MULTI-MODAL TRANSPORTATION PLAN

November 25, 2013

for consideration by:

City of Birmingham Michigan

submitted by:

The Greenway Collaborative, Inc.

Toole Design Group

CITY OF BIRMINGHAM MULTI-MODAL TRANSPORTATION PLAN

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*The Proposed Network Map (this is a large map) may be downloaded from the Project Webpage at http://greenwaycollab.com/Projects/Birmingham/Birmingham.html

SUPPLEMENTAL DOCUMENTS:

The following documents are not specific to Birmingham but are provided as a reference guide for continued development of bicycle and pedestrian improvements:

- Public Policy Best Practices
- Physical Environment Best Practices
- Community Program Best Practices
- Quality of Life Best Practices

WHY PLAN FOR MULTI-MODAL TRANSPORTATION?

The City of Birmingham's Multi-modal Transportation Plan and Appendix fills over 470 pages. This begs the question, what is the problem that warrants such attention? And as a follow-up question, do the benefits of the proposals outweigh the costs? While a full blown cost benefit analysis is outside of the scope of this project the following provides a brief overview of the rationale behind the plan.

THE COST OF DOING NOTHING

From 2004 through 2011 automobiles struck 67 pedestrians and 44 bicycles in the City of Birmingham. That works out to be over one crash each month. Each crash results in a tremendous physical and emotional toll on the person hit and their families. There is also an emotional toll on the drivers of vehicles that hit the pedestrians and bicyclists.

Beyond the emotional and physical costs of each crash there is an economic cost. The National Safety Council (NSC) makes estimates of the average economic costs of fatal and nonfatal injuries. The NSC considers the calculable costs of crashes are wage and productivity losses, medical expenses, administrative expenses, vehicle damage and employer's uninsured costs. When doing a cost benefit analysis for a transportation project, the NSA states that one must look beyond those costs and take into account a measure of the value of lost quality of life. The NSC uses figures based on empirical studies to determine the more inclusive average comprehensive cost. Using NSC's average comprehensive costs figures from 2011, the comprehensive cost of those 111 pedestrian and bicycle crashes over that 8 year period is nearly 17 million dollars. This works out to be 2.1 million dollars a year or $104 per resident each year. See the Appendix pages D21 and D33 for a detailed breakdown of the costs.

The total cost of Phase 1 and 2, which will together yield a substantial system, is about 2.3 million dollars. This is not to say that when completed, the plan will eliminate all crashes, but the recommendations are based on proven safety countermeasures. If the completion of Phase 1 and Phase 2 were to take a total of 8 years and reduce the crash rates by as little as 14%, the project would be viewed as a success from a cost benefit perspective.

THE COST OF PHYSICAL INACTIVITY

According to 2010 data from the Center for Disease Control and Prevention over 1/3 of Metro Detroit's residents are overweight, another 1/3 are classified as obese and 28% reported doing no physical activity or exercise in the past 30 days. One of the largest costs associated with physical inactivity is the loss of productive hours for workers. In 2003, a study was conducted titled *The Economic Cost of Physical Inactivity in Michigan*. It looked at the costs associated with the health effects of physical inactivity including its contribution to cardiovascular disease, obesity, diabetes, osteoporosis, mental health disorders and some cancers. The study found that on average physical inactivity cost each Michigan adult resident $1,175 in 2002 dollars.

There has been a growing body of research that shows that the physical environment of a community has a direct impact on the physical activity levels of its residents. Active Living Research has compiled research that shows that public transit users take 30% more steps per day than people who rely on a car and that people who live in neighborhoods with sidewalks on most streets are 47% more likely to be active at least 30 minutes a day.

PREPARING FOR AN AGING POPULATION

SEMCOG's Community Profile of Birmingham shows that there was a 2.3% increase in residents 65 and older from 2000 to 2010. Seniors 65 and older now comprise just under 14% of the City's population. Yet, in the City, drivers 65 and older are involved in 28% of all crashes. Between 2010 and 2040 the population 65 and older is expected to increase to over 59% and seniors will make up 20% of the total population of the City. As the population gets older strategies need to be employed to address both the particular needs of senior drivers and enhance the mobility of those who no longer have the option to drive.

Improvements to the pedestrian environment such as crosswalks that are shorter in length, more conveniently located and improve visibility between motorists and pedestrians provide viable options for independent mobility for seniors. Better access to transit accompanied by more amenities and information at transit stops help make a bus trip a more attractive option for seniors who are more accustomed to driving themselves. Converting roadways from 4 lanes to 3 lanes make left turns easier for seniors by improving sight lines between drivers and conflicting oncoming traffic.

POSITIONING BIRMINGHAM FOR THE NEW ECONOMY

SEMCOG's Community Profile of Birmingham also shows a massive decline in 25 to 39 year old residents between 2000 and 2010; a loss of a total of 1,131 young adults in the span of only 10 years. This does not bode well for the long-term prosperity of the City of Birmingham.

Michigan State University's Land Policy Institute's Growth Study found that communities should be targeting educated youth along with high-equity immigrants, educated senior citizens and entrepreneurs as a means to attract economic growth. The Growth Study found that placemaking, including vibrant downtowns, green infrastructure, pedestrian and bicycle linkages and transit are key to attracting this demographic. The study found that these knowledge workers are especially mobile and make location choices based on the quality of a place more than job availability.

A PROJECT TAILORED TO BIRMINGHAM

This plan builds upon the City of Birmingham's brand as "A Walkable Community." 90% of the cost of proposed improvements in Phase 1 and Phase 2 are for pedestrian improvements. These include providing more convenient and safer road crossings, addressing gaps in the sidewalk system and wayfinding improvements. The result will be a dramatic improvement in pedestrian mobility for all ages in the initial stages of the project.

The proposed bicycle system offers ways for bicyclists of all ages and abilities to access key destinations. Cyclists will have the option to use a low-stress network that utilizes low-speed local roads and connecting pathways guided by wayfinding signage. Or they may choose more direct routes using accommodations such as bike lanes and shared lane markings on busier roadways. Their choice will likely vary based on their age, skills, current conditions and the nature of their trip. The complementary bicycle networks, while extensive, are accomplished in an economical manner by making the most of existing infrastructure and by applying low-cost road modifications.

The improvements to the pedestrian and bicycle networks are coordinated with the transit system making it easier to access transit stops and get to the opposite side of the road at a stop. For transit routes with the highest volume of users, bus shelters are proposed and basic improvements are proposed to transit stops throughout the system.

ECONOMICAL IMPLEMENTATION THROUGH LONG-RANGE PLANNING

While the cost of the proposed improvements has been identified as part of this project, the reality is many of the proposed improvements will be integrated into larger road construction projects. This is by far the most economical approach to completing the system and many of the costs will be incidental to the larger projects. By having a comprehensive plan, multi-modal elements can be integrated into typical street projects at a project's inception. The plan outlines an approach to make sure that all roadway users perspectives are addressed at the earliest stages of a project which may preceded construction by a few years.

Also, by taking a comprehensive look at the City, recommendations for particular corridors are made based on a system perspective rather than in a piecemeal approach. This allows for project phasing that focuses on establishing foundation system that crisscrosses the City that will be completed in the early stages.

HOW TO USE THE MASTER PLAN

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

But it should be recognized that it is still a master plan level document and that every nuance of each street and all of the intersections cannot be effectively addressed at a city-wide scale. It should also be recognized that multi-modal transportation planning and design is a rapidly changing field. New design ideas and research is becoming available almost on a monthly basis. Across the country, there has been a marked increase in demand for high quality (and high cost) multi-modal transportation options accompanied by greater willingness to pay for the improvements.

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

INTRODUCTION

The City of Birmingham's Multi-Modal Transportation Plan presents 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 or take transit. The plan looks at how the City of Birmingham may transform its streets into outstanding attractive public spaces that are even friendlier to pedestrians, integrate facilities bicyclists and transit users while continuing to serve the needs of motorized traffic. Once implemented, the proposed improvements will help the City of Birmingham continue to be an attractive place to live, work, and play and be enhance its desirability among educated youth, entrepreneurs and senior citizens.

Many of the improvements are designed to accomplish multiple goals. For example, improvements for pedestrians on Lincoln Street are also are designed to lower traffic speeds to a level appropriate to the residential nature of the roadway and enhance the appearance of the corridor. The proposed 4 to 3 lane conversions are proven to provide dramatic increases in motorized traffic safety and reduce excessive speeding all while providing space for bike lanes and crossing islands for pedestrians. Wayfinding signs are designed for both bicyclists and pedestrians and promote the idea of walking and bicycling to specific destinations in town. Proposed improvements to Woodward Avenue are designed not only to provide safe and convenient facilities for pedestrians, bicyclists and transit users, but also to help create a sense of place that will enhance the property values along the corridor.

Together, the proposed improvements to the pedestrian, bicycle and transit environments will provide residents and visitors additional viable transportation choices. Communities around Michigan, the US and the world that have invested in multi-modal facilities have experienced a significant increase in the number of people who walk, bicycle and take transit. Birmingham's vibrant downtown surrounded by close-in residential areas on a tight grid of streets provides an enviable foundation to build upon. Most residents are within convenient walking and bicycling distant to the majority of destinations in the City. This plan provides the guidance on how to capitalize on that good fortune and make Birmingham not simply a walkable community, but an outstanding walkable, bikeable and transit friendly community.

BACKGROUND

The City of Birmingham has a population of 20,103 residents (according to the 2010 US Census) and is approximately 4.8 square miles. The city is centrally located within the region with a vibrant downtown, wide range of housing opportunities, strong commercial corridors and has distinguished itself as a "walkable community."

Birmingham offers tremendous potential for non-motorized and multi-modal travel. In October 2011, the City passed a Complete Streets resolution and in January 2012 the Birmingham City Commission identified the need to develop a comprehensive city-wide document that clearly defines a vision for multi-modal travel and provides recommendations based on current best management practices for realizing the vision. This plan is intended to define the City's future transportation needs and goals, guide the implementation of best practices for multi-modal travel and ensure these improvements are routinely considered in all public infrastructure projects.

To help guide this project, an Advisory Committee was established that included representatives from different stakeholder groups in the community which included members of City staff, Police Department, The Birmingham School District, Parks and Recreation, Planning Board, Principal Shopping District Board, Traffic and Safety Board, Advisory Parking Committee and individuals representing pedestrians, bicyclists, transit users, seniors and the physically handicapped. Those individuals were chosen because they were knowledgeable of the issues and could influence change.

INTRODUCTION

1.1 BENEFITS OF A MULTI-MODAL TRANSPORTATION PLAN

A multi-modal system based on best practices is of paramount importance to the health, safety and general welfare of the citizens of Birmingham. The benefits of a multi-modal system extend beyond the direct benefits to the users of the system but to the public as a whole. A well-implemented multi-modal system will reap rewards by:

- Providing viable transportation alternatives for individuals who are capable of independent travel yet do not hold a driver's license or have access to a motor vehicle at all times.
- Improving safety, especially for the young and old who are at most risk due to their dependence on non-motorized facilities and their physical abilities.
- Improving access for the 19% of all Americans who have some type of disability and the 13% of all Americans who have a severe disability.[1]
- Improving the economic viability of the community by making it an attractive place to locate a business while simultaneously reducing public and private health care costs associated with inactivity.
- Encouraging healthy lifestyles by promoting active living.
- Reducing the water, air, and noise pollution associated with automobile use by shifting local trips from automobiles to walking, bicycling or transit.
- Improving the aesthetics of the roadway and community by adding landscaping and medians that improve the pedestrian environment and safety.
- Providing more transportation choices that respect an individual's religious beliefs, environmental ethic, and/or uneasiness in operating a vehicle.
- Reducing the need for parking spaces.
- Creating a stronger social fabric by fostering the personal interaction that takes place while on foot, bicycle or using transit.
- Reducing dependence on and use of fossil fuel with the resulting positive impact on climate change.

Improvements to multi-modal facilities touch all individuals directly, as almost all trips begin and end as a pedestrian.

[1] Americans With Disabilities: 2010 Household Economic Studies, US Census Bureau

1.2 PLANNING PROCESS

The planning process was a multi-step effort led by the Steering Committee and shaped by public input. The planning process for the Multi-Modal Transportation Plan included the following major tasks:

- Inventory and Analysis of the existing transportation environment
- Review of other projects and studies that were relevant to the planning process
- Public Engagement in the form of two public workshops, a project website and a web based survey
- Monthly meetings with the Steering Committee
- Four meetings with the City Commission to update them on the progress of the project
- Development of a project vision, goals and objectives
- Identification of opportunities and determination of potential facilities
- Recommendations to provide a spectrum of facilities that provide a multi-modal network throughout the City for a variety of users
- Recommendations for the priority public policies, physical environment improvements, community programs and quality of life outcomes
- Identification and recommendations for transit facilities and amenities
- Development of an Implementation Action Plan that identified priority routes and phasing
- Providing planning level cost estimates for the first two phases
- Crafting a Multi-Modal Transportation Report and Network Map
- Approval by the City Commission for the adoption of the Multi-Modal Transportation Plan

The planning process took 14 months to complete, beginning in September 2012.

INTRODUCTION

1.3 PUBLIC ENGAGEMENT

OVERVIEW

Helping to shape this plan, has been a dedicated group of elected officials, appointed officials, public employees and the general public. The results of a web survey and the input gathered at two public workshops guided the proposed multi-modal network as well as setting implementation priorities. The public engagement process was designed to ensure that the City of Birmingham's Multi-Modal Transportation Plan reflects a shared vision supported by the community at large as well as the key stakeholders. The following pages give an overview of the public engagement process for this project.

PROJECT WEBSITE

A project website was created to help keep the public informed during the project. The website included an overview of the project, project schedule, links to surveys, survey results, presentations, meeting summaries and draft project documents. The project website can be found at: http://www.greenwaycollab.com/Projects/Birmingham/BMMTP.html

STAKEHOLDER KICK-OFF MEETING

The kick-off meeting for the project consisted of a selected group of stakeholders including the Steering Committee and members of City staff. The meeting included a presentation of best practices, a downtown walking audit and around town bicycling audit. The purpose of the meeting was to immerse the stakeholder group in the issues that they would be addressing over the course of the project and to create excitement about the effort that would spread beyond the initial stakeholder group.

WEB SURVEY

The first major public engagement effort was a web survey. The web survey was helpful as it permitted input from a large number of people who were not able or inclined to come to one of the public workshops. The web survey was available for two weeks at the end of October. 550 people began the survey and 429 completed the entire survey. The survey included both multiple choice selections as well as open-ended questions and collected information from the participants on a wide range of topics including, general information about the survey respondent, non-motorized travel, travel to school, public transit and project hopes and concerns. The information from the survey was used to guide the analysis as well as draft goals and objectives. Survey results can found in the Appendix.

Photo's courtesy of Carroll DeWeese

PUBLIC VISIONING WORKSHOP

A Public Visioning Workshop was held on January 17, 2013 from 7:00pm to 9:00pm at the Baldwin Public Library. Forty-three people were in attendance. During the workshop, participants were given the opportunity to give input through a variety of individual and group exercises. The workshop began with an overview of best practices and web survey results and then a role playing exercise was conducted to get people to look at non-motorized and multi-modal transportation from a variety of perspectives. Following the role playing exercise there were a number of different exercises that focused on major and minor corridor evaluations, Downtown Birmingham, Woodward Avenue, and neighborhood connector routes and trail connections. The project vision, goals and objectives were also introduced and participants were asked to complete a short web survey that was available for one week after the workshop. Results from the Public Visioning Workshop can found in the Appendix.

PRELIMINARY PLAN OPEN HOUSE

A Preliminary Plan Open House was held on February 28, 2013 with two identical sessions held from 3:00pm to 5:00pm and from 7:00pm to 9:00pm at the Baldwin Public Library. The total attendance for both sessions was thirty-seven people. Each session began with a short presentation of the preliminary plan recommendations. Following the presentation, stations were set-up around the room where participants could provide feedback and agree or disagree with other participant's comments to help build a consensus. Results from the Preliminary Plan Open House can be found in the Appendix.

INTRODUCTION

1.4 VISION, GOALS AND OBJECTIVES

OVERVIEW

The following vision, goals and objectives were developed to guide the development of the plan. They evolved through an extensive public involvement process that began with a web survey that was completed by 429 people. Participants were asked to individually list their top three desired project outcome. From this visioning process the project team found that the desired "outcomes" of the plan fell into the following general categories:

- Pedestrian & Bicycle Friendly Community
- Increase in Alternative Transportation
- Safety
- Inclusive Multi-Modal System

Using the survey input as a guide, the project team developed goals and objectives for the plan that would deliver these outcomes. The vision, goals and objectives were then presented at the public visioning workshop and participants were asked to complete a short web survey to indicate their agreement or disagreement and offer modifications to improve them. Public input was incorporated as appropriate and the following vision, goals and objectives resulted.

COMMUNITY VISION:

The City of Birmingham seeks to build upon its brand as a walkable community. The purpose of this plan is to provide a document that the Community may reference when contemplating future actions regarding infrastructure, policies and programs.

It is envisioned that this plan will guide improvements designed to give people additional transportation choices, thereby enhancing the quality of life in the City of Birmingham.

GOAL ONE: COMPLETE THE INFRASTRUCTURE

Provide an appropriate balance between motorized and non-motorized methods of transportation.

OBJECTIVES:

a. Expand the infrastructure as necessary to create a more pedestrian, bicycle and transit friendly community
b. Provide convenient and appropriate road crossing opportunities for pedestrians and bicyclists
c. Provide additional and enhanced bicycle parking options
d. Enhance transit amenities (e.g. shelters, benches, information resources, etc.) including appropriate pedestrian and bicycle connections to the transit facilities

GOAL TWO: A CONNECTED COMMUNITY

Create a greater sense of community by improving and increasing the opportunities for social interactions between those walking, bicycling and taking transit.

OBJECTIVES:

a. Increase the number people walking, bicycling and taking transit, especially for daily transportation trips such as commuting to work and running errands
b. Increase the number of children walking and bicycling to school

GOAL THREE: INCLUSIVE TRANSPORTATION SYSTEM

Develop a multi-modal system that respects the unique needs of all different users.

OBJECTIVES:

a. Reduce negative and dangerous interactions between motorists, transit users, bicyclists and pedestrians
b. Enhance the ability for youth, seniors and persons with physical and/or cognitive challenges to travel throughout the community independently
c. Develop strategies to educate all transportation system users to create an atmosphere of respect among all travelers

Together, the three goals will combine to enhance the safety of the citizens and visitors of Birmingham through appropriate infrastructure, safety in numbers and a greater understanding among all users of the City's transportation system.

INTRODUCTION

1.5 INVENTORY AND ANALYSIS

OVERVIEW

The inventory and analysis process provided a detailed assessment of the existing multi-modal environment including current policies, programs and statistics. A thorough understanding of the existing conditions helps to identify what multi-modal improvements are possible and appropriate.

The following inventory and analysis assessments were conducted:

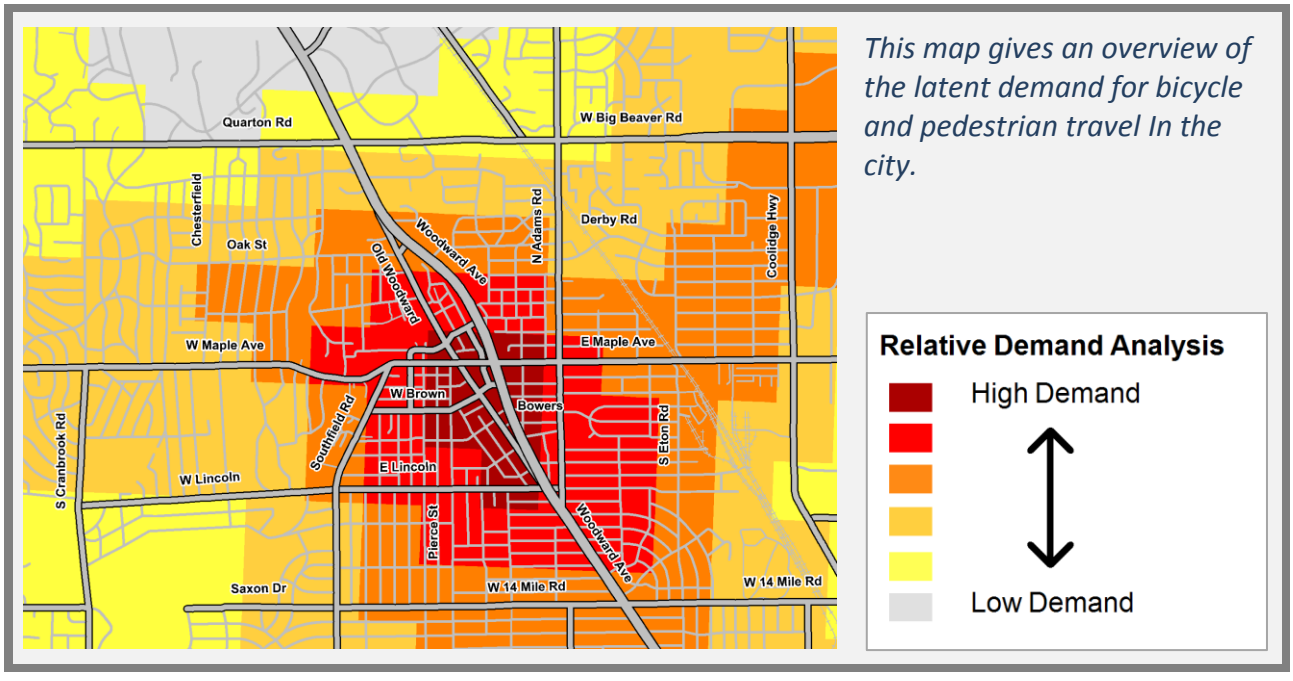
- Evaluation of the existing roadway system including, road width, number of lanes, speed limit and the resulting bicycle level of service and pedestrian road crossing difficulty
- Evaluation of the existing sidewalk completeness, placement and buffer conditions and the resulting sidewalk level of service
- Documentation of the location and type of existing pedestrian crosswalks and the resulting crosswalk spacing analysis
- Documentation of off-road trail system
- Evaluation of the primary road system to determine the degree to which the roads are capable of incorporating bicycle lanes via, lane narrowing, 4 to 3 lane conversions, paved shoulders and other roadway reconfigurations and an assessment of the resulting implications of the roadway modifications options to motor vehicle LOS
- Evaluation of the existing SMART bus stops
- Preparation of a relative demand model that considered block size, population density, job density, access to transit, land use diversity and activity generators, to contrast system deficiencies against demands as well as help priority improvements
- Evaluation of the urban form including a block size analysis
- Evaluation of bicycle and pedestrian crashes
- Evaluation of existing access issues related to ADA
- Evaluation of eight intersections identified by the City
- Evaluation of the current public policy issues
- Existing community program assessment
- Review of existing plans from the City of Birmingham, Oakland County, Woodward Corridor and adjacent communities and townships

A detailed report of the inventory and analysis for the physical environment is provided in the Appendix.

KEY FINDINGS

The following are some of the key findings that influenced the development of the Bicycle & Pedestrian Plan:

- The City is characterized by a central located vibrant downtown, wide range of housing opportunities, strong commercial corridors and high density development well served by public amenities.
- The City has a dense urban grid with a nearly complete sidewalk system that contributes to a bicycle and pedestrian friendly community.
- Beyond the Rouge Trails, which are mainly used for recreational use, there are limited transportation facilities for bicyclists in the City.
- Opportunities to cross busy roads are limited with poor bicycle and pedestrian connectivity between neighborhood and destinations that are located on opposite of the roadway; this is especially true for Woodward Avenue.
- Only a small percentage of Birmingham residents currently use transit in the City of Birmingham. SMART provides bus service along the primary arterials with limited service on the weekends. Amtrak service is available in the Rail District with a new Intermodal Transit Center planned in Troy.
- Based on the web survey and relative demand analysis, Downtown Birmingham has a high latent demand for bicycle and pedestrian travel.
- Speeding is an issue on some of the collector roads such as Lincoln and Eton.



This map gives an overview of the latent demand for bicycle and pedestrian travel In the city.

INTRODUCTION

1.6 PROJECT APPROACH

The purpose of the Multi-Modal Transportation Plan is to identify the means to establish a physical and cultural environment that supports and encourages safe, comfortable and convenient ways for a wide spectrum of pedestrians, bicyclists and transit users to travel throughout the City and into the surrounding communities all while respecting the need to maintain an appropriate level of service for motorized transportation. It is anticipated that the physical and cultural changes will result in a greater number of individuals choosing walking, bicycling and transit as their preferred mode of transportation for many local trips. These choices will in turn lead to healthier lifestyles, improved air and water quality, and a more energy efficient and sustainable transportation system.

The project approach is based on three essential elements that create quality of life as they influence the number of people who walk, bike and take transit: Public Policies, the Physical Environment and Community Programs. The graphic on the previous page shows the key issues within these three elements and the culminating in quality of life outcomes that will be the ultimate measure of the project's success.

PROPOSED RECOMMENDATIONS

The following chapters of this plan focus on the priority near-term improvements that were identified for public policies, physical environment, community programs and quality of life outcomes.

It should be noted that the purpose of this plan is to provide a general background on the issues of multi-modal transportation as well as to present a proposal on how to address the issues through specific policies, programs, and design guidelines for facility improvements. This is not intended to be a replacement for the *AASHTO Guide for the Development of Bicycle Facilities*, *AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities, AASHTO Guide for Achieving Flexibility in Highway Design,* USDOT's *Designing Sidewalks and Trails for Access – Part II, Best Practices Design Guide*, *Accessible Public Right-of-Way, Planning and Designing for Alternations*, the *Revised Draft Guidelines for Accessible Public Rights-of-Way*, *Manual of Uniform Traffic Control Devices*, *Michigan Manual of Uniform Traffic Control Devices* or any other applicable federal, state, or local guidelines. Rather, it is intended as a synthesis of key aspects of those documents and to provide an interpretation on how they may be applied in typical situations in the City of Birmingham. Given the evolving nature of multi-modal transportation planning, these guidelines should be periodically reevaluated to determine their appropriateness.

MASTER PLAN LEVEL RECOMMENDATIONS VS. DETAILED AREA STUDIES AND DESIGNS

The facility recommendations within this plan represent a Master Plan level evaluation of the suitability of the proposed facilities for the existing conditions. Prior to proceeding with any of the recommendations in this report, a more detailed corridor level assessment or traffic study should be done in order to fully investigate the appropriateness of the proposed roadway modifications and/or proposed bicycle, pedestrian or transit facilities.

INTRODUCTION

1.7 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:

AASHTO – American Association of State Highway & Transportation Officials.

Bicycle Boulevard - a low-volume and low-speed street that has been optimized for bicycle travel through treatments such as traffic calming and traffic reduction; signage and pavement markings; and intersection crossing treatments.

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. Examples can be found on portions of South Lake Drive, East Lake Drive and Taft Road.

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.

Bulb-outs – see Curb Extensions.

Clear Zones – area free of obstructions around roads, Shared-use Paths, and Walkways.

Clearance Interval – the flashing "Don't Walk" or flashing "Red Hand" phase of pedestrian signals. It indicates to pedestrians that they should not begin to cross the street. A correctly timed clearance interval allows a pedestrian who entered the crosswalk during the "Walk" phase to finish crossing the street at an unhurried pace.

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. A crossing island may be located at signalized intersections and at unsignalized crosswalks. These are also known as **Refuge Islands.**

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.

Curb Extensions – extending the curb further into the intersections in order to minimize pedestrian crossing distance, also known as **Bulb-outs**.

Dispersed Crossing – where pedestrians typically cross the road at numerous points along the roadway, rather than at an officially marked crosswalk.

E-Bike – a bicycle that is propelled by an electric motor and/or peddling.

Fines – finely crushed gravel 3/8" or smaller. The fines may be loosely applied or bound together with a stabilizing agent.

Inside Lane – the travel lane adjacent to the center of the road or the Center Turn Lane.

Ladder Style Crosswalk – a special emphasis crosswalk marking where 1' to 2' wide white pavement markings are placed perpendicular to the direction of a crosswalk to clearly identify the crosswalk.

Lateral Separation – horizontal distance separating one use from another (pedestrians from cars, for example) or motor vehicles from a fixed obstruction such as a tree.

Leading Pedestrian Interval –a traffic signal phasing approach where the pedestrian "Walk" phase precedes the green light going in the same direction by generally 4 to 5 seconds.

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. Additional studies will need to be completed for each location to determine the ultimate suitability as a crosswalk location and appropriate solution to address the demand to cross the road.
Mid-block Crosswalk – a crosswalk where motorized vehicles are not controlled by a traffic signal or stop sign. At these locations, pedestrians wait for a gap in traffic to cross the street, motorists are required to yield to a pedestrian who is in the crosswalk (but not if the pedestrian is on the side of the road waiting to cross).

MMUTCD – Michigan Manual of Uniform Traffic Control Devices. This document is based on the National Manual of Uniform Traffic Control Devices (MUTCD). It specifics how signs,

pavement markings and traffic signals are to be used. The current version is the 2005 MMUTCD. It was adopted on August 15, 2005 and is based on the 2003 National MUTCD. In 2009 a new National MUTCD was adopted, the state has two years to adopt the national manual. Typically, there are only minor divergences between the two manuals due to specifics in Michigan traffic laws.

Mode-share / Mode split – the percent of trips for a particular mode of transportation relative to all trips. A mode-share / mode split may be for a particular type of trip such as home-to-work.

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

MVC – Michigan Vehicle Code, a state law addressing the operation of motor vehicles and other modes of transportation.

Near-term Opportunities –improvements that may generally be done with minimal changes to existing roadway infrastructure. They include road re-striping projects, paved shoulders, new sidewalks and crossing islands. In general, existing curbs and drainage structures are not changed.

Neighborhood Connector / Neighborhood Greenway – a route that utilizes residential streets and short connecting pathways that link destinations such as parks, schools and **Shared Use Paths**. Neighborhood Greenways may contain the characteristics of a **Bicycle Boulevard** but, in addition, provide accommodations for pedestrians and sustainable design elements such as rain gardens.

Out-of-Direction Travel – travel in an out-of-the-way, undesirable direction.

Outside Lane – the travel lane closest to the side of the road.

Off-road Trail – see Shared Use Path

Pedestrian Desire Lines – preferred pedestrian direction of travel.

Pedestrian Hybrid Beacon –a warning device used at crosswalks to bring motorized traffic to a stop and allow pedestrians to cross the street. The beacon rests “dark” with no display. Traffic is brought to a stop by a sequence of a flashing amber light, followed by a solid amber light and finally a solid red signal at which point the pedestrian is given a “Walk” indication. When the pedestrian sees the flashing “Don’t Walk,” motorists see a alternating red signal indicating that they may proceed if the crosswalk is clear.

Refuge Islands – see Crossing Islands.

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. Also known as an Active Warning Beacon.

Roundabouts – yield-based circular intersections that permit continuous vehicle travel movement.

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 alerts 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 including Sidewalk Bikeways that have unique characteristics and issues. An example of a Shared Use Path would be the I-275 Metro Trail.

Roadside Pathway – a specific type of Shared Use Path that parallels a roadway generally within the road right-of-way. This is also known as a **Sidepath**.

Signalized Crosswalk – a crosswalk where motor vehicle and pedestrian movements are controlled by traffic signals. These are most frequently a part of a signalized roadway intersection but a signal may be installed solely to facilitate pedestrians crossings.

Speed Table – raised area across the road with a flat top to slow traffic.

UTC – Uniform Traffic Code, is a set of laws that can be adopted by municipalities to become local law that address the operation of motor vehicles and other modes of transportation. The UTC is a complementary set of laws to the MVC.

Yield Lines – a row of triangle shaped pavement markings placed on a roadway to signal to vehicles the appropriate place to yield right-of-way. This is a new pavement marking that is used in conjunction with the new "Yield to Pedestrians Here" sign in advance of marked crosswalks.

CHAPTER 2

POLICY AND PROGRAM RECOMMENDATIONS

Policies have a direct impact on the physical environment and programs influence how the physical environment is used and success measured. Based on input from the Steering Committee, City Staff and the public engagement efforts the following policies, programs and quality of life measurements were found to be of high priority for the City of Birmingham.

It is recommended that the City focus on implementing these policies in the near-term. Every few years these public policy improvements should be re-evaluated to determine their progress and if there is a new policy the City should focus on. The following pages give a detailed overview of the priority public policies and the steps that need to be taken to bring them to fruition.

TOPICS:

POLICY AND PROGRAM RECOMMENDATIONS

2.1 TRANSPORTATION PROJECT COORDINATION & PUBLIC INPUT

DESCRIPTION

All transportation projects within the public right of way and off-road trails require oversight from multiple departments and public input from numerous perspectives.

A system should be put in place that upon initiation of any transportation project, a formal coordination procedure between engineering, planning and public safety is launched. This would include an initial project scoping meeting that addresses all of the complete streets principles.

In addition, a standing committee that has representation from a diverse range of travel modes, age groups and mobility issues should be established. The purpose of the group would be to provide design and planning input during the earliest stages of the project prior to the preparation of engineering drawings. This group would reference this plan and others in the review of any transportation project. It is envisioned that the committee would provide formal recommendations to the Planning Board and/or City Commission regarding specific projects.

RECOMMENDATIONS

In 2011, the City of Birmingham passed a resolution of support for Complete Streets. To further the City of Birmingham's complete streets policy the following procedures are recommended:

- ☐ Set up a system for interdepartmental coordination between engineering, planning and public safety for all transportation projects.
- ☐ The interdepartmental group should use tools such as the 2010 Highway Capacity Manual to do multi-modal evaluations of alternatives.
- ☐ The interdepartmental group should develop a multi-modal checklist for projects that considers multi-modal issues such as pedestrian access along and across the roadway, variety of bicycle types along and across the roadway, transit, accessibility and visibility.
- ☐ The interdepartmental group should coordinate with non-governmental agencies on the implementation of the *Recommended Community Partner Programs* (See the Appendix for recommendations).

☐ Form a standing committee that has representation from the following perspectives:

- School District Representative
- Business Representative
- Pedestrian Representative
- Bicycle Representative
- Transit Rider Representative
- Representatives of the elderly/mobility/vision impaired community
- Representative under 35 year olds
- Traffic Representative
- Planning Board Representative

As a result, this committee would have a similar composition to the steering committee assembled for this project and may be a direct outgrowth of that group.

EXPECTED TIME FRAME FOR IMPLEMENTATION

Within One Year:

☐ Form the City Council appointed committee.

☐ Set in place interdepartmental coordination procedures for all transportation projects and develop multi-modal checklist

Within Three Years to Five Years:

☐ Review the effectiveness of interdepartmental coordination procedures and committee composition and function and make change as needed

RESPONSIBLE FOR MAKING IMPROVEMENTS: DIRECTORS OF PLANNING & ENGINEERING DEPARTMENTS AND CHIEF OF POLICE.

Complete Streets Policies:

- Michigan Complete Streets Legislation (Public Acts 134 and 135) signed in 2010
- The City of Birmingham passed a resolution of support for Complete Streets in 2011
- Oakland County Commission passed a Complete Streets resolution in 2011
- The Road Commission for Oakland County accepted a set of Complete Streets Guidelines in 2012
- The State Transportation Commission officially adopted a Complete Streets policy in 2012

2.2 BICYCLE PARKING

DESCRIPTION

The lack of a secure parking space discourages many people from using their bikes for basic transportation. When sufficient bike parking is not provided, theft becomes a concern and it leads to bike being locked up to sign posts, trees, benches and other street furniture. When bicycles are parked in these spaces they often disrupt pedestrian flow because the bikes impede the walkway. Bicycles also get impounded by local enforcement when parked in these areas causing an even greater deterrent to bicycle use. Bicycle parking needs to be visible, accessible, plentiful and convenient. If any of these criteria are not met, there is a good chance a cyclist will not use the facilities and will park their bike wherever they feel it will be safest.

Definition of a Bicycle Parking Space- A bicycle parking space is an area two feet by six feet or the area occupied by a bicycle when using a bicycle parking device as designed.

Short-Term Bicycle Parking - Short-term bicycle parking is defined as a rack to which the frame and at least one wheel can be secured with a user-provided U-lock or padlock and cable. This type of parking is appropriate for short term parking at locations such as shopping areas, libraries, restaurants and other places where typical parking duration is less than two hours. In 2012 the City of Birmingham put in an extensive number of short-term bicycle parking hoops in the downtown.

Long-Term Bicycle Parking- A long-term bicycle parking space is defined as protecting the entire bicycle and its components from inclement weather and theft or vandalism. It is to be located where it will serve the needs of cyclists who need to leave their bicycles unattended for extended periods of time, such as employees, tenants or residents.

RECOMMENDATIONS

The City should update the code to include bicycle parking requirements and design standards. The following is a checklist of key policies that should be included:

- ☐ Require a minimum number of bicycle parking spaces at each commercial or multi-family development.

- ☐ For multi-family dwellings require a number of the bicycle parking spaces to be covered
- ☐ Incentives should be provided to commercial and multi-family dwellings for providing covered and/or secured bicycle parking (e.g. reduction of vehicular parking and/or density bonus could be offered)
- ☐ Require bicycle parking facilities to be credited toward provision of motor vehicle parking. For example, each ten required bicycle parking spaces, or fraction thereof, may be substituted for one code required motor vehicle parking space
- ☐ Require hoops on every block with retail in a downtown/commercial zone
- ☐ Provide secured and covered in downtown parking public garages as demand dictates. The cost for such should be offset by a monthly user fee. See specific area recommendations for more details.
- ☐ Provide a reference or graphical design guidelines with information on the specifics of bicycle rack design and placement. The Association of Pedestrian and Bicycle Professionals publishes a Bicycle Parking Guideline that serves as a good model and may be found at: http://www.apbp.org/resource/resmgr/publications/bicycle_parking_guidelines.pdf

For examples of bicycle parking ordinances check out the City of Ann Arbor at, http://www.a2gov.org/government/city_administration/city_clerk/ordinances/Pages/Online%20City%20Code.aspx and the City of Lansing at, http://www.lansingmi.gov/clerk/city_charter_&_ordinances.jsp

The City of Ann Arbor also provides a bike parking guide for businesses considering the installation of bike facilities at, http://www.a2gov.org/government/publicservices/systems_planning/Transportation/Documents/BikeParkingGuide_Sep08.pdf

EXPECTED TIME FRAME FOR IMPLEMENTATION

Within One Year:

- ☐ Update the local government code to include bicycle parking requirements and design standards

Within Three Years:

- ☐ Implement the bicycle parking requirements and design standards

RESPONSIBLE FOR MAKING IMPROVEMENTS: PLANNING DEPARTMENT

2.3 SNOW REMOVAL

DESCRIPTION

People who rely on non-motorized transportation as a means of travel are often at the mercy of the weather, especially in the winter. In many communities the current practices of snow removal on sidewalks, curb cuts and crossing islands make large portions of the City impassible to many mobility impaired pedestrians as well as those pushing strollers or grocery carts.

Just as important for roads to be cleared for automobiles, it is important for sidewalks to be cleared for pedestrians. If the sidewalks are not cleared, many times pedestrians will use the cleared roadways instead of the sidewalk, presenting a dangerous situation for both cars and pedestrians.

Areas of special concern are curb ramps at intersections and pedestrian crossing islands. Generally, crossing islands are not the responsibility of adjacent property owners, so they require clearing by City staff. Additional attention may be needed to identify "orphan" areas, such as bridges, crossing islands and other pubic rights-of-way to ensure that these areas are cleared by the appropriate agency.

Many northern cities around the globe maintain excellent facilities for non-motorized travel in the winter. For example Boulder, Colorado and Madison, Wisconsin have significant amounts of snow each winter (Boulder – 60", Madison – 42"). Both of these cities have high bicycle mode-shares. Minneapolis and Madison have higher bicycle commuting rates than San Diego.

Web Survey Results:
Snow and ice removal from sidewalks and pathways was ranked third highest (65.8%) when asked what was most important to making future non-motorized trips actually happen

KEY PROGRAMS TO CONTINUE

The City of Birmingham currently has a snow removal policy in place. Property owners are responsible for the snow removal on the sidewalk adjoining their property within 12 hours after snow or ice ceases to fall or form during daylight hours or by 6:00 pm the following day if it ceases to fall or form during the nighttime. If it becomes necessary to immediately remove accumulations of snow and ice for the health, safety and/or welfare of the public by the City then the expense of clearing will be billed to the owner or occupant of the lot.

RECOMMENDATIONS

The City of Birmingham snow removal policy should be continued and enforced. Educational campaigns should be developed to encourage property owners to follow the existing snow removal ordinance. Additionally, a policy for maintenance and snow removal of "orphan" areas, such as crossing islands should be established.

EXPECTED TIME FRAME FOR IMPLEMENTATION

Within One Year:

- ☐ Develop an educational campaign encouraging property owners to clear curb ramps and bus stops when shoveling their sidewalks
- ☐ Establish a policy for maintenance and show removal of crossing islands.

Within Three Years:

- ☐ The City should assess the effectiveness of the efforts of the code compliance staff to enforce the existing snow removal ordinance on privately owned hard surfaced sidewalks and pathways, specifically on local roads and private drives. If necessary, the City should develop a program to assure snow removal from privately owned sidewalks and pathways along Arterials and Collectors.
- ☐ The City should designate or hire additional staff and assign responsibility for clearing and maintaining crossing islands and off-road pathways of snow and ice.

RESPONSIBLE FOR MAKING IMPROVEMENTS: DEPARTMENT OF PUBLIC SAFETY

2.4 ADA TRANSITION PLAN

DESCRIPTION

Title II of the Americans with Disabilities Act of 1990 (ADA) requires local governments to make their activities, programs and services accessible to persons with disabilities. In the area of non-motorized transportation, public entities with 50 or more employees are required to use accessible design standards for newly constructed and reconstructed sidewalks and shared use paths to the maximum extent feasible and make altered facilities through the City as part of a transition plan. Title II also requires that the public entity must regularly update the ADA plan and make the plan available to the public.

At a minimum an ADA transition plan should identify physical barriers and provide a detailed outline to remove those barriers. An ADA coordinator must be designated to coordinate compliance efforts.

CITY OF BIRMINGHAM'S ADA TRANSITION PLAN

An Americans with Disabilities Act (ADA) Transition Plan element was included as a part of the Multimodal Transportation Plan. This effort focused on the public right-of-way and did not address other ADA-related issues such as buildings and communications. The ADA Transition Plan, included as an appendix, outlines existing conditions that impact accessibility in Birmingham, MI, while also identifying barriers that limit accessibility. It documents the City of Birmingham's ongoing commitment to making its public rights-of-way accessible.

By identifying both proactive and reactive strategies to improve accessibility, the plan outlines a framework for addressing accessibility moving forward. It is assumed that the document will need to be updated and expanded once an ongoing ADA related data collection effort is complete. In the coming years, ADA related data collection will be an ongoing need and it is assumed that the ADA Transition Plan will be updated regularly as new data become available. As such, this effort should be considered the first step in an ongoing process to document the City of Birmingham's commitment to and strategy for identifying and addressing barriers to accessibility.

The City will implement the following program and physical upgrades in the coming years as identified in the ADA Transition Plan.

PROGRAM UPGRADES AND EXPECTED IMPLEMENTATION

1. The City Engineer will be designated as the official ADA coordinator for the City of Birmingham. *(Timeframe: Within the next 2 years)*

2. The project Steering Committee, formed as part of the Multimodal Transportation Master Plan process, will become an official standing committee responsible for multi-modal issues, including ADA issues and compliance. In his/her capacity as the ADA Coordinator, the City Engineer will serve as a non-voting member of the committee. Insofar as possible, the committee should include disability advocates and members with knowledge of ADA regulations, in addition to members that represent pedestrian, bicycle, and transit rider perspectives. *(Timeframe: Within the next 2 years)*

3. The City will document and make publicly available ADA-related requests received and resolution obtained. The City is currently developing a system to track all public requests, including ADA related issues. *(Timeframe: Within the next 2 years)*

4. The City will continue a regular ADA training regimen to ensure that key staff members remain up to date on the latest ADA planning and design issues. The Engineering Department currently participates and will continue to participate in yearly staff trainings as available. In addition, new and existing staff will continue to be encouraged to attend trainings, especially as national standards change and evolve. The City may want to consider evaluating the proficiency of current staff and training to determine the level of new or updated training that should be undertaken. *(Timeframe: Ongoing)*

5. As noted, the City is currently collecting key ADA-related data. The data elements to be collected focus on curb ramp characteristics. Given current staff time and work load, the ADA database update will take 6 to 12 months to complete. Subsequent data collection efforts should focus on sidewalks, traffic signals and trails. Additional data items that will need to be collected include missing curb ramps, compliance of the accessible route along sidewalks, signal compliance, protruding objects, and other elements within the right-of-way with impacts to accessibility. *(Timeframe: Ongoing)*

6. The City will provide more detailed ADA-related information on its website and make it easier to locate and access. A separate ADA page will be created to serve as a “one stop shop” clearinghouse for all ADA-related information. This information will provide an educational function, for example by directing people to the location of national design standards documents and other publicly available ADA resources. *(Timeframe: Within the next 2 years)*

7. The ADA Transition Plan will be expanded and updated once the data collection effort described above is completed. This will allow the city to more specifically document its strategy for addressing physical barriers moving forward. A framework for addressing potential physical barriers is outlined below. *(Timeframe: Within the next 2 years)*

POTENTIAL PHYSICAL UPGRADES

1. The City will continue all existing ADA-related investments including the sidewalk program, pedestrian countdown timer installation, road repaving, etc. *(Timeframe: Ongoing)*

2. The City will evaluate and retime all traffic signals to make pedestrian crossing times consistent with the latest MUTCD guidance. The first step will be to determine the number of signals that do not meet current standards and the second step will be to develop a strategy to proactively adjust a set number each year. This information should be detailed in the updated ADA Transition Plan once the data becomes available. *(Timeframe: Within the next 5 years)*

3. The City will continue to install pedestrian countdown signals and other signal upgrades throughout the city. *(Timeframe: Ongoing)*

4. As part of this study, specific recommendations were developed for eight intersections. The City's ability to implement recommendations at these locations will be determined by the extent and nature of the proposed changes. Potential recommendations include actuated signals, roundabouts, geometric improvements, and signal timing adjustments. *(Timeframe: Within the next 10 years)*

5. Upon completion of the curb ramp inventory and data collection process currently underway, the City will update this plan. It will initiate a proactive process to address deficient curb ramps and to build curb ramps where they are currently absent and are necessary. The size and scope of the effort will depend on the results of the data collection process. The goal will be to upgrade all curb ramps in the city to make them fully compliant in a specified amount of time as determined and stated in the updated plan. This will be accomplished through the following strategy:

   - Curb ramps will be added and improved through reconstruction projects completed as a part of the City's five year Capital Improvement Program process.

   - A standalone curb retrofit program will be initiated to improve noncompliant ramps in locations that are not already on the 5-year project list. This program will likely require an ongoing annual budget in order to make progress towards the goal every year. Alternatively, the program can be integrated with the ongoing sidewalk program. This would mean that ramps will be added and improved on a 7 year cycle, per the existing sidewalk program schedule. A prioritization methodology should be developed to inform the phasing of curb ramp improvements and/or to help identify focus areas for curb ramp improvements.

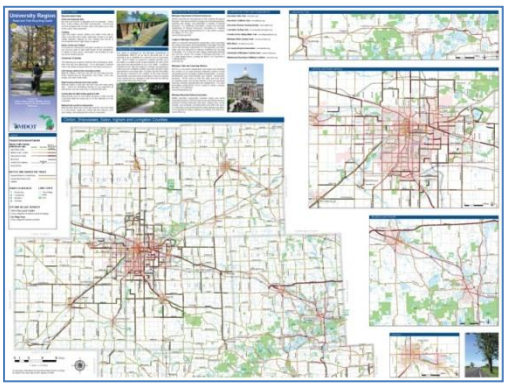
   (Timeframe: Within the next 10 years)

6. The City will implement targeted sidewalk widening projects using an established prioritization methodology to determine phasing. Many of the sidewalks in the City are four feet wide. In many cases these will be maintained as is; however, the goal will be to develop a framework for determining locations where a five foot minimum on residential roads, six foot minimum on collector roads and eight foot minimum on arterial roads should be considered. In many cases, private developers would implement these new sidewalks as part of their development. To inform this effort, criteria should be developed to guide and formalize decisions about whether to continue to improve a four foot sidewalk or upgrade and widen it in its entirely. Conditions that could lead to the decision to widen the sidewalk should be outlined, and could include high existing or projected demand, proximity to generators, poor current conditions, and available right-of-way. *(Timeframe: Within the next 10 years)*

2.5 WALKING & BIKING MAPS

DESCRIPTION

A bicycle map does more than simply provide wayfinding information. It helps build the brand of the community as an accommodating and welcoming place to bicyclists. A walking map is usually developed for downtown areas and highlights the different amenities and resources in the area. A map can also be an effective marketing tool for local merchants and businesses by offering advertising and sponsorship space, which can offset the cost of production and printing.



RECOMMENDATIONS

A walking and biking map of Birmingham should be created that includes the following:

- ☐ A bike map should include the entire street network and community destinations as a base. Some maps are prescriptive in that they color code routes based on bicycle level of service or highlight recommended routes. Others are informational providing data on traffic volumes and existing facilities to let cyclists make choices based on their own skill sets. The maps should include information on bicycle laws and safety recommendations as well as trail etiquette.
- ☐ A walking map should include destinations, including both publicly owned structures such as museums and libraries as well as private enterprises that are open to the public. The map may also include suggested walking routes, local walking events and safety information.
- ☐ The map should be a standalone document distributed to every household to generate excitement and awareness about walking and bicycling in the community. The goal should be to provide the map at no cost to the end user. Map production and print costs can be offset by selling advertising or underwriting from tourism organizations. The map can be paired with other publications already targeting residents' mailboxes for efficiency and coverage as well. The map should be located at welcome centers, gas stations, parking garages, bicycle shops, businesses and kiosks for further distribution.
- ☐ An outstanding walking and bicycle map has the potential to be the community map of choice even for households that do not bicycle or walk. This provides an opportunity to help promote understanding between bicyclists, pedestrians and motorists.

EXPECTED TIME FRAME FOR IMPLEMENTATION

Within Two Years:

- ☐ Develop and distribute maps

Within Five Years:

- ☐ Update map with new facilities every few years

RESPONSIBLE FOR MAKING IMPROVEMENTS: PLANNING DEPARTMENT

Web Survey Results:

- Around 80% of respondents feel maps of available pedestrians and bicycle facilities are very important or somewhat important to making future walking and bicycling trips actually happen

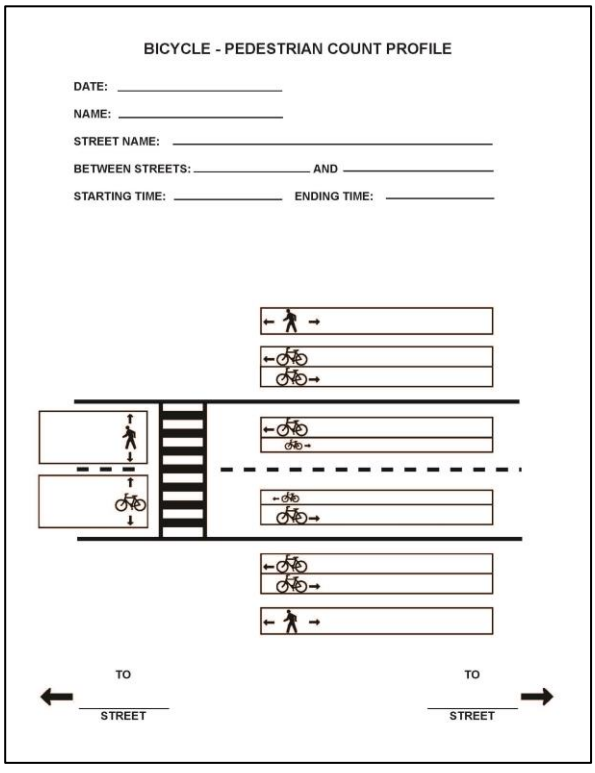
2.6 BICYCLE AND PEDESTRIAN COUNTS

DESCRIPTION

Bicycle and pedestrian counts are essential to understand if a community's efforts to increase the number of people walking and bicycling are being successful and to be able to effectively evaluate changes in the overall crash rate as well as the number of crashes at specific locations. They also help gauge a community's progress as compared to other peer communities.

RECOMMENDATIONS

- ☐ Bicycle and pedestrian counts should be conducted as part of the National Bicycle and Pedestrian Documentation Project. The National Bicycle and Pedestrian Documentation Project is a nationwide effort to provide a consistent model of data collection and ongoing data for use by planners, governments, and bicycle and pedestrian professionals. The counts should be done on a biennial basis, with consistent locations used each year. Please visit, www.bikepeddocumentation.org for more information on conducting a bicycling and pedestrian count and on ways the local communities can participate in a national count.



It should be noted that since the 2000 US Census, bicycle and pedestrian commute data has been collected by the American Community Survey. Unfortunately, especially for small and mid-sized communities, the sample size is too small to give an accurate account of bicycle and pedestrian commutes making actual counts even more important in those communities.

EXPECTED TIME FRAME FOR IMPLEMENTATION

Within One Year:

- ☐ Identify approximately a dozen locations around town where pedestrian and bicycle counts will be taken.
- ☐ Become involved in the National Bicycle and Pedestrian Documentation Project and make at least one count at each of the locations.

On a yearly basis:

- ☐ Always conduct counts before a facility is improved to document changes that are the result of a facility being constructed
- ☐ Conduct bicycle and pedestrian counts from the same locations every year

RESPONSIBLE FOR BICYCLE AND PEDESTRIAN COUNTS: PLANNING DEPARTMENT

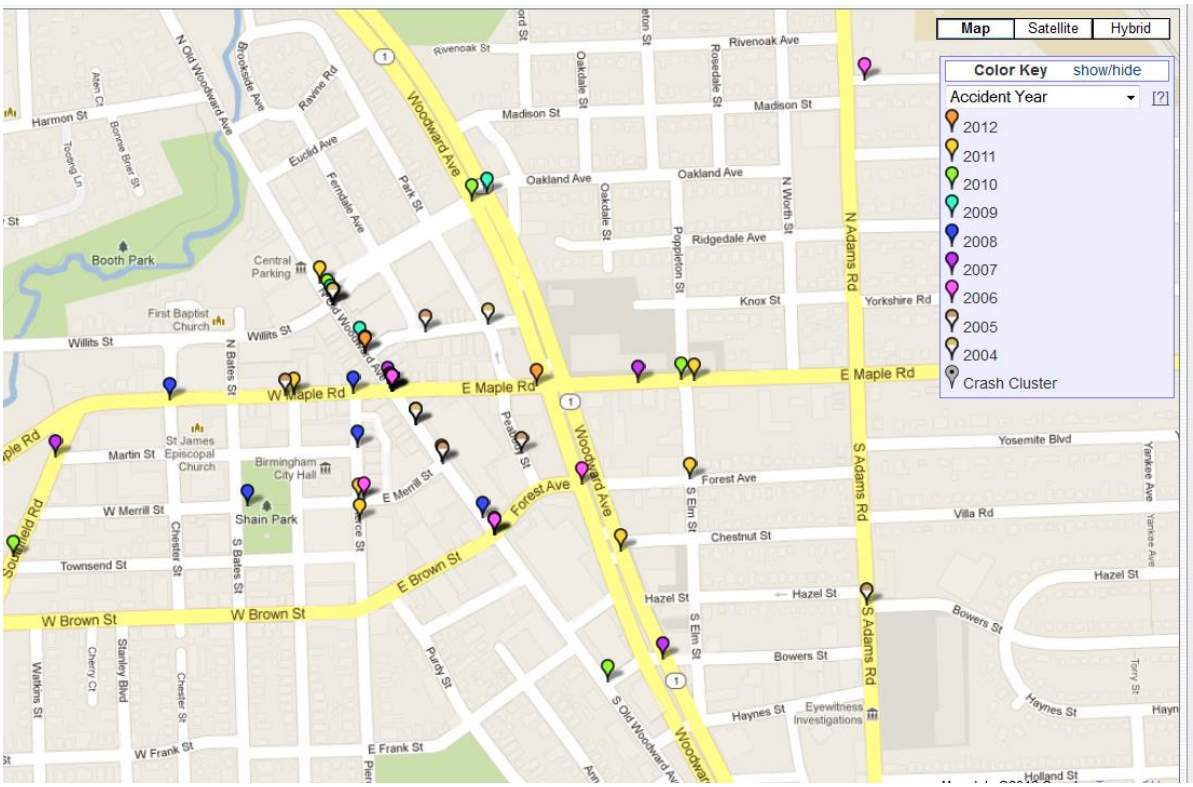
2.7 BICYCLE AND PEDESTRIAN CRASH TRACKING

DESCRIPTION

Streets without safe places to walk, cross, catch a bus or bicycle put people at risk. Nearly 5,000 pedestrians and bicyclists died on U.S. roads in 2010 and more than 120,000 were injured. Bicycle and pedestrian crashes should be monitored and analyzed on a yearly basis. Frequency, type, severity, time of day, time of year, road conditions and location should be analyzed to identify commonalities between crashes and determine how they can be mitigated. Studies have found that measures that design the street with pedestrians and bicycles in mind, such as sidewalks, raised medians, bus stop placement and traffic-calming measures, improve safety for non-motorized users.

RECOMMENDATIONS

Crash rates should be analyzed on a yearly basis by comparing the number of crashes with the pedestrian and bicycle counts that were conducted in the same year (described in previous section). In general, past studies have shown that an increase in the number of bicycle and pedestrians leads to a decrease in crash rates.



Michigan Traffic Crash Facts: http://www.michigantrafficcrashfacts.org/datatool/build.php

EXPECTED TIME FRAME FOR IMPLEMENTATION

On a Yearly Basis:

- ☐ Identify pedestrian and bicycle crash locations on a yearly basis
- ☐ Compare crashes with bicycle and pedestrian counts to determine crash rates

RESPONSIBLE FOR ANALYSIS: POLICE DEPARTMENT

Inventory & Analysis:

- There were 44 bicycle crashes during the 8 year period (2004 – 2011) for the City of Birmingham – No fatalities were reported and 7 crashes resulted in serious injury
- There were 67 pedestrian crashes during the 8 year period (2004 – 2011) for the City of Birmingham – 2 fatalities were reported and 13 crashes resulted in serious injury

2.8 COMMUNITY RECOGNITION

DESCRIPTION

Sense of place is challenging to measure but community recognitions and awards can help provide an outlook on a community's quality of life. If a community receives an award it becomes a great promotional tool not only for the program but for the community as a whole.

RECOMMENDATIONS

The following is a list of awards and recognitions that a community should strive to fulfill.

- ☐ ***Complete application for Bike Friendly Community Award with community and partner input***

  The League of American Bicyclists promotes communities throughout the country with its Bike Friendly Community Award. The process of applying for the award is a great way to determine what is being done in the community as well as where improvements might need to be made. The community can be engaged in the process of applying for the award through public meetings.

- ☐ ***Complete application for the Promoting Active Communities Award with community and partner input***

  The Promoting Active Communities Award is a Michigan-Based award for communities that show a strong commitment to supporting physical activity. This award is a great way to engage the community in multi-modal transportation issues as well as a good promotional tool, should a community receive a designation. The City has participated in this award in the past and currently holds gold status.

- ☐ ***Encourage local businesses to complete application for the Bicycle Friendly Business Award***

  The Bicycle Friendly Business award, put on by the League of American Bicyclists, recognizes employers' efforts to encourage a more bicycle friendly atmosphere for employees and customers. The program honors innovative bike friendly efforts and provides technical assistance and information to help companies and organizations become even better for bicyclists.

- ☐ ***Recognition in Regional and State Media***

  Many times communities are recognized through state and regional press for bicycle and pedestrian improvements. It is important to use these opportunities to promote current programs and leverage future initiatives.

EXPECTED TIME FRAME FOR IMPLEMENTATION

On a Yearly Basis:

- ☐ Apply for Awards
- ☐ Encourage local business to apply for awards
- ☐ Brag about the Cities progress and accomplishments in multi-modal transportation

RESPONSIBLE FOR APPLICATIONS: PLANNING DEPARTMENT

The City of Birmingham was awarded the Gold Promoting Active Communities Award

2.9 MEASUREMENTS OF INFRASTRUCTURE PROGRESS

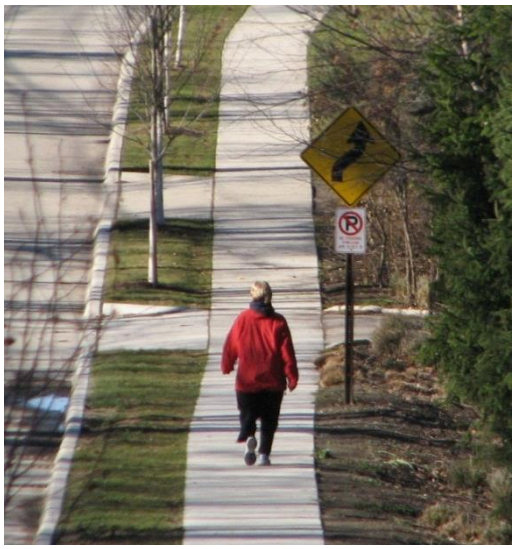
DESCRIPTION

A relatively simple way to measure the progress of the Multi-modal Transportation Network is to track the miles of facilities built every year. Beyond tracking the progress, it is important to keep up-to-date documentation of these facilities because these measurements are used to apply for awards.

RECOMMENDATIONS

- ☐ Track the miles of built facilities in the multi-modal network. The miles of built facilities should be documented on a yearly basis to track the development of the multi-modal network. The miles of bike lanes, pathways, sidewalks, neighborhood connectors/bike routes, number of mid-block crossing improvements and number of bike parking spaces should be tracked.

- ☐ Publish the statistics to a public forum such as the City's website.



EXPECTED TIME FRAME FOR IMPLEMENTATION

On a Yearly Basis:

- ☐ Track the miles of built facilities
- ☐ Publish the statistics

RESPONSIBLE FOR UPDATES: ENGINEERING DEPARTMENT

PHYSICAL ENVIRONMENT

The physical environment of a community says a lot about where bicycles and pedestrians stand in a community's priority list. A strong presence of multi-modal transportation facilities does not only help pedestrians, bicyclists and transit users get around conveniently, safely and comfortably, it signals to motorists to expect these users on the roadway and underscores that they are officially endorsed modes of travel. The following describes the key Physical Environment issues that were evaluated as part of the planning process.

URBAN FORM – The grain of a community's street network is probably the most significant indicator of the potential for multi-modal travel. Population density and diversity of land uses can also be used to predict demand. The urban form is studied to identify where improvements are most needed and where they will do the most good.

PUBLIC RIGHT-OF-WAY – All streets from the leafy low speed residential streets to the busiest commercial arterials need to be complete streets. But how that is accomplished and how the different modes are accommodated will change with the street's primary purpose and context.

PUBLIC SPACES – Parks, plazas, and transit stations are all important destinations for bicyclists and pedestrians.

OFF-ROAD TRAILS – The showpieces of a community's multi-modal transportation network is often off-road trails; but they do not exist in a vacuum. Issues include trail design, amenities and how the trails are linked to the greater multi-modal network.

WAYFINDING – Oftentimes there are great "secret" back ways to key places around town by bike or foot that avoid a lot the busier roads. Marking not only the routes, but where they lead to and how far away they are is an outstanding way for on the ground marketing.

BICYCLE AND PEDESTRIAN SUPPORT FACILITIES – A route does not complete the transportation system. Like with automobiles, parking of a variety of types, maintenance,

breakdown assistance, rest areas and water sources are necessary to create a functional system.

ENVIRONMENTAL AND ART ENHANCEMENTS – A community's streets are its most significant public space. They are the public form, they define a community, they are the place we spend the most time recreating and too often they are treated as purely utilitarian enterprises. They also have a significant impact on the environment. Integrating "Green Street" technologies such as rain gardens, tree cover and LED lighting help reduce the environmental impact. Art and community gardens make streets a resource and enhance property values.

PRIORITY IMPROVEMENTS TO THE PHYSICAL ENVIRONMENT

Based on input from the Steering Committee, City Staff and public engagement efforts the following improvements to the physical environment were found to be of high priority for the City of Birmingham.

- Adding bicycle and pedestrian facilities to auto focused corridors
- Providing bicycle support infrastructure
- Enhanced amenities for off-road trails

The following pages provide recommendations that focus on these issues and how they can realistically be addressed in the near-term with the existing opportunities and limitations.

Every few years the improvements should be re-evaluated to determine their progress and if there are new items that the City should focus on. Please refer to the supplemental document, *Physical Environment Evaluations,* for assistance.

The following pages give a detailed overview of the proposed improvements to the physical environment.

TOPICS:

PHYSICAL ENVIRONMENT RECOMMENDATIONS

3.1 MULTI-MODAL NETWORK

GENERAL PROJECT APPROACH

A single transportation corridor can be viewed very differently depending on a person's perspective. This is impacted not only by their mode of travel, by foot, bicycle, riding a bus or driving a motor vehicle, but also their intention. Is the person moving along or trying to cross the corridor or are they simply trying to enter the corridor from a side street? When traveling along a corridor the desire will be to travel at a high rate of speed, uninterrupted by signals or stop signs no matter what mode of travel. However, when crossing the same corridor the desire will be for convenient opportunities with minimal delay.

There is only so much right-of-way available for each corridor and this plan looks at how the needs of all of the different users can be balanced in that space.

The following provides a summary of the approach for the different street types in the City.

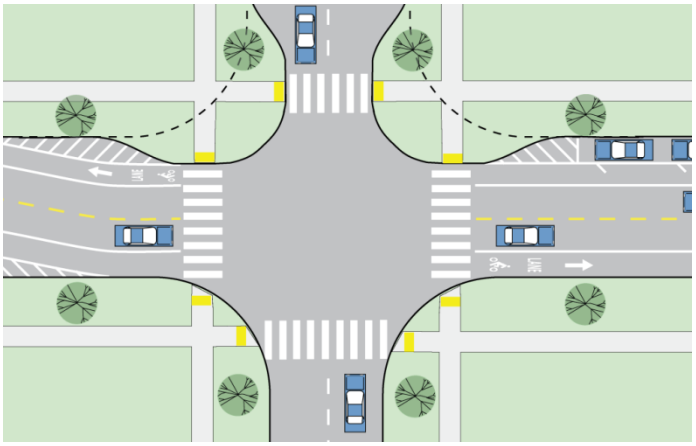
LOCAL ROADS

These roads, located for the most part in residential areas, already have low speeds and low volumes. Most bicyclists can comfortably share these roads with motorists. A network that uses the local system has been identified that links neighborhoods to parks, schools and the downtown. In some places, the local road network is supplemented with short connecting pathways through schools, parks and between neighborhoods. This allows for more direct travel for pedestrians and bicyclists than is possible by motor vehicles.

One key improvement is a wayfinding system that directs pedestrians and bicyclists to key destinations and that includes information on how far it is to the destination. The other key improvement is making sure that when these routes intersect busier roadways there is a safe way for pedestrians and bicyclists to cross the roadway. Elements such as traffic calming, public art, rain gardens and historic features can be added to enhance the routes over time.

COLLECTORS AND SIGNIFICANT LOCAL ROADS

Collectors, such as Lincoln and other significant local roads such as Oak Ave and Eton Road, carry more motorized vehicle traffic but are also key routes for pedestrians and bicyclists. In most cases these roads are bordered by residences. For these streets, an emphasis has been placed on the needs of pedestrians and bicyclists. These roadways will have design elements such as frequent mid-block crossings, curb extensions, medians and street trees that will result in motorists naturally driving the roadway at 25 to 30 mph.



The proposed changes will not reduce the number of lanes as all of these roads are currently two-lane roads. The changes focus on how parking is configured, intersection improvements and traffic calming measures. Where the road width and parking demand permits, bike lanes are recommended. Where that is not possible, shared lane markings are recommended.

The result is that the road will be a much more comfortable environment to walk along and cross. For bicyclists, the differential between their speed and the speed of motor vehicles will be reduced making it more comfortable and safe to bicycle.

ARTERIAL STREETS

There are some streets in the City that need to carry large volumes of motor vehicles. The intent with these corridors is to maintain the motor vehicle capacity while improving safety for all users. Enhanced pedestrian crosswalks will help pedestrians safety cross the busier streets at high demand locations. Bike lanes will be introduced wherever possible to provide a greater separation between bicyclists and motorists. Where this is not feasible, alternative routes (using local roads) have been identified. In the case of Woodward Avenue, pedestrians and bicyclists will be buffered from the through traffic.

PROPOSED MULTI-MODAL NETWORK

The solution for a community's multi-modal network is not one dimensional, but rather responds to the needs of the various users and trip types. By doing so, the plan addresses the needs of the majority of the community's population, not simply a small interest group.

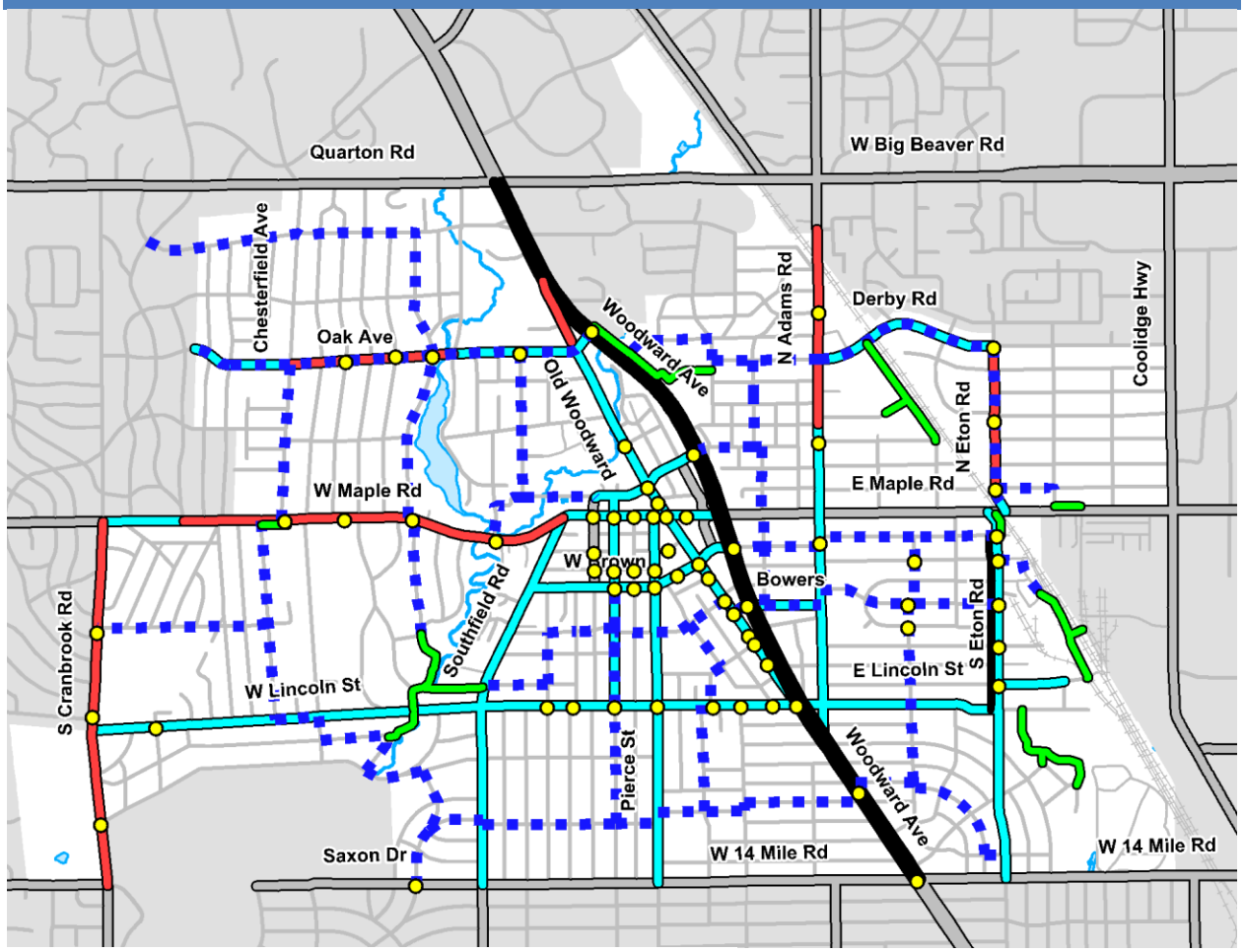
The proposed multi-modal network recognizes that pedestrians, bicyclists and transit users are a diverse population and that no one solution will apply to all users. Thus, bike lanes and sidewalks have been proposed along the primary roads in the City. Some of these roads are more oriented to bicyclists and pedestrians than others, as they carry fewer motor vehicles and will be designed such to keep motor vehicle speeds in the 30 to 35 mph range. Complementing the primary road system will be a network of neighborhood connectors and off-road trails that provide access to key destinations in the City while minimizing exposure to a large volume of high speed motor vehicles. Once implemented, together they will provide a city wide multi-modal network that users of all ages and abilities will be able to enjoy.

The following pages provide a more detailed breakdown of the multi-modal network:

- *Sidewalks*
- *Road Crossing Improvements*
- *Bike Lanes*
- *Buffered Bike Lanes*
- *Shared Lane Markings*
- *Neighborhood Connector Routes*
- *Pedestrian & Bicycle Wayfinding*
- *Neighborhood Greenway*
- *Tree Extensions*
- *Bicycle Parking*
- *Transit Facilities Amenities*
- *Intersections*

Please refer to Fig. 3.1 for an overview map of the proposed multi-modal network. In addition, a large map of the proposed network can be downloaded from the project webpage at http://greenwaycollab.com/Projects/Birmingham/Birmingham.html

FIGURE 3.1E OVERVIEW OF PROPOSED MULTI-MODAL NETWORK



Legend

- Proposed Crossing Improvement
- Proposed Off-road Trail
- Proposed Neighborhood Connector Route
- Proposed Bike Lane
- Proposed Buffered Bike Lane
- Proposed Shared-lane Marking

Due to the scale of this map some facilities were not included.
Please refer to the following maps for more details.

Web Survey Results:

- About 72% of respondents would walk to work and/or do errands if there was a system of sidewalks, pathways, crosswalks, bike lanes, etc.
- Around 84% of respondents feel that a complete network for bicycle facilities such as bike lanes, signed routes and trails are very important or somewhat important to making future bicycling trips actually happen

3.2 SIDEWALKS

DESCRIPTION

Sidewalks are the unsung heroes of a multi-modal system. They are usually the first facilities to be constructed and provide a backbone to a complete multi-modal network. They are one of the key components to a walkable community and should be completed on both sides of all roads in an urban area.

A community's long term goal should be to provide sidewalks on both sides of the roadway along all roads. Sidewalks are proven to reduce pedestrian crashes and are critical to children safely walking to school, especially in dark conditions. Providing a complete sidewalk network along all roadways is important from a safety and connectivity standpoint and the city should work towards completing its network.

For the most up-to-date guidelines please refer to AASHTO's *Guide for the Planning, Design, and Operation of Pedestrian Facilities.*

All newly constructed and reconstructed sidewalks and shared use pathways should be in compliance with Title II of the Americans with Disabilities Act of 1990 (ADA). Please refer to the *Accessible Public Rights-of-Way: Planning and Designing for Alternatives* guide for more information.

RECOMMENDATIONS

The first priority is to provide sidewalks along all the major roadways. In the near-term the City should focus on completing sidewalk gaps along S Cranbrook Road to connect to the high school and dog park and along S Old Woodard to connect on-street parking to the businesses along the corridor. Please refer to the Network Implementation Plan for more details.

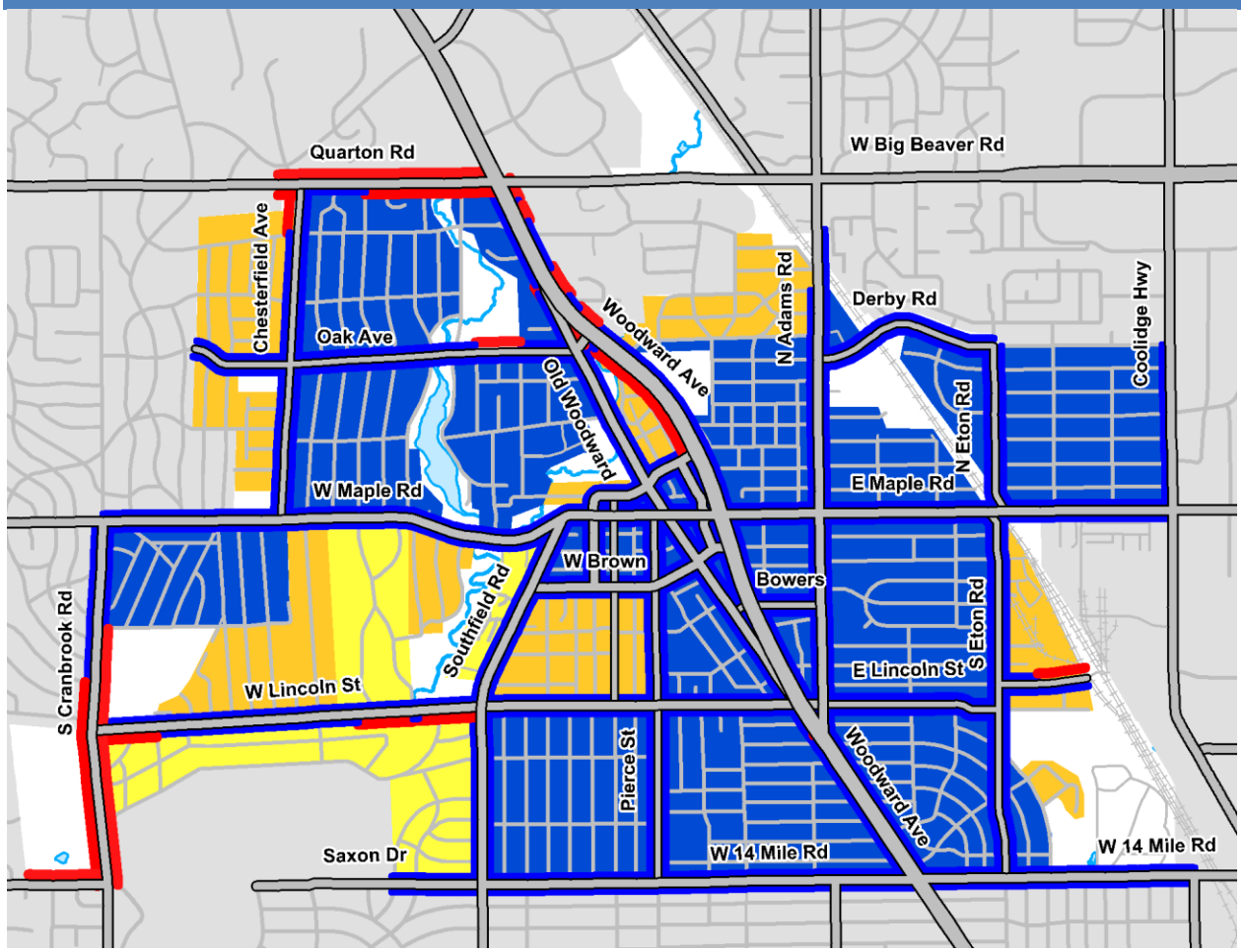
The second priority should be to complete the sidewalk gaps in neighborhoods that already have an existing sidewalk system partially in place.

The third priority should be to complete sidewalks in all neighborhoods.

In general, sidewalks should be installed by developers when constructing or reconstructing buildings or homes and by local city, county or state agencies during a roadway improvement project. Sidewalks should be a minimum of 5' wide. 6' is preferred along Collector roadways and 8' is preferred along Arterial roadways.

Please refer to Fig. 3.2A for a map of the proposed sidewalks.

FIGURE 3.2A PROPOSED SIDEWALKS



Proposed Sidewalks:

- Existing Sidewalks
- Prioirty 1: Complete Sidewalks along Major Roads
- Prioirty 2: Complete Sidewalk Gaps in Neighborhood
- Priority 3: Add Sidewalks to Neighborhood

APPROXIMATELY 2.5 MILES OF SIDEWALK ARE PROPOSED ALONG PRIMARY ROADS IN THE CITY OF BIRMINGHAM

Web Survey Results:

- About 38% of respondents walk to work and/or the store daily or weekly
- About 80% of respondents walk for fun and/or exercise daily or weekly
- Around 79% of respondents feel a complete sidewalk system is very important to non-motorized trips actually happening in the future

PHYSICAL ENVIRONMENT RECOMMENDATIONS

3.3 ROAD CROSSING IMPROVEMENTS

DESCRIPTION

Road crossing improvements are needed in areas where there is demand to cross by pedestrians and/or bicyclists. These areas occur where a bike route crosses a collector or arterial road, a major bus stop or bus shelter is present, there is a long distance between crosswalks, or there is a high demand based on land use and population density.

There are many different types of countermeasures that can be used to improve the safety and visibility of pedestrians at crosswalks. Traffic speeds, traffic volume, number of lanes and location of the crossing in context to the surrounding land use will dictate what type of crossing improvement is appropriate for a specific location. In some instances the improvements are as simple as adding high visibility crosswalk markings and in others signalization may be needed.

For the most up-to-date guidelines please refer to all Chapters of the *MUTCD* and Chapter 3 & 4 of AASHTO's *Guide for the Planning, Design and Operation of Pedestrian Facilities*.

RECOMMENDATIONS

The exact solution for every crossing has not been determined; rather, the location and recommended countermeasure has been identified. Please note that these are initial recommendations and that each crossing needs to be studied further prior to implementation. Please refer to the Network Implementation Plan for specific recommendations on near-term crossing improvements.

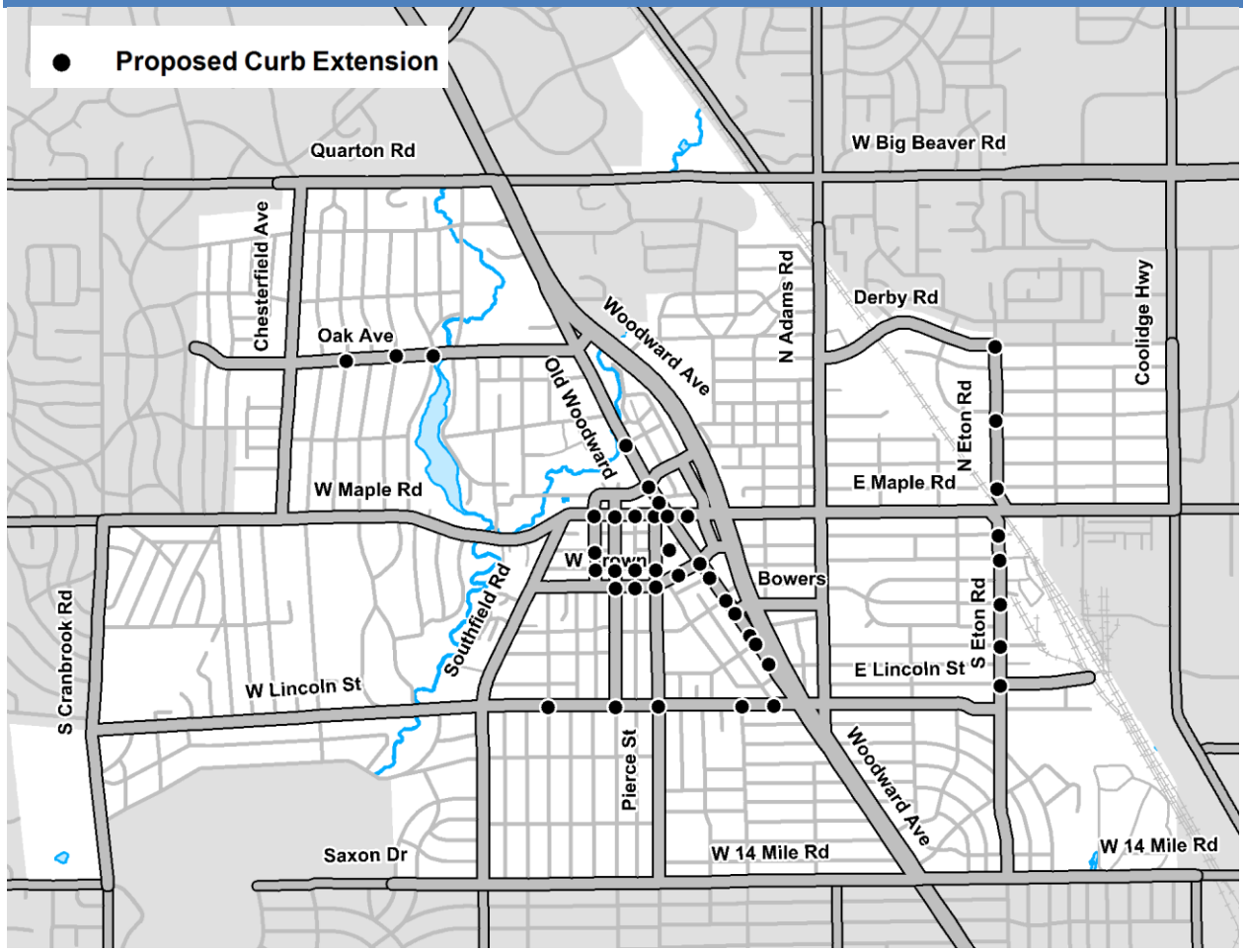
At signalized intersections it is recommended that leading pedestrian signals and signal countdowns be implemented.

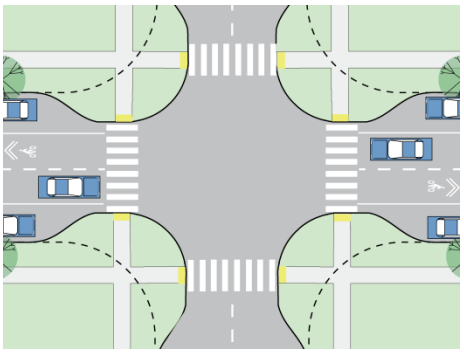
Please refer to Fig. 3.3A, 3.3B and 3.3C for maps of the proposed crossing improvements.

Web Survey Results:

- Around 61% of respondents feel that mid-block crosswalks are very important or somewhat important to making future walking and bicycling trips actually happen

FIGURE 3.3A CROSSING IMPROVEMENTS – CURB EXTENSIONS

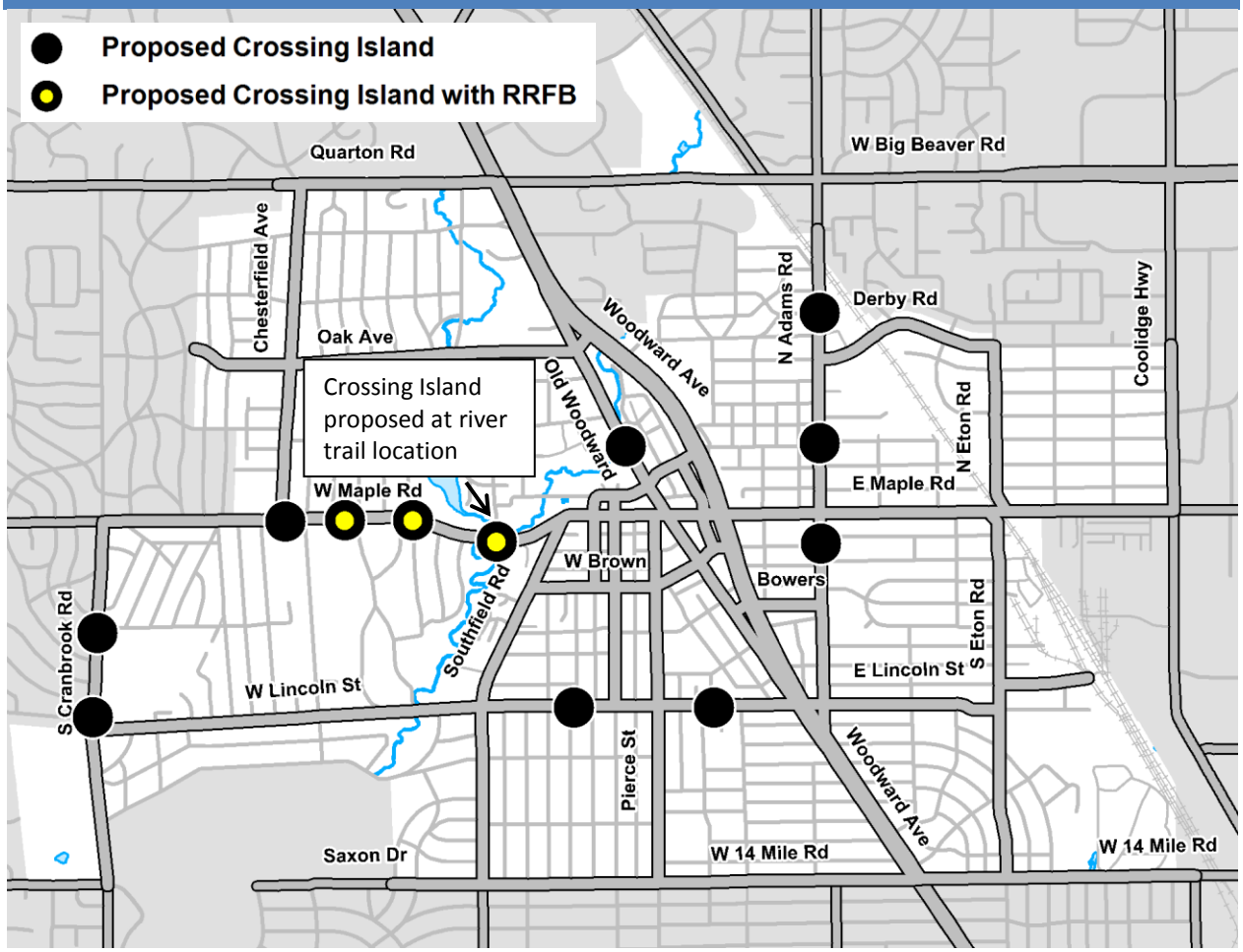




42 CURB EXTENSIONS ARE PROPOSED

- Curb Extensions reduce the effective street width by extending the sidewalk or curb into the parking lane
- Curb Extensions shorten the pedestrian's crossing distance and increase visibility between pedestrians and motorists
- Curb Extensions create small curb radii that control traffic speeds around corners
- Curb Extensions reduce the effective street width which encourages motorists to drive slower
- When curb extensions are used on a road with bike lanes, the bike lane continues past the curb extension
- Landscaping may be incorporated

FIGURE 3.3B PROPOSED CROSSING IMPROVEMENTS – CROSSING ISLANDS



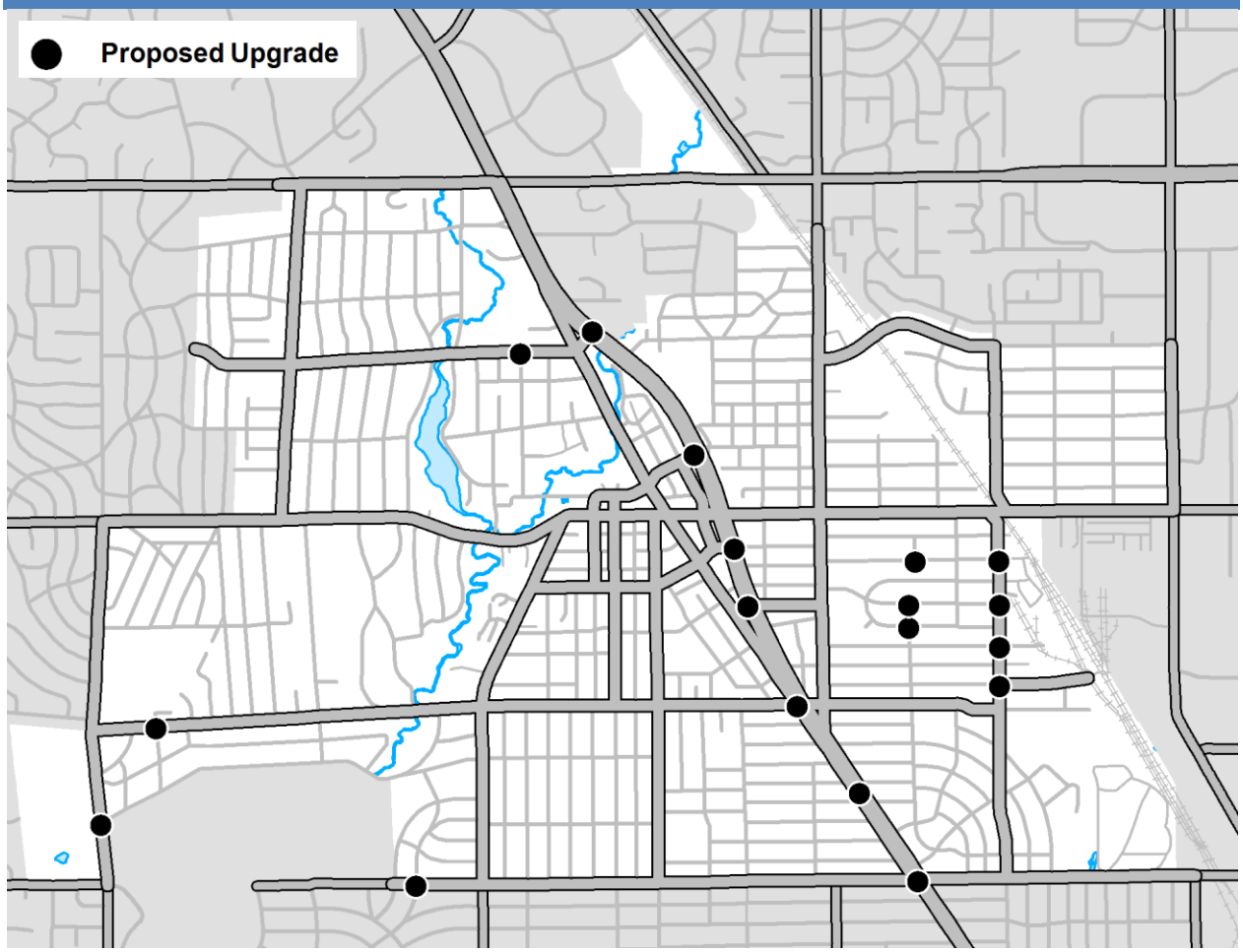
9 CROSSING ISLANDS ARE PROPOSED

- Crossing Islands create a physical barrier in the middle of the roadway which increase visibility of the crosswalk to motorists, reduce pedestrian crossing distances and encourage motorists to drive slower

3 CROSSING ISLANDS WITH RECTANGULAR RAPID FLASH BEACONS (RRFB) ARE PROPOSED

- RRFB are crosswalk signs paired with high intensity LED flashers that alternate and get motorists' attention when activated
- The proposed RRFB would be used in conjunction with crossing islands

FIGURE 3.3C PROPOSED CROSSING IMPROVEMENTS – UPGRADES



18 ROAD CROSSING UPGRADES ARE PROPOSED

Many of the proposed improvements include upgrades such as ramps, detectable warnings, pedestrian signals, and high visibility crosswalk markings.

Please refer to the Network Implementation Plan and Special Area Concept Plans for more details.

3.4 BIKE LANES

DESCRIPTION

Bike lanes are a designated space in the roadway for bicyclists to travel with the flow of traffic. Pavement striping, markings and signage are used to delineate the lane. A striped bicycle lane or designated paved shoulder within the roadway is usually the safest place for a cyclist to ride.

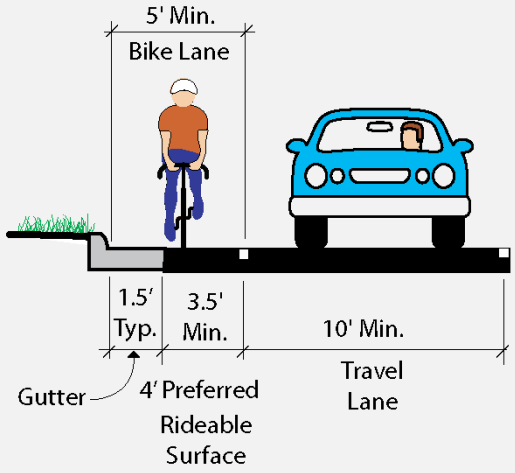
For the most up-to-date guidelines please refer to Chapter 9 of the *MUTCD*, Chapter 4 of AASHTO's *Guide for the Development of Bicycle Facilities*, and the Bike Lane section of NACTO's *Urban Bikeway Design Guide*.

RECOMMENDATIONS

There is potential to add bike lanes on a number of the primary roads in the near future as part of CIP projects and by simply re-striping the roadway. Please refer to the Network Implementation Plan for more details.

For some roadways, the cost to add bike lanes independent of a road reconstruction project would be significant. Thus, to maximize the impact of finite resources, long-term improvements are expected to be implemented when a road is completely reconstructed (not just resurfaced). Eventually, bike lanes should be added to all arterial and collector roadways and significant local roadways. Generally roads with ADTs below 3,500 vehicles per day do not require bike lanes.

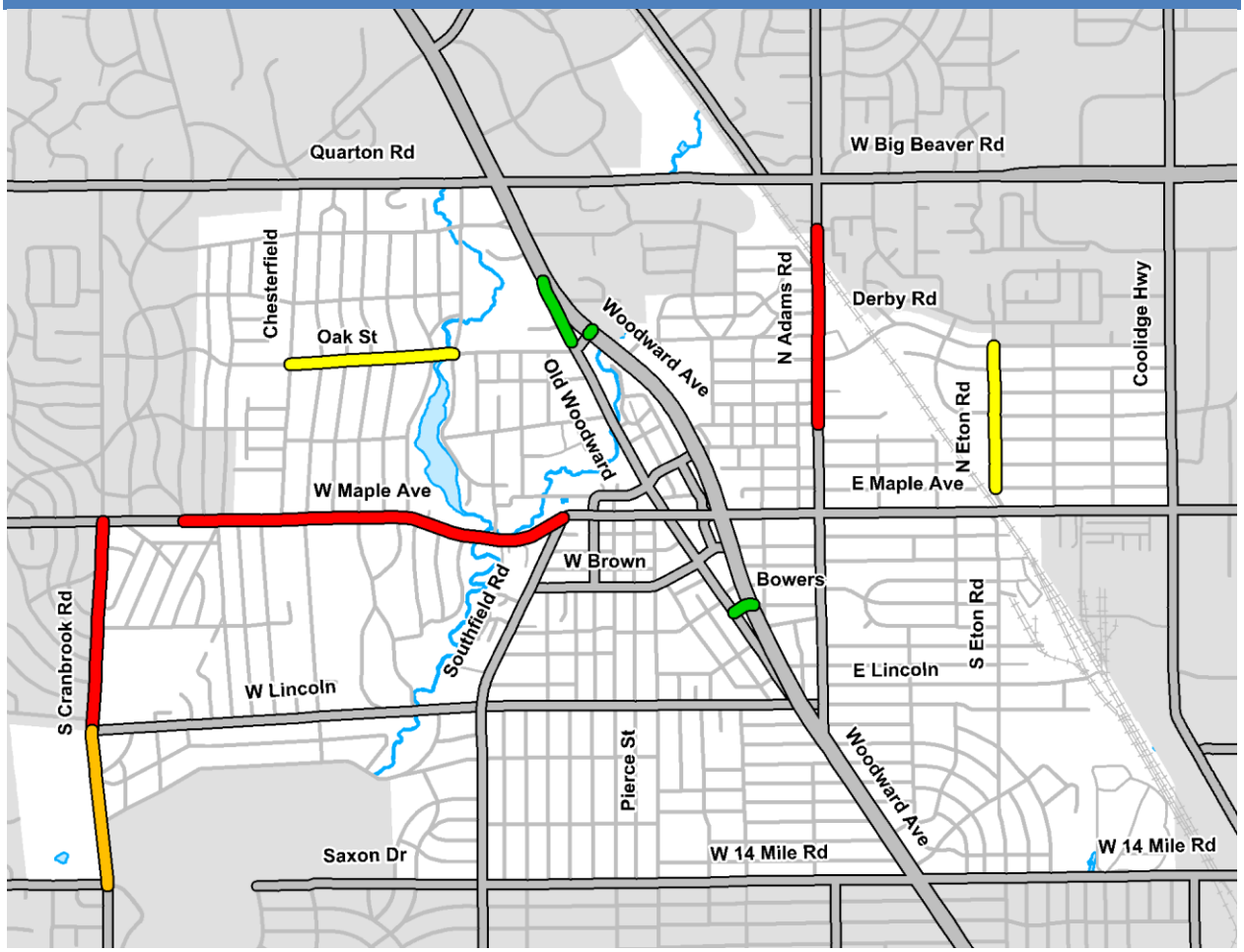
Bike Lane Guidelines:



Please note that minimum widths are displayed; 7' Bike Lanes and 11' Travel Lanes are the recommended width whenever possible.

Please refer to Fig. 3.4A for a map of the proposed bike lanes.

FIGURE 3.4A PROPOSED NEAR-TERM BIKE LANES



Proposed Bike Lanes

- Through Lane Narrowing
- Through 4 to 3 Lane Conversion
- By Consolidating Parking
- By Paving the Shoulder

APPROXIMATELY 3.7 MILES OF NEW BIKE LANES ARE PROPOSED

Web Survey Results:

- Around 20% of respondents currently bike to work and/or the store on a weekly basis
- Around 68% of respondents would be comfortable riding a bike in a bike lane on a Minor Road
- Around 30% would be comfortable riding a bike in a bike lane on a major road
- Around 58% would be comfortable riding a bike in a bike lane on a minor road
- If the appropriate facilities were constructed 69% of respondents would be interested in bicycling to work and/or for errands

3.5 BUFFERED BIKE LANES

DESCRIPTION

Buffered bikes lanes are conventional bike lanes paired with a designated space separating the bicycle lane from the motor vehicle lane. Similar to bike lanes, bicyclists travel with the flow of traffic. Pavement striping, markings and signage are used to delineate the lane.

When the buffer area between the bike lane and motor vehicle lane has a physical barrier, such as curbs, the facility is called a cycle track.

For the most up-to-date guidelines please refer to Chapter 9 of the *MUTCD*, Chapter 4 of AASHTO's *Guide for the Development of Bicycle Facilities*, and the Buffered Bike Lane section of NACTO's *Urban Bikeway Design Guide*.


Buffered Bike Lanes


Cycle Track

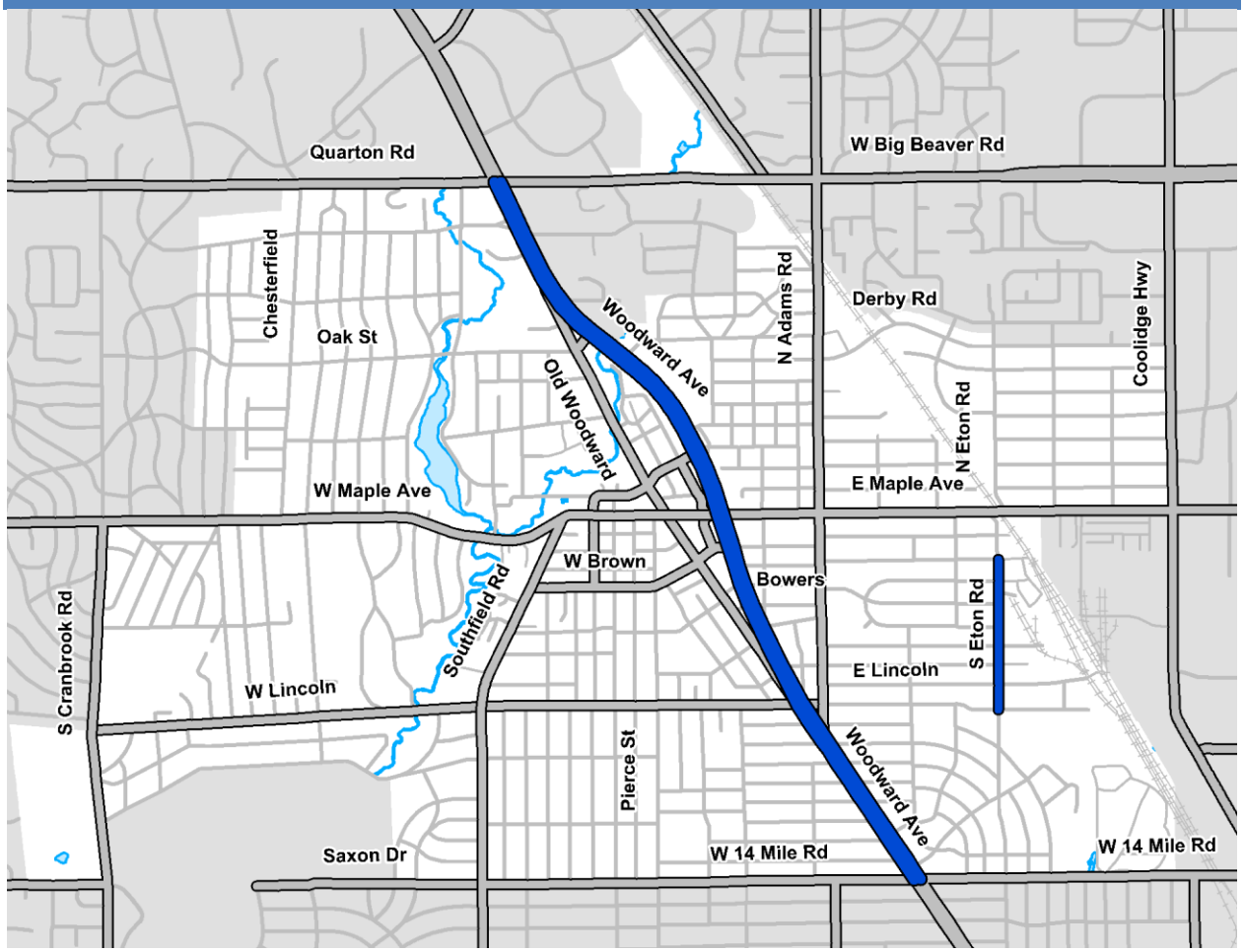
RECOMMENDATIONS

On S. Eton Road between W. Maple Road and W. Lincoln Street there is potential to add buffered bike lanes to the west side of the road by removing on-street parking from that side of the street. Due to the proximity of the Rail District, parking would remain on the east side of the street. See the Network Implementation Plan for more details.

There is potential to enhance the bicycle and pedestrian environment along Woodward Avenue. Bike lanes could be added to the service drive with a curbed buffer area between the bike lane and Woodward Avenue. Please refer to the Special Area Concept Plans for more details.

Please refer to Fig. 3.5A for a map of the proposed buffered bike lanes.

FIGURE 3.5A PROPOSED NEAR-TERM BIKE LANES



Buffered Bike Lanes

Proposed

APPROXIMATELY 2.8 MILES OF BUFFERED BIKE LANES ARE PROPOSED

Web Survey Results:

- Around 75% of respondents would be comfortable riding a bike on a cycle track

3.6 SHARED LANE MARKINGS

DESCRIPTION

Shared Lane Markings are used to indicate to bicyclists a recommended lane position and to indicate to motorists to expect bicycles. They are used on roads with speeds of 35 mph or less. Shared lane markings may be used to help position bicyclists a safe distance from parked cars (so that they do not run into opening car doors). They are also used in conjunction with bike lanes where the bike lane is discontinued for a stretch of roadway due to limited road width.

Colored Shared Lane Markings are Shared Lane Markings placed on top of a continuous green lane. They should be used in areas where a higher level of visibility is desired.

For the most up-to-date guidelines please refer to Chapter 9 of the *MUTCD*, Chapter 4 of AASHTO's *Guide for the Development of Bicycle Facilities*, and the Bikeway Signing & Marking section of NACTO's *Urban Bikeway Design Guide*.

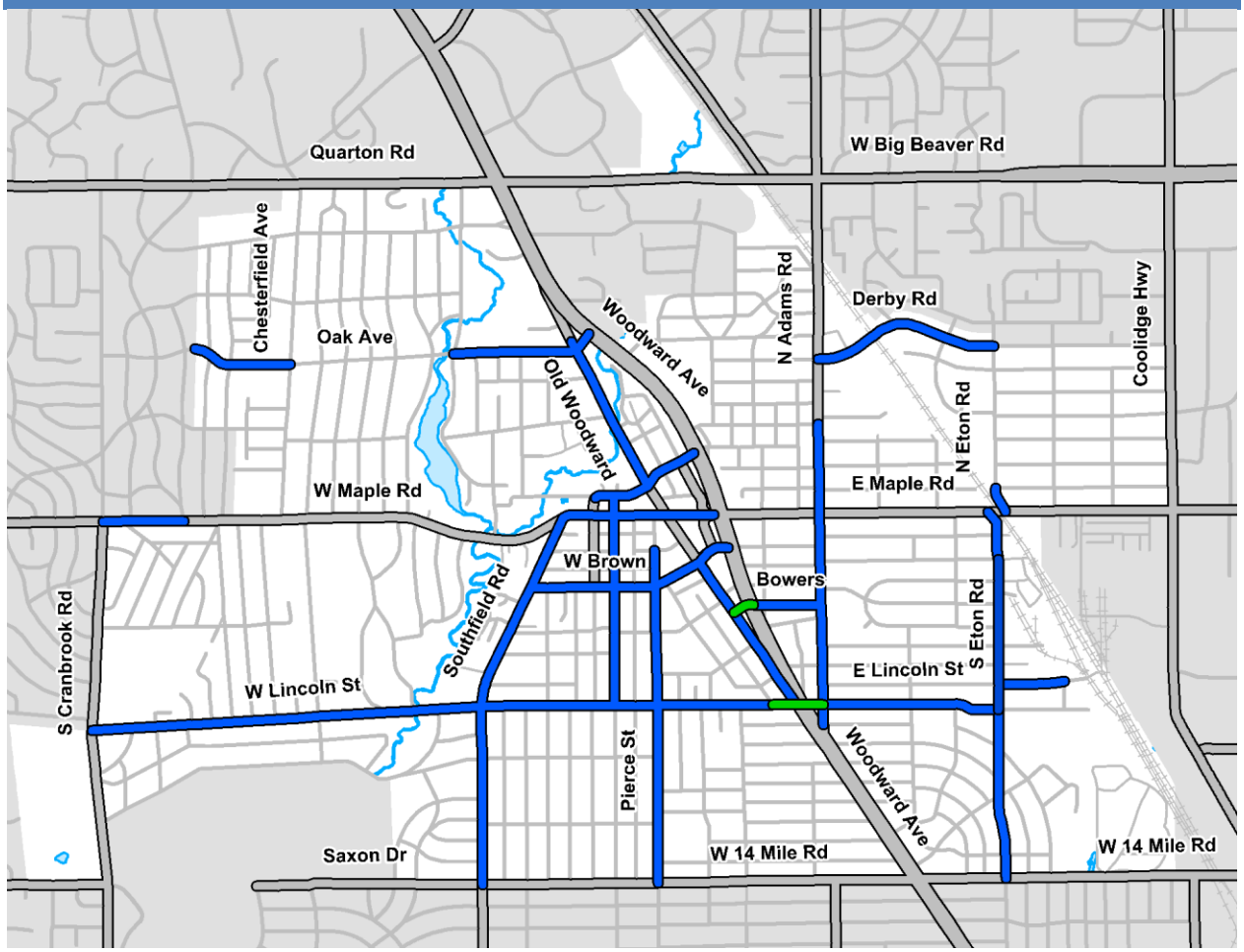
RECOMMENDATIONS

Due to the desire to keep on-street parking, Shared Lane Markings are proposed on most collector roads and some arterial roads. Please refer to the Network Implementation Plan for more details.

Colored Shared Lane Markings are proposed on segments of Bowers Street and E Lincoln Street where they cross Woodward Avenue. Please refer to the Network Implementation Plan and Special Area Concept Plans for more details.

Please refer to Fig. 3.6A for a map of the proposed shared lane markings.

FIGURE 3.6A PROPOSED SHARED LANE MARKINGS



Shared Lane Markings

- Proposed Shared Lane Markings
- Proposed Colored Shared Lane Markings

APPROXIMATELY 10.7 MILES OF NEW SHARED LANES MARKINGS ARE PROPOSED AND 0.2 MILES OF COLORED SHARED LANE MARKINGS ARE PROPOSED

PHYSICAL ENVIRONMENT RECOMMENDATIONS

3.7 NEIGHBORHOOD CONNECTOR ROUTES

DESCRIPTION

Neighborhood Connector Routes, also known as Bicycle Boulevards, are primarily located on low speed, low volume local roads and connecting pathways. They link neighborhoods to parks, schools and commercial areas. Signs provide wayfinding by noting direction and distance to key destinations. Elements such as traffic calming, public art, rain gardens and historic features can be added to enhance the routes. These routes appeal to families, children and people who are less comfortable walking and bicycling along a major roadway.

For the most up-to-date guidelines please refer to Chapter 9 of the *MUTCD*, Chapter 4 & 5 of AASHTO's *Guide for the Development of Bicycle Facilities*, and the Bike Route Wayfinding section of NACTO's *Urban Bikeway Design Guide*.

RECOMMENDATIONS

Neighborhood Connector Routes should be developed over time. Initial improvements include wayfinding signage and crossing improvements where the route intersects a major roadway. Traffic calming is added only if it is necessary. Environmental and aesthetic improvements are implemented based on community input and available budgets. Please refer to the Network Implementation Plan for more details.

Please refer to Fig. 3.7A for a map of the proposed neighborhood connector routes

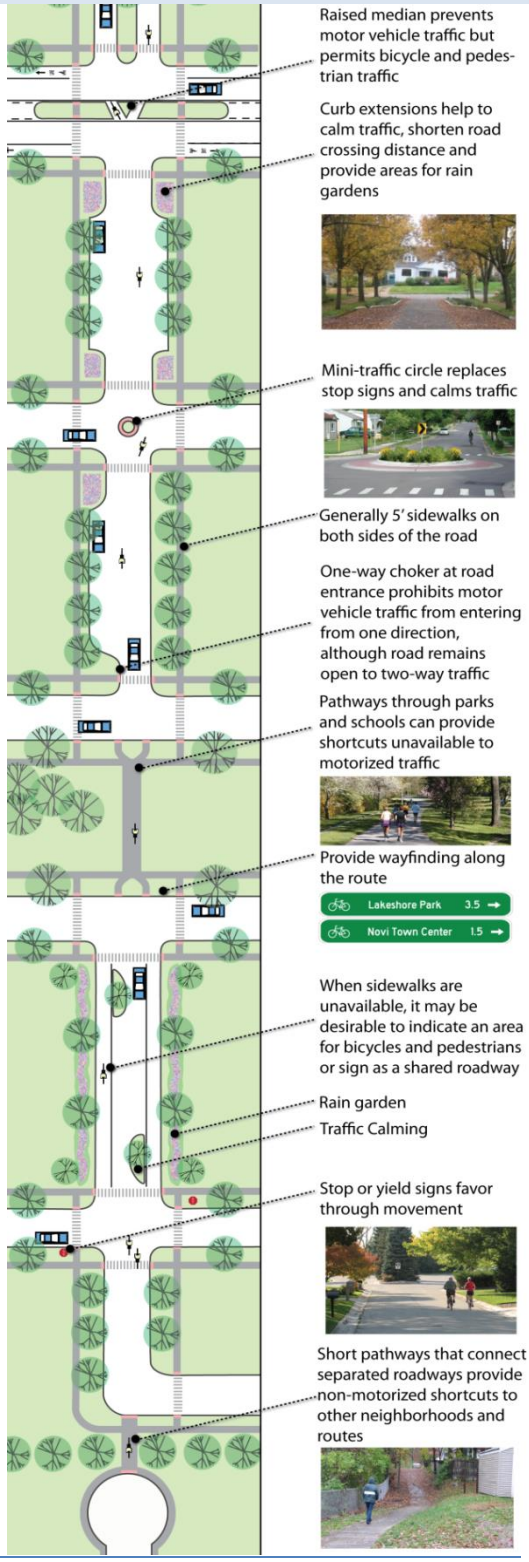
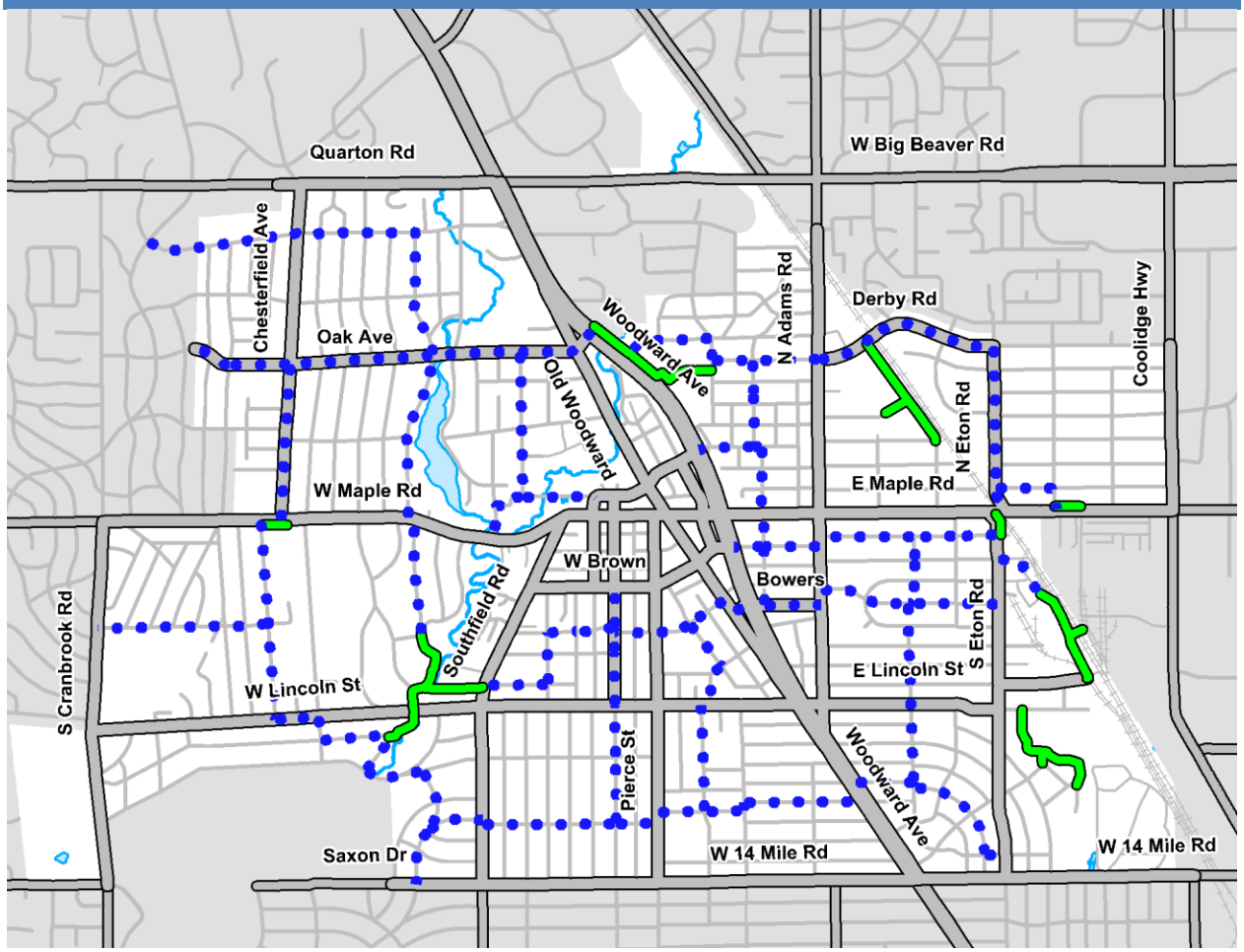


FIGURE 3.7A PROPOSED NEIGHBORHOOD CONNECTOR ROUTES



Proposed Neighborhood Connector Routes

Proposed Routes on Local Roadways

Proposed Off-Road Trail

APPROXIMATELY 15.4 MILES OF NEIGHBORHOOD CONNECTOR ROUTES AND 2.25 MILES OF PAVED OFF-ROAD TRAILS ARE PROPOSED

Web Survey Results:

- Around 73% of respondents would be comfortable riding a bike along a Bike Route on a Residential Road

PHYSICAL ENVIRONMENT RECOMMENDATIONS

3.8 PEDESTRIAN & BICYCLE WAYFINDING

DESCRIPTION

Careful and thoughtful use of signage can greatly enhance a user's experience of a community's non-motorized facilities. Several important considerations for the design and use of signage include:

- ☐ Keep signage consistent in design along the length of the route to establish a sense of continuity and character
- ☐ Signs should be clearly legible, understandable and be made of fade proof and weather-proof surface materials and inks
- ☐ Signs should be durable and require minimal maintenance
- ☐ Signs should be paced to prevent obstruction or collision along the route

BICYCLE ROUTE GUIDE SIGNS

These are placed along the route to indicate a designated bicycle route to specific destinations. The D1-1c signs are about the size of a street name sign and are typically placed on the same post as a street name sign. The D11-1c signs are placed at intervals along the route to inform users they are on the route. These signs also act to promote bicycle use to non-cyclists who may have never considered bicycling to the destinations listed on the signs.

D1-1c - Used where the route changes direction, they provide information on the direction, destination and

D11-1c – Used along the route, they confirm the route and destination

BICYCLE ROUTE IDENTIFICATION SIGNS

Some bike routes are significant enough to warrant a name or numerical designation. Typically these are regional routes or "trails" that are comprised of many different facility types. Bike Route Identification Signs establish a unique identification for a bike route. The M1-8a signs are typically used with auxiliary plaques that indicate the direction of travel and any changes in direction of the route.

M1-8a – These have a space at the top for a unique logo and a name may also be used instead of a number

**If a route is for bicycle and pedestrians both symbols should be used on the sign*

ACTIVE TRANSPORTATION HUBS

Active transportation hubs are wayfinding kiosks that serve as orientation and resource centers for multi-modal trips. They help those who are already walking and bicycling find community resources and introduce people to new walking and bicycling opportunities. They are typically located in city centers or significant parks with major non-motorized routes. They are most effective when placed in high profile locations. When used consistently throughout a region they become focal points for navigation and their locations are shown on regional maps.

Active Transportation Hubs include the following amenities:

- **Four Sided Information Kiosk**
  - **County/Regional Trail Map**
  - **Downtown Attractions/ Walking Map**
  - **Bulletin Board with Events**
  - **General Tourist Information**
- **Drinking Fountain**
- **Bicycle Maintenance Station with Air Pump**
- **Bike Parking, Bench and Trash/Recycling Receptacles**
- **Lighting**
- **Vending machines that dispense basic bicycle repair supplies if there is not a bike shop nearby**

RECOMMENDATIONS

- ☐ Place bicycle route guide signs along the proposed neighborhood connector routes system to indicate designated routes to specific destinations
- ☐ Provide wayfinding signage for the existing Rouge Trails
- ☐ Provide Active Transportation Hubs at key locations around town such as Booth Park, Millrace Park, City Hall and in the Rail District

Web Survey Results:

- Around 82% of respondents feel wayfinding signs for suggested bicycle and pedestrian routes to key destinations are very important or somewhat important to making future walking and bicycling trips actually happen

3.9 NEIGHBORHOOD GREENWAY

DESCRIPTION

A Neighborhood Greenway is a non-motorized route that connects major destinations, links up regional connections and provides the organizing framework for a multi-modal system.

Neighborhood Greenways function as premium bicycle and pedestrian routes. Like Neighborhood Connector Routes, Neighborhood Greenways are primarily located on low speed, low volume roads and connecting pathways. Signs provide wayfinding by noting direction and distance to key destinations. If the route is significant enough it may even be designated with special branding and signage. These routes generally appeal to families, children and people who are less comfortable walking or bicycling along major routes.

Neighborhood Greenways typically incorporate sustainable design elements such as rain gardens, bio-swales and native plantings. They may also incorporate pedestrian amenities such as art installations, benches, interpretive signs, community vegetable gardens and ornamental gardens. For many communities where an off-road trail is not available or feasible, a Neighborhood Greenway provides similar amenities but within the existing right-of-way.

For the most up-to-date guidelines please refer to Chapter 9 of the *MUTCD*, Chapter 4 & 5 of AASHTO's *Guide for the Development of Bicycle Facilities,* and the Bikeway Signing & Marking section of NACTO's *Urban Bikeway Design Guide*.

RECOMMENDATIONS

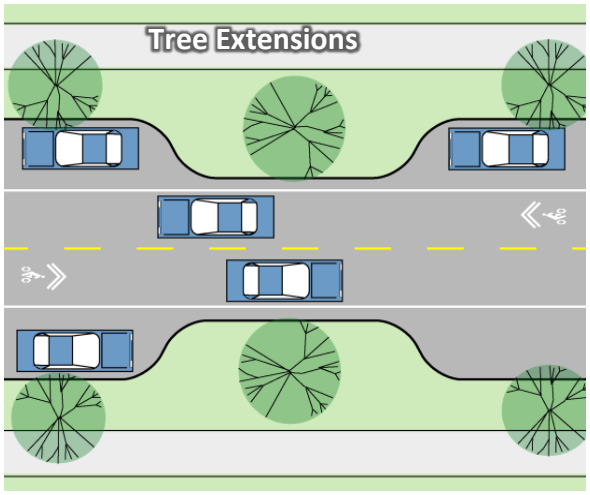
Once the proposed neighborhood connector routes are implemented, the City should evaluate if any of the routes should be designated as Neighborhood Greenways and receive further enhancements.

PHYSICAL ENVIRONMENT RECOMMENDATIONS

3.10 TREE EXTENSIONS

DESCRIPTION

Tree extensions reduce the effective street width by extending the curb line out into the parking lane. They create a physical barrier in the roadway which encourages motorists to drive slower. Tree extensions are built very similar to curb extensions but include landscaping and canopy trees in place of the pedestrian crossing.



RECOMMENDATIONS

Two tree extensions are proposed on Lincoln Street to help calm traffic between Southfield Road and Woodward Avenue.

FIGURE 3.10A PROPOSED TREE EXTENSIONS

3.11 BICYCLE PARKING

DESCRIPTION

Bicycle parking needs to be visible, accessible, plentiful and convenient. If any of these criteria are not met, there is a good chance cyclists will not use the facilities and will park their bike wherever they feel it will be safest.

UNCOVERED BICYCLE PARKING – Uncovered bicycle racks are the primary bike parking approach where people are expected to park their bikes for only a few hours. Generally the "U" design is considered the best model. These types of racks should be located on every block where there is retail within a commercial district. Recently, the City put in an extensive number of U racks in the downtown.

ENCLOSED & SECURED BICYCLE PARKING – Enclosed and secured bicycle parking is best for areas where bikes are kept for extended periods of time, such as apartment buildings and near places of employment. These facilities are generally placed within the existing parking structures and may come with extra bicycle parking amenities. Bicycle parking is generally provided at a fee to the user.

TEMPORARY BICYCLE PARKING – Temporary bicycle parking consists of movable racks that are placed within an open area of the sidewalk or take the place of on-street motor vehicle parking. Since these racks are temporary, they can be experimented with and moved as needed. They can also be used on a seasonal basis and can be removed during the winter or placed in different locations for large events.

BICYCLE REPAIR STATIONS - Developing infrastructure that supports bicycling is important to encourage and extend bicycling trips in the community. Initiatives should be started to spread bicyclists' common needs beyond the bike shop. Bicycle repair stations that include basic tools and air pumps should be located in areas with high bicycle traffic such as in major parks and in downtown areas.

RECOMMENDATIONS

In 2012, the City of Birmingham installed 45 new uncovered bicycle U racks in the downtown. In addition to these enhancements the following improvements have been recommended:

- ☐ Two bicycle racks should be placed on each proposed curb extension in the downtown
- ☐ Bicycle racks should be placed on a hard surface with ample lighting and high visibility to discourage theft and vandalism
- ☐ Bicycle racks should be placed to avoid conflicts with pedestrians and when installed in public spaces there needs to be at least 5 feet of clear sidewalk space for pedestrians
- ☐ Bicycle racks should be covered whenever there is opportunity to do so
- ☐ Seasonally, temporary bike racks should be placed in the downtown where there are large curb extensions or where space is available adjacent to outdoor dining decks
- ☐ Provide temporary staffed bike racks during special events to encourage bicycling and provide a secure environment for bikes
- ☐ Provide enclosed and secured parking in downtown parking decks
- ☐ Provide amenities such as compressed air and basic public bike fix stations at key locations around town

Please refer to the Network Implementation Plan and Specific Area Concept Plans for more details.

Web Survey Results:

- Around 86% of respondents feel that bicycle parking is very important or somewhat important to making future walking and bicycling trips actually happen

3.12 TRANSIT FACILITY AMENITIES

DESCRIPTION

When developing a multi-modal plan it is important to consider transit users because at some point the transit user becomes a pedestrian. Many times, people who use transit do not own an automobile, so walking and bicycling are their main forms of transportation. It is important to not only to provide safe and convenient ways to access transit but also to provide infrastructure and amenities at the transit stop.

At the very minimum bus stops should provide a concrete pad so wheelchair users can safely access the bus stop.

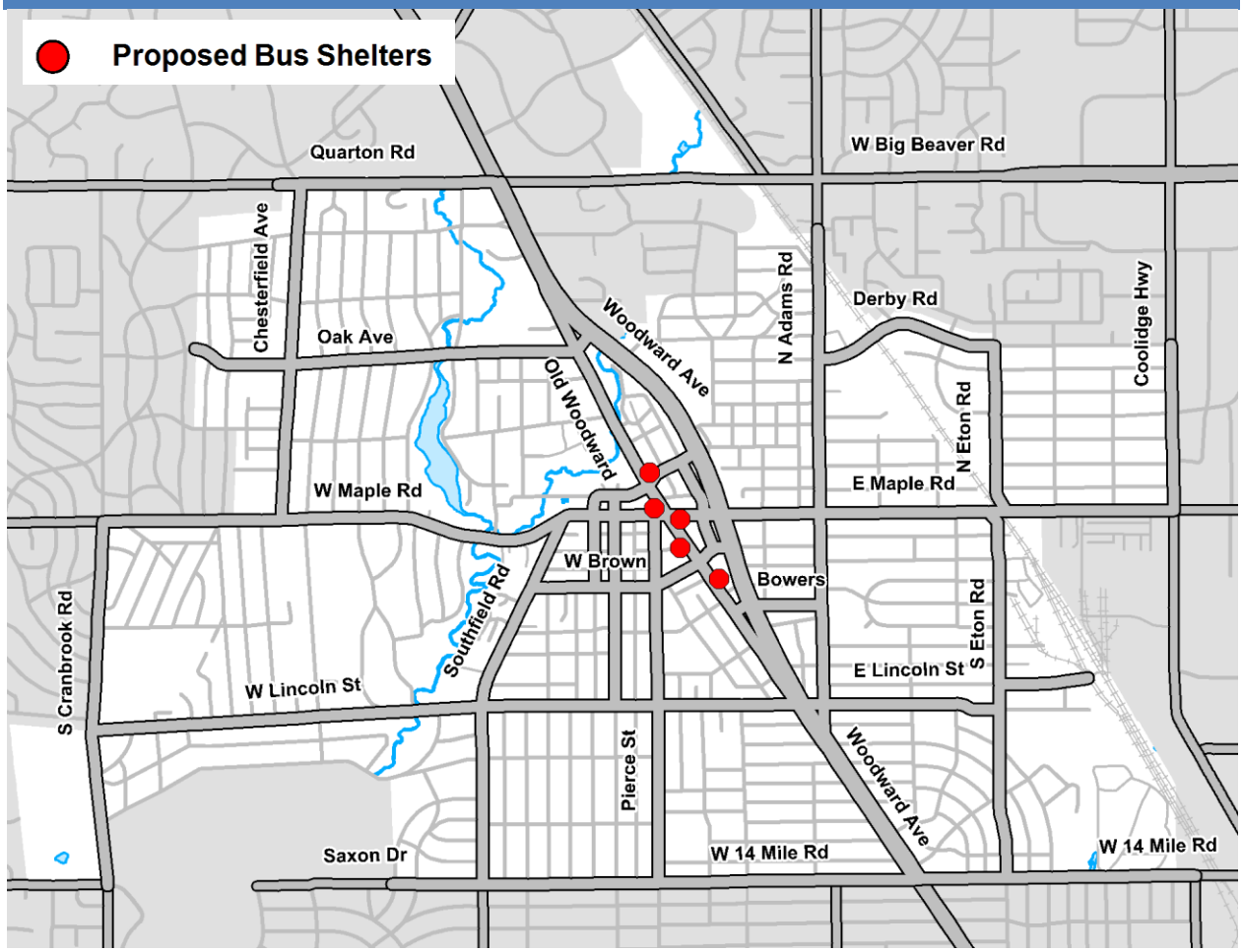
Super Stops are essentially bus stops with additional amenities such as benches, shelters, maps and schedules, bus pull-off area and lighting. Since there are additional amenities, the stops will have a larger draw area. Generally these occur where a bicycle and pedestrian route intersects a bus route and in areas of high ridership.

RECOMMENDATIONS

- ☐ At a minimum, all bus stops should provide a concrete pad so wheelchair users can safely access the bus stop
- ☐ Consistent bus stop signs should be used throughout the City
- ☐ In areas with a high number of people boarding or exiting buses, provide additional amenities such as shelter, lighting, benches, route maps and schedules

Please refer to the Special Area Concept Plans for more information.

FIGURE 3.12A PROPOSED DOWNTOWN BUS SHELTERS



5 BUS SHELTERS ARE PROPOSED IN THE DOWNTOWN

Web Survey Results:

- Around 43.7% of respondents who do not use transit said they would be encouraged to reconsider taking transit it if a shelter was located at the bus stop
- 100% of the respondents who currently ride SMART said that bus shelters are very important or somewhat important to the comfort and convenience of their trip

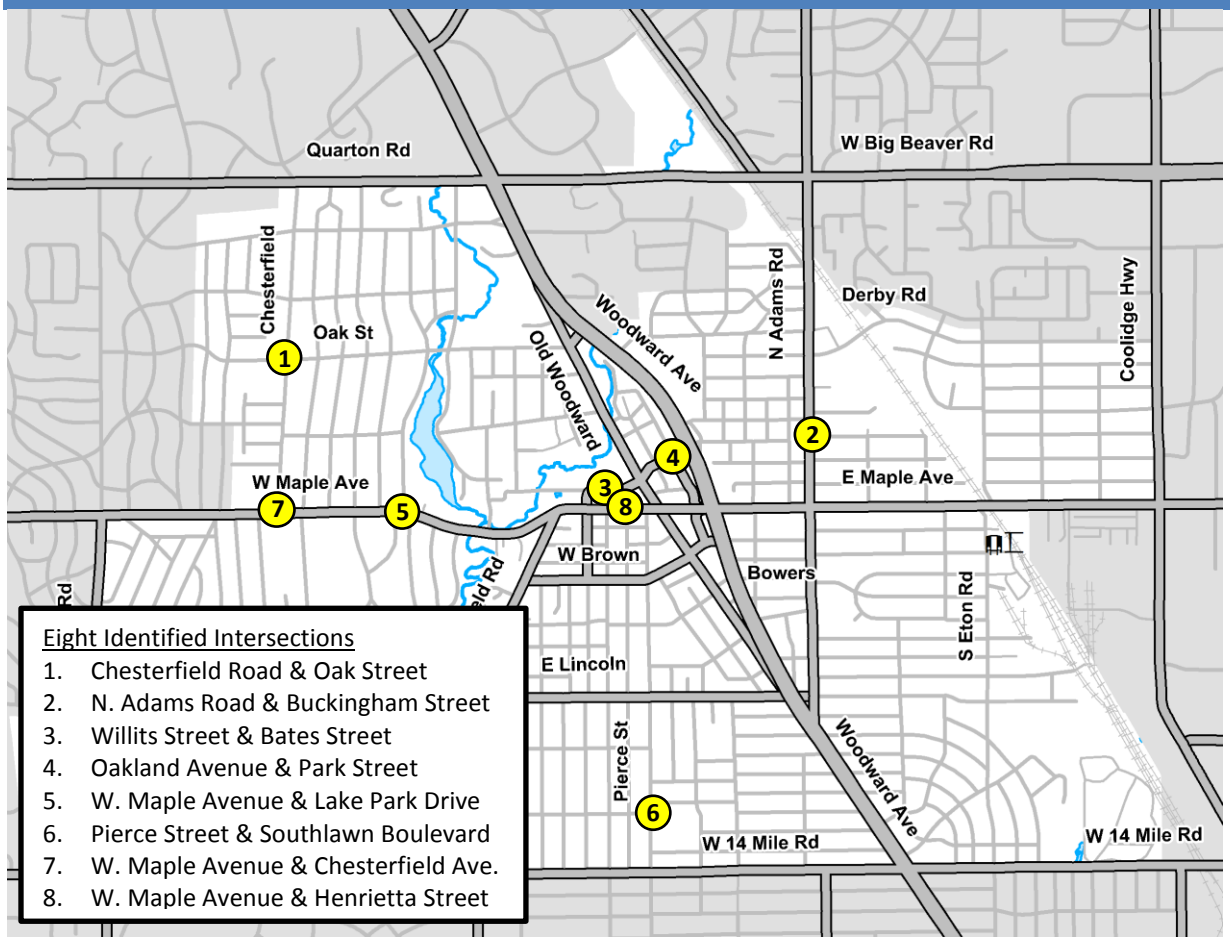
PHYSICAL ENVIRONMENT RECOMMENDATIONS

3.13 INTERSECTION RECOMMENDATIONS

DESCRIPTION

The City of Birmingham identified eight signalized intersections that may benefit from operational improvements to better balance the needs of transit vehicles, motorists, pedestrians and bicyclists. Existing conditions analysis was conducted at each intersection, which are shown on the map below and selected by the City of Birmingham. Recommendations were developed for each intersection and include potential intersection improvements and next steps to implementing these improvements. This section of the plan serves as a summary of both the existing conditions and recommendations. Additional details and the full reports can be found in Appendix E.

FIGURE 3.13A INTERSECTIONS UNDER EVALUATION



EXISTING CONDITIONS

The intersections on the preceding page share some common characteristics, as described below. Additional details on the existing conditions at each of the study intersections are provided in Appendix E.

1. All of the intersections are signalized and pre-timed, or fixed, meaning that the signal continually runs on the same pattern of timings and the vehicle and pedestrian indications (i.e. a green light or white walking person) are provided during each signal cycle regardless of whether vehicles or pedestrians are present.
    - Pre-timed signals are beneficial to pedestrians because they are not required to push a button to receive the WALK indication (i.e. white walking person).
    - Pre-timed signals can be inefficient for motor vehicles, especially during off-peak times. For instance, the minor street could receive the green indication when there are no cars present. These off-peak inefficiencies are addressed by putting the signal in flashing operation during off-peak hours, typically overnight, as seen at many of these signals. Flashing operation usually means the major street receives a flashing yellow indication, while the minor street receives a flashing red indication, operating like a two-way stop. In some cases all approaches may receive a flashing red indication and the signal will operate like an all-way stop.
2. Most intersections have crosswalks on all legs, or all but one leg, of the intersection.
3. All intersections have pedestrian WALK (white walking man), flashing DON'T WALK (flashing yellow hand) or DON'T WALK (solid yellow hand) indications and most have countdown timers, which indicate to the pedestrians how much time they have remaining to cross the street. Countdown timers typically decrease the number of pedestrians remaining in the crosswalk at the onset of the DON'T WALK indication, but increase the number of pedestrians violating the flashing DON'T WALK indication.
4. No bicycle facilities (e.g. striped bike lane, shared lane marking, etc.), indications (bicycle signal), or Accessible Pedestrian Signal accommodations (as described in the Americans with Disabilities Act) are provided at the study intersections.

RECOMMENDATION INTERSECTON ALTERNATIVES

The following table outlines one or more alternatives each intersection. For each alternative the potential improvements are noted in the table. Prior to any physical changes to the intersections, a comprehensive engineering study will be conducted for each intersection to identify the preferred alternative and refine the proposed improvements.

FIGURE 3.13B RECOMMENDED INTERSECTION IMPROVEMENTS

	Add Curb Extensions	Add Median Island	Add Crosswalk	Implement Road Diet	Convert to Roundabout	Remove Signal	Add Countdown Timers	Update Pedestrian Times	Add Leading Pedestrian Interval	Shorten Signal Cycle Length	Add/Extend Flashing Operation	Add Detection	Other Improvements
1. Oak & Chesterfield													
Roundabout Alternative					X	X							X
Signalized Alternative	X							X			X	X	X
Stop-Controlled Alternative	X					X							X
2. Adams & Buckingham													
Signalized Alternative			X					X		X	X	X	
Stop-Controlled Alternative		X				X							
3. Willits & BatesM													
Signalized Alternative	X							X	X	X			X
Stop-Controlled Alternative	X					X							
4. Oakland & Park													
Signalized Alternative	X			X				X	X		X	X	X
5. Maple & Lake Park													
Non-Road-Diet Alternative			X				X	X		X		X	
Signalized Road-Diet Alt.		X	X	X			X	X		X	X	X	
Stop-Controlled Road-Diet Alt.		X		X		X							
6. Pierce & Southlawn													
Signalized Alternative	X							X			X	X	
Stop-Controlled Alternative		X	X			X							
7. Maple & Chesterfield													
Non-Road Diet Alternative							X	X		X		X	
Road-Diet Alternative		X		X			X	X		X	X	X	
8. Maple & Henrietta													
Signalized Alternative	X							X	X	X			
Stop-Controlled Alternative	X					X							X

OVERVIEW OF RECOMMENDED INTERSECTION IMPROVEMENT TREATMENTS

A brief description of each improvement identified in Figure 3.13B, Recommended Intersection Improvements, is provided on the following pages. Additional details including benefits, limitations and next steps are outlined in Appendix E.

GEOMETRIC IMPROVEMENTS:

- **Adding curb extensions** shortens the crossing distance for pedestrians, improves visibility between pedestrians and motorists, adds more pedestrian queuing space and may reduce vehicle turning speed.
- **Adding a median island** provides refuge for pedestrians crossing the road. A median island allows the pedestrian to cross in two stages, which increases crossing opportunities.
- **Adding a crosswalk** improves pedestrian connectivity and decreases pedestrian delay. In many cases, adding a crosswalk does not affect signal timing and is a very cost-effective way to improve pedestrian conditions at an intersection.

OPERATIONAL IMPROVEMENTS:

- **Implementing a road diet** may slow traffic and reduces pedestrian crossing distance and can create space for a bike lane or parking lane, which provides an additional buffer from traffic for pedestrians. (See “Additional Details on Implementing a Road Diet” below).
- **Converting an intersection to a roundabout** may reduce delay and potential conflicts for motorists at the intersection.
- **Removing a signal** and converting the intersection to a two- or all-way stop-controlled intersection may reduce delay to all users. At locations where signals are to be removed, geometric improvements may be required to provide pedestrian and bicyclists safer opportunities to cross roadways. Before removing the traffic signal, the intersection should be adjusted to operate in flash operation 24-hours per day as a pilot to test removing the signal. (See “Additional Details on Removing a Signal” below)

SIGNAL IMPROVEMENTS:

- **Adding countdown timers** informs pedestrians of the remaining time they have to cross the street and may reduce conflicts between motorist and pedestrians
- **Updating pedestrian times** includes adding a pedestrian buffer time and changing the pedestrian change interval (flashing DON’T WALK time) to allow more time for pedestrians to cross the street.

- **Adding leading pedestrian intervals** allows pedestrians to get a head start in crossing the intersection before conflicting turning vehicles are released.
- **Shortening the signal cycle length** reduces pedestrian and motorist delay where appropriate.
- **Adding/Extending flashing operation** reduces delay for all users at times of day when demand is low and can be added or implemented at more hours of the day at locations where traffic is high during peak hours and low during the remaining hours of the day. At locations where signals operate in flash, geometric improvements may be required to provide pedestrians and bicyclists safer opportunities to cross roadways.
- **A semi-actuated signal** responds to traffic on the minor street and pedestrians crossing the major street to reduce delay when traffic volumes on the minor street are relatively low. During peak hours, the minor streets will actuate each cycle (i.e. at least every 80 seconds), creating gaps for motorists exiting adjacent side streets.
- **Other improvements include** widening a median island to provide additional queuing space for pedestrians, changing the signal phasing to better accommodate all users, and implementing safe routes to school strategies to improve operations during student arrival and dismissal periods.

ADDITIONAL DETAILS ON IMPLEMENTING A ROAD DIET:

This plans recommendations the consideration of a road diet on Maple Avenue between Lake Park Drive and Chesterfield Avenue and on Oakland Avenue near Park Avenue:

- **On Maple Avenue**, a 4 to 3 lane conversion is recommended, which reduces traffic to one lane in each direction and adds either a two-way-left-turn lane or a median island with left-turn pockets where needed. This conversion reallocates the remaining roadway width to add a bicycle lane in each direction. Signal time typically should be modified to serve the changes to traffic and accommodate bicyclists.

- **On Oakland Avenue**, a road diet that converts the right travel lane to a buffered bicycle lane or a bike lane and parking lane in each direction is recommended. Signal time typically should be modified to serve the changes to traffic and accommodate bicyclists.

Before road diets are implemented on either of these roads, the following should be considered:

- **Additional, more detailed analysis.** This plan has completed a high-level analysis of road diets along Maple Avenue and Oakland Avenue. Before a road diet is implemented, a detailed traffic capacity analysis is required to determine the feasibility of removing travel lanes.

- **Pilot to test road diet.** Where curb work changes are necessary for a road diet, a pilot road diet can be implemented using pavement markings, flexible posts and temporary curbs. A pilot road diet costs less to construct and provides the opportunity to evaluate the effects to traffic flow and safety before fully reconstructing the road.

FIGURE 3.13C PILOT ROAD DIET EXAMPLE

This graphic provides an example of how flexible posts and temporary curbs can be used to pilot changes to roadway configurations.

ADDITIONAL DETAILS ON REMOVING A SIGNAL:

This plans recommendations the consideration of a removing the traffic signal at several intersections including Oak & Chesterfield, Adams & Buckingham, Willits & Bates, Maple & Lake Park, Pierce & Southlawn and Maple & Henrietta. At each of these intersections ***the removal of the signal is only recommended in conjunction with other improvements*** that will provide opportunities for pedestrians to cross the street and motorists to turn onto the major street. Additional considerations for the alternatives that included removal of a traffic signal at these intersections include:

- **Test the removal of the signal.** The traffic signals can be switched to 24-hour flashing operation to test how the intersection would operate without a signal.
- **Add curb extensions.** At Oak & Chesterfield, Willits & Bates and Maple & Henrietta, curb extensions are recommended for the "Stop-Controlled Alternative". Curb extensions improve the pedestrian crossing in the absence of a signal.
- **Add a median island.** At Adams & Buckingham, Maple & Lake Park and Pierce & Southlawn, median islands are recommended for the "Stop-Controlled Alternative". Median islands improve the pedestrian crossing in the absence of a signal and allow pedestrians to cross the street in two stages.
- **Add a center-left-turn lane.** At Maple & Lake Park, the removal of the signal is only recommended in conjunction with the road diet. The road diet will include the installation of a center-left-turn lane that will provide motorists with the opportunity to turn left in two stages, only crossing one lane of traffic at a time. Further, vehicles traveling in one direction will be confined to one lane on Maple Avenue, making it easier for motorists on the side street to judge the availability of gaps in vehicles along the major road.

NETWORK IMPLEMENTATION PLAN

MASTER PLAN ADOPTION

Adopting the Multi-modal Plan is the first step in the implementation process as this gives the recommendations official standing. Having the plan officially adopted is key when seeking outside funding for recommended improvements. It indicates to outside funding sources that a particular project is part of a larger vision and has community buy-in.

COORDINATION

The project Steering Committee should continue to meet after the plan has been adopted to provide continued coordination and to help oversee the implementation of the plan.

TOPICS:

NETWORK IMPLEMENTATION PLAN

4.1 NETWORK PHASING OVERVIEW

PHASE 1

Phase 1 focuses on already planned road and infrastructure projects in the City that are included within the City's Capital Improvement Plan (CIP). Integrating improvements into other larger projects is typically the most cost effective way to implement improvements. Some elements of Phase 1 are incidental to the cost of the currently planned projects, others expand the scope and cost of the planned projects. The implementation plan identifies the costs that exceed the original scope of the project.

PHASE 2

For the next ten or so years (depending on available funding), the project should focus on establishing the core network. This network includes improvements that may be accomplished by relatively modest changes to the existing road system. It creates connections all the way across the City and establishes the backbone to the multi-modal system. The connections incorporate existing facilities, proposed bike lanes and shared lane markings on primary roads, proposed bike routes on local roads, proposed road crossings improvements, and connections to transit locations. While not everyone will be comfortable using all of these facilities, they will provide a strong foundation from which to build a more comprehensive multi-modal network.

The goal is that with the completion of Phase 1 and Phase 2 there will be a substantial multi-modal network in place that provides connections to key destinations around the City on routes that a large majority of the population would be comfortable using.

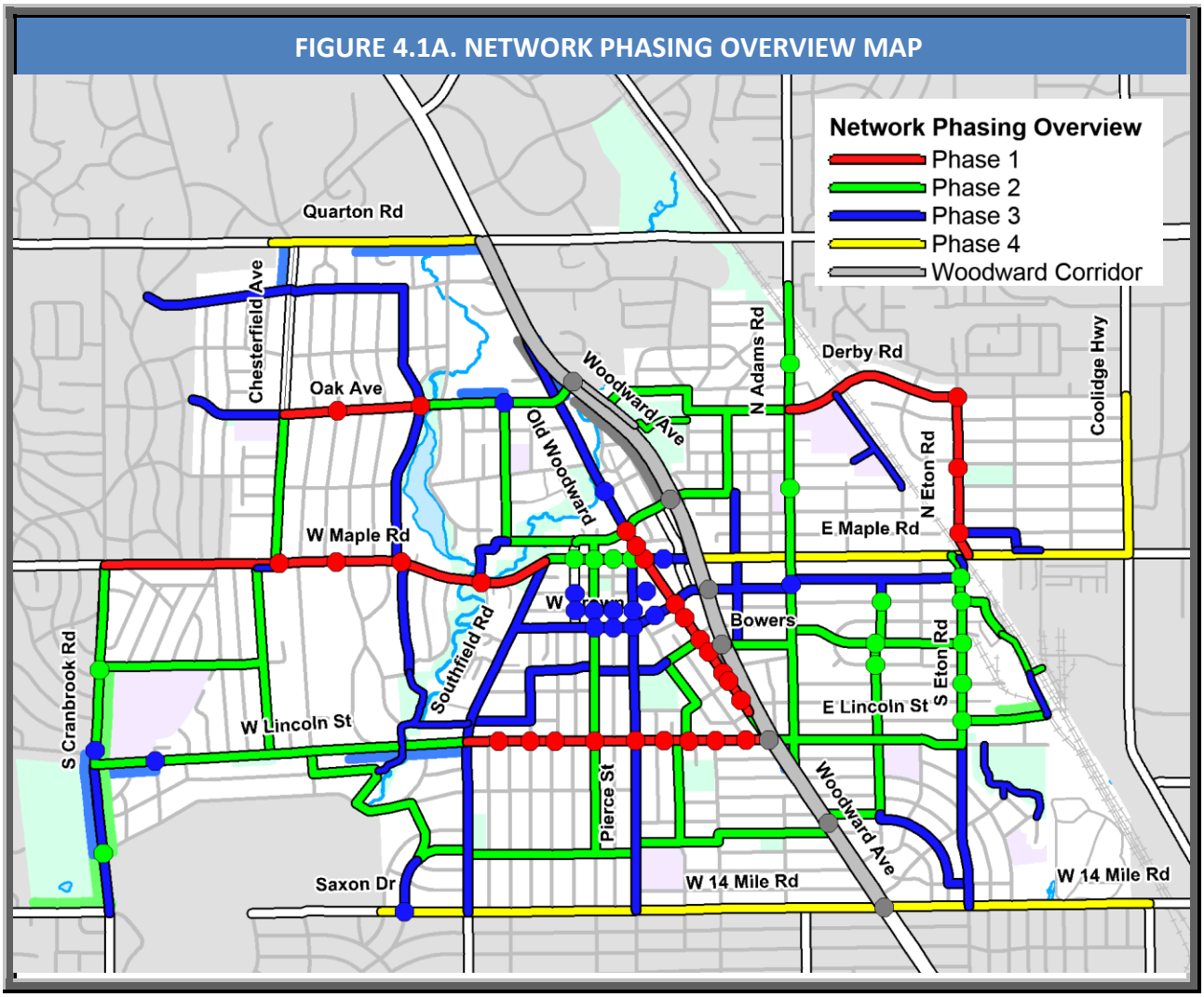
PHASE 3

Phase 3 focuses on expanding the network via cost-effective projects that may generally be accomplished within the existing road cross section. This phase includes all the of the remaining network improvements. Some projects in phase 3 may be dependent on items in phases one and two being completed.

PHASE 4

For some roads such as 14 Mile Road, E. Maple, Quarton Road and Coolidge Highway there are limited cost effective solutions for some mode types in the near-term. In the future, when these streets are reconstructed they should be evaluated at that time to see what types of improvements are possible and desired.

FIGURE 4.1A. NETWORK PHASING OVERVIEW MAP



CONCURRENT STUDIES

Numerous concurrent studies were underway on the Woodward Avenue Corridor during the creation of this plan. Due to this occurrence, implementation recommendations for this corridor were not provided. Details on the Woodward Avenue Corridor can be found under the Specific Area Concept Plans.

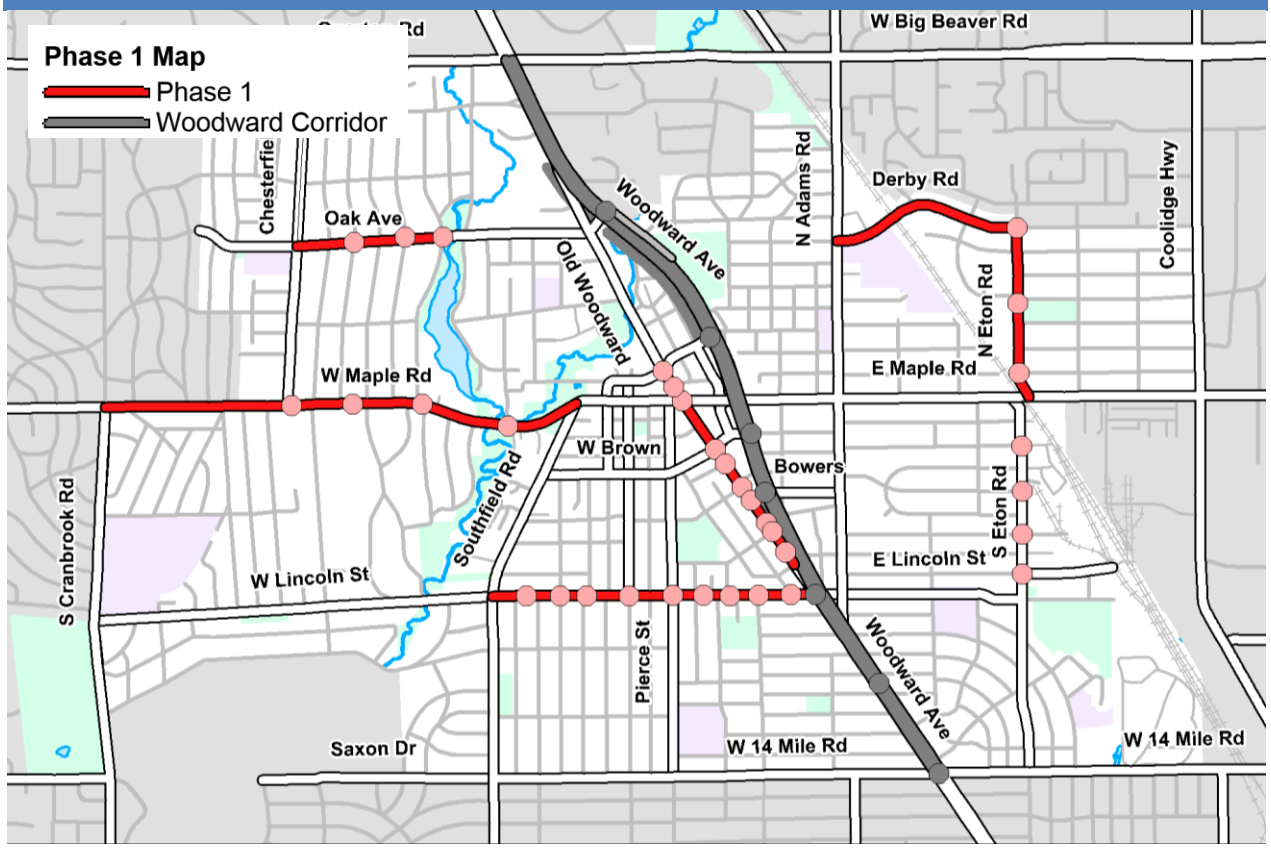
4.2 PHASE 1

PHASE 1: OVERVIEW

Many of the routes in Phase 1 may be implemented as part of the City's Capital Improvement Plan (CIP). A Capital Improvement Plan is a short-range plan, usually five to ten years which identifies capital projects and provides planning schedules and options for financing the plan. CIP roadway projects generally fall into two categories, resurfacing and reconstruction. Resurfacing projects typically only affect the surface of the roadway, whereas in a reconstruction project the existing roadway, curb and sidewalk may be completely removed and reconstructed. Incorporating the proposed improvements with the CIP is a cost effective way to implement the facilities as it will reduce mobilization costs and help to consolidate roadway closures.

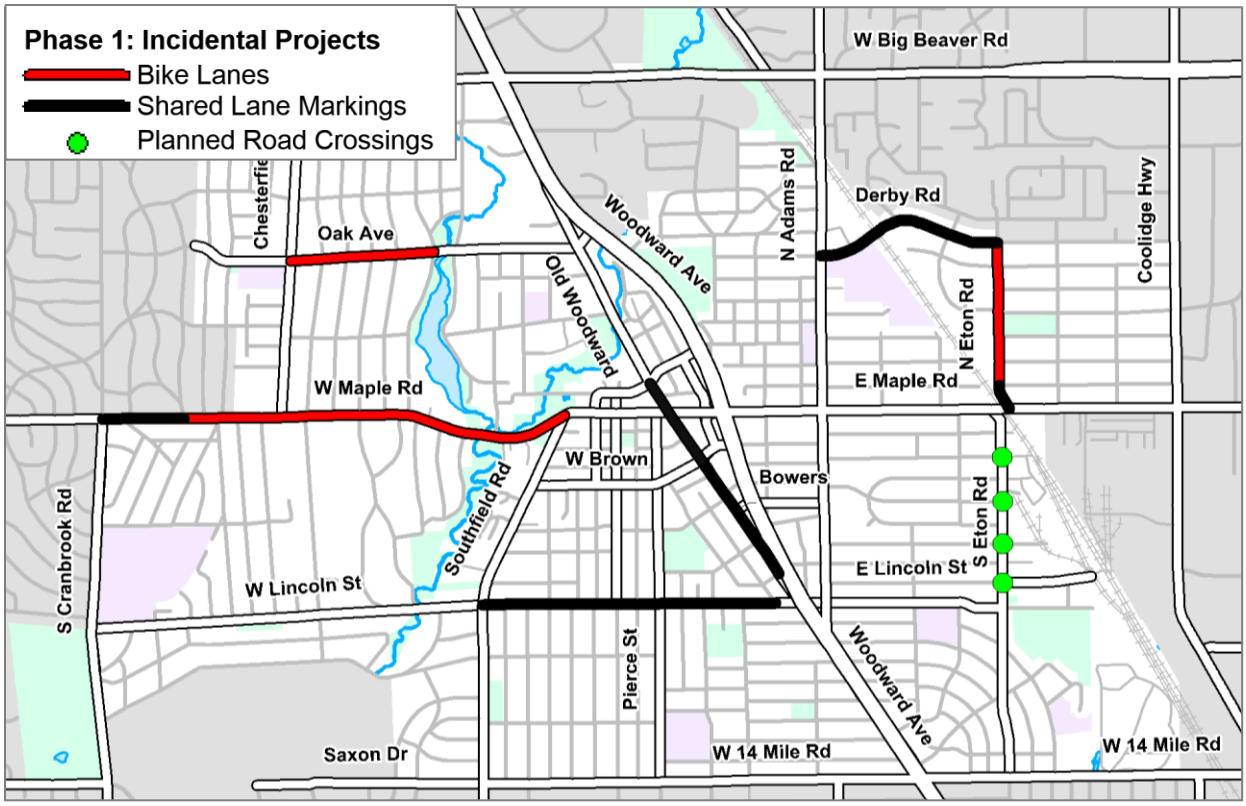
The following pages provide a more detailed breakdown of Phase 1.

FIGURE 4.2A. PHASE 1



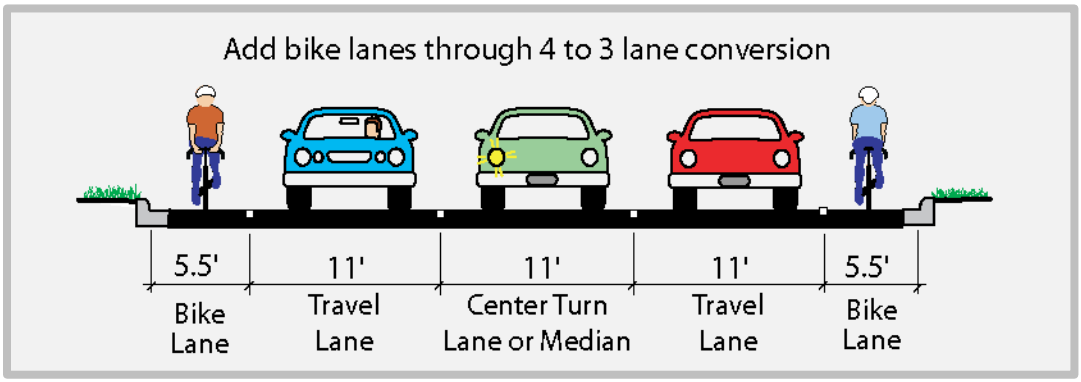
PHASE 1: INCIDENTAL PROJECTS

The following is a list of projects that could be implemented as part of the City's Capital Improvement Plan (CIP) with incidental costs.



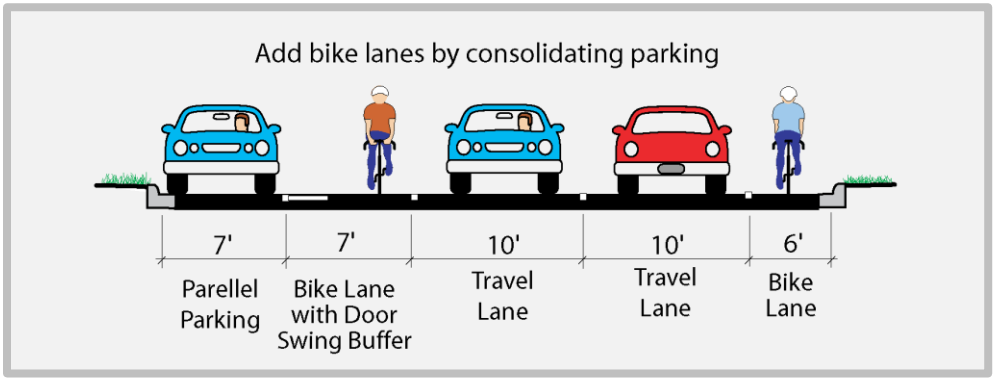
Add bike lanes to W Maple Road between Waddington Street and Southfield Road through a four-lane to three-lane conversion as part of the 2015 road resurfacing project.

W MAPLE ROAD

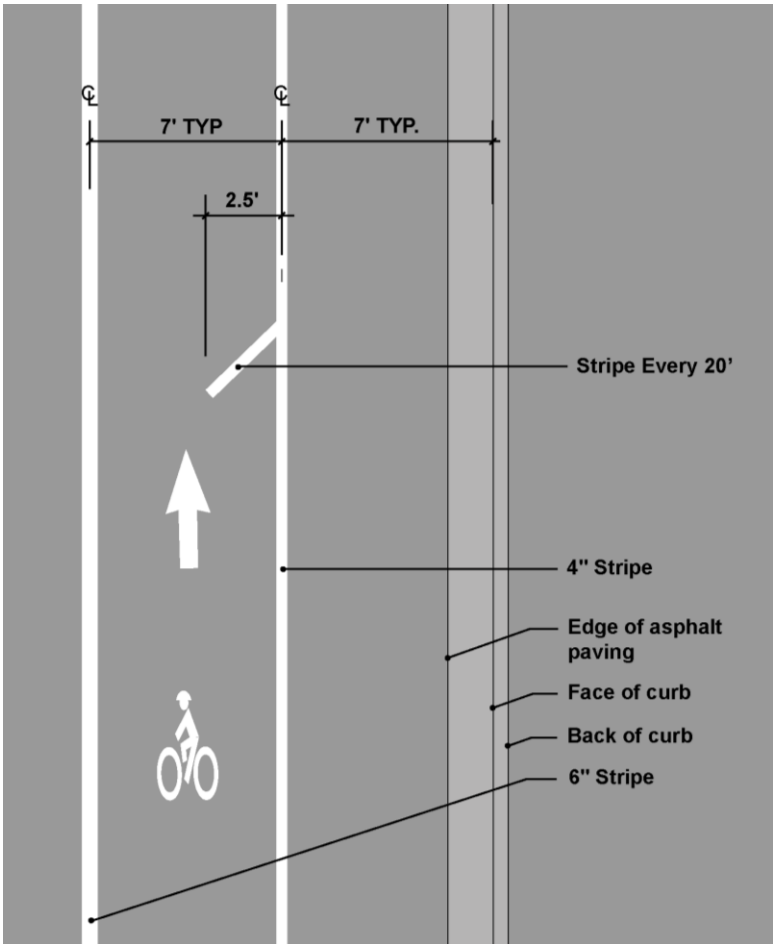


Add bike lanes to N Eton Road between Derby Road and Yorkshire Road by consolidating the parking to the west side of the road as part of the 2014 road reconstruction project.

N ETON ROAD



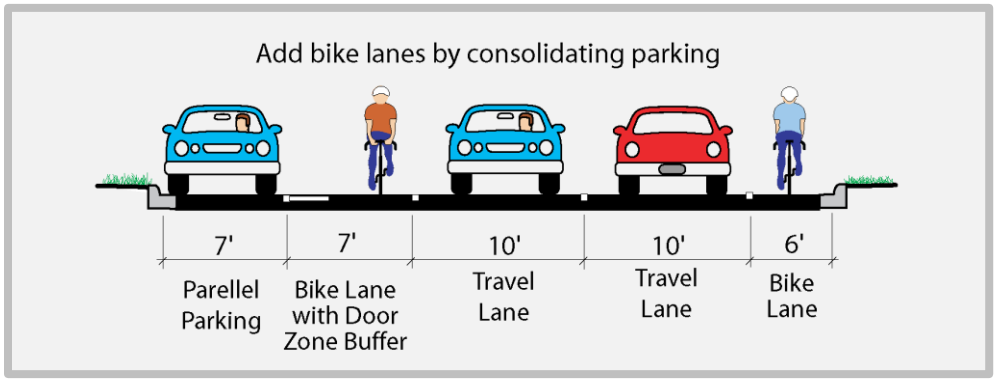
Markings for the door swing zone of the parked cars are proposed within the bike lane when it is adjacent to on-street parking.

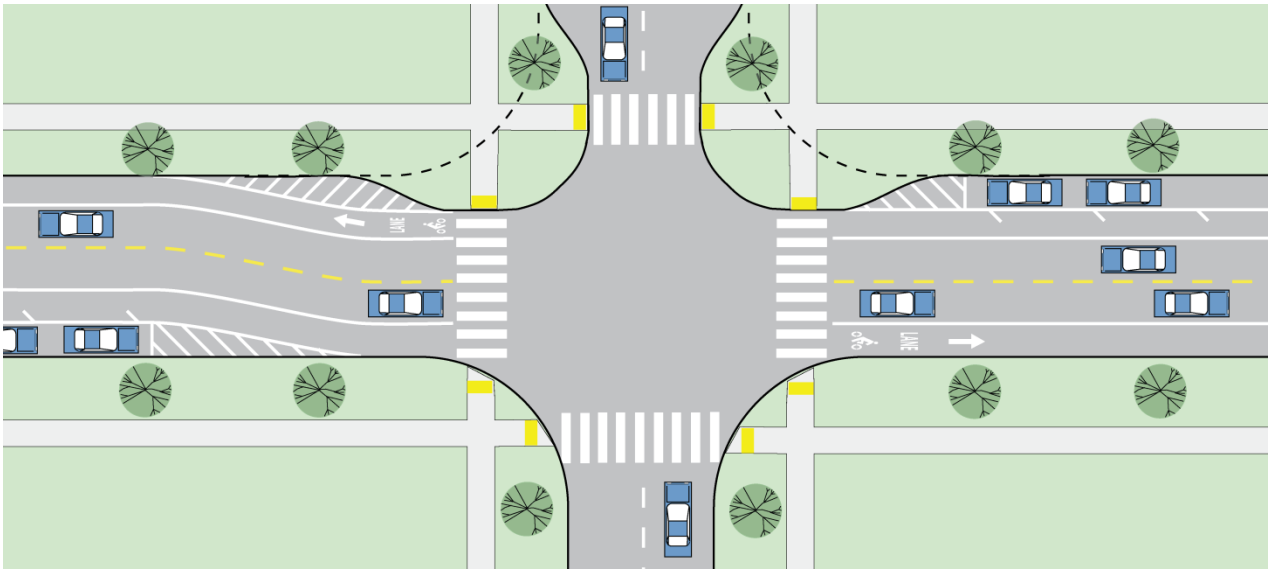


Add bike lanes to Oak Avenue between Chesterfield Avenue and Lake Park Drive by consolidating the parking to one side of the road as part of the 2016 road reconstruction project. To provide additional traffic calming the consolidated parking should alternate from the north side of the road to the south side of the road every few blocks, changing sides where there are proposed curb extensions:

- Chesterfield Avenue to Suffield Avenue – Parking on south side
- Suffield Avenue to Puritan Avenue – Parking on north side
- Puritan Avenue to Lake Park Drive – Parking on south side

OAK AVENUE





Pavement markings for the door swing zone are proposed between the on-street parking and the bike lane. See previous page for details.

Add shared lane markings to the following corridors:

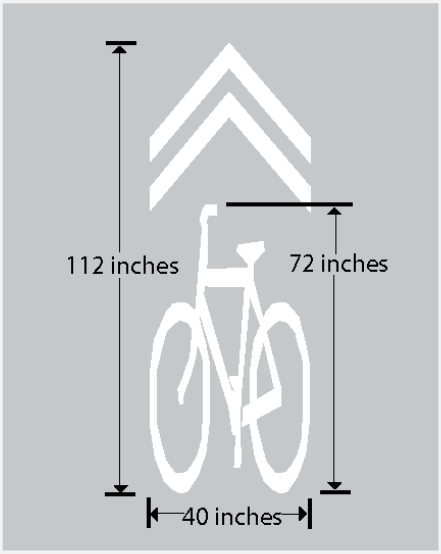
- Derby Road between N Adams Road and the Railroad Overpass (2013 reconstruction project)
- Derby Road between the Railroad Overpass and N Eton Road (2014 resurfacing project)
- Lincoln Street between Southfield Road and Ann Street (2014 resurfacing project)
- N Eton Road between Yorkshire Road and E Maple Road (2014 reconstruction project)
- W Maple Road between Cranbrook Road and Waddington Street (2015 resurfacing project)
- N Old Woodward Avenue between Willits Street and W Maple Road (2016 reconstruction project)
- S Old Woodward Avenue between W Maple Road and E Brown Street (2016 reconstruction project)
- S Old Woodward Avenue between E Brown Street and Landon Road (2017 reconstruction project)

Four new road crossings are planned on S Eton Road between E Maple Road and E Lincoln Street in 2013. The plans for these crossing include basic improvements such as pavement markings. As part of Phase 2 it is recommended that curb extensions be implemented at these crossing locations as well.

PHASE 1 INCIDENTAL PROJECTS:				
Road	From	To	Quantity	Unit
Bike Lanes:				
N Eton Rd	Yorkshire Rd	Derby Rd	0.40	MI
W Maple Rd	Waddington St	Southfield Rd	1.12	MI
Oak Ave	Chesterfield Ave	Lake Park Dr	0.40	MI
Shared Lane Markings (placed every 200' - 250'):				
Derby Rd	N Adams Rd	Railroad Overpass	0.17	MI
Derby Rd	Railroad Overpass	N Eton Rd	0.36	MI
Lincoln St	Southfield Rd	Ann St	0.80	MI
W Maple Rd	Cranbrook Rd	Waddington St	0.20	MI
N Old Woodward Ave	Willits St	W Maple Rd	0.10	MI
S Old Woodward Ave	W Maple Rd	E Brown St	0.17	MI
S Old Woodward Ave	E Brown St	Landon Rd	0.43	MI
Road Crossings				
S Eton Rd	at Villa Rd		1	EACH
S Eton Rd	at Bowers St		1	EACH
S Eton Rd	at Holland St		1	EACH
S Eton Rd	at Cole St		1	EACH

Guidelines to Follow When Adding Shared Lane Markings:

Please note that when used on a street without on-street parking that has an outside travel lane that is less than 14 feet wide, the center of the shared Lane markings should be at least 4 feet from the face of the curb or from the edge of the pavement where there is no curb.



PHASE 1: PROPOSED COLORED SHARED LANE MARKING

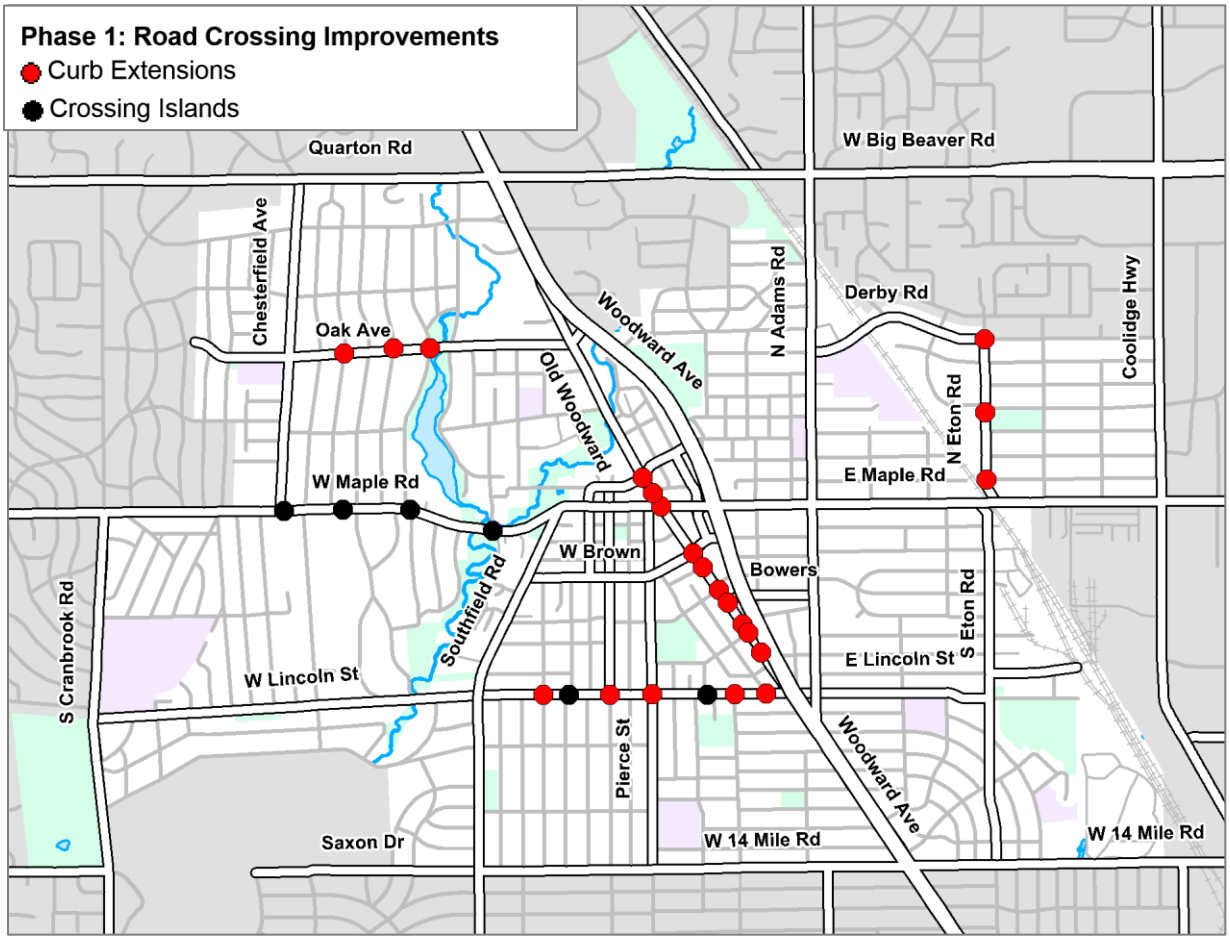
There is an opportunity to add colored shared lane markings to W Lincoln Street between Ann Street and Woodward Avenue during the 2014 road resurfacing project and to Bowers Avenue between S Old Woodward Avenue and Woodward Avenue during the 2017 road reconstruction project. **Please note that these projects would probably result in additional costs to the CIP.**

PHASE 1 COLORED SHARED LANE MARKING:				
Road	**From**	**To**	**Quantity**	**Unit**
Colored Shared Lane Markings (placed every 200' - 250' with solid green paint the entire length):				
W Lincoln St	Ann St	Woodward Ave	0.10	MI
Bowers	S Old Woodward Ave	Woodward Ave	0.05	MI

**As an alternative to the green paint, white chevrons may be used through the intersections.*

PHASE 1: PROPOSED ROAD CROSSING IMPROVEMENTS

The following table provides a list of proposed road crossing improvements that could be implemented as part of the City's Capital Improvement Plan (CIP). **Please note that these projects would probably result in additional costs to the CIP.**



With the proposed four-lane to three-lane conversion as part of the 2015 road resurfacing project on W Maple Road there is the potential for crossing islands at Chesterfield Avenue, Baldwin Road, between Suffield Drive and Pilgrim Avenue and between Lake Park Drive and Linden Road. Double posted rectangular rapid flash beacons with advanced warning signs in both directions are recommended at all crossing islands except Chesterfield Avenue due to the existing signal (assuming the signal at Lake Park Drive is removed with the four to three lane conversions).`

Crossing islands and curb extensions are proposed on Lincoln Street between Southfield Road and Woodward Avenue with the 2014 road resurfacing project.

Curb extensions are proposed on N Eton Road between Derby Road and E Maple Avenue with the 2014 road reconstruction project.

Curb extensions are recommended at intersections along Old Woodward Avenue between Willits Road and E Brown Street as part of the 2016 road reconstruction project and between E Brown Street and Landon Street as part of the 2017 road reconstruction project.

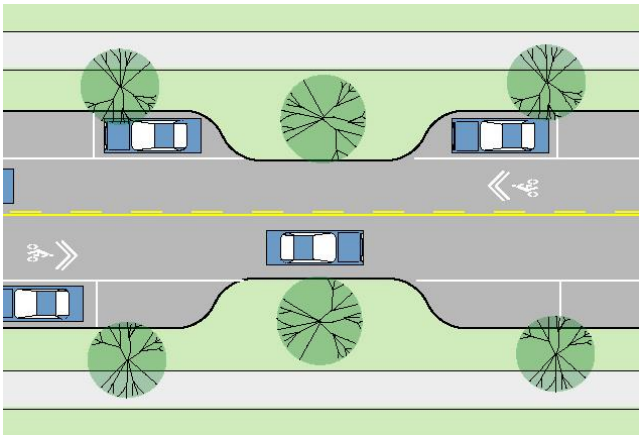
Curb extensions are proposed on Oak Avenue at Suffield Avenue, Puritan Avenue and Lake Park Drive with the 2016 road reconstruction project.

- Suffield Avenue – curb extensions on north side of road
- Puritan Avenue – curb extension on south side of road
- Lake Park Drive – curb extension on north side of road

PHASE 1 ROAD CROSSING IMPROVEMENTS:				
Road	From	To	Quantity	Unit
Crossing Islands (Bollards, landscaping, concrete curbs, striping):				
W Maple Rd	at Chesterfield Ave		1	EACH
W Lincoln St	at Stanley Blvd		1	EACH
W Lincoln St	at Floyd St		1	EACH
Crossing Islands with Double Posted Rectangular Rapid Flash Beacon with Advance Warning Signs				
W Maple Rd	Between Suffield Dr and Pilgram Ave		1	EACH
W Maple Rd	Between Lake Park Dr and Linden Rd		1	EACH
W Maple Rd	at Baldwin Rd		1	EACH
Curb Extensions (Sidewalks, landscaping, concrete curbs, sidewalk)				
Oak Ave	at Suffield Ave		2	EACH
Oak Ave	at Puritan Ave		2	EACH
Oak Ave	at Lake Park Dr		2	EACH
N Eton Rd	at Derby Rd		4	EACH
N Eton Rd	at Windemere Rd		1	EACH
N Eton Rd	at Yorkshire Rd		2	EACH
W Lincoln St	at Maryland Blvd		4	EACH
W Lincoln St	Pierce St		4	EACH
E Lincoln St	at Grant St		3	EACH
E Lincoln St	at Bates		4	EACH
E Lincoln St	at Ann St		4	EACH
N Old Woodward Ave	at Willits St		2	EACH
N Old Woodward Ave	at Hamilton Row		4	EACH
N Old Woodward Ave	at E Maple Rd		4	EACH
S Old Woodward Ave	at W Merrill St		4	EACH
S Old Woodward Ave	at E Brown St/Forest Ave		4	EACH
S Old Woodward Ave	at Danes Street		2	EACH
S Old Woodward Ave	at Hazel St/Frank St		2	EACH
S Old Woodward Ave	at Bowers St		3	EACH
S Old Woodward Ave	at Haynes St		3	EACH
S Old Woodward Ave	between George St and Landon St		2	EACH

PHASE 1: PROPOSED TREE EXTENSIONS

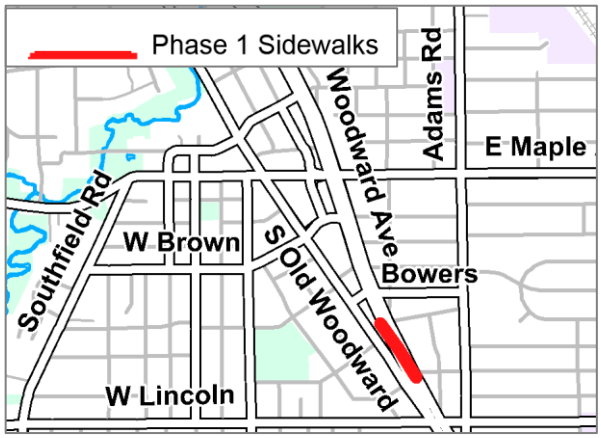
The following table provides a list of proposed tree extensions along Lincoln Street that could be implemented as part of the 2014 road resurfacing project**. Please note that these projects would probably result in additional costs to the CIP.**



PHASE 1 TREE EXTENSIONS:				
Road	From	To	Quantity	Unit
Tree Extensions (curb extension and landscaping)				
W Lincoln St	between Clark St and Lincoln Ct		2	EACH
E Lincoln St	between Shipman Blvd and Birmingham Blvd		2	EACH

PHASE 1: PROPOSED SIDEWALKS

There is an opportunity to provide a sidewalk along the east side of S Old Woodward Avenue between Haynes Street and Landon Street with the 2017 road reconstruction project. **Please note that this project would probably result in additional costs to the CIP.**

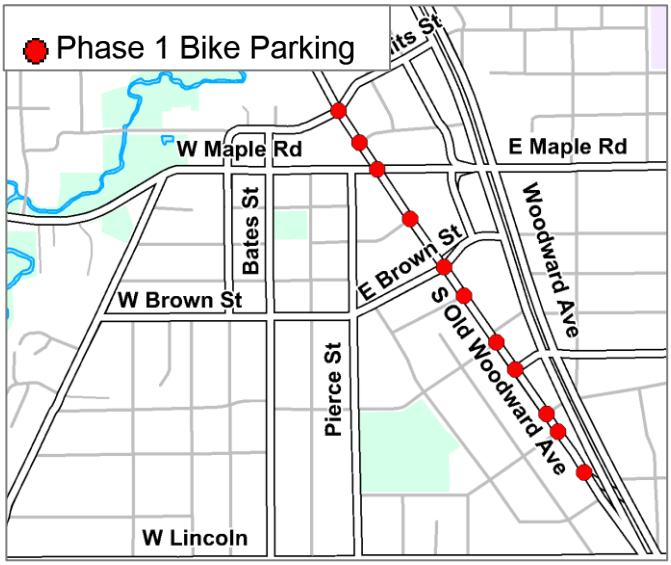


PHASE 1 SIDEWALKS:				
Road	From	To	Quantity	Unit
Sidewalks (8' wide):				
S Old Woodward Ave (east)	Haynes St	Landon St	700	LF

PHASE 1: PROPOSED BICYCLE PARKING

In 2012, the City of Birmingham implemented 45 new bike racks in the downtown area. In addition to these racks, the following table provides a list of proposed bike rack locations that could be implemented as part of the City's Capital Improvement Plan (CIP). **Please note that the bike racks would probably result in additional costs to the CIP.**

In general, it is recommended that 2 bike racks be placed on each proposed curb extension in the Downtown area.

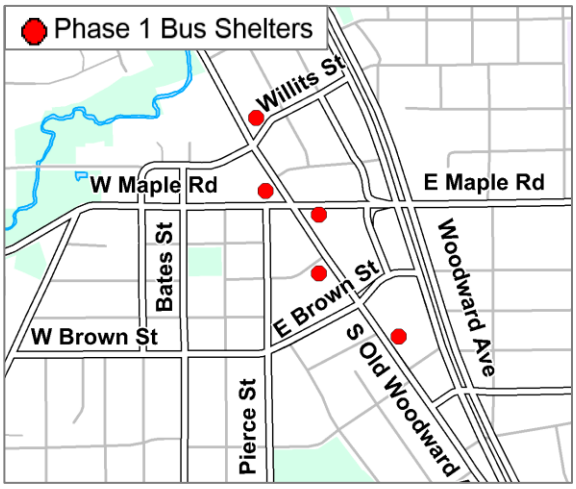


PHASE 1 BICYCLE PARKING:				
Road	From	To	Quantity	Unit
Bicycle Parking Hoops (custom):				
N Old Woodward Ave	at Willits St		4	EACH
	(2 racks per curb extension)			
N Old Woodward Ave	at Hamilton Row		6	EACH
	(2 racks per curb extension)			
N Old Woodward Ave	at E Maple Rd		6	EACH
	(2 racks per curb extension on northeast, northwest and southeast			
S Old Woodward Ave	at W Merrill St		2	EACH
	(2 racks on curb extension on east side)			
S Old Woodward Ave	at E Brown St/Forest Ave		8	EACH
	(2 racks per curb extension)			
S Old Woodward Ave	at Daines Street		2	EACH
	(2 racks on curb extension on northwest corner)			
S Old Woodward Ave	at Hazel St/Frank St		4	EACH
	(2 racks per curb extension)			
S Old Woodward Ave	at Bowers St		4	EACH
	(racks per curb extension on northeast and southeast corners)			
S Old Woodward Ave	at Haynes St		6	EACH
	(2 racks per curb extension)			
S Old Woodward Ave	between George St and Landon St		2	EACH
	(2 racks per curb extension)			

PHASE 1: PROPOSED TRANSIT IMPROVEMENTS

The following table provides a list of proposed transit shelters that could be implemented as part of the City's Capital Improvement Plan (CIP). **Please note that the shelters would probably result in additional costs to the CIP**.

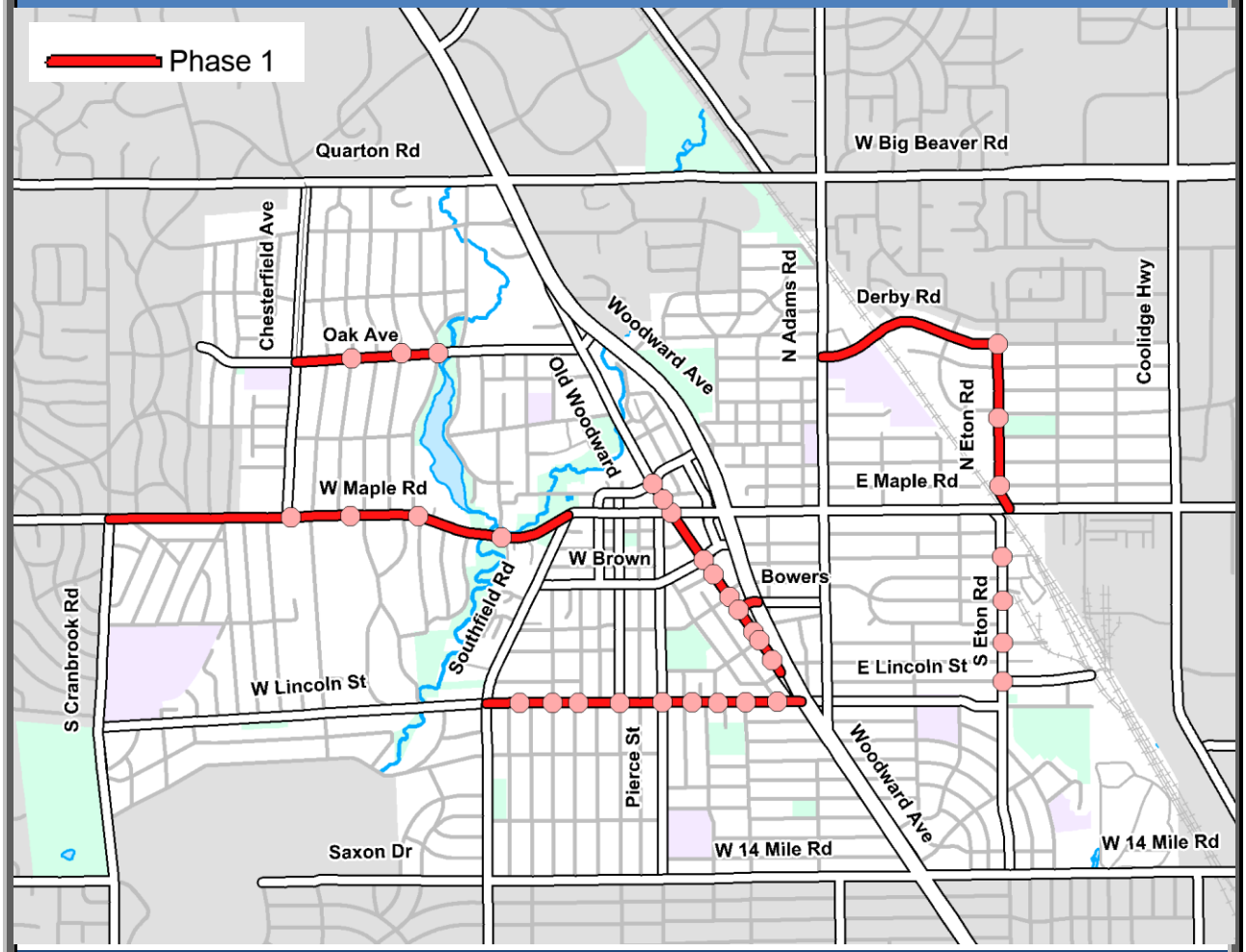
Bus shelters are recommended at high volume bus stops in the downtown in coordination with proposed curb extensions.



PHASE 1 TRANSIT IMPROVEMENTS:				
Road	From	To	Quantity	Unit
Bus Shelter				
N Old Woodward Ave	at the northeast corner of Willits St		1	EACH
N Old Woodward Ave	at the northwest corner of W Maple Rd		1	EACH
N Old Woodward Ave	at the southeast corner of E Maple Rd		1	EACH
S Old Woodward Ave	at the southwest corner of W Merrill St		1	EACH
S Old Woodward Ave	at the southeast Daines Street		1	EACH
Does not include engineering fees or contingency				

EXISTING BUS SHELTER ON S OLD WOODARD AVENUE

FIGURE 4.2B. PHASE 1 SUMMARY MAP



APPROXIMATE COST ESTIMATE FOR PHASE 1: $1,300,000

APPROXIMATELY 4.5 MILES OF NEW MULTI-MODAL FACILITIES ARE PROPOSED IN PHASE 1:

- 2 MILES OF BIKE LANES
- 2.3 MILES OF SHARED LANE MARKINGS
- 0.1 MILES OF COLORED SHARED LANE MARKINGS
- 0.1 MILES OF SIDEWALK (NOT SHOWN ON MAP)
- 31 ROAD CROSSING IMPROVEMENTS
- 2 TREE EXTENSIONS
- 44 BICYCLE PARKING HOOPS (NOT SHOWN ON MAP)
- 5 BUS SHELTERS (NOT SHOWN ON MAP)

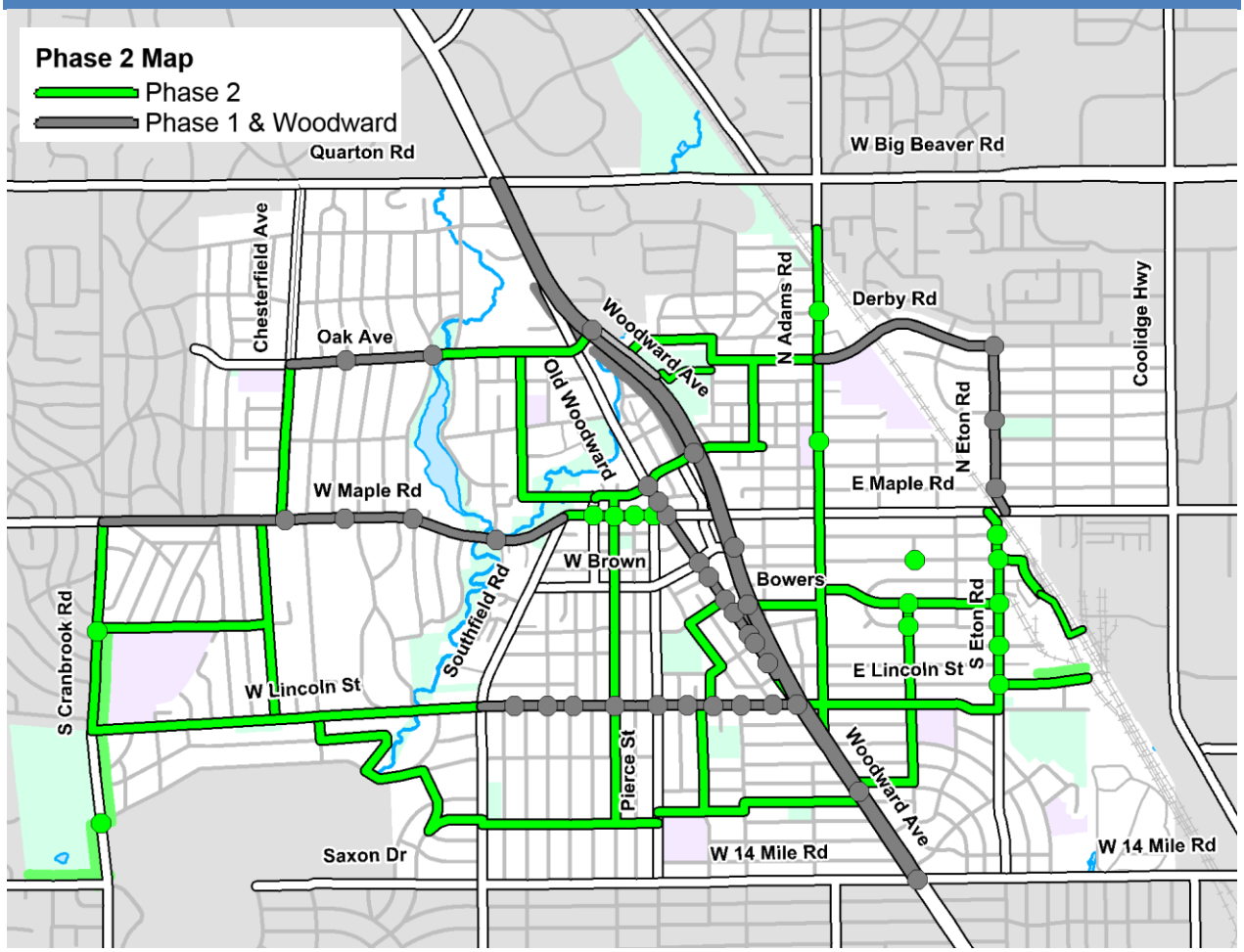
4.3 PHASE 2

PHASE 2: OVERVIEW

Phase 2 objective is to provide connections across the community and create a backbone for the City's long-range multi-modal system. This phase achieves this by building on the existing multi-modal system.

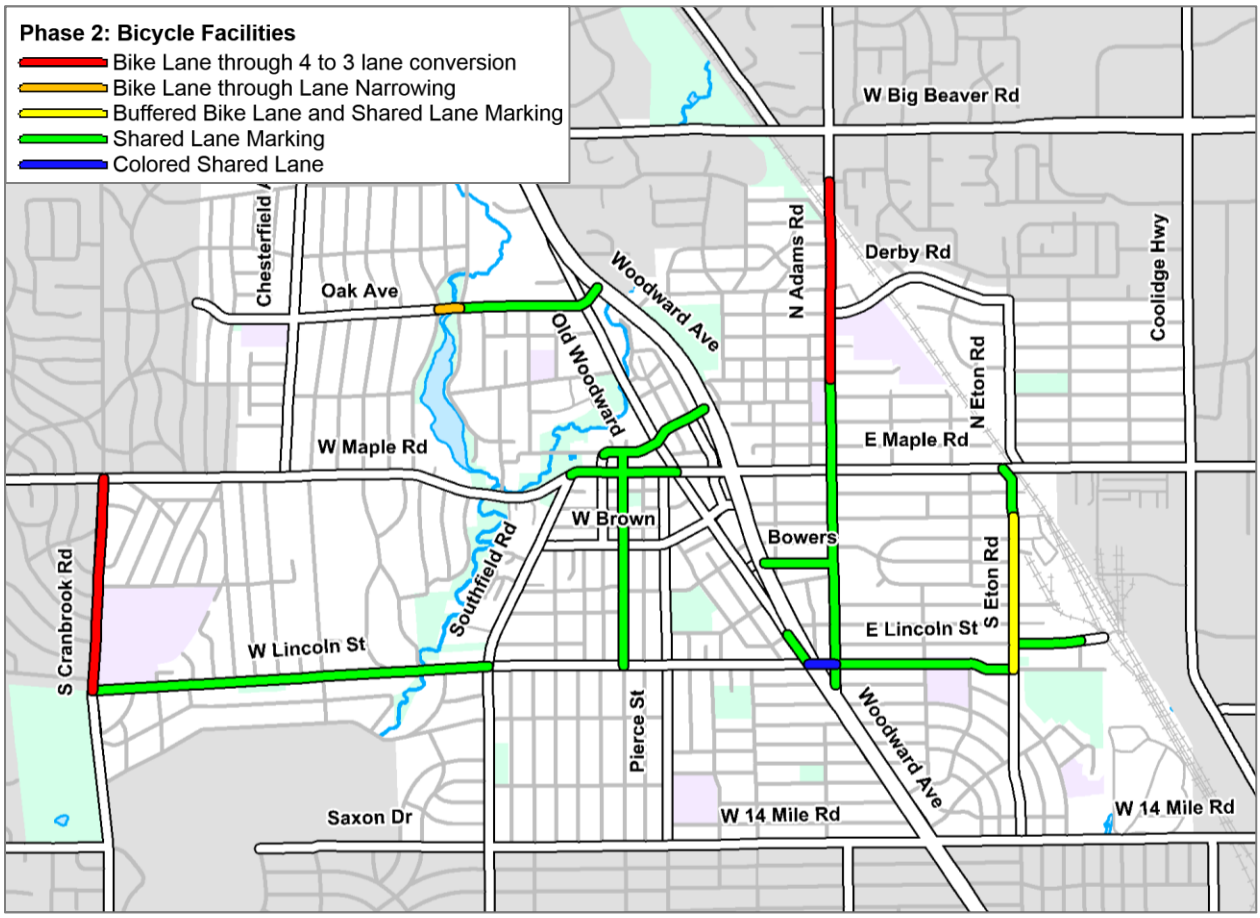
The following pages provide a more detailed breakdown of Phase 2.

FIGURE 4.3A. PHASE 2



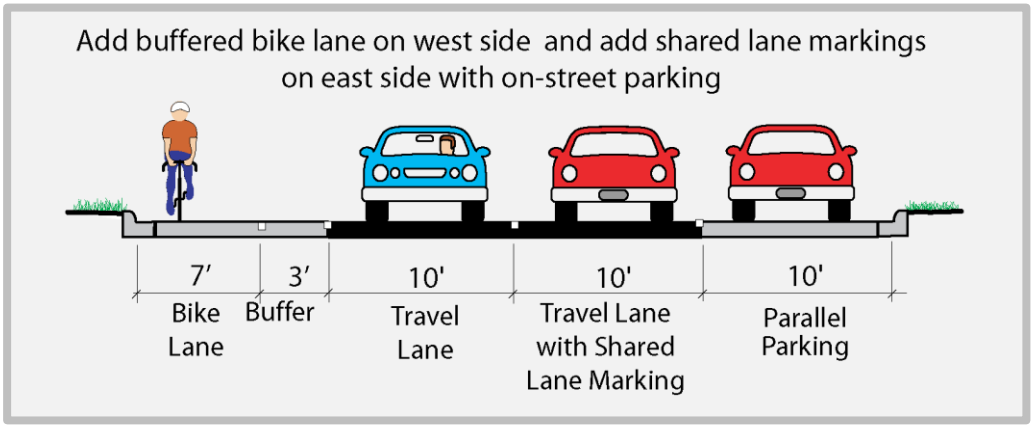
PHASE 2: PROPOSED BIKE FACILITIES

The following provides a list of on-road bike facilities that can be implemented in the near-term with minimal changes to the roadway. Please note that at time of implementation all bike facilities should be accompanied by appropriate signage.



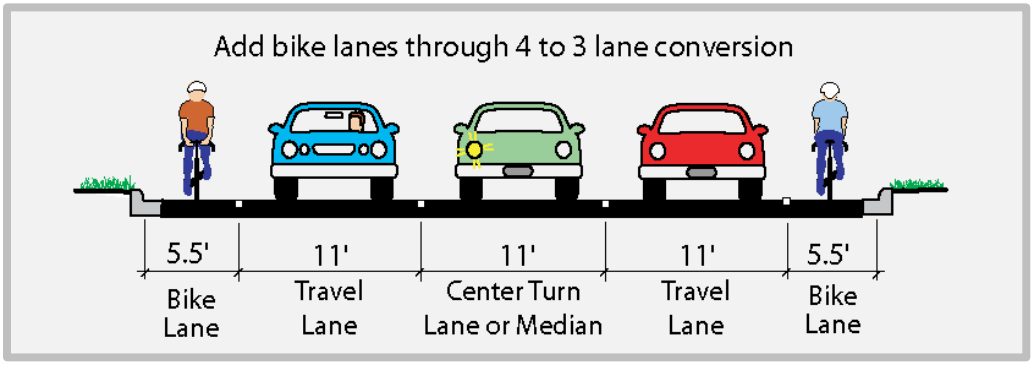
On S Eton Road between Yosemite Boulevard and E Lincoln Street, remove parking on the west side of the street and add a buffered bike lane. On the east side of the street keep on-street parking and add a shared-lane marking. The buffer between the bike lane and travel lane should be cross hatched.

S ETON ROAD



Add bike lanes to S Cranbrook Road between W Maple Avenue and W Lincoln Street through a four-lane to three-lane conversion. Add bike lanes to N Adams Road between Madison Street and Evergreen Drive through a four-lane to three-lane conversion. Please note that prior to implementation a micro-simulation may be necessary to see how school traffic timing affects both corridors.

S CRANBROOK ROAD AND N ADAMS ROAD



Add bike lanes to Oak Avenue between Lake Park Drive and Lakeside Drive by adding an edge stripe 6’ out from the curb on both sides of the road.

Add shared lane markings to the following roadways:

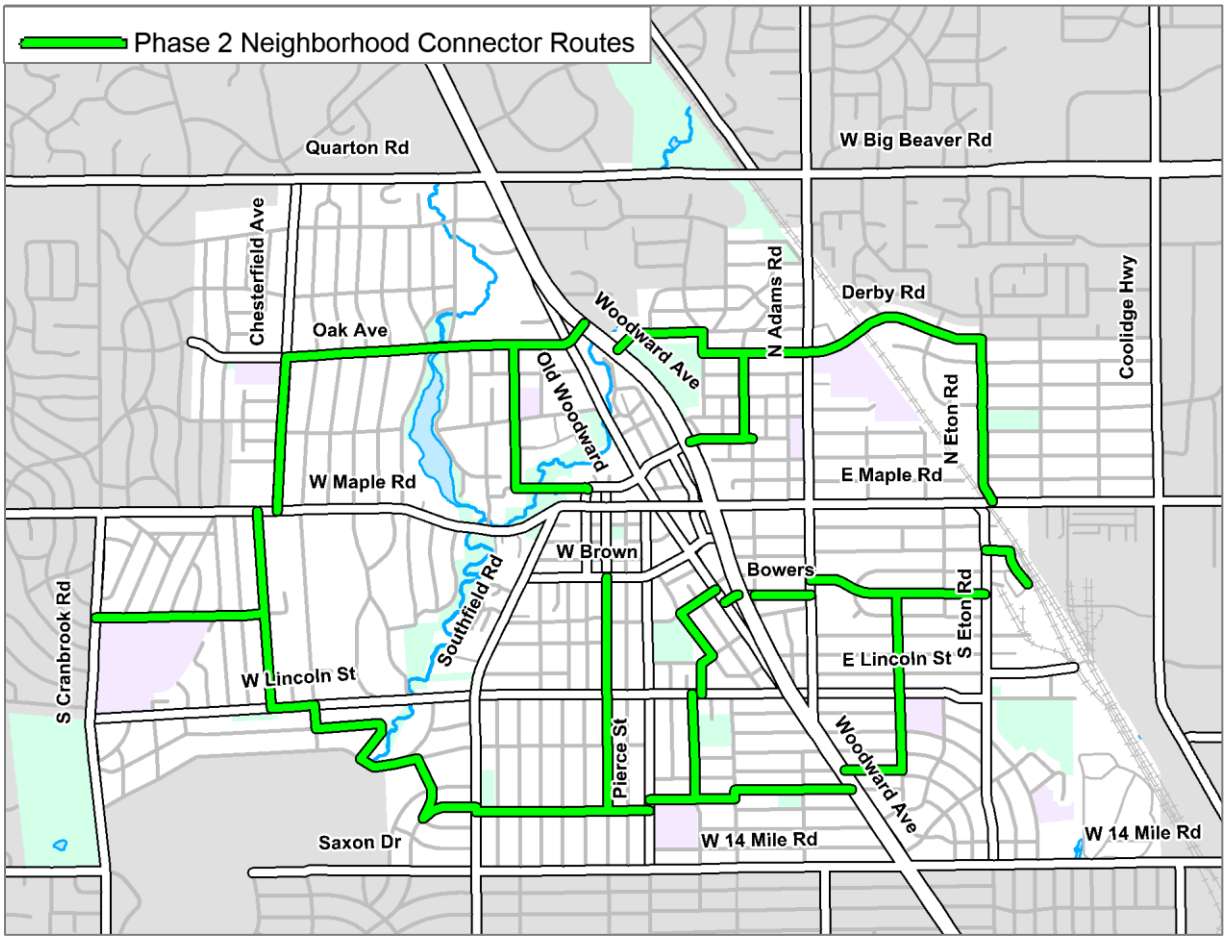
- W Lincoln Street between S Cranbrook Road and Southfield Road
- E Lincoln Street between Adams Road and S Eton Road
- S Eton Road between W Maple Rd and Yosemite
- N Eton Road between Yorkshire Road and W Maple Road
- Bowers Street between Woodward Avenue and Adams Avenue
- Oakland Avenue between N Old Woodward Avenue and Woodward Avenue
- Willits Street between N Chester Street and N Old Woodward Avenue
- W Maple Road between Southfield Road and N Old Woodard Avenue
- S Bates Street between W Lincoln St and Willits Street
- Cole Street east of S Eton Street
- Adams Road between Madison Street and Woodward Avenue
- Oak Avenue between Lake Park Drive and Woodward Avenue
- Chesterfield Avenue between Oak Avenue and W Maple Road
- One-way on S Old Woodward Ave between Landon Rd and E Lincoln St

Add colored shared lane markings to E Lincoln Street between Woodward Avenue and Adams Road.

PHASE 2 BICYCLE FACILITIES:				
Road	From	To	Quantity	Unit
Bike Lanes through 4 to 3 lane conversion (stripe removal, pavement markings and signage):				
S Cranbrook Rd	W Maple Rd	W Lincoln Rd	0.57	MI
N Adams Rd	Evergreen Dr	Madison St	0.55	MI
Buffered Bike Lane (pavement markings and signage in one direction)				
S Eton Rd	Yosemite Blvd	E Lincoln St	0.5	LF
Bike Lanes through Lane Narrowing:				
Oak Ave	Lake Park Dr	Lakeside Dr	0.06	MI
Shared Lane Markings (placed every 200' - 250'):				
W Lincoln St	S Cranbrook Rd	Southfield Rd	1.00	MI
E Lincoln St	Adams Rd	S Eton Rd	0.51	MI
S Eton Rd	W Maple Rd	Yosemite	0.07	MI
N Eton Rd	Yorkshire Rd	W Maple Rd	0.08	MI
Bowers St	Woodward Ave	Adams Rd	0.2	MI
Oakland Ave	N Old Woodward Ave	Woodward Ave	0.16	MI
Willits St	N Chester St	N Old Woodward Ave	0.15	MI
W Maple Rd	Southfield Rd	N Old Woodward Ave	0.27	MI
S Bates	W Lincoln St	Willits St	0.6	MI
Cole St	East of S Eton St		0.25	MI
Adams Rd	Madison St	Woodward Ave	0.9	MI
Oak Ave	Lake Park Dr	Woodward Ave	0.46	MI
Chesterfield Ave	Oak Ave	W Maple Rd	0.45	MI
Shared Lane Markings (placed every 200' - 250' in one direction):				
S Eton Rd	Yosemite Blvd	E Lincoln St	0.5	MI
S Old Woodward Ave	Landon Rd	E Lincoln St	0.12	MI
Colored Shared Lane Markings (placed every 200' - 250' with solid green paint the entire length):				
W Lincoln St	Woodward Ave	Adams Rd	0.10	MI

PHASE 2: PROPOSED NEIGHBORHOOD CONNECTOR ROUTES

The following map displays the neighborhood connector routes that should be implemented first. Initially, implementation along these routes is as simple as providing wayfinding signage identifying the direction of the route and key destinations. Eventually, other enhancements such as rain gardens, traffic calming measures, and street art may be incorporated. Please note that some of these routes are dependent on road crossings which are proposed in Phase 1 and Phase 2.

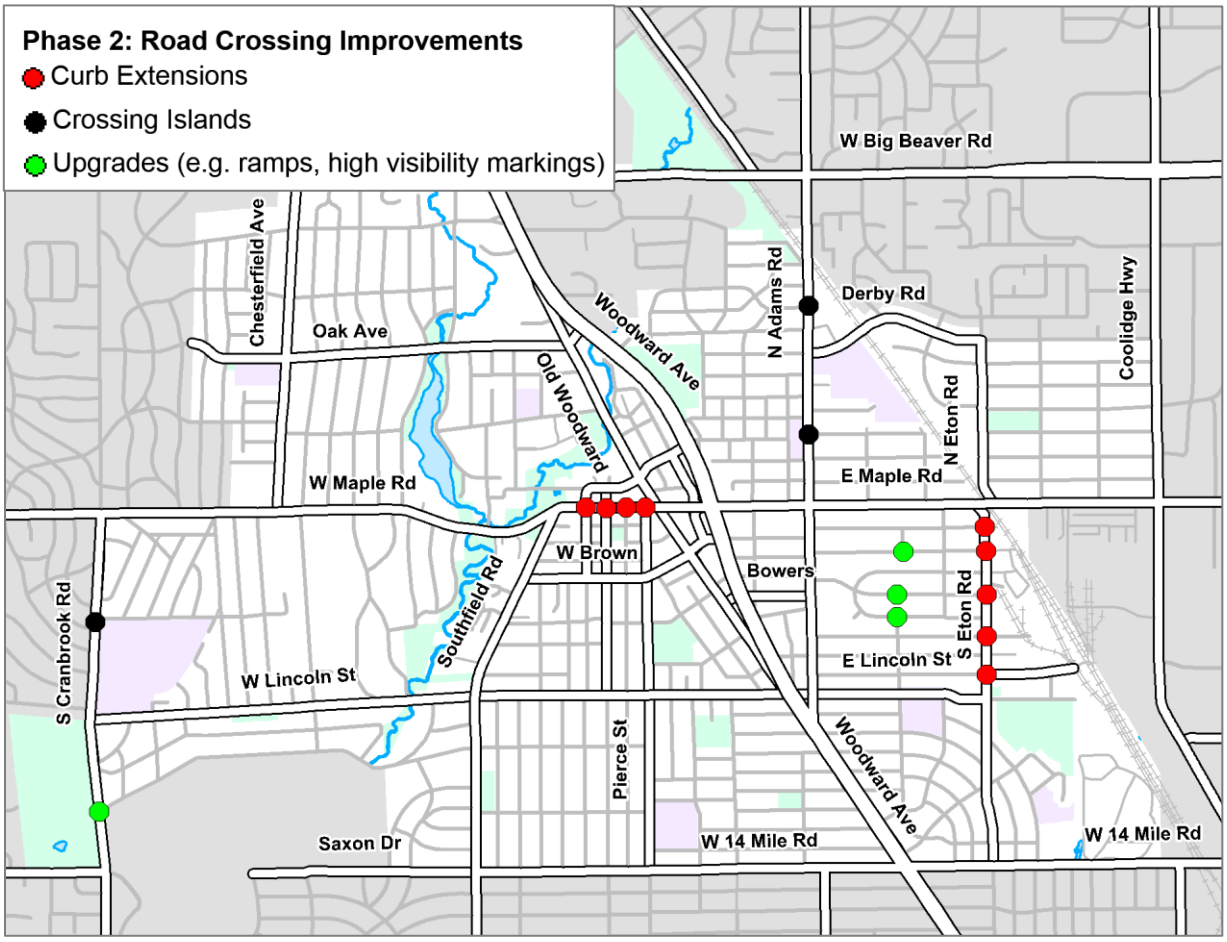


In Phase 2 only wayfinding signage is proposed. In the future, the City may consider adding some additional enhancements such as mini traffic circles, pavement markings, chicanes, street diverters, and pedestrian street lighting.

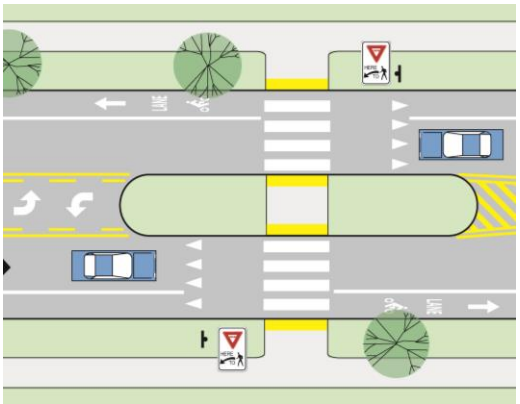
PHASE 2 NEIGHBORHOOD CONNECTOR ROUTES:				
Road	From	To	Quantity	Unit
Wayfinding Signs:				
Midvale	S Cranbrook Rd	Larchlea Dr	0.47	MI
Larchlea Dr	W Maple Rd	W Lincoln St	0.57	MI
W Lincoln St	Larchlea Dr	Pleasant St	0.13	MI
Pleasant St	W Lincoln St	Fairway Dr	0.08	MI
Fairway Dr	Pleasant St	Northlawn Blvd	0.30	MI
Northlawn Blvd	Fairway Dr	Latham St	0.18	MI
Latham St	Northlawn Blvd	Worthington Rd	0.16	MI
Worthington Rd	Latham St	Southfield Rd	0.16	MI
W Southlawn Blvd	Southfield Rd	Peirce St	0.36	MI
Pierce St	W Southlawn Blvd	W Southlawn Blvd	0.03	MI
E Southlawn Blvd	Pierce St	Grand St	0.24	MI
Grant St	E Southlawn Blvd	Emmons Ave	0.03	MI
Emmons Ave	Grant St	Woodward Ave	0.35	MI
Chapin Ave	Woodward Ave	Troy St	0.17	MI
Torry St	Haynes St	Chapin Ave	0.45	MI
Pathway (north of Torry St)	Bowers St	Haynes St	0.08	MI
Bowers St	Adams Rd	S Eton Rd	0.52	MI
Adams Rd	Bowers St	Bowers St	0.03	MI
Bowers St	Woodward Ave	Adams Rd	0.18	MI
Bowers St	S Old Woodward Ave	Woodward Ave	0.07	MI
S Old Woodward Ave	E Frank St	Bowers St	0.03	MI
E Frank St	Purdy St	S Old Woodward Ave	0.11	MI
Purdy St	E Frank St	George St	0.15	MI
George St	Floyd St	Purdy St	0.03	MI
Floyd St	George St	E Lincoln St	0.08	MI
E Lincoln St	Edgewood Rd	Floyd St	0.03	MI
Edgewood Rd	E Lincoln St	E Southlawn Blvd	0.3	MI
S Bates St	W Brown St	Southlawn Blvd	0.66	MI
Washington Blvd	W Lincoln St	W Southlawn Blvd	0.34	MI
Chesterfield Ave	Oak Ave	W Maple Rd	0.44	MI
Oak Ave	Chesterfield Ave	Woodward Ave	0.87	MI
Greenwood St	Oak Ave	Willits St	0.4	MI
Willits St	Greenwood St	N Chester St	0.2	MI
Woodward Ave Sidepath	Oak Ave	Wimbleton Dr	0.13	MI
Wimbleton Dr	Wooddward Ave	Oxford St	0.26	MI
Oxford St	Wimbleton Dr	Mohegan St	0.06	MI
Mohegan St	Oxford St	N Adams Rd	0.3	MI
Poppleton St	Mohegan St	Oakland Ave	0.25	MI
Oakland Ave	Poppleton St	Woodward Ave	0.15	MI
Derby Rd	N Adams Rd	N Eton Rd	0.53	MI
E Eton St	Derby Rd	E Maple Rd	0.48	MI
E Maple Rd Sidepath	S Eton Rd	N Eton Rd	0.06	MI
S Eton St Sidepath	E Maple Rd	Yosemite Blvd	0.09	MI
Villa Ave	S Eton Rd	Villa Rd	0.09	MI
Villa Rd	Villa Ave	Proposed Pathway	0.12	MI
Proposed Pathway extending from Villa Rd to Troy Transit Station			0.2	MI

PHASE 2: PROPOSED ROAD CROSSING IMPROVEMENTS

The proposed road crossing improvements include both new road crossings and recommended upgrades to existing road crossings. Due to the high volume of walking that already exists in the City, it is important to improve the existing crossings and provide new crossings where there is high demand in order to create a safer environment for everyone.



A crossing island is proposed on S Cranbrook Road at Midvale on the south side of the intersection to be implemented concurrent with the proposed 4 to 3 lane conversion. A crossing island is proposed on N Adams at Abbey Road on north side of the intersection to be implemented concurrent with the proposed 4 to 3 lane conversion. And a crossing island is proposed at N Adams at Buckingham Avenue on the south side of intersection in the unused center turn lane.



Curb extensions are proposed throughout the downtown to help eliminate the stepped curbed and provide ramps to make the downtown more accessible to everyone. Because of the cluster of proposed curb extensions it would make more sense to implement as part of a road reconstruction project.

Curb extensions are proposed along S Eton Road near the Rail District. They should extend into the roadway 5' on the west side of the street and 8' on the east side of the street.

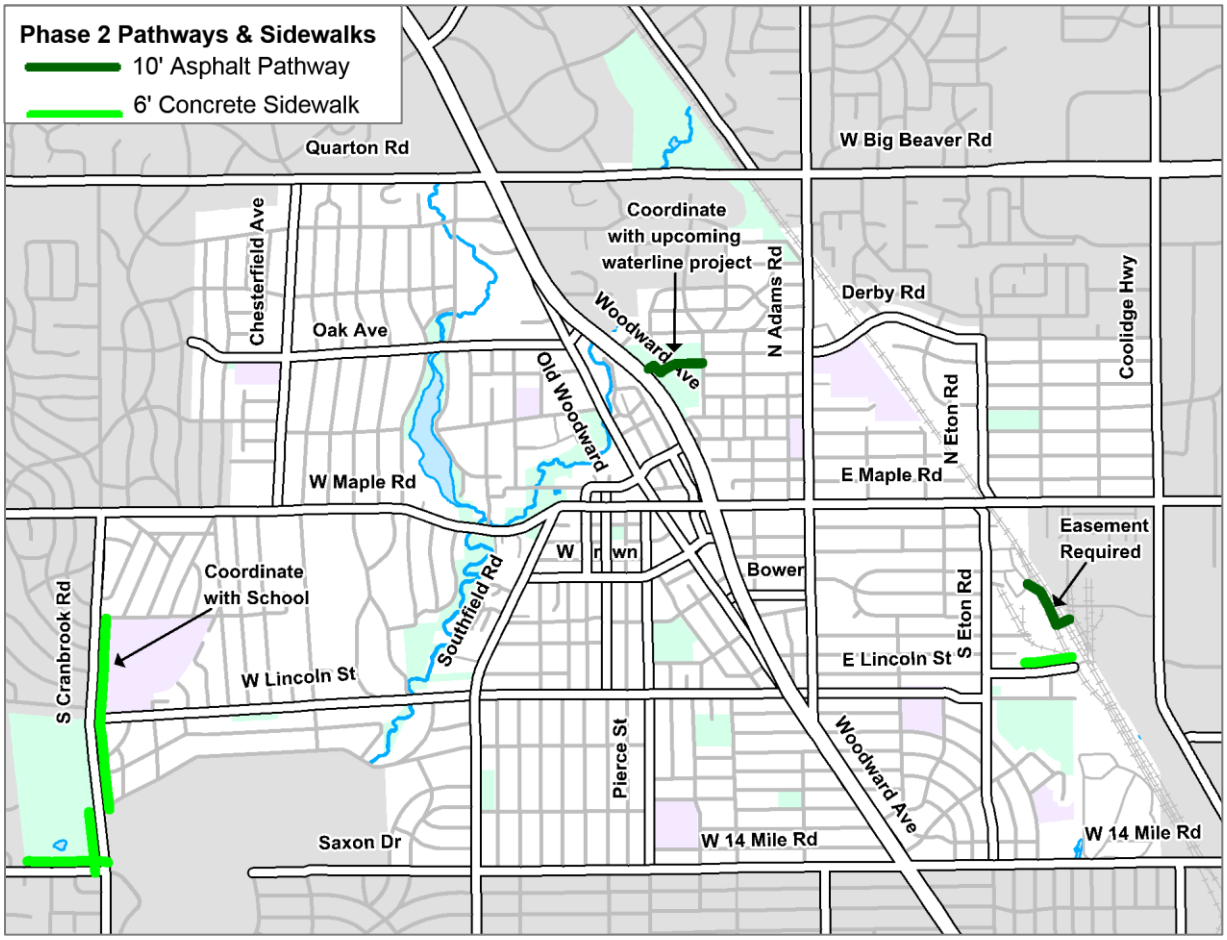
There are a few locations where pedestrian crossings are needed and/or minor improvements should be made.

- North side of Haynes Street between Bowers Street and Columbia Street – improvements include ramp, detectable warning, sidewalk extension, signs, high visibility pavement marking
- Bowers Street between Haynes Street and Columbia Street – improvements include detectable warnings, signs, high visibility pavement markings
- Villa Road at Yankee – improvements include detectable warnings, signs, high visibility pavement markings
- S Cranbrook Road at Northlawn Boulevard - improvement include ramps, detectable warnings, signs and high visibility pavement markings

PHASE 2 ROAD CROSSING IMPROVEMENTS:				
Road	From	To	Quantity	Unit
Crossing Islands (Bollards, landscaping, concrete curbs, striping):				
S Cranbrook Rd	at Midvale		1	EACH
N Adams Rd	at Abbey Rd		1	EACH
N Adams Rd	at Buckingham Ave		1	EACH
Curb Extensions				
S Eton Rd	at Yosemite Blvd		4	EACH
S Eton Rd	at Villa Rd		4	EACH
S Eton Rd	at Bowers St		4	EACH
S Eton Rd	at Holland St		4	EACH
S Eton Rd	at Cole St		4	EACH
W Maple Rd	at Chester St		1	EACH
W Maple Rd	at S Bates St		4	EACH
W Maple Rd	at Henrietta St		4	EACH
W Maple Rd	at Pierce St		4	EACH
Minor Upgrades (high visibility markings, ramps and signs)				
Haynes St	between Bowers St and Columbia St		1	EACH
Bowers St	between Haynes St and Columbia St		1	EACH
Villa Rd	at Yankee		1	EACH
S Cranbrook Rd	at Northlawn Blvd		1	EACH

PHASE 2: PROPOSED PATHWAYS & SIDEWALKS

Due to the nearly complete existing sidewalk system in the City of Birmingham, only a few key sidewalk and pathway connections have been proposed in the initial phases.



Sidewalks are proposed along the west side of S Cranbrook Road between Midvale and Northlawn Boulevard and south of Northlawn Boulevard on the east side of the road down to W 14 Mile Road providing a connection between the high school and dog park. The City should coordinate with the high school when implementing the sidewalk segment along school property.

A sidewalk is proposed along the north side of W 14 Mile west of S Cranbrook Road to provide a connection to the existing sidewalk in Bloomfield Township.

A sidewalk is proposed along the north side of Cole Street east of S Eton Street to help provide connections to businesses along the corridor and in preparation for future connections to the Troy Intermodal Transit Center.

A pathway is proposed at the end of Villa Road to connect the rail district to the future Troy Intermodal Transit Center. The implementation of this pathway should be coordinated with property owners and the final design and construction of the Troy Intermodal Transit Center. Easements may be required to make this connection.

A pathway is proposed through Poppleton Park connecting Woodward Avenue to Oxford Street. Implementation of this pathway should be coordinated with the upcoming waterline project in Poppleton Park.

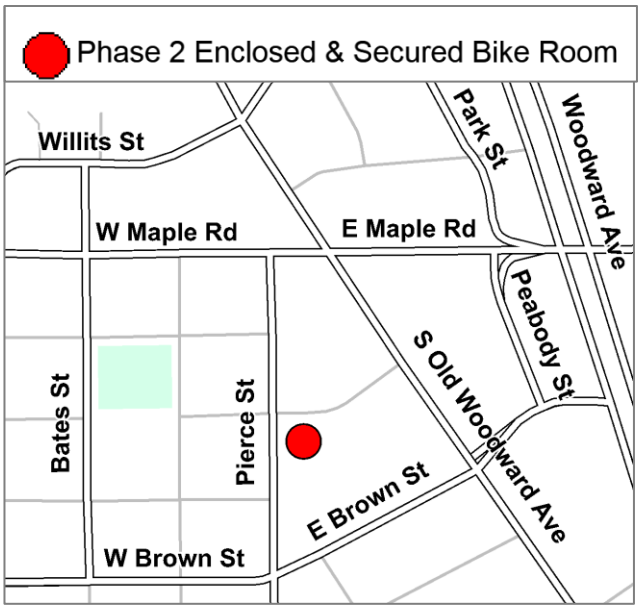
PHASE 2 PATHWAYS 7 SIDEWALKS:				
Road	From	To	Quantity	Unit
Sidewalk (6' wide) along Road Right-of-way				
S Cranbrook Rd (east)	Midvale	Northlawn Blvd	1500	LF
S Cranbrook Rd (west)	Northlawn Blvd	W 14 Mile Rd	900	LF
Cole St (north)	East of S Eton St		800	LF
W 14 Mile Rd	1200' west of S Cranbrook Rd		1200	LF
Asphalt Pathway (10' wide, does not include cost of aquiring easment)				
Rail District - Connecting Villa Rd to Troy Transit Station (easment required)			650	LF
Poppleton Park - Connecting Woodward Ave to Oxford St			1400	LF

PHASE 2: PROPOSED BICYCLE PARKING

Two types of bicycle parking are proposed in the downtown.

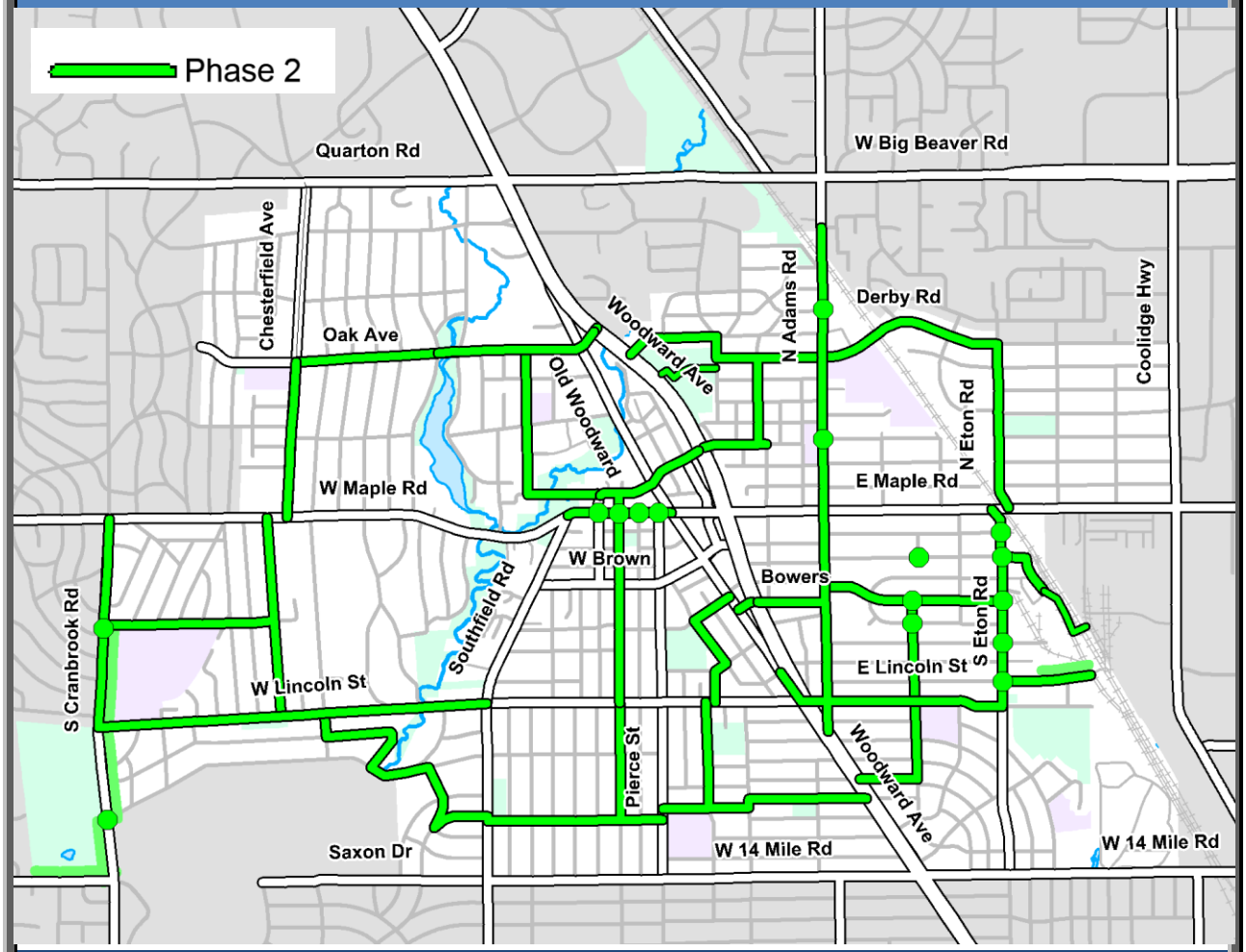
Temporary/Seasonal bicycle racks should be placed where there are large curb extensions or where space is available adjacent to outdoor dining decks. Based on their success, additional racks may be added as needed.

An enclosed and secured bike room should be placed on the ground floor (level 2) of the northeast corner of the Pierce Street parking garage.



PHASE 2 BICYCLE PARKING:				
Road	From	To	Quantity	Unit
Temporary/Seasonal Racks				
Downtown Area			3	EA
Enclosed & Secure Bike Room				
Pierce St Parking Garage			1	EA

FIGURE 4.3B. PHASE 2 SUMMARY MAP



APPROXIMATE COST ESTIMATE FOR PHASE 2 IMPLEMENTATION: $1,000,000

APPROXIMATELY 17 MILES OF NEW MULTI-MODAL FACILITIES ARE PROPOSED IN PHASE 2:

- 1.1 MILES OF BIKE LANES
- 0.5 MILES OF BUFFERED BIKE LANES
- 5.7 MILES OF SHARED LANE MARKINGS
- 0.1 MILES OF COLORED SHARED LANE MARKINGS
- 11 MILES OF NEIGHBORHOOD CONNECTOR ROUTES
- 0.8 MILES OF SIDEWALKS & PATHWAYS
- 16 ROAD CROSSING IMPROVEMENTS
- 1 ENCLOSED & SECURED BIKE ROOM (NOT SHOWN ON MAP)

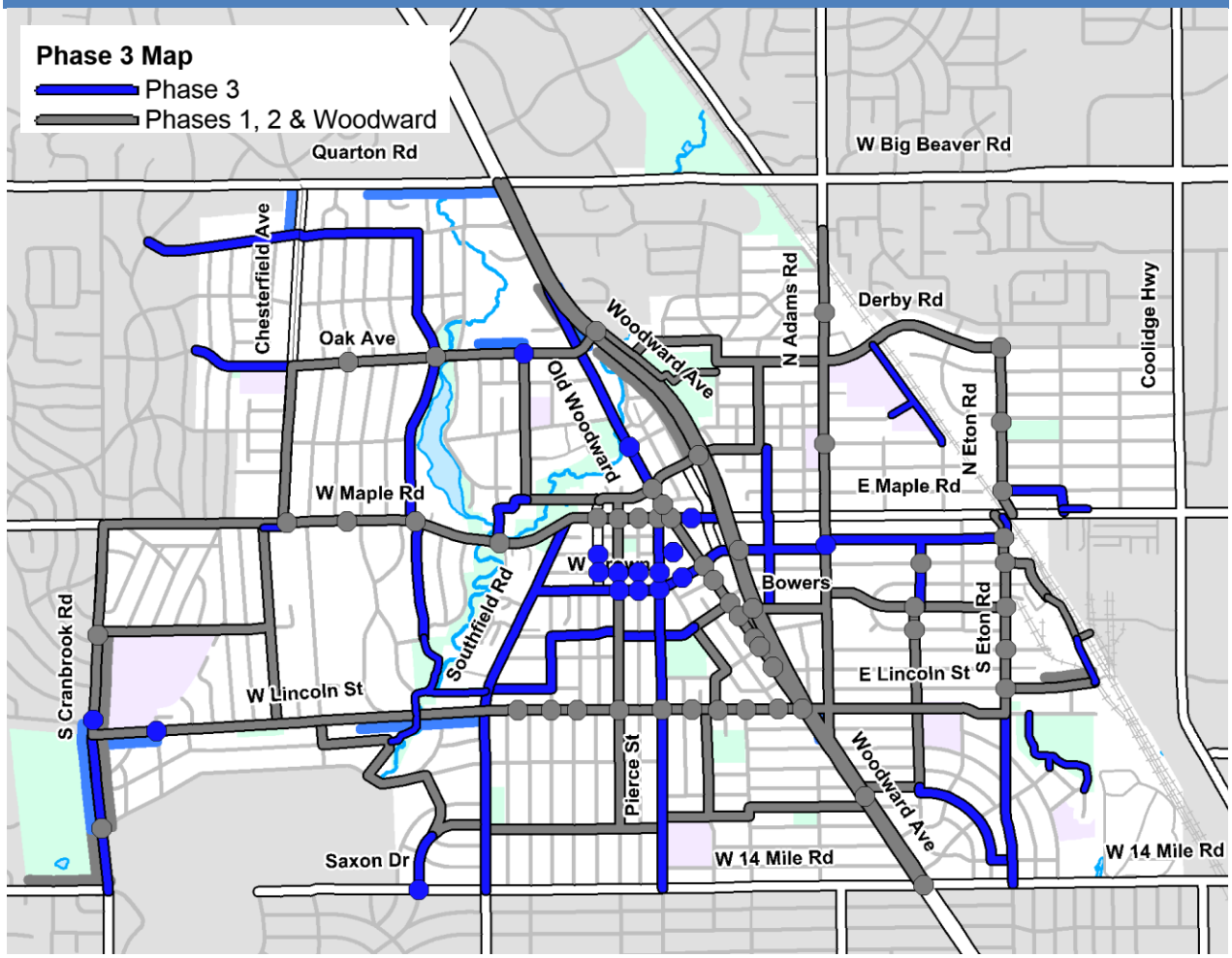
4.4 PHASE 3

PHASE 3: OVERVIEW

This phase focuses on completing the multi-modal network and includes the remaining network improvements. Due to the length of time it is going to take to complete the first two phases, the remaining improvements have been grouped into Phase 3. When the first two phases are near completion, a more thorough evaluation should be done to determine what new opportunities are available and what the costs may be.

The following pages outline the remaining infrastructure improvements to complete the multi-modal network.

FIGURE 4.3A. PHASE 3

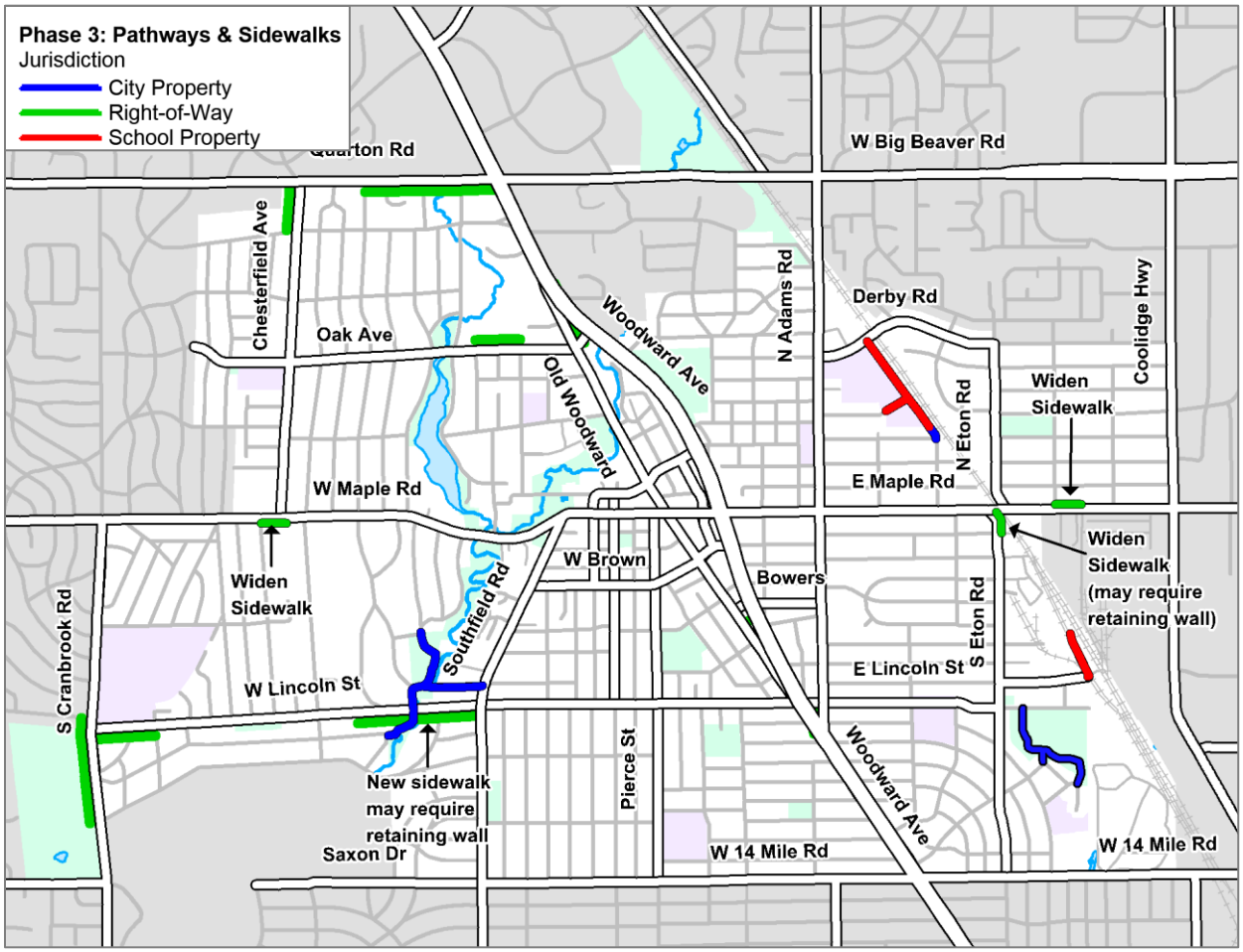


PHASE 3: RECOMMENDED PATHWAYS & SIDEWALKS

Phase 1 and Phase 2 focus on addressing some of the more critical gaps in the sidewalk system. Phase 3 should focus on completing the remaining gaps in the system. Completing sidewalk gaps can be costly so it is important to utilize opportunities, especially when a road is reconstructed or a property is developed.

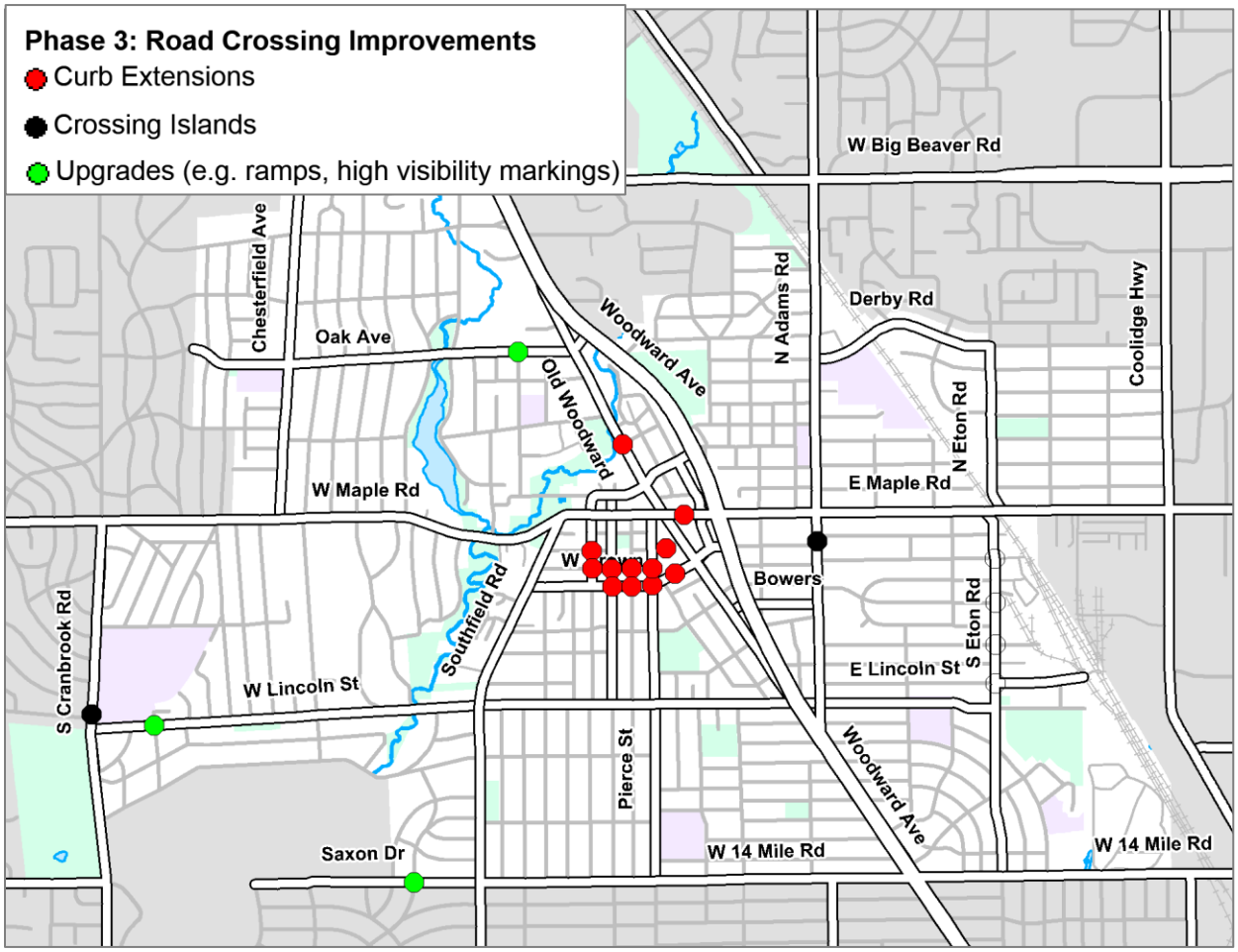
The remaining sidewalks and pathways are on City property, school property or in the road right-of-way.

In the future, whenever a site is redeveloped, non-motorized connections should be provided either as a sidewalk along a roadway with bike lanes or a shared-use pathway.



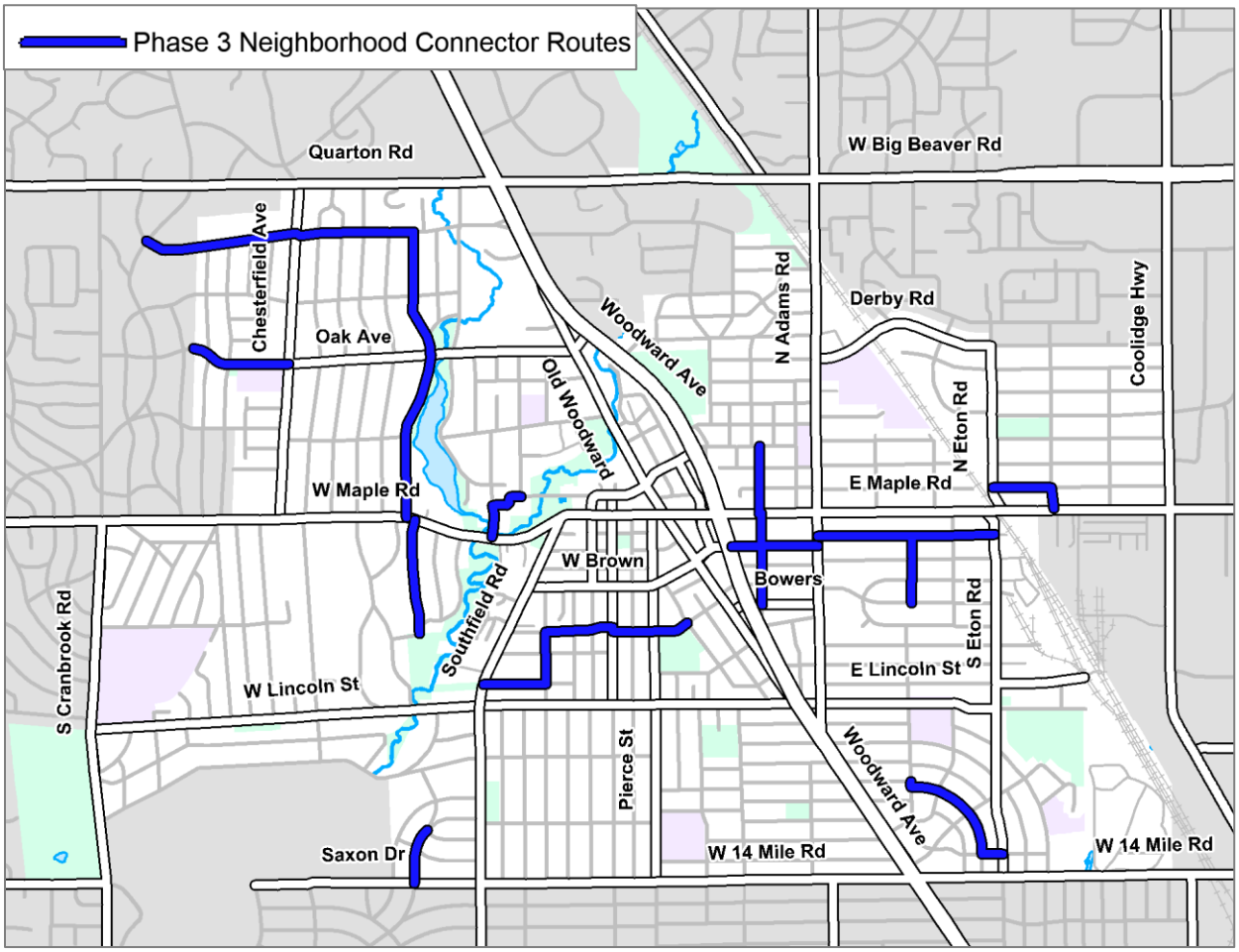
PHASE 3: RECOMMENDED ROAD CROSSING IMPROVEMENTS

Many of the remaining road crossing improvements align with the neighborhood connector routes, provide mid-block crossings and increase visibility between motorists and pedestrians in the downtown.



PHASE 3: RECOMMENDED NEIGHBORHOOD CONNECTOR ROUTES

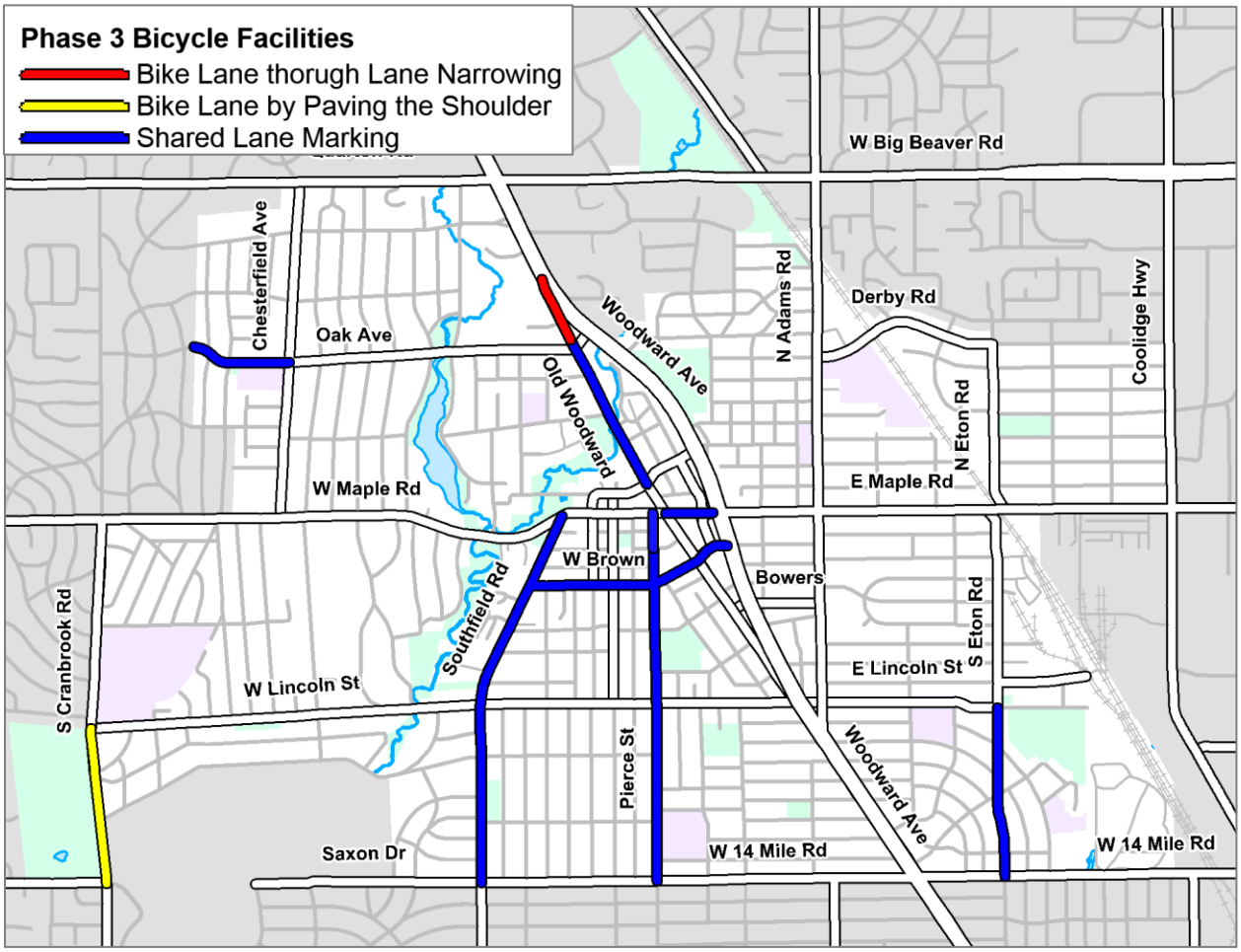
This phase focuses on completing the neighborhood connector routes. While the neighborhood connector routes are relatively easy and economical to implement some are dependent on the construction of proposed pathways and road crossing improvements. It will be important to prioritize the implementation of the neighborhood connector routes in this phase based on the progress of pathways implementation and road crossing improvements.



PHASE 3: RECOMMENDED BICYCLE FACILITIES

With the exception of paving the shoulder on S Cranbrook Road, the remainder of the proposed bicycle facilities can be implemented quite easily within the existing roadway with pavement markings.

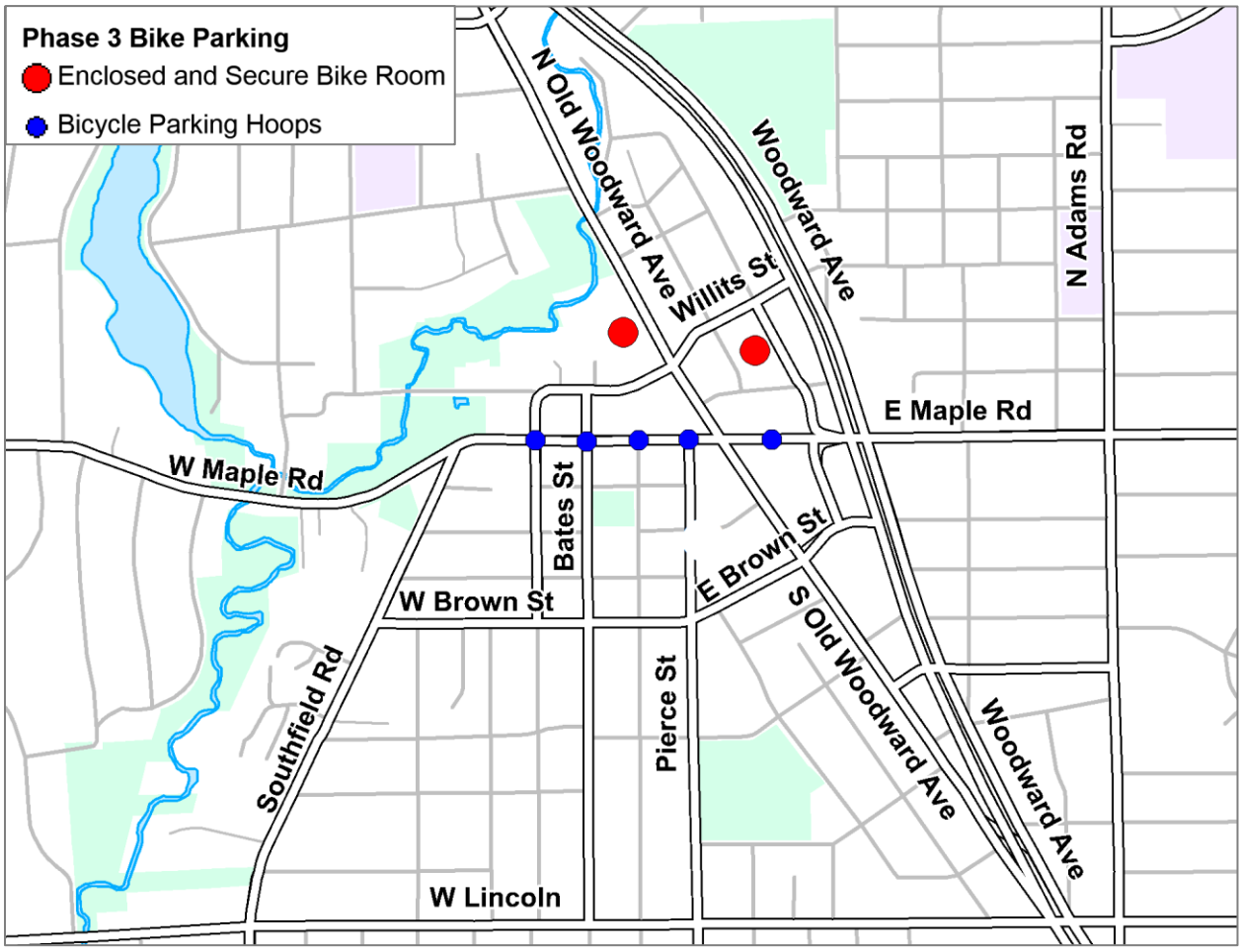
With time, as bicycle levels increase there may be a desire to add a designated bike lane in place of shared lane markings. For many of the roadways this would mean removing on-street parking or widening the roadway. Where the removal of on-street parking is not an option or not desired, the cost to add bike lanes to the roadway independent of a road reconstruction project would be significant. Thus to maximize the impact of finite resources bicycle lanes should be implemented when the road is completely reconstructed.



PHASE 3: RECOMMENDED BICYCLE PARKING

It is recommended that 2 bike racks be placed on each proposed curb extension along Maple Road in the downtown.

Based on the success of the proposed bike room in the Pierce Street Parking Garage, the City should evaluate if bike rooms should be implemented in other parking garages in the downtown.



PHASE 3: RECOMMENDED ACTIVE TRANSPORTATION HUBS

As the multi-modal system begins to develop and the first two phases are complete, Active Transportation Hubs should be placed in key locations around town such as Booth Park, Millrace Park, outside City Hall and in the Rail District.

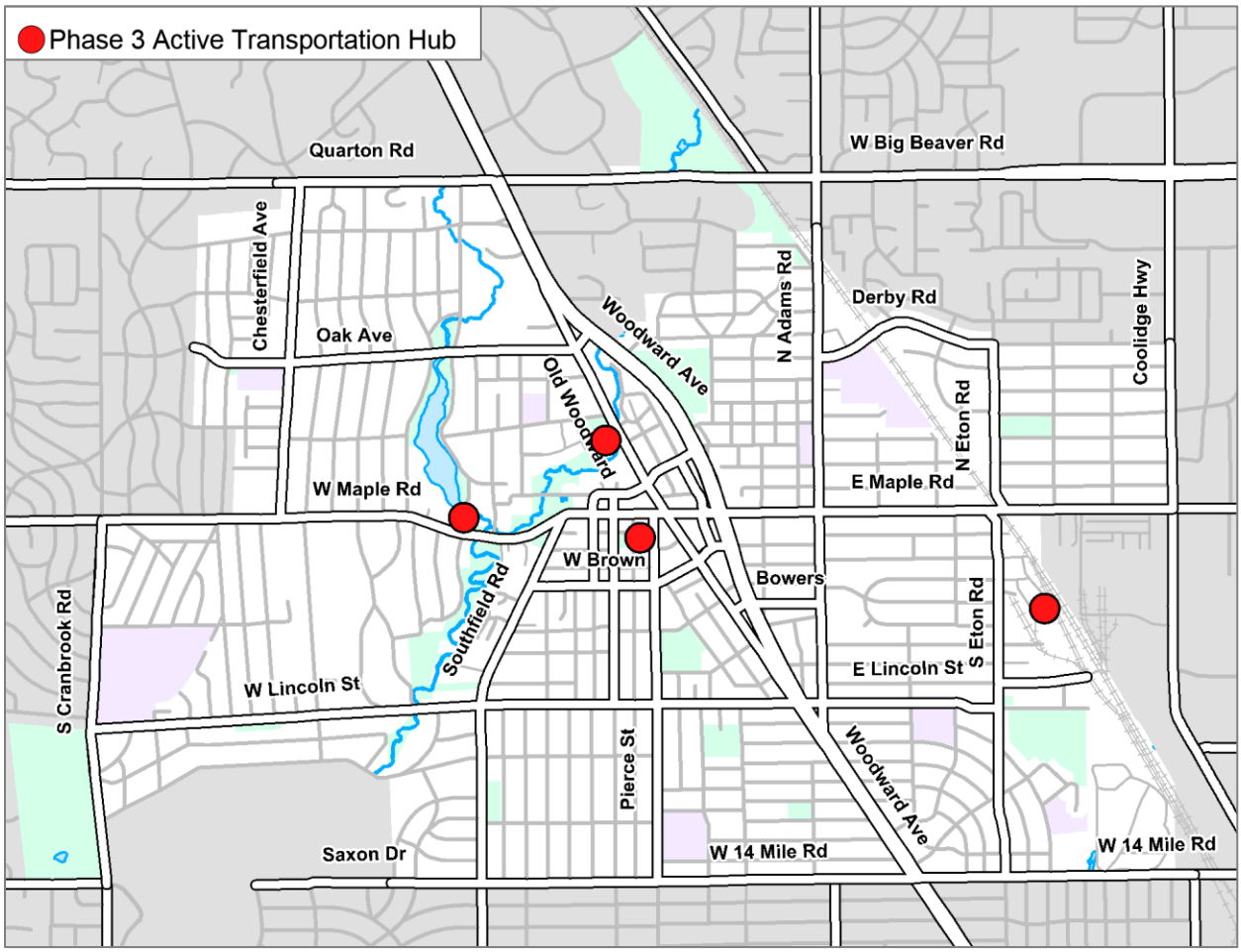
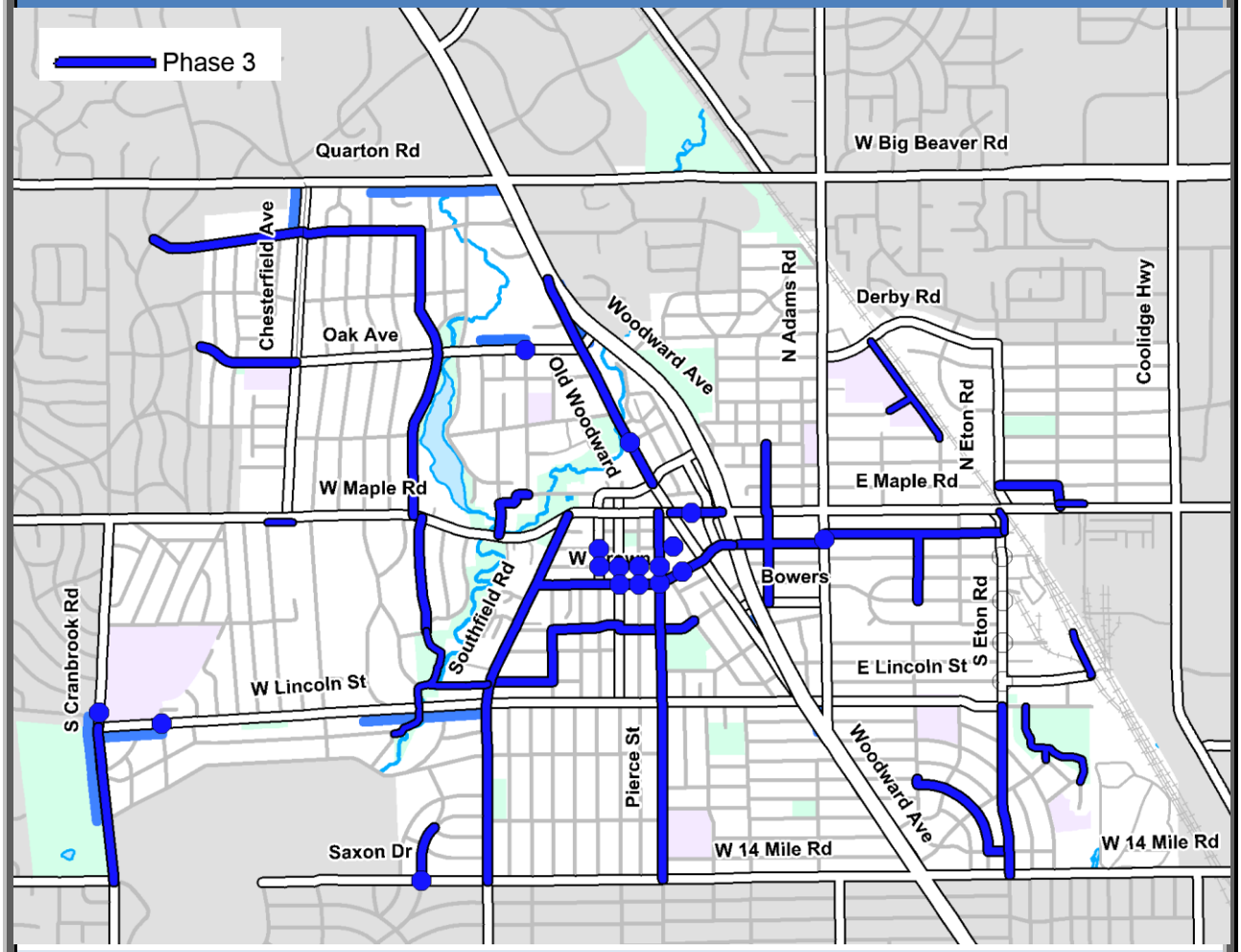


FIGURE 4.4B. PHASE 3 SUMMARY MAP



APPROXIMATELY 15 MILES OF NEW MULTI-MODAL FACILITIES ARE PROPOSED IN PHASE 3:

- 0.7 MILES OF BIKE LANES
- 4 MILES OF SHARED LANE MARKINGS
- 5 MILES OF NEIGHBORHOOD CONNECTOR ROUTES
- 1.3 MILES OF ASPHALT PATHWAYS
- 1.3 MILES OF SIDEWALK
- 17 ROAD CROSSING IMPROVEMENTS
- 4 ACTIVE TRANSPORTATION HUBS (NOT SHOWN ON MAP)
- 20 BICYCLE HOOPS (NOT SHOWN ON MAP)
- 2 BIKE ROOMS (NOT SHOWN ON MAP)

4.5 PHASE 4

PHASE 4: OVERVIEW

For some roads such as 14 Mile Road, E Maple Road, Quarton Road and Coolidge Highway there are limited cost effective solutions for some mode types in the near-term. In the future, when these streets are reconstructed they should be evaluated at that time to see what types of improvements are possible and desired.

Additionally, this report does not define the ideal long-term cross section for every primary road in the area. Rather it defines what near-term improvements should be included driven by public input and current best practices. In the future, when a roadway is reconstucted it should be re-evaluated to determine what multi-modal improvements are possible.

FIGURE 4.5A. PHASE 4

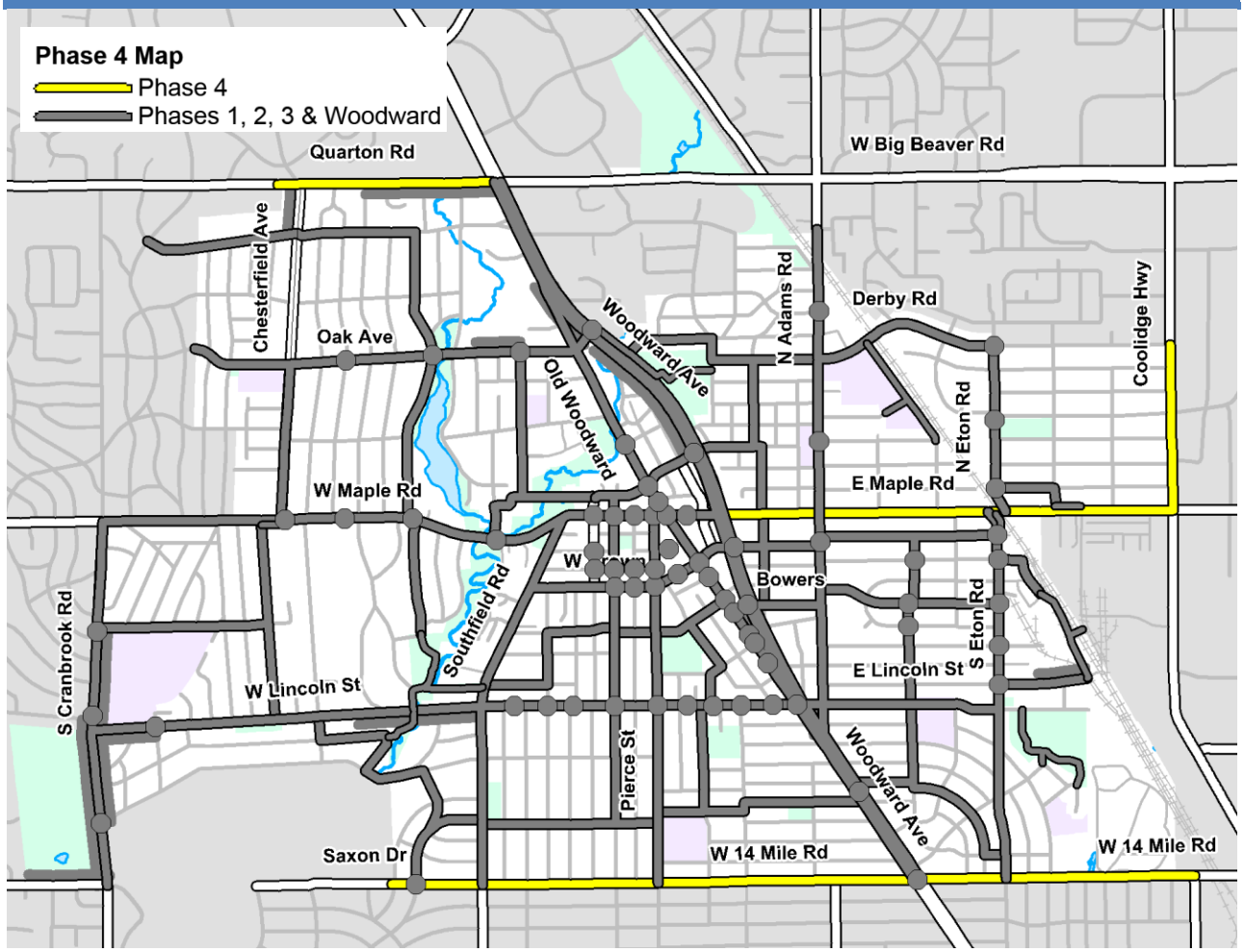
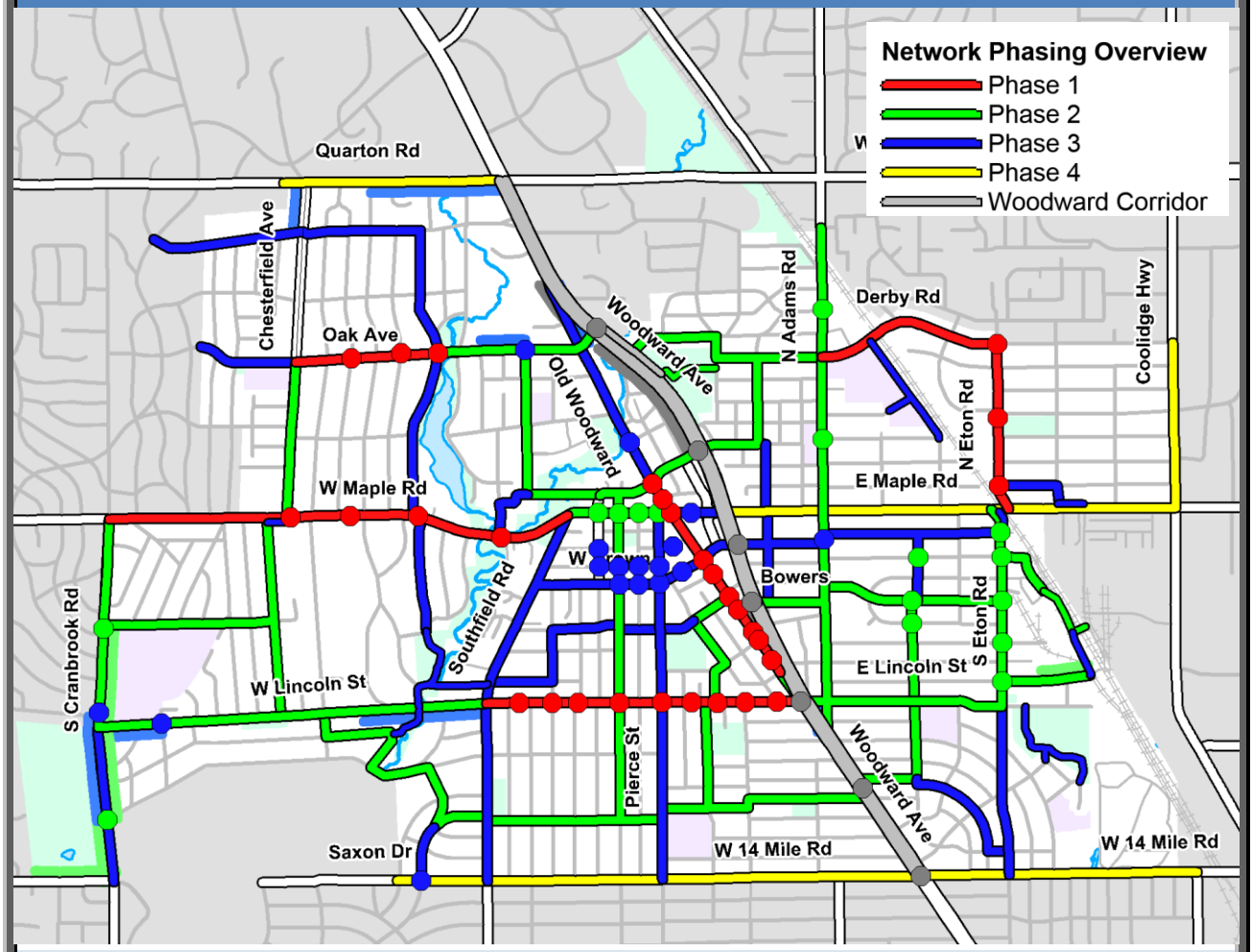


FIGURE 4.5B. NETWORK PHASING SUMMARY MAP



APPROXIMATELY 15 MILES OF NEW MULTI-MODAL FACILITIES ARE PROPOSED:

- 3.8 MILES OF BIKE LANES
- 0.5 MILES OF BUFFERED BIKE LANES
- 12 MILES OF SHARED LANE MARKINGS
- 0.2 MILES OF COLORED SHARED LANE MARKINGS
- 16 MILES OF NEIGHBORHOOD CONNECTOR ROUTES
- 3.5 MILES OF PATHWAYS & SIDEWALKS
- 64 ROAD CROSSING IMPROVEMENTS
- 2 TREE EXTENSIONS
- 4 ACTIVE TRANSPORTATION HUBS (NOT SHOWN ON MAP)
- 5 BUS SHELTERS (NOT SHOWN ON MAP)
- 64 BICYCLE HOOPS (NOT SHOWN ON MAP)
- 3 ENCLOSED & SECURED BIKE ROOMS (NOT SHOWN ON MAP)

4.6 PHASE 1 AND 2 COST ESTIMATE OVERVIEW

COST ESTIMATE INTRODUCTION

In order to illustrate magnitude of costs and begin planning and budgeting for implementation, planning level cost estimates have been completed for the improvements identified in Phase 1 and Phase 2. Due to the length of time it is going to take to complete the first two phases, cost estimates are not provided beyond this point.

Phase 1 and Phase 2 are estimated to cost around $2,288,980. The following figure provides an overview of the costs estimated for this network.

FIGURE 4.6A. PHASE 1 AND 2 COST OVERVIEW

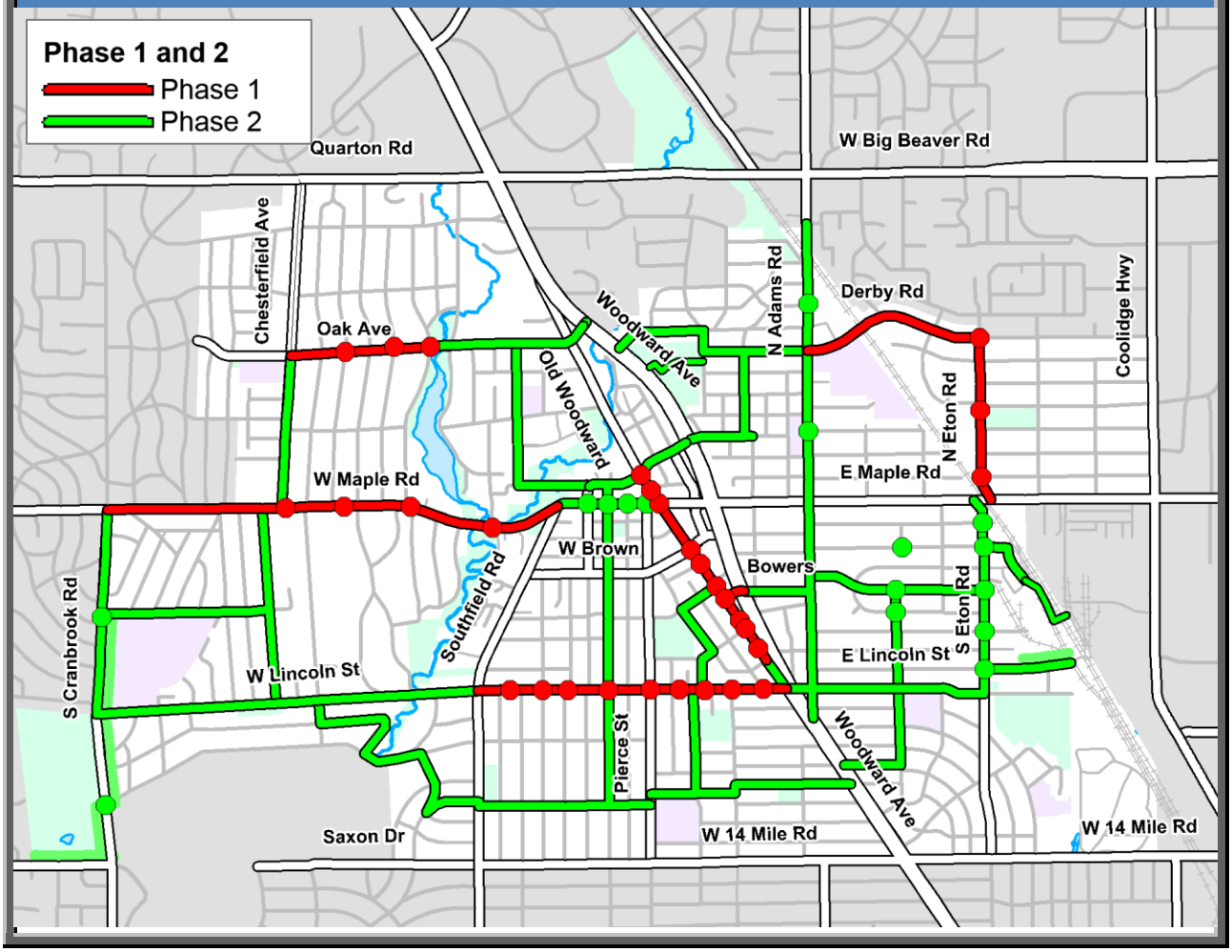
PHASE 1			
Proposed Road Crossing Improvements	$	1,134,000	88%
Proposed Tree Extensions	$	60,000	5%
Proposed Transit Improvements	$	50,000	4%
Proposed Sidewalks	$	25,200	2%
Proposed Colored Shared Lane Markings	$	15,000	1%
Proposed Bicycle Parking	$	11,000	1%
Total:	**$**	**1,295,200**	**100%**

PHASE 2			
Proposed Road Crossing Improvements	$	559,000	56%
Proposed Pathways & Sidewalks	$	277,050	28%
Proposed Bike Facilities	$	68,090	7%
Proposed Neighborhood Connector Routes	$	49,140	5%
Proposed Bicycle Parking	$	40,500	4%
Total:	**$**	**993,780**	**100%**

COST ESTIMATE FOR PHASE 1 AND 2		
Total:	**$**	**2,288,980**

A detailed breakdown of the cost estimate for Phase 1 and Phase 2 can be found in the Appendix.

FIGURE 4.6B. PHASE 1 AND 2 COMBINED NETWORK MAP



ACQUIRING RIGHT-OF-WAY

In Phase 2 an easement may be required to implement the proposed pathway connection between Villa Road and the future Troy Intermodal Transit Center. Please keep in mind that acquiring easements and/or right-of-way may add to the financial burden of implementation. In most cases, local business see the value to their own business and the community as a whole and are willing to provide a trail easement at no cost if the community assumes any liability. Easements should secure access in perpetuity or at a minimum the expected life-span of the improvement.

SPECIFIC AREA CONCEPT PLANS

OVERVIEW

The following concept plans were prepared to show how some of the ideas of the plan may be applied to specific areas. These concept plans should not be taken as completely developed designs. Rather, they are to illustrate a design idea. The areas shown may require separate design studies that may involve a more detailed investigation of the site conditions including public input and the development of alternatives and draft preliminary plans.

The following pages illustrate conceptual recommendations for specific areas.

TOPICS:

SPECIFIC AREA CONCEPT PLANS

5.1 LINCOLN STREET

The following concept plan is for the segment of Lincoln Street between Southfield Road and Woodward Avenue, which is going to be resurfaced in 2014.

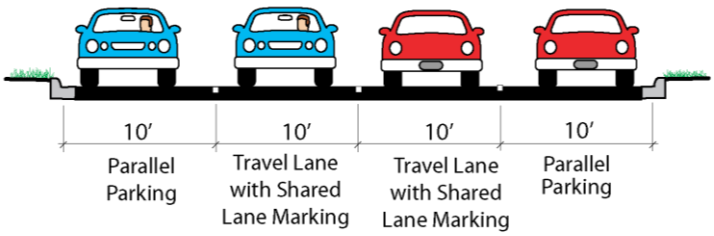
PROPOSED BICYCLE FACILITIES:

Shared Lane Markings are proposed for Lincoln Street between Southfield Road and Ann Street.

Colored Shared Lane Markings are proposed for Lincoln Street between Ann Street and Woodward Avenue.

The following is a recommendation of how the road should be restriped when it is resurfaced in 2014. All measurements for Lincoln are to face of curb.

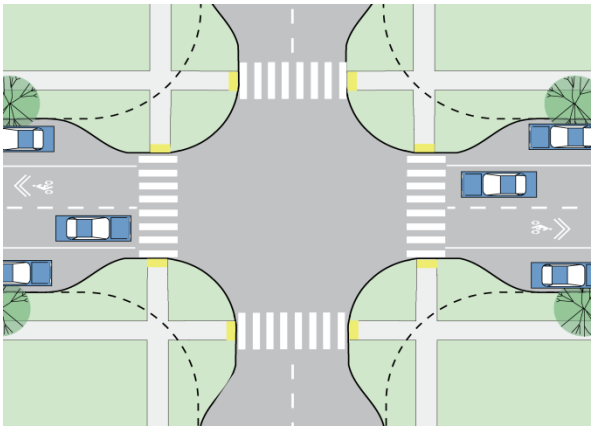
Add shared lane markings to travel lane



Shared Lane Marking

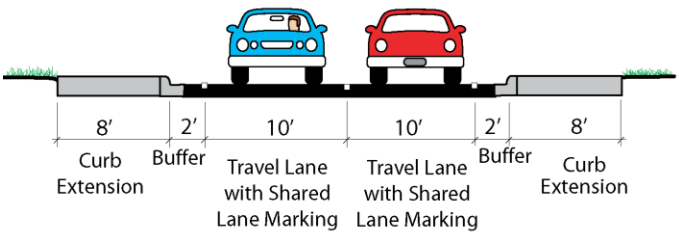
Colored Shared Lane Marking

PROPOSED CURB EXTENSIONS:



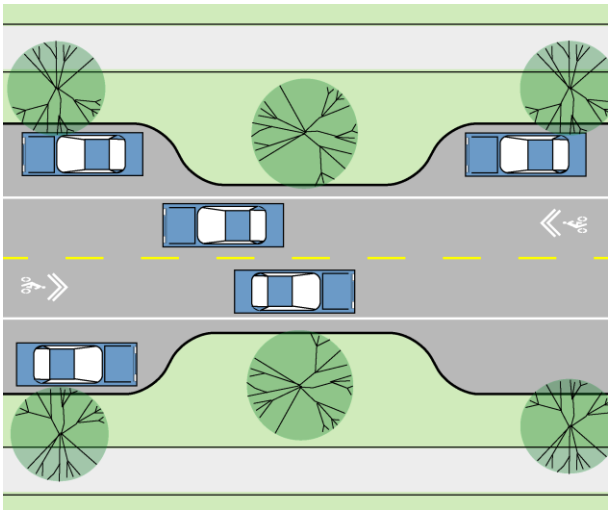
Curb extensions are proposed at Maryland Boulevard, Bates Street, Pierce Street, Grant Street and Ann Street.

Curb extensions with shared lane markings

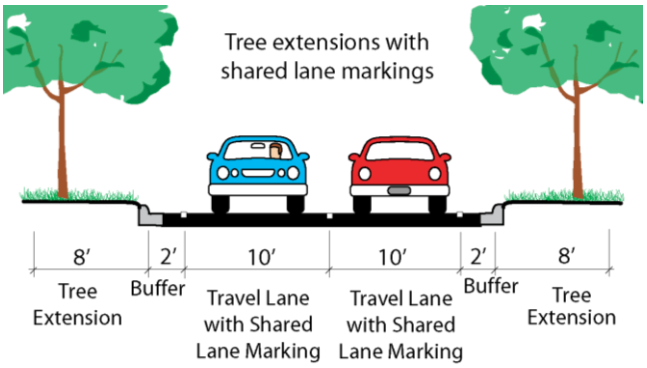


At intersections where curb extensions are not proposed the existing pavement markings should be maintained.

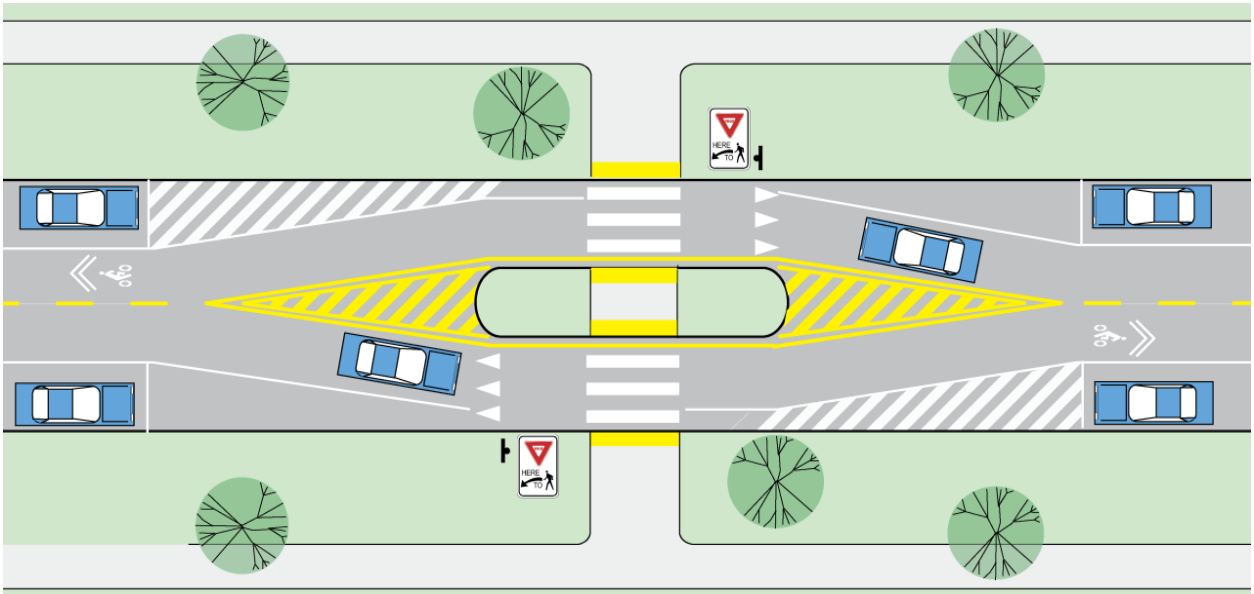
PROPOSED TREE EXTENSIONS:



Tree extensions are proposed mid-block between Clark Street and Lincoln Court and between Shipman Blvd and Birmingham Blvd.

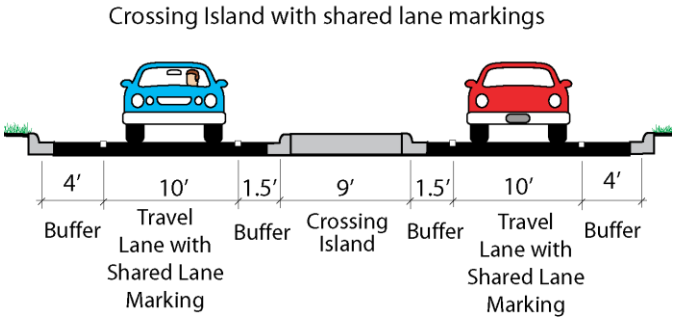


PROPOSED CROSSING ISLANDS:



**PLAN VIEW CONDENSED FOR ILLUSTRATION PURPOSE - TAPER LENGTH AS PER AASHTO GUIDELINES*

Crossing islands are proposed at Stanley Boulevard and on the east side of the intersection at Floyd Street.



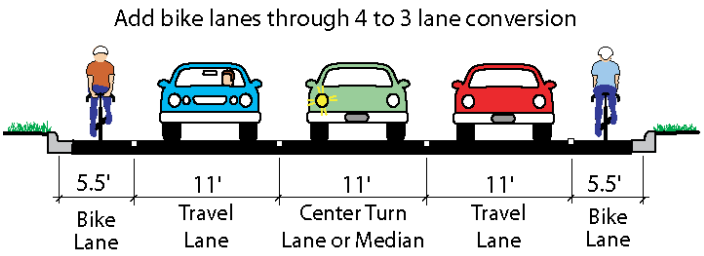
SPECIFIC AREA CONCEPT PLANS

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.

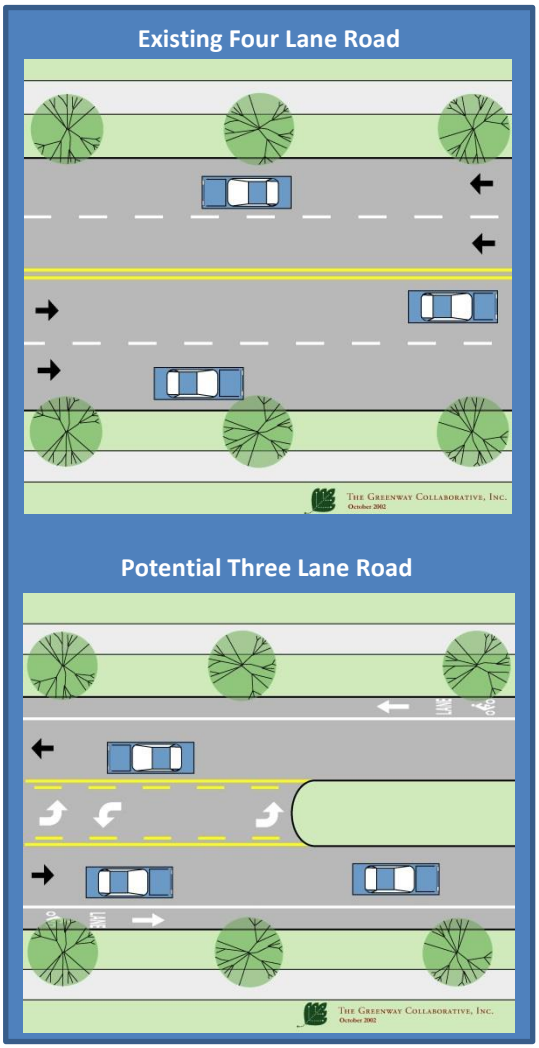
PROPOSED BICYCLE FACILITIES:

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

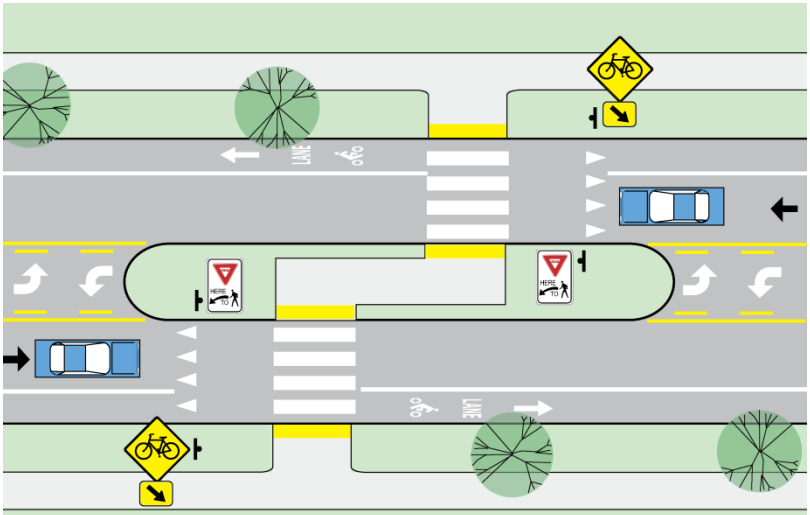


The existing road cross-section should be maintained on W Maple Avenue between Waddington Street and Cranbrook Road in order to allow for motor vehicle stacking at the intersection. A shared lane marking is proposed along this segment, along with signage directing bicyclists to a neighborhood connector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



**ADVANCED WARNINGS SHOULD BE INCLUDED*

Rectangular Rapid Flash Beacon

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.

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.

5.3 WOODWARD AVENUE

Concurrent with the development of this plan are two regional planning efforts that address the entirety of Woodward Avenue to determine how this iconic corridor can integrate new transit alternatives and become a true complete street. The recommendations in this report are to help inform those studies. While Woodward Ave's transition to a true complete street will take some time, some elements, such as improving the crossing at Oak Street can be undertaken immediately that will provide safety and mobility improvements.

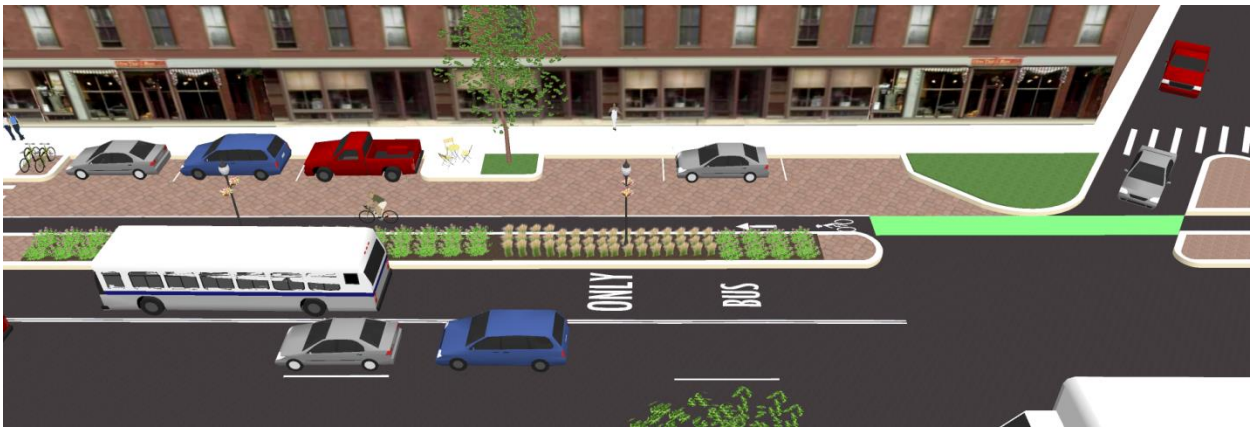
During the Visioning Workshop participants were asked about their vision for the Woodward and overall there was a desire to create more of a "Main Street" feel along the corridor. Some of the key items that were identified for this corridor included parallel parking, a designated transit lane, sidewalks, landscape buffer and a designated bicycle facility in the form of a bike lane or one-way cycle track.

CONCEPTUAL DESIGN:

Using the space between the buildings and the travel lanes, a "Main Street" area within the Woodward Corridor is created. The following conceptual design provides a more pedestrian scaled area that incorporates on-street parking with a service drive, sidewalk, and bike lane that are all buffered from Woodward Avenue by a landscaped median and transit lane.

KEY ELEMENTS:

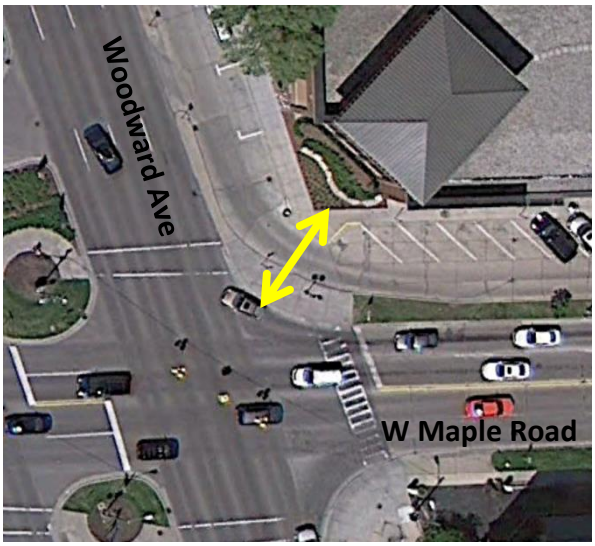
- Parallel parking between the service drive and sidewalk
- 8’ wide sidewalk
- 8’ wide landscape buffer with areas for transit stops
- Outside motor vehicle lane designated as transit lane
- Bike lane along left side of service drive and buffered from Woodward Avenue
- Trees and café areas extend into parking spaces as appropriate for context
- Curb extensions and pedestrian crosswalks provided at transit stops
- Bicycle parking provided on curb extensions near transit stops
- Pedestrian scale street lighting with flower baskets and/or banners
- Decorative brick pavers used in the service drive and parking areas
- “Pork-chop” diverters provided in unused areas of intersection where local roads intersect Woodward Avenue at an angle
- Green pavement markings placed in areas where there is potential for conflict between bicycle and automobiles to increase visibility of the bike lanes

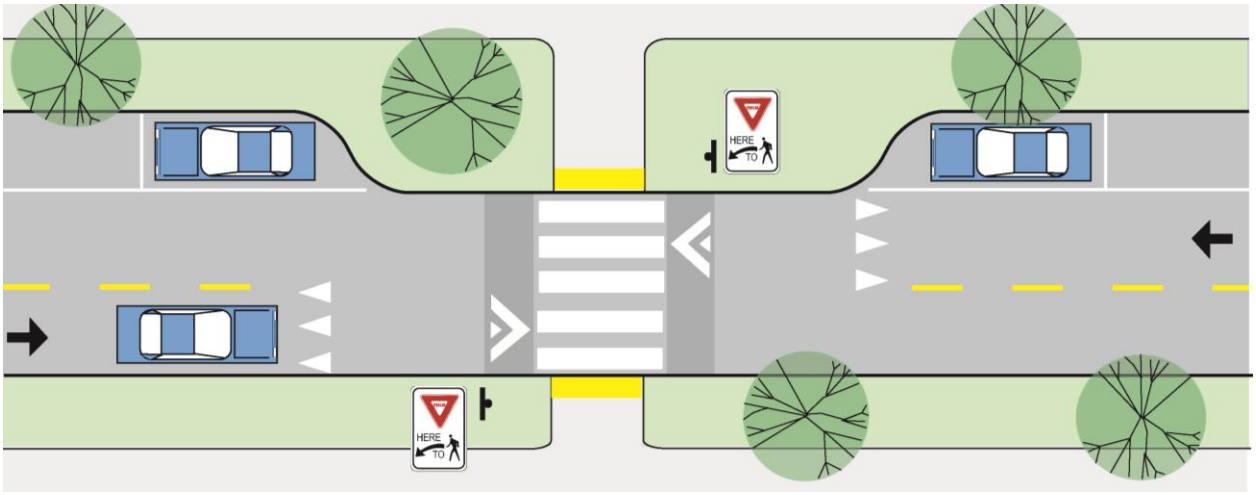


PROPOSED ROAD CROSSING IMPROVEMENTS ON WOODWARD AVENUE:

A raised crosswalk is proposed across the service drive on the northeast corner of Woodward Avenue and E Maple Road.

Raised crosswalks are crosswalks constructed 3” to 4” above the elevation of the street and serve as a traffic calming measure by extending the sidewalk across the road and bringing motor vehicles to the pedestrian level. By extending the sidewalk across the road at an elevation the raised crosswalk reduces vehicle speeds and improves pedestrian visibility.



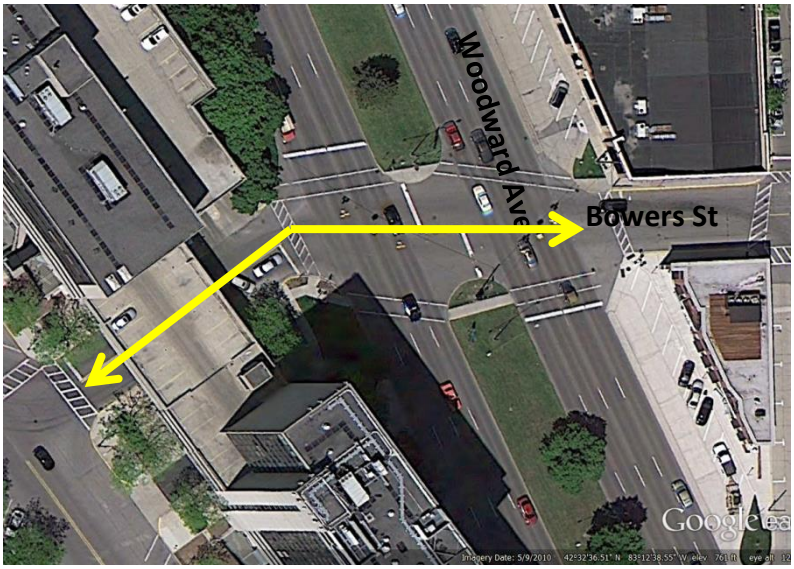


The Michigan Department of Transportation has proposed a full traffic signal in both directions at or near the intersection of Forest Avenue.

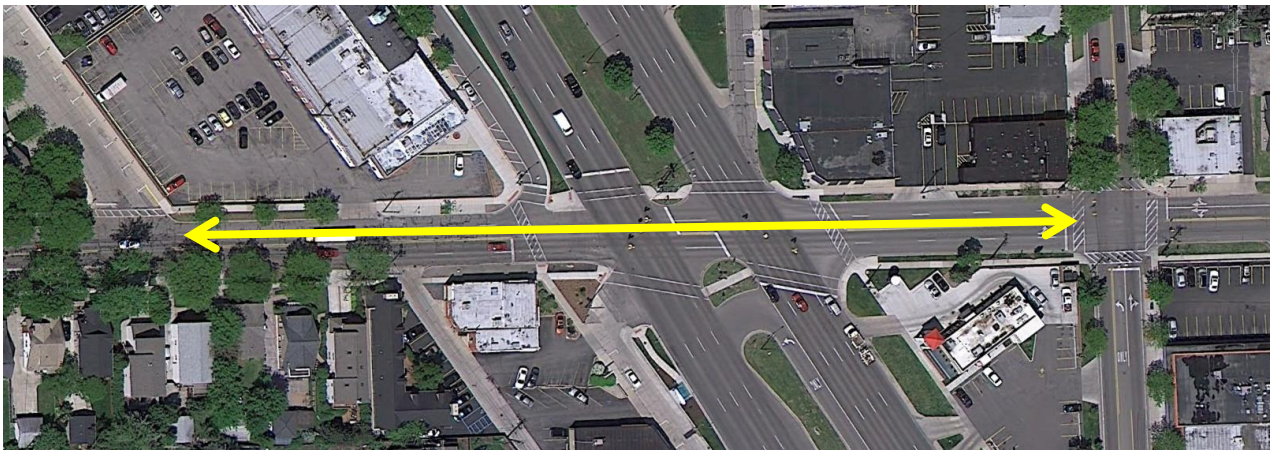
Currently, southbound traffic is stopped at the crosswalk by a signal, but the northbound traffic is not controlled by a signal. Pedestrians crossing the four northbound lanes at a gap in traffic frequently conflict with motorists turning right from Forest Avenue.

Colored Shared Lane Markings are proposed on Bowers Street through the Woodward Avenue intersection to help bicyclists cross the road.

Colored pavement with Shared Lane Markings increases visibility of the facility identifies potential areas of conflict and reinforces priority to bicyclists through the intersection.



Colored Shared Lane Markings are proposed on E Lincoln Street between Ann Street and Adams Road to help bicyclists navigate through the intersection.



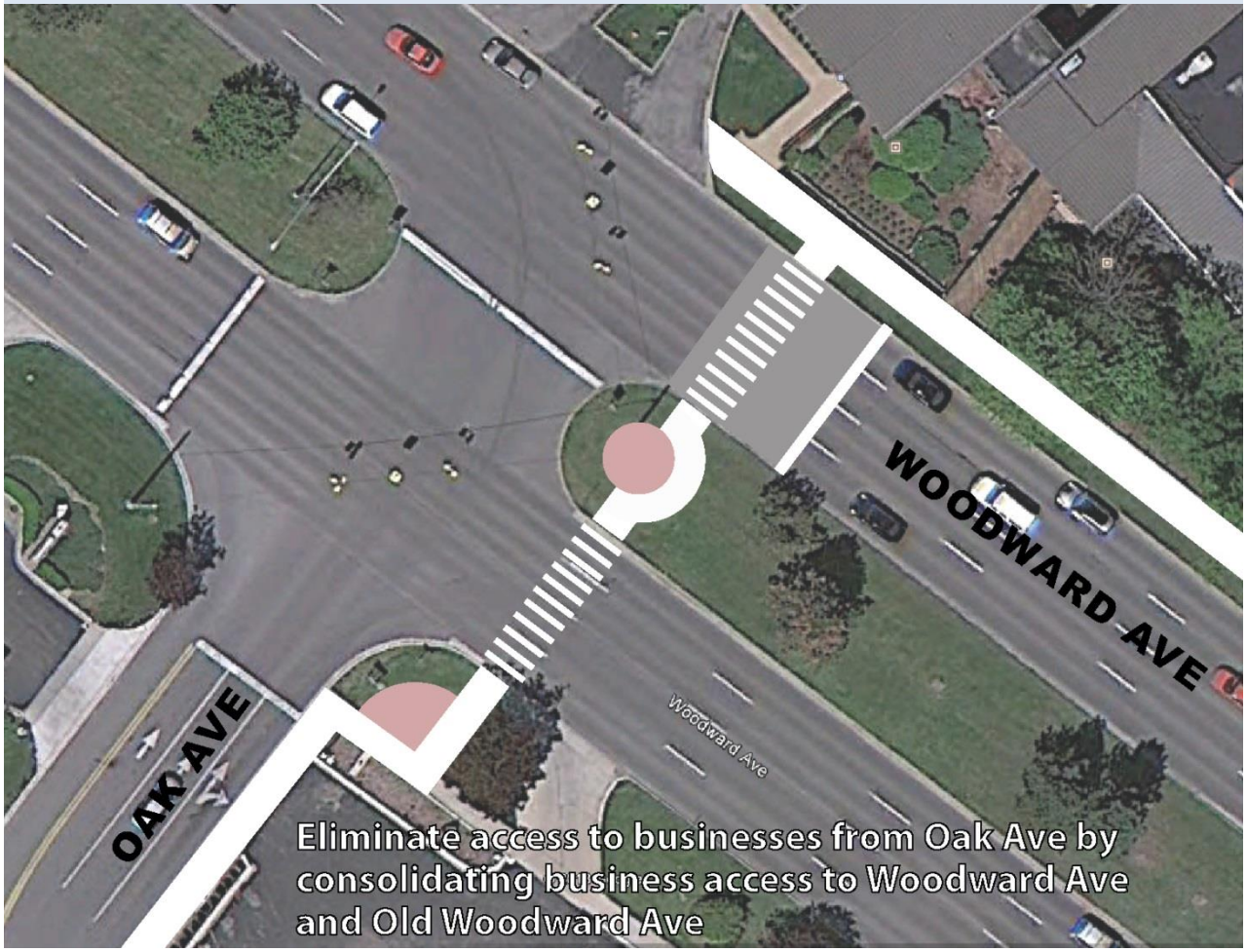
Colored pavement with Shared Lane Markings increases visibility of the facility, identifies potential areas of conflict and reinforces priority to bicyclists in conflict areas.

This improvement may be implemented as part of a 2014 road resurfacing project as noted under CIP Opportunities.

A new pedestrian signal is proposed at Oak Avenue to help pedestrians and bicyclists cross Woodward Avenue.

Currently, there is a signal at Oak Avenue on Woodward Avenue but no pedestrian crossing. It is important to provide a crossing here, as it is part of the east-west neighborhood connector route along Oak Avenue and Derby Road that provides an alternative to Maple Road. Also, there are limited road crossing opportunities on Woodward Avenue between Maple Road and Quarton Road.

CONCEPTUAL ROUTING:



Provide Enhancements to the Pedestrian Environment at Road Crossings along Woodward Avenue.

Due to Woodward Avenue's significance as a regional motor vehicle corridor it should be noted that there is not much that can be done to change the signal timing and it should be expected that most pedestrians will probably end up spending a cycle of the light in the median. Waiting in the median of Woodward Avenue can be an intimidating environment for pedestrians so enhancements should be made if pedestrians are expected to spend any period of time out there. It order to provide a better sense of enclosure and protection and make the median more pedestrian friendly the following enhancements should be considered:

- Art
- Landscaping
- Low retaining walls that provide seating opportunities and a physical separation from the roadway
- Overhead structures that add visual interest and enclosure

IN THE CITY OF FERNDALE A CROW'S NEST SCULPTURE WAS INCORPORATED IN THE MEDIAN AT WOODWARD & 9 MILE

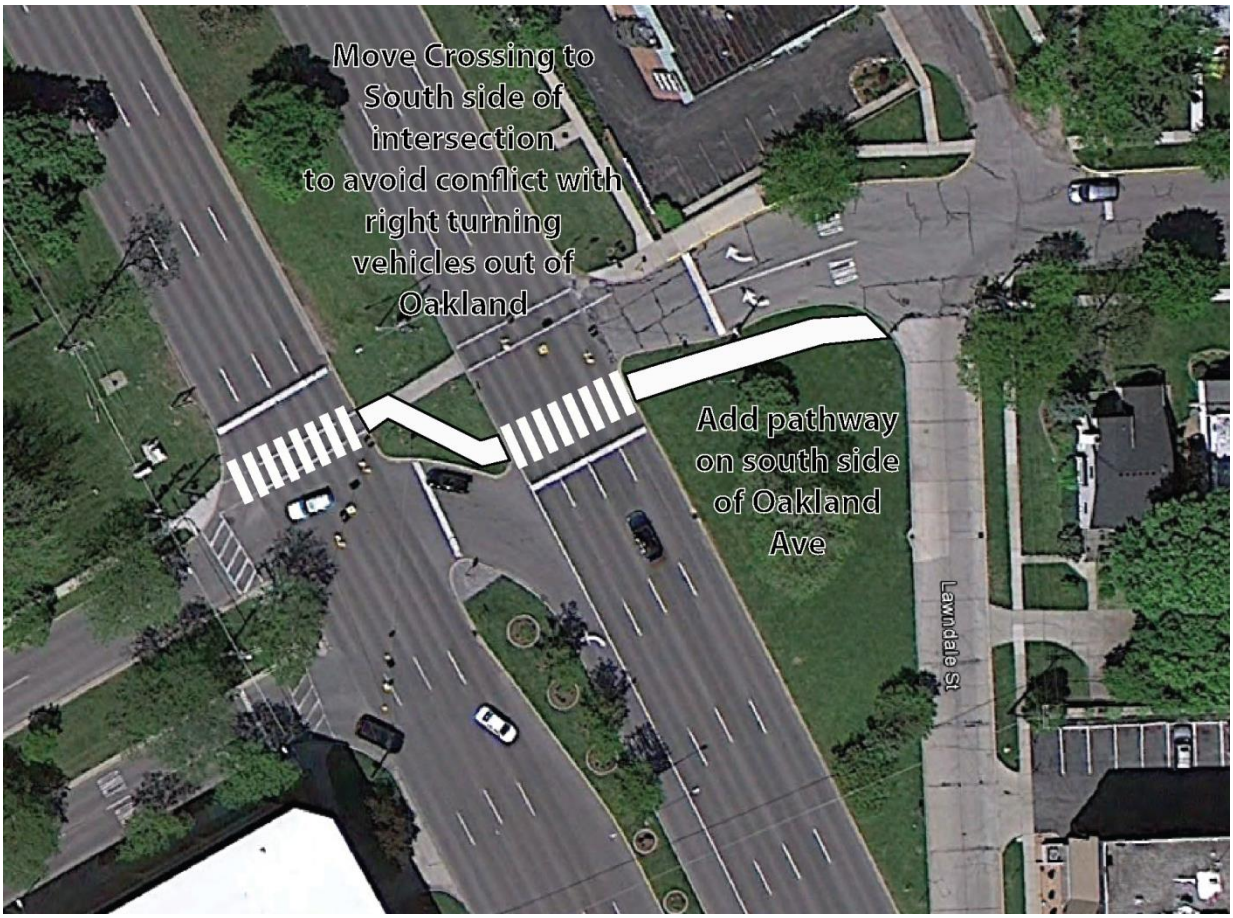
A SHELTER IS PROVIDED IN THE MEDIAN ON GRAND RIVER IN EAST LANSING

All enhancements should be designed such as to not impede visibility between pedestrians and motorists.

Provide for two-way bicycle traffic at intersection with Oakland Avenue

Oakland Avenue is indicated at a bike route connecting downtown to the neighborhoods on the west side of Woodward Avenue. Presently, Oakland is one-way for one block just east of Woodward Avenue and is comprised of two right-only turn lanes. This presents a number of challenges. First, the right turning movements from Oakland Avenue to northbound Woodward Avenue conflict with pedestrians and bicyclists in the crosswalk. Second, east-bound bicyclists crossing Woodward are forced onto a narrow sidewalk and have an awkward entrance back onto Oakland Avenue.

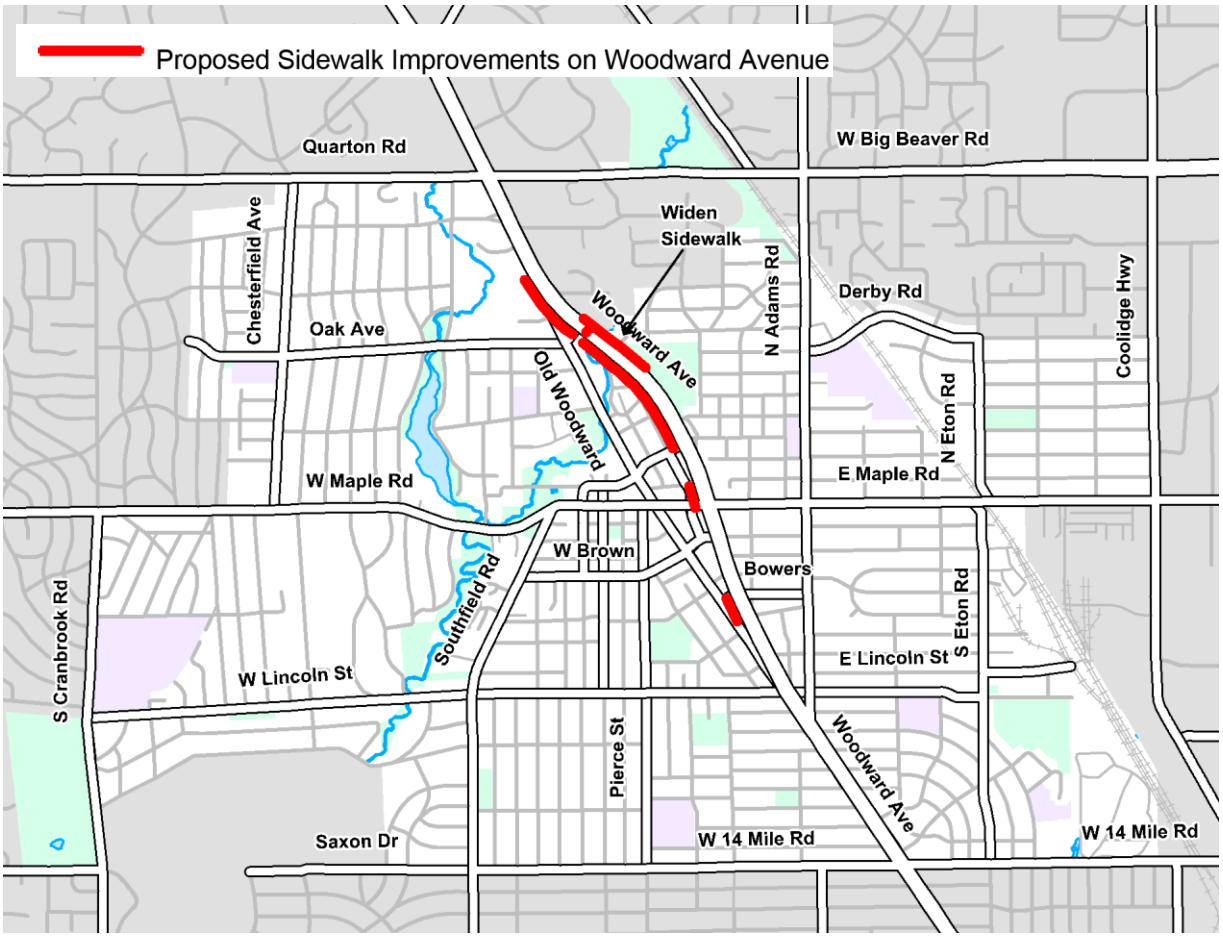
To address this situation, the crosswalk on north-bound Woodward is proposed to be moved to the south side of the intersection. This eliminates the conflict with right turning vehicles from Oakland Avenue onto north-bound Woodward Avenue. Also, a shared-use pathway is proposed on the south side of Oakland Avenue for the one block which the road is one-way to allow bicyclists to by-pass this one block and easily merge back into the two-way traffic east of Lawndale Street.



PROPOSED SIDEWALK IMPROVEMENTS ON WOODWARD AVENUE:

It is recommended that the City of Birmingham work with MDOT to implement the proposed sidewalk improvements.

- Complete sidewalk gaps along the west side of Woodward Avenue in the City of Birmingham
- Widen Sidewalk on east side of Woodard Avenue between Oak Avenue and the proposed pathway in Poppleton Park to 10' wide to accommodate bicycle and pedestrians. When implementing it is probably more appropriate to remove the old sidewalk and rebuild a new 10' wide pathway for this segment.



WOODWARD AVENUE IMPLEMENTATION:

Since Woodward Avenue is under MDOT jurisdiction it is recommended that the City of Birmingham work with MDOT to ensure the proposed recommendations along Woodward Avenue are implemented.

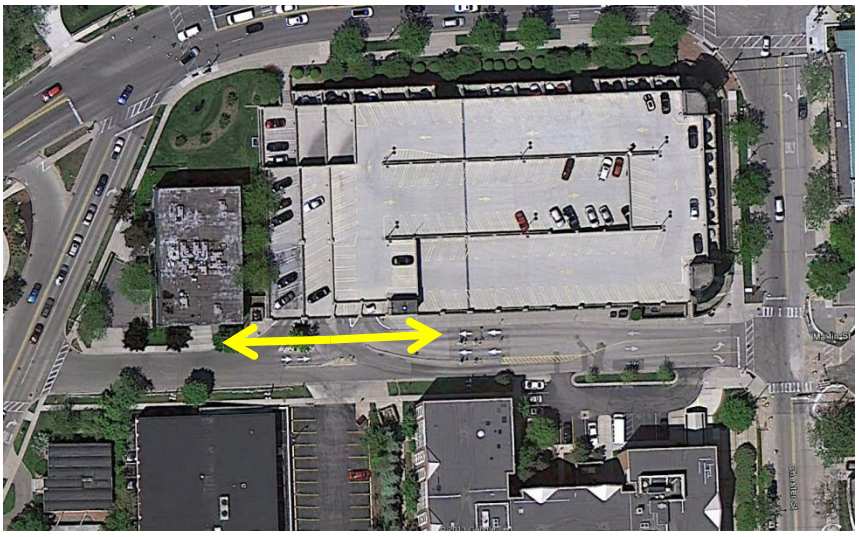
5.4 DOWNTOWN

Downtown Birmingham contains many of the elements of a bicycle and pedestrian friendly downtown such as short street blocks, small shops and business that line the street, seating and other amenities. The design of the downtown environment has a direct effect on the degree to which people enjoy walking, biking and taking transit. If designed appropriately, the environment serves not only the people who currently walk, bike and use transit but also entices those who do not.

PEDESTRIAN IMPROVEMENTS:

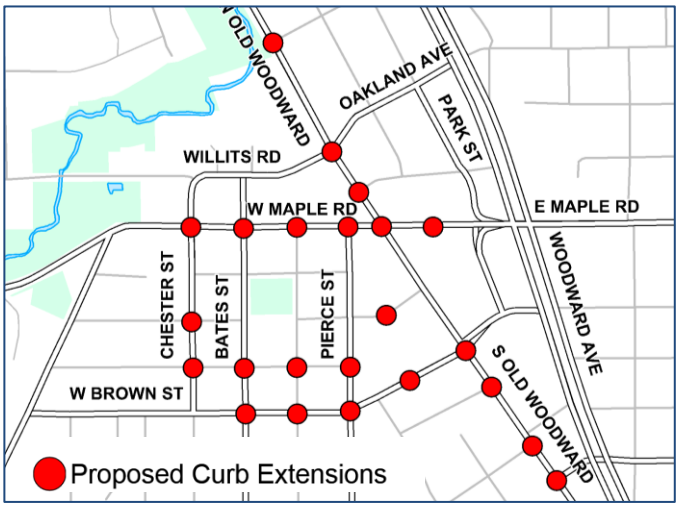
One of the biggest inhibitors to pedestrian activity in the downtown is the stepped curb. Stepped curbs are located in numerous areas in the downtown and present hazardous situations for some pedestrians, especially when they are located at crosswalks where there are no ramps. The near-term recommendation is to remove the stepped curb by installing curb extensions with ramps at road crossings. In the long-term the stepped curb should be eliminated through the downtown by re-grading the road.

The entrance to the City parking garage located on Martin Street between Southfield Road and Chester Street presents a challenging environment for pedestrians. Due to the numerous entrances to the parking garage there is no indication for pedestrians on how to navigate across the entrance.



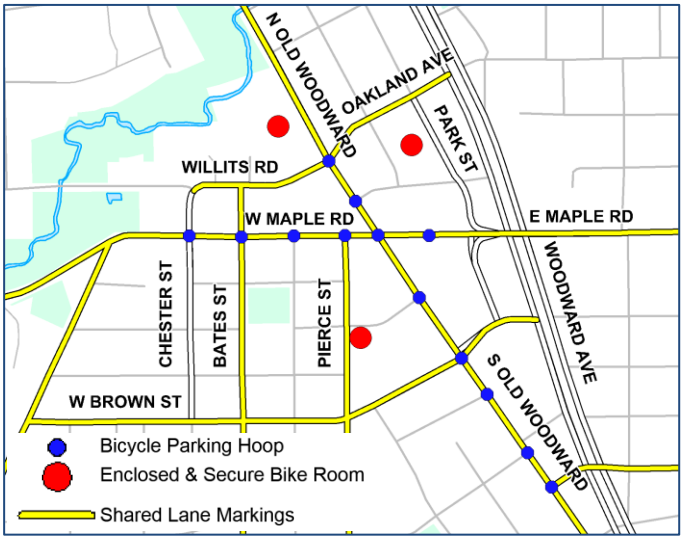
It is recommended that high visibility crosswalks markings be painted across the parking garage entrance as well as providing a sidewalk across the “pork chop” diverter island located between the parking garage entrances.

As previously noted, curb extensions are proposed throughout the downtown as a near-term solution to the stepped curbs. Curb extensions also shorten crossing distances for pedestrians and increase visibility between pedestrians and motorists at intersections. The following map shows all of the locations for proposed curb extensions in the downtown. Please note that some of the proposed curb-extensions align with the City of Birmingham's Alley & Passages Plan 2012.



PROPOSED BICYCLE FACILITIES:

Due to the limited road width and demand for on-street parking, Shared Lane Markings are proposed in the downtown on Maple Road, Old Woodward Avenue, Willits Road, Oakland Avenue, Bates Street, Brown Street, and Pierce Street.



In 2012, the City installed an extensive number of bicycle hoops. In addition to these hoops, 44 bike hoops are proposed in the downtown area in coordination with the proposed curb-extensions. The City has also been experimenting with seasonal bicycle parking. Seasonal bike racks should be placed where there are large curb extensions or adjacent to outdoor dining decks.

For long-term bicycle storage, enclosed and secured bike rooms are proposed in the City's parking decks. Initially, a bike room should be installed in the Pierce Street Parking Garage, and if successful, additional rooms should be placed in other parking garages in the downtown.

ROADWAY IMPROVEMENTS:

It is recommended that Park Street between Hamilton Row and Maple Road be changed from a one-way street to a two-way street and the intersection reconfigured so Park Street meets Maple Road at a 90 degree angle.

TRANSIT IMPROVEMENTS:

Five bus shelters are proposed in coordination with the proposed curb extensions on Maple Road and Old Woodward in the Downtown.

WAYFINDING:

An Active Transportation Hub is proposed near the City Hall to serve as a resource center for multi-modal transportation in the City. While placing the hub right at city hall would be ideal, in order to preserve the buildings character it is recommended that the hub be placed on the southeast corner of Pierce Street and Merrill Street between City Hall and the parking garage.

A large map of the downtown recommendations can be downloaded from the project website at http://www.greenwaycollab.com/Projects/Birmingham/BMMTP.html