



## **REGULAR VILLAGE BOARD MEETING**

### **MEETING NOTICE AND AGENDA**

**VILLAGE OF WHITEFISH BAY  
5300 North Marlborough Drive**

**Monday, September 19, 2016, 6:00 PM**

- I. Call to Order and Roll Call
  
- II. Consent Agenda – Upon request of any Trustee, any item may be removed from the Consent Agenda for separate consideration under General Business.
  1. Appointment of Trustee Davis to the Public Works Committee (to replace Trustee Fuda).
  
- III. Report of Village Officers
  1. Village Attorney
  2. Village Manager
  3. Village President
  4. Miscellaneous Trustee
  
- IV. Petitions and Communications – This is an opportunity for anyone to address the Village Board on any issue NOT on the current agenda. While the Board encourages input from residents of the Village, it may not discuss or act on any issue that is not duly noticed on the agenda.
  
- V. General Business
  1. Discussion/action on recommendations from the Building Codes Review Committee.

2. Discussion/action on contract amendment with Sigma for construction engineering services associated with the 2016 Roadway and Utility Improvement project.
3. Discussion/action regarding contract award for the 2016 Sanitary Sewer Improvement project.
4. Discussion/action regarding storm water improvements on Cramer Street.
5. Village Board study session on Solid Waste/Recyclable Collection.
6. The Board may convene into Closed Session pursuant to Wisconsin State Statute §19.85(1)(c) considering employment, promotion, compensation or performance evaluation data of any public employee over which the governmental body has jurisdiction or exercises responsibility – specifically regarding evaluation of personnel.
7. The Board may reconvene to open session. The Board reserves the right to take action on any topic discussed in Closed Session.

## VI Adjourn

Upon reasonable notice, efforts will be made to accommodate the needs of disabled individuals.

## REGULAR VILLAGE BOARD MEETING

A regular meeting of the Board of Trustees of Whitefish Bay was held in the Village Board Room of Village Hall, 5300 North Marlborough Drive, September 7, 2016

Pursuant to law, written notice of this meeting was given to the press and posted on the public bulletin boards.

### **I. Call to Order and Roll Call**

President Siegel called the meeting to order at 6:05 pm.

Present: Trustees Saunders, Miller, Serebin (arrived at 7:20pm) Demet, Fuda, Davis and President Siegel.

Also Present: Village Manager Steve Sheiffer  
Police Chief Michael Young  
Village Attorney Chris Jaekels  
Assistant Manager Paul Boening  
Library Director Nyama Marsh  
Director of Building Services Joel Oestreich  
Finance Director Jen Amerell  
Director of Public Works John Edlebeck  
Deputy Clerk Caren Brustmann

### **II. Consent Agenda**

It was moved by Trustee Miller, seconded by Trustee Demet, and unanimously carried by the Village Board to approve the following items on the consent agenda;

1. Minutes of regular meeting held on August 8, 2016.
2. Minutes of special meeting held on August 15, 2016.
3. Minutes of special meeting held on August 23, 2016.
4. Investment Report for July 2016.
5. Claims for August 2016.

### **III. Report of Village Officers**

#### a. Village Attorney

Village Attorney Chris Jaekels noted a statute was passed about 2 years ago in regards to where wireless companies may place new towers. The Village's ordinance will need to be revised to regulate the distance and height limit of the company's equipment from resident's property.

#### b. Village Manager

Village Manager Steve Sheiffer stated a DNR permit was received for all sewer improvements on E. Fairmount Ave. utilizing the 12 inch line, for the pump station on N. Palisades Rd., and for the work on N. Lake Drive.

#### c. Village President – No report

d. Miscellaneous Trustee Reports – No report

**IV. Petitions and Communications** - None

**V. General Business**

**1. Discussion/action to approve Resolution No. 2979 in Recognition of Lloyd Reams for 39 years of service to the Village of Whitefish Bay.**

Director of Public Works John Edlebeck congratulated Lloyd Reams for his service and dedication to the Village for the past 39 years.

It was moved by Trustee Fuda, seconded by Trustee Davis, and unanimously carried by the Village Board to adopt Resolution No. 2979 in Recognition of Lloyd Reams for 39 years of service to the Village of Whitefish Bay.

**5. The Board may convene into Closed Session pursuant to Wisconsin State Statute §19.85(1)(e) deliberating or negotiating the purchase of public property, investing of public funds, conducting other specified business whenever competitive and/or bargaining reasons require a closed session – specifically regarding potential development opportunities.**

It was moved by Trustee Saunders, seconded by Trustee Fuda, and unanimously carried by the Village Board to convene into Closed Session pursuant to Wisconsin State Statute §19.85(1)(e) deliberating or negotiating the purchase of public property, investing of public funds, conducting other specified business whenever competitive and/or bargaining reasons require a closed session – specifically regarding potential development opportunities.

**6. The Board may reconvene to open session. The Board reserves the right to take action on any topic discussed in closed session.**

It was moved by Trustee Fuda, seconded by Trustee Demet, and unanimously carried by the Village Board to reconvene into open session. No Village Board action taken.

**VI. Adjourn**

There being no further business, it was moved by Trustee Serebin, seconded by Trustee Saunders, and unanimously carried by the Village Board to adjourn the meeting at 9:15 pm.

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Caren Brustmann  
Deputy Clerk

REGULAR VILLAGE BOARD MEETING September 19, 2016

A regular meeting of the Board of Trustees of Whitefish Bay was held in the Village Board Room of Village Hall, 5300 North Marlborough Drive, September 19, 2016

Pursuant to law, written notice of this meeting was given to the press and posted on the public bulletin boards.

I. **Call to Order and Roll Call**

President Siegel called the meeting to order at 6:03 pm.

Present: Trustees Davis, Saunders, Miller, Demet, Serebin, and Fuda

Also Present: Village Manager Steve Sheiffer  
Police Chief Michael Young  
Village Attorney Chris Jaekels  
Finance Director Jen Amerell  
Assistant Village Manager Paul Boening  
Building Inspector Joel Oestreich  
Library Director Nyama Marsh  
Public Works Director John Edlebeck  
Communications Specialist Jenny Heyden

II. **Consent Agenda**

It was moved by Trustee Demet, seconded by Trustee Saunders, and unanimously carried by the Village Board to approve the following items on the consent agenda;

1. Appointment of Trustee Davis to the Public Works Committee (to replace Trustee Fuda).

III. **Report of Village Officers**

1. Village Attorney

Village Attorney Chris Jaekels informed the Board about a complaint that was received pertaining to a dilapidated building foundation at 5960 N. Shore Dr.

2. Village Manager – No report
3. Village President – No report
4. Miscellaneous Trustee Reports – None

IV. **Petitions and Communications** - None

V. **General Business**

1. **Discussion/action on recommendations from the Building Codes Review Committee.**

Trustee Davis provided an overview of the Building Codes Review Committee's work

and recommendations.

It was moved by Trustee Demet, seconded by Trustee Saunders, and unanimously carried by the Village Board to direct staff to:

- Amend the Roofing Permit Fee (included as part of the Village Budget) to include a maximum permit amount of \$250.
- Draft an ordinance to amend the Plumbing Code language as reflected in Exhibit A of the staff memo.
- Draft an ordinance to amend the Municipal Code to revise the approval process for small sheds as detailed in the staff memo.
- Draft an ordinance to amend the Code language pertaining to Central Air Conditioning units as reflected in Exhibit C of the staff memo.
- Draft an ordinance to amend the Municipal Code to change the height of play structures requiring ARC approval to 10'.
- Draft an ordinance to allow outdoor fire pits subject the conditions as detailed in the staff memo.

**2. Discussion/action on contract amendment with Sigma for construction engineering services associated with the 2016 Roadway and Utility Improvement project.**

It was moved by Trustee Demet, seconded by Trustee Davis, and unanimously carried by the Village Board to approve Work Authorization #3 with Sigma Group in the amount not to exceed \$50,625.00 to take into account the additional construction engineering services work required as it relates to lead water service replacements and construction phasing on the 2016 Village Roadway and Utility Improvement Project.

**3. Discussion/action regarding contract award for the 2016 Sanitary Sewer Improvement project.**

It was moved by Trustee Fuda, seconded by Trustee Serebin, and unanimously carried by the Village Board to award the 2016 Sanitary Sewer Improvement Project to Advance Construction of Green Bay, WI for the bid upon unit prices not to exceed \$1,498,794.00.

**4. Discussion/action regarding storm water improvements on Cramer Street.**

It was moved by Trustee Davis, seconded by Trustee Saunders, and unanimously carried by the Village Board to authorize the Village Manager to proceed with storm water modifications for the Cramer Street area for an amount not to exceed \$50,000 to be funded by previously borrowed storm water funds.

**5. Village Board study session on Solid Waste/Recyclable Collection.**

Village Manager Steve Sheffer conducted a study session with the Board to discuss issues and opportunities related to Solid Waste and Recyclable collection.

**6. The Board may convene into Closed Session pursuant to Wisconsin State Statute §19.85(1)(c) considering employment, promotion, compensation or performance evaluation data of any public employee**

**over which the governmental body has jurisdiction or exercises responsibility – specifically regarding evaluation of personnel.**

It was moved by Trustee Saunders, seconded by Trustee Miller, and unanimously carried by the Village Board to convene into Closed Session pursuant to Wisconsin State Statute §19.85(1)(c) considering employment, promotion, compensation or performance evaluation data of any public employee over which the governmental body has jurisdiction or exercises responsibility – specifically regarding evaluation of personnel.

**7. The Board may reconvene to open session. The Board reserves the right to take action on any topic discussed in closed session.**

It was moved by Trustee Fuda, seconded by Trustee Davis, and unanimously carried by the Village Board to reconvene into open session. No Village Board action taken.

VI. **Adjourn**

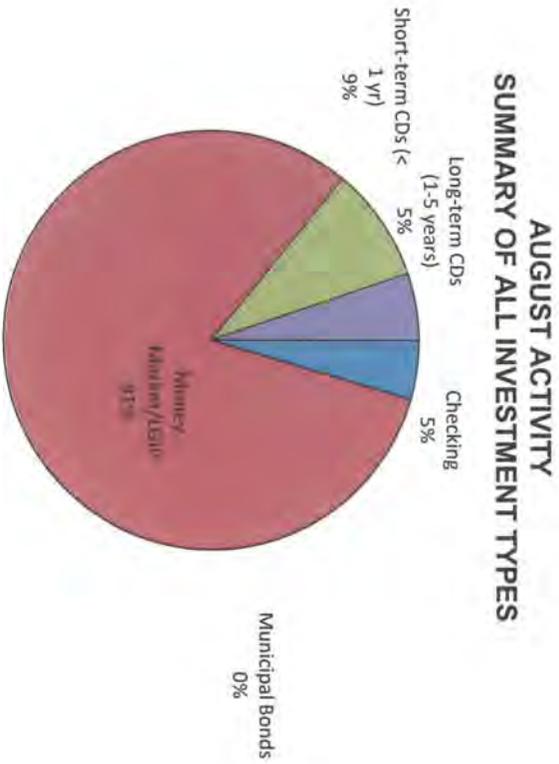
There being no further business, it was moved by Trustee Fuda, seconded by Trustee Davis and unanimously carried by the Village Board to adjourn the meeting at 9:05pm.

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Paul Boening  
Assistant Village Manager

## Summary of Investments 8/31/2016

Cash/Investment Type	Balance End of Month
BMO Harris Checking Account	\$ 1,066,021.00
<b>LGIP</b>	
Interest earned	\$ 19,268,438.63
	\$ 6,993.87
<b>General Investments</b>	
Money Market	\$ 12,921.17
Short-term CDs (less than 1 year)	\$ 1,839,090.26
Long-term CDs (1-5 years)	\$ 1,230,273.44
Municipal Bonds	\$ -
Interest Accrued	\$ 12,388.98
<b>General Bond Proceeds</b>	
Money Market	\$ -
Short-term CDs (less than 1 year)	\$ 250,000.00
Long-term CDs (1-5 years)	\$ -
Municipal Bonds	\$ -
Interest Accrued	\$ 1,574.66
<b>Sewer Revenue Bond Proceeds</b>	
Money Market	\$ -
Short-term CDs (less than 1 year)	\$ -
Long-term CDs (1-5 years)	\$ -
Municipal Bonds	\$ -
Interest Accrued	\$ -
<b>Total - all Sources</b>	
Checking	\$ 1,066,021.00
Money Market/LGIP	\$ 19,281,359.80
Short-term CDs (less than 1 year)	\$ 2,089,090.26
Long-term CDs (1-5 years)	\$ 1,230,273.44
Municipal Bonds	\$ -
Interest Accrued	\$ 20,957.51





Village of Whitefish Bay  
5300 N. Marlborough Drive  
Whitefish Bay, Wisconsin 53217

## Memorandum

To: Steve Sheiffer, Village Manager  
From: Jen Amerell, Finance Director/Clerk  
Date: September 28, 2016  
Re: 2017 Budget Highlights *JFA*

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In the next week you will receive a copy of the Recommended 2017 budget. You will also receive a detailed list of page numbers that correlate with the individual budget pages we will review at the budget review session on October 17<sup>th</sup>.

Staff has worked hard over the past couple months to put together a budget that continues with a financial discipline that balances resident expectations while continuing on an aggressive infrastructure improvement plan and not exceeding a 2.5% increase in overall market basket. The market basket increase from 2016 to 2017 is 1.2% and the overall increase in the market basket from the base year of 2014 to 2017 is 2.3%.

We are confident the 2017 Recommended Budget balances resident needs and places the Village in a great financial position to proactively address the issues affecting Whitefish Bay. Below are a few of the highlights of the 2017 budget and a history of municipal charges for the last three years. We will discuss the below in further detail on October 17<sup>th</sup>.

### Overview

- Summary of 2017 Budget Impacts and Achievements
  - 1.04% Increase in Municipal Tax Rate
  - \$188,396 or 1.75% Increase in Tax Levy which is a result of increased debt service requirements and public safety costs
  - 0% Water Rate Increase
  - 6% Sewer Rate Increase with \$173,424 contribution from General Fund
  - 0% Stormwater Rate Increase with \$155,365 contribution from General Fund
  - Maintains Current Service Levels
    - Only Staff Change is to Part-time Police Clerical Officer Hours
    - Includes Wage Increase of 2%
    - Includes 1.5% Increase in Health Insurance Premium costs, offset by an increased percentage of employee paid share of premium of 10.5% compared to 9% in 2016
  
- On the next page, please find two tables summarizing the municipal charges on an average Whitefish Bay home, including the proposed 2017 impact, as well as a three year history of municipal rates.

TABLE 1 - Three Year History of Municipal Charges on Average Home & Utility Usage	2014	2015	2016	2017 Proposed	\$ Change from 2016	% Change from 2016
Taxes on a \$400,000 Home	\$ 2,148.00	\$ 2,168.00	\$ 2,148.00	\$ 2,168.00	\$ 20.00	1%
Annual Water Bill for Avg Usage of 22Ccf	\$ 311.70	\$ 311.70	\$ 311.70	\$ 311.70	\$ -	0%
Annual Sewer Bill for Avg Usage of 22Ccf	\$ 202.62	\$ 219.12	\$ 232.32	\$ 246.16	\$ 13.84	6%
Annual Stormwater Bill for 1 ERU	\$ 100.00	\$ 100.00	\$ 100.00	\$ 100.00	\$ -	0%
Total Annual Municipal Charges	\$ 2,762.32	\$ 2,798.82	\$ 2,792.02	\$ 2,825.86	\$ 33.84	1%
% Change from Previous Year	5%	1%	0%	1%		

TABLE 2 - Three Year History of Rates	2014	2015	2016	2017 Proposed	% Change from 2016
Municipal Tax Rate	\$ 5.37	\$ 5.42	\$ 5.37	\$ 5.42	1%
Local Water Usage Rate per CCF	\$ 2.23	\$ 2.23	\$ 2.23	\$ 2.23	0%
Local Sewer Usage Rate per CCF	\$ 3.07	\$ 3.32	\$ 3.52	\$ 3.73	6%
Stormwater Usage Rate per ERU	\$ 100.00	\$ 100.00	\$ 100.00	\$ 100.00	0%



# LAKE DRIVE TRAFFIC & PEDESTRIAN STUDY

DATE SUBMITTED: SEPTEMBER 29, 2016

**PREPARED FOR:**

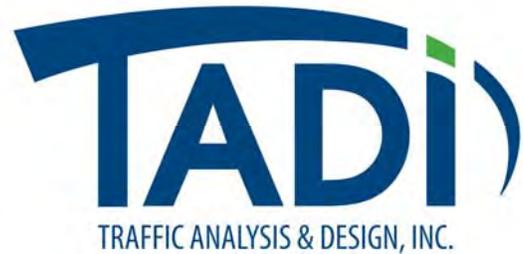
Steve Sheiffer, Village Manager &  
John Edlebeck, P.E., Director of Public Works  
Village of Whitefish Bay  
5300 N. Marlborough Drive  
Whitefish Bay, WI 53217  
Phone: (414) 962-6690

**PREPARED BY:**

Traffic Analysis and Design, Inc. (TADI)  
N36 W7505 Buchanan Court  
Cedarburg, WI 53012  
Authors: John Campbell, P.E. &  
Michael May, P.E., PTOE  
Phone: (800) 605-3091



# Executive Summary

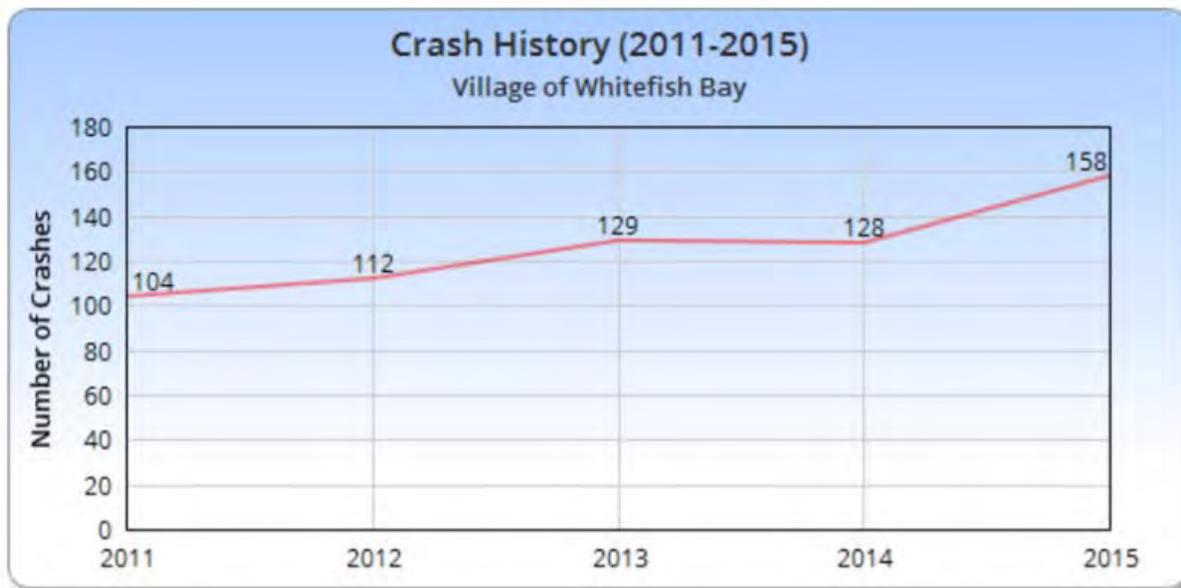


September 29, 2016

PROVIDING TRAFFIC ENGINEERING SOLUTIONS

**To:** Steve Sheiffer, Whitefish Bay Village Manager and Village Board Members  
**cc:** John Edlebeck, P.E., Whitefish Bay Director of Public Works  
**From:** John Campbell, P.E. (Senior Traffic Engineer, TADI)  
**Subject:** Lake Drive Traffic & Pedestrian Study

Traffic crashes in the Village of Whitefish Bay have been trending up. In the past five years there have been 631 reportable traffic crashes, including 17 involving pedestrians and 20 involving bicyclists. Furthermore, over 200 angle crashes have occurred. All three of these crash types can cause serious injuries and fatalities. TADI has worked with the Village to devise strategies for reducing crashes in the community. This report addresses traffic and pedestrian safety along the Lake Drive (STH 32) corridor and provides a summary of the ongoing Highway Safety Improvement Program (HSIP) applications submitted by the Village in 2016.



The Lake Drive Study was organized into four technical memorandums, available in Chapter 1.

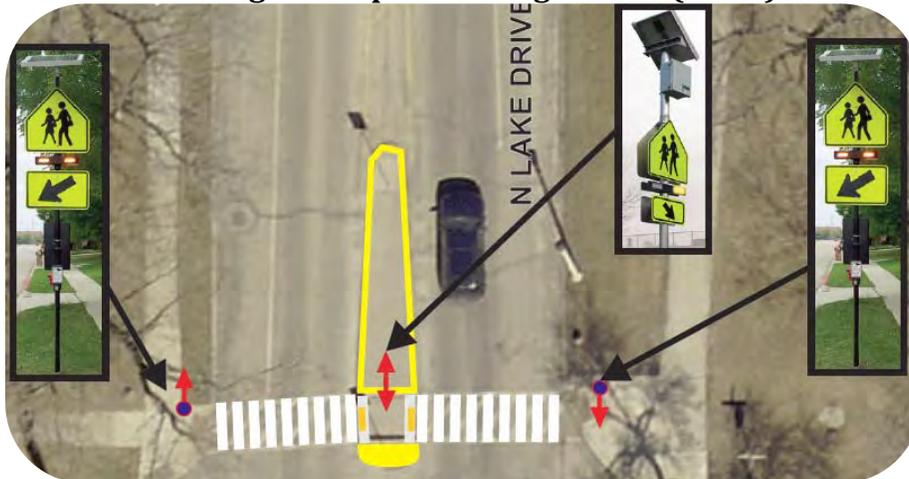
1. Lake Drive & Belle Avenue, Lake Drive & Day Avenue
2. Lake Drive & Silver Spring Drive/Marlborough Drive
3. Lake Drive & Sylvan Avenue, Lake Drive & Henry Clay Street/Ardmore Avenue
4. Lake Drive & Bartlett Avenue/Palisades Road – Technical Memorandum

The purpose of this study was to assess the traffic and pedestrian conditions, review past recommendations from a previous consultant, and determine recommendations to improve traffic and safety conditions along Lake Drive.

### **Belle Avenue and Day Avenue Intersections with Lake Drive**

Both of these intersections are popular locations, particularly for children, to cross Lake Drive. They serve as a connection from Richards Elementary School to the lakefront, neighborhoods, and Klode Park. Getting the attention of drivers and reinforcing the state law to yield to pedestrians within the crosswalk are the objectives of the traffic safety improvement recommendations at these intersections. The recommendations include installing Rectangular Rapid Flashing Beacon (RRFB) Pedestrian Crossing signs on the north leg of each intersection, paired with blinking overhead signs on the two existing mast-arms. The blinking signs would be activated when the RRFB signs are activated, and would provide advanced warning of the presence of pedestrians. The devices could be activated by pedestrian push buttons (recommended) or using an automated detection technology.

#### **Rectangular Rapid Flashing Beacon (RRFB)**



#### **Overhead Blinking Sign**



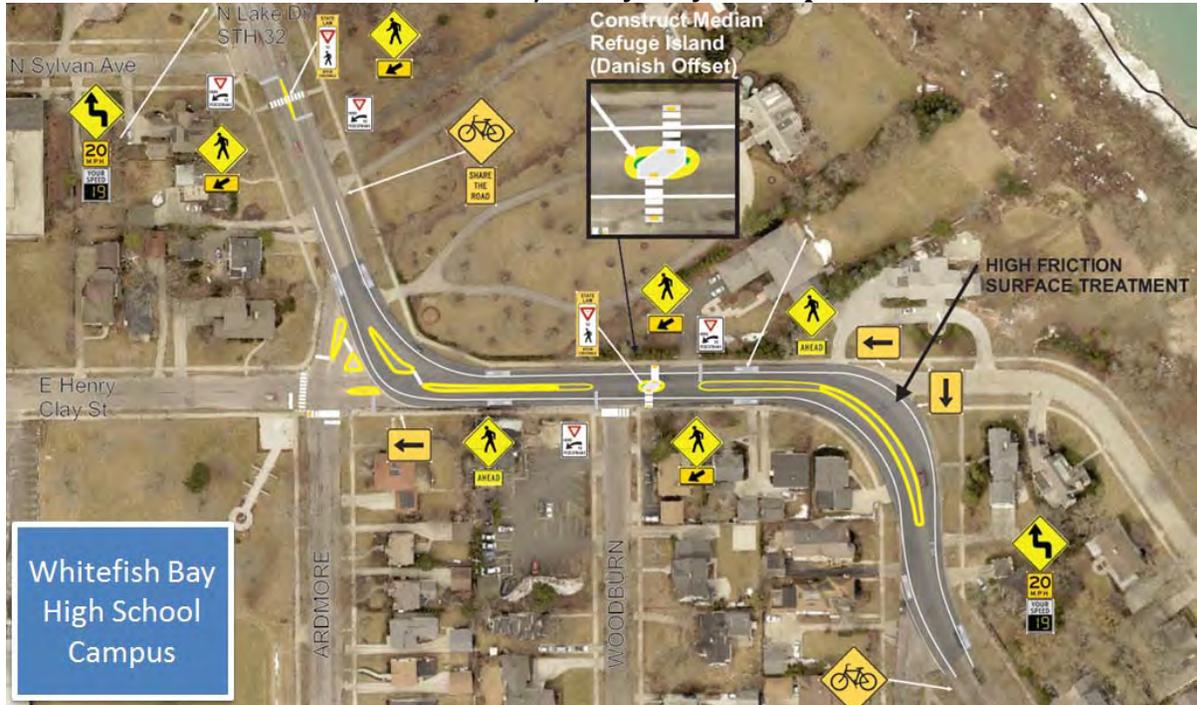
## Lake Drive S-Curves

Two S-Curves along Lake Drive present challenges for transporting pedestrians, bicyclists, and vehicles safely and efficiently. Reducing speeds, improving bicycle accommodations, and providing safe crossing locations across Lake Drive are the main objectives of the recommendations at both sites. Recommendations include providing a dedicated pedestrian crossing with a median refuge island. The suggested Danish Offset concept is designed to make pedestrians walk in the direction of oncoming traffic while within the refuge. This design improves the likelihood the pedestrians will make eye contact with approaching drivers. For bicyclists, navigating these sections of Lake Drive can be difficult and a dedicated bike lane is recommended through the S-Curves. For the safety of all users, strategies are recommended to reduce speeds through these curves. Speed reduction devices include center medians, dynamic speed feedback signs, and precisely placed signing. To further address speed-related crashes, a high-friction-surface-treatment is recommended through the curves.

### Lake Drive/Fairmount Concept



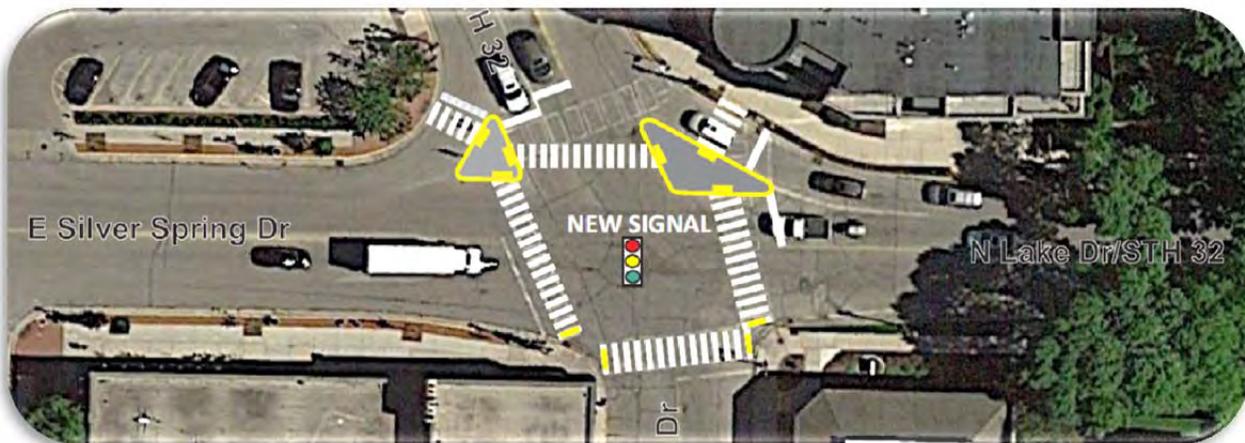
### Lake Drive/Henry Clay Concept



### Lake Drive Intersection with Silver Spring Drive

The junction of Lake Drive with Silver Spring Drive is a busy intersection used by pedestrians, bicyclists, trucks, buses, and automobiles. The intersection observed 19 crashes in the past five years and is lacking in pedestrian accommodations and traffic signal head visibility. TADI recommends a reconstruction of the two channelizing islands to better accommodate pedestrians. The suggested design will enable the north crossing to be routed through the island rather than around it. Routing the north crossing through the island reduces the crossing length and improves sight lines for both pedestrians and approaching vehicles. Additionally, TADI recommends a new traffic signal complete with countdown pedestrian timers, updated signal timings, and an overhead signal on each approach.

### Silver Spring/Lake Drive/Marlborough Drive Intersection Concept



## **HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP) APPLICATIONS**

The Highway Safety Improvement Program is a federal reimbursement program with funds set aside specifically for local roadway projects that meet certain benefit (crash reduction) versus cost (design and construction) criteria. In Wisconsin, the program is administered through the Wisconsin Department of Transportation. If an application is accepted, projects are funded 90 percent federally and 10 percent locally up-to the amount of money applied for. The Village has submitted three HSIP applications in 2016. Application #3 is primarily based on the results and recommendations of the Lake Drive Traffic & Pedestrian Study.

### **HSIP #1 Bay Ridge Drive and Silver Spring Intersection - Accepted**

The first application, submitted in February 2016, was approved and provides \$294,879 in federal funding for new traffic signals at the intersection of Bay Ridge Avenue and Silver Spring Drive. The Village's 10 percent matching contribution is \$32,764. Design year is scheduled for 2017 and construction in 2018.

### **HSIP #2 Local Road Improvements - Pending**

The second application, submitted in August 2016, is currently pending and includes nearly 1.7 million dollars in safety improvements. The improvements primarily target pedestrian, bicycle, and angle crashes and could result in 90 less crashes over a 10 year period. The application includes traffic signal replacement at three locations, numerous high-visibility crosswalks, additional signing and pavement marking, and street lighting upgrades along Silver Spring Drive. If approved, the federal contribution is expected to be \$1,528,061 million dollars with a local contribution of \$169,785. It is anticipated design would occur in 2018 or 2019, with construction in 2019 or 2020.

### **HSIP #3 Lake Drive (STH 32) Improvements - Pending**

The third application, also submitted in August 2016, is currently pending and also includes nearly 1.7 million dollars in safety improvements. The improvements primarily target pedestrian, bicycle, and run-off-the-road crashes and could result in 60 less crashes over a 10 year period. The application includes enhanced pedestrian crossings at Belle Avenue and at Day Avenue via Rectangular Rapid Flashing Beacons, median refuge islands at the S-curves located at Henry Clay Street and at Fairmount Avenue, high-friction-surface-treatment at the two S-curves and the 90 degree bend at Silver Spring Drive, numerous high-visibility crosswalks, additional signing and pavement marking, and dynamic speed feedback signs. If approved, the federal contribution is expected to be \$1,527,083 million dollars with a local contribution of \$169,676. It is anticipated design would occur in 2018 or 2019, with construction in 2019 or 2020. A breakdown of the expected costs per location is provided on the next page.

## **SUMMARY**

Opportunities exist throughout the Village of Whitefish Bay to improve the safety and operations of the roadway network. TADI has documented traffic and safety recommendations along the Lake Drive (STH 32) corridor in this report. Through one accepted and two pending HSIP applications, the Village may be able to fund many of the improvements recommended by TADI with 90 percent funding from the Federal Government. Each component of the Lake Drive Study is assembled in Chapter 1 as listed in the Table of Contents.

# ITEMIZED COST ESTIMATE - HSIP Application #3

Lake Drive (STH 32), Village of Whitefish Bay

Original Submittal Date: 8/15/16

Cost Estimated Updated: 9/22/16

Location:	Cost
#1 Silver Spring & Lake Drive	\$ 493,313
#2 Curve on Lake Dr btwn Glen & Northshore	\$ 58,597
#3 Curve on Lake Dr btwn Sylvan & Cumberland	\$ 412,056
#4 Curve on Lake Dr btwn 500' N of Fairmount & 300' N of Oakland	\$ 394,156
#5 Lake Dr & Belle	\$ 140,760
#6 Lake Dr & Day	\$ 144,367
#7 Lake Dr & Hampton	\$ 12,672
#8 Lake Dr & Lexington	\$ 22,464
#9 Lake Dr & Montclair	\$ 9,072
#10 Lake Dr & Oakland	\$ 9,302
<b>Total</b>	<b>\$ 1,696,759</b>

## Summary

Estimated Construction Costs	\$ 1,413,966
Estimated Design Costs	\$ 282,793
<b>Total Estimated Cost of Improvements (Includes Design &amp; Construction)</b>	<b>\$ 1,696,759</b>

Overview Map



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### **Chapter 1 – Lake Drive Traffic & Pedestrian Study**

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1.1 Lake Drive & Belle Avenue, Lake Drive & Day Avenue – Technical Memorandum

1.2 Lake Drive & Silver Spring Drive/Marlborough Drive – Technical Memorandum

1.3 Lake Drive & Sylvan Avenue, Lake Drive & Henry Clay Street/Ardmore Avenue –  
Technical Memorandum

1.4 Lake Drive & Bartlett Avenue/Palisades Road – Technical Memorandum

### **Appendix – Traffic Counts**

# **Chapter 1 – Lake Drive Traffic & Pedestrian Studies**

1.0 Transmittal Letter and Overview Map



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PROVIDING TRAFFIC ENGINEERING SOLUTIONS

Date: September 28, 2016

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## Letter of Transmittal

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To: John Edlebeck, P.E.  
Village of Whitefish Bay  
151 West Fairmount Avenue  
Whitefish Bay, WI 53217

From: Michael May, P.E., PTOE  
John Campbell, P.E.

Job Name & Reference Number: Lake Drive Traffic & Pedestrian Studies  
(Work Order #3)

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### - Enclosures -

1. Lake Drive & Belle Avenue, Lake Drive & Day Avenue – Technical Memorandum
2. Lake Drive & Silver Spring Drive/Marlborough Drive – Technical Memorandum
3. Lake Drive & Sylvan Avenue, Lake Drive & Henry Clay Street/Ardmore Avenue – Technical Memorandum
4. Lake Drive & Bartlett Avenue/Palisades Road – Technical Memorandum

### - Remarks -

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Dear John,

Attached for your review and use please four technical memorandums prepared to address traffic and pedestrian conditions at the Lake Drive intersections with Belle Avenue, Day Avenue, Silver Spring Drive/Marlborough Drive, Sylvan Avenue, Henry Clay Street/Ardmore Avenue, and Bartlett Avenue/Palisades Road. See attached map for these locations. The memorandums include the results of site observations and recommended improvements for Village consideration.

In addition to the recommendations outlined in each memorandum, the following general improvements are recommended:

- Check trees along Lake Drive every summer to ensure branches are not blocking signs or traffic signals, and trim braches as necessary.
- The pavement markings along Lake Drive were observed to be fading. Establish a pavement marking maintenance schedule in an effort to keep pavement markings visible for pedestrians, bicyclists, and motorists.
- The gutter pans along Lake Drive were observed to be deteriorating and in many places potholed. Bicyclists along Lake Drive utilize the curb lane and require a smooth surface for safe travel. Repair the pavement along the gutter pans.

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**TRAFFIC ANALYSIS & DESIGN, INC.**

Phone: 800.605.3091

N36 W7505 Buchanan Street  
Cedarburg, WI 53012  
[www.tadi-us.com](http://www.tadi-us.com)

Fax: 262.377.4381

- Consider posting a 30 mph sign exiting the reverse curve northbound between Fairmount and Cumberland.
- Consider retaining a sign engineer to ensure sign locations, sizes, and types meet MUTCD guidelines.

Thank you, John. Please feel free to contact me (414-807-1912, [mmay@tadi-us.com](mailto:mmay@tadi-us.com)) or John Campbell (414-305-3256, [icampbell@tadi-us.com](mailto:icampbell@tadi-us.com)) with any questions or comments at any time.

Sincerely,



Michael May, P.E. PTOE  
Senior Traffic Engineer

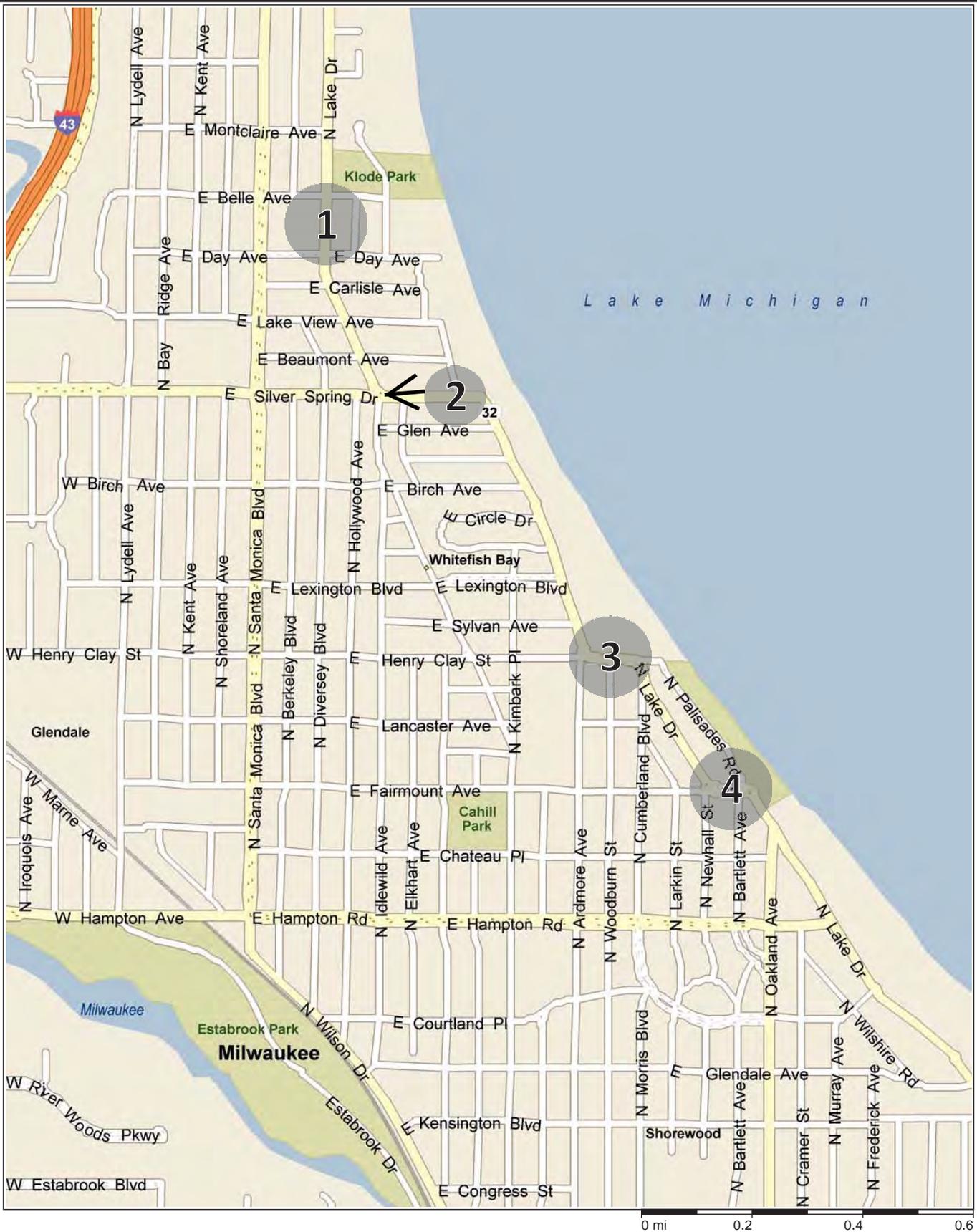
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**TRAFFIC ANALYSIS & DESIGN, INC.**

Phone: 800.605.3091

N36 W7505 Buchanan Street  
Cedarburg, WI 53012  
[www.tadi-us.com](http://www.tadi-us.com)

Fax: 262.377.4381



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# LOCATIONS STUDIED IN EACH TECHNICAL MEMORANDUM

**OVERVIEW MAP  
 LAKE DRIVE STUDY LOCATIONS  
 VILLAGE OF WHITEFISH BAY  
 MILWAUKEE COUNTY, WISCONSIN**

# **Chapter 1 – Lake Drive Traffic & Pedestrian Studies**

1.1 Lake Drive & Belle Avenue, Lake Drive & Day Avenue – Technical Memorandum

**Date:** August 24, 2016

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## Technical Memorandum

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**To:** John Edlebeck, P.E.  
Village of Whitefish Bay

**From:** Michael May, P.E. PTOE  
John Campbell, P.E.

**Subject:** Lake Drive & Belle Avenue , Lake Drive & Day Avenue  
Traffic Operations  
Village of Whitefish Bay, Wisconsin

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### PART A – INTRODUCTION

The Village of Whitefish Bay received several emails from citizens with concerns for pedestrian crossing conditions at the Lake Drive intersections with Belle Avenue and Day Avenue. More specifically, the citizen concerns were that it was difficult to cross Lake Drive to get to/from school and summer camp, and that motorists do not stop for pedestrians. The concerned citizens requested better crosswalk paint and the installation of traffic lights to control traffic.

This technical memorandum has been prepared to provide guidance to the Village on the operation of Lake Drive & Belle Avenue and Lake Drive & Day Avenue based on intersection traffic counts, the layout of the existing intersection, and observations of traveler behavior.

### PART B – EXISTING INTERSECTION LAYOUT CONDITIONS

Lake Drive is a north/south two-lane arterial street with an on-street parking, sidewalks, and a posted speed limit of 30mph within the study area. The curb-to-curb width of Lake Drive is approximately 48-feet. An 8-foot wide island separates the northbound and southbound directions of travel at the intersections with Belle Avenue and Day Avenue, leaving approximately 20-feet of width from island to curb for each direction. A 20 mph school zone exists when children are present.

Belle Avenue is an east/west 25-mph residential street with sidewalks and a curb-to-curb width of approximately 30-feet. Parking is allowed along both sides of the street. The Belle Avenue approaches to Lake Drive are stop controlled. Klode Park exists in the northeast corner of Lake Drive & Belle Avenue with a parking lot to the park and beach located two blocks east of Lake Drive.

Day Avenue is an east/west 25-mph residential street with sidewalks and a curb-to-curb width of approximately 26-feet west of Lake Drive and 27-feet east of Lake Drive. The Day Avenue approaches to Lake Drive are stop controlled. The west leg of Day Avenue is one-way eastbound-only.

The following are photographs of each approach to the intersections.



*Southbound Lake Drive at Belle*



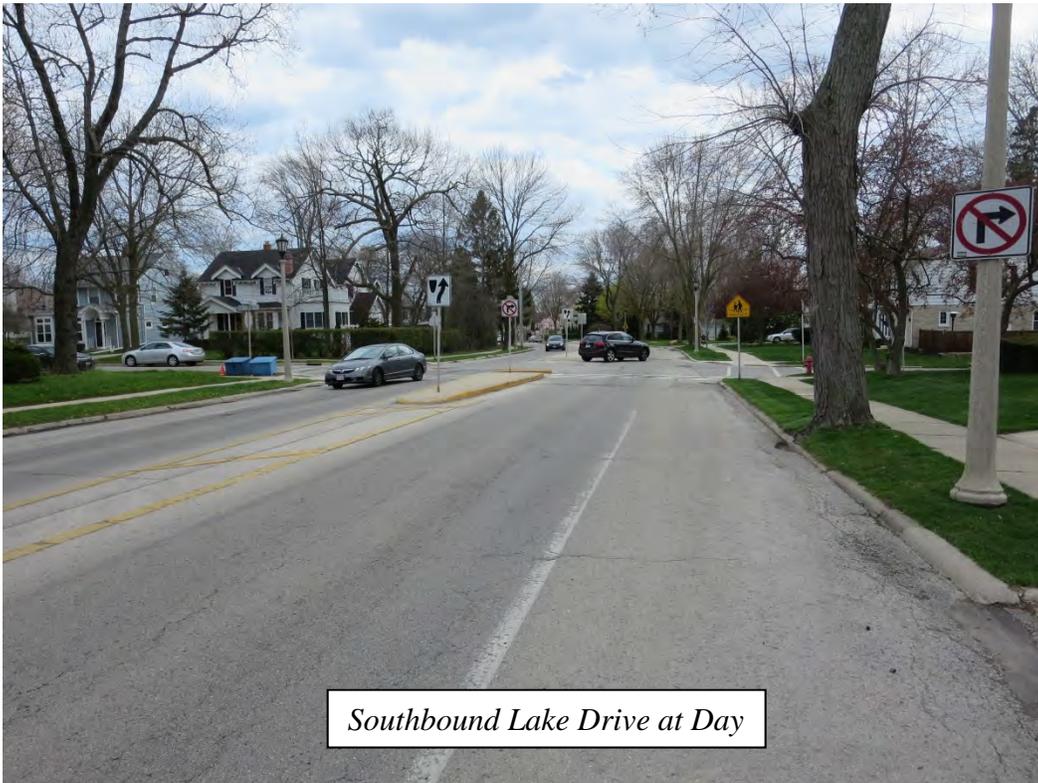
*Northbound Lake Drive at Belle*



*Westbound Belle at Lake Drive*



*Eastbound Belle at Lake Drive*



*Southbound Lake Drive at Day*



*Northbound Lake Drive at Day*



*Westbound Day at Lake Drive*



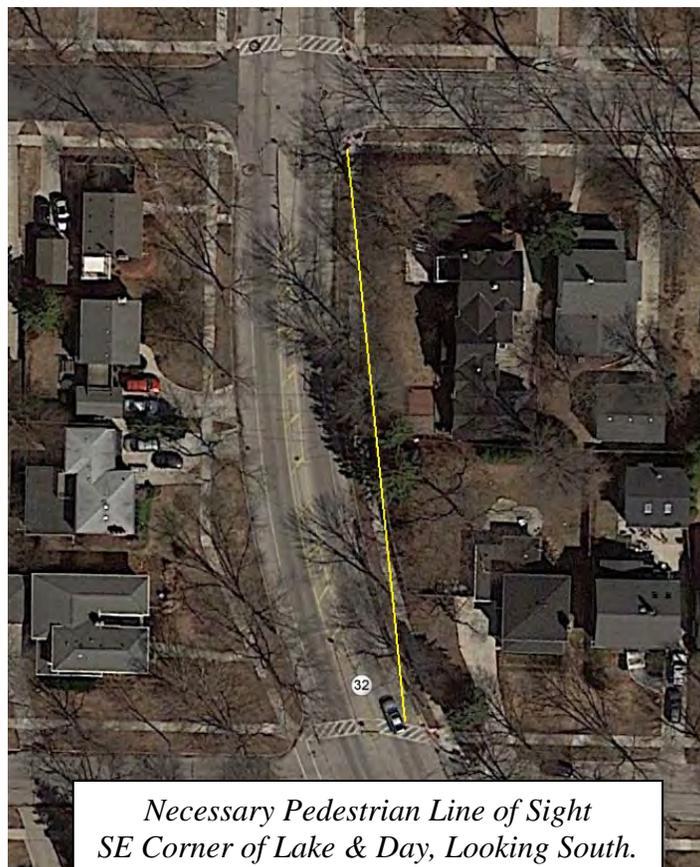
*Eastbound Day at Lake Drive*

The pavement was observed to be in good condition except for the gutters of Lake Drive where areas of asphalt were severely potholed or missing. The pavement deterioration was especially evident in the gutter pans along the northbound direction.

The STOP signs, DO NOT ENTER signs, and NO TURN signs were readily visible during daylight.

Good corner lines of sight were observed except for the westbound approach of Day Avenue to Lake Drive. Lake Drive curves towards the southeast south of the Lake Drive & Day Avenue intersection, and a large hedgerow abuts the sidewalk in the southeast corner of the intersection. As a result, westbound motorists were observed creeping into the Lake Drive intersection to see oncoming traffic in an effort to judge gaps to cross or turn right.

The same curve on Lake Drive south of Day Avenue also makes it difficult for pedestrians on the southeast corner to see oncoming traffic and on-coming traffic to see pedestrians on the southeast corner. Pedestrians need a 6-second gap in traffic to cross from the southeast corner to the median island at a 4.0 feet per second (fps) crossing speed. For a vehicle traveling at the posted speed limit, or 30 mph (44 fps), this means a pedestrian needs to be capable of seeing a vehicle approximately 265-feet south of the intersection, and vice versa, to safely and completely cross to the median island. That is, a pedestrian crossing the south leg of Lake Drive & Day Avenue needs to readily see a vehicle exiting the Lake Drive & Carlisle Avenue intersection, and vice versa, for a safe crossing. The necessary line of sight is illustrated below.



TADI observed overhead school zone signs upstream of the Lake Drive & Belle Avenue (165-foot north of Belle) and Lake Drive & Day Avenue (165-foot south of Carlisle) intersections. A photograph of the sign north of Belle Avenue is shown below. The signs south of Carlisle Avenue look similar.

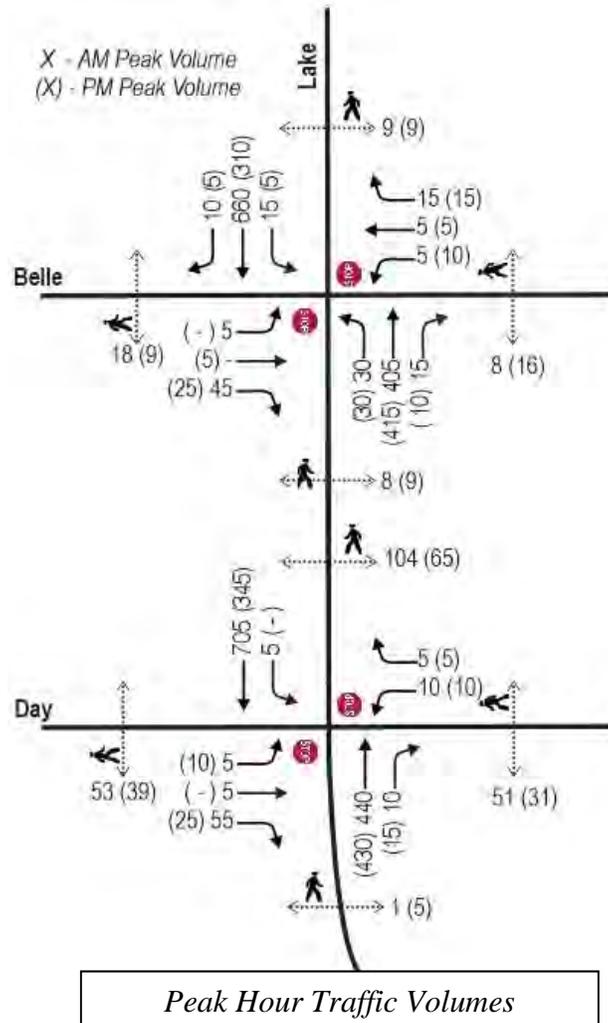


TADI did not observe the amber beacons on either side of the variable message signs operating, nor did the variable message sign change messages. Striped crosswalks were present on Lake Drive immediately below the signs. No accessible curb ramps or paved receiving areas were present for pedestrians that may use the crosswalks. The crosswalks lead directly to the overhead sign pole and not to a clear travel way. No pedestrian actuation devices were observed.

## **PART C – TRAFFIC VOLUMES & OBSERVATIONS**

### **C1. Traffic Volumes**

Turning movement traffic counts were performed on a weekday morning (7:30 to 8:30am) and a weekday afternoon (2:30 to 3:30pm) in early May of 2016. Weather was favorable for pedestrian activity with sunny skies, a light breeze from the west, and early- to mid-50's during the morning peak hour, and mostly sunny skies, a light breeze from the east, and mid- to upper-50's during the afternoon peak hour. The hours of the counts were selected to capture children's crossing activity to/from Richards Elementary. Richards Elementary had a class start of 8:05am and a school dismissal of 3:05pm.



As is common practice, on-street bicyclists were counted as vehicles and off-street bicyclists as pedestrians. Vehicle volumes were rounded to the nearest 5 vehicles while pedestrian volumes were not.

**C2. Observations**

C2.1 Lake Drive & Belle Avenue Observations

Pedestrian and bicycle activity was low to moderate at the Lake Drive & Belle Avenue intersection. The majority of pedestrians at this intersection – approximately two-thirds – were adult walkers and runners. Pedestrians were observed to be cognizant of their surroundings, properly waited and looked before crossing, and were able to cross without undue delay. Pedestrians were not observed to experience difficulty crossing the intersection. No erratic vehicular or pedestrian traffic behavior was observed. Vehicles properly yielded the right-of-way when pedestrians showed their intent to cross by standing at the edge of the curb.

The majority of motorists on Lake Drive appeared to travel at the posted speed limits. Many gaps in northbound and southbound Lake Drive traffic were observed to occur simultaneously, which is beneficial for pedestrians crossing Lake Drive.

The width of Belle Avenue and the activity of pick-up/drop-off during the arrival and dismissal periods resulted in a narrow two-way driving area between parked cars west of Lake Drive. Parents were observed to navigate the street with little problems. There was observed a vehicle parked along the north side of Belle Avenue in close proximity to Lake Drive that made it difficult for northbound-to-westbound left-turn motorists to proceed through the intersection.

Additional observations include:

- The pedestrian crossing of the west leg of the intersection is not striped.
- Detectable warning fields were not present in the median islands along Lake Drive or on the southwest corner curb ramp.
- Through-traffic motorists on Lake Drive were observed to safely bypass left-turn motorists.

#### C2.2 Lake Drive & Day Avenue Observations

Pedestrian and bicycle activity was heavy at the Lake Drive & Day Avenue intersection. The majority of pedestrians at this intersection were school-aged children. A crossing guard was present from 7:45am to 8:10am and from 3:05pm to 3:35pm to accommodate surges in pedestrian activity. The crossing guard was observed to have a commanding control of the intersection – pedestrians waited for her help in crossing and motorists on Lake Drive properly stopped. Like pedestrians at Lake Drive & Belle Avenue, pedestrians at Lake Drive & Day Avenue were observed to be cognizant of their surroundings, properly waited and looked before crossing, and were able to cross without undue delay. Pedestrians were not observed to experience difficulty crossing the intersection. No erratic vehicular or pedestrian traffic behavior was observed. Vehicles properly yielded the right-of-way when pedestrians showed their intent to cross by standing at the edge of the curb.

The majority of motorists on Lake Drive appeared to travel at the posted speed limits. Many gaps in northbound and southbound Lake Drive traffic were observed to occur simultaneously, which is beneficial for pedestrians crossing Lake Drive.

Additional observations include:

- The pedestrian crossing of the south leg of the intersection is not striped.
- Detectable warning fields were not present in the median islands along Lake Drive or on the northwest corner curb ramp.
- The pavement surface around a manhole located in the north leg crosswalk has deteriorated and may pose a tripping hazard.
- Through-traffic motorists on Lake Drive were observed to safely bypass left-turn motorists.

#### **PART D – RECOMMENDATION & CONCLUSION**

TADI recommends the following intersection improvements to improve the pedestrian and vehicular traveling environment at Lake Drive & Belle Avenue and Lake Drive & Day Avenue:

- Consider extending the median island nose on the south leg of Lake Drive & Day Avenue to allow pedestrians to cross through the median island.
- Consider reconstructing the curb ramps on the southwest corner of Lake Drive & Belle Avenue and the northwest corner of Lake Drive & Belle to include separate ramps for crossing each direction.
- Consider removing the hedgerow that abuts the sidewalk in the southeast corner of Lake Drive & Day Avenue to improve lines of sight.
- Repair the pavement in the gutter pans along Lake Drive and within crosswalk areas.
- Install detectable warning fields in the median islands along Lake Drive, on the southwest corner of Lake Drive & Belle Avenue, and on the northwest corner of Lake Drive & Day Avenue.
- Paint the Lake Drive median island noses and curbs yellow. Refresh other pavement markings at the intersections.
- Prohibit parking within 30-feet of the intersections to improve lines of sight.
- Install rectangular rapid flashing beacons (RRFB) along the north leg of the intersections of Lake Drive & Belle Avenue and Lake Drive & Day Avenue . Operate the RRFBs by pedestrian actuation (e.g. pushbutton) or passive (e.g. infrared) detection.

In addition to the improvements at Lake Drive & Belle Avenue and Lake Drive & Day Avenue, the overhead signing locations north and south of the intersections should be revised:

- Eliminate the crosswalk striping that exists under the overhead signs.
- Consider revising the overhead signing to eliminate the variable message sign and replace with an MUTCD-compliant school zone speed limit signing and/or overhead pedestrian crossing sign. If the beacons are retained, locate them to either side of the school zone speed limit signs and operate them during school arrival and dismissal periods. If the beacons are removed, consideration may be given to modifying the signs to have blinking lights around their edges. Any flashing or blinking operations at these overhead sites is recommended to occur when pedestrians are detected at Belle or Day, respectively, to serve as advanced warning of pedestrians' presence.

**EXISTING**

Looking south towards Belle Ave.

Overhead Mast Arm ~165 feet north of intersection



**PROPOSED**

State Law Yield To Pedestrians & School 20mph  
Blinking - when RRFB activated



Should any questions or comments arise, please feel free to contact Michael May, P.E. PTOE (414-807-1912, [mmay@tadi-us.com](mailto:mmay@tadi-us.com)) or John Campbell (414-350-3256, [jcampbell@tadi-us.com](mailto:jcampbell@tadi-us.com)) at any time.

# **Chapter 1 – Lake Drive Traffic & Pedestrian Studies**

1.2 Lake Drive & Silver Spring Drive/Marlborough Drive – Technical Memorandum

**Date:** August 24, 2016

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## Technical Memorandum

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**To:** John Edlebeck, P.E.  
Village of Whitefish Bay

**From:** Michael May, P.E. PTOE  
John Campbell, P.E.

**Subject:** Lake Drive & Silver Spring Drive/Marlborough Drive  
Traffic Operations  
Village of Whitefish Bay, Wisconsin

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### PART A – INTRODUCTION

The Village of Whitefish Bay seeks to improve pedestrian and vehicular safety and efficiency at the Lake Drive & Silver Spring Drive/Marlborough Drive intersection.

This technical memorandum has been prepared to provide guidance to the Village on the operation of Lake Drive & Silver Spring Drive/Marlborough Drive based on intersection traffic counts, the layout of the existing intersection, and observations of traveler behavior.

### PART B – EXISTING INTERSECTION LAYOUT CONDITIONS

Lake Drive is a north/south two-lane arterial street with a posted speed limit of 30 mph north of the study area intersection, and an east/west two-lane arterial street with a posted speed limit of 25 mph east of the intersection. Sidewalks exist along both sides of Lake Drive. Right-turn islands exist in the northwest and northeast corners of the study intersection. Lake Drive is also designated at State Trunk Highway (STH) 32. No average daily traffic (ADT) volumes are recorded by WisDOT along Lake Drive near the study area intersection.

Silver Spring Drive is an east/west 25-mph street with sidewalks. Parking is allowed along both sides of the street, west of Hollywood Avenue, to service the central business district. WisDOT reports a preliminary Year 2016 ADT along Silver Spring Drive, east of Santa Monica Boulevard, of approximately 8,700 vpd.

Marlborough Drive is a north/south 25-mph collector street with sidewalks and on-street parking. WisDOT reports a preliminary Year 2016 ADT along Marlborough Drive, south of Silver Spring Drive, of approximately 4,700 vpd.

The following are photos of each approach to the intersections.





*Westbound Lake at Marlborough*



*Eastbound Silver Spring at Lake*

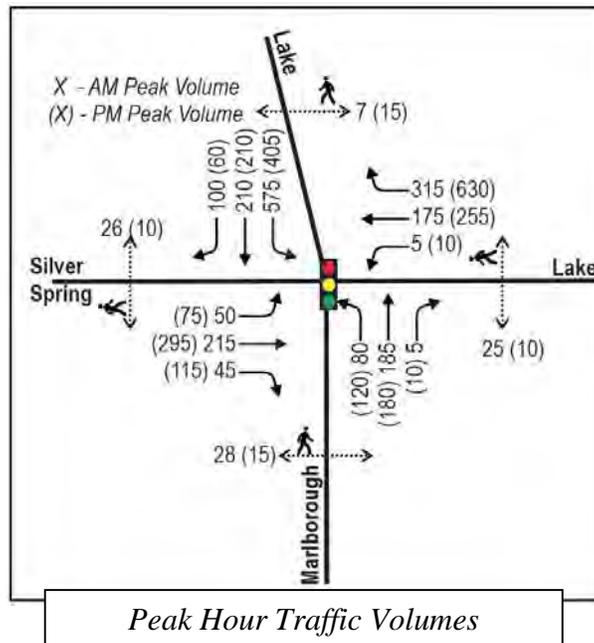
The asphalt pavement within the intersection and within the first 50-feet of the east leg of Lake were observed to be severely cracked. The right-turn island in the northeast corner of the intersection is severely deteriorating.

TADI noted that the westbound-to-northbound right-turn signal indications were not located at or before the crosswalk that exists between the northeast right-turn island and the northeast corner. The near-side right-turn signal indications should be located at or before the westbound-to-northbound right-turn stop line.

**PART C – TRAFFIC VOLUMES & OBSERVATIONS**

**C1. Traffic Volumes**

Turning movement traffic counts were performed on a weekday morning (7:00 to 9:00am) and a weekday afternoon (3:00 to 6:00pm) in early May of 2016. Weather was favorable for pedestrian activity with sunny skies and temperatures in the 60s. The peak traffic hours were 7:30 to 8:30am and 4:45 to 5:45pm.



As is common practice, on-street bicyclists were counted as vehicles and off-street bicyclists as pedestrians. Vehicle volumes were rounded to the nearest 5 vehicles while pedestrian volumes were not.

**C2. Observations**

The crosswalk across the north leg of the intersection was observed to cross from the northwest right-turn island to the northeast corner rather than through the northeast right-turn island. The westbound-to-northbound right-turn movement is heavy and motorists making the turn were observed to look over their left shoulders to ensure conflicting vehicles were not present, and few checked over their right shoulders to ensure pedestrians were not in the north crosswalk. This condition is a safety concern.

The southbound Lake Drive to westbound Silver Spring Drive right-turn configuration is challenging. There is a masonry gateway feature in the northwest corner of the intersection that makes it difficult for southbound-to-eastbound motorists to see pedestrians waiting to cross from the curb to the right-turn island. The masonry feature also makes it difficult for the pedestrians to see oncoming traffic. Note that a crossing guard was observed at the intersection.

A driveway to Sendik's is located approximately 90-feet north of the Lake Drive stop line at Silver Spring Drive. Motorists were observed exiting the driveway and attempting to turn left towards the north on Lake Drive through breaks in traffic queues. This is an unsafe condition that may result in "courtesy queue" crashes. A courtesy queue crash occurs when motorists are waved through a traffic stream only to find too late an oncoming vehicle in an adjacent lane.

## **PART D – TRAFFIC OPERATIONS**

### **D1. Level of Service Definitions**

The study area intersections were analyzed based on the procedures set forth in the *2010 Highway Capacity Manual* (HCM). Intersection operation is defined by "level of service". Level of service (LOS) is a quantitative measure that refers to the overall quality of flow at an intersection ranging from very good, represented by LOS 'A', to very poor, represented by LOS 'F'. For the purpose of this study, LOS D was used to define desirable peak hour operating conditions. Descriptions of the various levels of service are as follows:

*LOS A* is the highest level of service that can be achieved. Under this condition, intersection approaches appear quite open, turning movements are easily made, and nearly all drivers find freedom of operation. At signalized intersections, average delays are less than 10 seconds.

*LOS B* represents stable operation. At signalized intersections, average vehicle delays are 10 to 20 seconds.

*LOS C* still represents stable operation, but periodic backups of a few vehicles may develop behind turning vehicles. Most drivers begin to feel restricted, but not objectionably so. At signalized intersections, average vehicle delays are 20 to 35 seconds.

*LOS D* represents increasing traffic restrictions as the intersection approaches instability. Delays to approaching vehicles may be substantial during short peaks within the peak period, but periodic clearance of long lines occurs, thus preventing excessive backups. At signalized intersections, average vehicle delays are 35 to 55 seconds.

*LOS E* represents the capacity of the intersection. At signalized intersections, average vehicle delays are 55 to 80 seconds.

*LOS F* represents jammed conditions where the intersection is over capacity. At signalized intersections, average vehicle delays exceed 80 seconds.

### **D2. Existing Traffic Operations & Queues**

TADI obtained existing traffic signal timings for the Lake Drive & Silver Spring Drive/Marlborough Drive intersection and analyzed the existing traffic volumes to measure

intersection operations. Table A shows the existing traffic operations and queues at the intersection.

**Table A**  
**Existing Intersection Operations & Queues**

Intersection	Peak Hour		Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Silver Spring Drive & Lake Drive/Marlborough Drive (Traffic Signal Control) <sup>1 2</sup>	AM	LOS	C	D	C	B	C	C	F	C	C			
		Queue	55'	215'	150'	40'	75'	160'	565'	150'	30'			
	PM	LOS	C	C	C	B	C	C	D	C	C			
		Queue	40	310'	180'	110'	85'	130'	345'	145'	25'			

Notes: (-) indicates a movement that is prohibited or does not exist; (\*) indicates a freeflow movement.

1. Assumes eastbound through traffic will bypass eastbound left-turn traffic.
2. AM southbound left-turn queue is theoretically infinite, meaning multiple cycles for vehicles to clear.

As shown, the southbound left-turn movement from Lake Drive currently operates at LOS F conditions with a theoretically infinite queue in the weekday morning peak hour. This movement takes multiple cycles for vehicles to clear the intersection.

### D3. Expected Traffic Operations & Queues with Improvements

The existing traffic signal timings at Lake Drive & Silver Spring Drive/Marlborough Drive were updated to reflect timings to meet the latest version of the Manual on Uniform Traffic Control Devices (MUTCD) guidance on the timing of yellow, all-red, walk, and flashing don't walk. The updated timings assumed recommended improvements are implemented. The retiming results in the same or longer times for these parameters, which in turn affects the amount of time that can be allocated to each movement and, thus, intersection operations. Table B shows the expected traffic operations and queues at the intersection with timing modifications.

**Table B**  
**Expected Intersection Operations & Queues with Timing Modifications**

Intersection	Peak Hour		Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Silver Spring Drive & Lake Drive/Marlborough Drive (Traffic Signal Control) <sup>1</sup>	AM	LOS	D	D	C	C	C	D	E	C	C			
		Queue	45'	240'	165'	50'	85'	175'	570'	150'	30'			
	PM	LOS	D	C	C	C	C	D	D	C	C			
		Queue	35'	265'	195'	155'	110'	165'	390'	170'	20'			

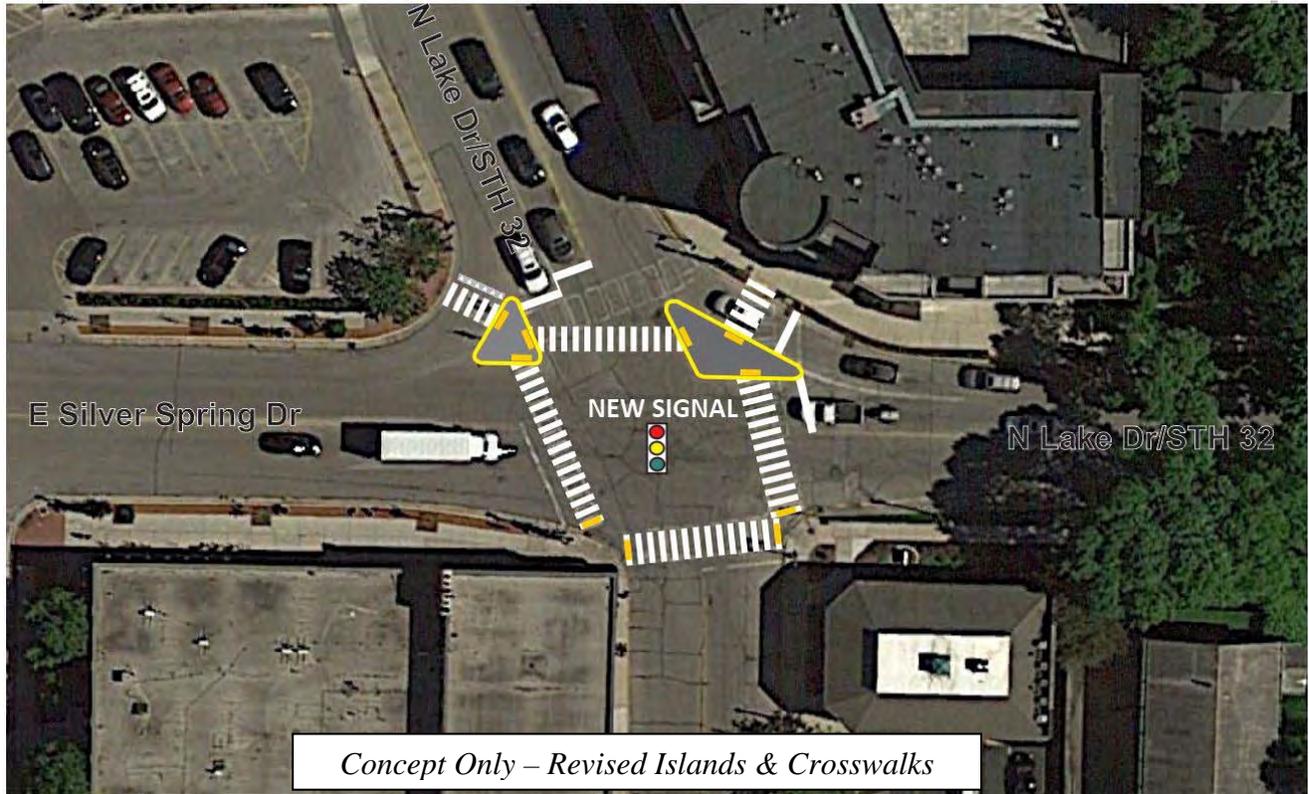
Notes: (-) indicates a movement that is prohibited or does not exist; (\*) indicates a freeflow movement.

1. Assumes eastbound through traffic will bypass eastbound left-turn traffic.

As shown, the southbound left-turn movement from Lake Drive is expected to improve to LOS E conditions and the theoretically infinite queue is no longer expected during the weekday morning peak hour. Several queues are expected to increase for other movements due to necessary changes in operations and timings, but all movements are expected to clear during each cycle.

## PART E – RECOMMENDATION & CONCLUSION

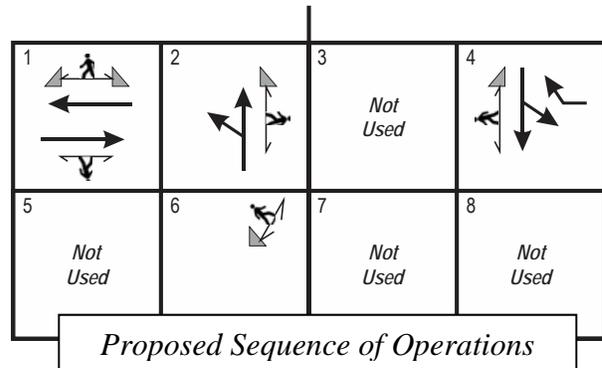
TADI recommends the following intersection improvements to improve the pedestrian and vehicular traveling environment at Lake Drive & Silver Spring Drive/Marlborough Drive. Reference the diagram below to help understand the recommendations.



- Increase the area of the right-turn islands in the northeast and northwest corners of the intersection to facilitate pedestrian refuge, paint the curbs of the islands yellow, and cross the pedestrians to/from the northwest and northeast corners through the islands. Crossing pedestrians through the islands shortens the pedestrian crossing distance, minimizing their exposure to vehicular traffic and allowing greater flexibility in operating the signal. Crossing pedestrians through the islands may also afford shorter vehicular crossing distances, which allows for greater flexibility in timing the signal.
- Install ADA-compliant detectable warning fields within the islands and on the corners of the intersection, and restripe the crosswalks with a continental or ladder striping pattern. Repair the pavement to provide smooth pedestrian crossing surfaces. Refresh other pavement markings at the intersections for greater visibility.

- Revise the traffic signal equipment to include the following:
  - Lake Drive westbound-to-northbound right-turn indications should be added prior to the pedestrian crossing, and pedestrian signal heads should be placed to cross between the northeast corner and the northeast island.
  - Install pedestrian countdown signal heads for all crossings. Ensure pedestrian signal heads are placed properly to align with the path of the pedestrians.

- Revise the traffic signal sequence of operation as shown conceptually to the right. This change will allow the pedestrians crossing to/from the northeast island and northeast corner (phase 6) to receive WALK and FLASHING DON'T WALK indications when eastbound/westbound traffic (phase 1) and northbound traffic (phase 2) is serviced.



- Retime the traffic signal to meet the latest Manual on Uniform Traffic Control Devices (MUTCD) guidance.
- Consider revising the alignment of the northwest right-turn island such that the southbound right-turn lane intersects Silver Spring Drive at or near 90-degrees (not shown in the concept). If undertaken, this improvement would provide better lines of sight for vehicles approaching the intersection and for pedestrians wishing to cross, as well as allow for better placement of approach signs. This improvement would result in the need to relocate the masonry decorative wall on the northwest corner and may require property acquisition.
- Consider access changes to the property located immediately northwest of the intersection. The driveway along Lake Drive should be closed or provide for right-in only traffic, as left-in and left-out movements are dangerous with traffic back-ups from the signal and the right-out movement is dangerous with lane changes so close to the signal. The driveway along Silver Spring Drive should provide for right-in/right-out only traffic or left-in/right-in/right-out only traffic due to traffic back-ups from the traffic signal. Impacted motorists may utilize access to Beaumont Avenue or to Consaul Place.

Should any questions or comments arise, please feel free to contact Michael May, P.E. PTOE (414-807-1912, [mmay@tadi-us.com](mailto:mmay@tadi-us.com)) or John Campbell (414-350-3256, [jcampbell@tadi-us.com](mailto:jcampbell@tadi-us.com)) at any time.

# **Chapter 1 – Lake Drive Traffic & Pedestrian Studies**

1.3 Lake Drive & Sylvan Avenue, Lake Drive & Henry Clay Street/Ardmore Avenue  
– Technical Memorandum

Date: August 24, 2016

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## Technical Memorandum

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**To:** John Edlebeck, P.E.  
Village of Whitefish Bay

**From:** Michael May, P.E. PTOE  
John Campbell, P.E.

**Subject:** Lake Drive & Sylvan Avenue  
Lake Drive & Henry Clay Street/Ardmore Avenue  
Traffic Operations  
Village of Whitefish Bay, Wisconsin

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### PART A – INTRODUCTION

The Village of Whitefish Bay received emails from two citizens with concerns for pedestrian crossing conditions at the Lake Drive intersection with Sylvan Avenue. More specifically, the residents stated that the crosswalk across Lake Drive was difficult for motorists to see and that rectangular rapid flashing beacons (RRFBs) should be installed. An email was received from a citizen with a concern for pedestrian safety through the Lake Drive curve at Henry Clay Street due to run-of-the-road crashes and a request to install a barrier to protect pedestrians.

This technical memorandum has been prepared to provide guidance to the Village on the operation of Lake Drive & Sylvan Avenue and Lake Drive & Henry Clay Street/Ardmore Avenue based on intersection traffic counts, the layout of the existing intersections, a crash analysis at Lake Drive & Henry Clay Street/Ardmore Avenue, and observations of traveler behavior.

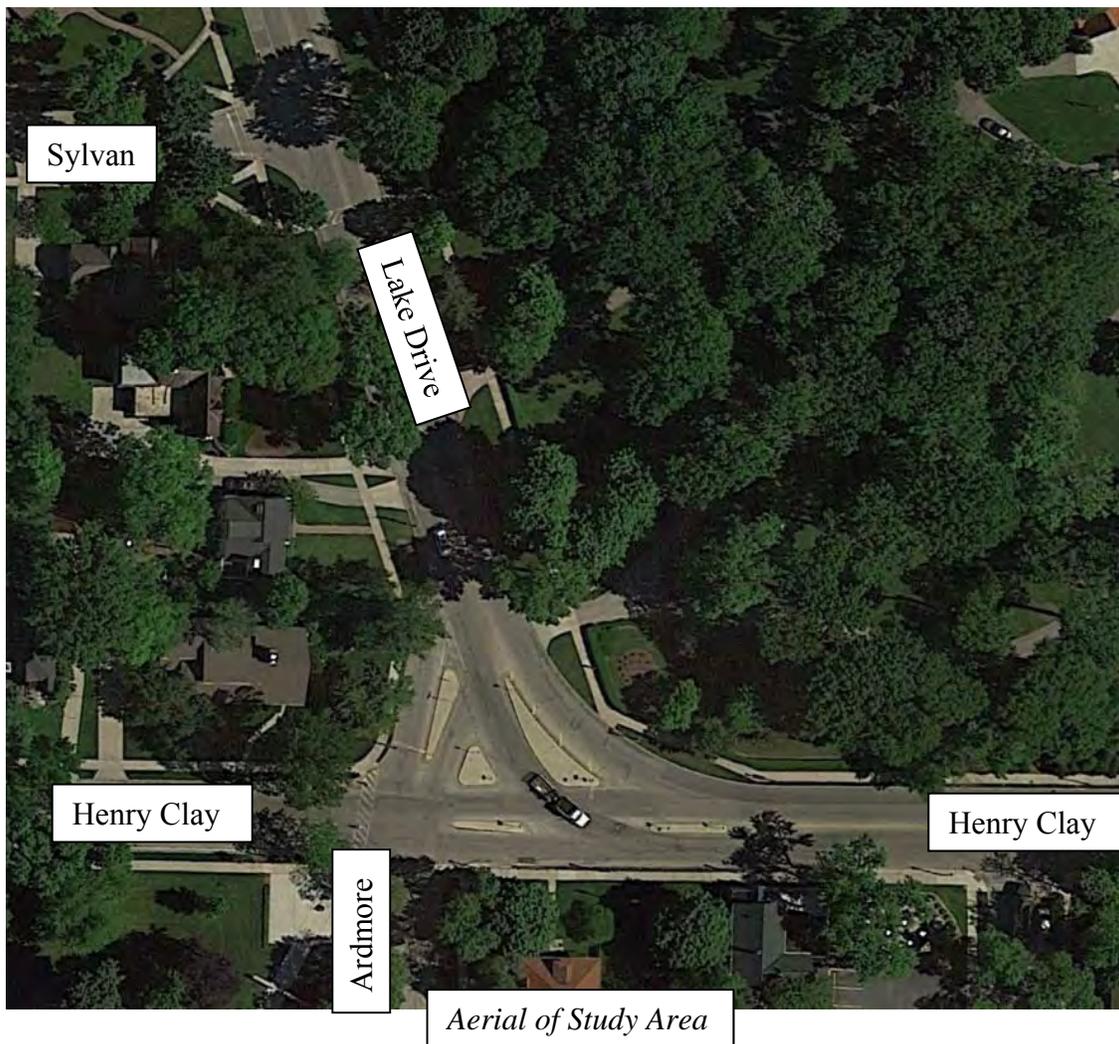
### PART B – EXISTING INTERSECTION LAYOUT CONDITIONS

Lake Drive is primarily a north/south two-lane arterial street with sidewalks and a posted speed limit of 30mph within the study area. Parking is allowed north of Henry Clay Street with a 7-9am southbound prohibition and a 4-6pm northbound prohibition. The WisDOT Year 2013 AADT volume on Lake Drive, between Sylvan Avenue and Henry Clay Street, was approximately 10,700 vehicles per day (vpd). Note that Lake Drive continues with Henry Clay Street for the two blocks between Ardmore Avenue and Palisades Road – this stretch of roadway is signed as Henry Clay Street. Lake Drive is also designated at State Trunk Highway (STH) 32.

Sylvan Avenue is an eastbound-only one-way 25-mph residential street with sidewalks. One-hour on-street parking is allowed on the north side of the street. Parking is prohibited on the south side of the street at the intersection. The eastbound approach of Sylvan Avenue to Lake Drive is stop sign controlled.

Henry Clay Street is an east/west 25-mph residential street with sidewalks and on-street parking west of Ardmore Avenue. The Henry Clay Street designation continues east of Ardmore Avenue on "Lake Drive" to Palisades Road with sidewalk and without on-street parking. The eastbound Henry Clay Street approach to Ardmore Avenue is stop controlled, the eastbound approach to Lake Drive is yield controlled, the westbound approach to Lake Drive is stop controlled, and the westbound approach to Ardmore Avenue is not controlled. The WisDOT Year 2004 AADT on Henry Clay Street was 1,900 vpd west of Ardmore Avenue.

Ardmore Avenue is a north/south two-lane 25-mph street with sidewalks and on-street parking. The northbound approaches of Ardmore Avenue to Henry Clay Street and to Lake Drive are stop controlled.



The following are photographs of each approach to the intersections.





*Eastbound Sylvan at Lake*



*Southbound Lake at Henry Clay*



*Northbound Ardmere at Henry Clay*



*Westbound Henry Clay at Lake*



The pavement was observed to be in good condition and signs were readily visible during daylight. Good corner lines of sight were observed.

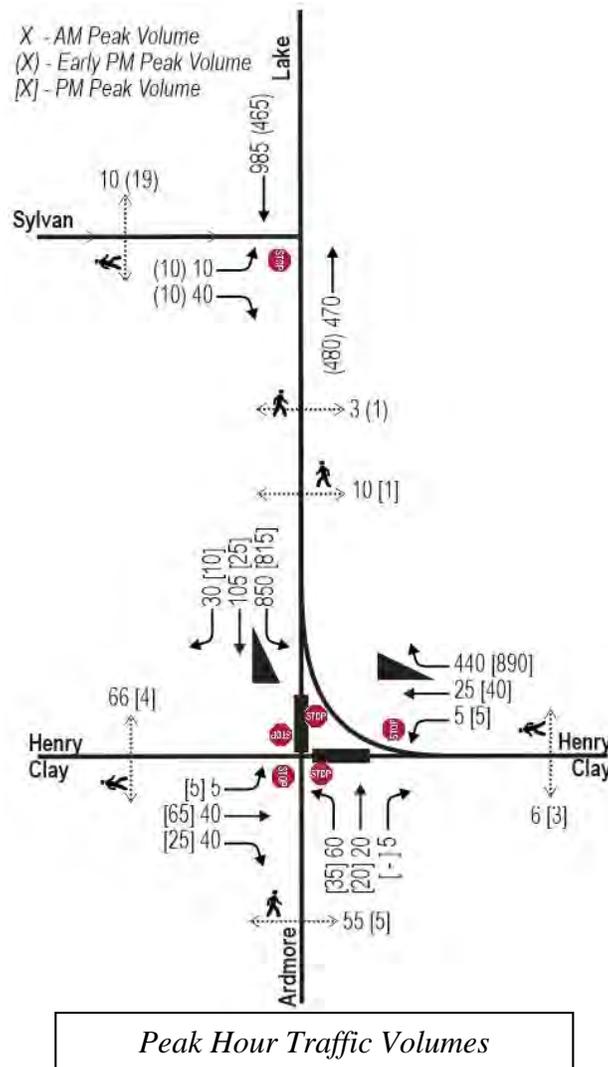
## **PART C – TRAFFIC VOLUMES & OBSERVATIONS**

### **C1. Traffic Volumes**

Turning movement traffic counts were performed at Lake Drive & Sylvan Avenue on a weekday morning (7:15 to 8:15am) and a weekday afternoon (2:30 to 3:30pm) in early May of 2016.

Weather was favorable for pedestrian activity with mostly cloudy skies, temperatures in the 50s, and a morning breeze from the east and an afternoon breeze from the northwest. The hours of the counts at Lake Drive & Sylvan Avenue were selected to capture activity to/from Whitefish Bay Middle School, which had a class start of 7:55am and a school dismissal of 3:10pm, and Whitefish Bay High School, which had a class start of 7:45am and a school dismissal of 3:05pm.

Turning movement traffic counts were also performed at Lake Drive & Henry Clay Street/Ardmore Avenue on a weekday morning (7:00 to 9:00am) and a weekday afternoon (3:00 to 6:00pm) in early May of 2016 under favorable weather conditions. The peak hours at Lake Drive & Henry Clay Street/Ardmore Avenue were identified as 7:15 to 8:15am and 4:45 to 5:45pm. The hours of the counts at Lake Drive & Henry Clay Street/Ardmore Avenue were selected to capture weekday morning and evening commuter rush hours.



As is common practice, on-street bicyclists were counted as vehicles and off-street bicyclists as pedestrians. Vehicle volumes were rounded to the nearest 5 vehicles while pedestrian volumes were not.

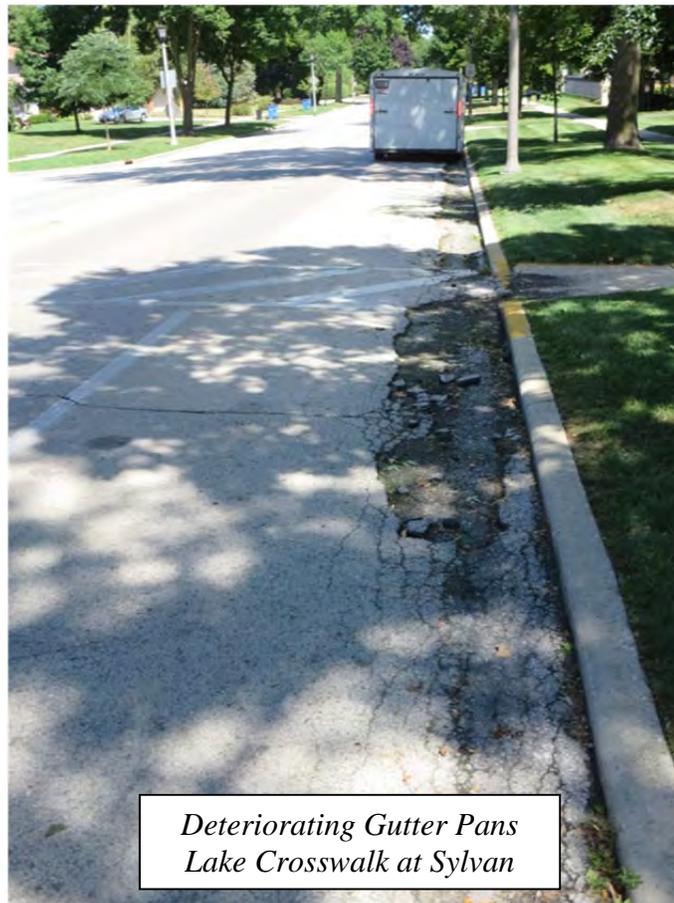
**C2. Observations**

**C2.1 Lake Drive & Sylvan Avenue Observations**

Pedestrian and bicycle activity was low crossing Lake Drive and low-to-moderate crossing Sylvan Avenue. Pedestrians crossing Lake Drive were primarily adult walkers and runners while those crossing Sylvan Avenue were a mix of children and adults. Pedestrians were observed to be cognizant of their surroundings, properly waited and looked before crossing, and were able to cross without undue delay. Pedestrians were not observed to experience difficulty crossing the intersection. No erratic vehicular or pedestrian traffic behavior was observed.

Additional observations include:

- Detectable warning fields were not present on the southwest corner curb ramp or southeast curb ramp.
- Crosswalk pavement markings across Lake Drive at Sylvan Avenue were faded and difficult to see.
- Pedestrian signing at the Lake Drive crosswalk appears to be properly located and is visible to motorists.
- The gutter pan along Lake Drive is deteriorating and potholed.



### C2.2 Lake Drive & Henry Clay Street/Ardmore Avenue Observations

Pedestrian and bicycle activity was low crossing Lake Drive but moderate to heavy crossing the west leg of Henry Clay Street and the south leg of Ardmore Avenue – particularly in the morning peak hour. Pedestrians were observed to be cognizant of their surroundings, properly waited and looked before crossing, and were able to cross without undue delay. Pedestrians were not observed to experience difficulty crossing the intersection. No erratic vehicular or pedestrian traffic behavior was observed.

The majority of motorists on Lake Drive appeared to travel at prudent speeds through the Lake Drive curve.

Additional observations include:

- While pedestrians crossed Lake Drive, no crosswalk – marked or unmarked – exists at the intersection through the curve. TADI noted that the nearest crosswalk location north of Lake Drive & Henry Clay Street/Ardmore Avenue is at Sylvan Avenue. A crosswalk location could not be found southeast along Lake Drive until of the intersection with Bartlett Avenue/Palisades Road.
- The Ardmore Avenue northbound approach to the Lake Drive curve does not have a stop line. The median-side stop sign for the approach is approximately 20-feet further from Henry Clay Street than the curb-side stop sign for the approach, which along with the lack of a stop line may result in driver confusion regarding the proper place to stop before proceeding.
- The eastbound Henry Clay Street stop sign at the approach to Ardmore Avenue is partially blocked by a tree.
- The eastbound Henry Clay Street yield sign at the approach to the Lake Drive curve is located in the median, and no curb-side yield sign exists.
- A guardrail exists along the south side of Henry Clay Street through the Lake Drive curve.
- Detectable warning fields were not present on the northwest corner curb ramp or southwest curb ramp of Henry Clay Street & Ardmore Street.
- Pedestrian crosswalk areas are deteriorating with other pavement in the intersection and may pose a tripping hazard.



*Deteriorating Pavement in Crosswalks  
Southwest Corner of Henry Clay & Ardmore*

## **PART D – TRAFFIC OPERATIONS**

### **D1. Level of Service Definitions**

The study area intersections were analyzed based on the procedures set forth in the *2010 Highway Capacity Manual* (HCM). Intersection operation is defined by “level of service”. Level of service (LOS) is a quantitative measure that refers to the overall quality of flow at an intersection ranging from very good, represented by LOS ‘A’, to very poor, represented by LOS ‘F’. For the purpose of this study, LOS D was used to define desirable peak hour operating conditions. Descriptions of the various levels of service are as follows:

*LOS A* is the highest level of service that can be achieved. Under this condition, intersection approaches appear quite open, turning movements are easily made, and nearly all drivers find freedom of operation. At unsignalized intersections, average delays are less than 10 seconds.

*LOS B* represents stable operation. At unsignalized intersections, average delays are 10 to 15 seconds.

*LOS C* still represents stable operation, but periodic backups of a few vehicles may develop behind turning vehicles. Most drivers begin to feel restricted, but not objectionably so. At unsignalized intersections, average delays are 15 to 25 seconds.

*LOS D* represents increasing traffic restrictions as the intersection approaches instability. Delays to approaching vehicles may be substantial during short peaks within the peak period, but periodic clearance of long lines occurs, thus preventing excessive backups. At unsignalized intersections, average delays are 25 to 35 seconds.

*LOS E* represents the capacity of the intersection. At unsignalized intersections, average delays are 35 to 50 seconds.

*LOS F* represents jammed conditions where the intersection is over capacity and acceptable gaps for unsignalized intersections in the mainline traffic flow are minimal. At unsignalized intersections, average delays exceed 50 seconds.

### **D2. Existing Traffic Operations & Queues**

TADI analyzed the existing traffic volumes at Lake Drive & Henry Clay Street/Ardmore Avenue at the request of the Village to measure existing intersection operations. Table A shows the existing traffic operations and queues at the intersection.

**Table A**  
**Lake Drive & Henry Clay Street/Ardmore Avenue - Existing Intersection Operations & Queues**

Intersection	Peak Hour		Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Henry Clay Street & Ardmore Avenue (Three-Way Stop)	AM	LOS	A			A			A			A		
		Queue	20'			20'			20'			20'		
	PM	LOS	A			A			A			A		
		Queue	20'			20'			20'			20'		
Henry Clay Street & Lake Drive Curve (Two-Way Stop)	AM	LOS	-	C	-	-	C	*	-	-	-	*	-	-
		Queue	-	20'	-	-	20'	*	-	-	-	*	-	-
	PM	LOS	-	C	-	-	C	*	-	-	-	*	-	-
		Queue	-	30'	-	-	20'	*	-	-	-	*	-	-
Ardmore Avenue & Lake Drive Curve <sup>1 2</sup> (One-Way Stop)	AM	LOS	-	-	-	-	-	*	-	E	-	*	*	
		Queue	-	-	-	-	-	*	-	20'	-	*	*	
	PM	LOS	-	-	-	-	-	*	-	F	-	*	*	
		Queue	-	-	-	-	-	*	-	35'	-	*	*	

Notes: (-) indicates a movement that is prohibited or does not exist; (\*) indicates a freeflow movement.

1. AM Peak: 0.7-sec beyond the LOS D/E threshold
1. PM Peak: 34.3-sec beyond the LOS D/E threshold

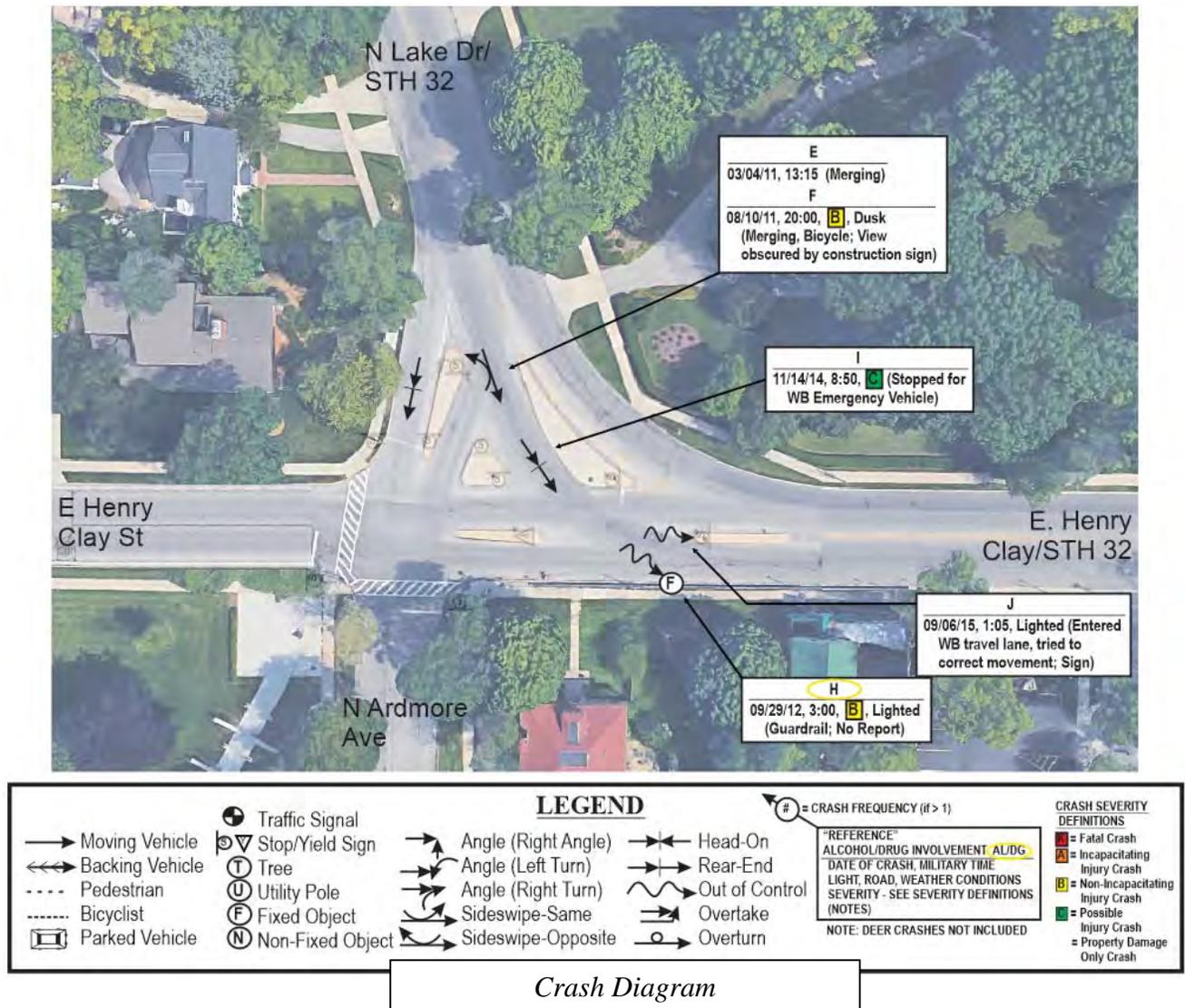
As shown, the northbound through movement from Ardmore Avenue to the Lake Drive curve currently operates at LOS E during the weekday morning peak hour and LOS F during the weekday evening peak hour. Though these operations are not desirable, the movement services a low volume of approximately 25 vehicles in each of the peak hours and traffic queues clear the intersection.

### PART E – CRASH ANALYSIS

The Village requested a crash analysis of the Lake Drive & Henry Clay Street/Ardmore Avenue intersection. The analysis was performed using crashes for the five-year period of January 1, 2011 through December 31, 2016.

The Lake Drive & Henry Clay Street/Ardmore Avenue intersection experienced six crashes during the five year study period, including:

- A run-off-the-road crash at 3:00am that involved the motorist striking the guardrail on the south side of the Lake Drive curve. This crash involved alcohol or drugs.
- A run-off-the-road crash at 1:05pm that involved a southbound-to-eastbound Lake Drive motorist who entered the westbound travel lane, tried to correct the movement, and struck a sign.
- A rear-end crash of a motorist stopped on the curve for an emergency vehicle.
- Two crashes involving northbound Ardmore Avenue to northbound Lake Drive motorists. The first involved a merging maneuver. The second also involved a merging maneuver and a bicyclist that was not seen due to construction signage blocking the motorists view.
- A rear-end crash southbound from Lake Drive towards Henry Clay Street.



Overall, the crash rate for the intersection was 0.26 crashes per million entering vehicles (MEV). A crash rate of 1.0 crashes per MEV or higher is an indicator of a crash problem. The crash analysis does not indicate a crash pattern or crash problem.

**PART F – RECOMMENDATION & CONCLUSION**

TADI recommends the following intersection improvements to improve the pedestrian and vehicular traveling environment at Lake Drive & Sylvan Avenue and Lake Drive & Henry Clay Street/Ardmore Avenue:

**F1. Lake Drive & Sylvan Avenue**

- Residents requested rectangular rapid flashing beacons (RRFBs) be installed for pedestrians crossing Lake Drive at Sylvan Avenue. The pedestrian volumes are low, existing signage is present and easily seen, and RRFBs are not warranted. Therefore, an

RRFB installation is not recommended. Existing pedestrian signs along Lake Drive at the crosswalk are sufficient.

- Install detectable warning fields at the crosswalk ramps at Lake Drive & Sylvan Avenue. Refresh crosswalk pavement markings for crossing Lake Drive, preferably in a continental or ladder striping pattern.
- Repair pavement in the gutter pans to provide a smooth surface for bicyclists.

## **F2. Lake Drive & Henry Clay Street/Ardmore Avenue**

- The Lake Drive & Henry Clay Street/Ardmore Avenue intersection, though unconventional in design, was observed to operate efficiently.
- Provide a stop line for northbound Ardmore Avenue traffic at the approach to the Lake Drive curve.
- The eastbound Henry Clay Street yield sign at the approach to the Lake Drive curve is located in the median. Provide a yield sign on the right-hand side of the approach, and consider providing a yield line.
- Consider additional pavement marking along Lake Drive through the curve to guide motorists along the curve, position bicyclists along the curve, and to give visual cues to motorists crossing the curve of where they can position themselves while waiting for a gap in mainline traffic.
- Consider striping bike lanes northbound and southbound on Lake Drive through the S-Curve.
- Refresh the yellow paint on the raised intersection islands and refresh other pavement markings at the intersection.
- A resident requested a barrier wall along Lake Drive through the curve at Henry Clay Street. TADI notes that a guardrail exists along the south side of Henry Clay Street through the curve with Lake Drive.

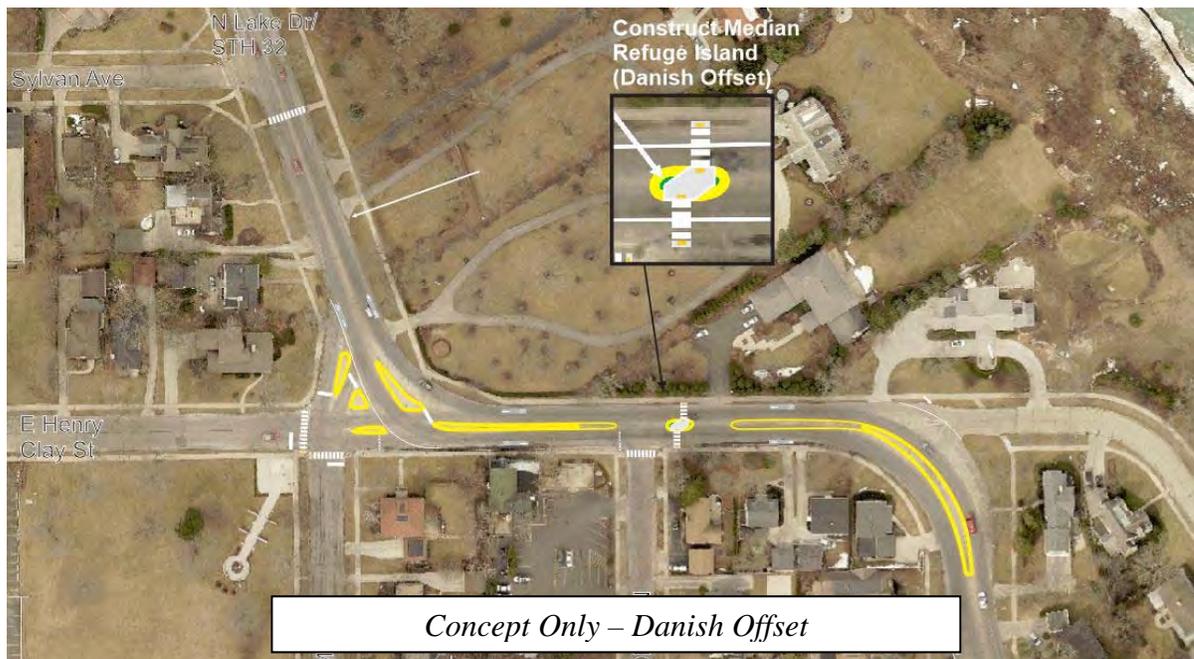
## **F3. Henry Clay Street & Ardmore Avenue**

- The intersection operates as three-way stop control with westbound traffic operating without a stop sign. Install a “Traffic From Right Does Not Stop” sign under the northbound approach stop sign, a “Traffic from the Left Does Not Stop” sign under the southbound approach stop sign, and an “Oncoming Traffic Does Not Stop” sign under the eastbound approach stop sign.
- Repair the pavement within the crosswalks to provide a crossing surface free of trip hazards.
- Install detectable warning fields at the crosswalk ramps at Henry Clay Street & Ardmore Avenue, and refresh crosswalk pavement markings, preferably in a continental or ladder striping pattern.

- The eastbound Henry Clay Street stop sign at the approach to Ardmore Avenue is partially blocked by a tree. Consider moving the stop sign closer to the street.

#### F4. Other Considerations

- TADI noted that the nearest crosswalk location north of Lake Drive & Henry Clay Street/Ardmore Avenue is at Sylvan Avenue. A crosswalk location could not be found southeast along Lake Drive until of the intersection with Bartlett Avenue/Palisesades Road, though pedestrians – particularly students – do cross Lake Drive between Ardmore Avenue and Cumberland Boulevard.
- Consider installing a Danish Offset pedestrian treatment across the east leg of the Lake Drive & Woodburn Street intersection. A concept is shown below. A Danish Offset allows pedestrians to cross the near-side stream of traffic and find refuge in a median. The pedestrian then travels a short distance in the median facing oncoming traffic before waiting to cross the far-side stream of traffic.
- If constructed, include pedestrian crossing signs and advance warning signs, if necessary, in accordance with the MUTCD. Consideration may be given to providing dynamic speed feedback signs approaching the S-curve, both northbound and southbound.



Should any questions or comments arise, please feel free to contact Michael May, P.E. PTOE (414-807-1912, [mmay@tadi-us.com](mailto:mmay@tadi-us.com)) or John Campbell (414-350-3256, [jcampbell@tadi-us.com](mailto:jcampbell@tadi-us.com)) at any time.

# **Chapter 1 – Lake Drive Traffic & Pedestrian Studies**

1.4 Lake Drive & Bartlett Avenue/Palisades Road – Technical Memorandum

Date: August 24, 2016

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## Technical Memorandum

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**To:** John Edlebeck, P.E.  
Village of Whitefish Bay

**From:** Michael May, P.E. PTOE  
John Campbell, P.E.

**Subject:** Lake Drive & Bartlett Avenue/Palisades Road  
Traffic Operations  
Village of Whitefish Bay, Wisconsin

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### PART A – INTRODUCTION

The Village of Whitefish Bay received a citizen request for a crossing signal at the Lake Drive intersection with Bartlett Avenue/Palisades Road.

This technical memorandum has been prepared to provide guidance to the Village on the operation of Lake Drive & Bartlett Avenue/Palisades Road based on intersection traffic counts and observations of traveler behavior.

### PART B – EXISTING INTERSECTION LAYOUT CONDITIONS

Lake Drive is a primarily north/south two-lane arterial street with a posted speed limit of 30 mph. Lake Drive intersects Bartlett Avenue/Palisades Road from the east and west within a reverse curve. A 20 mph advisory speed is posted upstream of the intersection (north of Fairmount Avenue to the northwest, north of Oakland Avenue to the south) due to the reverse curves east and west of the intersection. Sidewalks exist along both sides of Lake Drive. Parking is prohibited. A guardrail is present along the northeast side of the Lake Drive curve just east of Bartlett Avenue/Palisades Road. The Year 2013 average daily traffic (ADT) volume was approximately 12,300 vehicles per day (vpd) between Newhall Street and Bartlett Avenue/Palisades Road. Lake Drive continues with Fairmount Avenue for the block between Bartlett Avenue/Palisades Road and Newhall Street, and is known on that stretch of roadway as Fairmount Avenue. Lake Drive is designated as State Trunk Highway (STH) 32.

Bartlett Avenue is a north/south two-lane 25-mph residential street that intersects Lake Drive from the south opposite Palisades Road. Sidewalks exist along both sides of the roadway and on-street parking is allowed.

Palisades Road is a north/south, one-lane, one-way northbound 25-mph street that intersects Lake Drive from the north opposite Bartlett Avenue. Sidewalks exist along the west side of the roadway and on-street parking is allowed. Big Bay Park exists immediately east of Palisades Road and has a multi-use trail that runs along the east side of the roadway.

The following are photos of each approach to the intersections.





*Northbound Bartlett at Lake*



*Southbound Palisades at Lake*

The crosswalk across Lake Drive connects the southeast corner of the intersection with the northwest corner of the intersection, as shown in the photo below. A six-foot wide median is present east of the crosswalk, but does not serve as a pedestrian refuge. Pedestrians utilize the center section of the crosswalk as refuge with little protection. The pavement through the crosswalk is in good condition and signs exist to warn motorists of the crossing. The pavement marking for the crosswalk is worn and faded.



Reverse curve and advisory speed signing is located upstream of the intersection. The location of the reverse curve signing is approximately 425-feet south of the eastern Lake Drive curve (southeast of Bartlett/Palisades), and approximately 275-feet north of the western Lake Drive curve (northwest of Fairmount/Newhall). The Manual on Uniform Traffic Control Devices (MUTCD) 2009 guidelines indicate that the warning signs should be placed anywhere from the point of curvature up to 100-feet in advance of the curve. The MUTCD also states that it should be installed in advance of the curve and at least 100 feet from any other signs. (Source: MUTCD 2009 Table 2C-4).

The pedestrian signs for northbound traffic also appear to be redundant (see below). There is a pedestrian crossing sign with a 20 mph advisory speed sign, a reverse curve sign with advisory speed sign, and then a pedestrian crossing sign with an “ahead” sign. The only pedestrian crossing observed on this stretch of Lake Drive is at Bartlett Avenue/Palisades Road. There may exist an opportunity to minimize the redundant pedestrian and advisory speed signs.



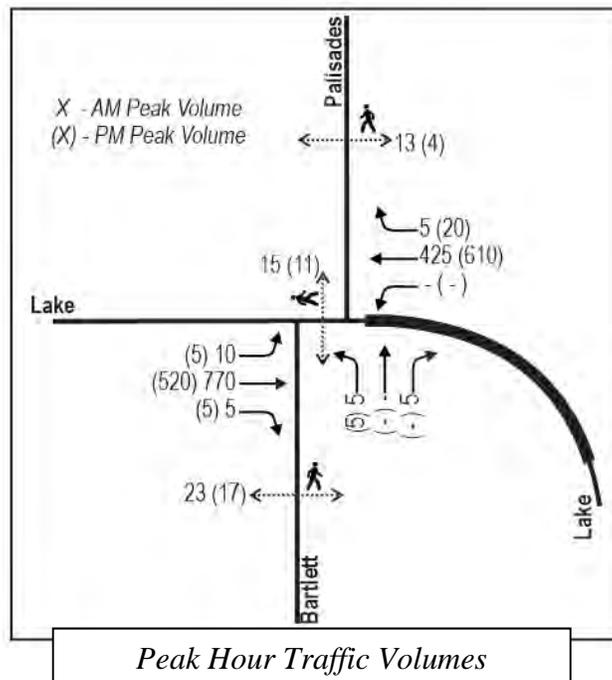
TADI noted that the directional arrow sign behind the guardrail is installed improperly for northbound approaching traffic. The arrow sign should be installed perpendicular to the driver's line of sight. The photo below was taken from behind the arrow sign and shows that it is not perpendicular to the driver's line of sight. No directional sign exists for eastbound traffic.



**PART C – TRAFFIC VOLUMES & OBSERVATIONS**

**C1. Traffic Volumes**

Turning movement traffic counts were performed on a weekday morning (7:15 to 8:15am) and a weekday afternoon (2:30 to 3:30pm) in early May of 2016. Weather was favorable for pedestrian activity with sunny skies and temperatures in the mid 50s (morning) to upper 60s (evening). The hours of the counts were selected to capture activity to/from Whitefish Bay Middle School, which had a class start of 7:55am and a school dismissal of 3:10pm, and Whitefish Bay High School, which had a class start of 7:45am and a school dismissal of 3:05pm.



As is common practice, on-street bicyclists were counted as vehicles and off-street bicyclists as pedestrians. Vehicle volumes were rounded to the nearest 5 vehicles while pedestrian volumes were not.

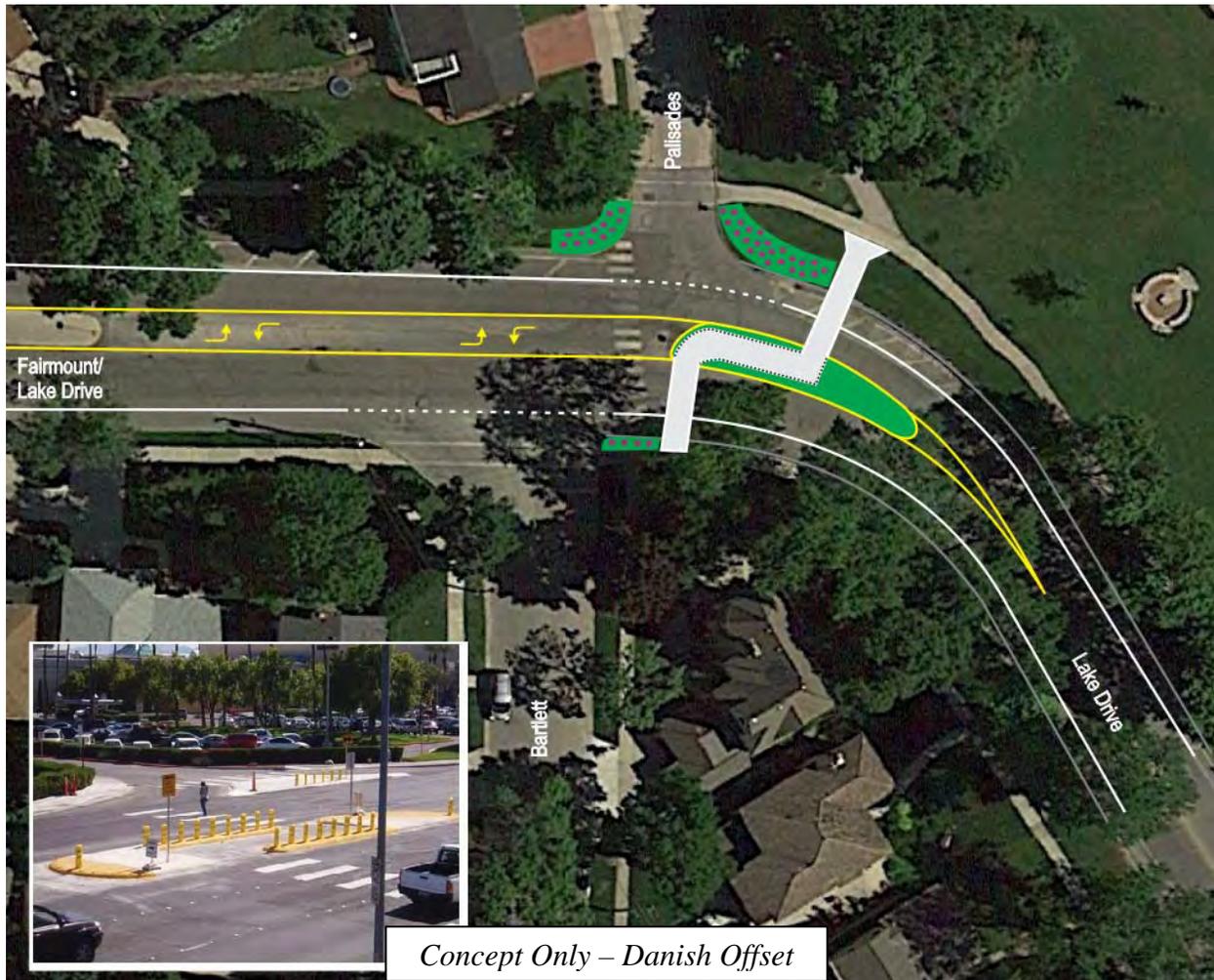
**C2. Observations**

The majority of pedestrians crossing Lake Drive were adults – few children were observed to cross Lake Drive. The pedestrians crossed cautiously and used the center of the road to cross half-way, wait for a gap in traffic, and then cross the remainder of the distance.

Due to the curvature of Lake Drive and trees along the southwest side of the curve, pedestrians in the center of Lake Drive can see vehicles (and vice versa) for a total distance of approximately 225-feet. The stopping sight distance at 30-mph is 200-feet.

## PART D – RECOMMENDATION & CONCLUSION

TADI recommends the following intersection improvements to improve the pedestrian and vehicular traveling environment at Lake Drive & Bartlett Avenue/Palisades Road. Reference the diagram below to help understand the recommendations.



- Install a Danish Offset pedestrian refuge island across the east leg of intersection. A Danish Offset allows pedestrians to cross the near-side stream of traffic and find refuge in a median. The pedestrian then travels a short distance in the median facing oncoming traffic before waiting to cross the far-side stream of traffic. The line of sight is expected to double as a result of the Danish Offset, providing motorists and pedestrians greater time to perceive and react to the other.
- Stripe a two-way left-turn lane (TWLTL, pronounced “twittle”) between the two medians on Lake Drive to show left-turn motorists where to position themselves and to better guide traffic through the reverse curves.
- Since parking is prohibited throughout the S-Curve, consider striping bike lanes northbound and southbound through the S-Curve. Revise the warning and other signing

on Lake Drive to follow the latest MUTCD signing guidance. This revision includes ensuring the directional arrows and chevron signs through the curve are perpendicular to motorist lines of sight, that the reverse curve and advisory speed signs are placed in a proper distance and order from the curve, and that signing redundancy is reduced for ease of motorist comprehension. Also consider placing dynamic speed signs on the approaches to the S-curve, both northbound and southbound.

- Install ADA-compliant detectable warning fields within the islands and on the curbside landings. Restripe the crosswalks with a continental or ladder striping pattern. Refresh other pavement markings at the intersections as well.
- Consideration may be given to modifying Bartlett Avenue to left-in/right-in/right-out only, or right-in/right-out only, due to its location in close proximity to the Lake Drive curve and poor line of sight. Impacted motorists may utilize Newhall Street or Oakland Avenue to complete their maneuvers.
- Consider additional pavement marking along Lake Drive through the curves to guide motorists along the curve, position bicyclists along the curve, and to give visual cues to motorists crossing the curve of where they can position themselves while waiting for a gap in mainline traffic.

Should any questions or comments arise, please feel free to contact Michael May, P.E. PTOE (414-807-1912, [mmay@tadi-us.com](mailto:mmay@tadi-us.com)) or John Campbell (414-350-3256, [jcampbell@tadi-us.com](mailto:jcampbell@tadi-us.com)) at any time.

## **Appendix – Traffic Counts**

# Intersection Traffic Volume Report

Count Basics		Version 2013.J4.1		Page 1 of 11	
Start Date:	Tuesday, May 03, 2016	Weekday		Schools in Session	
Total Number of Hours Counted:	5	Non-Holiday		No Special Events	

## Base Information, Observed (5) Hour and Estimated (24) Hour Volume Summaries

Intersection of: **Lake Drive and Lake Dr-Silver Spring**

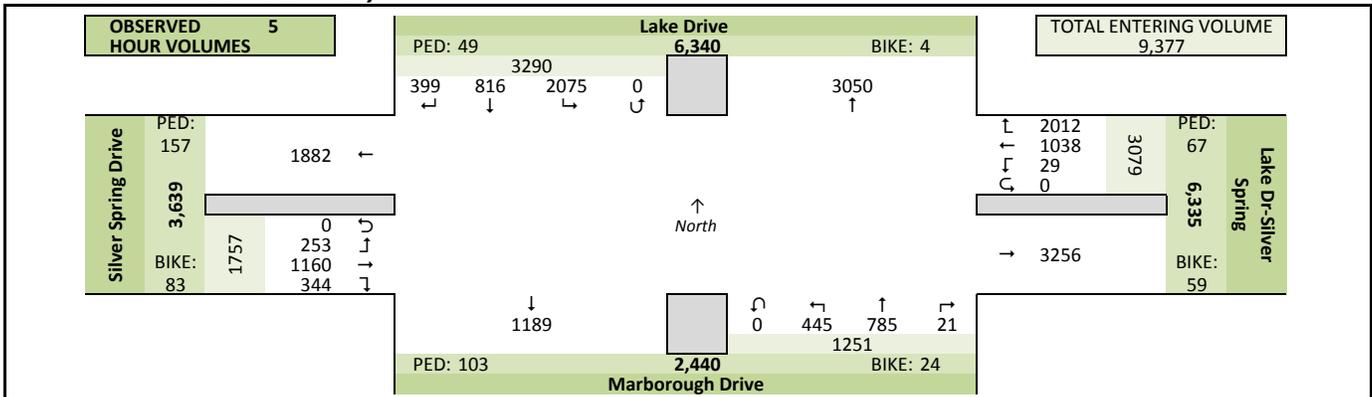
### Site Information

Municipality	Village of Whitefish Bay
County	Milwaukee
WisDOT Region	SE
Traffic Control	Traffic Signal
Roadway Names	North Direction
North Leg	Lake Drive
East Leg	Lake Dr-Silver Spring
South Leg	Marborough Drive
West Leg	Silver Spring Drive
Special Considerations	
Schools	In Session
Holidays	None
Special Events	None
Special Pedestrians Observed	
Pre-school children	None
Elementary school age children	None
Visually impaired (white cane/helper dog)	None
Elderly/disabled (except wheelchairs)	None
Wheelchairs/electric scooters	None
Other (describe)	None

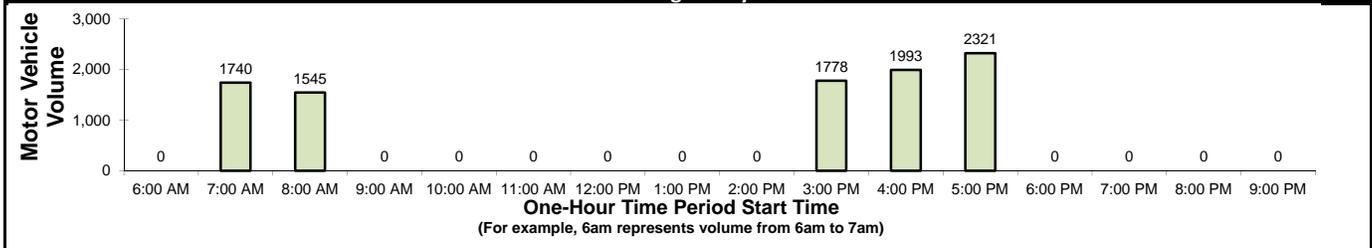
### Count Information

Hrs Counted:	7:00 AM-9:00 AM and 3:00 PM-6:00 PM		
1st Day of Count	Tuesday, May 03, 2016	Weather	Clear & Dry
AM Peak Period	Tuesday, May 03, 2016	Weather	Clear & Dry
Midday Peak Period	Tuesday, May 03, 2016	Weather	Clear & Dry
PM Peak Period	Tuesday, May 03, 2016	Weather	Clear & Dry
Calculated Peak Hours	AM 7:30-8:30am	MD	PM 4:45-5:45pm
Peak Hours Selected for Analysis	AM 7:30-8:30am	MD	PM 4:45-5:45pm
Daily/Seasonal Adjustment Group	(2) Urban Arterials & Collectors		
Count Expansion Group	(2) Urban Arterials & Collectors		
Daily/Seasonal Adjustment Factor	0.899	Count Expansion Factor	2.650
Company Name	TADI, Inc.	Manual Adj.	1.000
Observers	AM Peak Period	Karlyn Bieberitz	
	Midday Peak Period	None	
	PM Peak Period	Karlyn Bieberitz	
Comments	Version 2011.J4.1 2014 DOT Factors		

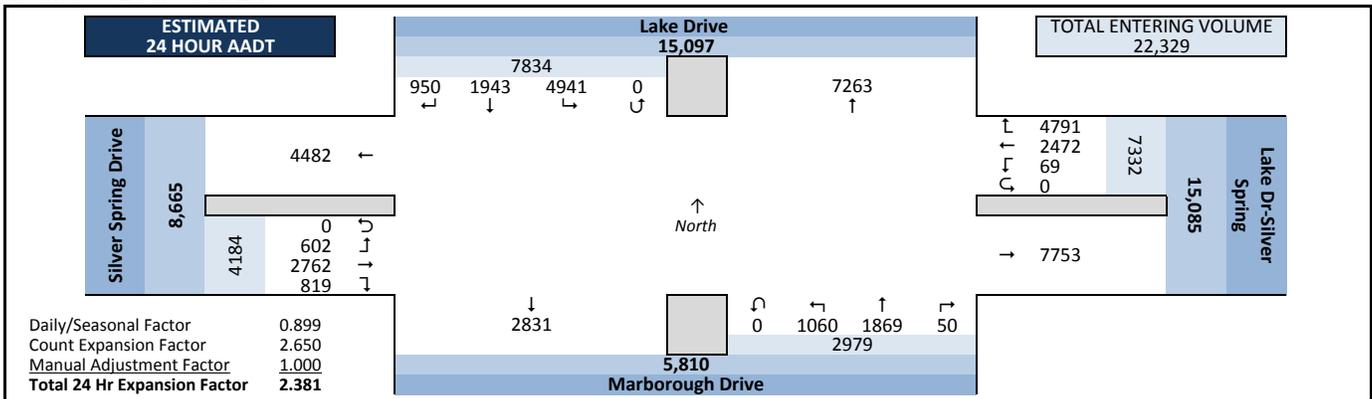
### Observed 5 Hour Volume Summary



### Total Entering Hourly Volume



### Estimated 24 Hour AADT



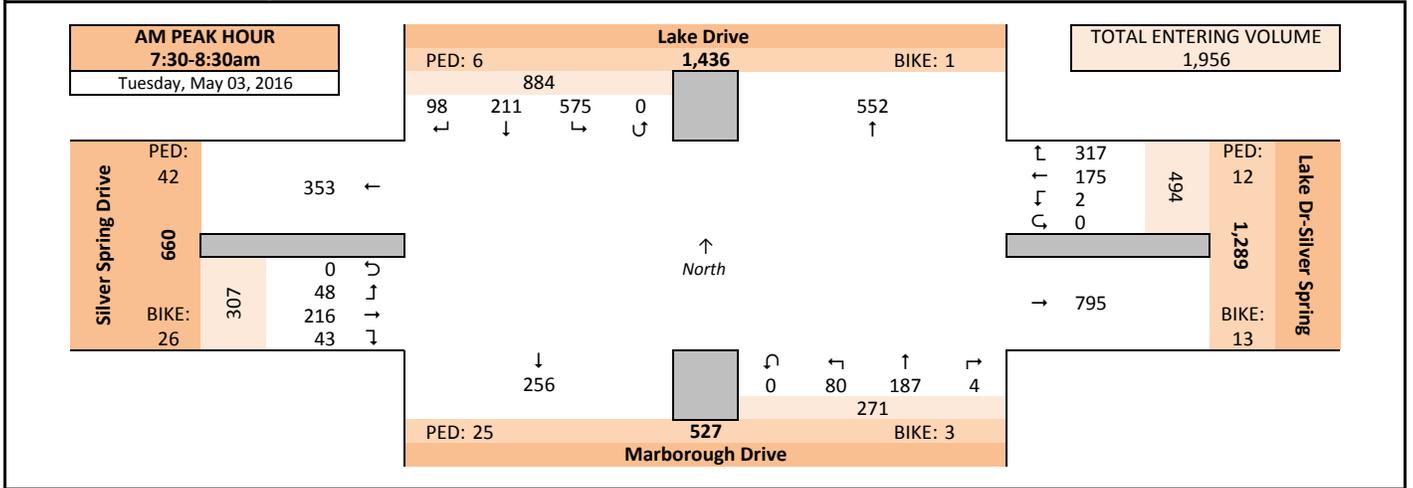
# Intersection Traffic Volume Report

<b>Count Basics</b>		<b>Page 2 of 11</b>	
Start Date:	Tuesday, May 03, 2016	Weekday	Schools in Session
Total Number of Hours Counted:	5	Non-Holiday	No Special Events

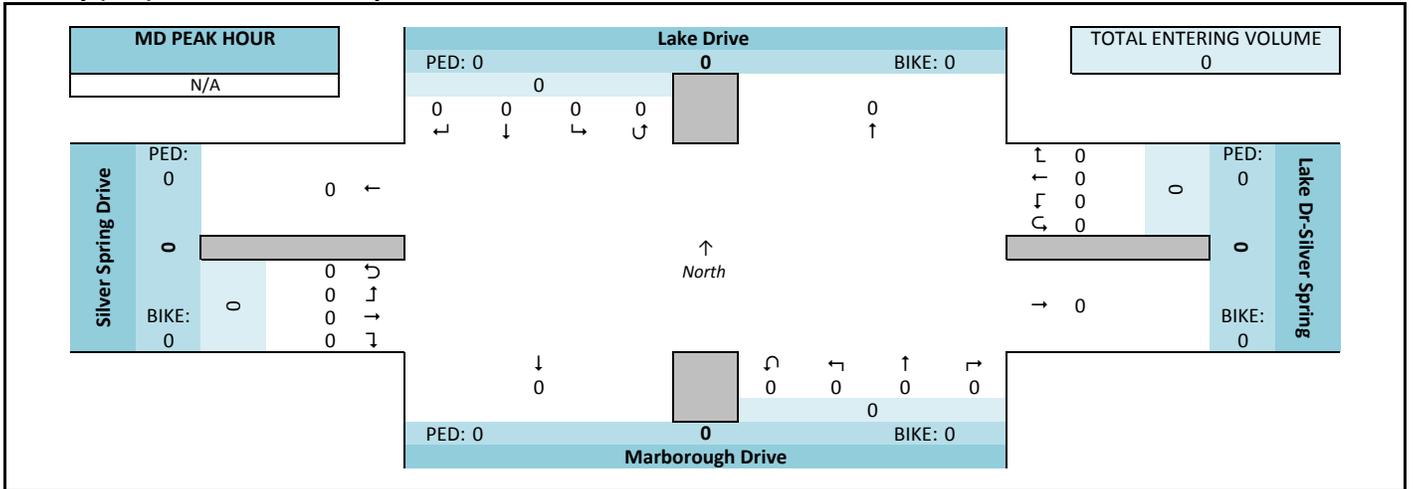
## Peak Hour Volume Graphical Summary

### Lake Drive and Lake Dr-Silver Spring

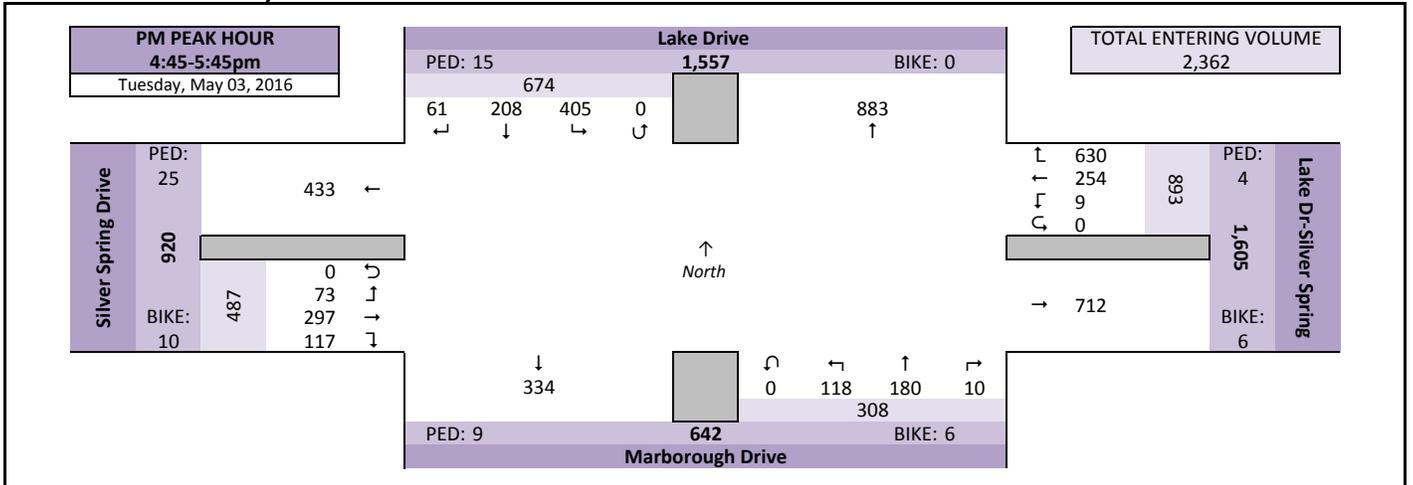
#### AM Peak Hour Summary



#### Midday (MD) Peak Hour Summary



#### PM Peak Hour Summary



# Intersection Traffic Volume Report

<b>Count Basics</b>			<b>Page 3 of 11</b>
Start Date:	Tuesday, May 03, 2016	Weekday	Schools in Session
Total Number of Hours Counted:	5	Non-Holiday	No Special Events

## Peak Hour Volume Summary

### Lake Drive and Lake Dr-Silver Spring



#### Peak Hour Volumes, Truck Percentages, and PHFs

Tuesday, May 03, 2016		From North					From East					From South					From West					Totals
AM Peak Hour	Start Time	Lake Drive					Lake Dr-Silver Spring					Marborough Drive					Silver Spring Drive					
		Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
	7:30 AM	23	110	156	0	289	75	36	1	0	112	2	60	19	0	81	13	48	14	0	75	557
	7:45 AM	14	39	153	0	206	97	68	0	0	165	0	71	28	0	99	8	58	11	0	77	547
	8:00 AM	35	37	148	0	220	73	41	0	0	114	2	28	12	0	42	11	64	9	0	84	460
	8:15 AM	26	25	118	0	169	72	30	1	0	103	0	28	21	0	49	11	46	14	0	71	392
	Peak Hour Volume	98	211	575	0	884	317	175	2	0	494	4	187	80	0	271	43	216	48	0	307	1956
	Rounded Hourly Volume	100	210	575	0	885	315	175	0	0	490	5	185	80	0	270	45	215	50	0	310	1955
	% Single Unit Trucks	5.1	2.4	1.7	0.0	2.3	1.3	1.1	0.0	0.0	1.2	0.0	1.6	5.0	0.0	2.6	14.0	1.9	4.2	0.0	3.9	2.3
	% Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	% Trucks (Total)	5.1	2.4	1.7	0.0	2.3	1.3	1.1	0.0	0.0	1.2	0.0	1.6	5.0	0.0	2.6	14.0	1.9	4.2	0.0	3.9	2.3
	Peak Hour Factor (PHF)	0.70	0.48	0.92	0.00	0.76	0.82	0.64	0.50	0.00	0.75	0.50	0.66	0.71	0.00	0.68	0.83	0.84	0.86	0.00	0.91	0.88

N/A		From North					From East					From South					From West					Totals
Midday (MD) Peak Hour	Start Time	Lake Drive					Lake Dr-Silver Spring					Marborough Drive					Silver Spring Drive					
		Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
	12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Peak Hour Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rounded Hourly Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	% Single Unit Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	% Trucks (Total)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Peak Hour Factor (PHF)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Tuesday, May 03, 2016		From North					From East					From South					From West					Totals
PM Peak Hour	Start Time	Lake Drive					Lake Dr-Silver Spring					Marborough Drive					Silver Spring Drive					
		Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
	4:45 PM	18	64	100	0	182	149	64	2	0	215	0	43	20	0	63	27	54	14	0	95	555
	5:00 PM	8	39	115	0	162	158	60	1	0	219	5	45	23	0	73	29	91	27	0	147	601
	5:15 PM	16	60	103	0	179	170	58	5	0	233	2	50	23	0	75	33	79	18	0	130	617
	5:30 PM	19	45	87	0	151	153	72	1	0	226	3	42	52	0	97	28	73	14	0	115	589
	Peak Hour Volume	61	208	405	0	674	630	254	9	0	893	10	180	118	0	308	117	297	73	0	487	2362
	Rounded Hourly Volume	60	210	405	0	675	630	255	10	0	895	10	180	120	0	310	115	295	75	0	485	2365
	% Single Unit Trucks	6.6	0.5	0.7	0.0	1.2	1.3	0.8	0.0	0.0	1.1	0.0	0.0	4.2	0.0	1.6	3.4	0.7	2.7	0.0	1.6	1.3
	% Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	% Trucks (Total)	6.6	0.5	0.7	0.0	1.2	1.3	0.8	0.0	0.0	1.1	0.0	0.0	4.2	0.0	1.6	3.4	0.7	2.7	0.0	1.6	1.3
	Peak Hour Factor (PHF)	0.80	0.81	0.88	0.00	0.93	0.93	0.88	0.45	0.00	0.96	0.50	0.90	0.57	0.00	0.79	0.89	0.82	0.68	0.00	0.83	0.96

#### Peak Hour Pedestrian and Bicyclist Volumes

Pedestrians and Bicyclists		Crossing North Approach			Crossing East Approach			Crossing South Approach			Crossing West Approach			Total Ped & Bike Volume
15-Minute Start Time		Lake Drive			Lake Dr-Silver Spring			Marborough Drive			Silver Spring Drive			
		Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total	
AM	7:30 AM	0	0	0	0	9	9	3	1	4	7	21	28	41
	7:45 AM	4	0	4	11	3	14	15	2	17	26	4	30	65
	8:00 AM	0	0	0	1	1	2	4	0	4	4	1	5	11
	8:15 AM	2	1	3	0	0	0	3	0	3	5	0	5	11
	<b>Total</b>	<b>6</b>	<b>1</b>	<b>7</b>	<b>12</b>	<b>13</b>	<b>25</b>	<b>25</b>	<b>3</b>	<b>28</b>	<b>42</b>	<b>26</b>	<b>68</b>	<b>128</b>
MD	12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
PM	4:45 PM	2	0	2	3	2	5	3	2	5	1	5	6	18
	5:00 PM	4	0	4	1	2	3	2	1	3	11	2	13	23
	5:15 PM	3	0	3	0	0	0	0	3	3	8	2	10	16
	5:30 PM	6	0	6	0	2	2	4	0	4	5	1	6	18
	<b>Total</b>	<b>15</b>	<b>0</b>	<b>15</b>	<b>4</b>	<b>6</b>	<b>10</b>	<b>9</b>	<b>6</b>	<b>15</b>	<b>25</b>	<b>10</b>	<b>35</b>	<b>75</b>

# Intersection Traffic Volume Report

<b>Count Basics</b>			<b>Page 4 of 11</b>
Start Date:	Tuesday, May 03, 2016	Weekday	Schools in Session
Total Number of Hours Counted:	5	Non-Holiday	No Special Events

## Hourly Volume Summary - Motor Vehicle Data

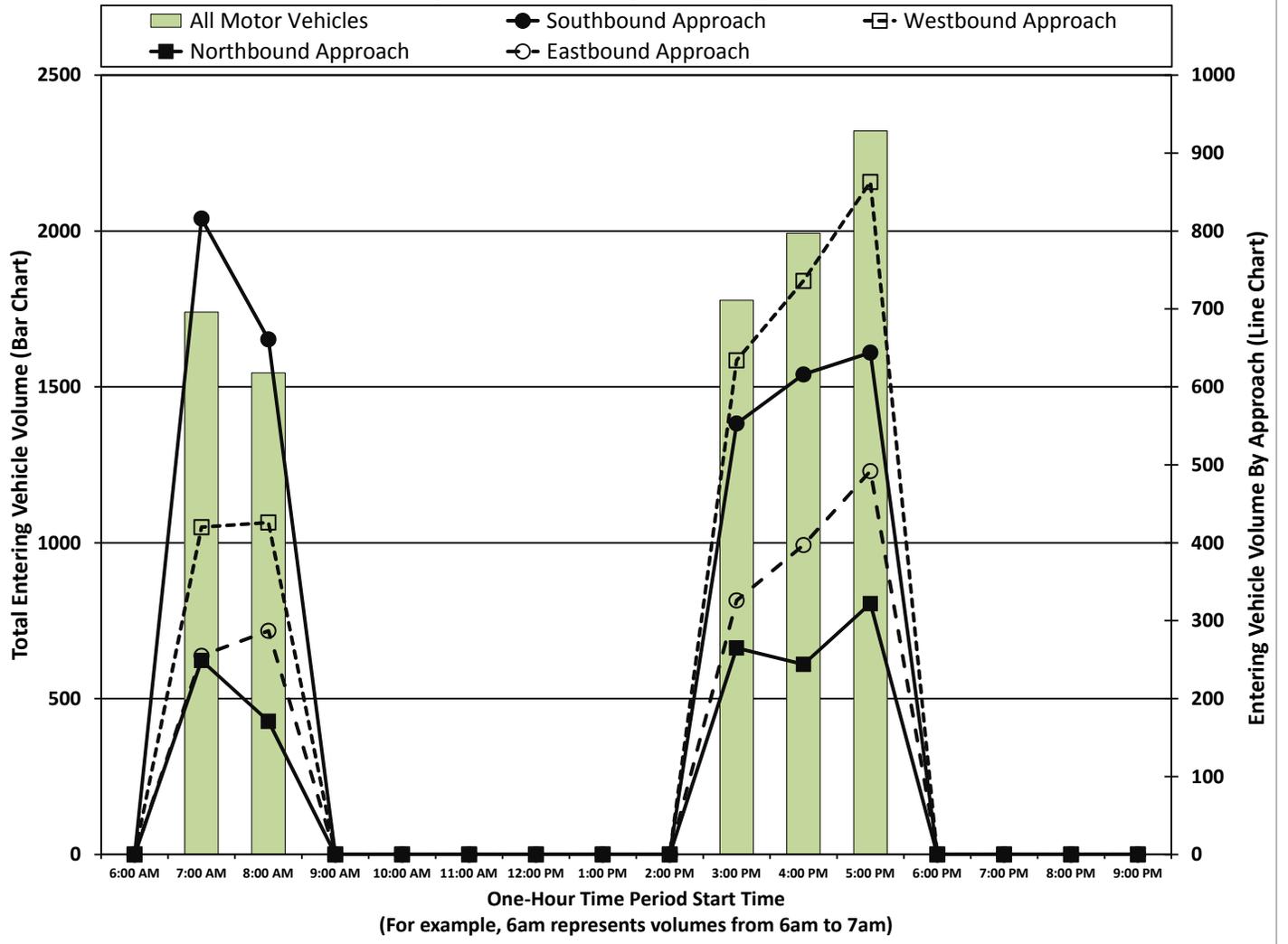
### Lake Drive and Lake Dr-Silver Spring



#### One-Hour Motor Vehicle Data

One-Hour Time Period Start Time	From North Lake Drive					From East Lake Dr-Silver Spring					From South Marborough Drive					From West Silver Spring Drive					Total Vehicle Volume	Directional Volume Totals	
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total		E/W	N/S
	6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
7:00 AM	73	208	535	0	816	250	166	4	0	420	2	167	80	0	249	48	172	35	0	255	1740	675	1065
8:00 AM	107	96	458	0	661	261	162	3	0	426	5	102	64	0	171	47	202	38	0	287	1545	713	832
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	85	162	306	0	553	402	227	5	0	634	3	190	72	0	265	65	210	51	0	326	1778	960	818
4:00 PM	74	163	379	0	616	493	234	9	0	736	1	141	102	0	244	77	263	57	0	397	1993	1133	860
5:00 PM	60	187	397	0	644	606	249	8	0	863	10	185	127	0	322	107	313	72	0	492	2321	1355	966
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	<b>399</b>	<b>816</b>	<b>2075</b>	<b>0</b>	<b>3290</b>	<b>2012</b>	<b>1038</b>	<b>29</b>	<b>0</b>	<b>3079</b>	<b>21</b>	<b>785</b>	<b>445</b>	<b>0</b>	<b>1251</b>	<b>344</b>	<b>1160</b>	<b>253</b>	<b>0</b>	<b>1757</b>	<b>9377</b>	<b>4836</b>	<b>4541</b>

### Graphical Summary of Hourly Volumes



# Intersection Traffic Volume Report

## 15-Minute Motor Vehicle Data

### Lake Drive and Lake Dr-Silver Spring



### 15-Minute Motor Vehicle Data

15-Minute Time Period Start Time	From North					From East					From South					From West					15-Min Totals	Hourly Sum	PHF	
	Lake Drive					Lake Dr-Silver Spring					Marborough Drive					Silver Spring Drive								
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total				
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7:00 AM	18	24	93	0	135	30	30	3	0	63	0	15	18	0	33	9	30	5	0	44	275	1740	0.78	
7:15 AM	18	35	133	0	186	48	32	0	0	80	0	21	15	0	36	18	36	5	0	59	361	1925	0.86	
7:30 AM	23	110	156	0	289	75	36	1	0	112	2	60	19	0	81	13	48	14	0	75	557	1956	0.88	
7:45 AM	14	39	153	0	206	97	68	0	0	165	0	71	28	0	99	8	58	11	0	77	547	1774	0.81	
8:00 AM	35	37	148	0	220	73	41	0	0	114	2	28	12	0	42	11	64	9	0	84	460	1545	0.84	
8:15 AM	26	25	118	0	169	72	30	1	0	103	0	28	21	0	49	11	46	14	0	71	392			
8:30 AM	24	14	106	0	144	63	50	2	0	115	2	20	13	0	35	16	57	8	0	81	375			
8:45 AM	22	20	86	0	128	53	41	0	0	94	1	26	18	0	45	9	35	7	0	51	318			
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
3:00 PM	19	55	64	0	138	73	58	1	0	132	1	40	15	0	56	20	44	11	0	75	401	1778	0.87	
3:15 PM	18	53	72	0	143	121	64	0	0	185	1	75	20	0	96	10	59	17	0	86	510	1845	0.90	
3:30 PM	28	30	87	0	145	89	51	3	0	143	1	38	15	0	54	21	50	10	0	81	423	1815	0.95	
3:45 PM	20	24	83	0	127	119	54	1	0	174	0	37	22	0	59	14	57	13	0	84	444	1882	0.96	
4:00 PM	18	29	84	0	131	101	70	1	0	172	0	37	28	0	65	21	63	16	0	100	468	1993	0.90	
4:15 PM	19	27	98	0	144	121	58	2	0	181	1	31	29	0	61	17	63	14	0	94	480	2126	0.88	
4:30 PM	19	43	97	0	159	122	42	4	0	168	0	30	25	0	55	12	83	13	0	108	490	2263	0.92	
4:45 PM	18	64	100	0	182	149	64	2	0	215	0	43	20	0	63	27	54	14	0	95	555	2362	0.96	
5:00 PM	8	39	115	0	162	158	60	1	0	219	5	45	23	0	73	29	91	27	0	147	601	2321	0.94	
5:15 PM	16	60	103	0	179	170	58	5	0	233	2	50	23	0	75	33	79	18	0	130	617			
5:30 PM	19	45	87	0	151	153	72	1	0	226	3	42	52	0	97	28	73	14	0	115	589			
5:45 PM	17	43	92	0	152	125	59	1	0	185	0	48	29	0	77	17	70	13	0	100	514			
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Totals	399	816	2075	0	3290	2012	1038	29	0	3079	21	785	445	0	1251	344	1160	253	0	1757	9377			

### Peak Hour All Vehicle Volume Summary

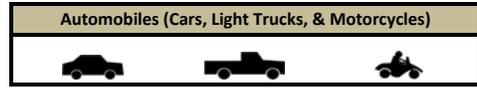
Hourly Time Period Start Time	From North					From East					From South					From West					Total Hourly Volume	PHF
	Lake Drive					Lake Dr-Silver Spring					Marborough Drive					Silver Spring Drive						
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total		
AM 7:30 AM	98	211	575	0	884	317	175	2	0	494	4	187	80	0	271	43	216	48	0	307	1956	0.88
MD 12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM 4:45 PM	61	208	405	0	674	630	254	9	0	893	10	180	118	0	308	117	297	73	0	487	2362	0.96

# Intersection Traffic Volume Report

<b>Count Basics</b>			<b>Page 6 of 11</b>	
Start Date:	Tuesday, May 03, 2016	Weekday	Schools in Session	
Total Number of Hours Counted:	5	Non-Holiday	No Special Events	

## 15-Minute Automobile Data

### Lake Drive and Lake Dr-Silver Spring



#### 15-Minute Automobile Data

15-Minute Time Period Start Time	From North					From East					From South					From West					15-Min Totals	Hourly Sum	
	Lake Drive					Lake Dr-Silver Spring					Marborough Drive					Silver Spring Drive							
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total			
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	18	24	91	0	133	29	30	3	0	62	0	15	17	0	32	8	29	4	0	41	268	1703	
7:15 AM	15	34	130	0	179	48	31	0	0	79	0	20	14	0	34	16	35	5	0	56	348	1878	
7:30 AM	23	110	156	0	289	75	35	1	0	111	2	58	18	0	78	11	48	14	0	73	551	1911	
7:45 AM	14	36	150	0	200	96	68	0	0	164	0	71	27	0	98	7	56	11	0	74	536	1722	
8:00 AM	31	35	144	0	210	72	40	0	0	112	2	27	11	0	40	10	62	9	0	81	443	1485	
8:15 AM	25	25	115	0	165	70	30	1	0	101	0	28	20	0	48	9	46	12	0	67	381		
8:30 AM	23	14	102	0	139	62	50	2	0	114	2	18	12	0	32	13	56	8	0	77	362		
8:45 AM	22	20	81	0	123	51	37	0	0	88	1	25	15	0	41	8	33	6	0	47	299		
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3:00 PM	19	54	64	0	137	71	58	1	0	130	1	40	14	0	55	18	43	11	0	72	394	1736	
3:15 PM	16	48	70	0	134	121	62	0	0	183	1	74	17	0	92	9	56	15	0	80	489	1799	
3:30 PM	28	30	86	0	144	87	50	3	0	140	1	38	14	0	53	20	50	10	0	80	417	1779	
3:45 PM	18	23	82	0	123	119	53	1	0	173	0	37	20	0	57	13	57	13	0	83	436	1844	
4:00 PM	18	29	82	0	129	98	69	1	0	168	0	37	26	0	63	19	63	15	0	97	457	1957	
4:15 PM	17	27	96	0	140	119	57	2	0	178	1	31	28	0	60	16	62	13	0	91	469	2094	
4:30 PM	19	43	97	0	159	120	42	4	0	166	0	29	22	0	51	11	82	13	0	106	482	2232	
4:45 PM	18	63	100	0	181	146	63	2	0	211	0	43	19	0	62	27	54	14	0	95	549	2331	
5:00 PM	8	39	114	0	161	156	59	1	0	216	5	45	22	0	72	28	91	26	0	145	594	2286	
5:15 PM	14	60	101	0	175	168	58	5	0	231	2	50	22	0	74	31	78	18	0	127	607		
5:30 PM	17	45	87	0	149	152	72	1	0	225	3	42	50	0	95	27	72	13	0	112	581		
5:45 PM	15	41	92	0	148	124	58	1	0	183	0	48	27	0	75	16	70	12	0	98	504		
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<b>Totals</b>	<b>378</b>	<b>800</b>	<b>2040</b>	<b>0</b>	<b>3218</b>	<b>1984</b>	<b>1022</b>	<b>29</b>	<b>0</b>	<b>3035</b>	<b>21</b>	<b>776</b>	<b>415</b>	<b>0</b>	<b>1212</b>	<b>317</b>	<b>1143</b>	<b>242</b>	<b>0</b>	<b>1702</b>	<b>9167</b>		

#### Peak Hour Automobile Volume Summary

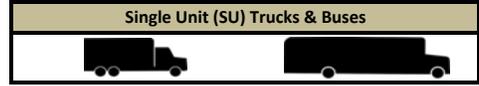
Hourly Time Period Start Time	From North					From East					From South					From West					Total Hourly Volume
	Lake Drive					Lake Dr-Silver Spring					Marborough Drive					Silver Spring Drive					
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
AM 7:30 AM	93	206	565	0	864	313	173	2	0	488	4	184	76	0	264	37	212	46	0	295	1911
MD 12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM 4:45 PM	57	207	402	0	666	622	252	9	0	883	10	180	113	0	303	113	295	71	0	479	2331

# Intersection Traffic Volume Report

<b>Count Basics</b>		<b>Page 7 of 11</b>	
Start Date:	Tuesday, May 03, 2016	Weekday	Schools in Session
Total Number of Hours Counted:	5	Non-Holiday	No Special Events

## 15-Minute Single Unit (SU) Truck & Bus Data

### Lake Drive and Lake Dr-Silver Spring



### 15-Minute Single Unit (SU) Truck & Bus Data

15-Minute Time Period Start Time	From North					From East					From South					From West					15-Min Totals	Hourly Sum
	Lake Drive					Lake Dr-Silver Spring					Marborough Drive					Silver Spring Drive						
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total		
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	2	0	2	1	0	0	0	1	0	0	1	0	1	1	1	1	0	0	2	6
7:15 AM	3	1	3	0	7	0	1	0	0	1	0	1	1	0	2	2	1	0	0	3	13	47
7:30 AM	0	0	0	0	0	0	1	0	0	1	0	2	1	0	3	2	0	0	0	2	6	45
7:45 AM	0	3	3	0	6	1	0	0	0	1	0	0	1	0	1	1	2	0	0	3	11	52
8:00 AM	4	2	4	0	10	1	1	0	0	2	0	1	1	0	2	1	2	0	0	3	17	60
8:15 AM	1	0	3	0	4	2	0	0	0	2	0	0	1	0	1	2	0	2	0	4	11	
8:30 AM	1	0	4	0	5	1	0	0	0	1	0	2	1	0	3	3	1	0	0	4	13	
8:45 AM	0	0	5	0	5	2	4	0	0	6	0	1	3	0	4	1	2	1	0	4	19	
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3:00 PM	0	1	0	0	1	2	0	0	0	2	0	0	1	0	1	2	1	0	0	3	7	42
3:15 PM	2	5	2	0	9	0	2	0	0	2	0	1	3	0	4	1	3	2	0	6	21	46
3:30 PM	0	0	1	0	1	2	1	0	0	3	0	0	1	0	1	1	0	0	1	6	36	36
3:45 PM	2	1	1	0	4	0	1	0	0	1	0	0	2	0	2	1	0	0	1	8	38	38
4:00 PM	0	0	2	0	2	3	1	0	0	4	0	0	2	0	2	2	0	1	0	3	11	36
4:15 PM	2	0	2	0	4	2	1	0	0	3	0	0	1	0	1	1	1	1	0	3	11	32
4:30 PM	0	0	0	0	0	2	0	0	0	2	0	1	3	0	4	1	1	0	0	2	8	31
4:45 PM	0	1	0	0	1	3	1	0	0	4	0	0	1	0	1	0	0	0	0	6	31	31
5:00 PM	0	0	1	0	1	2	1	0	0	3	0	0	1	0	1	1	0	1	0	2	7	35
5:15 PM	2	0	2	0	4	2	0	0	0	2	0	0	1	0	1	2	1	0	0	3	10	
5:30 PM	2	0	0	0	2	1	0	0	0	1	0	0	2	0	2	1	1	1	0	3	8	
5:45 PM	2	2	0	0	4	1	1	0	0	2	0	0	2	0	2	1	0	1	0	2	10	
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<b>Totals</b>	<b>21</b>	<b>16</b>	<b>35</b>	<b>0</b>	<b>72</b>	<b>28</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>44</b>	<b>0</b>	<b>9</b>	<b>30</b>	<b>0</b>	<b>39</b>	<b>27</b>	<b>17</b>	<b>10</b>	<b>0</b>	<b>54</b>	<b>209</b>	

### Peak Hour Single Unit (SU) Truck & Buses Volume Summary

Hourly Time Period Start Time	From North					From East					From South					From West					Total Hourly Volume
	Lake Drive					Lake Dr-Silver Spring					Marborough Drive					Silver Spring Drive					
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
AM 7:30 AM	5	5	10	0	20	4	2	0	0	6	0	3	4	0	7	6	4	2	0	12	45
MD 12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM 4:45 PM	4	1	3	0	8	8	2	0	0	10	0	0	5	0	5	4	2	2	0	8	31

# Intersection Traffic Volume Report

<b>Count Basics</b>		<b>Page 8 of 11</b>	
Start Date:	Tuesday, May 03, 2016	Weekday	Schools in Session
Total Number of Hours Counted:	5	Non-Holiday	No Special Events

## 15-Minute Semi-Truck Data

### Lake Drive and Lake Dr-Silver Spring



#### 15-Minute Semi-Truck Data

15-Minute Time Period	From North					From East					From South					From West					15-Min Totals	Hourly Sum	
	Lake Drive					Lake Dr-Silver Spring					Marborough Drive					Silver Spring Drive							
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total			
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1

#### Peak Hour Semi-Truck Volume Summary

Hourly Time Period	From North					From East					From South					From West					Total Hourly Volume		
	Lake Drive					Lake Dr-Silver Spring					Marborough Drive					Silver Spring Drive							
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total			
AM 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MD 12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

# Intersection Traffic Volume Report

<b>Count Basics</b>		<b>Page 9 of 11</b>	
Start Date:	Tuesday, May 03, 2016	Weekday	Schools in Session
Total Number of Hours Counted:	5	Non-Holiday	No Special Events

## 15-Minute Heavy Vehicle Data

### Lake Drive and Lake Dr-Silver Spring



#### 15-Minute Heavy Vehicle Data

15-Minute Time Period Start Time	From North					From East					From South					From West					15-Min Totals	Hourly Sum	
	Lake Drive					Lake Dr-Silver Spring					Marborough Drive					Silver Spring Drive							
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total			
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	2	0	2	1	0	0	0	1	0	0	1	0	1	1	1	1	1	0	0	3	7
7:15 AM	3	1	3	0	7	0	1	0	0	1	0	1	1	0	2	2	1	0	0	0	3	13	47
7:30 AM	0	0	0	0	0	0	1	0	0	1	0	2	1	0	3	2	0	0	0	2	6	45	
7:45 AM	0	3	3	0	6	1	0	0	0	1	0	0	1	0	1	1	2	0	0	3	11	52	
8:00 AM	4	2	4	0	10	1	1	0	0	2	0	1	1	0	2	1	2	0	0	3	17	60	
8:15 AM	1	0	3	0	4	2	0	0	0	2	0	0	1	0	1	2	0	2	0	4	11		
8:30 AM	1	0	4	0	5	1	0	0	0	1	0	2	1	0	3	3	1	0	0	4	13		
8:45 AM	0	0	5	0	5	2	4	0	0	6	0	1	3	0	4	1	2	1	0	4	19		
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3:00 PM	0	1	0	0	1	2	0	0	0	2	0	0	1	0	1	2	1	0	0	3	7	42	
3:15 PM	2	5	2	0	9	0	2	0	0	2	0	1	3	0	4	1	3	2	0	6	21	46	
3:30 PM	0	0	1	0	1	2	1	0	0	3	0	0	1	0	1	1	0	0	1	6	36	36	
3:45 PM	2	1	1	0	4	0	1	0	0	1	0	0	2	0	2	1	0	0	1	8	38	38	
4:00 PM	0	0	2	0	2	3	1	0	0	4	0	0	2	0	2	2	0	1	0	3	11	36	
4:15 PM	2	0	2	0	4	2	1	0	0	3	0	0	1	0	1	1	1	1	0	3	11	32	
4:30 PM	0	0	0	0	0	2	0	0	0	2	0	1	3	0	4	1	1	0	2	8	31	31	
4:45 PM	0	1	0	0	1	3	1	0	0	4	0	0	1	0	1	0	0	0	0	6	31	31	
5:00 PM	0	0	1	0	1	2	1	0	0	3	0	0	1	0	1	1	0	1	0	2	7	35	
5:15 PM	2	0	2	0	4	2	0	0	0	2	0	0	1	0	1	2	1	0	0	3	10		
5:30 PM	2	0	0	0	2	1	0	0	0	1	0	0	2	0	2	1	1	1	0	3	8		
5:45 PM	2	2	0	0	4	1	1	0	0	2	0	0	2	0	2	1	0	1	0	2	10		
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<b>Totals</b>	<b>21</b>	<b>16</b>	<b>35</b>	<b>0</b>	<b>72</b>	<b>28</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>44</b>	<b>0</b>	<b>9</b>	<b>30</b>	<b>0</b>	<b>39</b>	<b>27</b>	<b>17</b>	<b>11</b>	<b>0</b>	<b>55</b>	<b>210</b>		

#### Peak Hour Heavy Vehicle Volume Summary

Hourly Time Period Start Time	From North					From East					From South					From West					Total Hourly Volume
	Lake Drive					Lake Dr-Silver Spring					Marborough Drive					Silver Spring Drive					
	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	Right	Thru	Left	U-Tn	Total	
AM 7:30 AM	5	5	10	0	20	4	2	0	0	6	0	3	4	0	7	6	4	2	0	12	45
MD 12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM 4:45 PM	4	1	3	0	8	8	2	0	0	10	0	0	5	0	5	4	2	2	0	8	31



# Intersection Traffic Volume Report

<b>Count Basics</b>		<b>Page 11 of 11</b>	
Start Date:	Tuesday, May 03, 2016	Weekday	Schools in Session
Total Number of Hours Counted:	5	Non-Holiday	No Special Events

## 15-Minute Pedestrian and Bicyclist Data

### Lake Drive and Lake Dr-Silver Spring



### 15-Minute Pedestrian and Bicyclist Data

15-Minute Time Period	Crossing North Approach			Crossing East Approach			Crossing South Approach			Crossing West Approach			15-Min Totals	Hourly Sum
	Lake Drive			Lake Dr-Silver Spring			Marborough Drive			Silver Spring Drive				
	Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total	Pedestrian	Bicyclist	Total		
6:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:00 AM	0	0	0	0	2	2	2	0	2	1	1	2	6	126
7:15 AM	0	0	0	3	2	5	0	0	0	9	9	14	131	
7:30 AM	0	0	0	0	9	9	3	1	4	7	21	28	41	128
7:45 AM	4	0	4	11	3	14	15	2	17	26	4	30	65	101
8:00 AM	0	0	0	1	1	2	4	0	4	4	1	5	11	43
8:15 AM	2	1	3	0	0	0	3	0	3	5	0	5	11	
8:30 AM	3	0	3	1	0	1	7	0	7	1	2	3	14	
8:45 AM	0	0	0	0	1	1	2	1	3	1	2	3	7	
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
3:00 PM	1	0	1	2	2	4	5	2	7	7	0	7	19	191
3:15 PM	7	2	9	10	20	30	26	5	31	39	10	49	119	185
3:30 PM	0	0	0	8	3	11	10	3	13	8	2	10	34	104
3:45 PM	2	0	2	3	3	6	3	0	3	6	2	8	19	87
4:00 PM	1	0	1	0	1	1	4	1	5	4	2	6	13	86
4:15 PM	4	0	4	18	2	20	3	0	3	6	5	11	38	96
4:30 PM	1	1	2	0	2	2	1	1	2	7	4	11	17	74
4:45 PM	2	0	2	3	2	5	3	2	5	1	5	6	18	75
5:00 PM	4	0	4	1	2	3	2	1	3	11	2	13	23	100
5:15 PM	3	0	3	0	0	0	0	3	3	8	2	10	16	
5:30 PM	6	0	6	0	2	2	4	0	4	5	1	6	18	
5:45 PM	9	0	9	6	2	8	6	2	8	10	8	18	43	
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
9:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	
<b>Totals</b>	<b>49</b>	<b>4</b>	<b>53</b>	<b>67</b>	<b>59</b>	<b>126</b>	<b>103</b>	<b>24</b>	<b>127</b>	<b>157</b>	<b>83</b>	<b>240</b>	<b>546</b>	

### Special Pedestrians

Pedestrian Type	None	1 or 2	A Few	Several	Many	Unknown
Pre-school Children	x					
Elementary School Age Children	x					
Visually Impaired (white cane/helper dog)	x					
Elderly/Disabled (except wheelchairs)	x					
Wheelchairs/Electric Scooters	x					
Other (None)	x					

September 26, 2016

To: Village Board

Subject: Award of Bid for Turnaround at Craig Counsell Park.

From: Steven Sheiffer - Village Manager

The 2016 Budget included \$40,000 to construct a turnaround on Lydell at Craig Counsell Park. Bids will be opened on the afternoon of October 3 with the goal to complete construction this year.

If the low bid is within budget, the Village's Purchasing Policy authorizes the Village Manger to award the bid. This item has been placed on your agenda in case there is an issue with the bids.

The motion would be: To authorize the Village Manager to proceed with the turnaround at Craig Counsell Park at an amount not to exceed \$\_\_\_\_\_, and to award the contract to \_\_\_\_\_.

cc: Chris Jaekels Esq. - Village Attorney