

AGENDA
REGUAR MEETING OF THE BIRMINGHAM MULTI-MODAL BOARD
THURSDAY JUNE 2nd, 2022

151 MARTIN ST., CITY COMMISSION ROOM 205, BIRMINGHAM MI*

*******6:00 pm*******

The highly transmissible COVID-19 Delta variant is spreading throughout the nation at an alarming rate. As a result, the CDC is recommending that vaccinated and unvaccinated personnel wear a facemask indoors while in public if you live or work in a substantial or high transmission area. Oakland County is currently classified as a substantial transmission area. The City has reinstated mask requirements for all employees while indoors. The mask requirement also applies to all board and commission members as well as the public attending public meetings.

- A. Roll Call
- B. Introductions & Chairpersons Comments
- C. Review of the Agenda
- D. Approval of Minutes, Meeting of **May 5th, 2022**
- E. Approval of Minutes, Meeting of **May 19th, 2022**
- F. New Business
 - 1. Transportation Day Review**
 - 2. Brown & Woodward Ave Crosswalk**
 - 3. Multi-Modal Transportation Plan review**
- G. Unfinished Business
- H. Meeting Open to the Public for items not on the Agenda
- I. Miscellaneous Communications
- J. Next Meeting – **July 7th, 2022**
- K. Adjournment

Please note that board meetings will be conducted in person once again. Members of the public can attend in person at Birmingham City Hall or may attend virtually at <https://us06web.zoom.us/j/88295194746> or dial: **929 205 6099 US Toll-free, Meeting ID: 824 7795 4435**

DRAFT

City Of Birmingham Multi-Modal Transportation Board Thursday, May 5, 2022

151 Martin Street, City Commission Room 205, Birmingham, MI

Minutes of the regular meeting of the City of Birmingham Multi-Modal Transportation Board held Thursday, May 5, 2022. Chair Doug White convened the meeting at 6:02 p.m.

A. Rollcall

Present: Chair Doug White; Board Members David Hocker, Anthony Long, Tom Peard, Victoria Policicchio, Michael St. Germain; Alternate Board Member Amanda Fishburn; Student Representative Ben Rosenfield

Absent: Board Member Joe Zane; Alternate Board Member Mark Doolittle; Student Representative Isabela Betanzos

Administration:

Brooks Cowan, Senior Planner
Laura Eichenhorn, City Transcriptionist
Scott Grewe, Operations Commander
Jim Surhigh, Consulting City Engineer

F&V: Julie Kroll

MKSK: Brad Strader

B. Approval of MMTB Minutes of April 7, 2022

Mr. Hocker asked that, under 'G. Meeting Open to the Public for Items not on the Agenda' on page three, the following be added:

- "Mr. Hocker also suggested paving the former walkway along Oak in lieu of the existing grass to at least accommodate a safe footing in the event of an errant walker."
- "Mr. Hocker noted that excessive overflow ponding on the south side of Raynale between Suffield and Fairfax should be investigated in tandem with the improvements to Westwood Street."

Motion by Mr. Peard

Seconded by Mr. Long to approve the MMTB Minutes of April 7, 2022 as amended.

Motion carried, 7-0.

VOICE VOTE

Yeas: White, Peard, Hocker, Long, Policicchio, St. Germain, Fishburn

Nays: None

C. Introductions & Chair Comments

D. Review of the Agenda

E. New Business

1. Public Hearing: Westwood Rd Improvements, Raynale to Oak

Motion by Mr. Hocker

Seconded by Mr. Long to receive and file the email from Kristen Reece dated May 3, 2022.

Motion carried, 7-0.

VOICE VOTE

Yeas: White, Peard, Hocker, Long, Policicchio, St. Germain, Fishburn

Nays: None

SP Cowan reviewed the purview of the Multi-Modal Transportation Board for both the Board and the public. He asked both the Board and the public to restrict their comments and discussion to the focus of the present discussion, which was street width recommendations.

Mr. Strader presented the item.

In reply to the Board, Mr. Strader stated:

- The City developed a street width standard of 26 feet in order to calm traffic, reduce flooding and stormwater runoff, and reduce pedestrian crossing distances;
- Reducing a road from 31 feet to 26 feet would reduce stormwater runoff by about 16%;
- The use of bump outs have also reduced pedestrian crossing distances; and,
- If the Board considers a deviation from the 26 foot width, they should explore parking on the street, traffic speeds, resident input, and other potential factors.

In reply to the Board, CCE Surhigh explained:

- A 26 foot wide street with parked vehicles on both sides would generally require an oncoming vehicle to yield to another oncoming vehicle in order to continue down the street;
- Glenhurst was not recommended for narrowing by the Commission in response to resident comment that the wider street was not causing issues in the area; and,
- This area of Raynale was ranked by the City as one of the streets most presently in need of infrastructure updates.

Mr. Peard complimented Staff on the report for this item.

Public Comment

Corey Holter, resident of Westwood, said the street has no speeding or flooding problems. He noted there is also a school bus route on Westwood, which could allow for a deviation from the width standards according to section 4C of the street design standards. He said he would like Westwood's width maintained and no bump outs added.

George Stern, Dan Lemont, Melissa Miller Farr, Beverly Prior, Gerald Van Wyke, Terry Matlen,

Kimberly Romanosky, Brock Rooney, Joe Hoegler, Denis Zimmer, and David Glass, residents of Westwood, also spoke in favor of maintaining Westwood's width.

A number of residents commented that the aesthetic of the wider street was a significant part of Westwood's appeal.

Messrs. Stern and Rooney added they were against adding bump outs.

Ms. Miller Farr said Westwood residents could provide a petition against the project if that would be helpful for the City to see.

Ms. Prior said making it so that oncoming traffic has to yield on Westwood would make the street less safe.

Mr. Van Wyke said Westwood and Glenhurst would remain 31 feet at Maple since they begin outside Birmingham and said that was a reason to maintain the width at 31 feet. He also concurred with Ms. Prior.

Ms. Romanosky noted that Westwood dead-ends at Redding, meaning there is limited pass-through traffic on the street.

Mr. Rooney noted that the sewer updates would be separating the storm and sanitary sewers, likely resulting in even less run-off concerns.

Mr. Glass asked whether the 16% reduction in run-off would be enough to reduce flooding in other areas of the City. He also asked whether there are any pedestrian safety issues on Westwood that necessitate its narrowing or the addition of bump-outs. He said that if the narrowing of Westwood would benefit residents in other areas of the City, those residents should help pay for the assessments for the project.

Seeing no further comment, Chair White returned discussion to the Board.

Mr. Long noted that the City developed criteria for ranking streets in need of infrastructure updates, and said residents could watch or read the presentation to gain more information about the process.

Ms. Policicchio noted that different neighborhoods in Birmingham have different characteristics, and said that maintaining the width of Westwood would help the area retain its particular character.

Ms. Fishburn said the stated lack of a flooding issue or a traffic issue were strong arguments against narrowing Westwood.

A number of Board members thanked the public for providing comment.

At the prompting of Mr. Peard, there was brief discussion of potentially recommended bump outs without recommending a narrowing of Westwood.

Mr. Peard noted that the non-verbal response from the public in the room indicated that they were not in favor of adding bump outs.

Motion by Mr. Peard

Seconded by Mr. Long to make a motion for the Multi-Modal Transportation Board to provide recommendations to the City Commission that the following streets be reconstructed with ADA compliant sidewalk ramps at each intersection, updated crosswalks meeting City standards, and further, to construct the new streets at the proposed widths as noted for each:

- A. Reconstructing Raynale Street at 31 feet wide (matching existing) between N. Glenhurst Drive and the western City limits;**
- B. Reconstructing Westwood Drive at 31 feet wide (matching existing) between Raynale Street and Oak Street; and,**
- C. Reconstructing Oak Street at 38 feet wide between N. Glenhurst Drive and Westwood Street, and at 31 feet wide between Westwood Street and the western City limits.**

Public Comment

John Prior, resident of Westwood, said he was against both narrowing Westwood and adding bump outs.

SP Cowan clarified that bump outs were not addressed in the motion.

In reply to Ms. Policicchio, CCE Surhigh clarified that City-standard crosswalks do not automatically include bump outs.

In reply to Ms. Miller Farr, SP Cowan confirmed that this motion, if passed, would recommend the Commission maintain Westwood's current width.

Mr. Rooney said the section of Oak address in the motion should not be narrowed.

Motion carried, 7-0.

ROLL CALL VOTE

Yeas: White, Peard, Hocker, Long, Policicchio, St. Germain, Fishburn

Nays: None

F. Unfinished Business

1. Crosswalk Markings and Location Standards

SP Cowan and Mr. Strader introduced the item.

Mr. St. Germain said he wanted to see the City taking a proactive approach to repairing or adding crosswalks in presently unsafe areas, and said he did not see that adequately captured in this document.

In reply, Mr. Strader said the document was intended to prescribe a proactive approach to adding

or repairing crosswalks. He said that intent could be emphasized when the standards are presented to the Commission. He said recommending the addition of crosswalks to areas near parks or schools could also be included as part of the Multi-Modal plan review.

OC Grewe stated that faded neighborhood crosswalks are repainted once a year, and that this year's round should be complete by the end of June.

Mr. Hocker stated 'public schools' should be changed to 'schools' on page 43 of the flowchart.

Motion by Ms. Policicchio

Seconded by Mr. Long to recommend to City Commission that the City of Birmingham adopt the Birmingham MI Crosswalk Installation Flow Chart as indicated on Exhibit A in the packet to serve as a guideline for determining the location of crosswalk installations, with the integration of the changes recommended by the Multi-Modal Transportation Board at its May 5, 2022 meeting.

Motion carried, 7-0.

VOICE VOTE

Yeas: White, Peard, Hocker, Long, Policicchio, St. Germain, Fishburn

Nays: None

2. S. Eton Bike Lane Study Session

SP Cowan introduced the item. Ms. Kroll presented the item.

In reply to Ms. Fishburn, Ms. Kroll confirmed that implementing these recommendations would also result in traffic calming along Eton.

In reply to Ms. Fishburn, SP Cowan said that a prior presentation on traffic calming measures could be included with this item moving forward to help the public understand the topic.

Mr. St. Germain spoke in favor of pylons or other physical barriers along the bike lane on S. Eton, saying he believed they have been instrumental in increasing use of the bike lane.

SP Cowan said the item would be brought back for further review.

3. Multi-Modal Transportation Day

SP Cowan summarized the item.

Motion by Mr. St. Germain

Seconded by Mr. Peard to schedule a special meeting of the Multi-Modal Transportation Board at 12 p.m. on May 19, 2022.

Motion carried, 7-0.

VOICE VOTE

Yeas: White, Peard, Hocker, Long, Policicchio, St. Germain, Fishburn

Nays: None

G. Meeting Open to the Public for Items not on the Agenda

H. Miscellaneous Communications

I. Adjournment

No further business being evident, the Board adjourned at 8:00 p.m.

Brooks Cowan, Senior Planner

A handwritten signature in black ink, appearing to read 'Laura Eichenhorn', with a long horizontal line extending to the right.

Laura Eichenhorn
City Transcriptionist

DRAFT

City Of Birmingham Multi-Modal Transportation Board Thursday, May 19th, 2022

151 Martin Street, City Commission Room 205, Birmingham, MI

Minutes of the special transportation day meeting of the City of Birmingham Multi-Modal Transportation Board held Thursday, May 19th, 2022. Chair Doug White convened the meeting at 6:02 p.m.

A. Roll call

Present: Chair Doug White; Board Members David Hocker, Tom Peard, Joe Zane

Absent: Board Member Michael St. Germain;
Anthony Long, Victoria Policicchio, Alternate Board Member Mark Doolittle; Student Representative Isabela Betanzos, Alternate Board Member Amanda Fishburn; Student Representative Ben Rosenfield

Administration:

Brooks Cowan, Senior Planner

MKSK: Kristyn Bowden

B. Approval of MMTB Minutes

(No minutes were reviewed during the special meeting)

C. Introductions & Chair Comments

D. Review of the Agenda

E. New Business

The Board members gathered at Birmingham Roast around 12pm to begin their day. Staff went over the DART app to download and use for riding the bus and the Transit app for bus timing and Mogo bike share use. Some board members had difficulty setting up accounts with the apps in a short period of time and linking a credit card for payments.

Board members and staff caught the 461 SMART bus at 12:41pm heading southbound. The new screens at the SMART stop aligned with the predicted arrival time on the Transit app. Chairman Doug White had difficulty using the DART app and paid cash to ride. The bus was approximately halfway occupied and members had little difficulty finding a seat.

Board members exited the bus at 9 Mile and Woodward at approximately 1pm and walked along 9 Mile to the Ferndale City Hall. A Ferndale DDA employee was there to greet the Birmingham representatives and assist in checking out a Mogo bike to ride. MKSK representative Kristyn Bowden also arrived at this time to join staff and Board members. Some participants were able

to use the Transit app to check out a Mogo bike. Others had difficulty entering payment information on the app and doing everything via their phone. Upon giving up using their phone the check out a bike, participants used the Mogo kiosk where users inserted a credit card, agreed to payment, and were issued a paper ticket with an unlocking code for a bike.

At approximately 1:30pm, all participants had bikes and began riding westbound in the bike lane along 9 mile. The bike lane ended near 9 Mile and Woodward where the lane narrowed and was a bit tighter for bike riders and cars to be traveling in the same space. After crossing Woodward, the Board members turned into the alley behind the restaurants and shops along 9 Mile to avoid 9 Mile traffic. The Board members proceeded along the alley and residential streets heading west towards Pinecrest Drive.

Board members turned right on Pinecrest Drive and rode north within the painted bike lane area. The small Mogo station at Gehry Park along the way was pointed out. The bike lane ended once it reached Pleasant Ridge City limits. The Board turned right and rode eastbound through Pleasant Ridge's residential streets to Stephenson Park. The Board crossed Woodward Ave at the Oakland Park Blvd intersection which provided enough crossing time at the stoplight for riders to safely make it from one side of Woodward to another.

The route then continued eastbound on Woodward Heights road where members rode in a painted bike lane along the curb. Board members passed by another Mogo station at Urbanrest Brewery. The Board then turned right on Hilton Road and continued south, still within a painted bike lane. Hilton Road had more traffic beside the bike lane, and there was less of a buffer between the painted lane and drive lane. The bike lane was also between parked cars and the driving lane which was busier than riding in the bike lanes along Pinecrest and Woodward Heights.

Board members thought it would be nice to try and get food at Detroit Fleet, so the participants headed east on 9 Mile in the bike lane. There were comments that it appeared as though 9 Mile in that area was converted from 4 lanes to 3 lanes with a center turn lane and bike lanes. The bike lanes were fairly wide and provided enough space to feel safe while riding on 9 Mile. Upon arrival, it was discovered that Detroit Fleet was not open for lunch, though the Board members took time to check out the smaller Mogo station located at the restaurant. Board members then rode in the bike lane along 9 Mile back to the Ferndale City Hall and parked their Mogo bikes around 2:15pm.

Birmingham staff and Board members then met at Comos with Ferndale City officials including Sommer Realy of the DDA, City Manager Joe Gaciuk, Mayor Melanie Piana, and Planning staff Kyle Bryce, and Roger Caruso, and Christine (last name unknown).

Mrs. Realy and Joe Gaciuk discussed how the City coordinates with Mogo and determines bike station locations. It was also discussed how Mogo works with Ferndale on trialing new elements and getting feedback from the City and users.

Mayor Piana then discussed what the process was like for Ferndale in pursuing a road diet for Woodward Avenue and reducing the vehicle travel lanes from 4 lanes down to 3. The Mayor emphasized maintaining constant communication with all political representatives and governmental organizations involved. The process can be long and require persistence from the local government to demonstrate to MDOT that the City is serious about what they are pursuing.

It was also discussed how local push-back against the road diet proposal will be an inherent part of the process, and how local representatives will have to be resilient in the face of opposition if they truly wish to pursue the road diet. Mayor Piana discussed how she feels that a road diet is worth pursuing given that pedestrians and cyclists are much more exposed to danger while crossing the street, and therefore additional safety features should be implemented to protect them and prioritize their safety over vehicle moving speeds.

Board members and staff wrapped up their conversations with Ferndale City employees and representatives around 4:10pm and headed out to the bus stop at 9 Mile and Woodward. The bus station arrival time and Transit app arrival time were once again correct. Board members got on the 461 SMART bus northbound at 4:15 pm which was close to full occupancy, participants could not all sit together given the limited number of seats available. Board members then exited the bus at Woodward and 15 Mile around 4:40pm.

At this time, staff member Brooks Cowan, Chairman Doug White, and Board member David Hocker decided it would be a good idea to try crossing at the newly painted Forest and Woodward crosswalk and take that to Brown Street. While standing at the crossing area on the east side of Woodward, the car in the easternmost right lane slowed to a stop to let the pedestrians cross. As the three of them began crossing, traffic from the light at Hazel began proceeding at a high speed and did not appear to be slowing down. The three of them began to run across the remaining lanes of Woodward as the oncoming traffic proceeded at high speeds. The drivers then honked at staff and Board members. The three of them made it safely to the median only by running across three lanes of traffic. While standing in the median, a driver then proceeded to yell at the three Birmingham representatives. Comments from the Board members were that that crosswalk is a mess and something needs to be done to make it safer for everyone.

The three of them made it safely across southbound Woodward when the traffic signal stopped vehicles from proceeding to conclude their day.

G. Meeting Open to the Public for Items not on the Agenda

H. Miscellaneous Communications

I. Adjournment

The transportation day meeting concluded at 4:40pm.

Brooks Cowan, Senior Planner



MEMORANDUM

(Planning Division)

DATE: May 27th, 2022

TO: Multi-Modal Transportation Day

FROM: Brooks Cowan, City Planner

SUBJECT: Transportation Day Review

City staff, transportation consultants, and Multi-Modal Transportation Board members went on a Transportation Day field trip to Ferndale, Michigan and experienced different transportation planning elements first hand. Highlights of the trip included the following:

- Downloading and using the DART bus ticket app and Transit transportation app for bus arrival times and mogo station bike rentals.
- Riding the 461 FAST bus southbound from 15 Mile to 9 Mile along Woodward Ave.
- Renting Mogo Bikes and riding a loop around Ferndale throughout their bike lane network
- Discussing transportation policy with Ferndale staff and City representatives with an emphasis on road diet planning for Woodward Avenue.
- Riding the 461 FAST bus northbound from 9 Mile to 15 Mile along Woodward Ave.
- Using the pedestrian crossing at Forest & Woodward to get to downtown Birmingham and almost getting hit by cars and then being honked at.

City staff recommends discussion and feedback on the experience. Input will be forwarded to the next City Manager's report that goes to City Commission.



MEMORANDUM

Police Department

DATE: May 27, 2022

TO: Multi-Modal Transportation Board

FROM: Scott Grewe, Operations Commander
Jim Surhigh, Engineering Department
Brooks Cowan, Planning Department

SUBJECT: Brown St. at Peabody and Woodward

INTRODUCTION:

The City of Birmingham is pursuing a new traffic signal for northbound Woodward Avenue at the intersection of Forest Avenue, as well as additional crosswalks connecting the southern sidewalks of Forest Avenue and Brown Street. In order to install a crosswalk connecting the south side of Brown Street to the Woodward median, the Michigan Department of Transportation has requested that the City of Birmingham reduce the travel lanes on eastbound Brown Street from 2 lanes down to 1 lane in order to reduce the right-turn vehicular conflicts with pedestrians.

The City's traffic consultants Fleis & Vandebrink conducted a traffic study testing the viability of the eastbound Brown Street being reduced to 1 lane and have recommended approval of such a change. **Please find the report and supplementary information regarding the intersection of Brown & Woodward Avenue from Fleis & Vandebrink following the Memo.**

BACKGROUND:

The City of Birmingham has experienced two fatal accidents within the past 2 years on Woodward at or near Brown during this same time period involving pedestrians.

1. On August 8, 2020 at 0150 hours (PD report #20-13309) a person walking across the northbound lanes of Woodward was struck by a vehicle and passed away. The person was walking on an angle near the gas station lot, in a northwest direction, not in a crosswalk, when struck.
2. On September 12, 2021 at 2113 hours (PD report #14244) a person walking eastbound from Brown, in the crosswalk, crossing the southbound lanes of Woodward was struck by a vehicle and passed away. The vehicle had a green light.

In both incidents, the pedestrians were found at fault. However, the safety of the crossing at this location became a primary concern. Staff and our consultants have met numerous times reviewing options at this location. Meetings have also been held with MDOT as Woodward is under their control, and any changes to Woodward have to be approved by them.

To date, additional signage has been placed at the crosswalk on the northbound side to help bring greater awareness of the crosswalk. Flags have been placed on both sides of Woodward that pedestrians can carry while crossing to make themselves more visible to drivers and pedestrian crossing signals have been added. The City has also upgraded the lighting to increase visibility at the crosswalk for Forest and northbound Woodward.

The City has been coordinating with MDOT on the installation of a traffic signal at northbound Woodward Ave and Forest Ave in order to increase pedestrian safety at the intersection. The proposed installation of a traffic signal would be coupled with a pedestrian crosswalk connecting the southern sidewalk paths of Brown Street and Forest Avenue.

In order to install a crosswalk connecting from the southern side of Brown Street to the Woodward Ave median, MDOT is requiring the City of Birmingham to reduce the vehicular lanes on eastbound Brown Street from 2 lanes to 1 lane at the Woodward Ave intersection to reduce the right turn vehicular conflicts with pedestrians.

City traffic consultants Fleis and Vandebrink conducted a trial analysis of converting eastbound Brown Street to 1 lane from Peabody Street to Woodward Avenue. Their findings were that there was no measurable change in traffic queueing during peak traffic periods, most drivers using this intersection are traveling to the U-turn across from Brown Street to travel northbound on Woodward Avenue.

The recommendation from Fleis and Vandebrink (F&V) is that eastbound Brown Street be designed with a 1 lane approach at the intersection of Brown Street and Woodward Avenue. Please view the attached report from F&V for further information.

SUGGESTED RECOMMENDATION

Motion to recommend to City Commission that eastbound Brown Street be reduced to one lane from _____ to Woodward Avenue to enable the installation of a crosswalk on Woodward Avenue connecting the southern sidewalk on Brown Street to the southern sidewalk of Forest Avenue.



Brooks Cowan <bcowan@bhamgov.org>

M-1 (Woodward) @ Brown St. & Forest Ave Pedestrian Crossing

2 messages

Good morning,

At our last meeting, we discussed the pedestrian crossing of SB Woodward, south of Brown, to be incorporated following permanent geometric changes on the Brown St approach to a signal right turn lane.

It is MDOT's understanding that the City will put in place a temporary modification on Brown St to evaluate the traffic impacts of changing from two right turn lanes to one right turn lane.

While this is being evaluated, MDOT will proceed with design of new traffic signal on NB Woodward with pedestrian crossings north and south of Forest. And, MDOT will proceed with design of pedestrian crossing on SB Woodward south of Brown.

MDOT requests a deadline of August 1, 2022 for the City to determine if the temporary operational change will be implemented permanently or not. If the City will not proceed with the permanent geometric changes, this date allows MDOT's design team to remove the SB Woodward signal work from the plans and still meet our intended final project turn in deadline.

If the City proceeds with implementing the permanent geometric changes, MDOT requests a deadline of March 1, 2023 for that work to be completed by the City. Once this work is completed, MDOT will authorize for pick up survey and prepare a Plan Revision to incorporate the final grades prior to the signal construction beginning.

A couple other design items for consideration and input:

1. Is the City interested in cost participation for mast arms at these locations?
2. With design proceeding for adding the south leg pedestrian crossing on SB Woodward and crossings north & south of Forest on NB Woodward, plans would not include the sidewalk connection between the north and south crossings in the median. This will minimize the number of impacts to the landscaping in that median. With the new crossings, the pedestrians would still be able to maneuver around the intersections like typical other locations. If this is not desirable, please share those concerns.
3. Does the City have any ROW information for the area? Particularly for the SW quad of SB Woodward & Brown. MDOT has been researching but not come up with any definitive information yet. We will look to order title information next.

Thank you for your review of this long and detailed email. I can set up a meeting to discuss if that's preferred.

MDOT understands this is a very important location for pedestrian safety changes to be made and we are working on expediting the process as much as is feasible.

Thank you!

Jackie Pethers, PE

ITS/Signals Cost & Scheduling

cell: 810-614-0002

PethersJ@michigan.gov

Julie M. Kroll <jkroll@fveng.com>
To: Brooks Cowan <bcowan@bhamgov.org>

Fri, May 27, 2022 at 10:28 AM

Julie M. Kroll, PE, PTOE

Traffic Services Manager | Associate

FLEIS & VANDENBRINK

C: 248.342.5786

www.fveng.com

[Quoted text hidden]

Cybercrime attempts have increased during the COVID-19 Pandemic. This includes "spoofing" the origination of email addresses. If you receive an unexpected message with links or attachments, consider first verifying with the sender before opening.

The information contained in this message and any attachment may be proprietary, confidential, and privileged or subject to the work product doctrine and thus protected from disclosure. If the reader of this message is not the intended recipient, or an employee or agent responsible for delivering this message to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify me immediately by replying to this message and deleting it and all copies and backups thereof. Thank you.

MEMO

From: Julie M. Kroll, P.E., PTOE
Fleis & VandenBrink

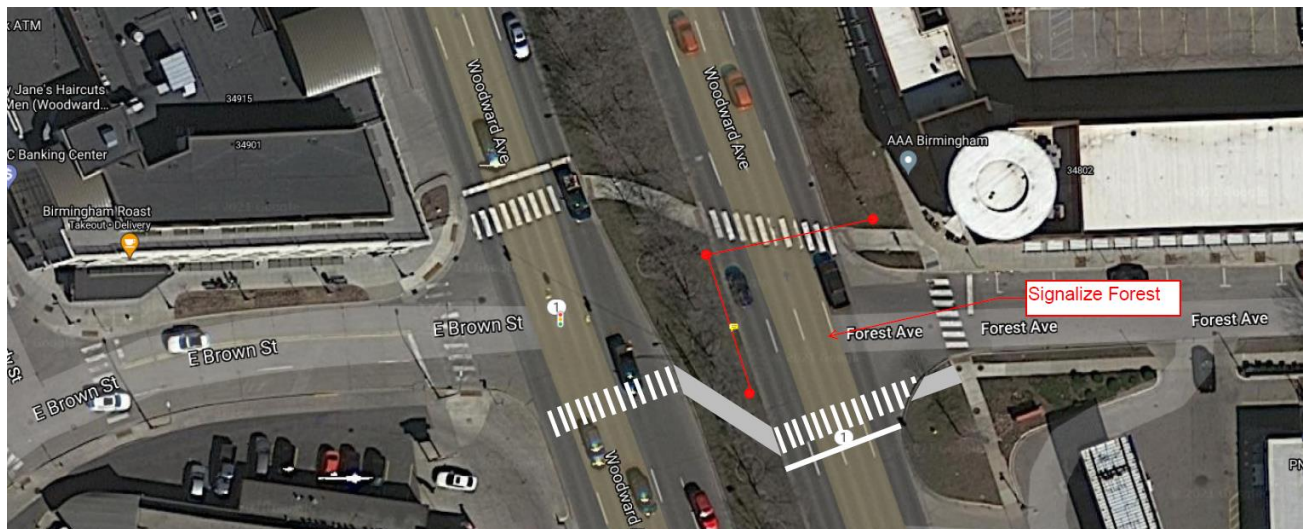
Date: May 26, 2022

Re: Brown Street & Woodward Ave.
City of Birmingham, Michigan
Before & After Study

INTRODUCTION

This memorandum presents the methodologies, analyses, and results of the Before & After Study for the Brown Street and Woodward Ave. intersection. This study was prepared to evaluate the impact of providing a single-lane approach on Brown Street at Woodward Ave. pursuant to MDOT requirements for the installation of a pedestrian crossing on the south leg of the intersection as illustrated below in **Figure 1**.

Figure 1: MDOT Programmed Pedestrian Improvements at Brown and Forest



DATA COLLECTION

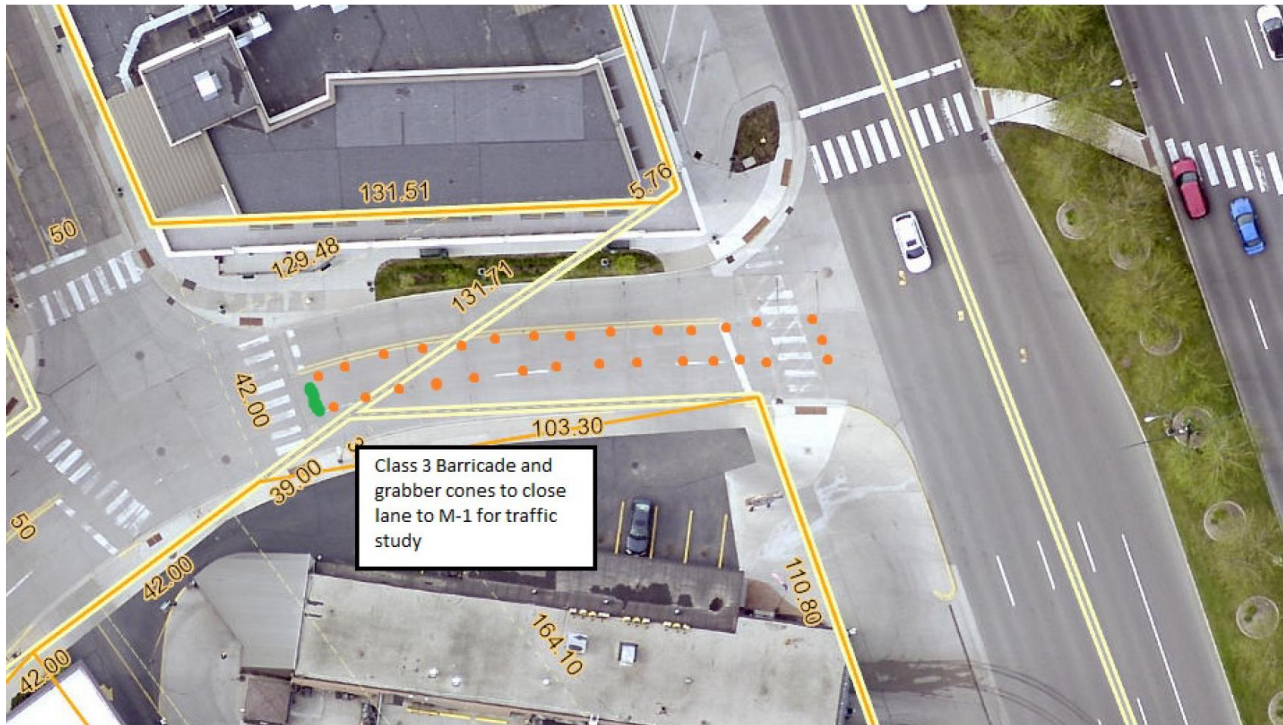
Turning movement counts were collected on Thursday February 25, 2022 for a period of 13-hours (6:00 AM-7:00PM) at the following intersections to capture the existing traffic operations.

- Brown Street & Peabody Street
- Brown Street & Woodward Ave.
- SB to NB Crossover & Woodward Ave.

The City set-up a temporary lane closure to evaluate the impact on traffic volumes and operations with the proposed one-lane approach. The temporary traffic control as shown in **Figure 2** was set-up on Tuesday March 15, 2022 and the data collection occurred the following week, on Thursday March 24, 2022. The before and after data collection performed are attached.

27725 Stansbury Boulevard, Suite 195
Farmington Hills, MI 48334
P: 248.536.0080
F: 248.536.0079
www.fveng.com

Figure 2: Temporary Barricade Placement



The results of the data collection showed that there was no measurable change on Brown Street or Peabody Street during the peak periods with the barricades in place. It was anticipated that vehicles would redistribute to the adjacent intersections in the event that the intersections were backed-up. However, review of the data showed that the traffic volumes were **higher** with the barricades in place. The traffic volume comparison is summarized in **Table 3**.

Table 3: Traffic Volume Comparison

Intersection	Approach	Existing Conditions (vph)			Trial Lane Closure (vph)			Difference		
		AM	MD	PM	AM	MD	PM	AM	MD	PM
Peabody & Brown	EB	180	203	245	191	218	290	11	15	45
	WB	165	167	150	188	183	126	23	16	-24
	SB	75	87	196	37	122	196	-38	35	0
	Overall	420	457	591	416	523	612	-4	66	21
Woodward & Brown SB to NB X/O at Woodward	EB	97	161	290	113	201	312	16	40	22
	SB	1810	1857	2423	2209	1858	2756	399	1	333
	U-Turn	249	418	375	291	338	395	42	-80	20
	Overall	2156	2436	3088	2613	2397	3463	457	-39	375

INTERSECTION ANALYSIS

The intersection operations were evaluated with both the existing operations and then with the proposed intersection geometry as required by MDOT to accommodate a pedestrian crossing on the south leg of Brown Street. The results of the intersection analysis are summarized in **Table 4** and shows that overall the impact of the geometry changes are minimal, with the exception of the PM peak hour on the eastbound Brown Street approach at Woodward. This intersection was further evaluated using SimTraffic and reviewing the videos that were performed during the trial data collection. This showed brief periods (< 15 min) where vehicle queue lengths on Brown Street extended into the Peabody Street intersection. Therefore, during the PM peak hour there may be occasionally delays for vehicles on this approach, but the impacts will be limited in duration.

Table 4: Intersection Operations Comparison

Intersection	Control	Approach	Existing Conditions						Trial Lane Closure						Difference					
			AM Peak		MD Peak		PM Peak		AM Peak		MD Peak		PM Peak		AM Peak		MD Peak		PM Peak	
			Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
Brown St & Peabody St	Stop (All Way)	EB	8.6	A	8.9	A	9.6	A	8.9	A	9.7	A	11.4	B	0.3	-	0.8	-	1.8	A→B
		WB	9.3	A	9.7	A	10.2	B	9.3	A	10.0	A	9.8	A	0.0	-	0.3	-	-0.4	B→A
		SB	8.8	A	8.6	A	10.1	B	7.9	A	9.1	A	10.7	B	-0.9	-	0.5	-	0.6	-
		Overall	8.9	A	9.1	A	9.9	A	9.0	A	9.7	A	10.9	B	0.1	-	0.6	-	1.0	A→B
Brown St & Woodward	Signal	EB	30.5	C	27.2	C	35.8	D	29.9	C	31.8	C	100.4	F	-0.6	-	4.6	-	64.6	D→F
		SB	1.2	A	2.9	A	1.5	A	14.6	B	2.9	A	1.2	A	13.4	A→B	0.0	-	-0.3	-

CONCLUSIONS

The results of this analysis are summarized below and show that reducing the eastbound approach to one lane will have minimal impact on the operations on the existing operations.

Traffic Volumes

- The data collection showed that there was no measurable change during the peak periods with the barricades in place.
- Review of the data showed that the traffic volumes were **higher** with the barricades in place.

Intersection Operations

- There are additional PM peak delays expected on Brown Street at Woodward Ave., however these delays are limited in duration.
- The trade-off for the projected vehicle increases in delay is an improvements to the intersection safety for pedestrians and vehicles.
- The single right-turn lane will allow of the construction of additional east-west pedestrian connectivity across Woodward Ave. with protected, signalized crossings on all six-legs of the Brown/Forest intersection
- The dual right-turns currently create the potential for sideswipe crashes and encourages aggressive driving as vehicles are looking to access the median U-turn on Woodward Ave., south of Brown.
- The dual right-turn lanes have a high crash potential as the number of conflict points is double that of a single lane approach.

RECOMMENDATIONS

- It is recommended that the intersection geometry at the Brown Street intersection at Woodward Ave. is designed with a one-lane approach to accommodate the E/W pedestrian crossing on the south leg of the intersection.
- The Brown Street and Peabody Street intersection operations and pedestrian facilities should be considered with the recommendations at Woodward Ave. Eliminating the right-turn lane at Woodward Ave. provides an opportunity to improve the pedestrian safety at the adjacent intersection.

Attachments:

Traffic Volume Data

Brown & Peabody - TMC

Thu Feb 24, 2022

Full Length (6 AM-7 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924280, Location: 42.545362, -83.211626

Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Peabody Southbound					Brown Eastbound					Brown Westbound					
Time	L	R	U	App	Ped*	L	T	U	App	Ped*	T	R	U	App	Ped*	Int
2022-02-24 6:00AM	1	1	0	2	1	2	4	0	6	0	3	0	0	3	0	11
6:15AM	0	1	0	1	0	1	3	0	4	0	5	3	0	8	0	13
6:30AM	1	0	0	1	2	1	9	0	10	0	4	1	0	5	0	16
6:45AM	3	2	0	5	0	2	16	0	18	2	10	4	0	14	0	37
Hourly Total	5	4	0	9	3	6	32	0	38	2	22	8	0	30	0	77
7:00AM	3	2	0	5	0	5	10	0	15	0	5	4	1	10	2	30
7:15AM	0	2	0	2	2	4	11	0	15	0	15	6	0	21	2	38
7:30AM	0	3	0	3	1	16	15	0	31	0	9	9	0	18	1	52
7:45AM	2	5	0	7	1	21	17	0	38	1	26	13	0	39	1	84
Hourly Total	5	12	0	17	4	46	53	0	99	1	55	32	1	88	6	204
8:00AM	3	2	0	5	0	15	16	0	31	0	28	12	0	40	0	76
8:15AM	3	4	0	7	5	19	28	0	47	1	26	16	0	42	1	96
8:30AM	4	8	0	12	4	23	28	0	51	0	30	17	0	47	2	110
8:45AM	6	8	0	14	16	24	14	0	38	1	26	16	0	42	0	94
Hourly Total	16	22	0	38	25	81	86	0	167	2	110	61	0	171	3	376
9:00AM	2	8	1	11	7	18	19	0	37	0	33	14	0	47	3	95
9:15AM	1	7	0	8	4	17	16	0	33	0	32	12	0	44	1	85
9:30AM	3	5	0	8	6	11	18	0	29	2	30	7	0	37	4	74
9:45AM	8	9	0	17	8	17	22	0	39	1	34	19	0	53	2	109
Hourly Total	14	29	1	44	25	63	75	0	138	3	129	52	0	181	10	363
10:00AM	11	14	0	25	7	19	21	0	40	0	32	17	0	49	1	114
10:15AM	5	10	0	15	5	21	30	0	51	0	21	8	0	29	1	95
10:30AM	8	10	0	18	9	16	34	0	50	0	26	8	0	34	2	102
10:45AM	5	12	0	17	11	10	24	0	34	1	39	19	0	58	1	109
Hourly Total	29	46	0	75	32	66	109	0	175	1	118	52	0	170	5	420
11:00AM	3	8	0	11	5	14	22	0	36	0	37	5	0	42	3	89
11:15AM	1	14	0	15	11	14	27	0	41	0	35	6	0	41	2	97
11:30AM	5	13	0	18	12	8	32	0	40	1	22	9	1	32	2	90
11:45AM	5	13	0	18	10	22	36	0	58	2	34	13	0	47	2	123
Hourly Total	14	48	0	62	38	58	117	0	175	3	128	33	1	162	9	399
12:00PM	5	13	0	18	12	14	30	0	44	2	26	10	0	36	1	98
12:15PM	6	16	0	22	16	17	49	0	66	1	38	15	0	53	5	141
12:30PM	11	18	0	29	16	12	23	0	35	1	27	4	0	31	1	95
12:45PM	5	24	0	29	13	12	32	0	44	0	31	14	0	45	3	118
Hourly Total	27	71	0	98	57	55	134	0	189	4	122	43	0	165	10	452
1:00PM	12	17	0	29	14	9	24	1	34	5	29	8	0	37	6	100
1:15PM	15	7	0	22	13	21	34	1	56	2	25	11	0	36	2	114
1:30PM	6	19	0	25	5	15	34	0	49	1	35	6	0	41	2	115
1:45PM	8	14	0	22	7	18	29	0	47	1	29	7	0	36	0	105
Hourly Total	41	57	0	98	39	63	121	2	186	9	118	32	0	150	10	434
2:00PM	11	15	0	26	11	12	29	0	41	1	23	6	0	29	4	96
2:15PM	10	6	0	16	7	14	26	0	40	1	21	6	0	27	3	83
2:30PM	7	14	0	21	5	16	35	0	51	1	35	7	0	42	1	114
2:45PM	13	14	0	27	13	13	34	0	47	0	31	12	0	43	1	117
Hourly Total	41	49	0	90	36	55	124	0	179	3	110	31	0	141	9	410
3:00PM	9	13	0	22	13	18	35	0	53	0	22	4	0	26	3	101
3:15PM	10	19	0	29	13	18	36	0	54	1	29	14	0	43	1	126
3:30PM	10	15	0	25	9	14	37	0	51	1	23	5	0	28	1	104
3:45PM	10	12	0	22	9	13	32	0	45	0	28	13	0	41	0	108
Hourly Total	39	59	0	98	44	63	140	0	203	2	102	36	0	138	5	439
4:00PM	16	25	0	41	3	15	47	1	63	2	31	16	0	47	1	151
4:15PM	11	11	0	22	4	13	33	0	46	0	32	4	0	36	0	104
4:30PM	27	16	0	43	4	16	50	0	66	1	29	10	0	39	2	148

Leg Direction	Peabody Southbound					Brown Eastbound					Brown Westbound					
Time	L	R	U	App	Ped*	L	T	U	App	Ped*	T	R	U	App	Ped*	Int
4:45PM	22	18	0	40	9	15	36	0	51	4	26	10	0	36	0	127
Hourly Total	76	70	0	146	20	59	166	1	226	7	118	40	0	158	3	530
5:00PM	42	30	0	72	2	13	59	0	72	1	27	5	0	32	1	176
5:15PM	16	25	0	41	4	21	35	0	56	0	36	7	0	43	0	140
5:30PM	24	27	0	51	3	18	42	0	60	0	21	7	0	28	0	139
5:45PM	18	10	0	28	3	17	26	0	43	5	34	3	0	37	1	108
Hourly Total	100	92	0	192	12	69	162	0	231	6	118	22	0	140	2	563
6:00PM	14	26	0	40	10	13	36	0	49	3	31	2	0	33	0	122
6:15PM	12	26	0	38	3	17	30	0	47	0	26	6	0	32	0	117
6:30PM	9	22	0	31	10	15	35	0	50	0	25	3	0	28	1	109
6:45PM	9	21	0	30	5	11	31	0	42	0	19	6	0	25	3	97
Hourly Total	44	95	0	139	28	56	132	0	188	3	101	17	0	118	4	445
Total	451	654	1	1106	363	740	1451	3	2194	46	1351	459	2	1812	76	5112
% Approach	40.8%	59.1%	0.1%	-	-	33.7%	66.1%	0.1%	-	-	74.6%	25.3%	0.1%	-	-	-
% Total	8.8%	12.8%	0%	21.6%	-	14.5%	28.4%	0.1%	42.9%	-	26.4%	9.0%	0%	35.4%	-	-
Lights	442	642	1	1085	-	723	1423	3	2149	-	1330	451	2	1783	-	5017
% Lights	98.0%	98.2%	100%	98.1%	-	97.7%	98.1%	100%	97.9%	-	98.4%	98.3%	100%	98.4%	-	98.1%
Single-Unit Trucks	9	8	0	17	-	14	26	0	40	-	20	7	0	27	-	84
% Single-Unit Trucks	2.0%	1.2%	0%	1.5%	-	1.9%	1.8%	0%	1.8%	-	1.5%	1.5%	0%	1.5%	-	1.6%
Articulated Trucks	0	1	0	1	-	0	2	0	2	-	0	0	0	0	-	3
% Articulated Trucks	0%	0.2%	0%	0.1%	-	0%	0.1%	0%	0.1%	-	0%	0%	0%	0%	-	0.1%
Buses	0	2	0	2	-	1	0	0	1	-	0	0	0	0	-	3
% Buses	0%	0.3%	0%	0.2%	-	0.1%	0%	0%	0%	-	0%	0%	0%	0%	-	0.1%
Bicycles on Road	0	1	0	1	-	2	0	0	2	-	1	1	0	2	-	5
% Bicycles on Road	0%	0.2%	0%	0.1%	-	0.3%	0%	0%	0.1%	-	0.1%	0.2%	0%	0.1%	-	0.1%
Pedestrians	-	-	-	-	362	-	-	-	-	46	-	-	-	-	76	
% Pedestrians	-	-	-	-	99.7%	-	-	-	-	100%	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	0	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	0.3%	-	-	-	-	0%	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Brown & Peabody - TMC

Thu Feb 24, 2022

Full Length (6 AM-7 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924280, Location: 42.545362, -83.211626

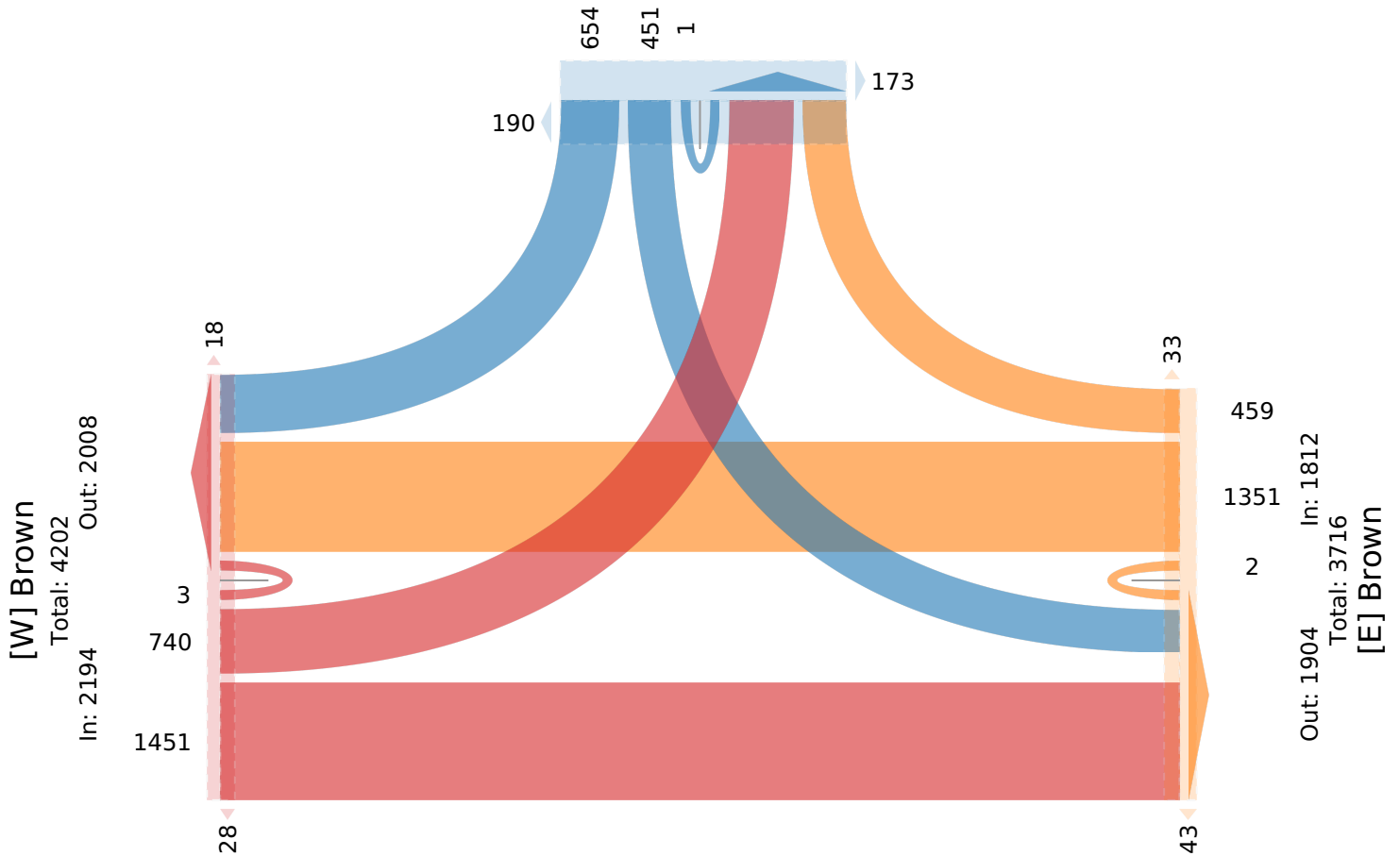


Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Peabody

Total: 2306

In: 1106 Out: 1200



Brown & Peabody - TMC

Thu Feb 24, 2022

AM Peak (9:45 AM - 10:45 AM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924280, Location: 42.545362, -83.211626



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Peabody Southbound					Brown Eastbound					Brown Westbound					
Time	L	R	U	App	Ped*	L	T	U	App	Ped*	T	R	U	App	Ped*	Int
2022-02-24 9:45AM	8	9	0	17	8	17	22	0	39	1	34	19	0	53	2	109
10:00AM	11	14	0	25	7	19	21	0	40	0	32	17	0	49	1	114
10:15AM	5	10	0	15	5	21	30	0	51	0	21	8	0	29	1	95
10:30AM	8	10	0	18	9	16	34	0	50	0	26	8	0	34	2	102
Total	32	43	0	75	29	73	107	0	180	1	113	52	0	165	6	420
% Approach	42.7%	57.3%	0%	-	-	40.6%	59.4%	0%	-	-	68.5%	31.5%	0%	-	-	-
% Total	7.6%	10.2%	0%	17.9%	-	17.4%	25.5%	0%	42.9%	-	26.9%	12.4%	0%	39.3%	-	-
PHF	0.727	0.768	-	0.750	-	0.900	0.787	-	0.895	-	0.831	0.684	-	0.778	-	0.919
Lights	31	42	0	73	-	69	104	0	173	-	110	51	0	161	-	407
% Lights	96.9%	97.7%	0%	97.3%	-	94.5%	97.2%	0%	96.1%	-	97.3%	98.1%	0%	97.6%	-	96.9%
Single-Unit Trucks	1	1	0	2	-	3	3	0	6	-	3	1	0	4	-	12
% Single-Unit Trucks	3.1%	2.3%	0%	2.7%	-	4.1%	2.8%	0%	3.3%	-	2.7%	1.9%	0%	2.4%	-	2.9%
Articulated Trucks	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Articulated Trucks	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Buses	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Buses	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Bicycles on Road	0	0	0	0	-	1	0	0	1	-	0	0	0	0	-	1
% Bicycles on Road	0%	0%	0%	0%	-	1.4%	0%	0%	0.6%	-	0%	0%	0%	0%	-	0.2%
Pedestrians	-	-	-	-	29	-	-	-	-	1	-	-	-	-	6	-
% Pedestrians	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Brown & Peabody - TMC

Thu Feb 24, 2022

AM Peak (9:45 AM - 10:45 AM)

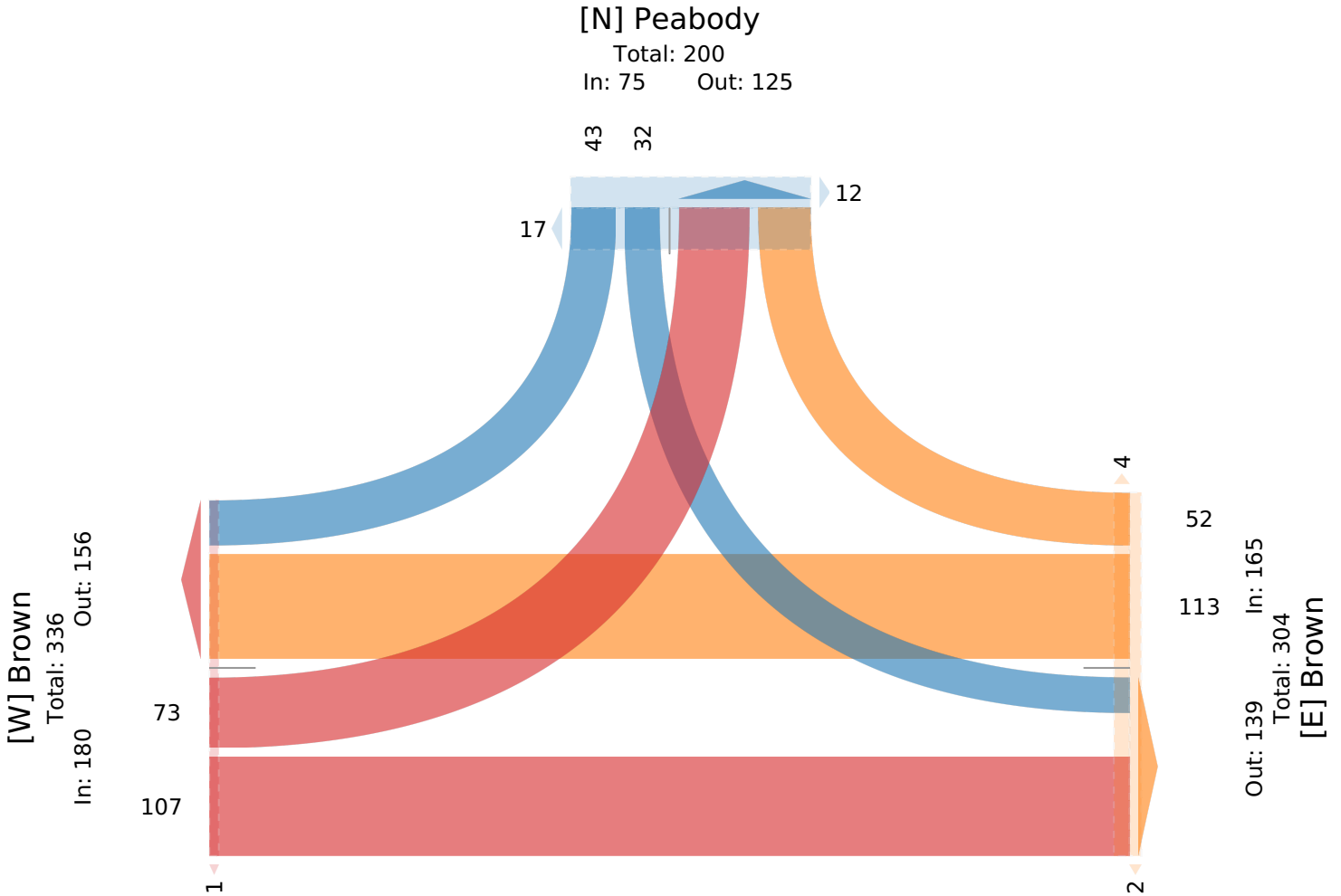
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924280, Location: 42.545362, -83.211626



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Brown & Peabody - TMC

Thu Feb 24, 2022

Midday Peak (11:45 AM - 12:45 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924280, Location: 42.545362, -83.211626



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Peabody Southbound					Brown Eastbound					Brown Westbound					
Time	L	R	U	App	Ped*	L	T	U	App	Ped*	T	R	U	App	Ped*	Int
2022-02-24 11:45AM	5	13	0	18	10	22	36	0	58	2	34	13	0	47	2	123
12:00PM	5	13	0	18	12	14	30	0	44	2	26	10	0	36	1	98
12:15PM	6	16	0	22	16	17	49	0	66	1	38	15	0	53	5	141
12:30PM	11	18	0	29	16	12	23	0	35	1	27	4	0	31	1	95
Total	27	60	0	87	54	65	138	0	203	6	125	42	0	167	9	457
% Approach	31.0%	69.0%	0%	-	-	32.0%	68.0%	0%	-	-	74.9%	25.1%	0%	-	-	-
% Total	5.9%	13.1%	0%	19.0%	-	14.2%	30.2%	0%	44.4%	-	27.4%	9.2%	0%	36.5%	-	-
PHF	0.614	0.833	-	0.750	-	0.739	0.704	-	0.769	-	0.822	0.700	-	0.788	-	0.810
Lights	25	60	0	85	-	62	133	0	195	-	124	42	0	166	-	446
% Lights	92.6%	100%	0%	97.7%	-	95.4%	96.4%	0%	96.1%	-	99.2%	100%	0%	99.4%	-	97.6%
Single-Unit Trucks	2	0	0	2	-	3	5	0	8	-	1	0	0	1	-	11
% Single-Unit Trucks	7.4%	0%	0%	2.3%	-	4.6%	3.6%	0%	3.9%	-	0.8%	0%	0%	0.6%	-	2.4%
Articulated Trucks	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Articulated Trucks	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Buses	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Buses	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	54	-	-	-	-	6	-	-	-	-	9	-
% Pedestrians	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Brown & Peabody - TMC

Thu Feb 24, 2022

Midday Peak (11:45 AM - 12:45 PM)

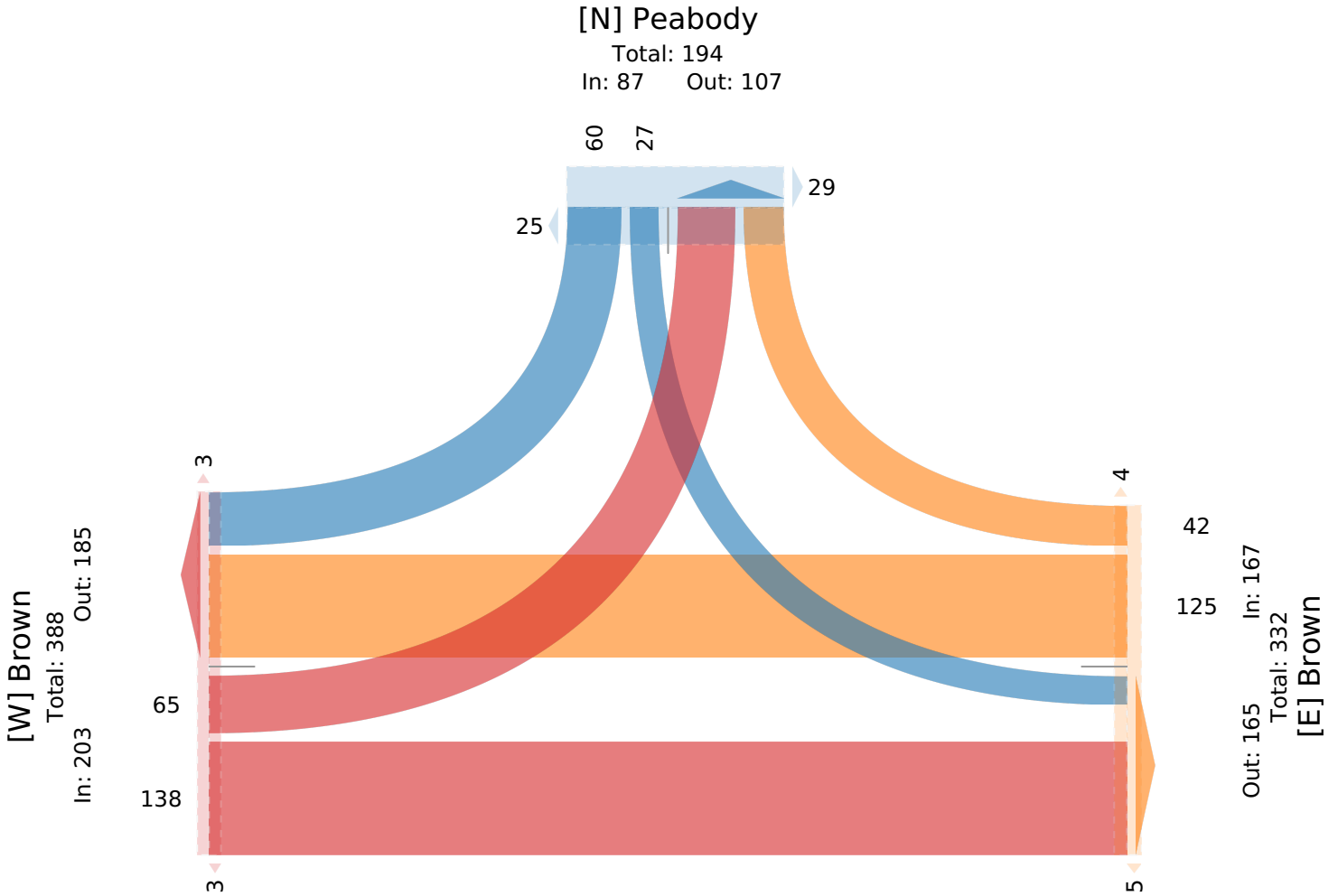
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924280, Location: 42.545362, -83.211626



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Brown & Peabody - TMC

Thu Feb 24, 2022

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924280, Location: 42.545362, -83.211626



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Peabody Southbound					Brown Eastbound					Brown Westbound					
Time	L	R	U	App	Ped*	L	T	U	App	Ped*	T	R	U	App	Ped*	Int
2022-02-24 4:30PM	27	16	0	43	4	16	50	0	66	1	29	10	0	39	2	148
4:45PM	22	18	0	40	9	15	36	0	51	4	26	10	0	36	0	127
5:00PM	42	30	0	72	2	13	59	0	72	1	27	5	0	32	1	176
5:15PM	16	25	0	41	4	21	35	0	56	0	36	7	0	43	0	140
Total	107	89	0	196	19	65	180	0	245	6	118	32	0	150	3	591
% Approach	54.6%	45.4%	0%	-	-	26.5%	73.5%	0%	-	-	78.7%	21.3%	0%	-	-	-
% Total	18.1%	15.1%	0%	33.2%	-	11.0%	30.5%	0%	41.5%	-	20.0%	5.4%	0%	25.4%	-	-
PHF	0.637	0.742	-	0.681	-	0.774	0.763	-	0.851	-	0.819	0.800	-	0.872	-	0.839
Lights	107	88	0	195	-	65	180	0	245	-	118	32	0	150	-	590
% Lights	100%	98.9%	0%	99.5%	-	100%	100%	0%	100%	-	100%	100%	0%	100%	-	99.8%
Single-Unit Trucks	0	1	0	1	-	0	0	0	0	-	0	0	0	0	-	1
% Single-Unit Trucks	0%	1.1%	0%	0.5%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0.2%
Articulated Trucks	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Articulated Trucks	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Buses	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Buses	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	19	-	-	-	-	6	-	-	-	-	3	-
% Pedestrians	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Brown & Peabody - TMC

Thu Feb 24, 2022

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

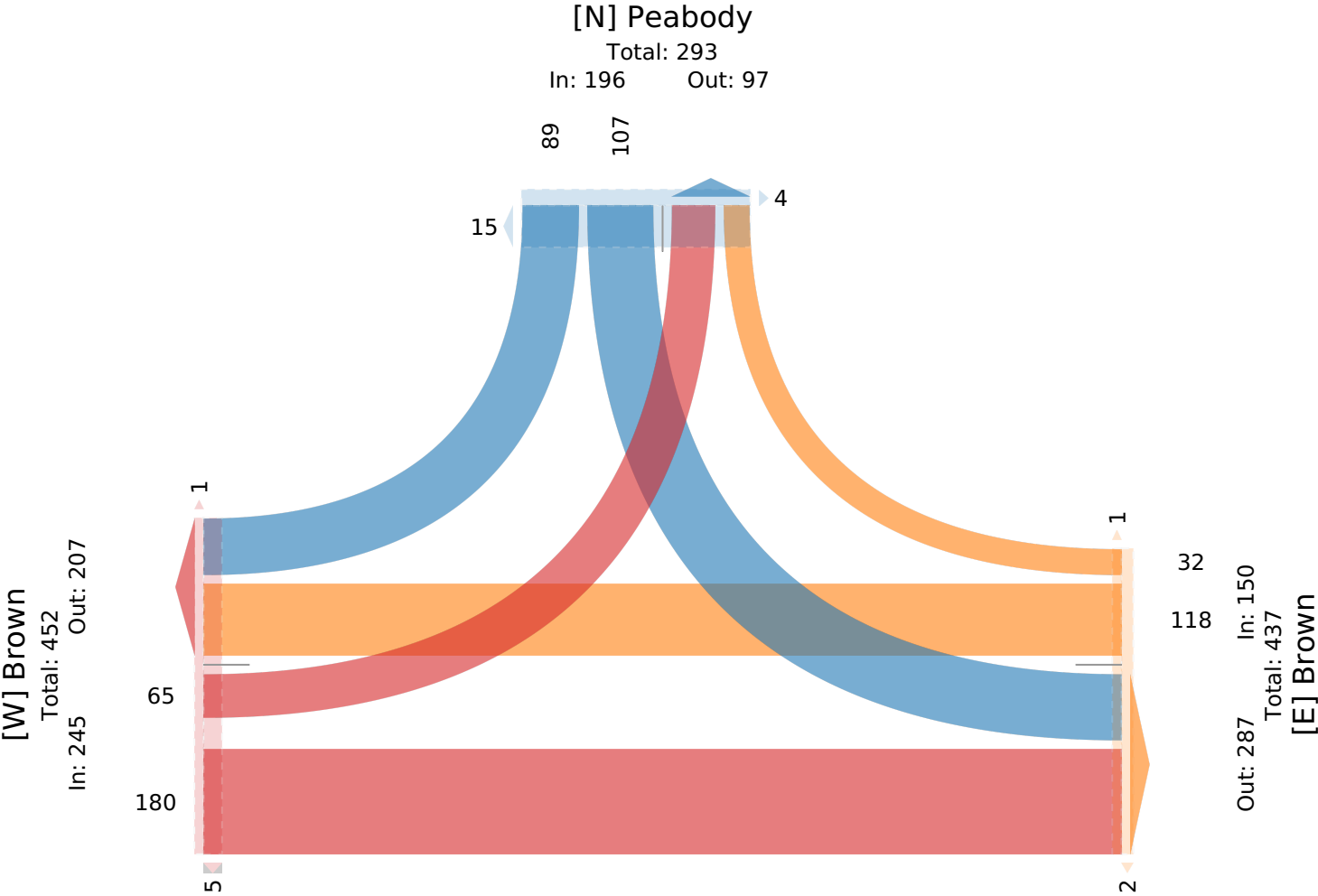
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924280, Location: 42.545362, -83.211626



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Brown & Woodward - 1 RTOR - TMC

Thu Feb 24, 2022

Full Length (6 AM-7 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924281, Location: 42.545459, -83.210863



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Woodward Northbound					Woodward Southbound					Brown Eastbound						
Time	L	T	U	App	Ped*	T	R	U	App	Ped*	L	R	U	RR	App	Ped*	Int
2022-02-24 6:00AM	0	0	0	0	0	148	3	0	151	2	0	1	0	4	5	0	156
6:15AM	0	0	0	0	1	211	10	0	221	1	0	0	0	2	2	1	223
6:30AM	0	0	0	0	0	281	5	0	286	0	0	11	0	2	13	0	299
6:45AM	0	0	0	0	0	237	14	0	251	0	0	12	0	5	17	0	268
Hourly Total	0	0	0	0	1	877	32	0	909	3	0	24	0	13	37	1	946
7:00AM	0	0	0	0	0	276	12	0	288	0	0	3	0	11	14	0	302
7:15AM	0	0	0	0	0	331	23	0	354	1	0	2	0	9	11	0	365
7:30AM	0	0	0	0	0	346	21	0	367	0	0	3	0	12	15	0	382
7:45AM	0	0	0	0	0	454	37	0	491	2	0	7	0	12	19	0	510
Hourly Total	0	0	0	0	0	1407	93	0	1500	3	0	15	0	44	59	0	1559
8:00AM	0	0	0	0	0	402	38	0	440	1	0	7	0	12	19	0	459
8:15AM	0	0	0	0	0	381	41	0	422	1	0	12	0	16	28	0	450
8:30AM	0	0	0	0	0	408	49	0	457	1	0	12	0	19	31	0	488
8:45AM	0	0	0	0	0	391	40	0	431	2	0	6	0	15	21	1	452
Hourly Total	0	0	0	0	0	1582	168	0	1750	5	0	37	0	62	99	1	1849
9:00AM	0	0	0	0	1	361	49	0	410	1	0	9	0	11	20	1	430
9:15AM	0	0	0	0	0	369	43	0	412	2	0	9	0	8	17	1	429
9:30AM	0	0	0	0	0	418	35	0	453	4	0	9	0	11	20	0	473
9:45AM	0	0	0	0	0	373	53	0	426	0	0	18	0	10	28	3	454
Hourly Total	0	0	0	0	1	1521	180	0	1701	7	0	45	0	40	85	5	1786
10:00AM	0	0	0	0	0	354	48	0	402	1	0	20	0	9	29	0	431
10:15AM	0	0	0	0	0	310	31	0	341	3	0	24	0	11	35	1	376
10:30AM	0	0	0	0	1	338	32	0	370	1	0	28	0	14	42	2	412
10:45AM	0	0	0	0	0	329	59	0	388	1	0	25	0	5	30	0	418
Hourly Total	0	0	0	0	1	1331	170	0	1501	6	0	97	0	39	136	3	1637
11:00AM	0	0	0	0	0	351	42	0	393	0	0	19	0	6	25	2	418
11:15AM	0	0	0	0	0	328	40	0	368	0	0	20	0	8	28	1	396
11:30AM	0	0	0	0	0	382	30	0	412	0	0	23	0	13	36	3	448
11:45AM	0	0	0	0	0	434	49	0	483	4	0	32	0	11	43	1	526
Hourly Total	0	0	0	0	0	1495	161	0	1656	4	0	94	0	38	132	7	1788
12:00PM	0	0	0	0	1	417	39	0	456	2	0	28	0	7	35	1	491
12:15PM	0	0	0	0	0	436	46	0	482	3	0	44	0	13	57	0	539
12:30PM	0	0	0	0	0	393	31	0	424	2	0	24	0	9	33	0	457
12:45PM	0	0	0	0	0	449	46	0	495	3	0	29	0	7	36	0	531
Hourly Total	0	0	0	0	1	1695	162	0	1857	10	0	125	0	36	161	1	2018
1:00PM	0	0	0	0	0	408	39	0	447	3	0	25	0	7	32	2	479
1:15PM	0	0	0	0	0	422	35	0	457	2	0	37	0	14	51	0	508
1:30PM	0	0	0	0	0	391	41	0	432	2	0	28	0	12	40	0	472
1:45PM	0	0	0	0	0	423	35	0	458	3	0	28	0	8	36	4	494
Hourly Total	0	0	0	0	0	1644	150	0	1794	10	0	118	0	41	159	6	1953
2:00PM	0	0	0	0	0	367	28	0	395	3	0	33	0	9	42	1	437
2:15PM	0	0	0	0	0	440	27	0	467	0	0	30	0	6	36	0	503
2:30PM	0	0	0	0	0	424	38	0	462	1	0	33	0	8	41	0	503
2:45PM	0	0	0	0	0	429	43	0	472	0	0	31	0	13	44	1	516
Hourly Total	0	0	0	0	0	1660	136	0	1796	4	0	127	0	36	163	2	1959
3:00PM	0	0	0	0	1	492	28	0	520	3	0	38	0	7	45	0	565
3:15PM	0	0	0	0	0	457	38	0	495	1	0	32	0	11	43	0	538
3:30PM	0	0	0	0	0	446	26	0	472	5	0	42	0	6	48	0	520
3:45PM	0	0	0	0	0	447	40	0	487	0	0	33	0	6	39	0	526
Hourly Total	0	0	0	0	1	1842	132	0	1974	9	0	145	0	30	175	0	2149
4:00PM	0	0	0	0	0	499	46	0	545	2	0	49	0	14	63	0	608
4:15PM	0	0	0	0	0	541	35	0	576	0	0	36	0	8	44	1	620
4:30PM	0	0	0	0	0	493	41	0	534	4	0	56	0	21	77	0	611

Leg Direction	Woodward Northbound					Woodward Southbound					Brown Eastbound						
Time	L	T	U	App	Ped*	T	R	U	App	Ped*	L	R	U	RR	App	Ped*	Int
4:45PM	0	0	0	0	0	546	35	0	581	3	0	49	0	10	59	1	640
Hourly Total	0	0	0	0	0	2079	157	0	2236	9	0	190	0	53	243	2	2479
5:00PM	0	0	0	0	1	578	31	0	609	2	0	75	0	28	103	0	712
5:15PM	0	0	0	0	0	658	41	0	699	0	0	34	0	17	51	0	750
5:30PM	0	0	0	0	0	512	30	0	542	0	0	51	1	14	66	0	608
5:45PM	0	0	0	0	0	466	38	0	504	3	0	34	0	12	46	0	550
Hourly Total	0	0	0	0	1	2214	140	0	2354	5	0	194	1	71	266	0	2620
6:00PM	0	0	0	0	0	477	33	0	510	0	0	38	0	15	53	0	563
6:15PM	0	0	0	0	0	519	32	0	551	1	0	33	0	10	43	0	594
6:30PM	0	0	0	0	0	380	28	0	408	1	0	33	0	11	44	0	452
6:45PM	0	0	0	0	0	320	24	0	344	0	0	27	0	12	39	0	383
Hourly Total	0	0	0	0	0	1696	117	0	1813	2	0	131	0	48	179	0	1992
Total	0	0	0	0	6	21043	1798	0	22841	77	0	1342	1	551	1894	28	24735
% Approach	0%	0%	0%	-	-	92.1%	7.9%	0%	-	-	0%	70.9%	0.1%	29.1%	-	-	-
% Total	0%	0%	0%	0%	-	85.1%	7.3%	0%	92.3%	-	0%	5.4%	0%	2.2%	7.7%	-	-
Lights	0	0	0	0	-	20623	1776	0	22399	-	0	1317	1	541	1859	-	24258
% Lights	0%	0%	0%	-	-	98.0%	98.8%	0%	98.1%	-	0%	98.1%	100%	98.2%	98.2%	-	98.1%
Single-Unit Trucks	0	0	0	0	-	287	22	0	309	-	0	24	0	9	33	-	342
% Single-Unit Trucks	0%	0%	0%	-	-	1.4%	1.2%	0%	1.4%	-	0%	1.8%	0%	1.6%	1.7%	-	1.4%
Articulated Trucks	0	0	0	0	-	78	0	0	78	-	0	1	0	1	2	-	80
% Articulated Trucks	0%	0%	0%	-	-	0.4%	0%	0%	0.3%	-	0%	0.1%	0%	0.2%	0.1%	-	0.3%
Buses	0	0	0	0	-	55	0	0	55	-	0	0	0	0	0	-	55
% Buses	0%	0%	0%	-	-	0.3%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	-	0.2%
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	-	-	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	6	-	-	-	-	75	-	-	-	-	-	27	
% Pedestrians	-	-	-	-	100%	-	-	-	-	97.4%	-	-	-	-	-	96.4%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	2	-	-	-	-	-	1	
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	2.6%	-	-	-	-	-	3.6%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Brown & Woodward - 1 RTOR - TMC

Thu Feb 24, 2022

Full Length (6 AM-7 PM)

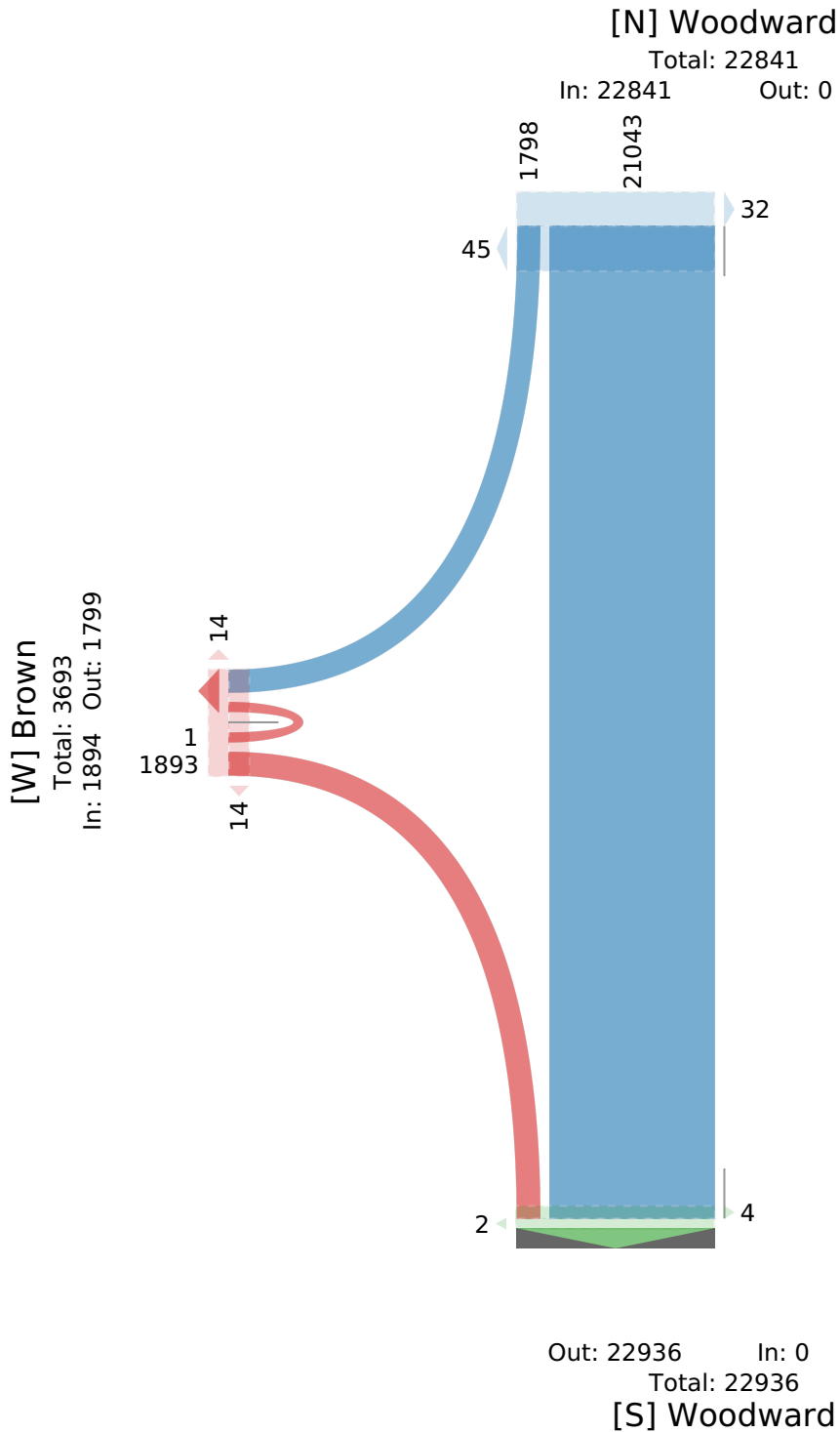
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924281, Location: 42.545459, -83.210863



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Brown & Woodward - 1 RTOR - TMC

Thu Feb 24, 2022

AM Peak (7:45 AM - 8:45 AM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924281, Location: 42.545459, -83.210863



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Woodward Northbound					Woodward Southbound					Brown Eastbound						
Time	L	T	U	App	Ped*	T	R	U	App	Ped*	L	R	U	RR	App	Ped*	Int
2022-02-24 7:45AM	0	0	0	0	0	454	37	0	491	2	0	7	0	12	19	0	510
8:00AM	0	0	0	0	0	402	38	0	440	1	0	7	0	12	19	0	459
8:15AM	0	0	0	0	0	381	41	0	422	1	0	12	0	16	28	0	450
8:30AM	0	0	0	0	0	408	49	0	457	1	0	12	0	19	31	0	488
Total	0	0	0	0	0	1645	165	0	1810	5	0	38	0	59	97	0	1907
% Approach	0%	0%	0%	-	-	90.9%	9.1%	0%	-	-	0%	39.2%	0%	60.8%	-	-	-
% Total	0%	0%	0%	0%	-	86.3%	8.7%	0%	94.9%	-	0%	2.0%	0%	3.1%	5.1%	-	-
PHF	-	-	-	-	-	0.906	0.842	-	0.922	-	-	0.792	-	0.776	0.782	-	0.935
Lights	0	0	0	0	-	1614	163	0	1777	-	0	37	0	58	95	-	1872
% Lights	0%	0%	0%	-	-	98.1%	98.8%	0%	98.2%	-	0%	97.4%	0%	98.3%	97.9%	-	98.2%
Single-Unit Trucks	0	0	0	0	-	16	2	0	18	-	0	1	0	1	2	-	20
% Single-Unit Trucks	0%	0%	0%	-	-	1.0%	1.2%	0%	1.0%	-	0%	2.6%	0%	1.7%	2.1%	-	1.0%
Articulated Trucks	0	0	0	0	-	9	0	0	9	-	0	0	0	0	0	-	9
% Articulated Trucks	0%	0%	0%	-	-	0.5%	0%	0%	0.5%	-	0%	0%	0%	0%	0%	-	0.5%
Buses	0	0	0	0	-	6	0	0	6	-	0	0	0	0	0	-	6
% Buses	0%	0%	0%	-	-	0.4%	0%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0.3%
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	-	-	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	0	-	-	-	-	5	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Brown & Woodward - 1 RTOR - TMC

Thu Feb 24, 2022

AM Peak (7:45 AM - 8:45 AM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924281, Location: 42.545459, -83.210863



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

[N] Woodward

Total: 1810

In: 1810

Out: 0

165

1645

5

[W] Brown

Total: 262

In: 97 Out: 165

97

Out: 1742

In: 0

Total: 1742

[S] Woodward

Brown & Woodward - 1 RTOR - TMC

Thu Feb 24, 2022

Midday Peak (12 PM - 1 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924281, Location: 42.545459, -83.210863



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Woodward Northbound					Woodward Southbound					Brown Eastbound						
Time	L	T	U	App	Ped*	T	R	U	App	Ped*	L	R	U	RR	App	Ped*	Int
2022-02-24 12:00PM	0	0	0	0	1	417	39	0	456	2	0	28	0	7	35	1	491
12:15PM	0	0	0	0	0	436	46	0	482	3	0	44	0	13	57	0	539
12:30PM	0	0	0	0	0	393	31	0	424	2	0	24	0	9	33	0	457
12:45PM	0	0	0	0	0	449	46	0	495	3	0	29	0	7	36	0	531
Total	0	0	0	0	1	1695	162	0	1857	10	0	125	0	36	161	1	2018
% Approach	0%	0%	0%	-	-	91.3%	8.7%	0%	-	-	0%	77.6%	0%	22.4%	-	-	-
% Total	0%	0%	0%	0%	-	84.0%	8.0%	0%	92.0%	-	0%	6.2%	0%	1.8%	8.0%	-	-
PHF	-	-	-	-	-	0.944	0.880	-	0.938	-	-	0.710	-	0.692	0.706	-	0.936
Lights	0	0	0	0	-	1640	161	0	1801	-	0	120	0	34	154	-	1955
% Lights	0%	0%	0%	-	-	96.8%	99.4%	0%	97.0%	-	0%	96.0%	0%	94.4%	95.7%	-	96.9%
Single-Unit Trucks	0	0	0	0	-	44	1	0	45	-	0	5	0	2	7	-	52
% Single-Unit Trucks	0%	0%	0%	-	-	2.6%	0.6%	0%	2.4%	-	0%	4.0%	0%	5.6%	4.3%	-	2.6%
Articulated Trucks	0	0	0	0	-	7	0	0	7	-	0	0	0	0	0	-	7
% Articulated Trucks	0%	0%	0%	-	-	0.4%	0%	0%	0.4%	-	0%	0%	0%	0%	0%	-	0.3%
Buses	0	0	0	0	-	4	0	0	4	-	0	0	0	0	0	-	4
% Buses	0%	0%	0%	-	-	0.2%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	-	0.2%
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	-	-	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	1	-	-	-	-	10	-	-	-	-	-	1	
% Pedestrians	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Brown & Woodward - 1 RTOR - TMC

Thu Feb 24, 2022

Midday Peak (12 PM - 1 PM)

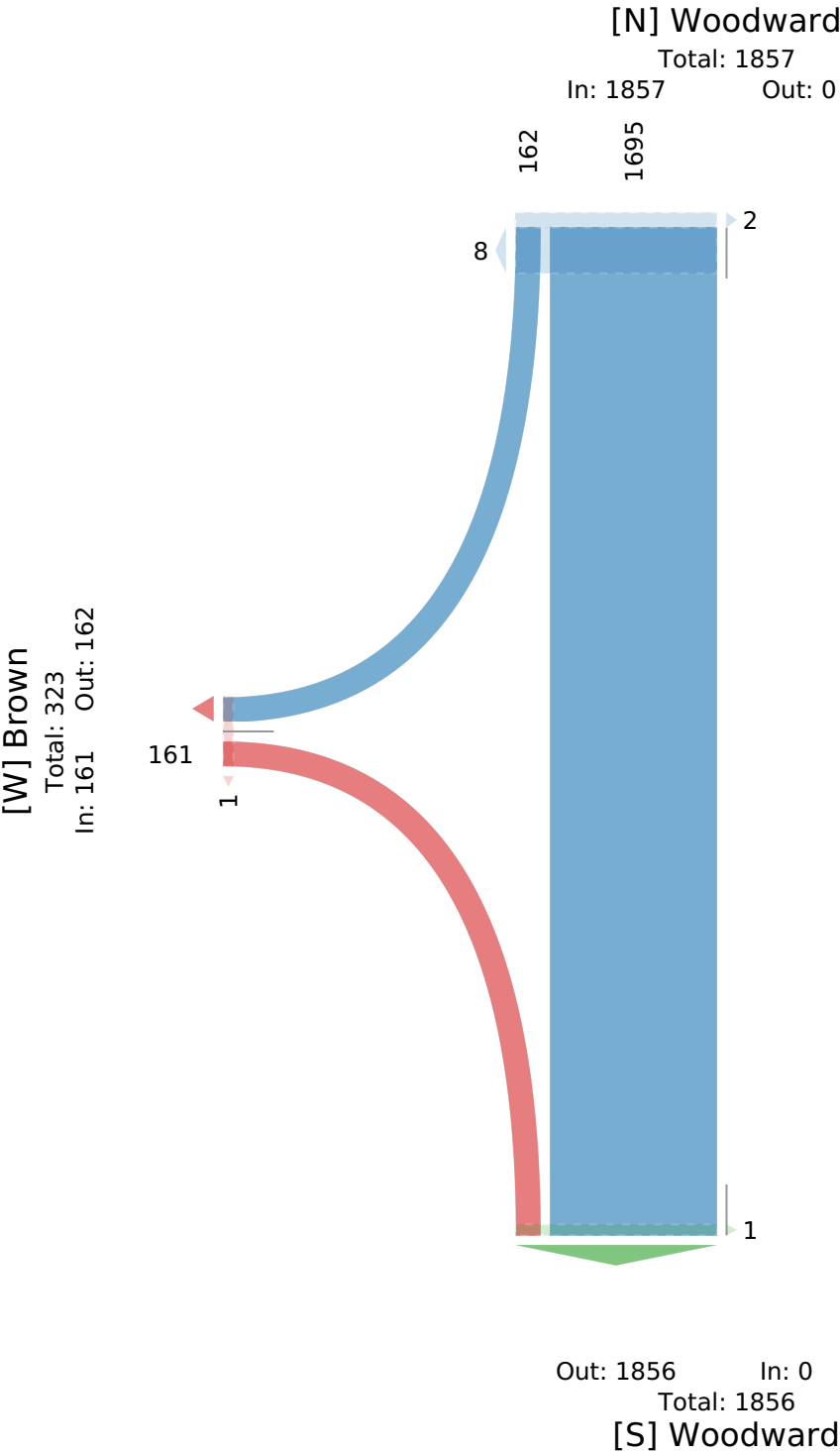
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924281, Location: 42.545459, -83.210863



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Brown & Woodward - 1 RTOR - TMC

Thu Feb 24, 2022

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924281, Location: 42.545459, -83.210863



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Woodward Northbound					Woodward Southbound					Brown Eastbound						
Time	L	T	U	App	Ped*	T	R	U	App	Ped*	L	R	U	RR	App	Ped*	Int
2022-02-24 4:30PM	0	0	0	0	0	493	41	0	534	4	0	56	0	21	77	0	611
4:45PM	0	0	0	0	0	546	35	0	581	3	0	49	0	10	59	1	640
5:00PM	0	0	0	0	1	578	31	0	609	2	0	75	0	28	103	0	712
5:15PM	0	0	0	0	0	658	41	0	699	0	0	34	0	17	51	0	750
Total	0	0	0	0	1	2275	148	0	2423	9	0	214	0	76	290	1	2713
% Approach	0%	0%	0%	-	-	93.9%	6.1%	0%	-	-	0%	73.8%	0%	26.2%	-	-	-
% Total	0%	0%	0%	0%	-	83.9%	5.5%	0%	89.3%	-	0%	7.9%	0%	2.8%	10.7%	-	-
PHF	-	-	-	-	-	0.864	0.902	-	0.867	-	-	0.713	-	0.679	0.704	-	0.904
Lights	0	0	0	0	-	2259	148	0	2407	-	0	213	0	76	289	-	2696
% Lights	0%	0%	0%	-	-	99.3%	100%	0%	99.3%	-	0%	99.5%	0%	100%	99.7%	-	99.4%
Single-Unit Trucks	0	0	0	0	-	6	0	0	6	-	0	1	0	0	1	-	7
% Single-Unit Trucks	0%	0%	0%	-	-	0.3%	0%	0%	0.2%	-	0%	0.5%	0%	0%	0.3%	-	0.3%
Articulated Trucks	0	0	0	0	-	6	0	0	6	-	0	0	0	0	0	-	6
% Articulated Trucks	0%	0%	0%	-	-	0.3%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	-	0.2%
Buses	0	0	0	0	-	4	0	0	4	-	0	0	0	0	0	-	4
% Buses	0%	0%	0%	-	-	0.2%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	-	0.1%
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	-	-	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	1	-	-	-	-	9	-	-	-	-	-	1	
% Pedestrians	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Brown & Woodward - 1 RTOR - TMC

Thu Feb 24, 2022

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

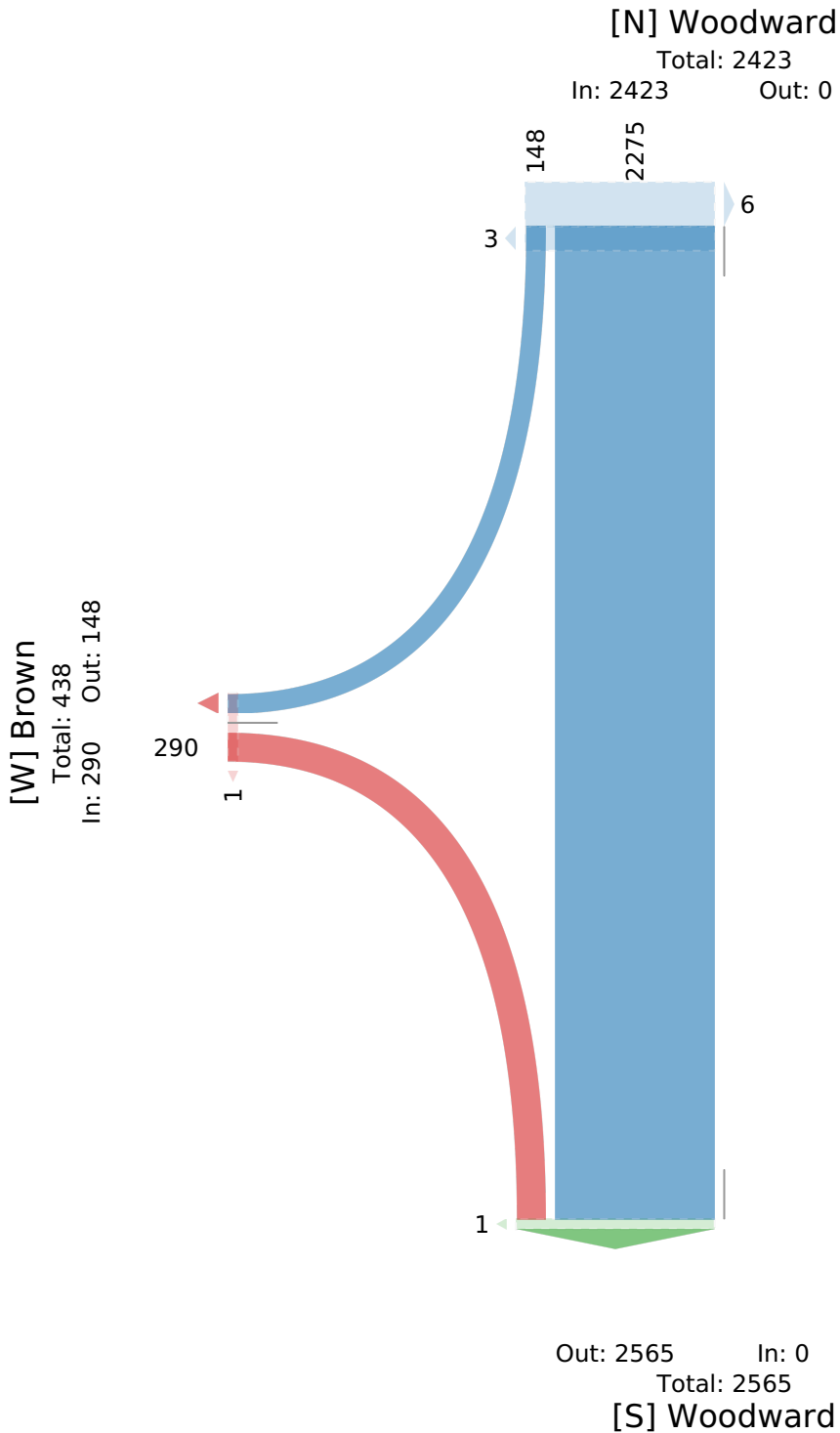
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924281, Location: 42.545459, -83.210863



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Sb Woodward & SB/NB X/O south of Brown - TMC

Thu Feb 24, 2022

Full Length (6 AM-7 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924282, Location: 42.544753, -83.210535



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Woodward Northbound					Woodward Southbound					Retail Westbound					
Time	T	R	U	App	Ped*	L	T	U	App	Ped*	L	R	U	App	Ped*	Int
2022-02-24 6:00AM	82	1	0	83	0	5	134	7	146	0	0	0	0	0	0	229
6:15AM	134	8	0	142	0	4	202	10	216	0	0	2	0	2	0	360
6:30AM	227	12	0	239	0	5	257	28	290	0	0	1	0	1	1	530
6:45AM	260	6	0	266	0	6	213	28	247	0	0	0	0	0	0	513
Hourly Total	703	27	0	730	0	20	806	73	899	0	0	3	0	3	1	1632
7:00AM	211	13	0	224	0	7	252	21	280	0	0	0	0	0	0	504
7:15AM	323	12	0	335	0	7	285	40	332	0	0	1	0	1	0	668
7:30AM	435	11	0	446	0	5	337	30	372	0	0	1	0	1	1	819
7:45AM	454	11	0	465	0	7	419	49	475	0	0	0	0	0	0	940
Hourly Total	1423	47	0	1470	0	26	1293	140	1459	0	0	2	0	2	1	2931
8:00AM	451	14	0	465	0	8	365	48	421	0	0	2	0	2	0	888
8:15AM	417	11	0	428	0	5	356	52	413	0	0	3	0	3	0	844
8:30AM	445	12	0	457	0	9	384	71	464	0	0	0	0	0	1	921
8:45AM	418	15	0	433	0	5	360	62	427	0	0	1	0	1	0	861
Hourly Total	1731	52	0	1783	0	27	1465	233	1725	0	0	6	0	6	1	3514
9:00AM	328	19	0	347	0	2	317	52	371	0	0	1	0	1	0	719
9:15AM	369	12	0	381	0	5	335	54	394	0	0	2	0	2	1	777
9:30AM	293	9	0	302	0	9	367	69	445	0	0	1	0	1	0	748
9:45AM	301	14	0	315	0	8	344	57	409	0	0	0	0	0	0	724
Hourly Total	1291	54	0	1345	0	24	1363	232	1619	0	0	4	0	4	1	2968
10:00AM	287	12	0	299	0	6	324	52	382	0	0	4	0	4	0	685
10:15AM	267	8	0	275	0	16	275	64	355	0	0	2	0	2	0	632
10:30AM	301	10	0	311	0	7	340	64	411	0	0	3	0	3	0	725
10:45AM	322	6	0	328	0	12	321	61	394	0	0	3	0	3	0	725
Hourly Total	1177	36	0	1213	0	41	1260	241	1542	0	0	12	0	12	0	2767
11:00AM	316	18	0	334	0	7	345	49	401	0	0	0	0	0	0	735
11:15AM	295	17	0	312	0	7	305	61	373	0	0	2	0	2	0	687
11:30AM	310	11	0	321	0	11	342	65	418	0	0	0	0	0	0	739
11:45AM	337	12	0	349	0	15	401	87	503	0	0	2	0	2	0	854
Hourly Total	1258	58	0	1316	0	40	1393	262	1695	0	0	4	0	4	0	3015
12:00PM	337	22	0	359	0	10	402	59	471	0	0	2	0	2	0	832
12:15PM	314	15	0	329	0	5	423	82	510	0	0	2	0	2	0	841
12:30PM	305	11	0	316	0	7	359	66	432	0	0	0	0	0	0	748
12:45PM	319	14	0	333	0	4	409	90	503	0	0	3	0	3	0	839
Hourly Total	1275	62	0	1337	0	26	1593	297	1916	0	0	7	0	7	0	3260
1:00PM	354	18	0	372	0	9	361	101	471	0	0	4	0	4	0	847
1:15PM	361	12	0	373	0	14	398	98	510	0	0	0	0	0	1	883
1:30PM	339	20	0	359	0	11	363	91	465	1	0	7	0	7	0	831
1:45PM	333	16	0	349	0	13	399	67	479	1	0	3	0	3	0	831
Hourly Total	1387	66	0	1453	0	47	1521	357	1925	2	0	14	0	14	1	3392
2:00PM	360	16	0	376	0	7	332	79	418	0	0	1	0	1	0	795
2:15PM	395	14	0	409	0	10	404	76	490	0	0	3	0	3	0	902
2:30PM	404	10	0	414	1	10	399	69	478	0	0	0	0	0	1	892
2:45PM	385	15	0	400	0	6	410	70	486	0	0	3	0	3	1	889
Hourly Total	1544	55	0	1599	1	33	1545	294	1872	0	0	7	0	7	2	3478
3:00PM	409	15	0	424	0	4	465	84	553	0	0	1	0	1	1	978
3:15PM	448	10	0	458	0	5	448	67	520	0	0	3	0	3	2	981
3:30PM	457	10	0	467	0	11	422	68	501	0	0	1	0	1	0	969
3:45PM	442	11	0	453	0	6	423	77	506	0	0	0	0	0	0	959
Hourly Total	1756	46	0	1802	0	26	1758	296	2080	0	0	5	0	5	3	3887
4:00PM	412	11	0	423	0	10	476	96	582	0	0	0	0	0	0	1005
4:15PM	453	10	0	463	0	10	464	89	563	0	0	3	0	3	0	1029
4:30PM	451	12	0	463	0	12	445	91	548	0	0	4	0	4	0	1015

Leg Direction	Woodward Northbound					Woodward Southbound					Retail Westbound					
Time	T	R	U	App	Ped*	L	T	U	App	Ped*	L	R	U	App	Ped*	Int
4:45PM	425	7	0	432	0	3	524	74	601	0	0	2	0	2	0	1035
Hourly Total	1741	40	0	1781	0	35	1909	350	2294	0	0	9	0	9	0	4084
5:00PM	498	16	0	514	0	9	566	111	686	0	0	1	0	1	1	1201
5:15PM	483	11	0	494	0	7	607	81	695	0	0	6	0	6	0	1195
5:30PM	504	9	0	513	0	7	513	83	603	0	0	0	0	0	0	1116
5:45PM	446	8	0	454	0	11	440	68	519	0	0	0	0	0	0	973
Hourly Total	1931	44	0	1975	0	34	2126	343	2503	0	0	7	0	7	1	4485
6:00PM	408	10	0	418	0	6	459	78	543	0	0	4	1	5	0	966
6:15PM	380	10	0	390	0	10	490	71	571	0	0	1	0	1	0	962
6:30PM	302	5	0	307	0	11	364	52	427	0	0	0	0	0	0	734
6:45PM	268	8	0	276	0	7	314	42	363	0	0	2	0	2	0	641
Hourly Total	1358	33	0	1391	0	34	1627	243	1904	0	0	7	1	8	0	3303
Total	18575	620	0	19195	1	413	19659	3361	23433	2	0	87	1	88	11	42716
% Approach	96.8%	3.2%	0%	-	-	1.8%	83.9%	14.3%	-	-	0%	98.9%	1.1%	-	-	-
% Total	43.5%	1.5%	0%	44.9%	-	1.0%	46.0%	7.9%	54.9%	-	0%	0.2%	0%	0.2%	-	-
Lights	18288	606	0	18894	-	405	19285	3303	22993	-	0	86	0	86	-	41973
% Lights	98.5%	97.7%	0%	98.4%	-	98.1%	98.1%	98.3%	98.1%	-	0%	98.9%	0%	97.7%	-	98.3%
Single-Unit Trucks	177	14	0	191	-	7	244	46	297	-	0	1	1	2	-	490
% Single-Unit Trucks	1.0%	2.3%	0%	1.0%	-	1.7%	1.2%	1.4%	1.3%	-	0%	1.1%	100%	2.3%	-	1.1%
Articulated Trucks	65	0	0	65	-	1	80	9	90	-	0	0	0	0	-	155
% Articulated Trucks	0.3%	0%	0%	0.3%	-	0.2%	0.4%	0.3%	0.4%	-	0%	0%	0%	0%	-	0.4%
Buses	45	0	0	45	-	0	50	3	53	-	0	0	0	0	-	98
% Buses	0.2%	0%	0%	0.2%	-	0%	0.3%	0.1%	0.2%	-	0%	0%	0%	0%	-	0.2%
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	1	-	-	-	-	2	-	-	-	-	11	
% Pedestrians	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Sb Woodward & SB/NB X/O south of Brown - TMC

Thu Feb 24, 2022

Full Length (6 AM-7 PM)

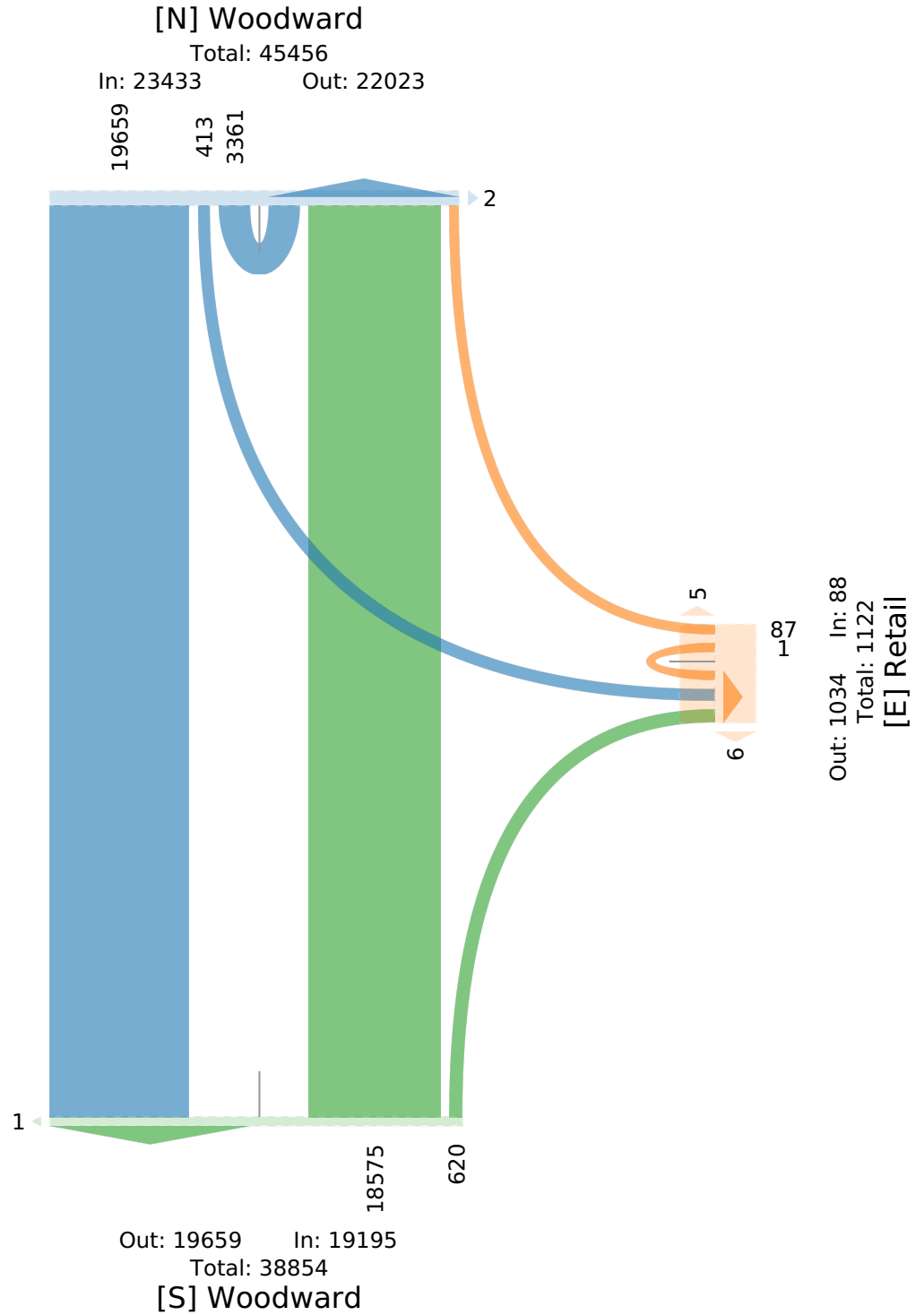
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924282, Location: 42.544753, -83.210535



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Sb Woodward & SB/NB X/O south of Brown - TMC

Thu Feb 24, 2022

AM Peak (7:45 AM - 8:45 AM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924282, Location: 42.544753, -83.210535



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Woodward Northbound					Woodward Southbound					Retail Westbound					
Time	T	R	U	App	Ped*	L	T	U	App	Ped*	L	R	U	App	Ped*	Int
2022-02-24 7:45AM	454	11	0	465	0	7	419	49	475	0	0	0	0	0	0	940
8:00AM	451	14	0	465	0	8	365	48	421	0	0	2	0	2	0	888
8:15AM	417	11	0	428	0	5	356	52	413	0	0	3	0	3	0	844
8:30AM	445	12	0	457	0	9	384	71	464	0	0	0	0	0	1	921
Total	1767	48	0	1815	0	29	1524	220	1773	0	0	5	0	5	1	3593
% Approach	97.4%	2.6%	0%	-	-	1.6%	86.0%	12.4%	-	-	0%	100%	0%	-	-	-
% Total	49.2%	1.3%	0%	50.5%	-	0.8%	42.4%	6.1%	49.3%	-	0%	0.1%	0%	0.1%	-	-
PHF	0.973	0.857	-	0.976	-	0.806	0.909	0.775	0.933	-	-	0.417	-	0.417	-	0.956
Lights	1745	47	0	1792	-	28	1496	217	1741	-	0	5	0	5	-	3538
% Lights	98.8%	97.9%	0%	98.7%	-	96.6%	98.2%	98.6%	98.2%	-	0%	100%	0%	100%	-	98.5%
Single-Unit Trucks	12	1	0	13	-	1	14	2	17	-	0	0	0	0	-	30
% Single-Unit Trucks	0.7%	2.1%	0%	0.7%	-	3.4%	0.9%	0.9%	1.0%	-	0%	0%	0%	0%	-	0.8%
Articulated Trucks	6	0	0	6	-	0	8	1	9	-	0	0	0	0	-	15
% Articulated Trucks	0.3%	0%	0%	0.3%	-	0%	0.5%	0.5%	0.5%	-	0%	0%	0%	0%	-	0.4%
Buses	4	0	0	4	-	0	6	0	6	-	0	0	0	0	-	10
% Buses	0.2%	0%	0%	0.2%	-	0%	0.4%	0%	0.3%	-	0%	0%	0%	0%	-	0.3%
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Sb Woodward & SB/NB X/O south of Brown - TMC

Thu Feb 24, 2022

AM Peak (7:45 AM - 8:45 AM)

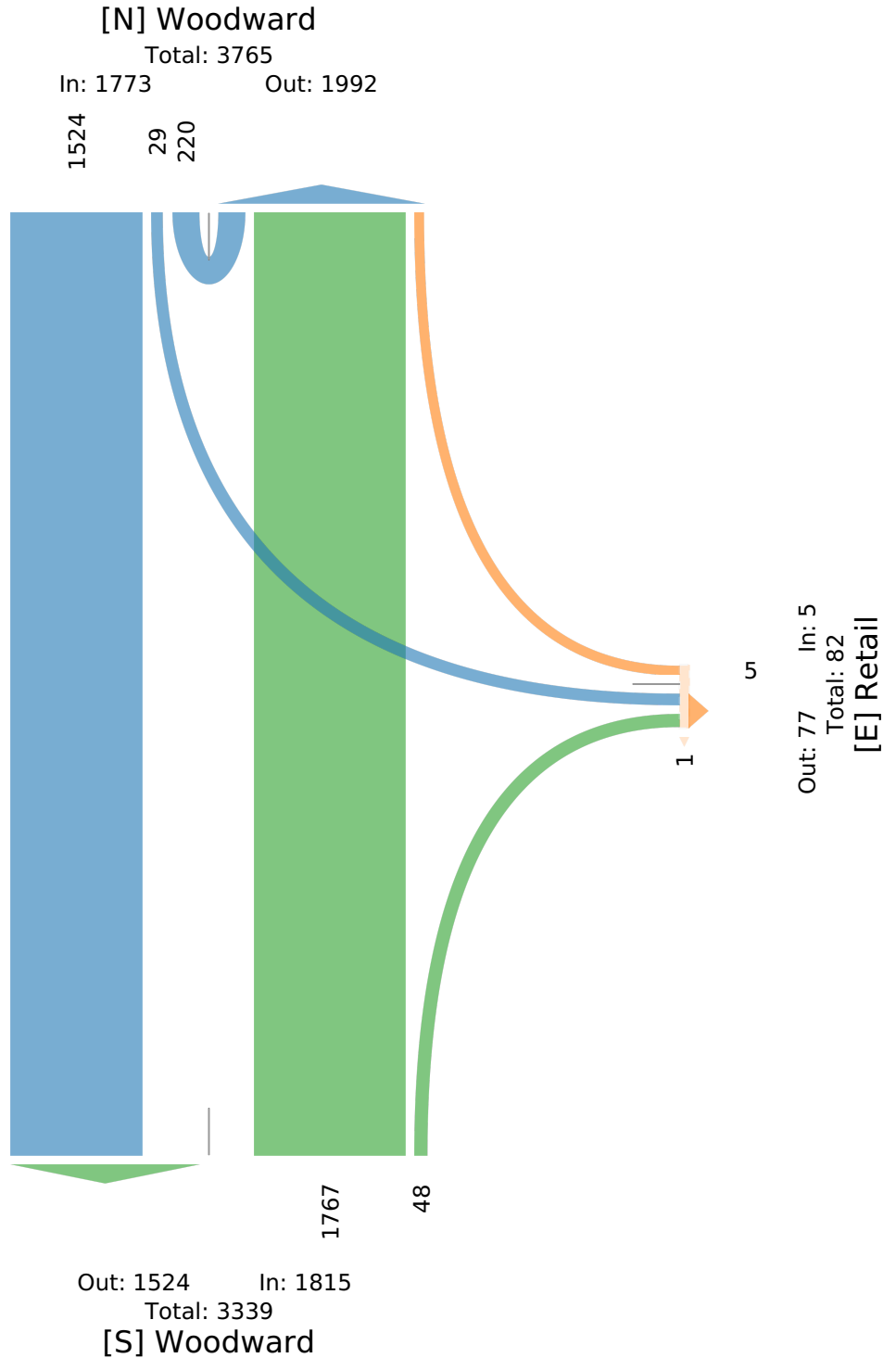
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924282, Location: 42.544753, -83.210535



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Sb Woodward & SB/NB X/O south of Brown - TMC

Thu Feb 24, 2022

Midday Peak (12:45 PM - 1:45 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924282, Location: 42.544753, -83.210535



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Woodward Northbound					Woodward Southbound					Retail Westbound					
Time	T	R	U	App	Ped*	L	T	U	App	Ped*	L	R	U	App	Ped*	Int
2022-02-24 12:45PM	319	14	0	333	0	4	409	90	503	0	0	3	0	3	0	839
1:00PM	354	18	0	372	0	9	361	101	471	0	0	4	0	4	0	847
1:15PM	361	12	0	373	0	14	398	98	510	0	0	0	0	0	1	883
1:30PM	339	20	0	359	0	11	363	91	465	1	0	7	0	7	0	831
Total	1373	64	0	1437	0	38	1531	380	1949	1	0	14	0	14	1	3400
% Approach	95.5%	4.5%	0%	-	-	1.9%	78.6%	19.5%	-	-	0%	100%	0%	-	-	-
% Total	40.4%	1.9%	0%	42.3%	-	1.1%	45.0%	11.2%	57.3%	-	0%	0.4%	0%	0.4%	-	-
PHF	0.951	0.800	-	0.963	-	0.679	0.936	0.941	0.955	-	-	0.500	-	0.500	-	0.963
Lights	1347	64	0	1411	-	36	1499	376	1911	-	0	14	0	14	-	3336
% Lights	98.1%	100%	0%	98.2%	-	94.7%	97.9%	98.9%	98.1%	-	0%	100%	0%	100%	-	98.1%
Single-Unit Trucks	18	0	0	18	-	2	19	4	25	-	0	0	0	0	-	43
% Single-Unit Trucks	1.3%	0%	0%	1.3%	-	5.3%	1.2%	1.1%	1.3%	-	0%	0%	0%	0%	-	1.3%
Articulated Trucks	6	0	0	6	-	0	9	0	9	-	0	0	0	0	-	15
% Articulated Trucks	0.4%	0%	0%	0.4%	-	0%	0.6%	0%	0.5%	-	0%	0%	0%	0%	-	0.4%
Buses	2	0	0	2	-	0	4	0	4	-	0	0	0	0	-	6
% Buses	0.1%	0%	0%	0.1%	-	0%	0.3%	0%	0.2%	-	0%	0%	0%	0%	-	0.2%
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	0	-	-	-	-	1	-	-	-	-	1	-
% Pedestrians	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Sb Woodward & SB/NB X/O south of Brown - TMC

Thu Feb 24, 2022

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924282, Location: 42.544753, -83.210535



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Woodward Northbound					Woodward Southbound					Retail Westbound					
Time	T	R	U	App	Ped*	L	T	U	App	Ped*	L	R	U	App	Ped*	Int
2022-02-24 4:45PM	425	7	0	432	0	3	524	74	601	0	0	2	0	2	0	1035
5:00PM	498	16	0	514	0	9	566	111	686	0	0	1	0	1	1	1201
5:15PM	483	11	0	494	0	7	607	81	695	0	0	6	0	6	0	1195
5:30PM	504	9	0	513	0	7	513	83	603	0	0	0	0	0	0	1116
Total	1910	43	0	1953	0	26	2210	349	2585	0	0	9	0	9	1	4547
% Approach	97.8%	2.2%	0%	-	-	1.0%	85.5%	13.5%	-	-	0%	100%	0%	-	-	-
% Total	42.0%	0.9%	0%	43.0%	-	0.6%	48.6%	7.7%	56.9%	-	0%	0.2%	0%	0.2%	-	-
PHF	0.947	0.672	-	0.950	-	0.722	0.910	0.786	0.930	-	-	0.375	-	0.375	-	0.947
Lights	1898	43	0	1941	-	24	2198	349	2571	-	0	9	0	9	-	4521
% Lights	99.4%	100%	0%	99.4%	-	92.3%	99.5%	100%	99.5%	-	0%	100%	0%	100%	-	99.4%
Single-Unit Trucks	6	0	0	6	-	1	2	0	3	-	0	0	0	0	-	9
% Single-Unit Trucks	0.3%	0%	0%	0.3%	-	3.8%	0.1%	0%	0.1%	-	0%	0%	0%	0%	-	0.2%
Articulated Trucks	3	0	0	3	-	1	7	0	8	-	0	0	0	0	-	11
% Articulated Trucks	0.2%	0%	0%	0.2%	-	3.8%	0.3%	0%	0.3%	-	0%	0%	0%	0%	-	0.2%
Buses	3	0	0	3	-	0	3	0	3	-	0	0	0	0	-	6
% Buses	0.2%	0%	0%	0.2%	-	0%	0.1%	0%	0.1%	-	0%	0%	0%	0%	-	0.1%
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Sb Woodward & SB/NB X/O south of Brown - TMC

Thu Feb 24, 2022

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

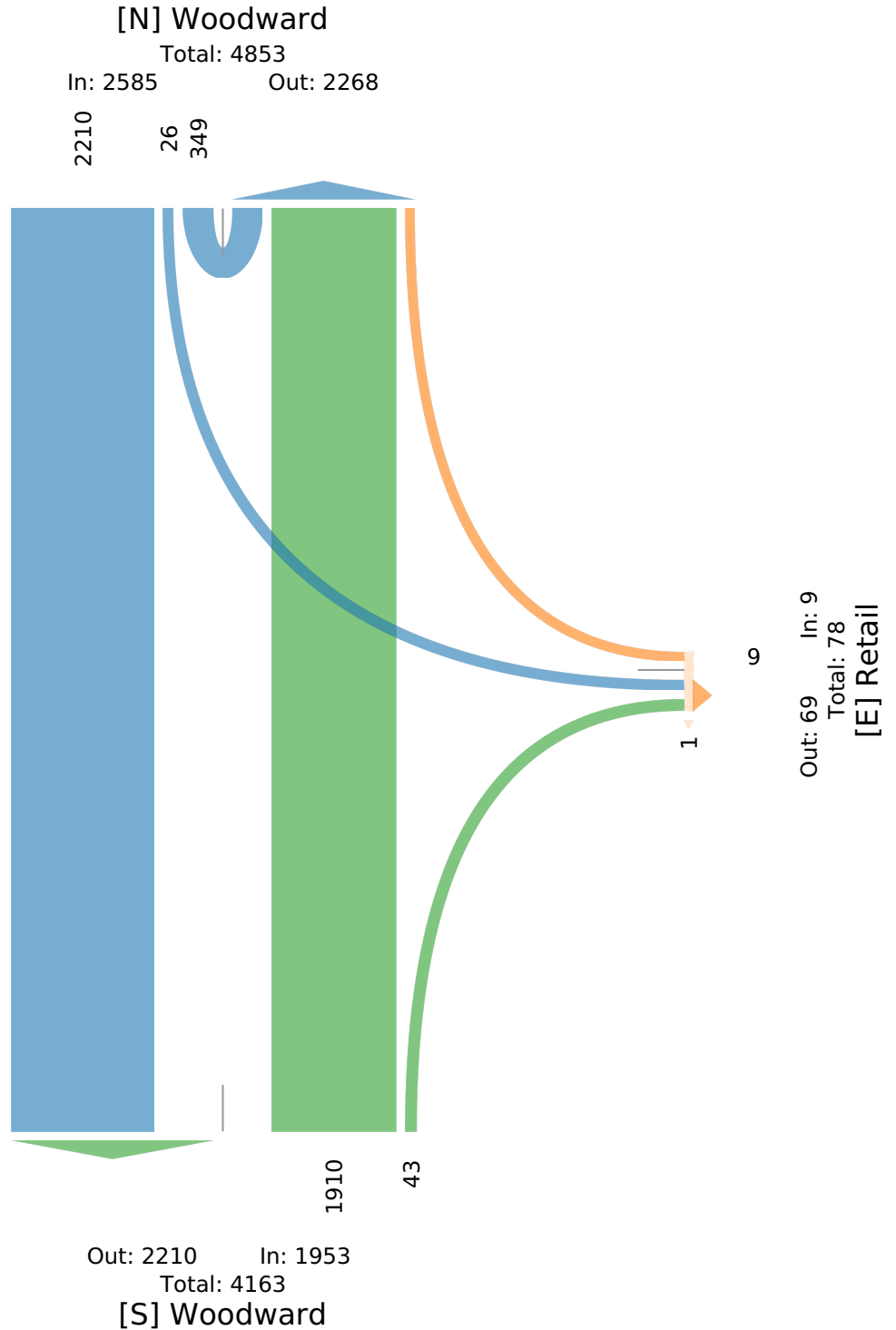
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 924282, Location: 42.544753, -83.210535



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Brown & Woodward - TMC

Thu Mar 24, 2022

Full Length (6 AM-7 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931151, Location: 42.545477, -83.210891



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Woodward Northbound						Woodward Southbound					
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*
2022-03-24 6:00AM	0	113	0	0	113	0	0	164	3	0	167	0
6:15AM	0	189	0	0	189	0	0	233	11	0	244	1
6:30AM	0	273	1	0	274	0	0	284	16	0	300	1
6:45AM	0	294	4	0	298	0	0	266	14	0	280	1
Hourly Total	0	869	5	0	874	0	0	947	44	0	991	3
7:00AM	0	329	1	0	330	1	0	292	10	0	302	1
7:15AM	0	453	2	0	455	0	0	349	19	0	368	2
7:30AM	0	561	7	0	568	0	0	452	32	0	484	1
7:45AM	0	640	7	0	647	0	0	457	36	0	493	0
Hourly Total	0	1983	17	0	2000	1	0	1550	97	0	1647	4
8:00AM	0	602	10	0	612	1	0	560	52	0	612	0
8:15AM	0	669	9	0	678	0	0	514	62	0	576	2
8:30AM	0	641	14	0	655	0	0	480	48	0	528	2
8:45AM	0	563	8	0	571	0	0	489	43	0	532	0
Hourly Total	0	2475	41	0	2516	1	0	2043	205	0	2248	4
9:00AM	0	511	11	0	522	1	0	541	47	0	588	2
9:15AM	0	487	3	0	490	0	0	440	57	0	497	0
9:30AM	0	459	5	0	464	0	0	457	51	0	508	0
9:45AM	0	435	7	0	442	0	0	442	49	0	491	2
Hourly Total	0	1892	26	0	1918	1	0	1880	204	0	2084	4
10:00AM	0	372	10	0	382	0	0	359	45	0	404	2
10:15AM	0	407	4	0	411	0	0	362	35	0	397	0
10:30AM	0	470	7	0	477	0	0	386	29	0	415	0
10:45AM	0	399	7	0	406	0	0	422	36	0	458	1
Hourly Total	0	1648	28	0	1676	0	0	1529	145	0	1674	3
11:00AM	0	423	9	0	432	0	0	410	27	0	437	3
11:15AM	0	462	7	0	469	0	0	438	35	0	473	0
11:30AM	0	477	2	0	479	0	0	397	58	0	455	3
11:45AM	0	450	13	0	463	0	0	480	44	0	524	0
Hourly Total	0	1812	31	0	1843	0	0	1725	164	0	1889	6
12:00PM	0	479	8	0	487	0	0	450	46	0	496	0
12:15PM	1	513	7	0	521	0	0	403	36	0	439	1
12:30PM	0	447	7	0	454	0	0	441	36	0	477	0
12:45PM	0	491	6	0	497	0	0	427	48	0	475	3
Hourly Total	1	1930	28	0	1959	0	0	1721	166	0	1887	4
1:00PM	0	514	9	0	523	0	0	412	42	0	454	3
1:15PM	0	477	8	0	485	0	0	434	43	0	477	3
1:30PM	0	496	5	0	501	0	0	397	46	0	443	1
1:45PM	0	497	11	0	508	0	0	447	37	0	484	1
Hourly Total	0	1984	33	0	2017	0	0	1690	168	0	1858	8
2:00PM	0	491	7	0	498	0	0	444	39	0	483	3
2:15PM	0	545	8	0	553	1	0	483	29	0	512	1
2:30PM	0	527	9	0	536	0	0	499	40	0	539	1
2:45PM	0	583	7	0	590	0	0	541	39	0	580	1
Hourly Total	0	2146	31	0	2177	1	0	1967	147	0	2114	6
3:00PM	0	565	12	0	577	0	0	490	42	0	532	3
3:15PM	0	631	5	0	636	2	0	522	37	0	559	0
3:30PM	0	593	9	0	602	0	0	509	34	0	543	3
3:45PM	0	635	3	0	638	0	0	573	36	0	609	0
Hourly Total	0	2424	29	0	2453	2	0	2094	149	0	2243	6
4:00PM	0	609	2	0	611	0	0	569	31	0	600	0
4:15PM	0	595	1	0	596	0	0	543	40	0	583	2
4:30PM	0	682	7	0	689	0	0	629	27	0	656	1

Leg Direction	Woodward Northbound						Woodward Southbound					
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*
4:45PM	0	634	7	0	641	0	0	600	34	0	634	3
Hourly Total	0	2520	17	0	2537	0	0	2341	132	0	2473	6
5:00PM	0	682	4	0	686	0	0	663	30	0	693	1
5:15PM	0	697	8	0	705	0	0	747	26	0	773	4
5:30PM	0	678	12	0	690	0	0	624	36	0	660	1
5:45PM	0	538	5	0	543	0	0	582	34	0	616	3
Hourly Total	0	2595	29	0	2624	0	0	2616	126	0	2742	9
6:00PM	0	508	5	0	513	0	0	529	27	0	556	8
6:15PM	0	508	7	0	515	0	0	514	34	0	548	0
6:30PM	0	460	2	0	462	0	0	475	20	0	495	1
6:45PM	0	444	4	0	448	0	0	462	19	0	481	0
Hourly Total	0	1920	18	0	1938	0	0	1980	100	0	2080	9
Total	1	26198	333	0	26532	6	0	24083	1847	0	25930	72
% Approach	0%	98.7%	1.3%	0%	-	-	0%	92.9%	7.1%	0%	-	-
% Total	0%	47.5%	0.6%	0%	48.1%	-	0%	43.7%	3.3%	0%	47.0%	-
Lights	1	25693	326	0	26020	-	0	23566	1828	0	25394	-
% Lights	100%	98.1%	97.9%	0%	98.1%	-	0%	97.9%	99.0%	0%	97.9%	-
Single-Unit Trucks	0	299	6	0	305	-	0	305	18	0	323	-
% Single-Unit Trucks	0%	1.1%	1.8%	0%	1.1%	-	0%	1.3%	1.0%	0%	1.2%	-
Articulated Trucks	0	114	0	0	114	-	0	119	0	0	119	-
% Articulated Trucks	0%	0.4%	0%	0%	0.4%	-	0%	0.5%	0%	0%	0.5%	-
Buses	0	92	1	0	93	-	0	93	1	0	94	-
% Buses	0%	0.4%	0.3%	0%	0.4%	-	0%	0.4%	0.1%	0%	0.4%	-
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-
Pedestrians	-	-	-	-	-	6	-	-	-	-	-	72
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Brown & Woodward - TMC

Thu Mar 24, 2022

Full Length (6 AM-7 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931151, Location: 42.545477, -83.210891



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Brown Eastbound							Forest Westbound						
Time	L	T	R	U	RR	App	Ped*	L	T	R	U	App	Ped*	Int
2022-03-24 6:00AM	0	0	1	0	5	6	0	0	0	0	0	0	0	286
6:15AM	0	0	5	0	3	8	0	0	0	4	0	4	0	445
6:30AM	0	0	6	0	3	9	2	0	0	7	0	7	1	590
6:45AM	0	0	13	0	5	18	1	0	0	6	0	6	0	602
Hourly Total	0	0	25	0	16	41	3	0	0	17	0	17	1	1923
7:00AM	0	0	2	0	8	10	0	0	0	5	0	5	0	647
7:15AM	0	0	2	0	11	13	2	0	0	11	0	11	0	847
7:30AM	0	0	12	0	12	24	0	0	0	11	0	11	1	1087
7:45AM	0	0	16	0	14	30	0	0	0	14	0	14	2	1184
Hourly Total	0	0	32	0	45	77	2	0	0	41	0	41	3	3765
8:00AM	0	0	14	0	8	22	0	0	0	11	0	11	0	1257
8:15AM	0	0	10	0	20	30	2	0	0	11	0	11	0	1295
8:30AM	0	0	16	0	15	31	1	0	0	11	0	11	3	1225
8:45AM	0	0	12	0	18	30	0	0	0	15	0	15	1	1148
Hourly Total	0	0	52	0	61	113	3	0	0	48	0	48	4	4925
9:00AM	0	0	13	1	12	26	2	0	0	22	0	22	1	1158
9:15AM	0	0	10	0	12	22	0	0	0	15	0	15	4	1024
9:30AM	0	0	10	0	12	22	5	0	0	13	0	13	2	1007
9:45AM	0	0	22	0	13	35	0	0	0	7	0	7	0	975
Hourly Total	0	0	55	1	49	105	7	0	0	57	0	57	7	4164
10:00AM	0	0	13	0	15	28	4	0	0	13	0	13	0	827
10:15AM	0	0	15	0	6	21	0	0	0	8	0	8	0	837
10:30AM	0	0	21	0	11	32	1	0	0	3	0	3	0	927
10:45AM	0	0	20	0	12	32	0	0	0	9	0	9	0	905
Hourly Total	0	0	69	0	44	113	5	0	0	33	0	33	0	3496
11:00AM	0	0	21	0	10	31	0	0	0	13	0	13	3	913
11:15AM	0	0	18	0	6	24	0	0	0	18	0	18	0	984
11:30AM	0	0	29	0	18	47	0	0	0	16	0	16	0	997
11:45AM	0	0	32	0	15	47	0	0	0	16	0	16	1	1050
Hourly Total	0	0	100	0	49	149	0	0	0	63	0	63	4	3944
12:00PM	0	0	33	0	13	46	0	0	0	16	0	16	2	1045
12:15PM	0	0	39	0	17	56	0	0	0	13	0	13	1	1029
12:30PM	0	0	21	0	16	37	1	0	0	11	0	11	0	979
12:45PM	0	0	24	0	9	33	1	0	0	19	0	19	1	1024
Hourly Total	0	0	117	0	55	172	2	0	0	59	0	59	4	4077
1:00PM	0	0	28	0	21	49	1	0	0	9	0	9	1	1035
1:15PM	0	0	34	0	17	51	0	0	0	9	0	9	1	1022
1:30PM	0	0	34	0	13	47	1	0	0	17	0	17	0	1008
1:45PM	0	0	42	0	12	54	3	0	0	11	0	11	1	1057
Hourly Total	0	0	138	0	63	201	5	0	0	46	0	46	3	4122
2:00PM	0	0	30	0	17	47	0	0	0	9	0	9	1	1037
2:15PM	0	0	30	0	16	46	3	0	0	15	0	15	1	1126
2:30PM	0	0	28	0	9	37	0	0	0	12	0	12	2	1124
2:45PM	0	0	22	0	11	33	2	0	0	18	0	18	1	1221
Hourly Total	0	0	110	0	53	163	5	0	0	54	0	54	5	4508
3:00PM	0	0	45	0	12	57	1	0	0	25	0	25	1	1191
3:15PM	0	0	32	0	19	51	2	0	0	17	0	17	1	1263
3:30PM	0	0	37	0	14	51	4	0	0	12	0	12	3	1208
3:45PM	0	0	35	0	5	40	0	0	0	12	0	12	0	1299
Hourly Total	0	0	149	0	50	199	7	0	0	66	0	66	5	4961
4:00PM	0	0	47	0	8	55	1	0	0	19	0	19	0	1285
4:15PM	0	0	51	0	15	66	0	0	0	21	0	21	1	1266
4:30PM	0	0	55	0	13	68	0	0	0	11	0	11	0	1424

Leg Direction	Brown Eastbound							Forest Westbound						
Time	L	T	R	U	RR	App	Ped*	L	T	R	U	App	Ped*	Int
4:45PM	0	0	43	0	13	56	1	0	0	13	0	13	1	1344
Hourly Total	0	0	196	0	49	245	2	0	0	64	0	64	2	5319
5:00PM	0	0	72	0	28	100	0	0	0	17	0	17	0	1496
5:15PM	0	0	66	0	22	88	0	0	0	15	0	15	1	1581
5:30PM	0	0	44	0	18	62	2	0	0	9	0	9	1	1421
5:45PM	0	0	40	0	8	48	0	0	0	11	0	11	1	1218
Hourly Total	0	0	222	0	76	298	2	0	0	52	0	52	3	5716
6:00PM	0	0	45	0	11	56	1	0	0	11	0	11	3	1136
6:15PM	0	0	33	0	10	43	2	0	0	13	0	13	3	1119
6:30PM	0	0	23	0	11	34	0	0	0	10	0	10	0	1001
6:45PM	0	0	23	0	14	37	1	0	0	9	0	9	0	975
Hourly Total	0	0	124	0	46	170	4	0	0	43	0	43	6	4231
Total	0	0	1389	1	656	2046	47	0	0	643	0	643	47	55151
% Approach	0%	0%	67.9%	0%	32.1%	-	-	0%	0%	100%	0%	-	-	-
% Total	0%	0%	2.5%	0%	1.2%	3.7%	-	0%	0%	1.2%	0%	1.2%	-	-
Lights	0	0	1368	1	652	2021	-	0	0	628	0	628	-	54063
% Lights	0%	0%	98.5%	100%	99.4%	98.8%	-	0%	0%	97.7%	0%	97.7%	-	98.0%
Single-Unit Trucks	0	0	16	0	3	19	-	0	0	12	0	12	-	659
% Single-Unit Trucks	0%	0%	1.2%	0%	0.5%	0.9%	-	0%	0%	1.9%	0%	1.9%	-	1.2%
Articulated Trucks	0	0	0	0	1	1	-	0	0	1	0	1	-	235
% Articulated Trucks	0%	0%	0%	0%	0.2%	0%	-	0%	0%	0.2%	0%	0.2%	-	0.4%
Buses	0	0	5	0	0	5	-	0	0	2	0	2	-	194
% Buses	0%	0%	0.4%	0%	0%	0.2%	-	0%	0%	0.3%	0%	0.3%	-	0.4%
Bicycles on Road	0	0	0	0	0	0	-	0	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	-	-	45	-	-	-	-	-	47	
% Pedestrians	-	-	-	-	-	-	95.7%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	-	2	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	4.3%	-	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Brown & Woodward - TMC

Thu Mar 24, 2022

Full Length (6 AM-7 PM)

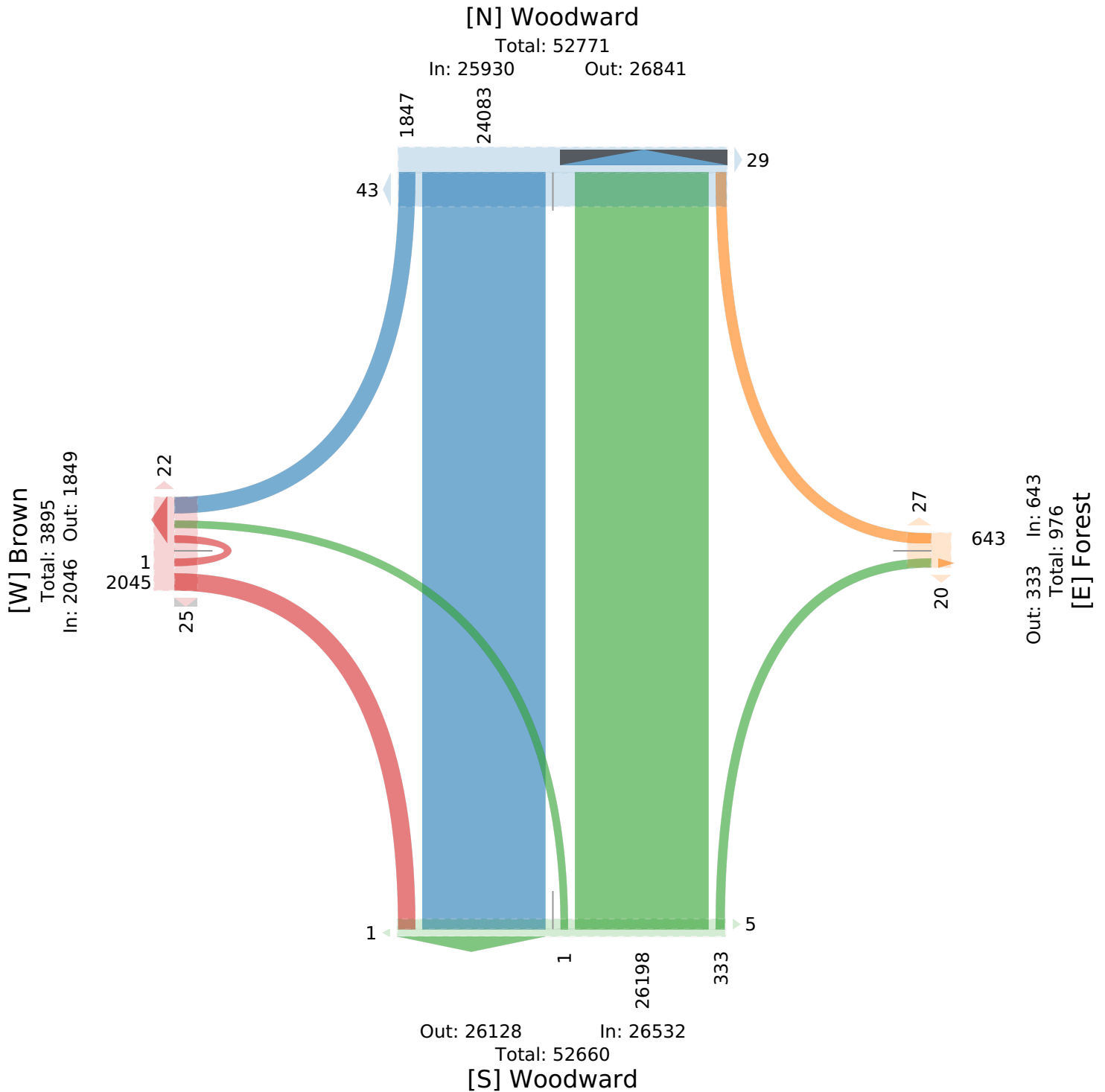
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931151, Location: 42.545477, -83.210891



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Brown & Woodward - TMC

Thu Mar 24, 2022

AM Peak (7:45 AM - 8:45 AM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931151, Location: 42.545477, -83.210891



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Woodward Northbound						Woodward Southbound					
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*
2022-03-24 7:45AM	0	640	7	0	647	0	0	457	36	0	493	0
8:00AM	0	602	10	0	612	1	0	560	52	0	612	0
8:15AM	0	669	9	0	678	0	0	514	62	0	576	2
8:30AM	0	641	14	0	655	0	0	480	48	0	528	2
Total	0	2552	40	0	2592	1	0	2011	198	0	2209	4
% Approach	0%	98.5%	1.5%	0%	-	-	0%	91.0%	9.0%	0%	-	-
% Total	0%	51.4%	0.8%	0%	52.2%	-	0%	40.5%	4.0%	0%	44.5%	-
PHF	-	0.954	0.714	-	0.956	-	-	0.898	0.798	-	0.902	-
Lights	0	2507	40	0	2547	-	0	1964	197	0	2161	-
% Lights	0%	98.2%	100%	0%	98.3%	-	0%	97.7%	99.5%	0%	97.8%	-
Single-Unit Trucks	0	25	0	0	25	-	0	25	1	0	26	-
% Single-Unit Trucks	0%	1.0%	0%	0%	1.0%	-	0%	1.2%	0.5%	0%	1.2%	-
Articulated Trucks	0	12	0	0	12	-	0	9	0	0	9	-
% Articulated Trucks	0%	0.5%	0%	0%	0.5%	-	0%	0.4%	0%	0%	0.4%	-
Buses	0	8	0	0	8	-	0	13	0	0	13	-
% Buses	0%	0.3%	0%	0%	0.3%	-	0%	0.6%	0%	0%	0.6%	-
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-
Pedestrians	-	-	-	-	-	1	-	-	-	-	-	4
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Brown & Woodward - TMC

Thu Mar 24, 2022

AM Peak (7:45 AM - 8:45 AM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931151, Location: 42.545477, -83.210891



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Brown Eastbound								Forest Westbound								
Time	L	T	R	U	RR	App	Ped*		L	T	R	U	App	Ped*		Int	
2022-03-24 7:45AM	0	0	16	0	14	30	0		0	0	14	0	14	2		1184	
8:00AM	0	0	14	0	8	22	0		0	0	11	0	11	0		1257	
8:15AM	0	0	10	0	20	30	2		0	0	11	0	11	0		1295	
8:30AM	0	0	16	0	15	31	1		0	0	11	0	11	3		1225	
Total	0	0	56	0	57	113	3		0	0	47	0	47	5		4961	
% Approach	0%	0%	49.6%	0%	50.4%	-	-		0%	0%	100%	0%	-	-		-	
% Total	0%	0%	1.1%	0%	1.1%	2.3%	-		0%	0%	0.9%	0%	0.9%	-		-	
PHF	-	-	0.875	-	0.713	0.911	-		-	-	0.839	-	0.839	-		0.958	
Lights	0	0	56	0	57	113	-		0	0	47	0	47	-		4868	
% Lights	0%	0%	100%	0%	100%	100%	-		0%	0%	100%	0%	100%	-		98.1%	
Single-Unit Trucks	0	0	0	0	0	0	-		0	0	0	0	0	-		51	
% Single-Unit Trucks	0%	0%	0%	0%	0%	0%	-		0%	0%	0%	0%	0%	-		1.0%	
Articulated Trucks	0	0	0	0	0	0	-		0	0	0	0	0	-		21	
% Articulated Trucks	0%	0%	0%	0%	0%	0%	-		0%	0%	0%	0%	0%	-		0.4%	
Buses	0	0	0	0	0	0	-		0	0	0	0	0	-		21	
% Buses	0%	0%	0%	0%	0%	0%	-		0%	0%	0%	0%	0%	-		0.4%	
Bicycles on Road	0	0	0	0	0	0	-		0	0	0	0	0	-		0	
% Bicycles on Road	0%	0%	0%	0%	0%	0%	-		0%	0%	0%	0%	0%	-		0%	
Pedestrians	-	-	-	-	-	-	3		-	-	-	-	-	5			
% Pedestrians	-	-	-	-	-	-	100%		-	-	-	-	-	100%		-	
Bicycles on Crosswalk	-	-	-	-	-	-	0		-	-	-	-	-	0			
% Bicycles on Crosswalk	-	-	-	-	-	-	0%		-	-	-	-	-	0%		-	

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Brown & Woodward - TMC

Thu Mar 24, 2022

AM Peak (7:45 AM - 8:45 AM)

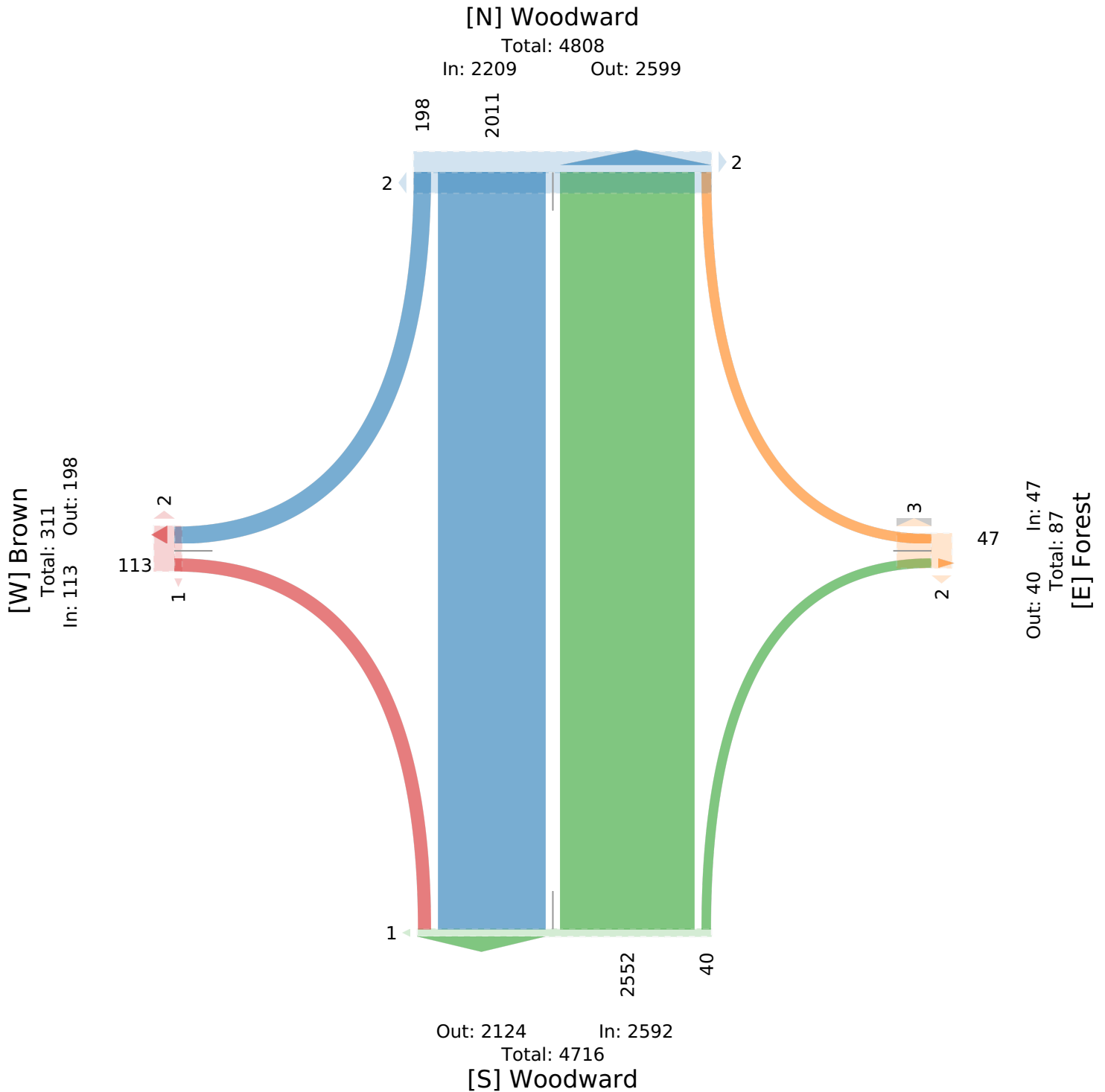
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931151, Location: 42.545477, -83.210891



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Brown & Woodward - TMC

Thu Mar 24, 2022

Midday Peak (1 PM - 2 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931151, Location: 42.545477, -83.210891



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Woodward Northbound						Woodward Southbound					
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*
2022-03-24 1:00PM	0	514	9	0	523	0	0	412	42	0	454	3
1:15PM	0	477	8	0	485	0	0	434	43	0	477	3
1:30PM	0	496	5	0	501	0	0	397	46	0	443	1
1:45PM	0	497	11	0	508	0	0	447	37	0	484	1
Total	0	1984	33	0	2017	0	0	1690	168	0	1858	8
% Approach	0%	98.4%	1.6%	0%	-	-	0%	91.0%	9.0%	0%	-	-
% Total	0%	48.1%	0.8%	0%	48.9%	-	0%	41.0%	4.1%	0%	45.1%	-
PHF	-	0.965	0.750	-	0.964	-	-	0.945	0.913	-	0.960	-
Lights	0	1945	33	0	1978	-	0	1647	166	0	1813	-
% Lights	0%	98.0%	100%	0%	98.1%	-	0%	97.5%	98.8%	0%	97.6%	-
Single-Unit Trucks	0	28	0	0	28	-	0	29	2	0	31	-
% Single-Unit Trucks	0%	1.4%	0%	0%	1.4%	-	0%	1.7%	1.2%	0%	1.7%	-
Articulated Trucks	0	7	0	0	7	-	0	9	0	0	9	-
% Articulated Trucks	0%	0.4%	0%	0%	0.3%	-	0%	0.5%	0%	0%	0.5%	-
Buses	0	4	0	0	4	-	0	5	0	0	5	-
% Buses	0%	0.2%	0%	0%	0.2%	-	0%	0.3%	0%	0%	0.3%	-
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	8
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	100%
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	0%

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Brown & Woodward - TMC

Thu Mar 24, 2022

Midday Peak (1 PM - 2 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931151, Location: 42.545477, -83.210891



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Brown Eastbound							Forest Westbound							
Time	L	T	R	U	RR	App	Ped*	L	T	R	U	App	Ped*	Int	
2022-03-24 1:00PM	0	0	28	0	21	49	1	0	0	9	0	9	1	1035	
1:15PM	0	0	34	0	17	51	0	0	0	9	0	9	1	1022	
1:30PM	0	0	34	0	13	47	1	0	0	17	0	17	0	1008	
1:45PM	0	0	42	0	12	54	3	0	0	11	0	11	1	1057	
Total	0	0	138	0	63	201	5	0	0	46	0	46	3	4122	
% Approach	0%	0%	68.7%	0%	31.3%	-	-	0%	0%	100%	0%	-	-	-	
% Total	0%	0%	3.3%	0%	1.5%	4.9%	-	0%	0%	1.1%	0%	1.1%	-	-	
PHF	-	-	0.821	-	0.750	0.931	-	-	-	0.676	-	0.676	-	0.975	
Lights	0	0	134	0	62	196	-	0	0	45	0	45	-	4032	
% Lights	0%	0%	97.1%	0%	98.4%	97.5%	-	0%	0%	97.8%	0%	97.8%	-	97.8%	
Single-Unit Trucks	0	0	3	0	1	4	-	0	0	1	0	1	-	64	
% Single-Unit Trucks	0%	0%	2.2%	0%	1.6%	2.0%	-	0%	0%	2.2%	0%	2.2%	-	1.6%	
Articulated Trucks	0	0	0	0	0	0	-	0	0	0	0	0	-	16	
% Articulated Trucks	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0.4%	
Buses	0	0	1	0	0	1	-	0	0	0	0	0	-	10	
% Buses	0%	0%	0.7%	0%	0%	0.5%	-	0%	0%	0%	0%	0%	-	0.2%	
Bicycles on Road	0	0	0	0	0	0	-	0	0	0	0	0	-	0	
% Bicycles on Road	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	
Pedestrians	-	-	-	-	-	-	4	-	-	-	-	-	3		
% Pedestrians	-	-	-	-	-	-	80.0%	-	-	-	-	-	100%	-	
Bicycles on Crosswalk	-	-	-	-	-	-	1	-	-	-	-	-	0		
% Bicycles on Crosswalk	-	-	-	-	-	-	20.0%	-	-	-	-	-	0%	-	

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Brown & Woodward - TMC

Thu Mar 24, 2022

Midday Peak (1 PM - 2 PM)

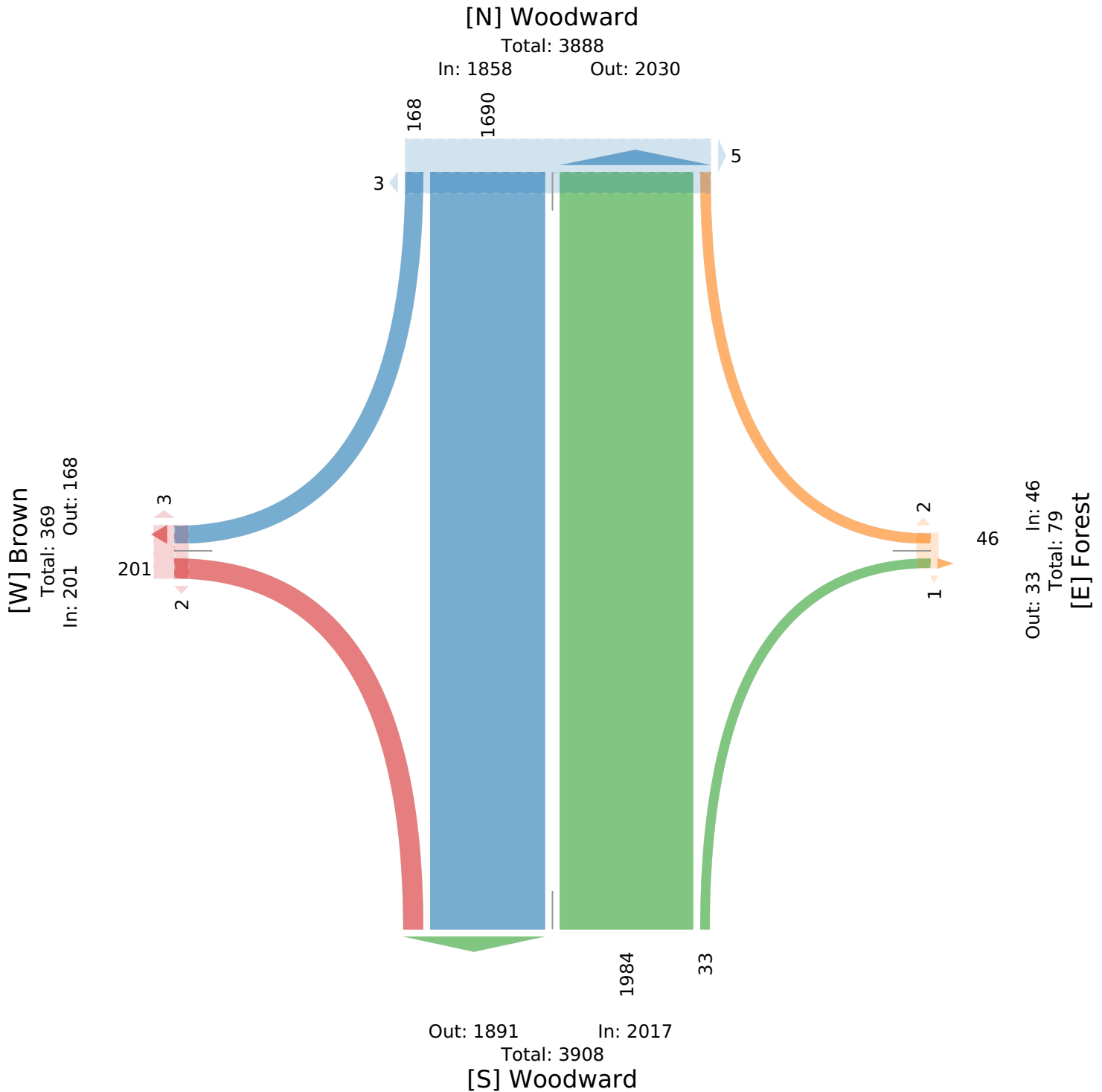
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931151, Location: 42.545477, -83.210891



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Brown & Woodward - TMC

Thu Mar 24, 2022

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931151, Location: 42.545477, -83.210891



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Woodward Northbound						Woodward Southbound					
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*
2022-03-24 4:30PM	0	682	7	0	689	0	0	629	27	0	656	1
4:45PM	0	634	7	0	641	0	0	600	34	0	634	3
5:00PM	0	682	4	0	686	0	0	663	30	0	693	1
5:15PM	0	697	8	0	705	0	0	747	26	0	773	4
Total	0	2695	26	0	2721	0	0	2639	117	0	2756	9
% Approach	0%	99.0%	1.0%	0%	-	-	0%	95.8%	4.2%	0%	-	-
% Total	0%	46.1%	0.4%	0%	46.6%	-	0%	45.1%	2.0%	0%	47.2%	-
PHF	-	0.967	0.813	-	0.965	-	-	0.883	0.860	-	0.891	-
Lights	0	2668	26	0	2694	-	0	2612	117	0	2729	-
% Lights	0%	99.0%	100%	0%	99.0%	-	0%	99.0%	100%	0%	99.0%	-
Single-Unit Trucks	0	13	0	0	13	-	0	12	0	0	12	-
% Single-Unit Trucks	0%	0.5%	0%	0%	0.5%	-	0%	0.5%	0%	0%	0.4%	-
Articulated Trucks	0	9	0	0	9	-	0	8	0	0	8	-
% Articulated Trucks	0%	0.3%	0%	0%	0.3%	-	0%	0.3%	0%	0%	0.3%	-
Buses	0	5	0	0	5	-	0	7	0	0	7	-
% Buses	0%	0.2%	0%	0%	0.2%	-	0%	0.3%	0%	0%	0.3%	-
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	9
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	100%
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	0%

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Brown & Woodward - TMC

Thu Mar 24, 2022

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931151, Location: 42.545477, -83.210891



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Brown Eastbound							Forest Westbound						
Time	L	T	R	U	RR	App	Ped*	L	T	R	U	App	Ped*	Int
2022-03-24 4:30PM	0	0	55	0	13	68	0	0	0	11	0	11	0	1424
4:45PM	0	0	43	0	13	56	1	0	0	13	0	13	1	1344
5:00PM	0	0	72	0	28	100	0	0	0	17	0	17	0	1496
5:15PM	0	0	66	0	22	88	0	0	0	15	0	15	1	1581
Total	0	0	236	0	76	312	1	0	0	56	0	56	2	5845
% Approach	0%	0%	75.6%	0%	24.4%	-	-	0%	0%	100%	0%	-	-	-
% Total	0%	0%	4.0%	0%	1.3%	5.3%	-	0%	0%	1.0%	0%	1.0%	-	-
PHF	-	-	0.819	-	0.679	0.780	-	-	-	0.824	-	0.824	-	0.924
Lights	0	0	236	0	76	312	-	0	0	54	0	54	-	5789
% Lights	0%	0%	100%	0%	100%	100%	-	0%	0%	96.4%	0%	96.4%	-	99.0%
Single-Unit Trucks	0	0	0	0	0	0	-	0	0	2	0	2	-	27
% Single-Unit Trucks	0%	0%	0%	0%	0%	0%	-	0%	0%	3.6%	0%	3.6%	-	0.5%
Articulated Trucks	0	0	0	0	0	0	-	0	0	0	0	0	-	17
% Articulated Trucks	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0.3%
Buses	0	0	0	0	0	0	-	0	0	0	0	0	-	12
% Buses	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0.2%
Bicycles on Road	0	0	0	0	0	0	-	0	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	-	-	1	-	-	-	-	-	2	
% Pedestrians	-	-	-	-	-	-	100%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	0%	-	-	-	-	-	0%	

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, RR: Right on red, T: Thru, U: U-Turn

Brown & Woodward - TMC

Thu Mar 24, 2022

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

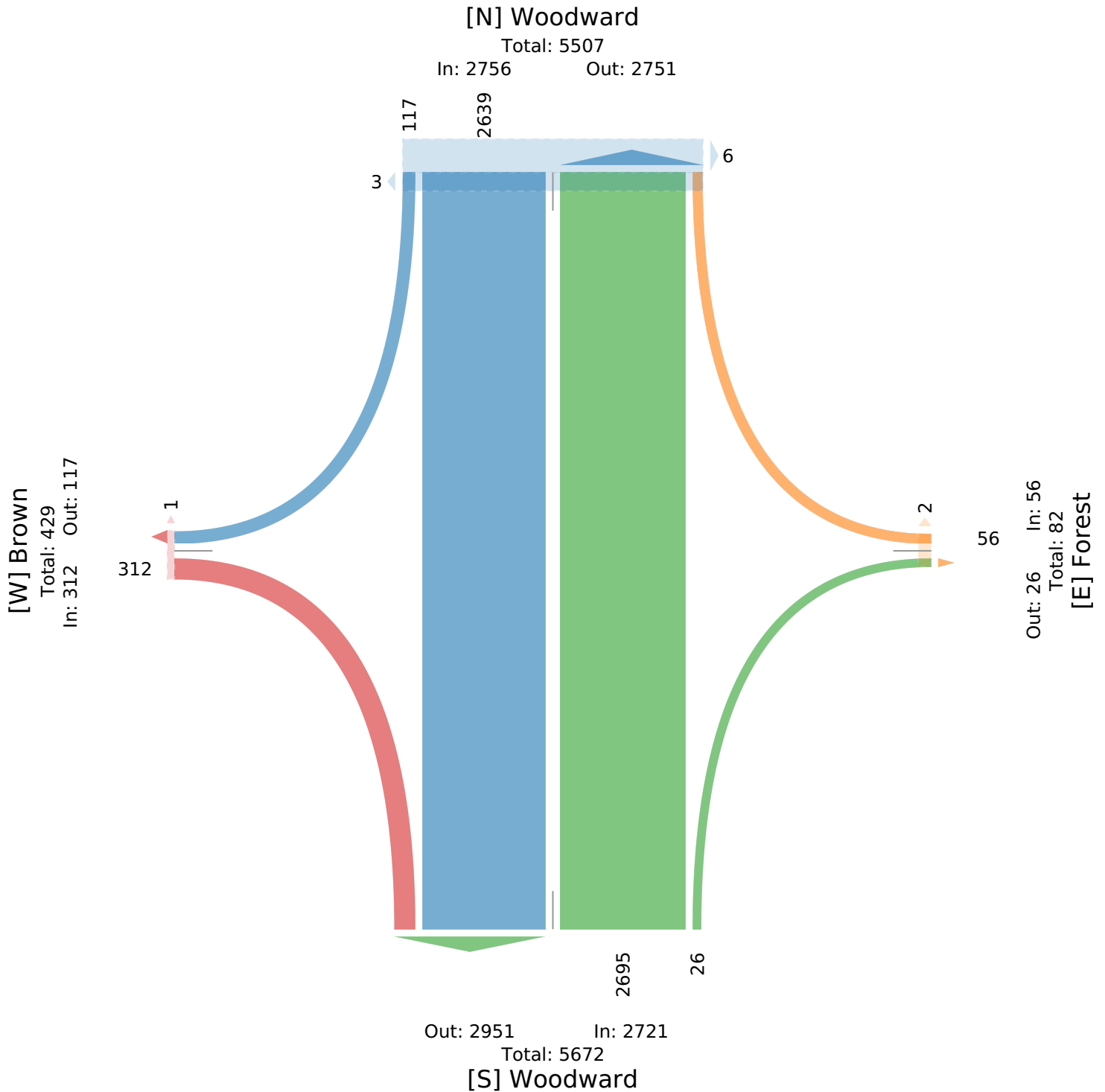
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931151, Location: 42.545477, -83.210891



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Peabody & Brown - TMC

Thu Mar 24, 2022

Full Length (6 AM-7 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931150, Location: 42.545386, -83.211648



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Peabody Southbound					Brown Eastbound					Brown Westbound					
Time	L	R	U	App	Ped*	L	T	U	App	Ped*	T	R	U	App	Ped*	Int
2022-03-24 6:00AM	4	2	0	6	0	4	2	0	6	1	1	2	0	3	1	15
6:15AM	2	2	0	4	1	2	6	0	8	0	4	6	0	10	2	22
6:30AM	1	1	0	2	0	0	9	0	9	0	12	5	0	17	0	28
6:45AM	5	3	0	8	1	3	15	0	18	0	8	6	0	14	1	40
Hourly Total	12	8	0	20	2	9	32	0	41	1	25	19	0	44	4	105
7:00AM	1	3	0	4	1	1	9	0	10	0	8	2	0	10	1	24
7:15AM	3	2	0	5	1	4	13	0	17	0	11	6	1	18	1	40
7:30AM	3	7	0	10	3	14	18	0	32	0	17	14	0	31	3	73
7:45AM	4	5	0	9	4	23	28	0	51	1	29	7	0	36	3	96
Hourly Total	11	17	0	28	9	42	68	0	110	1	65	29	1	95	8	233
8:00AM	2	5	0	7	1	12	20	1	33	0	35	17	0	52	0	92
8:15AM	2	6	0	8	7	24	27	0	51	1	38	19	0	57	3	116
8:30AM	2	10	1	13	9	26	30	0	56	1	25	18	0	43	3	112
8:45AM	2	3	0	5	9	17	25	0	42	1	22	15	1	38	1	85
Hourly Total	8	24	1	33	26	79	102	1	182	3	120	69	1	190	7	405
9:00AM	2	4	0	6	10	23	26	0	49	0	35	13	0	48	0	103
9:15AM	3	3	0	6	9	17	17	0	34	0	39	18	0	57	0	97
9:30AM	6	4	0	10	14	20	21	0	41	0	35	16	0	51	7	102
9:45AM	3	7	0	10	6	19	27	0	46	1	28	21	0	49	1	105
Hourly Total	14	18	0	32	39	79	91	0	170	1	137	68	0	205	8	407
10:00AM	3	13	0	16	9	15	23	0	38	2	22	21	0	43	3	97
10:15AM	4	6	0	10	8	14	17	0	31	1	27	11	0	38	3	79
10:30AM	8	4	0	12	16	11	25	0	36	0	18	11	0	29	2	77
10:45AM	8	10	0	18	9	16	25	0	41	0	30	6	0	36	2	95
Hourly Total	23	33	0	56	42	56	90	0	146	3	97	49	0	146	10	348
11:00AM	5	11	0	16	6	15	24	0	39	0	20	7	0	27	2	82
11:15AM	6	6	0	12	6	13	21	0	34	0	29	5	0	34	0	80
11:30AM	10	13	0	23	15	26	37	0	63	3	37	21	0	58	2	144
11:45AM	9	20	0	29	8	19	36	0	55	3	29	16	0	45	0	129
Hourly Total	30	50	0	80	35	73	118	0	191	6	115	49	0	164	4	435
12:00PM	11	19	0	30	14	10	35	0	45	2	27	15	0	42	2	117
12:15PM	15	25	0	40	9	13	42	0	55	0	25	13	0	38	3	133
12:30PM	9	15	0	24	8	17	30	0	47	2	25	10	0	35	3	106
12:45PM	6	19	0	25	11	21	24	0	45	3	36	11	0	47	2	117
Hourly Total	41	78	0	119	42	61	131	0	192	7	113	49	0	162	10	473
1:00PM	15	13	0	28	15	14	38	0	52	1	27	14	0	41	1	121
1:15PM	9	20	0	29	20	17	43	1	61	2	32	13	0	45	1	135
1:30PM	3	18	0	21	6	10	43	0	53	1	30	16	0	46	0	120
1:45PM	11	19	0	30	10	7	42	0	49	0	27	10	0	37	1	116
Hourly Total	38	70	0	108	51	48	166	1	215	4	116	53	0	169	3	492
2:00PM	8	18	0	26	10	24	41	0	65	0	29	9	0	38	3	129
2:15PM	7	20	0	27	8	20	39	0	59	0	24	7	0	31	2	117
2:30PM	15	15	0	30	6	7	23	0	30	0	29	9	0	38	4	98
2:45PM	7	18	0	25	6	16	23	0	39	0	25	15	0	40	2	104
Hourly Total	37	71	0	108	30	67	126	0	193	0	107	40	0	147	11	448
3:00PM	9	8	0	17	2	10	49	1	60	2	34	8	0	42	1	119
3:15PM	8	14	1	23	13	7	43	0	50	3	28	10	0	38	1	111
3:30PM	7	16	0	23	4	20	42	0	62	2	22	10	0	32	0	117
3:45PM	12	10	0	22	10	23	31	0	54	0	22	14	0	36	3	112
Hourly Total	36	48	1	85	29	60	165	1	226	7	106	42	0	148	5	459
4:00PM	14	26	0	40	5	34	37	0	71	2	24	8	0	32	0	143
4:15PM	24	22	0	46	14	19	43	0	62	1	28	12	0	40	0	148
4:30PM	14	23	0	37	6	19	55	0	74	0	18	9	0	27	0	138

Leg Direction	Peabody Southbound					Brown Eastbound					Brown Westbound					
Time	L	R	U	App	Ped*	L	T	U	App	Ped*	T	R	U	App	Ped*	Int
4:45PM	16	19	0	35	11	14	39	0	53	2	25	9	0	34	0	122
Hourly Total	68	90	0	158	36	86	174	0	260	5	95	38	0	133	0	551
5:00PM	40	25	0	65	13	18	64	0	82	3	22	8	0	30	0	177
5:15PM	25	33	0	58	6	26	61	1	88	1	22	4	0	26	0	172
5:30PM	21	17	0	38	1	27	40	0	67	4	25	11	0	36	0	141
5:45PM	12	18	0	30	6	13	37	0	50	0	28	6	0	34	3	114
Hourly Total	98	93	0	191	26	84	202	1	287	8	97	29	0	126	3	604
6:00PM	21	30	0	51	16	13	31	0	44	1	18	6	1	25	6	120
6:15PM	13	25	0	38	1	12	29	0	41	1	24	10	0	34	0	113
6:30PM	11	22	0	33	5	10	21	0	31	1	13	5	1	19	2	83
6:45PM	3	21	0	24	3	15	31	0	46	1	14	5	0	19	0	89
Hourly Total	48	98	0	146	25	50	112	0	162	4	69	26	2	97	8	405
Total	464	698	2	1164	392	794	1577	4	2375	50	1262	560	4	1826	81	5365
% Approach	39.9%	60.0%	0.2%	-	-	33.4%	66.4%	0.2%	-	-	69.1%	30.7%	0.2%	-	-	-
% Total	8.6%	13.0%	0%	21.7%	-	14.8%	29.4%	0.1%	44.3%	-	23.5%	10.4%	0.1%	34.0%	-	-
Lights	462	692	2	1156	-	779	1555	4	2338	-	1247	556	4	1807	-	5301
% Lights	99.6%	99.1%	100%	99.3%	-	98.1%	98.6%	100%	98.4%	-	98.8%	99.3%	100%	99.0%	-	98.8%
Single-Unit Trucks	2	3	0	5	-	13	17	0	30	-	14	4	0	18	-	53
% Single-Unit Trucks	0.4%	0.4%	0%	0.4%	-	1.6%	1.1%	0%	1.3%	-	1.1%	0.7%	0%	1.0%	-	1.0%
Articulated Trucks	0	2	0	2	-	1	0	0	1	-	0	0	0	0	-	3
% Articulated Trucks	0%	0.3%	0%	0.2%	-	0.1%	0%	0%	0%	-	0%	0%	0%	0%	-	0.1%
Buses	0	0	0	0	-	0	5	0	5	-	1	0	0	1	-	6
% Buses	0%	0%	0%	0%	-	0%	0.3%	0%	0.2%	-	0.1%	0%	0%	0.1%	-	0.1%
Bicycles on Road	0	1	0	1	-	1	0	0	1	-	0	0	0	0	-	2
% Bicycles on Road	0%	0.1%	0%	0.1%	-	0.1%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	391	-	-	-	-	50	-	-	-	-	81	
% Pedestrians	-	-	-	-	99.7%	-	-	-	-	100%	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	0	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	0.3%	-	-	-	-	0%	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Peabody & Brown - TMC

Thu Mar 24, 2022

Full Length (6 AM-7 PM)

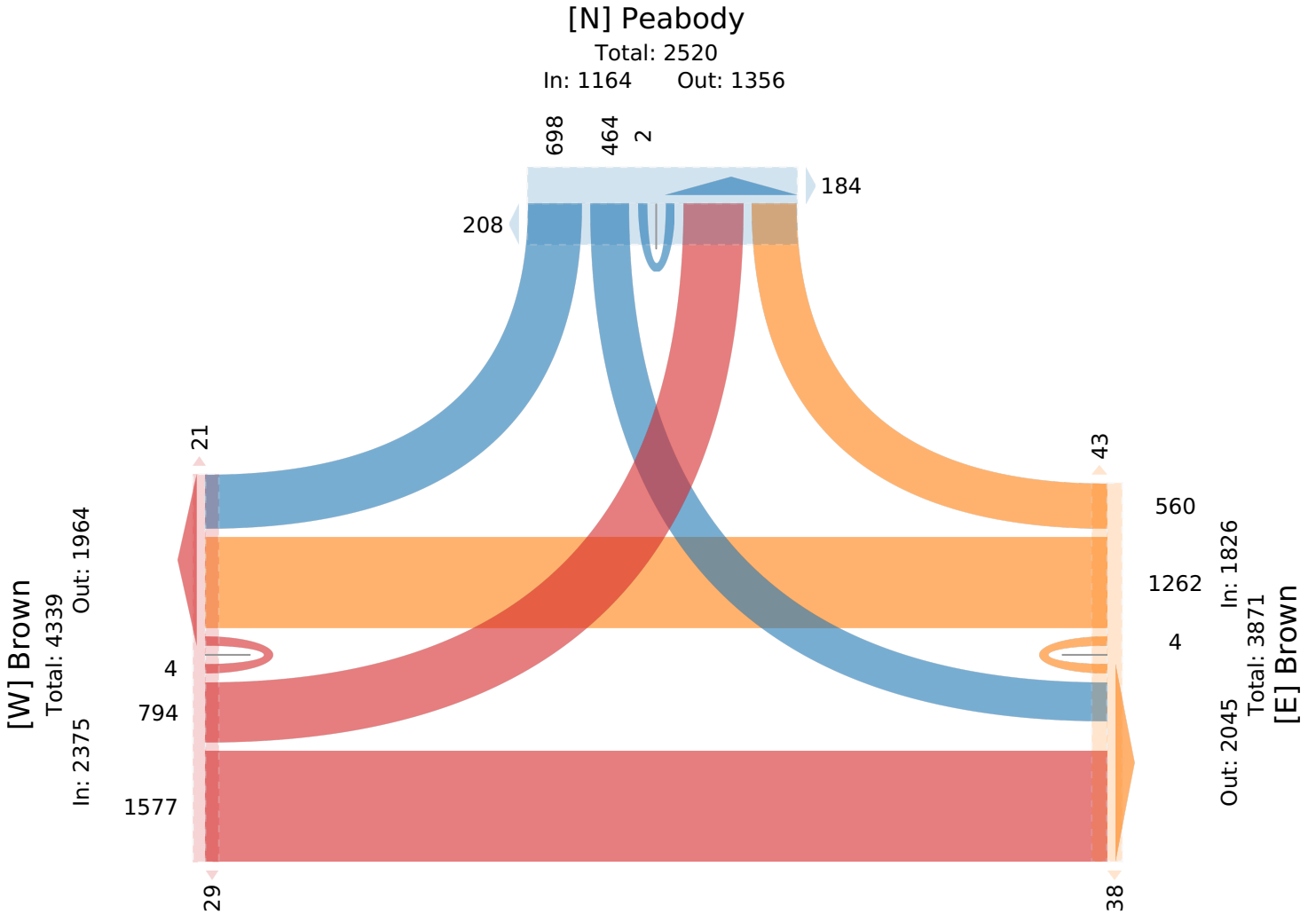
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931150, Location: 42.545386, -83.211648



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Peabody & Brown - TMC

Thu Mar 24, 2022

AM Peak (7:45 AM - 8:45 AM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931150, Location: 42.545386, -83.211648



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Peabody Southbound					Brown Eastbound					Brown Westbound					
Time	L	R	U	App	Ped*	L	T	U	App	Ped*	T	R	U	App	Ped*	Int
2022-03-24 7:45AM	4	5	0	9	4	23	28	0	51	1	29	7	0	36	3	96
8:00AM	2	5	0	7	1	12	20	1	33	0	35	17	0	52	0	92
8:15AM	2	6	0	8	7	24	27	0	51	1	38	19	0	57	3	116
8:30AM	2	10	1	13	9	26	30	0	56	1	25	18	0	43	3	112
Total	10	26	1	37	21	85	105	1	191	3	127	61	0	188	9	416
% Approach	27.0%	70.3%	2.7%	-	-	44.5%	55.0%	0.5%	-	-	67.6%	32.4%	0%	-	-	-
% Total	2.4%	6.3%	0.2%	8.9%	-	20.4%	25.2%	0.2%	45.9%	-	30.5%	14.7%	0%	45.2%	-	-
PHF	0.625	0.650	0.250	0.712	-	0.817	0.875	0.250	0.853	-	0.836	0.803	-	0.825	-	0.897
Lights	10	26	1	37	-	84	105	1	190	-	126	61	0	187	-	414
% Lights	100%	100%	100%	100%	-	98.8%	100%	100%	99.5%	-	99.2%	100%	0%	99.5%	-	99.5%
Single-Unit Trucks	0	0	0	0	-	1	0	0	1	-	1	0	0	1	-	2
% Single-Unit Trucks	0%	0%	0%	0%	-	1.2%	0%	0%	0.5%	-	0.8%	0%	0%	0.5%	-	0.5%
Articulated Trucks	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Articulated Trucks	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Buses	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Buses	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	21	-	-	-	-	3	-	-	-	-	9	-
% Pedestrians	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Peabody & Brown - TMC

Thu Mar 24, 2022

AM Peak (7:45 AM - 8:45 AM)

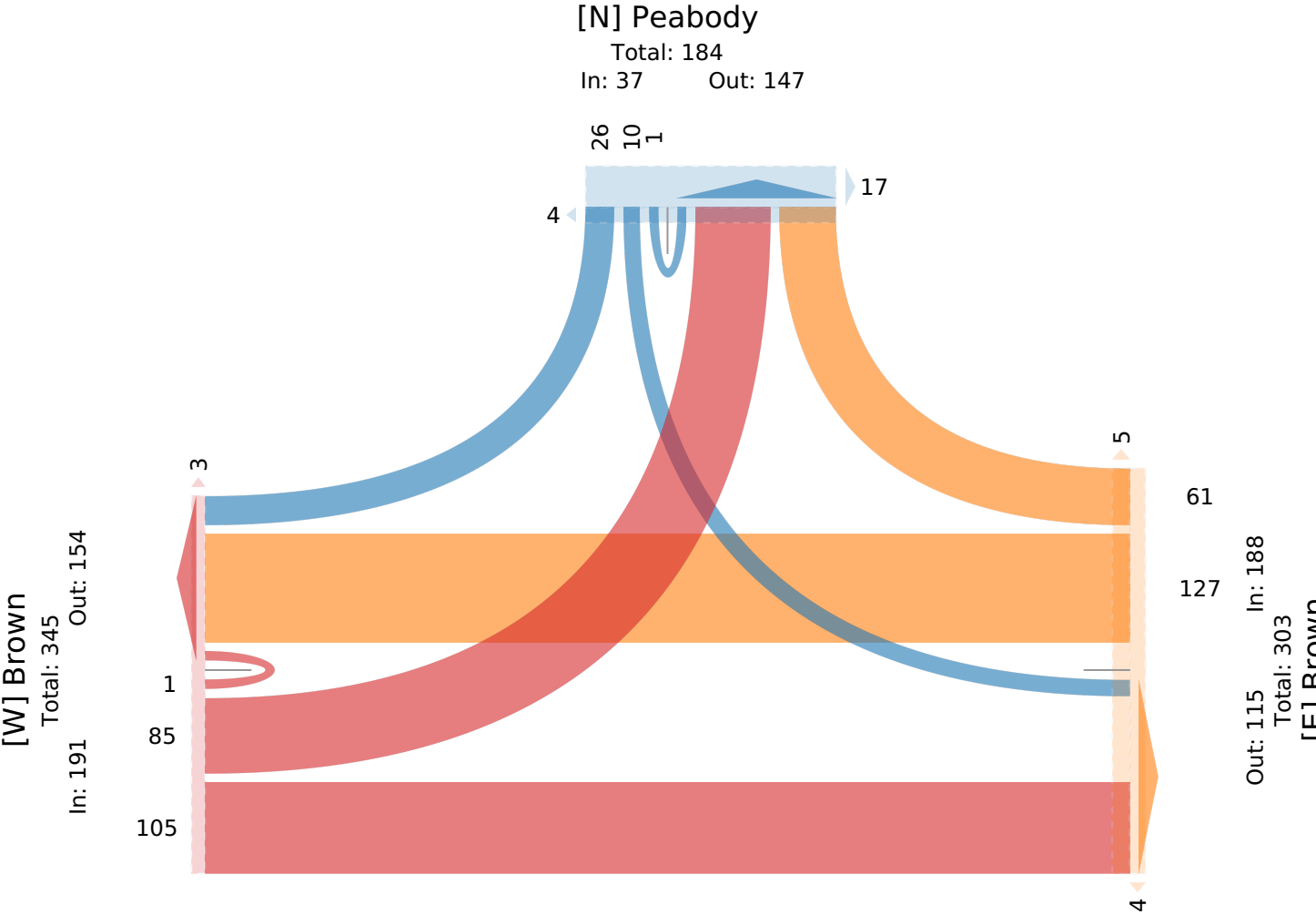
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931150, Location: 42.545386, -83.211648



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Peabody & Brown - TMC

Thu Mar 24, 2022

Midday Peak (11:30 AM - 12:30 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931150, Location: 42.545386, -83.211648



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Peabody Southbound					Brown Eastbound					Brown Westbound					
Time	L	R	U	App	Ped*	L	T	U	App	Ped*	T	R	U	App	Ped*	Int
2022-03-24 11:30AM	10	13	0	23	15	26	37	0	63	3	37	21	0	58	2	144
11:45AM	9	20	0	29	8	19	36	0	55	3	29	16	0	45	0	129
12:00PM	11	19	0	30	14	10	35	0	45	2	27	15	0	42	2	117
12:15PM	15	25	0	40	9	13	42	0	55	0	25	13	0	38	3	133
Total	45	77	0	122	46	68	150	0	218	8	118	65	0	183	7	523
% Approach	36.9%	63.1%	0%	-	-	31.2%	68.8%	0%	-	-	64.5%	35.5%	0%	-	-	-
% Total	8.6%	14.7%	0%	23.3%	-	13.0%	28.7%	0%	41.7%	-	22.6%	12.4%	0%	35.0%	-	-
PHF	0.750	0.770	-	0.763	-	0.654	0.893	-	0.865	-	0.797	0.774	-	0.789	-	0.908
Lights	44	75	0	119	-	67	147	0	214	-	116	65	0	181	-	514
% Lights	97.8%	97.4%	0%	97.5%	-	98.5%	98.0%	0%	98.2%	-	98.3%	100%	0%	98.9%	-	98.3%
Single-Unit Trucks	1	1	0	2	-	1	3	0	4	-	2	0	0	2	-	8
% Single-Unit Trucks	2.2%	1.3%	0%	1.6%	-	1.5%	2.0%	0%	1.8%	-	1.7%	0%	0%	1.1%	-	1.5%
Articulated Trucks	0	1	0	1	-	0	0	0	0	-	0	0	0	0	-	1
% Articulated Trucks	0%	1.3%	0%	0.8%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0.2%
Buses	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Buses	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	46	-	-	-	-	8	-	-	-	-	7	-
% Pedestrians	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Peabody & Brown - TMC

Thu Mar 24, 2022

Midday Peak (11:30 AM - 12:30 PM)

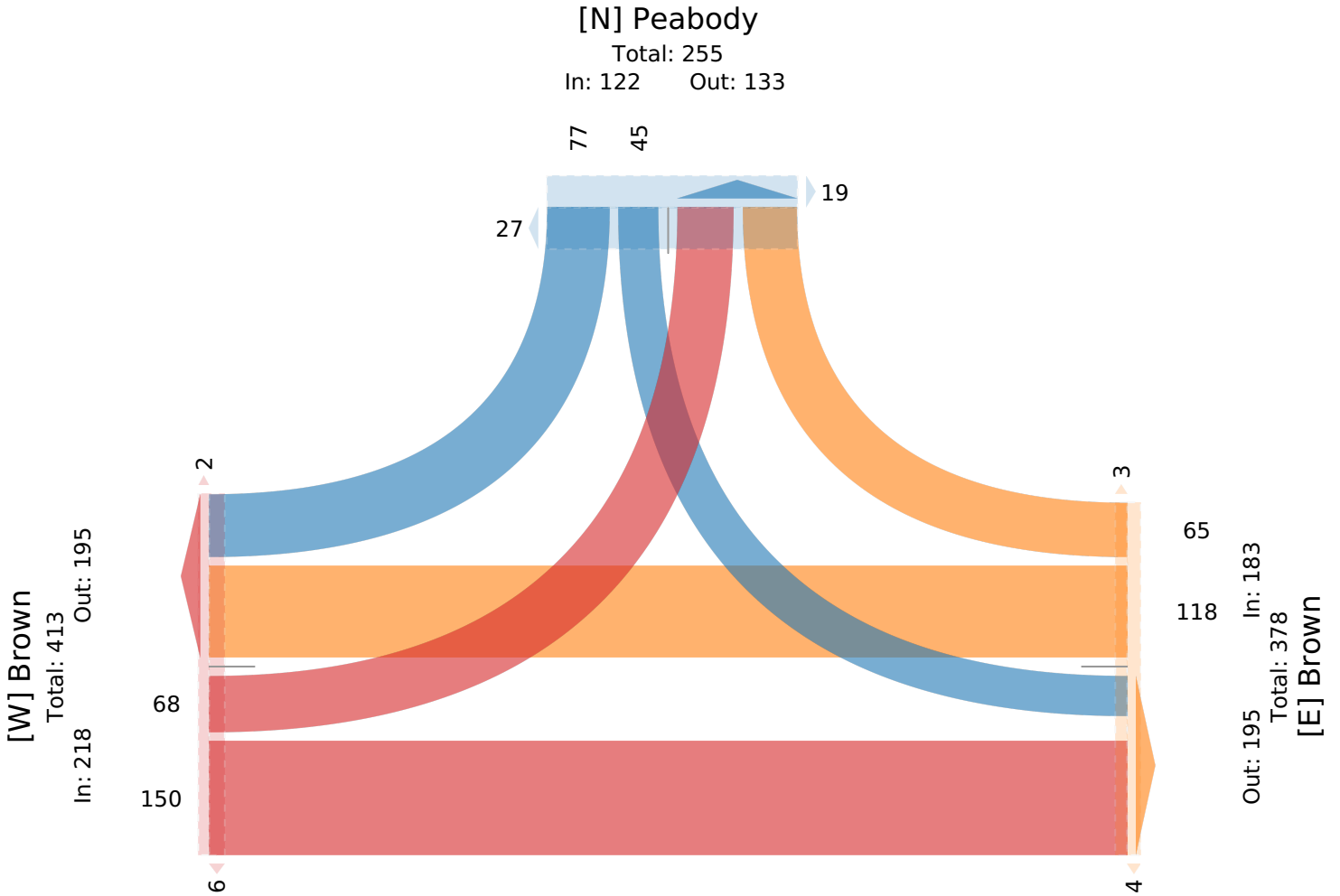
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931150, Location: 42.545386, -83.211648



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



Peabody & Brown - TMC

Thu Mar 24, 2022

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931150, Location: 42.545386, -83.211648



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Peabody Southbound					Brown Eastbound					Brown Westbound					
Time	L	R	U	App	Ped*	L	T	U	App	Ped*	T	R	U	App	Ped*	Int
2022-03-24 4:45PM	16	19	0	35	11	14	39	0	53	2	25	9	0	34	0	122
5:00PM	40	25	0	65	13	18	64	0	82	3	22	8	0	30	0	177
5:15PM	25	33	0	58	6	26	61	1	88	1	22	4	0	26	0	172
5:30PM	21	17	0	38	1	27	40	0	67	4	25	11	0	36	0	141
Total	102	94	0	196	31	85	204	1	290	10	94	32	0	126	0	612
% Approach	52.0%	48.0%	0%	-	-	29.3%	70.3%	0.3%	-	-	74.6%	25.4%	0%	-	-	-
% Total	16.7%	15.4%	0%	32.0%	-	13.9%	33.3%	0.2%	47.4%	-	15.4%	5.2%	0%	20.6%	-	-
PHF	0.638	0.712	-	0.754	-	0.787	0.797	0.250	0.824	-	0.940	0.727	-	0.875	-	0.864
Lights	102	94	0	196	-	85	204	1	290	-	94	32	0	126	-	612
% Lights	100%	100%	0%	100%	-	100%	100%	100%	100%	-	100%	100%	0%	100%	-	100%
Single-Unit Trucks	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%
Articulated Trucks	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Articulated Trucks	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Buses	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Buses	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	31	-	-	-	-	10	-	-	-	-	0	-
% Pedestrians	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Peabody & Brown - TMC

Thu Mar 24, 2022

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

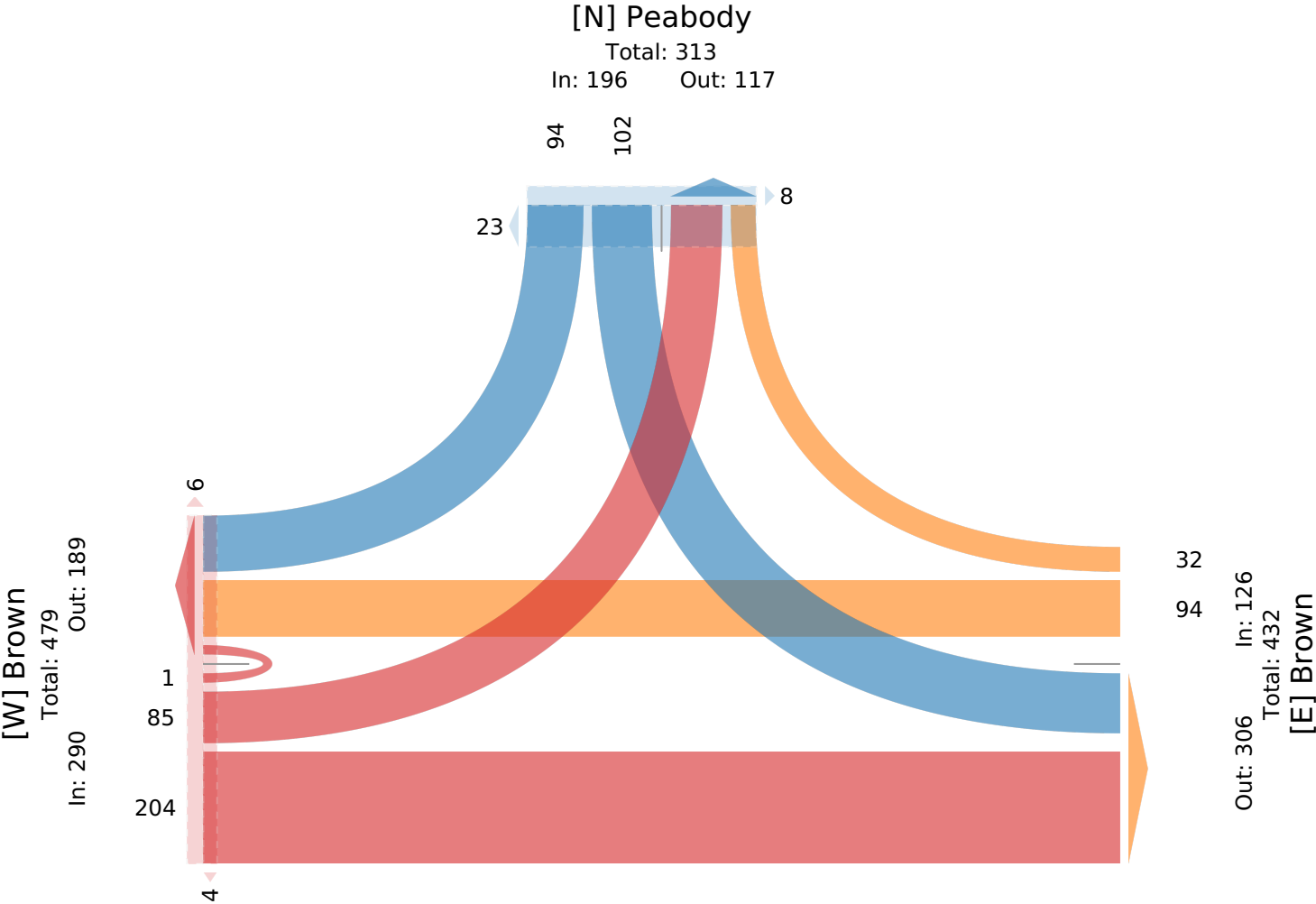
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931150, Location: 42.545386, -83.211648



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



SB Woodward & SB/NB X/O south of Brown - TMC

Thu Mar 24, 2022

Full Length (6 AM-7 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931152, Location: 42.544801, -83.210548



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Woodward Northbound				Woodward Southbound				
Time	T	U	App	Ped*	T	U	App	Ped*	Int
2022-03-24 6:00AM	102	0	102	0	162	14	176	0	278
6:15AM	176	0	176	0	228	23	251	0	427
6:30AM	261	0	261	0	283	16	299	0	560
6:45AM	268	0	268	0	248	42	290	0	558
Hourly Total	807	0	807	0	921	95	1016	0	1823
7:00AM	302	0	302	0	263	32	295	0	597
7:15AM	425	0	425	0	342	38	380	0	805
7:30AM	525	0	525	0	493	51	544	0	1069
7:45AM	580	0	580	0	513	67	580	0	1160
Hourly Total	1832	0	1832	0	1611	188	1799	0	3631
8:00AM	515	0	515	0	504	73	577	0	1092
8:15AM	605	0	605	0	498	70	568	0	1173
8:30AM	591	0	591	0	453	81	534	0	1125
8:45AM	501	0	501	0	461	76	537	0	1038
Hourly Total	2212	0	2212	0	1916	300	2216	0	4428
9:00AM	450	0	450	0	477	84	561	0	1011
9:15AM	443	0	443	0	405	68	473	0	916
9:30AM	401	0	401	0	411	75	486	0	887
9:45AM	388	0	388	0	417	72	489	0	877
Hourly Total	1682	0	1682	0	1710	299	2009	0	3691
10:00AM	317	0	317	0	355	62	417	1	734
10:15AM	355	0	355	0	339	52	391	0	746
10:30AM	401	0	401	0	342	83	425	0	826
10:45AM	338	0	338	0	389	64	453	0	791
Hourly Total	1411	0	1411	0	1425	261	1686	1	3097
11:00AM	374	0	374	0	379	74	453	0	827
11:15AM	419	0	419	0	407	78	485	0	904
11:30AM	425	0	425	0	401	75	476	0	901
11:45AM	408	0	408	0	455	93	548	2	956
Hourly Total	1626	0	1626	0	1642	320	1962	2	3588
12:00PM	416	0	416	0	417	85	502	0	918
12:15PM	437	0	437	0	393	85	478	0	915
12:30PM	386	0	386	0	406	79	485	0	871
12:45PM	432	0	432	0	385	87	472	0	904
Hourly Total	1671	0	1671	0	1601	336	1937	0	3608
1:00PM	439	0	439	0	393	85	478	0	917
1:15PM	414	0	414	0	407	81	488	0	902
1:30PM	435	0	435	0	368	89	457	0	892
1:45PM	427	0	427	0	430	82	512	0	939
Hourly Total	1715	0	1715	0	1598	337	1935	0	3650
2:00PM	440	0	440	0	413	87	500	0	940
2:15PM	494	0	494	0	430	88	518	0	1012
2:30PM	476	0	476	0	446	77	523	0	999
2:45PM	532	0	532	0	484	78	562	0	1094
Hourly Total	1942	0	1942	0	1773	330	2103	0	4045
3:00PM	500	0	500	0	475	88	563	0	1063
3:15PM	579	0	579	0	506	82	588	0	1167
3:30PM	521	0	521	0	485	89	574	0	1095
3:45PM	562	0	562	0	534	83	617	0	1179
Hourly Total	2162	0	2162	0	2000	342	2342	0	4504
4:00PM	515	0	515	0	559	89	648	0	1163
4:15PM	477	0	477	0	533	99	632	0	1109
4:30PM	576	0	576	0	589	106	695	0	1271

Leg Direction	Woodward Northbound				Woodward Southbound				
Time	T	U	App	Ped*	T	U	App	Ped*	Int
4:45PM	553	0	553	0	567	88	655	0	1208
Hourly Total	2121	0	2121	0	2248	382	2630	0	4751
5:00PM	601	0	601	0	674	99	773	0	1374
5:15PM	601	0	601	0	729	122	851	0	1452
5:30PM	620	0	620	0	612	86	698	0	1318
5:45PM	474	0	474	0	552	79	631	0	1105
Hourly Total	2296	0	2296	0	2567	386	2953	0	5249
6:00PM	433	0	433	0	512	85	597	0	1030
6:15PM	445	0	445	0	474	90	564	0	1009
6:30PM	408	0	408	0	447	64	511	0	919
6:45PM	392	0	392	0	437	64	501	0	893
Hourly Total	1678	0	1678	0	1870	303	2173	0	3851
Total	23155	0	23155	0	22882	3879	26761	3	49916
% Approach	100%	0%	-	-	85.5%	14.5%	-	-	-
% Total	46.4%	0%	46.4%	-	45.8%	7.8%	53.6%	-	-
Lights	22720	0	22720	-	22457	3807	26264	-	48984
% Lights	98.1%	0%	98.1%	-	98.1%	98.1%	98.1%	-	98.1%
Single-Unit Trucks	269	0	269	-	260	36	296	-	565
% Single-Unit Trucks	1.2%	0%	1.2%	-	1.1%	0.9%	1.1%	-	1.1%
Articulated Trucks	89	0	89	-	87	14	101	-	190
% Articulated Trucks	0.4%	0%	0.4%	-	0.4%	0.4%	0.4%	-	0.4%
Buses	77	0	77	-	78	22	100	-	177
% Buses	0.3%	0%	0.3%	-	0.3%	0.6%	0.4%	-	0.4%
Bicycles on Road	0	0	0	-	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	-	0%	0%	0%	-	0%
Pedestrians	-	-	-	0	-	-	-	3	
% Pedestrians	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	0	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. T: Thru, U: U-Turn

SB Woodward & SB/NB X/O south of Brown - TMC

Thu Mar 24, 2022

Full Length (6 AM-7 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931152, Location: 42.544801, -83.210548



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



SB Woodward & SB/NB X/O south of Brown - TMC

Thu Mar 24, 2022

AM Peak (7:45 AM - 8:45 AM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931152, Location: 42.544801, -83.210548



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Woodward Northbound				Woodward Southbound				
Time	T	U	App	Ped*	T	U	App	Ped*	Int
2022-03-24 7:45AM	580	0	580	0	513	67	580	0	1160
8:00AM	515	0	515	0	504	73	577	0	1092
8:15AM	605	0	605	0	498	70	568	0	1173
8:30AM	591	0	591	0	453	81	534	0	1125
Total	2291	0	2291	0	1968	291	2259	0	4550
% Approach	100%	0%	-	-	87.1%	12.9%	-	-	-
% Total	50.4%	0%	50.4%	-	43.3%	6.4%	49.6%	-	-
PHF	0.947	-	0.947	-	0.959	0.898	0.974	-	0.970
Lights	2257	0	2257	-	1935	283	2218	-	4475
% Lights	98.5%	0%	98.5%	-	98.3%	97.3%	98.2%	-	98.4%
Single-Unit Trucks	23	0	23	-	15	3	18	-	41
% Single-Unit Trucks	1.0%	0%	1.0%	-	0.8%	1.0%	0.8%	-	0.9%
Articulated Trucks	6	0	6	-	8	2	10	-	16
% Articulated Trucks	0.3%	0%	0.3%	-	0.4%	0.7%	0.4%	-	0.4%
Buses	5	0	5	-	10	3	13	-	18
% Buses	0.2%	0%	0.2%	-	0.5%	1.0%	0.6%	-	0.4%
Bicycles on Road	0	0	0	-	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	-	0%	0%	0%	-	0%
Pedestrians	-	-	-	0	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	0	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. T: Thru, U: U-Turn

SB Woodward & SB/NB X/O south of Brown - TMC

Thu Mar 24, 2022

AM Peak (7:45 AM - 8:45 AM)

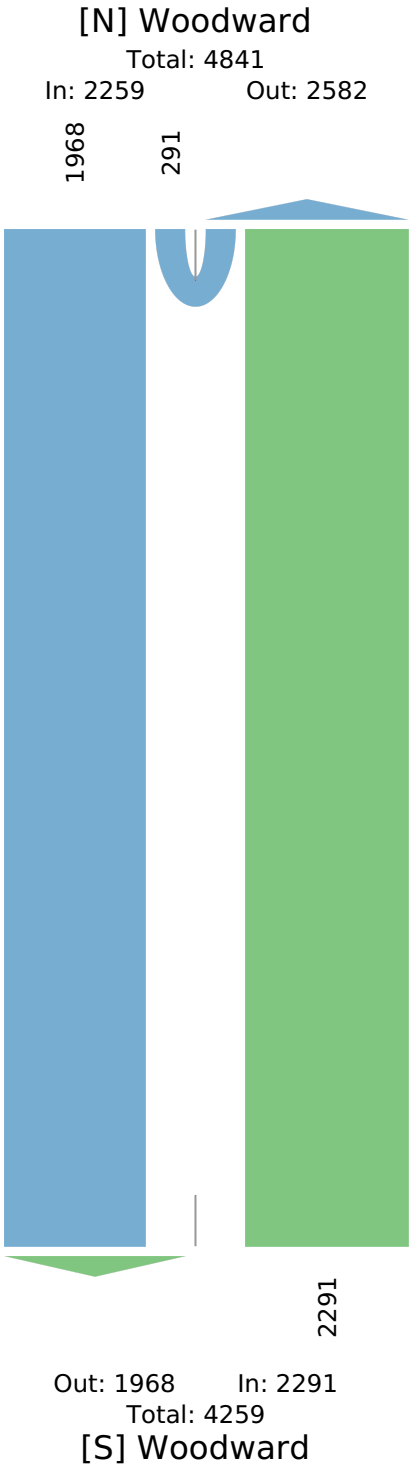
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931152, Location: 42.544801, -83.210548



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



SB Woodward & SB/NB X/O south of Brown - TMC

Thu Mar 24, 2022

Midday Peak (11:30 AM - 12:30 PM)

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931152, Location: 42.544801, -83.210548



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Woodward Northbound				Woodward Southbound				
Time	T	U	App	Ped*	T	U	App	Ped*	Int
2022-03-24 11:30AM	425	0	425	0	401	75	476	0	901
11:45AM	408	0	408	0	455	93	548	2	956
12:00PM	416	0	416	0	417	85	502	0	918
12:15PM	437	0	437	0	393	85	478	0	915
Total	1686	0	1686	0	1666	338	2004	2	3690
% Approach	100%	0%	-	-	83.1%	16.9%	-	-	-
% Total	45.7%	0%	45.7%	-	45.1%	9.2%	54.3%	-	-
PHF	0.965	-	0.965	-	0.915	0.909	0.914	-	0.965
Lights	1637	0	1637	-	1623	329	1952	-	3589
% Lights	97.1%	0%	97.1%	-	97.4%	97.3%	97.4%	-	97.3%
Single-Unit Trucks	31	0	31	-	32	7	39	-	70
% Single-Unit Trucks	1.8%	0%	1.8%	-	1.9%	2.1%	1.9%	-	1.9%
Articulated Trucks	9	0	9	-	8	1	9	-	18
% Articulated Trucks	0.5%	0%	0.5%	-	0.5%	0.3%	0.4%	-	0.5%
Buses	9	0	9	-	3	1	4	-	13
% Buses	0.5%	0%	0.5%	-	0.2%	0.3%	0.2%	-	0.4%
Bicycles on Road	0	0	0	-	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	-	0%	0%	0%	-	0%
Pedestrians	-	-	-	0	-	-	-	2	-
% Pedestrians	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	0	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. T: Thru, U: U-Turn

SB Woodward & SB/NB X/O south of Brown - TMC

Thu Mar 24, 2022

Midday Peak (11:30 AM - 12:30 PM)

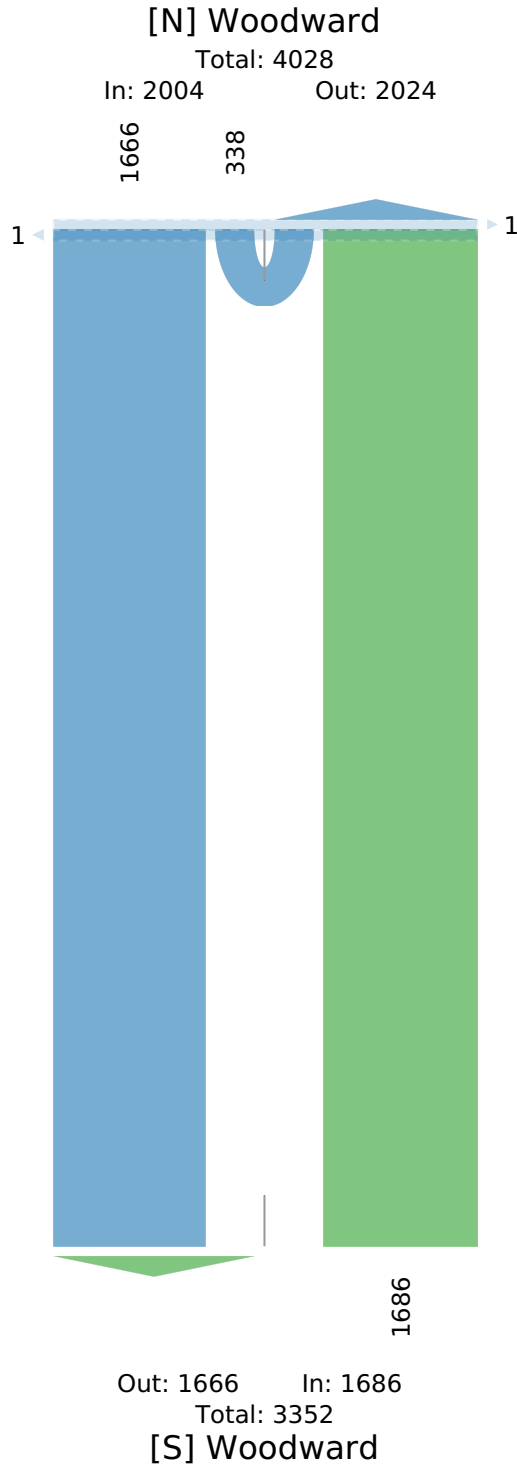
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931152, Location: 42.544801, -83.210548



Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US



SB Woodward & SB/NB X/O south of Brown - TMC

Thu Mar 24, 2022

PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour

All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 931152, Location: 42.544801, -83.210548

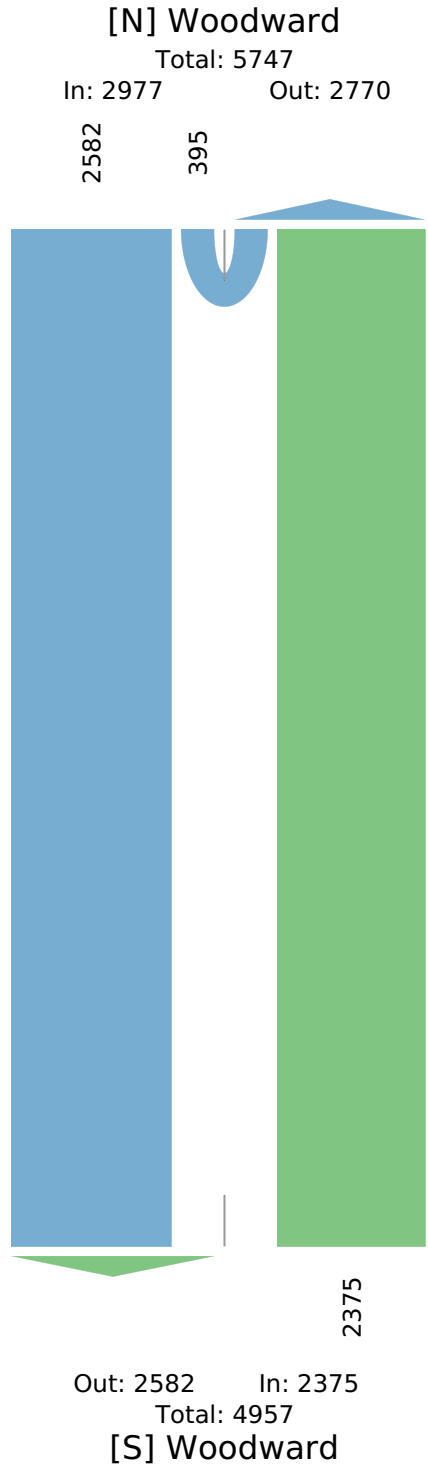


Provided by: Gewalt Hamilton Associates Inc.
625 Forest Edge Drive, Vernon Hills, IL, 60061, US

Leg Direction	Woodward Northbound				Woodward Southbound				
Time	T	U	App	Ped*	T	U	App	Ped*	Int
2022-03-24 4:45PM	553	0	553	0	567	88	655	0	1208
5:00PM	601	0	601	0	674	99	773	0	1374
5:15PM	601	0	601	0	729	122	851	0	1452
5:30PM	620	0	620	0	612	86	698	0	1318
Total	2375	0	2375	0	2582	395	2977	0	5352
% Approach	100%	0%	-	-	86.7%	13.3%	-	-	-
% Total	44.4%	0%	44.4%	-	48.2%	7.4%	55.6%	-	-
PHF	0.958	-	0.958	-	0.885	0.809	0.875	-	0.921
Lights	2352	0	2352	-	2564	394	2958	-	5310
% Lights	99.0%	0%	99.0%	-	99.3%	99.7%	99.4%	-	99.2%
Single-Unit Trucks	12	0	12	-	9	0	9	-	21
% Single-Unit Trucks	0.5%	0%	0.5%	-	0.3%	0%	0.3%	-	0.4%
Articulated Trucks	6	0	6	-	4	1	5	-	11
% Articulated Trucks	0.3%	0%	0.3%	-	0.2%	0.3%	0.2%	-	0.2%
Buses	5	0	5	-	5	0	5	-	10
% Buses	0.2%	0%	0.2%	-	0.2%	0%	0.2%	-	0.2%
Bicycles on Road	0	0	0	-	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	-	0%	0%	0%	-	0%
Pedestrians	-	-	-	0	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	0	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. T: Thru, U: U-Turn

SB Woodward & SB/NB X/O south of Brown - TMC
Thu Mar 24, 2022
PM Peak (4:45 PM - 5:45 PM) - Overall Peak Hour
All Classes (Lights, Single-Unit Trucks, Articulated Trucks, Buses,
Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 931152, Location: 42.544801, -83.210548





MEMORANDUM

City Manager's Office

DATE: October 20, 2021

TO: Thomas M. Markus, City Manager

FROM: Jana Ecker, Assistant City Manager

SUBJECT: Woodward Avenue Pedestrian Safety Issues

INTRODUCTION:

On September 17, 2021, a second fatal pedestrian accident occurred on Woodward Avenue at the pedestrian crossing at the Brown/Forest intersection. Previously, Wesley Stamps was also fatally injured crossing Woodward on August 8, 2020 in the same vicinity. As a result, the City received extensive public outcry calling for Birmingham to address the safety concerns with this dangerous intersection. However, the entire 200' wide Woodward Avenue right-of-way is owned and controlled by the Michigan Department of Transportation (MDOT) and not by the City. Thus, the City has no jurisdiction over Woodward Avenue, and the design of the roadway is entirely controlled by MDOT, including the location and timing of all vehicle and pedestrian traffic signals, all pedestrian crossings (whether at grade, below grade or on a bridge over Woodward), intersection geometry, speed limits and roadway maintenance and improvements.

BACKGROUND:

Birmingham and many other Woodward communities have spent the last several decades working to enhance the Woodward Corridor through the use of pedestrian scale building placement and design, multi-modal amenities, landscaping and other measures to create a human-scale, safe and comfortable corridor for all of our residents, of all ability levels, using all modes of transportation. However, cities do not have the jurisdiction to make required safety improvements in the Woodward Avenue right-of-way.

Over the past several years, the City has repeatedly expressed ongoing safety concerns for pedestrians at the intersection of Woodward and Brown/Forest to MDOT officials. Specifically, the City has requested the addition of a signal to improve the pedestrian crossing over the northbound lanes of Woodward, the addition of an overhead HAWK signal, pedestrian signals, crosswalk enhancements, as well as traffic calming measures to be implemented along the corridor.

The City has continued to press MDOT to invest in pedestrian crossing improvements at the intersection of Woodward and Brown/Forest, and others along the corridor. City officials were able to organize a meeting with MDOT officials on site last month. At the conclusion of the meeting on September 22, 2021, City officials advised MDOT that immediate action was needed to improve pedestrian safety. The City requested additional signage, lighting, pavement markings or even the addition of containers of pedestrian high visibility orange fluorescent crossing flags on both sides of the Woodward crossing, and to have one or more of these safety measures installed within one week. City officials also asked MDOT to schedule a Road Safety Audit as soon as possible.

Over a month has now passed, and MDOT has not installed any permanent or temporary pedestrian safety measures at the Woodward and Brown/Forest pedestrian crossing. The City has reached out to Governor Whitmer and State legislators to request assistance in compelling MDOT to address the safety concerns at Woodward and Brown/Forest. MDOT officials have not formally provided any commitment to install or implement any pedestrian safety measures, nor scheduled a Road Safety Audit.

However, the City was informed by Ms. Swanson, Oakland TSC Manager with MDOT during a telephone call on October 18, 2021, that MDOT had approved the installation of flashing beacons on the crosswalk signage on both sides of Woodward to be installed as soon as possible, funded by MDOT. Ms. Swanson also indicated that MDOT had approved installation of a new traffic signal for the northbound lanes of Woodward, and the addition of pedestrian countdown signal heads on both the southbound and northbound lanes of Woodward, to be funded by MDOT, and installed in the summer of 2022. Ms. Swanson indicated that she was drafting a letter outlining this formal commitment, which she expected to complete by the end of the week.

Ms. Lori Swanson, Oakland TSC Manager, and Ms. Kimberly Webb, Metro Region Engineer, with the Michigan Department of Transportation will be in attendance at the City Commission meeting on October 25, 2021 to update the public regarding MDOT's immediate and long term plans to address the ongoing pedestrian safety issues at Woodward and Brown/Forest.

Since the on site meeting with MDOT representatives, City staff conducted a site inspection of the MDOT right-of-way to survey existing vegetation to determine if any tree trimming was needed to address sight distance concerns. City staff found that there are no trees, tree limbs or other vegetation obstructing sight distance for pedestrians or drivers, nor any vegetation obstructing any of the existing street lighting located in the MDOT right-of-way.

Since the on site meeting, City staff has also surveyed the existing street lighting in the vicinity of the Brown/Forest crosswalk and noted that there are lighting issues in the MDOT right-of-way. Accordingly, City staff also met with a representative of DTE to discuss potential improvements to the overhead street lighting in the MDOT right-of-way. Current deficiencies were noted with regards to overall illumination levels, and light distribution at grade in the vicinity of the Woodward and Brown/Forest pedestrian crossing. After a review of available options, the City Manager has committed to making the lighting improvements to replace the existing high pressure sodium luminaires with new LED luminaires on Woodward from Lincoln to Maple, subject to receipt and approval of the appropriate DTE agreements. In addition, the City Manager has committed to purchasing upgraded LED luminaires to provide brighter lighting at the Woodward and Brown/Forest pedestrian crosswalk, subject to receipt and approval of the appropriate DTE agreements.

Mr. Brandon Faron, DTE Community Lighting Account Manager, will be in attendance via Zoom at the City Commission meeting on October 25, 2021 to respond to any questions on the proposed new lighting.

As mentioned above, the City has received extensive public outcry calling for safety improvements at the Woodward and Brown/Forest pedestrian crossing. Local residents contacted Channel 4 news, WDIV, and on October 14, 2021, Channel 4 ran a segment on the 11:00pm news, with a follow

up web article on October 15, 2021. Clinton Baller purchased and installed pedestrian crossing safety flags, and installed them on either side of the Woodward and Brown/Forest crosswalk. Since the meeting with MDOT officials, City staff has also conducted research into the use of pedestrian flags to increase the visibility of pedestrians in marked crosswalks, and studied other communities that have used the flags as tools to enhance the safety of pedestrians. Based on this research, City staff recommends seeking approval from MDOT for the pedestrian crosswalk flag system that has already been installed on Woodward at Brown/Forest.

LEGAL REVIEW:

The City Attorney has reviewed the proposed agreement with DTE to upgrade the LED lighting on Woodward and has no objection as to form or substance.

FISCAL IMPACT:

As the City does not own or control Woodward Avenue, the City does not have a budget allocated for safety upgrades. However, the City Manager has indicated a willingness to cover the estimated \$23,340 in costs quoted by DTE to install upgraded LED lighting on Woodward to enhance the visibility and safety of pedestrian crossings on Woodward, and to pay for the replacement of pedestrian safety flags as needed.

PUBLIC COMMUNICATIONS:

With two pedestrian fatalities having occurred during the past 14 months, there has been media coverage of both the fatal accidents and the need to address the pedestrian safety issues at the intersection of Woodward and Brown/Forest. Local residents have reached out to the City to express their concerns, and the City has responded through discussions at public meetings, social media, and correspondence with MDOT, the Governor and our State legislators, with copies to local news media. The pedestrian safety issues were discussed with Senator Mallory McMorrow personally at the October 4, 2021 City Commission meeting, and with Representative Mari Manoogian on October 20, 2021 via Zoom.

SUMMARY:

The City requests that MDOT take immediate corrective action at the pedestrian crossing at Woodward and Brown/Forest through the installation of pedestrian signals, LED Enhanced Warning signs, advance yield lines, positive offset lighting and/or pedestrian hybrid beacons or other safety measures.

City staff recommends upgrading Woodward Avenue's median lighting, in the MDOT right-of-way, to LED lighting between Maple Road and Lincoln St., and to include higher illumination LED lighting at the Woodward and Brown/Forest pedestrian crossing to enhance the safety of the crossing. DTE can complete the project in this area by the end of the year if approved. This work will both improve pedestrian safety in this area, and will also reduce lighting costs over time.

City staff also recommends seeking approval from MODT for a pedestrian crosswalk flag system on Woodward Avenue at the Brown/Forest crossing to increase the visibility of pedestrians and improve driver awareness.

ATTACHMENTS:

- Letter from Manager Markus dated September 23, 2021
- Letter from Police Chief Clemence dated October 4, 2021

- Letter from Senator McMorrow and State Representative Manoogian received October 4, 2021
- Letter from Assistant City Manager Ecker dated October 8, 2021
- Letter from Assistant City Manager Ecker dated October 13, 2021
- Engineering Department report and agreement with DTE for upgraded LED lighting on Woodward
- Police Department report on pedestrian crosswalk safety flags

SUGGESTED COMMISSION ACTION:

Make a motion adopting a resolution approving the DTE Purchase Agreement to upgrade to LED lighting on the Woodward Avenue median between Maple Road and Lincoln St.;

Further to authorize and direct the City Manager to sign the DTE Lighting Agreement with funding to be provided from Account #401-901.010-98.0100, in an amount not to exceed \$23,340.00.

AND

Make a motion authorizing the Chief of Police and the City Engineer to seek approval from the Michigan Department of Transportation for a pedestrian crosswalk flag system on Woodward Avenue at Brown/Forest;

Further to approve the Chief of Police to purchase additional pedestrian crosswalk flags as needed and to charge this expenditure to the Major Streets Fund Traffic Controls operating supplies account # 202-303.001-729.0000.



September 23, 2021

Ms. Gretchen Whitmer, Governor

Ms. Mari Manoogian, State Representative, 40th House District

Ms. Mallory McMorrow, State Senator, District 13

Re: Pedestrian Safety Concerns on Woodward Avenue

It is with great sadness that I pass along the news that we had yet another fatal pedestrian accident this past weekend on Woodward Avenue that involved the loss of life of one of our residents. This is the second pedestrian fatality that has recently occurred at the pedestrian crossing at the Brown/Forest intersection in Birmingham south of Maple Road. In August 2020, there was another pedestrian fatally injured attempting to cross Woodward at the same intersection.

Extensive public outcry has been received in my office, by our City Commission members and City staff this past week calling for Birmingham to address the safety concerns with this dangerous intersection. However, as you are aware, the entire 200' wide Woodward Avenue right-of-way is owned and controlled by the Michigan Department of Transportation (MDOT) and not by the City. Thus, the City has no jurisdiction over Woodward Avenue, and the design of the roadway is entirely controlled by MDOT, including the location and timing of all vehicle and pedestrian traffic signals, all pedestrian crossings (whether at grade, below grade or on a bridge over Woodward), intersection geometry, speed limits and roadway maintenance and improvements. The City's only role in the design and improvement of Woodward Avenue is to investigate incidents, record observations and request assistance and action from MDOT.

Over the past several years, the City has repeatedly expressed ongoing safety concerns for pedestrians at the intersection of Woodward and Brown/Forest to MDOT officials. Specifically, the City has requested the addition of a signal to improve the pedestrian crossing over the northbound lanes of Woodward, the addition of an overhead HAWK signal, pedestrian signals, crosswalk enhancements, as well as traffic calming measures to be implemented along the corridor.

The City continues to press MDOT to invest in pedestrian crossing improvements at the intersection of Woodward and Brown/Forest, and others along the corridor. In fact, the City reached out to MDOT officials through our transportation consultants this summer to attempt yet again to persuade MDOT of the clear danger for pedestrians crossing Woodward Avenue at Brown/Forest. Several weeks ago a meeting was finally scheduled with MDOT officials and traffic engineers to meet on site to discuss our ongoing safety concerns for pedestrians at this intersection. Earlier this week, MDOT officials requested cancellation of this on site meeting due to predicted rain and cold weather. Naturally, this was not well received by the City given the fatal accident that occurred this past weekend. MDOT agreed to meet as originally planned.

This morning, myself, Birmingham Police Chief Clemence, Commander Scott Grewe, City officials from the Planning and Engineering Departments and the City's transportation consultants all met on site, in the rain, to impress upon the two MDOT officials present the clear and present danger at this intersection and the need for immediate action to prevent further injury or death. It was clear from the ensuing discussion that the MDOT officials in attendance did not have the authority to offer any short term or long term solutions to the ongoing safety issues at the intersection of Brown/Forest. We were advised that MDOT could start by conducting pedestrian and traffic counts, perhaps request a Road Safety Audit and study the area to determine what improvements may be warranted.

In response, the City advised MDOT short term efforts needed to be made immediately to address the safety issues and to at least improve pedestrian safety while all of the appropriate studies are conducted. Unfortunately, the City has been told on several occasions in the past that MDOT would conduct safety assessments and studies at this intersection, and get back to us with recommendations. Yet, the dangerous situation remains and another fatality has occurred.

As the top elected officials in Michigan, each of you has the opportunity and obligation to provide executive and legislative oversight for the Michigan Department of Transportation to ensure that the health, safety and welfare of our citizens is protected, and that MDOT takes immediate and appropriate action to address dangerous conditions on our roadways to prevent further loss of life.

Birmingham and many other Woodward communities have spent the last several decades working to enhance the Woodward Corridor through the use of pedestrian scale building placement and design, multi-modal amenities, landscaping and other measures to create a human-scale, safe and comfortable corridor for all of our residents, of all ability levels, using all modes of transportation. However, cities do not have the jurisdiction to make the required safety improvements in the Woodward Avenue right-of-way, but the State of Michigan does have this obligation.

The City of Birmingham asks that MDOT stop spending valuable resources and time on an ITS interstate traffic messaging system on Woodward while ignoring the pressing pedestrian safety issues. The addition of interstate-scale equipment and signage will have a significant negative impact on the aesthetics of the corridor and will not be compatible with the efforts of Birmingham, Royal Oak, Ferndale, Pleasant Ridge, Detroit and other local communities to create a less auto-centric corridor. It is incumbent upon MDOT to prioritize and allocate limited funding to those projects that are in fact necessary and valuable for enhancing the safety of our transportation infrastructure, for all users. The City of Birmingham understands that there are many other components of our transportation infrastructure along Woodward that are in dire need of funding, including but not limited to, pedestrian crossing improvements, the provision of a continuous and safe sidewalk network, bicycle infrastructure and traffic calming measures.

The City of Birmingham requests that each of you exercise your executive oversight and require MDOT to prioritize funding along Woodward for the improvement of the pedestrian environment over the vehicular environment, and specifically for safety improvements at the intersection of Woodward and Brown/Forest before another fatality occurs.

Yours truly,

A handwritten signature in black ink, appearing to read "T. Markus".

Thomas M. Markus,
City Manager

Cc: Birmingham City Commission
Birmingham Eccentric (Open Letter)
Downtown Publication (Open Letter)



BIRMINGHAM POLICE DEPARTMENT

MARK H. CLEMENCE, CHIEF OF POLICE

October 4, 2021

Ms. Gretchen Whitmer, Governor

C/O: Ms. Amanda Dietlin, Community Affairs Liaison – Office of the Governor

Ms. Mari Manoogian, State Representative, 40th House District

Ms. Mallory McMorrow, State Senator, District 13

Mr. Chuck Moss, Oakland County Commissioner, District 12

RE: Pedestrian Safety Concerns on Woodward Avenue – Site Visit

To All,

As you all are aware, the City of Birmingham has had two pedestrian fatalities on Woodward Avenue near Brown/Forest over the past 13 months. As a police officer working in the City for the past 37 years, I can assure you that this loss of life is unprecedented and totally unacceptable to me as the chief of police, to our entire City staff and to our community members. As the elected officials for our City, I would like to invite you to come to your constituent community and meet with me and other City staff to observe the area for yourselves. A site visit would allow the City the opportunity to show each of you first hand where the safety concerns are and discuss potential solutions with you. The primary reason for requesting that you attend a site visit is to detail the urgency of the City's situation and that we move forward together with actions that will lead to swift and immediate changes to dramatically improve the safety of pedestrian and vehicular safety at this location.

I understand that Woodward Avenue is under the jurisdiction of the Michigan Department of Transportation (MDOT). The City is working with MDOT to improve the pedestrian

crossings in the area and looking at other possible enhancements that would improve both pedestrian safety and have an impact on traffic calming. It is our hope, that with your assistance, the City can see this process streamlined in order to expeditiously create a safe environment for all. While we have met at the site with MDOT, their record of accomplishment for addressing safety concerns at this location has been buried in bureaucracy. That situation cannot continue. MDOT must address these safety concerns at this location as soon as possible. Once this immediate concern has been addressed, the City would like to move forward with a more comprehensive examination of Woodward Ave to address pedestrian safety as a whole and to integrate the road into the fabric of our "walkable" community. I am quite certain that all of the communities along the Woodward corridor share this desire. It should be noted that Birmingham is unique in that Woodward Avenue effectively runs through the middle of the city. It is imperative that residents on both sides of Woodward Ave are able to safely traverse Woodward Ave in order for our community to truly be united.

In the interest of time, I would be happy to coordinate the site visit. I propose the last week of October (October 26, 27, and 28) or the first week of November (November 2, 3, and 4). Please email me at mclemence@bhamgov.org or call me at 248-530-1875 with your availability on these dates. I look forward to the opportunity to expand your understanding of the safety issues present and to discuss potential solutions.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "M. H. Clemence". The signature is fluid and cursive, with the first name "M." and last name "Clemence" clearly distinguishable.

Mark H. Clemence

Chief of Police



13TH DISTRICT
BINSFELD OFFICE BUILDING
P.O. BOX 30005
LANSING, MI 48209-7526

MICHIGAN SENATE
STATE SENATOR MALLORY MCMORROW

PHONE: (517) 373-2523
FAX: (517) 373-5669
senmmcmorrow@senate.michigan.gov
senate.michigan.gov/mcmorrow

Dear City Manager Markus,

Thank you for reaching out to our office regarding the public safety concerns at the pedestrian crossing at the Brown/Forest intersection in Birmingham. After receiving your letter and hearing concerns from a number of residents, our office reached out to the Michigan Department of Transportation (MDOT) to ensure they are aware of the seriousness of this issue and the steps the department is taking to ensure it gets addressed swiftly. MDOT responded to our office with their solutions for improvements to this pedestrian crossing, their communication is shared below.

What has been done so far:

- MDOT met internally to discuss possible solutions to improve pedestrian safety.
- MDOT collected pedestrian counts for the Woodward at Forest/Brown crosswalk for two days:
 - 9/8/2021, 4:00 pm -5:00 pm, 17 pedestrians crossed (three elderly pedestrians were included and counts as two pedestrians)
 - 9/9/2021, 8:00 am to 9:00 am, 9 ped crossed

MDOT had an onsite meeting with Birmingham's City Manager and city officials at the Woodward/Forest Ave. pedestrian crossing. During the field visit, the team observed pedestrian activity, reviewed intersection geometry, and identified a few immediate action steps for both the city of Birmingham and MDOT.

Immediate action steps for MDOT:

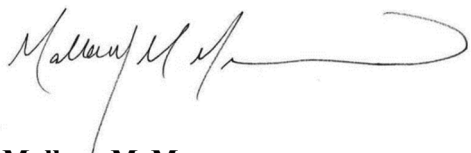
- The Oakland TSC staff will observe pedestrian activities from Forest Ave. to Hazel Street to determine if Forest Ave is the best location for pedestrians to cross.
- MDOT is exploring installing flashing beacons on northbound Woodward Avenue on the existing pedestrian ahead crossing signs.
- MDOT will deploy the speed radar trailer on Woodward Ave.
- MDOT will investigate installing pedestrian countdown signals for SB Woodward at Forest/Brown crosswalk.
- MDOT will evaluate installing a traffic signal with pedestrian countdown signals for NB Woodward at Forest/Brown crosswalk.
- TSC is determining if a pedestrian RSA should be completed.

Actions Steps of City Identified by MDOT:

- The city will investigate removing grown tree branches to improve sight distance.
- The city will investigate installing/changing overhead streetlights.
- The city will provide MDOT with a list of upcoming special events so MDOT can observe and conduct a pedestrian count study.
- The city will provide possible origins and destinations on both sides of Woodward Avenue.
- The city will provide input regarding any pedestrian activity to the south of Forest Ave such as pedestrians crossing near Speedway or transit stops.

As this project is currently in the study phase, MDOT is not able to provide us with a specific timeline, however, we have been assured this is a top priority and has been expedited. We will continue to provide updates as we work with MDOT on identifying solutions at the state level.

Sincerely,



Mallory McMorrow
State Senator
13th District



Mari Manoogian
State Representative
40th District

Cc:

Birmingham City Commission



October 8, 2021

Ms. Gretchen Whitmer, Governor

Ms. Mari Manoogian, State Representative, 40th House District

Ms. Mallory McMorrow, State Senator, District 13

Re: Pedestrian Safety Concerns on Woodward Avenue

Today, it will have been four weeks since we had yet another pedestrian fatality occur on Woodward Avenue at the pedestrian crossing located at the Brown/Forest intersection in Birmingham.

City Manager Tom Markus wrote to each of you on September 23, 2021 and requested your assistance to exercise your executive and legislative oversight and require the Michigan Department of Transportation ("MDOT") to take immediate action to correct the dangerous conditions on Woodward at Brown/Forest to prevent further loss of life. City Manager Markus also requested your assistance to require MDOT to prioritize future funding along Woodward for the improvement of the pedestrian environment.

As noted in our previous letter, extensive public outcry has been received from City residents asking for immediate improvements to address the safety concerns at the dangerous intersection of Woodward and Brown/Forest, and concerns continue to come in from citizens. However, the entire 200' wide Woodward Avenue right-of-way is owned and controlled by MDOT and not by the City. The City's only role in the design and improvement of Woodward Avenue is to investigate incidents, record observations and request assistance and action from MDOT.

In response to our previous correspondence, the City received a joint response letter dated October 4, 2021 from State Senator McMorrow and State Representative Manoogian. This letter stated that both offices reached out to MDOT to ensure they were aware of the seriousness of the safety issues at Woodward and Brown/Forest, and to inquire as to the actions taken by MDOT to swiftly address the dangerous conditions. The letter states that MDOT responded to their request with the following solutions for improvements to this pedestrian crossing:

What has been done so far:

- MDOT met internally to discuss possible solutions to improve pedestrian safety;
- MDOT collected pedestrian counts on September 8 and 9, 2021 for the Woodward at Brown/Forest crosswalk area; and
- MDOT met onsite with City officials and identified action steps for both the City and MDOT.

Immediate Action Steps for MDOT:

- The Oakland TSC staff will **observe** pedestrian activities from Forest to Hazel on Woodward to determine if Brown/Forest is the best location for pedestrians to cross;
- MDOT is **exploring** installing flashing beacons on NB Woodward on the existing pedestrian ahead crossing signs
- MDOT will deploy the speed radar trailer on Woodward;
- MDOT will **investigate** installing pedestrian countdown signals for SB Woodward at Brown/Forest
- MDOT will **evaluate** installing a traffic signal with pedestrian countdown signals for NB Woodward at Brown/Forest
- TSC is **determining** if a pedestrian RSA should be completed. (Emphasis added)

Action Steps of City Identified by MDOT:

- City will investigate removing grown tree branches to improve sight distance;
- City will investigate installing/changing overhead streetlights;
- City will provide MDOT with a list of upcoming specials events so MDOT can observe and conduct a pedestrian count study;
- City will provide possible origins and destinations on both sides of Woodward; and
- City will provide input regarding any pedestrian activity to the south of Forest such as pedestrians crossing near Speedway or transit stops.

While the City appreciates the efforts of Senator McMorrow and State Representative Manoogian to reach out to MDOT for a status update, MDOT's response as outlined in the October 4, 2021 letter continues to demonstrate a lack of urgency to address the clear and present danger to pedestrians at the intersection of Woodward and Brown/Forest.

MDOT's response also conflicts with information provided to the City. MDOT has indicated that so far they met internally to discuss possible solutions to improve pedestrian safety, they have collected pedestrian counts for the Woodward and Brown/Forest intersection, and that they have met with City officials on site. However, when City officials met on site on September 22, 2021, the MDOT representatives stated that they had not conducted any pedestrian counts at the intersection.

MDOT's response further provides that their staff will observe pedestrian activities from Forest to Hazel on Woodward, they will explore installing flashing beacons at the Brown/Forest crosswalk, investigate installing pedestrian countdown signals, evaluate adding a new traffic signal, and determine if a pedestrian Road Safety Audit should be completed. Each of these statements were offered as "solutions for improvements to this pedestrian crossing". Yet these "solutions" involve MDOT agreeing only to observe, explore, investigate and evaluate existing conditions and crossing improvements, with no commitment whatsoever to install or implement any permanent improvements. The only site change MDOT proposes is to temporarily deploy a speed radar trailer on Woodward.

However, MDOT's response assigns specific action items and site improvements to the City of Birmingham. This is clearly a deflection of responsibility for the safety, design and operation of Woodward to the City, despite the fact that MDOT owns and controls the entire 200' width of Woodward Avenue. It should also be noted that the information requested from the City with

regards to upcoming special events and possible origins and destinations on Woodward in the vicinity of the Brown/Forest pedestrian crossing were provided directly to the MDOT representatives present at the site visit on September 22, 2021.

Since the site meeting with MDOT representatives, City staff has conducted a site inspection of the MDOT right-of-way to survey existing vegetation to determine if any tree trimming was needed to address sight distance concerns. City staff found that there are no trees, tree limbs or other vegetation obstructing sight distance for pedestrians or drivers, nor any vegetation obstructing any of the existing street lighting located in the MDOT right-of-way. City staff has also surveyed the existing street lighting in the vicinity of the Brown/Forest crosswalk and noted that there are lighting issues in the MDOT right-of-way.

Accordingly, City staff also met with a representative of DTE earlier this week to discuss potential improvements to the overhead street lighting in the MDOT right-of-way. Current deficiencies were noted with regards to overall illumination levels, and light distribution at grade in the vicinity of the Woodward and Brown/Forest pedestrian crossing. After a review of available options, the City Manager has committed to making the lighting improvements to replace the existing high pressure sodium luminaires with new LED luminaires on Woodward from Lincoln to Maple, subject to receiving the appropriate DTE agreements. In addition, the City Manager has committed to purchasing upgraded LED luminaires to provide brighter lighting at the Woodward and Brown/Forest pedestrian crosswalk, subject to receiving the appropriate DTE agreements.

At the conclusion of the on site meeting on September 22, 2021, City officials advised MDOT that immediate action was needed to improve pedestrian safety. The City requested additional signage, lighting, pavement markings or even the addition of containers of pedestrian high visibility orange fluorescent crossing flags on both sides of the Woodward crossing, and to have one or more of these safety measures installed within one week. City officials also asked MDOT to schedule a Road Safety Audit as soon as possible.

Four weeks have now passed, and MDOT has not installed any permanent or temporary pedestrian safety measures at the Woodward and Brown/Forest pedestrian crossing. MDOT officials have not provided any commitment to install or implement any pedestrian safety measures, nor scheduled a Road Safety Audit.

The City of Birmingham has continued to reach out to MDOT over the past month and has specifically requested the consideration of the following safety improvement alternatives for emergency implementation at the Brown/Forest pedestrian crossing:

1. The installation of pedestrian signal heads at the existing west leg of the intersection;
2. The installation of LED Enhanced Warning signs;
3. The installation of advance yield lines and signage on NB Woodward at the uncontrolled crossing, as recommended on page 27 of MDOT's Best Design Practices manual;
4. The installation of additional lighting, with a positive offset, as recommended on page 33 of MDOT's Best Design Practices manual; and/or
5. The installation of a Pedestrian Hybrid Beacon, a pedestrian traffic signal or a grade separated crossing to comply with MDOT's Type D crossing standards.

The only response the City has received from MDOT to date was an email that indicated that MDOT was currently working on a guidance document for the installation of LED Enhanced Warning signs, but the document was still being reviewed by the Traffic Safety Statewide

Alignment Team and had not yet been finalized. Despite this response to delay consideration of LED Enhanced Warning signs, these signs are already installed and in use on I-75 within Oakland County and could certainly be considered for the Brown/Forest crossing on Woodward. Advance yield lines, overhead crossing signage with beacons and rapid flashing beacons are also currently in use on Telegraph due to previous pedestrian fatalities, and could immediately be installed on Woodward at the Brown/Forest pedestrian crossing to prevent additional injury or death.

The City of Birmingham has requested pedestrian crossing improvements at Brown/Forest for many years, and has been told on several occasions that MDOT would conduct safety assessments and studies at this intersection, and get back to us with recommendations. The same answer is given each time...MDOT will study the issue. Yet, the dangerous situation remains.

Once again, MDOT has indicated in their response to Senator McMorrow and State Representative Manoogian that they are currently "in the study phase" and thus unable to provide a specific timeline for the implementation of pedestrian safety measures on Woodward at Brown/Forest. This is simply not enough. Two pedestrians have lost their lives at this intersection over the past 13 months, and still no improvements have been made. Years have passed in which MDOT has had more than enough time to study the issues at this crossing. Immediate action is needed, and it is incumbent upon each of you as elected officials to ensure that pedestrian improvements are installed and/or implemented immediately to protect the health, safety and welfare of our citizens.

The City of Birmingham requests your intervention to compel MDOT to take immediate corrective action at the pedestrian crossing at Woodward and Brown/Forest through the installation of pedestrian signals, LED Enhanced Warning signs, advance yield lines, positive offset lighting and/or pedestrian hybrid beacons or other safety measures. Further, the City requests your assistance to compel MDOT officials to appear before the Birmingham City Commission on October 25, 2021 to inform the public of both immediate and long term plans to address the pedestrian safety issues on Woodward at Brown/Forest to reduce the clear and present danger to our citizens.

Yours truly,

Jana L Ecker,
Assistant City Manager

Cc: Paul Ajegba, Director, MDOT
Chuck Moss, Oakland County Commissioner
Thomas Markus, Birmingham City Manager
Birmingham City Commission
City Department Heads



October 13, 2021

Ms. Gretchen Whitmer, Governor

Ms. Mari Manoogian, State Representative, 40th House District

Ms. Mallory McMorrow, State Senator, District 13

Re: Pedestrian Safety Concerns on Woodward Avenue

Birmingham City Manager Tom Markus wrote to each of you on September 23, 2021 and requested your assistance to exercise your executive and legislative oversight and require the Michigan Department of Transportation ("MDOT") to take immediate action to correct the dangerous conditions on Woodward at Brown/Forest to prevent further loss of life. City Manager Markus also requested your assistance to require MDOT to prioritize future funding along Woodward for the improvement of the pedestrian environment.

Birmingham Police Chief Clemence wrote to you on October 4, 2021, again seeking your assistance to motivate MDOT to immediately address pedestrian safety concerns at the intersection of Woodward and Brown/Forest. And further, to request that MDOT move forward with a comprehensive review of Woodward Avenue to address pedestrian safety as a whole and to integrate the road into the fabric of our walkable community.

I also wrote to each of you again on October 8, 2021 requesting your intervention to compel MDOT to take immediate corrective action at the pedestrian crossing at Woodward and Brown/Forest through the installation of pedestrian signals, LED Enhanced Warning signs, advance yield lines, positive offset lighting and/or pedestrian hybrid beacons or other safety measures.

To date, more than four weeks after the second pedestrian death occurred at the intersection of Woodward and Brown/Forest, MDOT has not made any permanent or temporary improvements to the existing pedestrian crossing despite ongoing requests for immediate action.

What has MDOT done? They have placed a speed trailer in the median in the vicinity of the crosswalk. In addition, on October 12, 2021 MDOT officials advised the City's transportation consultants at Fleis and VandenBrink that a quote has been requested from the Road Commission for Oakland County ("RCOC") for the following:

- The installation of pedestrian signal heads on the southbound leg of the Woodward and Brown/Forest intersection on the existing signal equipment; and

- The installation of a flashing beacon to the existing advance crosswalk signage located in advance of the marked crosswalks on both the northbound and southbound lanes of Woodward.

While the installation of pedestrian signal heads on the southbound leg of the intersections would certainly enhance the safety of this portion of the pedestrian crosswalk, the addition of flashing beacons to existing signage will likely have a minimal effect on enhancing pedestrian safety in the crossing on the northbound leg of the intersection. Safety measures that would directly improve the safety of pedestrians on the northbound leg include the installation of LED Enhanced Warning signs, advance yield lines, positive offset lighting and/or pedestrian hybrid beacons at the pedestrian crossing, as previously requested by the City of Birmingham.

With that being said, the City is thankful that MDOT has now recognized the pedestrian safety concerns at the intersection of Woodward and Brown/Forest, and has agreed that physical improvements are necessary to ensure the safety of pedestrians at this location. The City certainly supports the installation of the above elements offered by MDOT as an interim measure.

However, MDOT has also advised that they do not have any funding available to implement even the above interim improvements, but that they are able to install the pedestrian signal heads and flashing beacons immediately if the City is willing to fund these improvements. Once again, MDOT's response is to deflect responsibility for safety issues in their right-of-way to the City of Birmingham, despite the fact that MDOT owns and controls the entire 200' width of Woodward Avenue.

This latest response from MDOT raises yet more questions:

- When will the estimated costs be available from the RCOC?
- Is MDOT requesting that the City of Birmingham pay for needed safety improvements on a roadway under MDOT's jurisdiction?
- Is MDOT asking the City of Birmingham to front the costs of these interim safety measures and then reimburse the City these funds at some specified future date?
- If so, when will MDOT be able to free up money to reimburse the City of Birmingham?
- Is it standard practice for MDOT to shirk responsibility for the design, operation and safety of State owned roads and deflect them onto local communities?
- How is it that MDOT has no money available to address clear and pressing pedestrian safety issues only two weeks into the start of their fiscal year?

MDOT continues to demonstrate to the citizens of Birmingham, and all Michigan residents, a lack of urgency to address clear and present danger to pedestrians on roadways owned and operated by MDOT. I implore each of you as elected officials to ensure that pedestrian improvements are installed and/or implemented immediately to protect the health, safety and welfare of our citizens.

Once again the City of Birmingham requests your intervention to compel MDOT to take immediate corrective action at the pedestrian crossing at Woodward and Brown/Forest through the installation of pedestrian signals, LED Enhanced Warning signs, advance yield lines, positive offset lighting and/or pedestrian hybrid beacons or other safety measures. Further, the City requests your assistance to compel MDOT officials to appear before the Birmingham City Commission on

October 25, 2021 to inform the public of both immediate and long term plans to address the pedestrian safety issues on Woodward at Brown/Forest.

Yours truly,

Jana L Ecker,
Assistant City Manager

Cc: Paul Ajegba, Director, MDOT
Chuck Moss, Oakland County Commissioner
Thomas Markus, Birmingham City Manager
Birmingham City Commission
City Department Heads

DATE: October 20, 2021

TO: Thomas M. Markus, City Manager
Jana Ecker, Assistant City Manager

FROM: Scott D. Zielinski, Assistant City Engineer

SUBJECT: Woodward Ave. Lighting Improvements

INTRODUCTION:

As part of the evaluation for safety improvements to the crosswalk across Woodward at E Brown St / Forest Ave, the City contacted DTE to see what improvements could be made to the lighting conditions of the crosswalk intersection, DTE provided recommendations for improving lighting conditions in both the immediate area of this crosswalk and the surrounding area to help improve pedestrian safety.

BACKGROUND:

Woodward Avenue has a pedestrian crossing that starts on the north side of E. Brown St. The cross walk proceeds across the southbound lanes of Woodward to the median between the southbound and north bound lanes. From the median the cross walk continues across the northbound lanes to the east to the north side of Forest Ave.

The primary lighting for this particular crosswalk is provided by the DTE lights in the median of Woodward Avenue.

The City met with DTE to discuss options for the best way to increase visibility in the crosswalk area by improving the lighting conditions of the cross walk area. The current lights in the median are High Pressure Sodium lights that provide an orange-amber light. DTE advised that an upgrade to a more efficient LED light would provide an immediate improvement to visibility. DTE advised as part of this work upgrading the lighting from Maple Road all the way to Lincoln St. should be undertaken (see the attached diagram provided by DTE).

By upgrading to LED, how many more lumens of light will be created and will that make this section of roadway more visible?

- The 136w LED luminaire has 17,400 initial delivered lumens. Approximately 128 lumens per watt. This luminaire has a Type II lighting distribution pattern. It will throw the light forward 50' measuring .5fc. Then have a lateral distribution of .5fc at approx. 80', .1fc at approx. 130'.

- The 238w LED luminaire has 29,185 initial delivered lumens. Approximately 123 lumens per watt. This luminaire has a Type II lighting distribution pattern. It will throw the light forward approx. 60' measuring .5fc. Then have a lateral distribution of .5fc at approx. 100', .1fc at approx. 160'.
- The 250w High Pressure Sodium has 23,000 lumens. 92 lumens per watt.

How will this area be brighter if there are less lumens in the LED?

- The existing 250w HPS luminaires have a drop glass lens. These are often referred to as omni-directional emitters because they throw out light/lumens in nearly all directions (including up in the sky). So you "lose" lumens because of that. Whereas LED luminaires have more of a direct light source. Generally, more of the LED light output goes where it is wanted (the road), and less where it's not wanted (up into the sky).
- HPS lamps give off an orange-amber glow and appear darker. Whereas the LEDs emit a bright white light and makes objects (people, buildings, cars, etc...) brighter.

What is the aesthetic difference in the light quality and how has the public reacted to that condition in other communities?

- The current lamp source along this stretch is High Pressure Sodium (HPS). HPS lamps emit an orange-amber light (~2200 Kelvin). Whereas the LED being proposed emit a natural white light (4000 Kelvin) that is comparable to the moonlight.
- Upgrading the lights to LED will brighten the roadway and make objects more visible (compared to HPS)
- For a heavy vehicle and pedestrian traffic area such as this, DTE believes that an overwhelming majority of residents will appreciate the new LED lighting source. All new projects that DTE has worked on with the City in the past 5 years have all been LED. So, the residents are already familiar with the nice white light. It is likely that some people might not like the LEDs. But the focus of this project is making this area safer.

What is the logic behind doing the roadway from Maple to Lincoln if we are prioritizing the Brown/Forest intersection?

If the focus of the project was to concentrate at the crosswalks, why are you recommending converting all the lights (from Maple to Lincoln) to LED?

- In short, it's easier on the eyes (retina, cones/rods) to have a consistent light source (LED), as opposed to the eyes having to adapt to a HPS light, then LED light, then HPS light.

How long will it take to install all the lights after the agreement is signed?

- Generally, our process allows 90 days to complete a project of this size. The 90 day process starts when we receive the signed agreement and payment for the project. However, the DTE representative feels confident that if DTE receives the signed agreements and payment by the end of the month, that DTE can have the project completed by mid/late-December.

LEGAL REVIEW:

The DTE Purchase Agreement was reviewed by the City Attorney, they have no objection to the form or substance of the agreement.

FISCAL IMPACT:

DTE's Purchase agreement indicates the total cost of the LED upgrade to be \$23,340.00. This cost has been confirmed by DTE. The City will save \$4,032.36 per year in costs related to lighting expenses. Upon completion of the project there will be a rebate of \$1,632.00.

SUMMARY:

In summary the City is looking to upgrade Woodward Avenues median lighting between the light on the north side of the Maple/Woodward intersection through the south side of the Lincoln/Woodward intersection to LED lighting for the median poles. DTE can complete the project in this area by the end of the year if approved. This work will both improve pedestrian safety in this area while saving the city money in lighting costs over time.

ATTACHMENTS:

DTE Purchase agreement including the Lighting Improvement map.

SUGGESTED COMMISSION ACTION:

Make a motion, adopting a resolution approving the DTE Purchase Agreement to upgrade the lighting to LED lighting for the Woodward Avenue Median between the Maple Road and Lincoln St., and to authorize and direct the City Manager to sign the DTE Lighting Agreement to proceed with this work.

Exhibit A to Master Agreement


Purchase Agreement

This Purchase Agreement (this "Agreement") is dated as of October 11, 2021 between DTE Electric Company ("Company") and City of Birmingham ("Customer").

This Agreement is a "Purchase Agreement" as referenced in the Master Agreement for Municipal Street Lighting dated April 11, 2013 (the "Master Agreement") between Company and Customer. All of the terms of the Master Agreement are incorporated herein by reference. In the event of an inconsistency between this Agreement and the Master Agreement, the terms of this Agreement shall control.

Customer requests Company to furnish, install, operate and maintain street lighting equipment as set forth below:

1. DTE Work Order Number:	55379363 If this is a conversion or replacement, indicate the Work Order Number for current installed equipment: N/A	
2. Location where Equipment will be installed:	[Woodward Ave between Maple and Lincoln], as more fully described on the map attached hereto as <u>Attachment 1</u> .	
3. Total number of lights to be installed:	61	
4. Description of Equipment to be installed (the " <u>Equipment</u> "):	Underground Fed Streetlight Conversion 47 - 250w High Pressure Sodium to 136w LED (Gray) 1 - 400w High Pressure Sodium to 136w LED (Gray) 10 - 250w High Pressure Sodium to 238w LED (Gray) 3 -136w LED to 238w LED (Gray)	
5. Estimated Total Annual Lamp Charges	\$21,131.16	
6. Estimated Total Annual Post Charges if selected	\$0.00	
7. Computation of Contribution in aid of Construction (" <u>CIAC Amount</u> ")	Total estimated construction cost, including labor, materials, and overhead:	\$23,340.00
	Revenue credit:	\$0.00
	CIAC Amount (cost minus revenue)	\$23,340.00
	Credit for Post Charge, if selected	\$0.00
8. Payment of CIAC Amount:	Due promptly upon execution of this Agreement \$23,340.00	
9. Term of Agreement	5 years. Upon expiration of the initial term, this Agreement shall continue on a month-to-month basis until terminated by mutual written consent of the parties or by either party with thirty (30) days prior written notice to the other party. If Post Charge "box" <input type="checkbox"/> is checked the Customer agrees to following term: 10 years. Upon expiration of the initial term, this Agreement shall continue on a month-to-month basis until terminated by mutual	

	written consent of the parties or by either party with thirty (30) days prior written notice to the other party.
10. Does the requested Customer lighting design meet IESNA recommended practices?	(Check One) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO If "No", Customer must sign below and acknowledge that the lighting design does not meet IESNA recommended practices Sign here _____ 
11. Customer Address for Notices:	City of Birmingham 151 Martin Street Birmingham, MI 48012

12. Special Order Material Terms:

All or a portion of the Equipment consists of special order material: (check one) ☐ YES ☒ NO

If "Yes" is checked, Customer and Company agree to the following additional terms.

A. Customer acknowledges that all or a portion of the Equipment is special order materials ("SOM") and not Company's standard stock. Customer will purchase and stock replacement SOM and spare parts as provided in Section B below. When replacement equipment or spare parts are installed from Customer's inventory, Company will credit Customer in the amount of the then-current material cost of Company standard street lighting equipment in lieu of which the SOM is being used.

B. Customer will maintain an inventory of at least _0_ posts and _0_ luminaires and any other materials agreed to by Company and Customer, and will replenish the stock by ordering materials no later than thirty (30) calendar days after the materials are drawn from inventory. Costs of initial inventory are included in this Agreement. If Customer fails to maintain the required inventory, Company, after 30 days' notice to Customer, may (but is not required to) order replacement SOM and Customer will reimburse Company for its costs (including the labor costs associated with Company's management of the supply chain for the SOM) no later than thirty (30) calendar days after receipt of Company's invoice for such costs. Customer acknowledges that failure to maintain required inventory could result in extended outages due to SOM lead times.

C. The inventory will be stored at _____. Access to Customer's inventory site must be provided between the hours of 9:00 am to 4:00 pm, Monday through Friday with the exceptions of federal Holidays. If Company is unable to access the site during such hours for any reason, Company (i) shall be relieved from any obligation or commitment to complete the work as scheduled, and (ii) may, at its option, procure the inventory itself and have Customer to reimburse Company's costs for doing so. Customer shall name an authorized representative to contact regarding inventory: levels, access, usage, transactions, and provide the following contact information to Company:

Name: _____ Title: _____

Phone Number: _____ Email: _____

Customer will immediately notify Company of any changes in the Authorized Customer Representative. Customer must comply with SOM manufacturer's recommended inventory storage guidelines and practices. Damaged SOM will not be installed by Company.

D. In the event that SOM is damaged by a third party, Company may (but is not required to) pursue a damage claim against such third party for all of Company's costs incurred because of the claim, including all labor and replacement materials. Company will notify Customer as to whether Company will pursue such claim within a reasonable time of the SOM being damaged.

E. In the event that SOM becomes obsolete, discontinued, or incompatible with Company's infrastructure, Customer shall select new alternate SOM that is compatible with Company's then-existing infrastructure. If Customer does not select compatible alternate SOM, Company reserves the right to select compatible SOM that is, in its reasonable judgment, substantially similar, or replace the SOM with standard materials, in either case being entitled to reimbursement from Customer for Company's costs in providing such transition of supply (including internal overhead and labor costs).

F. Should Customer experience, in Company's reasonable judgment, excessive LED equipment failures that are not supported by LED manufacturer warranties, Company will replace the LED equipment with other Company supported Solid State or High Intensity Discharge luminaires at Company's discretion. The full cost to complete these replacements to standard street lighting equipment will be the responsibility of Customer.

Company and Customer have executed this Purchase Agreement as of the date first written above.

Company:

DTE Electric Company

By: _____

Name: _____

Title: _____

Customer:

City of Birmingham

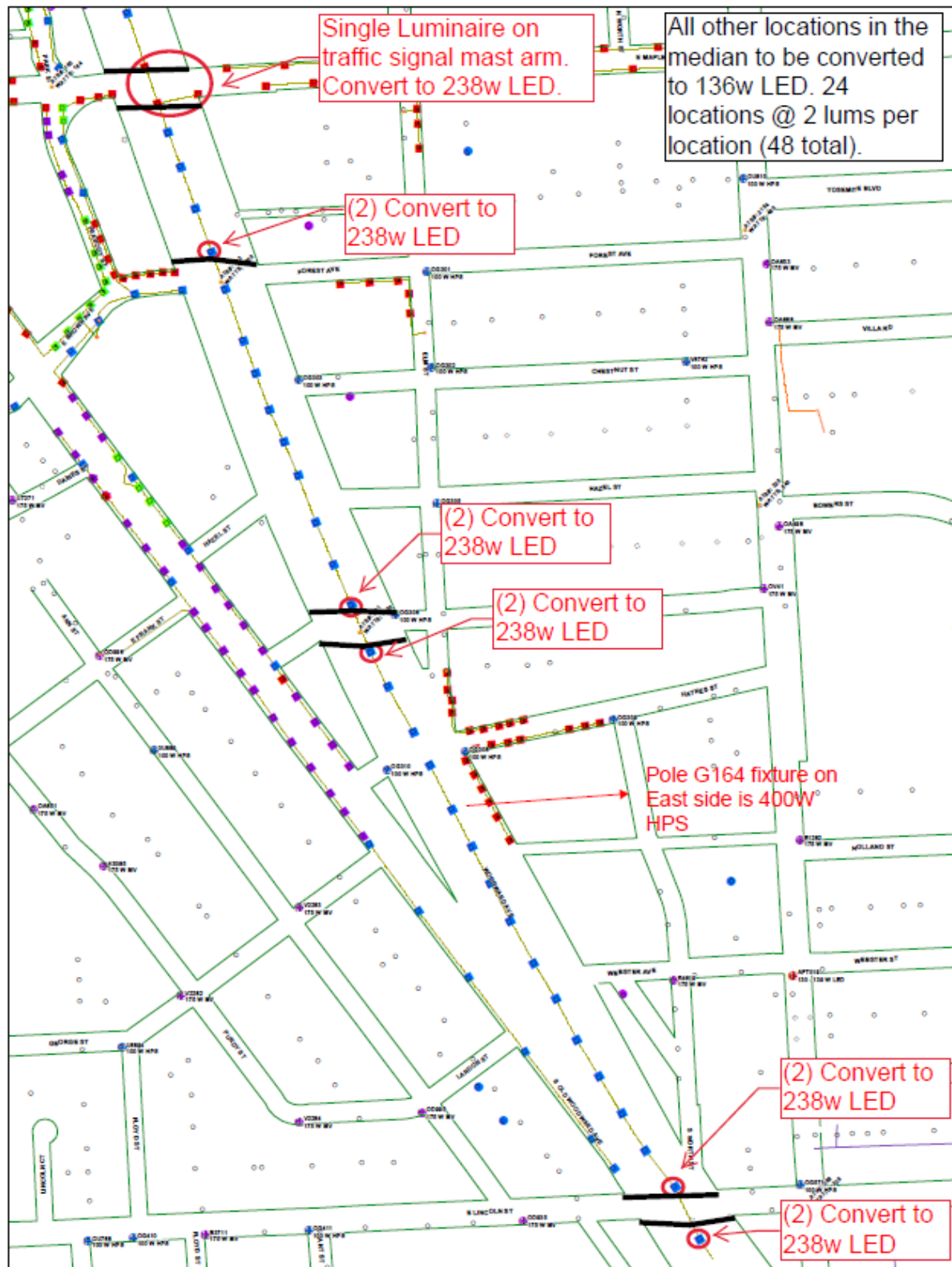
By: _____

Name: _____

Title: _____

SIGN HERE

Map of Location



MEMORANDUM

(Police Department)

DATE: October 13, 2021

TO: Thomas M. Markus, City Manager

FROM: Mark H. Clemence, Chief of Police

SUBJECT: Pedestrian Safety – Crosswalk Flags

INTRODUCTION:

Two fatal pedestrian crashes at Woodward and Brown/Forest have occurred in the past thirteen months. In both of these incidents the pedestrians were struck by vehicles (northbound and southbound) as they attempted to walk across Woodward Avenue.

Many cities throughout the country have incorporated the use of pedestrian flags at select intersections to reinforce pedestrian safety. Pedestrian flag programs place bright colored flags at crosswalks to help pedestrians obtain the attention of motorists. Pedestrians simply pick up a flag from the storage canister when reaching a crosswalk, hold the flag out raised toward the street, wait for traffic to clear, cross the street holding the flag and leave the flag in the canister on the other side of the street. Pedestrian flags are not traffic control devices. Pedestrian flags are tools to increase visibility and driver awareness. Criteria for determining locations for use of pedestrian flags (pedflags) currently in use by other communities include: the crosswalk must be marked and NOT controlled by any traffic control device (signal, sign or beacon).

BACKGROUND:

Pedestrian flags are low cost items and installation is simple. Approximately 10 flags are used at each crosswalk. Flag holder containers are attached to existing sign posts or utility poles near the ends of crosswalks. If no mounting post is available, one could be easily installed. Once the installation of the flag holders and signs are complete the only ongoing cost is for replacement flags. Many communities use volunteers (merchants, scouts, community members) to monitor, redistribute and replace flags.

The proposed flags would be 12"x12" in size, printed on high visibility orange vinyl coated nylon material and would include a reflective strip sewn into each side of the flags. The flags would be attached to a 24" wooden dowel.

The City of Kirkland, Washington implemented a pedflag program in 1995 in an attempt to improve pedestrian safety. This program was instituted following two fatal pedestrian accidents in 1994. A resident of Kirkland had seen a pedestrian flag system in Japan and suggested a similar program. As of 2019, Kirkland has over 90 crosswalks with pedflags.

The City of Bellvue, Washington launched a pedflag pilot project in 2017 to evaluate the effectiveness of pedestrian flags. After a one year study, the engineer evaluating the program noted that although the flags can draw more attention to pedestrians, the use of the flags was limited and most people chose not to pick up and use the flags. Senior Transportation Engineer Kurt Latt of the Bellvue Transportation Department stated that he is "not convinced that the flags are beneficial to pedestrian safety." Mr. Latt stated that he would not promote crosswalk flags on high speed multi-lane divided highways as a higher level of scrutiny is warranted under these circumstances.

Several communities utilize pedestrian crossing flags in school zones to improve pedestrian visibility and enhance driver awareness. The City of Arlington, Massachusetts implemented a pedestrian crossing flag program to improve safety around schools. The pedestrian flags were determined to be a low cost measure to improve pedestrian visibility. Response from this program was reported to be overwhelmingly positive and the program was extended to other schools and locations.

The City of Seattle, Washington installed pedestrian crossing flags at 17 locations as part of a pilot program in 2008. The pilot program lasted for 3 years. After evaluation of the results at the 17 pilot locations (including measuring motorist compliance at the 17 crosswalks) the Seattle Department of Transportation ended the pilot program. The evaluation concluded that availability of flags did not seem to make pedestrians more visible to motorists. Theft and maintenance of flags were other issues cited upon termination of the pilot program. The Seattle program ended after it found that "there was not a consistent pattern of improved compliance observed, and some locations were not able to be evaluated due to frequent theft of the flags."

Berkeley, California implemented a pedflag program at 7 intersections between 2001 and 2004. The results of this program revealed that only 2% of pedestrians used the flags. Theft of flags was also a significant issue in Berkeley and the city had to buy 8,000 flags due to theft related disappearances. The conclusions from Berkeley were that "the flag program did not seem to have a significant effect on pedestrian safety."

Salt Lake City, Utah initiated a crosswalk flags program after that city was declared "not pedestrian friendly". In 2000, the mayor of Salt Lake City created a pedestrian safety committee aimed at reducing pedestrian injury accidents. The crosswalk flags program was part of several safety measures initiated in 2000. Pedestrian flag usage in Salt Lake City resulted in increased visibility and the flags clearly signaled pedestrians' desire to cross the street. The Salt Lake City project showed that both pedestrians and drivers thought that there was a benefit of the simple presence of the flags available at crosswalks.

Due to lack of funding and increased demand for additional flagged intersections the Salt Lake City, an Adopt-a-Crosswalk Program was initiated in 2001. This program allows individuals or businesses to "adopt" crosswalks – the sponsor monitors the flags and purchases replacement flags when needed. The city is responsible for the purchase and installation of the flag holders, usage signs and the initial supply of flags. While six initial crosswalks were equipped with flags in 2000, by 2007 there were 40 city maintained flag locations in the Salt Lake City downtown area. The Adopt-a-Crosswalk program resulted in an additional 134 "adopted" crosswalks; 46 adopted by schools and 88 adopted by businesses and residents.

Salt Lake City (SLC) Transportation Planner Dan Bergenthal stated that SLC has utilized crosswalk flags on an eight-lane divided highway. This project was initiated after permission was granted from the Utah Department of Transportation (UDOT). Mr. Bergenthal stated that crosswalk flags are used only on unprotected and non-signalized crossings and he added that SLC received "little grief" from UDOT. The SLC city attorney reviewed the crosswalk flag program prior to implementation and found no liability issues or objections as the flags are not official traffic control devices. Mr. Bergenthal also stated that there are no COVID policies or procedures for the crosswalk flags.

Salt Lake City modified city ordinances to increase penalties for drivers who fail to yield for disabled pedestrians, pedestrians carrying orange flags and school crossing guards with a recommended fine of \$425.00.

After installation of the initial crosswalk flags in Salt Lake City, observations and interviews revealed that 11% of pedestrians were using the flags. 6 months after installation the flag usage was estimated at 14%. Although the usage was low, media coverage resulted in increased public awareness about pedestrian safety education. The pedestrian flags and Adopt-a-Crosswalk program have been credited with inducing a 31% decrease in citywide pedestrian injury crashes.

Roger Millar, vice president of Smart Growth America and director of the National Complete Streets Coalition created a flag program in McCall, Idaho when he was the community development director for that city. Millar stated that the program worked well and is not concerned by occasional flag theft. Mr. Millar says that the flags are "a great amenity" particularly for families, seniors and people who take additional street crossing cautions.

A crosswalk flag pilot project could be implemented at Woodward Avenue at Brown/Forest at little expense.

- (8) 12"x18" aluminum usage signs (directions for pedestrian flag use)
@ \$22.00 each = \$176.00
(vendor: Dornbos Signs)
- (4) galvanized U-channel posts @ \$59.70 each = \$238.80
(vendor: Dornbos Signs)
- (24) 12"x12" orange vinyl coded nylon high visibility pedestrian flags with reflective strips sewn into both sides of flag (mounted onto a 24" wooden dowel handle). Includes (4) sturdy all-weather flag storage canisters and post mounting hardware = \$399.98 (vendor: See Me Flags)
- Replacement flags are available for a cost of \$6.00 each – sold by the dozen (24 spare flags including shipping = \$166.00)
(vendor: See Me Flags)

Total cost for Woodward Avenue at Brown/Forest intersection pedflag project = \$980.78

LEGAL REVIEW:

The city attorney was asked to review this program and found no objections or legal actions required.

FISCAL IMPACT:

Funding is available in the Major Streets Traffic Controls operating supplies account number 202303.001-729.0000 to provide for the purchase of the materials needed for the implementation of a crosswalk flag program at the Woodward Avenue Brown/Forest Street intersection. A budget amendment or budget adjustment is not required.

PUBLIC COMMUNICATIONS:

None

SUMMARY:

The purpose of pedestrian flags is to assist pedestrians in gaining attentiveness from motorists. It is paramount that pedestrians remain vigilant and use safe street crossing techniques at all intersections. Some issues concerning pedestrian crossing flags include clarity of use, management of flags to maintain availability on both sides of the street, theft of flags and consistent monitoring of flag supply. Similar to the SLC experience in Utah, the City of Birmingham would have to receive permission from the Michigan Department of Transportation (MDOT) for the installation of a pedflag system at Woodward and Brown/Forest.

Topics for study during the pedestrian flag pilot project will include:

- Determine whether pedestrians use the flags or choose to cross without them
- Determine whether drivers respond differently to a pedestrian using a flag
- Determine the frequency at which flags go missing and other maintenance required
- Determine if the pedestrian flags increase overall safety for users

ATTACHMENTS:

- Crosswalk Flag Usage Instructions Sign Proof
- Crosswalk Flag, Canisters and Usage Photo

SUGGESTED COMMISSION ACTION:

Make a motion authorizing the chief of police and the city engineer to seek approval from the Michigan Department of Transportation to install a pedestrian crosswalk flag system on Woodward Avenue at Forest/Brown; further to approve the chief of police to purchase additional pedestrian crosswalk flags as needed; further to charge this expenditure to the Major Streets Fund Traffic Controls operating supplies account # 202-303.001-729.0000.







MEMORANDUM

Planning Division

DATE: May 27th, 2022

TO: Multi-Modal Transportation Board

FROM: Brooks Cowan, Senior Planner
Scott Zielinski, Assistant City Engineer
Commander Scott Grewe, Police Department

SUBJECT: Multi-Modal Transportation Plan Overview

INTRODUCTION:

On April 7th, 2022, City staff presented an overview of the Multi-Modal Transportation Plan to the Board. A part of the discussion included what had been accomplished, and what elements could possibly be updated for the plan, given that it is almost 10 years old now.

In order to guide the process for making updates to the Multi-Modal Plan, City staff and consultants would like to gauge feedback on what updates are important to the Multi-Modal Board. MKSK has prepared a survey for the Board members to fill out, please find the link below to fill out. Results will be presented to the Board on Thursday June 2nd, 2022 to encourage discussion regarding priorities in the Multi-Modal Transportation Plan. The April 7th, 2022 Memo is below under background, along with related attachments and link to the actual plan.

Please complete the survey link below:

<https://forms.office.com/r/ETexmfsqCE>

BACKGROUND:

The City of Birmingham adopted the Multi-Modal Transportation Plan (MMTP) in November of 2013. The Multi-Modal Transportation Plan acts as a guiding document for projects related to mobility for automobiles, pedestrians, bicycles, public transit, and other various modes of transportation. As stated in the MMTP's Executive Summary:

The Multi-modal Transportation Plan is very specific in its recommendations by design, perhaps more so than most other master plans. The plan's specificity is a response to the demands of transportation planning within an existing, constricted environment. It presents a realistic picture of what is currently feasible within the confines of the existing roadway and public rights-of-way.

.... this Master Plan should be used as a guide. It provides a pragmatic vision of what can be accomplished in the City of Birmingham in the near future. As each corridor is scheduled for improvements, the recommendations should be revisited to see that they work with the current context, still meet the expectations of the community and reflect current best practices. What will hold over time is the concept of complementary networks. As each corridor is evaluated, it should be done so through the lens of the network of which it is a part and the overall intent of the master plan.

Referring to recommendations in the MMTP is meant to guide the City's boards towards decisions in a consistent manner that is not arbitrary or random. The Multi-Modal Transportation Board refers to recommendations in the MMTP whenever construction and/or repairs are scheduled for a particular road, sidewalk, or right-of-way. Elements including but not limited to road width, sidewalk width, street parking, bike lanes, street trees, signage, crosswalk markings, bus stops, and more are considered when evaluating upcoming projects. The Multi-Modal Transportation Board also refers to the MMTP when the City is evaluating ways to enhance existing conditions with additional multi-modal features such as bike lanes, bump-outs, and bus stops.

The 2013 Multi-Modal Transportation Plan is broken into five main sections of the following:

1. Introduction - Covers items such as vision, goals, and objectives of the plan as well as the project approach.
2. Policy & Program Recommendations – Programs the City should pursue to accommodate a better multi-modal network, such as creating what is now known as the Multi-Modal Transportation Board and ensuring the City's sidewalk and crosswalk network is ADA compliant.
3. Physical Environment Recommendations – a multi-modal network for pedestrians, bicyclists, and transit users that is safe and pleasant to use. This section identifies specific locations in the City that could benefit from multi-modal enhancements.
4. Network Implementation Plan – Recommendations for how the City should approach implementing the Plan's recommendations in a phasing process.
5. Specific Area Concept Plans – Design recommendations for Lincoln Street, West Maple Road, Woodward Avenue, and Downtown.

The five main sections of the MMTP are supplemented with the plan's public engagement process including survey results, workshop results, and open house results. It also

includes reference documents related to best practices for public policy, physical environment design, community programs, and quality of life measures.

Link to Multi-Modal Transportation Plan

<https://greenwaycollab.com/projects/birmingham-multi-modal-transportation-plan/>