WOODWARD AVENUE BICYCLING AND WALKING SAFETY AUDIT

WOODWARD AVE

RIGH

Get a Move On

WOODWARD AVENUE BICYCLING AND WALKING SAFETY AUDIT

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1 INTRODUCTION

1.1 PLANNING CONTEXT AND IMPETUS

Woodward Avenue is a major regional corridor that connects communities in Oakland and Wayne counties from Detroit to Pontiac. This Michigan Department of Transportation (MDOT)managed state trunk line is the "front door" of the communities of Ferndale and Pleasant Ridge—two walkable and bike friendly communities with a lively and diverse mix of more than 1,200 businesses. Both cities have Complete Streets ordinances and plans that identify nonmotorized improvements along Woodward Avenue as key priorities. Each has also adopted the Woodward Avenue Action Association Complete Streets Plan, which includes the installation of a Bus Rapid Transit (BRT) line and separated bicycle facilities along the full length of the corridor to provide a crucial multimodal spine that connects the region.

The Ferndale and Pleasant Ridge segment of Woodward Avenue is an important link in the bicycling network between the City of Detroit and Oakland County. Connecting users through the cities will provide a more direct and safer connection to transit, downtown business districts, and more; today, most bicyclists use a circuitous route. This safety audit and report aims to analyze current bicycling and walking patterns along the Woodward Avenue Corridor and create an actionable plan to implement protected bicycle infrastructure and streetscape improvements that enhance the travel experience for all road users.



Figure 1: A bird's-eye view of Woodward Avenue at Nine Mile Road

The ultimate intent of this study is to provide the safety impetus for establishing and supporting a convenient multimodal street that attracts new cycling and pedestrian activity to increase mode share and enhance quality of life in the community.

1.2 GUIDING PRINCIPLES

The recommendations in this plan are guided by the following principles:

- Quality of life
- Safety
- Convenience
- Multimodal throughput of people
- Economic development
- Sustainability
- Aesthetics and identity
- Legibility

1.3 STUDY AREA

This safety audit looked at the roughly 2-mile segment of Woodward Avenue that crosses through the Cities of Pleasant Ridge and Ferndale, from Eight Mile Road in the south to Interstate 696 (Ten Mile Road) in the north (Figure 2).



Figure 2: Woodward Avenue Study Corridor (Basemap Source: Google Maps)

2 BASELINE REVIEW

2.1 PUBLIC PARTICIPATION

Members of the public had two opportunities to participate in this project.

Online Survey

A survey was circulated that included a series of questions regarding users' habits and preferences for walking, biking, and driving on Woodward. Participants also had the opportunity to identify specific problem spots along the corridor and needed improvements in those areas. The survey was available between March 26 and May 30, both online and in hard copy at the Ferndale Public Library.

A summary of the major findings from the survey are listed below; the full survey results are found in APPENDIX A: PUBLIC INPUT RESULTS.

- Three-hundred and eighty-seven people responded to the survey. The large majority of respondents were residents of Ferndale (66.2%) or Pleasant Ridge (16.4%), but there were additional responses from people who work in Ferndale (14.9%) or Pleasant Ridge (2.4%) as well as individuals from outside the two communities (14.7%)
- Area residents are already walking and bicycling on Woodward Avenue in large numbers. Seventy-four percent of respondents reported walking on the street several times a month or more. Sixty-two percent also reported bicycling on the street at least a few times a year. Twenty-four percent also ride the bus on Woodward Avenue at least a few times a year.



Figure 3: Participants in the walk audit on April 18, 2019

- Among the greatest concerns on Woodward Avenue were pedestrian, bicycle, and vehicular safety and crashes (82%, 82%, and 61% respectively). These outranked concerns about traffic congestion (50%). Condition of the pavement was also a concern (64%). Other write-in concerns included air quality and pollution, transit, sustainability, and stormwater management
- Respondents said the major elements keeping them from walking more on Woodward Avenue are the danger of crossing the street, weather, distance, and discomfort from traffic. Additional reasons cited were walking with young children, lack of destinations, uncomfortable conditions, narrow sidewalks, proximity to traffic, and preference for residential routes.
- The elements keeping people from bicycling more on Woodward Avenue are discomfort with traffic, lack of bike

lanes or paths, danger of crossing the street, and poor pavement conditions. Another major reason cited was concern about distracted drivers.

- Participants stated that the elements most likely to lead them to walk more were more frequent crossings, more pleasing character, more user comfort, and better sidewalk conditions. For increasing biking, bicycle routes separated from traffic was the highest request by far, followed by better pavement conditions, more crossings, and a more pleasing character.
- People currently feel very uncomfortable crossing Woodward Avenue, with only 49% feeling very or somewhat comfortable crossing. The highest rated treatments for crossing Woodward Avenue were curb extensions and high visibility crosswalks. People feel slightly more comfortable crossing side streets, at 56%. The highest-rated treatments for crossing cross streets were high visibility crosswalks and raised crosswalks.
- Only 7.4% of people feel comfortable biking on Woodward even though 62% report doing so on occasion. The most preferred bikeway types for the corridor were a curb-protected bike lane, a two-way cycle track, and a shared-use sidepath.
- The intersections where respondents had the greatest concerns about safety were at Interstate 696, Nine Mile Road and Troy Street. Other locations mentioned included at all side streets, on blocks between signalized crossings, Eight Mile

Road, Vester Avenue/Withington Street, Pearson Street, Fielding Street, and Woodward Heights.

- The safety concerns described at these intersections were repeatedly stated for locations throughout the corridor. These included:
 - Not enough time is provided in the pedestrian walk phase to cross even one side of Woodward Avenue.
 - Crossing locations are too infrequent across Woodward Avenue, especially in the stretch between Cambourne Street and Oakland Park Boulevard, meaning that long and circuitous walking is required to reach businesses located just across the street.
 - Drivers fail to look for pedestrians and bicyclists when making turns. This includes speeding around corners when leaving Woodward Avenue and creeping into crosswalks or failing to look right when turning onto Woodward Avenue.
 - Drivers drive too fast on Woodward Avenue and often "run" red and yellow signal phases.
 - Bicycle facilities that cross Woodward Avenue do not go through the intersection, exposing bicyclists to conflicts in the area where protection is most needed.
 - In areas where an indirect "Michigan Left" (an at-grade stopcontrolled u-turn) is across from an intersecting street (such as at Troy Street), the number of turning and merging movements is confusing and complicated. This leads to drivers failing to look for pedestrians and bicyclists.

Walk Audit

Members of the public were invited to participate in a walk audit conducted on April 18 at 6:00 PM. Despite rainy conditions, approximately 15 people participated to learn about the project and share ideas, including several MDOT staff members and members of the Ferndale City Council and Pleasant Ridge City Commission. The group met on Woodward Avenue at Nine Mile Road and walked north along Woodward Avenue, stopping at multiple locations where conditions made bicycling or walking difficult. Participants expressed enthusiasm for re-purposing a motor vehicle travel lane into a protected bike facility and making a major commitment to walkability on Woodward Avenue. They also shared ideas of where they would like to see additional crossing locations, and the desire to create a sense of place that reminded motorists that they are passing through the community's "front yard.

2.2 PREVIOUS PLANS

Walking and bicycling conditions on Woodward Avenue and throughout Ferndale and Pleasant Ridge have been examined in previous and ongoing plans. This study affirms the goals outlined in those plans and will allow the cities to implement those goals.

M-1 (Woodward Avenue) from 8 Mile Road to 12 Mile Road Metro Region Scoping Study (MDOT, 2014)

MDOT commissioned a road study for the above-named segment of Woodward Avenue to study roadway fixes that would consider and accommodate Complete Streets criteria and the planned BRT line. The scoping report proposes rehabilitation and reconstruction of the roadway including pavement replacement, parking reconfiguration, pedestrian facilities, driveway approach reconfiguration, drainage replacement, signal and signage upgrades, lighting replacement, and corridor beautification. It also proposes parking-protected bicycle lanes on both sides of the roadway, new bus stop designs, and widened sidewalks.



Figure 4: Participants in the walk audit on April 18, 2019

Woodward Avenue Rapid Transit Alternatives Analysis Locally Preferred Alternative (Southeast Michigan Council of Governments (SEMCOG), 2014)

The Regional Transit Authority of Southeast Michigan was established in 2012 to bring rapid transit service to Woodward Avenue. SEMCOG led the analysis of the potential rapid transit alternatives for the corridor and identified the preferred alignment along the full corridor. The preferred alternative envisions exclusive center median-running transit lanes for the full study corridor, with stations at Eight Mile, Nine Mile, and Ten Mile Roads. The envisioned BRT system has not been funded for construction. While its recommendations should be considered as the long-term vision for the corridor, this Safety Audit also focuses on more immediate improvements that can be made in the interim, rather than waiting for its construction.

Woodward Avenue Complete Streets Study (Woodward Avenue Action Association (WA3), 2015)

Both cities participated in the planning process and adopted the results of the WA3 Complete Streets Study, which put forth the vision that "Woodward Avenue will be a complete street that provides safe and efficient means of travel for all users; creates excellent quality of place that benefits local residents; builds value for property; and inspires visitors to return." The plan envisions the adoption of BRT, cycle tracks on both sides, a reconstructed pedestrian zone, furnishings, street trees, stormwater management, and on-street parking for the corridor.

Woodward-696 Conceptual Complete Streets Study (Cities of Huntington Woods, Pleasant Ridge, and Royal Oak, 2015)

The original WA3 Complete Streets study includes typical layouts for the different cross sections found along Woodward Avenue but does not address certain special conditions at the more local level, such as the underpass area at Interstate 696/Ten Mile Road. This study provided additional analysis and designs for this area, envisioning a long-term project to remove the underpass and bring Woodward Avenue back to grade at Ten Mile Road. It also recommends other street reconfigurations to improve the pedestrian and bicycle experience.

Ferndale Moves! (City of Ferndale, 2014 and ongoing)

The City of Ferndale's multimodal plan, *Ferndale Moves*! is maintained as a dynamic website to reflect the changing transportation landscape in the city. It aims to increase transportation options, balance needs and improve safety for all road users, and transform the city's streets into remarkable and functional places. The plan proposes a network of bicycle routes



Figure 5: Recommended Complete Streets concepts for Woodward Avenue in Ferndale

and pedestrian improvements, which has been undergoing implementation over the past five years and has resulted in a growing walking and bicycling network.

Ferndale Master Plan (City of Ferndale, 2017)

The City of Ferndale's vision for its future is to be progressive, equitable, sustainable, and resilient. Its master plan includes goals that will be addressed by the recommendations made in this study, such as promoting walkability, incorporating green stormwater infrastructure, and promoting transportation diversity. This study also specifically addresses Task 2.1, "Work with MDOT to improve pedestrian conditions at major roads, particularly Woodward Avenue and Eight Mile Road." It also discusses a long-term vision to bring Woodward Avenue to grade at Eight Mile Road.

Downtown Ferndale Development and TIF Plan (City of Ferndale, forthcoming).

Ferndale's Downtown Development Authority is currently producing a development plan for the city's downtown district that will include intersection improvements and bike lanes on Nine Mile Road and resurfacing and priority projects on Woodward Avenue. That plan should be informed by the recommendations of this study.

Woodward Avenue Milling and Resurfacing Project (MDOT, forthcoming)

The Michigan Department of Transportation is undertaking a project to mill and resurface Woodward Avenue, with design work to begin in June 2019 and construction in 2020. This project is the best opportunity to begin implementing interim changes to the study corridor through pavement markings and lane reconfiguration. The recommendations of this Safety Audit will be shared with MDOT to be incorporated into their designs.

2.3 LAND USE CONTEXT

Within the study area, Woodward Avenue can be differentiated into three major districts.

- The Core Downtown district is located in the heart of Ferndale and is centered around Nine Mile Road, from Albany Street/Ardmore Drive to Cambourne Street. It is currently the most walkable and mixed-use area, characterized by closely located one-to two-story buildings that do not have setbacks and that house a variety of restaurants and retail businesses. Two bus stops with shelters are located within the district.
- There are Auto-Oriented and Office districts on both ends of the Downtown district. The one on the southern portion it is located on both sides of Woodward Avenue, stretching all the way to Eight Mile Road. The one on the northern portion stretches into the Pleasant Ridge city limits, ending at Oxford Boulevard on the west side and at Devonshire Road on the east side. This district is characterized by single-story retail and office buildings with more autooriented designs such as multiple driveways per building and parking lots located in front of or between buildings; fast food restaurants; and several car dealerships.
- The Residential district is located within Pleasant Ridge at the northern end of the study area, southwest of Interstate 696. This area includes the greenbelt parks, Pleasant Ridge City Hall, and single-family residential land use and streets. This area is also characterized by the Woodward Avenue/Interstate 696 Underpass, commonly referred to as "The Ditch," which dramatically divides the western and eastern sides of the corridor as well as the western and eastern halves of Pleasant Ridge.



Figure 6: Woodward Avenue's "districts'

2.4 TRANSPORTATION CONTEXT

Current Corridor Layout

Along most of the study area, the right-of-way is at least 205 ft wide. Woodward Avenue has a boulevard design, with a 71' planted median dividing the road into two one-way halves. Each side of the median has three 11' travel lanes, a 12' travel lane on the inside, an 11' parking lane on the outside, and an 11' sidewalk with bumpouts (see Figure 9). There are currently no dedicated bicycle lanes on Woodward Avenue.

Woodward Avenue is oriented at approximately a 30-degree skew to intersecting streets. This angle, along with cars parked on Woodward Avenue and buildings located at some corners, severely limits a driver's field of vision onto Woodward Avenue. When stopped at the current stop bar locations of intersecting streets, drivers cannot adequately see oncoming traffic on Woodward Avenue and must pull out across the crosswalks in order to have a line of sight (see Figure 10). In some locations, one parking space before an intersection has been removed and replaced with bicycle parking racks to help improve visibility (Figure 7).

With the exception of six signalized intersections, drivers on crossstreets may only turn right onto Woodward. As a result, there are ten indirect "Michigan Left" locations, or at-grade stop-controlled uturns that cross the median and allow drivers to change direction on Woodward Avenue (Figure 8). These turning movements can prevent safe crossing opportunities for bicyclists or pedestrians, and they may not be possible in the future if median-operating bus rapid transit is installed on the corridor.



Figure 7: Bicycle parking at a cross street intersection



Figure 8: A "Michigan Left" turning location



Figure 9: Woodward Avenue typical cross section - Existing conditions

- Despite the wide right-of-way, existing sidewalks are narrow and crowded, with pedestrians, people riding bicycles, street furnishings, and sidewalk cafes vying for space. Varied, uneven pavement and numerous obstacles make the sidewalk challenging to navigate.
- (2) The wide roadway surfaces, with four lanes of traffic in each direction, encourage unsafe speeds, necessitate challenging merges for turning drivers, and create an intimidating barrier between the two sides of Woodward Avenue. The narrow separation between the sidewalk and traffic makes the environment louder and less pleasant for people at sidewalk cafes or walking to businesses.
- (3) Generally, it appears that only the most confident and experienced bicycle riders feel comfortable biking in the street. This shifts most bicycle riders to the sidewalk.



Figure 10: Typical cross street intersection – Existing conditions

- Existing stop bar placement provides only a limited view of oncoming traffic. There is a crash history of drivers focused on looking for a gap in traffic accelerating into people crossing in the crosswalk, especially people on bicycles approaching from the right.
- (2) The skew of the intersection results in a gradual turn onto Woodward, inviting drivers to turn at speeds that pose a danger to people trying to cross the street.
- (3) Sidewalk pavement is in poor condition and curb ramps are not compliant with the latest accessibility standards for people with disabilities.
- (4) Wide crossings expose people in the crosswalk to greater risk.

While most of this segment of Woodward Avenue is at grade with its cross streets, the areas near Eight Mile Road and Interstate 696/Ten Mile Road are exceptions. At Eight Mile Road, Woodward Avenue is elevated across an overpass; two lanes continue across the overpass and three lanes continue at grade as a service road, allowing for turns onto Eight Mile Road. The overpass reaches grade and merges back with the rest of Woodward Avenue just north of Webster Road. In this area, a 1,400' segment of Woodward Avenue cannot be crossed, reducing connectivity for all travel modes.

Woodward Avenue also passes underneath Interstate 696 at the northern end of the study area. "The Ditch," as this area is commonly known, begins north of Amherst Road. Two lanes continue into the underpass, while three lanes remain at grade. This creates another major divide between the two sides of the road and another 1,900' barrier to crossing (Figure 11). On the southbound side of Woodward Avenue there is no on-street parking (Figure 13).

The intersection of Main Street and Woodward Avenue at the northern end of the corridor also differs from the majority of other cross-street intersections (Figure 12). On the eastern side of Woodward Avenue just south of Ten Mile Road, Main Street turns off from Woodward Avenue in a due north direction, with three lanes of northbound travel; this provides an important connection across Ten Mile Road/Interstate 696 and into downtown Royal Oak. The obtuse angle at this intersection and the width of the road allow drivers to turn at high speeds, and pedestrians often report that drivers fail to yield to them in the crosswalk. Pleasant Ridge conducted a pilot project to reduce Main Street to only one lane at this intersection, which would force drivers to slow down and yield at the crosswalk. During this pilot, all the vehicles were able to get through the traffic signal at Ten Mile road in a single cycle, despite the reduction in lanes.



Figure 11: "The Ditch" underpass at Interstate 696 creates a major barrier



Figure 12: The intersection of Main Street and Woodward Avenue is a vehicle/pedestrian conflict point





Figure 13: Southbound Woodward Avenue in Pleasant Ridge – existing conditions

- (1) People walking and bicycling share a narrow sidewalk.
- (2) Five lanes of traffic are provided in each direction, three on the frontage road and two in the grade-separated bypass.

Active Transportation

Woodward Avenue does not currently have designated lanes for bicycling. Public feedback participants stated their reluctance to attempt to bike along the corridor, and multiple people were observed cycling on the sidewalk during field observations. While bicycling is permitted on sidewalks, it is often not the ideal place to ride on the corridor; the large number of cross streets and driveway entrances create frequent points of conflict with turning vehicles, and the sidewalk is not generally wide enough to accommodate large pedestrian volumes along with bicyclists.

Apart from Woodward Avenue, the cities have a considerable bicycle network both throughout the city and on streets intersecting with Woodward Avenue (Figure 15). Protected bicycle lanes and standard bicycle lanes are provided on several streets, complemented by low-stress shared routes. Bicycle parking racks are provided in 15 locations along Woodward Avenue within the Downtown district near businesses and attractions. However, Woodward Avenue is an attractive bicycling option because it is the main through street for both Ferndale and Pleasant Ridge and it provides the most direct route and connectivity to major destinations. A well-designed protected bicycle facility along Woodward Avenue would complement the existing facilities and provide true connectivity for cyclists of all ages and abilities. It would also provide a regional connection between the City of Detroit and Oakland County.

Sidewalks are present throughout the corridor on both sides of Woodward Avenue, and there are no major gaps in connectivity. Sidewalk widths vary along the corridor from around 5' in some areas to 11' or more (including furnishing zones). Sidewalks are generally in good repair. Curb extensions have been installed at some intersections, and these help to both keep drivers from speeding around turns and delineate parking lanes.



Figure 14: People are regularly seen bicycling on the sidewalk on Woodward Avenue



Figure 15: Ferndale Bicycle Network (Source: City of Ferndale, 2019, accessed at <u>http://ferndale.maps.arcgis.com/apps/View/index.html?appid=0f7decffc45b469</u> <u>9817c31c691f21ed6.</u> Full scale map available in *APPENDIX B: FERNDALE* BICYCLE NETWORK.)

Transit

Fixed route transit service in Ferndale and Pleasant Ridge is provided by the Suburban Mobility Authority for Regional Transportation (SMART). Three fixed bus routes serve Woodward Avenue: Lines 445 Woodward Limited, 450/460 Woodward Local, and 461/462 FAST Woodward, with frequencies of 15 to 30 minutes on weekdays. There are 14 designated stops on each side of the road; only those at Nine Mile Road and at Marshall Street have covered shelters. The amenities at other stops vary, from only signage to uncovered benches and bike racks. Providing sheltered, well-lit bus stops increases the attractiveness of using transit at all times of the year.

The formation of the Regional Transit Authority of Southeast Michigan in 2012 aimed to bring rapid transit service to Woodward Avenue. Though this process is still ongoing and funding has not yet been secured, bus rapid transit should be expected to arrive to Woodward Avenue at some point in the future. In the meantime, improvements to the corridor should aim to minimize conflicts between buses and bicyclists and improve the transit experience in the interim.



Figure 16: A bus shelter on Woodward Avenue near Nine Mile Road

Street Crossings

There are limited opportunities for pedestrians and bicyclists to safely and comfortably cross Woodward Avenue. The width and speed of the road create a major barrier, reducing the feeling of cohesion between the two sides of the street. Within the 2-mile study area, there are currently eight signalized locations where pedestrians may cross (Figure 17). On average, this means that pedestrians arriving to Woodward Avenue from a cross street or parking their car along the road must walk about 1,500 ft to cross the street; however, crossings are closer together in some areas and even farther apart in others. The longest stretch with no marked crossing is over a half-mile long, between Cambourne Street (the northern edge of the Downtown district) and Oakland Park Boulevard/Sylvan Avenue (in the transition area into the Residential district). Many of the bus stops are not located near crossings, meaning that transit riders must walk additional distances to reach a destination on the opposite side of the street.

At the existing signalized crossings, observations showed that the pedestrian crossing phase was not long enough to cross the entire street at once; pedestrians must wait in the median for the next signal cycle to cross the second half of the road. Signal timing was observed at four locations; the pedestrian walk phases to cross Woodward Avenue ranged from 20 to 38 seconds, while the wait time to begin crossing ranged from 62 to 80 seconds. As a result, pedestrians arriving to a crossing location at the very end of the pedestrian phase must wait over a minute to begin crossing, traverse 45 feet of pavement in about 30 seconds, and then wait another minute or more to cross the second half of the street, for a total of around three minutes just to cross the street. According to the National Association of City Transportation Officials (NACTO), pedestrians are usually only willing to spend three minutes to walk to a crosswalk, wait to the cross the street, and resume their



Figure 17: Existing Signalized Intersections and Pedestrian Crossings on Woodward Avenue (Base map source: ESRI).

journey¹. The combination of long distances between crossings and long wait times on Woodward Avenue therefore results in unsafe crossing behavior, with pedestrians choosing to cross the busy street at unsignalized locations close to their destination rather than having to travel thousands of feet and many minutes out of their way.

The existing signalized crossings are currently marked with highvisibility striped crosswalks or standard transverse line crosswalks. The crossings at Nine Mile Road and Fielding Street also have inlaid brick between the transverse lines, in varying states of repair. Crossings across the cross streets are also marked with transverse lines.

Every driveway off of Woodward Avenue is also, in essence, an intersection that pedestrians and bicyclists must cross. Current designs tend to favor the motor vehicle at these intersections, with wide curb radii allowing for fast turns and multiple driveways allowed for a single business. The pedestrian pathway is not always clearly continued across these driveways.



Figure 18: Existing side street crosswalk



Figure 19: A driveway off Woodward Avenue

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¹ <u>https://nacto.org/publication/urban-street-design-guide/intersection-</u> design-elements/crosswalks-and-crossings/

Crash Analysis

In the past ten years, 39 crashes involving pedestrians or bicyclists have been reported along the study corridor. This number does not include "near misses," as these do not result in a crash report. Of these reports, two thirds of the crashes occurred when drivers were turning right onto Woodward Avenue and pulled into the crosswalk while looking left to see oncoming traffic, typically colliding with people walking from the right and attempting to cross in front of the vehicle. These crashes can likely be attributed to the visibility issues at cross streets described in the Current Corridor Layout section; in addition to needing to pull across the crosswalk to see oncoming traffic at an angle, drivers do not look right to see traffic coming from the other direction and likely do not pay sufficient attention to pedestrians approaching from the right. Most of these crashes resulted in only minor injuries.

In contrast, **most of the fatal and debilitating injuries followed crashes where pedestrians were attempting to cross Woodward Avenue** itself. Given the high speeds of cars traveling on Woodward Avenue and the need to cross multiple lanes, this is not surprising. Research shows that the risk of fatality in a crash increases dramatically as vehicle speeds increase, while drivers' cone of vision is simultaneously reduced, making it less likely for a driver to see a pedestrian and stop in time. Some of these crashes occurred at signals, with pedestrians crossing against a red light, while others were at midblock locations. The addition of more signalized crossings and adjustments to the timing of signals will help improve the safety and convenience of crossing Woodward Avenue.

Crash type	Number of crashes
Right Turn Looking Left	26
Bicyclist/Pedestrian Crossing Woodward	13
Fail to Yield to Parallel Crosswalk	5
Vehicle Crossing Woodward	3
On Street Parking	2
Road Rage Assault	1



Figure 20: Pedestrian fatality rates increase with vehicle speed

Traffic Volumes

The Southeast Michigan Council of Governments (SEMCOG) records traffic volumes on Woodward Avenue. The agency's 2013 and 2015 Annual Average Daily Traffic estimates for Woodward Avenue indicate volumes of 15.000 to 17.900 on the northbound segment and 13,500 to 23,000 on the southbound segment (excluding the underpass/overpass portions of the segment)². The Federal Highway Administration's guidance on road diets³ states that four-lane roads with ADT of 20,000 or less are likely to be good candidates for road diets. If each half of the divided roadway is considered as a four-lane road, both are likely to be a good candidates reducing the number of lanes without significantly affecting motor vehicle operations and greatly improving conditions for other modes of transportation. Additional traffic analysis and modeling should be undertaken in accordance with the MDOT Road Diet Checklist to determine the feasibility of a road diet on Woodward Avenue and how it would affect all roadway users. This analysis should analyze the operations of signalized intersections and unsignalized Michigan Left turns under existing conditions and those proposed in this plan. The analysis should and gather data on turning movements, volume and speed, and should be complemented with a crash analysis.



Figure 21: SEMCOG Traffic Volumes, 2013-2015

³ Federal Highway Administration (n.d.) . *Road Diet FAQ*. <u>https://safety.fhwa.dot.gov/road_diets/resources/pdf/fhwasa17021.pdf</u>

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² SEMCOG (2015). *Traffic Volume*. <u>https://maps.semcog.org/TrafficVolume/</u>

3 RECOMMENDATIONS

The recommendations proposed for the Woodward Avenue study area follow the principles outlined in Section 1.2 of this report. They aim to improve safety for all road users, especially the most vulnerable, and make it more convenient to walk and bike on this major corridor. They also aim to unite the two sides of the street, currently separated by over 200 feet of space and fast-moving vehicles. The recommendations include the installation of two-way separated cycle tracks on both sides of Woodward Avenue, implementation of new signalized crossings, and reconfigurations at the cross-street intersections. By implementing these recommendations, the Cities of Ferndale and Pleasant Ridge can serve as a model for the future of the Woodward Avenue corridor and set the stage for creating a complete, vibrant, multimodal street that accommodates the future addition of bus rapid transit. Recommendations are made for short-term, interim changes that can be made as Woodward Avenue is repaved and in the next few years; as well as a long-term buildout that should be implemented in coordination with the installation of a bus rapid transit line.



Figure 22: A two-way cycle track on Jackson Street in Saint Paul, MN.

Proposed Corridor Layout: Interim Design



Figure 23: Proposed corridor typical cross section – Interim Design

- Two-way separated bike lanes provide more comfortable and intuitive access to businesses on Woodward. Shifting bicycle traffic off the sidewalk provides somewhat more space for pedestrians.
 Road diet promotes safer
- speeds and makes merging easier for drivers. Configuration would be compatible with potential future planted median between outer lane and through travel lanes.
- (3) The interim concept maintains the existing gutter, curb, and sidewalk.
- (4) The interim bike lane
 configuration would bend
 around existing curb
 extensions wherever
 possible to save costs.

Proposed Corridor Layout: Long-Term Design



Figure 24: Proposed corridor typical cross section – Long-Term Design

- Reconstructed and widened sidewalk provides an easier path of travel for pedestrians.
- (2) Moving the curb line allows the bike lane to follow a straight path. Since the bike lane is no longer bordered by vertical curbs, the same usable width can be provided without the need for shy space, allowing additional width to be reallocated to the sidewalk.
- (3) Road diet promotes safer speeds and makes merging easier for drivers. Configuration would be compatible with potential future planted median between outer lane and through travel lanes.
- (4) Green stormwater infrastructure can be incorporated within the curb extensions in line with the parking lane.

Proposed Corridor Layout, Southbound Woodward Ave in Pleasant Ridge: Interim Design





Figure 25: Proposed cross section, Southbound Woodward Ave in Pleasant Ridge – Interim Design

- (1) Two-way separated bikeway is created from outer lane of frontage road. Bikeway has 8' width from gutter seam to median curb, 10' width between curb faces.
- (2) Sections of concrete curb separate the bikeway from vehicle traffic.
- (3) Frontage road is narrowed to two lanes.
- (4) Interim concept has no changes outside the frontage road to the grade-separated bypass.
- (5) Recreational riders may choose to navigate through the park on a future connected/modified park path system.



Proposed Corridor Layout, Southbound Woodward Ave in Pleasant Ridge: Final Design



Figure 26: Proposed cross section, Southbound Woodward Ave in Pleasant Ridge – Long-Term Design

- Sidewalk level two-way separated bikeway provided between the sidewalk and the curb. Bikeway is bordered on either side by narrow landscaped areas to provide separation from both the roadway and the sidewalk.
- (2) Frontage road is narrowed to two lanes.
- (3) No changes to grade-separated bypass.
- (4) Recreational riders may choose to navigate through the park on a future connected/modified park path system.

New/upgraded signalized intersections and crossing locations

Add signals and crossings at the following locations (Table 1, Figure 27). Crosswalks should be designed in accordance with the MDOT Crosswalk Installation Guidelines.⁴ Locations were chosen for the most frequent crossings within the Downtown district (around every 300 ft), and they are slightly less frequent in office/auto oriented district (around 600 ft). Signal timing should also be adjusted to reduce wait times for crossing Woodward.

Table 1: Crossing improvement locations

Location	Status	Recommendation
8 Mile Rd	Existing	
Fielding St	Existing	Reduce wait times, eventually make into regular signalized intersection
Channing St	Proposed	Install signalized intersection
Marshall St	Existing	Change timing to extend crossing time across Woodward and shorten crossing time across Marshall
Pearson St	Existing	Reduce wait times, eventually make into regular signalized intersection
Albany St	Proposed	Install signalized intersection



Figure 27: Proposed signalized crossing locations

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⁴ Michigan Department of Transportation. *Guidance for Installation* ofPedestrian Crosswalks on Michigan State Trunkline Highways.

Location	Status	Recommendation
Troy St	Proposed	Install signalized intersection
Nine Mile Rd	Existing	Change timing to extend crossing time across Woodward and shorten crossing time across Nine Mile
Vester Ave	Proposed	Install signalized intersection
Breckenridge St	Proposed	Install signalized intersection
Cambourne St	Existing	Change timing to extend crossing time across Woodward and shorten crossing time across Cambourne
Maplehurst Ave	Proposed	Install signalized intersection
Drayton Ave	Proposed	Install signalized intersection
Woodward Heights	Existing	Upgrade existing signal across half of Woodward. Add signal to other side and marked crosswalk.
Sylvan Ave	Existing	Change timing to extend crossing time across Woodward and shorten crossing time across Sylvan

Proposed signalized intersection



- (1) Road diet and curb extensions provide space for pedestrians to wait to cross Woodward after crossing the bikeway.
- (2) Bike lane would narrow to 8' and raise to sidewalk level at the corners to allow the bikeway to cross the intersection with the crosswalk. The consolidated crossings are intuitive and make it easier for turning drivers to yield.
- (3) Existing wide sidewalk in Pleasant Ridge could accommodate bikeway while still leaving space on either side for the bus stop and through pedestrian zone.

- (4) Green stormwater infrastructure can be incorporated within the curb extensions in line with the parking lane.
- (5) The interim concept would maintain the existing gutter, curb, and sidewalk away from the intersections. The intersection design would also be compatible with a long-term sidewalk reconstruction.

Figure 28: Proposed Signalized Intersection

Cross street intersections



- (3) Design provides space to wait for a gap in traffic *after* crossing the crosswalk, allowing drivers to focus on each task separately. Waiting area after crosswalk, combined with more perpendicular alignment of intersection approach, helps drivers more easily see approaching traffic on Woodward. Realignment encourages slower turns.
- (4) Design provides space for drivers turning off of Woodward to wait for people to cross without pressure from Woodward Avenue traffic approaching from behind.
- (5) Curb extensions across side street minimize crossing distance and risk exposure while also making people waiting to cross more visible to approaching drivers.

- (4) Green stormwater infrastructure can be incorporated within the curb extensions in line with the parking lane.
- (5) Bike lane narrows to 8' and raises to sidewalk level at the corners to allow the bikeway to cross the intersection with the crosswalk. The consolidated crossings are intuitive, promote driver yielding, and provide space for the driver waiting areas between the bikeway and the street.
- (6) The interim concept maintains the existing gutter, curb, and sidewalk away from the intersections. The intersection design is also compatible with a long-term sidewalk reconstruction.

Figure 29: Proposed cross street intersection



Figure 31: In current conditions, drivers stopping behind the crosswalk at a cross street intersection can't see very far down Woodward Avenue due to the angle of the street and location of buildings.



Figure 30: Under proposed conditions, the crosswalk will be moved farther back, and drivers stopped beyond the crosswalk will have a more unobstructed view down Woodward Avenue.



Main Street and Woodward Avenue Intersection

- Main Street is narrowed to single lane at crosswalk to address the "multiple threat" risk. When a driver yields, the person crossing no longer needs to worry that another driver will drive through the crosswalk in the other lane.
- (2) A tighter radius for the turn onto Main Street encourages drivers to slow down before turning instead of continuing onto Main Street at full speed.
- (3) A reduction in the number of vehicular lanes provides space for a two-way separated bike lane.

Figure 32: Main Street and Woodward Ave proposed intersection reconfiguration.

Eight Mile Road Underpass



- (1) This line represents the inside edge of a full-size trailer tracking behind a big rig. The existing curb line accommodates a full-size tractor trailer turning right from Woodward Avenue to Eight Mile Road with several feet to spare.
- (2) This line represents the inside edge of a passenger car turning right with a speed of 10 miles per hour, which is slow enough to provide ample time to see somebody in the crosswalk, decide to stop, and come to a stop.
- (3) A mountable truck apron could be added to the corner to cue drivers of smaller vehicles to take the turn slowly while still allowing fullsize tractor trailers to comfortably round the corner.

Figure 33: Proposed Eight Mile Road underpass truck apron

Bus stop locations and design



Figure 34: Proposed bus stop design

- (1) The proposed design adds a bus boarding platform at sidewalk level in line with the parking lane. The boarding platform provides space for bus riders to get off the bus without stepping directly into the bike lane. It also adds room for the bus shelter, benches, and other street furnishings.
- (2) The design may require partially reconstructing existing curb extensions to accommodate a sidewalk-level, two-way bikeway outside the path of bus boarding area.
- (3) Relocating the bus shelter to the boarding platform expands sidewalk space available to pedestrians.
- (4) Green stormwater infrastructure can be incorporated within the curb extension in line with the parking lane and transit boarding platform.

Green Infrastructure

Green infrastructure and stormwater management are priorities for both Ferndale and Pleasant Ridge and can be implemented throughout the entire corridor as part of safety measures to improve stormwater infiltration and improve the walking and biking experience and corridor aesthetics.

Permeable Pavement

Permeable pavement such as porous asphalt may be used as the surface of the cycle tracks in a long-term reconstruction scenario. Open-graded stone beds would be installed under the pavement to allow infiltration of water into the soil. Porous pavement was used in the construction of Saint Paul's Capital City Bikeway to reduce flooding on the trail and more effectively redirect stormwater into the storm system (Figure 37).

Bioretention Gardens

Bioretention, or rain gardens, serves a dual purpose of both collecting and infiltrating stormwater and adding pleasing natural materials to a corridor. In the proposed designs, such gardens can be installed at corner curb extensions at the cross streets and/or in buffer areas between the cycle tracks and the parking lanes (Figure 31). Plants that are native to Southern Michigan should be the preferred vegetation. Drainage inlets should be installed to allow stormwater to enter the retention areas and infiltrate the soil (Figure 35).

These solutions can be implemented in the short term where curb extensions are viable now.



Figure 37: Capital City Bikeway in St Paul, MN



Figure 36: Bioretention gardens as a bikeway buffer



Figure 35: Drainage inlets allow runoff to enter the retention area

4 IMPLEMENTATION PLAN

4.1 COST ESTIMATES

Costs associated with interim solutions should be considered on an intersection-by-intersection basis, and it should be noted that the cost between intersections can/will be leveraged through the MDOT milling and resurfacing contract.

This approach will allow the Ferndale and Pleasant Ridge to incrementally build out curb extensions that may be simply accommodated by paint over the coming years.

The costs are based on levels of complexity:

Item	Conceptual Cost
Supporting study for road diet (range considers existing counts vs. new counts needed)	\$40,000-\$100,000
Simple intersecting two-lane street bulb and narrowing. (No stormwater infrastructure; no utility concerns).	\$12,000- \$18,000
Complex intersecting two-lane street bulb and narrowing. (With stormwater infrastructure; with utility concerns).	\$25,000- \$40,000
Intersecting street with more than two-lanes	\$25,000- \$80,000

These costs assume that a limited amount of design services are necessary and contain contingencies. Costs do not account for local pricing conditions in southeast Michigan and should be validated using recent construction tenders for similar local projects before budgeting.

4.2 PROGRAMS AND POLICIES

The following programs and policies should be implemented to support the successful implementation and maintenance of the proposed facilities.

Signal timing

- Work with MDOT to reprogram signal times and implement coordinated signal timing of existing and proposed traffic signals to permit single phase crossing of Woodward Avenue.
- At left turn signals, implement leading pedestrian intervals and/or right turn on red restrictions.

Maintenance

- Cycle tracks are a part of the transportation network, and they must be accessible year-round. Bicycle facilities must be included as priority plowing routes at the same priority as the rest of Woodward Avenue. Plowed snow should not be stored in the cycle tracks.
- Ten-foot-wide cycle tracks are compatible with narrow snow plow designs. The City of Ferndale maintenance

department (which services both cities) should plan to acquire the appropriate equipment in conjunction with the installation of the new facilities.

 Green infrastructure such as the proposed bioretention gardens also require ongoing maintenance and should be included in regular maintenance activities and budgets.

Zoning/building code changes

- The City of Ferndale is currently making updates to its zoning ordinance for access management (Article X). The updates will require that as future properties are built or updated, multiple driveways off of Woodward Avenue should be eliminated and access to businesses encouraged from the rear alleys. This will reduce the number of conflict points with vehicles crossing the cycle tracks and sidewalks. Limitations on driveways should be the strictest in the Downtown district. The proposed updates also include additional requirements for bicycle parking and access to electric vehicle parking.
- The City of Ferndale has also created a Transit Oriented Development zoning overlay for the full length of Woodward Avenue within the city limits. This will influence the future development and land use of the corridor.
- Continue to implement new land use and zoning standards that encourage a dense mix of uses along the corridor.

Education and outreach

• Produce educational materials and campaigns to educate road users about the new crosswalk alignments and two-way cycle tracks.

4.3 PARTNERSHIPS

This plan's recommendations require coordination between multiple parties for successful implementation. The following entities should be involved in the implementation of the shortand long-term recommendations of this plan.

- Cities of Ferndale and Pleasant Ridge: Lead design, implementation, and maintenance.
- Ferndale and Pleasant Ridge Downtown Development Authorities: Coordinate plan recommendations with other economic development initiatives; coordinate with businesses to fund and support improvements.
- MDOT: Provide approval for road diets and signal installation; lead roadway repaving; collaborate on signal reprogramming and implementation funding.
- SEMCOG: Facilitate coordination with connecting jurisdictions and support implementation funding.
- RTA: Collaborate on long-term implementation of recommendations in coordination with the installations of Bus Rapid Transit and budget for total right-of-way reconstruction that includes protected two-way cycle facilities on both sides of Woodward Avenue and green infrastructure improvements.

4.4 FUNDING SOURCES

Funding for bicycle and pedestrian improvements are available from federal and state sources. A selection of Michiganspecific resources are listed below. Federal grants and their applicability are included in Table 2.

Transportation Alternatives Program (SEMCOG)

TAP is a competitive grant program that funds projects, such as bicycle facilities, shared-use paths, green infrastructure, and safe routes to school. SEMCOG is expected to receive at least \$5 million for FY-2020.

Michigan Safe Routes to Schools Program

Major grants are available to help communities build sidewalks, crosswalks, and any other infrastructure improvements that may be needed to make it possible for students to walk, bike, and roll safely to school. Each year, there is up to \$200,000 available for infrastructure at each school.

4.5 ACTION PLAN

Early Actions

The Cities of Ferndale and Pleasant Ridge should leverage the upcoming MDOT milling and resurfacing project to reconfigure

Woodward Avenue through pavement markings to provide bicycle facilities protected by a parking lane buffer. To facilitate this activity, the cities should meet MDOT's Road Diet Requirements checklist through the rapid implementation of a traffic study and "interim" design for MDOT's designers and contractors to follow. This will only involve paint and more temporary materials.

Long-Term Implementation

The long-term designs assume the installation of a centeroperating bus rapid transit line along the median of Woodward Avenue. Additional traffic signals and timing, crossing islands, and other road reconfigurations should be coordinated with that project to ensure success. Long term designs represent the preferred conditions in this scenario.

4.6 MONITORING AND EVALUATION

- Ferndale and Pleasant Ridge should implement regular bicycle and pedestrian counts to observe how usage of the facilities changes over time, especially between interim and long-term recommendations.
- The cities should conduct surveys of road users similar to the Ferndale Bicycle Survey or the survey conducted for this plan to understand how the new facilities are received by residents and visitors.

Table 2: Federal Bicycle and Pedestrian Funding Sources

Facility Type	<u>BUILD</u>	<u>TIFIA</u>	<u>FTA</u>	<u>ATI</u>	<u>HSIP</u>	<u>NHPP</u>	<u>STBG</u>	<u>TA</u>	<u>RTP</u>	<u>SRTS</u>
Bicycle and pedestrian overpasses	Α	Α	Α	Α	Α	Α	Α	Α	A	Α
Bicycle parking	С	С	Α	Α	D	Α	Α	Α	Α	Α
Bicycle and pedestrian scale lighting	А	А	А	А	А	Α	А	А	А	А
Curb ramps	Α	Α	Α	Α	Α	Α	Α	Α	Α	Α
Bike lanes	Α	Α	Α	Α	Α	Α	Α	Α	D	Α
Paved shoulders	Α	Α	D	D	Α	Α	Α	Α	D	Α
Separated bike lanes	Α	Α	Α	Α	Α	Α	Α	Α	D	Α
Shared use paths	Α	Α	Α	Α	Α	Α	Α	Α	Α	Α
Signed routes	Α	Α	Α	Α	Α	D	Α	Α	Α	D
Signs and signals	Α	Α	Α	Α	Α	Α	Α	Α	Α	D
Streetscaping	С	С	С	Α	D	D	Α	Α	Α	D
Traffic calming	Α	Α	Α	Α	D	Α	Α	Α	Α	D
Shared use path bridges	Α	Α	Α	D	В	Α	Α	Α	Α	Α
Shared use path crossings	Α	Α	Α	D	В	Α	Α	Α	Α	Α
Shared use path facilities (e.g. restrooms)	С	С	С	D	D	D	D	В	В	В
Tunnels/ underpasses	Α	Α	Α	Α	В	Α	Α	Α	Α	Α

Source: Adapted from the U.S. Department of Transportation (2018),

https://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/funding_opportunities.cfm

Table Key		Program Abbreviations			
		BUILD: Better Utilizing Investments to Leverage Development			
Α	Funds may be used for this activity	TIFIA: Transportation Infrastructure Finance and Innovation Act (loans)			
		FTA: Federal Transit Administration Capital Funds			
в	See <u>program-specific notes</u> for restrictions	ATI: Associated Transit Improvement (1% set-aside of FTA)			
		HSIP: Highway Safety Improvement Program			
	Eligible, but not competitive unless part of a larger project	NHPP: National Highway Performance Program			
С		STBG: Surface Transportation Block Grant Program			
	Not eligible	TA: Transportation Alternatives Set-Aside (formerly Transportation Alternatives Program)			
D		RTP: Recreational Trails Program			
		SRTS: Safe Routes to School Program/Activities			

APPENDIX A: PUBLIC INPUT RESULTS

A survey was circulated that included a series of questions regarding users' habits and preferences for walking, biking, and driving on Woodward. Participants also had the opportunity to identify specific problem spots along the corridor and needed improvements in those areas. The survey was available between March 26 and May 30, both online and in hard copy at the Ferndale Public Library. 386 people completed the survey online, and 1 person completed the survey in hard copy. The full results of the survey are found in this appendix.





Write-in Responses
Flying
I drive a Smart Bus for Huntington Woods
Moped
Run or jog
Scooters
Uber or Lyft
driven by others



Do you or anyone in your household go to any of the following destinations on Woodward Ave between 8 Mile Road and Interstate 696?





Write-In Responses
Affirmations
Bars
Daily commute through that area in a vehicle during rush hour
traffic.
Dream Cruise. Memorial Day Parade.
Everything: library, voting, banking, visiting people, exercise,
community events, doctors office
Gym
LIBRARY
Library
Library; community meetings;
Visit friends who live in Ferndale
Visiting friends who live in the area
businesses
daily studying downtown
events, zoo
exercise - walks
gym



Write-in Responses
Visibility in turn-arounds
We need another cross walk towards Sneakers
large trucks and buses
stormwater management
too few crosswalks
wayfinding, street signs, lighting
Too few crosswalks. Visibility issues due to parked cars when pulling out of side streets. Timing of lights requires you to go over 40 to get them all green. Confusion of right of way between Turn arounds vs cars coming from side street
Too many vehicle lanes. Allows people to drive too fast
Transit service

Write-in Responses (cont.) 9 Mile crossing could be elevated? Air quality, noise, sun exposure Better use of the boulevard for additional travel or bike lanes. CONDITION OF PAVEMENT! Cars waiting to enter private businesses on woodward Fix the damn roads first before wasting money on bike lanes and tearing up the Woodward sidewalks High speed of cars. Lights that are too fast changing so you can't cross without running. I am sure this will be meaningless but who wants to live in a congested area. You need to look at the value of homes. You are create a utopia. Also this survey needs to be mailed to all residents. The questions are geared for a favorable response. I'm concerned about traffic speeds. People drive very fast through here. It's already hard to pull out from side streets with trucks parked thereyou can't see. Keeping the Free Motor Flowing Traffic Land Use Pollution Pollution Pollution, garbage, people texting while driving, people who don't know the rules of the road, drunk people driving, bikes on the sidewalk Safety of turning left in a car onto Woodward from Fielding St. Speed Sustainability The angle of Woodward crates Limited site when turning onto Woodward from a side street cars parked along Woodward. You're looking one way, edging out, when in the opposite direction there's pedestrians and bikers creating potential incidencc	
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Timing of crosswalks on Woodward Timing of lights	The angle of Woodward crates Limited site when turning onto Woodward from a side street cars parked along Woodward. You'r looking one way, edging out, when in the opposite direction there's pedestrians and bikers creating potential incidence
Timing of lights	Timing of crosswalks on Woodward
	Timing of lights



Write-in Response	Keeps me from walking	Keeps me from biking
Accompanied by young children	1	1
Aesthetics	1	1
Aggressive/speedy driving	1	1
Connectivity across 696 is loud, awkward, and feels dangerous	1	1
Crazy drivers, ugly environment (buildings, roads), horrible pedestrian crossings	1	1
Crosswalk signal timing is horrible	1	0
Distance in short period of time	1	0
Driving is faster, easier, etc.	1	1
Freezing temperatures	1	1
Health issues prevent walking and biking	1	1

Write-in Response	Keeps me from walking	Keeps me from biking
Lack of and poor walk timing of crosswalks across Woodward	1	0
Lack of destinations in Pleasant Ridge	1	0
Lack of full stop/paying attention to pedestrians by cars turning on to Woodward	1	0
More crosswalks crossing over Woodward	1	1
Narrow space between sidewalks and road, pedestrians/bicyclists and congested cars	1	1
Needing to get somewhere quickly	1	1
No separated/buffered bike lanes. Sidewalk too narrow	1	1
No shade, vehicle exhaust, traffic noise	1	1
Not enough crossovers between Pleasant Ridge and Ferndale!	1	1
PAVEMENT IN POOR CONDITION.	1	1
Panhandlers and Catcalls	1	1
Poor attention of drivers turning onto Woodward at crossings	1	0
Prefer a residential route	1	1
Recent increased personal mobility challenges (arthritis)	1	1
Sidewalk conditions	1	0
Sidewalks in poor conditions - pavers missing	1	0
Sidewalks not well maintained during winter	1	0
Small sidewalks too close to traffic in places no barriers.	1	1
Speed & volume of traffic is very loud	1	1
Speed of traffic. No barriers.	1	1
The aesthetics of parts of Woodward.	1	1
The amount of space given to personal motorized vehicles.	1	1
The traffic noise and speed is overwhelming	1	0
There is only 1 spot to cross Woodward.	1	1
Unpleasant because of sounds and noise of traffic.	1	1
Vehicle noise and exhaust fumes	1	1
disability and never learned to bike	1	1
my back and feet hurt.	1	1

Write-in Response	Keeps me from walking	Keeps me from biking
Bikers not following traffic rules	0	1
Dangerous Traffic on Woodward	0	1
Dangerous traffic and crappy roads	0	1
I am afraid to bike because of distracted drivers so I walk everywhere I can. If it is too far, I will drive. I would love to be able to bike down woodward. Also the homeless people near 8 mile are scary.	0	1
I use the alley to bike, because I rarely have to deal with Woodward traffic, only side street traffic	0	1
Lack of Connection with other communities	0	1
Lack of buffered/protected bike lanes	0	1
Lack of safe bike paths	0	1
No bike lane	0	1
Other side streets offer more direct paths to destinations and most have dedicated bike paths with less traffic	0	1
People should not be biking on Woodward. It is designed for getting across a large area quickly, not for biking, bikers would make it more dangerous and more congested.	0	1
Road conditions	0	1
Salt on the road	0	1
lack of driver awareness/child safety	0	1





Would you bike more often on Woodward Ave if any

Write-in Response	Would walk more	Would bike more
Better road conditions!	1	1
Bus lane blocked off from vehicular traffic	1	1
Calmer traffic	1	1
Considering purchasing an e-bike	1	1
Could you narrow the corridor to something more modern and functional for city wide events, foliage, open spaces etc. Widen sidewalks or even better create bike lane with barriers installed like livernois for turns keep 4 lanes each way	1	1
Create barriers between autos and walking/biking.	1	1
FIX THE POTHOLES!	1	1
If adherence to stop signs by drivers were more heavily enforced.	0	0
If the corridor was designed in a way to welcome pedestrian foot and bicycle traffic.	1	1
Jogging	0	0
Less noise, dust, debris	0	0

Write-in Response	Would walk	Would bike
•	more	more
Longer times at lights to allow people to cross without running	1	0
Personal physical capbility	1	1
Safer.	1	1
Separated from sight and noise of traffic	1	1
Slower traffic.	1	1
Somehow calming the crosswalks where the intersection has		
an angle with poor visibility from cars turning right (always	1	1
looking keft, usually crossing all four lanes). Most of the SW	1	1
and NE corners are bad like this.		
bike lane down median	1	1
Bike lanes	1	1
Curb to divide bike lane from vehicle lanes	1	1
Dedicated bike lane on woodward.	1	1
Defined bike lanes possibly on median	1	1
Designated/protected bike lanes	1	1
Don't reduce travel lanes for traffic	1	1
If I could get to downtown Detroit more easily	1	1
Improve road condition	1	1
More places to park my bike	1	1
Roads conditions are bad, and marked lanes	1	1
Safe bike paths	1	1
Safer and friendlier for bikes	1	1
Smooth bike paths off WW	1	1
Woodward is fine in its current configuration. I can walk		
wherever I wish. There are adequate crosswalks that		
facilitate crossing it. If biking, there are multiple avenues	0	0
available to me to get where I wish to. All of which get more		
congested if traffic		







Write-in response	Number
Frequency/number of crossings	36
8 mile	11
Cross streets	9
Withington	5
Vester	3
Woodward Heights	2
Pearson	2
Fielding	2
Pinecrest	1
Marshall	1
Maplehurst	1
Lewiston	1
Leroy	1
Cambourne	1
Allen	1



With what race/ethnicity do you identify?







What is your annual household income?

APPENDIX B: FERNDALE BICYCLE NETWORK



Figure 38: Ferndale Bicycle Network (Source: City of Ferndale, 2019, accessed at http://ferndale.maps.arcgis.com/apps/View/index.html?appid=0f7decffc45b4699817c31c691f21ed6)