8. RECOMMENDATIONS & CONCLUSIONS

8.1 Recommendations to Accommodate Study Area Traffic

Based on the previously completed analyses the following recommendations are being made for the study area intersections:

US Route 6 & Center Street
Consider the removal of the existing traffic signal control and install minor street stop sign control on Center Road.

US Route 6 & Williams Street
No improvements were found to be necessary at this intersection.

US Route 6 & Main Street
The intersection currently operates with a pre-timed signal timing operation with no pushbuttons for activation of the pedestrian signals. It is our recommendation to upgrade the traffic signal installation so that an actuated timing operation can be put in place and to add pushbuttons to the pedestrian signals. It is likely that the traffic signal controllers will need to be modified or replaced as a result of this recommendation. The complete upgrade of the traffic signal installation may also be necessary.

US Route 6 & Huron Street
No improvements were found to be necessary at this intersection.

US Route 6 & River Road
Implement the proposed road diet along US Route 6. The intersection will require either the installation of a traffic signal or roundabout to accommodate the expected to 2034 traffic volumes with the proposed road diet conditions.

US Route 6 & Tiffin Avenue
Implement the proposed road diet along US Route 6.

US Route 6 & East/West Plaza Access Driveways
Implement the proposed road diet along US Route 6.

US Route 6 & Berlin Road

Implement the proposed road diet along US Route 6. The existing traffic signal does not meet traffic signal warranting criteria. The removal of the traffic signal installation should be considered with either a roundabout or stop sign control on the Berlin Road approaches as the replacement traffic control method.

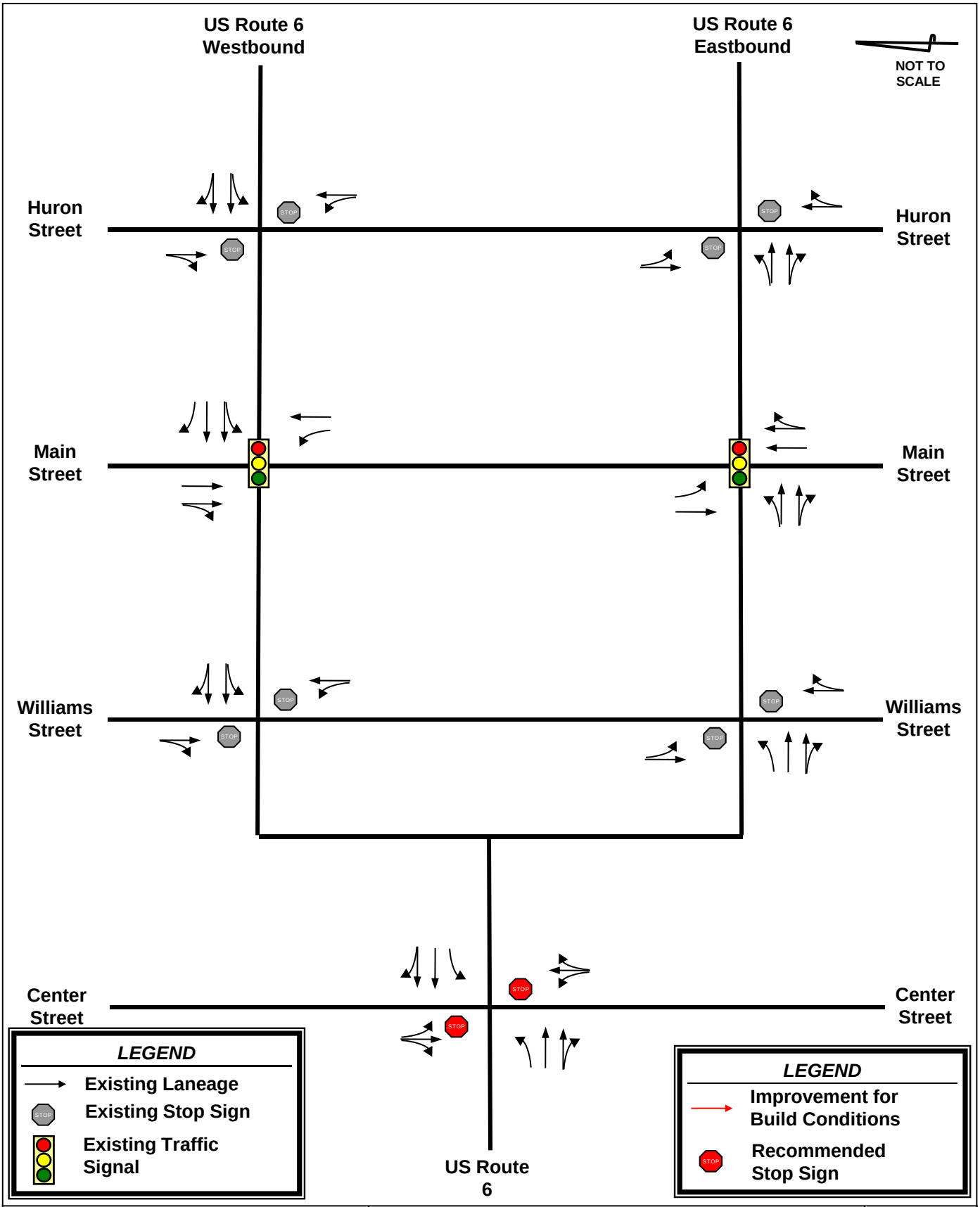
All intersection crosswalks within the US Route 6 corridor should comply with the Americans with Disabilities Act (ADA) to maximize mobility for all users. It should also be noted that curb ramps are required for all new or reconstructed curbs per **Section 729.12** of the **Ohio Revised Code**. These curb ramps should include a detectable warning surface.

Curb ramps should be designed to the least slope consistent with the curb height, available corner area and underlying topography. A level landing is necessary for turning, maneuvering or bypassing the sloped surface. Proper curb ramp design is important to users either continuing along a sidewalk path or attempting to cross the street. Perpendicular ramps are generally perpendicular to the curb and line up directly with the crosswalk. Users will generally be traveling perpendicular to vehicular traffic when they enter the street at the bottom of the ramp.

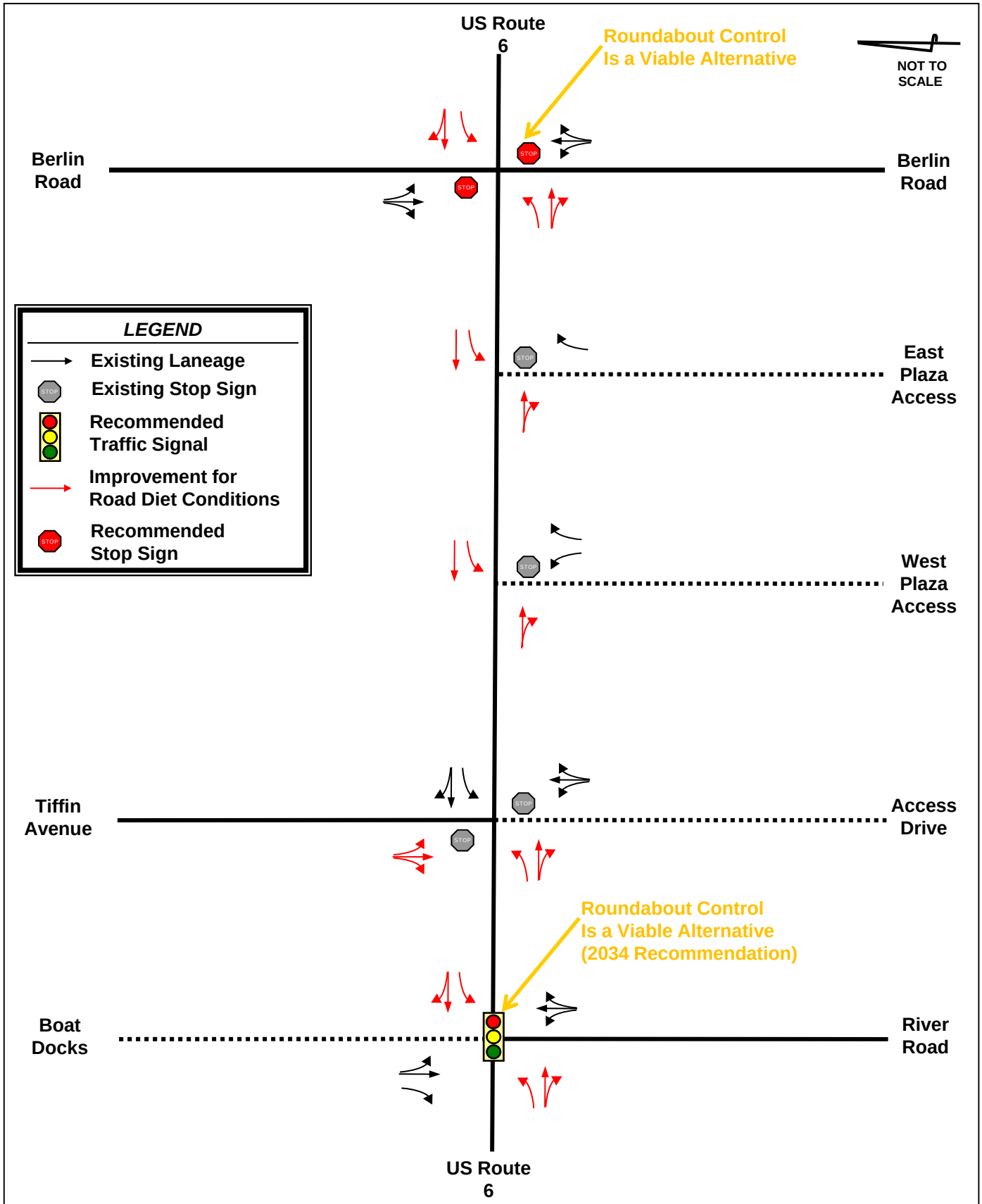
Detectable warnings are standardized surface features on walking surfaces to warn visually impaired people of the transition between the sidewalk and the street. Truncated domes are specified as the detectable warnings to be used in the ODOT **Location and Design Manual, Volume 1**. Truncated domes must have a visual contrast with adjoining surfaces. Many existing curb ramps can remain in place if they were originally constructed to current ADA standards. However, these curb ramp may need to have truncated domes installed. ODOT has approved several cast-in-place type of products for installation in new concrete and some surface applied products specifically manufactured to be placed on existing sound concrete as a retro-fit.

Several of the curb ramps in the study area have been upgraded and retro fitted with detectable warning surfaces to meet requirements. Curb ramps within the study area that still fail to meet these requirements should be upgraded.

The recommended lane use and traffic control for the study area to accommodate the anticipated 2014 and 2034 traffic volumes and the proposed road diet can be seen in **Figure 6, Page 52.**



TMS Engineers, Inc. Transportation Management Services 4547 Hudson Drive Stow, Ohio 44224 www.TMSEngineers.com	US Route 6 Huron, Ohio Transportation Study	Recommended Lane Use and Traffic Control	Figure 6A Page 52A



TMS Engineers, Inc. Transportation Management Services 4547 Hudson Drive Stow, Ohio 44224 www.TMSEngineers.com	US Route 6 Huron, Ohio Transportation Study	Recommended Lane Use and Traffic Control	Figure 6B Page 52B

8.2 Conclusions

Based on the results of the analyses, we offer the following conclusions and recommendations:

8.2.1 US Route 6 is currently a four-lane roadway. This study will analyze the impact of performing a road diet on the section between Huron Street and Berlin Road by reducing the roadway to one through lane in each direction and center lane for left turns. The study will also determine the appropriate traffic control at all study area intersections.

8.2.2 The peak hours in the study area were found to be 8:00 AM to 9:00 AM and 3:00 PM to 4:00 PM for the study area roadways. These periods were analyzed since they reflect the periods of the highest volume of traffic flow for the study area roadways.

8.2.3 The years 2014 and 2034 were used as the analysis years to determine the impact of future traffic and all recommendations on the study area intersections.

8.2.4 The speed zone analysis determined that US Route 6 has an 85^{TH} percentile speed of 44 miles per hour.

8.2.5 A traffic signal warrant analysis determined that the existing traffic signals at the intersections of US Route 6 at Center Road and Berlin Road are not warranted under the existing 2012 conditions. These traffic signals should be considered for removal and replaced with stop sign control on the minor street approaches. It was also determined that roundabout control at US Route 6 and Berlin Road is a suitable alternative to stop control at the intersection.

8.2.6 All intersections within the study area are operating with acceptable levels-of-service under the 2012 existing conditions during the weekday AM and PM peak hours with the existing traffic control measures. The intersections of US Route 6 and Center Road and Berlin Road are expected to operate with acceptable levels-of-service under stop sign control if the traffic signals are removed. US Route 6 and Berlin Road can also be expected to operate with acceptable levels-of-service as a roundabout.

8.2.7 All intersections within the study area are anticipated to operate at acceptable levels-of-service with the 2014 and 2034 volumes with the recommended traffic control during the weekday AM and PM peak hours.

8.2.8 All intersections between Huron Street and Berlin Road are anticipated to operate at acceptable levels-of-service with the proposed road diet under the 2014 conditions for the weekday AM and PM peak hours.

8.2.9 All intersections between Huron Street and Berlin Road are anticipated to operate at acceptable levels-of-service with the proposed road diet under the 2034 conditions for the weekday AM and PM peak hours except for US Route 6 and River Road. US Route 6 and River Road will require the installation of traffic signal control or the conversion of the intersection a roundabout to mitigate the expected poor level-of-service.

8.2.10 Based upon the results of the analysis in this study, it can be seen that with the recommended turn lanes and traffic control measures, the implementation of a road diet along US Route 6 between Huron Street and Berlin Road can be accommodated without significantly impacting the area roadway network under both the AM and PM peak hour conditions.

8.2.11 The traffic signal installation at the intersection of US Route 6 and Main Street should be upgraded to allow for actuated operation and the use of pedestrian pushbuttons.

8.2.12 All intersection crosswalks within the US Route 6 corridor should comply with the Americans with Disabilities Act (ADA) to maximize mobility for all users. Several of the curb ramps in the study area have been upgraded and retro fitted with detectable warning surfaces to meet requirements. Curb ramps within the study area that still fail to meet these requirements should be upgraded.