MULTI-MODAL TRANSPORTATION BOARD
THURSDAY, JANUARY 3, 2019
6:00 PM
CITY COMMISSION ROOM
151 MARTIN STREET, BIRMINGHAM

1. Roll Call
2. Introductions
3. Review of the Agenda
4. Approval of Minutes, Meeting of **November 1, 2018**
5. **Whole Foods Entry at Maple Road / N. Eton –** Request by property owner to **e**liminate no right turn into Whole Foods
6. **Maple Road / N. Eton – Signal Timing**
7. Meeting Open to the Public for items not on the Agenda
8. Miscellaneous Communications
9. Next Meeting – **February 7, 2019**
10. Adjournment

Notice: Due to Building Security, public entrance during non-business hours is through the Police Department—Pierce St. Entrance only. Individuals with disabilities requiring assistance to enter the building should request aid via the intercom system at the parking lot entrance gate on Henrietta St.

Persons with disabilities that may require assistance for effective participation in this public meeting should contact the City Clerk's Office at the number (248) 530-1880, or (248) 644-5115 (for the hearing impaired) at least one day before the meeting to request help in mobility, visual, hearing, or other assistance.

Las personas con incapacidad que requieren algún tipo de ayuda para la participación en esta sesión pública deben ponerse en contacto con la oficina del escribano de la ciudad en el número (248) 530-1800 o al (248) 644-5115 (para enos un dia antes de la reunión para solicitar ayuda a la movilidad, visual, auditiva, o de otras asistencias. (Title VI of the Civil Rights Act of 1964).

CITY OF BIRMINGHAM
MULTI-MODAL TRANSPORTATION BOARD
THURSDAY, NOVEMBER 1, 2018
City Commission Room
151 Martin Street, Birmingham, Michigan

Minutes of the regular meeting of the City of Birmingham Multi-Modal Transportation Board held Thursday, November 1, 2018.

Vice-Chairperson Lara Edwards convened the meeting at 6:04 p.m.

1. ROLL CALL

Present: Board Members Vice-Chairperson Lara Edwards, Amy Folberg, Daniel Rontal, Katie Schafer, Doug White; Alternate Board Member Daniel Isaksen

Absent: Chairperson Johanna Slanga; Student Representative Alex Lindstrom

Administration: Jana Ecker, Planning Director
Austin Fletcher, Asst. City Engineer
Scott Grewe, Police Dept. Commander
Paul O'Meara, City Engineer
Carole Salutes, Recording Secretary

Fleis & Vanderbrink ("F&V"):
Justin Rose, Traffic Engineer

MKSK: Brad Strader

2. INTRODUCTIONS

Mr. Strader introduced Scott Shogan from WSP who is their national speaker on autonomous connected vehicles.

3. REVIEW AGENDA (no change)

4. APPROVAL OF MINUTES, MMTB MEETING OF OCTOBER 4, 2018

Motion by Ms. Folberg
Seconded by Mr. Rontal to approve the MMTB Minutes of October 4, 2018 as presented.

Motion carried, 6-0.

VOICE VOTE
Yeas: Folberg, Rontal, Edwards, Isaksen, Schafer, White
Abstain: None
Nays: None
Absent: Slanga

5. MAPLE RD. IMPROVEMENTS - SOUTHFIELD RD. TO WOODWARD AVE.

Mr. Strader recalled that since they last met and this board made recommendations, they went to the City Commission and the Commission agreed with most of the recommendations. However, there were some that they wanted to revisit in more detail, so MKSK and F&V have been working to respond to those and to the Commission's additional ideas as well. He offered the refined design in a PowerPoint presentation.

- Direction from the City Commission on the following topics and locations:
  - Parking spaces - MKSK and F&V went with the Xs and proposed a barrier free design. The City Commission felt the barrier free design intruded too much on the sidewalk and they wanted to go with the standard design with a wider sidewalk.
  - The street trees were revised to delete the columnar trees. Zelkova trees are now being recommended, in addition to Honey Locusts.
  - The City Commission wanted more detail on the Southfield Rd./Maple Rd. Intersection.
  - The Commission wanted to terminate the view at the intersection of Maple Rd. and Henrietta.
  - They requested clarity on the amenities.
  - Also, they requested additional options for the intersection at Maple Rd./Park/Peabody to meet MMTB goals.

- MKSK and F&V are still on their time line; coming back to this board in November for the final design recommendations, then beginning the engineering drawings and looking at a 2020 construction.

- Only five overall parking spaces will be lost after working with MDOT, City staff and the design team. Initially they thought 25 spaces would be lost. They were able to keep the Xs between parking spaces.
- There is very good coverage on barrier-free spaces along Old Woodward Ave. with one ADA accessible space for every 25 spaces in a block. With the angled parking, extra barrier space is allowed for van accessibility.
- The City Commission agreed with the flush tree grates if they are needed to get as much sidewalk width as possible. However, they think after working with MDOT that there is now enough width so the grates may not be needed.
- Mr. Rose took over the presentation at this point. He advised that the City Commission endorsed the mast arm signal recommendation and requested more design details to

ease pedestrian crossing but still accommodate truck turns. Their data collection consultant is scheduled to determine what size trucks need to be accommodated.

- Ms. Ecker commented that they don't want the big trucks to go through Downtown. However, once the truck counts are received they will see if it is worth dedicating all of that pavement to them.
- Mr. Rose said they are looking at something to differentiate and guide the passenger vehicles into the normal concrete but allow trucks to go over it.
- Mr. O'Meara verified that they have asked F&V to explore a couple of other ideas that are still in the design stages before this gets to the Commission.
- Mr. Rontal suggested if they do away with the bumpout on the SE corner and add a pedestrian refuge in between, it would effectively cut the crosswalk distance in half.

- Mr. Strader said at the intersection of Maple Rd. and Henrietta the terminating vista treatment could be a large art sculpture, seating, and/or enhanced landscaping.
- The amenities in Phase 1 will be included in Phase 2, such as bike racks near tapered zones, benches at intersections, and mid-block crossings.
- For the intersection at Maple Rd./Park/Peabody Mr. Rose recalled that everyone was in agreement that Option 4 which is a fully signalized intersection where there is stop control for the right turns heading WB would work the best. However, the City Commission's issue was the width of the sidewalk on the south side of Maple Rd. between Woodward Ave. and Park/Peabody. They asked that several different options be explored. However, every option to reduce the number of lanes forced cars to become backed up. So the conclusion was that five lanes are important. Also, eliminating the right turn lane ended up being a catastrophe.
    - Then they went to MDOT and asked what else they could do. MDOT was open to reducing the five lanes to 10 ft. in width for that one block. That enabled them to get 11.5 ft. of sidewalk to the south which is enough room to continue all of the streetscaping elements.
    - Discussion concluded that a gateway treatment at both the east and west would be a good idea.
- The City Commission wondered if they could include a pedestrian crossing on the east leg of the Park/Peabody intersection. However, anaylsis showed that if that crossing was added it would not work for vehicles or pedestrians.

Motion by Ms. Folberg
Seconded by Mr. Rontal that with the understanding that the intersection of Southfield Rd. and Maple Rd. still needs some refinement, the Multi-Modal Transportation Board makes the following recommendations relative to the Maple Rd. conceptual design from Southfield Rd. to Woodward Ave.:
1. The crossing of Maple Rd. on the eastern leg at Peabody/Park will not be pursued.
2. Three ADA accessible parking spaces will be provided in the corridor. The spaces shall be sized the same as the other parking spaces in the project area, and located near an intersection so as to be able to make use of the proposed ramps at the intersection.

3. Columnar trees will be deleted in favor of trees similar to those used on the Phase 1 project.
4. The Southfield Rd. intersection realignment will be refined to permit all truck turning movements, as shown.
5. The taper length east of Old Woodward Ave. will be reduced to the minimum required, thereby allowing the addition of two more parking spaces on the E. Maple Rd. block.
6a. The cross-section of Maple Rd. east of Park St. will be reconstructed with five 10 ft. wide lanes, pending approval of a design exception from MDOT.

Motion carried, 6-0.

VOICE VOTE
Yeas: Folberg, Rontal, Edwards, Isaksen, Schafer, White
Nays: None
Absent: Slanga

6. COLLECTOR STREET PAVING PROGRAM IMPROVEMENTS

Park St. – Oakland Blvd. to Hamilton Ave.
Peabody St. – E. Maple Rd. to E. Brown St.
Bowers St. – Woodward Ave. to S. Adams Rd.
Elm St. – Bowers St. to Woodward Ave.

The above commercial street segments are budgeted for maintenance work in 2019. The work varies from asphalt resurfacing to full depth pavement replacement. Other than Park St., no curb and gutter sections are planned for removal, other than patching. With that in mind, no street widths are being changed with this project. As is typically done, staff has reviewed the Multi-Modal Transportation Plan (MMTP) to verify if any multi-modal improvements should be incorporated into the project at this time. The following summarizes this review:

1. Park St. - Oakland Blvd. to Hamilton Ave.: The MMTP does not call for any improvements on this segment.

Staff Recommendation:
- Replace handicap ramps and pavement markings at the Oakland Blvd. intersection with new 12 ft. wide walking surface.
- Replace handicap ramps and pavement markings at the mid-block crossing with new 8 ft. wide walking surface.

2. Peabody St. – E. Maple Rd. to E. Brown St.: The MMTP does not call for any improvements on Peabody St.

Staff Recommendation:

- Require construction of a mid-block crossing at a later date as a part of the new construction as 34965 Woodward Ave.
- At Brown St., replace the handicap ramps and pavement markings to meet the City's current standards at the mid-block crossing at 8 ft. wide.

3. Bowers St. – Woodward Ave. to S. Adams Rd.: The MMTP recommended the addition of sharrows to mark this stretch as a part of a neighborhood connector route.

Elm St. – Bowers St. to Woodward Ave.: The MMTP does not call for any improvements on Elm St. A widened crosswalk is also proposed on Elm St. where it meets Woodward Ave.

Discussion considered eliminating parking along the south side of Bowers St. and adding two bike lanes. Board members discussed adding markings for bicycles at a later date when there are other connections for the neighborhood connector route. Ms. Ecker noted the number one complaint from the Triangle District is the lack of parking. Further, getting rid of the parking would not provide enough room for bike lanes.

Staff Recommendation:

- On Bowers St., replace handicap ramps at the Elm St. and Adams Rd. intersections to meet the City's current crosswalk standards at 8 ft. wide.
- On Elm St., replace handicap ramps at the Elm St. and Woodward Ave. intersection to meet the City's current crosswalk standards at 6 ft. wide.

Motion by Mr. Rontal
Seconded by Ms. Folberg to recommend to the City Commission the following improvements to be included in the Collector Streets Paving Program, in accordance with the Multi-Modal Transportation Plan:

Regarding Park St.:
• Replace handicap ramps and pavement markings to meet the City's current standards such that the Oakland Blvd. crossing has a 12 ft. wide walking surface, and the mid-block crossing has an 8 ft. wide walking surface.

Regarding Peabody St.:
• Postpone construction of a mid-block crossing until new construction at 34965 Woodward Ave. is completed.
• Replace handicap ramps and pavement markings to meet the City's current crosswalk standards such that the Brown St. crossing has an 8 ft. wide walking surface.

Regarding Bowers St. and Elm St.:
• Replace handicap ramps and pavement markings to meet the City's current crosswalk standards such that the Bowers St. intersections of Elm St. and

Adams Rd., as well as the Elm St. intersection at Woodward Ave. have 8 ft. wide walking surfaces.

There was no public present to comment.

Motion carried, 6-0.

VOICE VOTE
Yeas: Rontal, Folberg, Edwards, Isaksen, Schafer, White
Nays: None
Absent: Slanga

7. CONTINUING EDUCATION: AUTONOMOUS VEHICLES

Guest Speaker: Scott Shogan, PE, PTOE
Connected/Automated Vehicle Market Leader, WSP

Mr. Shogan presented background regarding the latest thinking on autonomous vehicles (AV). There is pressure on the companies that are developing this technology to race ahead. There will be opportunities opening up for new users that may not be able to access the system well today, such as the elderly and people with disabilities. The car companies are looking increasingly at how they would provide mobility as a service rather than selling vehicles directly to consumers.

Almost all of these automated vehicles are being built on electric vehicle platforms. So, advancing battery technology will be a big piece going forward. General Motors is talking about next year launching driverless fleets of taxis in three different locations.

Most of the automated vehicles do everything via sensors that are onboard as opposed to connected vehicles which use a cooperative communication system where the vehicles are actually talking digitally to one another, the roadside, and to the cloud interoperable systems that work across all equipment and manufacturers.

It's not just about the technology, there is also the reality of physical street space.

- Mr. Strader spoke about the new mobility era:
  - Ride hailing (Uber, Lyft, car-share)
  - Shared bike systems
  - Rapid bus systems
  - Communication technology
  - On-board vehicle safety features

25% of peak hour traffic in San Francisco is Uber/Lyft.

- Impacts on cities and timing will depend upon:

- Will vehicle travel go up or down?
- Who will own the AVs - individuals or shared use?
- Where will the vehicles park and drop off?
- Will convenience of AVs reduce the willingness to walk or bike?

Self-driving vehicles are likely to increase total vehicle travel, although it depends on the ownership model and the level of supporting infrastructure.

Connected autonomous vehicles will improve the capacity of intersections.

- Impacts to certain land uses:
  - Gas stations replaced by electric charging stations.
  - Will we have fewer or more auto-oriented uses?

- Impacts on street design:
  - Will more narrow lanes be feasible?
  - Demands for curbside space.
  - Cost to upgrade "Smart Transportation" infrastructure.

- Parking Impacts:
  - How will autonomous vehicles affect parking demand?
  - There is likely to be a reduced overall parking demand.
  - Developers and cities may be less willing to build expensive parking structures, or seek alternatives.

Design new garages for flexibility, such as having flat floors to accommodate new uses in the future.

Mr. Rontal questioned if there is anything that can be done to try and future proof some of their plans and make it easier to do conversions down the road. Mr. Shogan suggested:

- Putting in the conduit for fiber optic cable when doing a road project.
- Plan parking structures in terms of re-use.
- Consider drop-off space in design schemes.

Mr. Rose asked what can be done from a traffic signal perspective. Mr. Shogan replied:

- Size the signal control cabinets to be ready.
- Add inexpensive features to the traffic signal controller that would make it easier to add new functionality later.

Ms. Edwards asked if there are any plans for electric vehicle charging stations. Mr. Shogan advised that the range has been increasing a lot. Already they can go 300 miles without a charge. The technology will definitely improve. Mr. O'Meara said there hasn't been enough demand in Birmingham that they would close off parking spaces and make them only available to electric vehicles.

Ms. Edwards asked about cyber security for the connected vehicles. Mr. Shogan said that is a whole industry unto itself because of the disastrous effect if there is vulnerability.

8. MEETING OPEN TO THE PUBLIC FOR ITEMS NOT ON THE AGENDA
(no public)

9. MISCELLANEOUS COMMUNICATIONS (none)

10. NEXT MEETING DECEMBER 6, 2018 at 6 p.m.

11. ADJOURNMENT

No further business being evident, the board members adjourned at 7:42 p.m.

Jana Ecker, Planning Director

Paul O'Meara, City Engineer

City of Birmingham
A Walkable Community

MEMORANDUM

Engineering Dept.
Planning Dept.
Police Dept.

DATE: **December 21, 2018**

TO: **Multi-Modal Transportation Board**

FROM: **Jana Ecker, Planning Director**
Scott Grewe, Police Commander
Paul T. O'Meara, City Engineer

SUBJECT: **Maple Rd. & N. Eton Rd. Intersection**
No Right Turn Restriction to Whole Foods Driveway

As you may be aware, extensive discussion occurred between the various interested parties to redesign the above intersection to accommodate the addition of the Whole Foods grocery store at this location. In order to encourage higher capacity of vehicles traveling eastbound on Maple Rd., a No Right Turn restriction was added to the site plan for eastbound Maple Rd. vehicles wishing to turn south into the first Whole Foods driveway. (Those customers are expected to continue east and use the second driveway into the Whole Foods property.)

At the request of Whole Foods, Rowe Engineering was hired to study whether there would be a measurable impact on the operation of the intersection if the No Right Turn restriction was removed. The attached analysis by Rowe, followed by responses from the City's consultant F&V, are attached. Both consultants, as well as City staff, are in agreement that this change will have minimal impact on the intersection operation. A suggested recommendation is attached.

SUGGESTED RESOLUTION:

To approve the removal of the No Right Turn restriction on eastbound Maple Rd., at the intersection of Maple Rd. and N. Eton Rd., provided that the applicant installs a TURNING VEHICLES WATCH FOR PEDESTRIANS sign to be placed for eastbound Maple Rd. traffic, as recommended.

ROWE PROFESSIONAL SERVICES COMPANY

Large Firm Resources. Personal Attention. sm

November 14, 2018

Mr. Linden Nelson
Nelson Ventures
3501 West Maple Road, Suite B
Troy, MI 48084

Re: Existing Whole Foods Supermarket
West Driveway Inbound Right-Turn Restriction Evaluation
City of Birmingham, Michigan

Dear Mr. Nelson:

ROWE Professional Services Company has completed our traffic evaluation related to the existing Whole Foods supermarket located on the south side of Maple Road just east of N. Eton Street in the City of Birmingham, Oakland County. Currently, the west site driveway, which forms the south leg of the signalized intersection of Maple Road and N. Eaton Street, has a signed prohibition of eastbound right-turn vehicles into the site, requiring these eastbound vehicles to enter the site at the east site driveway. The evaluation has been performed to determine the operational and vehicle queuing impacts of allowing these eastbound vehicles access to the site at the west driveway. This evaluation has been performed in accordance with the requirements specified by the City of Birmingham and their traffic consultant.

Traffic Counts

Turning movement traffic counts were collected during the weekday AM (7 a.m. to 9 a.m.), mid-day (11 a.m. to 1 p.m.), and PM (4 p.m. to 6 p.m.) peak periods on September 18, 2018, as well as the weekend peak supermarket period (1 p.m. to 3 p.m.) on September 16, 2018 at the intersections of Maple Road with S. Eton Street and N. Eton Street/west Whole Foods driveway, as well as the east Whole Foods driveway. The existing turning movement traffic counts are shown in Figure 2 attached to this letter.

At the same time the traffic counts were being collected, origin-destination information was collected on the right-turn movement into the Whole Foods site at the east site driveway to determine which entering vehicles were coming from southbound N. Eton Street, and those coming from the west on Maple Road for all the peak periods reviewed. The origin-destination traffic counts are shown in Figure 3 attached to this letter.

Proposed Traffic Redistribution

Using the information obtained from the origin-destination data, the portion of the site traffic entering the Whole Food site via right turns at the east site driveway from Maple Road west of N. Eton Street was redistributed to the west site driveway opposite N. Eton Street. This traffic was deducted from both the eastbound through movement at N. Eton Street and the eastbound right-turn movement at the east site driveway and added to the existing (currently prohibited) eastbound right-turn movement at N. Eton Road. The redistributed driveway volumes are shown in Figure 4, with the redistributed intersection volumes shown in Figure 5.

Level of Service Analysis

Level of service (LOS) analyses for existing and redistributed traffic conditions for the weekday AM, mid-day, and PM peak hours, as well as the Sunday peak period, was performed for the intersections of Maple Road with S. Eton Street, N. Eton Street/west Whole Foods driveway, and the east Whole Foods site driveway.

According to the most recent edition (6th Edition) of the Highway Capacity Manual, LOS is a qualitative measure describing operational conditions of a traffic stream or intersection. Level of service ranges from A to F, with LOS A being the best. LOS D is generally considered to be acceptable. Tables 1 and 2 present the criteria for defining the various levels of service for unsignalized and signalized intersections, respectively.

Currently, the signalized intersections of Maple Road with S. Eton Street and N. Eton Street/west Whole Foods driveway are operated via a single controller. The *HCM 6th Edition* does not allow for evaluation of these "clustered" intersections, so the evaluation was performed in accordance with the methodology specified in the *HCM 2000 Edition*, in accordance with Michigan Department of Transportation requirements.

Table 1
Level of Service Criteria (Unsignalized Intersection)

Level of Service	Average Stopped Delay/Vehicle (seconds)
A	≤10
B	>10 and ≤ 15
C	>15 and ≤ 25
D	>25 and ≤ 35
E	>35 and ≤ 50
F	> 50

Note: LOS "D" is considered acceptable in urban/suburban areas.

Table 2
Level of Service Criteria (Signalized Intersection)

Level of Service	Average Stopped Delay/Vehicle (seconds)
A	≤10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

Note: LOS "D" is considered acceptable in urban/suburban areas.

The results of the level of service and 95th percentile queue length analyses for the intersections listed above are summarized in Tables 3 through 8.

Signalized Intersection of Maple Road and S. Eton Street
The results of the LOS analysis for the signalized intersection of Maple Road and S. Eton Street indicate that all approaches to the intersection operate at an LOS D or better during all peak periods. The overall intersection operates at an LOS C during all peak periods, except for the PM peak period when it operates at an LOS B.

The intersection would continue to operate in a manner like existing conditions with the proposed removal of the eastbound right-turn prohibition at the intersection of Maple Road and N. Eton Street/west Whole Foods driveway.

The operational and 95th percentile queue length results for the intersection of Maple Road and S. Eton Street are presented in Tables 3 and 4.

Table 3
Existing Eastbound Right-Turn Prohibition
Proposed Eastbound Right-Turn Allowed
Level of Service Analysis for Maple Road and S. Eton Street

Approach	2018 AM Peak	2018 Mid-Day Peak	2018 PM Peak	2018 Sunday Peak
Eastbound Maple Road	D (39.9)	D (39.4)	D (37.5)	C (34.8)
Westbound Maple Road	A (2.8)	A (2.3)	A (2.2)	A (2.7)
Northbound S. Eton Street	D (49.5)	D (49.1)	C (28.8)	D (39.1)
Overall Intersection	**C (22.4)**	**C (24.2)**	**B (19.4)**	**C (21.6)**

(XX.X) Average seconds of delay per vehicle.

Table 4
Existing Eastbound Right-Turn Prohibition
Proposed Eastbound Right-Turn Allowed
95th Percentile Queue Lengths - Maple Road and S. Eton Street

Approach	2018 AM Peak	2018 Mid-Day Peak	2018 PM Peak	2018 Sunday Peak
Eastbound Maple Road TH	337’	358’	427’	276’
Westbound Maple Road TH	112’	80’	103’	61’
Northbound S. Eton Street LT	78’	106’	112’	56’
Northbound S. Eton Street RT	94’	85’	306’	59’

Signalized Intersection of Maple Road and N. Eton Street/West Whole Foods Driveway
The results of the LOS analysis for the signalized intersection of Maple Road and N. Eton Street/west Whole Foods driveway indicate that all approaches to the intersection operate at an LOS D or better during all peak periods, except for the northbound approach which operates at an LOS E during the mid-day and PM peak periods. The overall intersection operates at an LOS C during all peak periods.

The intersection would continue to operate in a manner like existing conditions with the proposed removal of the eastbound right-turn prohibition at the intersection of Maple Road and N. Eton Street/west Whole Foods driveway.

The operational and 95th percentile queue length results for the intersection of Maple Road and N. Eton Street/east Whole Foods driveway are presented in Tables 5 and 6.

Table 5
Existing Eastbound Right-Turn Prohibition
Proposed Eastbound Right-Turn Allowed
Level of Service Analysis for Maple Road and N. Eton Street/West Whole Foods Driveway

Approach	2018 AM Peak	2018 Mid-Day Peak	2018 PM Peak	2018 Sunday Peak
Eastbound Maple Road	B (17.1)	B (11.5)	A (1.5)	B (13.1)
Westbound Maple Road	D (39.2)	D (39.9)	D (40.9)	D (35.4)
Northbound Whole Foods Driveway	D (47.1)	E (62.2)	E (58.5)	D (39.0)
Southbound N. Eton Street	C (24.6)	D (48.3)	C (25.4)	C (21.2)
Overall Intersection	**C (27.1)**	**C (29.1)**	**C (21.0)**	**C (23.8)**

(XX.X) Average seconds of delay per vehicle.

Table 6
Existing Eastbound Right-Turn Prohibition
Proposed Eastbound Right-Turn Allowed
95th Percentile Queue Lengths - Maple Road and N. Eton Street/West Whole Foods Driveway

Approach	2018 AM Peak	2018 Mid-Day Peak	2018 PM Peak	2018 Sunday Peak
Eastbound Maple Road TH	155’ / 154’	119’ / 116’	30’ / 28’	119’ / 116’
Westbound Maple Road LT	0’	16’	25’	25’
Westbound Maple Road TH	411’	387’	448’	291’
Northbound Whole Foods Driveway LT	42’	137’	115’	104’
Northbound Whole Foods Driveway TH	5’	38’	39’	34’
Southbound N. Eton LT	92’	85’	101’	69’
Southbound N. Eton TH	136’	51’	159’	7’

XX’ / XX’ Existing Prohibited Right-Turn Queue Length / Proposed Allowed Right-turn Queue Length. If not indicated, queue lengths reported as same for both conditions.

Unsignalized Intersection of Maple Road and the East Whole Foods Driveway

The results of the LOS analysis for the signalized intersection of Maple Road and the east Whole Foods driveway indicate that all approaches to the intersection operate at an LOS C or better during all peak periods.

The intersection would operate marginally better than existing conditions with the proposed removal of the eastbound right-turn prohibition at the intersection of Maple Road and N. Eton Street/west Whole Foods driveway.

The operational and 95th percentile queue length results for the intersection of Maple Road and the east Whole Foods driveway are presented in Tables 7 through 9.

Table 7
Existing Eastbound Right-Turn Prohibition
Level of Service Analysis for Maple Road and the East Whole Foods Driveway

Approach	2018 AM Peak	2018 Mid-Day Peak	2018 PM Peak	2018 Sunday Peak
Eastbound Maple Road	A (-)	A (-)	A (-)	A (-)
Westbound Maple Road[1]	B (10.2)	B (11.4)	B (12.4)	B (10.9)
Northbound Whole Foods Driveway	B (12.3)	C (16.3)	C (16.8)	C (15.8)

(XX.X) Average seconds of delay per vehicle.
(-) Approach is unopposed and experiences no delay.
[1] Results presented are for left-turn movement. Overall approach operates at LOS A with minimal delays.

Table 8
Proposed Eastbound Right-Turn Allowed
Level of Service Analysis for Maple Road and the East Whole Foods Driveway

Approach	2018 AM Peak	2018 Mid-Day Peak	2018 PM Peak	2018 Sunday Peak
Eastbound Maple Road	A (-)	A (-)	A (-)	A (-)
Westbound Maple Road[1]	B (10.0)	B (10.9)	B (12.4) / B (12.0)	B (10.4)
Northbound Whole Foods Driveway	B (12.1)	C (15.5)	C (16.8) / C (16.1)	B (14.9)

(XX.X) Average seconds of delay per vehicle.
(-) Approach is unopposed and experiences no delay.
[1] Results presented are for left-turn movement. Overall approach operates at LOS A with minimal delays.
X (XX.X) / X (XX.X) Existing Prohibited Right-Turn LOS / Proposed Allowed Right-turn LOS. If not indicated, LOS reported as same for both conditions.

Table 9
Existing Eastbound Right-Turn Prohibition
Proposed Eastbound Right-Turn Allowed
95th Percentile Queue Lengths - Maple Road and the East Whole Foods Driveway

Approach	2018 AM Peak	2018 Mid-Day Peak	2018 PM Peak	2018 Sunday Peak
Eastbound Maple Road TH	(-)	(-)	(-)	(-)
Westbound Maple Road LT	5' (0.2 veh.)	20' (0.8 veh.)	18' (0.7 veh.) / 15' (0.6 veh.)	18' (0.7 veh.) / 15' (0.6 veh.)
Northbound Whole Foods Driveway RT	8' (0.3 veh.)	38' (1.5 veh.) / 35' (1.4 veh.)	25' (1.0 veh.) / 23' (0.9 veh.)	30' (1.2 veh.) / 28' (1.1 veh.)

XX' / XX' Existing Prohibited Right-Turn Queue Length / Proposed Allowed Right-turn Queue Length. If not indicated, queue lengths reported as same for both conditions.
(-) Approach is unopposed and does not experience queuing.
HCM 6th Edition provides queue lengths in terms of vehicles. Lengths provided are based on assumed vehicle length of 25 feet.

Three-Year Safety Review

As part of our operational review of permitting westbound right-turns into the Whole Foods site driveway opposite N. Eton Road, ROWE has reviewed the most recent available three-year, eight-month (January 1, 2015 through August 15, 2018) crash history near the project location. Crash data was obtained from the Transportation Improvement Association of Michigan for the approximately three-year (January 1, 2015 to December 31, 2017) period prior to the store opening (on October 25, 2017), and the approximately eight-month period since the store opening (January 1 through August 15, 2018). The review consisted of all crashes reported at the intersections of E. Maple Road with S. Eton Road, N. Eton Road and Edenborough Road, as well as the E. Maple Road segments between the intersections. The result of the crash review is provided below.

E. Maple Road and S. Eton Road

During the entire three-year, eight-month review period, a total of 37 crashes were reported within 200 feet of this intersection, consisting of 25 rear-end crashes, 5 sideswipe crashes (4 same-direction and 1 opposite-direction), 4 single vehicle collisions, 2 angle crashes, and 1 other-object collision. Twenty-one (21) crashes occurred during dry pavement conditions, 8 during wet pavement conditions, 4 during snowy pavement conditions, 2 during icy pavement conditions, and 2 during slushy pavement conditions. Neither alcohol nor drugs were listed as a factor in any of the reported collisions.

Table 10
E. Maple Road and S. Eton Road
Crashes by Type

#	Type of Crash	Crashes	Crash % Based on Type of Crash
1	Rear End	25	67.6%
2	Sideswipe Same Direction	4	10.8%
3	Miscellaneous Single Vehicle	4	10.8%
4	Angle Straight	2	5.4%
5	Sideswipe Opposite Direction	1	2.7%
6	Other-Object	1	2.7%
	Totals	**37**	**100.0%**

Of the 37 total crashes to occur within 200 feet of this intersection, 3 crashes resulted in C-level (possible) injuries to four people; no other injuries or fatalities occurred during the review period. Most of the crashes occurred during peak periods with congested traffic conditions and most could be attributed to driver errors (failure to yield, unable to stop, improper lane use, etc.). All the crashes reported appear to be related to the signalized operation of the intersection and unrelated to the Whole Foods site driveways.

E. Maple Road and N. Eton Road/West Whole Foods Driveway

During the entire three-year, eight-month review period, a total of 15 crashes were reported within 200 feet of this intersection, consisting of 8 rear-end crashes, 4 sideswipe same-direction collisions, 2 angle crashes and 1 head-on collision. Thirteen (13) of the crashes occurred during dry pavement conditions, 1 during wet pavement conditions, and 1 during snowy pavement conditions. One collision reported alcohol as a factor, the single head-on collision, which involved a parked vehicle.

Table 11
E. Maple Road and N. Eton Road
Crashes by Type

#	Type of Crash	Crashes	Crash % Based on Type of Crash
1	Rear End	8	53.3%
2	Sideswipe Same Direction	4	26.7%
3	Angle Straight	2	13.3%
4	Head-On (Alcohol Related)	1	6.7%
	Totals	**15**	**100.0%**

Of the 15 total crashes to occur within 200 feet of this intersection, only 1 collision resulted in C-level (possible) injuries to one person; no other injuries or fatalities occurred during the review period. Like the intersection of E. Maple Road and S. Eton Road, most of the crashes occurred during peak periods with congested traffic conditions and most could be attributed to driver errors (failure to yield, unable to stop, disregard traffic control, etc.).

Only 1 of the 35 total crashes were related to the Whole Foods site driveway, a sideswipe collision that occurred on July 30th of this year between two vehicles attempting to exit the site simultaneously. None of the collisions reported involved interactions between eastbound vehicles and the Whole Foods site driveway.

E. Maple Road and Edenborough Road, including E. Maple Road between N. Eton and Edenborough Roads
During the entire three-year, eight-month review period, a total of 13 crashes were reported along E. Maple Road and within 200 feet of the Edenborough Road intersection, consisting of 9 rear-end crashes, 3 angle crashes and 1 sideswipe same-direction collision. Nine of the crashes occurred during dry pavement conditions, two during wet pavement conditions, one during snowy pavement conditions and one during slushy pavement conditions. One collision reported alcohol as a factor, one of the rear-end collisions, involving westbound vehicles stopped on the road occurring during the weekday PM peak period (congested traffic) with dry pavement conditions.

Table 12
E. Maple Road between N. Eton and Edenborough Roads
Crashes by Type

#	Type of Crash	Crashes	Crash % Based on Type of Crash
1	Rear End	9	69.2%
2	Angle Straight	3	23.1%
3	Sideswipe Same Direction	1	7.7%
	Totals	**13**	**100.0%**

Of the 13 total crashes to occur along this segment of E. Maple Road, only 3 crashes resulted in C-level (possible) injuries to six people; no other injuries or fatalities occurred during the review period. Like the intersections of Maple Road with N. Eton and S. Eton Streets, most crashes occurred during peak periods with congested traffic conditions and most could be attributed to driver errors (failure to yield or unable to stop).

None of the crashes reported were related to the Whole Foods driveway. All the rear-end crashes and the sideswipe collision involved westbound vehicles stopped in traffic due to the traffic signal at E. Maple Road and N. Eton Street, and the angle collisions were related to the apartment complex driveways on the north side of E. Maple Road (2) or the LA Fitness driveway on the south side of E. Maple Road (1).

Sight Distance for Right Turning Vehicles into the West Driveway
An evaluation of the available sight distance for vehicles wishing to turn right into the west driveway was completed. The evaluation revealed a driver traveling eastbound in the right lane on Maple Road, can see a pedestrian or bicyclist approximately 150 feet in advance of the driveway. Traveling the speed limit without slowing down, the driver will travel the 150 feet in about 3.4 seconds. Researching this requirement, we found no specific design parameters for this situation. However, we believe that there is enough concern due to the uniqueness of the situation where a warning to right turning drivers is justified. We researched the Michigan Manual of Uniform Traffic Control Devices and found a sign that is ideally suited for this situation. The sign is an R10-15, “Turning Vehicles Yield to Pedestrians”. The intent of this sign is to remind drivers who are making turns to yield to pedestrians.

Impact on Multi-Modal Transportation Plan Recommendations

Review of the Multi-Modal Transportation Plan with respect to this proposed change revealed no impact on the plan.

Conclusions and Recommendations

The proposed removal of the eastbound right-turn restriction at the intersection of Maple Road and N. Eton Street/west Whole Foods driveway is not anticipated to noticeably affect the operation or vehicle queues at the study intersections during all three peak periods reviewed. Allowing the eastbound right-turn at the west Whole Foods driveway would marginally improve the operation of the east site driveway, since fewer vehicles would be arriving at the intersection, providing more and larger gaps for traffic to use exiting the site.

The review of the three-year crash history did not reveal any safety issues at either of the Whole Foods driveways. Only one crash of the 63 reported appeared to be related to either of the Whole Foods driveways.

The review of the available sight distance for vehicles wishing to turn right into the west driveway revealed, a driver traveling eastbound in the right lane on Maple Road can see a pedestrian or bicyclist about 150 feet in advance of the west driveway. This distance gives a driver approximately 3.4 seconds to see and properly yield to a pedestrian or bicyclist. We recommend that a R10-15, "Turning Vehicles Yield to Pedestrians", be installed in place of the right turn restriction sign in advance of the west driveway.

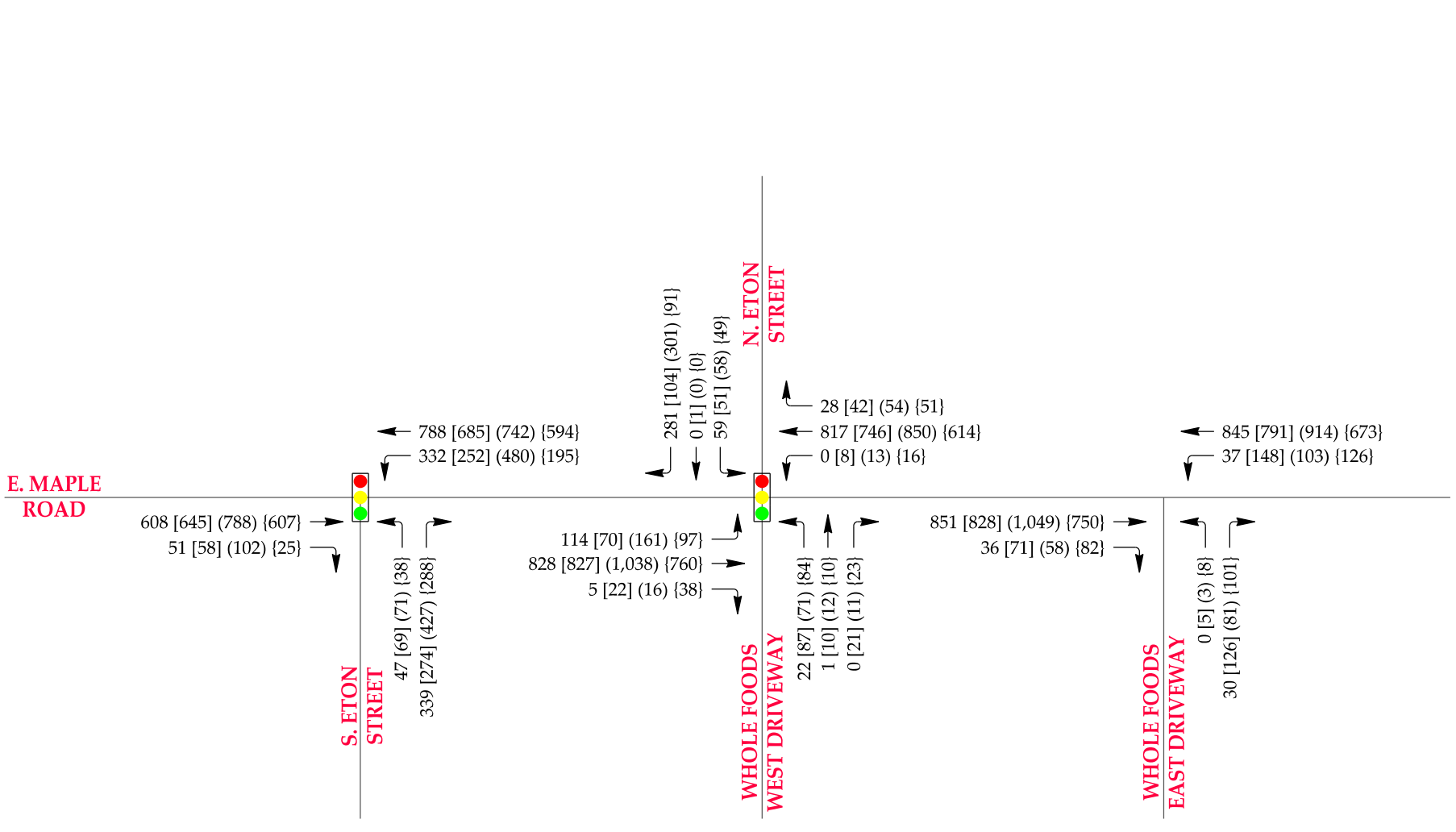
Sincerely,
ROWE Professional Services Company

Michael J. Labadie, PE
Senior Project Manager

Attachments

\\sem\cad\Projects\18F0027\Docs\Design\Birmingham_Whole-Foods_TIA_Letter_11-18.docx

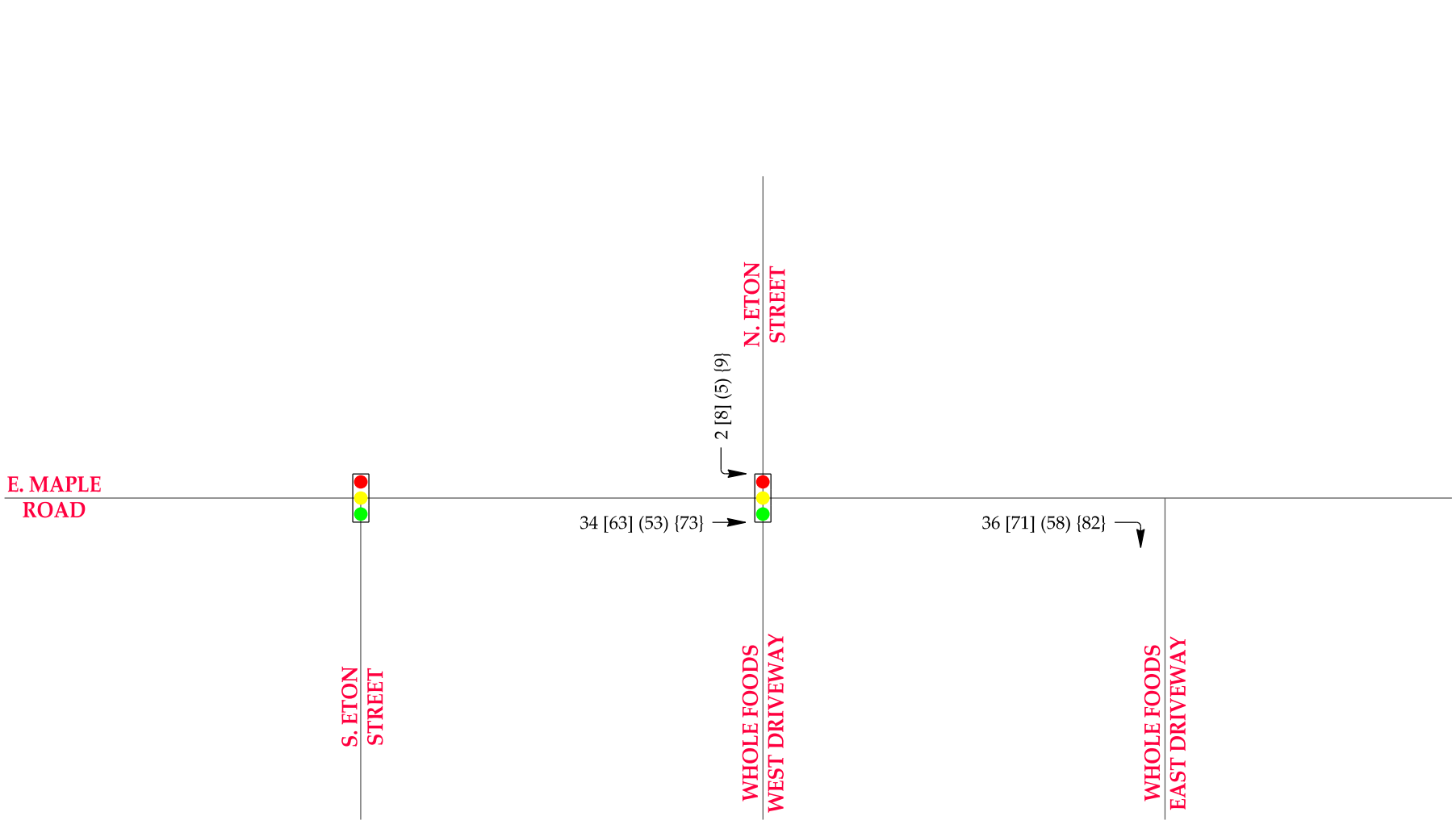
REPORT FIGURES



2018 EXISTING AM [MID] (PM) {SUN} PEAK HOUR TRAFFIC VOLUMES

ROWE PROFESSIONAL SERVICES COMPANY

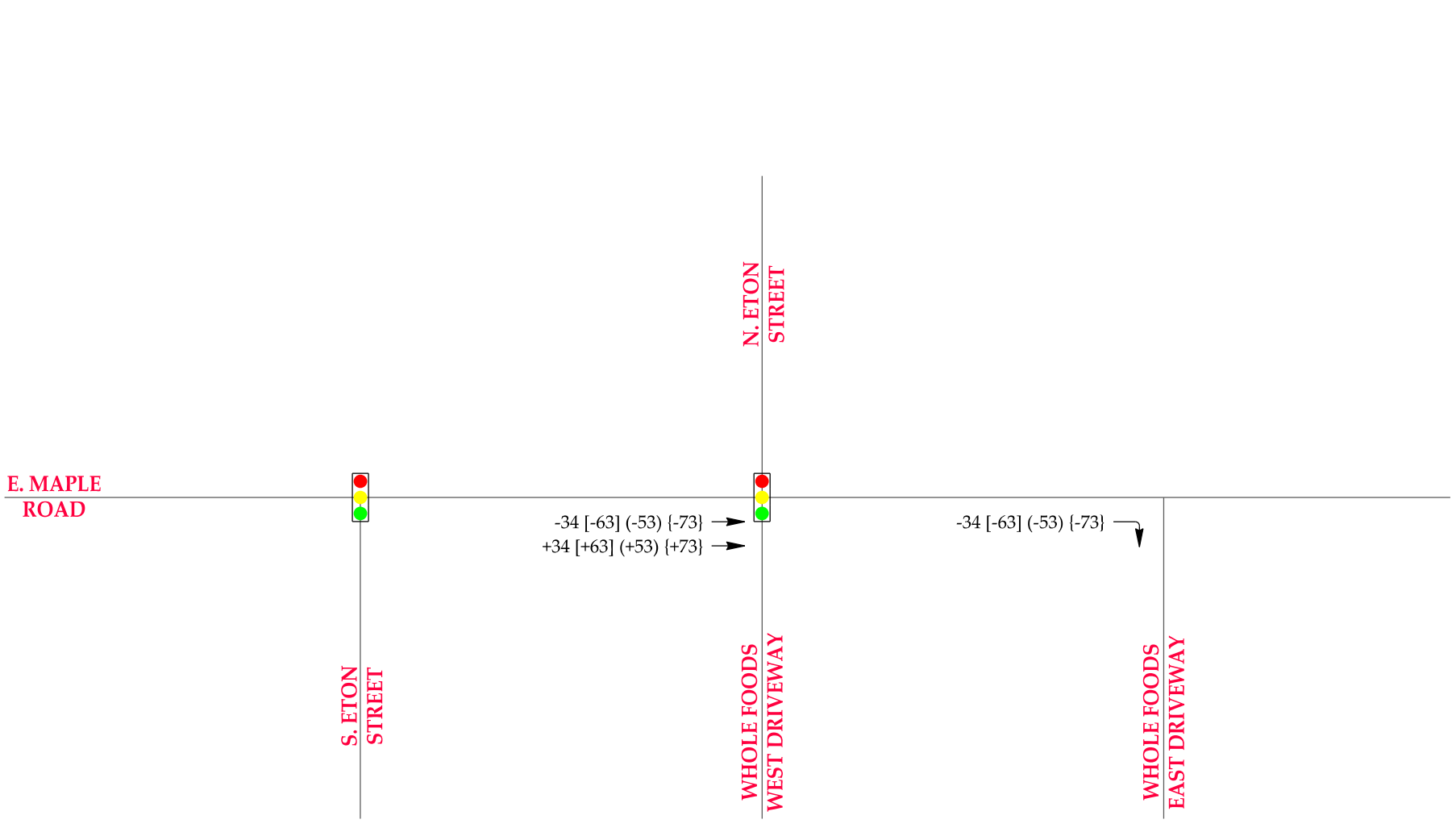
FIGURE 2



2018 EXISTING ORIGIN-DESTINATION AM [MID} (PM) {SUN} PEAK HOUR TRAFFIC VOLUMES

ROWE PROFESSIONAL SERVICES COMPANY

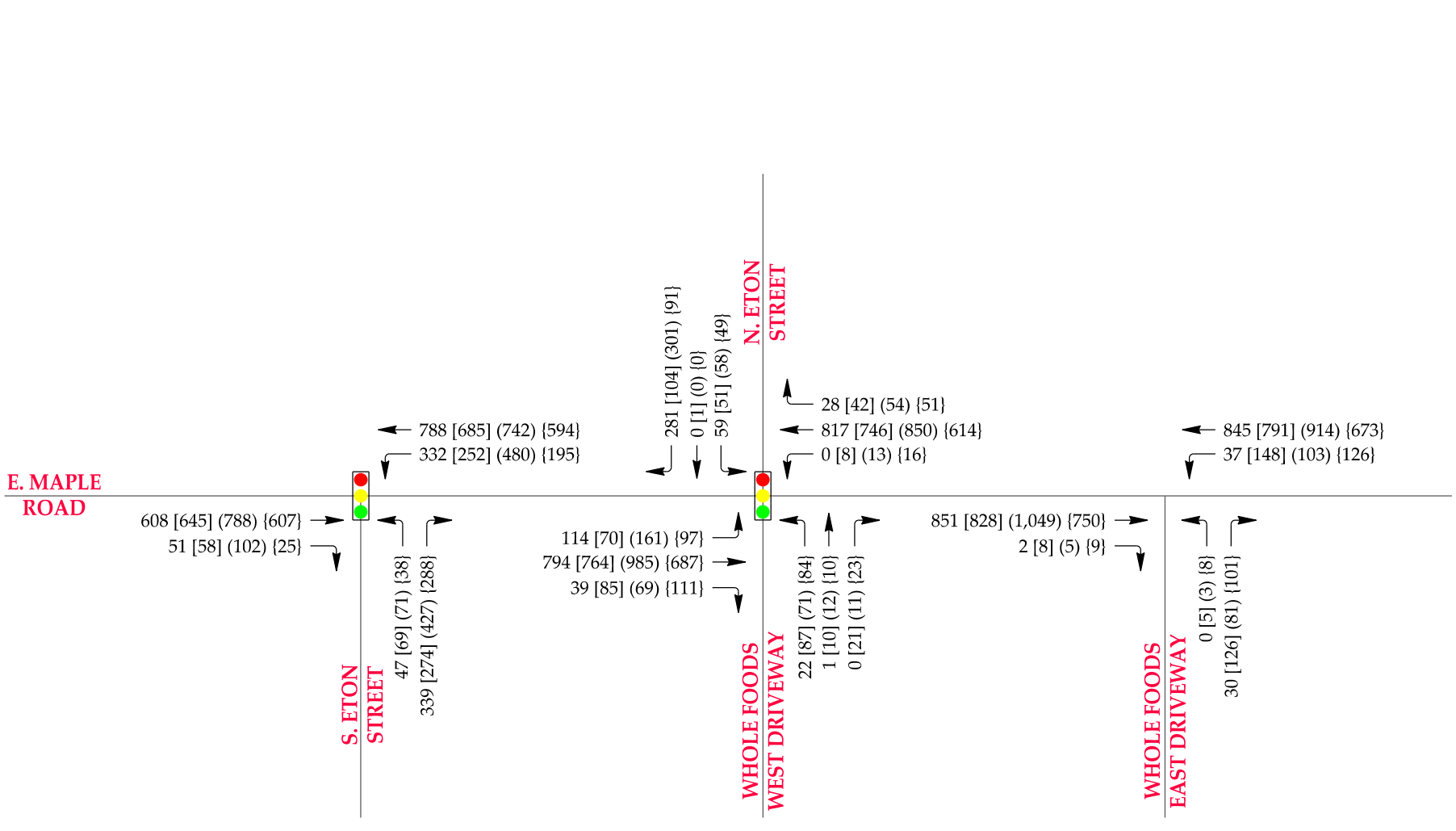
FIGURE 3



100% REDISTRIBUTION OF EASTBOUND SITE TRAFFIC AM [MID} (PM) {SUN} PEAK HOUR TRAFFIC VOLUMES

ROWE PROFESSIONAL SERVICES COMPANY

FIGURE 4



100% EASTBOUND THROUGH DIVERSION TO WEST DRIVEWAY AM [MID] (PM) {SUN} PEAK HOUR TRAFFIC VOLUMES

ROWE PROFESSIONAL SERVICES COMPANY

FIGURE 5

TRAFFIC COUNTS

Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 4PU SE

File Name : O&D_ Maple & Whole Foods EDw_Sun_Rt Turns
Site Code : TMC_2
Start Date : 9/16/2018
Page No : 1

2 Hour video traffic study was conducted during Sunday from 1:00 PM- 3:00 PM PM afternoon peak hours.

Groups Printed- From Maple @ Eaton

	Maple Road Westbound				Whole Foods East Driveway Northbound				Maple Road Eastbound				
Start Time	Thru	Left	Peds	App. Total	Right	X Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
01:00 PM	0	0	0	0	0	0	0	0	15	0	0	15	15
01:15 PM	0	0	0	0	0	0	0	0	18	0	0	18	18
01:30 PM	0	0	0	0	0	0	0	0	19	0	0	19	19
01:45 PM	0	0	0	0	0	0	0	0	22	0	0	22	22
Total	0	0	0	0	0	0	0	0	74	0	0	74	74
02:00 PM	0	0	0	0	0	0	0	0	18	0	0	18	18
02:15 PM	0	0	0	0	0	0	0	0	14	0	0	14	14
02:30 PM	0	0	0	0	0	0	0	0	24	0	0	24	24
02:45 PM	0	0	0	0	0	0	0	0	16	0	0	16	16
Total	0	0	0	0	0	0	0	0	72	0	0	72	72
Grand Total	0	0	0	0	0	0	0	0	146	0	0	146	146
Apprch %	0	0	0		0	0	0		100	0	0		
Total %	0	0	0	0	0	0	0	0	100	0	0	100	

TDC Traffic Comments: Non-signalized intersection. Video VCU camera was located within SE intersection quadrant. Traffic counts performed for ROWE Professional Services Company for Birmingham Whole Foods Traffic Study.

Traffic Data Collection, LLC

www:tdccounts.com

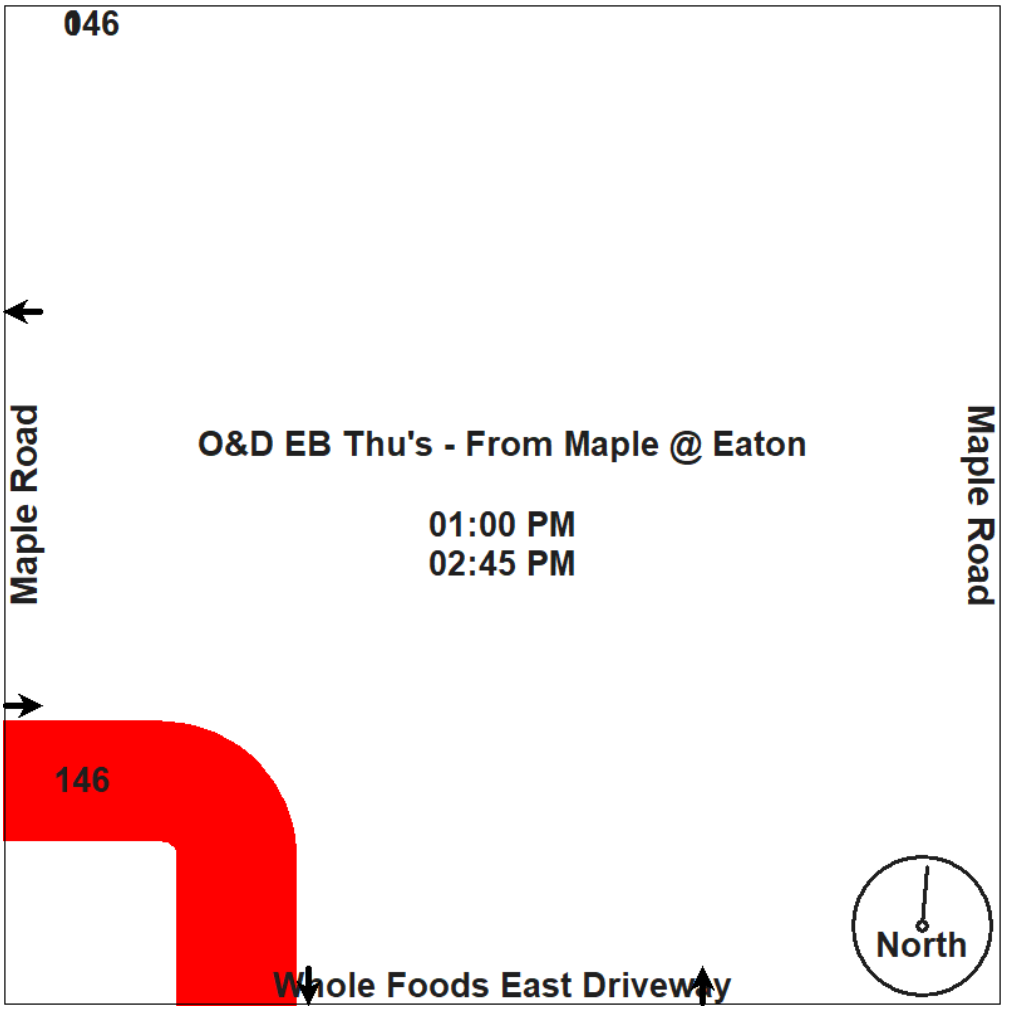
Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 4PU SE

File Name : O&D_ Maple & Whole Foods EDw_Sun_Rt Turns
Site Code : TMC_2
Start Date : 9/16/2018
Page No : 2



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

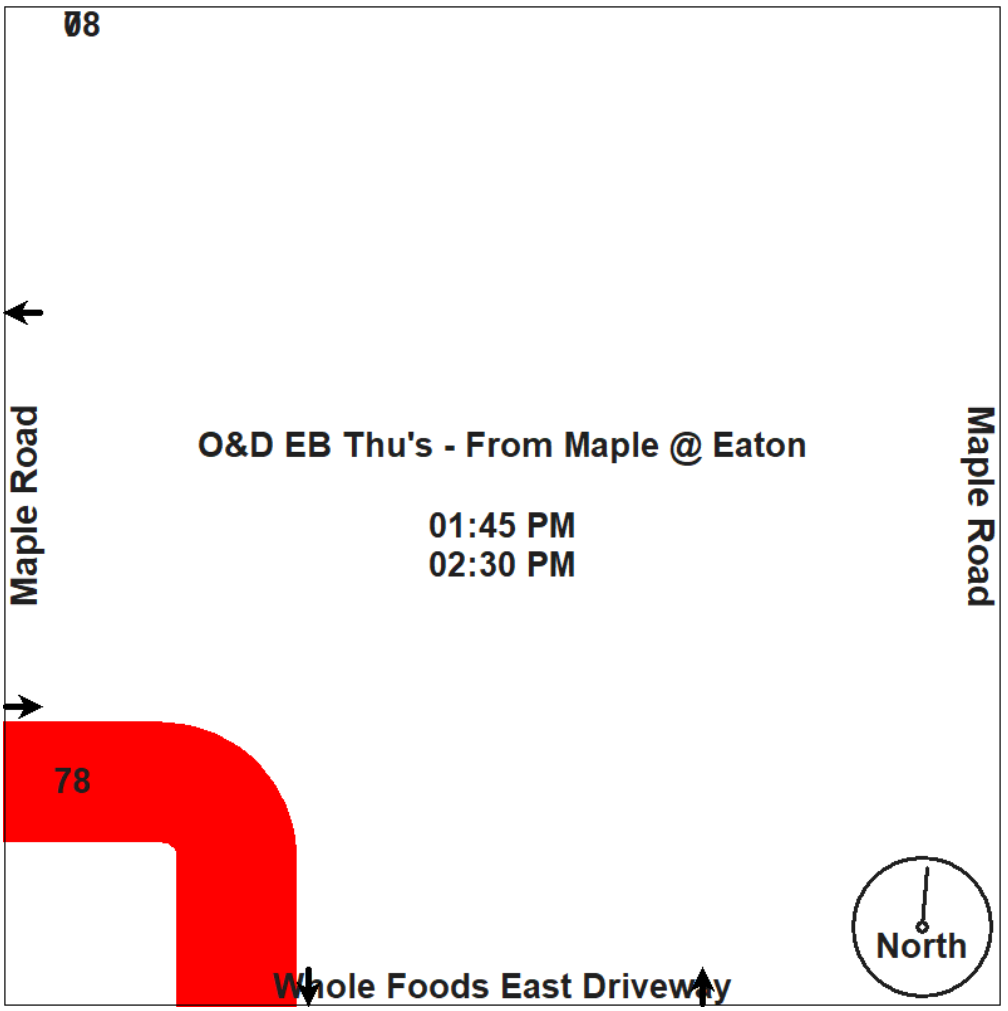
Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 4PU SE

File Name : O&D_ Maple & Whole Foods EDw_Sun_Rt Turns
Site Code : TMC_2
Start Date : 9/16/2018
Page No : 3

	Maple Road Westbound			Whole Foods East Driveway Northbound			Maple Road Eastbound			
Start Time	Thru	Left	App. Total	Right	X Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 01:45 PM										
01:45 PM	0	0	0	0	0	0	22	0	22	22
02:00 PM	0	0	0	0	0	0	18	0	18	18
02:15 PM	0	0	0	0	0	0	14	0	14	14
02:30 PM	0	0	0	0	0	0	**24**	0	**24**	**24**
Total Volume	0	0	0	0	0	0	78	0	78	78
% App. Total	0	0		0	0		100	0		
PHF	.000	.000	.000	.000	.000	.000	.813	.000	.813	.813



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : O&D_ Maple & Whole Foods EDw_Tue_Rt Turns
Site Code : TMC_4
Start Date : 9/18/2018
Page No : 1

6 Hour video traffic study was conducted during typical weekday (Tuesday-Thursday) from 7:00 AM -9:00 AM morning, 12:00 -3:00 PM mid-day & 4:00 PM - 6:00 PM afternoon peak hours, while school was in session..

Groups Printed- From Maple @ Eaton

	Maple Road Westbound				Whole Foods East Driveway Northbound				Maple Road Eastbound				
Start Time	Thru	Left	Peds	App. Total	Right	X Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
*** BREAK ***													
07:30 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
07:45 AM	0	0	0	0	0	0	0	0	3	0	0	3	3
Total	0	0	0	0	0	0	0	0	5	0	0	5	5
08:00 AM	0	0	0	0	0	0	0	0	8	0	0	8	8
08:15 AM	0	0	0	0	0	0	0	0	10	0	0	10	10
08:30 AM	0	0	0	0	0	0	0	0	10	0	0	10	10
08:45 AM	0	0	0	0	0	0	0	0	6	0	0	6	6
Total	0	0	0	0	0	0	0	0	34	0	0	34	34
*** BREAK ***													
12:00 PM	0	0	0	0	0	0	0	0	28	0	0	28	28
12:15 PM	0	0	0	0	0	0	0	0	12	0	0	12	12
12:30 PM	0	0	0	0	0	0	0	0	11	0	0	11	11
12:45 PM	0	0	0	0	0	0	0	0	12	0	0	12	12
Total	0	0	0	0	0	0	0	0	63	0	0	63	63
01:00 PM	0	0	0	0	0	0	0	0	13	0	0	13	13
01:15 PM	0	0	0	0	0	0	0	0	11	0	0	11	11
01:30 PM	0	0	0	0	0	0	0	0	13	0	0	13	13
01:45 PM	0	0	0	0	0	0	0	0	12	0	0	12	12
Total	0	0	0	0	0	0	0	0	49	0	0	49	49
*** BREAK ***													
04:00 PM	0	0	0	0	0	0	0	0	9	0	0	9	9
04:15 PM	0	0	0	0	0	0	0	0	17	0	0	17	17
04:30 PM	0	0	0	0	0	0	0	0	13	0	0	13	13
04:45 PM	0	0	0	0	0	0	0	0	16	0	0	16	16
Total	0	0	0	0	0	0	0	0	55	0	0	55	55
05:00 PM	0	0	0	0	0	0	0	0	11	0	0	11	11
05:15 PM	0	0	0	0	0	0	0	0	15	0	0	15	15
05:30 PM	0	0	0	0	0	0	0	0	11	0	0	11	11
05:45 PM	0	0	0	0	0	0	0	0	16	0	0	16	16
Total	0	0	0	0	0	0	0	0	53	0	0	53	53
Grand Total	0	0	0	0	0	0	0	0	259	0	0	259	259
Apprch %	0	0	0		0	0	0		100	0	0		
Total %	0	0	0	0	0	0	0	0	100	0	0	100	

TDC Traffic Comments: Non-signalized intersection, restricted driveway with NB left turns probitied. Video VCU camera was located within SE intersection quadrant. Note: Origin & Destination Study . are excluded from peak hour reports. Traffic counts performed for ROWE Professional Services Company for Birmingham Whole Foods Traffic Study.

Traffic Data Collection, LLC

www:tdccounts.com

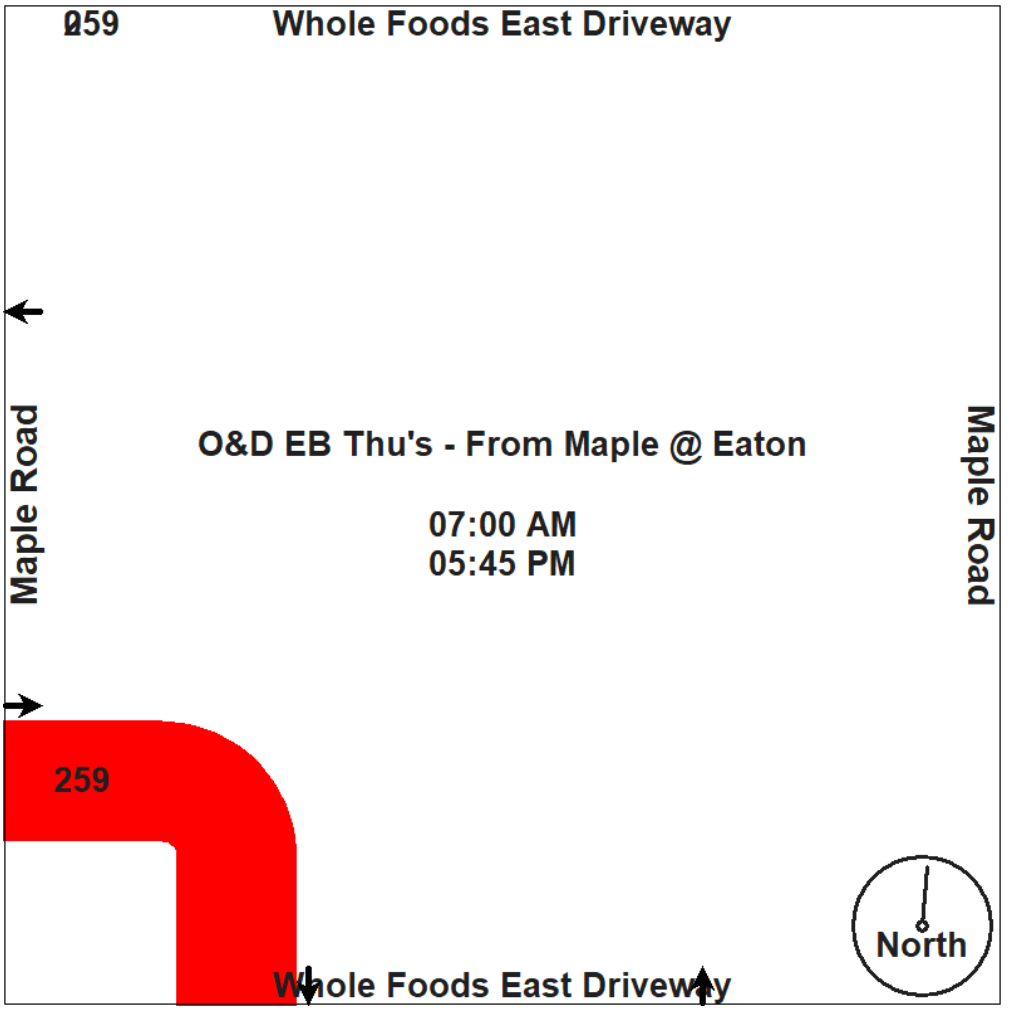
Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : O&D_ Maple & Whole Foods EDw_Tue_Rt Turns
Site Code : TMC_4
Start Date : 9/18/2018
Page No : 2



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

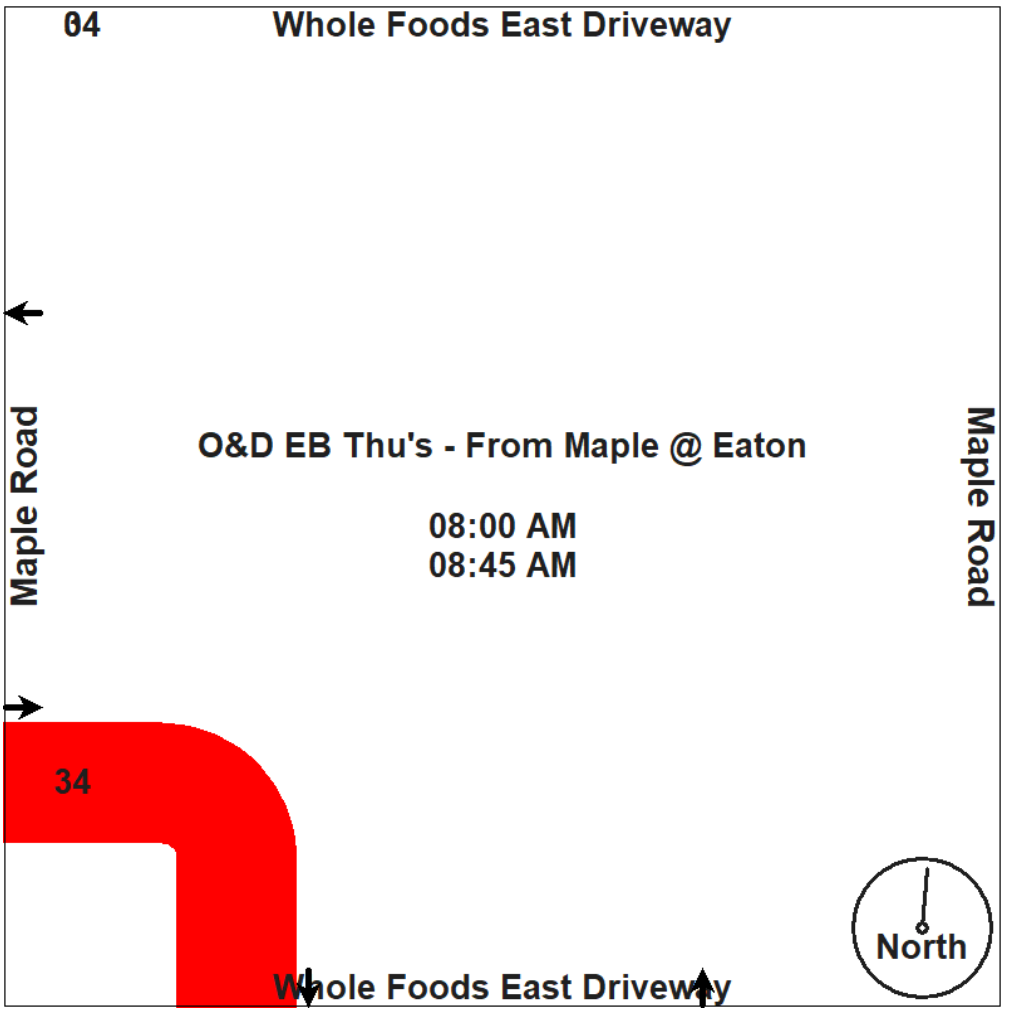
Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : O&D_ Maple & Whole Foods EDw_Tue_Rt Turns
Site Code : TMC_4
Start Date : 9/18/2018
Page No : 3

	Maple Road Westbound			Whole Foods East Driveway Northbound			Maple Road Eastbound			
Start Time	Thru	Left	App. Total	Right	X Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	0	0	0	0	0	0	8	0	8	8
08:15 AM	0	0	0	0	0	0	**10**	0	**10**	**10**
08:30 AM	0	0	0	0	0	0	10	0	10	10
08:45 AM	0	0	0	0	0	0	6	0	6	6
Total Volume	0	0	0	0	0	0	34	0	34	34
% App. Total	0	0		0	0		100	0		
PHF	.000	.000	.000	.000	.000	.000	.850	.000	.850	.850



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

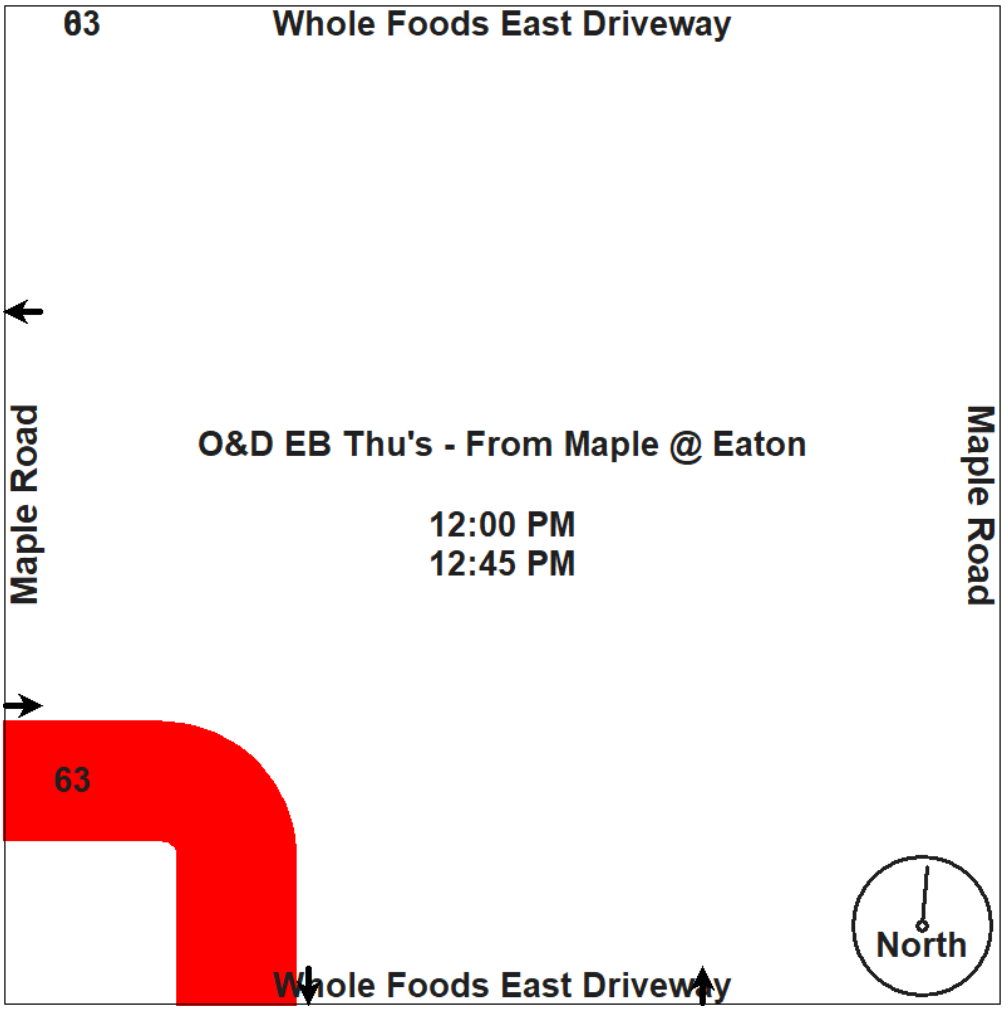
Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : O&D_ Maple & Whole Foods EDw_Tue_Rt Turns
Site Code : TMC_4
Start Date : 9/18/2018
Page No : 4

	Maple Road Westbound			Whole Foods East Driveway Northbound			Maple Road Eastbound			
Start Time	Thru	Left	App. Total	Right	X Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 12:00 PM										
12:00 PM	0	0	0	0	0	0	**28**	0	**28**	**28**
12:15 PM	0	0	0	0	0	0	12	0	12	12
12:30 PM	0	0	0	0	0	0	11	0	11	11
12:45 PM	0	0	0	0	0	0	12	0	12	12
Total Volume	0	0	0	0	0	0	63	0	63	63
% App. Total	0	0		0	0		100	0		
PHF	.000	.000	.000	.000	.000	.000	.563	.000	.563	.563



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

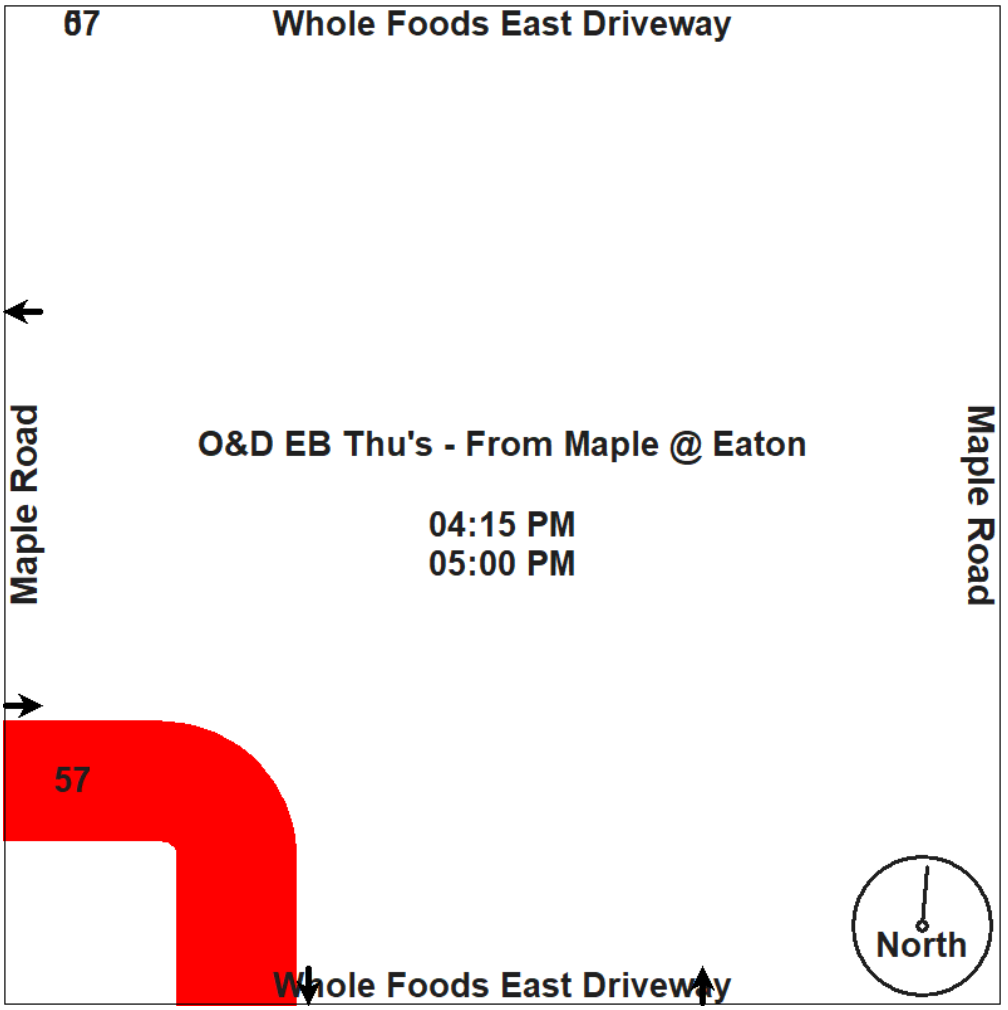
Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : O&D_ Maple & Whole Foods EDw_Tue_Rt Turns
Site Code : TMC_4
Start Date : 9/18/2018
Page No : 5

	Maple Road Westbound			Whole Foods East Driveway Northbound			Maple Road Eastbound			
Start Time	Thru	Left	App. Total	Right	X Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	0	0	0	0	0	**17**	0	**17**	**17**
04:30 PM	0	0	0	0	0	0	13	0	13	13
04:45 PM	0	0	0	0	0	0	16	0	16	16
05:00 PM	0	0	0	0	0	0	11	0	11	11
Total Volume	0	0	0	0	0	0	57	0	57	57
% App. Total	0	0		0	0		100	0		
PHF	.000	.000	.000	.000	.000	.000	.838	.000	.838	.838



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 4PU SE

File Name : O&D_ Maple & Whole Foods EDw_Sun_Rt Turns
Site Code : TMC_2
Start Date : 9/16/2018
Page No : 1

2 Hour video traffic study was conducted during Sunday from 1:00 PM- 3:00 PM PM afternoon peak hours.

Groups Printed- O&D SB Left Turns From N.Eaton

	Maple Road Westbound				Whole Foods East Driveway Northbound				Maple Road Eastbound				
Start Time	Thru	Left	Peds	App. Total	Right	X Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
01:00 PM	0	0	0	0	0	0	0	0	2	0	0	2	2
01:15 PM	0	0	0	0	0	0	0	0	3	0	0	3	3
01:30 PM	0	0	0	0	0	0	0	0	4	0	0	4	4
01:45 PM	0	0	0	0	0	0	0	0	2	0	0	2	2
Total	0	0	0	0	0	0	0	0	11	0	0	11	11
*** BREAK ***													
02:15 PM	0	0	0	0	0	0	0	0	2	0	0	2	2
02:30 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
02:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	0	0	4	0	0	4	4
Grand Total	0	0	0	0	0	0	0	0	15	0	0	15	15
Apprch %	0	0	0		0	0	0		100	0	0		
Total %	0	0	0	0	0	0	0	0	100	0	0	100	

TDC Traffic Comments: Non-signalized intersection. Video VCU camera was located within SE intersection quadrant. Traffic counts performed for ROWE Professional Services Company for Birmingham Whole Foods Traffic Study.

Traffic Data Collection, LLC

www:tdccounts.com

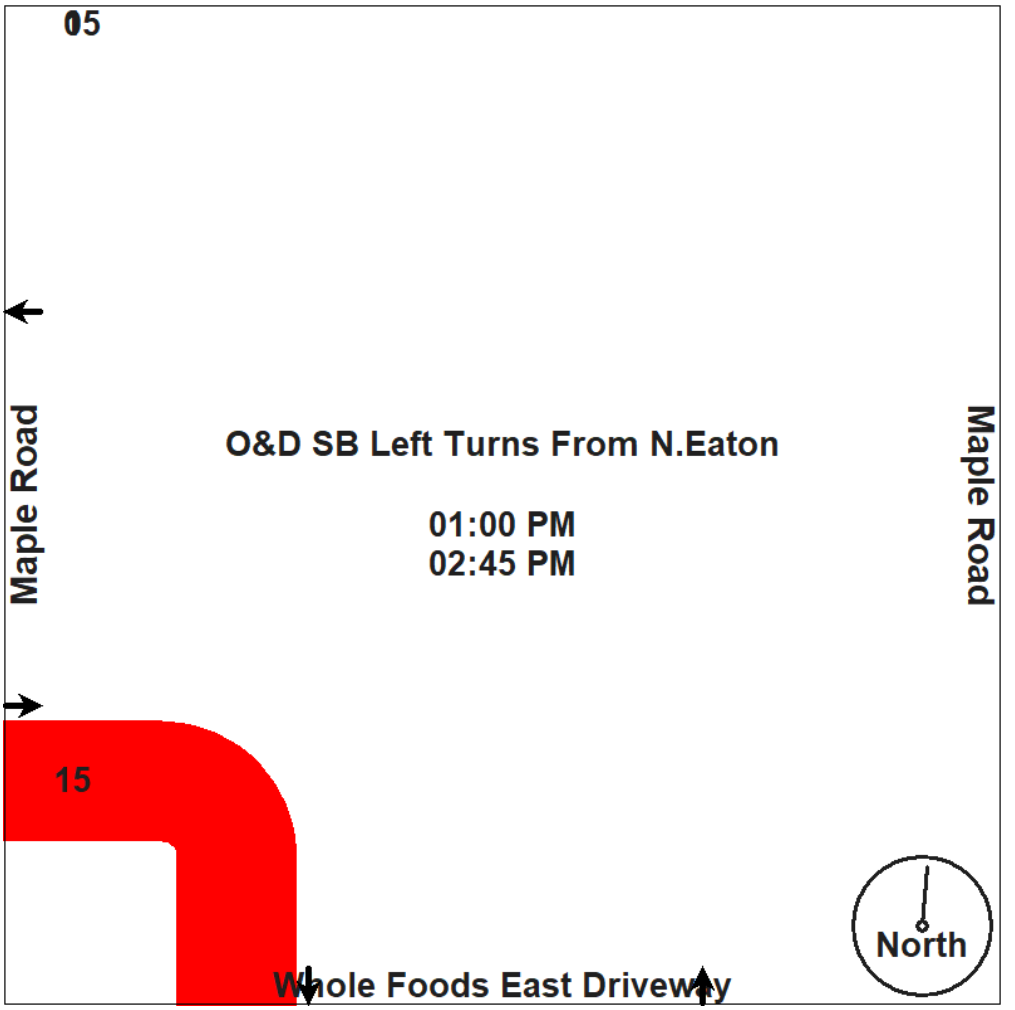
Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 4PU SE

File Name : O&D_ Maple & Whole Foods EDw_Sun_Rt Turns
Site Code : TMC_2
Start Date : 9/16/2018
Page No : 2



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

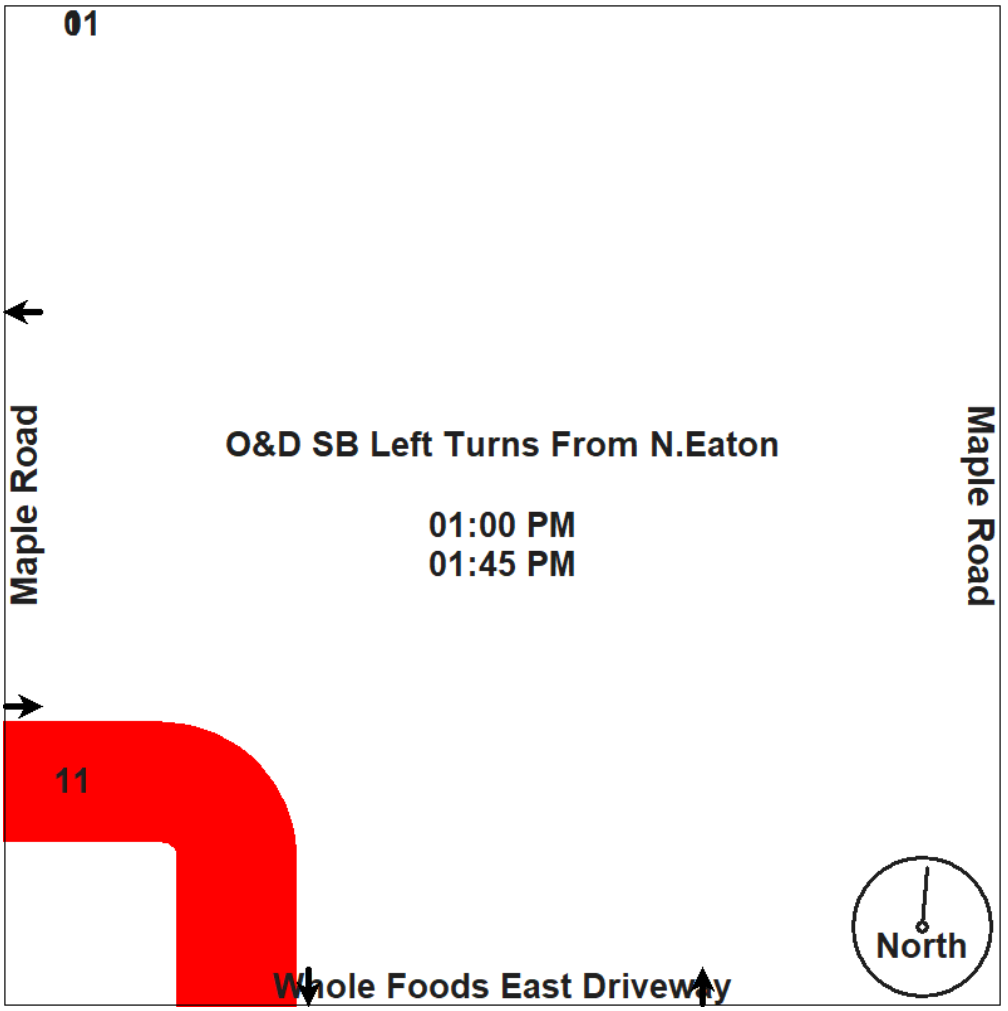
Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 4PU SE

File Name : O&D_ Maple & Whole Foods EDw_Sun_Rt Turns
Site Code : TMC_2
Start Date : 9/16/2018
Page No : 3

	Maple Road Westbound			Whole Foods East Driveway Northbound			Maple Road Eastbound			
Start Time	Thru	Left	App. Total	Right	X Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 01:00 PM										
01:00 PM	0	0	0	0	0	0	2	0	2	2
01:15 PM	0	0	0	0	0	0	3	0	3	3
01:30 PM	0	0	0	0	0	0	**4**	0	**4**	**4**
01:45 PM	0	0	0	0	0	0	2	0	2	2
Total Volume	0	0	0	0	0	0	11	0	11	11
% App. Total	0	0		0	0		100	0		
PHF	.000	.000	.000	.000	.000	.000	.688	.000	.688	.688



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : O&D_ Maple & Whole Foods EDw_Tue_Rt Turns
Site Code : TMC_4
Start Date : 9/18/2018
Page No : 1

6 Hour video traffic study was conducted during typical weekday (Tuesday-Thursday) from 7:00 AM -9:00 AM morning, 12:00 -3:00 PM mid-day & 4:00 PM - 6:00 PM afternoon peak hours, while school was in session..

Groups Printed- O&D SB Left Turns From N.Eaton

	Maple Road Westbound				Whole Foods East Driveway Northbound				Maple Road Eastbound				
Start Time	Thru	Left	Peds	App. Total	Right	X Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
*** BREAK ***													
08:30 AM	0	0	0	0	0	0	0	0	2	0	0	2	2
*** BREAK ***													
Total	0	0	0	0	0	0	0	0	2	0	0	2	2
*** BREAK ***													
12:00 PM	0	0	0	0	0	0	0	0	5	0	0	5	5
12:15 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
12:30 PM	0	0	0	0	0	0	0	0	2	0	0	2	2
*** BREAK ***													
Total	0	0	0	0	0	0	0	0	8	0	0	8	8
01:00 PM	0	0	0	0	0	0	0	0	2	0	0	2	2
01:15 PM	0	0	0	0	0	0	0	0	2	0	0	2	2
01:30 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
01:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	0	0	6	0	0	6	6
*** BREAK ***													
04:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
04:15 PM	0	0	0	0	0	0	0	0	2	0	0	2	2
04:30 PM	0	0	0	0	0	0	0	0	3	0	0	3	3
04:45 PM	0	0	0	0	0	0	0	0	2	0	0	2	2
Total	0	0	0	0	0	0	0	0	8	0	0	8	8
05:00 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
05:15 PM	0	0	0	0	0	0	0	0	3	0	0	3	3
05:30 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
05:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	0	0	0	0	0	0	0	6	0	0	6	6
Grand Total	0	0	0	0	0	0	0	0	30	0	0	30	30
Apprch %	0	0	0		0	0	0		100	0	0		
Total %	0	0	0	0	0	0	0	0	100	0	0	100	

TDC Traffic Comments: Non-signalized intersection, restricted driveway with NB left turns probitied. Video VCU camera was located within SE intersection quadrant. Note: Origin & Destination Study . are excluded from peak hour reports. Traffic counts performed for ROWE Professional Services Company for Birmingham Whole Foods Traffic Study.

Traffic Data Collection, LLC

www:tdccounts.com

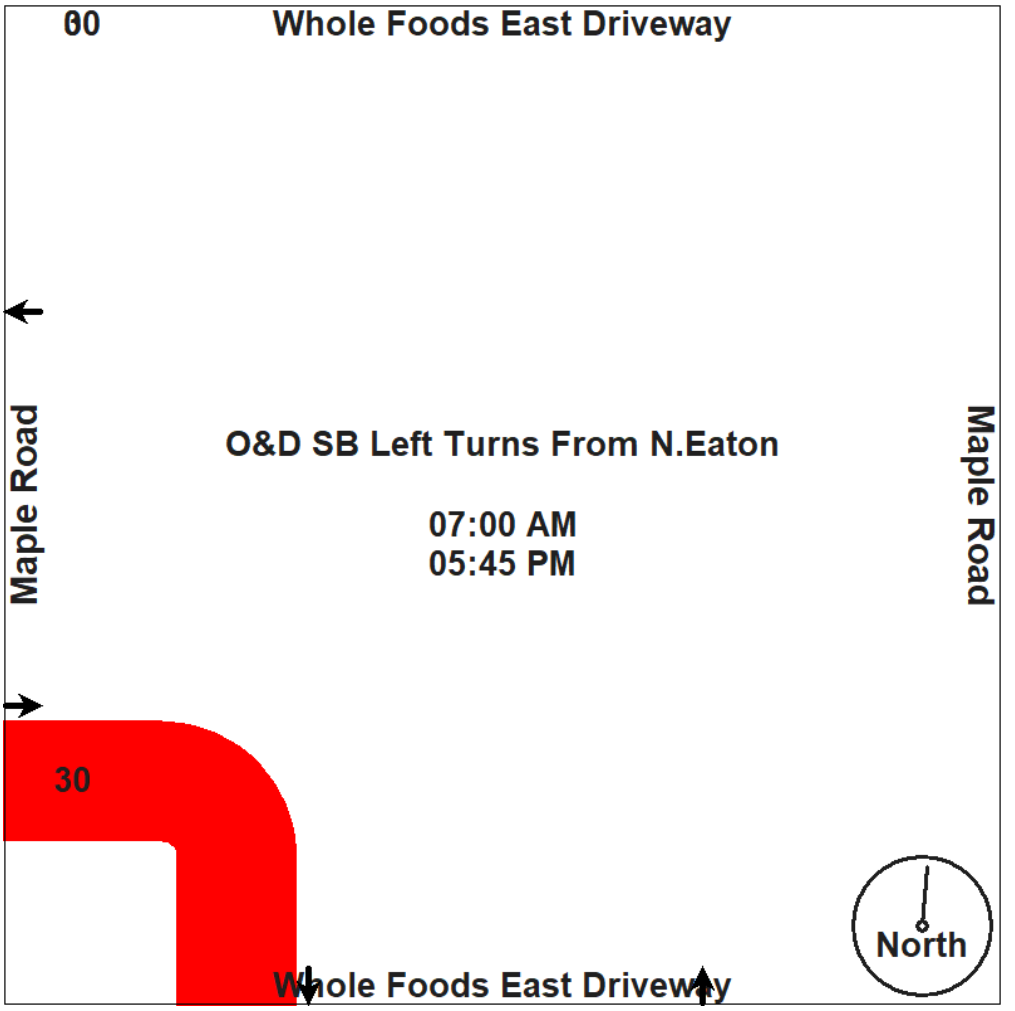
Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : O&D_ Maple & Whole Foods EDw_Tue_Rt Turns
Site Code : TMC_4
Start Date : 9/18/2018
Page No : 2



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

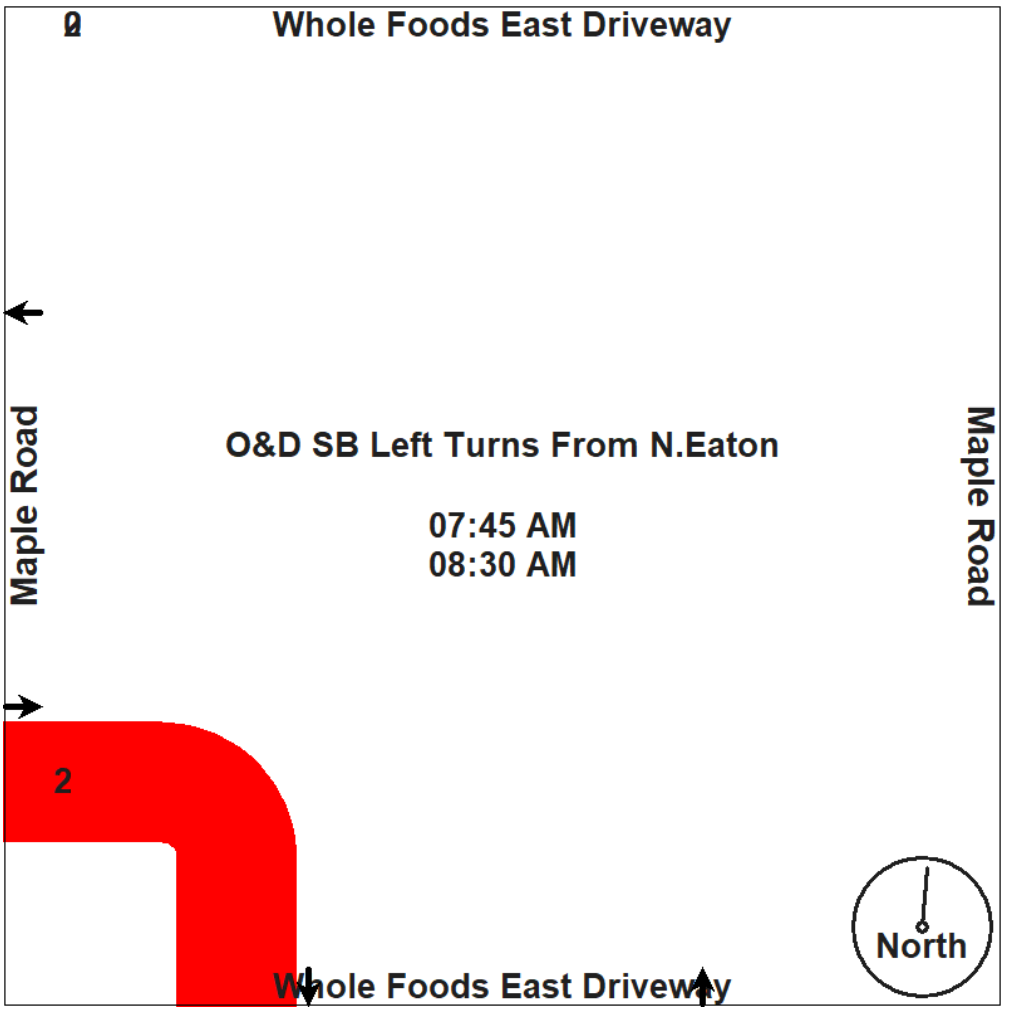
Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : O&D_ Maple & Whole Foods EDw_Tue_Rt Turns
Site Code : TMC_4
Start Date : 9/18/2018
Page No : 3

	Maple Road Westbound			Whole Foods East Driveway Northbound			Maple Road Eastbound			
Start Time	Thru	Left	App. Total	Right	X Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:45 AM										
07:45 AM	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	**2**	0	**2**	**2**
Total Volume	0	0	0	0	0	0	2	0	2	2
% App. Total	0	0		0	0		100	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

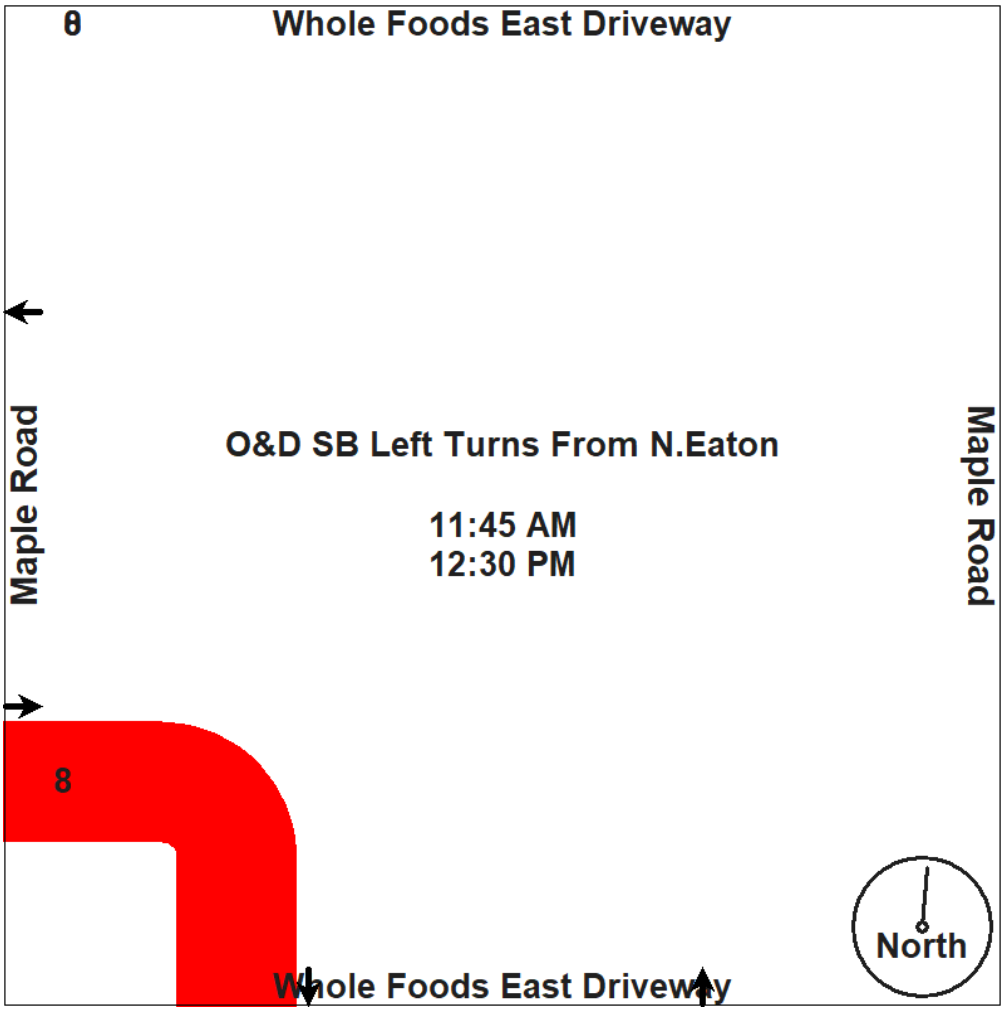
Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : O&D_ Maple & Whole Foods EDw_Tue_Rt Turns
Site Code : TMC_4
Start Date : 9/18/2018
Page No : 4

	Maple Road Westbound			Whole Foods East Driveway Northbound			Maple Road Eastbound			
Start Time	Thru	Left	App. Total	Right	X Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 11:45 AM										
11:45 AM	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	**5**	0	**5**	**5**
12:15 PM	0	0	0	0	0	0	1	0	1	1
12:30 PM	0	0	0	0	0	0	2	0	2	2
Total Volume	0	0	0	0	0	0	8	0	8	8
% App. Total	0	0		0	0		100	0		
PHF	.000	.000	.000	.000	.000	.000	.400	.000	.400	.400



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

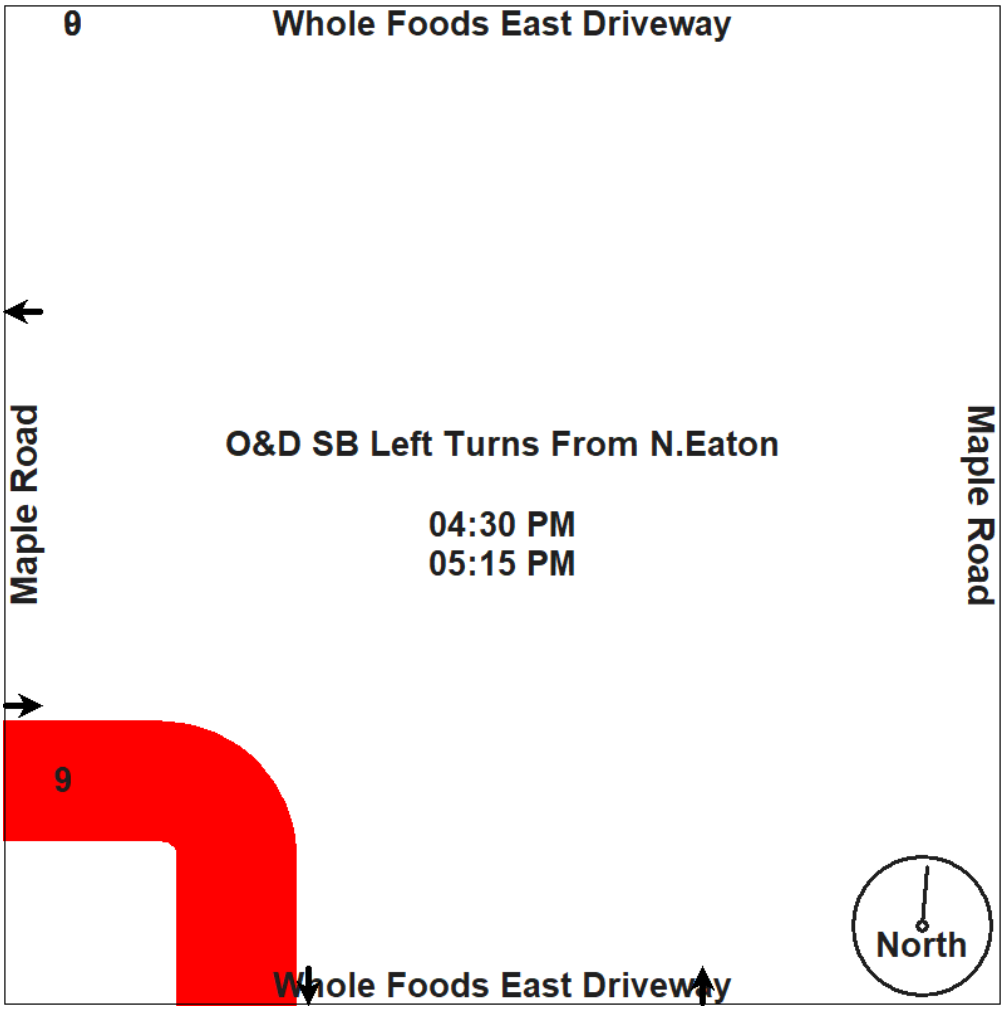
Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : O&D_ Maple & Whole Foods EDw_Tue_Rt Turns
Site Code : TMC_4
Start Date : 9/18/2018
Page No : 5

	Maple Road Westbound			Whole Foods East Driveway Northbound			Maple Road Eastbound			
Start Time	Thru	Left	App. Total	Right	X Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	0	0	0	0	0	0	**3**	0	**3**	**3**
04:45 PM	0	0	0	0	0	0	2	0	2	2
05:00 PM	0	0	0	0	0	0	1	0	1	1
05:15 PM	0	0	0	0	0	0	3	0	3	3
Total Volume	0	0	0	0	0	0	9	0	9	9
% App. Total	0	0		0	0		100	0		
PHF	.000	.000	.000	.000	.000	.000	.750	.000	.750	.750



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:2 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 24L SE

File Name : TMC_1 Maple & SEaton_Sun
Site Code : TMC_1
Start Date : 9/16/2018
Page No : 1

2 Hour video traffic study was conducted during Sunday from 1:00 PM- 3:00 PM PM afternoon peak hours.

Groups Printed- Pass Cars - Buses - Single Units - Heavy Trucks - Bikes On Road - Bikes On Walk - Peds

	Maple Road Westbound				S. Eaton St. Northbound				Maple Road Eastbound				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
01:00 PM	149	55	0	204	51	16	1	68	8	166	5	179	451
01:15 PM	143	45	0	188	69	7	3	79	5	157	0	162	429
01:30 PM	138	49	0	187	60	13	3	76	4	145	5	154	417
01:45 PM	150	51	1	202	87	9	3	99	6	145	2	153	454
Total	580	200	1	781	267	45	10	322	23	613	12	648	1751
02:00 PM	147	50	0	197	72	9	3	84	10	160	7	177	458
02:15 PM	131	55	0	186	56	6	4	66	10	153	1	164	416
02:30 PM	136	50	0	186	57	7	4	68	11	143	7	161	415
02:45 PM	136	56	0	192	54	6	2	62	7	143	1	151	405
Total	550	211	0	761	239	28	13	280	38	599	16	653	1694
Grand Total	1130	411	1	1542	506	73	23	602	61	1212	28	1301	3445
Apprch %	73.3	26.7	0.1		84.1	12.1	3.8		4.7	93.2	2.2		
Total %	32.8	11.9	0	44.8	14.7	2.1	0.7	17.5	1.8	35.2	0.8	37.8	
Pass Cars	1126	408	0	1534	485	73	0	558	61	1205	0	1266	3358
% Pass Cars	99.6	99.3	0	99.5	95.8	100	0	92.7	100	99.4	0	97.3	97.5
Buses	4	0	0	4	0	0	0	0	0	4	0	4	8
% Buses	0.4	0	0	0.3	0	0	0	0	0	0.3	0	0.3	0.2
Single Units	0	0	0	0	1	0	0	1	0	2	0	2	3
% Single Units	0	0	0	0	0.2	0	0	0.2	0	0.2	0	0.2	0.1
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
Bikes On Road	0	3	0	3	20	0	0	20	0	1	0	1	24
% Bikes On Road	0	0.7	0	0.2	4	0	0	3.3	0	0.1	0	0.1	0.7
Bikes On Walk	0	0	1	1	0	0	8	8	0	0	0	0	9
% Bikes On Walk	0	0	100	0.1	0	0	34.8	1.3	0	0	0	0	0.3
Peds	0	0	0	0	0	0	15	15	0	0	28	28	43
% Peds	0	0	0	0	0	0	65.2	2.5	0	0	100	2.2	1.2

TDC Traffic Comments: Signalized "T intersection with ped. signals for west & south legs. Push buttons for west leg. Video VCU camera was located within SE intersection quadrant. Note: Peds. are excluded from peak hour reports. Traffic counts performed for ROWE Professional Services Company for Birmingham Whole Foods Traffic Study.

Traffic Data Collection, LLC

www:tdccounts.com

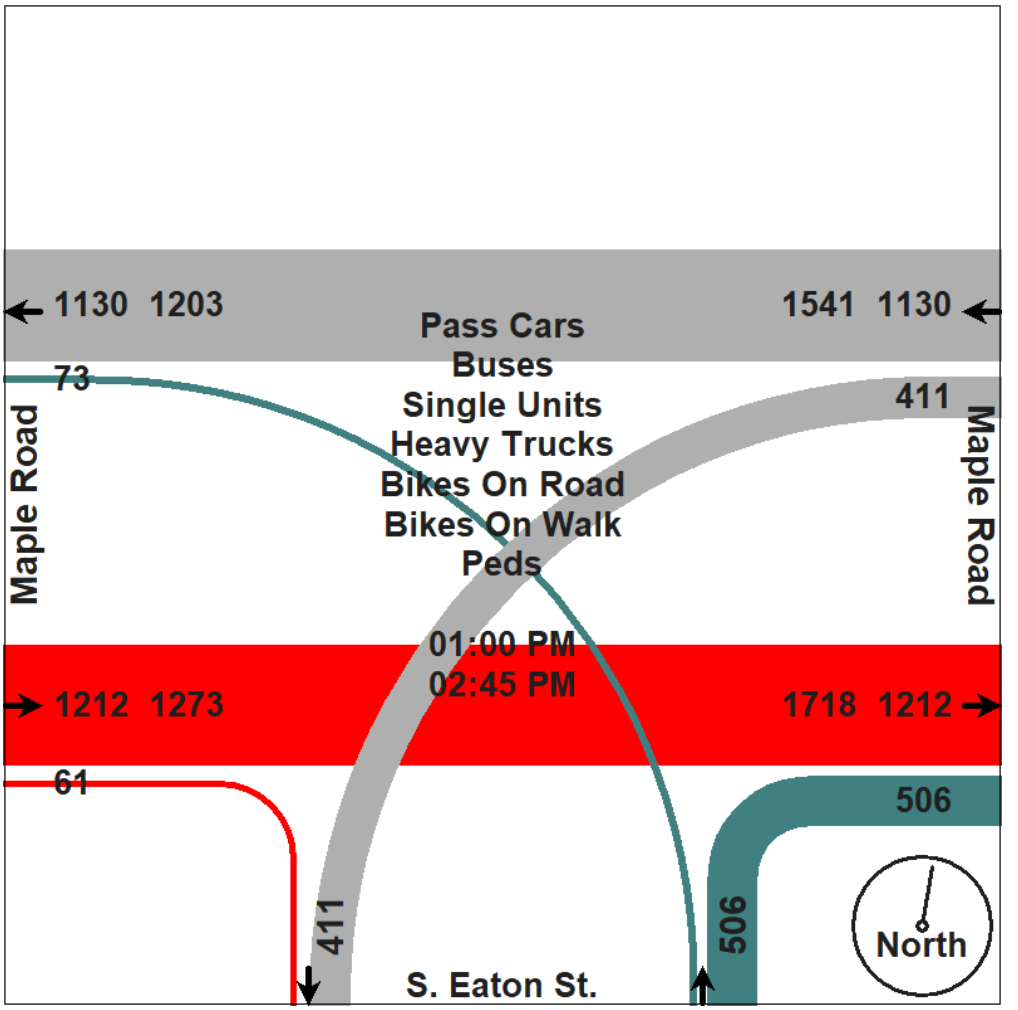
Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:2 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 24L SE

File Name : TMC_1 Maple & SEaton_Sun
Site Code : TMC_1
Start Date : 9/16/2018
Page No : 2



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:2 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 24L SE

File Name : TMC_1 Maple & SEaton_Sun
Site Code : TMC_1
Start Date : 9/16/2018
Page No : 3

	Maple Road Westbound			S. Eaton St. Northbound			Maple Road Eastbound			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 01:15 PM										
01:15 PM	143	45	188	69	7	76	5	157	162	426
01:30 PM	138	49	187	60	**13**	73	4	145	149	409
01:45 PM	**150**	**51**	**201**	**87**	9	**96**	6	145	151	**448**
02:00 PM	147	50	197	72	9	81	**10**	**160**	**170**	448
Total Volume	578	195	773	288	38	326	25	607	632	1731
% App. Total	74.8	25.2		88.3	11.7		4	96		
PHF	.963	.956	.961	.828	.731	.849	.625	.948	.929	.966
Pass Cars	577	195	772	270	38	308	25	605	630	1710
% Pass Cars	99.8	100	99.9	93.8	100	94.5	100	99.7	99.7	98.8
Buses	1	0	1	0	0	0	0	1	1	2
% Buses	0.2	0	0.1	0	0	0	0	0.2	0.2	0.1
Single Units	0	0	0	0	0	0	0	0	0	0
% Single Units	0	0	0	0	0	0	0	0	0	0
Heavy Trucks	0	0	0	0	0	0	0	0	0	0
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0
Bikes On Road	0	0	0	18	0	18	0	1	1	19
% Bikes On Road	0	0	0	6.3	0	5.5	0	0.2	0.2	1.1
Bikes On Walk	0	0	0	0	0	0	0	0	0	0
% Bikes On Walk	0	0	0	0	0	0	0	0	0	0
Peds	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0

Traffic Data Collection, LLC

www:tdccounts.com

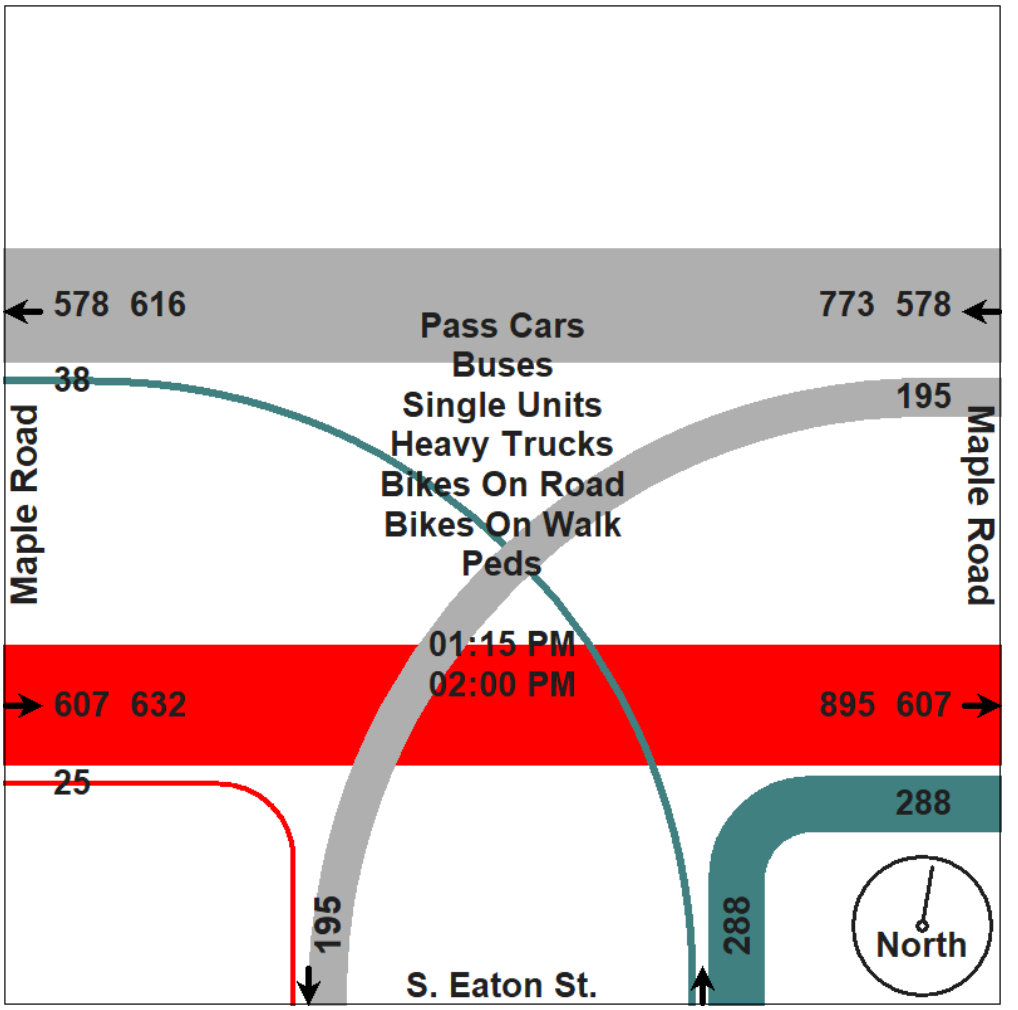
Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:2 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 24L SE

File Name : TMC_1 Maple & SEaton_Sun
Site Code : TMC_1
Start Date : 9/16/2018
Page No : 4



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 24L SE

File Name : TMC_1 Maple & SEaton_Tue
Site Code : TMC_1
Start Date : 9/18/2018

6 Hour video traffic study was conducted during typical weekday (Tuesday-Thursday) from 7:00 AM -9:00 AM morning, 12:00 - 2:00 PM mid-day & 4:00 PM - 6:00 PM afternoon peak hours, while school was in session.

Groups Printed- Pass Cars - Buses - Single Units - Heavy Trucks - Bikes On Road - Bikes On Walk - Peds

	Maple Road Westbound				S. Eaton St. Northbound				Maple Road Eastbound				
Start Time	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
07:00 AM	103	46	0	149	24	12	0	36	6	79	0	85	270
07:15 AM	154	58	0	212	42	18	2	62	8	86	1	95	369
07:30 AM	180	78	0	258	56	12	0	68	6	114	0	120	446
07:45 AM	181	98	0	279	94	15	0	109	10	121	1	132	520
Total	618	280	0	898	216	57	2	275	30	400	2	432	1605
08:00 AM	222	84	1	307	82	11	1	94	11	153	0	164	565
08:15 AM	191	82	0	273	95	9	1	105	15	133	2	150	528
08:30 AM	186	83	0	269	87	10	0	97	10	168	1	179	545
08:45 AM	189	83	0	272	75	17	2	94	15	145	1	161	527
Total	788	332	1	1121	339	47	4	390	51	599	4	654	2165
*** BREAK ***													
12:00 PM	164	75	0	239	64	19	0	83	24	176	2	202	524
12:15 PM	162	68	0	230	62	16	1	79	8	165	0	173	482
12:30 PM	177	45	0	222	75	19	2	96	14	150	1	165	483
12:45 PM	182	64	0	246	73	15	1	89	12	154	1	167	502
Total	685	252	0	937	274	69	4	347	58	645	4	707	1991
01:00 PM	145	70	0	215	59	11	0	70	15	176	1	192	477
01:15 PM	171	40	0	211	68	20	3	91	15	185	1	201	503
01:30 PM	164	60	0	224	57	11	4	72	10	144	0	154	450
01:45 PM	155	57	0	212	62	15	0	77	22	162	0	184	473
Total	635	227	0	862	246	57	7	310	62	667	2	731	1903
*** BREAK ***													
04:00 PM	200	78	0	278	79	17	0	96	14	151	0	165	539
04:15 PM	175	98	0	273	99	19	2	120	27	159	2	188	581
04:30 PM	176	108	0	284	98	16	0	114	17	177	1	195	593
04:45 PM	227	103	0	330	92	27	2	121	31	160	1	192	643
Total	778	387	0	1165	368	79	4	451	89	647	4	740	2356
05:00 PM	175	113	0	288	99	22	1	122	27	210	0	237	647
05:15 PM	171	130	0	301	109	15	0	124	23	181	0	204	629
05:30 PM	191	125	0	316	112	20	0	132	27	204	2	233	681
05:45 PM	193	112	0	305	107	14	5	126	25	193	0	218	649
Total	730	480	0	1210	427	71	6	504	102	788	2	892	2606
Grand Total	4234	1958	1	6193	1870	380	27	2277	392	3746	18	4156	12626
Apprch %	68.4	31.6	0		82.1	16.7	1.2		9.4	90.1	0.4		
Total %	33.5	15.5	0	49	14.8	3	0.2	18	3.1	29.7	0.1	32.9	
Pass Cars	4123	1910	0	6033	1836	348	0	2184	347	3672	0	4019	12236
% Pass Cars	97.4	97.5	0	97.4	98.2	91.6	0	95.9	88.5	98	0	96.7	96.9
Buses	36	25	0	61	11	10	0	21	26	32	0	58	140
% Buses	0.9	1.3	0	1	0.6	2.6	0	0.9	6.6	0.9	0	1.4	1.1
Single Units	59	18	0	77	16	15	0	31	15	40	0	55	163
% Single Units	1.4	0.9	0	1.2	0.9	3.9	0	1.4	3.8	1.1	0	1.3	1.3
Heavy Trucks	15	3	0	18	3	7	0	10	3	1	0	4	32
% Heavy Trucks	0.4	0.2	0	0.3	0.2	1.8	0	0.4	0.8	0	0	0.1	0.3
Bikes On Road	1	2	0	3	4	0	0	4	1	1	0	2	9
% Bikes On Road	0	0.1	0	0	0.2	0	0	0.2	0.3	0	0	0	0.1

Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

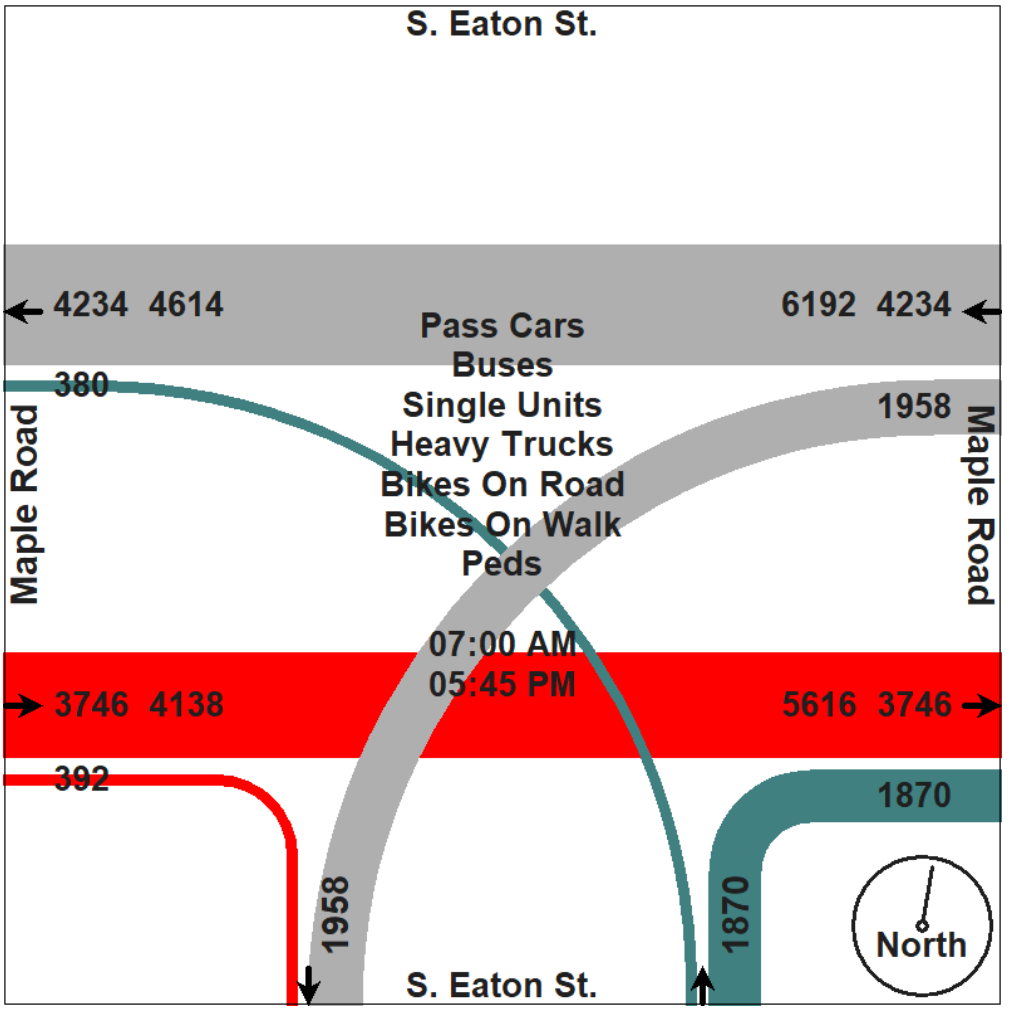
Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 24L SE

File Name : TMC_1 Maple & SEaton_Tue
Site Code : TMC_1
Start Date : 9/18/2018
Page No : 2

Groups Printed- Pass Cars - Buses - Single Units - Heavy Trucks - Bikes On Road - Bikes On Walk - Peds

	Maple Road Westbound				S. Eaton St. Northbound				Maple Road Eastbound				
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Bikes On Walk	0	0	0	0	0	0	13	13	0	0	5	5	18
% Bikes On Walk	0	0	0	0	0	0	48.1	0.6	0	0	27.8	0.1	0.1
Peds	0	0	1	1	0	0	14	14	0	0	13	13	28
% Peds	0	0	100	0	0	0	51.9	0.6	0	0	72.2	0.3	0.2

TDC Traffic Comments: Signalized "T" intersection with ped. signals for west & south legs. Push buttons for west leg. Video VCU camera was located within SE intersection quadrant. Note: Peds. are excluded from peak hour reports. Traffic counts performed for ROWE Professional Services Company for Birmingham Whole Foods Traffic Study.



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 24L SE

File Name : TMC_1 Maple & SEaton_Tue
Site Code : TMC_1
Start Date : 9/18/2018
Page No : 3

	Maple Road Westbound			S. Eaton St. Northbound			Maple Road Eastbound			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	**222**	**84**	**306**	82	11	93	11	153	164	**563**
08:15 AM	191	82	273	**95**	9	**104**	**15**	133	148	525
08:30 AM	186	83	269	87	10	97	10	**168**	**178**	544
08:45 AM	189	83	272	75	**17**	92	15	145	160	524
Total Volume	788	332	1120	339	47	386	51	599	650	2156
% App. Total	70.4	29.6		87.8	12.2		7.8	92.2		
PHF	.887	.988	.915	.892	.691	.928	.850	.891	.913	.957
Pass Cars	765	315	1080	331	39	370	41	576	617	2067
% Pass Cars	97.1	94.9	96.4	97.6	83.0	95.9	80.4	96.2	94.9	95.9
Buses	5	11	16	5	0	5	8	9	17	38
% Buses	0.6	3.3	1.4	1.5	0	1.3	15.7	1.5	2.6	1.8
Single Units	14	5	19	3	5	8	2	13	15	42
% Single Units	1.8	1.5	1.7	0.9	10.6	2.1	3.9	2.2	2.3	1.9
Heavy Trucks	4	1	5	0	3	3	0	1	1	9
% Heavy Trucks	0.5	0.3	0.4	0	6.4	0.8	0	0.2	0.2	0.4
Bikes On Road	0	0	0	0	0	0	0	0	0	0
% Bikes On Road	0	0	0	0	0	0	0	0	0	0
Bikes On Walk	0	0	0	0	0	0	0	0	0	0
% Bikes On Walk	0	0	0	0	0	0	0	0	0	0
Peds	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0

Traffic Data Collection, LLC

www:tdccounts.com

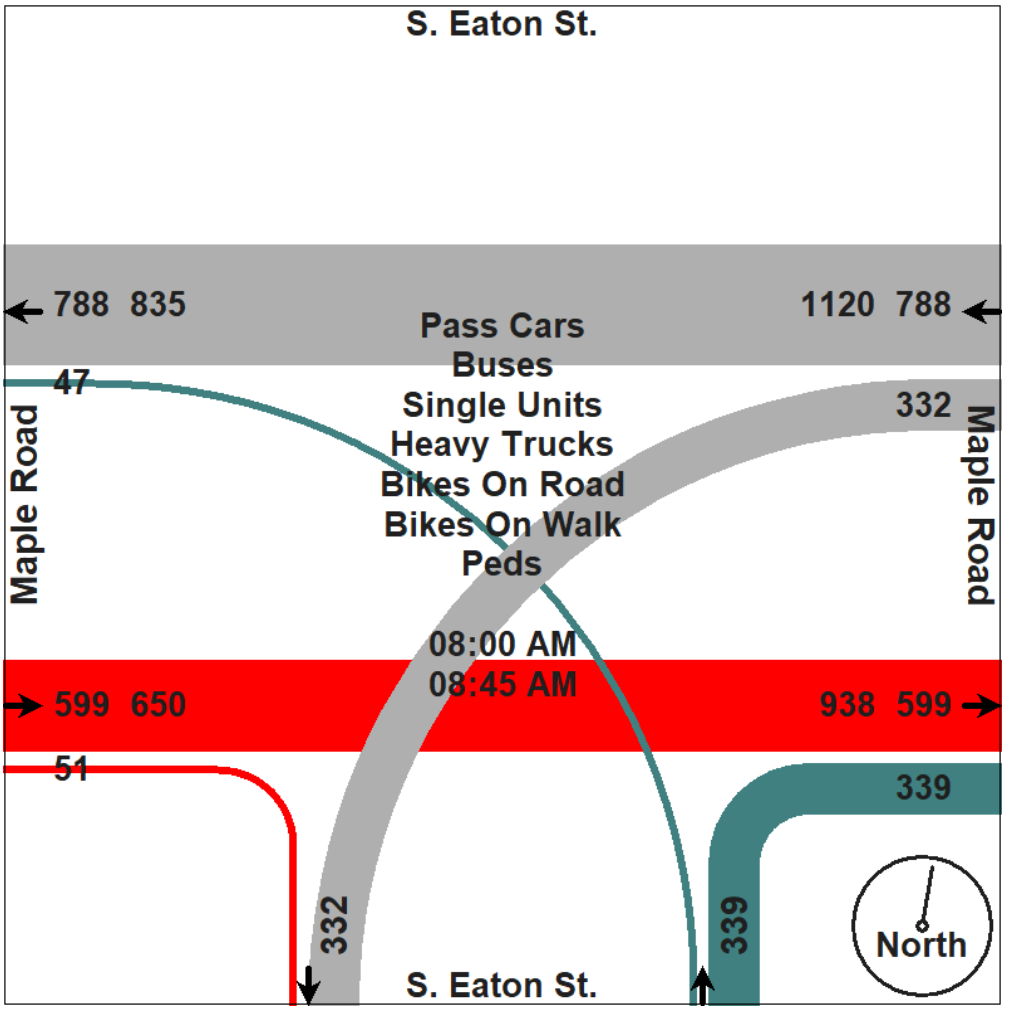
Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 24L SE

File Name : TMC_1 Maple & SEaton_Tue
Site Code : TMC_1
Start Date : 9/18/2018
Page No : 4



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 24L SE

File Name : TMC_1 Maple & SEaton_Tue
Site Code : TMC_1
Start Date : 9/18/2018
Page No : 5

	Maple Road Westbound			S. Eaton St. Northbound			Maple Road Eastbound			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 12:00 PM										
12:00 PM	164	**75**	239	64	**19**	83	**24**	**176**	**200**	**522**
12:15 PM	162	68	230	62	16	78	8	165	173	481
12:30 PM	177	45	222	**75**	19	**94**	14	150	164	480
12:45 PM	**182**	64	**246**	73	15	88	12	154	166	500
Total Volume	685	252	937	274	69	343	58	645	703	1983
% App. Total	73.1	26.9		79.9	20.1		8.3	91.7		
PHF	.941	.840	.952	.913	.908	.912	.604	.916	.879	.950
Pass Cars	663	248	911	272	62	334	52	638	690	1935
% Pass Cars	96.8	98.4	97.2	99.3	89.9	97.4	89.7	98.9	98.2	97.6
Buses	6	0	6	0	1	1	0	4	4	11
% Buses	0.9	0	0.6	0	1.4	0.3	0	0.6	0.6	0.6
Single Units	14	3	17	2	5	7	4	3	7	31
% Single Units	2.0	1.2	1.8	0.7	7.2	2.0	6.9	0.5	1.0	1.6
Heavy Trucks	2	1	3	0	1	1	2	0	2	6
% Heavy Trucks	0.3	0.4	0.3	0	1.4	0.3	3.4	0	0.3	0.3
Bikes On Road	0	0	0	0	0	0	0	0	0	0
% Bikes On Road	0	0	0	0	0	0	0	0	0	0
Bikes On Walk	0	0	0	0	0	0	0	0	0	0
% Bikes On Walk	0	0	0	0	0	0	0	0	0	0
Peds	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0

Traffic Data Collection, LLC

www:tdccounts.com

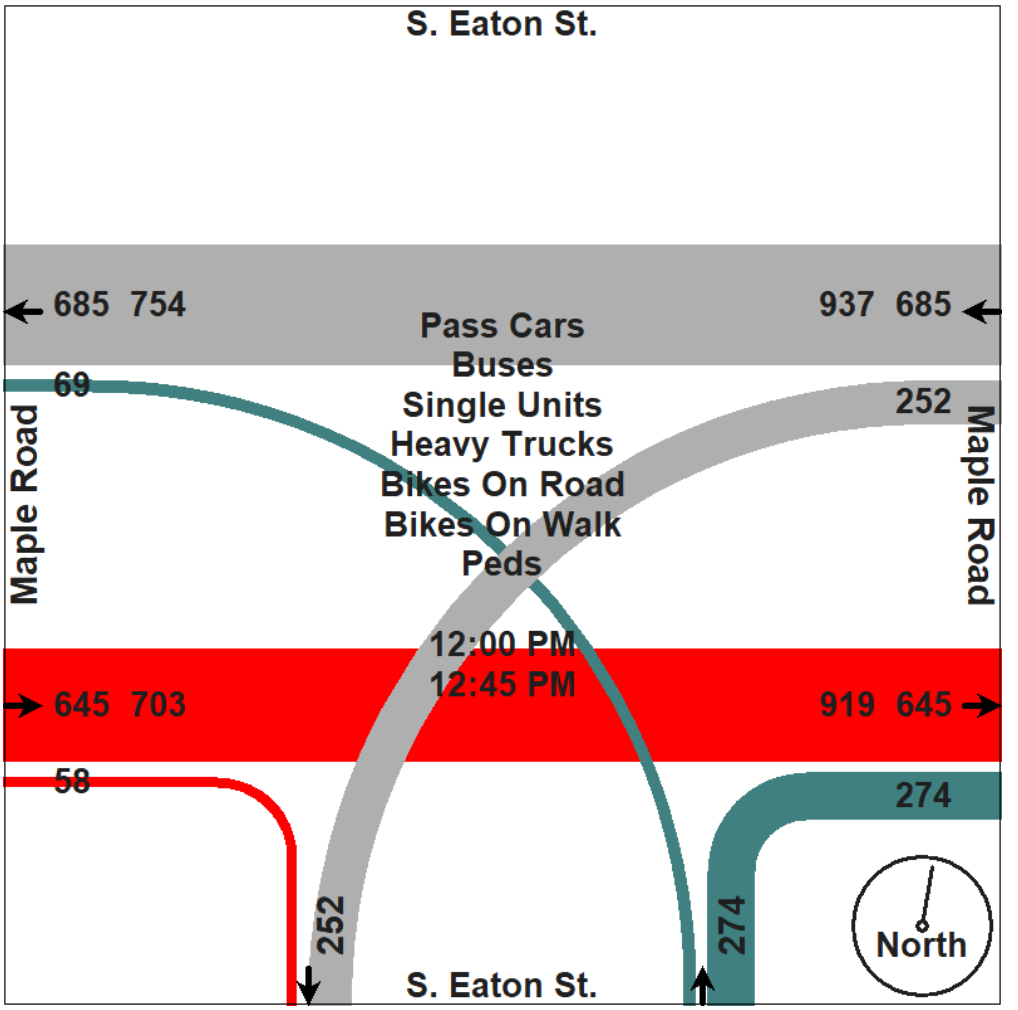
Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 24L SE

File Name : TMC_1 Maple & SEaton_Tue
Site Code : TMC_1
Start Date : 9/18/2018
Page No : 6



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 24L SE

File Name : TMC_1 Maple & SEaton_Tue
Site Code : TMC_1
Start Date : 9/18/2018
Page No : 7

	Maple Road Westbound			S. Eaton St. Northbound			Maple Road Eastbound			
Start Time	Thru	Left	App. Total	Right	Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	175	113	288	99	**22**	121	**27**	**210**	**237**	646
05:15 PM	171	**130**	301	109	15	124	23	181	204	629
05:30 PM	191	125	**316**	**112**	20	**132**	27	204	231	**679**
05:45 PM	**193**	112	305	107	14	121	25	193	218	644
Total Volume	730	480	1210	427	71	498	102	788	890	2598
% App. Total	60.3	39.7		85.7	14.3		11.5	88.5		
PHF	.946	.923	.957	.953	.807	.943	.944	.938	.939	.957
Pass Cars	723	479	1202	421	70	491	97	783	880	2573
% Pass Cars	99.0	99.8	99.3	98.6	98.6	98.6	95.1	99.4	98.9	99.0
Buses	4	0	4	0	0	0	3	5	8	12
% Buses	0.5	0	0.3	0	0	0	2.9	0.6	0.9	0.5
Single Units	2	1	3	2	1	3	2	0	2	8
% Single Units	0.3	0.2	0.2	0.5	1.4	0.6	2.0	0	0.2	0.3
Heavy Trucks	1	0	1	1	0	1	0	0	0	2
% Heavy Trucks	0.1	0	0.1	0.2	0	0.2	0	0	0	0.1
Bikes On Road	0	0	0	3	0	3	0	0	0	3
% Bikes On Road	0	0	0	0.7	0	0.6	0	0	0	0.1
Bikes On Walk	0	0	0	0	0	0	0	0	0	0
% Bikes On Walk	0	0	0	0	0	0	0	0	0	0
Peds	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0

Traffic Data Collection, LLC

www:tdccounts.com

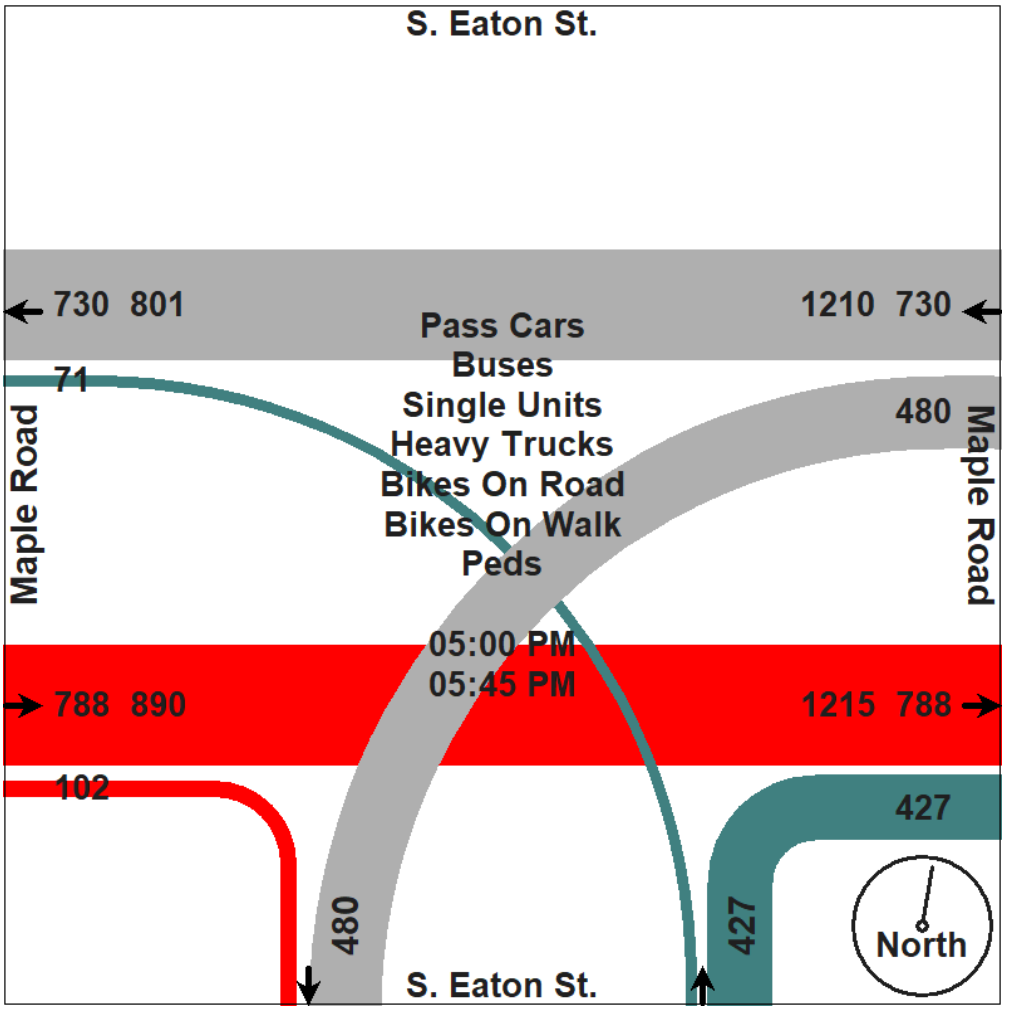
Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 24L SE

File Name : TMC_1 Maple & SEaton_Tue
Site Code : TMC_1
Start Date : 9/18/2018
Page No : 8



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

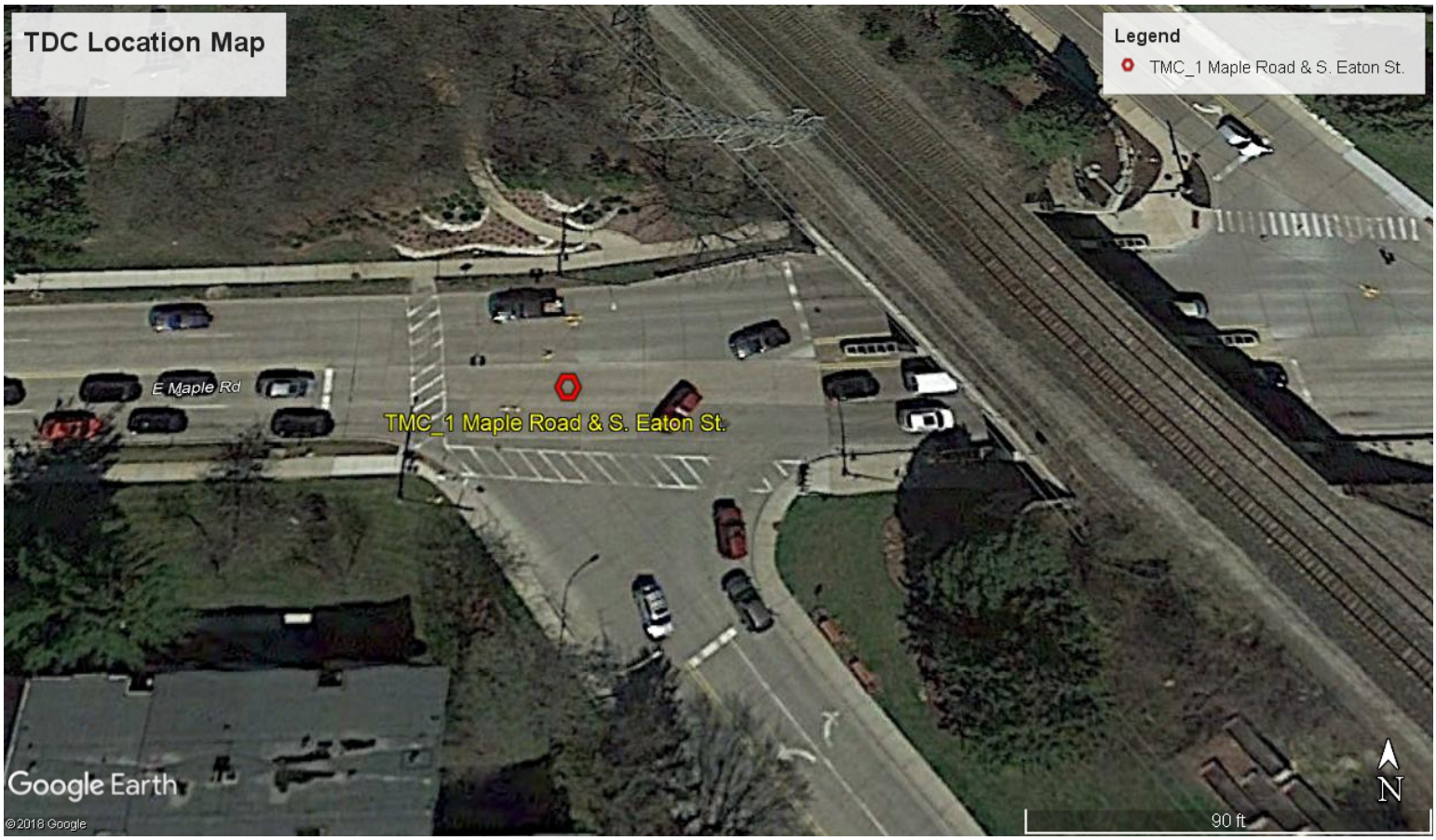
Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 24L SE

File Name : TMC_1 Maple & SEaton_Tue
Site Code : TMC_1
Start Date : 9/18/2018
Page No : 9

Aerial Photo



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 5RA & 4SY

File Name : TMC_2 Maple & NEaton_Sun
Site Code : TMC_2
Start Date : 9/16/2018
Page No : 1

2 Hour video traffic study was conducted during Sunday from 1:00 PM- 3:00 PM PM afternoon peak hours.

Groups Printed- Pass Cars - Buses - Single Units - Heavy Trucks - Bikes On Road - Bikes On Walk - Peds

	N. Eaton St. Southbound					N. Eaton St. Westbound					Whole Foods West Driveway Northbound					Maple Road Eastbound					
Start Time	Right	X Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	X Right	Thru	Left	Peds	App. Total	Int. Total
01:00 PM	35	0	15	0	50	15	142	3	0	160	2	2	21	3	28	10	193	18	0	221	459
01:15 PM	24	0	16	3	43	7	147	3	1	158	5	3	16	7	31	8	192	20	0	220	452
01:30 PM	16	0	17	2	35	13	152	5	3	173	5	2	19	8	34	8	185	16	0	209	451
01:45 PM	27	0	6	0	33	11	151	4	0	166	2	1	21	4	28	15	176	42	0	233	460
Total	102	0	54	5	161	46	592	15	4	657	14	8	77	22	121	41	746	96	0	883	1822
02:00 PM	28	0	14	1	43	11	146	4	0	161	7	3	23	4	37	11	193	27	0	231	472
02:15 PM	20	0	12	1	33	16	165	3	1	185	9	4	21	10	44	4	187	12	0	203	465
02:30 PM	14	1	15	1	31	12	135	1	1	149	5	2	21	4	32	1	179	24	0	204	416
02:45 PM	17	0	14	0	31	11	151	4	0	166	7	6	28	5	46	12	158	25	0	195	438
Total	79	1	55	3	138	50	597	12	2	661	28	15	93	23	159	28	717	88	0	833	1791
Grand Total	181	1	109	8	299	96	1189	27	6	1318	42	23	170	45	280	69	1463	184	0	1716	3613
Apprch %	60.5	0.3	36.5	2.7		7.3	90.2	2	0.5		15	8.2	60.7	16.1		4	85.3	10.7	0		
Total %	5	0	3	0.2	8.3	2.7	32.9	0.7	0.2	36.5	1.2	0.6	4.7	1.2	7.7	1.9	40.5	5.1	0	47.5	
Pass Cars	180	1	109	0	290	96	1184	27	0	1307	42	23	170	0	235	68	1455	166	0	1689	3521
% Pass Cars	99.4	100	100	0	97	100	99.6	100	0	99.2	100	100	100	0	83.9	98.6	99.5	90.2	0	98.4	97.5
Buses	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	1	5	0	0	6	9
% Buses	0	0	0	0	0	0	0.3	0	0	0.2	0	0	0	0	0	1.4	0.3	0	0	0.3	0.2
Single Units	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	4
% Single Units	0	0	0	0	0	0	0.2	0	0	0.2	0	0	0	0	0	0	0.1	0	0	0.1	0.1
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bikes On Road	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	18	0	19	20
% Bikes On Road	0.6	0	0	0	0.3	0	0	0	0	0	0	0	0	0	0	0	0.1	9.8	0	1.1	0.6
Bikes On Walk	0	0	0	3	3	0	0	0	0	0	0	0	0	11	11	0	0	0	0	0	14
% Bikes On Walk	0	0	0	37.5	1	0	0	0	0	0	0	0	0	24.4	3.9	0	0	0	0	0	0.4
Peds	0	0	0	5	5	0	0	0	6	6	0	0	0	34	34	0	0	0	0	0	45
% Peds	0	0	0	62.5	1.7	0	0	0	100	0.5	0	0	0	75.6	12.1	0	0	0	0	0	1.2

TDC Traffic Comments: Signalized intersection with ped. signals north, east & south legs. Push buttons for east leg. Note: SB Thru & EB Right turn movements prohibited. Video VCU cameras were located within NW & SW intersection quadrants. Note: Peds. are excluded from peak hour reports. Traffic counts performed for ROWE Professional Services Company for Birmingham Whole Foods Traffic Study.

Traffic Data Collection, LLC

www:tdccounts.com

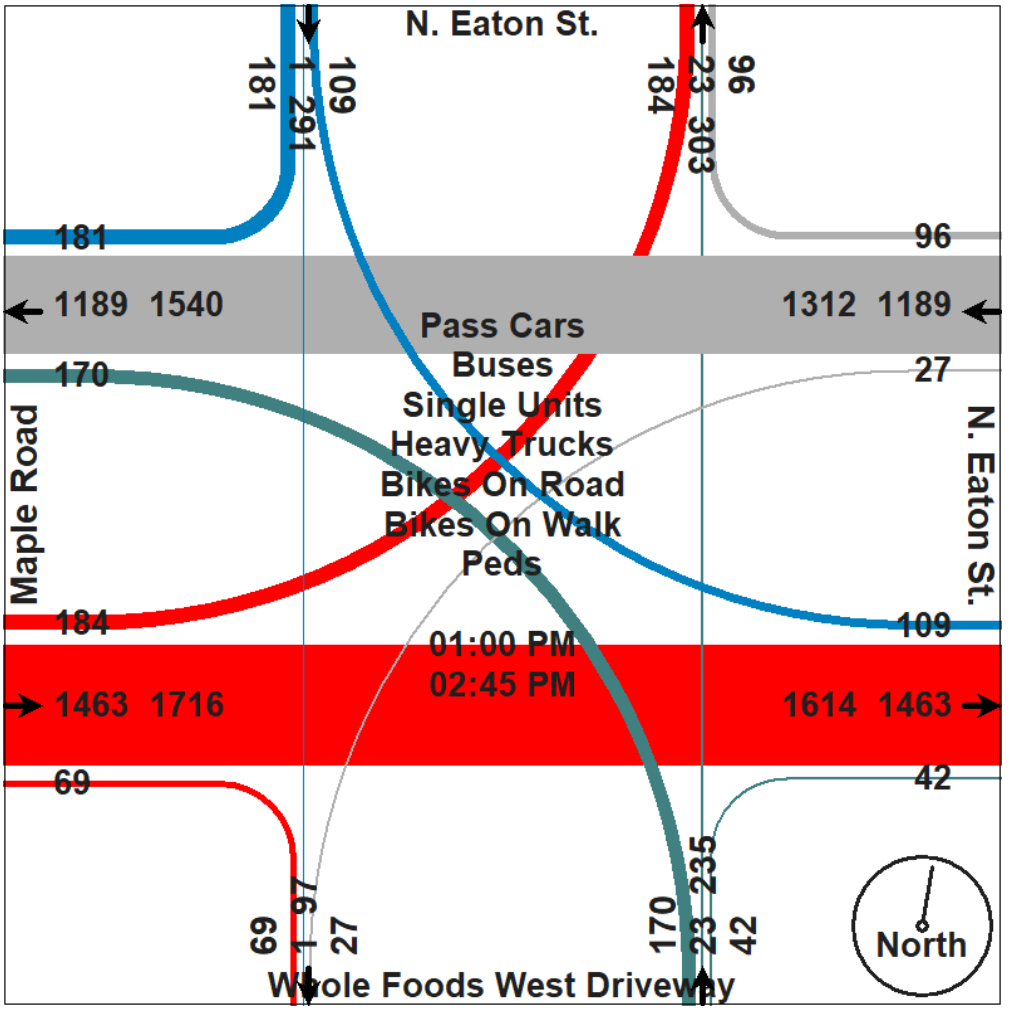
Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 5RA & 4SY

File Name : TMC_2 Maple & NEaton_Sun
Site Code : TMC_2
Start Date : 9/16/2018
Page No : 2



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 5RA & 4SY

File Name : TMC_2 Maple & NEaton_Sun
Site Code : TMC_2
Start Date : 9/16/2018
Page No : 3

	N. Eaton St. Southbound				N. Eaton St. Westbound				Whole Foods West Driveway Northbound				Maple Road Eastbound				
Start Time	Right	X Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	X Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 01:30 PM																	
01:30 PM	16	0	**17**	33	13	152	**5**	170	5	2	19	26	8	185	16	209	438
01:45 PM	27	0	6	33	11	151	4	166	2	1	21	24	**15**	176	**42**	**233**	456
02:00 PM	**28**	0	14	**42**	11	146	4	161	7	3	**23**	33	11	**193**	27	231	**467**
02:15 PM	20	0	12	32	**16**	**165**	3	**184**	**9**	**4**	21	**34**	4	187	12	203	453
Total Volume	91	0	49	140	51	614	16	681	23	10	84	117	38	741	97	876	1814
% App. Total	65	0	35		7.5	90.2	2.3		19.7	8.5	71.8		4.3	84.6	11.1		
PHF	.813	.000	.721	.833	.797	.930	.800	.925	.639	.625	.913	.860	.633	.960	.577	.940	.971
Pass Cars	91	0	49	140	51	612	16	679	23	10	84	117	38	739	81	858	1794
% Pass Cars	100	0	100	100	100	99.7	100	99.7	100	100	100	100	100	99.7	83.5	97.9	98.9
Buses	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	1	2
% Buses	0	0	0	0	0	0.2	0	0.1	0	0	0	0	0	0.1	0	0.1	0.1
Single Units	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
% Single Units	0	0	0	0	0	0.2	0	0.1	0	0	0	0	0	0	0	0	0.1
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bikes On Road	0	0	0	0	0	0	0	0	0	0	0	0	0	1	16	17	17
% Bikes On Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	16.5	1.9	0.9
Bikes On Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes On Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Traffic Data Collection, LLC

www:tdccounts.com

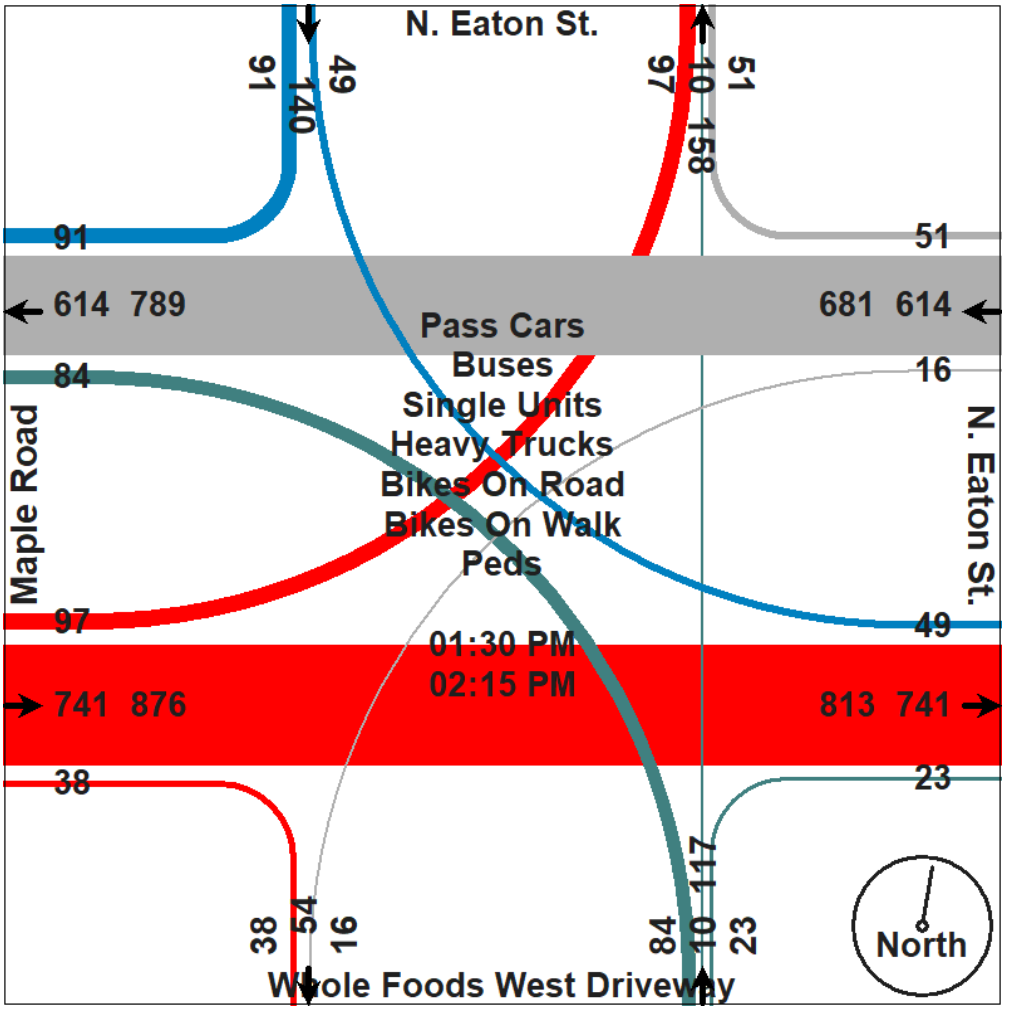
Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 5RA & 4SY

File Name : TMC_2 Maple & NEaton_Sun
Site Code : TMC_2
Start Date : 9/16/2018
Page No : 4



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 5RA & 4SY

File Name : TMC_2 Maple & NEaton_Tue
Site Code : TMC_2
Start Date : 9/18/2018
Page No : 1

6 Hour video traffic study was conducted during typical weekday (Tuesday-Thursday) from 7:00 AM -9:00 AM morning, 12:00 -2:00 PM mid-day & 4:00 PM - 6:00 PM afternoon peak hours, while school was in session.

Groups Printed- Pass Cars - Buses - Single Units - Heavy Trucks - Bikes On Road - Bikes On Walk - Peds

	N. Eaton St. Southbound					Maple Road Westbound					Whole Foods West Driveway Northbound					Maple Road Eastbound					
Start Time	Right	X Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	X Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	39	0	7	1	47	0	107	0	0	107	0	2	1	1	4	0	101	7	0	108	266
07:15 AM	53	0	5	1	59	0	160	1	0	161	0	0	1	3	4	1	120	7	0	128	352
07:30 AM	65	0	10	0	75	6	199	0	0	205	1	0	1	1	3	1	147	17	0	165	448
07:45 AM	75	0	16	1	92	0	197	4	1	202	0	0	5	2	7	1	175	36	0	212	513
Total	232	0	38	3	273	6	663	5	1	675	1	2	8	7	18	3	543	67	0	613	1579
08:00 AM	93	0	19	0	112	7	206	0	0	213	0	1	7	0	8	2	211	24	0	237	570
08:15 AM	59	0	5	0	64	5	201	0	0	206	0	0	6	5	11	0	198	34	0	232	513
08:30 AM	66	0	20	0	86	10	203	0	0	213	0	0	4	2	6	1	215	41	0	257	562
08:45 AM	62	0	15	2	79	6	205	0	1	212	0	0	5	5	10	2	204	15	0	221	522
Total	280	0	59	2	341	28	815	0	1	844	0	1	22	12	35	5	828	114	0	947	2167
*** BREAK ***																					
12:00 PM	26	0	13	0	39	11	190	3	0	204	2	1	20	1	24	6	219	15	0	240	507
12:15 PM	23	1	10	1	35	6	187	2	1	196	5	2	20	1	28	4	207	14	0	225	484
12:30 PM	22	0	16	0	38	16	172	3	0	191	6	4	23	5	38	5	200	17	0	222	489
12:45 PM	33	0	12	2	47	9	192	0	1	202	8	3	24	2	37	7	190	22	0	219	505
Total	104	1	51	3	159	42	741	8	2	793	21	10	87	9	127	22	816	68	0	906	1985
01:00 PM	18	1	13	0	32	15	176	1	0	192	3	0	18	0	21	6	217	16	0	239	484
01:15 PM	18	0	9	0	27	5	178	1	2	186	4	6	16	3	29	6	223	21	0	250	492
01:30 PM	28	0	8	1	37	6	166	3	1	176	3	3	26	6	38	3	181	24	0	208	459
01:45 PM	24	0	7	2	33	7	161	2	1	171	3	2	27	0	32	4	198	18	0	220	456
Total	88	1	37	3	129	33	681	7	4	725	13	11	87	9	120	19	819	79	0	917	1891
*** BREAK ***																					
04:00 PM	54	0	20	1	75	8	190	2	0	200	1	5	20	1	27	5	207	19	0	231	533
04:15 PM	38	0	12	1	51	10	223	2	0	235	2	0	14	2	18	3	226	33	0	262	566
04:30 PM	40	0	14	1	55	13	228	1	0	242	1	4	12	2	19	3	230	36	0	269	585
04:45 PM	62	0	16	1	79	9	246	1	1	257	0	2	17	3	22	3	221	34	0	258	616
Total	194	0	62	4	260	40	887	6	1	934	4	11	63	8	86	14	884	122	0	1020	2300
05:00 PM	64	0	11	0	75	13	217	6	2	238	4	5	18	0	27	6	257	37	0	300	640
05:15 PM	81	0	14	0	95	15	208	1	3	227	3	1	15	4	23	3	236	42	0	281	626
05:30 PM	85	0	15	1	101	19	213	5	2	239	2	5	19	2	28	6	261	36	0	303	671
05:45 PM	71	0	18	1	90	7	208	1	3	219	2	1	19	4	26	1	247	46	0	294	629
Total	301	0	58	2	361	54	846	13	10	923	11	12	71	10	104	16	1001	161	0	1178	2566
Grand Total	1199	2	305	17	1523	203	4633	39	19	4894	50	47	338	55	490	79	4891	611	0	5581	12488
Apprch %	78.7	0.1	20	1.1		4.1	94.7	0.8	0.4		10.2	9.6	69	11.2		1.4	87.6	10.9	0		
Total %	9.6	0	2.4	0.1	12.2	1.6	37.1	0.3	0.2	39.2	0.4	0.4	2.7	0.4	3.9	0.6	39.2	4.9	0	44.7	
Pass Cars	1167	1	300	0	1468	196	4512	37	0	4745	49	46	336	0	431	77	4797	593	0	5467	12111
% Pass Cars	97.3	50	98.4	0	96.4	96.6	97.4	94.9	0	97	98	97.9	99.4	0	88	97.5	98.1	97.1	0	98	97
Buses	16	0	1	0	17	0	41	0	0	41	0	0	0	0	0	0	26	11	0	37	95
% Buses	1.3	0	0.3	0	1.1	0	0.9	0	0	0.8	0	0	0	0	0	0	0.5	1.8	0	0.7	0.8
Single Units	12	0	4	0	16	5	62	1	0	68	0	0	2	0	2	1	62	3	0	66	152
% Single Units	1	0	1.3	0	1.1	2.5	1.3	2.6	0	1.4	0	0	0.6	0	0.4	1.3	1.3	0.5	0	1.2	1.2
Heavy Trucks	2	1	0	0	3	2	18	1	0	21	1	0	0	0	1	1	6	0	0	7	32
% Heavy Trucks	0.2	50	0	0	0.2	1	0.4	2.6	0	0.4	2	0	0	0	0.2	1.3	0.1	0	0	0.1	0.3
Bikes On Road	2	0	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	4	0	4	7
% Bikes On Road	0.2	0	0	0	0.1	0	0	0	0	0	0	2.1	0	0	0.2	0	0	0.7	0	0.1	0.1
Bikes On Walk	0	0	0	4	4	0	0	0	2	2	0	0	0	14	14	0	0	0	0	0	20
% Bikes On Walk	0	0	0	23.5	0.3	0	0	0	10.5	0	0	0	0	25.5	2.9	0	0	0	0	0	0.2

Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

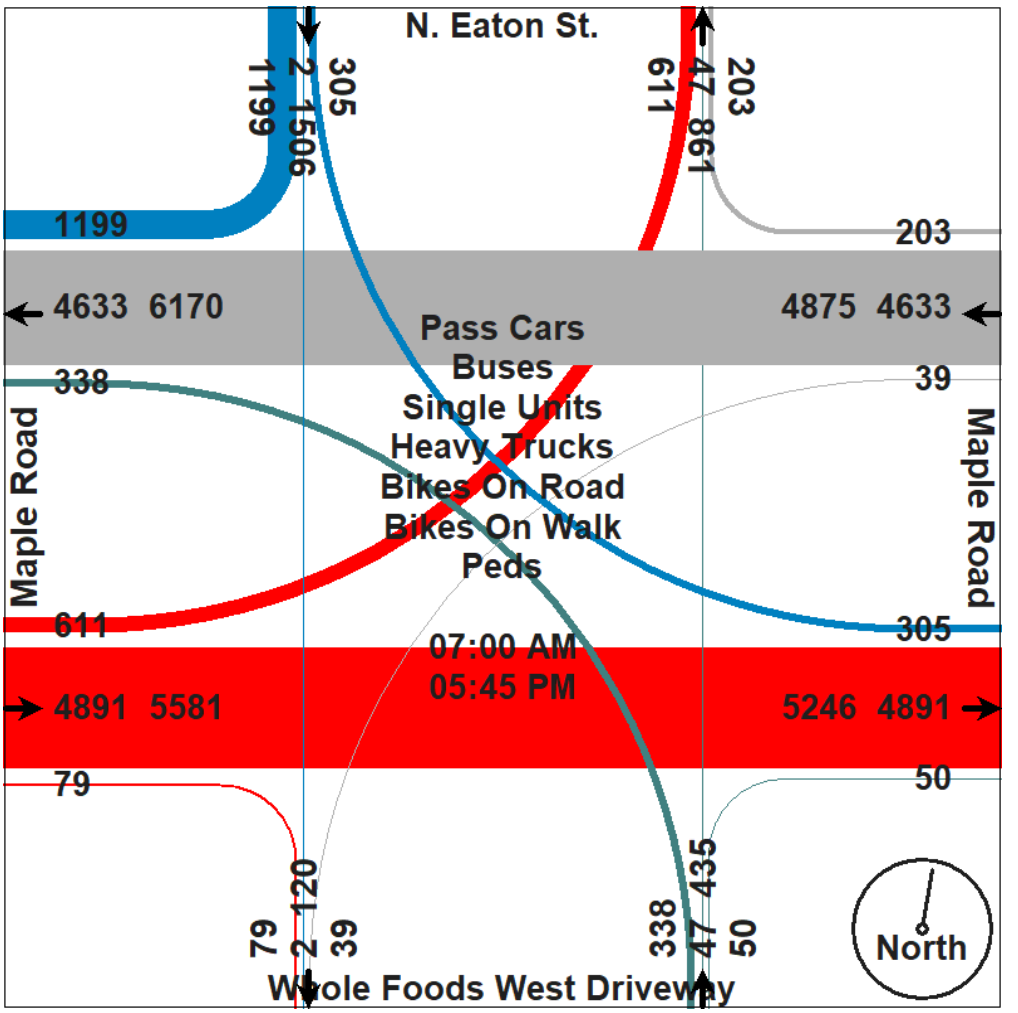
Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 5RA & 4SY

File Name : TMC_2 Maple & NEaton_Tue
Site Code : TMC_2
Start Date : 9/18/2018
Page No : 2

Groups Printed- Pass Cars - Buses - Single Units - Heavy Trucks - Bikes On Road - Bikes On Walk - Peds

	N. Eaton St. Southbound					Maple Road Westbound					Whole Foods West Driveway Northbound					Maple Road Eastbound					
	Right	X Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	X Right	Thru	Left	Peds	App. Total	Int. Total
Peds	0	0	0	13	13	0	0	0	17	17	0	0	0	41	41	0	0	0	0	0	71
% Peds	0	0	0	76.5	0.9	0	0	0	89.5	0.3	0	0	0	74.5	8.4	0	0	0	0	0	0.6

TDC Traffic Comments: Signalized intersection with ped. signals for north, east & south legs. Push buttons for east leg. Note: SB Thru & EB Right turn movements are prohibited. Video VCU cameras were located within NW & SW intersection quadrants: Note: Peds. are excluded from peak hour reports. Traffic counts performed for ROWE Professional Services Company for Birmingham Whole Foods Traffic Study.



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 5RA & 4SY

File Name : TMC_2 Maple & NEaton_Tue
Site Code : TMC_2
Start Date : 9/18/2018
Page No : 3

	N. Eaton St. Southbound				Maple Road Westbound				Whole Foods West Driveway Northbound				Maple Road Eastbound				
Start Time	Right	X Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	X Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	**93**	0	19	**112**	7	**206**	0	**213**	0	**1**	**7**	**8**	**2**	211	24	237	**570**
08:15 AM	59	0	5	64	5	201	0	206	0	0	6	6	0	198	34	232	508
08:30 AM	66	0	**20**	86	**10**	203	0	213	0	0	4	4	1	**215**	**41**	**257**	560
08:45 AM	62	0	15	77	6	205	0	211	0	0	5	5	2	204	15	221	514
Total Volume	280	0	59	339	28	815	0	843	0	1	22	23	5	828	114	947	2152
% App. Total	82.6	0	17.4		3.3	96.7	0		0	4.3	95.7		0.5	87.4	12		
PHF	.753	.000	.738	.757	.700	.989	.000	.989	.000	.250	.786	.719	.625	.963	.695	.921	.944
Pass Cars	268	0	57	325	24	785	0	809	0	1	22	23	5	803	107	915	2072
% Pass Cars	95.7	0	96.6	95.9	85.7	96.3	0	96.0	0	100	100	100	100	97.0	93.9	96.6	96.3
Buses	8	0	0	8	0	8	0	8	0	0	0	0	0	6	7	13	29
% Buses	2.9	0	0	2.4	0	1.0	0	0.9	0	0	0	0	0	0.7	6.1	1.4	1.3
Single Units	3	0	2	5	3	17	0	20	0	0	0	0	0	18	0	18	43
% Single Units	1.1	0	3.4	1.5	10.7	2.1	0	2.4	0	0	0	0	0	2.2	0	1.9	2.0
Heavy Trucks	1	0	0	1	1	5	0	6	0	0	0	0	0	1	0	1	8
% Heavy Trucks	0.4	0	0	0.3	3.6	0.6	0	0.7	0	0	0	0	0	0.1	0	0.1	0.4
Bikes On Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes On Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bikes On Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes On Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Traffic Data Collection, LLC

www:tdccounts.com

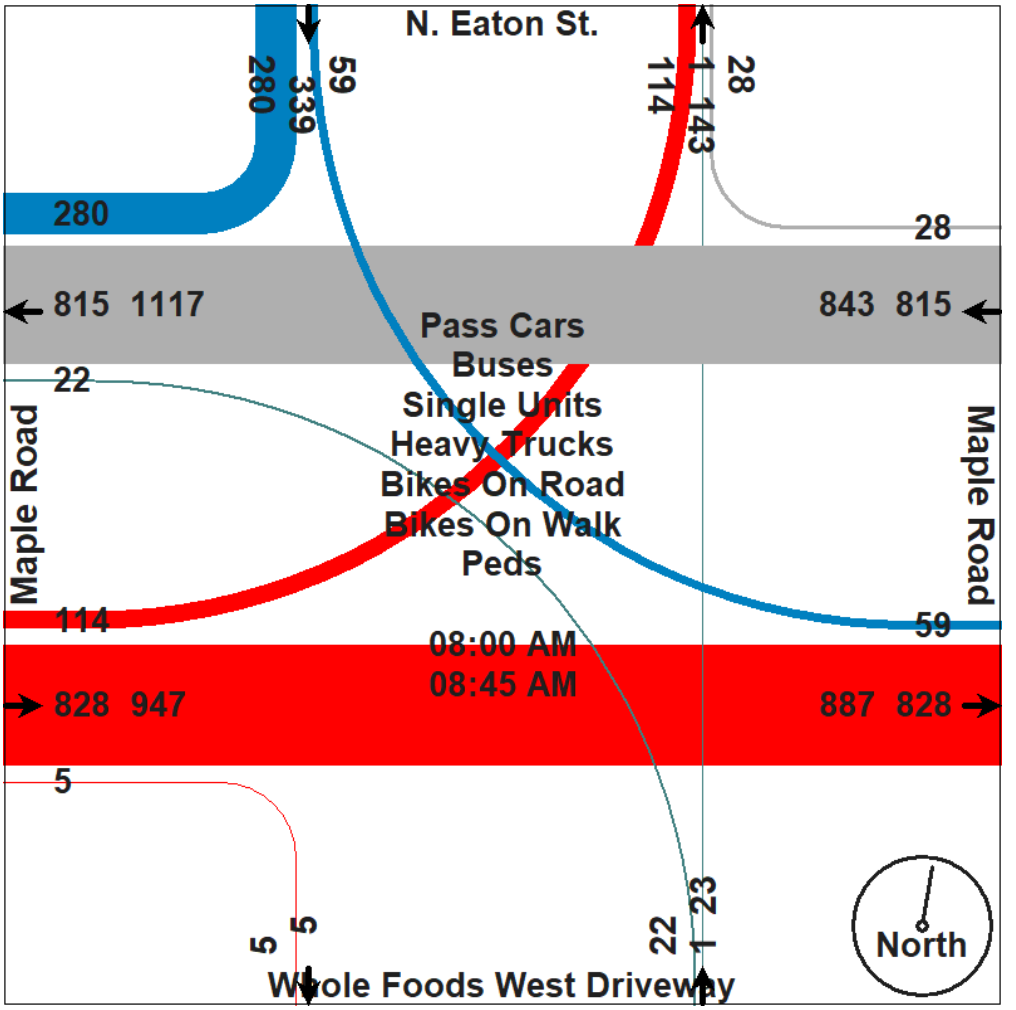
Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 5RA & 4SY

File Name : TMC_2 Maple & NEaton_Tue
Site Code : TMC_2
Start Date : 9/18/2018
Page No : 4



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 5RA & 4SY

File Name : TMC_2 Maple & NEaton_Tue
Site Code : TMC_2
Start Date : 9/18/2018
Page No : 5

	N. Eaton St. Southbound				Maple Road Westbound				Whole Foods West Driveway Northbound				Maple Road Eastbound				
Start Time	Right	X Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	X Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	26	0	13	39	11	190	**3**	**204**	2	1	20	23	6	**219**	15	**240**	**506**
12:15 PM	23	**1**	10	34	6	187	2	195	5	2	20	27	4	207	14	225	481
12:30 PM	22	0	**16**	38	**16**	172	3	191	6	**4**	23	33	5	200	17	222	484
12:45 PM	**33**	0	12	**45**	9	**192**	0	201	**8**	3	**24**	**35**	**7**	190	**22**	219	500
Total Volume	104	1	51	156	42	741	8	791	21	10	87	118	22	816	68	906	1971
% App. Total	66.7	0.6	32.7		5.3	93.7	1		17.8	8.5	73.7		2.4	90.1	7.5		
PHF	.788	.250	.797	.867	.656	.965	.667	.969	.656	.625	.906	.843	.786	.932	.773	.944	.974
Pass Cars	100	0	51	151	40	723	8	771	21	10	85	116	21	807	67	895	1933
% Pass Cars	96.2	0	100	96.8	95.2	97.6	100	97.5	100	100	97.7	98.3	95.5	98.9	98.5	98.8	98.1
Buses	0	0	0	0	0	5	0	5	0	0	0	0	0	4	0	4	9
% Buses	0	0	0	0	0	0.7	0	0.6	0	0	0	0	0	0.5	0	0.4	0.5
Single Units	4	0	0	4	1	10	0	11	0	0	2	2	1	5	1	7	24
% Single Units	3.8	0	0	2.6	2.4	1.3	0	1.4	0	0	2.3	1.7	4.5	0.6	1.5	0.8	1.2
Heavy Trucks	0	1	0	1	1	3	0	4	0	0	0	0	0	0	0	0	5
% Heavy Trucks	0	100	0	0.6	2.4	0.4	0	0.5	0	0	0	0	0	0	0	0	0.3
Bikes On Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes On Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bikes On Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes On Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Traffic Data Collection, LLC

www:tdccounts.com

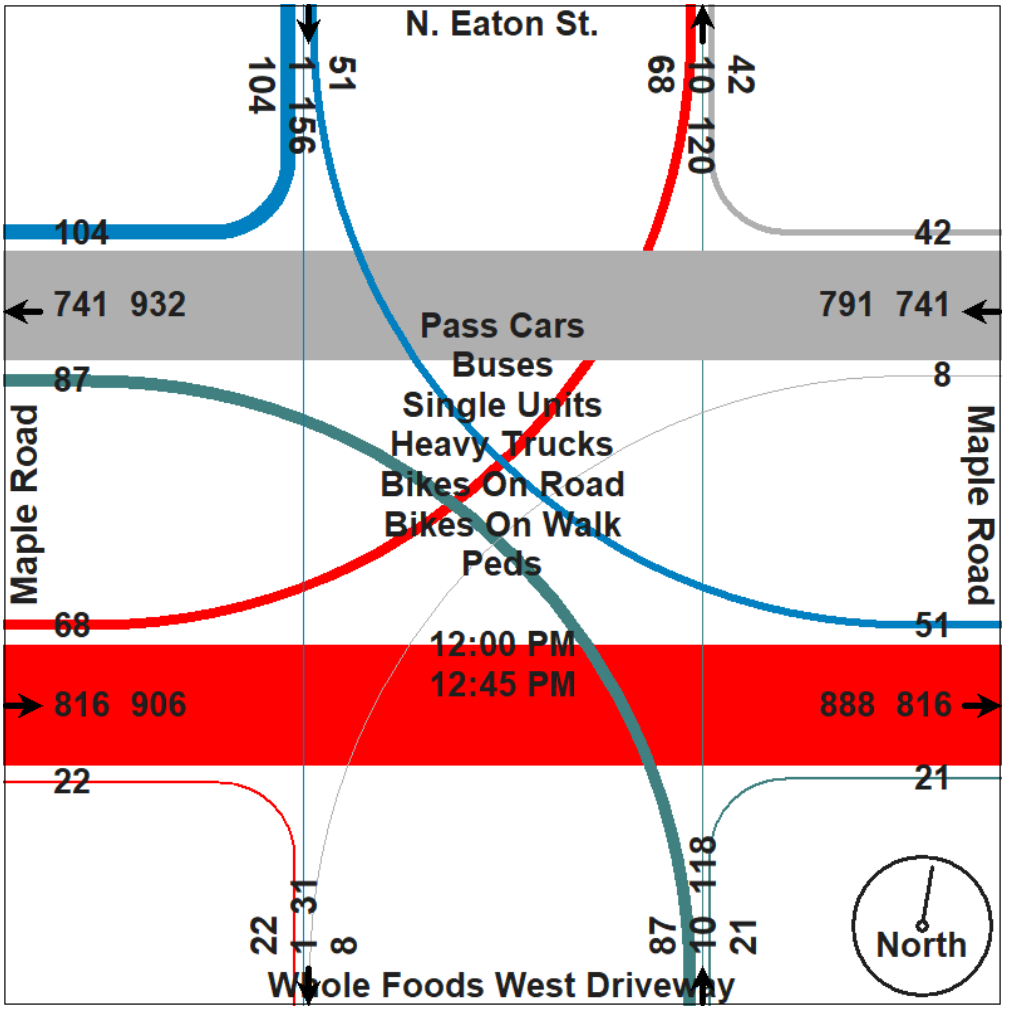
Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 5RA & 4SY

File Name : TMC_2 Maple & NEaton_Tue
Site Code : TMC_2
Start Date : 9/18/2018
Page No : 6



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 5RA & 4SY

File Name : TMC_2 Maple & NEaton_Tue
Site Code : TMC_2
Start Date : 9/18/2018
Page No : 7

	N. Eaton St. Southbound				Maple Road Westbound				Whole Foods West Driveway Northbound				Maple Road Eastbound				
Start Time	Right	X Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	X Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	64	0	11	75	13	**217**	**6**	236	**4**	**5**	18	**27**	**6**	257	37	300	638
05:15 PM	81	0	14	95	15	208	1	224	3	1	15	19	3	236	42	281	619
05:30 PM	**85**	0	15	**100**	**19**	213	5	**237**	2	5	**19**	26	6	**261**	36	**303**	**666**
05:45 PM	71	0	**18**	89	7	208	1	216	2	1	19	22	1	247	**46**	294	621
Total Volume	301	0	58	359	54	846	13	913	11	12	71	94	16	1001	161	1178	2544
% App. Total	83.8	0	16.2		5.9	92.7	1.4		11.7	12.8	75.5		1.4	85	13.7		
PHF	.885	.000	.806	.898	.711	.975	.542	.963	.688	.600	.934	.870	.667	.959	.875	.972	.955
Pass Cars	299	0	57	356	53	839	13	905	11	12	71	94	16	986	158	1160	2515
% Pass Cars	99.3	0	98.3	99.2	98.1	99.2	100	99.1	100	100	100	100	100	98.5	98.1	98.5	98.9
Buses	0	0	1	1	0	5	0	5	0	0	0	0	0	3	0	3	9
% Buses	0	0	1.7	0.3	0	0.6	0	0.5	0	0	0	0	0	0.3	0	0.3	0.4
Single Units	1	0	0	1	1	1	0	2	0	0	0	0	0	10	0	10	13
% Single Units	0.3	0	0	0.3	1.9	0.1	0	0.2	0	0	0	0	0	1.0	0	0.8	0.5
Heavy Trucks	1	0	0	1	0	1	0	1	0	0	0	0	0	2	0	2	4
% Heavy Trucks	0.3	0	0	0.3	0	0.1	0	0.1	0	0	0	0	0	0.2	0	0.2	0.2
Bikes On Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3
% Bikes On Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.9	0.3	0.1
Bikes On Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes On Walk	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Traffic Data Collection, LLC

www:tdccounts.com

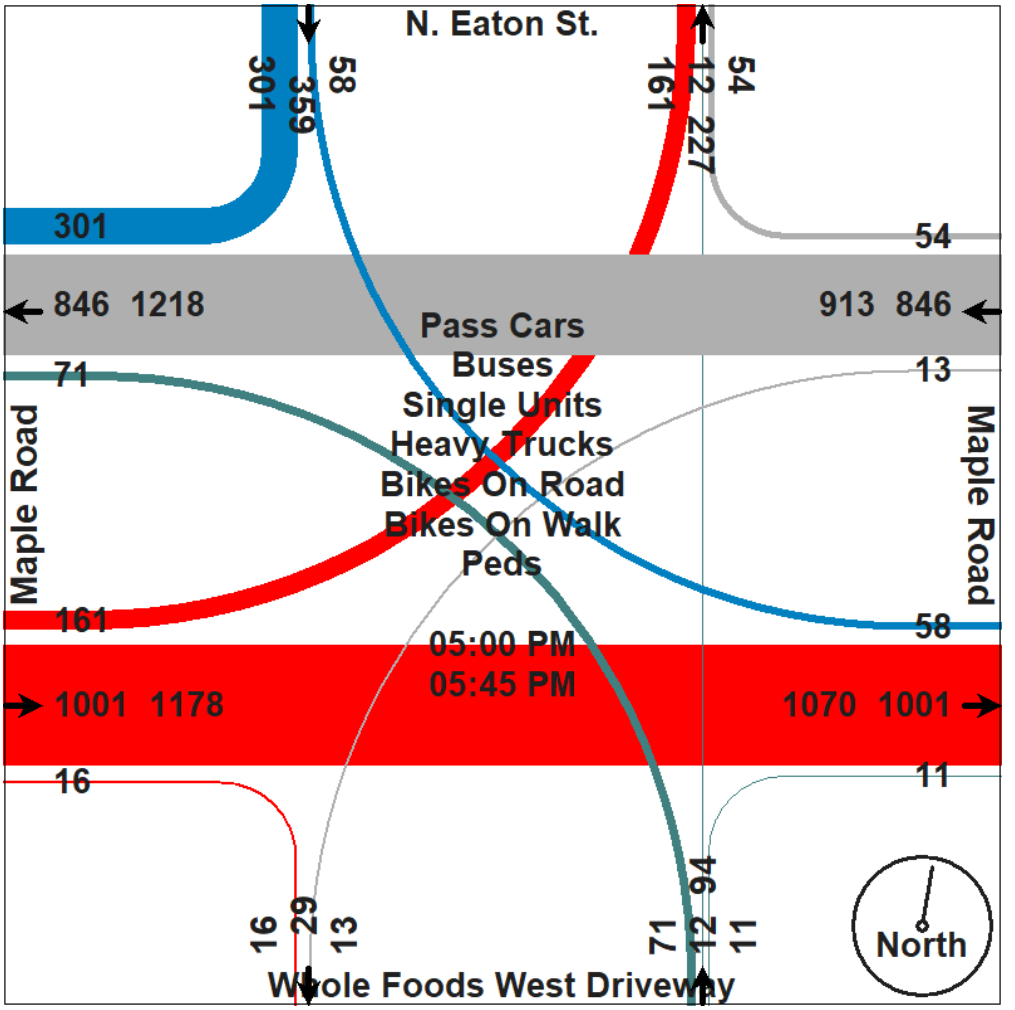
Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 5RA & 4SY

File Name : TMC_2 Maple & NEaton_Tue
Site Code : TMC_2
Start Date : 9/18/2018
Page No : 8



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

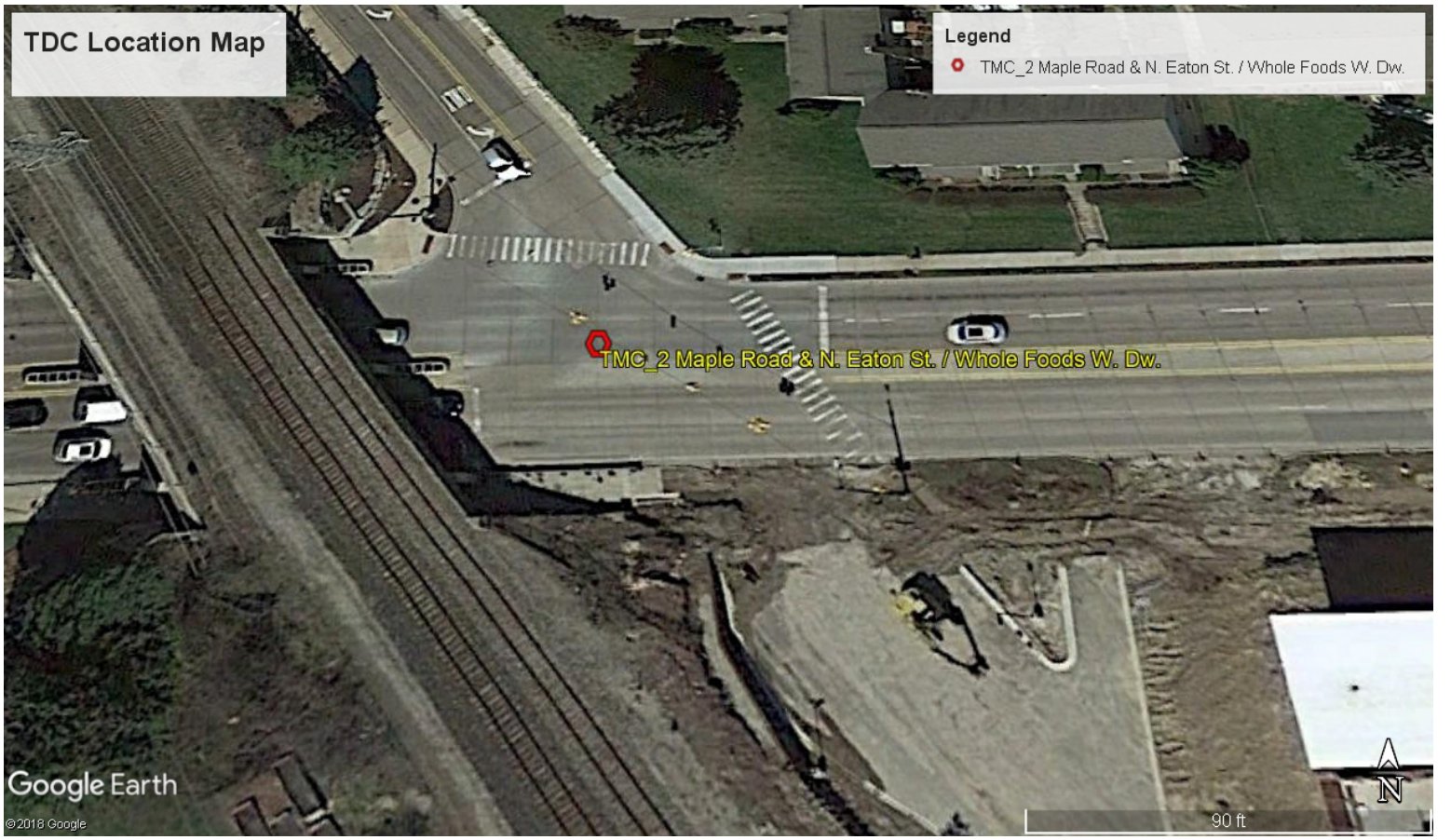
Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 5RA & 4SY

File Name : TMC_2 Maple & NEaton_Tue
Site Code : TMC_2
Start Date : 9/18/2018

Aerial Photo



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : TMC_3 Maple & Whole Foods EDw_Sun
Site Code : TMC_3
Start Date : 9/16/2018
Page No : 1

2 Hour video traffic study was conducted during Sunday from 1:00 PM- 3:00 PM PM afternoon peak hours.

Groups Printed- Pass Cars - Buses - Single Units - Heavy Trucks - Bikes On Road - Bikes On Walk - Peds

	Maple Road Westbound				Whole Foods East Driveway Northbound				Maple Road Eastbound				
Start Time	Thru	Left	Peds	App. Total	Right	X Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
01:00 PM	154	30	0	184	25	0	0	25	17	188	2	207	416
01:15 PM	157	35	0	192	28	1	0	29	21	190	0	211	432
01:30 PM	176	32	0	208	34	1	0	35	23	179	1	203	446
01:45 PM	170	33	0	203	16	2	0	18	24	151	1	176	397
Total	657	130	0	787	103	4	0	107	85	708	4	797	1691
02:00 PM	157	32	0	189	26	1	2	29	19	203	0	222	440
02:15 PM	167	29	0	196	25	4	9	38	16	197	0	213	447
02:30 PM	144	42	0	186	39	2	5	46	24	173	0	197	429
02:45 PM	167	29	0	196	23	3	9	35	17	163	0	180	411
Total	635	132	0	767	113	10	25	148	76	736	0	812	1727
Grand Total	1292	262	0	1554	216	14	25	255	161	1444	4	1609	3418
Apprch %	83.1	16.9	0		84.7	5.5	9.8		10	89.7	0.2		
Total %	37.8	7.7	0	45.5	6.3	0.4	0.7	7.5	4.7	42.2	0.1	47.1	
Pass Cars	1285	262	0	1547	216	14	0	230	160	1438	0	1598	3375
% Pass Cars	99.5	100	0	99.5	100	100	0	90.2	99.4	99.6	0	99.3	98.7
Buses	3	0	0	3	0	0	0	0	0	4	0	4	7
% Buses	0.2	0	0	0.2	0	0	0	0	0	0.3	0	0.2	0.2
Single Units	4	0	0	4	0	0	0	0	1	2	0	3	7
% Single Units	0.3	0	0	0.3	0	0	0	0	0.6	0.1	0	0.2	0.2
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
Bikes On Road	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes On Road	0	0	0	0	0	0	0	0	0	0	0	0	0
Bikes On Walk	0	0	0	0	0	0	8	8	0	0	0	0	8
% Bikes On Walk	0	0	0	0	0	0	32	3.1	0	0	0	0	0.2
Peds	0	0	0	0	0	0	17	17	0	0	4	4	21
% Peds	0	0	0	0	0	0	68	6.7	0	0	100	0.2	0.6

TDC Traffic Comments: Non-signalized intersection, restricted driveway. NB left turns prohibited. Video VCU camera was located within SE intersection quadrant. Note: Peds. are excluded from peak hour reports. Traffic counts performed for ROWE Professional Services Company for Birmingham Whole Foods Traffic Study.

Traffic Data Collection, LLC

www:tdccounts.com

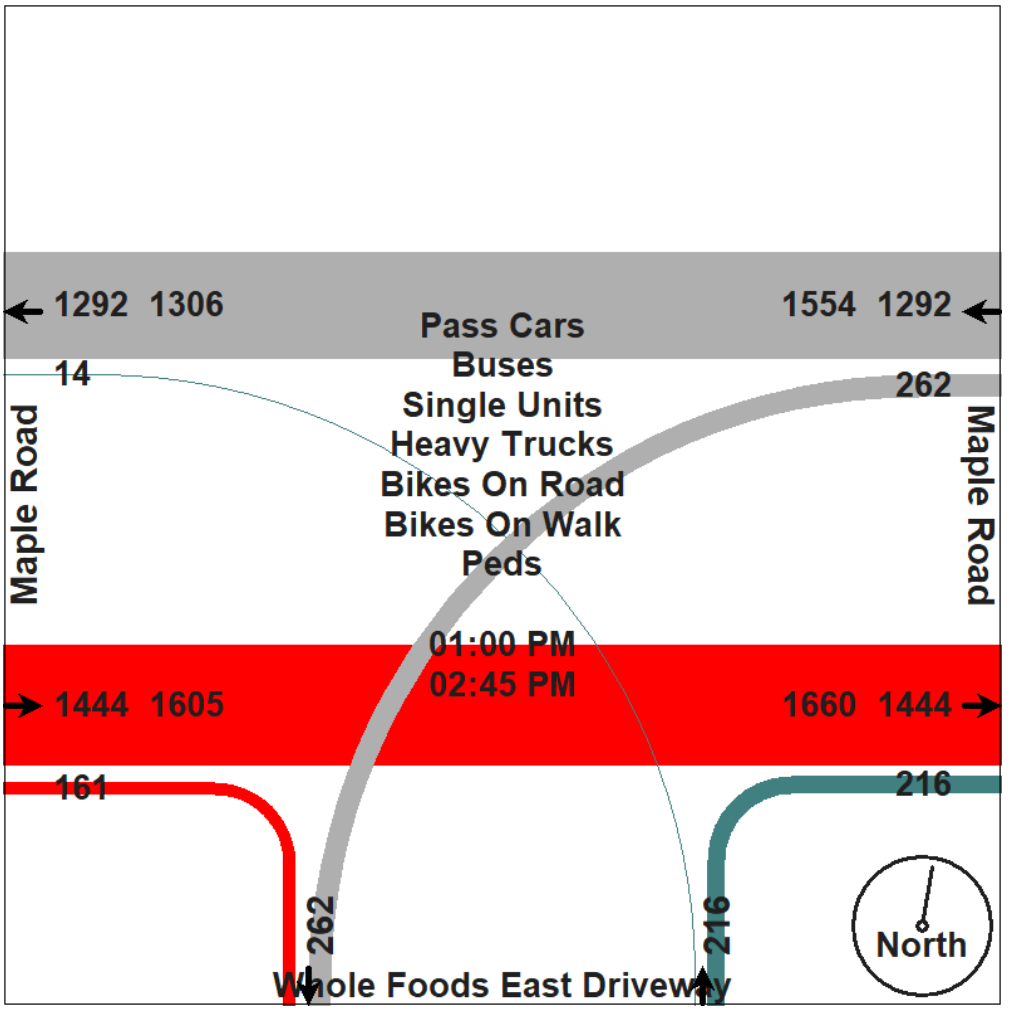
Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : TMC_3 Maple & Whole Foods EDw_Sun
Site Code : TMC_3
Start Date : 9/16/2018
Page No : 2



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : TMC_3 Maple & Whole Foods EDw_Sun
Site Code : TMC_3
Start Date : 9/16/2018
Page No : 3

	Maple Road Westbound			Whole Foods East Driveway Northbound			Maple Road Eastbound			
Start Time	Thru	Left	App. Total	Right	X Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 01:30 PM										
01:30 PM	**176**	32	**208**	**34**	1	**35**	23	179	202	**445**
01:45 PM	170	**33**	203	16	2	18	**24**	151	175	396
02:00 PM	157	32	189	26	1	27	19	**203**	**222**	438
02:15 PM	167	29	196	25	**4**	29	16	197	213	438
Total Volume	670	126	796	101	8	109	82	730	812	1717
% App. Total	84.2	15.8		92.7	7.3		10.1	89.9		
PHF	.952	.955	.957	.743	.500	.779	.854	.899	.914	.965
Pass Cars	668	126	794	101	8	109	82	729	811	1714
% Pass Cars	99.7	100	99.7	100	100	100	100	99.9	99.9	99.8
Buses	1	0	1	0	0	0	0	1	1	2
% Buses	0.1	0	0.1	0	0	0	0	0.1	0.1	0.1
Single Units	1	0	1	0	0	0	0	0	0	1
% Single Units	0.1	0	0.1	0	0	0	0	0	0	0.1
Heavy Trucks	0	0	0	0	0	0	0	0	0	0
% Heavy Trucks	0	0	0	0	0	0	0	0	0	0
Bikes On Road	0	0	0	0	0	0	0	0	0	0
% Bikes On Road	0	0	0	0	0	0	0	0	0	0
Bikes On Walk	0	0	0	0	0	0	0	0	0	0
% Bikes On Walk	0	0	0	0	0	0	0	0	0	0
Peds	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0

Traffic Data Collection, LLC

www:tdccounts.com

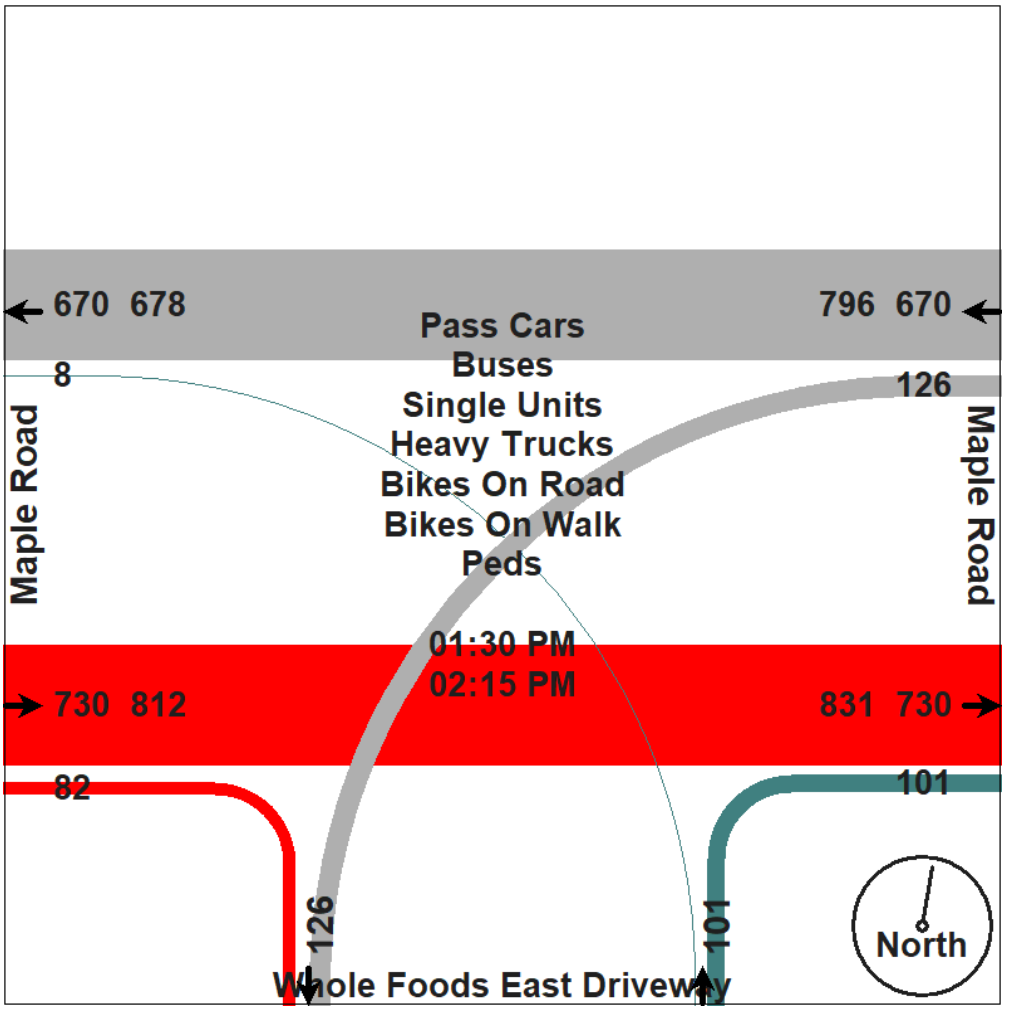
Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:4 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : TMC_3 Maple & Whole Foods EDw_Sun
Site Code : TMC_3
Start Date : 9/16/2018
Page No : 4



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : TMC_3 Maple & Whole Foods EDw_Tue
Site Code : TMC_3
Start Date : 9/18/2018
Page No : 1

6 Hour video traffic study was conducted during typical weekday (Tuesday-Thursday) from 7:00 AM -9:00 AM morning, 12:00 -3:00 PM mid-day & 4:00 PM - 6:00 PM afternoon peak hours, while school was in session..

Groups Printed- Pass Cars - Buses - Single Units - Heavy Trucks - Bikes On Road - Bikes On Walk - Peds

	Maple Road Westbound				Whole Foods East Driveway Northbound				Maple Road Eastbound				
Start Time	Thru	Left	Peds	App. Total	Right	X Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
07:00 AM	107	1	0	108	0	1	0	1	1	106	0	107	216
07:15 AM	163	1	0	164	1	0	0	1	0	126	0	126	291
07:30 AM	205	0	1	206	0	1	0	1	1	157	0	158	365
07:45 AM	211	2	0	213	1	0	0	1	3	190	0	193	407
Total	686	4	1	691	2	2	0	4	5	579	0	584	1279
08:00 AM	216	8	0	224	3	0	0	3	8	224	0	232	459
08:15 AM	210	10	0	220	3	0	0	3	10	192	0	202	425
08:30 AM	202	6	0	208	14	0	0	14	12	216	0	228	450
08:45 AM	217	13	0	230	10	0	1	11	6	213	0	219	460
Total	845	37	0	882	30	0	1	31	36	845	0	881	1794
*** BREAK ***													
12:00 PM	195	48	0	243	27	1	5	33	27	208	0	235	511
12:15 PM	186	39	0	225	40	1	1	42	17	205	0	222	489
12:30 PM	188	34	0	222	38	0	4	42	14	211	0	225	489
12:45 PM	198	27	0	225	21	3	1	25	13	204	0	217	467
Total	767	148	0	915	126	5	11	142	71	828	0	899	1956
01:00 PM	182	28	0	210	26	1	1	28	15	216	0	231	469
01:15 PM	183	31	0	214	29	3	2	34	13	224	0	237	485
01:30 PM	170	35	0	205	20	2	3	25	14	183	0	197	427
01:45 PM	173	22	0	195	17	1	1	19	13	197	0	210	424
Total	708	116	0	824	92	7	7	106	55	820	0	875	1805
*** BREAK ***													
04:00 PM	211	23	0	234	22	0	0	22	10	224	0	234	490
04:15 PM	234	26	0	260	21	1	0	22	20	222	0	242	524
04:30 PM	222	16	0	238	23	0	0	23	16	229	0	245	506
04:45 PM	248	19	0	267	21	0	0	21	18	217	0	235	523
Total	915	84	0	999	87	1	0	88	64	892	0	956	2043
05:00 PM	226	13	0	239	18	1	3	22	12	271	0	283	544
05:15 PM	232	35	0	267	17	1	3	21	17	243	0	260	548
05:30 PM	234	22	0	256	20	1	8	29	13	276	0	289	574
05:45 PM	222	33	0	255	26	0	4	30	16	259	0	275	560
Total	914	103	0	1017	81	3	18	102	58	1049	0	1107	2226
Grand Total	4835	492	1	5328	418	18	37	473	289	5013	0	5302	11103
Apprch %	90.7	9.2	0		88.4	3.8	7.8		5.5	94.5	0		
Total %	43.5	4.4	0	48	3.8	0.2	0.3	4.3	2.6	45.1	0	47.8	
Pass Cars	4699	492	0	5191	417	18	0	435	289	4920	0	5209	10835
% Pass Cars	97.2	100	0	97.4	99.8	100	0	92	100	98.1	0	98.2	97.6
Buses	44	0	0	44	0	0	0	0	0	30	0	30	74
% Buses	0.9	0	0	0.8	0	0	0	0	0	0.6	0	0.6	0.7
Single Units	67	0	0	67	0	0	0	0	0	54	0	54	121
% Single Units	1.4	0	0	1.3	0	0	0	0	0	1.1	0	1	1.1
Heavy Trucks	24	0	0	24	0	0	0	0	0	8	0	8	32
% Heavy Trucks	0.5	0	0	0.5	0	0	0	0	0	0.2	0	0.2	0.3
Bikes On Road	1	0	0	1	1	0	0	1	0	1	0	1	3
% Bikes On Road	0	0	0	0	0.2	0	0	0.2	0	0	0	0	0

Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

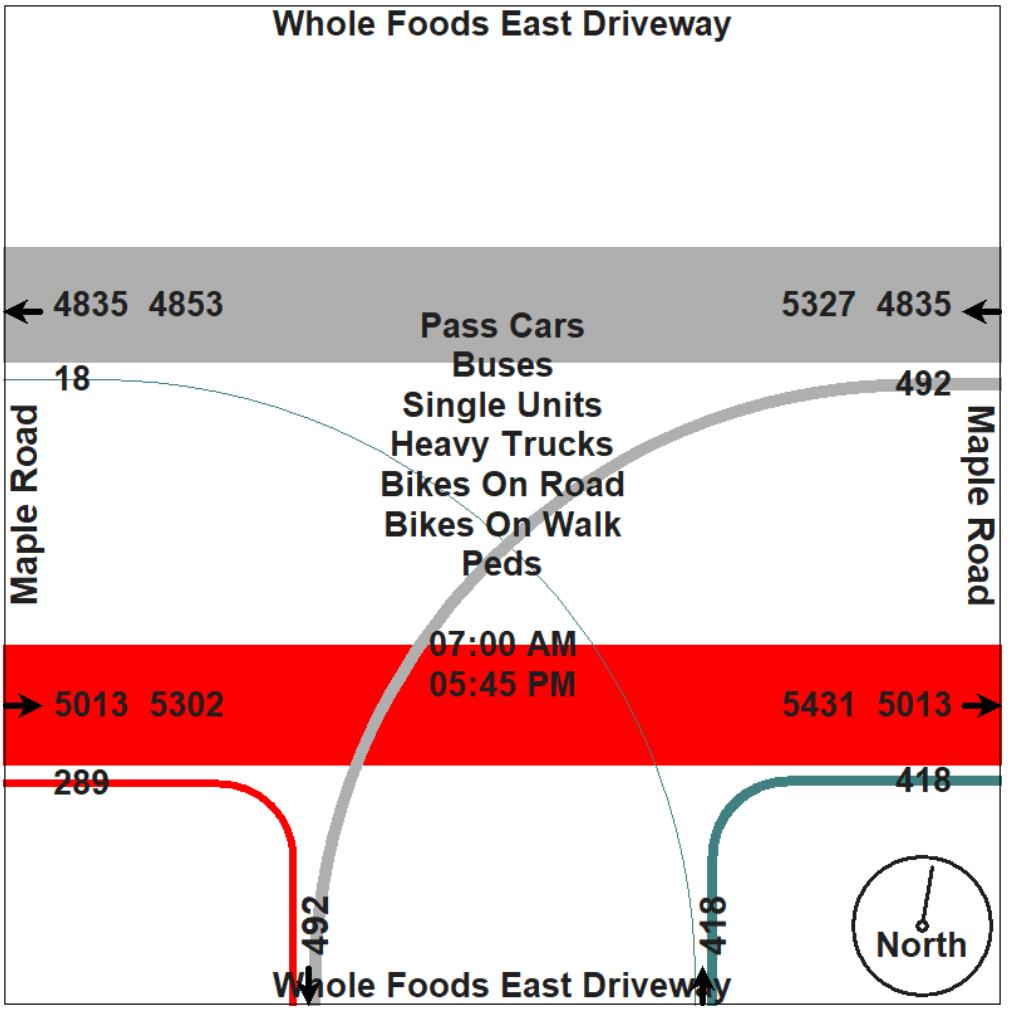
Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : TMC_3 Maple & Whole Foods EDw_Tue
Site Code : TMC_3
Start Date : 9/18/2018
Page No : 2

Groups Printed- Pass Cars - Buses - Single Units - Heavy Trucks - Bikes On Road - Bikes On Walk - Peds

	Maple Road Westbound				Whole Foods East Driveway Northbound				Maple Road Eastbound				
	Thru	Left	Peds	App. Total	Right	X Left	Peds	App. Total	Right	Thru	Peds	App. Total	Int. Total
Bikes On Walk	0	0	0	0	0	0	11	11	0	0	0	0	11
% Bikes On Walk	0	0	0	0	0	0	29.7	2.3	0	0	0	0	0.1
Peds	0	0	1	1	0	0	26	26	0	0	0	0	27
% Peds	0	0	100	0	0	0	70.3	5.5	0	0	0	0	0.2

TDC Traffic Comments: Non-signalized intersection, restricted driveway with NB left turns probitied. Video VCU camera was located within SE intersection quadrant. Note: Peds. are excluded from peak hour reports. Traffic counts performed for ROWE Professional Services Company for Birmingham Whole Foods Traffic Study.



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : TMC_3 Maple & Whole Foods EDw_Tue
Site Code : TMC_3
Start Date : 9/18/2018
Page No : 3

	Maple Road Westbound			Whole Foods East Driveway Northbound			Maple Road Eastbound			
Start Time	Thru	Left	App. Total	Right	X Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	216	8	224	3	0	3	8	**224**	**232**	**459**
08:15 AM	210	10	220	3	0	3	10	192	202	425
08:30 AM	202	6	208	**14**	0	**14**	**12**	216	228	450
08:45 AM	**217**	**13**	**230**	10	0	10	6	213	219	459
Total Volume	845	37	882	30	0	30	36	845	881	1793
% App. Total	95.8	4.2		100	0		4.1	95.9		
PHF	.974	.712	.959	.536	.000	.536	.750	.943	.949	.977
Pass Cars	810	37	847	30	0	30	36	820	856	1733
% Pass Cars	95.9	100	96.0	100	0	100	100	97.0	97.2	96.7
Buses	9	0	9	0	0	0	0	7	7	16
% Buses	1.1	0	1.0	0	0	0	0	0.8	0.8	0.9
Single Units	20	0	20	0	0	0	0	17	17	37
% Single Units	2.4	0	2.3	0	0	0	0	2.0	1.9	2.1
Heavy Trucks	6	0	6	0	0	0	0	1	1	7
% Heavy Trucks	0.7	0	0.7	0	0	0	0	0.1	0.1	0.4
Bikes On Road	0	0	0	0	0	0	0	0	0	0
% Bikes On Road	0	0	0	0	0	0	0	0	0	0
Bikes On Walk	0	0	0	0	0	0	0	0	0	0
% Bikes On Walk	0	0	0	0	0	0	0	0	0	0
Peds	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0

Traffic Data Collection, LLC

www:tdccounts.com

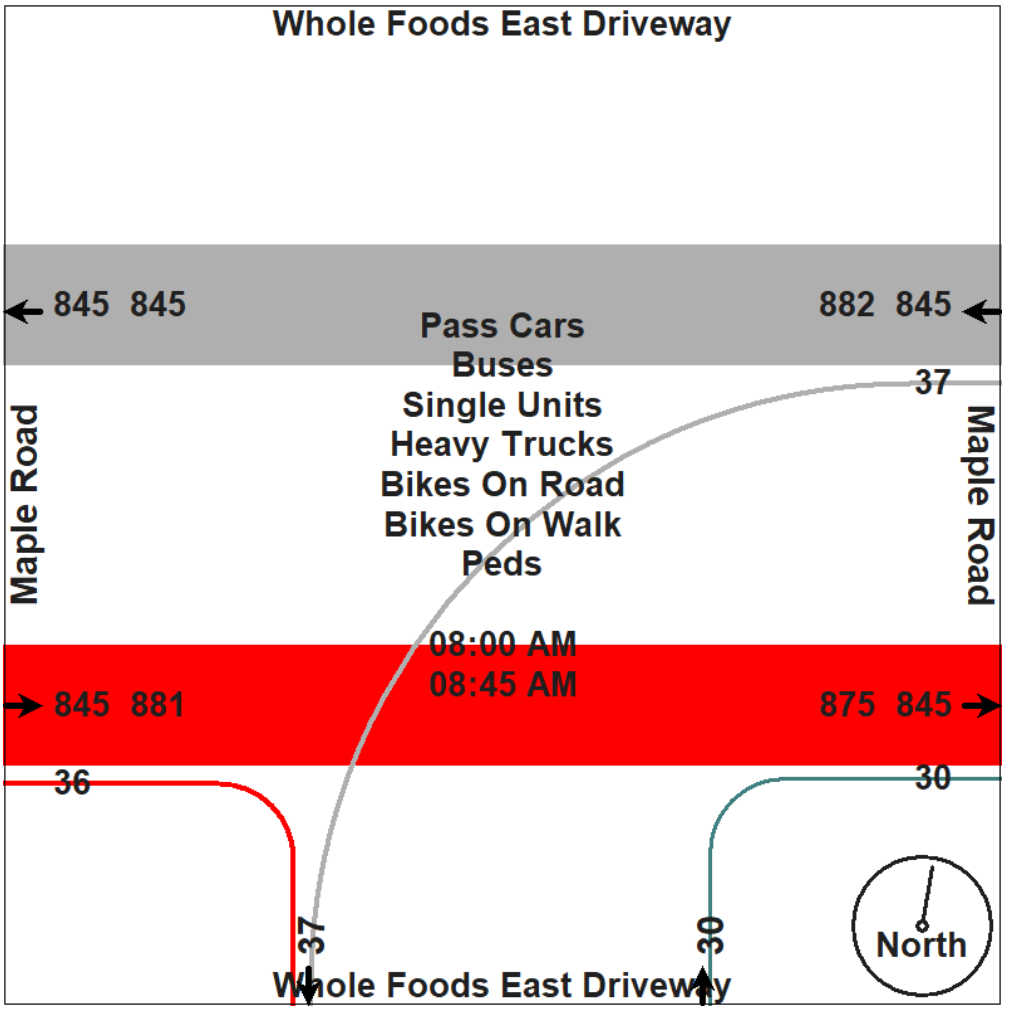
Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : TMC_3 Maple & Whole Foods EDw_Tue
Site Code : TMC_3
Start Date : 9/18/2018
Page No : 4



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : TMC_3 Maple & Whole Foods EDw_Tue
Site Code : TMC_3
Start Date : 9/18/2018
Page No : 5

	Maple Road Westbound			Whole Foods East Driveway Northbound			Maple Road Eastbound			
Start Time	Thru	Left	App. Total	Right	X Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 12:00 PM										
12:00 PM	195	**48**	**243**	27	1	28	**27**	208	**235**	**506**
12:15 PM	186	39	225	**40**	1	**41**	17	205	222	488
12:30 PM	188	34	222	38	0	38	14	**211**	225	485
12:45 PM	**198**	27	225	21	**3**	24	13	204	217	466
Total Volume	767	148	915	126	5	131	71	828	899	1945
% App. Total	83.8	16.2		96.2	3.8		7.9	92.1		
PHF	.968	.771	.941	.788	.417	.799	.657	.981	.956	.961
Pass Cars	748	148	896	126	5	131	71	820	891	1918
% Pass Cars	97.5	100	97.9	100	100	100	100	99.0	99.1	98.6
Buses	6	0	6	0	0	0	0	3	3	9
% Buses	0.8	0	0.7	0	0	0	0	0.4	0.3	0.5
Single Units	8	0	8	0	0	0	0	5	5	13
% Single Units	1.0	0	0.9	0	0	0	0	0.6	0.6	0.7
Heavy Trucks	5	0	5	0	0	0	0	0	0	5
% Heavy Trucks	0.7	0	0.5	0	0	0	0	0	0	0.3
Bikes On Road	0	0	0	0	0	0	0	0	0	0
% Bikes On Road	0	0	0	0	0	0	0	0	0	0
Bikes On Walk	0	0	0	0	0	0	0	0	0	0
% Bikes On Walk	0	0	0	0	0	0	0	0	0	0
Peds	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0

Traffic Data Collection, LLC

www:tdccounts.com

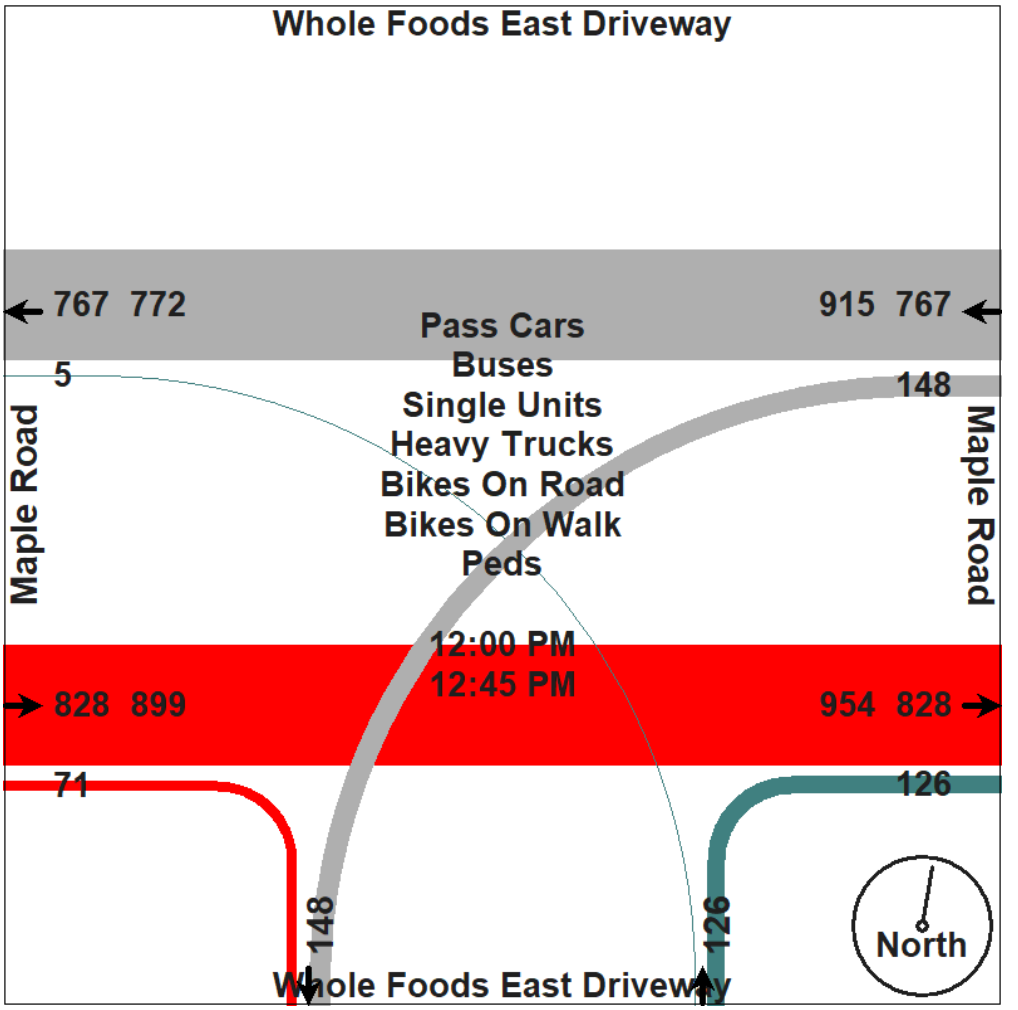
Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : TMC_3 Maple & Whole Foods EDw_Tue
Site Code : TMC_3
Start Date : 9/18/2018
Page No : 6



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : TMC_3 Maple & Whole Foods EDw_Tue
Site Code : TMC_3
Start Date : 9/18/2018
Page No : 7

	Maple Road Westbound			Whole Foods East Driveway Northbound			Maple Road Eastbound			
Start Time	Thru	Left	App. Total	Right	X Left	App. Total	Right	Thru	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	226	13	239	18	**1**	19	12	271	283	541
05:15 PM	232	**35**	**267**	17	1	18	**17**	243	260	545
05:30 PM	**234**	22	256	20	1	21	13	**276**	**289**	**566**
05:45 PM	222	33	255	**26**	0	**26**	16	259	275	556
Total Volume	914	103	1017	81	3	84	58	1049	1107	2208
% App. Total	89.9	10.1		96.4	3.6		5.2	94.8		
PHF	.976	.736	.952	.779	.750	.808	.853	.950	.958	.975
Pass Cars	906	103	1009	81	3	84	58	1039	1097	2190
% Pass Cars	99.1	100	99.2	100	100	100	100	99.0	99.1	99.2
Buses	5	0	5	0	0	0	0	3	3	8
% Buses	0.5	0	0.5	0	0	0	0	0.3	0.3	0.4
Single Units	2	0	2	0	0	0	0	6	6	8
% Single Units	0.2	0	0.2	0	0	0	0	0.6	0.5	0.4
Heavy Trucks	1	0	1	0	0	0	0	1	1	2
% Heavy Trucks	0.1	0	0.1	0	0	0	0	0.1	0.1	0.1
Bikes On Road	0	0	0	0	0	0	0	0	0	0
% Bikes On Road	0	0	0	0	0	0	0	0	0	0
Bikes On Walk	0	0	0	0	0	0	0	0	0	0
% Bikes On Walk	0	0	0	0	0	0	0	0	0	0
Peds	0	0	0	0	0	0	0	0	0	0
% Peds	0	0	0	0	0	0	0	0	0	0

Traffic Data Collection, LLC

www:tdccounts.com

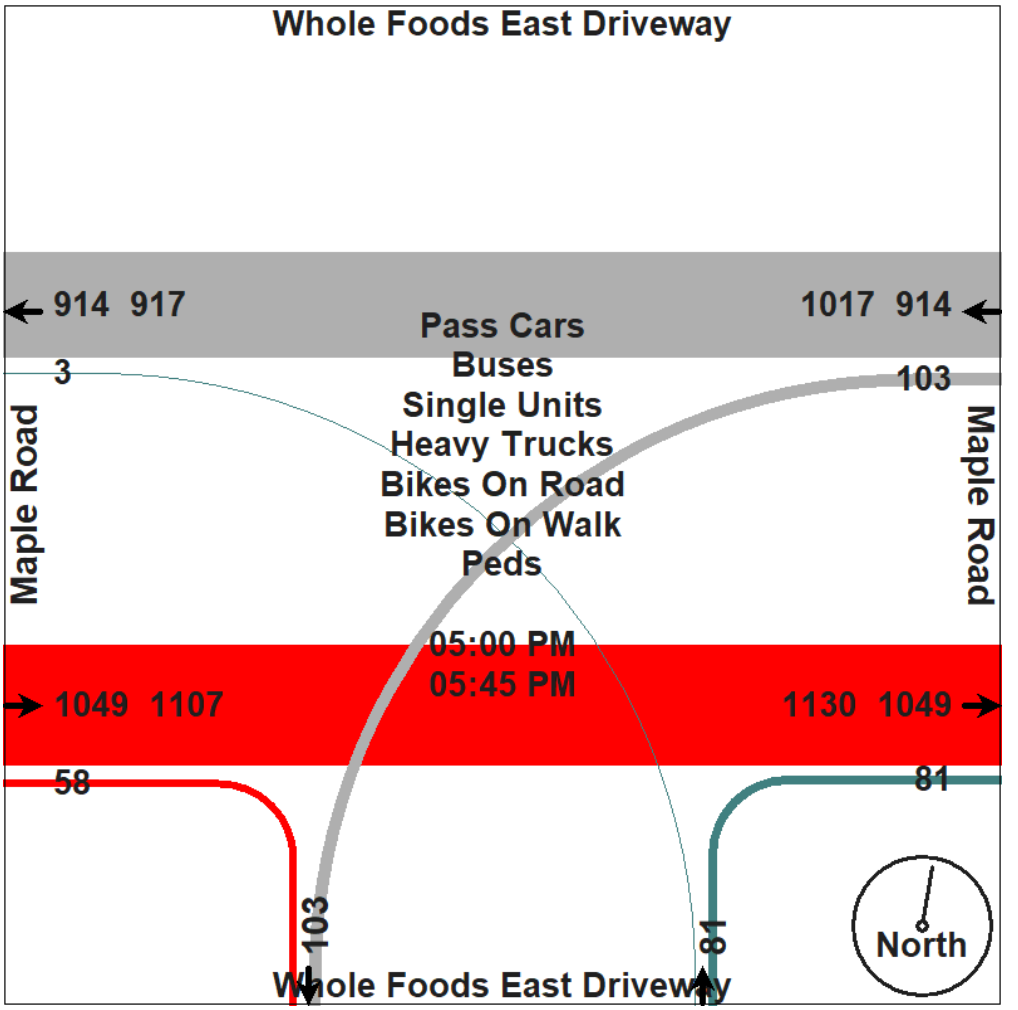
Phone: 586.786-5407

Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : TMC_3 Maple & Whole Foods EDw_Tue
Site Code : TMC_3
Start Date : 9/18/2018
Page No : 8



Traffic Data Collection, LLC

www:tdccounts.com

Phone: 586.786-5407

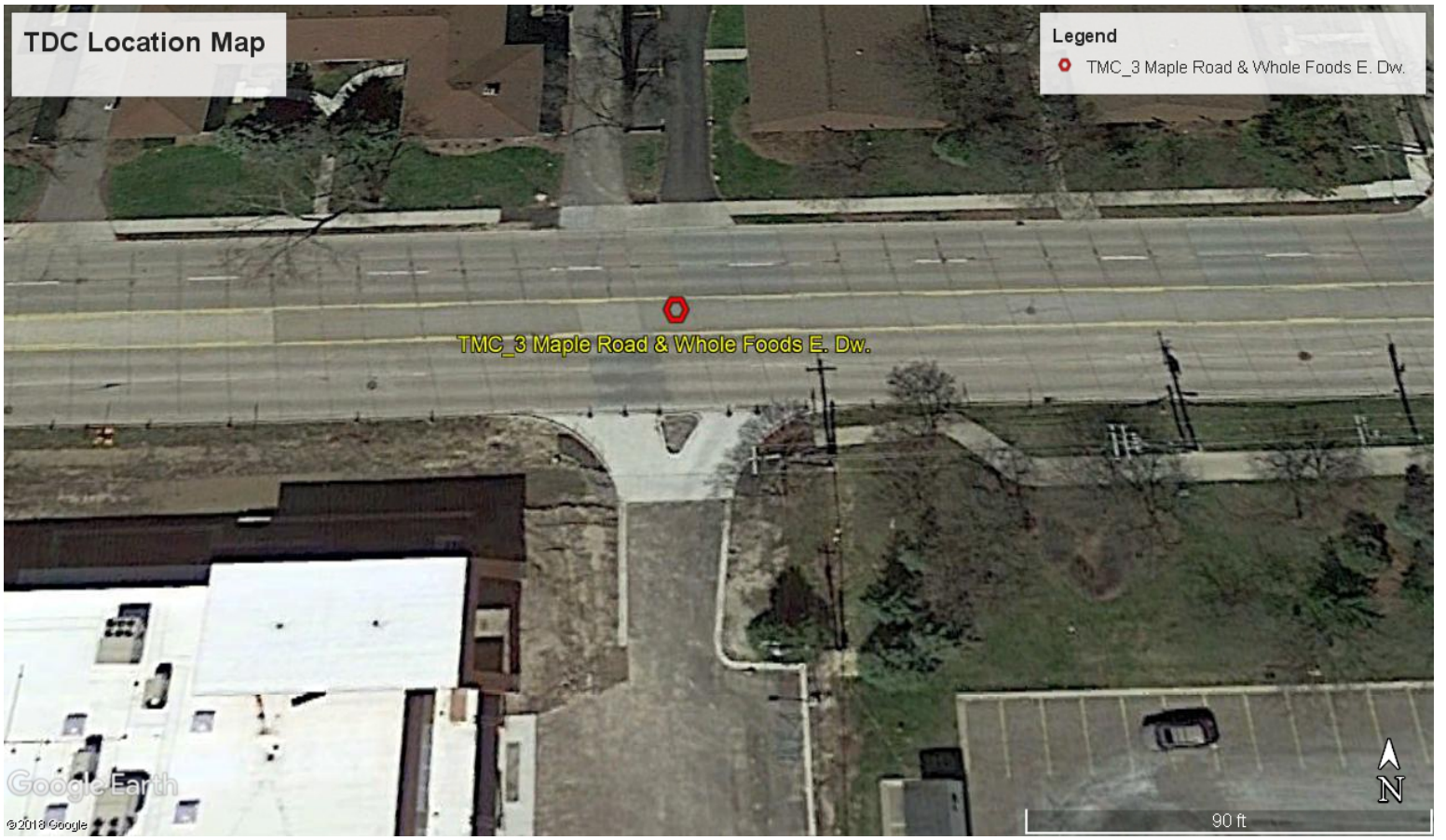
Traffic Study Performed For:

ROWE Professional Services Company

Project: Birmingham Whole Foods TIS
Study:6 Hr. Video Turning Movement Count
Weather: Sunny/Cldy. Dry PM Deg's 80's
Count By Miovision Video VCU 34N SE

File Name : TMC_3 Maple & Whole Foods EDw_Tue
Site Code : TMC_3
Start Date : 9/18/2018
Page No : 9

Aerial Photo



LEVEL OF SERVICE

OUTPUT REPORTS

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	608	51	332	788	47	339
Future Volume (vph)	608	51	332	788	47	339
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	11	12	14	12	10	10
Total Lost time (s)	8.9			2.9	3.0	3.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	1.00
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3550			3669	1739	1556
Flt Permitted	1.00			0.56	0.95	1.00
Satd. Flow (perm)	3550			2085	1739	1556
Peak-hour factor, PHF	0.91	0.91	0.92	0.92	0.93	0.93
Adj. Flow (vph)	668	56	361	857	51	365
RTOR Reduction (vph)	5	0	0	0	0	306
Lane Group Flow (vph)	719	0	0	1218	51	59
Confl. Peds. (#/hr)		4	4		4	
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	6		1	3	8	
Permitted Phases			3			8
Actuated Green, G (s)	33.0			100.0	18.0	18.0
Effective Green, g (s)	42.1			103.1	21.0	21.0
Actuated g/C Ratio	0.32			0.79	0.16	0.16
Clearance Time (s)	18.0			6.0	6.0	6.0
Lane Grp Cap (vph)	1149			2288	280	251
v/s Ratio Prot	c0.20			c0.21	0.03	
v/s Ratio Perm				0.21		c0.04
v/c Ratio	0.63			0.53	0.18	0.23
Uniform Delay, d1	37.3			4.8	47.1	47.5
Progression Factor	1.00			0.44	1.00	1.00
Incremental Delay, d2	2.6			0.7	1.4	2.2
Delay (s)	39.9			2.8	48.5	49.7
Level of Service	D			A	D	D
Approach Delay (s)	39.9			2.8	49.5	
Approach LOS	D			A	D	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	30.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	608	51	332	788	47	339
Future Volume (vph)	608	51	332	788	47	339
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	11	12	14	12	10	10
Total Lost time (s)	8.9			2.9	3.0	3.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	1.00
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3550			3669	1739	1556
Flt Permitted	1.00			0.56	0.95	1.00
Satd. Flow (perm)	3550			2085	1739	1556
Peak-hour factor, PHF	0.91	0.91	0.92	0.92	0.93	0.93
Adj. Flow (vph)	668	56	361	857	51	365
RTOR Reduction (vph)	5	0	0	0	0	306
Lane Group Flow (vph)	719	0	0	1218	51	59
Confl. Peds. (#/hr)		4	4		4	
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	6		1	3	8	
Permitted Phases			3			8
Actuated Green, G (s)	33.0			100.0	18.0	18.0
Effective Green, g (s)	42.1			103.1	21.0	21.0
Actuated g/C Ratio	0.32			0.79	0.16	0.16
Clearance Time (s)	18.0			6.0	6.0	6.0
Lane Grp Cap (vph)	1149			2288	280	251
v/s Ratio Prot	c0.20			c0.21	0.03	
v/s Ratio Perm				0.21		c0.04
v/c Ratio	0.63			0.53	0.18	0.23
Uniform Delay, d1	37.3			4.8	47.1	47.5
Progression Factor	1.00			0.44	1.00	1.00
Incremental Delay, d2	2.6			0.7	1.4	2.2
Delay (s)	39.9			2.8	48.5	49.7
Level of Service	D			A	D	D
Approach Delay (s)	39.9			2.8	49.5	
Approach LOS	D			A	D	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	30.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	724	1218	51	365
v/c Ratio	0.63	0.53	0.18	0.66
Control Delay	39.8	3.8	49.1	10.9
Queue Delay	0.4	0.3	0.0	0.1
Total Delay	40.2	4.1	49.1	11.1
Queue Length 50th (ft)	269	97	38	0
Queue Length 95th (ft)	337	112	78	94
Internal Link Dist (ft)	1220	224	675	
Turn Bay Length (ft)			285	
Base Capacity (vph)	1153	2288	280	557
Starvation Cap Reductn	0	422	0	0
Spillback Cap Reductn	112	0	0	11
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.70	0.65	0.18	0.67

Intersection Summary

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	724	1218	51	365
v/c Ratio	0.63	0.53	0.18	0.66
Control Delay	39.8	3.8	49.1	10.9
Queue Delay	0.4	0.3	0.0	0.1
Total Delay	40.2	4.1	49.1	11.1
Queue Length 50th (ft)	269	97	38	0
Queue Length 95th (ft)	337	112	78	94
Internal Link Dist (ft)	1220	224	675	
Turn Bay Length (ft)			285	
Base Capacity (vph)	1153	2288	280	557
Starvation Cap Reductn	0	422	0	0
Spillback Cap Reductn	113	0	0	11
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.70	0.65	0.18	0.67

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	645	58	252	685	69	274
Future Volume (vph)	645	58	252	685	69	274
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	11	12	14	12	10	10
Total Lost time (s)	8.9			2.9	3.0	3.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	1.00
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3546			3676	1739	1556
Flt Permitted	1.00			0.55	0.95	1.00
Satd. Flow (perm)	3546			2040	1739	1556
Peak-hour factor, PHF	0.88	0.88	0.95	0.95	0.91	0.91
Adj. Flow (vph)	733	66	265	721	76	301
RTOR Reduction (vph)	5	0	0	0	0	252
Lane Group Flow (vph)	794	0	0	986	76	49
Confl. Peds. (#/hr)		4	4		4	
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	6		1	3	8	
Permitted Phases			3			8
Actuated Green, G (s)	35.0			100.0	18.0	18.0
Effective Green, g (s)	44.1			103.1	21.0	21.0
Actuated g/C Ratio	0.34			0.79	0.16	0.16
Clearance Time (s)	18.0			6.0	6.0	6.0
Lane Grp Cap (vph)	1202			2248	280	251
v/s Ratio Prot	c0.22			c0.17	c0.04	
v/s Ratio Perm				0.18		0.03
v/c Ratio	0.66			0.44	0.27	0.19
Uniform Delay, d1	36.6			4.3	47.8	47.2
Progression Factor	1.00			0.44	1.00	1.00
Incremental Delay, d2	2.9			0.5	2.4	1.7
Delay (s)	39.4			2.3	50.2	48.9
Level of Service	D			A	D	D
Approach Delay (s)	39.4			2.3	49.1	
Approach LOS	D			A	D	

Intersection Summary			
HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	30.0
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	645	58	252	685	69	274
Future Volume (vph)	645	58	252	685	69	274
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	11	12	14	12	10	10
Total Lost time (s)	8.9			2.9	3.0	3.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	1.00
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3546			3676	1739	1556
Flt Permitted	1.00			0.55	0.95	1.00
Satd. Flow (perm)	3546			2040	1739	1556
Peak-hour factor, PHF	0.88	0.88	0.95	0.95	0.91	0.91
Adj. Flow (vph)	733	66	265	721	76	301
RTOR Reduction (vph)	5	0	0	0	0	252
Lane Group Flow (vph)	794	0	0	986	76	49
Confl. Peds. (#/hr)		4	4		4	
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	6		1	3	8	
Permitted Phases			3			8
Actuated Green, G (s)	35.0			100.0	18.0	18.0
Effective Green, g (s)	44.1			103.1	21.0	21.0
Actuated g/C Ratio	0.34			0.79	0.16	0.16
Clearance Time (s)	18.0			6.0	6.0	6.0
Lane Grp Cap (vph)	1202			2248	280	251
v/s Ratio Prot	c0.22			c0.17	c0.04	
v/s Ratio Perm				0.18		0.03
v/c Ratio	0.66			0.44	0.27	0.19
Uniform Delay, d1	36.6			4.3	47.8	47.2
Progression Factor	1.00			0.44	1.00	1.00
Incremental Delay, d2	2.9			0.5	2.4	1.7
Delay (s)	39.4			2.3	50.2	48.9
Level of Service	D			A	D	D
Approach Delay (s)	39.4			2.3	49.1	
Approach LOS	D			A	D	

Intersection Summary			
HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	30.0
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	799	986	76	301
v/c Ratio	0.66	0.44	0.27	0.60
Control Delay	39.4	2.9	50.8	10.6
Queue Delay	0.1	0.4	0.0	0.0
Total Delay	39.5	3.3	50.8	10.6
Queue Length 50th (ft)	297	60	57	0
Queue Length 95th (ft)	358	80	106	85
Internal Link Dist (ft)	1220	224	675	
Turn Bay Length (ft)			285	
Base Capacity (vph)	1208	2249	280	503
Starvation Cap Reductn	0	670	0	0
Spillback Cap Reductn	32	0	0	2
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.68	0.62	0.27	0.60

Intersection Summary

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	799	986	76	301
v/c Ratio	0.66	0.44	0.27	0.60
Control Delay	39.4	2.9	50.8	10.6
Queue Delay	0.1	0.4	0.0	0.0
Total Delay	39.5	3.3	50.8	10.6
Queue Length 50th (ft)	297	60	57	0
Queue Length 95th (ft)	358	80	106	85
Internal Link Dist (ft)	1220	224	675	
Turn Bay Length (ft)			285	
Base Capacity (vph)	1208	2249	280	503
Starvation Cap Reductn	0	670	0	0
Spillback Cap Reductn	33	0	0	2
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.68	0.62	0.27	0.60

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	788	102	480	742	71	427
Future Volume (vph)	788	102	480	742	71	427
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	11	12	14	12	10	10
Total Lost time (s)	8.9			2.9	3.0	3.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	1.00
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.98			1.00	1.00	0.85
Flt Protected	1.00			0.98	0.95	1.00
Satd. Flow (prot)	3528			3654	1739	1556
Flt Permitted	1.00			0.51	0.95	1.00
Satd. Flow (perm)	3528			1890	1739	1556
Peak-hour factor, PHF	0.94	0.94	0.95	0.95	0.95	0.95
Adj. Flow (vph)	838	109	505	781	75	449
RTOR Reduction (vph)	7	0	0	0	0	27
Lane Group Flow (vph)	940	0	0	1286	75	422
Confl. Peds. (#/hr)		2	2		6	
Turn Type	NA		pm+pt	NA	Prot	pm+ov
Protected Phases	6		1	3	8	1
Permitted Phases			3			8
Actuated Green, G (s)	40.0			107.0	11.0	60.0
Effective Green, g (s)	49.1			110.1	14.0	66.0
Actuated g/C Ratio	0.38			0.85	0.11	0.51
Clearance Time (s)	18.0			6.0	6.0	6.0
Lane Grp Cap (vph)	1332			2307	187	825
v/s Ratio Prot	c0.27			c0.22	0.04	c0.20
v/s Ratio Perm				0.25		0.07
v/c Ratio	0.71			0.56	0.40	0.51
Uniform Delay, d1	34.3			2.9	54.1	21.3
Progression Factor	1.00			0.49	1.00	1.00
Incremental Delay, d2	3.2			0.8	6.3	2.3
Delay (s)	37.5			2.2	60.4	23.5
Level of Service	D			A	E	C
Approach Delay (s)	37.5			2.2	28.8	
Approach LOS	D			A	C	

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	30.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	788	102	480	742	71	427
Future Volume (vph)	788	102	480	742	71	427
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	11	12	14	12	10	10
Total Lost time (s)	8.9			2.9	3.0	3.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	1.00
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.98			1.00	1.00	0.85
Flt Protected	1.00			0.98	0.95	1.00
Satd. Flow (prot)	3528			3654	1739	1556
Flt Permitted	1.00			0.51	0.95	1.00
Satd. Flow (perm)	3528			1890	1739	1556
Peak-hour factor, PHF	0.94	0.94	0.95	0.95	0.95	0.95
Adj. Flow (vph)	838	109	505	781	75	449
RTOR Reduction (vph)	7	0	0	0	0	27
Lane Group Flow (vph)	940	0	0	1286	75	422
Confl. Peds. (#/hr)		2	2		6	
Turn Type	NA		pm+pt	NA	Prot	pm+ov
Protected Phases	6		1	3	8	1
Permitted Phases			3			8
Actuated Green, G (s)	40.0			107.0	11.0	60.0
Effective Green, g (s)	49.1			110.1	14.0	66.0
Actuated g/C Ratio	0.38			0.85	0.11	0.51
Clearance Time (s)	18.0			6.0	6.0	6.0
Lane Grp Cap (vph)	1332			2307	187	825
v/s Ratio Prot	c0.27			c0.22	0.04	c0.20
v/s Ratio Perm				0.25		0.07
v/c Ratio	0.71			0.56	0.40	0.51
Uniform Delay, d1	34.3			2.9	54.1	21.3
Progression Factor	1.00			0.49	1.00	1.00
Incremental Delay, d2	3.2			0.8	6.3	2.3
Delay (s)	37.5			2.2	60.4	23.5
Level of Service	D			A	E	C
Approach Delay (s)	37.5			2.2	28.8	
Approach LOS	D			A	C	

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	30.0
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	947	1286	75	449
v/c Ratio	0.71	0.56	0.40	0.53
Control Delay	37.4	3.4	61.1	19.9
Queue Delay	0.0	0.4	0.0	0.0
Total Delay	37.4	3.7	61.1	19.9
Queue Length 50th (ft)	349	104	60	209
Queue Length 95th (ft)	427	103	112	306
Internal Link Dist (ft)	1220	224	675	
Turn Bay Length (ft)			285	
Base Capacity (vph)	1340	2307	187	851
Starvation Cap Reductn	0	451	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.71	0.69	0.40	0.53

Intersection Summary

Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	947	1286	75	449
v/c Ratio	0.71	0.56	0.40	0.53
Control Delay	37.4	3.4	61.1	19.9
Queue Delay	0.0	0.4	0.0	0.0
Total Delay	37.4	3.7	61.1	19.9
Queue Length 50th (ft)	349	104	60	209
Queue Length 95th (ft)	427	103	112	306
Internal Link Dist (ft)	1220	224	675	
Turn Bay Length (ft)			285	
Base Capacity (vph)	1340	2307	187	851
Starvation Cap Reductn	0	451	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.71	0.69	0.40	0.53

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	607	25	195	594	38	288
Future Volume (vph)	607	25	195	594	38	288
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	11	12	14	12	10	10
Total Lost time (s)	8.9			2.9	3.0	3.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	1.00
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3571			3673	1739	1556
Flt Permitted	1.00			0.60	0.95	1.00
Satd. Flow (perm)	3571			2230	1739	1556
Peak-hour factor, PHF	0.93	0.93	0.95	0.95	0.85	0.85
Adj. Flow (vph)	653	27	205	625	45	339
RTOR Reduction (vph)	3	0	0	0	0	274
Lane Group Flow (vph)	677	0	0	830	45	65
Confl. Peds. (#/hr)		14	14		12	
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	6		1	3	8	
Permitted Phases			3			8
Actuated Green, G (s)	25.0			80.0	18.0	18.0
Effective Green, g (s)	34.1			83.1	21.0	21.0
Actuated g/C Ratio	0.31			0.76	0.19	0.19
Clearance Time (s)	18.0			6.0	6.0	6.0
Lane Grp Cap (vph)	1107			2210	331	297
v/s Ratio Prot	c0.19			c0.14	0.03	
v/s Ratio Perm				0.15		c0.04
v/c Ratio	0.61			0.38	0.14	0.22
Uniform Delay, d1	32.3			4.6	37.0	37.6
Progression Factor	1.00			0.49	1.00	1.00
Incremental Delay, d2	2.5			0.4	0.9	1.7
Delay (s)	34.8			2.7	37.8	39.2
Level of Service	C			A	D	D
Approach Delay (s)	34.8			2.7	39.1	
Approach LOS	C			A	D	

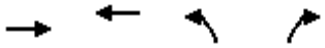
Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	30.0
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	607	25	195	594	38	288
Future Volume (vph)	607	25	195	594	38	288
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000
Lane Width	11	12	14	12	10	10
Total Lost time (s)	8.9			2.9	3.0	3.0
Lane Util. Factor	0.95			0.95	1.00	1.00
Frpb, ped/bikes	1.00			1.00	1.00	1.00
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	0.99			1.00	1.00	0.85
Flt Protected	1.00			0.99	0.95	1.00
Satd. Flow (prot)	3571			3673	1739	1556
Flt Permitted	1.00			0.60	0.95	1.00
Satd. Flow (perm)	3571			2230	1739	1556
Peak-hour factor, PHF	0.93	0.93	0.95	0.95	0.85	0.85
Adj. Flow (vph)	653	27	205	625	45	339
RTOR Reduction (vph)	3	0	0	0	0	274
Lane Group Flow (vph)	677	0	0	830	45	65
Confl. Peds. (#/hr)		14	14		12	
Turn Type	NA		pm+pt	NA	Prot	Perm
Protected Phases	6		1	3	8	
Permitted Phases			3			8
Actuated Green, G (s)	25.0			80.0	18.0	18.0
Effective Green, g (s)	34.1			83.1	21.0	21.0
Actuated g/C Ratio	0.31			0.76	0.19	0.19
Clearance Time (s)	18.0			6.0	6.0	6.0
Lane Grp Cap (vph)	1107			2210	331	297
v/s Ratio Prot	c0.19			c0.14	0.03	
v/s Ratio Perm				0.15		c0.04
v/c Ratio	0.61			0.38	0.14	0.22
Uniform Delay, d1	32.3			4.6	37.0	37.6
Progression Factor	1.00			0.49	1.00	1.00
Incremental Delay, d2	2.5			0.4	0.9	1.7
Delay (s)	34.8			2.7	37.8	39.2
Level of Service	C			A	D	D
Approach Delay (s)	34.8			2.7	39.1	
Approach LOS	C			A	D	

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	30.0
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

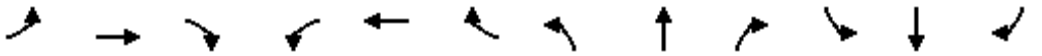
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	680	830	45	339
v/c Ratio	0.61	0.38	0.14	0.59
Control Delay	35.0	3.1	38.3	8.9
Queue Delay	0.2	0.3	0.0	0.0
Total Delay	35.1	3.3	38.3	9.0
Queue Length 50th (ft)	213	47	27	0
Queue Length 95th (ft)	276	61	56	59
Internal Link Dist (ft)	1220	224	675	
Turn Bay Length (ft)			285	
Base Capacity (vph)	1109	2212	331	571
Starvation Cap Reductn	0	681	0	0
Spillback Cap Reductn	58	0	0	5
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.54	0.14	0.60

Intersection Summary



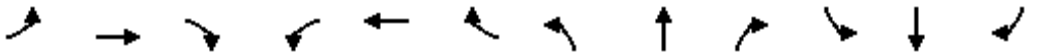
Lane Group	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	680	830	45	339
v/c Ratio	0.61	0.38	0.14	0.59
Control Delay	35.0	3.1	38.3	8.9
Queue Delay	0.2	0.3	0.0	0.0
Total Delay	35.2	3.3	38.3	9.0
Queue Length 50th (ft)	213	47	27	0
Queue Length 95th (ft)	276	61	56	59
Internal Link Dist (ft)	1220	224	675	
Turn Bay Length (ft)			285	
Base Capacity (vph)	1109	2212	331	571
Starvation Cap Reductn	0	681	0	0
Spillback Cap Reductn	59	0	0	5
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.65	0.54	0.14	0.60

Intersection Summary



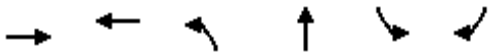
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	114	828	5	0	817	28	22	1	0	59	0	281
Future Volume (vph)	114	828	5	0	817	28	22	1	0	59	0	281
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	10	10	12	12	11	12	12	12	12	10	10	10
Total Lost time (s)		2.9			8.9		3.0	3.0		3.0		5.0
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00		1.00
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00		1.00
Flpb, ped/bikes		1.00			1.00		1.00	1.00		0.97		1.00
Frt		1.00			1.00		1.00	1.00		1.00		0.85
Flt Protected		0.99			1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)		3454			3581		1863	1961		1691		1556
Flt Permitted		0.99			1.00		0.95	1.00		0.76		1.00
Satd. Flow (perm)		3454			3581		1863	1961		1348		1556
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.72	0.72	0.72	0.76	0.76	0.76
Adj. Flow (vph)	124	900	5	0	860	29	31	1	0	78	0	370
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	0	58
Lane Group Flow (vph)	0	1029	0	0	887	0	31	1	0	78	0	312
Confl. Peds. (#/hr)	1					1			12	12		
Turn Type	Split	NA		Split	NA		Perm	NA		Perm		pt+ov
Protected Phases	7	7		2	2			8				7 4
Permitted Phases							8			4		
Actuated Green, G (s)		45.0			37.0		18.0	18.0		18.0		69.0
Effective Green, g (s)		48.1			46.1		21.0	21.0		21.0		70.0
Actuated g/C Ratio		0.37			0.35		0.16	0.16		0.16		0.54
Clearance Time (s)		6.0			18.0		6.0	6.0		6.0		
Lane Grp Cap (vph)		1277			1269		300	316		217		837
v/s Ratio Prot		c0.30			c0.25			0.00				c0.20
v/s Ratio Perm							0.02			0.06		
v/c Ratio		0.81			0.70		0.10	0.00		0.36		0.37
Uniform Delay, d1		36.8			36.0		46.5	45.7		48.5		17.3
Progression Factor		0.35			1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2		4.3			3.2		0.7	0.0		4.6		1.3
Delay (s)		17.1			39.2		47.2	45.7		53.1		18.6
Level of Service		B			D		D	D		D		B
Approach Delay (s)		17.1			39.2			47.1			24.6	
Approach LOS		B			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



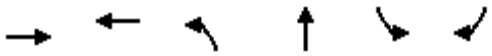
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	114	794	39	0	817	28	22	1	0	59	0	281
Future Volume (vph)	114	794	39	0	817	28	22	1	0	59	0	281
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	10	10	12	12	11	12	12	12	12	10	10	10
Total Lost time (s)		2.9			8.9		3.0	3.0		3.0		5.0
Lane Util. Factor		0.95			0.95		1.00	1.00		1.00		1.00
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00		1.00
Flpb, ped/bikes		1.00			1.00		1.00	1.00		0.97		1.00
Frt		0.99			1.00		1.00	1.00		1.00		0.85
Flt Protected		0.99			1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)		3435			3581		1863	1961		1691		1556
Flt Permitted		0.99			1.00		0.95	1.00		0.76		1.00
Satd. Flow (perm)		3435			3581		1863	1961		1348		1556
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.72	0.72	0.72	0.76	0.76	0.76
Adj. Flow (vph)	124	863	42	0	860	29	31	1	0	78	0	370
RTOR Reduction (vph)	0	3	0	0	2	0	0	0	0	0	0	58
Lane Group Flow (vph)	0	1026	0	0	887	0	31	1	0	78	0	312
Confl. Peds. (#/hr)	1					1			12	12		
Turn Type	Split	NA		Split	NA		Perm	NA		Perm		pt+ov
Protected Phases	7	7		2	2			8				7 4
Permitted Phases							8			4		
Actuated Green, G (s)		45.0			37.0		18.0	18.0		18.0		69.0
Effective Green, g (s)		48.1			46.1		21.0	21.0		21.0		70.0
Actuated g/C Ratio		0.37			0.35		0.16	0.16		0.16		0.54
Clearance Time (s)		6.0			18.0		6.0	6.0		6.0		
Lane Grp Cap (vph)		1270			1269		300	316		217		837
v/s Ratio Prot		c0.30			c0.25			0.00				c0.20
v/s Ratio Perm							0.02			0.06		
v/c Ratio		0.81			0.70		0.10	0.00		0.36		0.37
Uniform Delay, d1		36.8			36.0		46.5	45.7		48.5		17.3
Progression Factor		0.35			1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2		4.4			3.2		0.7	0.0		4.6		1.3
Delay (s)		17.1			39.2		47.2	45.7		53.1		18.6
Level of Service		B			D		D	D		D		B
Approach Delay (s)		17.1			39.2			47.1			24.6	
Approach LOS		B			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



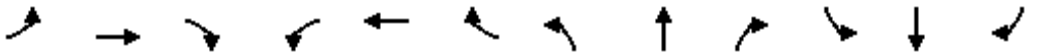
Lane Group	EBT	WBT	NBL	NBT	SBL	SBR
Lane Group Flow (vph)	1029	889	31	1	78	370
v/c Ratio	0.81	0.70	0.10	0.00	0.36	0.41
Control Delay	17.3	39.5	47.6	46.0	53.9	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.3	39.5	47.6	46.0	53.9	12.8
Queue Length 50th (ft)	117	335	23	1	59	113
Queue Length 95th (ft)	155	411	42	5	92	136
Internal Link Dist (ft)	224	370		170		
Turn Bay Length (ft)					140	
Base Capacity (vph)	1277	1271	300	316	217	896
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.70	0.10	0.00	0.36	0.41

Intersection Summary



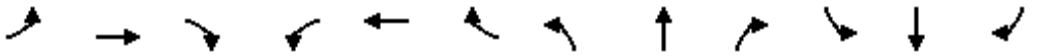
Lane Group	EBT	WBT	NBL	NBT	SBL	SBR
Lane Group Flow (vph)	1029	889	31	1	78	370
v/c Ratio	0.81	0.70	0.10	0.00	0.36	0.41
Control Delay	17.2	39.5	47.6	46.0	53.9	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.2	39.5	47.6	46.0	53.9	12.8
Queue Length 50th (ft)	116	335	23	1	59	113
Queue Length 95th (ft)	154	411	42	5	92	136
Internal Link Dist (ft)	224	370		170		
Turn Bay Length (ft)					140	
Base Capacity (vph)	1273	1271	300	316	217	896
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.70	0.10	0.00	0.36	0.41

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	827	22	8	746	42	87	10	21	51	1	104
Future Volume (vph)	70	827	22	8	746	42	87	10	21	51	1	104
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	10	10	12	12	11	12	12	12	12	10	10	10
Total Lost time (s)		2.9		8.9	8.9		3.0	3.0		3.0	3.0	
Lane Util. Factor		0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00		1.00	1.00		1.00	0.98		1.00	0.97	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		0.98	1.00	
Frt		1.00		1.00	0.99		1.00	0.90		1.00	0.85	
Flt Protected		1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3450		1863	3568		1863	1724		1704	1505	
Flt Permitted		1.00		0.95	1.00		0.52	1.00		0.73	1.00	
Satd. Flow (perm)		3450		1863	3568		1024	1724		1315	1505	
Peak-hour factor, PHF	0.94	0.94	0.94	0.95	0.95	0.95	0.84	0.84	0.84	0.87	0.87	0.87
Adj. Flow (vph)	74	880	23	8	785	44	104	12	25	59	1	120
RTOR Reduction (vph)	0	1	0	0	3	0	0	21	0	0	101	0
Lane Group Flow (vph)	0	976	0	8	826	0	104	16	0	59	20	0
Confl. Peds. (#/hr)	2		2	2		2			9	9		10
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	7	7		2	2			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)		47.0		35.0	35.0		18.0	18.0		18.0	18.0	
Effective Green, g (s)		50.1		44.1	44.1		21.0	21.0		21.0	21.0	
Actuated g/C Ratio		0.39		0.34	0.34		0.16	0.16		0.16	0.16	
Clearance Time (s)		6.0		18.0	18.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)		1329		631	1210		165	278		212	243	
v/s Ratio Prot		c0.28		0.00	c0.23			0.01			0.01	
v/s Ratio Perm							c0.10			0.04		
v/c Ratio		0.73		0.01	0.68		0.63	0.06		0.28	0.08	
Uniform Delay, d1		34.2		28.5	36.9		50.9	46.1		47.8	46.3	
Progression Factor		0.25		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.8		0.0	3.1		16.9	0.4		3.2	0.7	
Delay (s)		11.5		28.5	40.1		67.8	46.5		51.1	47.0	
Level of Service		B		C	D		E	D		D	D	
Approach Delay (s)		11.5			39.9			62.2			48.3	
Approach LOS		B			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	29.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	73.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	764	85	8	746	42	87	10	21	51	1	104
Future Volume (vph)	70	764	85	8	746	42	87	10	21	51	1	104
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	10	10	12	12	11	12	12	12	12	10	10	10
Total Lost time (s)		2.9		8.9	8.9		3.0	3.0		3.0	3.0	
Lane Util. Factor		0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00		1.00	1.00		1.00	0.98		1.00	0.97	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		0.98	1.00	
Frt		0.99		1.00	0.99		1.00	0.90		1.00	0.85	
Flt Protected		1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3407		1863	3568		1863	1724		1704	1505	
Flt Permitted		1.00		0.95	1.00		0.52	1.00		0.73	1.00	
Satd. Flow (perm)		3407		1863	3568		1024	1724		1315	1505	
Peak-hour factor, PHF	0.94	0.94	0.94	0.95	0.95	0.95	0.84	0.84	0.84	0.87	0.87	0.87
Adj. Flow (vph)	74	813	90	8	785	44	104	12	25	59	1	120
RTOR Reduction (vph)	0	6	0	0	3	0	0	21	0	0	101	0
Lane Group Flow (vph)	0	971	0	8	826	0	104	16	0	59	20	0
Confl. Peds. (#/hr)	2		2	2		2			9	9		10
Turn Type	Split	NA		Split	NA		Perm	NA		Perm	NA	
Protected Phases	7	7		2	2			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)		47.0		35.0	35.0		18.0	18.0		18.0	18.0	
Effective Green, g (s)		50.1		44.1	44.1		21.0	21.0		21.0	21.0	
Actuated g/C Ratio		0.39		0.34	0.34		0.16	0.16		0.16	0.16	
Clearance Time (s)		6.0		18.0	18.0		6.0	6.0		6.0	6.0	
Lane Grp Cap (vph)		1313		631	1210		165	278		212	243	
v/s Ratio Prot		c0.28		0.00	c0.23			0.01			0.01	
v/s Ratio Perm							c0.10			0.04		
v/c Ratio		0.74		0.01	0.68		0.63	0.06		0.28	0.08	
Uniform Delay, d1		34.3		28.5	36.9		50.9	46.1		47.8	46.3	
Progression Factor		0.25		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.9		0.0	3.1		16.9	0.4		3.2	0.7	
Delay (s)		11.5		28.5	40.1		67.8	46.5		51.1	47.0	
Level of Service		B		C	D		E	D		D	D	
Approach Delay (s)		11.5			39.9			62.2			48.3	
Approach LOS		B			D			E			D	

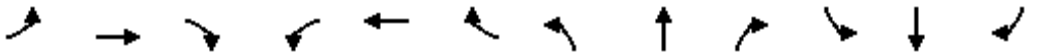
Intersection Summary			
HCM 2000 Control Delay	29.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	27.0
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	977	8	829	104	37	59	121
v/c Ratio	0.74	0.01	0.68	0.63	0.12	0.28	0.35
Control Delay	11.6	28.8	40.2	69.0	24.1	51.9	11.3
Queue Delay	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.7	28.8	40.2	69.0	24.1	51.9	11.3
Queue Length 50th (ft)	87	5	313	83	9	44	1
Queue Length 95th (ft)	119	16	387	137	38	85	51
Internal Link Dist (ft)	224		370		170		245
Turn Bay Length (ft)		250				140	
Base Capacity (vph)	1329	631	1213	165	299	212	343
Starvation Cap Reductn	30	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.01	0.68	0.63	0.12	0.28	0.35

Intersection Summary

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	977	8	829	104	37	59	121
v/c Ratio	0.74	0.01	0.68	0.63	0.12	0.28	0.35
Control Delay	11.5	28.8	40.2	69.0	24.1	51.9	11.3
Queue Delay	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	28.8	40.2	69.0	24.1	51.9	11.3
Queue Length 50th (ft)	85	5	313	83	9	44	1
Queue Length 95th (ft)	116	16	387	137	38	85	51
Internal Link Dist (ft)	224		370		170		245
Turn Bay Length (ft)		250				140	
Base Capacity (vph)	1318	631	1213	165	299	212	343
Starvation Cap Reductn	19	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.01	0.68	0.63	0.12	0.28	0.35

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	1038	16	13	850	54	71	12	11	58	0	301
Future Volume (vph)	161	1038	16	13	850	54	71	12	11	58	0	301
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	10	10	12	12	11	12	12	12	12	10	10	10
Total Lost time (s)		2.9		8.9	8.9		3.0	3.0		3.0		5.0
Lane Util. Factor		0.95		1.00	0.95		1.00	1.00		1.00		1.00
Frpb, ped/bikes		1.00		1.00	1.00		1.00	0.98		1.00		1.00
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		0.97		1.00
Frt		1.00		1.00	0.99		1.00	0.93		1.00		0.85
Flt Protected		0.99		0.95	1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)		3447		1863	3558		1863	1782		1686		1556
Flt Permitted		0.56		0.22	1.00		0.95	1.00		0.74		1.00
Satd. Flow (perm)		1937		425	3558		1863	1782		1313		1556
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.87	0.87	0.87	0.90	0.90	0.90
Adj. Flow (vph)	169	1093	17	14	895	57	82	14	13	64	0	334
RTOR Reduction (vph)	0	1	0	0	4	0	0	12	0	0	0	58
Lane Group Flow (vph)	0	1278	0	14	948	0	82	15	0	64	0	276
Confl. Peds. (#/hr)	10					10			10	10		
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm		pt+ov
Protected Phases	5	7			2			8				5 4
Permitted Phases	7			2			8			4		
Actuated Green, G (s)		107.0		37.0	37.0		11.0	11.0		11.0		69.0
Effective Green, g (s)		110.1		46.1	46.1		14.0	14.0		14.0		70.0
Actuated g/C Ratio		0.85		0.35	0.35		0.11	0.11		0.11		0.54
Clearance Time (s)		6.0		18.0	18.0		6.0	6.0		6.0		
Lane Grp Cap (vph)		2280		150	1261		200	191		141		837
v/s Ratio Prot		c0.24			c0.27			0.01				0.18
v/s Ratio Perm		0.24		0.03			0.04			c0.05		
v/c Ratio		0.56		0.09	0.75		0.41	0.08		0.45		0.33
Uniform Delay, d1		2.9		28.0	36.9		54.1	52.2		54.4		16.8
Progression Factor		0.25		1.00	1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2		0.8		1.2	4.2		6.1	0.8		10.2		1.1
Delay (s)		1.5		29.2	41.1		60.3	53.0		64.6		17.9
Level of Service		A		C	D		E	D		E		B
Approach Delay (s)		1.5			40.9			58.5			25.4	
Approach LOS		A			D			E			C	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	985	69	13	850	54	71	12	11	58	0	301
Future Volume (vph)	161	985	69	13	850	54	71	12	11	58	0	301
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	10	10	12	12	11	12	12	12	12	10	10	10
Total Lost time (s)		2.9		8.9	8.9		3.0	3.0		3.0		5.0
Lane Util. Factor		0.95		1.00	0.95		1.00	1.00		1.00		1.00
Frpb, ped/bikes		1.00		1.00	1.00		1.00	0.98		1.00		1.00
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		0.97		1.00
Frt		0.99		1.00	0.99		1.00	0.93		1.00		0.85
Flt Protected		0.99		0.95	1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)		3425		1863	3558		1863	1782		1686		1556
Flt Permitted		0.56		0.22	1.00		0.95	1.00		0.74		1.00
Satd. Flow (perm)		1924		425	3558		1863	1782		1313		1556
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.87	0.87	0.87	0.90	0.90	0.90
Adj. Flow (vph)	169	1037	73	14	895	57	82	14	13	64	0	334
RTOR Reduction (vph)	0	3	0	0	4	0	0	12	0	0	0	58
Lane Group Flow (vph)	0	1276	0	14	948	0	82	15	0	64	0	276
Confl. Peds. (#/hr)	10					10			10	10		
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm		pt+ov
Protected Phases	5	7			2			8				5 4
Permitted Phases	7			2			8			4		
Actuated Green, G (s)		107.0		37.0	37.0		11.0	11.0		11.0		69.0
Effective Green, g (s)		110.1		46.1	46.1		14.0	14.0		14.0		70.0
Actuated g/C Ratio		0.85		0.35	0.35		0.11	0.11		0.11		0.54
Clearance Time (s)		6.0		18.0	18.0		6.0	6.0		6.0		
Lane Grp Cap (vph)		2265		150	1261		200	191		141		837
v/s Ratio Prot		c0.24			c0.27			0.01				0.18
v/s Ratio Perm		0.24		0.03			0.04			c0.05		
v/c Ratio		0.56		0.09	0.75		0.41	0.08		0.45		0.33
Uniform Delay, d1		2.9		28.0	36.9		54.1	52.2		54.4		16.8
Progression Factor		0.25		1.00	1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2		0.8		1.2	4.2		6.1	0.8		10.2		1.1
Delay (s)		1.5		29.2	41.1		60.3	53.0		64.6		17.9
Level of Service		A		C	D		E	D		E		B
Approach Delay (s)		1.5			40.9			58.5			25.4	
Approach LOS		A			D			E			C	

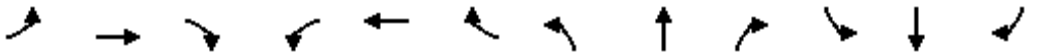
Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	80.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBR
Lane Group Flow (vph)	1279	14	952	82	27	64	334
v/c Ratio	0.56	0.09	0.75	0.41	0.13	0.45	0.37
Control Delay	1.4	30.2	41.2	60.9	35.0	65.6	11.6
Queue Delay	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.7	30.2	41.2	60.9	35.0	65.6	11.6
Queue Length 50th (ft)	26	8	367	66	11	51	93
Queue Length 95th (ft)	30	25	448	115	39	101	159
Internal Link Dist (ft)	224		370		170		
Turn Bay Length (ft)		250				140	
Base Capacity (vph)	2280	150	1265	200	203	141	896
Starvation Cap Reductn	371	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.09	0.75	0.41	0.13	0.45	0.37

Intersection Summary

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBR
Lane Group Flow (vph)	1279	14	952	82	27	64	334
v/c Ratio	0.56	0.09	0.75	0.41	0.13	0.45	0.37
Control Delay	1.4	30.2	41.2	60.9	35.0	65.6	11.6
Queue Delay	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.6	30.2	41.2	60.9	35.0	65.6	11.6
Queue Length 50th (ft)	25	8	367	66	11	51	93
Queue Length 95th (ft)	28	25	448	115	39	101	159
Internal Link Dist (ft)	224		370		170		
Turn Bay Length (ft)		250				140	
Base Capacity (vph)	2267	150	1265	200	203	141	896
Starvation Cap Reductn	359	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.09	0.75	0.41	0.13	0.45	0.37

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	97	760	38	16	614	51	84	10	23	49	0	91
Future Volume (vph)	97	760	38	16	614	51	84	10	23	49	0	91
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	10	10	12	12	11	12	12	12	12	10	10	10
Total Lost time (s)		2.9		8.9	8.9		3.0	3.0		3.0		5.0
Lane Util. Factor		0.95		1.00	0.95		1.00	1.00		1.00		1.00
Frpb, ped/bikes		1.00		1.00	1.00		1.00	0.96		1.00		1.00
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		0.95		1.00
Frt		0.99		1.00	0.99		1.00	0.90		1.00		0.85
Flt Protected		0.99		0.95	1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)		3437		1863	3552		1863	1682		1655		1556
Flt Permitted		0.99		0.95	1.00		0.95	1.00		0.73		1.00
Satd. Flow (perm)		3437		1863	3552		1863	1682		1275		1556
Peak-hour factor, PHF	0.94	0.94	0.94	0.93	0.93	0.93	0.86	0.86	0.86	0.83	0.83	0.83
Adj. Flow (vph)	103	809	40	17	660	55	98	12	27	59	0	110
RTOR Reduction (vph)	0	3	0	0	6	0	0	22	0	0	0	48
Lane Group Flow (vph)	0	949	0	17	709	0	98	17	0	59	0	62
Confl. Peds. (#/hr)	4					4			26	26		
Turn Type	Split	NA		Split	NA		Perm	NA		Perm		pt+ov
Protected Phases	7	7		2	2			8				7 4
Permitted Phases							8			4		
Actuated Green, G (s)		37.0		25.0	25.0		18.0	18.0		18.0		61.0
Effective Green, g (s)		40.1		34.1	34.1		21.0	21.0		21.0		62.0
Actuated g/C Ratio		0.36		0.31	0.31		0.19	0.19		0.19		0.56
Clearance Time (s)		6.0		18.0	18.0		6.0	6.0		6.0		
Lane Grp Cap (vph)		1252		577	1101		355	321		243		877
v/s Ratio Prot		c0.28		0.01	c0.20			0.01				0.04
v/s Ratio Perm							c0.05			0.05		
v/c Ratio		0.76		0.03	0.64		0.28	0.05		0.24		0.07
Uniform Delay, d1		30.7		26.4	32.7		38.0	36.4		37.8		10.9
Progression Factor		0.31		1.00	1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2		3.5		0.1	2.9		1.9	0.3		2.4		0.2
Delay (s)		13.1		26.5	35.6		39.9	36.7		40.1		11.1
Level of Service		B		C	D		D	D		D		B
Approach Delay (s)		13.1			35.4			39.0			21.2	
Approach LOS		B			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	97	687	111	16	614	51	84	10	23	49	0	91
Future Volume (vph)	97	687	111	16	614	51	84	10	23	49	0	91
Ideal Flow (vphpl)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Lane Width	10	10	12	12	11	12	12	12	12	10	10	10
Total Lost time (s)		2.9		8.9	8.9		3.0	3.0		3.0		5.0
Lane Util. Factor		0.95		1.00	0.95		1.00	1.00		1.00		1.00
Frpb, ped/bikes		1.00		1.00	1.00		1.00	0.96		1.00		1.00
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		0.95		1.00
Frt		0.98		1.00	0.99		1.00	0.90		1.00		0.85
Flt Protected		0.99		0.95	1.00		0.95	1.00		0.95		1.00
Satd. Flow (prot)		3394		1863	3552		1863	1682		1655		1556
Flt Permitted		0.99		0.95	1.00		0.95	1.00		0.73		1.00
Satd. Flow (perm)		3394		1863	3552		1863	1682		1275		1556
Peak-hour factor, PHF	0.94	0.94	0.94	0.93	0.93	0.93	0.86	0.86	0.86	0.83	0.83	0.83
Adj. Flow (vph)	103	731	118	17	660	55	98	12	27	59	0	110
RTOR Reduction (vph)	0	10	0	0	6	0	0	22	0	0	0	48
Lane Group Flow (vph)	0	942	0	17	709	0	98	17	0	59	0	62
Confl. Peds. (#/hr)	4					4			26	26		
Turn Type	Split	NA		Split	NA		Perm	NA		Perm		pt+ov
Protected Phases	7	7		2	2			8				7 4
Permitted Phases							8			4		
Actuated Green, G (s)		37.0		25.0	25.0		18.0	18.0		18.0		61.0
Effective Green, g (s)		40.1		34.1	34.1		21.0	21.0		21.0		62.0
Actuated g/C Ratio		0.36		0.31	0.31		0.19	0.19		0.19		0.56
Clearance Time (s)		6.0		18.0	18.0		6.0	6.0		6.0		
Lane Grp Cap (vph)		1237		577	1101		355	321		243		877
v/s Ratio Prot		c0.28		0.01	c0.20			0.01				0.04
v/s Ratio Perm							c0.05			0.05		
v/c Ratio		0.76		0.03	0.64		0.28	0.05		0.24		0.07
Uniform Delay, d1		30.7		26.4	32.7		38.0	36.4		37.8		10.9
Progression Factor		0.31		1.00	1.00		1.00	1.00		1.00		1.00
Incremental Delay, d2		3.6		0.1	2.9		1.9	0.3		2.4		0.2
Delay (s)		13.0		26.5	35.6		39.9	36.7		40.1		11.1
Level of Service		B		C	D		D	D		D		B
Approach Delay (s)		13.0			35.4			39.0			21.2	
Approach LOS		B			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	29.0
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBR
Lane Group Flow (vph)	952	17	715	98	39	59	110
v/c Ratio	0.76	0.03	0.65	0.28	0.11	0.24	0.12
Control Delay	13.1	26.8	35.6	40.5	19.1	40.9	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.1	26.8	35.6	40.5	19.1	40.9	1.0
Queue Length 50th (ft)	86	8	226	60	7	36	0
Queue Length 95th (ft)	119	25	291	104	34	69	7
Internal Link Dist (ft)	224		370		170		
Turn Bay Length (ft)		250				140	
Base Capacity (vph)	1256	577	1106	355	342	243	942
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.03	0.65	0.28	0.11	0.24	0.12

Intersection Summary

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBR
Lane Group Flow (vph)	952	17	715	98	39	59	110
v/c Ratio	0.76	0.03	0.65	0.28	0.11	0.24	0.12
Control Delay	13.0	26.8	35.6	40.5	19.1	40.9	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	26.8	35.6	40.5	19.1	40.9	1.0
Queue Length 50th (ft)	83	8	226	60	7	36	0
Queue Length 95th (ft)	116	25	291	104	34	69	7
Internal Link Dist (ft)	224		370		170		
Turn Bay Length (ft)		250				140	
Base Capacity (vph)	1247	577	1106	355	342	243	942
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.03	0.65	0.28	0.11	0.24	0.12

Intersection Summary

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	851	36	37	845	0	30
Future Vol, veh/h	851	36	37	845	0	30
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	500	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	60	60
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	896	38	39	889	0	50

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	934	0	-	468
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	729	-	0	542
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	729	-	-	542
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	542	-	-	729	-
HCM Lane V/C Ratio	0.092	-	-	0.053	-
HCM Control Delay (s)	12.3	-	-	10.2	-
HCM Lane LOS	B	-	-	B	-
HCM 95th %tile Q(veh)	0.3	-	-	0.2	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	851	2	37	845	0	30
Future Vol, veh/h	851	2	37	845	0	30
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	500	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	60	60
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	896	2	39	889	0	50

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	898	0	-	450
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	4.14	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	2.22	-	-	3.32
Pot Cap-1 Maneuver	-	-	752	-	0	556
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	752	-	-	556
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	12.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	556	-	-	752	-
HCM Lane V/C Ratio	0.09	-	-	0.052	-
HCM Control Delay (s)	12.1	-	-	10	-
HCM Lane LOS	B	-	-	B	-
HCM 95th %tile Q(veh)	0.3	-	-	0.2	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	828	71	148	791	5	126
Future Vol, veh/h	828	71	148	791	5	126
Conflicting Peds, #/hr	0	0	0	0	0	11
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	500	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	94	94	80	80
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	872	75	157	841	6	158

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	947	0	1645	485
Stage 1	-	-	-	-	910	-
Stage 2	-	-	-	-	735	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	721	-	90	528
Stage 1	-	-	-	-	353	-
Stage 2	-	-	-	-	435	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	721	-	70	523
Mov Cap-2 Maneuver	-	-	-	-	158	-
Stage 1	-	-	-	-	276	-
Stage 2	-	-	-	-	435	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.8	16.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	481	-	-	721	-
HCM Lane V/C Ratio	0.34	-	-	0.218	-
HCM Control Delay (s)	16.3	-	-	11.4	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	1.5	-	-	0.8	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	828	8	148	791	5	126
Future Vol, veh/h	828	8	148	791	5	126
Conflicting Peds, #/hr	0	0	0	0	0	11
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	500	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	94	94	80	80
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	872	8	157	841	6	158

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	880	0	1611	451
Stage 1	-	-	-	-	876	-
Stage 2	-	-	-	-	735	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	764	-	95	556
Stage 1	-	-	-	-	368	-
Stage 2	-	-	-	-	435	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	764	-	76	551
Mov Cap-2 Maneuver	-	-	-	-	165	-
Stage 1	-	-	-	-	293	-
Stage 2	-	-	-	-	435	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	15.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	506	-	-	764	-
HCM Lane V/C Ratio	0.324	-	-	0.206	-
HCM Control Delay (s)	15.5	-	-	10.9	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	1.4	-	-	0.8	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1049	58	103	914	3	81
Future Vol, veh/h	1049	58	103	914	3	81
Conflicting Peds, #/hr	0	0	0	0	0	18
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	500	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1104	61	108	962	4	100

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1165	0	1832	601
Stage 1	-	-	-	-	1135	-
Stage 2	-	-	-	-	697	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	595	-	68	443
Stage 1	-	-	-	-	269	-
Stage 2	-	-	-	-	455	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	595	-	56	436
Mov Cap-2 Maneuver	-	-	-	-	147	-
Stage 1	-	-	-	-	220	-
Stage 2	-	-	-	-	455	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	16.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	407	-	-	595	-
HCM Lane V/C Ratio	0.255	-	-	0.182	-
HCM Control Delay (s)	16.8	-	-	12.4	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	1	-	-	0.7	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1049	5	103	914	3	81
Future Vol, veh/h	1049	5	103	914	3	81
Conflicting Peds, #/hr	0	0	0	0	0	18
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	500	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	81	81
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1104	5	108	962	4	100

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1109	0	1804	573
Stage 1	-	-	-	-	1107	-
Stage 2	-	-	-	-	697	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	625	-	71	463
Stage 1	-	-	-	-	278	-
Stage 2	-	-	-	-	455	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	625	-	59	456
Mov Cap-2 Maneuver	-	-	-	-	152	-
Stage 1	-	-	-	-	230	-
Stage 2	-	-	-	-	455	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	16.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	426	-	-	625	-
HCM Lane V/C Ratio	0.243	-	-	0.173	-
HCM Control Delay (s)	16.1	-	-	12	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	0.9	-	-	0.6	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	750	82	126	673	8	101
Future Vol, veh/h	750	82	126	673	8	101
Conflicting Peds, #/hr	0	2	2	0	0	11
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	500	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	95	95	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	824	90	133	708	10	129

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	916	0	1491	470
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	620	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	740	-	114	540
Stage 1	-	-	-	-	370	-
Stage 2	-	-	-	-	499	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	739	-	93	534
Mov Cap-2 Maneuver	-	-	-	-	193	-
Stage 1	-	-	-	-	303	-
Stage 2	-	-	-	-	499	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	15.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	473	-	-	739	-
HCM Lane V/C Ratio	0.295	-	-	0.179	-
HCM Control Delay (s)	15.8	-	-	10.9	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	1.2	-	-	0.7	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	750	9	126	673	8	101
Future Vol, veh/h	750	9	126	673	8	101
Conflicting Peds, #/hr	0	2	2	0	0	11
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	500	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	95	95	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	824	10	133	708	10	129

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	836	0	1451	430
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	620	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	794	-	122	573
Stage 1	-	-	-	-	388	-
Stage 2	-	-	-	-	499	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	793	-	101	567
Mov Cap-2 Maneuver	-	-	-	-	202	-
Stage 1	-	-	-	-	322	-
Stage 2	-	-	-	-	499	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.6	14.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	501	-	-	793	-
HCM Lane V/C Ratio	0.279	-	-	0.167	-
HCM Control Delay (s)	14.9	-	-	10.4	-
HCM Lane LOS	B	-	-	B	-
HCM 95th %tile Q(veh)	1.1	-	-	0.6	-

SIMTRAFFIC

QUEUING REPORTS

Intersection: 10: Site Driveway & Maple

Movement	WB	WB	NB
Directions Served	L	T	R
Maximum Queue (ft)	32	155	72
Average Queue (ft)	11	21	20
95th Queue (ft)	34	86	50
Link Distance (ft)		643	235
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	500		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 283: Eton S. & Maple

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	TR	LT	T	L	R
Maximum Queue (ft)	370	369	156	131	117	224
Average Queue (ft)	235	208	79	65	35	93
95th Queue (ft)	344	320	133	108	78	167
Link Distance (ft)	1269	1269	211	211		714
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					285	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7283: Office Driveway/Eton N. & Maple

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	T	TR	L	TR	L	R
Maximum Queue (ft)	185	221	375	358	59	24	165	248
Average Queue (ft)	112	128	297	239	14	1	59	120
95th Queue (ft)	194	206	394	363	41	8	145	213
Link Distance (ft)	211	211	358	358	179	179		231
Upstream Blk Time (%)		0	3	0				0
Queuing Penalty (veh)		1	14	1				0
Storage Bay Dist (ft)							140	
Storage Blk Time (%)			21				0	7
Queuing Penalty (veh)			0				0	5

Network Summary

Network wide Queuing Penalty: 21

Intersection: 10: Site Driveway & Maple

Movement	EB	WB	WB	WB	NB
Directions Served	TR	L	T	T	R
Maximum Queue (ft)	22	54	172	172	52
Average Queue (ft)	1	17	40	6	24
95th Queue (ft)	7	50	130	58	49
Link Distance (ft)	358		643	643	235
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		500			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 283: Eton S. & Maple

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	TR	LT	T	L	R
Maximum Queue (ft)	420	404	201	119	92	250
Average Queue (ft)	243	225	98	70	26	112
95th Queue (ft)	349	345	151	116	62	191
Link Distance (ft)	1269	1269	211	211		714
Upstream Blk Time (%)			0			
Queuing Penalty (veh)			0			
Storage Bay Dist (ft)					285	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7283: Office Driveway/Eton N. & Maple

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	T	TR	L	TR	L	R
Maximum Queue (ft)	210	217	375	364	83	26	165	199
Average Queue (ft)	122	140	310	279	15	2	54	118
95th Queue (ft)	200	215	402	379	43	13	125	182
Link Distance (ft)	211	211	358	358	179	179		231
Upstream Blk Time (%)	0	1	6	1				
Queuing Penalty (veh)	0	3	24	3				
Storage Bay Dist (ft)							140	
Storage Blk Time (%)			24					4
Queuing Penalty (veh)			0					3

Network Summary

Network wide Queuing Penalty: 33

Queuing and Blocking Report

Intersection: 10: Site Driveway & Maple

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	75	30	135	74	30	180
Average Queue (ft)	5	2	58	6	1	63
95th Queue (ft)	34	15	105	32	10	122
Link Distance (ft)	353	353		648	648	236
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			500			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 283: Eton S. & Maple

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	TR	LT	T	L	R
Maximum Queue (ft)	424	364	136	162	95	196
Average Queue (ft)	241	235	75	57	52	86
95th Queue (ft)	342	313	128	117	102	159
Link Distance (ft)	1269	1269	211	211		714
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					285	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7283: Office Driveway/Eton N. & Maple

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	206	183	12	363	352	127	71	128	96
Average Queue (ft)	71	101	2	229	192	56	19	39	43
95th Queue (ft)	140	169	10	347	314	108	45	83	76
Link Distance (ft)	211	211		353	353	179	179		231
Upstream Blk Time (%)	0			0	0				
Queuing Penalty (veh)	0			1	0				
Storage Bay Dist (ft)			250					140	
Storage Blk Time (%)				7				0	
Queuing Penalty (veh)				1				0	

Network Summary

Network wide Queuing Penalty: 2

Intersection: 10: Site Driveway & Maple

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	53	99	93	54	30	136
Average Queue (ft)	6	11	42	8	2	55
95th Queue (ft)	30	56	76	36	14	98
Link Distance (ft)	353	353		648	648	236
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			500			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 283: Eton S. & Maple

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	TR	LT	T	L	R
Maximum Queue (ft)	333	308	119	112	134	173
Average Queue (ft)	228	209	62	47	56	80
95th Queue (ft)	312	307	101	95	98	132
Link Distance (ft)	1269	1269	211	211		714
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					285	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7283: Office Driveway/Eton N. & Maple

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	L	T	TR	L	TR	L	TR
Maximum Queue (ft)	135	171	274	353	340	127	68	106	75
Average Queue (ft)	64	94	12	265	236	57	16	40	38
95th Queue (ft)	127	157	94	356	336	108	46	88	60
Link Distance (ft)	211	211		353	353	179	179		231
Upstream Blk Time (%)				0	0				
Queuing Penalty (veh)				1	0				
Storage Bay Dist (ft)			250					140	
Storage Blk Time (%)				9					
Queuing Penalty (veh)				1					

Network Summary

Network wide Queuing Penalty: 2

Queuing and Blocking Report

Intersection: 10: Site Driveway & Maple

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	31	50	116	239	199	98
Average Queue (ft)	5	8	53	31	14	38
95th Queue (ft)	23	35	95	127	75	72
Link Distance (ft)	356	356		643	643	180
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			500			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 283: Eton S. & Maple

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	TR	LT	T	L	R
Maximum Queue (ft)	504	494	228	82	310	422
Average Queue (ft)	339	314	118	38	60	175
95th Queue (ft)	478	448	201	80	152	299
Link Distance (ft)	1269	1269	211	211		714
Upstream Blk Time (%)			0			
Queuing Penalty (veh)			2			
Storage Bay Dist (ft)					285	
Storage Blk Time (%)						1
Queuing Penalty (veh)						1

Intersection: 7283: Office Driveway/Eton N. & Maple

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	L	T	TR	L	TR	L	R
Maximum Queue (ft)	75	86	274	430	430	127	48	164	289
Average Queue (ft)	30	19	13	355	313	49	18	57	133
95th Queue (ft)	71	56	95	470	438	98	45	136	230
Link Distance (ft)	211	211		356	356	179	179		231
Upstream Blk Time (%)				15	5				2
Queuing Penalty (veh)				71	24				0
Storage Bay Dist (ft)			250					140	
Storage Blk Time (%)				38					9
Queuing Penalty (veh)				5					5

Network Summary

Network wide Queuing Penalty: 108

Queuing and Blocking Report

Intersection: 10: Site Driveway & Maple

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	90	96	118	339	267	138
Average Queue (ft)	9	10	48	137	89	48
95th Queue (ft)	45	50	82	321	260	92
Link Distance (ft)	356	356		643	643	180
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			500			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 283: Eton S. & Maple

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	TR	LT	T	L	R
Maximum Queue (ft)	475	499	226	107	133	359
Average Queue (ft)	313	295	127	35	48	175
95th Queue (ft)	437	434	201	81	103	314
Link Distance (ft)	1269	1269	211	211		714
Upstream Blk Time (%)			1			
Queuing Penalty (veh)			5			
Storage Bay Dist (ft)					285	
Storage Blk Time (%)						2
Queuing Penalty (veh)						2

Intersection: 7283: Office Driveway/Eton N. & Maple

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	L	T	TR	L	TR	L	R
Maximum Queue (ft)	95	49	274	466	453	106	50	165	281
Average Queue (ft)	23	15	32	411	375	54	20	66	139
95th Queue (ft)	65	44	167	482	471	95	44	143	221
Link Distance (ft)	211	211		356	356	179	179		231
Upstream Blk Time (%)				40	20				1
Queuing Penalty (veh)				182	91				0
Storage Bay Dist (ft)			250					140	
Storage Blk Time (%)			0	59				0	8
Queuing Penalty (veh)			0	8				0	5

Network Summary

Network wide Queuing Penalty: 292

Intersection: 10: Site Driveway & Maple

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	74	80	94	49	52	79
Average Queue (ft)	4	10	43	3	2	43
95th Queue (ft)	31	48	77	20	17	65
Link Distance (ft)	353	353		648	648	236
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			500			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 283: Eton S. & Maple

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	TR	LT	T	L	R
Maximum Queue (ft)	313	311	159	113	93	206
Average Queue (ft)	218	204	68	53	32	80
95th Queue (ft)	293	281	124	95	76	145
Link Distance (ft)	1269	1269	211	211		714
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					285	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7283: Office Driveway/Eton N. & Maple

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	L	T	TR	L	TR	L	R
Maximum Queue (ft)	280	239	33	267	210	144	70	64	135
Average Queue (ft)	61	88	5	181	146	66	24	26	44
95th Queue (ft)	156	165	21	254	214	122	56	61	96
Link Distance (ft)	211	211		353	353	179	179		231
Upstream Blk Time (%)	0	1							
Queuing Penalty (veh)	1	2							
Storage Bay Dist (ft)			250					140	
Storage Blk Time (%)				1					0
Queuing Penalty (veh)				0					0

Network Summary

Network wide Queuing Penalty: 3

Intersection: 10: Site Driveway & Maple

Movement	EB	EB	WB	WB	WB	NB
Directions Served	T	TR	L	T	T	LR
Maximum Queue (ft)	74	55	75	55	90	142
Average Queue (ft)	4	8	37	5	4	44
95th Queue (ft)	31	36	67	27	33	84
Link Distance (ft)	353	353		648	648	236
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			500			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 283: Eton S. & Maple

Movement	EB	EB	WB	WB	NB	NB
Directions Served	T	TR	LT	T	L	R
Maximum Queue (ft)	324	250	100	114	91	166
Average Queue (ft)	198	180	60	53	28	72
95th Queue (ft)	276	243	100	103	68	113
Link Distance (ft)	1269	1269	211	211		714
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)					285	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 7283: Office Driveway/Eton N. & Maple

Movement	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	L	T	TR	L	TR	L	R
Maximum Queue (ft)	162	163	274	356	312	108	73	86	117
Average Queue (ft)	64	86	24	216	176	48	15	28	39
95th Queue (ft)	126	150	137	329	280	106	47	68	85
Link Distance (ft)	211	211		353	353	179	179		231
Upstream Blk Time (%)				1					
Queuing Penalty (veh)				2					
Storage Bay Dist (ft)			250					140	
Storage Blk Time (%)				6					
Queuing Penalty (veh)				1					

Network Summary

Network wide Queuing Penalty: 3

CRASH HISTORY REPORTS

Transportation Improvement Association

Crash Detail Report

Request #: 0047732 Printed By: Patrick Cawley Printed On: 9/14/2018

DATE_VAL:	between 1/1/2015 and 12/31/2017
PR/MP	PR 683906 FROM MP 14.746 TO MP 14.886 [E Maple Rd & N Eton Rd to E Maple Rd & Edenborough]

#1 **Location:** E MAPLE RD (14.84) 238 feet E of N ETON RD **Crash ID:** 9207715

Crash Date: 02/11/2015 **Day:** Wed **Hour:** 6pm **Weather:** clear **Roadway:** wet **Light:** dark/ltd
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** angle
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 150002095

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	N	left turn	veh in transpt	none	none	none	failed to yield	car	rtfront
2	W	go straight	veh in transpt	none	none	none	none	car	lftfront

UD-10: 9207715

#2 **Location:** E MAPLE AVE (14.80) 300 feet E of N ETON ST **Crash ID:** 9857338

Crash Date: 10/28/2016 **Day:** Fri **Hour:** 4pm **Weather:** cloudy **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 2 **Inj 0:** 0 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** Y **Drugs:** Y **Complaint No:** 160012503

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	unknown	veh in transpt	none	none	none	unknown	car	ctrfront
2	W	stop on road	veh in transpt	none	none	none	none	car	ctrrear
3	W	stop on road	veh in transpt	none	none	none	unknown	car	none

UD-10: 9857338

Crash Type

Count	Type
0	uncoded
0	single
0	head-on
0	head-on/lt
1	angle
1	rr-end
0	rr-end/lt
0	rr-end/rt
0	ss-same
0	ss-opp
0	back
0	other
0	unknown
Totals:	2

Light Conditions

Count	Type
0	uncoded
1	day
0	dawn
0	dusk
1	dark/ltd
0	dark/unltd
0	other
0	unknown
Totals:	2

Weather

Count	Type
0	uncoded
1	clear
0	smoke
1	cloudy
0	fog
0	rain
0	snow
0	wind
0	sleet/hail
0	blowing snow
0	blowing sand
0	unknown
Totals:	2

Road Condition

Count	Type
0	uncoded
1	dry
0	oily
1	wet
0	ice
0	snow
0	mud
0	slush
0	debris
0	water
0	sand
0	other
0	unknown
Totals:	2

Crashes By Month

Count	Type
0	January
1	February
0	March
0	April
0	May
0	June
0	July
0	August
0	September
1	October
0	November
0	December
Totals:	2

Hazardous Action

Count	Type
2	none
0	speeding
0	imprp/no signal
0	imprp backing
0	unable to stop
0	other
2	unknown
0	reckls driving
0	carels driving
0	spd too slow
1	failed to yield
0	disrgd traffic cntrl
0	wrong way
0	left of center
0	imprp passing
0	imprp lane use
0	imprp turn
Totals:	5

Unit Type

Count	Type
0	Bicyclist
0	Engineer
5	Vehicle
0	Pedestrian
Totals:	5

Crashes By Year

Count	Type
0	2000
0	2001
0	2002
0	2003
0	2004
0	2005
0	2006
0	2007
0	2008
0	2009
0	2010
0	2011
0	2012
0	2013
0	2014
1	2015
1	2016
0	2017
0	2018
Totals:	2

Crash Severity

	FATAL	A	B	C	No Inj	Total
Persons	0	0	0	2	2	4
Crashes	0	0	0	1	1	2

Alcohol in Crashes

	FATAL	PI	PD	Total
Drinking	0	1	0	1
Not Drinking	0	0	1	1
Total	0	1	1	2

Crashes per Hour by Day

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Unknown	Total
12a - 1a	0	0	0	0	0	0	0	0	**0**
1a - 2a	0	0	0	0	0	0	0	0	**0**
2a - 3a	0	0	0	0	0	0	0	0	**0**
3a - 4a	0	0	0	0	0	0	0	0	**0**
4a - 5a	0	0	0	0	0	0	0	0	**0**
5a - 6a	0	0	0	0	0	0	0	0	**0**
6a - 7a	0	0	0	0	0	0	0	0	**0**
7a - 8a	0	0	0	0	0	0	0	0	**0**
8a - 9a	0	0	0	0	0	0	0	0	**0**
9a - 10a	0	0	0	0	0	0	0	0	**0**
10a - 11a	0	0	0	0	0	0	0	0	**0**
11a - 12p	0	0	0	0	0	0	0	0	**0**
12p - 1p	0	0	0	0	0	0	0	0	**0**
1p - 2p	0	0	0	0	0	0	0	0	**0**
2p - 3p	0	0	0	0	0	0	0	0	**0**
3p - 4p	0	0	0	0	0	0	0	0	**0**
4p - 5p	0	0	0	0	0	1	0	0	**1**
5p - 6p	0	0	0	0	0	0	0	0	**0**
6p - 7p	0	0	0	1	0	0	0	0	**1**
7p - 8p	0	0	0	0	0	0	0	0	**0**
8p - 9p	0	0	0	0	0	0	0	0	**0**
9p - 10p	0	0	0	0	0	0	0	0	**0**
10p - 11p	0	0	0	0	0	0	0	0	**0**
11p - 12a	0	0	0	0	0	0	0	0	**0**
Unknown Time	0	0	0	0	0	0	0	0	**0**
Total	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**0**	**2**

Transportation Improvement Association

Crash Detail Report

Request #: 0047733 Printed By: Patrick Cawley Printed On: 9/14/2018

ON_ROAD:	E Maple Rd
AT_ROAD:	Edenborough
STATE:	MI
COUNTY:	OAKLAND
STAT_YEAR:	3-Year

#1 **Location:** MAPLE (14.88) 30 feet W of EDENBOROUGH **Crash ID:** 9317305

Crash Date: 06/22/2015 **Day:** Mon **Hour:** 5pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 8 **How:** angle
CVT: Troy **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 150008469

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	N	left turn	veh in transpt	none	none	none	failed to yield	pickup	lftfront
2	W	go straight	veh in transpt	veh in transpt	none	none	none	car	lftfront
3	W	slow/stop on rd	veh in transpt	veh in transpt	none	none	none	car	ctrrear
4	W	slow/stop on rd	veh in transpt	veh in transpt	none	none	none	car	ctrrear
5	W	slow/stop on rd	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 9317305

#2 **Location:** E MAPLE AVE (14.88) 15 feet W of EDENBOROUGH ST **Crash ID:** 9426006

Crash Date: 10/29/2015 **Day:** Thu **Hour:** 8pm **Weather:** clear **Roadway:** dry **Light:** dark/unltd
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** rr-end
CVT: Troy **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 150014172

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	W	stop on road	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 9426006

#3 **Location:** E MAPLE RD (14.89) 10 feet E of EDENBOROUGH RD **Crash ID:** 9712527

Crash Date: 05/16/2016 **Day:** Mon **Hour:** 7pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 3 **Inj 0:** 4 **How:** rr-end
CVT: Troy **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 160005490

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	go straight	veh in transpt	none	none	none	unknown	car	none
2	W	stop on road	veh in transpt	none	none	none	unable to stop	car	ctrfront
3	W	stop on road	veh in transpt	none	none	none	none	car	ctrrear
4	W	stop on road	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 9712527

#4 **Location:** E MAPLE RD (14.87) 100 feet W of EDENBOROUGH RD **Crash ID:** 9761661

Crash Date: 07/16/2016 **Day:** Sat **Hour:** 5pm **Weather:** cloudy **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 1 **Inj 0:** 3 **How:** rr-end
CVT: Troy **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 160008213

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	W	stop on road	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 9761661

#5 **Location:** E MAPLE RD (14.88) 30 feet W of EDENBOROUGH RD **Crash ID:** 9763454
Crash Date: 07/19/2016 **Day:** Tue **Hour:** 12pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** rr-end
CVT: Troy **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 160008325

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	slow/stop on rd	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	W	stop on road	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 9763454

#6 **Location:** E MAPLE RD (14.87) 74 feet W of EDENBOROUGH **Crash ID:** 9901929
Crash Date: 12/08/2016 **Day:** Thu **Hour:** 9am **Weather:** snow **Roadway:** wet **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 3 **How:** angle
CVT: Troy **Area:** inter driveway **HBD:** N **Drugs:** N **Complaint No:** 160038236

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	N	left turn	veh in transpt	none	none	none	failed to yield	car	ctrfront
2	W	left turn	veh in transpt	none	none	none	none	car	lftrear

UD-10: 9901929

#7 **Location:** E MAPLE RD (14.89) 0 feet X of EDENBOROUGH RD **Crash ID:** 1070997
Crash Date: 06/14/2017 **Day:** Wed **Hour:** 6pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** rr-end
CVT: Troy **Area:** w/i intersection **HBD:** N **Drugs:** N **Complaint No:** 170006587

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	W	slow/stop on rd	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 1070997

#8 **Location:** E MAPLE RD (14.89) 30 feet E of EDENBOROUGH **Crash ID:** 1084584
Crash Date: 06/30/2017 **Day:** Fri **Hour:** 1pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** rr-end
CVT: Troy **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 170007294

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	W	stop on road	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 1084584

#9 **Location:** E MAPLE RD (14.87) 100 feet W of EDENBOROUGH RD **Crash ID:** 1261929
Crash Date: 12/24/2017 **Day:** Sun **Hour:** 1pm **Weather:** snow **Roadway:** snow **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 3 **How:** rr-end
CVT: Troy **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 170017588

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	W	stop on road	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 1261929

Crash Type

Count	Type
0	uncoded
0	single
0	head-on
0	head-on/lt
2	angle
7	rr-end
0	rr-end/lt
0	rr-end/rt
0	ss-same
0	ss-opp
0	back
0	other
0	unknown
Totals:	9

Light Conditions

Count	Type
0	uncoded
8	day
0	dawn
0	dusk
0	dark/ltd
1	dark/unltd
0	other
0	unknown
Totals:	9

Weather

Count	Type
0	uncoded
6	clear
0	smoke
1	cloudy
0	fog
0	rain
2	snow
0	wind
0	sleet/hail
0	blowing snow
0	blowing sand
0	unknown
Totals:	9

Road Condition

Count	Type
0	uncoded
7	dry
0	oily
1	wet
0	ice
1	snow
0	mud
0	slush
0	debris
0	water
0	sand
0	other
0	unknown
Totals:	9

Crashes By Month

Count	Type
0	January
0	February
0	March
0	April
1	May
3	June
2	July
0	August
0	September
1	October
0	November
2	December
Totals:	9

Hazardous Action

Count	Type
13	none
0	speeding
0	imprp/no signal
0	imprp backing
7	unable to stop
0	other
1	unknown
0	reckls driving
0	carels driving
0	spd too slow
2	failed to yield
0	disrgd traffic cntrl
0	wrong way
0	left of center
0	imprp passing
0	imprp lane use
0	imprp turn
Totals:	23

Unit Type

Count	Type
0	Bicyclist
0	Engineer
23	Vehicle
0	Pedestrian
Totals:	23

Crashes By Year

Count	Type
0	2000
0	2001
0	2002
0	2003
0	2004
0	2005
0	2006
0	2007
0	2008
0	2009
0	2010
0	2011
0	2012
0	2013
0	2014
2	2015
4	2016
3	2017
0	2018
Totals:	9

Crash Severity

	FATAL	A	B	C	No Inj	Total
Persons	0	0	0	4	29	33
Crashes	0	0	0	2	7	9

Alcohol in Crashes

	FATAL	PI	PD	Total
Drinking	0	0	0	0
Not Drinking	0	2	7	9
Total	0	2	7	9

Crashes per Hour by Day

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Unknown	Total
12a - 1a	0	0	0	0	0	0	0	0	**0**
1a - 2a	0	0	0	0	0	0	0	0	**0**
2a - 3a	0	0	0	0	0	0	0	0	**0**
3a - 4a	0	0	0	0	0	0	0	0	**0**
4a - 5a	0	0	0	0	0	0	0	0	**0**
5a - 6a	0	0	0	0	0	0	0	0	**0**
6a - 7a	0	0	0	0	0	0	0	0	**0**
7a - 8a	0	0	0	0	0	0	0	0	**0**
8a - 9a	0	0	0	0	0	0	0	0	**0**
9a - 10a	0	0	0	0	1	0	0	0	**1**
10a - 11a	0	0	0	0	0	0	0	0	**0**
11a - 12p	0	0	0	0	0	0	0	0	**0**
12p - 1p	0	0	1	0	0	0	0	0	**1**
1p - 2p	1	0	0	0	0	1	0	0	**2**
2p - 3p	0	0	0	0	0	0	0	0	**0**
3p - 4p	0	0	0	0	0	0	0	0	**0**
4p - 5p	0	0	0	0	0	0	0	0	**0**
5p - 6p	0	1	0	0	0	0	1	0	**2**
6p - 7p	0	0	0	1	0	0	0	0	**1**
7p - 8p	0	1	0	0	0	0	0	0	**1**
8p - 9p	0	0	0	0	1	0	0	0	**1**
9p - 10p	0	0	0	0	0	0	0	0	**0**
10p - 11p	0	0	0	0	0	0	0	0	**0**
11p - 12a	0	0	0	0	0	0	0	0	**0**
Unknown Time	0	0	0	0	0	0	0	0	**0**
Total	**1**	**2**	**1**	**1**	**2**	**1**	**1**	**0**	**9**

Transportation Improvement Association

Crash Detail Report

Request #: 0047740 Printed By: Patrick Cawley Printed On: 9/14/2018

ON_ROAD:	E Maple Rd
AT_ROAD:	Edenborough
PROVINCE:	MI
COUNTY:	OAKLAND

#1 **Location:** E MAPLE RD (14.89) 10 feet E of EDENBOROUGH RD **Crash ID:** 1305206

Crash Date: 02/03/2018 **Day:** Sat **Hour:** 3pm **Weather:** snow **Roadway:** slush **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** rr-end
CVT: Troy **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 180002213

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	slow/stop on rd	veh in transpt	none	none	none	other	car	ctrfront
2	W	slow/stop on rd	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 1305206

#2 **Location:** E MAPLE RD (14.88) 20 feet W of EDENBOROUGH **Crash ID:** 1414817

Crash Date: 06/15/2018 **Day:** Fri **Hour:** 9am **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** ss-same
CVT: Troy **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 180010467

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	change lanes	veh in transpt	none	none	none	failed to yield	car	rtfront
2	W	go straight	veh in transpt	none	none	none	none	car	lftside

UD-10: 1414817

Crash Type

Count	Type
0	uncoded
0	single
0	head-on
0	head-on/lt
0	angle
1	rr-end
0	rr-end/lt
0	rr-end/rt
1	ss-same
0	ss-opp
0	back
0	other
0	unknown
Totals:	2

Light Conditions

Count	Type
0	uncoded
2	day
0	dawn
0	dusk
0	dark/ltd
0	dark/unltd
0	other
0	unknown
Totals:	2

Weather

Count	Type
0	uncoded
1	clear
0	smoke
0	cloudy
0	fog
0	rain
1	snow
0	wind
0	sleet/hail
0	blowing snow
0	blowing sand
0	unknown
Totals:	2

Road Condition

Count	Type
0	uncoded
1	dry
0	oily
0	wet
0	ice
0	snow
0	mud
1	slush
0	debris
0	water
0	sand
0	other
0	unknown
Totals:	2

Crashes By Month

Count	Type
0	January
1	February
0	March
0	April
0	May
1	June
0	July
0	August
0	September
0	October
0	November
0	December
Totals:	2

Hazardous Action

Count	Type
2	none
0	speeding
0	imprp/no signal
0	imprp backing
0	unable to stop
1	other
0	unknown
0	reckls driving
0	carels driving
0	spd too slow
1	failed to yield
0	disrgd traffic cntrl
0	wrong way
0	left of center
0	imprp passing
0	imprp lane use
0	imprp turn
Totals:	4

Unit Type

Count	Type
0	Bicyclist
0	Engineer
4	Vehicle
0	Pedestrian
Totals:	4

Crashes By Year

Count	Type
0	2000
0	2001
0	2002
0	2003
0	2004
0	2005
0	2006
0	2007
0	2008
0	2009
0	2010
0	2011
0	2012
0	2013
0	2014
0	2015
0	2016
0	2017
2	2018
Totals:	2

Crash Severity

	FATAL	A	B	C	No Inj	Total
Persons	0	0	0	0	4	4
Crashes	0	0	0	0	2	2

Alcohol in Crashes

	FATAL	PI	PD	Total
Drinking	0	0	0	0
Not Drinking	0	0	2	2
Total	0	0	2	2

Crashes per Hour by Day

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Unknown	Total
12a - 1a	0	0	0	0	0	0	0	0	**0**
1a - 2a	0	0	0	0	0	0	0	0	**0**
2a - 3a	0	0	0	0	0	0	0	0	**0**
3a - 4a	0	0	0	0	0	0	0	0	**0**
4a - 5a	0	0	0	0	0	0	0	0	**0**
5a - 6a	0	0	0	0	0	0	0	0	**0**
6a - 7a	0	0	0	0	0	0	0	0	**0**
7a - 8a	0	0	0	0	0	0	0	0	**0**
8a - 9a	0	0	0	0	0	0	0	0	**0**
9a - 10a	0	0	0	0	0	1	0	0	**1**
10a - 11a	0	0	0	0	0	0	0	0	**0**
11a - 12p	0	0	0	0	0	0	0	0	**0**
12p - 1p	0	0	0	0	0	0	0	0	**0**
1p - 2p	0	0	0	0	0	0	0	0	**0**
2p - 3p	0	0	0	0	0	0	0	0	**0**
3p - 4p	0	0	0	0	0	0	1	0	**1**
4p - 5p	0	0	0	0	0	0	0	0	**0**
5p - 6p	0	0	0	0	0	0	0	0	**0**
6p - 7p	0	0	0	0	0	0	0	0	**0**
7p - 8p	0	0	0	0	0	0	0	0	**0**
8p - 9p	0	0	0	0	0	0	0	0	**0**
9p - 10p	0	0	0	0	0	0	0	0	**0**
10p - 11p	0	0	0	0	0	0	0	0	**0**
11p - 12a	0	0	0	0	0	0	0	0	**0**
Unknown Time	0	0	0	0	0	0	0	0	**0**
Total	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**2**

Transportation Improvement Association

Crash Detail Report

Request #: 0047730 Printed By: Patrick Cawley Printed On: 9/14/2018

Criteria:	None Specified

#1 **Location:** E MAPLE AVE (14.76) 50 feet E of N ETON ST **Crash ID:** 9226098

Crash Date: 03/10/2015 **Day:** Tue **Hour:** 12pm **Weather:** cloudy **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 3 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 150003346

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	W	stop on road	veh in transpt	none	none	none	none	motorhome	ctrrear

UD-10: 9226098

#2 **Location:** E MAPLE AVE (14.76) 75 feet E of N ETON ST **Crash ID:** 9226449

Crash Date: 03/13/2015 **Day:** Fri **Hour:** 11am **Weather:** cloudy **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** rr-end
CVT: Birmingham **Area:** inter other **HBD:** N **Drugs:** N **Complaint No:** 150003517

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	W	slow/stop on rd	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 9226449

#3 **Location:** E MAPLE AVE (14.74) 20 feet W of N ETON ST **Crash ID:** 9252106

Crash Date: 04/17/2015 **Day:** Fri **Hour:** 7pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 3 **How:** rr-end
CVT: Birmingham **Area:** inter driveway **HBD:** N **Drugs:** N **Complaint No:** 150005102

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	start on rdwy	veh in transpt	none	none	none	unable to stop	pickup	ctrfront
2	E	start on rdwy	veh in transpt	none	none	none	none	car	ctrfront

UD-10: 9252106

#4 **Location:** E MAPLE AVE (14.75) 20 feet E of N ETON ST **Crash ID:** 9319309

Crash Date: 06/24/2015 **Day:** Wed **Hour:** 3pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 150008635

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	W	slow/stop on rd	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 9319309

#5 **Location:** N ETON AVE (0.00) 25 feet NW of E MAPLE ST **Crash ID:** 9420267

Crash Date: 10/23/2015 **Day:** Fri **Hour:** 8am **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 3 **How:** ss-same
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 150013883

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	S	change lanes	veh in transpt	veh in transpt	none	none	imprp lane use	car	lftfront
2	S	go straight	veh in transpt	none	none	none	none	car	rtside
3	S	stop on road	veh in transpt	none	none	none	none	car	lftrear

UD-10: 9420267

#6 **Location:** E MAPLE AVE (14.77) 150 feet E of N ETON ST **Crash ID:** 9989749

Crash Date: 03/13/2017 **Day:** Mon **Hour:** 9am **Weather:** snow **Roadway:** snow **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** ss-same
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 170002583

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	change lanes	veh in transpt	none	none	none	imprp turn	truck/bus	rtfront
2	W	go straight	veh in transpt	none	none	none	none	car	lftfront

UD-10: 9989749

#7 **Location:** E MAPLE RD (14.74) 9 feet W of N ETON RD **Crash ID:** 1104434

Crash Date: 07/25/2017 **Day:** Tue **Hour:** 8am **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 3 **How:** ss-same
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 170008244

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	change lanes	veh in transpt	none	none	none	failed to yield	car	lftfront
2	W	go straight	veh in transpt	none	none	none	none	car	rtfront

UD-10: 1104434

#8 **Location:** N ETON ST (0.00) 0 feet X of E MAPLE AVE **Crash ID:** 1178795

Crash Date: 10/15/2017 **Day:** Sun **Hour:** 7pm **Weather:** clear **Roadway:** dry **Light:** dark/ltd
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** angle
CVT: Birmingham **Area:** w/i intersection **HBD:** N **Drugs:** N **Complaint No:** 170012705

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	S	go straight	veh in transpt	none	none	none	disrgd traffic cntrl	car	rtside
2	E	go straight	veh in transpt	none	none	none	none	car	rtfront

UD-10: 1178795

#9 **Location:** E MAPLE AVE (14.75) 0 feet X of N ETON ST **Crash ID:** 1190503

Crash Date: 10/26/2017 **Day:** Thu **Hour:** 4pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** angle
CVT: Birmingham **Area:** w/i intersection **HBD:** N **Drugs:** N **Complaint No:** 170013540

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	S	go straight	veh in transpt	none	none	none	disrgd traffic cntrl	car	lftside
2	E	go straight	veh in transpt	none	none	none	none	car	lftfront

UD-10: 1190503

#10 **Location:** E MAPLE AVE (14.76) 75 feet SE of N ETON ST **Crash ID:** 1220278

Crash Date: 11/23/2017 **Day:** Thu **Hour:** 8pm **Weather:** clear **Roadway:** dry **Light:** dark/ltd
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 1 **Inj 0:** 1 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 170015560

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1		go straight	veh in transpt	none	none	none	unknown	car	none
2	W	stop on road	veh in transpt	none	none	none	none	car	ctrfront
3	W	stop on road	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 1220278

Crash Type

Count	Type
0	uncoded
0	single
0	head-on
0	head-on/lt
2	angle
5	rr-end
0	rr-end/lt
0	rr-end/rt
3	ss-same
0	ss-opp
0	back
0	other
0	unknown
Totals:	10

Light Conditions

Count	Type
0	uncoded
8	day
0	dawn
0	dusk
2	dark/ltd
0	dark/unltd
0	other
0	unknown
Totals:	10

Weather

Count	Type
0	uncoded
7	clear
0	smoke
2	cloudy
0	fog
0	rain
1	snow
0	wind
0	sleet/hail
0	blowing snow
0	blowing sand
0	unknown
Totals:	10

Road Condition

Count	Type
0	uncoded
9	dry
0	oily
0	wet
0	ice
1	snow
0	mud
0	slush
0	debris
0	water
0	sand
0	other
0	unknown
Totals:	10

Crashes By Month

Count	Type
0	January
0	February
3	March
1	April
0	May
1	June
1	July
0	August
0	September
3	October
1	November
0	December
Totals:	10

Hazardous Action

Count	Type
12	none
0	speeding
0	imprp/no signal
0	imprp backing
4	unable to stop
0	other
1	unknown
0	reckls driving
0	carels driving
0	spd too slow
1	failed to yield
2	disrgd traffic cntrl
0	wrong way
0	left of center
0	imprp passing
1	imprp lane use
1	imprp turn
Totals:	22

Unit Type

Count	Type
0	Bicyclist
0	Engineer
22	Vehicle
0	Pedestrian
Totals:	22

Crashes By Year

Count	Type
0	2000
0	2001
0	2002
0	2003
0	2004
0	2005
0	2006
0	2007
0	2008
0	2009
0	2010
0	2011
0	2012
0	2013
0	2014
5	2015
0	2016
5	2017
0	2018
Totals:	10

Crash Severity

	FATAL	A	B	C	No Inj	Total
Persons	0	0	0	1	23	24
Crashes	0	0	0	1	9	10

Alcohol in Crashes

	FATAL	PI	PD	Total
Drinking	0	0	0	0
Not Drinking	0	1	9	10
Total	0	1	9	10

Crashes per Hour by Day

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Unknown	Total
12a - 1a	0	0	0	0	0	0	0	0	**0**
1a - 2a	0	0	0	0	0	0	0	0	**0**
2a - 3a	0	0	0	0	0	0	0	0	**0**
3a - 4a	0	0	0	0	0	0	0	0	**0**
4a - 5a	0	0	0	0	0	0	0	0	**0**
5a - 6a	0	0	0	0	0	0	0	0	**0**
6a - 7a	0	0	0	0	0	0	0	0	**0**
7a - 8a	0	0	0	0	0	0	0	0	**0**
8a - 9a	0	0	1	0	0	1	0	0	**2**
9a - 10a	0	1	0	0	0	0	0	0	**1**
10a - 11a	0	0	0	0	0	0	0	0	**0**
11a - 12p	0	0	0	0	0	1	0	0	**1**
12p - 1p	0	0	1	0	0	0	0	0	**1**
1p - 2p	0	0	0	0	0	0	0	0	**0**
2p - 3p	0	0	0	0	0	0	0	0	**0**
3p - 4p	0	0	0	1	0	0	0	0	**1**
4p - 5p	0	0	0	0	1	0	0	0	**1**
5p - 6p	0	0	0	0	0	0	0	0	**0**
6p - 7p	0	0	0	0	0	0	0	0	**0**
7p - 8p	1	0	0	0	0	1	0	0	**2**
8p - 9p	0	0	0	0	1	0	0	0	**1**
9p - 10p	0	0	0	0	0	0	0	0	**0**
10p - 11p	0	0	0	0	0	0	0	0	**0**
11p - 12a	0	0	0	0	0	0	0	0	**0**
Unknown Time	0	0	0	0	0	0	0	0	**0**
Total	**1**	**1**	**2**	**1**	**2**	**3**	**0**	**0**	**10**

Transportation Improvement Association

Crash Detail Report

Request #: 0047739 Printed By: Patrick Cawley Printed On: 9/14/2018

ON_ROAD:	E Maple Rd
AT_ROAD:	N Eton Rd
PROVINCE:	MI
COUNTY:	OAKLAND

#1 **Location:** E MAPLE AVE (14.74) 25 feet W of N ETON ST **Crash ID:** 1270131

Crash Date: 01/01/2018 **Day:** Mon **Hour:** 1am **Weather:** clear **Roadway:** wet **Light:** dark/unltd
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 1 **How:** head-on
CVT: Birmingham **Area:** straight **HBD:** Y **Drugs:** N **Complaint No:** 180000002

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	stop on road	veh in transpt	none	none	none	other	car	ctrfront
2	W	nodriver parked	veh in transpt	none	none	none	none	car	ctrfront

UD-10: 1270131

#2 **Location:** E MAPLE AVE (14.74) 20 feet NW of N ETON ST **Crash ID:** 1366336

Crash Date: 04/18/2018 **Day:** Wed **Hour:** 3pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 4 **How:** rr-end
CVT: Birmingham **Area:** w/i intersection **HBD:** N **Drugs:** N **Complaint No:** 180006848

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	start on rdwy	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	W	slow/stop on rd	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 1366336

#3 **Location:** E MAPLE AVE (14.77) 100 feet E of N ETON ST **Crash ID:** 1368007

Crash Date: 04/21/2018 **Day:** Sat **Hour:** 11am **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 180007029

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	W	stop on road	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 1368007

#4 **Location:** MAPLE RD (14.77) 100 feet E of N ETON ST **Crash ID:** 1375848

Crash Date: 05/01/2018 **Day:** Tue **Hour:** 6pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 3 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 180007676

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	start on rdwy	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	W	stop on road	veh in transpt	veh in transpt	none	none	none	car	ctrrear
3	W	stop on road	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 1375848

#5 **Location:** E MAPLE AVE (14.75) 10 feet S of N ETON ST **Crash ID:** 1449812

Crash Date: 07/30/2018 **Day:** Mon **Hour:** 3pm **Weather:** cloudy **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** ss-same
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 180012847

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	N	stop on road	veh in transpt	none	none	none	other	car	lftside
2	N	right turn	veh in transpt	none	none	none	none	truck/bus	rtside

UD-10: 180570583

Crash Type

Count	Type
0	uncoded
0	single
1	head-on
0	head-on/lt
0	angle
3	rr-end
0	rr-end/lt
0	rr-end/rt
1	ss-same
0	ss-opp
0	back
0	other
0	unknown
Totals:	5

Light Conditions

Count	Type
0	uncoded
4	day
0	dawn
0	dusk
0	dark/ltd
1	dark/unltd
0	other
0	unknown
Totals:	5

Weather

Count	Type
0	uncoded
4	clear
0	smoke
1	cloudy
0	fog
0	rain
0	snow
0	wind
0	sleet/hail
0	blowing snow
0	blowing sand
0	unknown
Totals:	5

Road Condition

Count	Type
0	uncoded
4	dry
0	oily
1	wet
0	ice
0	snow
0	mud
0	slush
0	debris
0	water
0	sand
0	other
0	unknown
Totals:	5

Crashes By Month

Count	Type
1	January
0	February
0	March
2	April
1	May
0	June
1	July
0	August
0	September
0	October
0	November
0	December
Totals:	5

Hazardous Action

Count	Type
6	none
0	speeding
0	imprp/no signal
0	imprp backing
3	unable to stop
2	other
0	unknown
0	reckls driving
0	carels driving
0	spd too slow
0	failed to yield
0	disrgd traffic cntrl
0	wrong way
0	left of center
0	imprp passing
0	imprp lane use
0	imprp turn
Totals:	11

Unit Type

Count	Type
0	Bicyclist
0	Engineer
11	Vehicle
0	Pedestrian
Totals:	11

Crashes By Year

Count	Type
0	2000
0	2001
0	2002
0	2003
0	2004
0	2005
0	2006
0	2007
0	2008
0	2009
0	2010
0	2011
0	2012
0	2013
0	2014
0	2015
0	2016
0	2017
5	2018
Totals:	5

Crash Severity

	FATAL	A	B	C	No Inj	Total
Persons	0	0	0	0	12	12
Crashes	0	0	0	0	5	5

Alcohol in Crashes

	FATAL	PI	PD	Total
Drinking	0	0	1	1
Not Drinking	0	0	4	4
Total	0	0	5	5

Crashes per Hour by Day

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Unknown	Total
12a - 1a	0	0	0	0	0	0	0	0	**0**
1a - 2a	0	1	0	0	0	0	0	0	**1**
2a - 3a	0	0	0	0	0	0	0	0	**0**
3a - 4a	0	0	0	0	0	0	0	0	**0**
4a - 5a	0	0	0	0	0	0	0	0	**0**
5a - 6a	0	0	0	0	0	0	0	0	**0**
6a - 7a	0	0	0	0	0	0	0	0	**0**
7a - 8a	0	0	0	0	0	0	0	0	**0**
8a - 9a	0	0	0	0	0	0	0	0	**0**
9a - 10a	0	0	0	0	0	0	0	0	**0**
10a - 11a	0	0	0	0	0	0	0	0	**0**
11a - 12p	0	0	0	0	0	0	1	0	**1**
12p - 1p	0	0	0	0	0	0	0	0	**0**
1p - 2p	0	0	0	0	0	0	0	0	**0**
2p - 3p	0	0	0	0	0	0	0	0	**0**
3p - 4p	0	1	0	1	0	0	0	0	**2**
4p - 5p	0	0	0	0	0	0	0	0	**0**
5p - 6p	0	0	0	0	0	0	0	0	**0**
6p - 7p	0	0	1	0	0	0	0	0	**1**
7p - 8p	0	0	0	0	0	0	0	0	**0**
8p - 9p	0	0	0	0	0	0	0	0	**0**
9p - 10p	0	0	0	0	0	0	0	0	**0**
10p - 11p	0	0	0	0	0	0	0	0	**0**
11p - 12a	0	0	0	0	0	0	0	0	**0**
Unknown Time	0	0	0	0	0	0	0	0	**0**
Total	**0**	**2**	**1**	**1**	**0**	**0**	**1**	**0**	**5**

Transportation Improvement Association

Crash Detail Report

Request #: 0047731 Printed By: Patrick Cawley Printed On: 9/14/2018

ON_ROAD:	E Maple Rd
AT_ROAD:	S Eton Rd
STATE:	MI
COUNTY:	OAKLAND
COMMUNITY:	Birmingham
STAT_YEAR:	3-Year

#1 **Location:** S ETON ST (1.04) 50 feet S of E MAPLE AVE **Crash ID:** 9163409

Crash Date: 01/04/2015 **Day:** Sun **Hour:** 4pm **Weather:** snow **Roadway:** ice **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 1 **How:** single
CVT: Birmingham **Area:** curved **HBD:** N **Drugs:** N **Complaint No:** 150000180

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	N	avoid veh-ft/bk	curb	none	none	none	unable to stop	car	rtfront

UD-10: 9163409

#2 **Location:** E MAPLE AVE (14.69) 25 feet SW of S ETON ST **Crash ID:** 9173151

Crash Date: 01/15/2015 **Day:** Thu **Hour:** 11am **Weather:** cloudy **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 150000722

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	E	stop on road	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 9173151

#3 **Location:** E MAPLE AVE (14.70) 5 feet N of S ETON ST **Crash ID:** 9186718

Crash Date: 01/22/2015 **Day:** Thu **Hour:** 6pm **Weather:** clear **Roadway:** wet **Light:** dark/ltd
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** angle
CVT: Birmingham **Area:** inter other **HBD:** N **Drugs:** N **Complaint No:** 150001074

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	S	left turn	veh in transpt	none	none	none	imprp turn	car	lftfront
2	W	go straight	veh in transpt	none	none	none	none	car	rtfront

UD-10: 9186718

#4 **Location:** S ETON (1.04) 50 feet S of E MAPLE ST **Crash ID:** 9192764

Crash Date: 02/04/2015 **Day:** Wed **Hour:** 3pm **Weather:** snow **Roadway:** wet **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 5 **How:** rr-end
CVT: Birmingham **Area:** inter other **HBD:** N **Drugs:** N **Complaint No:** 150001743

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	N	slow/stop on rd	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	N	stop on road	veh in transpt	none	none	none	none	car	ctrfront
3	N	stop on road	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 9192764

#5 **Location:** E MAPLE AVE (14.68) 75 feet SW of S ETON ST **Crash ID:** 9220172

Crash Date: 03/03/2015 **Day:** Tue **Hour:** 8am **Weather:** snow **Roadway:** snow **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 4 **How:** rr-end

CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 150003001

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	E	stop on road	veh in transpt	veh in transpt	none	none	none	car	ctrrear
3	E	stop on road	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 9220172

#6 **Location:** E MAPLE AVE (14.70) 30 feet E of S ETON ST **Crash ID:** 9244414

Crash Date: 04/04/2015 **Day:** Sat **Hour:** 9am **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 1 **Inj 0:** 1 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 150004512

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	go straight	veh in transpt	none	none	none	unable to stop	car	lftfront
2	W	slow/stop on rd	veh in transpt	none	none	none	none	car	rtrear

UD-10: 9244414

#7 **Location:** E MAPLE AVE (14.72) 100 feet NE of S ETON ST **Crash ID:** 9292530

Crash Date: 05/29/2015 **Day:** Fri **Hour:** 3pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 150007145

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	E	stop on road	veh in transpt	none	none	none	none	pickup	ctrrear

UD-10: 9292530

#8 **Location:** E MAPLE AVE (14.69) 15 feet W of S ETON ST **Crash ID:** 9333748

Crash Date: 07/10/2015 **Day:** Fri **Hour:** 12pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** rr-end
CVT: Birmingham **Area:** inter other **HBD:** N **Drugs:** N **Complaint No:** 150009316

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	E	stop on road	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 9333748

#9 **Location:** E MAPLE AVE (14.69) 45 feet W of S ETON ST **Crash ID:** 9358788

Crash Date: 08/09/2015 **Day:** Sun **Hour:** 3pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 150010620

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	E	stop on road	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 9358788

#10 **Location:** E MAPLE AVE (14.70) 5 feet W of S ETON ST **Crash ID:** 9373818

Crash Date: 09/05/2015 **Day:** Sat **Hour:** 12pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** rr-end
CVT: Birmingham **Area:** inter other **HBD:** N **Drugs:** N **Complaint No:** 150011790

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	go straight	veh in transpt	none	none	none	unable to stop	pickup	ctrfront
2	E	stop on road	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 9373818

#11 **Location:** EB E MAPLE AVE (14.69) 20 feet W of S ETON ST **Crash ID:** 9448902

Crash Date: 11/18/2015 **Day:** Wed **Hour:** 3pm **Weather:** rain **Roadway:** wet **Light:** day

Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 3 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 150015060

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	right turn	veh in transpt	none	none	none	unable to stop	car	lftfront
2	E	slow/stop on rd	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 9448902

#12 **Location:** E MAPLE AVE (14.69) 45 feet W of S ETON ST **Crash ID:** 9452353
Crash Date: 11/22/2015 **Day:** Sun **Hour:** 1pm **Weather:** clear **Roadway:** wet **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 1 **How:** single
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 150015164

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	change lanes	ran off road/r	tree	none	none	unable to stop	car	ctrfront

UD-10: 9452353

#13 **Location:** E MAPLE AVE (14.69) 40 feet W of S ETON ST **Crash ID:** 9648131
Crash Date: 02/24/2016 **Day:** Wed **Hour:** 9am **Weather:** snow **Roadway:** snow **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** ss-same
CVT: Birmingham **Area:** inter driveway **HBD:** N **Drugs:** N **Complaint No:** 160002119

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	change lanes	veh in transpt	none	none	none	imprp lane use	car	rtrear
2	E	go straight	veh in transpt	none	none	none	none	car	lftfront

UD-10: 9648131

#14 **Location:** E MAPLE AVE (14.68) 100 feet W of S ETON ST **Crash ID:** 9653669
Crash Date: 03/01/2016 **Day:** Tue **Hour:** 8pm **Weather:** snow **Roadway:** slush **Light:** dark/unltd
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 1 **How:** single
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 160002374

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	slow/stop on rd	ran off road/r	traffic sign post	none	none	speeding	car	rtfront

UD-10: 9653669

#15 **Location:** E MAPLE AVE (14.68) 100 feet W of S ETON ST **Crash ID:** 9680730
Crash Date: 03/29/2016 **Day:** Tue **Hour:** 8am **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 160003499

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	E	slow/stop on rd	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 9680730

#16 **Location:** E MAPLE AVE (14.70) 50 feet N of S ETON ST **Crash ID:** 9707855
Crash Date: 05/13/2016 **Day:** Fri **Hour:** 7am **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 160005331

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	go straight	veh in transpt	none	none	none	unable to stop	pickup	ctrfront
2	W	stop on road	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 9707855

#17 **Location:** E MAPLE AVE (14.69) 30 feet W of S ETON ST **Crash ID:** 9726567
Crash Date: 06/02/2016 **Day:** Thu **Hour:** 7pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 160006295

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	go straight	veh in transpt	none	none	none	unable to stop	truck/bus	ctrfront
2	E	slow/stop on rd	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 9726567

#18 **Location:** E MAPLE AVE (14.69) 25 feet W of S ETON ST **Crash ID:** 9747038

Crash Date: 06/27/2016 **Day:** Mon **Hour:** 11pm **Weather:** clear **Roadway:** dry **Light:** dark/ltd
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 3 **How:** rr-end
CVT: Birmingham **Area:** w/i intersection **HBD:** N **Drugs:** N **Complaint No:** 160007412

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	E	stop on road	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 9747038

#19 **Location:** S ETON ST (1.04) 15 feet E of E MAPLE AVE **Crash ID:** 9747992

Crash Date: 06/29/2016 **Day:** Wed **Hour:** 2pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** ss-same
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 160007497

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	change lanes	veh in transpt	none	none	none	failed to yield	car	lftfront
2	E	go straight	veh in transpt	none	none	none	none	car	rtside

UD-10: 9747992

#20 **Location:** E MAPLE AVE (14.70) 10 feet E of S ETON ST **Crash ID:** 9874620

Crash Date: 11/13/2016 **Day:** Sun **Hour:** 5pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 2 **Inj 0:** 1 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 160013147

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	W	stop on road	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 9874620

#21 **Location:** E MAPLE AVE (14.69) 20 feet W of S ETON ST **Crash ID:** 9912096

Crash Date: 12/17/2016 **Day:** Sat **Hour:** 7pm **Weather:** snow **Roadway:** ice **Light:** dark/ltd
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 3 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 160014394

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	slow/stop on rd	veh in transpt	none	none	none	unable to stop	car	rtfront
2	E	stop on road	veh in transpt	none	none	none	none	car	lftrear

UD-10: 9912096

#22 **Location:** E MAPLE AVE (14.70) 10 feet SW of S ETON ST **Crash ID:** 9987299

Crash Date: 03/10/2017 **Day:** Fri **Hour:** 2pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** rr-end
CVT: Birmingham **Area:** w/i intersection **HBD:** N **Drugs:** N **Complaint No:** 170002500

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	start on rdwy	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	E	start on rdwy	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 9987299

#23 **Location:** E MAPLE AVE (14.70) 10 feet W of S ETON ST **Crash ID:** 1012831

Crash Date: 04/07/2017 **Day:** Fri **Hour:** 3pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 6 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 170003532

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	E	right turn	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 1012831

#24 **Location:** E MAPLE AVE (14.70) 10 feet W of S ETON ST **Crash ID:** 1027398

Crash Date: 04/27/2017 **Day:** Thu **Hour:** 3pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 170004368

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	go straight	veh in transpt	none	none	none	unable to stop	car	lftfront
2	E	slow/stop on rd	veh in transpt	none	none	none	none	car	rtrear

UD-10: 1027398

#25 **Location:** E MAPLE AVE (14.71) 50 feet E of S ETON ST **Crash ID:** 1073458

Crash Date: 06/13/2017 **Day:** Tue **Hour:** 3pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 3 **How:** ss-same
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 170006522

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	go straight	veh in transpt	none	none	none	failed to yield	car	lftside
2	E	change lanes	veh in transpt	none	none	none	none	other	rtfront

UD-10: 1073458

#26 **Location:** E MAPLE AVE (14.70) 25 feet E of S ETON ST **Crash ID:** 1083593

Crash Date: 06/29/2017 **Day:** Thu **Hour:** 4pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 170007259

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	W	slow/stop on rd	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 1083593

#27 **Location:** E MAPLE AVE (14.69) 20 feet W of S ETON ST **Crash ID:** 1087021

Crash Date: 07/02/2017 **Day:** Sun **Hour:** 3pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 170007368

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	E	stop on road	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 1087021

#28 **Location:** E MAPLE AVE (14.70) 10 feet W of S ETON ST **Crash ID:** 1115417

Crash Date: 08/07/2017 **Day:** Mon **Hour:** 4pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** other
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 170008812

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	go straight	cargo loss/shift	veh in transpt	none	none	other	car	none
2	W	go straight	other non-fixed obj	none	none	none	none	car	ctrfront

UD-10: 1115417

#29 **Location:** S ETON ST (1.04) 15 feet S of E MAPLE AVE **Crash ID:** 1173374

Crash Date: 10/11/2017 **Day:** Wed **Hour:** 8pm **Weather:** rain **Roadway:** wet **Light:** dark/ltd
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 4 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 170012391

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	N	go straight	veh in transpt	none	none	none	unable to stop	car	rtfront
2	N	stop on road	veh in transpt	none	none	none	none	car	rtrear

UD-10: 1173374

#30 **Location:** E MAPLE ST (14.70) 20 feet E of S ETON ST **Crash ID:** 1173375

Crash Date: 10/11/2017 **Day:** Wed **Hour:** 12pm **Weather:** rain **Roadway:** wet **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 170012372

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	W	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	W	stop on road	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 1173375

#31 **Location:** E MAPLE AVE (14.69) 20 feet W of S ETON ST **Crash ID:** 1266252

Crash Date: 12/28/2017 **Day:** Thu **Hour:** 9pm **Weather:** snow **Roadway:** snow **Light:** dark/ltd
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 3 **How:** rr-end
CVT: Birmingham **Area:** inter driveway **HBD:** N **Drugs:** N **Complaint No:** 170017791

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	go straight	veh in transpt	none	none	none	unable to stop	car	ctrfront
2	E	stop on road	veh in transpt	none	none	none	none	car	ctrrear

UD-10: 1266252

#32 **Location:** E MAPLE RD (14.69) 20 feet SW of S ETON ST **Crash ID:** 1272863

Crash Date: 12/31/2017 **Day:** Sun **Hour:** 5am **Weather:** clear **Roadway:** wet **Light:** dark/ltd
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 0 **How:** single
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 170017913

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	SW	unknown	cross ctrline	ran off road/l	curb	hydrant	unknown	car	ctrfront

UD-10: 1272863

Crash Type

Count	Type
0	uncoded
4	single
0	head-on
0	head-on/lt
1	angle
23	rr-end
0	rr-end/lt
0	rr-end/rt
3	ss-same
0	ss-opp
0	back
1	other
0	unknown
Totals:	32

Light Conditions

Count	Type
0	uncoded
25	day
0	dawn
0	dusk
6	dark/ltd
1	dark/unltd
0	other
0	unknown
Totals:	32

Weather

Count	Type
0	uncoded
21	clear
0	smoke
1	cloudy
0	fog
3	rain
7	snow
0	wind
0	sleet/hail
0	blowing snow
0	blowing sand
0	unknown
Totals:	32

Road Condition

Count	Type
0	uncoded
19	dry
0	oily
7	wet
2	ice
3	snow
0	mud
1	slush
0	debris
0	water
0	sand
0	other
0	unknown
Totals:	32

Crashes By Month

Count	Type
3	January
2	February
4	March
3	April
2	May
5	June
2	July
2	August
1	September
2	October
3	November
3	December
Totals:	32

Hazardous Action

Count	Type
30	none
1	speeding
0	imprp/no signal
0	imprp backing
25	unable to stop
1	other
1	unknown
0	reckls driving
0	carels driving
0	spd too slow
2	failed to yield
0	disrgd traffic cntrl
0	wrong way
0	left of center
0	imprp passing
1	imprp lane use
1	imprp turn
Totals:	62

Unit Type

Count	Type
0	Bicyclist
0	Engineer
62	Vehicle
0	Pedestrian
Totals:	62

Crashes By Year

Count	Type
0	2000
0	2001
0	2002
0	2003
0	2004
0	2005
0	2006
0	2007
0	2008
0	2009
0	2010
0	2011
0	2012
0	2013
0	2014
12	2015
9	2016
11	2017
0	2018
Totals:	32

Crash Severity

	FATAL	A	B	C	No Inj	Total
Persons	0	0	0	3	73	76
Crashes	0	0	0	2	30	32

Alcohol in Crashes

	FATAL	PI	PD	Total
Drinking	0	0	0	0
Not Drinking	0	2	30	32
Total	0	2	30	32

Crashes per Hour by Day

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Unknown	Total
12a - 1a	0	0	0	0	0	0	0	0	**0**
1a - 2a	0	0	0	0	0	0	0	0	**0**
2a - 3a	0	0	0	0	0	0	0	0	**0**
3a - 4a	0	0	0	0	0	0	0	0	**0**
4a - 5a	0	0	0	0	0	0	0	0	**0**
5a - 6a	1	0	0	0	0	0	0	0	**1**
6a - 7a	0	0	0	0	0	0	0	0	**0**
7a - 8a	0	0	0	0	0	1	0	0	**1**
8a - 9a	0	0	2	0	0	0	0	0	**2**
9a - 10a	0	0	0	1	0	0	1	0	**2**
10a - 11a	0	0	0	0	0	0	0	0	**0**
11a - 12p	0	0	0	0	1	0	0	0	**1**
12p - 1p	0	0	0	1	0	1	1	0	**3**
1p - 2p	1	0	0	0	0	0	0	0	**1**
2p - 3p	0	0	0	1	0	1	0	0	**2**
3p - 4p	2	0	1	2	1	2	0	0	**8**
4p - 5p	1	1	0	0	1	0	0	0	**3**
5p - 6p	1	0	0	0	0	0	0	0	**1**
6p - 7p	0	0	0	0	1	0	0	0	**1**
7p - 8p	0	0	0	0	1	0	1	0	**2**
8p - 9p	0	0	1	1	0	0	0	0	**2**
9p - 10p	0	0	0	0	1	0	0	0	**1**
10p - 11p	0	0	0	0	0	0	0	0	**0**
11p - 12a	0	1	0	0	0	0	0	0	**1**
Unknown Time	0	0	0	0	0	0	0	0	**0**
Total	**6**	**2**	**4**	**6**	**6**	**5**	**3**	**0**	**32**

Transportation Improvement Association

Crash Detail Report

Request #: 0047738 Printed By: Patrick Cawley Printed On: 9/14/2018

ON_ROAD:	E Maple Rd
AT_ROAD:	S Eton Rd
PROVINCE:	MI
COUNTY:	OAKLAND

#1 **Location:** S ETON ST (1.04) 10 feet S of E MAPLE AVE **Crash ID:** 1306377

Crash Date: 02/04/2018 **Day:** Sun **Hour:** 3pm **Weather:** snow **Roadway:** slush **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 4 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 180002269

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	N	go straight	loss of control	veh in transpt	none	none	unable to stop	car	rtfront
2	N	stop on road	veh in transpt	none	none	none	none	car	lftrear

UD-10: 1306377

#2 **Location:** S ETON ST (1.04) 50 feet S of E MAPLE AVE **Crash ID:** 1310842

Crash Date: 02/09/2018 **Day:** Fri **Hour:** 6pm **Weather:** snow **Roadway:** snow **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** ss-opp
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 180002652

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	SE	right turn	loss of control	veh in transpt	none	none	speeding	car	lftfront
2	N	stop on road	veh in transpt	none	none	none	none	car	lftfront

UD-10: 1310842

#3 **Location:** E MAPLE AVE (14.67) 150 feet W of S ETON ST **Crash ID:** 1323103

Crash Date: 02/23/2018 **Day:** Fri **Hour:** 11am **Weather:** cloudy **Roadway:** wet **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** ss-same
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 180003575

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	E	passing	veh in transpt	none	none	none	imprp passing	car	rtside
2	E	stop on road	veh in transpt	none	none	none	none	car	lftfront

UD-10: 1323103

#4 **Location:** E MAPLE AVE (14.70) 0 feet X of S ETON ST **Crash ID:** 1385210

Crash Date: 05/13/2018 **Day:** Sun **Hour:** 8pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 1 **Inj 0:** 2 **How:** angle
CVT: Birmingham **Area:** w/i intersection **HBD:** N **Drugs:** N **Complaint No:** 180008347

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage
1	SW	left turn	veh in transpt	none	none	none	imprp turn	car	lftfront
2	NW	stop on road	veh in transpt	none	none	none	none	car	ctrfront

UD-10: 1385210

#5 **Location:** MAPLE (14.70) 15 feet NE of S ETON ST **Crash ID:** 1408013

Crash Date: 06/08/2018 **Day:** Fri **Hour:** 4pm **Weather:** clear **Roadway:** dry **Light:** day
Injuries K: 0 **Inj A:** 0 **Inj B:** 0 **Inj C:** 0 **Inj 0:** 2 **How:** rr-end
CVT: Birmingham **Area:** straight **HBD:** N **Drugs:** N **Complaint No:** 180010008

Unit No	Veh Dir	Action Prior	Event 1	Event 2	Event 3	Event 4	Haz Action	Veh Type	Damage

1	W	slow/stop on rd	veh in transpt	none	none	none	none	car	rtrear
2	W	go straight	veh in transpt	none	none	none	unable to stop	car	lftfront

UD-10: 1408013

Crash Type

Count	Type
0	uncoded
0	single
0	head-on
0	head-on/lt
1	angle
2	rr-end
0	rr-end/lt
0	rr-end/rt
1	ss-same
1	ss-opp
0	back
0	other
0	unknown
Totals:	**5**

Light Conditions

Count	Type
0	uncoded
5	day
0	dawn
0	dusk
0	dark/ltd
0	dark/unltd
0	other
0	unknown
Totals:	**5**

Weather

Count	Type
0	uncoded
2	clear
0	smoke
1	cloudy
0	fog
0	rain
2	snow
0	wind
0	sleet/hail
0	blowing snow
0	blowing sand
0	unknown
Totals:	**5**

Road Condition

Count	Type
0	uncoded
2	dry
0	oily
1	wet
0	ice
1	snow
0	mud
1	slush
0	debris
0	water
0	sand
0	other
0	unknown
Totals:	**5**

Crashes By Month

Count	Type
0	January
3	February
0	March
0	April
1	May
1	June
0	July
0	August
0	September
0	October
0	November
0	December
Totals:	**5**

Hazardous Action

Count	Type
5	none
1	speeding
0	imprp/no signal
0	imprp backing
2	unable to stop
0	other
0	unknown
0	reckls driving
0	carels driving
0	spd too slow
0	failed to yield
0	disrgd traffic cntrl
0	wrong way
0	left of center
1	imprp passing
0	imprp lane use
1	imprp turn
Totals:	**10**

Unit Type

Count	Type
0	Bicyclist
0	Engineer
10	Vehicle
0	Pedestrian
Totals:	**10**

Crashes By Year

Count	Type
0	2000
0	2001
0	2002
0	2003
0	2004
0	2005
0	2006
0	2007
0	2008
0	2009
0	2010
0	2011
0	2012
0	2013
0	2014
0	2015
0	2016
0	2017
5	2018
Totals:	**5**

Crash Severity

	FATAL	A	B	C	No Inj	Total
Persons	0	0	0	1	12	13
Crashes	0	0	0	1	4	5

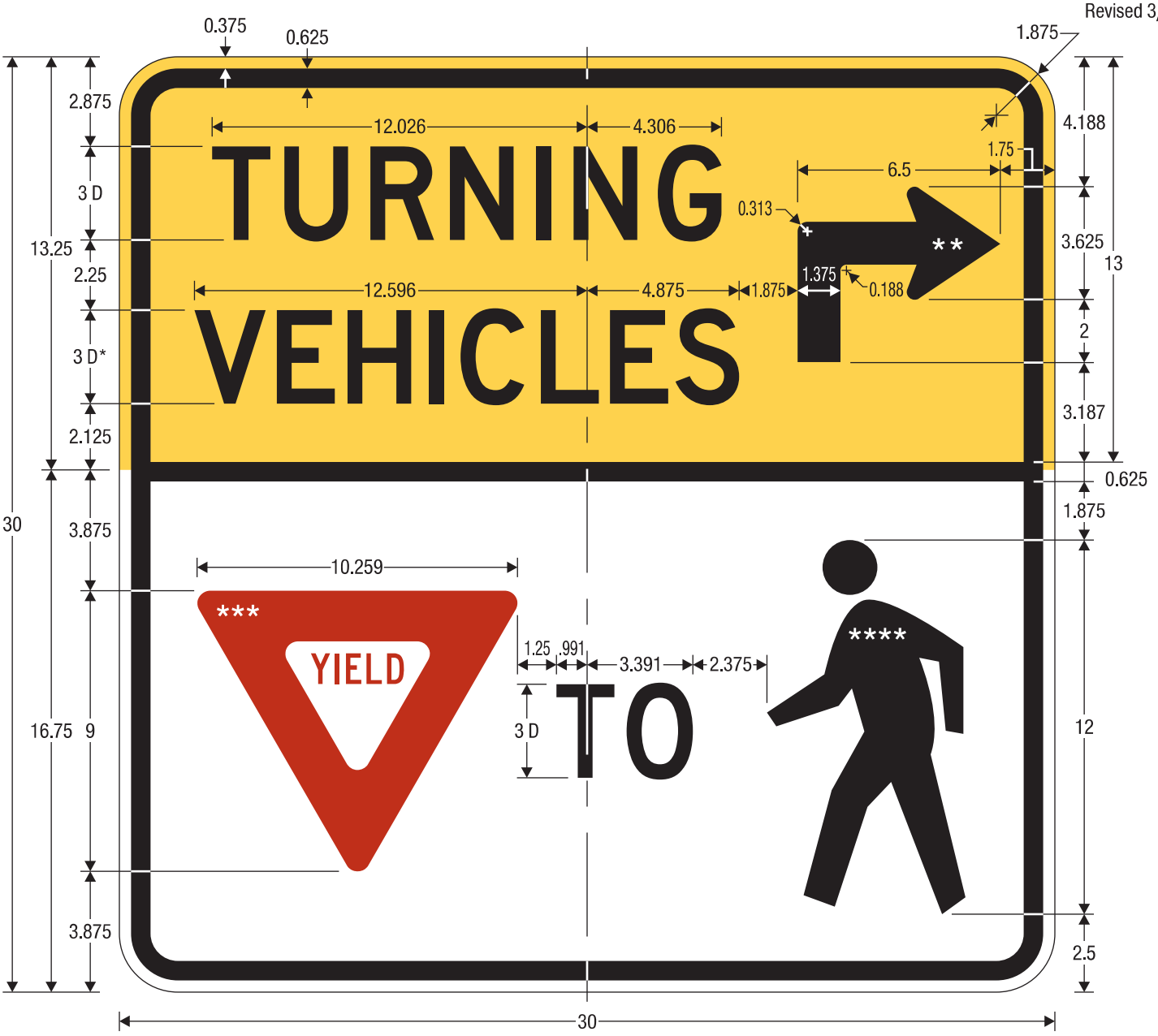
Alcohol in Crashes

	FATAL	PI	PD	Total
Drinking	0	0	0	0
Not Drinking	0	1	4	5
Total	0	1	4	5

Crashes per Hour by Day

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Unknown	Total
12a - 1a	0	0	0	0	0	0	0	0	**0**
1a - 2a	0	0	0	0	0	0	0	0	**0**
2a - 3a	0	0	0	0	0	0	0	0	**0**
3a - 4a	0	0	0	0	0	0	0	0	**0**
4a - 5a	0	0	0	0	0	0	0	0	**0**
5a - 6a	0	0	0	0	0	0	0	0	**0**
6a - 7a	0	0	0	0	0	0	0	0	**0**
7a - 8a	0	0	0	0	0	0	0	0	**0**
8a - 9a	0	0	0	0	0	0	0	0	**0**
9a - 10a	0	0	0	0	0	0	0	0	**0**
10a - 11a	0	0	0	0	0	0	0	0	**0**
11a - 12p	0	0	0	0	0	1	0	0	**1**
12p - 1p	0	0	0	0	0	0	0	0	**0**
1p - 2p	0	0	0	0	0	0	0	0	**0**
2p - 3p	0	0	0	0	0	0	0	0	**0**
3p - 4p	1	0	0	0	0	0	0	0	**1**
4p - 5p	0	0	0	0	0	1	0	0	**1**
5p - 6p	0	0	0	0	0	0	0	0	**0**
6p - 7p	0	0	0	0	0	1	0	0	**1**
7p - 8p	0	0	0	0	0	0	0	0	**0**
8p - 9p	1	0	0	0	0	0	0	0	**1**
9p - 10p	0	0	0	0	0	0	0	0	**0**
10p - 11p	0	0	0	0	0	0	0	0	**0**
11p - 12a	0	0	0	0	0	0	0	0	**0**
Unknown Time	0	0	0	0	0	0	0	0	**0**
Total	**2**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**5**

TURNING VEHICLES YIELD TO PEDESTRIANS SIGN



R10-15R

TURNING VEHICLES YIELD TO PEDESTRIANS

R10-15L

* Reduce character spacing 20%.
** See page 6-2 for arrow design.
*** See page 1-2 for sign design.
**** See page 6-10 for symbol design.

UPPER SECTION
COLORS: LEGEND, BORDER — BLACK
BACKGROUND — YELLOW (RETROREFLECTIVE)

LOWER SECTION
COLORS: LEGEND, BORDER — BLACK
YIELD SYMBOL — RED (RETROREFLECTIVE)
BACKGROUND — WHITE (RETROREFLECTIVE)

FLEIS&VANDENBRINK
DESIGN. BUILD. OPERATE.

December 12, 2018

Ms. Jana L. Ecker
Planning Director
City of Birmingham
151 Martin Street, P.O. Box 3001
Birmingham, MI 48012

VIA EMAIL

RE: Whole Foods Birmingham, Michigan
West Driveway Inbound Right-Turn Restriction Evaluation

Dear Ms. Ecker:

Fleis & VandenBrink (F&V) staff have completed our review of the West Driveway Inbound Right-Turn Restriction Evaluation performed for the existing Whole Foods Supermarket. The traffic study dated November 14, 2018 was prepared by Rowe, Inc. and was received by F&V on November 26, 2018. Additionally, the Synchro models were requested to complete the review and were provided by Rowe, Inc. on November 29, 2018. Based on this review, we have the following comments and observations.

1. The scope of work provided by F&V and the City requested the evaluation of the weekday (PM) and Saturday peak hours (11AM-1PM). The analysis performed in the study included the weekday (AM, Mid-day, and PM) and Sunday (1:00 PM to 3:00 PM) peak hours.
    - Provide additional information regarding how the peak periods included in the study were determined.
2. The scope of work provided by F&V and the City requested that the assumptions for redistribution of the right-turning traffic be reviewed and approved prior to submittal; F&V did not receive any correspondence from Rowe, Inc. with their assumptions.

    The analysis assumed that 100% site generated traffic on Maple Road west of the site would use west site drive. Although, this distribution of site generated traffic is unlikely, it was determined to be acceptable, as it provides the most conservative analysis.
3. A review of the Synchro models provided indicates that the allowance of eastbound right-turns at the N. Eton site drive will produce a minimal impact on the vehicle delays experienced by eastbound through vehicles on Maple Road.
4. A crash analysis was performed for the study area. However, there was no mention in the study about how the proposed operations (adding eastbound right-turns at the west site driveway) will impact crashes.
    - It would be expected that allowing right-turns at the west site driveway would increase the number of rear-end crashes.

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

5. A sight distance evaluation was performed and indicates that vehicles in the eastbound right lane have approximately a 150-ft line of sight in advance of the driveway. The study recommends installing a R10-15 "Turning Vehicles Yield to Pedestrians" sign to provide an advanced warning for right-turning vehicles.
    - Due to a large number of pedestrians and bicyclists at this location, F&V agrees with this recommendation.
6. The lane configuration for the south leg (NB approach) at the study intersection of Maple Road & N. Eton/Whole Foods driveway is incorrect. The Synchro models and report provided have a two-lane approach, with one left-turn lane and one shared through/right lane.
    - The existing conditions on the Whole Foods west driveway provide: a left-turn lane, a through lane, and a channelized, stop-controlled, right-turn lane. The Synchro models and analysis should be revised to reflect the correct geometry.
7. The 95th percentile queues reported throughout the study were based on Synchro outputs.
    - The vehicle queue lengths reported in the study should be taken from SimTraffic in accordance with the analysis guidelines outlined in the MDOT Electronic Traffic Control Device Guidelines.
8. Please provide Traffic Study Form B.
9. Please provide the signal timing permits used in this study.

SUMMARY

Based on the results of our review, the following revisions to the traffic study are necessary:

- Provide additional information regarding how the peak periods included in the study were determined.
- Revise Synchro models with the correct lane configuration for the northbound approach at the intersection of Maple Road and N. Eton/Whole Foods driveway.
- The vehicle queue lengths reported in the study should be taken from SimTraffic in accordance with the analysis guidelines outlined in the MDOT Electronic Traffic Control Device Guidelines.
- Provide a copy of Traffic Study Form B.
- Provide the signal timing permits used in this study.

We hope that this report addresses the City's needs regarding this project. If you have any questions, please do not hesitate to contact us at your convenience.

Sincerely,

FLEIS & VANDENBRINK ENGINEERING, INC.

Julie M. Kroll

Julie M. Kroll, PE, PTOE
Sr. Project Manager

ROWE PROFESSIONAL SERVICES COMPANY

Large Firm Resources. Personal Attention. sm

December 17, 2018

Paul T. O'Meara, PE
City Engineer
City of Birmingham
151 Martin Street
PO Box 3001
Birmingham, MI 48012

Re: Whole Foods West Driveway Right Turn Restriction
Consultant Comments Letter Dated December 12, 2018

Dear Mr. O'Meara:

ROWE Professional Services Company has received your consultant comments in their letter dated December 12, 2018 regarding our traffic study dated November 14, 2018. Our responses to their comments are presented below:

1. Concerning item one, discussions were held with the site owner regarding when the busiest times were for Whole Foods. The site owner asked the Whole Foods manager and was told the peak time for the store is Sunday between 1 p.m. and 3 p.m.
2. For item two, it would be a rare occurrence for a customer coming from the west to by-pass the first site driveway they come across and enter only at the second driveway. It is our opinion that only drivers from the east and north would elect to enter the site at the east site driveway. In either case, assuming all customers from the west are entering at the west site driveway provides the most conservative analysis for the operation and queuing of vehicles for the west leg of the intersection of Maple Road and North Eton Street, which was found to be of minimal impact based on F&V's comment number 3.
3. As for item three no response is required.
4. Similarly, no response is required for item four
5. A response is not required for item five, which affirms our recommendation on sign installation for the eastbound approach to this intersection.
6. About item six, given the large channelizing island that significantly separates the northbound right-turn movement from the signalized intersection, along with providing stop control for this movement, it can be argued that it forms its own, separate intersection from the signalized intersection of Maple Road and North Eton Street. Furthermore, by assuming the northbound through movement combined with the right-turn movement in the same lane, the operational results provided for the northbound approach are more conservative than if these movements are separated, which were still acceptable. Finally, the lane configuration for the northbound approach has no bearing or impact on the seminal point of this study, which was whether to allow eastbound right-turns at this intersection.

7. For item seven, there is no requirement in the latest version of MDOT's *Electronic Traffic Control Device Guidelines, Revision 11/29/17* to use the 95th percentile queues from SimTraffic.
8. Regarding item 8, Traffic Study Form B can be completed, although this form is typically used to provide information for new, proposed developments and not existing facilities.
9. Item nine: The RCOC timing permit, received via email on August 28, 2018, is attached to this response.

We hope the report and these answers leave the city with the understanding the removal of the right turn prohibition in question will be a minimal impact. Please feel free to contact us if you have any questions.

Sincerely,
ROWE Professional Services Company

Michael J. Labadie, PE
Senior Project Manager

Jill M. Bauer, PE, PTOE
Project Manager

Attachment

OAKLAND COUNTY ROAD COMMISSION
TRAFFIC - SAFETY DEPARTMENT
SIGNAL WORK ORDER

LOCATION: Maple + Eton DATE: 10/17/17

CITY/TOWNSHIP: Birmingham BY: CARISSA MARKEL

COUNTY#: 283 STATE#: — CHARGES: 78002830

PLEASE PERFORM THE FOLLOWING:

_____ ELECTRICAL DEVICE: ____ INSTALL _____ MODERNIZE _____ MAINTENANCE

_____ UNDERGROUND: _____

_____ EDISON OK: _____ YES _____ NO JOB#: _____

OCT 30 2017

_____ COORDINATE W/DISTRICT 7: _____

	DIAL..	1	1	1	1		2	2	2	2		3	3	3	3		4	4	4	4
	SPLIT.	1	2	3	4		1	2	3	4		1	2	3	4		1	2	3	4
X	CHANGE TIMING.....	X					X					X	X				X			
_____	CHANGE OFFSET.....																			
_____	CHANGE CYCLE LENGTH.....																			
_____	ADD DIAL/SPLIT.....																			

_____ CHANGE BREAKOUT OR EPROM: _____

_____ CHANGE HOURS OF OPERATION:

OLD: _____

NEW: _____

_____ REPROGRAM TBC

_____ INSTALL INTERCONNECT: _____ TBC _____ MINITROL _____ TONE

_____ MBT OK: _____ YES _____ NO

_____ NO CHANGE - RECORD CORRECTION

X OTHER: 3. Phase Data - 1. Basic Timings

(Rev #4)

APPROVED BY: _____ DATE: 10/24/17

DATE INSTALLED: 10/26/17

INSTALLED BY: Dave Hollier

OAKLAND COUNTY, WATERFORD, MICHIGAN
PROGRAM LOG FOR EAGLE SIGNAL CONTROLLER - MOD 52 EPAC

INTERSECTION: Maple + Eton

CITY/VILLAGE/TOWNSHIP: Birmingham

COUNTY#: 283 MDOT#: — REV#: 4 DETROIT EDISON#:

DRAWN BY: C. Markel APPROVED BY: DATE DRAWN: 10/17/17

INSTALLED BY: DATE INSTLD: / /

HOURS OF OPERATION: 7 Days : 24 Hours

HOURS OF FLASHING: None

2. UTILITIES - 1. ACCESS

CODE.....: 1642 CODE: Four digits (0000 - 9999)

2. UTILITIES - 6. LOAD DEFAULT

C - CHANGE CURRENT SOFTWARE OPTION

SELECT SOFTWARE OPTION 2 1- FIO (TS1 ONLY); 2- TS2 (TS2 ONLY)

4. UNIT DATA - 5. RING STRUCTURE

**** NOTE: INSERT ALL RING #'S FIRST, THEN NXT & CONCUR ****

CHANNEL:	RING	PHNXT	CONCURRENT PHASES															CHANNEL	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	VEH	PED
PHASE 1:	1	7	1					1											1	
PHASE 2:	1	8		1															2	9
PHASE 3:	1	5			1															
PHASE 4:	1	2				1													4	10
PHASE 5:	1	4					1													
PHASE 6:	2	6	1					1	1										6	11
PHASE 7:	1	3						1	1											
PHASE 8:	1	1								1										
PHASE 9:											1									
PHASE 10:												1								
PHASE 11:													1							
PHASE 12:														1						
PHASE 13:															1					
PHASE 14:																1				
PHASE 15:																	1			
PHASE 16:																		1		

CODES:

RING	Ring Number for Phase (1-4)
PHNXT	Phase Next in Ring (1-16)
CONCUR PH	Phases To Be Concurrent (0=NO, 1=YES)

For vehicle channel & ped channel, enter "1" under channel# shown.

3. PHASE DATA - 1. BASIC TIMINGS

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	RANGE
Minimum Green	5	5	5	5	5	5	5	5									00-99
Passage																	0.0-9.9
Maximum #1	36	36	5	24	5	36	36	5									000-999
Maximum #2																	000-999
Yellow Clearance	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5									3.0-9.9
Red Clearance	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5									0.0-9.9

ROAD COMMISSION FOR OAKLAND COUNTY, WATERFORD, MICHIGAN
PROGRAM LOG FOR EAGLE SIGNAL CONTROLLER - MOD 52 EPAC

3. PHASE DATA - 3. PEDESTRIAN TIMINGS

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	RANGE (SEC)
Walk		7		4		7											00-99
Pedest Clearance		13		13		18											00-99
Flashing Walk																	
Extend Ped Clear		2		0		2											(0-no, 1-Y+R, 2-Y)
Act Rest in Walk																	

3. PHASE DATA - 4. INITIALIZE & NON ACTUATED RESPONSE

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Initial	1	4	1	1	1	1	1	1								
NA Response																

CODES:	0	1	2	3	4
Initial	none	inactive	red	yellow	green
NA Response	none	to 1	to 2	both	------

3. PHASE DATA - 5. VEHICLE & PEDESTRIAN RECALLS

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Vehicle Recall	3	3	3	3	3	3	3	3								
Pedestrian Recall		2		0		2										

CODES:	0	1	2	3	4
Vehicle	none	1 call	min	max	soft
Pedestrian	none	1 call	ped	bot N. A.	------

3. PHASE DATA - 6. NONLOCK & MISC CONTROLS

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Nonlock Memory																
Dual Entry																
Last Car Passage																
Conditional Service																

CODES: 0 = NO 1 = YES

3. PHASE DATA - 7. SPECIAL SEQUENCE

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Omit					3		1									
-Yel																
Ocal																

3. PHASE DATA - 8. SPECIAL DETECTOR - 0. SPC 1-8 (TS1 ONLY)

Detector # on Print	1	2	3	4	5	6	7	8
Assigned Phase								

CODES: 0 1 2 3 4

Operation Mode: Norm Veh Norm Ped 1 call St Bar A St Bar B

A. CONTROLS	RANGE (SEC)
Extend Time	00-99
Delay Time	00-999

3. PHASE DATA - 8. SPECIAL DETECTOR - 1. VEH 1-8 OR 2.VEH 9-16 (TS2 ONLY)

Detector # on Print	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Assigned Phase																

CODES: 0 1 2 3 4

Operation Mode: Norm Veh Norm Ped 1 call St Bar A St Bar B

A. CONTROLS	RANGE (SEC)
Extend Time	00-99
Delay Time	00-999

ROAD COMMISSION FOR OAKLAND COUNTY, WATERFORD, MICHIGAN
PROGRAM LOG FOR EAGLE SIGNAL CONTROLLER - MOD 52 EPAC

3. PHASE DATA - 0. MISC PED+VEH OPT

Phase	1	2	3	4	5	6	7	8
WOFF/10								
MODE								

Walk Offset MODE: 0 = Advance Walk 1 = Delay Walk

GDLY/10								
YDLY/10								

GDLY = Amt of time Advance Warning remains ON after the beginning of Green

YDLY = Amt of time the Advance Warning turns ON before the end of Green

4. UNIT DATA - 1. STARTUP & MISCELLANEOUS

Start up time : 10 (00-99) State : 0 (0 = fl, 1 = red)
Auto ped clear : 0 Red revert : 7.0 (2.0 - 9.9)
Stop time reset : 0 (0 = No, 1 = Yes)

4. UNIT DATA - 2. REMOTE FLASH

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
FLASH																	(0=No; 1=R, 2=Y)
ALT																	(0=On/Off; 1=Off/On)
ENTER																	
EXIT																	

* DO NOT USE NIGHT FLASH *

Test A = Remote Flash: _____ (0 = no & 1 = yes)

6. TIME BASE - 0. SPC FUNCTION MAPPING

FUNCTION NAME
AS 8-15 = OLI - P FL G PHS
AS 8-15 = OLI - P FL R PHS

SPC FUNC							
1	2	3	4	5	6	7	8

NOTE: Go up after entering to get this screen.

4. UNIT DATA - 6. ALT SEQ. 08-15

EPAC ALT SEQ (PHASE PAIR TO REVERSE)

SEQ	.PP1.	.PP2.	.PP3.	.PP4.	.PP5.	.PP6.
08						
09						
10						
11						

SEQ	.PP1.	.PP2.	.PP3.	.PP4.	.PP5.	.PP6.
12						
13						
14						
15						

4. UNIT DATA - 3. OVERLAP STANDARD

Phase	1	2	3	4	5	6	7	8	CH#
OVL A Phses									13
+GRN Phses							1		
OVL B Phses									14
+GRN Phses				1					
OVL C Phses		1	1		1	1		1	15
OVL D			1		1	1			16
OVL E		1						1	5
OVL F		1					1	1	7

Phase	1	2	3	4	5	6	7	8	CH#
Overlap G		1		1				1	8
Overlap H				1	1		1		3
Overlap K									
Overlap L									
Overlap M									
Overlap N									
Overlap 0									
Overlap P									

* For FYA operation, '+GRN' entry is the thru phase opposing the FYA phase

4. UNIT DATA - 4. OVERLAP SPECIAL

Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trail green																
Trail yellow																
Trail red																
-Green / -yellow (-G/Y)	1	9														
TG Preempt																

* Overlap green omitted by # - phase green; Overlap yellow omitted by # - phase yellow
* For FYA operation, '-G/Y' entry defines the phase that is the green arrow

4. UNIT DATA - 7. PORT 1 / ITS DATA (TS2 ONLY)

ADDRESS	DESCRIPTION	PRES	M40
0	T&F BIU #1 TS2	\	
1	T&F BIU #2 TS2	\	
2	T&F BIU #3 TS2		
3	T&F BIU #4 TS2		
4	T&F BIU #5 RESERVED		
5	T&F BIU #6 RESERVED		
6	T&F BIU #7 MFG USE		
7	T&F BIU #8 MFG USE		
8	DET BIU #1 TS2		
9	DET BIU #2 TS2		
10	DET BIU #3 TS2		
11	DET BIU #4 TS2		
12	DET BIU #5 RESERVED		
13	DET BIU #6 RESERVED		
14	DET BIU #7 MFG USE		
15	DET BIU #8 MFG USE		
16	MALFUNCTION UNIT	\	
17	DIAGNOSTIC (MSG 30)		
18	CONTROLLER UNIT	\	

CODES: 0=NO / 1=YES

4. UNIT DATA - 8. I/O MISCELLANEOUS

Ring#	1	2	3	4
Input Response	\	2		
Output Select	\	2		

I/O Modes	INPUT	OUTPUT
"ABC" Connector		
"D" Connector		

Controller with Detection (TS1 ONLY):
EPAC300/M52 enter **"1"** under D Conn Input
2070 enter **"0"** under D Conn Input

5. COORDINATION DATA - 1. COORD SETUP

		0	1	2	3	4	5
OPER:	\	FRE	AUT	MAN	--------	--------	--------
MODE:	0	PRM	YLD	PYL	POM	SOM	FAC
MAX :	0	INH	MX1	MX2	--------	--------	--------
CORR:	2	DWL	MDW	SWY	SW+	--------	--------
OFST:	0	BEG	END	OF GREEN			
FRCE:	0	PLN CYC LE TIME					

MX DWELL: 0 YIELD PERIOD: 0

5. COORDINATION DATA - 3. DIAL/SPLIT DATA

Mode: 0 = actuated
1 = coord phase
2 = minimum recall
3 = maximum recall
4 = pedestrain recall
5 = maximum + pedestrain recall
6 = phase omit
7 = dual coord phase

Sequence: 00 - 15 (Unit data has definition)
Ring Lag: Ring offset from local cycle zero when not barrier locked to Ring #1.
Time: 00 - 99 seconds.

5. COORDINATION DATA - 3. DIAL/SPLIT DATA

LEVEL 2

DIAL 1 / SPLIT 1 CYCLE LENGTH: 110

PHASE	1	2	3	4	5	6	7	8
TIME	31	31	12	24	0	31	0	12
MODE	7	1	3	3	6	7	6	3

DIAL 1 / SPLIT 2 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 1 / SPLIT 3 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 1 / SPLIT 4 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

LEVEL 1

OFFSET	1	2	3
TIME	0		
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			

DIAL 2 / SPLIT 1 CYCLE LENGTH: 130

PHASE	1	2	3	4	5	6	7	8
TIME	43	39	12	24	0	43	0	12
MODE	7	1	3	3	6	7	6	3

DIAL 2 / SPLIT 2 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 2 / SPLIT 3 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 2 / SPLIT 4 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

OFFSET	1	2	3
TIME	0		
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			

* Note: PH 3, 5, 8 = Trail green = 5+1 (Trail Green) + 3.5 (Y) + 2.5 (AR) = 12 sec * - DO NOT CHANGE!

ROAD COMMISSION FOR OAKLAND COUNTY, WATERFORD, MICHIGAN
PROGRAM LOG FOR EAGLE SIGNAL CONTROLLER - MOD 52 EPAC

5. COORDINATION DATA - 3. DIAL/SPLIT DATA

LEVEL 2

DIAL 3 / SPLIT 1 CYCLE LENGTH: 130

PHASE	1	2	3	4	5	6	7	8
TIME	41	41	12	24	0	41	0	12
MODE	7	1	3	3	6	7	6	3

DIAL 3 / SPLIT 2 CYCLE LENGTH: 130

PHASE	1	2	3	4	5	6	7	8
TIME	0	46	0	17	12	43	43	12
MODE	6	1	6	3	3	7	7	3

DIAL 3 / SPLIT 3 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 3 / SPLIT 4 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

LEVEL 1

OFFSET	1	2	3
TIME	0		
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME	0		
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			

DIAL 4 / SPLIT 1 CYCLE LENGTH: 130

PHASE	1	2	3	4	5	6	7	8
TIME	42	40	12	24	0	42	0	12
MODE	7	1	3	3	6	7	6	3

DIAL 4 / SPLIT 2 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 4 / SPLIT 3 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

DIAL 4 / SPLIT 4 CYCLE LENGTH:

PHASE	1	2	3	4	5	6	7	8
TIME								
MODE								

OFFSET	1	2	3
TIME	0		
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			
OFFSET	1	2	3
TIME			
SEQUENCE			
RING 2 LAG			
RING 3 LAG			
RING 4 LAG			

ROAD COMMISSION FOR OAKLAND COUNTY, WATERFORD, MICHIGAN
PROGRAM LOG FOR EAGLE SIGNAL CONTROLLER - MOD 52 EPAC

6. TIME BASE DATA - 2. SET TIME / DATE

-- DATE -- MM/DD/YY	-- TIME -- HH:MM:SS	MON & WEEK:	BEG -- DST MM	SW	-- END MM	SW
/ /	: :		03	02	11	01

CYCLE ZERO: 24 : 00 (HH:MM - EVENT)

STZ DIFF: -18000 (GPS OFFSET)

2. UTILITIES - 8. CONFIGURE PORTS - 8. GPS CONFIGURATION

GPS: 1 (0-NO, 1-YES) PORT: 4

6. TIME BASE DATA - 3. TRAFFIC EVENTS

PRO DAY	TIME HH : MM	COORD PATRN		MAX 2 PHASE #S									OMIT PHASE #S							
* * *	* * * * *	D / S / O		*	*	*	*	*	*	*	*		*	*	*	*	*	*	*	*
01	00 :00	4/ 1 /1																		
01	10 :00	1/ 1 /1																		
01	19 :00	4/ 1 /1																		
02	00 :00	4/ 1 /1																		
02	07 :00	2/ 1 /1																		
02	12 :00	3/ 1 /1																		
02	16 :00	3/ 2 /1																		
02	18 :00	3/ 1 /1																		
02	20 :00	4/ 1 /1																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		
	:	/ /																		

REFERENCE DATA
PRO DAY = 01 - 99
(Program day)

HH:MM = 24 Hour clock

PATTERN: (D/S/O)
FLASH =5/5/
FREE =0/0/4

MAX2 & OMITS:
Call free, set pattern to 0/0/0.

D = DIAL #
S = SPLIT #
0 = OFFSET #

6. TIME BASE DATA - 4. AUXILIARY EVENTS

PRO	TIME		AUX				DET VALUE				DIM
DAY	HH : MM		A1	A2	A3		D1	D2	D3		DIM
	:										
	:										
	:										
	:										
	:										
	:										
	:										
	:										
	:										
	:										
	:										
	:										
	:										

REFERENCE DATA:
PRO DAY = 00 - 99
(Program day)

HH:MM = 24 Hour clock

AUX = Output states
DET VALUE:
1 = Det diag value
2 = Enables report
3 = Repeat multiplier

DIM = Dimming state

ALL: 0 = off, 1 = on

6. TIME BASE DATA - 5. TIME OF YEAR EVENTS

DATE		SPECIAL		DATE		SPECIAL	
MM / DD / YY		DAY	WEEK	MM / DD / YY		DAY	WEEK
/ /				/ /			
/ /				/ /			
/ /				/ /			
/ /				/ /			
/ /				/ /			
/ /				/ /			
/ /				/ /			
/ /				/ /			
/ /				/ /			
/ /				/ /			
/ /				/ /			
/ /				/ /			
/ /				/ /			
/ /				/ /			
/ /				/ /			
/ /				/ /			
/ /				/ /			
/ /				/ /			
/ /				/ /			
/ /				/ /			
/ /				/ /			
/ /				/ /			

REFERENCE DATA
Special day = Any program day 00 - 99.

Special week:
Week 0 = Pro Day 01-07
Week 1 = Pro Day 11-17
Week 2 = Pro Day 21-27

6. TIME BASE DATA - 6. EQUATE/TRANSFER

CODE: 0 (0 = equate, 1 = transfer)

FROM

01 = 07						
02 = 03	04	05	06			
=						
=						
=						
=						
=						

DAY EQUATE: Care must be taken to insure days are not equated to undefined days or days that are equated to other days. The result wil be a day without events to run.

ROAD COMMISSION FOR OAKLAND COUNTY, WATERFORD, MICHIGAN
PROGRAM LOG FOR EAGLE SIGNAL CONTROLLER - MOD 52 EPAC

7. PREEMPT DATA - 1. ALL PREEMPTS

RING TIMES		1	2	3	4	
MIN GREEN/WALK						
OVERRIDE	FL	1/2	2/3	3/4	4/5	5/6
STATUS						
CODES	0 = NO, 1 = YES					

7. PREEMPT DATA - PREEMPT 1

1. MISC DATA: (0 = no, 1 = yes)

TEST..: ____ N-LOCK.: ____ LINK PR#..: ____
DELAY: ____ EXTEND: ____ DURATION: ____
MXCALL: ____ LOCK OUT: ____

RING	1	2	3	4	5	6	7	8
EXIT								
CALLS								

2. INTERVAL TIMES:

SEL PED CLR : ____ TRK YEL CHG : __.__
SEL YEL CHG : __.__ TRK RED CLR : __.__
SEL RED CLR : __.__ DWELL GREEN: ____
TRACK GREEN: ____ RET PED CLR : ____
TRK PED CLR : ____ RET YEL CHG : __.__
RET YEL CLR : __.__

3. VEHICLE STATUS:

PHASE	1	2	3	4	5	6	7	8
TRK GRN								
DWELL								

(0=red, 1=grn, 2=flr, 3=fly, 4=dark)

CYCLE								

(0=no, 1=act, 2=min recall, 3=max recall)

4. PEDESTRIAN STATUS:

PHASE	1	2	3	4	5	6	7	8
TRK GRN								
DWELL								

(0=dont wlk, 1=wlk, 2=flwlk, 3=dark)

CYCLE								

(0 = no, 1 = act, 2 = recall)

5. OVERLAP STATUS:

OVERLAP	A	B	C	D
TRK GRN				
DWELL				

(0=red, 1=grn, 2=flr, 3=fly, 4=dark)

CYCLE								

(0 = no, 1 = act)

6. LOW PRIORITY: (0=no, 1=yes)

TEST..: __ N-LOCK.: __ SKIP.....: __
DELAY: __ EXTEND: __ DURATION: __
DWELL: MXCALL: LOCK OUT:

RING	1	2	3	4	5	6	7	8
DWELL								
CALLS								

SIGNAL PHASING

PHASE#	ROAD	PHASE	LOAD SW	FLASH
1	WB Maple LT (East) (Green Arrow)	ALE	1	—
2	EB Maple (West)	CW	2	R
3	Dummy - Trail Green OLC/D (following 1)			
4	NB Eton (East, West)	DE, DW	4	R
5	Dummy - Trail Green OLC/D/F (following 7)			
6	WB Maple (East)	AE	6	R
7	Dummy - Runs EB/WB			
8	Dummy - Trail Green OLC/E/F (following 2)			
OLA	WB Maple LT (East) (FYA, yellow arrow, red arrow)	ALE	13	R
OLB	SB Eton LT (East) (FYA, yellow arrow, red arrow)	BE	14	R
OLC	WB Maple (West)	AW	15	R
OLD	WB Maple LT (West) (G, A)	ALW	16	—
OLE	EB Maple LT (East) (G, A)	CLE	5	—
OLF	EB Maple (East)	CE	7	R
OLG	SB Eton RT (East)	BRE	8	R
OLH	NB Eton RT G A (West)	DRW	3	—
2PED	EB Maple Ped (South Leg East, South Leg West)	WCE, WXW	9	—
4PED	Eton Ped (East Leg East, West Leg West)	WDE, WDW	10	—
6PED	WB Maple Ped (North Leg East)	WAE	11	—

CONTROLLER INFORMATION SHEET
Size P44-16 **TS2** Cabinet with MOD 60 EPAC

INTERSECTION: Maple & Eton
COUNTY NO: 283
STATE NO: -
PREPARED BY: Carissa Markel
DATE: 10/11/17

BACKPANEL :- SIZE P44-16 **TS2** CABINET

Load Switch 1:	WB Maple LT (East)(G arrow)	ALE	-
Load Switch 2:	EB Maple (West)	CW	FLR
Load Switch 3 (OLH):	NB Eton RTGA (West) (G Only)	DRW	-
Load Switch 4:	NB Eton (East & West)	DE & DW	FLR
Load Switch 5 (OLE):	EB Maple LT (East) (G,A)	CLE	-
Load Switch 6 (OLI):	WB Maple (East)	AE	FLR
Load Switch 7 (OLF):	EB Maple (East)	CE	FLR
Load Switch 8 (OLG):	SB Eton RT (East)	BRE	FLR
Load Switch 9:	EB Maple Ped (South Leg East & South Leg West)	WCE & WCW	
Load Switch 10:	Eton Ped East Lag East & West Leg West)	WDE & WDW	
Load Switch 11:	WB Maple Ped (North Leg East)	WAE	
Load Switch 13 (OLA):	WB Maple LT (East) (FYA, Y arrow, R arrow)	ALE	FLR
Load Switch 14 (OLB):	SB Eton LT (East) (FYA, Y arrow, R arrow)	BE	FLR
Load Switch 15 (OLC):	WB Maple (West)	AW	FLR
Load Switch 16 (OLD):	WB Maple LT(West) (G,A)	ALW	-

MMU 2 :- (MENU : SET/VIEW CONFIG)

Field Check Enable

Channel 1: G
Channel 2: G, Y, R
Channel 3: G
Channel 4: G, Y, R
Channel 5: G, Y
Channel 6: G, Y, R
Channel 7: G, Y, R
Channel 8: G, Y, R
Channel 13: G, Y, R
Channel 14: G, Y, R
Channel 15: G, Y, R
Channel 16: G, Y

Dual Indication Enable:

R+G: Channel 2,4,6,7,8,9,10,11,13,14,15
R+Y: Channel 2,4,6,7,8,13,14,15
G+Y: Channel 2,4,5,6,7,8,13,14,15,16

Red Fail Enable:

Enable: Channel 1,2,3,4,5,6,7,8,13,14,15,16

Unit Options:

All OFF except:
Recurrent pulse
Program Memory Card

Y & R Clearance Disable:

Channel 2,4,5,6,7,8,13,14,15,16 Enabled

Flashing Yellow Arrow:

Enable: Channel Pair 1-13

Program Card:

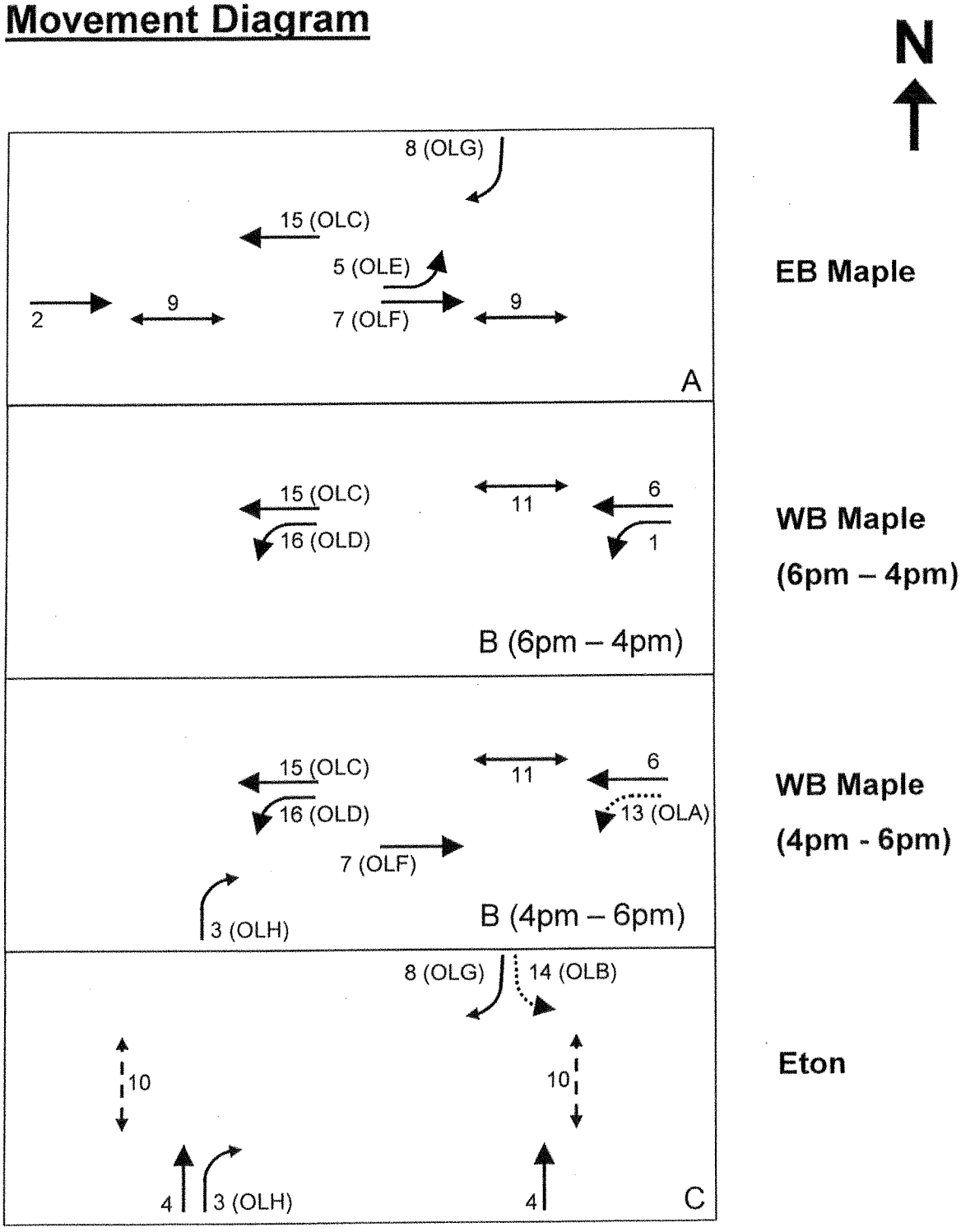
Compatible Channels:
1-6, 1-11, 1-13, 1-15, 1-16, 2-5, 2-7, 2-8, 2-9, 2-15, 3-4, 3-6, 3-7, 3-8, 3-10, 3-11, 3-13, 3-14, 3-15, 3-16, 4-8, 4-10, 4-14, 5-7, 5-8, 5-9, 5-15, 6-7, 6-11, 6-13, 6-15, 6-16, 7-8, 7-9, 7-11, 7-13, 7-15, 7-16, 8-9, 8-10, 8-14, 8-15, 9-15, 10-14, 11-13, 11-15, 11-16, 13-15, 13-16, 15-16

Min Flash Time: 4+2+1
Min Yellow Change Disable: 9,10,11
Voltage Monitor Latch: NONE

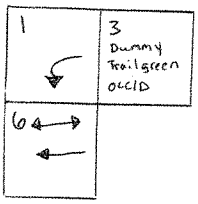
Note: Add jumper 16 MMU flash – 116 Monitor ST Out

#283 – Maple & Eton

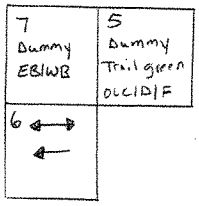
• Movement Diagram

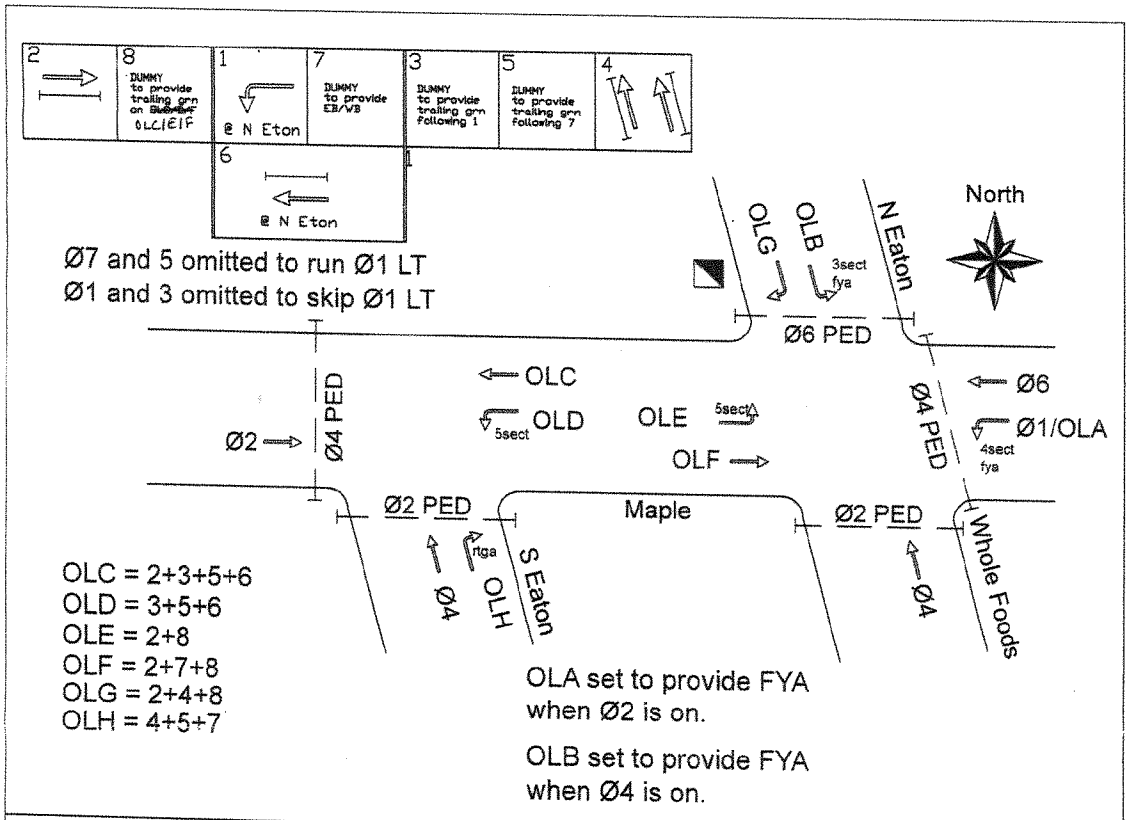


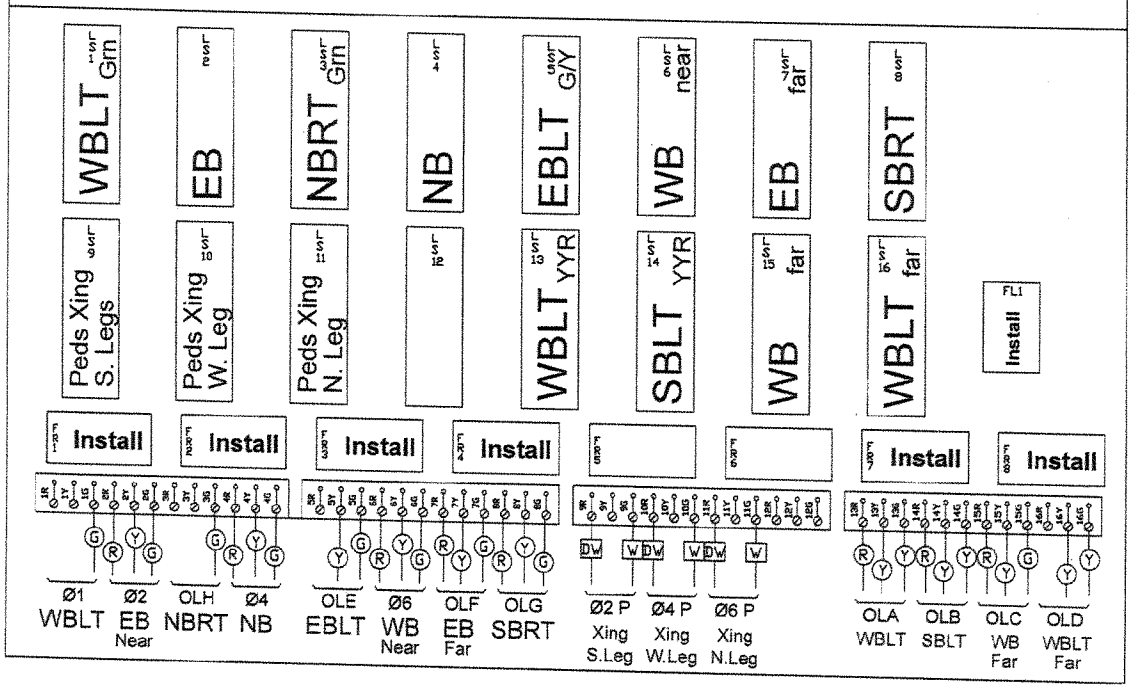
Runs WBLT green
Omit 5+7

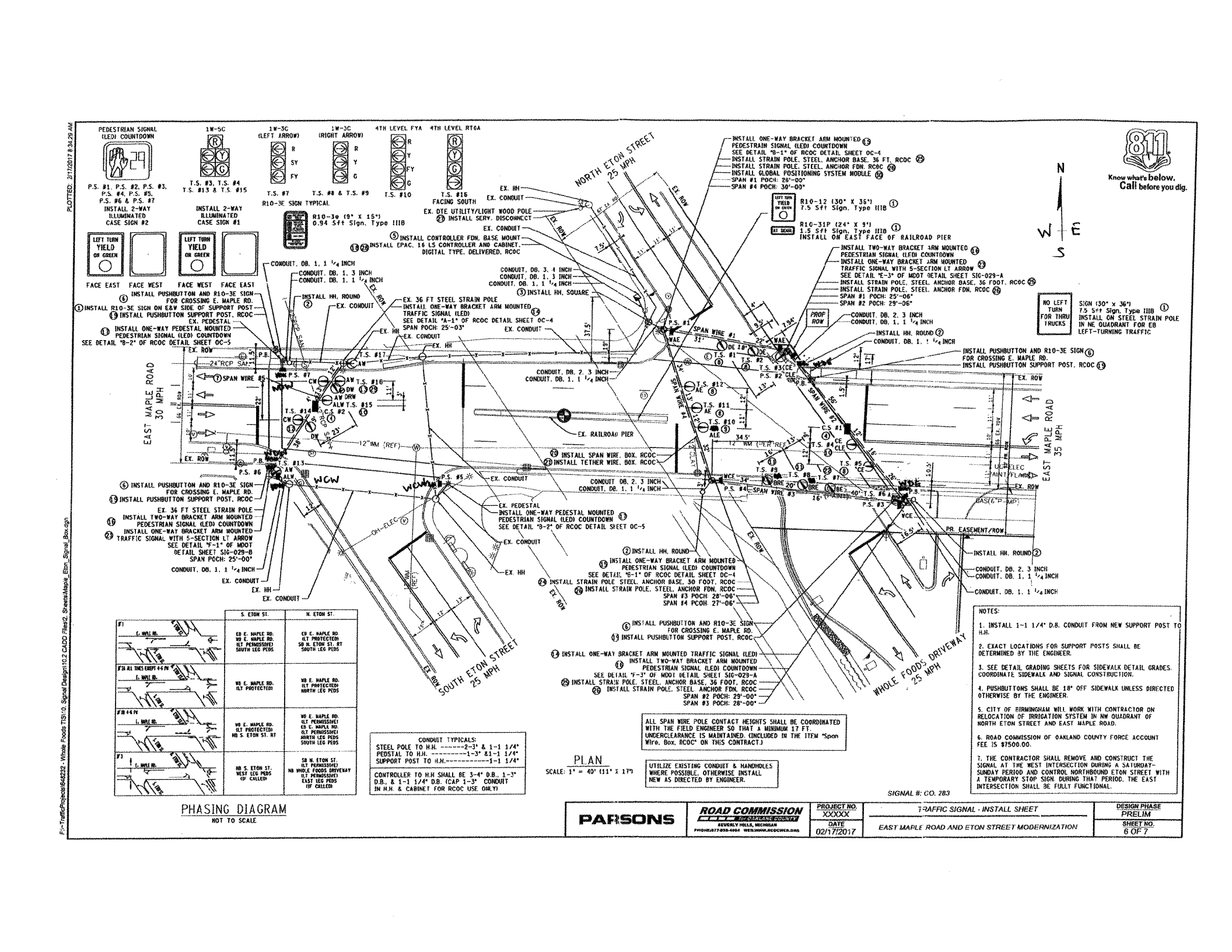


Runs WBLT Flashing Yellow (No green arrows)
Omit 1+3








PEDESTRIAN SIGNAL (LED) COUNTDOWN
P.S. #1, P.S. #2, P.S. #3, P.S. #4, P.S. #5, P.S. #6 & P.S. #7
INSTALL 2-WAY ILLUMINATED CASE SIGN #2
1W-5C
T.S. #3, T.S. #4 T.S. #13 & T.S. #15
INSTALL 2-WAY ILLUMINATED CASE SIGN #1
1W-3C (LEFT ARROW)
T.S. #7
1W-3C (RIGHT ARROW)
T.S. #8 & T.S. #9
4TH LEVEL FYA
T.S. #10
4TH LEVEL RTOA
T.S. #16 FACING SOUTH
R10-3E SIGN TYPICAL
R10-3e (9" X 15")
0.94 Sft Sign, Type IIIB
FACE EAST
FACE WEST
FACE WEST
FACE EAST
LEFT TURN YIELD ON GREEN
NORTH ETON STREET
25 MPH
EAST MAPLE ROAD
30 MPH
EAST MAPLE ROAD
35 MPH
SOUTH ETON STREET
25 MPH
WHOLE FOODS DRIVEWAY
25 MPH
EX. RAILROAD PIER
R10-12 (30" X 36")
7.5 Sft Sign, Type IIIB
R10-31P (24" X 9")
1.5 Sft Sign, Type IIIB
INSTALL ON EAST FACE OF RAILROAD PIER
NO LEFT TURN FOR THRU TRUCKS
SIGN (30" x 36")
7.5 Sft Sign, Type IIIB
INSTALL ON STEEL STRAIN POLE IN NE QUADRANT FOR EB LEFT-TURNING TRAFFIC
Know what's below. Call before you dig.
811
N
S
E
W
PHASING DIAGRAM
NOT TO SCALE
PLAN
SCALE: 1" = 40' (11" X 17")
CONDUIT TYPICALS:
STEEL POLE TO H.H. -------2-3" & 1-1 1/4"
PEDSTAL TO H.H. ----------1-3" &1-1 1/4"
SUPPORT POST TO H.H.----------1-1 1/4"
CONTROLLER TO H.H SHALL BE 3-4" D.B., 1-3" D.B., & 1-1 1/4" D.B. (CAP 1-3" CONDUIT IN H.H. & CABINET FOR RCOC USE ONLY)
ALL SPAN WIRE POLE CONTACT HEIGHTS SHALL BE COORDINATED WITH THE FIELD ENGINEER SO THAT A MINIMUM 17 FT. UNDERCLEARANCE IS MAINTAINED. (INCLUDED IN THE ITEM "Span Wire, Box, RCOC" ON THIS CONTRACT.)
UTILIZE EXISTING CONDUIT & HANDHOLES WHERE POSSIBLE, OTHERWISE INSTALL NEW AS DIRECTED BY ENGINEER.
NOTES:
1. INSTALL 1-1 1/4" D.B. CONDUIT FROM NEW SUPPORT POST TO H.H.
2. EXACT LOCATIONS FOR SUPPORT POSTS SHALL BE DETERMINED BY THE ENGINEER.
3. SEE DETAIL GRADING SHEETS FOR SIDEWALK DETAIL GRADES. COORDINATE SIDEWALK AND SIGNAL CONSTRUCTION.
4. PUSHBUTTONS SHALL BE 18" OFF SIDEWALK UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
5. CITY OF BIRMINGHAM WILL WORK WITH CONTRACTOR ON RELOCATION OF IRRIGATION SYSTEM IN NW QUADRANT OF NORTH ETON STREET AND EAST MAPLE ROAD.
6. ROAD COMMISSION OF OAKLAND COUNTY FORCE ACCOUNT FEE IS $7500.00.
7. THE CONTRACTOR SHALL REMOVE AND CONSTRUCT THE SIGNAL AT THE WEST INTERSECTION DURING A SATURDAY-SUNDAY PERIOD AND CONTROL NORTHBOUND ETON STREET WITH A TEMPORARY STOP SIGN. DURING THAT PERIOD, THE EAST INTERSECTION SHALL BE FULLY FUNCTIONAL.
S. ETON ST.
N. ETON ST.
SIGNAL #: CO. 283
PARSONS
ROAD COMMISSION FOR OAKLAND COUNTY
BEVERLY HILLS, MICHIGAN
PROJECT NO. XXXXX
DATE 02/17/2017
TRAFFIC SIGNAL - INSTALL SHEET
EAST MAPLE ROAD AND ETON STREET MODERNIZATION
DESIGN PHASE PRELIM
SHEET NO. 6 OF 7
PLOTTED: 2/17/2017 8:34:29 AM
F:\-TrafficProjects\648222 - Whole Foods TIS\10. Signal Design\10.2 CADD Files\2. Sheets\Maple_Eton_Signal_Box.dgn

FLEIS&VANDENBRINK
DESIGN. BUILD. OPERATE.

December 21, 2018

Ms. Jana L. Ecker
Planning Director
City of Birmingham
151 Martin Street, P.O. Box 3001
Birmingham, MI 48012

VIA EMAIL

RE: Whole Foods Birmingham, Michigan
West Driveway Inbound Right-Turn Restriction Evaluation

Dear Ms. Ecker:

Fleis & VandenBrink (F&V) staff provided a review of the West Driveway Inbound Right-Turn Restriction Evaluation performed for the existing Whole Foods Supermarket prepared by Rowe, Inc. Our comments were documented in a review letter dated December 12, 2018.

Rowe, Inc. provided a response to these comments in a letter dated December 17, 2018 and received by F&V on December 18, 2018. F&V requested in our review letter (12-12-18) that a revised TIS is provided that addresses all of our comments, the response letter did not include a revised TIS, nor did it include the additional analysis necessary to complete our review of the right-turn restriction. F&V reached out to Jill Bauer at Rowe, Inc. on December 19, 2018 regarding a revised TIS; we have not received a response to this request.

Therefore, F&V performed the necessary analysis in order to provide an opinion regarding the right-turn restriction. Based on this analysis, we have the following comments, observations and recommendations.

- The Synchro models were revised to address the comments noted in our review letter. Subsequently, a SimTraffic analysis was performed in accordance with the MDOT Electronic Traffic Control Guidelines methodology. The SimTraffic queueing analysis at the west Whole Foods driveway is summarized in the table below. The results of the analysis showed minimal queueing in the eastbound right lane and the projected right-turns at the west Whole Foods driveway are not expected to impact the intersection operations.

Peak Period	Approach	Existing Geometry (with right-turn restriction)		Proposed Geometry (without right-turn restriction)	
		Average (ft)	95th % (ft)	Average (ft)	95th % (ft)
AM	EBTR	121	190	134	206
MD	EBTR	103	172	102	174
PM	EBTR	19	51	21	60
SUN	EBTR	81	143	93	164

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

SUMMARY

- The existing eastbound right-turn restriction at the west Whole Foods driveway may be removed.
- If the restriction is removed, the existing right-turn prohibited signage should be removed and an R10-15 “Turning Vehicles Yield to Pedestrians” sign should be installed.

We hope that this report addresses the City’s needs regarding this project. If you have any questions, please do not hesitate to contact us at your convenience.

Sincerely,

FLEIS & VANDENBRINK ENGINEERING, INC.

Julie M. Kroll

Julie M. Kroll, PE, PTOE
Sr. Project Manager

City of Birmingham
A Walkable Community

MEMORANDUM

Engineering Dept.
Planning Dept.
Police Dept.

DATE: **December 27, 2018**

TO: **Multi-Modal Transportation Board**

FROM: **Jana Ecker, Planning Director**
Scott Grewe, Police Commander
Paul T. O'Meara, City Engineer

SUBJECT: **Maple Rd. & N. Eton Rd. Intersection – Signal Timing**

Over the past several months, City staff have received numerous complaints regarding the timing and configuration of the signal at Maple and N. Eton Road. Specifically, concerns are related to drivers turning left out of the western Whole Foods driveway onto westbound Maple that are not yielding as required to the drivers turning right coming southbound on S. Eton to head westbound on Maple.

Accordingly, the City reached out to the Road Commission for Oakland County to determine if any timing changes had recently been made. In addition, City staff asked our transportation consultant, Fleis & Vandenbrink ("F & V"), to study the intersection timing, circulation and flow and recommend any changes or improvements that may be needed. Please find attached a report from F & V outlining their recommendations for your review.

SUGGESTED RESOLUTION:

To recommend approval of Alternative 1 as noted in F & V's report dated December 27, 2018 to add a permissive flashing yellow left turn arrow for northbound left turning vehicles exiting the western Whole Foods driveway, at a cost of $6050.

OR

To recommend approval of Alternative 2 as noted in F & V's report dated December 27, 2018 to add both a permissive flashing yellow left turn arrow and a protected green left turn arrow for northbound left turning vehicles exiting the western Whole Foods driveway at a cost of $7260.

FLEIS&VANDENBRINK
DESIGN. BUILD. OPERATE.

December 27, 2018

VIA EMAIL

Mr. Paul O'Meara
City Engineer
City of Birmingham
151 Martin Street
Birmingham, MI 48012

RE: Maple Road & Eton Street Intersection Operations
Whole Foods Drive Approach

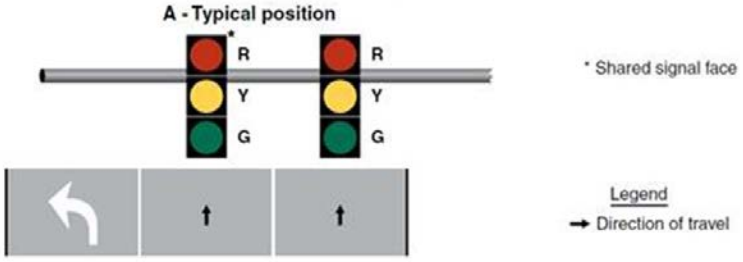
Dear Mr. O'Meara,

The purpose of this letter is to address concerns regarding the signal operations at the Maple Road & Eton Street; specifically, the Whole Foods drive opposite the N. Eton Street approach. Included herein is an overview of the existing PM peak signal operations on the Whole Foods approach, concerns that have been raised, mitigation that has been implemented and additional mitigation measures that may be considered by the City to address operational concerns.

EXISTING CONDITIONS

The existing signal operations on the Whole Food approach is a "Shared Signal Face". As summarized in the Michigan Manual of Uniform Traffic Control Devices (MMUTCD, Sections 4D.17-20), this type of signal face controls both the left-turn movement and the adjacent movement (usually the through movement) and can serve as one of the two required primary signal faces for the adjacent movement. A shared signal face always displays the same color of circular indication that is displayed by the signal face or faces for the adjacent movement.

Figure 4D-6. Typical Position and Arrangements of Shared Signal Faces for Permissive Only Mode Left Turns



With this type of operation, the left-turning vehicles must yield to opposing traffic and through and right-turning vehicles have the right-of-way. The source of confusion at this intersection is that the opposing (N. Eton Street) approach does not allow southbound through vehicles, so the opposing traffic is only southbound right-turns. Additional signage was added facing the Whole Foods approach to help remind drivers that left-turning must yield to oncoming traffic.

Despite the additional signage, there have been no changes in driver behavior. Drivers continue to be observed making left-turns despite not having the right-of-way and causing crashes and near misses with southbound right-turning vehicles.

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

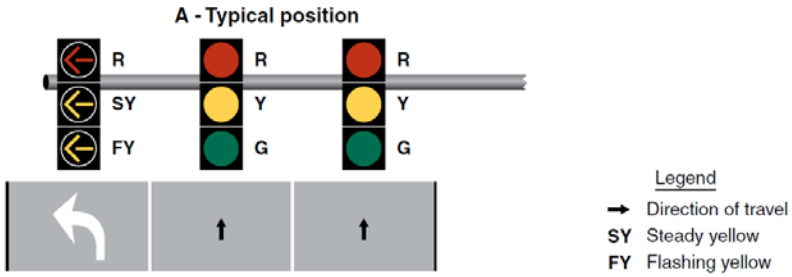
ALTERNATIVES ANALYSIS

To improve the safety of the intersection, several alternatives were evaluated. These alternatives all involve the addition of a signal head to the Whole Foods approach, with the operations varying by signal operations. For the purpose of this analysis, only the PM peak hour operations were evaluated, as the PM peak volumes were significantly larger than all other peak periods. The alternatives considered are summarized below.

Alternative 1: Permissive Only Left-turns

This alternative maintains the existing intersection operations, but adds a permissive only signal head for the northbound left-turning vehicles on the Whole Foods approach. This left-turn signal head is the same that is currently displayed for the N. Eton Street approach.

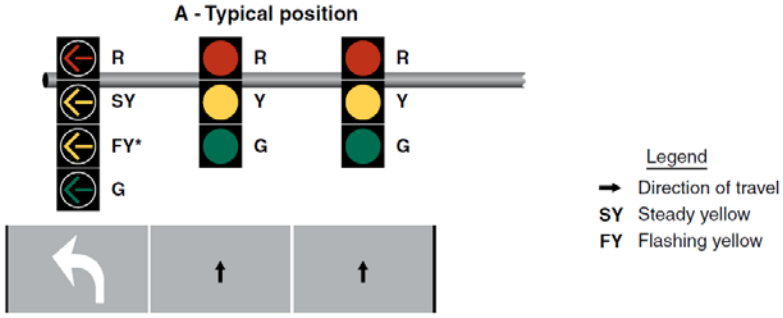
Figure 4D-7. Typical Position and Arrangements of Separate Signal Faces with Flashing Yellow Arrow for Permissive Only Mode Left Turns



Alternative 2: Permissive/Protected Left-turns

This alternative maintains the existing permissive operations and adds a protected movement for northbound left-turning vehicles on the Whole Foods approach. The addition of a protected movement on this approach will impact the overall intersection operations as summarized in Table 1.

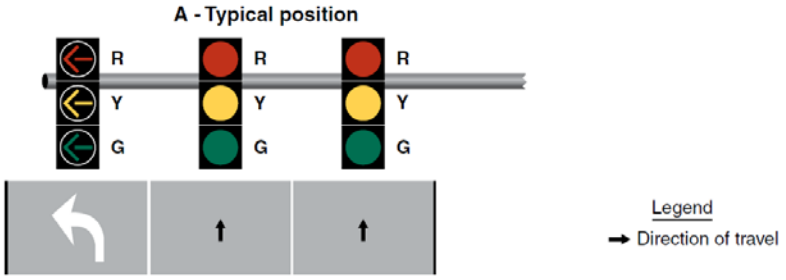
Figure 4D-12. Typical Position and Arrangements of Separate Signal Faces with Flashing Yellow Arrow for Protected/Permissive Mode and Protected Only Mode Left Turns



Alternative 3: Protected Only Left-turns

This alternative would permit northbound left-turns only as a protect movement. The N. Eton Street approach would maintain the existing permissive operations and Whole Foods approach would have a separate phase just for left-turns. It is also feasible to add protected southbound left-turns with this alternative; however, the N. Eton Street signals would also need to be changed to accommodate protected southbound left-turns. The cost associated with protected southbound and northbound left-turns would be similar to that of Alternative 4. The protected only northbound left-turn movement on this approach will impact the overall intersection operations as summarized in Table 1.

Figure 4D-10. Typical Position and Arrangements of Separate Signal Faces for Protected Only Mode Left Turns



Alternative 4: Split Phasing

This alternative would permit all northbound and southbound movements as a protected only movement. The N. Eton Street approach also need to be changed to reflect a split phasing operation. The split phasing will impact the overall intersection operations as summarized in Table 1.

TABLE 1: LOS SUMMARY

Intersection	Approach	PM Peak							
		Existing / Alternative 1		Alternative 2		Alternative 3		Alternative 4	
		Permissive Only		Permissive / Protected		NB Protected Only		Split Phase	
		Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
Maple Road & N. Eton/Whole Foods	NBL	50.0	D	50.0	D	50.0	D	62.5	E
	NBT	46.3	D	46.3	D	46.3	D	53.7	D
	SBL	51.4	D	51.4	D	51.4	D	60.7	E
	SBR	16.2	B	26.9	C	30.6	C	27.6	C
	WBL	31.5	C	31.5	C	31.5	C	33.0	C
	WBTR	45.5	D	45.5	D	45.5	D	49.3	D
	EB	2.3	A	2.3	A	2.3	A	3.6	A
	Overall	**22.1**	**C**	**23.4**	**C**	**23.8**	**C**	**26.0**	**C**
Maple Road & S. Eton Street	NBL	50.1	D	50.1	D	50.1	D	42.1	D
	NBR	20.8	C	20.8	C	20.8	C	17.0	B
	WBTL	3.2	A	2.6	A	2.0	A	3.4	A
	EBTR	42.5	D	42.5	D	42.5	D	54.1	D
	Overall	**20.8**	**C**	**20.6**	**C**	**20.3**	**C**	**24.1**	**D**

COST ESTIMATE COMPARISON

The estimated costs associated with each of the alternatives is summarized in Table 2. This information is provided for use in consideration with the alternatives for implementation.

TABLE 2: COST ESTIMATE

Intersection	Approach	Alternative 1	Alternative 2	Alternative 3	Alternative 4
		Permissive Only	Permissive/Protected	Protected Only	Split Phase
Maple Road & N. Eton/Whole Foods	NB	$2,500.00	$3,000.00	$2,500.00	$2,500.00
	SB	$0.00	$0.00	$2,500.00	$2,500.00
	SubTotal	*$2,500.00*	*$3,000.00*	*$5,000.00*	*$5,000.00*
	Design	$2,750.00	$3,300.00	$5,500.00	$5,500.00
	Contingency/ Mobilization	$3,300.00	$3,960.00	$6,600.00	$6,600.00
	Total	**$6,050.00**	**$7,260.00**	**$12,100.00**	**$12,100.00**

SUMMARY

The results of the analysis show that the existing permissive operations provide the best overall intersection operations. Since there is continued driver confusion associated with the existing "green ball" permissive operations, the installation of flashing yellow arrow associated with Alternative should be considered to help reduce confusion associated with permissive operations.

An additional option for consideration is a permissive/protected movement with Alternative 2. This would provide both a permissive (flashing yellow arrow) and a protected (green arrow) movement. There is some additional delay associated with adding a protected movement and additional cost with a four-section head (vs. three section head).

Alternatives 3 and 4 are not recommended. These have higher associated costs and overall higher delay. In addition, alternatives 1 and 2 can adequate address the operational concerns as noted at this intersection.

If you have any questions or concerns, please contact our office.

Sincerely,

FLEIS & VANDENBRINK

Julie M. Kroll

Julie M. Kroll, PE, PTOE
Sr. Project Manager

JMK:jjs:jmk

City of Birmingham
A Walkable Community

Paul O'Meara <pomeara@bhamgov.org>

Fwd: Maple & Eton - signal timings

1 message

Scott Grewe <Sgrewe@bhamgov.org> Mon, Dec 3, 2018 at 2:18 PM
To: Paul O'Meara <Pomeara@bhamgov.org>, jrose@fveng.com, Mark Clemence <Mclemence@bhamgov.org>

Here are the changes from Oakland County.

---------- Forwarded message ---------
From: **Jones, Rachel** <rjones@rcoc.org>
Date: Mon, Dec 3, 2018 at 2:16 PM
Subject: Maple & Eton - signal timings
To: sgrewe@bhamgov.org <sgrewe@bhamgov.org>
Cc: Deneau, Danielle <ddeneau@rcoc.org>

Hi Commander Grewe,

Per our earlier conversation please find attached the following signal timings for Maple & Eton:

Co 283_rev4 (Installed 10/26/17)

Co 283_rev5 (Installed 10/12/18)

The signal times have not been changed between rev 4 and rev 5, however the operation has been modified which should be an improvement in the intersection efficiency. The change was to bring up the WB LT green after the EB thru at Eton (S) (ie the west side of the bridge). This should bring up this WB LT a few seconds earlier; in rev 4 it didn't come on until after the EB signals at Eton (N) (ie on the East side of the bridge). Hope this makes sense.

The change is noted on the rev 5 paperwork.

We had a crew check the signal last week and they found the signal operating per paperwork. I have an engineer out there now rechecking the controller, clock, signal operation etc. I'll let you know what we find.

Please contact me if you require further info and / or to discuss the timings.

Thanks,

Rachel

Rachel Jones

Signal Operations Engineer

Traffic Operations Center

Road Commission For Oakland County

1200 N.Telegraph Road, West 49

Pontiac, MI 48341-0421

Phone (248) 858 7250

Fax (248) 858 7251

Email rjones@rcoc.org

--
Scott Grewe
Operations Commander
Birmingham Police Department
151 Martin St.
Birmingham, MI. 48009
(248)530-1867

2 attachments

283_rev5_timing.pdf
6244K

283_rev4_timing.pdf
6000K

Vox

Why walkable cities are good for the economy, according to a city planner

People spend more money when cities are less vehicle-oriented.

By Aditi Shrikant | aditi@vox.com | Updated Oct 26, 2018, 2:18pm EDT

Philadelphia is the fifth most walkable city in America, with a walk score of 79. | M. Edlow for VISIT PHILADELPHIA®

The Goods BY Vox

You've probably seen the term "walkability" thrown around in relation to cities, neighborhoods, and even apartments. A city's walkability, per **Walk Score**, is determined by analyzing how many errands can be done without a car, and cities with the highest scores (like Boston, New York, and San Francisco) often come with an incredibly steep cost of living.

On Walk Score's one to 100 scale that evaluates cities with a population of 200,000 or more, New York City is the most walkable city in the country with a score of 89, and

Fayetteville, North Carolina, is the least walkable with a score of 29. The average walk score of all American cities with a population of over 200,000 is 49.

Walkability is treated as a static part of a city; your city is either walkable or not. You either need a car or you don't. But a city's walkability is dynamic and can be improved with people-oriented city planning, which will benefit the local economy and make societies more equitable.

Walkability is great for the economy

American city planner Jeff Speck has been advocating for walkability for the past 25 years, and in his new book, *Walkability City Rules: 101 Steps to Making Better Places*, he carefully outlines how to "sell" walkability and then implement it.

The idea is marketed based on a few big benefits, according to Speck's book, one of them being economics. Cities with high walk scores also have high property values. According to a **2009 study**, each additional walk score point resulted in home values increasing between $500 and $3,000.

Investing in walkable cities, whether through allocating funds to repaint pedestrian walkways or building affordable housing close to downtowns, also attracts diverse populations and creates jobs. According to the **Chicago Metropolitan Agency for Planning**, 63 percent of millennials and 42 percent of boomers would like to live in a place where they don't need a car. And according to the National Association of Realtors, **62 percent of millennials** prefer to live in a walkable community where a car is optional. If cities seem less automobile-dependent, chances are they are more appealing to a range of ages.

Walking also costs the city very little, unlike cars and even public transit. According to Speck's book, if a resident takes a bus ride, it may cost them $1 but costs the city $1.50 in bus operation. If a resident decides to drive, it costs the city $9.20 in services like policing and ambulances. When a resident walks, the cost to the city is a penny.

People also tend to spend more money in walkable cities, stimulating the local economy. A **2008 report of San Francisco's downtown** found that public transit users and walkers spent less on each trip downtown but made more frequent trips, which meant they spent more money overall. Those in cars spent more money on one trip but frequented downtown less.

This aligns with the concept of **people-oriented streets**, the urban planning practice of making roads safe to cross and filled with amenities people need (restaurants, banks, salons etc.). Many streets in America, especially in areas of suburban sprawl, are vehicle-oriented, don't have sidewalks, and are not accessible without a car.

Even though the United States is a car-centric society, one-third of Americans don't have a license, and according to a government census, a majority of those who walk to work make under $50,000.

"The most common condition is the poor person who can afford a car but it totally disrupts their finances," Speck told me. "The unfortunate circumstance is that most Americans live in places where car ownership is mandatory."

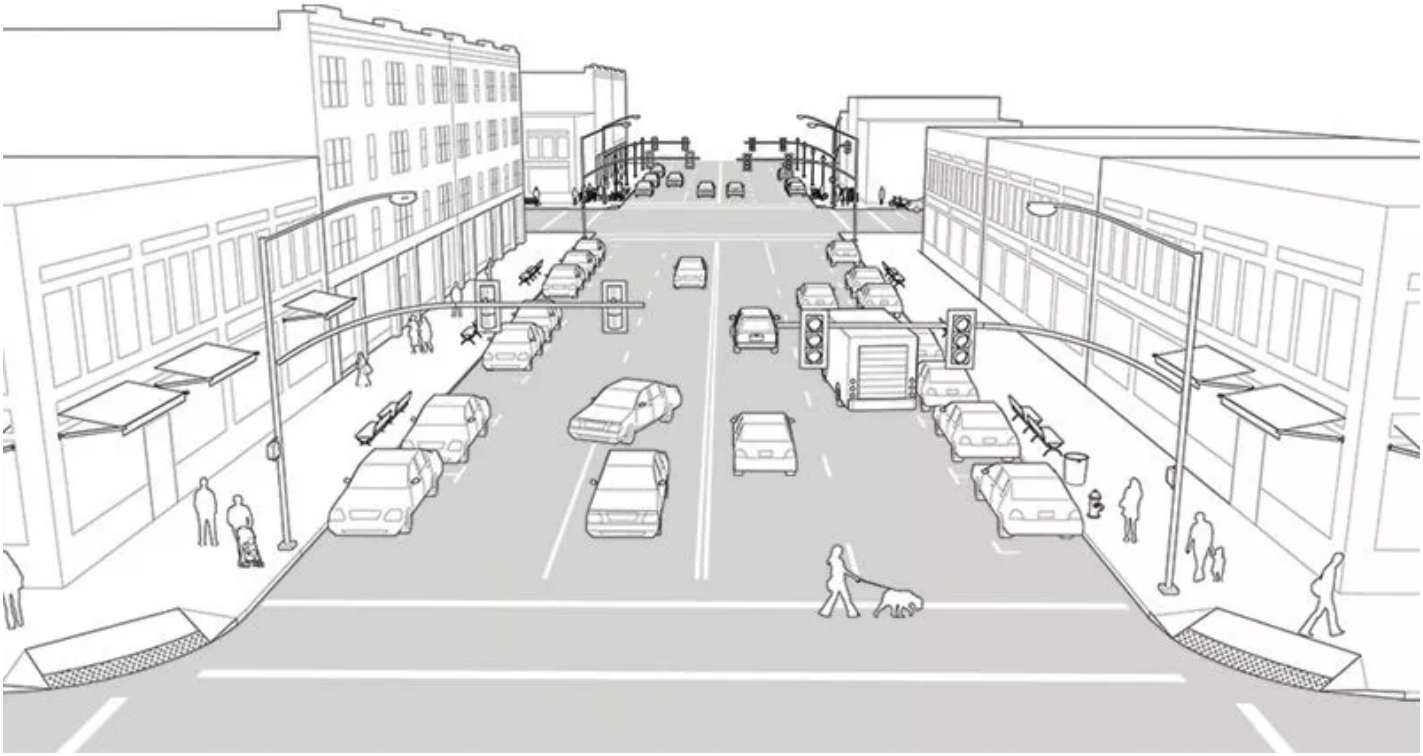
Walkability doesn't have to mean gentrification

With talk of home prices going up and walkability attracting more people, walkability can read as a recipe for displacement. Take Oakland, California, for example. When San Francisco become too pricey and people were looking for a more affordable alternative, nearby Oakland was an appealing option. But while the influx of people spurred new development and increased walkability, it also hiked the cost of living; now the **average rent for an apartment in Oakland is $2,926**, compared to $1,695 in 2011.

But Speck says walkability can actually work to make communities more equitable. According to his book, cities with more transit choice demonstrate less income inequality and less overspending on rent. Walkability opens up the world to the elderly, who often struggle to find transportation when they lose the ability to drive, and public transit is used most by minorities and those making under $50,000. Since transit and walking go hand in hand, improving the walkability of a city could help better serve those in lower income brackets.

"For the typical city where most Americans live, there's very little risk of improved walkability causing gentrification," he told Vox, "particularity in the short term, just because [cities] have so far to go just to reach a modicum of safety and comfort."

How cities can become more walkable



The National Association of City Transportation provides before and after blue prints of what an auto-oriented street would look like if transformed into a people-oriented street. | National Association of City Transportation

The National Association of City Transportation's drawing of a Neighborhood Main Street. | National Association of City Transportation

Though he's been preaching the walking gospel for years, Speck says the message has only recently caught on. "In the '80s, no one got it," he said. "In the '90s, developers started to get it. In the aughts, the cities got it. And now I'm finally seeing in this decade that the engineers are starting to get it. Our biggest impediment [in developing walkable cities] was the public works folks and engineers who weren't letting us do things right."

The **National Association of City Transportation** (NACTO)'s executive director, Linda Bailey, says that in years past, the national city planning standard addressed people walking as an afterthought, which is why NACTO builds design guides to direct cities on how to become more pedestrian-friendly. Guides outline a number of transformations including **how to turn a heavy-traffic two-way street into a "neighborhood main street"** with bike lanes, sidewalks, and greenery.

Cities that have been notably increasing their walkability include Washington, DC, and Seattle, where city planners started dedicating space on the edges of roads to pedestrians and calling them "walkways" as opposed to sidewalks.

One of the biggest reasons many cities aren't walkable is because land is dissected into "uses," something called "single-use zoning": Retail cannot be next to a medical office cannot be next a single-family home cannot be next to a multi-family home. So in order for a person to get lunch, go to the doctor, and then buy a birthday present, they have to travel to three different "zones," and can only do so efficiently by car.

This may have been helpful in the 19th century when homes needed to be far away from factories emitting toxic fumes, but today it makes less sense. The solution: Cities should adopt regulations that allow land to be multi-use, such as in the mixed-use developments that dot the sprawling landscape of many American suburbs and cities.

In Plano, Texas, the Legacy Town Center features shops, apartments, a movie theater, and restaurants in a pedestrian-friendly smattering of urbanism. The city of Tampa is constructing **Water Street Tampa** — a $3 billion development that will include shops, entertainment, residences, and offices.

Bailey says mixed-use developments are attractive to developers because they present an opportunity to experience what it could have been like to plan a city 50 or 80 years ago.

"Really, they're trying to recreate what cities like Philadelphia have always had," she says. (With a walk score of 79, Philly is the fifth most walkable city in America.)

Other steps in Speck's book include pushing for local parks and schools, both of which foster community and ownership of a neighborhood. He also says that cities need to invest in attainable housing downtown so they don't get overrun with the wealthy.

"An extreme example [of wealth in walkable cities] is this kind of jack-o'-lantern effect, where many homes are owned by people who own five homes and if they are distributing their time between these homes evenly, most of the time a house is empty, so you get this weird condition of the extremely dense ghost town, which is the worst," Speck says.

There are also more simple tasks like reallocating road space to accommodate bikes or creating street parking so people can drive to a city, park, and then walk around and enjoy. "Restriping a too-fast street to include a bike lane, or turning a row of parallel parking spaces into angled parking, these things can be done for the price of paint," Speck tells Vox. "If a street needs resurfacing anyway as part of its regular maintenance, the changes can be done for free."

Whatever method, walkability is a spectrum, and implementing positive change that gets people to drive their car less is better for the economy and the environment. "The more we can walk, bike, and take transit, we're spending a lot less than the alternative, which is to drag around a two-ton carcass of steel that belches climate change," Speck says.

Watch: Superblocks — how Barcelona is taking city streets back from cars

Correction: An earlier version of this story misidentified the American city with the lowest Walk Score.

NATIONAL

'Talent Wants Transit': Companies Near Transportation Gaining The Upper Hand

November 29, 2018 · 9:16 AM ET

DAVID SCHAPER

Chicago Transit Authority's new Morgan St. "L" station.

David Schaper/NPR

One of the important criteria in Amazon's high-profile search for a second (and third) public transportation for the company's s, N.Y. and Arlington, Va. for its new HQ2s — ps. And a new study finds Amazon is not alone

In this regard, businesses all over the country increasingly want to be near bus and train lines, as they struggle to attract and keep top talent in a tight labor market.

A case in point is McDonald's, a company that owes its enormous success to people driving their cars. After all, the fast food giant sells millions of meals through drive-thru windows.

BUSINESS

Amazon's Grand Search For 2nd Headquarters Ends With Split: NYC And D.C. Suburb

For decades, McDonald's made its corporate home in a sprawling campus in the Chicago suburb of Oak Brook, Ill.; a location that was pretty much only accessible by car.

A few months ago, McDonald's traded the lawns, trees and ponds of their suburban home for sidewalks, concrete, glass and steel and moved into a new corporate headquarters building, just west of downtown Chicago. It's within walking distance of a stop on two Chicago Transit Authority "L" lines, two Metra commuter rail stations, several bus stops and it's easy to get to by bicycle.

"We actually at one point knew that 97 percent of our folks were arriving by themselves in a car," says Sheri Malec, director of workplace solutions for McDonald's. She says that 80-acre park-like setting worked well for the company through the 70s, 80s and 90s, but more recently, the remote, suburban location made it difficult for McDonald's to attract and retain talent, especially millennials.

Article continues below

"For a job open on my team a couple weeks ago I interviewed a young woman and she confided in me, 'you know, I really wouldn't have applied for the job if it had been in Oak Brook, because I don't own a car,'" Malec says.

McDonald's recently moved into a new corporate headquarters building, just west of the loop in downtown Chicago.
David Schaper/NPR

So instead of having 97 percent of McDonald's corporate employees commuting to work with each of them alone in a car, Malec says, "right now, we have I think around 90 percent of our folks are arriving in a non-automobile fashion."

Chicago isn't the only region experiencing this business boom along transit lines. From Seattle to St. Louis and Minneapolis to Atlanta, studies show that companies are relocating to be near transit lines, as they seek to attract workers, especially millennials, who prefer living in more urban areas and increasingly don't want the long, driving commutes of their parents' generation.

"Talent is choosing to ride transit," says Audrey Wennink, director of transportation at Chicago's Metropolitan Planning Council, a regional non-profit research and advocacy

organization on urban issues, and co-author of a new study indicating that more and more businesses want to be located close to rail and bus stations.

The report shows that since 2005, 60 percent of all the new jobs created in the Chicago region are in areas with high quality transit service, and about half of all newly created jobs are within a half mile of a CTA or Metra rail station. Within a quarter mile of a CTA "L" or Metra station, jobs grew at a rate of 20 percent, which is more than twice the growth rate in the region as a whole, according to the MPC report.

"Businesses are finding that talent wants transit," says Wennink. "To have the most broad labor pool and access to the best workers, they need to offer that (access to transit lines) as an option."

One example is the Fulton Market neighborhood west of Chicago's central business district downtown, which used to be full of produce and other food wholesalers, distributors and a lot of big warehouses. But not any more. Now it's new office buildings, condos and loft living spaces. And Wennink says a big game changer was the opening of the Morgan Street "L" stop in 2012. "There's been development incessantly since then," she says. "McDonald's moved here. Google's (Midwest) headquarters are here, they've been here for about three years. We have tons of restaurants; there are tons of co-working spaces. This is the hip neighborhood."

MPC's research also finds that in 2017 alone, 85-percent of all new business construction in the Chicago area occurred within a half a mile of a transit station, and Wennink says the data also shows that transit fosters economic resiliency.

"In the depths of the recession, 2008 and 2009, we lost 150,000 jobs in this region, but we actually gained jobs within a quarter mile of transit stations," she said.

And the business boom around transit is not just a city thing, but it's happening in the suburbs too.

Companies that are moving to the suburbs are finding locations where their talent can commute via public transit, says Vicki Noonan, executive managing director of the commercial real estate firm Cushman & Wakefield in Chicago.

One example is the heavy equipment manufacturer, Caterpillar, which just relocated it's corporate headquarters from Peoria, Ill. to a Chicago suburb, but located the office close to a commuter train station.

"There are some larger vacancies up in that area along what we would view as a major driving corridor," Noonan says, referring to suburban corporate office spaces that are only accessible by car. She says those buildings that are close to commuter rail stations are in high demand.

One building owner, she says, decided to fight the trend by providing free shuttle buses to transit stations and even showers for those who want to bike from the train.

"That office building is almost 100 percent full when others around them are vacant because they took the time to say, 'OK, we need to figure out our work force, how are they getting here and how can we enhance their experience,'" says Noonan.

"At the bottom line of everyone's search is they want to optimize the financial performance of either the asset they're buying or the space that they are leasing," says Noonan. "You have a higher probability of that on a transit line than you do when you're off the transit line," she says, because transit improves a company's ability to attract and retain talent.

> "Where transit goes, the economy grows.
>
> Kirk Dillard

"Where transit goes, the economy grows," says Kirk Dillard, the Republican chairman of the Regional Transportation Authority in Chicago.

But Dillard says many of the nation's aging transit systems, Chicago's included, are in desperate need of repairs and upgrades.

"I ride in every day on a Metra train that was delivered when Dwight Eisenhower was president," Dillard says. "We need new equipment, we need to stay up with 21st century technology."

Rail and bus systems around the country have backlogs of repair and maintenance needs in the billions of dollars, and transit advocates say not only is more state and local funding needed for upgrades and to expand transit routes, but a big federal infrastructure investment is needed, too. Without it, they fear the nation's economic growth could suffer. But they note such funding may be hard to to get out of a federal administration that seems at times hostile to transit, and instead seems to want to invest more in highways.

More Stories From NPR

NATIONAL

2 Years After Standing Rock Protests, Tensions Remain But Oil Business Booms

The New York Times

The Pedestrian Strikes Back

Officials in several countries are getting the message: Cities are about people, not cars.

By Richard Conniff
Contributing Opinion Writer

Dec. 15, 2018

In many of the major cities of the world, it has begun to dawn even on public officials that walking is a highly efficient means of transit, as well as one of the great underrated pleasures in life. A few major cities have even tentatively begun to take back their streets for pedestrians.

Denver, for instance, is proposing a plan to invest $1.2 billion in sidewalks, and, at far greater cost, bring frequent public transit within a quarter-mile of most of its residents. In Europe, where clean, safe, punctual public transit is already widely available, Oslo plans to ban all cars from its city center beginning next year. Madrid is banning cars owned by nonresidents, and is also redesigning 24 major downtown avenues to take them back for pedestrians. Paris has banned vehicles from a road along the Seine, and plans to rebuild it for bicycle and pedestrian use.

Yes, car owners are furious. That's because they have mistaken their century-long domination over pedestrians for a right rather than a privilege. The truth is that cities are not doing nearly enough to restore streets for pedestrian use, and it's the pedestrians who should be furious.

Many American cities still rely on "level of service" (LOS) design models developed in the 1960s that focus single-mindedly on keeping vehicle traffic moving, according to Elizabeth Macdonald, an urban design specialist at the University of California, Berkeley. "Hence improvements for other modes (walking, cycling, transit) that might increase vehicle delay are characterized as LOS. impediments," she and her co-authors write in The Journal of Urban Design. The idea of pedestrians as "impediments" is of course perverse, especially given the word's original meaning: An impediment was something that functioned as a shackle for the feet — unlimited vehicle traffic, say.

The emphasis on vehicle traffic flow is also a perversion of basic social equity, and the costs show up in ways large and small. Vehicles in cities contribute a major portion of small-particle pollution, the kind that penetrates deep into the lungs. (The percentage can reach as high as 49 percent in Phoenix and 55 percent in Los Angeles. It's just 6 percent in Beijing, but that's because there are so many other pollution sources.) People living close to busy roads, particularly infants and older people in lower-income households, pay most of the cost in respiratory, cardiovascular

and other problems. A 2013 M.I.T. study estimated that vehicle emissions cause 53,000 early deaths a year in the United States, and a study just last month from Lancaster University in Britain found that children with intellectual disabilities are far more likely to live in areas with high levels of vehicle pollution.

Among the smaller costs: Most people in cities from Bangalore to Brooklyn cannot afford to keep a car, and yet our cities routinely turn over the majority of public thoroughfares to those who can. They allow parked cars to eat up 350 square feet apiece, often at no charge, in cities where private parking spaces rent for as much as $700 a month. And they devote most of what's left of the street to the uninterrupted flow of motor vehicles.

But that's not really such a small cost, after all: It means that we often cannot afford room for parks or shade trees, which other studies have repeatedly shown to be an important factor in the health and mental well-being of residents. Even when car-mad cities leave enough room on the side to squeeze in trees, they tend to be miniaturized, lollipop versions of what street trees used to be. Hardly anyone plants the towering oaks or maples that used to intertwine their branches overhead and make the sidewalks feel like a leafy grove in the heart of the city.

Urban walking has thus deteriorated from a civilized pleasure to an overheated, unshaded, traffic-harried race to a destination. It's like what the art historian Vincent Scully once said about the demolition of the old Penn Station and its replacement by the commuter hell squeezed beneath Madison Square Garden: "One entered the city like a god; now one scuttles in like a rat."

Happily, some urban planners are waking up to the idea that we can, in fact, do better. Copenhagen has already largely accomplished the shift in focus from vehicles to human beings, thanks considerably to a 40-year campaign by the architect and urban thinker Jan Gehl. I was stunned during a recent visit to the city center when an armada of bicycles actually came to a stop at a red light and waited patiently for pedestrians to cross. I was accustomed to the United States, where cyclists often pay no attention to traffic laws, and cars turn right on red with little regard for either cyclists or pedestrians. Stopping for pedestrians in crosswalks that are not controlled by traffic lights is a legal requirement in only nine states and the District of Columbia.

Maybe we can't turn every street into a pedestrian paradise. Urban planners in London now follow a sort of zoning plan, with some streets developed primarily for moving vehicles, and others focused on the richer (and more retail-friendly) urban life of the pedestrian. In this country, Berkeley's Professor Macdonald and her co-authors have recently published a simple system for urban planners to identify — and presumably prioritize — factors that make streets pedestrian-friendly. For instance, on large arterial roadways, walkers feel comfortable only if the sidewalks are at least 15 feet wide.

But we don't have to wait for governments to wake up to the idea that a street without pedestrians is, as Mr. Gehl put it, "like an empty theater: Something must be wrong with the production since there is no audience." City residents can stage their own lessons in livability. The

"Walk Your City" movement, for instance, provides a tool kit for neighborhood organizations to post signs giving the distance on foot or by bike (with directions via scannable QR code) to local attractions: "It's just a 10-minute walk to …" a nice park, a sunset viewpoint, a great art museum. Since its start in 2012 in Raleigh, N.C., "Walk Your City" has spread to more than 400 communities in 55 countries.

Likewise, the Better Block Foundation helps neighborhoods stage pop-up events to demonstrate their potential to become more livable, with bike lanes and curb extensions (known as "bump-outs") in place of parking spaces, and lots of benches, bus stop shelters, kiosks, sidewalk cafes and playgrounds. Sadly, pop-ups aren't permanent. These temporary displays come down again after a few days. But seeing the possibilities sometimes leads city leaders to make the vision a reality.

This is the fundamental common sense rule: Cities and their streets are about people, not cars, and all urban design should think first about the only transit equipment that comes factory-standard for the average human being — our feet.

Richard Conniff (@RichardConniff) is the author of "House of Lost Worlds: Dinosaurs, Dynasties and the Story of Life on Earth" and a contributing opinion writer.

Follow The New York Times Opinion section on Facebook and Twitter (@NYTopinion), and sign up for the Opinion Today newsletter.

A version of this article appears in print on Dec. 16, 2018, on Page SR5 of the New York edition with the headline: The Urban Pedestrian Strikes Back

Transportation Demand Management: Taking Wheels Off the Road

By Joan Mooney | Posted: Wednesday, December 5, 2018 2:00 pm

Eric Sundquist, managing director of the State Smart Transportation Initiative at the University of Wisconsin, said we have been going about the problem of traffic congestion all wrong.

Instead of "destroying the village to save it" – making roads wider and development more auto-centric – we should approach traffic from the demand perspective. That means figuring out how to reduce traffic and reduce the number and length of car trips, especially single-occupancy vehicle trips.

That's more complicated, but it may be less expensive than widening roads. And it is likely more effective in the long term. Cities and drivers alike have seen areas where there's a short period of relief after roads are widened, only to see the wider roads just as clogged six months or a year later.

There's another problem with focusing on the supply part of traffic management.

A New Way

Transportation planners are beginning to look at traffic congestion in a whole new way. Instead of building new roads and more lanes, it's far more sustainable to find ways to get more cars and trucks off the road altogether.

"When you put in wider roads, that squeezes out other modes of transportation," said Sundquist. "Let's put a thumb on the scale (to favor other modes)."

That's transportation demand management, which focuses on reducing the number and length of auto trips, especially in peak travel times. TDM includes a variety of measures, ranging from subsidized carpooling apps run by the city to make carpooling easier, to incentives such as subsidized transit passes, to bicycle and pedestrian facilities.

California led the way in 2013

City planners have focused more on TDM in the past five years. Pasadena, Calif., led the effort when it passed a new set of planning metrics in 2013.

"(The city was) responding to this notion that they kept widening the roads but it didn't make things better," said Sundquist. "It made it harder to walk, and there was more traffic because of that."

Pasadena was responding to a new California law, SB 743. The state law changed the focus of the environmental review process from measuring cars' wait time at intersections and their ability to drive at the speed limit, to instead measuring vehicle miles traveled (VMT).

The change was made largely because VMT "is a better indicator of vehicle emissions – the true environmental impact – and to better support active transportation modes" such as

walking and biking. The quote is from *Modernizing Mitigation: A Demand-Centered Approach*, published in September 2018 by the Mayors Innovation Project and the State Smart Transportation Initiative. Sundquist is a lead author.

In California, "the new law prompted several cities to broadly rethink supply-side mitigation and reorient their mitigation framework toward demand management," the report says. In this context, mitigation means "actions taken to address transportation impacts from land use changes."

Pasadena, for example, adopted a set of metrics that all large new developments must adhere to, including maximum VMT per capita (22.6 daily), maximum vehicle trips per capita, and other metrics such as bicycle facilities, transit facilities and the city's Pedestrian Accessibility Score.

"Meeting the requirements is relatively easy in the urban core," the report says. "For developers that are farther from the urban core, developers may need to add a mixed-use component, build a bike facility, or improve transit access by providing shuttle service or paying for a route modification." All of those measures are less costly and less disruptive than widening roads.

From employer-run to city-run mitigation measures

"There are a fair number of TDM measures that are run through employers," Sundquist said. Large employers may offer subsidized transit passes or bike lockers. "What's less common is to push that notion to the way the city operates as a whole."

For example, as part of an effort to lower VMT, a city can change the traditional parking requirements for new developments. Historically, cities have required new residential developments to have a minimum number of parking spaces per residential unit. But a plan being developed in Los Angeles takes the opposite approach, requiring mitigation measures to "offset" parking spaces they provide as part of a development.

In some cities, such as San Francisco, developers can earn mitigation points or credits by implementing a variety of measures. These can include improvements in bicycle infrastructure and amenities, a bikeshare program, a carpooling program (more on that below), and improvements to the pedestrian network, among others. The aim is to involve developers in the effort to lower the city's VMT.

More broadly, "a city can try to reduce the need to travel for all kinds of things, or reduce the number of single-occupancy vehicles," he said. "What congests the roads the most, for travelers and governments, is single-occupancy vehicles."

Setting up carpools to decrease VMT

One way to cut the number of single-occupancy vehicles is to encourage carpooling. Many large employers organize carpools for their workers. City and regional governments have started to do the same. Some, such as Miami Valley, Ohio, use a centrally run computer program, and others, such as Palo Alto, Calif., use carpooling apps such as Scoop and Waze.

Nearly 40 years ago, the Miami Valley Regional Planning Commission started a region-wide carpooling program in response to the oil embargo of the mid-1970s. The RIDESHARE program now uses a software program, RideAmigos, that allows users to fill in information about where they live and work so it can look for carpool matches.

Users receive a list of carpool matches, and the rest is up to the individuals. Organizers encourage people to meet ahead of time in a neutral location and figure out the route and timing.

"It's a way to try to eliminate the uncertainty of getting in a car with a stranger," said Laura Loges, director of marketing and public affairs for the Miami Valley RPC.

Members of the carpool can decide if they want two or three people in the group.

"If it's over four, we try to get them into a vanpool," Loges said. RIDESHARE has several vanpools that go to Wright-Patterson Air Force Base, the largest employer in the area. RIDESHARE provides a $700 monthly subsidy to encourage the vanpools.

The efforts are paying off. In 2010, the Brookings Institution found that while carpooling declined nationwide in the 2000s, of the 100 largest metro areas, only Dayton saw an increase.

Carpooling – There's an app for that

Many urban dwellers are accustomed to using an app for transportation, to call an Uber or Lyft. But some research has shown that such ride-hailing companies increase the number of cars on the road. So what about using an app to create carpools? Miami Valley RIDESHARE looked into that and was dissuaded by research showing that people don't want to download one more app.

But some do. And Google is ready to serve them with its new Waze Carpool smartphone app, which rolled out nationally in October.

Like RideAmigos, users type in their home and work location and commuting hours to look for a ride or offer one. One advantage to users is that they can then drive in the carpool lane in large urban areas.

Cities are starting to sign up. Palo Alto uses both Scoop, another carpooling app, and Waze. It's another tool for the Palo Alto Transportation Management Association, which was formed in January 2016 to reduce the number of single-occupancy vehicles downtown. Besides carpooling, it also uses transit subsidies and bicycling incentives.

Users who download the city's free Scoop app are guaranteed a price of just $2 — subsidized by the city – for pickup from their home (within a 40-mile radius of downtown Palo Alto) to their job in the city. In third-quarter 2018, Scoop had 207 active users a month, with a slight increase in each of the first three quarters of the year. Waze Carpool, which was being tested in California before being rolled out nationwide, had 90 active users a month in the third quarter.

What are the downsides to carpooling apps? Safety and reliability may be two.

"Do you want to get in a car with a complete stranger?" said Kimberly Burton, president of Burton Planning Services, Westerville, Ohio. She notes that young people are more trusting and perhaps more willing to take such a risk. Waze does offer the option for women to request a female driver.

Another potential downside is the social equity component, Burton said. Lower-income urban residents may not have smartphones and cannot download a "free" app.

Transportation demand management measures such as city-organized carpooling and subsidized transit may require a change in priorities for many cities.

"None of these things are brain surgery," said Sundquist. "The hardest things are the requirements you're under as a developer to provide a lot of parking and make it easier to drive. We can't make everything super-car-accessible and expect people to walk. They'll drive because it's easier."

The job of cities that care about sustainability is to make it just as easy to use other modes of transportation.

City of Birmingham
A Walkable Community

Paul O'Meara <pomeara@bhamgov.org>

Fwd: TC's approach to parking and congestion

1 message

Joe Valentine <Jvalentine@bhamgov.org> Fri, Nov 9, 2018 at 12:13 PM
To: Jana Ecker <Jecker@bhamgov.org>, Tiffany Gunter <tgunter@bhamgov.org>, Paul O'Meara <Pomeara@bhamgov.org>, Scott Grewe <Sgrewe@bhamgov.org>

FYI

---------- Forwarded message ---------
From: **Stuart Jeffares** <stuartjeffares@gmail.com>
Date: Tue, Nov 6, 2018 at 12:26 PM
Subject: TC's approach to parking and congestion
To: Joe Valentine <jvalentine@bhamgov.org>

Joe - FYI. TC's problem is exacerbated by seasonal tourism but the discussions I hear there often sound familiar.

Stuart

https://mail.google.com/mail/u/0/#inbox/FMfcgxvzLXBnnMRhjcjXdNdppcWrfLKj

New Groundwork Center Program Seeks Experimental Solutions For Traffic, Parking Woes

By Beth Milligan

SHARE

Traffic and parking remain two of the top challenges for the Grand Traverse region – with pressure on infrastructure only expected to worsen in the coming years as tourism and population rates grow. To look to what other communities are doing to address the issue – ranging from bike and car-share programs to private shuttles to sensor-based parking spaces – the Groundwork Center for Resilient Communities is launching a new initiative called the Mobility Lab aimed at exploring experimental options in Traverse City that can reduce traffic congestion and free up parking.

“Most locals agree that Traverse City’s existing transportation system is insufficient, and existing roads are too often congested,” says Groundwork Center Deputy Director James Bruckbauer. “Few people have, or are knowledgeable about, transportation options other than driving. These realities hurt the area’s quality of life, pollute the air, waste fuel and time, and hamper business growth.”

The Mobility Lab project will “truly operate in the spirit of a lab, experimenting with and testing different ideas and putting potential solutions in play so they can be assessed in the real world,” says Bruckbauer. The Groundwork Center plans to work with local partners including Bay Area Transportation Authority (BATA), TART Trails, Norte, the Traverse City Downtown Development Authority (DDA) and other public and private groups to “outline a set of regional priorities around traffic and parking demands,” then test real-world solutions to meet those needs.

“Some ideas will feel brand new to Traverse City,” says Bruckbauer. “Other ideas will be about improving the use and performance of existing transportation options.”

Among the new offerings the Mobility Lab will explore are bringing bike, scooter, or car-share programs to Traverse City. Common in larger metropolitan areas, bike and scooter-share systems let users rent a bike or electric scooter for short-term use through self-serve docking stations or phone apps. Such programs can either be offered through a private

company or managed by a municipality, as is the case in Ann Arbor. A small bike-share pilot program recently launched locally as a partnership between Grand Traverse County and Norte; Mobility Lab could explore further options for expanding bike or scooter-share programs in the area.

Car-sharing is another emerging trend in the transportation market, spearheaded by companies like Zipcar. Zipcar users pay for a monthly membership to participate in the program and – once their driver's license and credit card are verified – use an app to rent cars that are owned by the company and parked throughout the city on a short-term basis, any time of day. Zipcar says the program saves members money on gas, insurance, parking, and maintenance for vehicles, and cites transportation data estimating that 10 percent of the population will adopt car-sharing as a primary mode of transportation by 2025. The program is currently available in downstate communities including Grand Rapids, Lansing, Ann Arbor, and Detroit, but has yet to reach northern Michigan.

Private circulator shuttles, or buses, are also "popping up in not only metro areas but small towns," says Bruckbauer. "We want to see what they could do for providing more options for people in the Traverse City region." There are also numerous technologies emerging that can improve traffic and parking, such as "smart" traffic lights (which can communicate with both self-driving and traditional cars to optimize roadways) and parking spaces with sensors attached that can collect parking data and show drivers where spaces are available. Citywide sensors can also measure factors ranging from traffic accidents and backups to weather changes, alerting drivers in real time to conditions that could affect their commute.

Bruckbauer notes that Groundwork Center isn't looking to "duplicate any existing efforts" when it comes to local transportation planning, including existing studies like the Eighth Street charrette, the Grand Traverse County Road Commission's east-west corridor study, and the DDA's recently completed transportation demand management (TDM) study. Instead, the nonprofit hopes to raise more awareness around those efforts, as well as the various transportation options that already exist in the city, like the TART Trails network and BATA's recently launched free Bayline bus route.

Part of the Mobility Lab's focus will be meeting with large employers – particularly downtown – to discuss offering incentives that would encourage more employees to carpool or use alternative transportation to get to work (Groundwork Center is willing to meet with any companies interested in using "ambitious strategies" to encourage employees to walk, bike, carpool, or take transit to work.) Bruckbauer says the group will work to identify barriers that prevent people from using such options – such as cost or scheduling conflicts – and offer solutions to address those challenges.

The Groundwork Center also aims to be practical in the applications of the Mobility Lab, Bruckbauer says. In addition to studying developing trends like self-driving cars and how those might impact Traverse City in the future, the organization also acknowledges that many people still prefer the convenience of driving – particularly during the winter – and are unwilling to give up the comfort and ease of that option. "There's this stereotype that you have to (smart commute) every day of the week," Bruckbauer says. "But even if you shared a ride to work three days a week, and then clustered your errands on the other two days when you drive alone, that makes a big difference. Providing more transportation options actually helps those people who have to drive, or want to drive, because it potentially frees up parking and traffic space for those who do end up driving."

But with an estimated one-third of residents unable to drive – including those under the legal driving age, older adults, individuals with disabilities, and those who can't afford a car – transportation solutions can't be focused solely on vehicles, Bruckbauer says. Instead, they must encourage a range of options. He hopes the Mobility Lab can find solutions that will

"better serve locals who face extra-tough challenges when getting around," adding: "New options will help people get to schools, jobs, and social events – without necessarily having to drive their own cars."

STUART JEFFARES, ASSOCIATE BROKER

JEFFARES GROUP
RESIDENTIAL REAL ESTATE

MAX BROOCK REALTORS® SINCE 1895

THEJEFFARESGROUP@GMAIL.COM C/248.321.2120 O/248.644.6700

Among the Top 5% of Realtors Nationally

HOUR MEDIA Real Estate All Star

--
Joseph A. Valentine
City Manager
City of Birmingham
151 Martin Street
Birmingham, MI 48009
(248) 530-1809 Office Direct
(248) 530-1109 Fax
jvalentine@bhamgov.org
Twitter: @JoeValentine151

To get the latest information regarding the City of Birmingham, please sign up for our communication tools by clicking here www.bit.ly/bhamnews.

A new lot in life: Cities transform dying parking garages into living neighbourhoods

Decades of car-friendly urban planning has left cities saddled with aging and expensive spaces for increasingly obsolete vehicles. What do we do with them?

OLIVER MOORE › URBAN TRANSPORTATION REPORTER
LONDON
PUBLISHED NOVEMBER 27, 2018
UPDATED 22 HOURS AGO

Peckham Levels used to be a seven-storey parking garage in South London, but has been converted into a space for entrepreneurs and artists.

JUSTIN GRIFFITHS-WILLIAMS/THE GLOBE AND MAIL

The yellow paint is still on the concrete, marking where cars once parked, but the ramps motorists drove up now funnel people on foot from one level to the next, where studio space, restaurants and shops attract thousands of visitors.

Converted for about £4-million ($6.7-million), the site has been run since December by a company that profit-shares with the local council, tries to support budding entrepreneurs and showcases one vision of parking's future.

Leaflet | © OpenStreetMap

A century of motordom has led to millions of parking spaces, many of them in multilevel structures. Expensive to build and maintain, some of these threaten to become redundant amid development changes, softening interest in car ownership among young people and the possibility that vehicles will need less parking space as they become autonomous.

"The amount of parking we need will be dropping over the next 20 to 30 years," said Christopher Leinberger, chair of the Center for Real Estate and Urban Analysis at George Washington University School of Business in Washington. "The decline in parking spaces is happening right now, and that sharp decline will continue as we build more walkable urban places."

As this happens, the question of what to do with unneeded garages will confront most cities, including Canadian ones that have been building these structures for decades. Although parking garages have been converted in a few places – including using parts of them in Berlin and Lisbon as popular bars – low ceilings and other design features can make that hard to do.

"It's definitely an interesting challenge to try to reuse and repurpose a building that was never built for this," said Lodewijk van den Belt, site director at Peckham Levels.

help jazz up utilitarian walls. But none of this has stopped newspaper columnists from gushing about the space, or the roof-top bar and its excellent view becoming a popular gathering spot.

Since December, Peckham Levels has been run by a startup-like company that tries to support budding entrepreneurs in the area.

THE GLOBE AND MAIL

1 of 9

Building to convert

Officials in a number of cities are trying to make garage conversions easier by pushing architects to add features that will allow the buildings new life in the future. Although this remains rare in Canada, one municipality going this route is Calgary.

“It is definitely an element of design that we will be using going forward,” said Reachel Knight, business strategy co-ordinator at the Calgary Parking Authority. “Parking demand has decreased, and could potentially decrease even further with the autonomous vehicle.”

An artist's rendering of what the 9th Avenue SE Parkade & Innovation Centre in Calgary would look like.

CMLC

The $80-million project is being done by Winnipeg’s 5468796 Architecture, and founding partner Johanna Hurme explains that instead of using ramps they are building the floor with a continuous gentle slope, which can be retopped to make it level in the future.

The floors are also sturdier than in a normal garage, to allow for future uses, with about four metres between them. The site will have enough elevators and stairs for alternative occupancies and a lightwell to brighten the space.

less today than it would be if we had to start making all of those measures [later],” she said.

Mary Smith, senior director of parking consulting at Walker Consultants, says that this sort of future-proofing is more economically defensible than planning a fully convertible garage, which she said carries a 30-per-cent to 50-per-cent cost premium. Plus, higher ceilings have value in the meantime.

“Your lighting is better, you can see across the structure better,” Ms. Smith said. “There’s benefits upfront if you provide the extra floor-to-floor height, and then you can have it there for the future. But to do anything more than that, I personally don’t think is a good investment.”

A limited-term lease left the team revamping Peckham Levels with few options to make structural changes. Besides, they didn't want to do too much to conceal that the space had once been a parking garage.

JUSTIN GRIFFITHS-WILLIAMS/THE GLOBE AND MAIL

When you have an old one

One of the earliest conversions was the so-called “Hotel for Autos” in Manhattan. Opened in 1930 as a high-tech space where vehicles could be moved mechanically into position, the business model promptly faltered. The building near Central Park became a warehouse in the 1940s and later a residence. It is now shared by apartments and a university facility.

In Toronto, a downtown parking garage designed by the same architecture firm that did Maple Leaf Gardens opened in 1925 and was converted to condos in the early 1980s. Designers wanted to keep the internal ramps, said resident Kristine Morris, who has researched the building’s history, which forced some creative thinking. Floors are split into two levels, each served by a different elevator.

“There’s all these weird kind of configurations in the building to accommodate the ramp system that’s there,” she said.

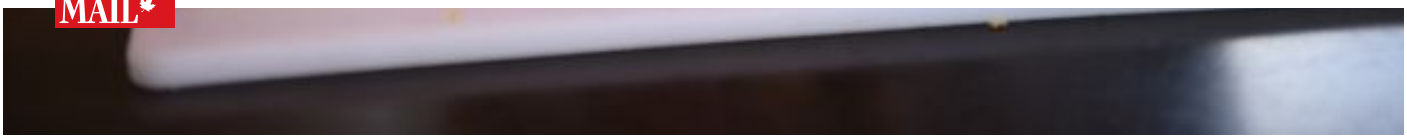
The team converting Peckham Levels in London didn’t want to disguise too much that it had been a garage, Mr. van den Belt said. And the limited-term lease made structural changes not feasible. There were also struggles with temperature control, and with perplexing acoustics that make sounds travel unexpectedly.

But they managed to turn it into a spot that hosts a popular annual festival and has periodic workshops for everything from sales to well-being. Visitors can get spa treatments or haircuts. On one of the upper levels, you can sit for a decent lunch, complete with a pint, at one of the brightly painted tables.

One of the restaurants up there specializes in duck. It goes by the name Canard and they pun on the receipt that they “Canardly wait to see you again.” Based on the steady stream of regulars through what had been a derelict old garage, the feeling appears to be mutual.

Canadian Hugo Worsley is the co-founder of Canard, a restaurant in Peckham Levels.

THE GLOBE AND MAIL



The restaurant specializes in duck and reinventions of traditional French food.

THE GLOBE AND MAIL

'Canardly wait to see you again,' the restaurant's receipts read.

THE GLOBE AND MAIL

FOLLOW OLIVER MOORE ON TWITTER
@MOORE_OLIVER

REPORT AN ERROR EDITORIAL CODE OF CONDUCT

RELATED

The Central Library: A new chapter for Calgary, and for architecture in Canada

Artscape's latest creative hub demonstrates a friendly relationship between culture and capital

COMMENTS