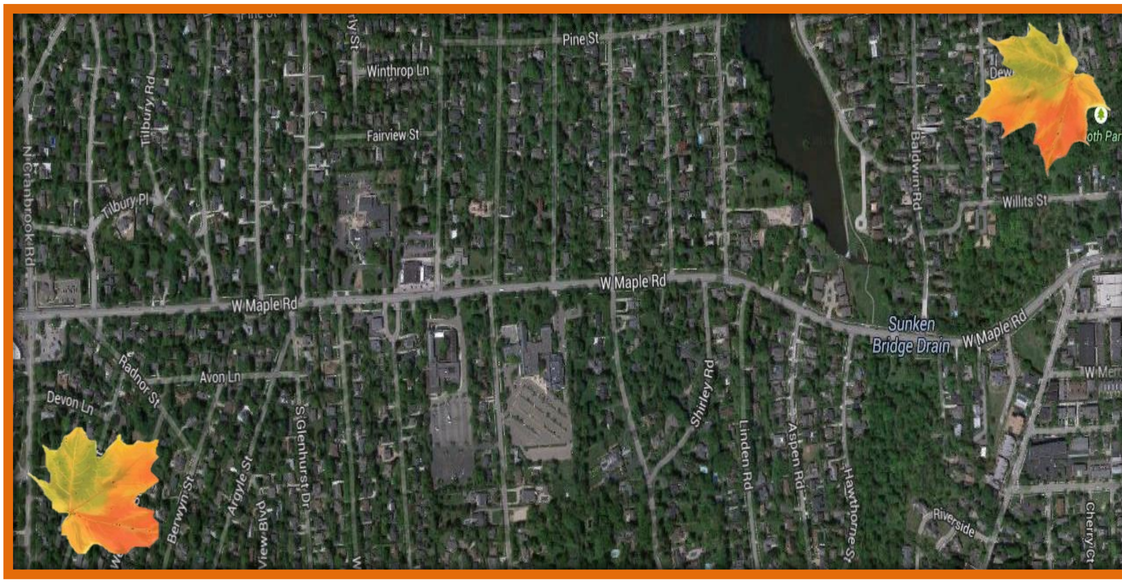
W. MAPLE ROAD
STEERING COMMITTEE REPORT



ACKNOWLEDGEMENTS

STEERING COMMITTEE
Stuart Bordman, MMTB
Mike Clawson, Resident on W. Maple
Lara Edwards, MMTB
Karen Rock, Resident North of W. Maple
Russ Ives, W. Maple Rd. Churches Representative
Terry Lang, Resident at Large
Vionna Adams, MMTB
Karen Daskas, Business Owner from CBD
David Underdown, Business Owner from W. Maple
Eugene Nelson, Resident South of W. Maple

CITY OF BIRMINGHAM STAFF
Jana Ecker, Planning Director
Lauren Chapman, Assistant City Planner
Paul O’Meara, City Engineer
Mark Clemence, Deputy Police Chief

TRANSPORTATION CONSULTANTS
Fleis & VandenBrink

TABLE OF CONTENTS

CHAPTER 1 GLOSSARY OF TERMS

Within this document there are a number of terms that may be unfamiliar to many people. The following is a brief glossary of some of the transportation terms that are found in this document:

Bike Lane – a portion of the roadway designated for bicycle use. Pavement striping and markings sometimes accompanied with signage are used to delineate the lane.

Bike Route –a designation that can be applied to any type of bicycle facility. It is intended as an aid to help bicyclists find their way to a destination where the route is not obvious.

Complete Street- streets that are planned, designed, operated and maintained such that all users may safely, comfortably and conveniently move along and across streets throughout a community.

Crossing Islands – a raised median within a roadway typically set between opposing directions of traffic that permits pedestrians to cross the roadway in two stages.

Crosswalk – the area of a roadway that connects sidewalks on either side at an intersection of roads (whether marked or not marked) and other locations distinctly indicated for pedestrian crossings by pavement markings.

> **Mid-block**– a crosswalk where motorized vehicles are not controlled by a traffic signal or stop sign. Pedestrians wait for a gap in traffic to cross the street; motorists are required to yield to a pedestrian who is in the crosswalk.
>
> **Signalized** – a crosswalk where motor vehicle and pedestrian movements are controlled by traffic signals. Frequently a part of a signalized roadway intersection but a signal may be installed solely to facilitate pedestrian crossings.

Level of Service (LOS) – a measurement of the motor vehicle flow of a roadway expressed by a letter grade with "A" being best or free flowing and "F" being worst or forced flow/heavily congested.

Mid-block Crossings – locations that have been identified based on land uses, bus stop locations and the difficulty of crossing the street as probable candidates for Mid-block Crosswalks.

Mode – distinct types of transportation (cars, bicycles and pedestrians are all different modes of travel).

Neighborhood Connector / Neighborhood Greenway – a route that utilizes residential streets and short connecting pathways that link destinations such as parks, schools and **Shared**

Rectangular Rapid Flash Beacons (RRFB) – are quickly alternating amber LED lights used in conjunction with a typical crosswalk or school crossing warning sign to supplement the signs visibility when a pedestrian is attempting to cross the road.

Shared Roadway –bicycles and vehicles share the roadway without any portion of the road specifically designated for the bicycle use. Shared Roadways may have certain undesignated accommodations for bicyclists such as wide lanes, paved shoulders, and/or low speeds. These routes may also be signed and include pavement markings such as shared-use arrows.

Shared Lane Markings – a pavement marking consisting of a bike symbol with a double chevron above, also known as "sharrows". These pavement markings are used for on-road bicycle facilities where the right-of-way is too narrow for designated bike lanes. The shared lane markings alert cars to take caution and allow cyclist to safely travel in these lanes when striping is not possible. They are often used in conjunction with signage.

Shared Use Path – a wide pathway that is separate from a roadway by an open unpaved space or barrier or located completely away from a roadway. A Shared Use Path is shared by bicyclists and pedestrians. There are numerous sub-types of Shared Use Paths.

CHAPTER 2 Introduction and Background

2.1 THE MULTI-MODAL TRANSPORTATION PLAN

In 2011, the City of Birmingham passed a resolution in support of Complete Streets to demonstrate a commitment to enhancing the built environment for all transportation users, including drivers, pedestrians, bicyclists and transit riders of all ages and abilities. In 2013, the City of Birmingham completed a rigorous 15 month process to complete and accept the Birmingham Multi-Modal Transportation Plan ("MMTP") to guide transportation improvements throughout the entire City.

The City of Birmingham's MMTP is a long-range plan to improve and expand opportunities for pedestrians, bicycles and transit users. It is a response to the growing demand for alternative forms of travel and the need to improve the safety of those who choose to walk, bicycle, drive, or take transit. The plan looks at how the City may transform its streets into better public spaces that are friendlier to pedestrians, bicyclists and transit users, while continuing to serve the needs of motorized traffic. The proposed improvements will help the City of Birmingham continue to be an attractive place to live, work, and play and will enhance its desirability among educated youth, entrepreneurs, and senior citizens.

Many of the improvements recommended in the MMTP are designed to accomplish multiple goals. For example, some improvements for pedestrians are also designed to lower traffic speeds to a level appropriate to the residential nature of the roadway and enhance the appearance of the corridor.

Together, the proposed improvements to the built environment will provide residents and visitors additional viable transportation choices. Several communities that have invested in multi-modal facilities have experienced a significant increase in the number of people who walk, bicycle and take transit. Many residents are within convenient walking and bicycling distance to many of their destinations, including the vibrant downtown. The MMTP provides the direction on how to make Birmingham not simply a walkable community, but an outstanding walkable, bikeable and transit friendly community.

In the MMTP, specific recommendations were made for the W. Maple corridor between Cranbrook Road and Southfield Road. Below is an excerpt from the Multi-Modal Transportation Plan regarding the proposed conceptual plans for W. Maple Road.

CITY OF BIRMINGHAM MULTIMODAL TRANSPORTATION PLAN

SPECIFIC AREA CONCEPT PLANS

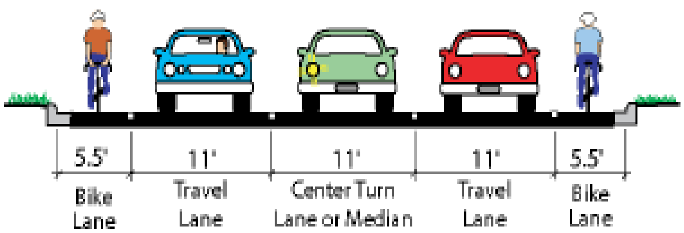
5.2 WEST MAPLE ROAD

The following concept plan is for the segment of W Maple Road between Cranbrook Road and Southfield Road, which is going to be resurfaced in 2015.

PROPOSED BICYCLE FACILITIES:

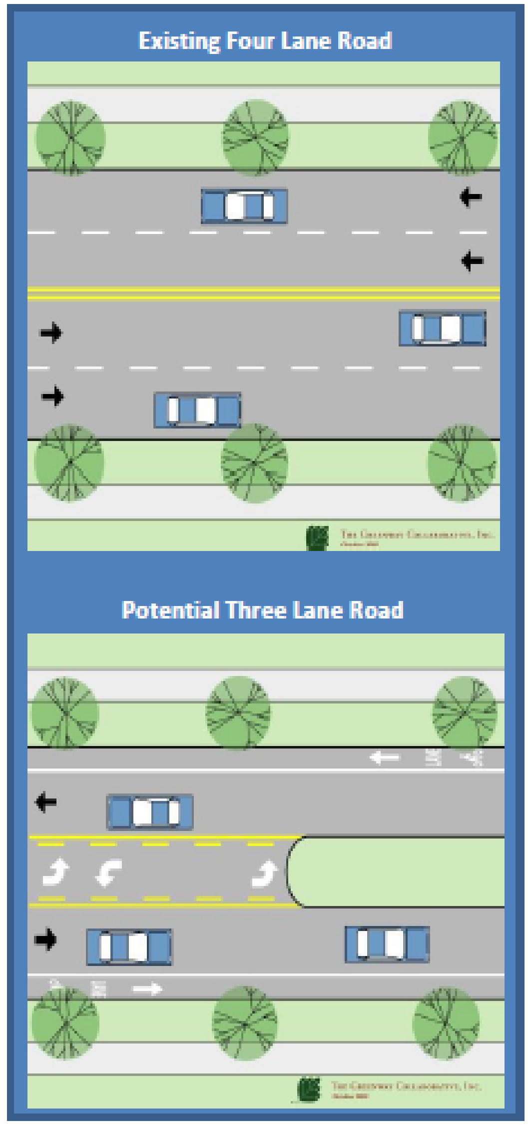
A four-lane to three-lane conversion is proposed on W Maple Avenue between Waddington Street and Southfield Road.

Add bike lanes through 4 to 3 lane conversion

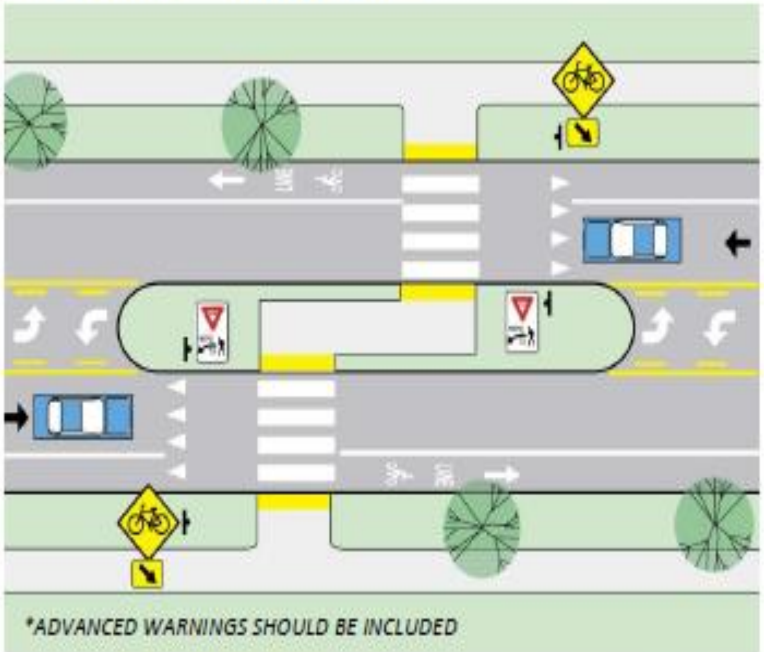


The existing road cross-section should be maintained on W Maple Avenue between Waddington Street and Cranbrook Road in order to allow for motor vehicle stacking at the intersection. A shared lane marking is proposed along this segment, along with signage directing bicyclists to a neighborhood connector route where the bike lane ends and the shared lane marking begins.

Please note that W Maple Road between Cranbrook Road and Southfield Road is at the cusp of where a four-lane to three-lane conversion will function. Additional analysis of the corridor is necessary to determine if the conversion is feasible.



PROPOSED CROSSING ISLANDS:



Crossing islands with rectangular rapid flash beacons are proposed on W Maple Road at:

- Baldwin Road
- Chesterfield Avenue
- Suffield Dr/Pilgrim Ave
- Lake Park Dr/Linden Rd

Please note that this is assuming the existing signal at Lake Park Drive will be removed with the proposed four to three lane conversion.


Rectangular Rapid Flash Beacon

A crossing island is also proposed at Chesterfield Avenue where there is an existing signal.

Bus stops along W Maple Road should be relocated to be closer to the proposed road crossings.

2.2 THE MULTI-MODAL TRANSPORTATION BOARD

The MMTP recognized the need for oversight on transportation projects from multiple departments, as well as the need for public input from many different perspectives to improve the quality of the transportation system, thus improving the quality of life in the City. The Plan recommended the implementation of a standing committee that represents people with a diverse range of travel mode experience, people of different age groups and people with mobility issues. The Multi-Modal Transportation Board ("MMTB") was created in 2014 by the City Commission as recommended in the MMTB. The Multi-Modal Transportation Board (MMTB) meets the first Thursday of each month at 6 p.m. at the Municipal Building.

2.3 THE MAPLE ROAD STEERING COMMITTEE

Recently, the MMTB finished its work relative to City road projects that will be built in 2015. The W. Maple Road project has been awarded an 80% federally funded construction grant for resurfacing during the 2016 construction season. Due to federal participation, the City is required to start the plan preparation for this project earlier than usual. Once the plans are prepared by our consulting engineer, they then need to be reviewed and approved through the local MDOT office. The plans need to be nearly complete by June of this year, in order to ensure they are submitted in a timely manner.

The MMTB recommended that a separate steering committee be formed for W. Maple Road. While the MMTB is still fully engaged in the process, it was determined that it would be helpful to bring others that are more direct stakeholders into the discussion. With that in mind, the Maple Road Steering Committee was formed to meet more often to fully understand the corridor, and make the best recommendation possible. The following positions were recommended, and approved to create the Ad Hoc W. Maple Steering Committee ("Steering Committee"):

- Three members of the Multi-Modal Transportation Board;
- Two members representing neighborhoods in the area (one from north of and one from south of W. Maple Rd);
- One homeowner with direct frontage on W. Maple ;
- One resident at large;
- One business owner from the corridor (preferably from the plaza located at Chesterfield Rd.);
- One business owner from the central business district; and
- One church staff member or active volunteer representing one of the three large churches along the project route (First United Methodist, First Presbyterian, Lutheran Church of the Redeemer).

The Steering Committee was formed in January of this year, and met over the course of four months to review and discuss the W. Maple Corridor.

CHAPTER 3 STEERING COMMITTEE PLANNING PROCESS

The planning process was a multi-step effort led by the MMTB, the Steering Committee and shaped by public input. The planning process for the discussion of the W. Maple Corridor included the following major tasks:

- An introduction to multi-modal transportation planning, the Birmingham MMTP, and transportation planning data and review standards;
- Review of strengths and weaknesses of the existing W. Maple Corridor;
- Development of goals and objectives for improvements to the W. Maple Corridor;
- Inventory and Analysis of the existing transportation environment in the W. Maple Corridor;
- Identification of opportunities and Complete Streets corridor improvement options;
- Analysis of future improvement options;
- Review of national examples and case study analysis of similar projects;
- Obtaining public input throughout the process; and
- Approving a recommendation to the MMTB on the future configuration of W. Maple.

3.1 INTRODUCTION TO MULTI-MODAL TRANSPORTATION PLANNING

At the steering committee meeting on January 22, 2015, Mr. Norm Cox of the Greenway Collaborative conducted a PowerPoint presentation outlining the basic principles of multi-modal transportation planning, how multi-modal planning can enhance accessibility, allow seniors to age in place and attract millennials, and outlining Michigan's Complete Streets policy. Mr. Cox also introduced some of the design tools communities can use in their street design to meet their specific objectives.

Mr. Mike Labadie of Fleis & VandenBrink also explained the basic types of data that traffic engineers collect and study when considering road improvements, and discussed the tools that will be available to better understand how changes to W. Maple Rd. will impact its Level of Service (LOS) to the public. Staff also provided an overview of the City's Multi-Modal Transportation Master Plan; what the MMTB board has accomplished to date; and how the suggestion of considering a change to W. Maple Rd. came about.

3.2 GOALS AND OBJECTIVES FOR THE W. MAPLE CORRIDOR

At the Steering Committee meeting on January 22, 2015, Steering Committee members and the public were also asked to provide their comments and concerns regarding existing conditions on the W. Maple corridor. Common findings were identified as follows:

- Concern that this section of W. Maple Road is dangerous and does not feel safe;
- Concern about the excessive speed of traffic on W. Maple;
- Concern about vehicles swerving to avoid other vehicles making turns along the corridor;
- Concern about the difficulties of turning onto W. Maple from adjacent side streets;
- Concern about traffic backups at Southfield Road;
- Difficulty for pedestrians to cross W. Maple; and
- Satisfaction with sidewalk conditions along the W. Maple corridor.

Accordingly, the Steering Committee agreed that each of the above common areas of concern should translate into the following **objectives for improvements** considered for the W. Maple corridor:

- Improve the safety of the corridor, especially for vehicular and pedestrian traffic;
- Lower the speed of vehicular traffic in the corridor;
- Reduce the amount of vehicles swerving to avoid cars making turns along the corridor;
- Enhance the ease of vehicles to turn onto W. Maple from adjacent side streets;
- Reduce traffic congestion in the vicinity of the Southfield Road intersection;
- Provide safe and convenient pedestrian crossings along the corridor; and
- Maintain sidewalk facilities in the corridor.

In addition, the steering committee stated that the following objectives should also be included:

- Ensure that any proposed changes in the corridor do not make existing conditions worse; and
- Ensure that any proposed changes in the corridor do not increase cut-through traffic in the surrounding neighborhoods.

3.3 INVENTORY AND ANALYSIS OF EXISTING CONDITIONS

At the Steering Committee meeting on February 26, 2015, Mr. Labadie conducted a presentation to review his findings regarding the existing conditions in the W. Maple corridor. Mr. Labadie reviewed the traffic counts collected (including bicycle and pedestrian counts), turning movement data collected, the most recent 3 year crash history and data, the results of past speed studies, sight distance findings, gap analysis findings, traffic queues and the levels of service for all intersections in the W. Maple corridor. All data was collected at the signalized study intersections during the AM (7:00 AM to 9:00 AM) and PM (4:00 PM to 6:00 PM) peak periods, on Tuesdays, Wednesdays and Thursdays of non-holiday weeks.

Mr. Labadie and Mr. Russo discussed their evaluation of existing peak hour vehicle delays and Levels of Service (LOS) at the study intersections along Maple Road from Cranbrook to Chester based on the existing land use and traffic control, existing peak hour traffic volumes, and the methodologies presented in the Highway Capacity Manual, 2010 (HCM). Typically, LOS D is considered acceptable, with LOS A representing minimal delay, and LOS F indicating failing conditions. Mr. Labadie also reviewed historical crash data from the Traffic Improvement Association of Michigan (TIA) for the most recent available three years (2012-2014) for the study segment of W. Maple Road. In addition to crash data, collision diagrams were obtained and presented for all signalized and unsignalized study intersections. Crash data from the intersection of W. Maple Road and Cranbrook Road were omitted from the analysis as the City of Birmingham only has jurisdiction over one leg of the intersection and no geometric improvements are proposed at the intersection as part of this project. The crash data and collision diagrams are attached and summarized in the appendix.

All data collected was put into a computer modelling SYNCHRO program to illustrate in actual time increments the existing conditions at AM and PM peak periods and throughout the day along the W. Maple corridor. Mr. Labadie responded to questions from steering committee members and the public, and then demonstrated the computerized SYNCHRO model of the actual corridor. The scaled model allows viewers to watch the operation and traffic flow of the corridor, and it becomes evident where the areas of concern exist. Committee members discussed the back up and traffic congestion around the W. Maple and Southfield intersection, the placement and timing of traffic signals, excessive speed, concerns regarding vehicular swerving around turning vehicles, pedestrian crossing issues and the difficulty for drivers to make turns out of the surrounding neighborhoods onto W. Maple at peak periods. The results of the existing conditions analysis are as follows:

1. Sight distance at Maple Road and the cross streets and driveways is adequate;

2. Traffic signals along Maple Road provide for some platooning of vehicles to create gaps in the traffic stream for cross streets and driveways;
3. Presently all of the signalized study intersections operate at an overall LOS C or better during the AM and PM peak periods;
4. All signalized study intersection approaches and movements currently operate acceptably at a LOS D or better during the AM and PM peak periods, except the southbound approach at the intersection of Maple Road and Chester Street which operates at a LOS E, with the southbound right turn movement operating at a LOS F during the PM peak period;
5. In the traffic simulations the intersection of Maple Road and Southfield Road experienced the worst traffic congestion:
   a. At the intersection of Maple Road and Southfield Road, long vehicle queues were observed for the eastbound approach during the AM peak period and the eastbound and northbound approach during the PM peak period.
   b. At the intersection of Maple Road and Chester Street a long vehicle queue is observed for the southbound right turn movement during the PM peak period.
   c. The eastbound right turns onto Southfield southbound do not have an adequate length of lane for merging into southbound traffic from Maple Road.
   d. There is inadequate storage length for eastbound left turns from Maple Road onto Chester Street. This causes left turning vehicles to spill back into the through travel lane along Maple Road and block through traffic.
   e. Field observations indicate that some eastbound through traffic on Maple Road utilizes the outside through lane before and after the Southfield Road intersection and merges over into the through lane or left turn lane between Southfield Road and Chester Street.

Both the data compiled and the computer model created using the data confirmed the perceptions of the Steering Committee members that were previously noted.

3.4 COMPLETE STREET IMPROVEMENT OPTIONS

At the Steering Committee meeting on March 19, 2015, Mr. Labadie reviewed the following complete street / multi-modal design tools that are available for study to meet the objectives established by the Steering Committee for improvements along the W. Maple Corridor:

- ADA ramps at all corners and crossings;
- Sidewalk improvements;

- Crosswalk marking improvements at the signalized intersections;
- Flashing beacons for pedestrian crossings;
- Intersection improvements;
- Installation of pedestrian crossing islands;
- Bike lanes or shared lane markings;
- Removal of low use bus stops and enhancement of higher use bus stops;
- Installation of right turn lane eastbound on Maple, south onto Southfield Road;
- Traffic calming measures (bump-outs, speed tables, signal coordination etc.);
- 4 to 3 lane conversion;
- Reconfiguration of road width; and
- Use of enhanced technology in signals to control and optimize signal cycle lengths and timing.

Mr. Labadie conducted a presentation to review his analysis of existing conditions in the corridor to determine which Complete Street improvement options should be considered for more detailed study.

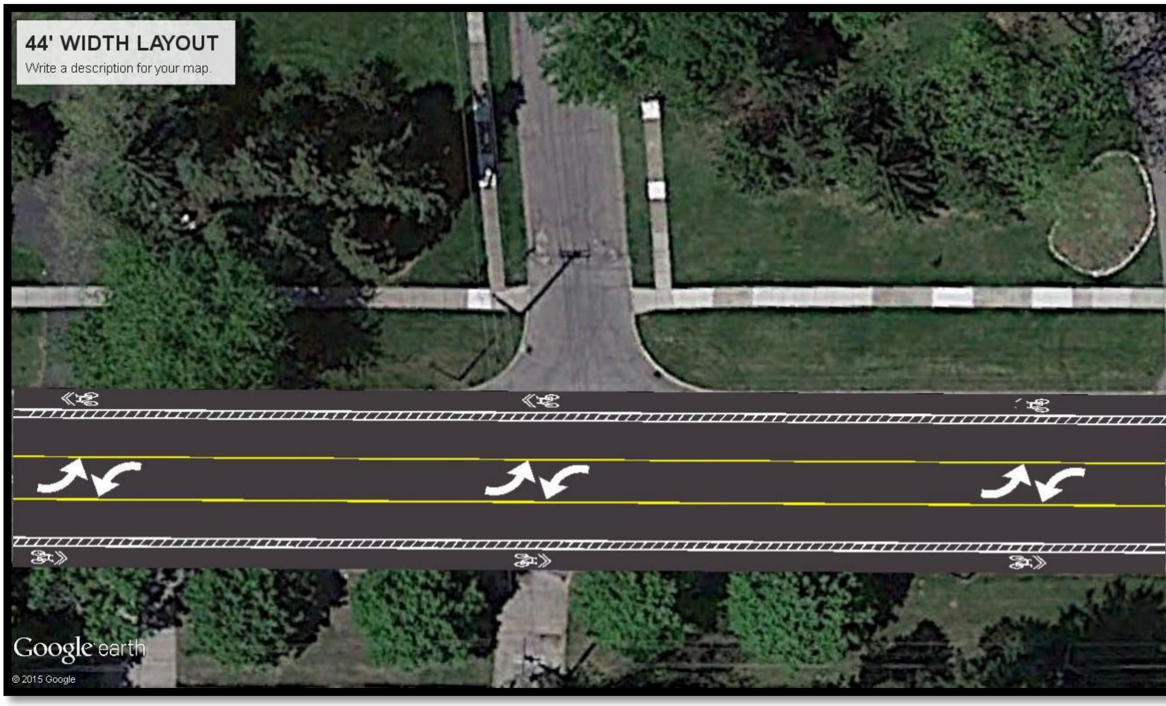
3.5 ANALYSIS OF FUTURE IMPROVEMENT OPTIONS

3.5.1 UNIVERSAL IMPROVEMENTS

At the Steering Committee meeting on March 19, 2015, Mr. Labadie and Mr. Russo reviewed each of the Complete Street improvement options, and presented their findings as to which options warrant further consideration. Mr. Labadie specifically recommended the addition of ADA ramps at all corners and crossings, sidewalk improvements, bus stop consolidation and enhancement and improved pedestrian crossings, regardless of the configuration of the road in terms of number of lanes, lane width, addition of bike lanes etc.

3.5.2 4 to 3 LANE CONVERSION OPTION

On both March 19, 2015 and April 16, 2015, Mr. Labadie and Mr. Russo also presented a detailed analysis of possible reconfiguration options for the W. Maple Corridor, including a 4 to 3 lane conversion (also known as a road diet) on W. Maple Road from Waddington Road to Southfield Road.



This reconfiguration could include a three lane cross-section with one lane in each direction and a center lane for left turns to improve safety, reduce speeds and make crossings safer. Additionally, 5' bike lanes could be provided in both directions.

A transition zone would be needed east of the intersection of W. Maple and Cranbrook Road from 4 lanes to 3 lanes. As the intersection at Maple and Cranbrook is not fully controlled by the City of Birmingham, no changes would be proposed.

At the east end of the W. Maple Corridor, the 4 to 3 lane conversion would also open up options for addressing existing congestion issues between the intersection of W. Maple Road and Southfield Road, and the intersection of W. Maple and Willits / Chester Street. The intersection of Maple Road & Southfield Road can be improved by eliminating the eastbound channelized right turn and instead have this movement be controlled by the signal with an overlap phase that provides a right turn green arrow for the eastbound right turn movement during the northbound Southfield Road phase. With these improvements, the intersection of Maple Road & Southfield Road would experience minor improvements in overall intersection operations.

There is also currently inadequate storage for eastbound left turns from Maple Road onto Chester Street which causes left turning vehicles to spill back into the through travel lane along Maple Road and block through traffic. In order to increase the storage length for this movement, Southfield Road could be realigned to intersect Maple Road further west, near the existing eastbound channelized right turn lane. This will help to create more storage for left turns between Chester Street and Southfield Road and make Maple Road & Southfield Road intersect closer to a 90 degree angle. This work would also reduce congestion and accidents. This could be possible in the future. Mr. Labadie informed the committee that Southfield Road could be a part of the group's purview, because it affects W. Maple.

A 4 to 3 lane conversion allows not only a continuous center left turning lane, but also provides the opportunity for the addition of pedestrian refuge islands to make crossing W. Maple more comfortable and convenient for pedestrians. Possible locations for such pedestrian crossing islands discussed are shown below.

SUMMARRY OF ANALYSIS FOR 4 TO 3 LANE OPTION

Mr. Labadie and Mr. Russo presented their LOS findings by intersection throughout the corridor both using existing conditions and future conditions in a 4 to 3 lane conversion. All intersections will continue to operate at a LOS C or higher overall (an acceptable LOS is D or higher). Mr. Labadie explained how these improvements would significantly reduce accident rates and accident severity, virtually eliminate sideswipe accidents, reduce speeds, provide a consistent speed for traffic, increase the gaps in traffic through the use of platooning, reduce congestion (particularly in the area of Southfield

Road), and would enhance pedestrian conditions and crossings throughout the corridor. Mr. Labadie also stated that there would not be an increase in cut through traffic if these improvements were made as traffic delays and queues would not increase, thus there would be no need or desire for traffic to divert from the corridor.

Mr. Labadie and Mr. Russo showed the Steering Committee the SYNCHRO model of the W. Maple Corridor showing the AM and PM peak hour conditions in a 4 to 3 lane conversion scenario to evaluate network operations and vehicle queues. The results can be summarized as follows:

1. With a three lane cross-section an eastbound right turn lane must be provided at Maple Road & Southfield Road.
2. Cycle lengths along Maple Road were optimized to 90 seconds.
3. With items 1 & 2 above, all study intersection approaches and movements would continue to operate acceptably during both peak periods, except the southbound approach at the intersection of Maple Road & Chester Street which would continue to operate at a LOS E, with the southbound right turn movement operating at a LOS F during the PM peak period.
4. In the traffic simulations the intersection of Maple Road & Southfield Road experienced the worst traffic congestion.
    a. At the intersection of Maple Road & Chester Street a long vehicle queue is observed for the northbound approach during the AM peak period. During the PM peak period brief periods of long vehicle queues were observed for the eastbound and northbound approaches.
    b. At the intersection of Maple Road & Chester Street a long vehicle queue is observed for the southbound right turn movement during the PM peak period.
5. Pedestrian Crossing Islands should be considered at appropriate locations along the corridor.

All detailed reports and data regarding the findings of the transportation consultant are provided in the Appendix found in Chapter 6 of this report.

CRASH REDUCTION ANALYSIS FOR 4 TO 3 LANE OPTION

Fleis & VandenBrink ("F & V") conducted research to find previous studies on 4 to 3 lane conversions and specific projects that have undergone a 4 to 3 lane conversion that are comparable to W. Maple Road between Cranbrook Road and Southfield Road. This data was compiled and further scrutinized to determine what, if any, impact a road diet from 4 to 3 lanes would have on the number and types of crashes that occur in the corridor as well as the average travel speed of vehicles.

The largest study completed in Michigan was done by Michigan State University (MSU) in 2012. It not only looked at examples of road diets throughout Michigan but also scrutinized previous studies performed on sites across the nation. While all the studied sites have different ADT, geometrics, intersections business/residential mix, etc., overall the number of crashes and the severity was reduced after completion of the conversion. From examining crash data before and after a four to three lane reduction with the addition of bike lanes, several common trends were revealed:

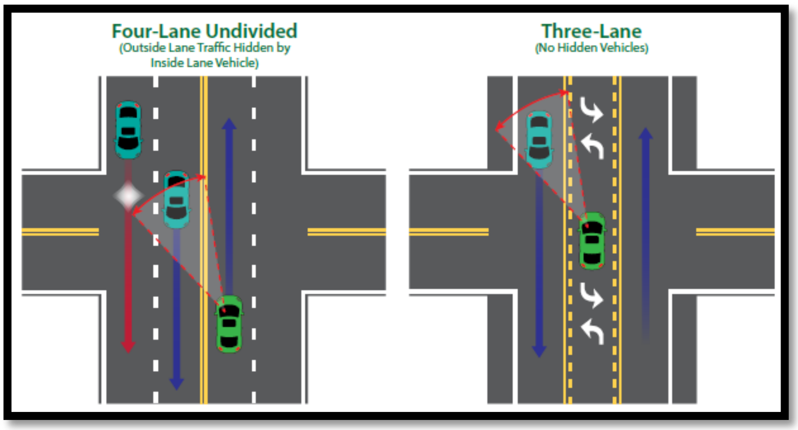
- An overall decrease in the number of crashes with a large decrease due to left turn movements now occurring in a reserved left turn lane at mid-block locations. MSU results show an approximate 9% reduction in accidents while many of the studies show an even greater reduction.
- The Federal Highway Administration (FHWA) suggests a 19-47% reduction in all roadway crashes when a roadway is modified from four travel lanes to two travel lanes with a two way left turn lane (TWLTL).

Crash Reduction

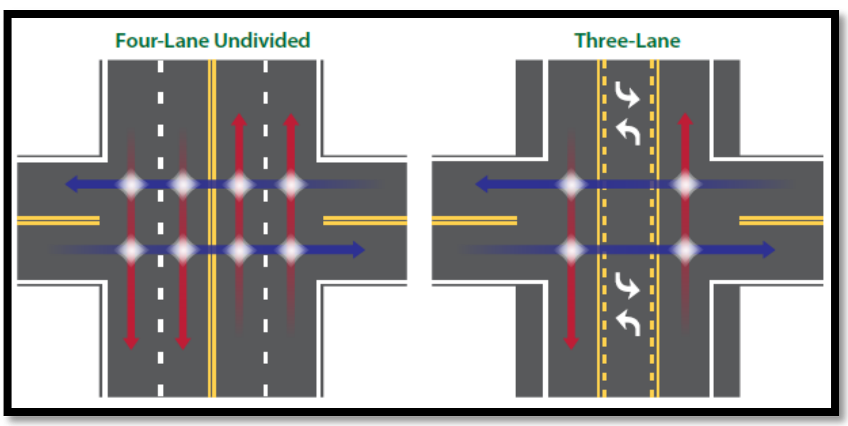
Comparable Sites	City, State	ADT	Crash Reduction	Speed Limit (MPH)	Year Project Completed
Maple Road	Birmingham, MI	21,000	NA	35	NA
N 45th Street*	Seattle, WA	20,000	14 %	30	1972
Madison St.*	Seattle, WA	18,000	-38%	30	1994
East Boulevard**	Charlotte, NC	21,400	-34%	35	2011
Fourth Plain Blvd.**	Vancouver, WA	17,000	-52%	50KM/H (31MPH)	2001
Portland Ave.**	Burnsville, MN	19,200	-32%	30	2011
Edgewater Drive**	Orlando, FL	20,000***	-40%	30	2002
	Average	19,120	-28%	-	

*Parallel parking instead of bike lanes
**Includes bike lanes
***Approximate count not included in average

- A slight increase in the number of crashes (rear-end collisions) where two lanes of through traffic are reduced into one. This is mostly due to the increased volumes in a single lane and unfamiliarity with the new road configuration.
- A decrease in pedestrian and cyclist involved crashes per overall pedestrian/cyclist trips. While the number of incidents in many cases remained the same or slightly increased, most were due in fact to the increased usage of the road and facilities because of the improved infrastructure (bike lanes, pedestrian refuge islands, etc.) No distinction was made in the reduction of crashes on roads with or without bike lanes.
- A reduction in the severity of crashes. Edgewater Drive in Orlando, FL saw a 71% decrease in injuries after project completion.
- A reduction in crashes due to improved site lines and distance.



- A reduction in crashes due to reduced traffic conflict points.



SPEED REDUCTION ANALYSIS FOR 4 TO 3 LANE OPTION

The research conducted by F & V clearly demonstrated that 4 to 3 lane conversions improve safety by reducing the speed differential between vehicles. On a four-lane undivided road, vehicle speeds can vary between travel lanes, and drivers frequently slow or change lanes due to slower or stopped vehicles (vehicles stopped in the left lane waiting to turn left). Drivers may also weave in and out of the traffic lanes at high speeds. In contrast, on three-lane roads with TWLTLs the vehicle speed differential is limited by the speed of the lead vehicle in the through lane, and through vehicles are separated from left-turning vehicles. Thus, 4 to 3 lane conversions can reduce the vehicle speed differential and vehicle interactions, which can reduce the number and severity of vehicle-to-vehicle crashes. Reducing operating speed decreases crash severity when crashes do occur. A review of numerous sites in the study suggest that not only will a reduction in the 85th percentile speed occur, but there will be a large reduction in the number of people traveling 5 mph or more over the speed limit.

- A study of 35 Iowa, California and Washington project sites reflected a 4-5 mph reduction in the 85th percentile speed and a 30% reduction of cars traveling more than 5 mph over the speed limit.
- A reduction in speed is shown to be a contributing factor in the reduction of accidents.
- East Boulevard (35mph speed limit) in Charlotte, NC with an ADT of 21,000 saw a 7% reduction in the 85th percentile speed.
- Stone Way (30mph speed limit) in Seattle, WA saw a 75% decrease in vehicles traveling 10 mph over the speed limit.
- A study of three road diets in San Francisco found a reduction in speeds of between 4% and 14%.

CUT THROUGH TRAFFIC ANALYSIS FOR 4 TO 3 LANE OPTION

A common concern among neighboring residents of lane reduction projects is the increase in traffic on connecting roads. This is most commonly caused by an increase in delays and reduction of capacity of the main road (reduction in LOS) after conversion from 4 to 3 lanes. However, the detailed Analysis of Future Improvements in Chapter 3 clearly demonstrates that the LOS of all study intersection approaches and movements would remain at an acceptable LOS D or better except for SB Maple Road & Chester Street, which would remain at LOS E. Most intersections LOS and delay remain basically unchanged, ranging between A and C whether 4 lanes or 3. Therefore, no increase in cut through traffic is expected. People will not seek alternative routes and cut through adjacent neighborhoods if there is no increase in delay or reduction in LOS.

PLATOONING ANALYSIS FOR 4 TO 3 LANE OPTION

Platooning occurs when vehicles travel in groups caused by traffic signal coordination. If a 4 lane to 3 lane conversion is done, platooning will occur on Maple Road between Southfield and Cranbrook Road due to the signal timing and the 4 lane to 3 lane road diet. Some benefits of platooning are increases in gaps, reduced speed and reduced speed variation between lanes, and increased capacity. Gaps will be created in traffic on Maple Road due to traffic signal timing. These gaps will give adequate time for vehicles to complete left turn movements off of adjacent side streets and driveways. When a platoon leaves from a traffic signal the speed of the platoon depends on the leading vehicle. All vehicles trailing the lead vehicle in the platoon will go equal to or less than their speed. This will reduce the average speed along the corridor. Platooning vehicles accelerate and decelerate as a group. This reduces the headway, which in turn increases the capacity of the roadway. Platooning is much less frequent on under-utilized four lane roads such as the existing configuration of W. Maple Rd. because it offers drivers choices, so vehicles spread out more by changing lanes depending on the speed of drivers in each of the two through lanes.

In order for platooning to occur along Maple Road, some additional signal equipment would be required. The additional equipment includes GPS clocks, antennas, and new software. The equipment and installation would cost between $15,000 and $21,000.

CHAPTER 4 STEERING COMMITTEE RECOMMENDATIONS

On April 16, 2015, the Steering Committee completed their review of the data presented, and reviewed their stated objectives for the W. Maple Corridor. The Steering Committee voted 7-2 to recommend to the Multi-Modal Transportation Board that W. Maple Rd. between Cranbrook Rd. and Southfield Rd. be reconfigured from a four lane road to a three lane road containing two 10 ft. wide through traffic lanes, one 10 ft. continuous left turn lane, and two 7 ft. wide shoulder areas without creating bike lanes, with the following additional conditions:

- (i) A 6 month trial period is to commence after the road is repaved with a formal study by the City to consider the effects of the reconfiguration in the last month, with such results to be reviewed by the Steering Committee;
- (ii) Installation of ADA ramps at all corners and crossings;
- (iii) Crosswalk marking improvements to be made at the signalized intersections;
- (iv) The addition of a right turn only lane for eastbound traffic turning south on Southfield Rd.;
- (v) The addition of pedestrian refuge striped crossing islands to the east of Chester field Ave., east of Lakepark Dr., and west of the Rouge River bridge, the latter with Rectangular Rapid Flashing Beacons;
- (vi) The removal of low use bus stops;
- (vii) The enhancement of higher use bus stops (concrete pad, benches, shelters etc.); and
- (viii) The addition of enhanced technology in the existing signals to control and optimize signal cycle lengths and timing.

CHAPTER 5 NEXT STEPS

The Ad Hoc Steering Committee has completed their role with respect to the W. Maple Road corridor study. No further meetings of the Steering Committee will be held unless so directed by the City Commission. The recommendation of the Steering Committee will be discussed by the MMTB at their next meeting. It is anticipated that the MMTB will study the findings and recommendation of the Steering Committee, and then make a formal recommendation to the City Commission as to the recommended improvements, if any, on the W. Maple Corridor. The City Commission will then consider the input of the Steering Committee, the MMTB and the public and make a final determination of the improvements, if any, to be made to W. Maple in 2016.

CHAPTER 6 APPENDIX

See attached Memos and Data from Transportation Consultant.