

## PROPOSED AGENDA

CHARTER TOWNSHIP OF BRIGHTON  
PLANNING COMMISSION  
4363 BUNO ROAD  
BRIGHTON, MI 48114

AUGUST 22, 2016  
REGULAR MEETING  
7:00 P.M.  
(810) 229.0562

- A. CALL TO ORDER
- B. PLEDGE OF ALLEGIANCE
- C. ROLL CALL
- D. CALL TO THE PUBLIC
- E. AGENDA
- F. MINUTES
  - 1. JULY 11, 2016 REGULAR MEETING
- G. BUSINESS
  - 1. RECOMMENDATION TO TOWNSHIP BOARD ON LIAISON FROM PLANNING COMMISSION TO ZBA
  - 2. CONDITIONAL REZONING PROJECT INTRODUCTION #16/01: ENCORE VILLAGE; ADDRESSES: 11001 AND 10675 E. GRAND RIVER; APPLICANT AND OWNER: MANCHESTER BRIGHTON; TAX ID#'S: 12-32-400-001 AND 12-33-400-010; ZONING: OS
- H. REPORTS AND CORRESPONDENCE
- I. CALL TO THE PUBLIC
- J. ADJOURNMENT

The Charter Township of Brighton will provide the necessary reasonable auxiliary aids and services, such as signers for the hearing impaired and audiotapes of printed materials being considered at the meeting to individuals with disabilities at the meeting upon 10 days' notice to the Charter Township of Brighton, Attn: Township Manager. Individuals should contact the Charter Township of Brighton by writing or contacting the following: Kelly Mathews, 4363 Buno Road, Brighton, MI 48114. Telephone: 810-229-0562 or e-mail at.....planner@brightontwp.com.

## PROPOSED MINUTES

**CHARTER TOWNSHIP OF BRIGHTON  
PLANNING COMMISSION  
4363 BUNO ROAD  
BRIGHTON, MI 48114**

**JULY 11, 2016  
REGULAR MEETING  
7:00 P.M.  
(810) 229.0562**

Chairman S. Holden called the meeting to order at 7:00 P.M. The Pledge of Allegiance was said.  
Present: S. Holden, D. Schiffko, M. Slaton, J. Stinedurf, G. Mitsopoulos  
Absent: G. Unruh, R. Doughty

### CALL TO THE PUBLIC

None

### AGENDA

G. Mitsopoulos moved and D. Schiffko seconded **to approve the agenda as presented.**  
Motion carried.

### MINUTES

G. Mitsopoulos moved and D. Schiffko seconded **to approve the minutes of the June 13, 2016 regular meeting as presented.**  
Motion carried.

PRELIMINARY SITE PLAN SP # 16/03 FOR BLOCKADE; ADDRESS: 1840 S. OLD 23; TAX ID #'S 12-08-400-019 AND 024; OWNER: MMK2 LLC; APPLICANT: TIM NICHOLS; ZONING: B-1 (LOCAL BUSINESS)

Tim Nichols, Applicant Representative, overviewed the request and the updates from last month's meeting. John Emos, General Counsel, was present as well as the owners and other representatives of Blockade.

J. Rushlow, Township Engineer, reviewed his letter dated July 7, 2016, K. Mathews, Township Planner, reviewed her letter dated July 8, 2016, and the Fire Department's letter dated July 7, 2016 was reviewed.

### PUBLIC COMMENTS

Jennifer Ryskamp Lopes and Jeffrey Lopes, 1855 Rodande - raised concern over landscape screening and lighting in the rear; they also had submitted an e-mail dated July 10, 2016.

Much discussion ensued from the Planning Commission regarding the landscaping and screening requirements i.e. fencing and the lighting and photometrics for the site.

G. Mitsopoulos moved and J. Stinedurf seconded **to approve the preliminary site plan SP# 16/03 for Blockade Restaurant and Bar; Address: 1840 S. Old 23; Tax ID #'s 12-08-400-019 and 024 contingent upon all of the items in the Township Planner's letter dated July 8, 2016; the Township Engineer's letter dated July 7, 2016; and the Fire Department's letter dated July 7, 2016 be addressed. Additionally, an eight (8) ft. high fence is required along the northerly boundary and a six (6) ft. high fence on the east and southern boundaries. The applicant will work with Township staff to add landscaping wherever possible on the site. It is also suggested that the entire parking lot be ripped out and redone.**

Ayes: S. Holden, D. Schiffko, J. Stinedurf, G. Mitsopoulos

Nays: M. Slaton

Motion carried.

### REPORTS AND CORRESPONDENCE

K. Mathews - Next month's meeting is August 22<sup>nd</sup> instead of August 8<sup>th</sup>.  
S. Holden - Livingston County Master Plan survey.

CALL TO THE PUBLIC

Jennifer Ryskamp Lopes and Jeffrey Lopes, 1855 Rodande - thanked the PC for listening to them regarding screening for their home and reiterated that they want landscape screening.

ADJOURNMENT

G. Mitsopoulos moved and D. Schiffko seconded **to adjourn**.  
Motion carried.

The meeting adjourned at 8:40 P.M.

Respectfully submitted,

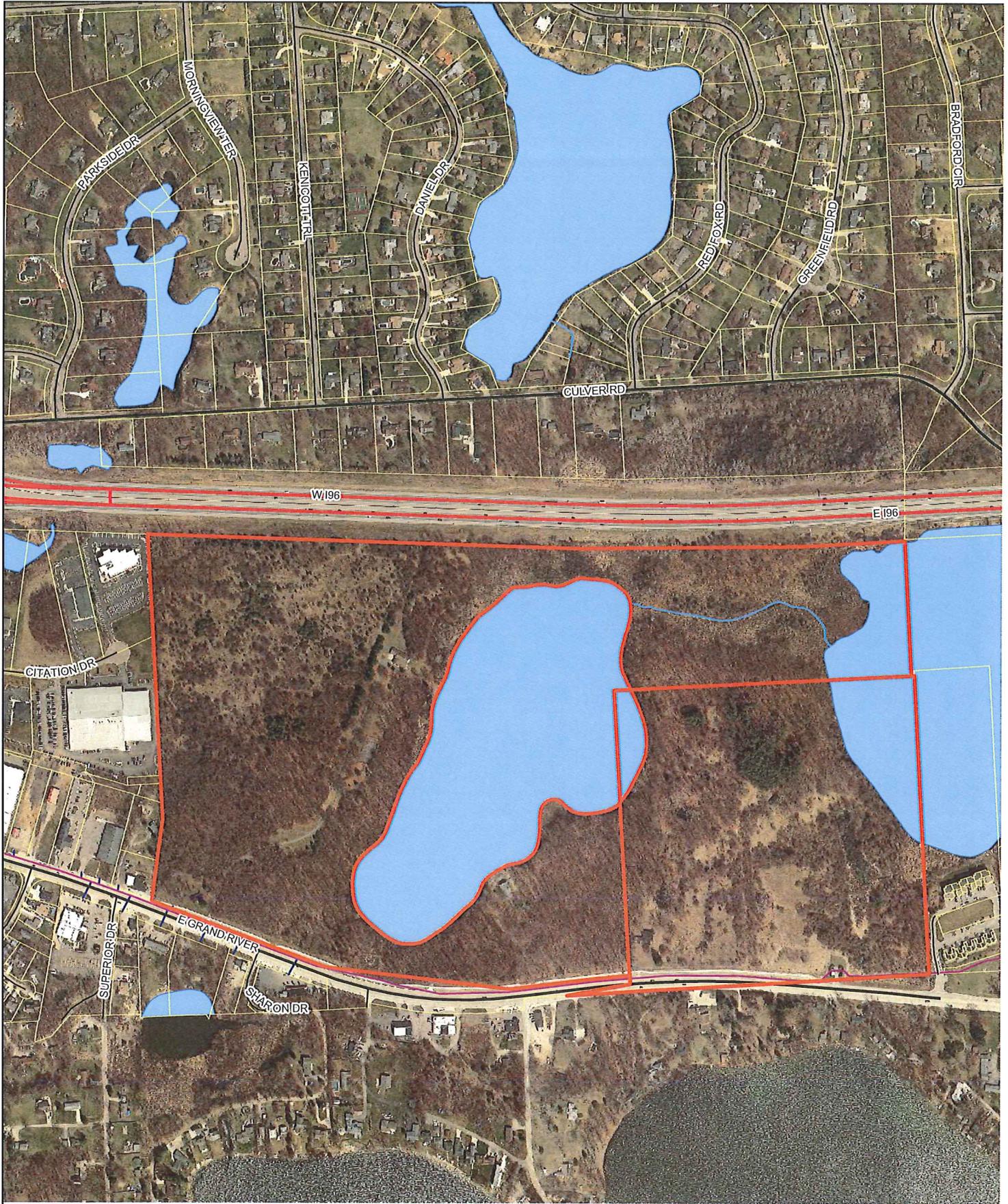
\_\_\_\_\_  
Steve Holden, Chairperson

\_\_\_\_\_  
Gary Unruh, Secretary

\_\_\_\_\_  
Kelly Mathews, Recording Secretary

\_\_\_\_\_  
Ann M. Bollin, CMC, CMMC, Clerk

# Encore Village



REZONING APPLICATION  
FOR THE CHARTER TOWNSHIP OF BRIGHTON

DATE 7/28/16

REZONING # 16/01

MEETING DATE \_\_\_\_\_

NAME OF APPLICANT MICHAEL FUNARI

ADDRESS 1700 W. BIG BEAVER SUITE 120 TROY MI 48064  
STREET CITY STATE ZIP CODE

PHONE # (248) 770-3877  
WORK HOME FAX

EMAIL MICHAEL@FAIRVIEWCO.COM

PROPERTY TAX ID # 4712-33-400-001 & 4712-33-400-010

TOTAL ACREAGE 147 ACRES SUBDIVISION \_\_\_\_\_

OWNER OF PROPERTY MANCHESTER BRIGHTON LLC

ADDRESS 1700 W. BIG BEAVER SUITE 120 TROY MI 48064  
STREET CITY STATE ZIP CODE

PHONE # (248) 770-3877  
WORK HOME FAX

REQUEST TO REZONE FROM OS TO RM-1 CONDITIONAL

PROPOSED USE OF THE PROPERTY TO BE REZONED THE PROPOSED  
USE OF THE PROPERTY WILL CONSIST OF AN  
ASSISTED LIVING FACILITY AND ACTIVE LIVING  
HOUSING.

ATTACHED: Legal description  
Proof of ownership  
Supporting data – market studies, TIS, plans, etc.

RECEIPT # \_\_\_\_\_ SIGNATURE [Signature]

PLEASE NOTE THAT ALL APPLICATIONS ARE NON-REFUNDABLE

RECEIVED

JUL 28 2016

BRIGHTON TOWNSHIP

**WARRANTY DEED**

KNOW ALL MEN BY THESE PRESENTS: That **Providence-Providence Park Hospital**, a Michigan nonprofit corporation, whose business address is 28000 Dequindre Rd., Warren, Michigan 48092 ("Grantor")

hereby conveys and warrants to **Manchester Brighton, LLC**, a Michigan limited liability company, whose business address is 45511 Market Street, Shelby Township, Michigan 48315 ("Grantee")

all right, title and interest in and to the following described premises in the Townships of Brighton and Green Oak, County of Livingston, and State of Michigan, to-wit:

*See attached Exhibit A.*

for the full consideration of:

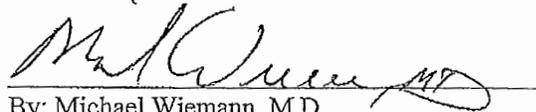
*See attached Real Estate Transfer Tax Valuation Affidavit.*

The Grantor grants to Grantee the right to make all divisions under Section 108 of the Land Division Act, Act No. 288 of the Public Acts of 1967.

The premises may be located within the vicinity of farmland or a farm operation. Generally accepted agricultural and management practice that may generate noise, dust, odors and other associated conditions may be used and are protected by the Michigan Right to Farm Act.

SIGNED AND SEALED:

**PROVIDENCE-PROVIDENCE PARK HOSPITAL**  
a Michigan nonprofit corporation



By: Michael Wiemann, M.D.  
Its: President

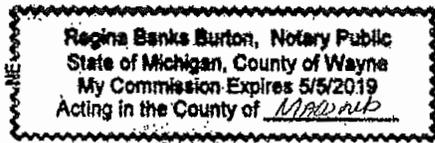
Effective: November 3, 2015

RECEIVED  
JUL 28 2016  
BRIGHTON TOWNSHIP

STATE OF MICHIGAN        )  
                                          ) ss  
COUNTY OF ~~OAKLAND~~    )  
                                          MACOMB

The foregoing instrument was acknowledged before me this 4<sup>th</sup>~~xx~~ day of November 2015, by Michael Wiemann, M.D., the President of Providence-Providence Park Hospital, a Michigan nonprofit corporation, on behalf of said corporation.

Regina Banks Burton  
Regina Banks Burton, Notary Public  
J Wayne County, Michigan  
My Commission Expires: 5/5/2019  
Acting in the County of: MACOMB



**Drafted by:**  
Kelly M. Blumline, Esq. (P77185)  
Hall, Render, Killian, Heath & Lyman, PLLC  
201 W. Big Beaver Rd.  
Suite 1200, Columbia Center  
Troy, Michigan 48084

**When recorded return to:**  
Manchester Brighton, LLC  
45511 Market Street  
Shelby Township, Michigan 48315

**Recording Fee:**                   \$ 23.00

**State Transfer Tax:**           *See attached Real Estate Transfer Tax Valuation Affidavit.*

**County Transfer Tax:**        *See attached Real Estate Transfer Tax Valuation Affidavit.*

**Send Subsequent tax bills to:** Grantee

**Tax Parcel Nos.:**               12-33-400-001  
                                          12-33-400-010  
                                          16-04-200-024

ESCROW#31469-47ca

Exhibit A

Legal Description

The Premises situated in the Township of Brighton, County of Livingston, State of Michigan, described as:

Part of the Southeast quarter and Southwest quarter of Section 33, Town 2 North, Range 6 East, Brighton Township and part of the Northeast quarter of Section 4, Town 1 North, Range 6 East, Green Oak Township, Livingston County, Michigan, more particularly described as follows: Beginning at the Southeast corner of said Section 33; thence along the South line of said Section 33, South 87 degrees 14 minutes 58 seconds West, 22.36 feet to the Northeast corner of Section 4, Town 1 North, Range 6 East; thence South 02 degrees 26 minutes 30 seconds East 48.02 feet; thence along the Northerly line of Grand River Avenue (100 foot wide Right of Way), North 84 degrees 32 minutes 22 seconds West, 593.08 feet; thence continuing along said North line, Westerly on an arc left, having a length of 906.51 feet, a radius of 4348.01 feet, a central angle of 11 degrees 56 minutes 44 seconds and a long chord which bears South 89 degrees 29 minutes 16 seconds West 904.87 feet; thence continuing along said North line, South 83 degrees 30 minutes 54 seconds West 343.07 feet; thence continuing along said North line, Westerly on an arc to the right, having a length of 838.35 feet, a radius of 1749.87 feet; a central angle of 27 degrees 27 minutes 00 seconds, and a long chord which bears North 82 degrees 45 minutes 36 seconds West, 830.36 feet; thence continuing along said North line, North 69 degrees 02 minutes 06 seconds West 831.70 feet to a found 1/2 inch iron rod; thence North 08 degrees 16 minutes 23 seconds East, 366.30 feet to a found 1 1/2 inch iron pipe; thence North 02 degrees 33 minutes 12 seconds West, 1260.64 feet to a found iron pipe in concrete; thence along the Southerly line of Limited Access Highway 1-96, South 87 degrees 40 minutes 01 seconds East, 1,924.66 feet; thence continuing along the Southerly line of said 1-96, Easterly on an arc left, having a length of 977.07 feet, a radius of 11,609.18 feet, a central angle of 04 degrees 49 minutes 20 seconds, and a long chord which bears North 89 degrees 55 minutes 19 seconds East, 976.78 feet; thence continuing along the Southerly line of said I-96, North 87 degrees 30 minutes 39 seconds East 40 feet to Traverse Point A; thence continuing along the Southerly line of said I-96, North 87 degrees 30 minutes 39 seconds East, 439.72 feet; thence along the East line of said Section 33, South 02 degrees 24 minutes 30 seconds East, 1355.49 feet to Traverse Point B, being the endpoint of a meandering traverse line beginning at aforementioned Traverse Point A, and having the following 2 courses: 1) South 00 degrees 29 minutes 05 seconds East, 595.20 feet, 2) South 33 degrees 34 minutes 35 seconds East, 888.22 feet; thence continuing along the East line of said Section 33, South 02 degrees 24 minutes 30 seconds East, 574.69 feet to the point of beginning.

AND as surveyed under the following legal:

Part of the Southeast 1/4 and Southwest 1/4 of Section 33, Town 2 North, Range 6 East, Brighton Township and part of the Northeast 1/4 of Section 4, Town 1 North, Range 6 East, Green Oak Township, Livingston County, Michigan, more particularly described as follows: Beginning at the Southeast corner of said Section 33; thence along the South line of said Section 33, South 86 degrees 40 minutes 21 seconds West 22.36 feet to the Northeast corner of Section 4, Town 1 North, Range 6 East; thence South 03 degrees 01 minutes 07 seconds East 50.03 feet; thence along the Northerly line of Grand River Avenue (100 foot wide Right of Way), North 85

degrees 09 minutes 55 seconds West 602.02 feet; thence continuing along said North line, Westerly on an arc left, having a length of 890.23 feet, a radius of 4347.80 feet, a central angle of 11 degrees 43 minutes 54 seconds and a long chord which bears South 88 degrees 58 minutes 05 seconds West 888.68 feet; thence continuing along said North line, South 83 degrees 06 minutes 05 seconds West 359.94 feet; thence continuing along said North line, Westerly on an arc to the right, having a length of 839.17 feet, a radius of 1750.12 feet, a central angle of 27 degrees 28 minutes 23 seconds and a long chord which bears North 83 degrees 10 minutes 24 seconds West 831.16 feet; thence continuing along said North line, North 69 degrees 26 minutes 55 seconds West 821.91 feet; thence North 07 degrees 41 minutes 46 seconds East 366.69 feet; thence North 03 degrees 07 minutes 49 seconds West 1260.64 feet; thence along the Southerly line of Limited Access Highway I-96, South 88 degrees 14 minutes 38 seconds East 1,924.66 feet; thence continuing along the Southerly line of said I-96, Easterly on an arc left, having a length of 977.07 feet, a radius of 11,609.18 feet, a central angle of 04 degrees 49 minutes 20 seconds, and a long chord which bears North 89 degrees 20 minutes 42 seconds East 976.78 feet; thence continuing along the Southerly line of said I-96, North 86 degrees 56 minutes 02 seconds East 40 feet to Traverse Point A; thence continuing along the Southerly line of said I-96, North 86 degrees 56 minutes 02 seconds East 439.72 feet; thence along the East line of said Section 33, South 02 degrees 59 minutes 07 seconds East 2669.05 feet to Traverse Point B, being the endpoint of a meandering traverse line beginning at aforementioned Traverse Point A, and having the following 2 courses: 1) South 01 degrees 03 minutes 42 seconds East 595.20 feet, 2) South 34 degrees 09 minutes 12 seconds East 888.22 feet; thence continuing along the East line of said Section 33, South 02 degrees 59 minutes 07 seconds East, 574.69 feet to the point of beginning.

Commonly known as: 10675, 11065, 10723 Grand River, Brighton, Michigan

Tax Parcel Nos.: 12-33-400-001  
12-33-400-010  
16-04-200-024

To: Planning Commission

From: Kelly Mathews

Re: Encore Village

Date: 8/18/16

This is a project introduction to the proposed conditional rezoning for Encore Village. The applicant is going to overview the material. No motions/etc. are going to be made; it is just a discussion to prepare for the tentatively planned public hearing on the rezoning on 9/12. Please keep your information for the 9/12 meeting. Thanks.

# MEMO

VIA EMAIL

To: **Mr. Michael Furnari**  
**The Fairview Companies**

From: **Michael J. Labadie, PE**  
**Julie M. Kroll, PE, PTOE**  
**Steven J. Russo, E.I.T.**  
**Fleis & VandenBrink**

RECEIVED

AUG 05 2016

Date: **July 19, 2016**

BRIGHTON TOWNSHIP

Re: **Proposed Multi-Family Residential Community**  
**Brighton Township, Michigan**  
**Traffic Impact Study**

## Introduction

This memorandum presents the results of a Traffic Impact Study (TIS) for the proposed Multi-Family residential development in Brighton Township, Michigan. The project site is located on the north side of Grand River Avenue, approximately one mile east of Old US-23 and is currently undeveloped. The multi-family residential development is proposed to include 411 apartment units and 104 bed assisted living facility. Site access for the site will be provided via four site access driveways to Grand River Avenue. Grand River Avenue and all other study roadways are under the jurisdiction of the Livingston County Road Commission (LCRC).

Based on the standards set forth in the Brighton Township Zoning Ordinance, a TIS is required to evaluate traffic impacts of the proposed development. This TIS has been completed to identify the impacts (if any) of the proposed development on the following study intersections:

- Grand River Avenue & Old US-23 / Whitmore Lake Road,
- Grand River Avenue & Pleasant Valley Road,
- Old US-23 & Spencer Road West, and
- The proposed site access points.

The scope of the study was developed based on Fleis & VandenBrink's (F&V) knowledge of the study area, understanding of the development program, accepted traffic engineering practice, and the methodologies published by the Institute of Transportation Engineers. Additionally, F&V solicited input regarding the proposed scope of work from the Livingston County Road Commission (LCRC) and the Township's traffic consultant, OHM. The study analyses were completed using Synchro and SimTraffic, Version 9 traffic analysis software.

## Data Collection

Existing weekday traffic volume data were collected by F&V subconsultant Traffic Data Collection, Inc. (TDC) on March 22, 2016. Vehicular turning movement counts were collected during the weekday AM (7:00 AM to 9:00 AM) and PM (4:00 PM to 6:00 PM) peak periods at all study intersections. This data was used as a baseline to establish existing traffic conditions without the proposed development. Additionally, F&V collected an inventory of existing lane use and traffic controls and obtained existing traffic signal timing information from LCRC. The applicable data referenced in this memorandum are attached.

**27725 Stansbury Boulevard, Suite 150**  
**Farmington Hills, MI 48334**  
P: 248.536.0080  
F: 248.536.0079  
[www.fveng.com](http://www.fveng.com)

### Existing Conditions

Existing peak hour vehicle delays and Levels of Service (LOS) were calculated at the study intersections using Synchro (Version 9) traffic analysis software. This analysis was based on the existing lane use and traffic control shown on the attached Figure 1, the existing peak hour traffic volumes shown on the attached Figure 2, and the methodologies presented in the *Highway Capacity Manual 2010* (HCM). Typically, LOS D is considered acceptable, with LOS A representing minimal delay, and LOS F indicating failing conditions. Additionally, SimTraffic network simulations were reviewed to evaluate network operations and vehicle queues. The existing conditions results are attached and summarized in Table 1 below.

**Table 1: Existing Intersection Operations**

Intersection	Control	Approach	AM Peak		PM Peak	
			Delay (s/veh)	LOS	Delay (s/veh)	LOS
1. Grand River Avenue & Old US-23 / Whitmore Lake Road	Signalized	EB	28.0	C	55.9	E
		WB	27.8	C	59.4	E
		NB	24.7	C	47.4	D
		SB	<u>27.8</u>	<u>C</u>	<u>51.0</u>	<u>D</u>
		<b>Overall</b>	<b>27.0</b>	<b>C</b>	<b>54.2</b>	<b>D</b>
2. Old US-23 & Spencer Road West	Signalized	EB	25.1	C	25.8	C
		NB	6.3	A	9.1	A
		SB	<u>15.6</u>	<u>B</u>	<u>14.1</u>	<u>B</u>
		<b>Overall</b>	<b>16.6</b>	<b>B</b>	<b>15.6</b>	<b>B</b>
3. Grand River Avenue & Pleasant Valley Road	STOP (Minor)	EB LT	8.3	A	11.2	B
		WB LT	8.7	A	7.9	A
		NB	0.0	A	593.6	F
		SB	21.3	C	29.3	D

The results of the existing conditions analysis indicate that all study intersection approaches and movements currently operate acceptably at a LOS D or better during the AM and PM peak periods with the exception of the following:

- The STOP controlled southbound left turn movement from Pleasant Valley Road onto eastbound Grand River Avenue which currently operates at a LOS F during both peak periods.
- The eastbound and westbound approaches, northbound through movement, and southbound left turn movement at the intersection of Grand River Avenue & Old US-23 / Whitmore Lake Road which currently operate at a LOS E during the PM peak period.
- The STOP controlled northbound Bar None Drive approach aligned with Pleasant Valley Road which currently operates at a LOS F during the PM peak period.

Review of network simulations indicates acceptable traffic operations during the AM peak period. During the PM peak period, long vehicle queues are observed for several approaches and movements at the intersection of Grand River Avenue & Old US-23 / Whitmore Lake Road. In particular, a long vehicle queue is observed for the westbound left turn movement which frequently exceeds available storage length and spills back into the through travel lanes along Grand River Avenue.

At the intersection of Grand River Avenue & Pleasant Valley Road / Bar None Drive, brief periods of long vehicle queues are observed for the southbound right turn movement and eastbound left turn movement

during the peak 30 minute period which occupy available storage length; however, these queues dissipate and are not present throughout the duration of the peak period.

**Existing Improvements**

In order to provide an acceptable LOS D or better for all study intersection approaches and movements, improvements to the study network were investigated. At the intersection of Grand River Avenue & Old US-23 / Whitmore Lake Road, traffic signal cycle length and timing changes were reviewed and it was determined that these changes do not sufficiently reduce vehicle delays. Subsequently, geometric improvements were evaluated and the results of this analysis indicate that right turn lanes should be constructed on the eastbound and westbound Grand River approaches and corresponding right turn overlap signal phases should be provided.

At the intersection of Grand River Avenue & Pleasant Valley Road / Bar None Drive, a signal warrant analysis was performed based on the guidelines set forth in the *Michigan Manual on Uniform Traffic Control Devices (MMUTCD)*. The MMUTCD outlines nine factors used in warranting the use of traffic signal control. As F&V only collected four hours of traffic volume data, Warrant 2 (4-Hour) was evaluated for this study.

The MMUTCD states “*The site-specific traffic characteristics should dictate whether an approach is considered as one lane or two lanes.*” Based on existing traffic volume data, the right turn movement is the predominant movement for the southbound approach accounting for approximately 90% of approach traffic. Therefore, the minor street approach was considered a one lane approach when applied against the signal warrants, while all major street approaches were considered as two lane approaches.

Additionally, the MMUTCD states “*The study should consider the effects of the right-turn vehicles from the minor street approaches.*” This is to account for vehicles which would be able to turn right on red under signalization. Based on traffic volume data and engineering judgment a 50% right turn reduction factor was applied for the Pleasant Valley Road approach to account for the “right turn on red” phenomena.

The results of the signal warrant analysis indicate that the approach volumes fall above the applicable curve for four hours with the application of the 70% factor. Therefore, **Warrant 2 is met** and LCRC should consider the installation of a traffic signal at the intersection. With the recommended improvements all study intersection approaches and movements will operate acceptably as shown in Table 2.

**Table 2: Existing Intersection Operations with Improvements**

Intersection	Control	Approach	AM Peak		PM Peak	
			Delay (s/veh)	LOS	Delay (s/veh)	LOS
1. Grand River Avenue & Old US-23 / Whitmore Lake Road	Signalized	EB	22.1	C	35.2	C
		WB	24.8	C	33.7	C
		NB	24.6	C	34.1	C
		SB	<u>26.9</u>	<u>C</u>	<u>35.7</u>	<u>D</u>
		<b>Overall</b>	<b>24.6</b>	<b>C</b>	<b>34.5</b>	<b>C</b>
3. Grand River Avenue & Pleasant Valley Road	Signalized	EB	6.4	A	14.7	B
		WB	16.5	B	19.8	B
		NB	0.0	A	28.8	C
		SB	<u>17.6</u>	<u>B</u>	<u>22.7</u>	<u>C</u>
		<b>Overall</b>	<b>9.7</b>	<b>A</b>	<b>18.4</b>	<b>B</b>

Although these improvements are needed to improve existing traffic operations today, no improvements to the study network are currently planned. Therefore, the remainder of this study evaluates traffic operations with the existing infrastructure.

### Background Conditions

In order to determine the applicable growth rate for the existing traffic volumes to the project build-out year of 2020, historical traffic data were referenced from LCRC. Most recent traffic data from LCRC indicate that between 2009 and 2013 overall traffic volumes in the area have decreased or remained stagnant. However, as no new traffic counts have been collected in the study area within the last three years, population forecasts for Brighton Township were also reviewed from the Southeast Michigan Council of Governments (SEMCOG). SEMCOG population forecasts for Brighton Township indicate an annual population growth rate of 0.75% which was utilized in this study for the analysis of background conditions **without the proposed development**.

In addition to background growth, it is important to account for traffic that will be generated by approved developments within the vicinity of the study area that have yet to be constructed or are currently under construction. Through conversations with LCRC and Brighton Township, no background developments were identified within the study area.

### Background Operations

Background peak hour vehicle delays and LOS were calculated based on the existing lane use and traffic control shown on the attached Figure 1, the background traffic volumes shown on the attached Figure 3, and the methodologies presented in the HCM. The results of the analysis of background conditions analysis are attached and summarized in Table 3.

**Table 3: Background Intersection Operations**

Intersection	Control	Approach	AM Peak		PM Peak	
			Delay (s/veh)	LOS	Delay (s/veh)	LOS
1. Grand River Avenue & Old US-23 / Whitmore Lake Road	Signalized	EB	29.1	C	60.3	E
		WB	28.6	C	68.9	E
		NB	25.0	C	50.0	D
		SB	<u>28.8</u>	<u>C</u>	<u>53.8</u>	<u>D</u>
		<b>Overall</b>	<b>27.8</b>	<b>C</b>	<b>59.6</b>	<b>E</b>
2. Old US-23 & Spencer Road West	Signalized	EB	25.0	C	25.9	C
		NB	6.6	A	9.4	A
		SB	<u>15.6</u>	<u>B</u>	<u>14.2</u>	<u>B</u>
		<b>Overall</b>	<b>16.6</b>	<b>B</b>	<b>15.7</b>	<b>B</b>
3. Grand River Avenue & Pleasant Valley Road	STOP (Minor)	EB LT	8.3	A	11.5	B
		WB LT	8.7	A	7.9	A
		NB	0.0	A	706.8	F
		SB	23.3	C	32.3	D

The results of the background conditions analysis indicate that all study intersection approaches and movements will continue to operate in a manner similar to existing conditions during the AM peak hour. Vehicle delays and LOS as shown in Table 3 will be similar to existing conditions and minor increases will not be discernable. Review of network simulations also indicates traffic operations which are similar to existing conditions.

During the PM peak hour, the signalized intersection of Grand River Avenue & Old US-23 / Whitmore Lake Road will be reduced to an overall LOS E with an increase in delay of 5.4 seconds per vehicle. Review of network simulations at this intersection indicate long vehicle queues for several approaches and movements throughout the duration of the peak period.

At the intersection of Grand River Avenue & Pleasant Valley Road / Bar None Drive, brief periods of long vehicle queues are observed for the southbound right turn movement and eastbound left turn movement during the peak 30 minute period which exceed available storage lengths.

**Site Trip Generation and Assignment**

A comparison of the trip generation potential of the subject parcel was forecast for existing permitted uses under the existing Office Service (OS) zoning and the proposed development project. The number of weekday, AM, and PM peak hour vehicle trips that would be generated was forecast based on data published by ITE in *Trip Generation, 9<sup>th</sup> Edition* and the *Trip Generation Handbook, 3<sup>rd</sup> Edition*.

In order to determine the maximum site trip generation potential under the existing zoning conditions, the principal uses permitted under the OS zoning classification were matched to the land use categories described by ITE in *Trip Generation, 9<sup>th</sup> Edition*. Review of the ITE land use descriptions indicates that the General Office Building (710) use best match the uses defined by Ordinance.

The maximum allowable density for the site was determined based on information provided by Boss Engineering which indicates that approximately 1,292,208 SF of office space can feasibly be accommodated on the site. The trip generation forecasts are summarized in Table 4 and indicate the proposed development would result in a significant decrease in daily and peak hour trip generation as compared to the uses permitted under existing zoning.

**Table 4: Site Trip Generation**

Land Use	ITE Code	Amount	Units	Average Daily Traffic	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
<b>EXISTING ZONING (OS)</b>										
Office	710	1,292,208	SF	9,179	1,304	178	1,482	259	1,267	1,526
<b>PROPOSED DEVELOPMENT</b>										
Apartments	230	411	D.U.	2,614	41	164	205	159	85	244
Assisted Living	254	104	Beds	277	10	5	15	10	13	23
<b>TOTAL</b>				<b>2,891</b>	<b>51</b>	<b>169</b>	<b>220</b>	<b>169</b>	<b>98</b>	<b>267</b>
<b>CHANGE IN NEW TRIPS FOR SITE</b>				<b>-6,288</b>	<b>-1,253</b>	<b>-9</b>	<b>-1,262</b>	<b>-90</b>	<b>-1,169</b>	<b>-1,259</b>

The vehicle trips that would be generated by the proposed development were assigned to the study road network based on existing peak hour traffic patterns, the proposed site plan, and the methodologies published by ITE. This methodology indicates that new trips will return to their direction of origin. The site trip distribution model outlined in Table 5 was applied to assign the future traffic volumes.

**Table 5: Site Trip Distribution**

To	via	AM	PM
North	Pleasant Valley Road	30%	27%
	Old US-23	5%	7%
South	Whitmore Lake Road	12%	11%
East	Grand River Avenue	35%	28%
West	Grand River Avenue	16%	24%
	Spencer Road	2%	3%
		100%	100%



The site-generated vehicle trips were assigned to the study road network based on this trip distribution pattern and is shown on the attached Figure 4. The site-generated trips were added to the background traffic volumes to calculate the future peak hour traffic volumes shown on the attached Figure 5.

**Future Conditions**

Future peak hour vehicle delays and LOS *with the proposed development* were calculated based on the existing lane use and traffic control, the proposed site access plan, the future traffic volumes, and the methodologies presented in the HCM. Additionally, SimTraffic simulations were utilized to evaluate network operations and vehicle queues. The results of the future conditions analysis are attached and shown in Table 6.

**Table 6: Future Intersection Operations**

Intersection	Control	Approach	AM Peak		PM Peak	
			Delay (s/veh)	LOS	Delay (s/veh)	LOS
1. Grand River Avenue & Old US-23 / Whitmore Lake Road	Signalized	EB	29.5	C	62.4	E
		WB	29.9	C	81.8	F
		NB	25.0	C	49.7	D
		SB	<u>29.0</u>	<u>C</u>	<u>59.1</u>	<u>E</u>
		<b>Overall</b>	<b>28.3</b>	<b>C</b>	<b>65.3</b>	<b>E</b>
2. Old US-23 & Spencer Road West	Signalized	EB	25.0	C	25.8	C
		NB	6.6	A	9.4	A
		SB	<u>15.7</u>	<u>B</u>	<u>14.3</u>	<u>B</u>
		<b>Overall</b>	<b>16.6</b>	<b>B</b>	<b>15.7</b>	<b>B</b>
3. Grand River Avenue & Pleasant Valley Road	STOP (Minor)	EB LT	8.6	A	12.6	B
		WB LT	8.9	A	8.0	A
		NB	0.0	A	3488.7	F
		SB	36.5	E	50.1	F
4. Grand River Avenue & Assisted Living Drive	STOP (Minor)	EB LT	8.2	A	10.2	B
		WB	Free		Free	
		SB	12.2	B	16.7	C
5. Grand River Avenue & W. Residential Site Drive	STOP (Minor)	EB LT	8.2	A	10.5	B
		WB	Free		Free	
		SB	13.7	B	18.6	C
6. Grand River Avenue & Middle Residential Site Drive	STOP (Minor)	EB LT	8.1	A	10.8	B
		WB	Free		Free	
		SB	14.4	B	22.2	C
7. Grand River Avenue & E. Residential Site Drive	STOP (Minor)	EB LT	0.0	A	10.4	B
		WB	Free		Free	
		SB	15.7	C	20.4	C



The results of the future conditions analysis indicate that all study intersection approaches and movements will continue to operate acceptably during the peak periods with the exception of the following:

- The STOP controlled southbound Pleasant Valley Road approach at Grand River Avenue which will operate at a LOS E and F during the AM and PM peak periods, respectively.
- The signalized intersection of Grand River Avenue & Old US-23 / Whitmore Lake Road which will continue to operate at an overall LOS E during the PM peak hour with several approaches and movements operating at a LOS E or F.
- The STOP controlled northbound Bar None Drive approach aligned with Pleasant Valley Road which will continue to operate at a LOS F during the PM peak period.

Review of network simulations indicates acceptable traffic operations during the AM peak hour. During the PM peak hour long vehicle queues are observed at several study intersections. At the intersection of Grand River Avenue & Pleasant Valley Road / Bar None Drive, brief periods of long vehicle queues are observed for the southbound right turn movement and eastbound left turn movement during the peak 30 minute period which exceed available storage lengths. At the intersection of Grand River Avenue & Old US-23 / Whitmore Lake Road, long vehicle queues are observed for several approaches and movements throughout the duration of the peak hour.

At the proposed site access points to Grand River Avenue, all approaches and movements will operate acceptably at a LOS C or better during both peak periods. Additionally, review of network simulations indicates acceptable driveway operations and significant vehicle queues are not observed.

### Future Improvements

In order to mitigate future traffic operations to be similar to background conditions, an analysis of future conditions with the improvements recommended under existing conditions was completed. The results of this analysis indicate that all study intersection approaches and movements would operate acceptably at a LOS D or better during both peak periods, as shown in Table 7. Review of network simulations also indicates acceptable traffic operations and vehicle queues are observed to be acceptably processed.

**Table 7: Future Intersection Operations with Improvements**

Intersection	Control	Approach	AM Peak		PM Peak	
			Delay (s/veh)	LOS	Delay (s/veh)	LOS
1. Grand River Avenue & Old US-23 / Whitmore Lake Road	Signalized	EB	22.3	C	39.5	D
		WB	26.1	C	40.2	D
		NB	24.9	C	39.8	D
		SB	<u>28.7</u>	<u>C</u>	<u>42.6</u>	<u>D</u>
		<b>Overall</b>	<b>25.5</b>	<b>C</b>	<b>40.3</b>	<b>D</b>
3. Grand River Avenue & Pleasant Valley Road	Signalized	EB	7.2	A	18.8	B
		WB	16.9	B	21.0	C
		NB	0.0	A	28.8	C
		SB	<u>17.6</u>	<u>B</u>	<u>29.5</u>	<u>C</u>
		<b>Overall</b>	<b>10.2</b>	<b>B</b>	<b>22.0</b>	<b>C</b>

### Turn Lane Warrants

MDOT warrants for right turn deceleration lanes were evaluated for the proposed site access points to Grand River Avenue. The results of the turn lane warrant evaluation indicate that a right turn taper only is recommended at the W. Residential Site Drive and full width right turn lane is recommended at the Middle

Residential Site Drive. At the Assisted Living Site Drive and W=E. Residential Site Drive no right turn treatment is required.

## Conclusions

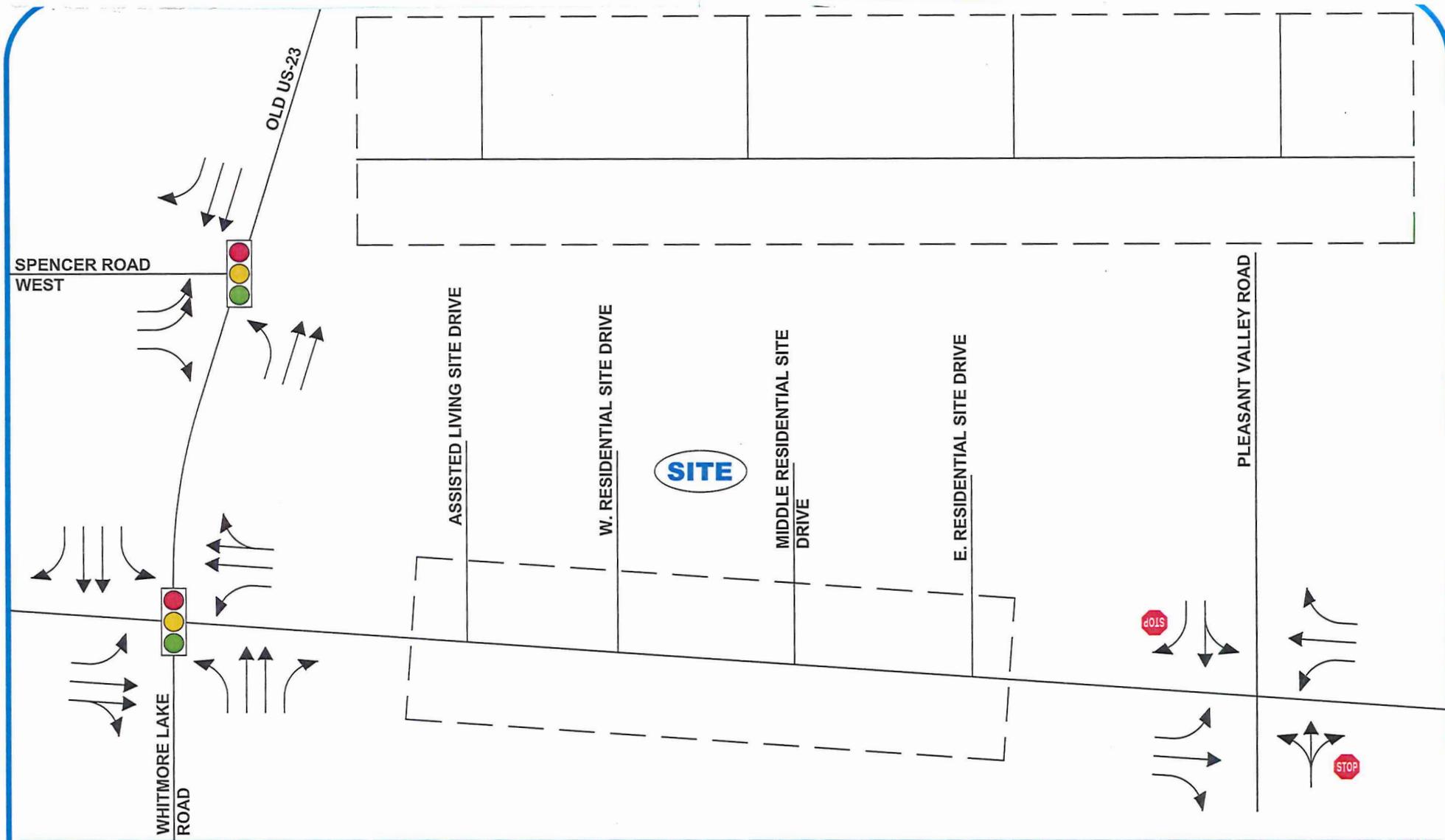
The conclusions of this Traffic Impact Study are as follows:

1. At the intersections of Grand River Avenue with Old US-23 / Whitmore Lake Road and Pleasant Valley Road, several approaches and movements currently operate at a LOS E or F during the PM peak period.
2. With the recommended existing improvements below, all study intersection approaches and movements will operate acceptably at a LOS D or better (*Note: these improvements are not currently planned; therefore, background and future conditions were evaluated with the existing infrastructure.*)
  - a. Construct right turn lanes on the EB and WB approaches at the intersection of Grand River Avenue & Old US-23 / Whitmore Lake Road.
  - b. Signalize the intersection of Grand River Avenue & Pleasant Valley Road / Bar None Drive.
3. Background conditions were evaluated which includes a traffic growth rate of 0.75% per year to the project buildout year of 2020.
4. Under background traffic conditions **without the proposed development**, traffic operations will operate in a manner similar to existing conditions with minor increases in vehicle delays and LOS.
5. The proposed development project would result in a significant decrease in daily and peak hour trips on the adjacent road network as compared to existing permitted site uses.
6. The analysis of future conditions **with the proposed development** indicates that several approaches and movements at the intersections of Grand River Avenue with Old US-23 / Whitmore Lake Road and Pleasant Valley Road will continue to operate at a LOS E or F.
7. With the recommended existing improvements, all movements at the study intersections will operate acceptably at a LOS D or better under future conditions.
8. All movements and approaches at the proposed site access points to Grand River Avenue will operate acceptably at a LOS C or better during both peak periods.
9. A right turn taper only is recommended at the proposed W. Residential Site Drive to Grand River Avenue while a full width right turn lane is recommended at the Middle Apartment Site Driveway.

Any questions related to this memorandum, study, analyses, and results should be addressed to Fleis & VandenBrink.

**Attached:** Figures 1 – 5  
Traffic Volume Data  
SEMCOG Data  
Synchro Results  
Turn Lane Warrants

SJR:mjl

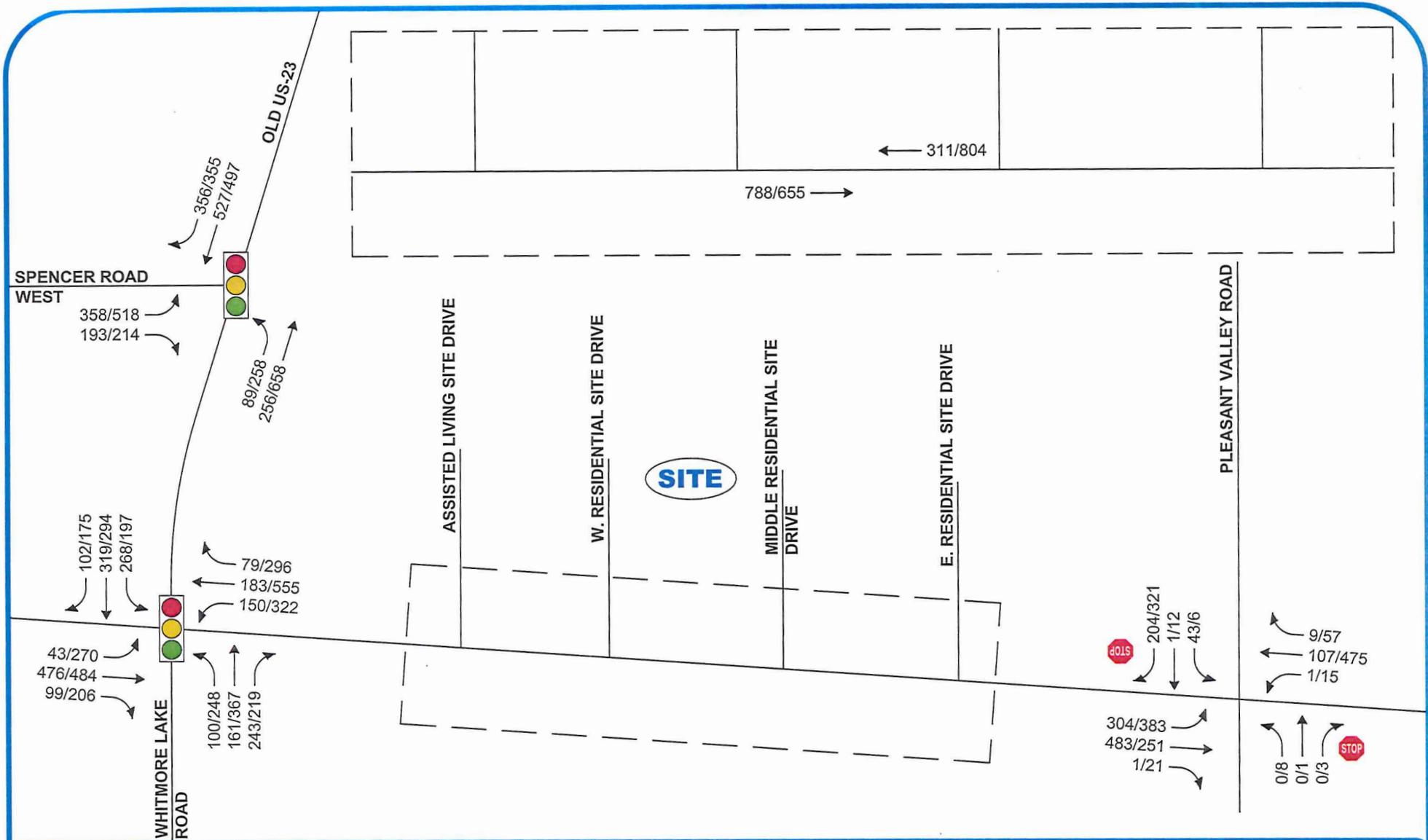


**FIGURE 1**  
**LANE USE AND TRAFFIC CONTROL**  
 MULTI-FAMILY RESIDENTIAL COMMUNITY - BRIGHTON TOWNSHIP, MI

**LEGEND**

-  SIGNALIZED INTERSECTION
-  UNSIGNALIZED INTERSECTION
-  ROADS
-  LANE USE





## FIGURE 2 EXISTING TRAFFIC VOLUMES

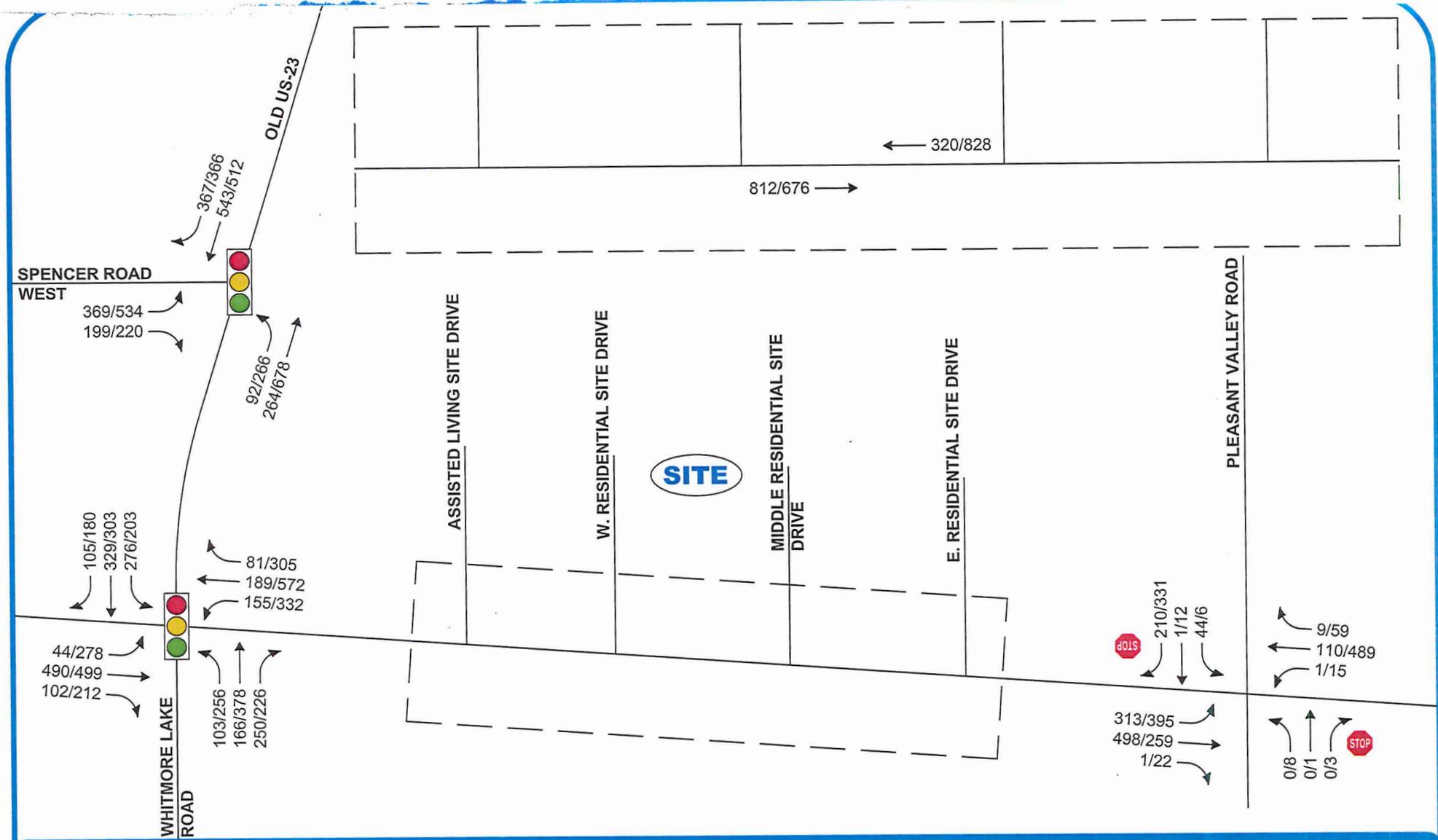
MULTI-FAMILY RESIDENTIAL COMMUNITY - BRIGHTON TOWNSHIP, MI

### LEGEND

-  SIGNALIZED INTERSECTION
-  UNSIGNALIZED INTERSECTION
-  TRAFFIC VOLUMES (AM/PM)
-  ROADS



NORTH  
SCALE: NOT TO SCALE

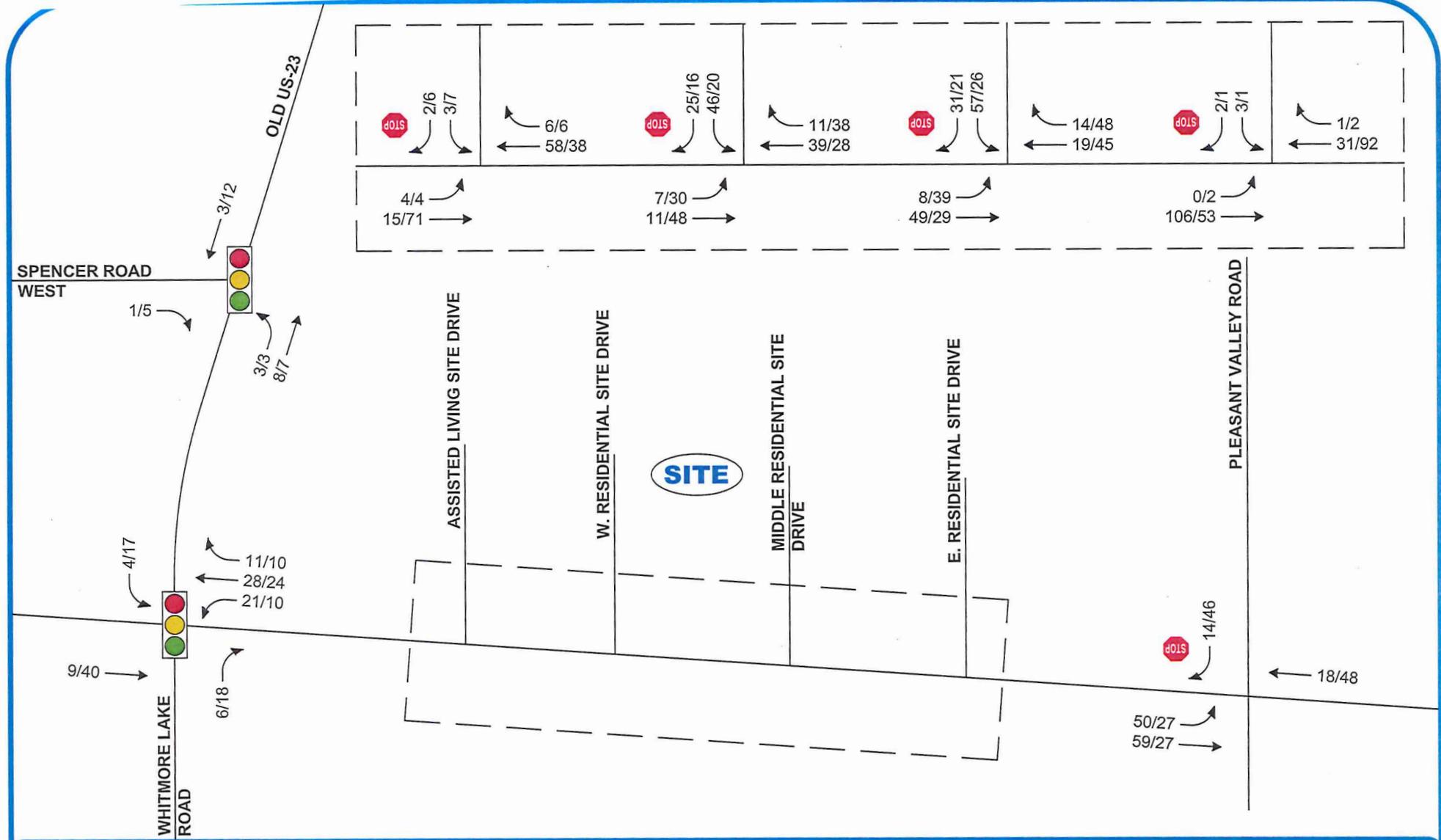


**FIGURE 3**  
**BACKGROUND TRAFFIC VOLUMES**  
 MULTI-FAMILY RESIDENTIAL COMMUNITY - BRIGHTON TOWNSHIP, MI

**LEGEND**

-  SIGNALIZED INTERSECTION
-  UNSIGNALIZED INTERSECTION
-  TRAFFIC VOLUMES (AM/PM)
-  ROADS





# FIGURE 4 SITE-GENERATED TRAFFIC VOLUMES

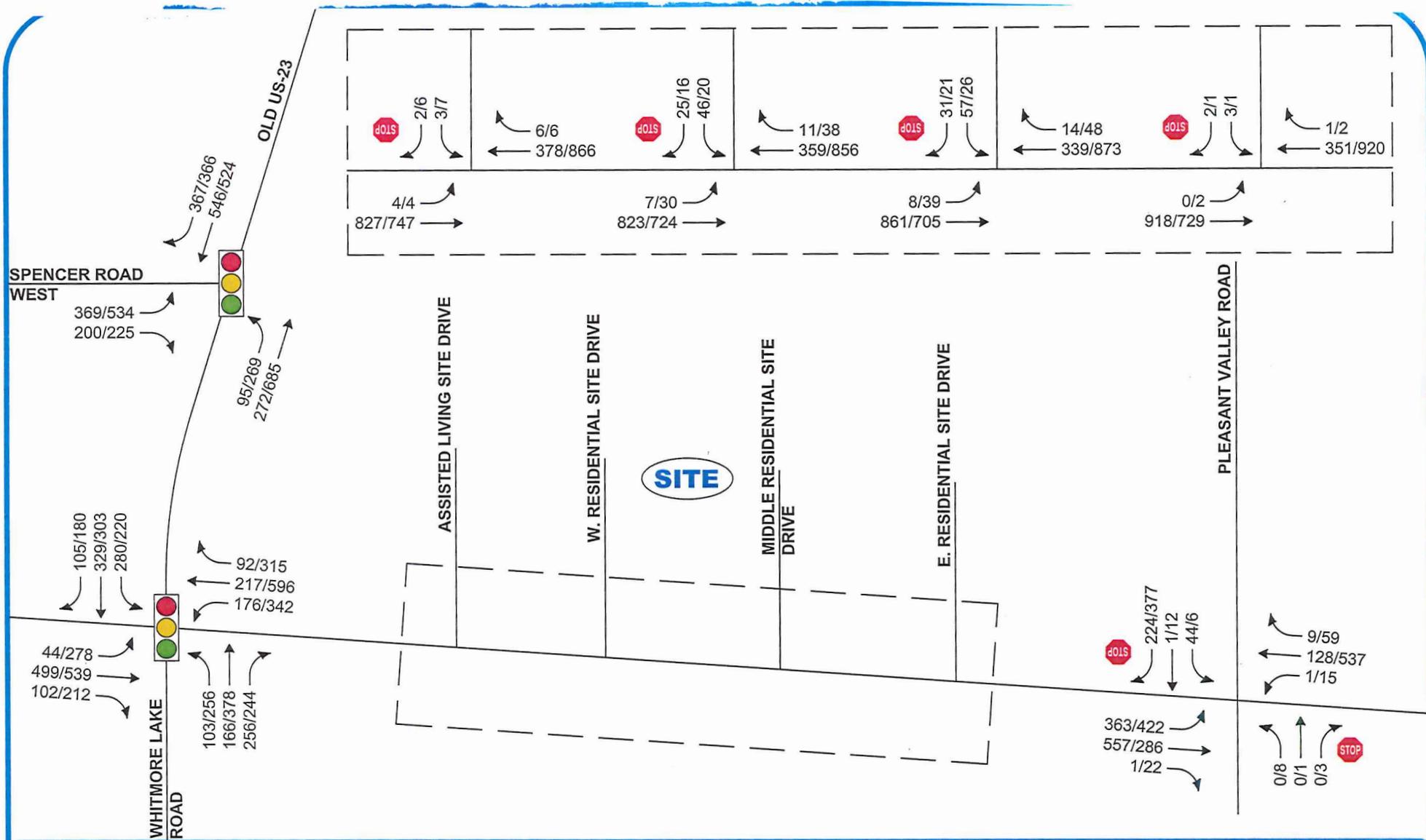
MULTI-FAMILY RESIDENTIAL COMMUNITY - BRIGHTON TOWNSHIP, MI

### LEGEND

-  SIGNALIZED INTERSECTION
-  UNSIGNALIZED INTERSECTION
-  TRAFFIC VOLUMES (AM/PM)
-  ROADS



NORTH  
SCALE: NOT TO SCALE



# FIGURE 5 FUTURE TRAFFIC VOLUMES

MULTI-FAMILY RESIDENTIAL COMMUNITY - BRIGHTON TOWNSHIP, MI

### LEGEND

-  SIGNALIZED INTERSECTION
-  UNSIGNALIZED INTERSECTION
-  TRAFFIC VOLUMES (AM/PM)
-  ROADS



# Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

**Fleis & VandenBrink**



Project: Brighton Twp. Traffic Study  
 Type: 4 Hr. Video Turning Movement Count  
 Weather: Pt. Sunny, Dry Temp 40's  
 Count By: Miovision Video VCU 1US

File Name : TMC\_1 US23&SpencerW\_3-22-16  
 Site Code : TMC\_1  
 Start Date : 3/22/2016  
 Page No : 1

Groups Printed- Pass Cars - Single Units - Heavy Trucks - Ped

Start Time	Old US-23 Hwy. Southbound					Westbound					Old US-23 Hwy. Northbound					West Spencer Road Eastbound					Int. Total
	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	
07:00 AM	132	120	0	0	252	0	0	0	0	0	0	27	15	0	42	35	0	59	0	94	388
07:15 AM	52	141	0	0	193	0	0	0	0	0	0	27	12	0	39	36	0	70	0	106	338
07:30 AM	47	103	0	0	150	0	0	0	0	0	0	54	20	0	74	59	0	74	0	133	357
07:45 AM	65	123	0	0	188	0	0	0	0	0	0	64	17	0	81	63	0	95	0	158	427
Total	296	487	0	0	783	0	0	0	0	0	0	172	64	0	236	193	0	298	0	491	1510
08:00 AM	70	135	0	0	205	0	0	0	0	0	0	52	20	0	72	36	0	70	0	106	383
08:15 AM	78	99	0	0	177	0	0	0	0	0	0	57	25	0	82	47	0	96	0	143	402
08:30 AM	111	133	0	0	244	0	0	0	0	0	0	87	20	0	107	51	0	108	0	159	510
08:45 AM	97	160	0	0	257	0	0	0	0	0	0	60	24	0	84	59	0	84	0	143	484
Total	356	527	0	0	883	0	0	0	0	0	0	256	89	0	345	193	0	358	0	551	1779
**** BREAK ****																					
04:00 PM	93	145	0	0	238	0	0	0	0	0	0	136	54	0	190	45	0	101	0	146	574
04:15 PM	83	121	0	0	204	0	0	0	0	0	0	150	45	0	195	62	0	99	0	161	560
04:30 PM	95	94	0	0	189	0	0	0	0	0	0	153	76	0	229	44	0	99	0	143	561
04:45 PM	72	109	0	0	181	0	0	0	0	0	0	150	54	0	204	59	0	123	0	182	567
Total	343	469	0	0	812	0	0	0	0	0	0	589	229	0	818	210	0	422	0	632	2262
05:00 PM	97	135	0	0	232	0	0	0	0	0	0	179	76	0	255	55	0	138	0	193	680
05:15 PM	89	125	0	0	214	0	0	0	0	0	0	156	72	0	228	54	0	115	0	169	611
05:30 PM	97	128	0	0	225	0	0	0	0	0	0	173	56	0	229	46	0	142	0	188	642
05:45 PM	62	122	0	0	184	0	0	0	0	0	0	137	43	0	180	52	0	110	0	162	526
Total	345	510	0	0	855	0	0	0	0	0	0	645	247	0	892	207	0	505	0	712	2459
Grand Total	1340	1993	0	0	3333	0	0	0	0	0	0	1662	629	0	2291	803	0	1583	0	2386	8010
Apprch %	40.2	59.8	0	0		0	0	0	0	0	0	72.5	27.5	0		33.7	0	66.3	0		
Total %	16.7	24.9	0	0	41.6	0	0	0	0	0	0	20.7	7.9	0	28.6	10	0	19.8	0	29.8	
Pass Cars	1322	1930	0	0	3252	0	0	0	0	0	0	1632	608	0	2240	783	0	1551	0	2334	7826
% Pass Cars	98.7	96.8	0	0	97.6	0	0	0	0	0	0	98.2	96.7	0	97.8	97.5	0	98	0	97.8	97.7
Single Units	15	60	0	0	75	0	0	0	0	0	0	29	18	0	47	13	0	26	0	39	161
% Single Units	1.1	3	0	0	2.3	0	0	0	0	0	0	1.7	2.9	0	2.1	1.6	0	1.6	0	1.6	2
Heavy Trucks	3	3	0	0	6	0	0	0	0	0	0	1	3	0	4	7	0	6	0	13	23
% Heavy Trucks	0.2	0.2	0	0	0.2	0	0	0	0	0	0	0.1	0.5	0	0.2	0.9	0	0.4	0	0.5	0.3
Ped	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Ped	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments: 4 hour video traffic study conducted during typical weekday (Tuesday) from 7:00-9:00 AM morning & 4:00-6:00 PM afternoon peak hours, while school was in session. Signalized skewed intersection no ped. signals. EB has dual left turn lanes. Video SCU camera was located within SW intersection quadrant.

# Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

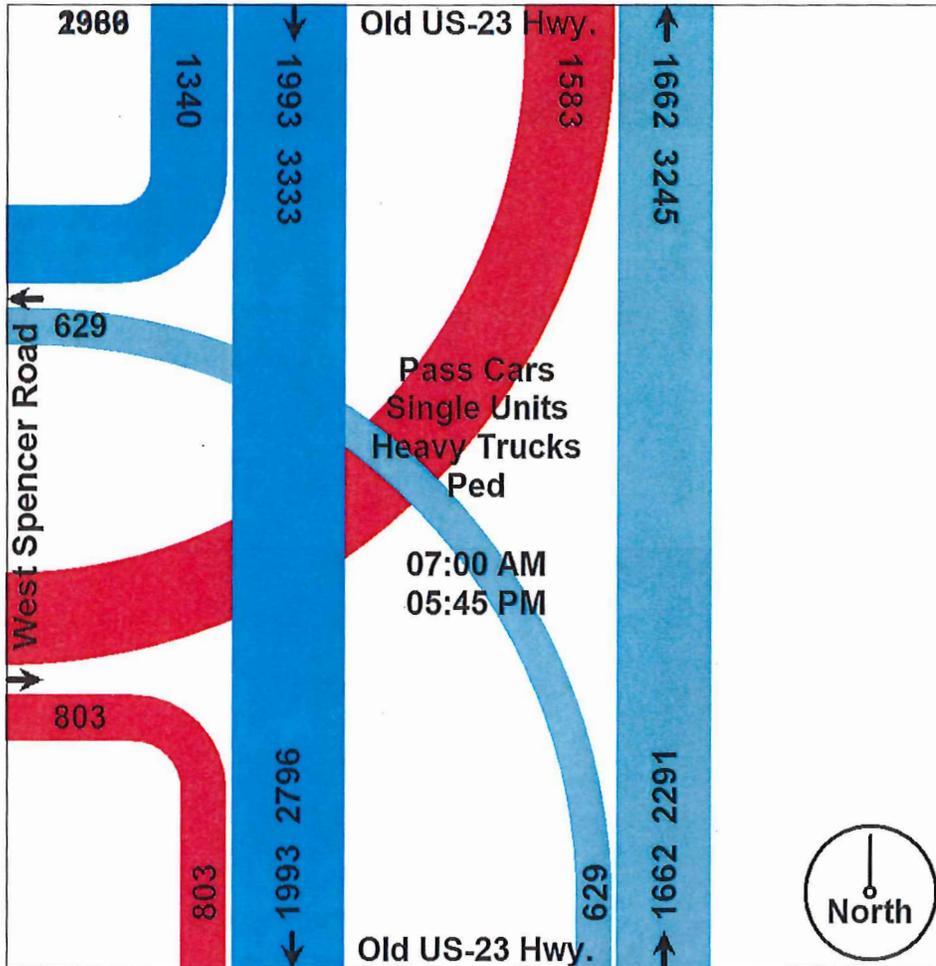
Traffic Study Performed For:

**Fleis & VandenBrink**



Project: Brighton Twp. Traffic Study  
Type: 4 Hr. Video Turning Movement Count  
Weather: Pt. Sunny, Dry Temp 40's  
Count By: Miovision Video VCU 1US

File Name : TMC\_1 US23&SpencerW\_3-22-16  
Site Code : TMC\_1  
Start Date : 3/22/2016  
Page No : 2



# Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

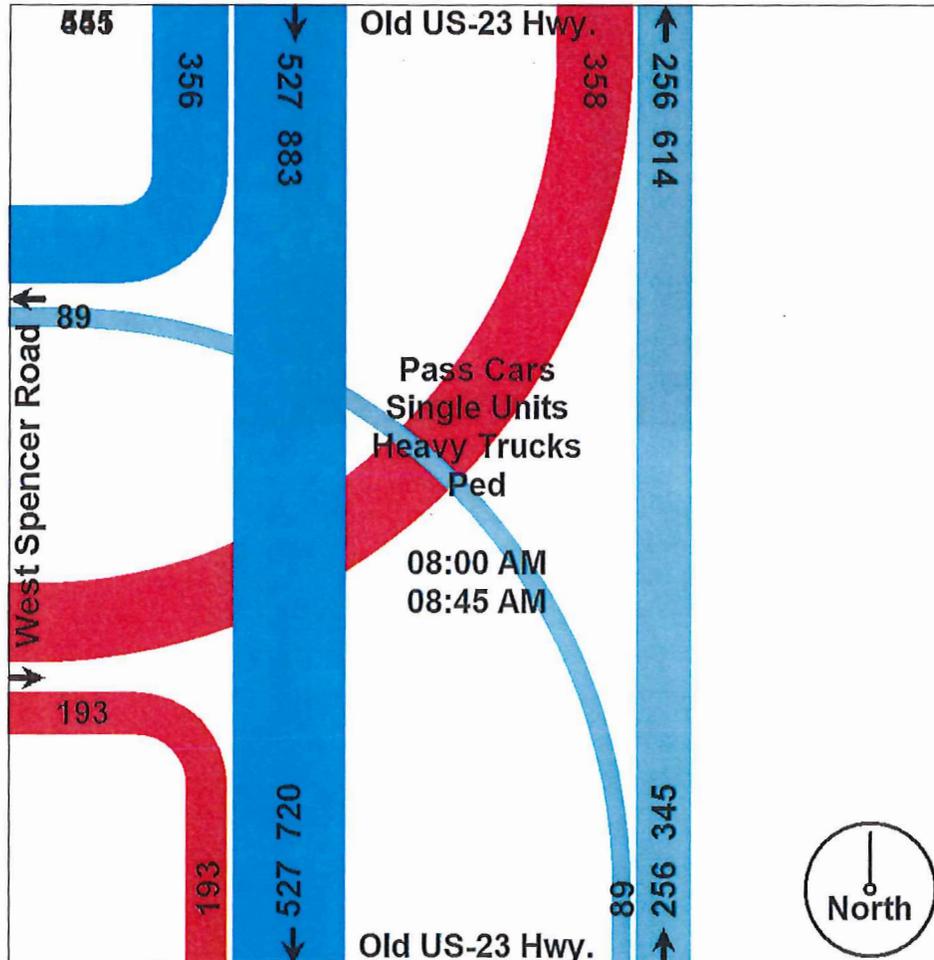
**Fleis & VandenBrink**



Project: Brighton Twp. Traffic Study  
 Type: 4 Hr. Video Turning Movement Count  
 Weather: Pt. Sunny, Dry Temp 40's  
 Count By: Miovision Video VCU 1US

File Name : TMC\_1 US23&SpencerW\_3-22-16  
 Site Code : TMC\_1  
 Start Date : 3/22/2016  
 Page No : 3

Start Time	Old US-23 Hwy. Southbound				Westbound				Old US-23 Hwy. Northbound				West Spencer Road Eastbound				Int. Total
	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 12:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	70	135	0	205	0	0	0	0	0	52	20	72	36	0	70	106	383
08:15 AM	78	99	0	177	0	0	0	0	0	57	25	82	47	0	96	143	402
08:30 AM	111	133	0	244	0	0	0	0	0	87	20	107	51	0	108	159	510
08:45 AM	97	160	0	257	0	0	0	0	0	60	24	84	59	0	84	143	484
Total Volume	356	527	0	883	0	0	0	0	0	256	89	345	193	0	358	551	1779
% App. Total	40.3	59.7	0		0	0	0		0	74.2	25.8		35	0	65		
PHF	.802	.823	.000	.859	.000	.000	.000	.000	.000	.736	.890	.806	.818	.000	.829	.866	.872
Pass Cars	347	494	0	841	0	0	0	0	0	246	84	330	186	0	339	525	1696
% Pass Cars	97.5	93.7	0	95.2	0	0	0	0	0	96.1	94.4	95.7	96.4	0	94.7	95.3	95.3
Single Units	8	33	0	41	0	0	0	0	0	10	4	14	3	0	14	17	72
% Single Units	2.2	6.3	0	4.6	0	0	0	0	0	3.9	4.5	4.1	1.6	0	3.9	3.1	4.0
Heavy Trucks	1	0	0	1	0	0	0	0	0	0	1	1	4	0	5	9	11
% Heavy Trucks	0.3	0	0	0.1	0	0	0	0	0	0	1.1	0.3	2.1	0	1.4	1.6	0.6
Ped	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Ped	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



# Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

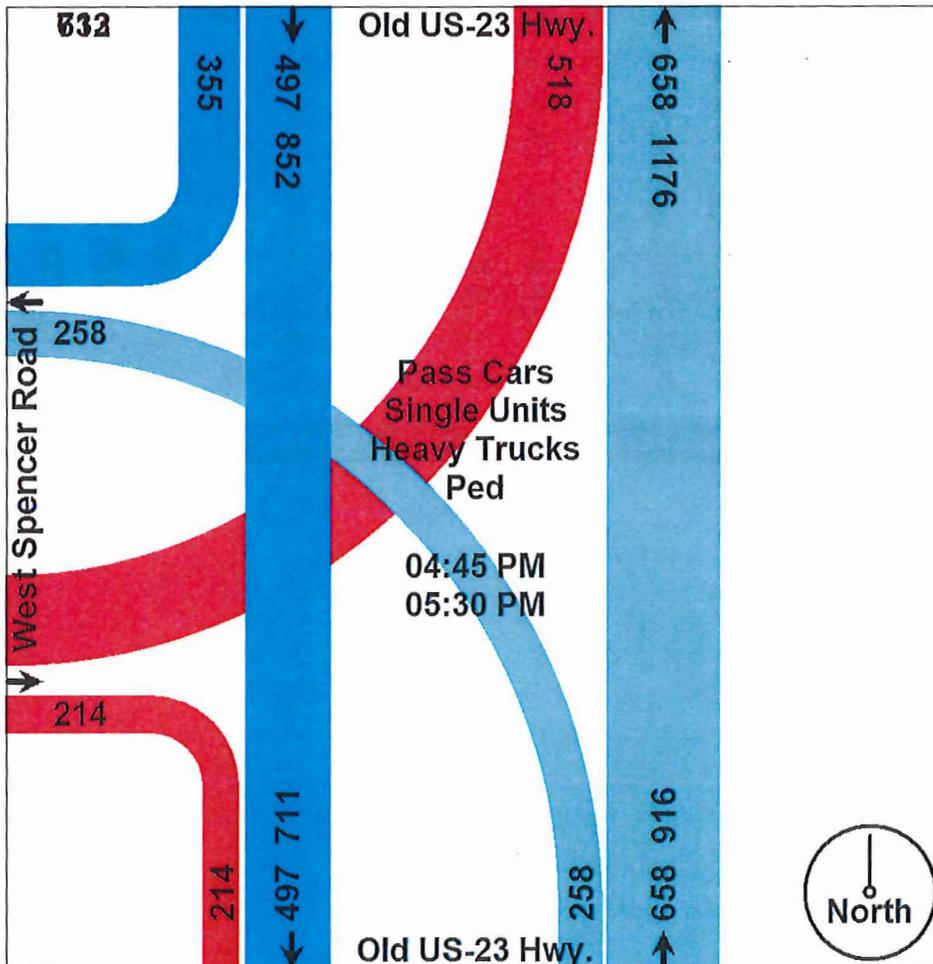
**Fleis & VandenBrink**



Project: Brighton Twp. Traffic Study  
 Type: 4 Hr. Video Turning Movement Count  
 Weather: Pt. Sunny, Dry Temp 40's  
 Count By: Miovision Video VCU 1US

File Name : TMC\_1 US23&SpencerW\_3-22-16  
 Site Code : TMC\_1  
 Start Date : 3/22/2016  
 Page No : 4

Start Time	Old US-23 Hwy. Southbound				Westbound				Old US-23 Hwy. Northbound				West Spencer Road Eastbound				Int. Total
	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	
Peak Hour Analysis From 12:45 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	72	109	0	181	0	0	0	0	0	150	54	204	59	0	123	182	567
05:00 PM	97	135	0	232	0	0	0	0	0	179	76	255	55	0	138	193	680
05:15 PM	89	125	0	214	0	0	0	0	0	156	72	228	54	0	115	169	611
05:30 PM	97	128	0	225	0	0	0	0	0	173	56	229	46	0	142	188	642
Total Volume	355	497	0	852	0	0	0	0	0	658	258	916	214	0	518	732	2500
% App. Total	41.7	58.3	0		0	0	0		0	71.8	28.2		29.2	0	70.8		
PHF	.915	.920	.000	.918	.000	.000	.000	.000	.000	.919	.849	.898	.907	.000	.912	.948	.919
Pass Cars	353	496	0	849	0	0	0	0	0	656	255	911	212	0	517	729	2489
% Pass Cars	99.4	99.8	0	99.6	0	0	0	0	0	99.7	98.8	99.5	99.1	0	99.8	99.6	99.6
Single Units	2	1	0	3	0	0	0	0	0	2	3	5	2	0	1	3	11
% Single Units	0.6	0.2	0	0.4	0	0	0	0	0	0.3	1.2	0.5	0.9	0	0.2	0.4	0.4
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Ped	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



# Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

**Fleis & VandenBrink**



Project: Brighton Twp. Traffic Study  
 Type: 4 Hr. Video Turning Movement Count  
 Weather: Pt. Sunny, Dry Temp 40's  
 Count By: Miovision Video VCU 5RA&4G2

File Name : TMC\_2 US23&GrandRiver\_3-22-16  
 Site Code : TMC\_2  
 Start Date : 3/22/2016  
 Page No : 1

Groups Printed- Pass Cars - Single Units - Heavy Trucks

Start Time	Old US-23 Hwy. Southbound					Grand River Road Westbound					Old US-23 Hwy. Northbound					Grand River Road Eastbound					Int. Total
	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	
07:00 AM	11	96	59	0	166	18	48	28	0	94	43	14	13	0	70	29	105	10	0	144	474
07:15 AM	17	93	71	0	181	10	41	52	0	103	46	26	15	0	87	24	121	8	0	153	524
07:30 AM	14	76	76	0	166	28	30	41	0	99	66	49	21	0	136	21	124	8	0	153	554
07:45 AM	39	73	73	0	185	18	62	30	0	110	85	52	32	0	169	35	123	15	0	173	637
<b>Total</b>	<b>81</b>	<b>338</b>	<b>279</b>	<b>0</b>	<b>698</b>	<b>74</b>	<b>181</b>	<b>151</b>	<b>0</b>	<b>406</b>	<b>240</b>	<b>141</b>	<b>81</b>	<b>0</b>	<b>462</b>	<b>109</b>	<b>473</b>	<b>41</b>	<b>0</b>	<b>623</b>	<b>2189</b>
08:00 AM	32	77	48	0	157	23	50	27	0	100	46	34	32	0	112	19	108	12	0	139	508
08:15 AM	34	66	49	0	149	24	53	25	0	102	57	44	24	0	125	27	97	16	0	140	516
08:30 AM	36	64	55	0	155	32	63	27	0	122	30	52	21	0	103	16	100	21	0	137	517
08:45 AM	49	89	57	0	195	23	64	30	0	117	56	35	45	0	136	29	108	12	0	149	597
<b>Total</b>	<b>151</b>	<b>296</b>	<b>209</b>	<b>0</b>	<b>656</b>	<b>102</b>	<b>230</b>	<b>109</b>	<b>0</b>	<b>441</b>	<b>189</b>	<b>165</b>	<b>122</b>	<b>0</b>	<b>476</b>	<b>91</b>	<b>413</b>	<b>61</b>	<b>0</b>	<b>565</b>	<b>2138</b>
**** BREAK ****																					
04:00 PM	46	87	44	0	177	46	99	78	0	223	47	95	49	0	191	53	117	54	0	224	815
04:15 PM	49	72	54	0	175	63	121	72	0	256	63	73	59	0	195	46	136	64	0	246	872
04:30 PM	32	71	58	0	161	86	114	79	0	279	70	78	59	0	207	51	104	66	0	221	868
04:45 PM	50	67	46	0	163	57	143	77	0	277	50	97	53	0	200	50	106	65	0	221	861
<b>Total</b>	<b>177</b>	<b>297</b>	<b>202</b>	<b>0</b>	<b>676</b>	<b>252</b>	<b>477</b>	<b>306</b>	<b>0</b>	<b>1035</b>	<b>230</b>	<b>343</b>	<b>220</b>	<b>0</b>	<b>793</b>	<b>200</b>	<b>463</b>	<b>249</b>	<b>0</b>	<b>912</b>	<b>3416</b>
05:00 PM	36	82	43	0	161	101	149	80	0	330	60	77	64	0	201	62	142	76	0	280	972
05:15 PM	55	69	61	0	185	71	128	84	0	283	63	104	66	0	233	45	113	51	0	209	910
05:30 PM	34	76	47	0	157	67	135	81	0	283	46	89	65	0	200	49	123	78	0	250	890
05:45 PM	39	101	54	0	194	47	103	54	0	204	47	72	33	0	152	50	80	52	0	182	732
<b>Total</b>	<b>164</b>	<b>328</b>	<b>205</b>	<b>0</b>	<b>697</b>	<b>286</b>	<b>515</b>	<b>299</b>	<b>0</b>	<b>1100</b>	<b>216</b>	<b>342</b>	<b>228</b>	<b>0</b>	<b>786</b>	<b>206</b>	<b>458</b>	<b>257</b>	<b>0</b>	<b>921</b>	<b>3504</b>
<b>Grand Total</b>	<b>573</b>	<b>1259</b>	<b>895</b>	<b>0</b>	<b>2727</b>	<b>714</b>	<b>1403</b>	<b>865</b>	<b>0</b>	<b>2982</b>	<b>875</b>	<b>991</b>	<b>651</b>	<b>0</b>	<b>2517</b>	<b>606</b>	<b>1807</b>	<b>608</b>	<b>0</b>	<b>3021</b>	<b>11247</b>
<b>Approch %</b>	<b>21</b>	<b>46.2</b>	<b>32.8</b>	<b>0</b>	<b>23.9</b>	<b>47</b>	<b>29</b>	<b>0</b>	<b>0</b>	<b>34.8</b>	<b>39.4</b>	<b>25.9</b>	<b>0</b>	<b>0</b>	<b>20.1</b>	<b>59.8</b>	<b>20.1</b>	<b>0</b>	<b>0</b>	<b>0</b>	
<b>Total %</b>	<b>5.1</b>	<b>11.2</b>	<b>8</b>	<b>0</b>	<b>24.2</b>	<b>6.3</b>	<b>12.5</b>	<b>7.7</b>	<b>0</b>	<b>26.5</b>	<b>7.8</b>	<b>8.8</b>	<b>5.8</b>	<b>0</b>	<b>22.4</b>	<b>5.4</b>	<b>16.1</b>	<b>5.4</b>	<b>0</b>	<b>26.9</b>	
<b>Pass Cars</b>	<b>541</b>	<b>1234</b>	<b>874</b>	<b>0</b>	<b>2649</b>	<b>699</b>	<b>1372</b>	<b>856</b>	<b>0</b>	<b>2927</b>	<b>863</b>	<b>977</b>	<b>631</b>	<b>0</b>	<b>2471</b>	<b>592</b>	<b>1776</b>	<b>597</b>	<b>0</b>	<b>2965</b>	<b>11012</b>
<b>% Pass Cars</b>	<b>94.4</b>	<b>98</b>	<b>97.7</b>	<b>0</b>	<b>97.1</b>	<b>97.9</b>	<b>97.8</b>	<b>99</b>	<b>0</b>	<b>98.2</b>	<b>98.6</b>	<b>98.6</b>	<b>96.9</b>	<b>0</b>	<b>98.2</b>	<b>97.7</b>	<b>98.3</b>	<b>98.2</b>	<b>0</b>	<b>98.1</b>	<b>97.9</b>
<b>Single Units</b>	<b>29</b>	<b>22</b>	<b>18</b>	<b>0</b>	<b>69</b>	<b>14</b>	<b>22</b>	<b>6</b>	<b>0</b>	<b>42</b>	<b>7</b>	<b>12</b>	<b>14</b>	<b>0</b>	<b>33</b>	<b>10</b>	<b>24</b>	<b>8</b>	<b>0</b>	<b>42</b>	<b>186</b>
<b>% Single Units</b>	<b>5.1</b>	<b>1.7</b>	<b>2</b>	<b>0</b>	<b>2.5</b>	<b>2</b>	<b>1.6</b>	<b>0.7</b>	<b>0</b>	<b>1.4</b>	<b>0.8</b>	<b>1.2</b>	<b>2.2</b>	<b>0</b>	<b>1.3</b>	<b>1.7</b>	<b>1.3</b>	<b>1.3</b>	<b>0</b>	<b>1.4</b>	<b>1.7</b>
<b>Heavy Trucks</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>9</b>	<b>1</b>	<b>9</b>	<b>3</b>	<b>0</b>	<b>13</b>	<b>5</b>	<b>2</b>	<b>6</b>	<b>0</b>	<b>13</b>	<b>4</b>	<b>7</b>	<b>3</b>	<b>0</b>	<b>14</b>	<b>49</b>
<b>% Heavy Trucks</b>	<b>0.5</b>	<b>0.2</b>	<b>0.3</b>	<b>0</b>	<b>0.3</b>	<b>0.1</b>	<b>0.6</b>	<b>0.3</b>	<b>0</b>	<b>0.4</b>	<b>0.6</b>	<b>0.2</b>	<b>0.9</b>	<b>0</b>	<b>0.5</b>	<b>0.7</b>	<b>0.4</b>	<b>0.5</b>	<b>0</b>	<b>0.5</b>	<b>0.4</b>

Comments: 4 hour video traffic study conducted during typical weekday (Tuesday) from 7:00-9:00 AM morning & 4:00-6:00 PM afternoon peak hours, while school was in session. Signalized, intersection no ped. signals. Video SCU cameras were located within NW & SE intersection quadrants.

# Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

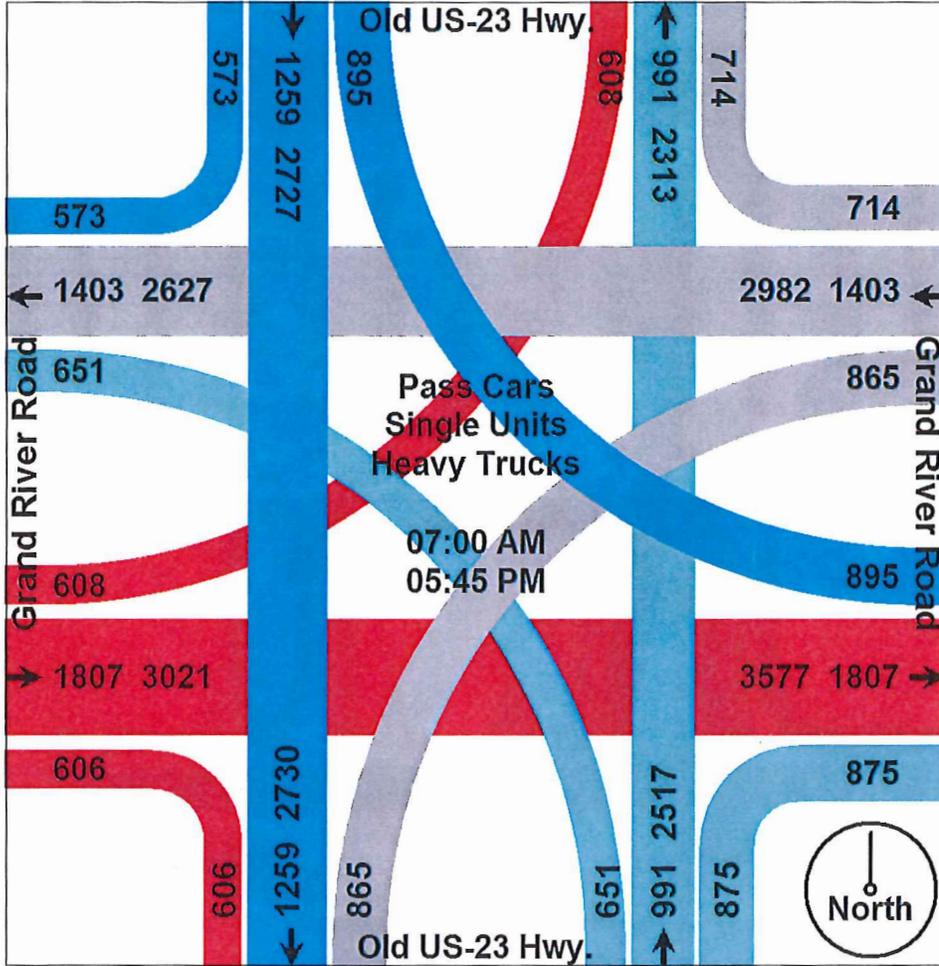
Traffic Study Performed For:

**Fleis & VandenBrink**



Project: Brighton Twp. Traffic Study  
Type: 4 Hr. Video Turning Movement Count  
Weather: Pt. Sunny, Dry Temp 40's  
Count By: Miovision Video VCU 5RA&4G2

File Name : TMC\_2 US23&GrandRiver\_3-22-16  
Site Code : TMC\_2  
Start Date : 3/22/2016  
Page No : 2



# Traffic Data Collection (TDC)

tdcounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

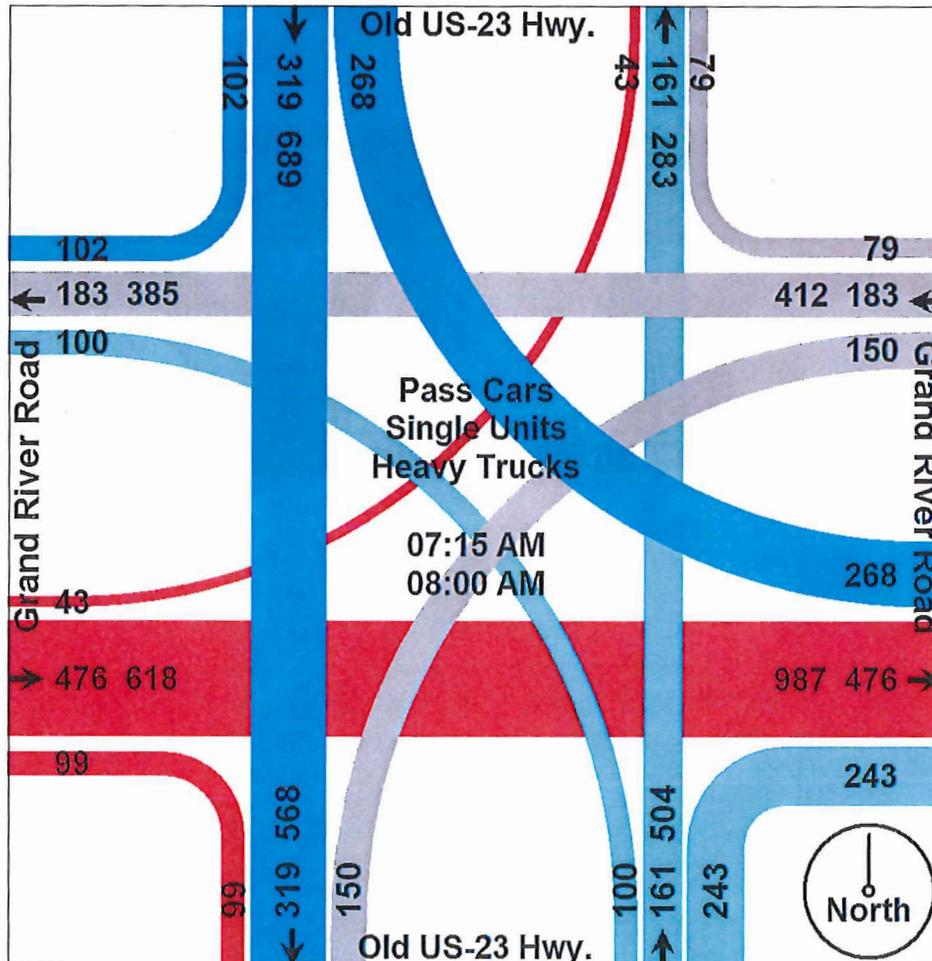
**Fleis & VandenBrink**



Project: Brighton Twp. Traffic Study  
 Type: 4 Hr. Video Turning Movement Count  
 Weather: Pt. Sunny, Dry Temp 40's  
 Count By: Miovision Video VCU 5RA&4G2

File Name : TMC\_2 US23&GrandRiver\_3-22-16  
 Site Code : TMC\_2  
 Start Date : 3/22/2016  
 Page No : 3

Start Time	Old US-23 Hwy. Southbound				Grand River Road Westbound				Old US-23 Hwy. Northbound				Grand River Road Eastbound				Int. Total
	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 12:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	17	93	71	181	10	41	52	103	46	26	15	87	24	121	8	153	524
07:30 AM	14	76	76	166	28	30	41	99	66	49	21	136	21	124	8	153	554
07:45 AM	39	73	73	185	18	62	30	110	85	52	32	169	35	123	15	173	637
08:00 AM	32	77	48	157	23	50	27	100	46	34	32	112	19	108	12	139	508
Total Volume	102	319	268	689	79	183	150	412	243	161	100	504	99	476	43	618	2223
% App. Total	14.8	46.3	38.9		19.2	44.4	36.4		48.2	31.9	19.8		16	77	7		
PHF	.654	.858	.882	.931	.705	.738	.721	.936	.715	.774	.781	.746	.707	.960	.717	.893	.872
Pass Cars	100	307	262	669	73	173	148	394	237	158	96	491	93	468	40	601	2155
% Pass Cars	98.0	96.2	97.8	97.1	92.4	94.5	98.7	95.6	97.5	98.1	96.0	97.4	93.9	98.3	93.0	97.2	96.9
Single Units	2	11	5	18	5	9	1	15	3	3	3	9	4	7	3	14	56
% Single Units	2.0	3.4	1.9	2.6	6.3	4.9	0.7	3.6	1.2	1.9	3.0	1.8	4.0	1.5	7.0	2.3	2.5
Heavy Trucks	0	1	1	2	1	1	1	3	3	0	1	4	2	1	0	3	12
% Heavy Trucks	0	0.3	0.4	0.3	1.3	0.5	0.7	0.7	1.2	0	1.0	0.8	2.0	0.2	0	0.5	0.5



# Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

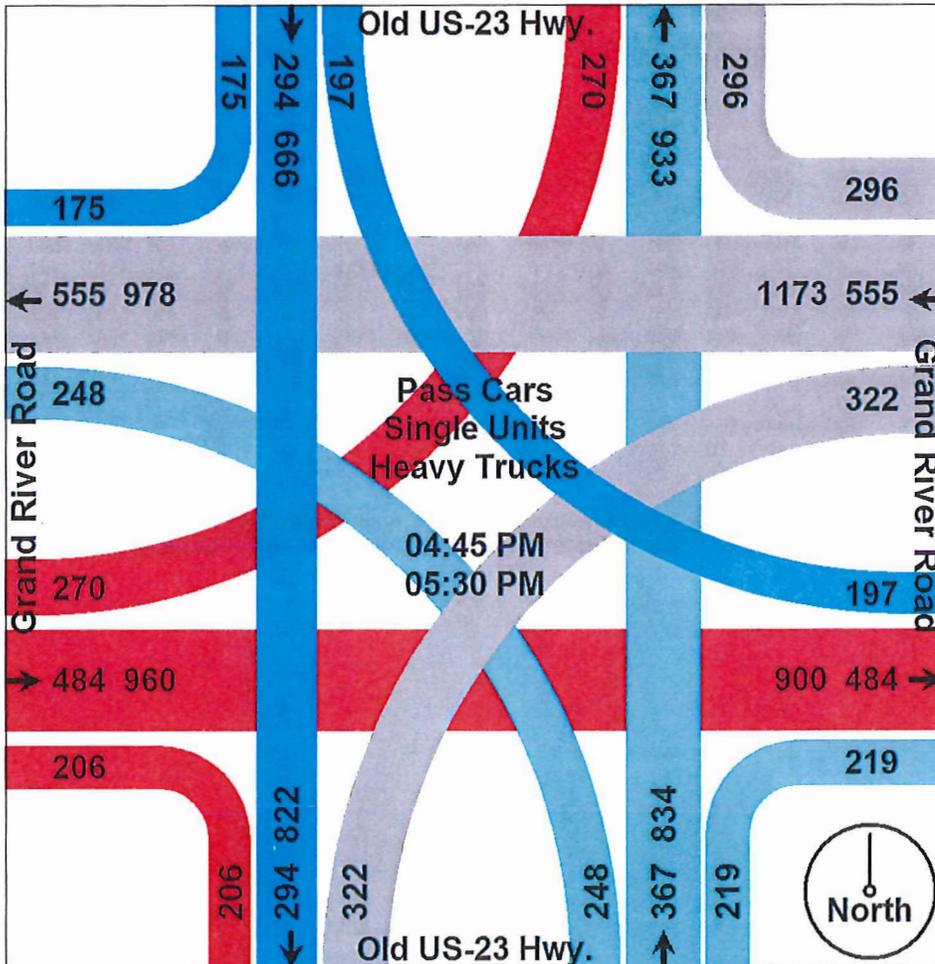
**Fleis & VandenBrink**



Project: Brighton Twp. Traffic Study  
 Type: 4 Hr. Video Turning Movement Count  
 Weather: Pt. Sunny, Dry Temp 40's  
 Count By: Miovision Video VCU 5RA&4G2

File Name : TMC\_2 US23&GrandRiver\_3-22-16  
 Site Code : TMC\_2  
 Start Date : 3/22/2016  
 Page No : 4

Start Time	Old US-23 Hwy. Southbound				Grand River Road Westbound				Old US-23 Hwy. Northbound				Grand River Road Eastbound				Int. Total
	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	
Peak Hour Analysis From 12:45 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	50	67	46	163	57	143	77	277	50	97	53	200	50	106	65	221	861
05:00 PM	36	82	43	161	101	149	80	330	60	77	64	201	62	142	76	280	972
05:15 PM	55	69	61	185	71	128	84	283	63	104	66	233	45	113	51	209	910
05:30 PM	34	76	47	157	67	135	81	283	46	89	65	200	49	123	78	250	890
Total Volume	175	294	197	666	296	555	322	1173	219	367	248	834	206	484	270	960	3633
% App. Total	26.3	44.1	29.6		25.2	47.3	27.5		26.3	44	29.7		21.5	50.4	28.1		
PHF	.795	.896	.807	.900	.733	.931	.958	.889	.869	.882	.939	.895	.831	.852	.865	.857	.934
Pass Cars	174	294	194	662	294	547	321	1162	218	366	244	828	205	481	269	955	3607
% Pass Cars	99.4	100	98.5	99.4	99.3	98.6	99.7	99.1	99.5	99.7	98.4	99.3	99.5	99.4	99.6	99.5	99.3
Single Units	1	0	3	4	2	4	1	7	0	1	2	3	1	3	1	5	19
% Single Units	0.6	0	1.5	0.6	0.7	0.7	0.3	0.6	0	0.3	0.8	0.4	0.5	0.6	0.4	0.5	0.5
Heavy Trucks	0	0	0	0	0	4	0	4	1	0	2	3	0	0	0	0	7
% Heavy Trucks	0	0	0	0	0	0.7	0	0.3	0.5	0	0.8	0.4	0	0	0	0	0.2



# Traffic Data Collection (TDC)

tdcounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

**Fleis & VandenBrink**



Project: Brighton Twp. Traffic Study  
 Type: 4 Hr. Video Turning Movement Count  
 Weather: Pt. Sunny, Dry Temp 40's  
 Count By: Miovision Video VCU 4PU

File Name : TMC\_3 GrandRiver&PleasantValley\_3-22-16  
 Site Code : TMC\_3  
 Start Date : 3/22/2016  
 Page No : 1

Groups Printed- Pass Cars - Single Units - Heavy Trucks - Ped

Start Time	Pleasant Valley Road Southbound					Grand River Road Westbound					Bar None Restaurant Northbound					Grand River Road Eastbound					Int. Total
	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	Rgt	Thru	Left	Peds	App. Total	
07:00 AM	48	0	9	0	57	3	24	0	0	27	0	0	0	0	0	0	97	62	0	159	243
07:15 AM	50	0	10	0	60	3	17	0	0	20	0	0	0	0	0	0	144	85	0	229	309
07:30 AM	45	0	13	0	58	3	31	0	0	34	0	0	0	0	0	0	128	76	0	204	296
07:45 AM	57	0	8	0	65	2	32	0	0	34	0	0	0	0	0	1	119	78	0	198	297
Total	200	0	40	0	240	11	104	0	0	115	0	0	0	0	0	1	488	301	0	790	1145
08:00 AM	52	1	12	0	65	1	27	1	0	29	0	0	0	0	0	0	92	65	0	157	251
08:15 AM	43	0	9	0	52	3	35	0	0	38	0	0	0	0	0	0	84	63	0	147	237
08:30 AM	47	0	5	0	52	1	31	2	0	34	0	0	0	0	0	0	50	70	0	120	206
08:45 AM	58	0	9	0	67	0	38	0	0	38	0	0	0	0	0	2	53	75	0	130	235
Total	200	1	35	0	236	5	131	3	0	139	0	0	0	0	0	2	279	273	0	554	929
*** BREAK ***																					
04:00 PM	75	2	5	0	82	11	79	2	0	92	1	0	2	0	3	3	54	76	0	133	310
04:15 PM	73	1	3	0	77	10	113	2	0	125	0	0	0	0	0	4	61	70	0	135	337
04:30 PM	90	2	0	0	92	16	133	2	0	151	0	1	4	0	5	7	72	90	0	169	417
04:45 PM	80	3	4	0	87	9	103	3	0	115	1	0	3	0	4	4	44	92	0	140	346
Total	318	8	12	0	338	46	428	9	0	483	2	1	9	0	12	18	231	328	0	577	1410
05:00 PM	75	4	0	0	79	25	127	8	0	160	1	0	1	0	2	2	79	108	0	189	430
05:15 PM	76	3	2	0	81	7	112	2	0	121	1	0	0	0	1	8	56	93	0	157	360
05:30 PM	83	1	1	0	85	17	118	3	0	138	3	0	5	0	8	2	56	99	0	157	388
05:45 PM	96	2	2	0	100	8	71	1	0	80	2	1	1	0	4	3	52	69	0	124	308
Total	330	10	5	0	345	57	428	14	0	499	7	1	7	0	15	15	243	369	0	627	1486
Grand Total	1048	19	92	0	1159	119	1091	26	0	1236	9	2	16	0	27	36	1241	1271	0	2548	4970
Apprch %	90.4	1.6	7.9	0		9.6	88.3	2.1	0		33.3	7.4	59.3	0		1.4	48.7	49.9	0		
Total %	21.1	0.4	1.9	0	23.3	2.4	22	0.5	0	24.9	0.2	0	0.3	0	0.5	0.7	25	25.6	0	51.3	
Pass Cars	1030	19	91	0	1140	118	1061	25	0	1204	9	2	15	0	26	35	1209	1251	0	2495	4865
% Pass Cars	98.3	100	98.9	0	98.4	99.2	97.3	96.2	0	97.4	100	100	93.8	0	96.3	97.2	97.4	98.4	0	97.9	97.9
Single Units	13	0	1	0	14	1	25	1	0	27	0	0	1	0	1	1	24	14	0	39	81
% Single Units	1.2	0	1.1	0	1.2	0.8	2.3	3.8	0	2.2	0	0	6.2	0	3.7	2.8	1.9	1.1	0	1.5	1.6
Heavy Trucks	5	0	0	0	5	0	5	0	0	5	0	0	0	0	0	0	8	6	0	14	24
% Heavy Trucks	0.5	0	0	0	0.4	0	0.5	0	0	0.4	0	0	0	0	0	0	0.6	0.5	0	0.5	0.5
Ped	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Ped	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Comments: 4 hour video traffic study conducted during typical weekday (Tuesday) from 7:00-9:00 AM morning & 4:00-6:00 PM afternoon peak hours, while school was in session. Non-signalized, intersection. Video SCU camera was located within SE intersection quadrant.

# Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

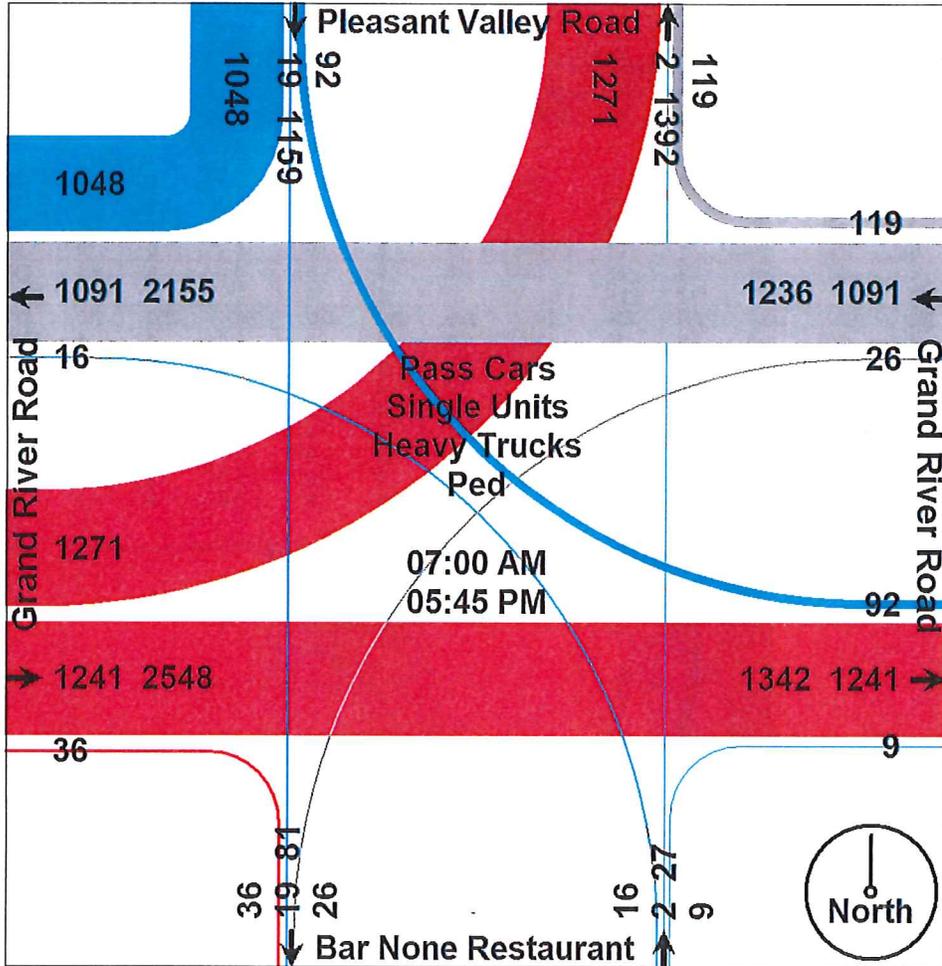
Traffic Study Performed For:

**Fleis & VandenBrink**



Project: Brighton Twp. Traffic Study  
Type: 4 Hr. Video Turning Movement Count  
Weather: Pt. Sunny, Dry Temp 40's  
Count By: Miovision Video VCU 4PU

File Name : TMC\_3 GrandRiver&PleasantValley\_3-22-16  
Site Code : TMC\_3  
Start Date : 3/22/2016  
Page No : 2



# Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

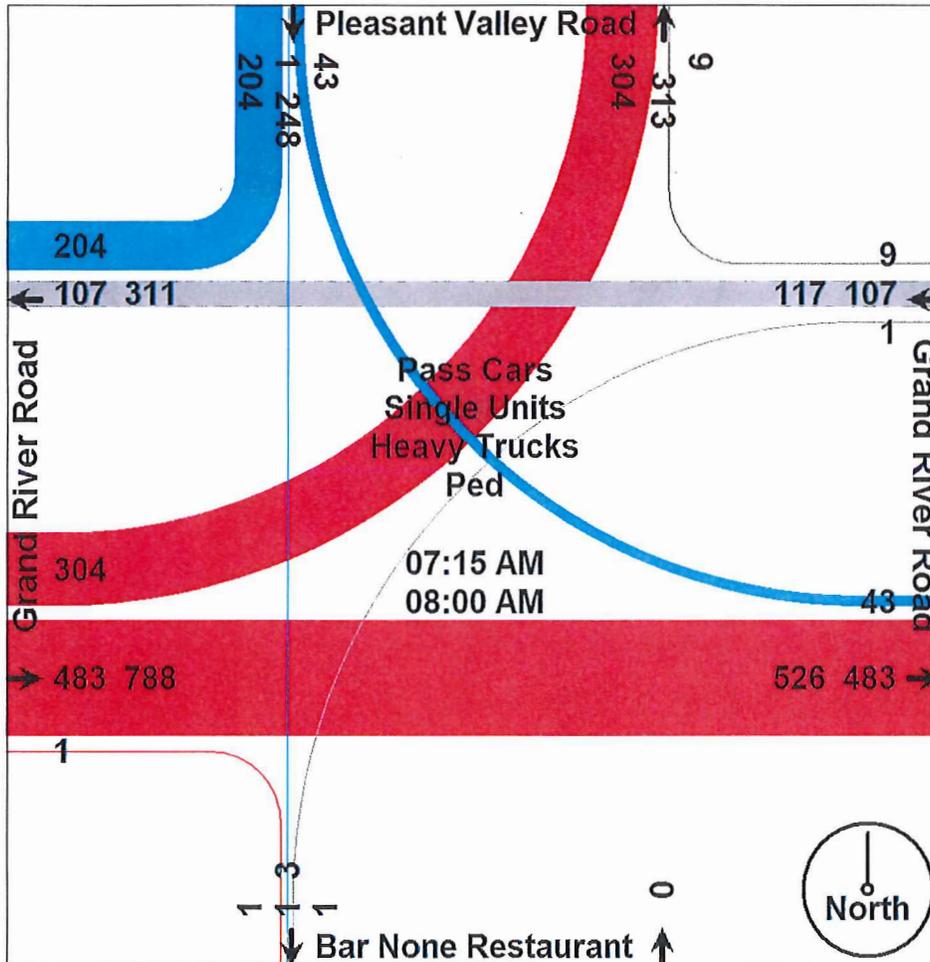
**Fleis & VandenBrink**



Project: Brighton Twp. Traffic Study  
 Type: 4 Hr. Video Turning Movement Count  
 Weather: Pt. Sunny, Dry Temp 40's  
 Count By: Miovision Video VCU 4PU

File Name : TMC\_3 GrandRiver&PleasantValley\_3-22-16  
 Site Code : TMC\_3  
 Start Date : 3/22/2016  
 Page No : 3

Start Time	Pleasant Valley Road Southbound				Grand River Road Westbound				Bar None Restaurant Northbound				Grand River Road Eastbound				Int. Total
	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 12:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	50	0	10	60	3	17	0	20	0	0	0	0	0	144	85	229	309
07:30 AM	45	0	13	58	3	31	0	34	0	0	0	0	0	128	76	204	296
07:45 AM	57	0	8	65	2	32	0	34	0	0	0	0	1	119	78	198	297
08:00 AM	52	1	12	65	1	27	1	29	0	0	0	0	0	92	65	157	251
Total Volume	204	1	43	248	9	107	1	117	0	0	0	0	1	483	304	788	1153
% App. Total	82.3	0.4	17.3		7.7	91.5	0.9		0	0	0		0.1	61.3	38.6		
PHF	.895	.250	.827	.954	.750	.836	.250	.860	.000	.000	.000	.000	.250	.839	.894	.860	.933
Pass Cars	197	1	42	240	9	100	0	109	0	0	0	0	1	468	299	768	1117
% Pass Cars	96.6	100	97.7	96.8	100	93.5	0	93.2	0	0	0	0	100	96.9	98.4	97.5	96.9
Single Units	5	0	1	6	0	6	1	7	0	0	0	0	0	11	5	16	29
% Single Units	2.5	0	2.3	2.4	0	5.6	100	6.0	0	0	0	0	0	2.3	1.6	2.0	2.5
Heavy Trucks	2	0	0	2	0	1	0	1	0	0	0	0	0	4	0	4	7
% Heavy Trucks	1.0	0	0	0.8	0	0.9	0	0.9	0	0	0	0	0	0.8	0	0.5	0.6
Ped	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Ped	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



# Traffic Data Collection (TDC)

tdccounts.com

Phone: (586) 786-5407

Traffic Study Performed For:

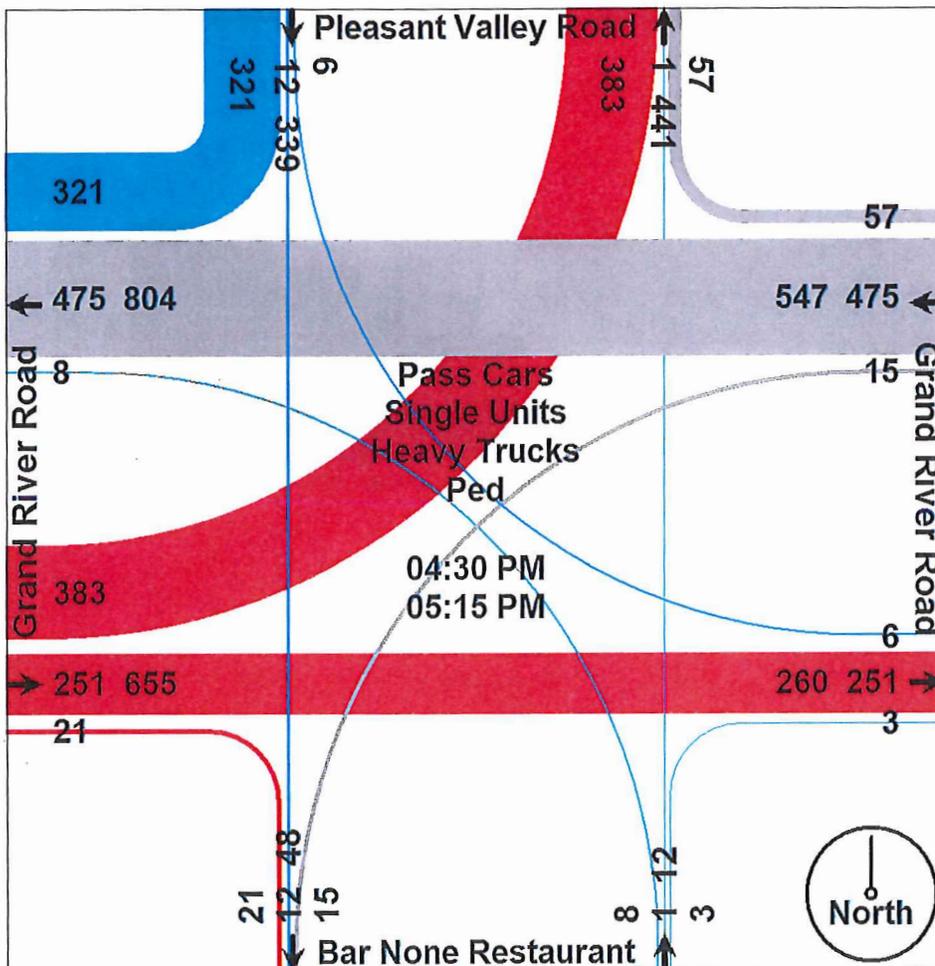
**Fleis & VandenBrink**



Project: Brighton Twp. Traffic Study  
 Type: 4 Hr. Video Turning Movement Count  
 Weather: Pt. Sunny, Dry Temp 40's  
 Count By: Miovision Video VCU 4PU

File Name : TMC\_3 GrandRiver&PleasantValley\_3-22-16  
 Site Code : TMC\_3  
 Start Date : 3/22/2016  
 Page No : 4

Start Time	Pleasant Valley Road Southbound				Grand River Road Westbound				Bar None Restaurant Northbound				Grand River Road Eastbound				Int. Total
	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	Rgt	Thru	Left	App. Total	
Peak Hour Analysis From 12:45 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	90	2	0	92	16	133	2	151	0	1	4	5	7	72	90	169	417
04:45 PM	80	3	4	87	9	103	3	115	1	0	3	4	4	44	92	140	346
05:00 PM	75	4	0	79	25	127	8	160	1	0	1	2	2	79	108	189	430
05:15 PM	76	3	2	81	7	112	2	121	1	0	0	1	8	56	93	157	360
Total Volume	321	12	6	339	57	475	15	547	3	1	8	12	21	251	383	655	1553
% App. Total	94.7	3.5	1.8		10.4	86.8	2.7		25	8.3	66.7		3.2	38.3	58.5		
PHF	.892	.750	.375	.921	.570	.893	.469	.855	.750	.250	.500	.600	.656	.794	.887	.866	.903
Pass Cars	318	12	6	336	57	466	15	538	3	1	7	11	20	243	379	642	1527
% Pass Cars	99.1	100	100	99.1	100	98.1	100	98.4	100	100	87.5	91.7	95.2	96.8	99.0	98.0	98.3
Single Units	2	0	0	2	0	8	0	8	0	0	1	1	1	7	3	11	22
% Single Units	0.6	0	0	0.6	0	1.7	0	1.5	0	0	12.5	8.3	4.8	2.8	0.8	1.7	1.4
Heavy Trucks	1	0	0	1	0	1	0	1	0	0	0	0	0	1	1	2	4
% Heavy Trucks	0.3	0	0	0.3	0	0.2	0	0.2	0	0	0	0	0	0.4	0.3	0.3	0.3
Ped	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Ped	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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YOU ARE VIEWING DATA FOR:

# Brighton Township

4363 Buno Rd  
Brighton, MI 48114-9269  
<http://www.brightontwp.com/>

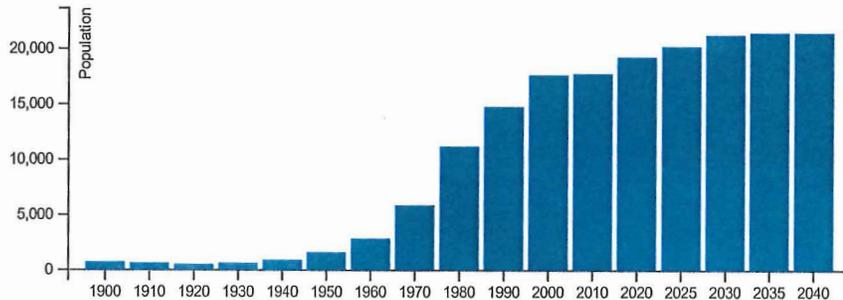


Census 2010 Population:  
17,791  
Area: 34.6 square miles

## Population and Households

Link to American Community Survey (ACS) Profiles:  Social | Demographic  
Population and Household Estimates for Southeast Michigan, July 2015

## Population Forecast



## Population and Households

Population and Households	Census 2010	Change 2000-2010	Pct Change 2000-2010	SEMCOG Jul 2015	SEMCOG 2040
<b>Total Population</b>	17,791	118	0.7%	17,888	21,498
<b>Group Quarters Population</b>	111	54	94.7%	111	136
<b>Household Population</b>	17,680	64	0.4%	17,777	21,362
<b>Housing Units</b>	6,765	588	9.5%	7,001	-
<b>Households (Occupied Units)</b>	6,415	465	7.8%	6,697	7,937
<b>Residential Vacancy Rate</b>	5.2%	1.5%	-	4.3%	-
<b>Average Household Size</b>	2.76	-0.20	-	2.65	2.69

Source: U.S. Census Bureau and SEMCOG 2040 Forecast produced in 2012.

## Components of Population Change

Components of Population Change	2000-2005 Avg.	2006-2010 Avg.	Source: Michigan Department of Community Health Vital Statistics U.S. Census Bureau, and SEMCOG.
<b>Natural Increase (Births - Deaths)</b>	136	54	
<b>Births</b>	212	143	
<b>Deaths</b>	76	89	
<b>Net Migration (Movement In - Movement Out)</b>	-43	-123	
<b>Population Change (Natural Increase + Net Migration)</b>	93	-69	

### Level of Service Criteria for Stop Sign Controlled Intersections

The level of service criteria are given in Table 17-2. As used here, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in queue.

The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation. . . .

Exhibit 17-2. Level of Service Criteria for TWSC Intersections

LEVEL OF SERVICE	AVERAGE CONTROL DELAY (sec/veh)
A	$\leq 10$
B	$> 10$ and $\leq 15$
C	$> 15$ and $\leq 25$
D	$> 25$ and $\leq 35$
E	$> 35$ and $\leq 50$
F	$> 50$

Average total delay less than 10 sec/veh is defined as Level of Service (LOS) A. Follow-up times of less than 5 sec have been measured when there is no conflicting traffic for a minor street movement, so control delays of less than 10 sec/veh are appropriate for low flow conditions. To remain consistent with the AWSC intersection analysis procedure described later in this chapter, a total delay of 50 sec/veh is assumed as the break point between LOS E and F.

The proposed level of service criteria for TWSC intersections are somewhat different from the criteria used in Chapter 16 for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, several driver behavior considerations combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, where drivers on the minor approaches to unsignalized intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized than signalized intersections. For these reasons, it is considered that the total delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection. . . .

LOS F exists when there are insufficient gaps of suitable size to allow a side street demand to cross safely through a major street traffic stream. This level of service is generally evident from extremely long total delays experienced by side street traffic and by queueing on the minor approaches. The method, however, is based on a constant critical gap size - that is, the critical gap remains constant, no matter how long the side street motorist waits. LOS F may also appear in the form of side street vehicles' selecting smaller-than-usual gaps. In such cases, safety may be a problem and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior. The latter is more difficult to observe on the field than queueing, which is more obvious.

Source: Highway Capacity Manual, 2010. Transportation Research Board, National Research Council

## Level of Service for Signalized Intersections

Level of service for signalized intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average stopped delay per vehicle for a 15-min analysis period. The criteria are given in Exhibit 16-2. Delay may be measured in the field or estimated using procedures presented later in this chapter. Delay is a complex measure and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the  $v/c$  ratio for the lane group in question.

**LOS A** describes operations with very low delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

**LOS B** describes operations with delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.

Exhibit 16-2. Level-of-Service Criteria for Signalized Intersections

LEVEL OF SERVICE	STOPPED DELAY PER VEHICLE (SEC)
A	$\leq 10.0$
B	$> 10.0$ and $\leq 20.0$
C	$> 20.0$ and $\leq 35.0$
D	$> 35.0$ and $\leq 55.0$
E	$> 55.0$ and $\leq 80.0$
F	$> 80.0$

**LOS C** describes operations with delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

**LOS D** describes operations with delay greater than 35 and up to 55 sec per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high  $v/c$  ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

**LOS E** describes operations with delay greater than 55 and up to 80 sec per vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high  $v/c$  ratios. Individual cycle failures are frequent occurrences.

**LOS F** describes operations with delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high  $v/c$  ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Source: Highway Capacity Manual, 2010. Transportation Research Board, National Research Council

HCM 2010 Signalized Intersection Summary  
 1: Whitmore Lake Road/Old US-23 & Grand River Avenue

Existing Conditions  
 AM Peak Hour

Movement												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	476	99	150	183	79	100	161	243	268	319	102
Future Volume (veh/h)	43	476	99	150	183	79	100	161	243	268	319	102
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1942	1942	2000	1923	1923	2000	1942	1942	1942	1942	1942	1942
Adj Flow Rate, veh/h	48	535	111	160	195	84	133	215	324	288	343	110
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.94	0.94	0.94	0.75	0.75	0.75	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	4	4	4	3	3	3	3	3	3
Cap, veh/h	474	692	143	253	390	162	255	310	511	404	418	483
Arrive On Green	0.15	0.23	0.23	0.08	0.15	0.15	0.08	0.16	0.16	0.13	0.22	0.22
Sat Flow, veh/h	1849	3046	629	1832	2519	1047	1849	1942	1650	1849	1942	1650
Grp Volume(v), veh/h	48	323	323	160	139	140	133	215	324	288	343	110
Grp Sat Flow(s),veh/h/ln	1849	1845	1831	1832	1827	1738	1849	1942	1650	1849	1942	1650
Q Serve(g_s), s	0.0	10.6	10.7	1.4	4.5	4.8	0.4	6.8	1.2	3.8	10.9	0.0
Cycle Q Clear(g_c), s	0.0	10.6	10.7	1.4	4.5	4.8	0.4	6.8	1.2	3.8	10.9	0.0
Prop In Lane	1.00		0.34	1.00		0.60	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	474	419	416	253	283	269	255	310	511	404	418	483
V/C Ratio(X)	0.10	0.77	0.78	0.63	0.49	0.52	0.52	0.69	0.63	0.71	0.82	0.23
Avail Cap(c_a), veh/h	541	543	539	452	538	512	541	542	707	589	542	588
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.1	23.4	23.4	27.6	25.0	25.1	27.5	25.6	19.1	24.6	24.1	17.3
Incr Delay (d2), s/veh	0.1	5.0	5.3	2.6	1.3	1.5	1.7	2.8	1.3	2.3	7.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	6.0	6.0	2.8	2.4	2.4	2.3	3.8	5.0	5.0	6.7	1.5
LnGrp Delay(d),s/veh	20.2	28.4	28.7	30.2	26.3	26.6	29.1	28.4	20.5	26.9	31.8	17.5
LnGrp LOS	C	C	C	C	C	C	C	C	C	C	C	B
Approach Vol, veh/h		694			439			672			741	
Approach Delay, s/veh		28.0			27.8			24.7			27.8	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.2	16.5	11.5	20.4	11.5	21.2	15.1	16.8				
Change Period (Y+Rc), s	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5				
Max Green Setting (Gmax), s	* 12	* 19	* 15	* 18	* 12	* 19	* 15	* 18				
Max Q Clear Time (g_c+l1), s	2.0	6.8	2.4	12.9	3.4	12.7	5.8	8.8				
Green Ext Time (p_c), s	0.4	1.1	1.0	1.0	0.3	2.0	0.9	1.6				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			27.0									
HCM 2010 LOS			C									
<b>Notes</b>												

HCM 2010 Signalized Intersection Summary  
2: Old US-23 & Spencer Road West

Existing Conditions  
AM Peak Hour

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations	 			 	 			
Traffic Volume (veh/h)	358	193	89	256	527	356		
Future Volume (veh/h)	358	193	89	256	527	356		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1886	1886	1942	1942	1886	1886		
Adj Flow Rate, veh/h	411	222	110	316	613	414		
Adj No. of Lanes	2	1	1	2	2	1		
Peak Hour Factor	0.87	0.87	0.81	0.81	0.86	0.86		
Percent Heavy Veh, %	5	5	4	4	5	5		
Cap, veh/h	640	741	693	2634	1438	913		
Arrive On Green	0.18	0.20	0.26	0.71	0.40	0.39		
Sat Flow, veh/h	3484	1603	1850	3788	3677	1603		
Grp Volume(v), veh/h	411	222	110	316	613	414		
Grp Sat Flow(s),veh/h/ln	1742	1603	1850	1845	1791	1603		
Q Serve(g_s), s	8.7	0.0	0.0	2.1	9.9	12.0		
Cycle Q Clear(g_c), s	8.7	0.0	0.0	2.1	9.9	12.0		
Prop In Lane	1.00	1.00	1.00			1.00		
Lane Grp Cap(c), veh/h	640	741	693	2634	1438	913		
V/C Ratio(X)	0.64	0.30	0.16	0.12	0.43	0.45		
Avail Cap(c_a), veh/h	1076	942	693	2634	1438	913		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	30.2	13.4	13.8	3.6	17.3	10.0		
Incr Delay (d2), s/veh	1.1	0.2	0.2	0.1	0.9	1.6		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	4.3	4.9	1.6	1.1	5.0	7.9		
LnGrp Delay(d),s/veh	31.3	13.6	14.0	3.7	18.2	11.6		
LnGrp LOS	C	B	B	A	B	B		
Approach Vol, veh/h	633			426	1027			
Approach Delay, s/veh	25.1			6.3	15.6			
Approach LOS	C			A	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		61.0		19.0	25.0	36.0		
Change Period (Y+Rc), s		7.2		6.4	7.2	7.2		
Max Green Setting (Gmax), s		43.8		22.6	7.8	28.8		
Max Q Clear Time (g_c+I1), s		4.1		10.7	2.0	14.0		
Green Ext Time (p_c), s		2.5		1.9	1.2	4.7		
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			16.6					
HCM 2010 LOS			B					

HCM 2010 TWSC  
 3: Bar None Drive/Pleasant Valley Road & Grand River Avenue

Existing Conditions  
 AM Peak Hour

Intersection

Int Delay, s/veh 6.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	304	483	1	1	107	9	0	0	0	43	1	204
Future Vol, veh/h	304	483	1	1	107	9	0	0	0	43	1	204
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									
Storage Length	300	-	375	150	-	250	-	-	-	-	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	92	92	92	95	95	95
Heavy Vehicles, %	3	3	3	7	7	7	2	2	2	3	3	3
Mvmt Flow	353	562	1	1	124	10	0	0	0	45	1	215

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	124	0	0	562	0	0	1396	1396	562	1396	1396	124
Stage 1	-	-	-	-	-	-	1269	1269	-	127	127	-
Stage 2	-	-	-	-	-	-	127	127	-	1269	1269	-
Critical Hdwy	4.13	-	-	4.17	-	-	7.12	6.52	6.22	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.263	-	-	3.518	4.018	3.318	3.527	4.027	3.327
Pot Cap-1 Maneuver	1457	-	-	985	-	-	119	141	526	118	140	924
Stage 1	-	-	-	-	-	-	206	239	-	874	789	-
Stage 2	-	-	-	-	-	-	877	791	-	206	238	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1457	-	-	985	-	-	74	107	526	96	106	924
Mov Cap-2 Maneuver	-	-	-	-	-	-	74	107	-	96	106	-
Stage 1	-	-	-	-	-	-	156	181	-	662	788	-
Stage 2	-	-	-	-	-	-	672	790	-	156	180	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.2	0.1	0	21.3
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1457	-	-	985	-	-	96	924
HCM Lane V/C Ratio	-	0.243	-	-	0.001	-	-	0.482	0.232
HCM Control Delay (s)	0	8.3	-	-	8.7	-	-	73.4	10.1
HCM Lane LOS	A	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	-	1	-	-	0	-	-	2.1	0.9

HCM 2010 Signalized Intersection Summary  
 1: Whitmore Lake Road/Old US-23 & Grand River Avenue

Existing Conditions  
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	484	206	322	555	296	248	367	219	197	294	175
Future Volume (veh/h)	270	484	206	322	555	296	248	367	219	197	294	175
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1980	1980	2000	1980	1980	2000	1980	1980	1980	1980	1980	1980
Adj Flow Rate, veh/h	314	563	240	362	624	333	276	408	243	219	327	194
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	1
Peak Hour Factor	0.86	0.86	0.86	0.89	0.89	0.89	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	352	649	276	438	671	358	353	460	646	251	383	633
Arrive On Green	0.15	0.25	0.25	0.18	0.28	0.28	0.14	0.23	0.23	0.10	0.19	0.19
Sat Flow, veh/h	1886	2574	1095	1886	2372	1266	1886	1980	1683	1886	1980	1683
Grp Volume(v), veh/h	314	411	392	362	495	462	276	408	243	219	327	194
Grp Sat Flow(s),veh/h/ln	1886	1881	1787	1886	1881	1757	1886	1980	1683	1886	1980	1683
Q Serve(g_s), s	14.2	23.2	23.2	14.7	28.3	28.3	9.8	22.1	0.0	8.8	17.7	0.0
Cycle Q Clear(g_c), s	14.2	23.2	23.2	14.7	28.3	28.3	9.8	22.1	0.0	8.8	17.7	0.0
Prop In Lane	1.00		0.61	1.00		0.72	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	352	474	450	438	532	497	353	460	646	251	383	633
V/C Ratio(X)	0.89	0.87	0.87	0.83	0.93	0.93	0.78	0.89	0.38	0.87	0.85	0.31
Avail Cap(c_a), veh/h	406	544	517	438	544	508	353	537	712	269	537	764
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.4	39.6	39.7	40.9	38.6	38.6	43.6	41.1	24.5	47.6	43.1	24.3
Incr Delay (d2), s/veh	19.6	12.6	13.5	12.3	22.6	23.7	10.7	14.9	0.4	24.5	9.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.2	13.7	13.1	12.0	18.0	17.0	9.1	13.9	5.4	8.3	10.6	4.2
LnGrp Delay(d),s/veh	64.0	52.3	53.1	53.2	61.2	62.3	54.3	56.0	24.9	72.2	52.4	24.6
LnGrp LOS	E	D	D	D	E	E	D	E	C	E	D	C
Approach Vol, veh/h		1117			1319			927			740	
Approach Delay, s/veh		55.9			59.4			47.4			51.0	
Approach LOS		E			E			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	23.3	37.8	21.7	27.9	26.7	34.4	17.4	32.2				
Change Period (Y+Rc), s	*6.5	*6.5	*6.5	*6.5	*6.5	*6.5	*6.5	*6.5				
Max Green Setting (Gmax), s	*20	*32	*12	*30	*20	*32	*12	*30				
Max Q Clear Time (g_c+I1), s	16.2	30.3	11.8	19.7	16.7	25.2	10.8	24.1				
Green Ext Time (p_c), s	0.6	1.0	0.0	1.8	0.8	2.6	0.1	1.6				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			54.2									
HCM 2010 LOS			D									
<b>Notes</b>												

HCM 2010 Signalized Intersection Summary  
2: Old US-23 & Spencer Road West

Existing Conditions  
PM Peak Hour

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	518	214	258	658	497	355		
Future Volume (veh/h)	518	214	258	658	497	355		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1980	1980	2000	2000	1980	1980		
Adj Flow Rate, veh/h	545	225	287	731	540	386		
Adj No. of Lanes	2	1	1	2	2	1		
Peak Hour Factor	0.95	0.95	0.90	0.90	0.92	0.92		
Percent Heavy Veh, %	0	0	1	1	0	0		
Cap, veh/h	770	778	685	2610	1510	1004		
Arrive On Green	0.21	0.23	0.24	0.69	0.40	0.39		
Sat Flow, veh/h	3658	1683	1905	3900	3861	1683		
Grp Volume(v), veh/h	545	225	287	731	540	386		
Grp Sat Flow(s),veh/h/ln	1829	1683	1905	1900	1881	1683		
Q Serve(g_s), s	11.1	0.0	0.0	6.0	8.0	9.6		
Cycle Q Clear(g_c), s	11.1	0.0	0.0	6.0	8.0	9.6		
Prop In Lane	1.00	1.00	1.00			1.00		
Lane Grp Cap(c), veh/h	770	778	685	2610	1510	1004		
V/C Ratio(X)	0.71	0.29	0.42	0.28	0.36	0.38		
Avail Cap(c_a), veh/h	992	880	685	2610	1510	1004		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	29.3	13.3	18.6	4.9	16.7	8.4		
Incr Delay (d2), s/veh	1.6	0.2	0.6	0.3	0.7	1.1		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.8	5.0	5.0	3.1	4.3	7.1		
LnGrp Delay(d),s/veh	30.9	13.5	19.2	5.1	17.4	9.6		
LnGrp LOS	C	B	B	A	B	A		
Approach Vol, veh/h	770			1018	926			
Approach Delay, s/veh	25.8			9.1	14.1			
Approach LOS	C			A	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		58.9		21.1	22.9	36.0		
Change Period (Y+Rc), s		7.2		6.4	7.2	7.2		
Max Green Setting (Gmax), s		46.8		19.6	10.8	28.8		
Max Q Clear Time (g_c+I1), s		8.0		13.1	2.0	11.6		
Green Ext Time (p_c), s		7.1		1.7	3.9	4.3		
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			15.6					
HCM 2010 LOS			B					

HCM 2010 TWSC  
 3: Bar None Drive/Pleasant Valley Road & Grand River Avenue

Existing Conditions  
 PM Peak Hour

Intersection

Int Delay, s/veh 15.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	383	251	21	15	475	57	8	1	3	6	12	321
Future Vol, veh/h	383	251	21	15	475	57	8	1	3	6	12	321
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									
Storage Length	300	-	375	150	-	250	-	-	-	-	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	86	86	86	60	60	60	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	0	0	0	1	1	1
Mvmt Flow	440	289	24	17	552	66	13	2	5	7	13	349

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	552	0	0	289	0	0	1763	1756	289	1759	1756	552
Stage 1	-	-	-	-	-	-	1169	1169	-	587	587	-
Stage 2	-	-	-	-	-	-	594	587	-	1172	1169	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.1	6.5	6.2	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.11	5.51	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.5	4	3.3	3.509	4.009	3.309
Pot Cap-1 Maneuver	1018	-	-	1273	-	-	66	86	755	66	85	535
Stage 1	-	-	-	-	-	-	237	269	-	497	498	-
Stage 2	-	-	-	-	-	-	495	500	-	235	268	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1018	-	-	1273	-	-	~ 12	48	755	42	48	535
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 12	48	-	42	48	-
Stage 1	-	-	-	-	-	-	135	153	-	282	491	-
Stage 2	-	-	-	-	-	-	165	493	-	131	152	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	6.6	0.2	\$ 593.6	29.3
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	17	1018	-	-	1273	-	-	46	535
HCM Lane V/C Ratio	1.176	0.432	-	-	0.014	-	-	0.425	0.652
HCM Control Delay (s)	\$ 593.6	11.2	-	-	7.9	-	-	132	23.5
HCM Lane LOS	F	B	-	-	A	-	-	F	C
HCM 95th %tile Q(veh)	2.9	2.2	-	-	0	-	-	1.5	4.7

Notes

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

HCM 2010 Signalized Intersection Summary

Existing Conditions W / Improvements

1: Whitmore Lake Road/Old US-23 & Grand River Avenue

AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	476	99	150	183	79	100	161	243	268	319	102
Future Volume (veh/h)	43	476	99	150	183	79	100	161	243	268	319	102
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1942	1942	1942	1923	1923	1923	1942	1942	1942	1942	1942	1942
Adj Flow Rate, veh/h	48	535	111	160	195	84	133	215	324	288	343	110
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.94	0.94	0.94	0.75	0.75	0.75	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	4	4	4	3	3	3	3	3	3
Cap, veh/h	481	783	572	279	581	390	261	312	484	411	419	487
Arrive On Green	0.13	0.21	0.21	0.08	0.16	0.16	0.08	0.16	0.16	0.13	0.22	0.22
Sat Flow, veh/h	1849	3689	1650	1832	3654	1635	1849	1942	1650	1849	1942	1650
Grp Volume(v), veh/h	48	535	111	160	195	84	133	215	324	288	343	110
Grp Sat Flow(s),veh/h/ln	1849	1845	1650	1832	1827	1635	1849	1942	1650	1849	1942	1650
Q Serve(g_s), s	0.0	8.4	0.0	0.5	3.0	0.0	0.3	6.6	2.5	3.5	10.6	0.0
Cycle Q Clear(g_c), s	0.0	8.4	0.0	0.5	3.0	0.0	0.3	6.6	2.5	3.5	10.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	481	783	572	279	581	390	261	312	484	411	419	487
V/C Ratio(X)	0.10	0.68	0.19	0.57	0.34	0.22	0.51	0.69	0.67	0.70	0.82	0.23
Avail Cap(c_a), veh/h	573	1319	812	469	1307	714	482	540	678	530	540	590
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.8	22.8	14.4	26.6	23.5	19.2	26.7	24.9	19.5	23.8	23.5	16.7
Incr Delay (d2), s/veh	0.1	1.1	0.2	1.8	0.3	0.3	1.5	2.7	1.6	2.9	7.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	4.4	1.4	2.7	1.5	1.2	2.3	3.8	4.8	4.9	6.5	1.5
LnGrp Delay(d),s/veh	18.9	23.9	14.6	28.4	23.8	19.5	28.2	27.6	21.1	26.7	31.1	17.0
LnGrp LOS	B	C	B	C	C	B	C	C	C	C	C	B
Approach Vol, veh/h		694			439			672			741	
Approach Delay, s/veh		22.1			24.7			24.6			27.3	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.8	16.5	11.5	20.1	11.5	19.8	15.0	16.6				
Change Period (Y+Rc), s	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5				
Max Green Setting (Gmax), s	* 12	* 23	* 13	* 18	* 12	* 23	* 13	* 18				
Max Q Clear Time (g_c+I1), s	2.0	5.0	2.3	12.6	2.5	10.4	5.5	8.6				
Green Ext Time (p_c), s	0.4	1.2	0.9	1.0	0.4	2.9	0.7	1.5				
Intersection Summary												
HCM 2010 Ctrl Delay			24.7									
HCM 2010 LOS			C									
Notes												

HCM 2010 Signalized Intersection Summary

Existing Conditions W / Improvements

3: Bar None Drive/Pleasant Valley Road & Grand River Avenue

AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	304	483	1	1	107	9	0	0	0	43	1	204
Future Volume (veh/h)	304	483	1	1	107	9	0	0	0	43	1	204
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1942	1942	1942	1869	1869	1869	2000	1961	2000	2000	1942	1942
Adj Flow Rate, veh/h	353	562	1	1	124	10	0	0	0	45	1	215
Adj No. of Lanes	1	1	1	1	1	1	0	1	0	0	1	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.92	0.92	0.92	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	7	7	7	2	2	2	3	3	3
Cap, veh/h	988	1408	1196	292	649	552	0	195	0	238	4	653
Arrive On Green	0.30	0.72	0.72	0.35	0.35	0.35	0.00	0.00	0.00	0.10	0.10	0.10
Sat Flow, veh/h	1849	1942	1650	804	1869	1589	0	1961	0	1367	43	1650
Grp Volume(v), veh/h	353	562	1	1	124	10	0	0	0	46	0	215
Grp Sat Flow(s),veh/h/ln	1849	1942	1650	804	1869	1589	0	1961	0	1410	0	1650
Q Serve(g_s), s	0.0	7.8	0.0	0.1	3.2	0.3	0.0	0.0	0.0	2.1	0.0	0.0
Cycle Q Clear(g_c), s	0.0	7.8	0.0	7.9	3.2	0.3	0.0	0.0	0.0	2.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.00		0.00	0.98		1.00
Lane Grp Cap(c), veh/h	988	1408	1196	292	649	552	0	195	0	242	0	653
V/C Ratio(X)	0.36	0.40	0.00	0.00	0.19	0.02	0.00	0.00	0.00	0.19	0.00	0.33
Avail Cap(c_a), veh/h	988	1408	1196	292	649	552	0	235	0	271	0	687
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.1	3.7	2.7	20.5	16.0	15.0	0.0	0.0	0.0	29.3	0.0	14.7
Incr Delay (d2), s/veh	0.2	0.8	0.0	0.0	0.7	0.1	0.0	0.0	0.0	0.4	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	4.4	0.0	0.0	1.8	0.1	0.0	0.0	0.0	0.9	0.0	2.9
LnGrp Delay(d),s/veh	9.3	4.6	2.7	20.5	16.6	15.1	0.0	0.0	0.0	29.7	0.0	15.0
LnGrp LOS	A	A	A	C	B	B				C		B
Approach Vol, veh/h		916			135			0			261	
Approach Delay, s/veh		6.4			16.5			0.0			17.6	
Approach LOS		A			B						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		56.4		13.6	26.4	30.0		13.6				
Change Period (Y+Rc), s		* 5.7		* 6.6	* 5.7	* 5.7		* 6.6				
Max Green Setting (Gmax), s		* 49		* 8.4	* 19	* 24		* 8.4				
Max Q Clear Time (g_c+I1), s		9.8		4.1	2.0	9.9		0.0				
Green Ext Time (p_c), s		4.8		0.3	4.1	0.5		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				9.7								
HCM 2010 LOS				A								
Notes												

HCM 2010 Signalized Intersection Summary

Existing Conditions W / Improvements

1: Whitmore Lake Road/Old US-23 & Grand River Avenue

PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	484	206	322	555	296	248	367	219	197	294	175
Future Volume (veh/h)	270	484	206	322	555	296	248	367	219	197	294	175
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1980	1980	1980	1980	1980	1980	1980	1980	1980	1980	1980	1980
Adj Flow Rate, veh/h	314	563	240	362	624	333	276	408	243	219	327	194
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.86	0.86	0.86	0.89	0.89	0.89	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	375	772	512	427	848	616	386	485	648	272	402	611
Arrive On Green	0.14	0.21	0.21	0.16	0.23	0.23	0.14	0.24	0.24	0.10	0.20	0.20
Sat Flow, veh/h	1886	3762	1683	1886	3762	1683	1886	1980	1683	1886	1980	1683
Grp Volume(v), veh/h	314	563	240	362	624	333	276	408	243	219	327	194
Grp Sat Flow(s),veh/h/ln	1886	1881	1683	1886	1881	1683	1886	1980	1683	1886	1980	1683
Q Serve(g_s), s	9.1	12.5	1.5	10.5	13.8	1.4	6.5	17.5	0.0	6.0	14.1	0.0
Cycle Q Clear(g_c), s	9.1	12.5	1.5	10.5	13.8	1.4	6.5	17.5	0.0	6.0	14.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	375	772	512	427	848	616	386	485	648	272	402	611
V/C Ratio(X)	0.84	0.73	0.47	0.85	0.74	0.54	0.72	0.84	0.38	0.80	0.81	0.32
Avail Cap(c_a), veh/h	522	1242	722	537	1242	792	427	676	810	392	676	844
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.1	33.2	25.2	33.7	32.2	22.4	34.1	32.1	19.8	37.8	34.0	20.5
Incr Delay (d2), s/veh	8.3	1.3	0.7	10.0	1.3	0.7	5.0	6.8	0.4	7.7	4.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	6.6	4.7	9.7	7.3	6.3	6.9	10.4	4.4	5.8	8.2	3.4
LnGrp Delay(d),s/veh	43.4	34.5	25.9	43.7	33.4	23.1	39.1	38.9	20.1	45.5	38.0	20.8
LnGrp LOS	D	C	C	D	C	C	D	D	C	D	D	C
Approach Vol, veh/h		1117			1319			927			740	
Approach Delay, s/veh		35.2			33.7			34.1			35.7	
Approach LOS		D			C			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.0	26.6	19.1	24.6	20.8	24.8	15.3	28.4				
Change Period (Y+Rc), s	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5				
Max Green Setting (Gmax), s	* 20	* 30	* 15	* 31	* 20	* 30	* 15	* 31				
Max Q Clear Time (g_c+I1), s	11.1	15.8	8.5	16.1	12.5	14.5	8.0	19.5				
Green Ext Time (p_c), s	1.5	4.4	0.8	2.0	1.3	3.8	0.9	2.4				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			34.5									
HCM 2010 LOS			C									

Notes

HCM 2010 Signalized Intersection Summary

Existing Conditions W / Improvements

3: Bar None Drive/Pleasant Valley Road & Grand River Avenue

PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	383	251	21	15	475	57	8	1	3	6	12	321
Future Volume (veh/h)	383	251	21	15	475	57	8	1	3	6	12	321
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1961	1961	1961	1961	1961	1961	2000	2000	2000	2000	1980	1980
Adj Flow Rate, veh/h	440	289	24	17	552	66	13	2	5	7	13	349
Adj No. of Lanes	1	1	1	1	1	1	0	1	0	0	1	1
Peak Hour Factor	0.87	0.87	0.87	0.86	0.86	0.86	0.60	0.60	0.60	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	0	0	0	1	1	1
Cap, veh/h	652	1420	1207	497	821	698	152	32	33	105	148	546
Arrive On Green	0.22	0.72	0.72	0.42	0.42	0.42	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	1867	1961	1667	1062	1961	1667	670	319	330	357	1481	1683
Grp Volume(v), veh/h	440	289	24	17	552	66	20	0	0	20	0	349
Grp Sat Flow(s),veh/h/ln	1867	1961	1667	1062	1961	1667	1318	0	0	1838	0	1683
Q Serve(g_s), s	5.3	3.3	0.3	0.7	15.9	1.7	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.3	3.3	0.3	4.1	15.9	1.7	0.7	0.0	0.0	0.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.65		0.25	0.35		1.00
Lane Grp Cap(c), veh/h	652	1420	1207	497	821	698	217	0	0	253	0	546
V/C Ratio(X)	0.68	0.20	0.02	0.03	0.67	0.09	0.09	0.00	0.00	0.08	0.00	0.64
Avail Cap(c_a), veh/h	652	1420	1207	497	821	698	241	0	0	288	0	580
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.0	3.1	2.7	14.1	16.5	12.3	28.7	0.0	0.0	28.6	0.0	20.2
Incr Delay (d2), s/veh	2.8	0.3	0.0	0.1	4.4	0.3	0.2	0.0	0.0	0.1	0.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.7	1.9	0.1	0.2	9.6	0.8	0.4	0.0	0.0	0.4	0.0	6.0
LnGrp Delay(d),s/veh	22.8	3.4	2.7	14.2	20.8	12.6	28.8	0.0	0.0	28.8	0.0	22.3
LnGrp LOS	C	A	A	B	C	B	C			C		C
Approach Vol, veh/h		753			635			20			369	
Approach Delay, s/veh		14.7			19.8			28.8			22.7	
Approach LOS		B			B			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		56.4		13.6	21.4	35.0		13.6				
Change Period (Y+Rc), s		* 5.7		* 6.6	* 5.7	* 5.7		* 6.6				
Max Green Setting (Gmax), s		* 49		* 8.4	* 14	* 29		* 8.4				
Max Q Clear Time (g_c+I1), s		5.3		2.6	7.3	17.9		2.7				
Green Ext Time (p_c), s		3.1		0.7	1.8	2.7		0.7				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				18.4								
HCM 2010 LOS				B								
<b>Notes</b>												

HCM 2010 Signalized Intersection Summary  
 1: Whitmore Lake Road/Old US-23 & Grand River Avenue

Background Conditions  
 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	490	102	155	189	81	103	166	250	276	329	105
Future Volume (veh/h)	44	490	102	155	189	81	103	166	250	276	329	105
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1942	1942	2000	1923	1923	2000	1942	1942	1942	1942	1942	1942
Adj Flow Rate, veh/h	49	551	115	165	201	86	137	221	333	297	354	113
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.94	0.94	0.94	0.75	0.75	0.75	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	4	4	4	3	3	3	3	3	3
Cap, veh/h	468	702	146	250	385	159	251	315	523	403	426	488
Arrive On Green	0.15	0.23	0.23	0.08	0.15	0.15	0.08	0.16	0.16	0.13	0.22	0.22
Sat Flow, veh/h	1849	3042	633	1832	2523	1043	1849	1942	1650	1849	1942	1650
Grp Volume(v), veh/h	49	333	333	165	144	143	137	221	333	297	354	113
Grp Sat Flow(s),veh/h/ln	1849	1845	1830	1832	1827	1739	1849	1942	1650	1849	1942	1650
Q Serve(g_s), s	0.0	11.1	11.2	1.7	4.7	5.0	0.6	7.0	1.2	4.3	11.4	0.0
Cycle Q Clear(g_c), s	0.0	11.1	11.2	1.7	4.7	5.0	0.6	7.0	1.2	4.3	11.4	0.0
Prop In Lane	1.00		0.35	1.00		0.60	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	468	426	422	250	279	266	251	315	523	403	426	488
V/C Ratio(X)	0.10	0.78	0.79	0.66	0.51	0.54	0.55	0.70	0.64	0.74	0.83	0.23
Avail Cap(c_a), veh/h	521	535	531	446	530	505	534	534	709	580	534	580
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.8	23.6	23.7	28.1	25.5	25.6	28.0	25.9	19.1	25.0	24.4	17.4
Incr Delay (d2), s/veh	0.1	5.9	6.1	3.0	1.5	1.7	1.8	2.8	1.3	2.9	8.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	6.3	6.4	3.0	2.5	2.5	2.4	4.0	5.2	5.3	7.1	1.5
LnGrp Delay(d),s/veh	20.9	29.5	29.8	31.1	27.0	27.3	29.8	28.8	20.4	27.9	33.2	17.7
LnGrp LOS	C	C	C	C	C	C	C	C	C	C	C	B
Approach Vol, veh/h		715			452			691			764	
Approach Delay, s/veh		29.1			28.6			25.0			28.8	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.6	16.5	11.5	20.9	11.5	21.6	15.2	17.1				
Change Period (Y+Rc), s	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5				
Max Green Setting (Gmax), s	* 12	* 19	* 15	* 18	* 12	* 19	* 15	* 18				
Max Q Clear Time (g_c+I1), s	2.0	7.0	2.6	13.4	3.7	13.2	6.3	9.0				
Green Ext Time (p_c), s	0.4	1.2	1.0	1.0	0.4	1.9	0.9	1.6				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				27.8								
HCM 2010 LOS				C								
<b>Notes</b>												

HCM 2010 Signalized Intersection Summary  
2: Old US-23 & Spencer Road West

Background Conditions  
AM Peak Hour

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations	 			 	 			
Traffic Volume (veh/h)	369	199	92	264	543	367		
Future Volume (veh/h)	369	199	92	264	543	367		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1886	1886	1942	1942	1886	1886		
Adj Flow Rate, veh/h	424	229	114	326	631	427		
Adj No. of Lanes	2	1	1	2	2	1		
Peak Hour Factor	0.87	0.87	0.81	0.81	0.86	0.86		
Percent Heavy Veh, %	5	5	4	4	5	5		
Cap, veh/h	654	741	680	2620	1438	920		
Arrive On Green	0.19	0.20	0.26	0.71	0.40	0.39		
Sat Flow, veh/h	3484	1603	1850	3788	3677	1603		
Grp Volume(v), veh/h	424	229	114	326	631	427		
Grp Sat Flow(s),veh/h/ln	1742	1603	1850	1845	1791	1603		
Q Serve(g_s), s	9.0	0.0	0.0	2.2	10.2	12.4		
Cycle Q Clear(g_c), s	9.0	0.0	0.0	2.2	10.2	12.4		
Prop In Lane	1.00	1.00	1.00			1.00		
Lane Grp Cap(c), veh/h	654	741	680	2620	1438	920		
V/C Ratio(X)	0.65	0.31	0.17	0.12	0.44	0.46		
Avail Cap(c_a), veh/h	1076	935	680	2620	1438	920		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	30.1	13.5	14.5	3.7	17.4	9.9		
Incr Delay (d2), s/veh	1.1	0.2	0.2	0.1	1.0	1.7		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	4.4	5.1	1.7	1.2	5.2	8.3		
LnGrp Delay(d),s/veh	31.1	13.7	14.7	3.8	18.4	11.6		
LnGrp LOS	C	B	B	A	B	B		
Approach Vol, veh/h	653			440	1058			
Approach Delay, s/veh	25.0			6.6	15.6			
Approach LOS	C			A	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		60.7		19.3	24.7	36.0		
Change Period (Y+Rc), s		7.2		6.4	7.2	7.2		
Max Green Setting (Gmax), s		43.8		22.6	7.8	28.8		
Max Q Clear Time (g_c+1), s		4.2		11.0	2.0	14.4		
Green Ext Time (p_c), s		2.6		1.9	1.2	4.8		
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			16.6					
HCM 2010 LOS			B					

HCM 2010 TWSC  
 3: Bar None Drive/Pleasant Valley Road & Grand River Avenue

Background Conditions  
 AM Peak Hour

Intersection

Int Delay, s/veh 6.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	313	498	1	1	110	9	0	0	0	44	1	210
Future Vol, veh/h	313	498	1	1	110	9	0	0	0	44	1	210
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									
Storage Length	300	-	375	150	-	250	-	-	-	-	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	92	92	92	95	95	95
Heavy Vehicles, %	3	3	3	7	7	7	2	2	2	3	3	3
Mvmt Flow	364	579	1	1	128	10	0	0	0	46	1	221

Major/Minor	Major1	Major2	Minor1	Minor2								
Conflicting Flow All	128	0	0	579	0	0	1438	1437	579	1437	1437	128
Stage 1	-	-	-	-	-	-	1307	1307	-	130	130	-
Stage 2	-	-	-	-	-	-	131	130	-	1307	1307	-
Critical Hdwy	4.13	-	-	4.17	-	-	7.12	6.52	6.22	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.263	-	-	3.518	4.018	3.318	3.527	4.027	3.327
Pot Cap-1 Maneuver	1452	-	-	970	-	-	111	133	515	110	133	919
Stage 1	-	-	-	-	-	-	196	230	-	871	787	-
Stage 2	-	-	-	-	-	-	873	789	-	195	228	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1452	-	-	970	-	-	67	100	515	89	100	919
Mov Cap-2 Maneuver	-	-	-	-	-	-	67	100	-	89	100	-
Stage 1	-	-	-	-	-	-	147	172	-	653	786	-
Stage 2	-	-	-	-	-	-	661	788	-	146	171	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.2	0.1	0	23.3
HCM LOS			A	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1452	-	-	970	-	-	89	919
HCM Lane V/C Ratio	-	0.251	-	-	0.001	-	-	0.532	0.241
HCM Control Delay (s)	0	8.3	-	-	8.7	-	-	84.3	10.2
HCM Lane LOS	A	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	-	1	-	-	0	-	-	2.4	0.9

HCM 2010 Signalized Intersection Summary  
 1: Whitmore Lake Road/Old US-23 & Grand River Avenue

Background Conditions  
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (veh/h)	278	499	212	332	572	305	256	378	226	203	303	180
Future Volume (veh/h)	278	499	212	332	572	305	256	378	226	203	303	180
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1980	1980	2000	1980	1980	2000	1980	1980	1980	1980	1980	1980
Adj Flow Rate, veh/h	323	580	247	373	643	343	284	420	251	226	337	200
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	1
Peak Hour Factor	0.86	0.86	0.86	0.89	0.89	0.89	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	355	655	278	428	665	355	356	466	657	256	390	636
Arrive On Green	0.15	0.25	0.25	0.18	0.28	0.28	0.14	0.24	0.24	0.10	0.20	0.20
Sat Flow, veh/h	1886	2574	1094	1886	2372	1266	1886	1980	1683	1886	1980	1683
Grp Volume(v), veh/h	323	424	403	373	510	476	284	420	251	226	337	200
Grp Sat Flow(s),veh/h/ln	1886	1881	1787	1886	1881	1757	1886	1980	1683	1886	1980	1683
Q Serve(g_s), s	15.3	24.7	24.8	16.4	30.6	30.6	10.9	23.5	0.0	9.6	18.8	0.0
Cycle Q Clear(g_c), s	15.3	24.7	24.8	16.4	30.6	30.6	10.9	23.5	0.0	9.6	18.8	0.0
Prop In Lane	1.00		0.61	1.00		0.72	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	355	479	455	428	527	492	356	466	657	256	390	636
V/C Ratio(X)	0.91	0.89	0.89	0.87	0.97	0.97	0.80	0.90	0.38	0.88	0.86	0.31
Avail Cap(c_a), veh/h	393	527	501	428	527	492	356	520	702	261	520	746
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.8	41.0	41.0	43.0	40.6	40.6	44.9	42.4	25.0	49.0	44.4	25.1
Incr Delay (d2), s/veh	23.5	15.4	16.3	17.5	30.9	32.2	12.0	17.6	0.4	27.7	11.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.3	14.9	14.3	13.4	20.4	19.2	9.7	15.1	5.7	9.0	11.5	4.5
LnGrp Delay(d),s/veh	69.3	56.4	57.3	60.5	71.5	72.8	57.0	60.0	25.3	76.7	55.4	25.4
LnGrp LOS	E	E	E	E	E	E	E	E	C	E	E	C
Approach Vol, veh/h		1150			1359			955			763	
Approach Delay, s/veh		60.3			68.9			50.0			53.8	
Approach LOS		E			E			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	24.2	38.5	22.5	29.0	27.1	35.6	18.2	33.4				
Change Period (Y+Rc), s	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5				
Max Green Setting (Gmax), s	* 20	* 32	* 12	* 30	* 20	* 32	* 12	* 30				
Max Q Clear Time (g_c+I1), s	17.3	32.6	12.9	20.8	18.4	26.8	11.6	25.5				
Green Ext Time (p_c), s	0.3	0.0	0.0	1.7	0.4	2.2	0.0	1.4				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			59.6									
HCM 2010 LOS			E									
<b>Notes</b>												

HCM 2010 Signalized Intersection Summary  
 2: Old US-23 & Spencer Road West

Background Conditions  
 PM Peak Hour

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	534	220	266	678	512	366		
Future Volume (veh/h)	534	220	266	678	512	366		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1980	1980	2000	2000	1980	1980		
Adj Flow Rate, veh/h	562	232	296	753	557	398		
Adj No. of Lanes	2	1	1	2	2	1		
Peak Hour Factor	0.95	0.95	0.90	0.90	0.92	0.92		
Percent Heavy Veh, %	0	0	1	1	0	0		
Cap, veh/h	786	778	671	2594	1510	1012		
Arrive On Green	0.21	0.23	0.23	0.68	0.40	0.39		
Sat Flow, veh/h	3658	1683	1905	3900	3861	1683		
Grp Volume(v), veh/h	562	232	296	753	557	398		
Grp Sat Flow(s),veh/h/ln	1829	1683	1905	1900	1881	1683		
Q Serve(g_s), s	11.4	0.0	0.0	6.3	8.3	9.9		
Cycle Q Clear(g_c), s	11.4	0.0	0.0	6.3	8.3	9.9		
Prop In Lane	1.00	1.00	1.00			1.00		
Lane Grp Cap(c), veh/h	786	778	671	2594	1510	1012		
V/C Ratio(X)	0.71	0.30	0.44	0.29	0.37	0.39		
Avail Cap(c_a), veh/h	992	873	671	2594	1510	1012		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	29.1	13.4	19.3	5.0	16.8	8.3		
Incr Delay (d2), s/veh	1.8	0.2	0.7	0.3	0.7	1.1		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	6.0	5.1	5.1	3.3	4.5	7.3		
LnGrp Delay(d),s/veh	30.9	13.6	19.9	5.3	17.5	9.5		
LnGrp LOS	C	B	B	A	B	A		
Approach Vol, veh/h	794			1049	955			
Approach Delay, s/veh	25.9			9.4	14.2			
Approach LOS	C			A	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		58.5		21.5	22.5	36.0		
Change Period (Y+Rc), s		7.2		6.4	7.2	7.2		
Max Green Setting (Gmax), s		46.8		19.6	10.8	28.8		
Max Q Clear Time (g_c+l1), s		8.3		13.4	2.0	11.9		
Green Ext Time (p_c), s		7.3		1.7	4.0	4.5		
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			15.7					
HCM 2010 LOS			B					

HCM 2010 TWSC  
 3: Bar None Drive/Pleasant Valley Road & Grand River Avenue

Background Conditions  
 PM Peak Hour

Intersection

Int Delay, s/veh 17.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	395	259	22	15	489	59	8	1	3	6	12	331
Future Vol, veh/h	395	259	22	15	489	59	8	1	3	6	12	331
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									
Storage Length	300	-	375	150	-	250	-	-	-	-	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	86	86	86	60	60	60	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	0	0	0	1	1	1
Mvmt Flow	454	298	25	17	569	69	13	2	5	7	13	360

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	569	0	0	298	0	0	1816	1809	298	1812	1809	569
Stage 1	-	-	-	-	-	-	1206	1206	-	603	603	-
Stage 2	-	-	-	-	-	-	610	603	-	1209	1206	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.1	6.5	6.2	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.11	5.51	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.5	4	3.3	3.509	4.009	3.309
Pot Cap-1 Maneuver	1003	-	-	1263	-	-	61	80	746	61	79	524
Stage 1	-	-	-	-	-	-	226	259	-	488	490	-
Stage 2	-	-	-	-	-	-	485	492	-	224	258	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1003	-	-	1263	-	-	~ 10	43	746	38	43	524
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 10	43	-	38	43	-
Stage 1	-	-	-	-	-	-	124	142	-	267	483	-
Stage 2	-	-	-	-	-	-	146	485	-	120	141	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	6.7	0.2	\$ 706.8	32.3
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	15	1003	-	-	1263	-	-	41	524
HCM Lane V/C Ratio	1.333	0.453	-	-	0.014	-	-	0.477	0.687
HCM Control Delay (s)	\$ 706.8	11.5	-	-	7.9	-	-	156	25.6
HCM Lane LOS	F	B	-	-	A	-	-	F	D
HCM 95th %tile Q(veh)	3.1	2.4	-	-	0	-	-	1.7	5.2

Notes

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

HCM 2010 Signalized Intersection Summary  
 1: Whitmore Lake Road/Old US-23 & Grand River Avenue

Future Conditions  
 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	499	102	176	217	92	103	166	256	280	329	105
Future Volume (veh/h)	44	499	102	176	217	92	103	166	256	280	329	105
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1942	1942	2000	1923	1923	2000	1942	1942	1942	1942	1942	1942
Adj Flow Rate, veh/h	49	561	115	187	231	98	137	221	341	301	354	113
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.94	0.94	0.94	0.75	0.75	0.75	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	4	4	4	3	3	3	3	3	3
Cap, veh/h	456	709	145	249	385	158	251	316	526	404	426	488
Arrive On Green	0.16	0.23	0.23	0.08	0.15	0.15	0.08	0.16	0.16	0.13	0.22	0.22
Sat Flow, veh/h	1849	3053	624	1832	2527	1040	1849	1942	1650	1849	1942	1650
Grp Volume(v), veh/h	49	338	338	187	165	164	137	221	341	301	354	113
Grp Sat Flow(s),veh/h/ln	1849	1845	1832	1832	1827	1740	1849	1942	1650	1849	1942	1650
Q Serve(g_s), s	0.0	11.3	11.4	2.5	5.5	5.8	0.6	7.1	1.4	4.4	11.4	0.0
Cycle Q Clear(g_c), s	0.0	11.3	11.4	2.5	5.5	5.8	0.6	7.1	1.4	4.4	11.4	0.0
Prop In Lane	1.00		0.34	1.00		0.60	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	456	428	425	249	278	265	251	316	526	404	426	488
V/C Ratio(X)	0.11	0.79	0.79	0.75	0.59	0.62	0.55	0.70	0.65	0.75	0.83	0.23
Avail Cap(c_a), veh/h	505	534	530	445	529	504	532	532	710	581	532	578
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.5	23.7	23.7	28.4	25.9	26.0	28.0	26.0	19.2	25.1	24.5	17.5
Incr Delay (d2), s/veh	0.1	6.3	6.6	4.5	2.0	2.3	1.9	2.8	1.4	3.1	8.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	6.5	6.5	3.6	3.0	3.0	2.5	4.0	5.3	5.4	7.1	1.6
LnGrp Delay(d),s/veh	21.6	30.0	30.3	32.9	27.9	28.4	29.9	28.8	20.5	28.2	33.3	17.7
LnGrp LOS	C	C	C	C	C	C	C	C	C	C	C	B
Approach Vol, veh/h		725			516			699			768	
Approach Delay, s/veh		29.5			29.9			25.0			29.0	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.7	16.5	11.5	20.9	11.5	21.7	15.2	17.2				
Change Period (Y+Rc), s	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5				
Max Green Setting (Gmax), s	* 12	* 19	* 15	* 18	* 12	* 19	* 15	* 18				
Max Q Clear Time (g_c+11), s	2.0	7.8	2.6	13.4	4.5	13.4	6.4	9.1				
Green Ext Time (p_c), s	0.4	1.3	1.0	1.0	0.4	1.9	0.9	1.6				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			28.3									
HCM 2010 LOS			C									
<b>Notes</b>												

HCM 2010 Signalized Intersection Summary  
 2: Old US-23 & Spencer Road West

Future Conditions  
 AM Peak Hour



Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	369	200	95	272	546	367		
Future Volume (veh/h)	369	200	95	272	546	367		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1886	1886	1942	1942	1886	1886		
Adj Flow Rate, veh/h	424	230	117	336	635	427		
Adj No. of Lanes	2	1	1	2	2	1		
Peak Hour Factor	0.87	0.87	0.81	0.81	0.86	0.86		
Percent Heavy Veh, %	5	5	4	4	5	5		
Cap, veh/h	654	741	684	2619	1438	920		
Arrive On Green	0.19	0.20	0.26	0.71	0.40	0.39		
Sat Flow, veh/h	3484	1603	1850	3788	3677	1603		
Grp Volume(v), veh/h	424	230	117	336	635	427		
Grp Sat Flow(s),veh/h/ln	1742	1603	1850	1845	1791	1603		
Q Serve(g_s), s	9.0	0.0	0.0	2.3	10.3	12.4		
Cycle Q Clear(g_c), s	9.0	0.0	0.0	2.3	10.3	12.4		
Prop In Lane	1.00	1.00	1.00			1.00		
Lane Grp Cap(c), veh/h	654	741	684	2619	1438	920		
V/C Ratio(X)	0.65	0.31	0.17	0.13	0.44	0.46		
Avail Cap(c_a), veh/h	1076	935	684	2619	1438	920		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	30.0	13.5	14.5	3.7	17.4	9.9		
Incr Delay (d2), s/veh	1.1	0.2	0.2	0.1	1.0	1.7		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	14.4	5.1	1.8	1.2	5.3	8.3		
LnGrp Delay(d),s/veh	31.1	13.7	14.7	3.8	18.4	11.6		
LnGrp LOS	C	B	B	A	B	B		
Approach Vol, veh/h	654			453	1062			
Approach Delay, s/veh	25.0			6.6	15.7			
Approach LOS	C			A	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		60.7		19.3	24.7	36.0		
Change Period (Y+Rc), s		7.2		6.4	7.2	7.2		
Max Green Setting (Gmax), s		43.8		22.6	7.8	28.8		
Max Q Clear Time (g_c+11), s		4.3		11.0	2.0	14.4		
Green Ext Time (p_c), s		2.7		1.9	1.2	4.8		
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			16.6					
HCM 2010 LOS			B					

HCM 2010 TWSC  
 3: Bar None Drive/Pleasant Valley Road & Grand River Avenue

Future Conditions  
 AM Peak Hour

Intersection

Int Delay, s/veh 9.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	363	557	1	1	128	9	0	0	0	44	1	224
Future Vol, veh/h	363	557	1	1	128	9	0	0	0	44	1	224
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									
Storage Length	300	-	375	150	-	250	-	-	-	-	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	92	92	92	95	95	95
Heavy Vehicles, %	3	3	3	7	7	7	2	2	2	3	3	3
Mvmt Flow	422	648	1	1	149	10	0	0	0	46	1	236

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	149	0	0	648	0	0	1644	1643	648	1643	1643	149
Stage 1	-	-	-	-	-	-	1492	1492	-	151	151	-
Stage 2	-	-	-	-	-	-	152	151	-	1492	1492	-
Critical Hdwy	4.13	-	-	4.17	-	-	7.12	6.52	6.22	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.263	-	-	3.518	4.018	3.318	3.527	4.027	3.327
Pot Cap-1 Maneuver	1426	-	-	914	-	-	80	100	470	79	99	895
Stage 1	-	-	-	-	-	-	154	187	-	849	770	-
Stage 2	-	-	-	-	-	-	850	772	-	153	186	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1426	-	-	914	-	-	45	70	470	61	70	895
Mov Cap-2 Maneuver	-	-	-	-	-	-	45	70	-	61	70	-
Stage 1	-	-	-	-	-	-	108	132	-	598	769	-
Stage 2	-	-	-	-	-	-	625	771	-	108	131	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.4	0.1	0	36.5
HCM LOS			A	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1426	-	-	914	-	-	61	895
HCM Lane V/C Ratio	-	0.296	-	-	0.001	-	-	0.777	0.263
HCM Control Delay (s)	0	8.6	-	-	8.9	-	-	165.9	10.5
HCM Lane LOS	A	A	-	-	A	-	-	F	B
HCM 95th %tile Q(veh)	-	1.2	-	-	0	-	-	3.4	1.1

HCM 2010 TWSC  
4: Grand River Avenue & Assisted Living Site Drive

Future Conditions  
AM Peak Hour

Intersection

Int Delay, s/veh 0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	4	827	378	6	3	2
Future Vol, veh/h	4	827	378	6	3	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	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	93	93	92	92
Heavy Vehicles, %	3	3	4	4	2	2
Mvmt Flow	5	962	406	6	3	2

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	413	0	900
Stage 1	-	-	410
Stage 2	-	-	490
Critical Hdwy	4.16	-	6.84
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	2.23	-	3.52
Pot Cap-1 Maneuver	1135	-	278
Stage 1	-	-	638
Stage 2	-	-	581
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1135	-	277
Mov Cap-2 Maneuver	-	-	403
Stage 1	-	-	638
Stage 2	-	-	578

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1135	-	-	-	503
HCM Lane V/C Ratio	0.004	-	-	-	0.011
HCM Control Delay (s)	8.2	-	-	-	12.2
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

HCM 2010 TWSC  
 5: Grand River Avenue & W. Residential Site Drive

Future Conditions  
 AM Peak Hour

Intersection

Int Delay, s/veh 0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	7	823	359	11	46	25
Future Vol, veh/h	7	823	359	11	46	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	93	93	92	92
Heavy Vehicles, %	3	3	4	4	2	2
Mvmt Flow	8	957	386	12	50	27

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	398	0	887
Stage 1	-	-	392
Stage 2	-	-	495
Critical Hdwy	4.16	-	6.84
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	2.23	-	3.52
Pot Cap-1 Maneuver	1150	-	284
Stage 1	-	-	652
Stage 2	-	-	578
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1150	-	282
Mov Cap-2 Maneuver	-	-	406
Stage 1	-	-	652
Stage 2	-	-	574

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	13.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1150	-	-	-	492
HCM Lane V/C Ratio	0.007	-	-	-	0.157
HCM Control Delay (s)	8.2	-	-	-	13.7
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.6

Intersection

Int Delay, s/veh 1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	8	861	339	14	57	31
Future Vol, veh/h	8	861	339	14	57	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	93	93	92	92
Heavy Vehicles, %	3	3	4	4	2	2
Mvmt Flow	9	1001	365	15	62	34

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	380	0	891
Stage 1	-	-	372
Stage 2	-	-	519
Critical Hdwy	4.13	-	6.63
Critical Hdwy Stg 1	-	-	5.43
Critical Hdwy Stg 2	-	-	5.83
Follow-up Hdwy	2.227	-	3.519
Pot Cap-1 Maneuver	1173	-	297
Stage 1	-	-	696
Stage 2	-	-	563
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1173	-	295
Mov Cap-2 Maneuver	-	-	415
Stage 1	-	-	696
Stage 2	-	-	559

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	14.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1173	-	-	-	480
HCM Lane V/C Ratio	0.008	-	-	-	0.199
HCM Control Delay (s)	8.1	-	-	-	14.4
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.7

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	0	918	351	1	3	2
Future Vol, veh/h	0	918	351	1	3	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	200	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	93	93	92	92
Heavy Vehicles, %	3	3	4	4	2	2
Mvmt Flow	0	1067	377	1	3	2

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	378	0	1445
Stage 1	-	-	378
Stage 2	-	-	1067
Critical Hdwy	4.13	-	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	2.227	-	3.518
Pot Cap-1 Maneuver	1175	-	145
Stage 1	-	-	693
Stage 2	-	-	331
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1175	-	145
Mov Cap-2 Maneuver	-	-	259
Stage 1	-	-	693
Stage 2	-	-	331

Approach	EB	WB	SB
HCM Control Delay, s	0	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1175	-	-	-	343
HCM Lane V/C Ratio	-	-	-	-	0.016
HCM Control Delay (s)	0	-	-	-	15.7
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0

HCM 2010 Signalized Intersection Summary  
 1: Whitmore Lake Road/Old US-23 & Grand River Avenue

Future Conditions  
 PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	278	539	212	342	596	315	256	378	244	220	303	180
Future Volume (veh/h)	278	539	212	342	596	315	256	378	244	220	303	180
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1980	1980	2000	1980	1980	2000	1980	1980	1980	1980	1980	1980
Adj Flow Rate, veh/h	323	627	247	384	670	354	284	420	271	244	337	200
Adj No. of Lanes	1	2	0	1	2	0	1	1	1	1	1	1
Peak Hour Factor	0.86	0.86	0.86	0.89	0.89	0.89	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	359	691	272	410	661	349	361	465	661	259	390	623
Arrive On Green	0.16	0.26	0.26	0.17	0.28	0.28	0.14	0.24	0.24	0.10	0.20	0.20
Sat Flow, veh/h	1886	2639	1039	1886	2381	1258	1886	1980	1683	1886	1980	1683
Grp Volume(v), veh/h	323	447	427	384	529	495	284	420	271	244	337	200
Grp Sat Flow(s),veh/h/ln	1886	1881	1797	1886	1881	1758	1886	1980	1683	1886	1980	1683
Q Serve(g_s), s	15.5	26.5	26.5	17.9	32.0	32.0	10.9	23.7	0.0	11.0	19.0	0.0
Cycle Q Clear(g_c), s	15.5	26.5	26.5	17.9	32.0	32.0	10.9	23.7	0.0	11.0	19.0	0.0
Prop In Lane	1.00		0.58	1.00		0.72	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	359	493	471	410	522	488	361	465	661	259	390	623
V/C Ratio(X)	0.90	0.91	0.91	0.94	1.01	1.01	0.79	0.90	0.41	0.94	0.86	0.32
Avail Cap(c_a), veh/h	390	522	499	411	522	488	361	516	703	259	516	730
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.9	41.2	41.2	44.7	41.6	41.6	45.1	42.8	25.3	49.7	44.8	26.0
Incr Delay (d2), s/veh	22.0	18.9	19.7	28.7	42.7	44.1	11.1	18.0	0.4	40.4	11.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.2	16.4	15.7	15.3	22.7	21.4	9.7	15.3	6.2	10.6	11.6	4.6
LnGrp Delay(d),s/veh	67.9	60.0	60.9	73.5	84.3	85.7	56.2	60.8	25.8	90.2	56.2	26.2
LnGrp LOS	E	E	E	E	F	F	E	E	C	F	E	C
Approach Vol, veh/h		1197			1408			975			781	
Approach Delay, s/veh		62.4			81.8			49.7			59.1	
Approach LOS		E			F			D			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	24.6	38.5	22.9	29.2	26.4	36.7	18.5	33.6				
Change Period (Y+Rc), s	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5				
Max Green Setting (Gmax), s	* 20	* 32	* 12	* 30	* 20	* 32	* 12	* 30				
Max Q Clear Time (g_c+I1), s	17.5	34.0	12.9	21.0	19.9	28.5	13.0	25.7				
Green Ext Time (p_c), s	0.7	0.0	0.0	1.7	0.0	1.7	0.0	1.4				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			65.3									
HCM 2010 LOS			E									
<b>Notes</b>												

HCM 2010 Signalized Intersection Summary  
2: Old US-23 & Spencer Road West

Future Conditions  
PM Peak Hour

								
Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	534	225	269	685	524	366		
Future Volume (veh/h)	534	225	269	685	524	366		
Number	7	14	5	2	6	16		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1980	1980	2000	2000	1980	1980		
Adj Flow Rate, veh/h	562	237	299	761	570	398		
Adj No. of Lanes	2	1	1	2	2	1		
Peak Hour Factor	0.95	0.95	0.90	0.90	0.92	0.92		
Percent Heavy Veh, %	0	0	1	1	0	0		
Cap, veh/h	787	778	674	2593	1510	1012		
Arrive On Green	0.22	0.23	0.23	0.68	0.40	0.39		
Sat Flow, veh/h	3658	1683	1905	3900	3861	1683		
Grp Volume(v), veh/h	562	237	299	761	570	398		
Grp Sat Flow(s),veh/h/ln	1829	1683	1905	1900	1881	1683		
Q Serve(g_s), s	11.4	0.0	0.0	6.4	8.6	9.9		
Cycle Q Clear(g_c), s	11.4	0.0	0.0	6.4	8.6	9.9		
Prop In Lane	1.00	1.00	1.00			1.00		
Lane Grp Cap(c), veh/h	787	778	674	2593	1510	1012		
V/C Ratio(X)	0.71	0.30	0.44	0.29	0.38	0.39		
Avail Cap(c_a), veh/h	992	873	674	2593	1510	1012		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00		
Uniform Delay (d), s/veh	29.1	13.5	19.2	5.0	16.9	8.3		
Incr Delay (d2), s/veh	1.8	0.2	0.7	0.3	0.7	1.1		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	6.0	5.2	5.2	3.4	4.6	7.3		
LnGrp Delay(d),s/veh	30.9	13.7	19.9	5.3	17.6	9.5		
LnGrp LOS	C	B	B	A	B	A		
Approach Vol, veh/h	799			1060	968			
Approach Delay, s/veh	25.8			9.4	14.3			
Approach LOS	C			A	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		58.5		21.5	22.5	36.0		
Change Period (Y+Rc), s		7.2		6.4	7.2	7.2		
Max Green Setting (Gmax), s		46.8		19.6	10.8	28.8		
Max Q Clear Time (g_c+l1), s		8.4		13.4	2.0	11.9		
Green Ext Time (p_c), s		7.4		1.7	4.0	4.6		
<b>Intersection Summary</b>								
HCM 2010 Ctrl Delay			15.7					
HCM 2010 LOS			B					

HCM 2010 TWSC  
 3: Bar None Drive/Pleasant Valley Road & Grand River Avenue

Future Conditions  
 PM Peak Hour

Intersection

Int Delay, s/veh 48.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	422	286	22	15	537	59	8	1	3	6	12	377
Future Vol, veh/h	422	286	22	15	537	59	8	1	3	6	12	377
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									
Storage Length	300	-	375	150	-	250	-	-	-	-	-	250
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	86	86	86	60	60	60	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	0	0	0	1	1	1
Mvmt Flow	485	329	25	17	624	69	13	2	5	7	13	410

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	624	0	0	329	0	0	1965	1958	329	1961	1958	624
Stage 1	-	-	-	-	-	-	1299	1299	-	659	659	-
Stage 2	-	-	-	-	-	-	666	659	-	1302	1299	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.1	6.5	6.2	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.11	5.51	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.5	4	3.3	3.509	4.009	3.309
Pot Cap-1 Maneuver	957	-	-	1231	-	-	48	64	717	48	64	487
Stage 1	-	-	-	-	-	-	200	234	-	454	462	-
Stage 2	-	-	-	-	-	-	452	464	-	199	233	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	957	-	-	1231	-	-	~ 3	31	717	27	31	487
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 3	31	-	27	31	-
Stage 1	-	-	-	-	-	-	99	115	-	224	456	-
Stage 2	-	-	-	-	-	-	69	458	-	96	115	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	7.3	0.2	\$ 3488.7	50.1
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	4	957	-	-	1231	-	-	30	487
HCM Lane V/C Ratio	5	0.507	-	-	0.014	-	-	0.652	0.841
HCM Control Delay (s)	\$ 3488.7	12.6	-	-	8	-	-	250.1	40.5
HCM Lane LOS	F	B	-	-	A	-	-	F	E
HCM 95th %tile Q(veh)	3.9	2.9	-	-	0	-	-	2.1	8.5

Notes

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

HCM 2010 TWSC  
 4: Grand River Avenue & Assisted Living Site Drive

Future Conditions  
 PM Peak Hour

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	4	747	866	6	7	6
Future Vol, veh/h	4	747	866	6	7	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	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	88	88	92	92
Heavy Vehicles, %	1	1	1	1	2	2
Mvmt Flow	5	859	984	7	8	7

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	991	0	1427
Stage 1	-	-	988
Stage 2	-	-	439
Critical Hdwy	4.12	-	6.84
Critical Hdwy Stg 1	-	-	5.84
Critical Hdwy Stg 2	-	-	5.84
Follow-up Hdwy	2.21	-	3.52
Pot Cap-1 Maneuver	699	-	126
Stage 1	-	-	321
Stage 2	-	-	617
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	699	-	125
Mov Cap-2 Maneuver	-	-	242
Stage 1	-	-	321
Stage 2	-	-	613

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	16.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	699	-	-	-	321
HCM Lane V/C Ratio	0.007	-	-	-	0.044
HCM Control Delay (s)	10.2	-	-	-	16.7
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection

Int Delay, s/veh 0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	30	724	856	38	20	16
Future Vol, veh/h	30	724	856	38	20	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	200	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	88	88	92	92
Heavy Vehicles, %	1	1	1	1	2	2
Mvmt Flow	34	832	973	43	22	17

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1016	0	508
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	6.94
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.21	-	3.32
Pot Cap-1 Maneuver	684	-	510
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	684	-	510
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	18.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	684	-	-	-	304
HCM Lane V/C Ratio	0.05	-	-	-	0.129
HCM Control Delay (s)	10.5	-	-	-	18.6
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4

Intersection

Int Delay, s/veh 0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	39	705	873	48	26	21
Future Vol, veh/h	39	705	873	48	26	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	88	88	92	92
Heavy Vehicles, %	1	1	1	1	2	2
Mvmt Flow	45	810	992	55	28	23

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1047	0	1514
Stage 1	-	-	1019
Stage 2	-	-	495
Critical Hdwy	4.11	-	6.63
Critical Hdwy Stg 1	-	-	5.43
Critical Hdwy Stg 2	-	-	5.83
Follow-up Hdwy	2.209	-	3.519
Pot Cap-1 Maneuver	668	-	121
Stage 1	-	-	347
Stage 2	-	-	579
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	668	-	113
Mov Cap-2 Maneuver	-	-	241
Stage 1	-	-	347
Stage 2	-	-	540

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	22.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	668	-	-	-	260
HCM Lane V/C Ratio	0.067	-	-	-	0.196
HCM Control Delay (s)	10.8	-	-	-	22.2
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.7

HCM 2010 TWSC  
7: Grand River Avenue & E. Residential Site Drive

Future Conditions  
PM Peak Hour

Intersection

Int Delay, s/veh 0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	2	729	920	2	1	1
Future Vol, veh/h	2	729	920	2	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	88	88	92	92
Heavy Vehicles, %	1	1	1	1	2	2
Mvmt Flow	2	838	1045	2	1	1

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1048	0	1890
Stage 1	-	-	1047
Stage 2	-	-	843
Critical Hdwy	4.11	-	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	2.209	-	3.518
Pot Cap-1 Maneuver	668	-	77
Stage 1	-	-	338
Stage 2	-	-	422
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	668	-	77
Mov Cap-2 Maneuver	-	-	206
Stage 1	-	-	338
Stage 2	-	-	421

Approach	EB	WB	SB
HCM Control Delay, s	0	0	20.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	668	-	-	-	236
HCM Lane V/C Ratio	0.003	-	-	-	0.009
HCM Control Delay (s)	10.4	-	-	-	20.4
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0

HCM 2010 Signalized Intersection Summary

Future Conditions W / Improvements

1: Whitmore Lake Road/Old US-23 & Grand River Avenue

AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	499	102	176	217	92	103	166	256	280	329	105
Future Volume (veh/h)	44	499	102	176	217	92	103	166	256	280	329	105
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1942	1942	1942	1923	1923	1923	1942	1942	1942	1942	1942	1942
Adj Flow Rate, veh/h	49	561	115	187	231	98	137	221	341	301	354	113
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.89	0.89	0.89	0.94	0.94	0.94	0.75	0.75	0.75	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	4	4	4	3	3	3	3	3	3
Cap, veh/h	480	806	582	268	570	383	257	317	502	410	427	491
Arrive On Green	0.14	0.22	0.22	0.08	0.16	0.16	0.08	0.16	0.16	0.13	0.22	0.22
Sat Flow, veh/h	1849	3689	1650	1832	3654	1635	1849	1942	1650	1849	1942	1650
Grp Volume(v), veh/h	49	561	115	187	231	98	137	221	341	301	354	113
Grp Sat Flow(s),veh/h/ln	1849	1845	1650	1832	1827	1635	1849	1942	1650	1849	1942	1650
Q Serve(g_s), s	0.0	9.0	0.0	1.9	3.6	0.0	0.5	6.9	2.6	4.1	11.1	0.0
Cycle Q Clear(g_c), s	0.0	9.0	0.0	1.9	3.6	0.0	0.5	6.9	2.6	4.1	11.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	480	806	582	268	570	383	257	317	502	410	427	491
V/C Ratio(X)	0.10	0.70	0.20	0.70	0.41	0.26	0.53	0.70	0.68	0.73	0.83	0.23
Avail Cap(c_a), veh/h	552	1295	801	454	1283	701	473	530	683	522	530	580
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.4	23.1	14.4	27.4	24.4	20.0	27.3	25.3	19.6	24.4	23.9	17.0
Incr Delay (d2), s/veh	0.1	1.1	0.2	3.3	0.5	0.3	1.7	2.8	1.6	3.9	8.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	4.6	1.4	3.4	1.9	1.5	2.4	3.9	5.2	5.4	7.0	1.5
LnGrp Delay(d),s/veh	19.5	24.2	14.6	30.7	24.8	20.3	29.0	28.1	21.2	28.3	32.7	17.2
LnGrp LOS	B	C	B	C	C	C	C	C	C	C	C	B
Approach Vol, veh/h		725			516			699			768	
Approach Delay, s/veh		22.3			26.1			24.9			28.7	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.5	16.5	11.5	20.6	11.5	20.5	15.1	17.0				
Change Period (Y+Rc), s	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5				
Max Green Setting (Gmax), s	* 12	* 23	* 13	* 18	* 12	* 23	* 13	* 18				
Max Q Clear Time (g_c+I1), s	2.0	5.6	2.5	13.1	3.9	11.0	6.1	8.9				
Green Ext Time (p_c), s	0.4	1.5	0.9	0.9	0.4	3.0	0.7	1.6				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			25.5									
HCM 2010 LOS			C									
<b>Notes</b>												

HCM 2010 Signalized Intersection Summary  
 3: Bar None Drive/Pleasant Valley Road & Grand River Avenue

Future Conditions W / Improvements  
 AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	363	557	1	1	128	9	0	0	0	44	1	224
Future Volume (veh/h)	363	557	1	1	128	9	0	0	0	44	1	224
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1942	1942	1942	1869	1869	1869	2000	1961	2000	2000	1942	1942
Adj Flow Rate, veh/h	422	648	1	1	149	10	0	0	0	46	1	236
Adj No. of Lanes	1	1	1	1	1	1	0	1	0	0	1	1
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.92	0.92	0.92	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	7	7	7	2	2	2	3	3	3
Cap, veh/h	984	1407	1196	266	649	552	0	195	0	245	4	653
Arrive On Green	0.30	0.72	0.72	0.35	0.35	0.35	0.00	0.00	0.00	0.10	0.10	0.10
Sat Flow, veh/h	1849	1942	1650	782	1869	1589	0	1961	0	1439	43	1650
Grp Volume(v), veh/h	422	648	1	1	149	10	0	0	0	47	0	236
Grp Sat Flow(s),veh/h/ln	1849	1942	1650	782	1869	1589	0	1961	0	1482	0	1650
Q Serve(g_s), s	0.0	9.7	0.0	0.1	4.0	0.3	0.0	0.0	0.0	2.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	9.7	0.0	9.7	4.0	0.3	0.0	0.0	0.0	2.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.00		0.00	0.98		1.00
Lane Grp Cap(c), veh/h	984	1407	1196	266	649	552	0	195	0	249	0	653
V/C Ratio(X)	0.43	0.46	0.00	0.00	0.23	0.02	0.00	0.00	0.00	0.19	0.00	0.36
Avail Cap(c_a), veh/h	984	1407	1196	266	649	552	0	235	0	280	0	687
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.2	4.0	2.7	21.9	16.2	15.0	0.0	0.0	0.0	29.3	0.0	14.9
Incr Delay (d2), s/veh	0.3	1.1	0.0	0.0	0.8	0.1	0.0	0.0	0.0	0.4	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	5.5	0.0	0.0	2.2	0.1	0.0	0.0	0.0	0.9	0.0	3.3
LnGrp Delay(d),s/veh	10.5	5.1	2.7	21.9	17.0	15.1	0.0	0.0	0.0	29.7	0.0	15.2
LnGrp LOS	B	A	A	C	B	B				C		B
Approach Vol, veh/h		1071			160			0			283	
Approach Delay, s/veh		7.2			16.9			0.0			17.6	
Approach LOS		A			B						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		56.4		13.6	26.4	30.0		13.6				
Change Period (Y+Rc), s		* 5.7		* 6.6	* 5.7	* 5.7		* 6.6				
Max Green Setting (Gmax), s		* 49		* 8.4	* 19	* 24		* 8.4				
Max Q Clear Time (g_c+I1), s		11.7		4.1	2.0	11.7		0.0				
Green Ext Time (p_c), s		6.0		0.4	5.0	0.5		0.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				10.2								
HCM 2010 LOS				B								
<b>Notes</b>												

HCM 2010 Signalized Intersection Summary

Future Conditions W / Improvements

1: Whitmore Lake Road/Old US-23 & Grand River Avenue

PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	278	539	212	342	596	315	256	378	244	220	303	180
Future Volume (veh/h)	278	539	212	342	596	315	256	378	244	220	303	180
Number	1	6	16	5	2	12	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1980	1980	1980	1980	1980	1980	1980	1980	1980	1980	1980	1980
Adj Flow Rate, veh/h	323	627	247	384	670	354	284	420	271	244	337	200
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.86	0.86	0.86	0.89	0.89	0.89	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	400	786	547	434	832	635	401	478	679	291	399	632
Arrive On Green	0.16	0.21	0.21	0.17	0.22	0.22	0.16	0.24	0.24	0.12	0.20	0.20
Sat Flow, veh/h	1886	3762	1683	1886	3762	1683	1886	1980	1683	1886	1980	1683
Grp Volume(v), veh/h	323	627	247	384	670	354	284	420	271	244	337	200
Grp Sat Flow(s),veh/h/ln	1886	1881	1683	1886	1881	1683	1886	1980	1683	1886	1980	1683
Q Serve(g_s), s	11.3	15.9	0.0	14.1	16.9	1.0	8.3	20.5	0.0	8.8	16.4	0.0
Cycle Q Clear(g_c), s	11.3	15.9	0.0	14.1	16.9	1.0	8.3	20.5	0.0	8.8	16.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	400	786	547	434	832	635	401	478	679	291	399	632
V/C Ratio(X)	0.81	0.80	0.45	0.89	0.81	0.56	0.71	0.88	0.40	0.84	0.84	0.32
Avail Cap(c_a), veh/h	519	995	641	529	995	708	417	563	751	382	563	771
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.1	37.6	26.7	37.9	37.0	24.6	37.4	36.6	21.3	41.7	38.5	22.2
Incr Delay (d2), s/veh	7.1	3.6	0.6	14.3	4.2	0.8	5.2	13.1	0.4	12.0	8.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.3	8.6	5.4	12.0	9.2	7.6	7.8	12.9	5.3	7.5	9.9	3.9
LnGrp Delay(d),s/veh	45.2	41.3	27.3	52.1	41.2	25.4	42.6	49.7	21.6	53.7	46.6	22.5
LnGrp LOS	D	D	C	D	D	C	D	D	C	D	D	C
Approach Vol, veh/h		1197			1408			975			781	
Approach Delay, s/veh		39.5			40.2			39.8			42.6	
Approach LOS		D			D			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.7	28.7	22.1	26.7	23.9	27.4	18.1	30.7				
Change Period (Y+Rc), s	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5	* 6.5				
Max Green Setting (Gmax), s	* 23	* 27	* 17	* 29	* 23	* 27	* 17	* 29				
Max Q Clear Time (g_c+I1), s	13.3	18.9	10.3	18.4	16.1	17.9	10.8	22.5				
Green Ext Time (p_c), s	1.6	3.2	0.9	1.8	1.3	3.1	0.9	1.8				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			40.3									
HCM 2010 LOS			D									
<b>Notes</b>												

HCM 2010 Signalized Intersection Summary

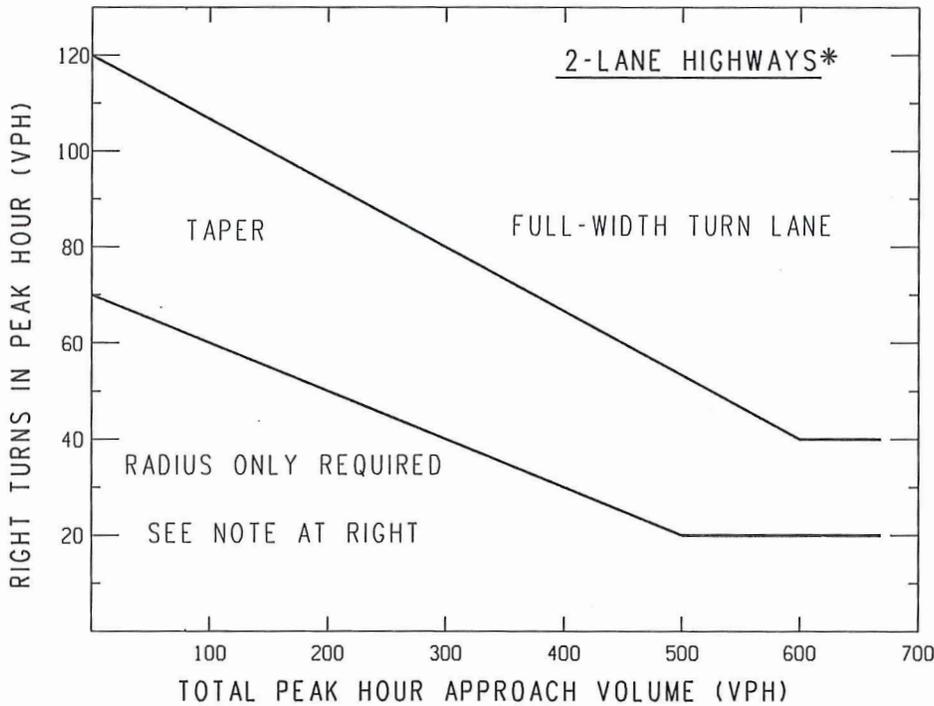
Future Conditions W / Improvements

3: Bar None Drive/Pleasant Valley Road & Grand River Avenue

PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	422	286	22	15	537	59	8	1	3	6	12	377
Future Volume (veh/h)	422	286	22	15	537	59	8	1	3	6	12	377
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1961	1961	1961	1961	1961	1961	2000	2000	2000	2000	1980	1980
Adj Flow Rate, veh/h	485	329	25	17	624	69	13	2	5	7	13	410
Adj No. of Lanes	1	1	1	1	1	1	0	1	0	0	1	1
Peak Hour Factor	0.87	0.87	0.87	0.86	0.86	0.86	0.60	0.60	0.60	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	0	0	0	1	1	1
Cap, veh/h	605	1420	1207	509	849	721	152	32	33	106	150	522
Arrive On Green	0.21	0.72	0.72	0.43	0.43	0.43	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	1867	1961	1667	1077	1961	1667	668	318	329	365	1496	1683
Grp Volume(v), veh/h	485	329	25	17	624	69	20	0	0	20	0	410
Grp Sat Flow(s),veh/h/ln	1867	1961	1667	1077	1961	1667	1314	0	0	1861	0	1683
Q Serve(g_s), s	8.6	3.9	0.3	0.7	18.5	1.7	0.0	0.0	0.0	0.0	0.0	0.9
Cycle Q Clear(g_c), s	8.6	3.9	0.3	4.6	18.5	1.7	0.7	0.0	0.0	0.6	0.0	0.9
Prop In Lane	1.00		1.00	1.00		1.00	0.65		0.25	0.35		1.00
Lane Grp Cap(c), veh/h	605	1420	1207	509	849	721	216	0	0	255	0	522
V/C Ratio(X)	0.80	0.23	0.02	0.03	0.74	0.10	0.09	0.00	0.00	0.08	0.00	0.79
Avail Cap(c_a), veh/h	605	1420	1207	509	849	721	223	0	0	266	0	531
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.3	3.2	2.7	13.8	16.5	11.7	28.7	0.0	0.0	28.6	0.0	22.0
Incr Delay (d2), s/veh	7.6	0.4	0.0	0.1	5.6	0.3	0.2	0.0	0.0	0.1	0.0	7.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	2.2	0.1	0.2	11.2	0.8	0.4	0.0	0.0	0.4	0.0	8.2
LnGrp Delay(d),s/veh	29.9	3.6	2.7	13.9	22.1	12.0	28.8	0.0	0.0	28.8	0.0	29.6
LnGrp LOS	C	A	A	B	C	B	C			C		C
Approach Vol, veh/h		839			710			20			430	
Approach Delay, s/veh		18.8			21.0			28.8			29.5	
Approach LOS		B			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		56.4		13.6	20.4	36.0		13.6				
Change Period (Y+Rc), s		* 5.7		* 6.6	* 5.7	* 5.7		* 6.6				
Max Green Setting (Gmax), s		* 50		* 7.4	* 14	* 30		* 7.4				
Max Q Clear Time (g_c+l1), s		5.9		2.9	10.6	20.5		2.7				
Green Ext Time (p_c), s		3.6		0.7	1.3	2.9		0.8				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay					22.0							
HCM 2010 LOS					C							
<b>Notes</b>												

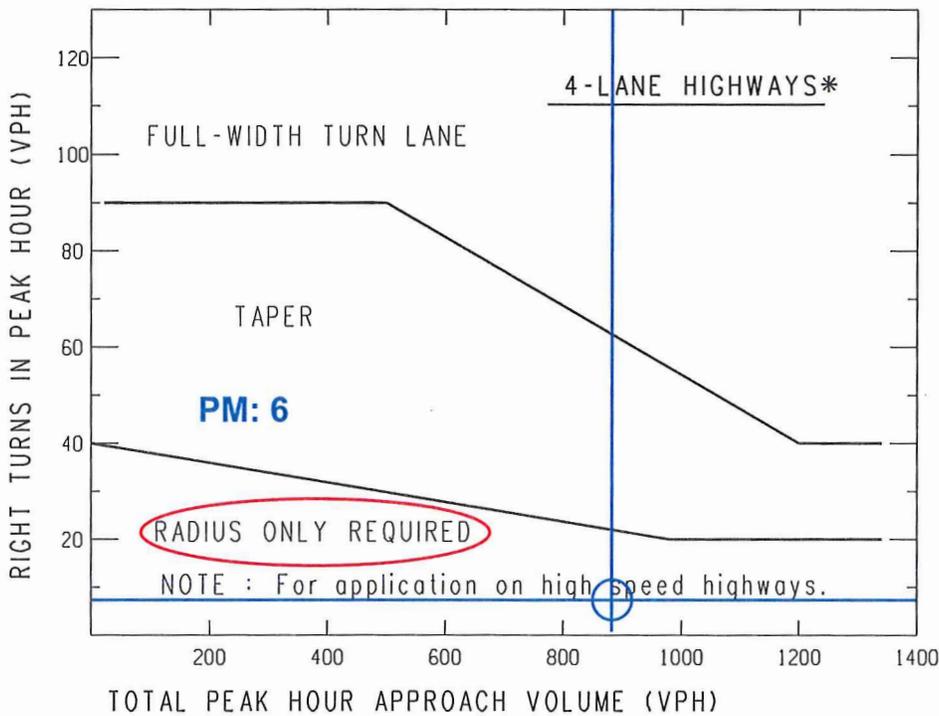
# GRAND RIVER AVENUE & ASSISTED LIVING DRIVE RT LANE WARRANT



**NOTE:**

For posted speeds at or under 45 mph, peak hour right turns greater than 40 vph, and total peak hour approach less than 300 vph, adjust right turn volumes.

Adjust peak hour right turns = Peak hour right turns - 20



\*If a center left-turn lane exists (i.e. 3 or 5 lane highway), subtract the number of left turns in approach volume from the total approach volume to get an adjusted total approach volume.

**PM: 872**

**Sample Problem:**

The Design Speed is 55 mph. The Peak Hour Approach Volume is 300 vph. The Number of Right Turns in the Peak Hour is 100 vph. Determine if a right turn lane is recommended.

**Solution:**

Figure indicates that the intersection of 300 vph and 100 vph is located above the upper trend line; thus, a right-turn lane may be recommended.



TRAFFIC AND SAFETY NOTE

TRAFFIC VOLUME GUIDELINES FOR RIGHT-TURN LANES AND TAPERS

DRAWN BY: MTS

08/05/2004

604A

SHEET

CHECKED BY: JAT

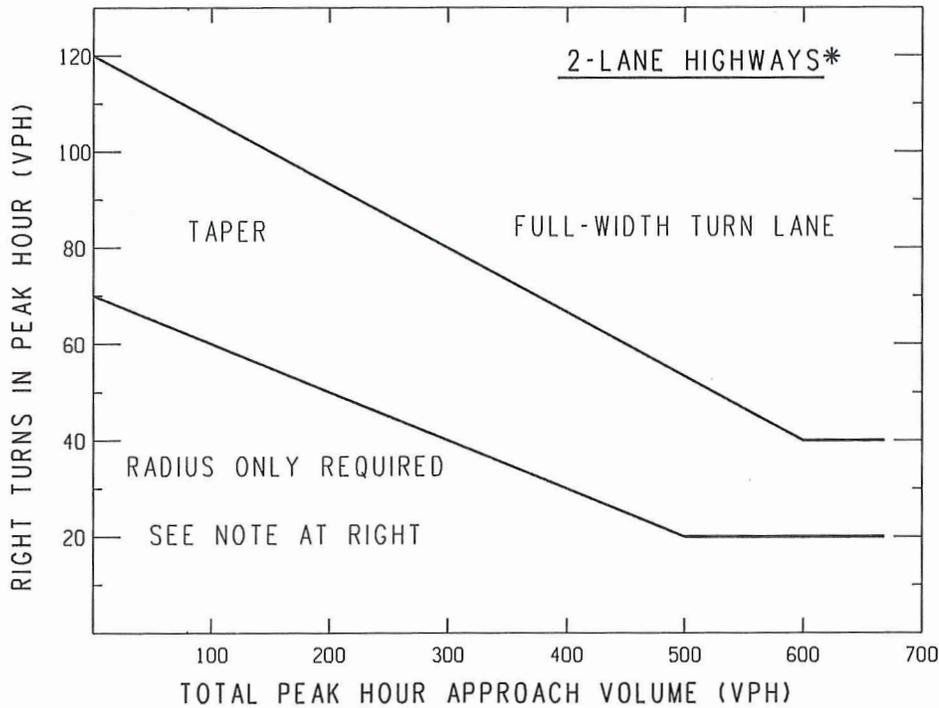
PLAN DATE:

2 OF 2

FILE: K:\DGN\ts notes\Note604A tsn.dgn

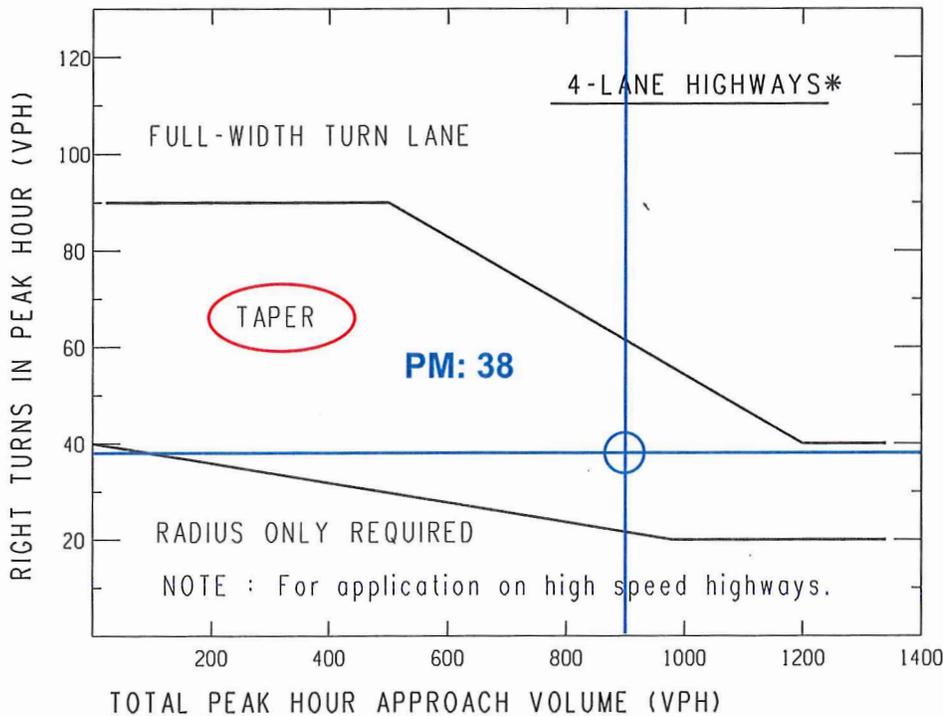
REV. 08/05/2004

# GRAND RIVER AVENUE & W. RESIDENTIAL SITE DRIVE RT LANE WARRANT



**NOTE:**  
For posted speeds at or under 45 mph, peak hour right turns greater than 40 vph, and total peak hour approach less than 300 vph, adjust right turn volumes.

Adjust peak hour right turns = Peak hour right turns - 20



\*If a center left-turn lane exists (i.e. 3 or 5 lane highway), subtract the number of left turns in approach volume from the total approach volume to get an adjusted total approach volume.

**PM: 894**

**Sample Problem:**

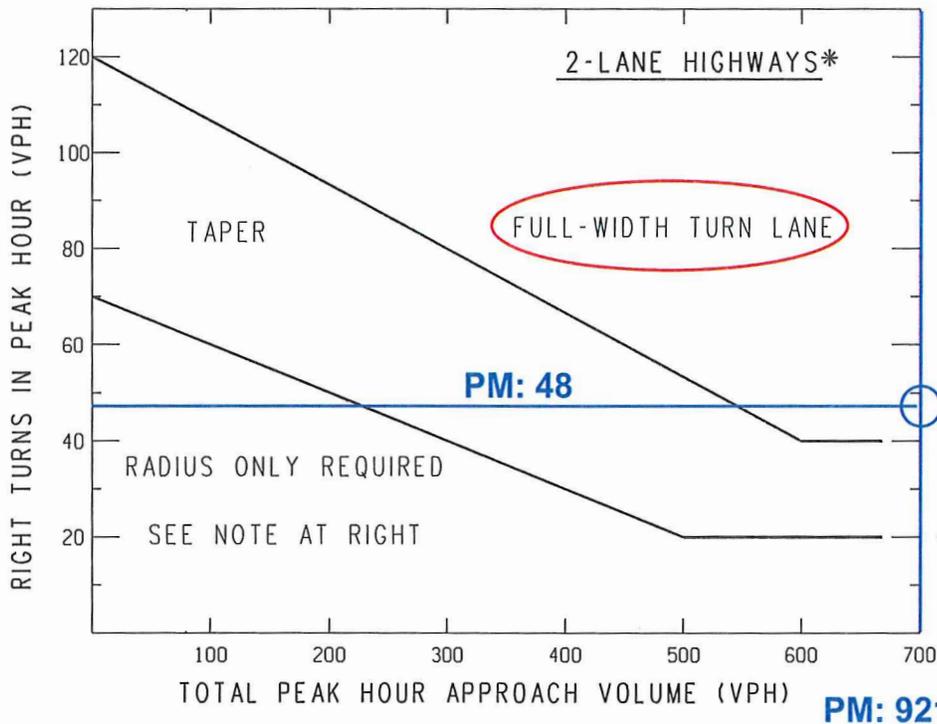
The Design Speed is 55 mph. The Peak Hour Approach Volume is 300 vph. The Number of Right Turns in the Peak Hour is 100 vph. Determine if a right turn lane is recommended.

**Solution:**

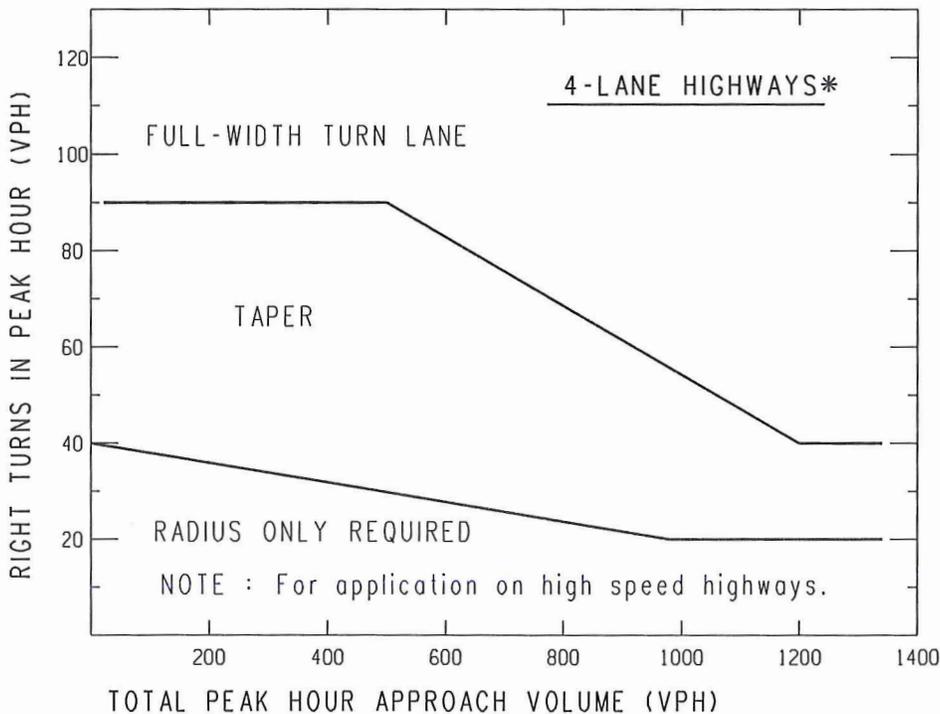
Figure indicates that the intersection of 300 vph and 100 vph is located above the upper trend line; thus, a right-turn lane may be recommended.

<p><b>MDOT</b> Michigan Department of Transportation</p> <p>TRAFFIC AND SAFETY NOTE</p>	<p>TRAFFIC VOLUME GUIDELINES FOR RIGHT-TURN LANES AND TAPERS</p>	
	<p>DRAWN BY: MTS</p> <p>CHECKED BY: JAT</p> <p>FILE: K:/DGN/ts notes/Note604A tsn.dgn</p>	<p>08/05/2004</p> <p>PLAN DATE:</p>

# GRAND RIVER AVENUE & MIDDLE RESIDENTIAL SITE DRIVE RT LANE WARRANT



NOTE:  
 For posted speeds at or under 45 mph, peak hour right turns greater than 40 vph, and total peak hour approach less than 300 vph, adjust right turn volumes.  
 Adjust peak hour right turns = Peak hour right turns - 20



\*If a center left-turn lane exists (i.e. 3 or 5 lane highway), subtract the number of left turns in approach volume from the total approach volume to get an adjusted total approach volume.

**Sample Problem:**

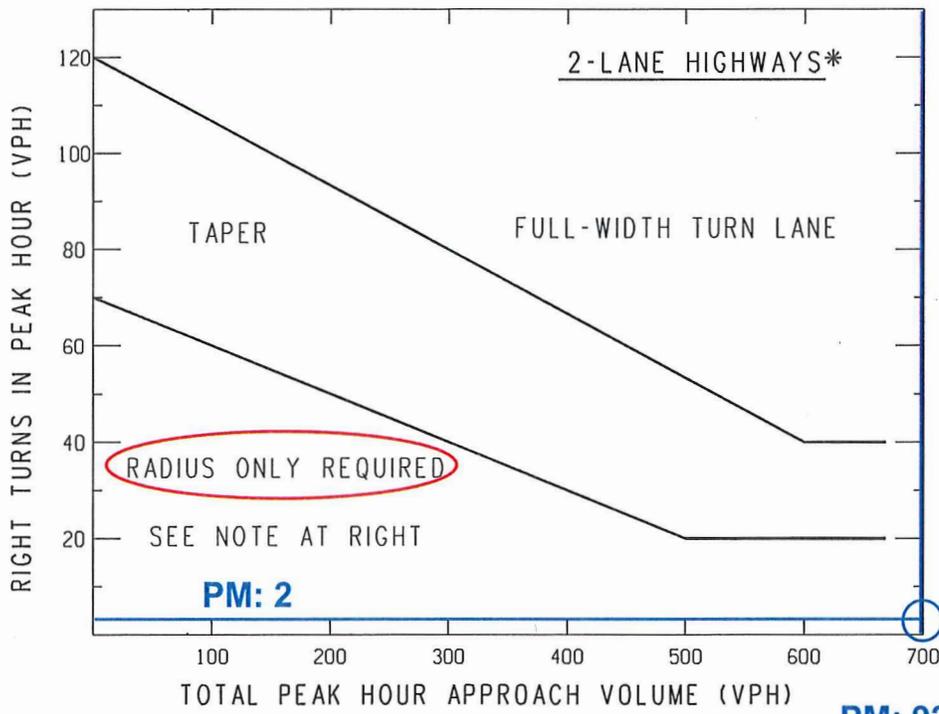
The Design Speed is 55 mph. The Peak Hour Approach Volume is 300 vph. The Number of Right Turns in the Peak Hour is 100 vph. Determine if a right turn lane is recommended.

**Solution:**

Figure indicates that the intersection of 300 vph and 100 vph is located above the upper trend line; thus, a right-turn lane may be recommended.

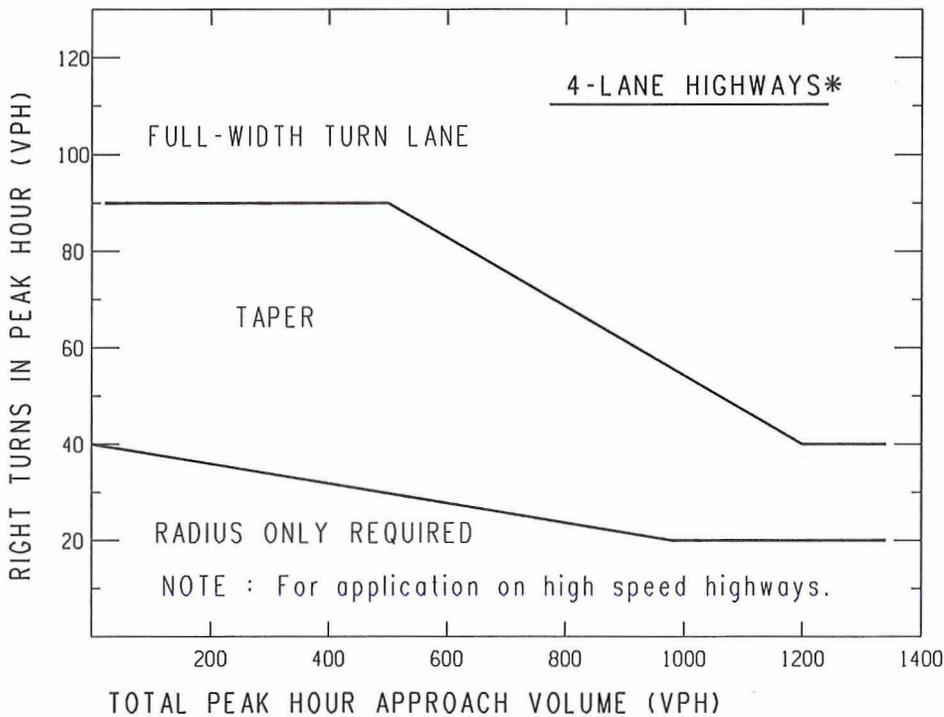
		<b>TRAFFIC VOLUME GUIDELINES                  FOR RIGHT-TURN LANES AND TAPERS</b>	
<b>TRAFFIC AND SAFETY                  NOTE</b>			
DRAWN BY: MTS	08/05/2004	<b>604A</b>	SHEET 2 OF 2
CHECKED BY: JAT	PLAN DATE:		
FILE: K:/DGN/ts notes/Note604A tsn.dgn		REV. 08/05/2004	

# GRAND RIVER AVENUE & E. RESIDENTIAL DRIVE RT LANE WARRANT



NOTE:  
For posted speeds at or under 45 mph, peak hour right turns greater than 40 vph, and total peak hour approach less than 300 vph, adjust right turn volumes.

Adjust peak hour right turns = Peak hour right turns - 20



\*If a center left-turn lane exists (i.e. 3 or 5 lane highway), subtract the number of left turns in approach volume from the total approach volume to get an adjusted total approach volume.

**Sample Problem:**

The Design Speed is 55 mph. The Peak Hour Approach Volume is 300 vph. The Number of Right Turns in the Peak Hour is 100 vph. Determine if a right turn lane is recommended.

**Solution:**

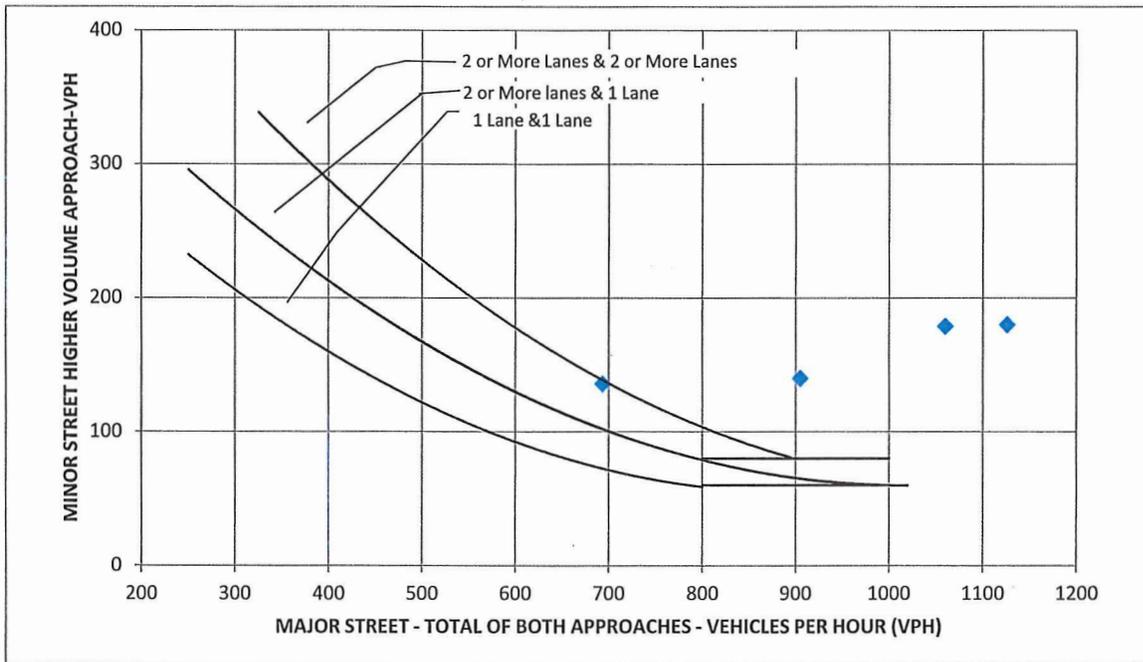
Figure indicates that the intersection of 300 vph and 100 vph is located above the upper trend line; thus, a right-turn lane may be recommended.

<p>TRAFFIC AND SAFETY NOTE</p>	<p>TRAFFIC VOLUME GUIDELINES FOR RIGHT-TURN LANES AND TAPERS</p>	
	<p>DRAWN BY: MTS</p> <p>CHECKED BY: JAT</p> <p>FILE: K:\DGN\ts notes&gt;Note604A tsn.dgn</p>	<p>08/05/2004</p> <p>PLAN DATE:</p>

**Michigan Manual of Uniform Traffic Control Devices  
Worksheet for Signal Warrants (Section 4C)  
WARRANT 2: Four-Hour Vehicular Volume**

Spot Number:	0		
Intersection:	Grand River Avenue @ Pleasant Valley		
Date	3/30/2016	by	F&V

2	: No. of Lanes on Major St.
1	: No. of Lanes on Minor St.
45	: Speed limit or 85th Percentile? (MPH)
NO	: Is the intersection within an isolated community?
	: What is the of the population isolated community?



How Many Hours Are Met	4
Is Warrant (70%) Met?	YES

proposed  
**Encore Village-West**  
 active living residential community

**I-96 Highway**

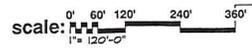


proposed  
**First Man**  
 assisted living - memory care

landscape concept plan for  
**Encore Village** a planned active living residential community

proposed  
**Encore Village-East**  
 active living residential community

AUG 05 2016



**note**  
 preliminary plan for inspection purposes only and in no way  
 official or approved for record purposes.



**FELINO A. PASCUAL**  
 and ASSOCIATES  
 Community Land Planner and  
 registered Landscape Architect  
 24333 Orchard Lake Rd., Suite C  
 Farmington Hills, MI 48336  
 ph: (248) 557-5588  
 fax: (248) 557-5416



client:  
**MANCHESTER**  
**BRIGHTON L.L.C.**  
 1700 W Big Beaver, Suite 120  
 Troy, MI 48064

project:  
**ENCORE**  
**VILLAGE**  
 a planned active living  
 residential community

project location:  
 Brighton Township,  
 Michigan  
 Grand River Avenue

sheet title:  
**STREET TREE**  
**PLANTING**

job no./issue/revision date:

drawn by:  
 JP, KM, CS  
 checked by:  
 FP  
 date:  
 2-19-2016

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project no:  
**LS16.027.05**

sheet no:  
**LS-1 of 8**

BRIGHTON TOWNSHIP



2A landscape planting detail  
SCALE: 1" = 60'-0"

(West Encore Village)

LAWN AREAS TO RECEIVE IRRIGATION AND SOUP ON FINISH GRADES, PROVIDE POSITIVE DRAINAGE. SEE ENGINEERING PLANS FOR GRADES.

AS-1 DENOTES SELECTIVE REMOVAL OF EXISTING HOODS AND VEGETATION TO PROVIDE BLENDED VIEWS  
EXISTING HOODS AND VEGETATION TO REMAIN  
PROPOSED ATTACHED RESIDENTIAL UNITS SEE ARCHITECTURAL FOR FLOOR PLANS, ELEVATIONS, AND DETAILS  
PROPOSED UNDERGROUND UTILITIES SEE ENGINEERING PLANS FOR FINAL LOCATIONS AND DETAILS

**landscape legend**

<b>deciduous trees</b> (Maples, Oaks, coccinifera, Zelkova serrata, Oaks, Lindens, Nyssa sylvatica, etc.)	
<b>ornamental trees</b> (Eastern Redwoods, Cypripedium, Hawthorn, Sarcococca, etc.)	
<b>evergreen trees</b> (White Pine, Austrian Pine, Spruces)	
<b>deciduous shrubs</b> (Viburnum, Forsythia, Burning Bush, Cornus, etc.)	
<b>evergreen shrubs</b> (Juniper, Yew, Holly, Boxwood, Barberry, etc.)	
<b>perennials and/or seasonal flowers</b> (Daylily, Salvia, Ornamental Grasses, Black Eyed Susan, etc.)	



location map  
NO SCALE

**FPA**  
FELINO & PASCUAL  
ASSOCIATES  
Community Land Planner and  
Registered Landscape Architect  
24253 Orchard Lake Rd., Suite C  
Farmington Hills, MI 48336  
ph: (248) 557-5588  
fax: (248) 557-5416



client:  
**MANCHESTER  
BRIGHTON L.L.C.**  
1700 W Big Beaver, Suite 120  
Troy, MI 48064

project:  
**ENCORE  
VILLAGE**  
a planned active living  
residential community

project location:  
Brighton Township,  
Michigan  
Grand River Avenue

sheet title:  
**LANDSCAPE  
PLANTING DETAIL**

Job no./issue/revision date:  
\_\_\_\_\_  
\_\_\_\_\_  
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drawn by:  
JP, KM, CS  
checked by:  
JP  
date:  
2-19-2016

notice:  
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3 WORKING DAYS  
BEFORE YOU DO  
CALL WSS BIG  
1-800-482-7171

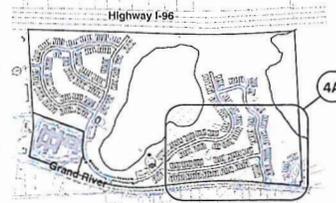
project no:  
LS16.027.05  
sheet no:  
LS-2 of 8





**4A** landscape planting detail  
SCALE: 1" = 60'-0"

(East Encore Village)



**location map**  
NO SCALE

**landscape legend**

- deciduous trees**  
Maple, Oak, Redwood, Yellow Birch, Oak, Linden, Norway Spruce, etc.
- ornamental trees**  
Garden Hydrangea, Camellia, Hawthorn, Sanicula, etc.
- evergreen trees**  
Spruce, Fir, Austrian Pine, Spire Pine
- deciduous shrubs**  
Plum, Forsythia, Burning Bush, Dogwood, etc.
- evergreen shrubs**  
Juniper, Yew, Holly, Arborvitae, Boxwood, etc.
- perennials and/or seasonal flowers**  
Daylily, Salvia, Ornamental Grasses, Black-eyed Susan, etc.



**FELINO A. PASCUAL and ASSOCIATES**  
Community Land Planner and  
Registered Landscape Architect  
24333 Orchard Lake Rd., Suite 4  
Farmington Hills, MI 48336  
ph. (248) 557-5588  
fax. (248) 557-5416



client:  
**MANCHESTER BRIGHTON L.L.C.**  
1700 W Big Beaver, Suite 120  
Troy, MI 48064

project:  
**ENCORE VILLAGE**  
a planned active living residential community

project location:  
Brighton Township,  
Michigan  
Grand River Avenue

sheet title:  
**LANDSCAPE PLANTING DETAIL**

job no./issue/revision date:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

drawn by:  
**JP, KM, CS**  
checked by:  
**FP**  
date:  
**2-19-2016**

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CALL MISS DICK  
1-800-482-1717

The location and elevation of existing features are shown on this drawing and only approximate. No guarantee is made or implied as to the completeness or accuracy. Contractor shall be responsible for determining the exact location of features prior to the start of construction.  
project no:  
**LS16.027.05**

sheet no:  
**LS-4 of 8**













FRONT ELEVATION C

SCALE 1/8" = 1'-0"

DATE	1/27
BY	AVB
PROJECT	ENCORE VILLAGE
CLIENT	MANCHESTER BRIGHTON LLC
LOCATION	BRIGHTON, MI
ARCHITECT	AVB
OWNER	MANCHESTER BRIGHTON LLC

DATE	7/27/18
BY	AVB
PROJECT	ENCORE VILLAGE
CLIENT	MANCHESTER BRIGHTON LLC
LOCATION	BRIGHTON, MI
ARCHITECT	AVB
OWNER	MANCHESTER BRIGHTON LLC

DATE	7/27/18
BY	AVB
PROJECT	ENCORE VILLAGE
CLIENT	MANCHESTER BRIGHTON LLC
LOCATION	BRIGHTON, MI
ARCHITECT	AVB
OWNER	MANCHESTER BRIGHTON LLC

DATE	7/27/18
BY	AVB
PROJECT	ENCORE VILLAGE
CLIENT	MANCHESTER BRIGHTON LLC
LOCATION	BRIGHTON, MI
ARCHITECT	AVB
OWNER	MANCHESTER BRIGHTON LLC

DATE	7/27/18
BY	AVB
PROJECT	ENCORE VILLAGE
CLIENT	MANCHESTER BRIGHTON LLC
LOCATION	BRIGHTON, MI
ARCHITECT	AVB
OWNER	MANCHESTER BRIGHTON LLC

DATE	7/27/18
BY	AVB
PROJECT	ENCORE VILLAGE
CLIENT	MANCHESTER BRIGHTON LLC
LOCATION	BRIGHTON, MI
ARCHITECT	AVB
OWNER	MANCHESTER BRIGHTON LLC





REAR ELEVATION

SCALE: 1/8" = 1'-0"



RIGHT ELEVATION (LEFT SIM.)

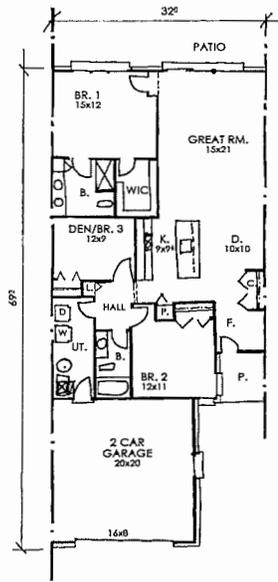
SCALE: 1/8" = 1'-0"



OWNER AM	DATE 7/27/16	PROJECT ENCORE VILLAGE MULTI-FAMILY COMMUNITY BRIGHTON, MICHIGAN
ARCHITECT ALEXANDER V. BOGAERTS + ASSOCIATES, P.C. 1627 BRIGHTON, MI 48302	SCALE 1/8" = 1'-0"	DATE 7/27/16

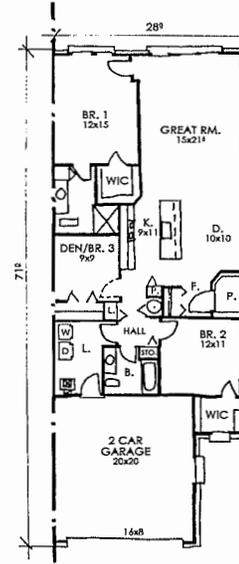
DATE 7/27/16	PROJECT ENCORE VILLAGE MULTI-FAMILY COMMUNITY BRIGHTON, MICHIGAN
SCALE 1/8" = 1'-0"	DATE 7/27/16

DATE 7/27/16	PROJECT ENCORE VILLAGE MULTI-FAMILY COMMUNITY BRIGHTON, MICHIGAN
SCALE 1/8" = 1'-0"	DATE 7/27/16



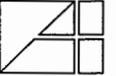
**FLOOR PLAN - INTERIOR UNIT FOR ALL BUILDINGS**  
 2 BEDROOM, 2 BATH, DEN  
 1486 SQ. FT.

SCALE: 1/8" = 1'-0"



**FLOOR PLAN - END UNIT FOR ALL BUILDINGS**  
 2 BEDROOM, 2 BATH, DEN  
 1441 SQ. FT.

SCALE: 1/8" = 1'-0"



Alexander V. Bogaerts + Associates, P.C. • Architecture • Planning • Interior Design  
 2445 Franklin Road  
 Bloomfield Hills, MI 48302  
 248 • 334 • 5000

PROJECT  
 UNIT PLANS

CLIENTS  
 MANCHESTER BRIGHTON LLC,  
 ENCORE VILLAGE  
 MULTI-FAMILY COMMUNITY  
 BRIGHTON, MICHIGAN

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PRELIMINARY  
 7-27-16  
 D B01

D PH05  
 D CONSTRUCTION

REVISIONS  
 SPA  
 7-27-16

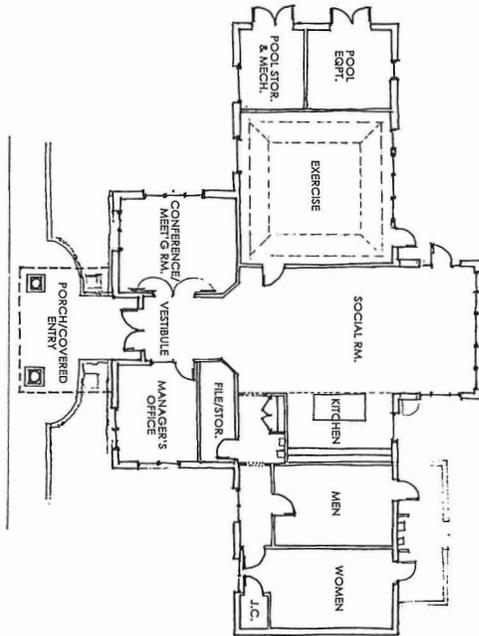
DRAWN BY  
 AM  
 CAD RELEASED  
 CHECKED BY  
 MAA  
 FOR REVIEW  
 1/27  
 DATE  
 SHEET NUMBER

A5



FRONT ELEVATION

SCALE 1/8" = 1'-0"



FLOOR PLAN

SCALE 1/8" = 1'-0"

PROJECT NO.	2445 FRANKLIN RD
CLIENT	ENCORE VILLAGE MULTI-FAMILY COMMUNITY
ARCHITECT	ALEXANDER V. BOGAERTS + ASSOCIATES, P.C.
DATE	7/27/16
SCALE	1/8" = 1'-0"
DESIGNER	AS

DATE	7/27/16
REVISION	5/A
DESCRIPTION	7/27/16
BY	AS

OWNER	ENCORE VILLAGE MULTI-FAMILY COMMUNITY
PROJECT NO.	2445 FRANKLIN RD
DATE	7/27/16
SCALE	1/8" = 1'-0"
DESIGNER	AS

PROJECT	CLUBHOUSE ELEVATION & FLOOR PLAN
DATE	7/27/16
SCALE	1/8" = 1'-0"
DESIGNER	AS

PROJECT	ENCORE VILLAGE MULTI-FAMILY COMMUNITY
PROJECT NO.	2445 FRANKLIN RD
DATE	7/27/16
SCALE	1/8" = 1'-0"
DESIGNER	AS





REAR ELEVATION

SCALE: 1/8" = 1'-0"



LEFT ELEVATION

SCALE: 1/8" = 1'-0"

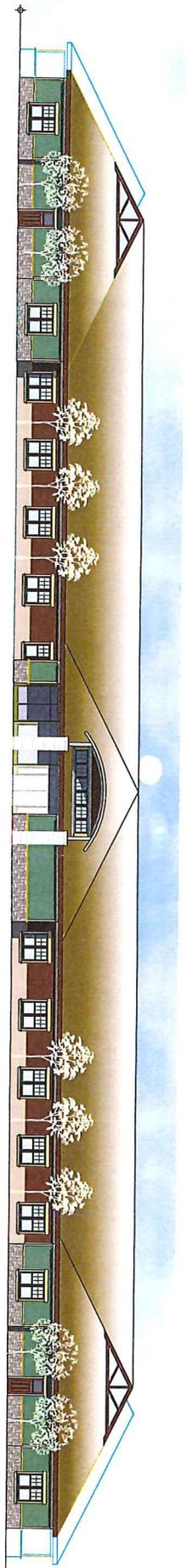


RIGHT ELEVATION

SCALE: 1/8" = 1'-0"







RECEIVED

AUG 05 2016

BRIGHTON TOWNSHIP

**CONDITIONAL CONCEPTUAL ZONING AGREEMENT**

**THIS CONDITIONAL CONCEPTUAL ZONING AGREEMENT** (the “Agreement”), is entered into by and between **Manchester Brighton, LLC**, a Michigan limited liability company, whose address is 1700 West Big Beaver, Suite 120, Troy, MI 48084 (“Developer”), and the **Charter Township of Brighton**, a Michigan municipal corporation whose address is 4363 Bruno Road, Brighton, MI 48114 (“Township”).

***RECITALS:***

- I. Developer is the owner of land (the “Property”) located within the Township located on the south side of Interstate 96, the north side of Grand River and west of Pleasant Lake Road, as more particularly described in **Exhibit 1** hereto.
- II. The Property consists of approximately 147 acres and is presently zoned OS-Office Service.
- III. Developer petitioned for a rezoning of the Property as a Conditional Rezoning request pursuant to Article 23 of the Township’s Zoning Ordinance and Section 3405 of the Michigan Zoning Enabling Act, found at MCL 125.3405, requesting a rezoning of the Property from OS-Office Service to RM-1, Residential Multiple Family and identified as Application for Rezoning \_\_\_\_\_, filed \_\_\_\_\_, 2016, for a proposed multiple family development to be known as “Encore Village” (the “Project”).
- IV. Based upon and subject to the Conditions proposed by Developer, the Township’s Planning Commission recommended to the Township Board approval of the rezoning request at its regular meeting held on \_\_\_\_\_, 2016, and the Township Board approved the rezoning request at its regular meeting held on \_\_\_\_\_, 2016.
- V. In proposing the rezoning with conditions to the Township, Developer has expressed as a firm an unalterable intent that Developer will develop the Property in strict conformance with the enumerated conditions of rezoning as set forth in **Exhibit 2** and the Concept Site Plan dated July 22, 2016, attached hereto as **Exhibit 3** (the “Concept Plan”) and as follows, each and every one of which being material:

- A. The Property shall be developed with a maximum of 411 multifamily residential units in buildings of various sizes as depicted on the Concept Plan, but no single building shall contain more than six (6) residential units. In addition, the southwest corner of the Property consisting of approximately 8 acres may be developed as an assisted living facility comprising no more than 104 beds. It is recognized that the Concept Plan has not yet been fully engineered and, the Planning Commission, as part of final site plan review, shall take into consideration the more detailed planning and engineering undertaken for the Property.
- B. Developer acknowledges that the Property shall be developed in accordance with all applicable ordinances, laws and regulations, and consistent with the offered conditions set forth in Exhibit 2 as attached, and the right to develop shall be subject to and in accordance with all applications, reviews, approvals, permits and authorizations required.
- D. The proposed development and Conditional Rezoning Request by the Developer enumerated herein, was not required by the Township, rather it was offered voluntarily by the Developer and the offered conditions, intended acts and forbearances are deemed necessary by Developer in order to preserve the character of the area, promote public safety and welfare, preserve and protect of environmental features, and without which Developer would not desire to develop or use the Property.
- E. Developer has not alleged or demonstrated that the existing zoning is invalid for any reason, rather the proposed conditional rezoning of the Property with the conditions offered was determined by Developer, and confirmed by the Township, to be consistent with the surrounding land uses and the goals of preserving the character of the area, promoting public safety and welfare, preserving and protecting environmental features, and to satisfying a housing need in the Community.
- F. The Township has relied on Developer's representations that it will act in strict conformance with the enumerated conditions of rezoning as set forth in Exhibit 2 and the Concept Plan in Exhibit 3, as attached, so that the development of the Property will preserve the character of the area, promote public safety and welfare, and preserve and protect the environmental features.

***NOW, THEREFORE, IT IS AGREED AS FOLLOWS:***

- 1. Developer agrees that if the Property is developed under the RM-1, Residential Multiple Family District, the development shall be in accordance with the Conditional Rezoning Request, and in accordance with the offered conditions set forth in Exhibit 2 as attached, the Concept Plan attached as Exhibit 3, and with all applicable ordinances, laws and regulations.

2. Developer agrees that the right to develop shall be subject to and in accordance with all applications, reviews, approvals, permits and authorizations required, including site plan and engineering plan reviews.
3. Developer agrees to forbear from acting in a manner inconsistent with the offered conditions set forth in Exhibit 2, and the Concept Pla attached as Exhibit 3, and all revisions and documents submitted and made a part of the record of approval.
4. If the Property is developed under the RM-1 District, the Property shall be developed in a manner consistent with the following conditions of rezoning:
  - a. The number or multiple family residential units shall be limited to 411 units in buildings containing no more than six (6) units per building.
  - b. The development shall include two clubhouses with pools.
  - c. The development shall preserve the natural features surrounding Pickerel and Woodruff Lakes as shown on the Concept Plan and include the following passive and active recreational features---viewing points for the two lakes; walking paths, nature viewing opportunities.
  - d. The development shall provide, but limit, access to Pickerel and Woodruff Lakes as shown on the Concept Plans.
  - e. Each unit shall be provided with an exterior patio or deck.
  - f. Yard setbacks for each multiple family building shall comply with the following:
    1. Front Yard Setback – not less than thirty feet (30’).
    2. Side Yard Setback between buildings – not less than thirty feet (20’) in total.
    3. Rear Yard Setback – not less than thirty feet (30’).
    4. Perimeter Setback from Property Line to Buildings—not less than thirty feet (30’).
    5. Natural Features Setback—not less than twenty-five feet (25’).
  - g. The development shall provide for Open Space Preservation consisting of approximately 71 acres comprising preserved woodlands, wetlands and lake areas as depicted on the Concept Plan.
  - h. The assisted living component of the development shall consist of no more than 104 beds and shall be only one story in height. It is

understood and agreed that the assisted living and multiple family developments may be developed separately, whether by parcel split or as a separate condominium unit, by different entities and may be under different ownership provided that appropriate easements for utilities, ingress/egress and use and maintenance of common elements be provided through condominium documents or covenants and restrictions approved by the Township in the exercise of reasonable discretion in connection with final site plan approvals for the development.

- k. The general quality of exterior construction of the multiple family residential buildings and the type and nature of the materials used on the buildings shall be generally consistent with the architectural elevations included in with the Concept Plan, unless otherwise approved by the Planning Commission as part of final site plan approval.
5. Subject to Developer obtaining all other required state and local permits and approvals for the development of the Property and compliance with Township final site plan, landscaping and engineering requirements, the Township agrees that Developer shall be permitted to develop the Property in accordance with the above-stated use and development conditions of rezoning.
6. The Township has not required the use and development conditions of rezoning. The Conditional Rezoning request was voluntarily offered by Developer in order to provide an enhanced use and value of the Property, to provide additional development options for the Property, to preserve the character of the area, promote public safety and welfare, and preserve and protect the environmental features.
7. All of the conditions represent actions, improvements and/or forbearances that are a direct benefit to the Property and/or to the development of the Property. The burden of the conditions on Developer is roughly proportionate to the burdens created by the development, and are a benefit which will accrue to the Property as a result of the conditions.
8. The rezoning shall take effect upon approval of the final site plan and all conditions of such plan being met.
9. In the event that the Developer, or any respective successors, assigns and/or transferees, thereafter attempts to proceed with development of the Property in a manner which is in any material respect in violation of the use and development conditions of rezoning as set forth in Exhibit 2 or the Concept Plan depicted in Exhibit 3, the Township may, following notice and a reasonable opportunity to cure, take action using the procedure prescribed by law for the rezoning of property, return the zoning of the Property to the OS-Office Service District and Developer nor any respective successors, assigns and/or transferees, shall have

any vested rights in the RM-1 District, and shall be estopped from objecting to a rezoning to the OS classification.

10. If the development as agreed to in this Agreement is not constructed, and the Property is rezoned back to the OS classification, this provision shall not prohibit a future owner of the Property from thereafter objecting to the reasonableness of the OS classification as applied to the Property, provided such objection shall not be based upon the allegation of a down zoning or other claim based upon the validity of this Agreement.
11. The action of the Township in entering into this Agreement as to Conditions of Rezoning is based upon the understanding that many of the land use and environmental objectives of the Township are reflected in the design of the development as proposed and the Township is thus achieving its police power objectives and has not, by this Agreement, bargained away or otherwise compromised any of its police power objectives.
12. After consulting with its legal counsel, Developer understands and agrees that this Agreement is authorized by all applicable state and federal laws and respective constitutions, that it shall be irrevocably estopped from taking a contrary position in the future, and that the Township shall be entitled to injunctive relief to prohibit any actions by Developer that are inconsistent with the strict terms of this Agreement.
13. This Agreement shall be binding upon and inure to the benefit of the parties to this Agreement and their respective heirs, successors, assigns and transferees, and an affidavit providing notice of this Agreement may be recorded by either party with the office of the Livingston County Register of Deeds.
14. This Agreement may be signed in counterparts.

**IN WITNESS WHEREOF**, each party has caused this Agreement to be duly executed and delivered in its name and on behalf its behalf by an authorized representative, as of the date written below.

PROPERTY OWNER/DEVELOPER:

**Manchester Brighton, LLC,**  
a Michigan limited liability company,

By: \_\_\_\_\_

Its: \_\_\_\_\_

Date: \_\_\_\_\_

TOWNSHIP:

**Charter Township of Brighton,**  
a Michigan municipal corporation

By: \_\_\_\_\_

Its: Township Supervisor

Date: \_\_\_\_\_

By: \_\_\_\_\_

Its: Township Clerk

Date: \_\_\_\_\_

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**DRAFT**

**EXHIBIT 1**  
**LEGAL DESCRIPTION**

**Exhibit 2**

**Enumerated Conditions of Rezoning**

DRAFT

**Exhibit 3**

**Conceptual Site Plan dated \_\_\_\_\_ 2016**

4845-1768-9653.1  
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DRAFT

# Natural Feature Assessment & Site Analysis

## Pickerel Lake Development Site

Site Assessment Date: March 9, 2016

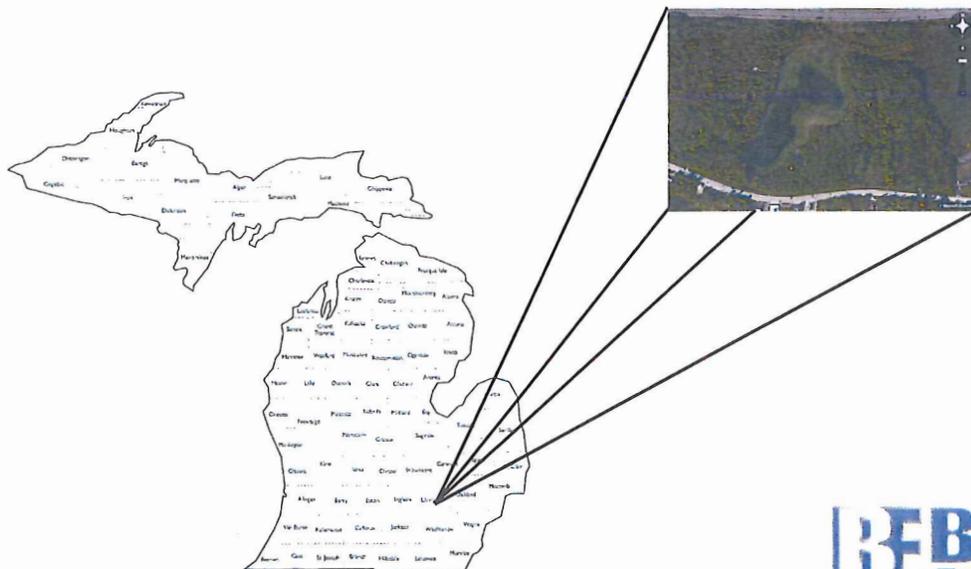
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AUG 05 2016

BRIGHTON TOWNSHIP



Location Map



The 147+/- acre site is located between the north side of Grand River Avenue and the south side of I-96 surrounding Pickerel Lake in Brighton Township in Livingston County. A site analysis was performed on the site on March 9, 2016 by Boss Engineering. A desk top analysis of the property was also performed to confirm the findings collected during the field analysis. Resources utilized for that study included aerial photos from Google Earth, a web soil survey prepared by the USDA, and Wetlands Inventory Maps prepared by the MDEQ as well as resources prepared by the United States Fish & Wildlife Service.

The soils on site consist of loam, sandy loam, loamy sand and muck. The soils map provided with this report (Appendix A) as compiled by the USDA is consistent with the field assessment of the different areas found on site. The areas indicated on the soils map are also indicative of the land cover identified in the field which consist of some impervious surfaces, wetland, woodland including sparsely wooded, and grassy upland areas. The steeper slopes found in the Boyer-Oshtemo and Fox-Boyer series such as BtE and FrE (see Appendix A) have severe rating for erodibility. As the site currently exists, erosion was not noted but, this could be because of the vegetative cover helping to hold sediment in place.

Topography on the site ranges from low depressions at the wetland edges and valleys found primarily on the eastern side of the property to high areas found on the northern and eastern sides. The property's east and west side topography vary greatly from each other. The western side is undulating but relatively flat except along a ridgeline which then has a steep slope of 1:3 down to the water's edge of Pickerel Lake. The eastern side contains hills and valleys ranging in slopes from 1:3 to 1:8 until they gradually lessen out towards the southern end of the site by Grand River. Wetlands predominate the northern portion of the site but, there is a hilltop that helps define the wetland border adjacent to I-96.

The land cover found in the field consisted of five different types; impervious surface (asphalt/concrete, building), wetland, open water, wooded area including sparsely wooded, and grassy upland areas. These types can be broken down further into the following approximate areas:

Total Site Area: 147 acres  
Impervious: +/- 1 acre  
Wetland: +/- 18 acres  
Open Water: +/- 35 acres  
Woodland: +/- 64 acres  
Grassy Upland: +/- 31 acres

*\*There is some overlap between wetland to woodland, and woodland to grassy upland areas\**

Included on the site are (4) four abandoned houses accompanied by 5 accessory buildings which comprise of a barn, garage, (2) sheds, and a pump/well house.

The vegetation identified in the woodland areas during the field assessment appear to constitute a southern dry-mesic deciduous forests which consists of the following plant species:

<u>Hardwoods</u>	<u>Herbaceous</u>	<u>Shrub</u>
Swamp White Oak	Wild Grape Vine	Staghorn Sumac
White Oak	Periwinkle	Shrubby Rubus (varieties)
Black Locust	Wild Ginger	American Bittersweet
Large-Tooth Aspen	Poison Ivy	

Other deciduous trees noted included Black Cherry, Shagbark Hickory, Cottonwood, Black Willow and Sugar Maple. The site did feature a good mix of evergreen trees which included but, not limited to Scotch Pine, Red Pine, Eastern Red Cedar, and Black Spruce. Due to the mature nature of some of the forests found onsite, understory shrubs and groundcovers were scarce. Large trees ranging in caliper size from 6"-24"+ can be found throughout the site, some of which (in larger caliper sizes) can perhaps be saved as signature or landmark trees. A large majority of the trees however, may not be considered signature or landmark quality but are still relatively large specimens that may be preserved in groups to keep some canopy cover and character of the existing site.

The grassy upland areas are reminiscent of an oak barren type of plant community. Different species of Panicum grasses appear to be growing along with some sedges and other native upland plants. These areas are located towards the southeastern part of the site along Grand River Ave. and in the upper half of the western side of the site.

The main wetland on the site is located to the north of Pickerel Lake and extends over to Woodruff Lake. According to the United States Fish & Wildlife Services this wetland is classified as a freshwater emergent wetland. Freshwater emergent wetlands feature grass-like vegetation such as cattails which extend above the water surface and standing water is present for most of the growing season. Given that this wetland connects two lakes it could play an important role in water levels/flood control, maintain natural habitat for aquatic wildlife, and water purification. There is another wetland classified as a Shrub/Scrub Wetland located on the southeastern side of the site adjacent to Woodruff lake and an existing residential community. Due to the nature and location of the northern wetland system which connects to inland lakes and the other adjacent to Woodruff Lake which is greater than 5 acres in size, it is highly likely that the MDEQ does have jurisdiction over these wetlands. There are also two smaller wetlands found in the central part of the eastern side which can also be

considered Shrub/Scrub Wetlands. A wetland delineation was performed by King & McGregor Environmental previously to 3/9/16 site analysis by Boss Engineering.

Mammal species which were evident to inhabit the site include deer, rabbit, and squirrel. Different birds were seen during the 3/9/16 site visit which included robins, cardinals, sparrows, geese, and falcon. Another species of note is the garter snake. During the site analysis multiple game paths were crossed that were created primarily by deer (see attached Appendix E for locations). The canopy cover in the woodland areas provided nesting opportunity for birds as well as squirrels. The patches of conifer trees provide a place for deer to bed down in addition to the upland grassy areas. The transition areas between the woodlands and grassy areas provide a perch for birds of prey such as the falcon for hunting. The site appears to be a well-balanced ecosystem with a healthy ecology to support the different species which inhabit the site.

This 147 acre property surrounding Pickerel Lake is unique given its varying topography and mature forested areas. It features easy access to major thoroughfares and is located within close proximity to Brighton's downtown area. The site provides scenic views of two different lakes and contains different animal life and land covers that contribute to its individual character.



1. United States. Department of Agriculture. [Web Soil Survey](http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm), 10 March 2016 <<http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>>

**Ho - Houghton Muck**

Consists of deep poorly drained soils comprised of organic materials creating anaerobic soil conditions. Common native vegetation is marsh grasses, cattails, sedges, reeds, and some water tolerant trees.

*Landform:* Drainage-ways, wetlands, moraines, depressions on outwash plains

*Depth to Restrictive Feature:* More than 80 inches

*Natural Drainage Class:* Very Poorly Drained

*Frequency of Ponding:* Frequent

*Slope:* 0-1 percent

**Gd- Gilford Sandy Loam**

Consists of deep poorly drained soils formed in loamy over sandy sediments. Native vegetation is primarily herbaceous wetland plants such as False Aster and Swamp Milkweed.

*Landform:* Glacial drainage channels

*Depth to Restrictive Feature:* More than 80 inches

*Natural Drainage Class:* Poorly Drained

*Frequency of Ponding:* Frequent

*Depth to Water Table:* 0-1 foot

*Slope:* 0-2 percent

**By- Brookston Loam**

Consists of deep poorly drained soils formed of silty material and underlying loamy till. Native vegetation is deciduous forests, sedges, and marsh grasses.

*Landform:* Depressions on till plains

*Depth to Restrictive Feature:* More than 80 inches

*Natural Drainage Class:* Poorly Drained

*Frequency of Ponding:* Frequent

*Depth to Water Table:* 0-1 foot

*Slope:* 0-2 percent

**FrD & FrE- Fox Boyer Complex**

This complex combines the Fox soil series and the Boyer soil series. The Fox series consists of deep well drained soil which are comprised of calcareous sandy outwash. Native vegetation for the Fox series includes deciduous forest trees such as White Oak Black Cherry, and Sugar Maple. The Boyer series consists of deep well drained soils formed in sandy and loamy drift underlain by gravelly sand outwash. Native vegetation is similar to the Fox series and includes deciduous forest trees.

*Landform:* Outwash plains and moraines

*Depth to Restrictive Feature:* More than 80 inches

*Natural Drainage Class:* Well Drained

*Frequency of Ponding:* None

*Depth to Water Table:* More than 80 inches

*Slope FrD:* 12-18 percent

*Slope FrE:* 18-25 percent

**FoA, FoB, & FoC- Fox Sandy Loam**

The Fox series consists of deep well drained soil which are comprised of calcareous sandy outwash. Native vegetation for the Fox series includes deciduous forest trees such as White Oak, Black Cherry, and Sugar Maple.

*Landform:* Valley trains, outwash plains, and moraines

*Depth to Restrictive Feature:* More than 80 inches

*Natural Drainage Class:* Well Drained

*Frequency of Ponding:* None

*Depth to Water Table:* More than 80 inches

*Slope FoA:* 0-2 percent

*Slope FoB:* 2-6 percent

*Slope FoC:* 6-12 percent

**BtA, BtB, BtC, BtD, & BtE - Boyer Oshtemo Loamy Sand**

This soil combines the Oshtemo soil series and the Boyer soil series. The Oshtemo series consists of deep well drained soil which are formed in stratified loamy and sandy deposits on valley trains. Native vegetation for the Oshtemo series includes deciduous forest trees such as Oak and Maple but, also pasture land. The Boyer series consists of deep well drained soils formed in sandy and loamy drift underlain by gravelly sand outwash. Native vegetation is similar to the Fox series and includes deciduous forest trees.

*Landform:* Moraines and outwash plains

*Depth to Restrictive Feature:* More than 80 inches

*Natural Drainage Class:* Well Drained

*Frequency of Ponding:* None

*Depth to Water Table:* More than 80 inches

*Slope BtA:* 0-2 percent

*Slope BtB:* 2-6 percent

*Slope BtC:* 6-12 percent

*Slope BtD:* 12-18 percent

*Slope BtE:* 18-25 percent







During the site analysis conducted on 3/9/16 by Boss Engineering different, outlook points or viewing stations were noted. Depicted to the left is a map of these locations and the direction in which the best views can be found.

This site has a varying topography which lends itself the opportunity to create outlook vantage points or viewing windows which capture interest and create a calm and relaxed feeling.



During the Boss Engineering site analysis conducted on 3/9/16, some game paths were discovered on the site. Given the strong evidence of deer on the site, it is likely that these paths were created by deer from routinely traveling to the same areas. There are likely other game trails which exist onsite but, the ones indicated to the left were the main ones noted during the site analysis. Any type of development is bound to be disruptive to the animals that inhabit this site but, preserving certain areas on site could minimize the level of disruption. For instance trying to preserve or maintain some of the areas around the game paths and preserving large spaces as a place of refuge for the animals should minimize some of the effects developing the site could have.



 Areas to Preserve

The graphic shown to the left are suggested areas to be preserved based upon the natural features of the site and other information presented in this report including soil type, land cover, and slope. Some areas are proposed to be preserved in an effort to retain some of the site character and create forested corridors within the site that tie back into preserved areas. The effort behind this proposal stems from the potential for mass grading activities. Depending on the proposed development, these forested corridors provide the opportunity to create not only visual interest but separate spaces for different uses.

This preservation plan has included the wetland areas found on site and many of the steep slopes found near the waters edge. These areas seem the most logical areas to try and preserve due to regulations and from a constructibility standpoint.

Despite some of the green areas overlapping the buildings onsite, they should be taken down. However, there is an opportunity to perhaps salvage some of the materials and reuse them as a feature element in either the landscape or architecture



- Areas to Preserve
- 100 ft Buffer from Wetland
- 25 ft Buffer from Wetland

This graphics intention is to show areas in which buffer spaces may be required. In Article 10 Section 6 of the Charter Township of Brighton Zoning Ordinance there is a setback requirement of 100 ft from natural feature protection areas. The wetlands onsite fall under these regulations and are depicted to the left. The yellow areas indicate approximately the 100 ft setback mark. There is a potential to reduce the setback requirement to 25 ft per the permission of the Planning Commission and those areas are shown in red. From an aesthetic point of view, some visual and noise buffers may be something to consider near I-96 and towards Grand River due to the noise and view. The west side of the site does not contain much noise pollution but does have commercial/office uses adjacent from it which provides an opportunity for a visual buffer.

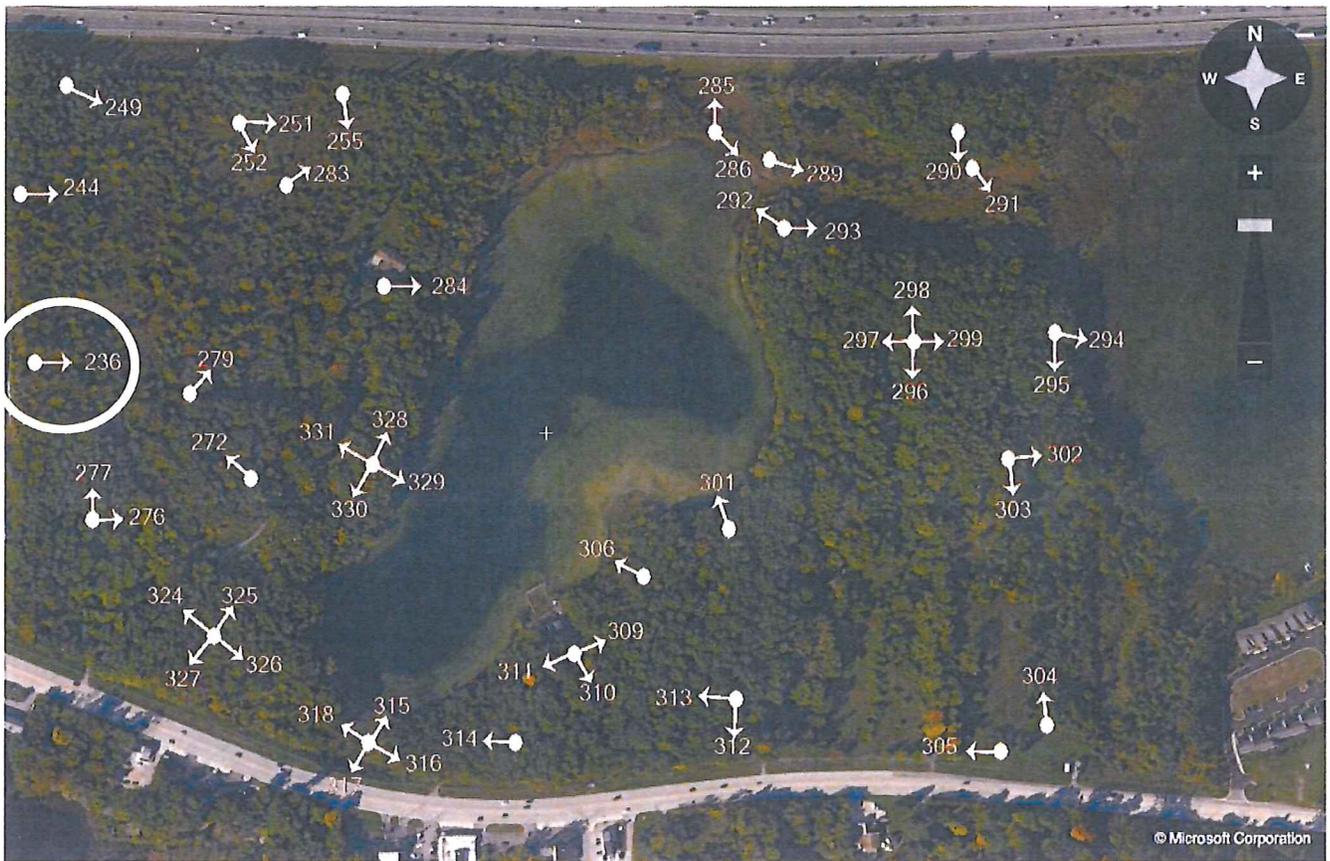
Overall Site Picture Key



Depicted above is a key for the locations and view direction for site photographs taken by Boss Engineering during the 3/9/16 site analysis.

Each number represents an individual photograph which will follow in the subsequent pages.

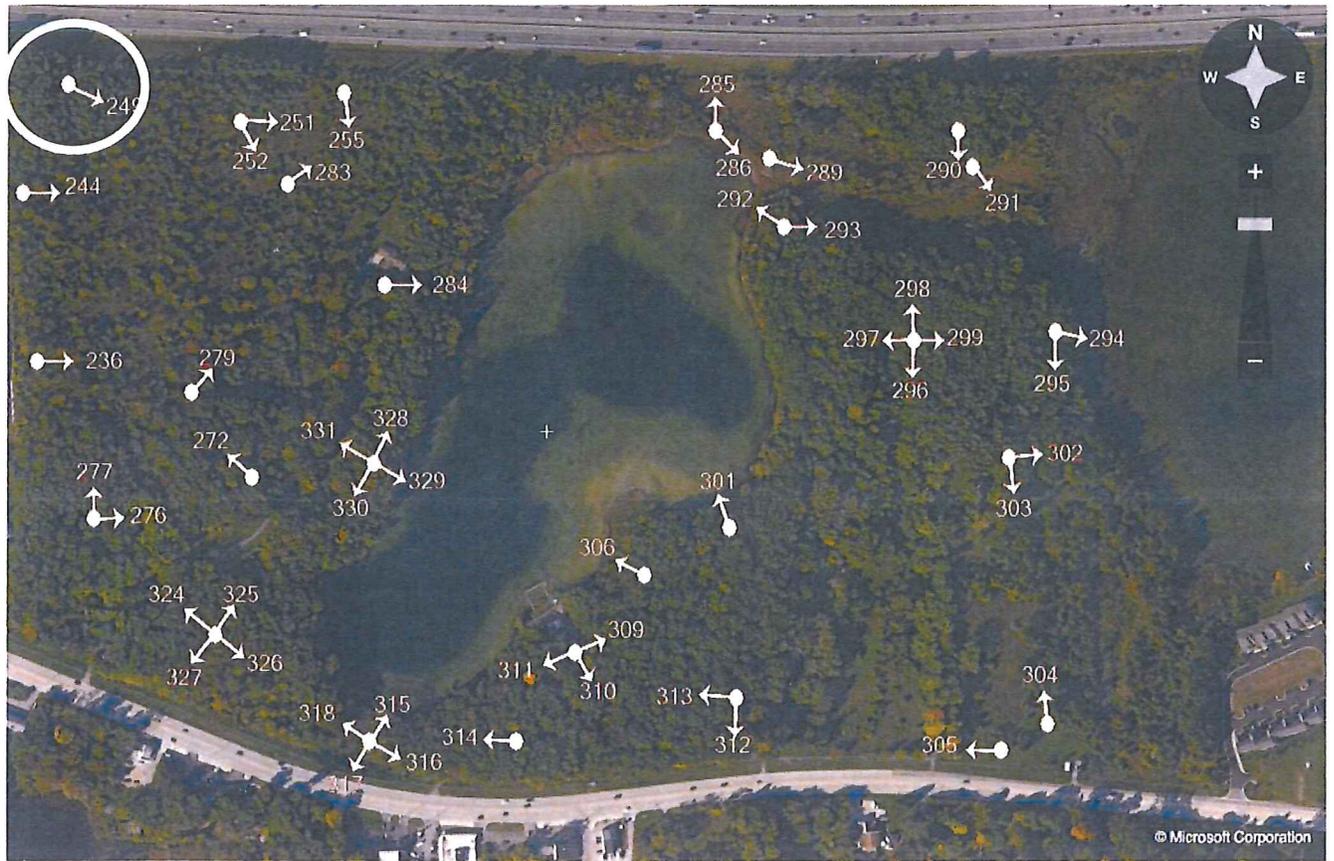
The intent of these pictures is to display some of the natural features and ecology of the site to help better understand potential future use and development plans.



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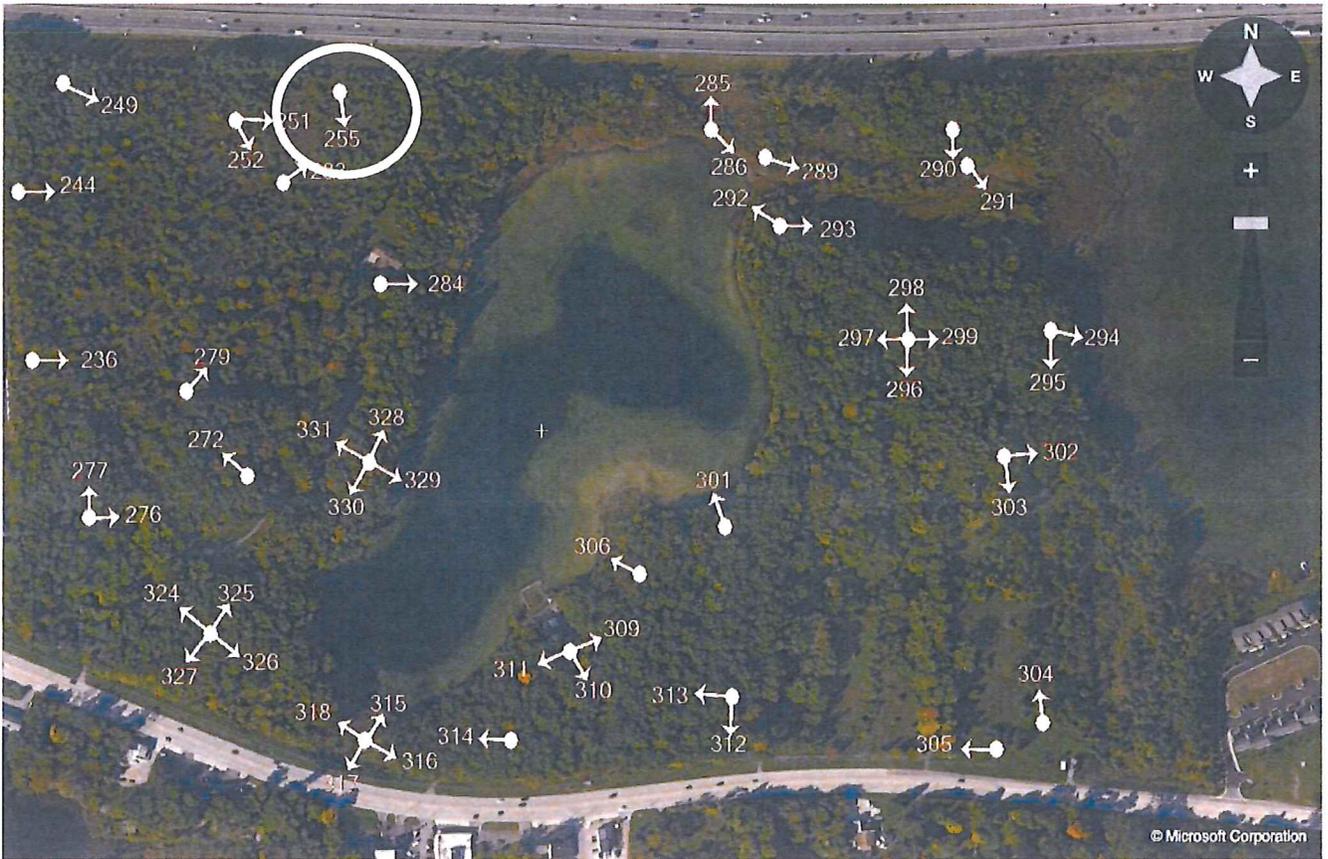
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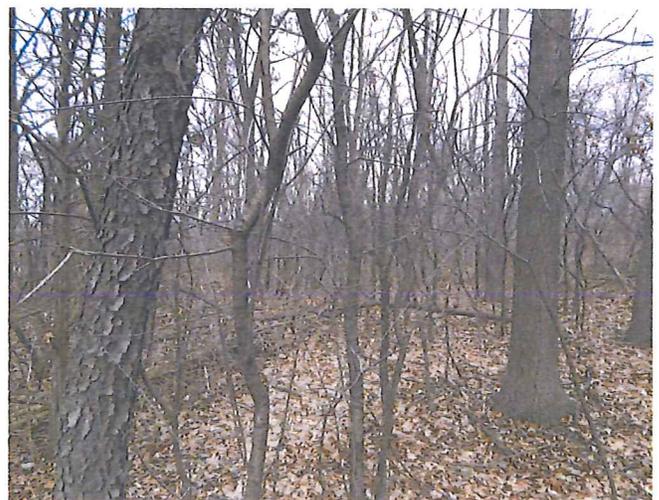
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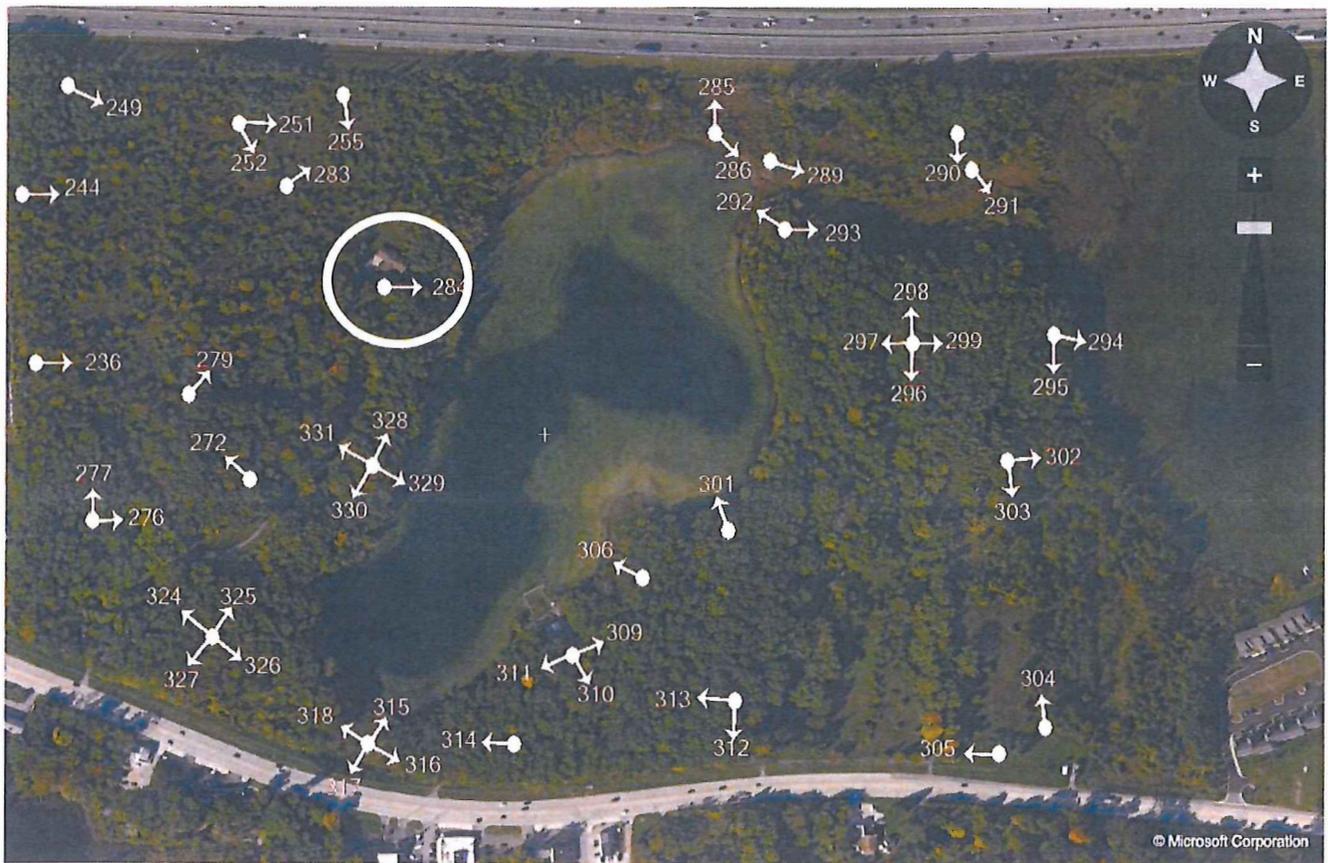
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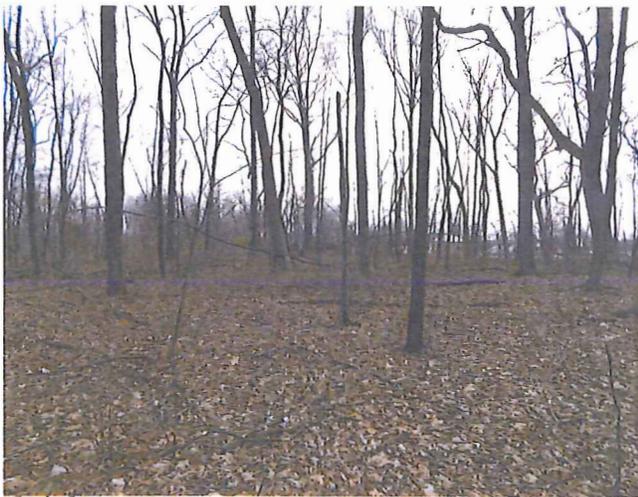
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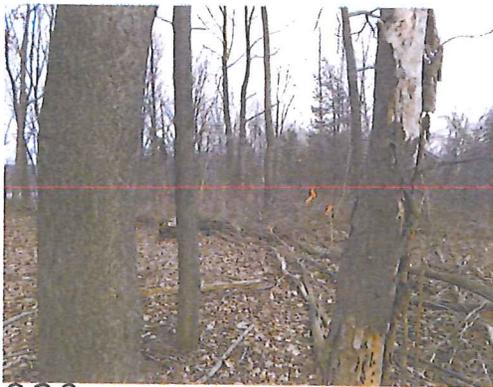
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SITE PLAN/CONDITIONAL REZONING  
PLAN FOR ENCORE VILLAGE

Dated JULY 22, 2016

Available for viewing in the  
Planning and Clerk's Department

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**MEMORANDUM**

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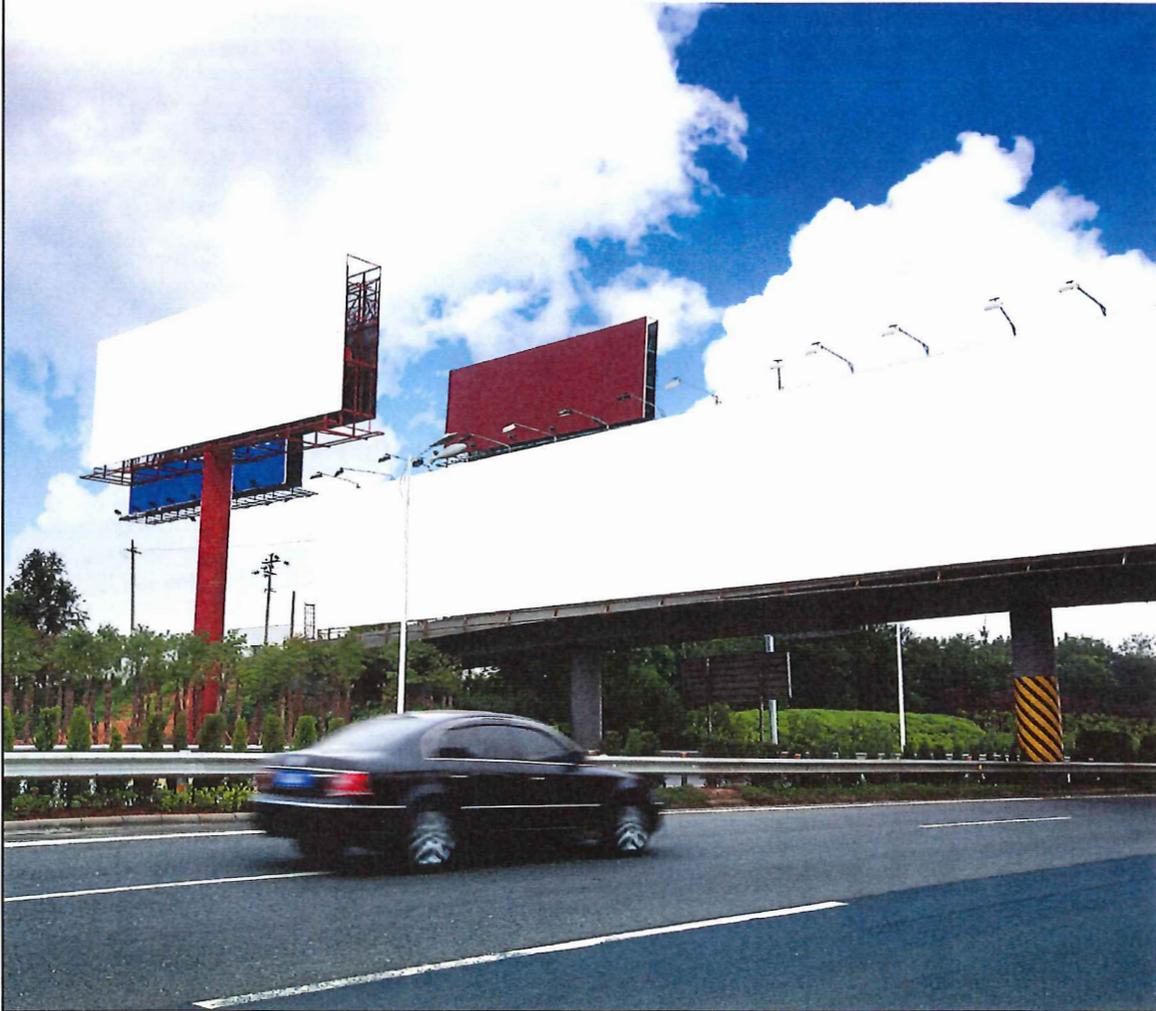
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**TO:** BRIGHTON TOWNSHIP RESIDENTS  
**FROM:** ANN M. BOLLIN, CLERK  
**SUBJECT:** PLANNING COMMISSION ELECTRONIC PACKETS  
**DATE:** MAY 6, 2016

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Packets for the Brighton Township Planning Commission meetings posted to the website contain scanned original documents. These electronic packets are subject to change based on meeting material presented to the Planning Commission throughout the course of the meeting. For a complete original packet following the Planning Commission meeting contact the Clerk's Office at 810-229-0560 or via email: [clerk@brightontwp.com](mailto:clerk@brightontwp.com)

## TWO NEW BILLBOARD CASES



**Here a billboard, there a billboard  
it sometimes seems everywhere is a billboard.**

Photo by Deposit Photos

### INSIDE

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**Citizen Planner**, Backcover

**Calendar**, Backcover



**Case Summaries by**  
**Catherine Kaufman, Lori Coates-Hay and Seth Koches, Bauckham, Sparks, Thall, Seeber,**  
*and Kaufman, P.C. Kalamazoo; Steven Joppich and Lisa Anderson, Johnson, Rosati,*  
*Schultz & Joppich, P.C. Farmington Hills; and Mark Eidelson, LandPlan, Meridian Township*

**MICHIGAN COURT OF APPEALS**

**Res Judicata/Equitable Estoppel/  
 City's Obligation to Pay  
 Township's Debts**

*The State Boundary Commission's approval of a city's home rule city petition did not impact township's claim that city was responsible for its proportionate share of township's bond obligations following the city's incorporation as a home rule city.*  
**Sylvan Township v City of Chelsea and Washtenaw County**, \_\_\_\_\_ NW2d \_\_\_\_\_.  
 Approved for publication. Decided Nov. 24, 2015.

In 2000, several qualified electors petitioned the State Boundary Commission (SBC) to consider the Village of Chelsea's incorporation as a home rule city. The petition proposed that territory in the Village of Chelsea and parts of Lima and Sylvan Townships be incorporated into the City of Chelsea. Sylvan Township opposed the petition before the SBC and later in circuit court.

**About the Authors**

**C**atherine Kaufman is an attorney at the municipal law firm of Bauckham, Sparks, Thall, Seeber, and Kaufman, P.C. in Kalamazoo. She focuses her practice on land use and municipal representation. Ms. Kaufman is also a certified planner with the American Institute of Certified Planners (AICP). She may be contacted at [kaufman@michigantownshiplaw.com](mailto:kaufman@michigantownshiplaw.com). Lori Coates-Hay and Seth Koches are associates at the law firm who also helped write these case summaries.

**S**teven P. Joppich is a shareholder and Lisa A. Anderson is an associate at the law firm of Johnson, Rosati, Schultz & Joppich, P.C., which serves municipalities throughout Michigan as general counsel and litigation counsel with offices located in Farmington Hills, Lansing and Marshall. Steve and Lisa may be contacted at [sjoppich@jrsjlaw.com](mailto:sjoppich@jrsjlaw.com) and [landerson@jrsjlaw.com](mailto:landerson@jrsjlaw.com).

**M**ark Eidelson, AICP is president of Landplan, Inc., a private consulting firm specializing in rural community planning and zoning services. His office is located in Meridian Township. He can be reached at [landplanning@comcast.net](mailto:landplanning@comcast.net) or [www.landplan-eidelson.com](http://www.landplan-eidelson.com).

At the same time, Sylvan Township established a special assessment district (SAD) for the construction of water and sewer systems, including the township's construction of its own waste water treatment plant. At some point thereafter, Sylvan Township changed its plans and entered into an agreement with an adjacent township to connect to that township's sewer system. Although the new plans were more expensive than the original plan, Sylvan Township did not revise its SAD or establish a new SAD to pay for the revised project costs/plans. In July 2001, Sylvan Township entered an agreement with Washtenaw County for issuance of bonds to cover the cost of the construction of the water and sewer systems. The agreement between the township and county said that Sylvan Township intended to defray payments to the county through a combination of special assessments, connection fees and user fees. Interest payments on the debt were due each year, beginning in November 2001.

In October 2001, a joint settlement agreement was reached between the Village of Chelsea, petitioners for the Village of Chelsea's incorporation, Sylvan Township and Lima Township. The agreement provided, in part, that Chelsea agreed to annex less land from Sylvan Township and Sylvan Township agreed to stop its opposition to Chelsea's incorporation as a home rule city. Thereafter, in May 2002, the SBC recommended approval of the petition for Chelsea's incorporation to a home rule city. The SBC's decision authorized Chelsea to move forward with an election on adoption of a city charter for the new City of Chelsea. Voters approved the new city's charter at the election in March 2004, at which time the Village of Chelsea along with specific parts of Sylvan and Lima Townships became the City of Chelsea.

During this timeframe, Sylvan Township's water and sewer systems became operative. In 2003/2004, Sylvan Township began to have disputes with developers subject to assessments in the SAD for water and sewer system improvements. Certain developers thereafter sued Sylvan Township and in 2010, the circuit court issued an order determining that the sewer system special assessments were invalid and enjoining the township from collecting special assessments from those developers.

Washtenaw County, in an effort to assist Sylvan Township with refinancing the amount owed to the County, agreed to approve refunding a portion of the bonds in 2010 (\$9.4 million). Thereafter, Sylvan

Township put a tax increase on the ballot to cover the payments on the refunded bonds, but that measure failed. In May 2012, Sylvan Township defaulted on the refunded bonds. In July 2012, Sylvan Township and Washtenaw County entered into a new agreement whereby the County would continue to advance funds to pay Sylvan Township's obligations. This agreement was contingent on Sylvan Township's voters approving a proposed millage increase, from which any funds collected would be used to pay Washtenaw County for the County's covering the township's debt obligations.

In October 2012, Sylvan Township contacted the City of Chelsea regarding the city's "share" of Sylvan Township's bond obligations, based on the premise that Chelsea took 41% of Sylvan Township's assessed valuation when it incorporated as a home rule city. Sylvan Township asserted that, per MCL 117.14, the city therefore assumed 41% of Sylvan Township's liability under the bonds. The City of Chelsea disagreed that it had any such obligation.

In March 2014, Sylvan Township sued the City of Chelsea seeking declaratory relief, asking the court to find that Chelsea assumed a proportionate share of Sylvan Township's liability when it became a city, including the proportionate share of the township's liability for repayment of the bond debt. Sylvan Township later amended its complaint to add Washtenaw County as a defendant. The City of Chelsea moved for summary disposition, based on the doctrines of *res judicata*, noting that the SBC's decision on the petition for the city's incorporation as a home rule city did not require Chelsea to assume any portion of the Sylvan Township's liability. Additionally, Chelsea argued that Sylvan Township's claim was unduly delayed and should be barred under the doctrines of *equitable estoppel* and *laches*.

After a hearing, the trial court granted the City of Chelsea's motion for summary disposition, holding that the SBC's prior decision barred Sylvan Township's current claim (because of *res judicata*) and that *equitable estoppel* also prevented Sylvan Township's current claim. Sylvan Township appealed.

The Court of Appeals reversed the trial court, finding that the SBC decision could not act as *res judicata* on the issue of the City of Chelsea's assumption of liabilities from Sylvan Township.

*"... [T]he legislature did not give the Commission (SBC) the general authority to resolve disputes concerning the*

succession to property or liabilities that might be occasioned by the incorporation of a new city; indeed it provided that the [s]uccession to property and liabilities, division of properties, sharing in revenue from various taxes and state funds distributable among local units and assessment and collection of taxes in newly incorporated municipalities shall be governed by the existing provisions of law."

The Court also noted it would be impractical to allow the SBC to decide the division of assets and liabilities for new cities as electors can adopt a city charter up to 3 years after the SBC's final decision. MCL 123.1010(6). Accordingly, the trial court erred when finding that the SBC decision acted as *res judicata* on the township' request for a declaratory action.

Likewise, the Court also found that the trial court erred in finding that *equitable estoppel* prevented Sylvan Township from claiming that the city is partially responsible for payment on the bonds. In order to prove that Sylvan Township was equitably estopped from asking Chelsea to pay part of the township's bond obligation, "...Chelsea had to present evidence that Sylvan's acts or representations induced Chelsea to believe the Sylvan would not enforce its rights under MCL 117.14, that Chelsea relied on this belief and that Chelsea was prejudiced as a result of this reliance." **McDonald v Farm Bureau Insurance**, 480 Mich 191, 204-205 (2008). Chelsea failed to present evidence that Sylvan Township acted in a way to convince Chelsea that Sylvan Township would not seek to assert its rights under MCL 117.14. Moreover, "although a party may induce reliance through silence, equitable estoppel will only arise from silence under circumstances where the party to be estopped ought to speak out in order to prevent prejudice to the party relying on the silence." See **Lichon v American Ins. Co.**, 435 Mich 408, 415 (1990). The Court found no evidence that Chelsea changed a position based on Sylvan Township's silence.

The Court of Appeals also found that Sylvan Township did not waive its rights under MCL 117.14 in the settlement agreement between the parties. The settlement agreement dealt with the boundaries of the municipalities and the township's waiver of any objection regarding the petitions submitted. In the agreement, the parties specifically noted that neither party waived "any claims or arguments, positions or rights" except as set forth in the agreement. Accordingly, Sylvan Township did not waive its right to enforce MCL 117.14.

On appeal, Sylvan Township states that its claim against Chelsea is not barred by the *statute of limitations* or *laches*, while Chelsea argues that the township's claim is not timely because it came years after the Chelsea incorporated as a city. Sylvan Township makes a claim pursuant to MCL 117.14, which provides that when a new city

is established, "the liabilities 'shall be . . . assumed' by the new city 'as of the date of filing the certified copy of the charter' and using 'the same ratio' provided for cases where a city annexes a portion of a township." Here, Sylvan Township is requesting that the court order Chelsea to pay Sylvan Township for that part of the debt on the bonds issued that Chelsea should have paid and which Sylvan has already paid, along with apportioning out Chelsea's share of the debt on the bonds remaining to be paid. The Court determined that, as this claim is akin to an accounting, the appropriate statute of limitations is 6 years. The Court found that the claim accrued at the time Chelsea first did not pay its share of the assumed liability, irrespective of whether Sylvan paid Chelsea's share at the time. The Court also held that to the extent that Sylvan incurred new liabilities related to the bonds after Chelsea's incorporation as a city, Chelsea did not have any obligation to that portion of the debt. The Court found that there was inadequate evidence in the record to determine when Sylvan Township's claim arose. Likewise, with respect to *laches*, the Court found that it was critical to determine when Sylvan Township's claim arose, in order to determine if the township's failure to earlier assert the claim prejudiced Chelsea. Accordingly, as there was not enough evidence in the record, the Court held that the trial court did not err in refusing to dismiss Chelsea's affirmative defenses of *statute of limitations* and *laches*.

Regarding *alternate relief* available to Sylvan Township and Chelsea, the Court found that the allocation of assets and liabilities between a township and a new city is governed by MCL 117.14, which provides, in part:

"The indebtedness and liabilities of every city, village and township, a part of which shall be annexed to a city shall be assumed by the city to which the same is annexed in the same proportion which the assessed valuation of the taxable property in the territory annexed bears to the assessed valuation of the taxable property in the entire city, village or township from which such territory is taken. Assessed valuation shall be determined in every division pursuant to this section from the last assessment roll of the city, village or township which has been confirmed by the board of review."

Sylvan Township argues that this statute requires that Chelsea assume 41% of Sylvan's debts and liabilities existing on the day that Chelsea's electors adopted the city charter. The Court found that although the former Village of Chelsea lay partially within the boundaries of Sylvan Township, Sylvan Township was not allowed to include the assessed valuation of any property that was located within the village for purposes of debt allocation/assumption under MCL 117.14, if the township did not have the authority to lawfully levy a tax on

that land to pay for the liability. Notably, as Sylvan Township could not legally levy a tax on land lying within the former Village of Chelsea, it could not include any part of those lands in calculating the proportion of Sylvan Township's debts assumed by the City of Chelsea upon incorporation.

The Court of Appeals held that the trial court erred when it granted Chelsea's motion for *summary disposition* based on the *statute of limitations* and *laches*, *res judicata*, *equitable estoppel* and *waiver*. The trial court did not err when denying Sylvan Township's motion for *summary disposition* based on *statute of limitations* and *laches*. The Court of Appeals reversed the trial court and remanded, ordering the trial court to enter an order detailing the proportion of the township's liability that Chelsea must assume, if any, which should not include any portion of the land formerly located within the Village of Chelsea boundaries and dismissing Chelsea's *res judicata*, *equitable estoppel* and *waiver* defenses. [C.K., L.C.H., S.K.]

## Covenants and Bylaws/ Architectural Control Committee

*Plaintiff developer sued a property owners association to determine applicability of architectural control committee restrictions to developer's lots. Philip F. Conlin, et al v. Tom Upton, et al, and Dixboro Farms Property Owners Association, \_\_\_\_\_ NW2d \_\_\_\_\_. No. 322458. Approved for publication. Decided November 24, 2015.*

In 1998 or 1999, Philip Conlin and others purchased approximately 90 acres for a 34-lot development known as Dixboro Farms in Washtenaw County. In January 2001, Conlin and his co-developers recorded restrictions and protective covenants for the development. One such restriction required property owners to obtain the developer's approval before an owner could build on any parcel of land. The covenants also permitted a property owners association to be formed and the appointment or election of a board of directors for that association; the selection method depending upon how much of the development was sold.

After the initial sale and development of eleven lots (of 34 total), there was a gap of development for several years, due to the economic slowdown. In 2010, two homes were approved for construction. After the new construction, some homeowners felt that the new homes did not meet the development's standards for the development. Among the concerns were that the new homes were "low-end, middle, medium-type tract homes," lacking brick and mortar and without "architectural definition." The homes also had "lots of shingles, exposed roof lines, [and were] vinyl-sided."

In an effort to address these concerns,

several residents contacted the developer (Conlin) to request that he appoint a board of directors for a property association. Conlin did so. The following month, at a meeting of the association, several homeowners expressed concerns about "architectural harmony in the subdivision" and asked Conlin to allow the association to elect its own board. Conlin agreed to allow this, although the restrictive covenants recorded in 2001 provided him with the right to appoint the board until 90% of the development was sold. Subsequently, the newly-elected board of directors hired an attorney and bylaws were adopted by a majority of association members over the objection of Conlin and another plaintiff. Those bylaws provided for, among other things, an architectural review committee, which required that a property owner submit a \$2,000 fee with building plans for review prior to building. The bylaws also allowed the committee to reject a plan if the committee was dissatisfied "with the effect of the proposed construction on the harmonious development" of Dixboro Farms." The bylaws were recorded in December 2011.

Thereafter, although he had not agreed to the bylaws, Conlin submitted a proposed development plan to the Association for review. In response, the architectural review committee objected to the proposed setback for the lot, emphasized required building materials and requested the \$2,000 fee.

The developers sued in August 2011, alleging that the bylaws contained invalid restrictions that did not apply to the developers' lots and that the bylaws slandered the developers' title. The trial court dismissed the slander of title claim and claims against the Association's individual officers, but the case still went to trial on the validity of the restrictions imposed by the bylaws.

At trial, the developers moved for a directed verdict, arguing that evidence showed the original covenants and restrictions were burdened by the bylaw requirements which were not permitted by original covenants. The trial judge determined it was up to the jury to decide whether the restrictions of the bylaws exceeded those allowed in the original covenants and whether Conlin assigned his approval rights to the Association. Ultimately, the jury only determined that the bylaws were not restrictive covenants running with the land and that they did not impair the developer's rights as set forth in the covenants and restrictions filed in 2001. The jury did not consider whether Conlin assigned his approval rights to the Association. Plaintiffs then took this appeal.

On appeal, the focus of the Court's analysis was on Article XII of the bylaws, i.e., that provision establishing the architectural review committee. As to the issue of the directed verdict, the Court of Appeals determined that there was undisputed evidence that the bylaws were

not unanimously approved and that the originally-filed covenants did not allow the Association to provide more restrictions in the absence of unanimous property owner consent. However, because the issue of whether Conlin assigned his approval rights over to the Association was never determined, the trial court did not err in denying the motion for a directed verdict. Furthermore, the Court of Appeals noted that the extent to which the bylaws actually imposed additional restrictions on lots depended upon whether Conlin did assign his approval rights to the architectural control committee. As that question was not answered at trial, the Court directed the trial court to hold a new trial as to that issue, if necessary. [C.K., L.C.H., S.K.]

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### Indemnification/Condominiums

*A trial court erred in its interpretation of an indemnification agreement between plaintiff condominium association and defendant city in ruling that the indemnification extended to flood damages and was not limited to damages in association with a sewer line running under the condominium site. Plaza Towers Condominium Association v City of Grand Rapids, No.323937. Decided December 10, 2015. Unpublished.\**

The Grand Rapids Downtown Development Authority (DDA) owned property along the Grand River. In 1987, defendant City of Grand Rapids entered into a Development Contract with United Development for the development of the property for a mixed-use project. The agreement included a provision that expressly indemnified the city and the DDA against any loss of any kind in association with construction over an existing sewer line and the use of the line, and that the indemnification is to run with the project site. In 1989, the city and United Development entered into a separate contract, entitled "Combined Sewer Easement and Indemnification Agreement" (Sewer Agreement). The 1989 Sewer Agreement made specific reference to the earlier 1987 Development Agreement and that United Development had previously agreed to indemnify the City against certain losses relative to the sewer.

Paragraph 6 of the 1989 Sewer Agreement reads as follows:

*"United hereby agrees that it shall not assert against the City or the DDA and shall protect, indemnify, and keep and save harmless the City and the DDA from and against any and all claims, suits, causes of action, judgments, costs, damages, or expenses (including reasonable attorney fees) of any kind or nature relating to any and all damages to any physical improvements, excluding the Sewer itself, constructed on the Project Site (as that term is defined in the Development Contract), including,*

*but not limited to, damages caused by the actual or alleged negligence of the City or the DDA in reconstructing, replacing, repairing, maintaining, removing or inspecting the Sewer."*

United Development constructed Plaza Towers on the project site, comprised of a 33-story mixed-use building and parking structures.

Following the construction of Plaza Towers, the city removed a portion of a floodwall in association with the city's construction of walkways along the Grand River. Flood conditions occurred in April 2013 in association with heavy rains. Flood conditions resulted in substantial damage to Plaza Towers. Plaintiff Plaza Towers Condominium Association filed a lawsuit against the city, alleging claims of condemnation and trespass/nuisance, and sought reimbursement for damages, repair costs, construction to prevent future similar occurrences, increased insurance premiums, and costs and attorney's fees. A trial court granted the city's motion for summary disposition on the basis that the Plaza Towers' claims were barred by the 1989 Sewer Agreement.

On appeal to the Court of Appeals, the Court clarified that the case issue was whether paragraph 6 of the 1989 Sewer Agreement prohibited Plaza Towers from taking action against the city for property damage not a result of the sewer below the site but, instead, the removal of the floodwall.

*"In this case, we conclude that the doctrine of ejusdem generis should apply to the interpretation of paragraph 6 because, when this paragraph is read in context of the Sewer Agreement as a whole and in light of the Development Agreement, it is plain that the parties intended to hold the City harmless for property damages only with respect to the City's conduct pertaining to the Sewer beneath the property...Further, from the recitals in the Sewer Agreement, it is clear that the indemnification provided in the Sewer Agreement was intended to effectuate the indemnification called for by the earlier 1987 Development Agreement. By its plain terms, the Development Agreement called for indemnification for damages 'arising out of the construction over the sewer line or use thereof.' The scope of this required indemnification, focused on the building's construction and use in relation to the Sewer, constituted a much a narrower grant of indemnification than what is now advanced by the City."*

The Court reversed the trial court's ruling and remanded. [M.E.]

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### Governmental Immunity/Sewage Disposal System Event Exception

*Property owners could proceed with their claim against a county road commission under the 'sewage disposal system event exception' to governmental immu-*

nity based on their allegation that clogged storm water catch basins and culvert, along a public roadway caused flooding and mold contamination in their home. **Mielcarek, et al. v Charter Township of Orion, et al.** No. 323396. Decided December 15, 2015. Unpublished.\*

Plaintiffs filed a lawsuit against the Oakland County Road Commission, Oakland County, and the Charter Township of Orion for damages due to mold contamination caused by the ongoing flooding of their home as a result of clogged storm water catch basins and culvert, along Waldon Road. Plaintiffs first experienced basement flooding in November 2011 and notified the county road commission after they were advised that the water was coming from clogged catch basins associated with a storm drain along a public roadway. The county road commission cleared the drain of debris and the flooding stopped. In 2013, plaintiffs experienced additional flooding and again notified the county road commission of the problem. The road commission repaired the catch basins in August 2013.

Plaintiffs moved out of their home in 2013, citing health concerns due to mold contamination. Sometime thereafter, plaintiffs filed suit against the county road commission and others, alleging that a clogged sanitary sewer line caused their property to flood. The sanitary sewer line was later eliminated as a cause of the water backup, and plaintiffs amended their argument to assert that clogged storm water catch basins and a culvert in front of their home and along a public roadway were to blame for the floods and mold contamination. Plaintiffs alleged that the county road commission failed to include the storm water catch basins and culvert on their regular maintenance schedule to remove accumulated debris and thus created a defect in the storm water drainage system. Plaintiffs also sought recovery under the highway exception to governmental immunity.

Oakland County and Orion Township were dismissed from the lawsuit and the case proceeded against the county road commission. The road commission moved for dismissal under a number of theories, arguing that the water originated from a source other than the culvert and basins, and claiming that plaintiffs' failure to maintain a sump pump or drainage system on the property contributed to the flooding. The road commission also claimed that plaintiffs could not establish a system defect because the commission had performed regular maintenance on the storm drain after November 2011. Plaintiffs moved for summary disposition as well on the issue of liability. The trial court partially granted the road commission's motion and dismissed plaintiffs' claim under the highway exception to governmental immunity, but declined to grant summary

disposition to either party on the application of the sewage system disposal event exception. Both parties filed an appeal.

On appeal, the county road commission relied on the Court of Appeal's previous decision in **Fingerle v City of Ann Arbor, 308 Mich App 318; 863 NW2d 698 (2014)**. **Fingerle** held that the sewage disposal system event exception to governmental immunity (referred to as the Sewage Act) did not apply to claims arising from rainwater flooding. The Court observed that the majority opinion in **Fingerle** had been vacated and concluded that the county road commission's reliance on **Fingerle** was misplaced.

Under the Government Tort Liability Act, a government agency like the county road commission is immune from tort liability for the overflow or backup of a sewage disposal system unless the overflow or backup is caused by a sewage disposal system event. MCL 691.1416(b). To avoid the bar of governmental immunity, a plaintiff must establish that the following conditions existed at the time of the event: (a) the government agency against which the claim is made is an appropriate governmental agency, (b) the sewage disposal system had a defect, (c) the governmental agency knew, or in the exercise of reasonable diligence should have known, about the defect, (d) despite its knowledge of the defect, the governmental agency failed to take reasonable steps in a reasonable amount of time to repair, correct, or remedy the defect, and (e) the defect was a substantial proximate cause of the event and the damage that occurred. MCL 691.1417(3).

The Act provides an exception to governmental immunity for sewage disposal system events, which it defines as the "overflow or backup of a sewage disposal system onto real property." A "sewage disposal system" is defined to include "a storm water drain system under the jurisdiction and control of a governmental agency."

The Court of Appeals concluded that the statutory definitions of sewage disposal system and sewage disposal system event expressly include storm water drainage systems like those alleged by plaintiffs. Additionally, the Court found that plaintiffs had succeeded in asserting genuine issues of fact as to whether the Road Commission created a defect by improperly maintaining the drains free from debris, and had introduced evidence to show that the water originated from the clogged drains. Ultimately, the Court concluded that genuine issues of fact remained on the applicability of the sewage disposal system event exception, and remanded the case for further proceedings. [S.J. & L.A.]

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### **Pawnbroker Transaction Ordinance**

*A trial court did not err in finding that defendant city's ordinance providing for a*

*third party to collect and maintain pawnbroker transaction information, and transmit such information to the local police department, was valid. Motor City Pawn Brokers, Inc. v City of Warren, No. 3222459. Decided December 17, 2015. Unpublished.\**

The Michigan Pawnbrokers Act (MCL446.201 et seq.) requires pawnbrokers to record certain information for all transactions such as the customer's name, address, driver's license, and the article sold or pledged to secure a loan, and that the pawnbroker must submit such information to the local police agency. Defendant City of Warren adopted an ordinance in 2012 that required transaction records to be submitted to LeadsOnline, LLC, a private company that maintains a database of pawnbroker transaction information and acts as an agent for local law enforcement agencies by receiving and compiling transaction reports. The information generated by LeadsOnline is available only to law enforcement agencies. Plaintiff Motor City Pawn Brokers, Inc. (Motor City), operating within the City, brought a suit against the City on multiple claims.

In regard to Motor City's claim that the City's ordinance violated the Financial Services Modernization Act (15 USC 6801 et seq.), the Court found that there was no such violation because the required disclosure of a pawnbroker transaction is necessary to complete the transaction requested by the consumer, the disclosure falls within the exception to nondisclosure provided by the Act, and the City's ordinance does not establish a lower level of consumer protection than as provided by the Act.

The Court disagreed with Motor City's claim that LeadsOnline was an interstate law enforcement intelligence organization under the Michigan Interstate Law Enforcement Intelligence Organizations Act (MCL 752.1 et seq.) and, as such, the City's police department's participation in the LeadsOnline program was illegal. The Court found that LeadsOnline met only three of the four requirements for qualifying as an interstate law enforcement intelligence organization. Specifically, the Court concluded that the information gathered by LeadsOnline does not constitute confidential information that is not available through regular police channels.

The Court disagreed with Motor City's claim that the surcharge assessed under the City's ordinance constituted a tax, in violation of the Headlee Amendment. The Court found that the surcharge constituted a user fee, the fee was reasonably related to actual costs of LeadsOnline, and the fee was voluntary as the act of doing business as a pawnbroker is a voluntary decision.

The Court disagreed with Motor City's claim that the City's ordinance violated the Fair Credit Reporting Act (15 USC1681 et seq.), finding that there was no evidence suggesting that LeadsOnline or the law

enforcement agencies it served intended to use the transaction data for determining customer credit worthiness.

The Court disagreed with Motor City's claim that the City's ordinance violated the Michigan Pawnbrokers Act, finding no conflict between the two including that the Act does not prohibit electronic reporting and the Act is silent regarding the designation of a third party as an agent for the police department for receiving and maintaining transaction reports.

The Court of Appeals affirmed the trial court's ruling. [M.E.]

## Riparian Rights

*A trial court did not err in ruling that plaintiff developer did not possess riparian rights in a lake created by defendant city to establish a municipal water supply. Lake Adrian Developers, LLC v City of Adrian and Savoy Energy, LP, No. 322511. Decided December 17, 2015. Unpublished.\**

In 1941, defendant City of Adrian dammed Wolf Creek to create a municipal water supply. The city has maintained the resulting lake since that time. Co-defendant Savoy Energy, LP (Savoy) entered into an agreement with the city for oil and gas exploration rights on various city-owned properties, including the Lake Adrian bottomlands, in exchange for royalty payments to the city. Plaintiff Lake Adrian Developers, LLC (Adrian Developers) filed a lawsuit, claiming that the six lots that it owned along Lake Adrian afforded Adrian Developers riparian rights and, as a result, should receive royalty payments as well. A trial court granted summary disposition in favor of the city.

On appeal to the Court of Appeals, the Court noted that common-law rule provides that riparian rights do not attach to an artificial watercourse and Lake Adrian was an artificial lake as its origin was a result of the damming of Wolf Creek by the city. *"City bought or acquired all of the property abutting Wolf Creek before damming its flow, and plaintiff only bought property after Lake Adrian – an artificial lake – was created. Accordingly, we agree with the trial court that the general rule – that riparian rights simply do not attach to an artificial watercourse – applies here."*

The Court disagreed with Adrian Developers' claim that it acquired riparian rights through adverse possession. The Court found that in addition to the artificial nature of Adrian Lake and resulting lack of riparian rights, Adrian Developers' actions were not exclusive or hostile as required under an adverse possession claim. The city allowed anyone to use the lake, subject to certain rules, and the city gave *"its implicit permission."*

The Court also disagreed with Adrian Developers' claim that the Inland Lakes and Streams Act granted it with riparian

rights. The Court did not agree with Adrian Developers' claim that under the Act, Lake Adrian constituted an *"inland lake"* because it was greater than five acres in area and, thus, it owned the shore of an inland lake. *"Lake Adrian may indeed be an inland lake for purposes of Part 301 of the NREPA, but MCL 324.30101 does not confer riparian rights where none previously existed, and the statute does not abrogate or transcend the general common-law rule discussed above."*

The Court of Appeals affirmed the trial court's ruling. [M.E.]

## Municipal Liens/Water Service

*A trial court erred in finding that defendant City's water service ordinance, and the liens established under such ordinance, were in conflict with the Municipal Water Service Act and Revenue Bond Act and therefore invalid. NL Ventures VI Farmington, LLC v City of Livonia, No. 323144. Decided December 22, 2015. Appointed for publication January 28, 2016.*

Plaintiff NL Ventures VI Farmington, LLC (NL Ventures) accumulated water and sewer charges and liens against its property in defendant City of Livonia. A trial court granted NL Ventures summary disposition and invalidated the charges and liens. NL Ventures claimed that the city's failure to follow its own water service ordinance regarding placement of water arrearages on the tax rolls required the court to render the liens unenforceable.

On appeal to the Court of Appeals, the city charged that the trial court misinterpreted the relevant statutory provisions of the Municipal Water Liens Act (MWLA, MCL 123.161, et seq.), the Revenue Bond Act (MCL 141.101, et seq.), and the city's ordinance provisions regarding water rates. With a lack of case law specific to the pertinent statutory provisions, the Court undertook an analysis of the provisions. In reviewing the MWLA, the Court noted that the Act's purpose is to provide (in part) for the collection of water or sewage system rates and provide for liens for water and sewage services, that the lien created by the MWLA may be enforced by a municipality through a municipal ordinance, and that a municipality may discontinue services for failure to pay the rates or the municipality may institute an action in court for collection. The Court of Appeals found that the trial court erred in dismissing and invalidating the City's liens on NL Ventures' property.

In regard to the MWLA claim, the Court noted that the requirements of MCL 123.162 are mandatory due to the use of the word *"shall"* and, as such, MCL 123.162 requires the establishment of a lien as security for the collection of rates and fees. MCL 123.162 further provides that the lien is effective upon the delivery of the service and its enforceability is limited to not more than 3 years after the lien

becomes effective. The Court noted that, taken as a whole, the MWLA's provisions

*"obviate the trial court's determination that defendant's failure to strictly conform to its own ordinance serves to negate the lien mandated by the statutory scheme of 1939 PA 178...This is not to suggest that defendant is entitled to the entirety of the amount indicated by its liens...At the very least, however, defendant is entitled to payment for those arrearages that are within the timeframe designated by MCL 123.162."*

The Court similarly found that the trial court erred in its interpretation of the relationship between the city's ordinance and the Revenue Bond Act (Bond Act).

*"The trial court's error was in reading the statutory provisions as unrelated entities and elevating the local ordinance to a position that would supersede 1939 PA 178 and MCL 141.101 et seq., rather than viewing all of the statutory schemes in a comprehensive and cohesive manner. In this instance, MCL 123.162 provided for the immediate effectuation of a lien for any water charges incurred on plaintiff's property. Notice of the existence of such a lien was constructive in accordance with MCL 123.164 and did not require actual notice by defendant to plaintiff for the lien to be valid. The method of enforcement for the lien was discretionary, with MCL 123.163 permitting defendant to elect methods prescribed 'in the charter of the municipality, by the general laws of the state providing for the enforcement of tax liens, or by an ordinance duly passed by the governing body of the municipality.' Most importantly, defendant, or any other similarly situated municipality, is not constrained in the manner for collection of the arrearages, rendering the validity of the liens sacrosanct, MCL 123.166, other than the imposition of limitations on when enforcement or collection actions can initiate, MCL 141.121(3), and the length of time available for enforcement, MCL 123.162."*

The Court of Appeals vacated the trial court's order and remanded for further proceedings. [M.E.]

## Sidewalk Liability

*A trial court did not err in finding that a particular segment of paving in defendant city was a sidewalk under MCL 691.1401(f) and rejecting the city's argument that plaintiff's claim of bodily injuries under the highway exception precluded economic damages for work loss and emotional injuries. Judith Angeloff v City of Royal Oak and Grand Trunk Western Railroad Co., No. 322643 and No. 322853. Decided December 29, 2016. Unpublished.\**

Plaintiff Judith Angeloff filed a lawsuit against defendant City of Royal Oak

(City), alleging that sidewalk defects underneath a railroad viaduct caused her to lose control of her bike and fall. Angeloff claimed that the city was liable under MCL 691.1402a because the sidewalk was under the city's jurisdiction and the city was responsible for maintaining the sidewalk. A trial court granted partial summary disposition in favor of Angeloff.

On appeal to the Court of Appeals, the city claimed that its motion for summary disposition should have been granted because the particular segment of pavement did not qualify as a "sidewalk" under the Government Tort Liability Act (GTLA) and, therefore, the exception to its immunity does not apply. The city claimed that the segment of paving under question did not satisfy the "public" or "intended for pedestrian use" elements of the GTLA's definition of sidewalk. The Court disagreed with the city's claim:

*"We disagree with Royal Oak's argument that Grand Trunk's ownership of the underlying fee precludes a determination that the sidewalk is a "public" sidewalk. Although Grand Trunk's surveyor indicated in his deposition that the area where Angeloff fell is Grand Trunk's property, he also stated that Grand Trunk's property was subject to Royal Oak's public rights. He testified that the north side was within the boundary lines of the Thirteen Mile Road right of way. Grand Trunk's warranty deed expressly provides that the property is subject to public's right-of-way. The 1925 subdivision plat depicting the disputed area specifies that, subject to a right of reversion, 'streets and alleys shown on said plat are hereby dedicated to the use of the public.'...Although there are some distinctions between common-law and statutory dedications with respect to whether a dedication is accompanied by a conveyance of the title or creates a public easement, the public control acquired over the land under either dedication is only in trust to secure the public rights."*

The Court also dismissed the city's claim that the trial court erred in dismissing its summary disposition motion to preclude Angeloff from recovering economic damages for work loss and noneconomic damages for emotional injuries and suffering. The Supreme Court had previously determined under the motor vehicle exception (MCL 691.1405), "bodily injury" includes physical or corporeal injury to the body.

The Court of Appeals affirmed the trial court's ruling. [M.E.]

## Wetlands/Takings

*A trial court did not err in ruling in favor of the DEQ and requiring the defendant remove four acres of fill material, restore the area to its original wetland character, cease all wetland violations, and pay a \$30,000 statutory fine. Department of En-*

**vironmental Quality v Jack O. Morley**, No. 323019. Decided December 15, 2015. Approved for publication February 9, 2016.

**T**he Department of Environmental Quality (DEQ) filed a lawsuit against defendant Jack O. Morley in association with Morley's alleged dredging, filling and draining a wetland and maintaining a use on such wetland, contrary to Part 303 of the Natural Resources and Environmental Protection Act. A trial court ruled in favor of the DEQ, finding that 92 of the 106-acre subject property was wetlands and requiring Morley to remove four acres of fill material, restore the area to its original wetland character, cease all Part 303 violations including farming activities, and pay to the DEQ a \$30,000 statutory fine.

On appeal to the Court of Appeals, Morley argued that the trial court erred when it granted the DEQ's motion to strike Morley's demand for a jury trial. The Court disagreed, referencing the Michigan Constitution and past court decisions, and noted that the Constitution ensures a right of trial by jury where the right to a jury trial existed prior to the Constitution's adoption.

*"Because there is no historical right to a jury trial in Michigan when the relief sought is equitable in nature – like in this case where the DEQ sought declaratory relief – defendant was not entitled to a jury trial...Because wetland protection is not a cause of action known to the common law, but is instead a new cause of action created by statute, there is no constitutional right to a jury trial... even though the statute also provides for monetary damages..."*

The Court dismissed Morley's claim that because the DEQ's claims were misdemeanor crimes, the state was required to prove Morley's guilt to a jury. The Court of Appeals noted that the DEQ only filed a civil action against Morley and did not seek to criminally prosecute him. "Thus, it is irrelevant that the statute provides for criminal liability." The Court similarly dismissed Morley's claim that federal law determines whether Morley was entitled to a jury trial – not state law. The Court noted that the U.S. Constitution grants the right to a jury trial in the case of civil trials, except where the Fourteenth Amendment applies fundamental, substantive rights to the states. The Court noted past decisions that concluded the Fourteenth Amendment

*"...neither implies that all trials must be by jury, nor guarantees any particular form or method of state procedure and that a state may choose the remedy best adapted, in the legislative judgment, to protect the interests concerned, provided its choice is not unreasonable or arbitrary, and the procedure it adopts satisfies the constitutional requirements of reasonable notice and opportunity to be heard. Further, our Supreme Court has recognized that the Constitution of the United States does not confer a fed-*

*eral constitutional right to trial by jury in state court civil cases."*

In response to Morley's claim that the trial court's order to cease all actions on the subject property constituted a judicial taking, the Court of Appeals disagreed and referenced its past decision in **K & K Construction**.

*"In K & K Constr, Inc v Dep't of Environmental Quality, 267 Mich App 523, 529-530, 549, 553-563; 705 NW2d 365 (2005), a panel of this Court concluded that wetland regulations, which resulted in the DEQ denying the plaintiff's application for a permit to fill wetlands, did not constitute a taking of the plaintiff's property, even though it decreased the value of the property significantly, because the property retained substantial value and usefulness, the plaintiffs were aware of the regulations when they purchased the property, and the regulations were universal throughout the state and did not single out the plaintiff's property to bear the burden of the public interest in wetlands. In so holding, this Court noted that, standing alone, a decrease in the value of the property is insufficient to establish a compensable taking."*

In speaking more specifically about the instant case, the Court noted:

*"Part 303 applies throughout the state for the benefit of everyone...and there is no evidence that defendant was singled out to bear the burden of the public's interest in wetlands...the designation of the majority of defendant's property does not itself constitute a taking. In addition, there was no evidence placed on the record that with the injunction there was no economically viable use of the property, regardless of the trial court's comment that there was nothing defendant could do with the property given the injunction. Moreover, contrary to defendant's assertion, the Army Corps of Engineers notified him in 1994 and 2007 that his property contained wetland. The DEQ also notified him in 2007 that he had regulated wetlands on his property. Furthermore, as the owner it is presumed that he was aware of the statutory ramifications if his land was regulated wetland."*

The Court of Appeals affirmed the trial court's decision. [M.E.] □

**\* Unpublished Opinions** are not precedent and not binding under the rule of *stare decisis* (MCR 7.215(C)(1)). See, **Dyball v Lennox**, 260 Mich App 698; 705 n1 (2003). Unpublished cases need not be followed by any other court, except in the court issuing that opinion. But, a court may find the unpublished case persuasive and dispositive, and adopt it or its analysis. Unpublished cases often recite stated law or common law. You are cautioned in using or referring to unpublished cases; and should discuss their relevance with legal counsel. □

# TWO NEW MICHIGAN BILLBOARD CASES

By Mark A. Wyckoff, FAICP, Editor

As the significant impact of the **Reed v. Gilbert** U.S. Supreme Court decision in June of 2015 has started to sink in and communities are beginning the process of reforming their sign provisions to be content-neutral (see **PZN** July 2015 and the **Michigan Sign Guidebook** – <http://sce-nicmichigan.org/sign-regulation-guide-book/>), two new unpublished Michigan Court of Appeals billboard decisions have recently been released. Both involve International Outdoor, Inc. By billboard company standards, this is a very small company serving Southeast Michigan. According to their website, they were founded in 1997, and operate over 77 billboard faces in Wayne, Oakland and Macomb counties, and will soon be expanding into digital displays. The defendant in the first case was the City of Harper Woods, while in the second case it was the City of Livonia. Each of the cases is summarized below.

## MICHIGAN COURT OF APPEALS

### Billboards/Record of BZA Decision

The Court upheld a constitutional challenge to city billboard standards, but remanded the BZA decision to prepare a complete record of its decision and rationale. **International Outdoor, Inc. v City of Harper Woods**. No 325469. Decided April 26, 2016. Unpublished.

Plaintiffs alleged that the sign regulations of the City of Harper Woods were unconstitutional and that the record of the Board of Zoning Appeals (BZA) in support of denial of a special permit were inadequate. The facts are reproduced from the Opinion below. Please, note the size of the signs permitted in the Harper Woods ordinance compared to that requested by plaintiff International Outdoor, Inc. – which were over three times larger. A special permit procedure involving the BZA was followed to consider a larger size.

*“Plaintiff is in the business of building billboards and selling advertising on those billboards. Plaintiff wanted to erect billboards in Harper Woods. Before building, plaintiff sought permission from defendant’s building inspector to obtain permits for construction. The building inspector denied the permit requests to build the signs, finding that plaintiff’s proposed billboards violated § 21-6 of defendant’s sign ordinance, which provides size, height, and setback requirements for signs. Harper Woods Ordinances, § 21-6. Specifically, § 21-6 requires that a ground pole or free-*

*standing sign, a category that includes billboards, have a maximum area of 200 square feet, maximum height of 22 feet, and minimum setback of 25 feet. Id. Plaintiff’s proposed billboards were 672 square feet in area, 70 feet tall, and had no setback.*

*The sign ordinance contains a provision permitting individuals to seek a ‘special permit’ to build a sign that does not comply with the sign ordinance. Harper Woods Ordinances, § 2115. Plaintiff submitted applications for special permits pursuant to § 21-15(d) of defendant’s sign ordinance. The applications submitted by plaintiff included a document expressing why plaintiff believed the special permits should be granted, citing, among other reasons, similar signs in the area. Pursuant to § 21-15, the special permit requests were considered by the BZA.*

*The record of the BZA reveals that the BZA received input from a community planner, McKenna Associates, as well as defendant’s fire marshal. The fire marshal was also the building inspector who initially denied the sign permit requests. Both McKenna Associates and the fire marshal recommended that the BZA deny the special permits. The leasing agent for a local apartment complex and the property manager for a local condominium complex submitted letters opposing the special permits for the billboards. McKenna Associates and the citizens asserted that the billboards would not be appropriate, while the fire marshal stated that defendant’s fire department was not equipped to handle a fire on the billboards.*

*Representatives from plaintiff attended the BZA meeting pertaining to plaintiff’s requests for special permits. The only official record of that meeting is the meeting minutes. The meeting minutes reveal that plaintiff was present, that several citizens were present to oppose the billboards, and that two letters were submitted. The minutes do not reflect what evidence was presented or what arguments were made. Nor do the minutes provide any factual findings or any reasoning on behalf of the BZA. Rather, the meeting minutes simply announce that the requests for special permits were denied.*

*Plaintiff appealed that decision as of right to the circuit court, alleging that the BZA failed to provide reasoning and factual findings on the record, and arguing that defendant’s sign ordinance was unconstitutional. After hearing arguments from the parties, the circuit court determined that defendant’s sign*

*ordinance was constitutional and that the BZA’s failure to state findings of fact and reasoning on the record was not error requiring reversal where the record provided by the BZA fully supported the reasoning behind the BZA’s decision. Subsequently, this Court granted leave to appeal.” [Footnotes omitted.]*

The plaintiff argued that the Harper Woods sign ordinance was an unconstitutional prior restraint on free speech. The Court of Appeals disagreed. In its analysis the Court noted the extensive public purposes for the ordinance, and that the signs as proposed failed to comply with the ordinance requirements. The Court also quoted the four standards which must be met in order for the BZA to grant a special permit. Note that each of the four standards is discretionary.

*“(1) The particular sign will be in harmony with the general purpose and intent of this chapter; (2) The sign will not be injurious to the immediate neighborhood or adjacent land use; (3) The sign is sufficiently compatible with the architectural and design character of the immediate neighborhood; (4) The sign will not be hazardous to passing traffic or otherwise detrimental to the public safety and welfare.”*

The Court also noted that even if a sign conforms with the four standards, that the decision to approve or deny rests with the BZA because of the way the empowering language in the ordinance was written. The Court reviewed previous U.S. Supreme Court decisions and disagreed with plaintiff’s assessment that the ordinance was “a licensing scheme that amounts to a prior restraint on speech and does not have sufficiently objective standards to avoid the dangers of censorship.” Instead the Court of Appeals relied heavily on the U.S. Supreme Court decision in **Thomas v Chicago Park District**, 534 US 316 (2002), and said that

*“it is clear that defendant’s sign ordinance permits signs, including billboards, that comply with the area, height, and setback requirements found in § 21-6, and that this section is a constitutional time, place, and manner restriction on signs. Section 21-15(d) merely permits the BZA to waive those requirements and grant a special permit for the reasons stated within that section. Defendant’s sign ordinance does not bar billboards entirely and then only permit them once a special permit is obtained.”*

With regard to plaintiff’s due process

challenge, the Court of Appeals agreed that the BZA had failed to make a proper record. The Court reviewed case law and statutory requirements for a proper record, especially as documented in **Reenders v Parker**, 217 Mich App 373 (1996) and concluded:

*"The present case reveals an even more egregious lack of factual findings than that in Reenders. Here, defendant's BZA did not make a single factual finding on the record, nor did it provide any reasoning for why plaintiff's special permits were denied. The BZA simply announced its position that the special permits were denied. Pursuant to the binding decision in Reenders, that action by the BZA is not permitted. As this Court stated in Reenders, 217 Mich App at 381, 'we cannot affirm a decision where the record is as devoid of factual or logical support as is the case here.'"*

The Court of Appeals reversed in part, affirmed in part, and remanded "in order for the BZA to develop the record related to its factual findings and reasoning for its decision." In an attached Order, the Court gave the BZA 56 days from the Clerk's certification of this order to prepare the supplementary record.

## Billboards/Exclusionary Zoning/ Equal Protection

Allegations of exclusionary zoning under common law or statutory law were rejected as were claims of equal protection violations. **International Outdoor, Inc. v City of Livonia**. No 325243. Decided June 14, 2016. Unpublished.

The plaintiff, International Outdoor, Inc. alleged that the City of Livonia engaged in exclusionary zoning and violated plaintiff's right to equal protection under the law. The facts and procedural history as laid out by the Court of Appeals follows:

*"Since 1952, defendant's zoning ordinance has prohibited the installation of any off-premises billboard within the city. Billboards that existed when the ordinance was enacted were allowed to remain, but the last of those billboards was eliminated in 1986.*

*In particular, § 18.16 of the zoning ordinance provides: The erection and maintenance of billboards and outdoor advertising signs on any parcel of land within the City of Livonia, or the use of any such parcel for said purpose, are hereby prohibited; provided, however, that this section shall not apply to billboards or outdoor advertising signs lawfully in existence at the time this ordinance becomes effective, nor to those specific signs which are expressly allowed by the district regulations contained in this ordinance.*

Section 18.50C, the provision specifically challenged by plaintiff, states:

*Section 18.50C Prohibited Signs. . . . A sign not expressly permitted in a zoning district is prohibited. The following signs as defined in Section 18.50A of this ordinance shall not be permitted and are expressly prohibited in any zoning district: \* \* \* 2. 'Billboards'*

Section 18.50A of defendant's zoning ordinance defines a 'billboard' as '[a] ground sign advertising a product, event, person, business or subject not related to the premises on which the sign is located.' Thus, a 'billboard' is an 'off-premises' sign—one that advertises a product not available at the location on which the sign is located. 'On-premises' signs are permitted so long as they meet certain site requirements.

Additionally, defendant's sign ordinances generally permit two types of signs outside of buildings: (1) wall signs, the maximum area of which are determined by the building's frontage on the adjoining street, and (2) grounds signs, which are generally limited to a height of no more than six feet, measured from the ground, and 30 square feet in area.

In December 2013, plaintiff filed a permit application to erect a billboard on leased property adjacent to the I-96 expressway. The application was denied because defendant did not allow billboards within its boundaries and the desired sign was too large to be permitted as a freestanding sign under the zoning ordinance. The zoning board of appeals denied plaintiff's subsequent request for a variance.

In July 2014, plaintiff filed a complaint in the circuit court, alleging that defendant's ordinance completely excluded an otherwise permissible use of land, was contrary to plaintiff's right to equal protection under the state and federal constitutions, and amounted to impermissible exclusionary zoning in violation of MCL 125.3207 and the common law. Defendant moved for summary disposition, arguing, *inter alia*, that (1) the ordinance was properly enacted to promote aesthetic qualities and traffic safety and, therefore, was reasonably related to the health, safety, or general welfare of the community; (2) as a city-wide ban on all new billboards, the ordinance did not treat plaintiff differently than any other similarly situated person or entity; and (3) plaintiff failed to establish a demonstrated need for billboards within defendant's boundaries.

The trial court granted defendant's motion, concluding that plaintiff failed to demonstrate a need for billboards within defendant's city limits because of the 'umpteen billboards that surround this area,' and that plaintiff's constitutional challenges lacked merit because defendant's concerns for traffic safety and aesthetics were reasonably related to the ordinance's purpose."

The Court of Appeals rejected plaintiff's allegations regarding exclusionary zoning and equal protection by first examining common law and its relationship to the equal protection clause of the Michigan Constitution, and then examining statutory law regarding exclusionary zoning. The Court noted without deciding, that common law claims concerning exclusionary zoning may no longer be viable in light of the statutory language on exclusionary zoning in the Michigan Zoning Enabling Act (citing **Hendee v Putnam Twp.** 486 Mich 556, 2010).

Plaintiff's claim was simple, based on prior court decisions that "a community cannot effectively zone out legal businesses." The Highway Advertising Act of 1972 (HAA, MCL 252.301 *et seq*) provides that billboards are a legal business. Ergo, a Michigan municipality cannot "declare itself a billboard free community."

However, section 4 of the HAA "recognizes that ordinances that were already in existence in 1972 are not invalidated by the Legislature's adoption of the HAA." The Court said that the plaintiff failed to show amendments to Livonia's 1952 prohibition of billboards that were made in 1978 did not conflict with state law. After reviewing a number of cases, and in particular the Michigan Supreme Court opinion in **Adams Outdoor Advertising, Inc. v City of Holland** 463 Mich 675, (2001), the Court of Appeals ruled that Livonia's ordinance "does not constitute a total prohibition on billboards on its face." (emphasis by Court). Because the prohibition does "not apply to billboards or outdoor advertising signs lawfully in existence at the time this ordinance becomes effective, nor to those specific signs which are expressly allowed by the district regulations contained in this ordinance."

With regard to the equal protection challenge, the Court reviewed the intent section of Livonia's sign restrictions and concluded:

*"It is clear that the primary rationales for the billboard restrictions in defendant's zoning ordinance were promoting aesthetic features, including the prevention of visual blight, and reducing traffic hazards for motorists. Each of these factors constitutes a legitimate governmental interest in regulating billboards. See **Metromedia, Inc v City of San Diego**, 453 US 490 (1981)."*

With regard to violation of the statutory prohibition against exclusionary zoning in section 207 of the MZEA (MCL 125.3207), the Court of Appeals acknowledged that:

*"Defendant's ordinance has the effect of totally banning billboards in the city since there no longer are any billboards in existence that preceded the adoption of the billboard ban in 1952, and because § 18.50C prohibits the erection any new billboards. Even so, plaintiff has failed to show a demonstrated need*

for billboards in Livonia or in the surrounding area.”

The Court of Appeals went on to say:

“The trial court concluded that there was no demonstrated need for billboards within defendant’s city limits because the billboards permitted by other surrounding communities adequately addressed any such need. We agree that the trial court’s grant of summary disposition on this claim was proper because plaintiff demonstrated, at most, that there is a demand for billboards as a means of communication and they can be useful to communities. However, plaintiff has failed to demonstrate that there is a public need for billboards within defendant’s boundaries.” [emphasis by Court].

With its response to defendant’s mo-

tion for summary disposition, plaintiff provided many examples of the ways in which billboards are used to communicate with the public. It also identified numerous individuals as well as public and private entities that routinely use billboards to communicate with the public. However, these examples do not demonstrate that billboards are needed in order to communicate with the public in Livonia, particularly when, as the trial court observed, there are many billboards within the surrounding communities, well within two miles of defendant’s boundaries. Instead, these examples merely reflect that there is a demand for billboards among individuals and organizations that utilize billboards as a means of advertising and sharing information. But plaintiff provided no evidence to this Court, the trial court, or

the zoning board that reflected any individual or corporate need for billboards in Livonia, and thus failed to satisfy its burden to oppose defendant’s motion for summary disposition.

Likewise, it is apparent that plaintiff has a desire to erect the billboard instigating the instant suit because it derives income, in light of this demand, from selling space on its billboards wherever they are erected. We have previously explained, however, that a ‘desire’ for a specific land use is not the same as a ‘demonstrated need’ for that use.” (citing nearly identical ordinance language reviewed by the court in **Outdoor Sys, Inc. v City of Clawson**, 262 Mich App 716, 2004).

The Court of Appeals affirmed the trial court’s decision. □

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## MICHIGAN’S 21<sup>ST</sup> CENTURY INFRASTRUCTURE COMMISSION LAUNCHES WEBSITE TO GATHER PUBLIC INPUT

Gov. Rick Snyder’s 21<sup>st</sup> Century Infrastructure Commission announced in mid-July a new website designed to gather public input and provide updates on the Commission’s work. The website – [www.miinfrastructurecommission.com](http://www.miinfrastructurecommission.com) – features opportunities for residents to participate in online discussions and polls, learn about upcoming events, and find recent news stories about Michigan’s infrastructure.

The Commission also announced a statewide three-stop tour that will provide additional opportunities for the public to meet with commissioners and offer suggestions on how to improve the state’s infrastructure. The first stop will be in Grand Rapids on July 21 from 6-7:30 p.m. at Grand Valley State University’s Seidman Center. The other two stops will be in Marquette and Detroit and additional details will be posted on the website.

*“Improving Michigan’s infrastructure today and for future generations*

*is a responsibility all of us should take seriously,”* Snyder said. *“I applaud the Commission for its efforts to gather public input. I encourage Michiganders to visit the website, attend the listening tour stops, and provide ideas for how we can better create safe and reliable infrastructure in our state.”*

Snyder created the 21<sup>st</sup> Century Infrastructure Commission in March 2016 to identify long-term strategies to ensure Michigan’s infrastructure remains safe and efficient now and in the future. The 27-member Commission, chaired by Evan Weiner - chief operating officer and executive vice president of Edw. C. Levy Co. - is comprised of state and independent industry experts. The Commission is responsible for identifying strategic best practices to modernize the state’s transportation, water and sewer, energy, and communications infrastructure.

*“Sound and modern infrastructure is vital to the health and well-being of*

*the people of Michigan and now is the time to develop a bold and innovative infrastructure vision —together— that will benefit the next generation and succeed in the future economy,”* Weiner said. *“The commissioners are looking forward to collaborating with Michigan residents, state departments, and experts to provide attainable recommendations that will help continue Michigan’s comeback.”*

Serving as an advisory body within the Executive Office, the Commission must present an infrastructure assessment and its recommendations no later than November 30, 2016.

For more information, to join the discussion online, and to sign-up for a listening tour stop, visit [www.miinfrastructurecommission.com](http://www.miinfrastructurecommission.com) □

# MICHIGAN ECONOMIC DEVELOPMENT INCENTIVES FOR HISTORIC PRESERVATION PLACEMAKING PROJECTS

The Michigan Historic Preservation Network (MHPN) recently released a white paper by their Placemaking Incentives Task Force to identify ways to accomplish historic preservation absent a specific tax credit program, see [http://www.mhpn.org/?page\\_id=3187](http://www.mhpn.org/?page_id=3187). This became necessary with the termination of the Michigan Historic Preservation Tax Credit Program early in the Snyder Administration. The white paper notes:

*"there are currently no incentives programs administered by the State of Michigan with the sole purpose of supporting historic rehabilitation and placemaking, per se. There are, however, a good number of existing programs, whose original purposes are varied, that can often be paired with each other and additional financing to make a rehabilitation project feasible. Those programs serve purposes such as: creation of affordable housing, blight elimination, transportation enhancement, Brownfield cleanup, economic development, job creation, etc."*

The white paper describes many of these programs and how they can be effectively used to help protect historic properties. The focus is on: best practices identified in the Redevelopment Ready Communities program; leveraging the Federal Tax Credit and other funding sources; the Michigan Community Revitalization Program (MCRP) for placemaking projects; using Historic Neighborhood Tax Increment Financing; and how to work with small communities of 25,000 population or less on projects for less than \$5 million.

The white paper concludes:

*"At the completion of its efforts to examine the State-level economic development programs in Michigan that incentivize placemaking efforts through historic preservation, the MHPN Placemaking Incentives Task Force determined that there is little expectation that a new or dramatically altered program can emerge at this time. Instead, through some programmatic adjustments and by ensuring that historic rehabilitation becomes a priority, the Task Force is confident that more and better placemaking projects will be completed and, simultaneously, more of Michigan's historic resources will be put back into productive use. This white paper summarizes the conclusions and recommendations of the Task Force. Further explorations may be needed, and further coordination with the appropriate state agencies regarding these will yield fruitful results."*

## Editorial Observation

Clearly for now, this pragmatic approach will continue to produce positive results. However, opportunities need to be identified for a more direct incentive for historic preservation if communities are to ensure preservation of important historic resources. As the MHPN web page notes:

*"Invariably, the locations with a special sense of place contain historic assets. These architectural gems inspire awe, give a place its unique character, build community, attract investment, and create fond new memories and reinforce existing ones. For these reasons, the preservation of historic assets must be a key, highly prioritized ingredient in any placemaking strategy."* □

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## Distribution of the Free Guidebook PLACEMAKING AS AN ECONOMIC DEVELOPMENT TOOL Passes 1,000 copies – Do You Have Yours?

**Placemaking as an Economic Development Tool** began distribution to the Michigan audience in February 2016 and then nationally in April and May. The Guidebook and the 36 hour curriculum upon which it was based were sponsored by the Michigan State Housing Development Authority and prepared by the MSU Land Policy Institute and MSU Extension. The guidebook is available for FREE to Michigan local governments and interested stakeholders. It is an easy to use, nearly 600 page guidebook that is extensively illustrated with drawings, photos and Michigan case studies along with guidelines to using the four types of **Placemaking as an Economic Development Tool**. In June the Guidebook received regional and national awards from the National Association of Community Development Extension Professionals at

their annual conference in Burlington, Vermont.

*Placemaking is the process of creating quality places where people want to live, work, play, shop, learn and visit.* Placemaking is really important as Michigan transitions from an older industrial, manufacturing-based economy to a more diversified economy that embraces entrepreneurship and innovation. Communities that successfully grow new jobs will be the ones that focus on talent attraction and retention. In order to do that, they have to be full of quality places with lots of choices in those places.

The guidebook was written by Mark Wyckoff, Glenn Pape, Kurt Schindler, and Brad Neumann all of Michigan State University.

**Placemaking as an Economic Development Tool** is an excellent re-

source for urban and regional planners, economic developers, community leaders, and others that want to see their community grow again. While every community is faced with a different set of challenges, this guidebook can be used to help provide knowledge of placemaking initiatives that are adaptable to every community's unique situations. The techniques and tools discussed in this guidebook will help to create an improved "sense of place," and improve local quality of life and economic competitiveness.

The guidebook is available in electronic format (PDF) only. To receive access to your free download visit <http://landpolicy.msu.edu/resources/pmedt-guidebook>. Don't delay! Get your full color, thirteen chapter (and six appendix) guidebook today! □

## PLANNING & ZONING NEWS®

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### FIRST CLASS MAIL

## AUGUST

**2-30 HOT TOPICS IN PLANNING & ZONING.** Join the Michigan Townships Association at four locations for a how-to guide and real-life practical experiences at the summer's hottest workshop series, Hot Topics in Planning & Zoning. This program identifies emerging issues and is targeted to planning commissioners, township board members and zoning administrators. Registration and dinner begin at 4:00 PM; the class is held from 5:00 - 8:30 PM.

**August 2** - Van Buren ISD Conference Center, Lawrence

**August 10** - Bavarian Inn Lodge, Frankenmuth

**August 17** - Ramada Inn Conference Center, Grayling

**August 30** - The Shack Country Inn, White Cloud

For registration and more information visit: [www.michigantownships.org](http://www.michigantownships.org)

**25-26 MEDA ANNUAL CONFERENCE.** Westin Book Cadillac, Detroit. What gets you the most "bang for your buck?" Often in economic development, it's reusing an asset that already has a foundation in the community, whether it be a building, a natural resource or the people living there. The annual meeting will teach you how to develop an eye for aspects of your community that have the potential for greatness as well as how to rebrand and promote the unique features your community already boasts. For more information, visit [www.medaweb.org/annual\\_meeting](http://www.medaweb.org/annual_meeting), or call 517-241-0011.

## SEPTEMBER

**8 - November 9 CITIZEN PLANNER - FUNDAMENTALS OF PLANNING & ZONING.** Classroom based training will be offered this Fall at:

### St. Clair County

**Thursdays, Sept. 8 - Oct. 20, 2016**

Classes will be held from 6:00 - 9:00 PM at the St. Clair County Donald Dodge Auditorium, 200 Grand River Ave, Port Huron, MI 48060. Registration will be open July 15 thru September 1 at midnight.  
<http://events.anr.msu.edu/CPSTC>.

### Manistee County

**Wednesdays, Sept. 21 - Nov. 9, 2016**

*No class October 26, 2016*

Classes will be held from 6:00 - 9:00 PM at the Norman Township Hall/Community Center, 1273 S. Seaman Road, Wellston, MI 49689. Registration will be open July 22 thru September 14 at midnight.  
<http://events.anr.msu.edu/CPMan/>.

**14-16 MML 2016 CONVENTION.** Grand Hotel on Mackinac Island. <http://blogs.mml.org/wp/events/>

**28-30 2016 RECLAIMING VACANT PROPERTIES CONFERENCE.** Baltimore, Maryland. <http://reclaimingvacantproperties.org/>

## OCTOBER

**26-28 MICHIGAN ASSOCIATION OF PLANNING ANNUAL CONFERENCE.** Radisson Hotel and Conference Center, Kalamazoo. <http://www.planningmi.org/conference.asp>

## NOVEMBER

**17-19 30th ANNUAL UM/ULI REAL ESTATE FORUM.** Detroit (17<sup>th</sup>) and Ann Arbor (18-19). <http://michigan.uli.org/>

## CITIZEN PLANNER ON THE WEB FUNDAMENTALS OF PLANNING & ZONING Accepting Sites for Fall 2016

This web-based classroom style Citizen Planner program is being offered again beginning on Tuesday, *September 27*. If you have a community that wants or needs training but can't support a full 20 person class, this is the option for you. With as few as 5 people you can add your site to the list and host a series. **For more information or to host a site contact Janean at the Citizen Planner office.** (269) 657-8213, [cplanner@msu.edu](mailto:cplanner@msu.edu)

## CITIZEN PLANNER ONLINE OPEN FOR ENROLLMENT

The Citizen Planner program is again available online after a migration to a new platform -- Moodle on eXtension. The new Citizen Planner Online is divided into three courses, Michigan Citizen Planner 101, 201 and 301. MiCP 101 introduces planning officials to their roles covering topics that include ethics, drafting the master plan, and working with the public. MiCP 201 covers the basic legal framework of planning and zoning, sources and limitations of government power over land use, and making zoning decisions. MiCP 301 covers roles and power in public policy, choosing appropriate meeting types, and placemaking and innovative techniques. Participants complete all three modules to receive a certificate of completion. The registration for the three-course package is \$275, a \$20 discount from the equivalent classroom-based program.

Interested individuals can enroll in the program at: CPOnline found at <http://campus.extension.org/enrol/index.php?id=1240>. Questions should be directed to the Citizen Planner office, 269-657-8213 or [cplanner@msu.edu](mailto:cplanner@msu.edu). □