

NON-MOTORIZED URBAN TRANSPORTATION MASTER PLAN

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Prepared for:
The City of Detroit
Traffic Engineering Division
Department of Public Works

Prepared by:
Giffels-Webster Engineers
Carter-Burgess
ArchiveDS
Brogan & Partners

NON-MOTORIZED URBAN TRANSPORTATION MASTER PLAN

Steering Committee Members

James Brown—Finance Department
Al Fields—Mayor's Office
Andrew Heffner—Recreation Department
Dr. Noble Maseru, PhD—Health and Wellness Promotion
Gregory Parrish—Planning and Development
Manilal Patel—Traffic Engineering Division/DPW
Ashok Patel—Traffic Engineering Division/DPW
Larry Sangster—City Engineering Division/DPW
Donald-Ray Smith—Planning and Development
Marcell Todd, Jr.—City Planning Commission
Crystal Wilson—Planning and Development

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Detroit Public Library
East Lake Baptist Church
Farwell Recreation Center
Motor City Blight Busters
Detroit Renaissance
Clemente Recreation Center
Tabernacle MBC
University of Detroit Mercy
Detroit 300
Detroit Riverfront Conservancy
Community Foundation/SE MI
Detroit Economic Growth Corp

Project Overseen by

Ashok Patel, Project Manager
City of Detroit
Department of Public Works
Traffic Engineering Division
2633 Michigan Avenue
Detroit, MI 48216



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Master Plan Prepared for the City of Detroit by



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Introduction

Project Overview

Through a grant from the Michigan Department of Transportation, the City of Detroit has undertaken the development of an urban non-motorized transportation master plan. The benefits of trail systems and other “greenways” have long been recognized, but seldom thought of in an urban context. An urban non-motorized system must not only provide a safe and visually appealing diversion, but also must become a part of the overall community fabric.



Creating this non-motorized system requires an understanding of the dynamics of the various types of corridors available and the varying needs of the end users. For example, one user may enjoy the increased access to destinations throughout the City while another may utilize the system to more freely take public transportation to their place of work. Because urban trails support such diverse uses, the preparation of a detailed master plan is an imperative step in the successful completion of the City's vision.

Access improvements for pedestrians and bicyclists are important to help improve the ability to take functional trips to destinations like shops, work and school. Currently, Detroit suffers from a lack of continuous, connected and maintained bikeways, and in some cases, walkways throughout the City.

With this Plan, Detroit takes measurable steps toward the goal of improving every citizen's quality of life, creating a more sustainable environment, and reducing traffic congestion, vehicle exhaust emissions, noise, and energy consumption. It also joins a growing list of North American cities that have implemented non-motorized improvements with great success.

Chicago, Boston, Portland, Denver, San Francisco, and Toronto are but a few of the major cities that have become trend setters in this regard. The importance of developing a pedestrian and bicycle system that is attractive and safe is a key element in preserving Detroit as a place where people want to live, work and visit.

“We will promote safe and environmentally friendly cycling and walking by providing safe infrastructure and network...”

World Health Organization
Charter on Transport, Environment and Health 1998

“The US Conference of Mayors calls on cities and communities to promote increased safe bicycle use for transportation and recreation...”

US Conference of Mayors, 2003

City of Detroit Non-motorized Transportation Master Plan

The *City of Detroit Urban Non-motorized Transportation Master Plan* provides detailed locations and types of non-motorized facilities recommended for the City as a whole. In addition, this plan proposes a strategy to implement the recommended improvements. Lastly, the plan outlines additional strategies related to maintenance and growth of the non-motorized system in the future.

Benefits of Non-motorized Systems

A complete and accessible non-motorized system provides numerous benefits to users and nonusers alike. Just as a properly planned and maintained road network impacts more than a driver's experience, a proper non-motorized system can improve general health, increase accessibility to the disadvantaged, promote a cleaner environment and stitch together a community.



Designated bicycle lanes can help ease traffic congestion.

Transportation Benefits

Non-motorized travel can play an important role in the overall transportation system. Both bicycling and walking are easy ways to complete short errands or commute to work while simultaneously helping to reduce traffic congestion. In addition, people without a driver's license (i.e., teenagers and seniors)

or access to a motor vehicle may rely on such activities as their main mode of transportation. A fully integrated non-motorized system can therefore increase opportunities for people on many levels.

Off-road bike paths can be used for increased health and recreation.



Health Benefits

Bicycling and walking are generally recognized as excellent forms of physical activity, and can help prevent and/or control the chronic conditions that lead to cardiovascular disease, diabetes, obesity, and high blood pressure to name but a few. Those who bicycle or walk frequently generally enjoy better than average health to the point that the United States Surgeon General and the Center for Disease Control and Prevention both encourage such exercise. Health is further benefited by the resulting decrease in fuel emissions that would result from a decrease in vehicle trips. Considering the effect of regular exercise on disease, bicycling and walking have the potential to improve both individual and public health like few other activities.

Economic Benefits

Non-motorized facilities can also benefit the City economically. Organized walking tours highlighting the City's history can provide visitor's with a glimpse at another layer of the community fabric. Bicycle and walking may therefore bring tourists to a city that may otherwise not see a great deal of tourism. Furthermore, as visitors from the region or beyond take advantage of their increase accessibility of the City's destinations they will likely spend more money at local businesses.

High profile facilities, such as the Riverfront Promenade, can also prove to attract tourists and related businesses to the region by reflecting a high quality of life. Homebuyers and businesses often seek out communities offering bicycle facilities because of these benefits.

Community Benefits

Non-motorized travel can also help define the City's character. A city with an extensive non-motorized network will tend to generate a significant amount of local bicycle and pedestrian travel. This tends to promote more



interaction among people within that city and a stronger resulting sense of community.

The Process Overview

In preparing this Master Plan, the City of Detroit assessed the feasibility and standards required for implementing non-motorized transportation routes within densely populated, urban environments. The process was information intensive, encouraging a broad perspective and a flexible framework for implementation. It relied on the partnering of residents, neighborhoods and districts to share ideas and balance individual agendas, considerations and challenges into one dynamic plan.

Various community stakeholders and City Departments were actively engaged to help develop creative possibilities for locating and designing the urban bikeways and walkways. The proposed plan that follows establishes the framework for the non-motorized transportation system extending throughout the entire City of Detroit.

By blending assets of the physical, natural, cultural, recreational, educational and historical environments the plan creates an effective and active non-motorized system. The overall strategy explored ways to meet the demand for non-motorized connections and recreation while providing a clear sense of community identity; where the bikeway/walkway system simultaneously

serves an equally important role of interpreting local historical, cultural and natural resources.

Planning Process

The project team established an open line of communication with the City, which was integral to the proper completion of the project. The Traffic Engineering Division (TED) of the Department of Public Works acted as the project manager for the City of Detroit. In addition to working directly with TED, a steering committee consisting of members of the other City Departments was created and involved in the project from the beginning. Quarterly meetings were facilitated by the Traffic Engineering Department to update the Steering Committee on the progress of work, discuss outstanding issues, and solicit feedback regarding varying portions of the report.

It is important to note that this plan was not prepared in a vacuum, as many other planning efforts impacting non-motorized travel had recently been completed or were underway. The City of Detroit, for instance, recently updated the land use Master Plan. Some of the goals of this plan include protecting the City's historical heritage, encouraging walk-ability, provide increased safe access to the City's parks and the riverfront, and supporting different modes of transportation. Furthermore, several high-profile non-motorized facilities have either recently been completed or are under

construction. The Riverwalk , Dequindre Cut, and Corktown-Mexicantown Greenlink project are just three of a handful of important projects that have been incorporated into this plan.

In addition to these efforts, a Downtown Transportation Master Plan, a Truck Route Master Plan Supplement, a DDOT Route Structure Evaluation, and a new Strategic Master Plan from the Recreation Department were all either recently completed or underway. The Urban Non-motorized Transportation Master Plan was drafted to compliment all of these efforts.

Currently, neither the Traffic Engineering Division nor the recently revised City of Detroit Zoning Ordinance outlines standards or requirements for non-motorized facilities. The recommendations included later in this report should be utilized in order to create such standard requirements to both ease and facilitate future implementation. That being said, the goals of the final plan include:

Connect users to important sites and districts within the City;

Provide Detroit residents with increased travel opportunities;

Assist in the revitalization of the "gateways" (Grand River, Michigan, Woodward, Jefferson, and Gratiot);

Create a bridge other existing and planned region trails;

The team's first tasks revolved around the collection of enough existing data to allow for a clear understanding of the baseline conditions. Subsequent tasks included the identification of possible destinations throughout the City and the iterative process of defining and then applying proper selection criteria to create a workable list of primary destinations and available routes that would make up the non-motorized system.

The data and analysis outlined in this Master Plan can be divided into one of two basic categories: urban planning, and transportation. *Urban Planning Data* refers to items related to neighborhood destinations and other existing/planned non-motorized trails. *Transportation Data* relates to the existing infrastructure of the City, including roadway geometry, traffic volume/speed, and demographic information as related to non-motorized transportation usage.

Public Involvement

Following the approval of draft versions of this report by the Steering Committee, the team actively engaged the public via open-house style meetings. The goal was to explain the scope of the project to the public and obtain feedback from residents and other non-motorized advocates.

As part of this effort we therefore also assembled a list of established running, walking and cycling groups that schedule activities in and around the City. We talked

with key members and solicited additional input on the non-motorized study while inviting representatives to attend the public meetings.

Cluster	Date Held	Location
1 & 2	11/15/05	Farwell Recreation Center
3	11/14/05	East Lake Baptist Church
4	11/16/05	Detroit Public Library
5	12/07/05	Clemente Recreation Center
6 & 7	12/01/05	Tabernacle MBC
8	12/06/05	Motor City Blight Busters
9 & 10	11/16/05	University of Detroit Mercy

Table 1: Public Meetings Held in 2005

Based on discussions with the Steering Committee we originally proposed to utilize the Neighborhood City Halls to host the public meetings. Upon contacting the Director, Mr. Raymond Cheeks, it was determined that the ability of the Neighborhood City Halls to handle our requests was greatly limited.

At the suggestion of the Mayor's office we then shifted our focus to a more grassroots effort at engaging the general public. It was determined following discussions with the Steering Committee, especially members of the Planning and Development Department and the City Planning Commission, that we would base the meetings around the ten existing planning clusters.

Seven meetings were held with representatives from all ten clusters during the final months of 2005 at local churches, recreation centers, community institutions, etc. in order to involve the general public.

City of Detroit Non-motorized Transportation Master Plan

Various methods were used to publicize these meetings in an attempt to attract from a varying cross-section of the City. We contacted Community Development Associations, all of the City's recreation centers, local churches, biking and pedestrian advocacy groups, and other organizations on numerous occasions to invite them to the meetings. An example of one of the fliers prepared and distributed for these meetings is included on the next page.

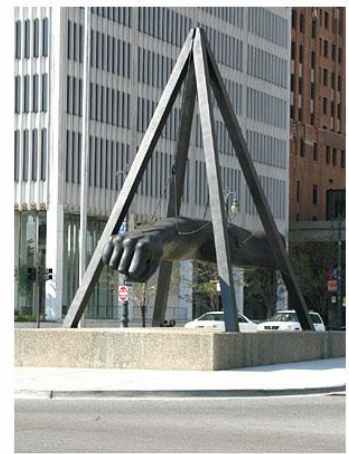


The riverfront was one of the desirable destinations most often given by the public.

Meeting Structure

All of the meetings began between 6 pm and 6:30 pm in order to allow for working families to attend. The project was introduced to attendees via a short (15 to 20 minute) multimedia presentation. This brief introduction outlined the purpose of study, how it was being funded, the general benefits of non-motorized transportation, and briefly displayed the bulk of the project inventory.

A list of frequently asked questions and answers was also provided to all attendees to help begin the conversation. A copy of this list is provided on the following pages.



©2003 - Janet Reid



Belle Isle, the Central Business District (Downtown), and Campus Martius were also often mentioned by residents as being important destinations.

Bike/Blade/Jog/Walk The Detroit Neighborhoods



**Attend a public information meeting,
find out more and offer your input.**

When: Tuesday, December 13 at 6:00 p.m.

Where: Detroit Public Library – Main; Explorer’s Room, Lower Level

Purpose: To explain the benefits of non-motorized transportation and gain the input of Detroiters to help complete a citywide master plan.



Hosted by: Giffels-Webster, City of Detroit Traffic Engineering Division,
Carter Burgess and Archive DS



Special thanks to the Detroit Public Library for its assistance

DETROIT NON-MOTORIZED TRANSPORTATION MASTER PLAN

2005 Public Information Meetings Frequently Asked Questions

1. Who is paying for this study? How much is it costing?

The study is being completely funded by the Michigan Department of Transportation (MDOT).

2. How much will these improvements cost?

This project only includes the preparation of a Master Plan that future physical improvements will be based upon. The overall cost of constructing these improvements will therefore depend on when they are installed. Improvements can be constructed with road funds, through grants or by private donations/investments.

3. How did other cities fund similar programs?

Many other municipalities and local community groups obtain funding for non-motorized improvements through state and federal grant programs. In addition, non-motorized improvements have been installed as part of general road maintenance. Private sector funding of improvements, either as part of a new development or as a result of personal and/or corporate donations, have also been utilized.

4. Why does Detroit need this project? What are the benefits for residents?

The master plan is being prepared to maximize several benefits for residents of the City of Detroit. By specifying safe areas for pedestrians and bicyclists the City will be promoting a healthier lifestyle to its residents. At the same time these facilities will allow residents greater access to the City's many parks and recreation areas. Additionally, a strong network of non-motorized facilities will help bind the entire City together by allowing residents who do not own a vehicle the opportunity to access the many destinations the City of Detroit has to offer.

5. Who will use this new system?

The new system will be available for all to use. Whether enjoying a leisurely walk, taking a jog, or biking around town, our goal is to provide residents with improved access to the City's neighborhoods, recreation, retail and cultural centers

6. It seems this plan is for young people with bikes – how many bikes are there in Detroit?

The system is not solely for bicycling; however it is a popular mode of transportation for young people. There also are a few bike clubs that tour the city for recreation and entertainment as a group. But the total system was designed for residents who also want to walk to enjoy the outdoors and its surroundings.

7. Is the Mayor and City Council supporting this program?

Yes. The study will be presented to the Mayor and the City Council upon completion.

8. What happens if a new mayor takes office next year?

The project is funded by the State of Michigan and therefore should not be affected by the election results. The master plan is being prepared under the supervision of the Department of Public Works, and regular input is being obtained from all interested City Departments. Once the City Departments have approved of the plan it will be forwarded to both the Mayor and City Council for additional input and approval.

9. Will we get a copy of the survey results?

We appreciate the time you are taking to complete the survey because your responses and ideas can help shape the system to meet resident needs. We will publish a summary of the meetings and survey results on the Planning and Development web site by early November. Printed copies of the results will be provided to the Neighborhood City Halls, and community and recreation centers for those without Internet access.

10. Is construction of this project going to cause traffic problems?

When the master plan is approved by the City of Detroit the implantation will be phased over several years. These types of improvements are typically installed very quickly and should therefore not significantly impact traffic flows. Furthermore, the Traffic Engineering Division of the Department of Public Works is supervising the preparation of the master plan, and will therefore be able to provide the appropriate input to minimize problems.

11. How will this program change the way I get around the city?

In the long run we hope that this new system will make getting around the city safer and more efficient. By designating areas for non-motorized transportation, we hope to provide the citizens of Detroit with additional transportation options.

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In addition to informing the public about the project, residents were also given the opportunity to provide their input directly during these meetings. The attendees were encouraged at any time to provide input on important destinations and routes.

General discussions also revolved around resident concerns and expectations related to non-motorized transportation. Designated bike lanes, signed routes, conflicts with vehicles, and other safety concerns were expressed by many of the attendees. In addition, many residents also felt that a high profile education program would be needed in order to educate users and law enforcement officials about the proper use of the non-motorized facilities once they are in place.



The public indicated that enforcement and way-finding signage was important to their safe use of a non-motorized system.

Ongoing Public Involvement

A short survey form was distributed at the meeting for further input. A copy of this survey, tabulating the results, has been included on the next page. Copies of the survey were left at the community centers for those who could not attend.



Not surprisingly, slightly more than 50% of respondents ranked the City fair or poor in walk-ability and bike-ability. On overwhelming number of respondents (over 90%) indicated that there were numerous places in their own neighborhood that they would like to walk or bike to if a suitable route existed.

On a City-wide context, many respondents also indicated that no adequate east/west routes were currently available. The most often listed destinations throughout the City include the riverfront, major parks and recreation centers, libraries, the central business district, and Eastern Market.

In addition to the open public meetings, we also met privately with members of several of the non-profit enterprises that have funded greenway projects in the past. Due to the sheer magnitude of any city-wide project, we believe that these organizations will play a crucial role in the successful implementation of the new non-motorized system in the City.

Representatives of the Community Foundation for Southeastern Michigan, Detroit Renaissance, Riverfront Conservancy and Detroit 300 attended a briefing intended to inform them of the project and solicit input from an implementation point of view. Other groups, such as the Detroit Economic Growth Corporation and the Downtown Detroit Partnership, were invited to this meeting but could not attend.

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These groups represent the likely sources of potential funding for non-motorized improvements, making their support of the plan imperative to its long-term success. During the meeting representatives of these groups provided invaluable input related to the plan's implementation.

As a result of this meeting, the project team was invited to present the draft Master Plan at a two-day greenway workshop at the end of March sponsored by the Community Foundation for Southeastern Michigan, in conjunction with the City Planning and Development Department and the Greening of Detroit. The project team viewed these meetings as additional opportunities to test the direction of the draft plan with the public and other greenway enthusiasts. Pertinent input obtained helped further refine the Non-motorized Master Plan prior to its completion.

We recommend that the City continue to include these groups in discussions regarding any future modifications to the Master Plan. Please refer to the Implementation section of this report for more details.

Non-motorized Clubs/Organizations

Belle Isle Runners & Walkers
Detroit Bikes
Downtown Runners
Girls on the Run
Michigan Runners
Motor City Blade Runners
Motor City Striders
Wolverine Sports Club



A public meeting was held at the University of Detroit Mercy (top). College campuses like this, as well as Wayne State University (bottom), are usually havens for non-motorized travelers.

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A non-motorized transportation system is designed primarily for the use of residents for walking, jogging, running, skating and for bicycling. Non-motorized systems may be part of the street (such as a shoulder or lane) or can be separated from roadway traffic (such as a bike path or sidewalk).

Resident Survey Results

We appreciate that you are taking the time to respond to our survey. It is important to learn how you currently move around your neighborhood, on foot and/or by bicycle, and to discover how the experience can be enhanced for the entire Detroit community.

Check one: Detroit Resident 83% Non-Detroit Resident 15% Undeclared 2.5%

Check one: Female 55% Male 42.5% Undeclared 2.5%

Age: under 21 0% 21-35 27.5% 36-45 15% 46-55 10% 56-65 27.5% Over 65 20%

1. How frequent do you walk, bike, jog or run in your neighborhood?

Walking: Often 37.5% Sometimes 32.5% Rarely 22.5% Never 5% Undeclared 2.5%

Bicycling: Often 37.5% Sometimes 25% Rarely 15% Never 22.5%

Running: Often 10% Sometimes 27.5% Rarely 22.5% Never 35% Undeclared 5%

2. What is the usual purpose of your walk, bicycling or running?

Recreation 40% Health 55% Social 40% Work 27.5% Shopping 32.5%

Specific destination (school, recreation center, city parks, museums or other attractions)

Please list these destinations:

3. Are there places nearby your neighborhood that you would like to be able to reach without the use of car or public transportation?

Yes 92.5% No 5% Undeclared 2.5%

If yes, please tell us the places you would like to be able to conveniently walk, bike or run/jog to near your neighborhood.

4. Is your neighborhood conveniently located near bus routes?

Yes 75% No 2.5% Don't know 10% Undeclared 12.5%

5. Are there parks or recreational pathways in or near your neighborhood?

Yes 65% No 22.5% Undeclared 12.5%

(If yes, please list names of the parks, pathways, etc.)

6. Please rate the current walkability in your neighborhood:

Excellent 12.5% Very Good 22.5% Fair 42.5% Poor 7.5% Undeclared 15%

Please rate the current bikeability in your neighborhood:

Excellent 2.5% Very Good 22.5% Fair 32.5% Poor 25% Undeclared 17.5%

Please rate the current ability to run and jog in your neighborhood:

Excellent 2.5% Very Good 15% Fair 45% Poor 17.5% Undeclared 20%

7. Add your additional thoughts below. Please be sure to include names of cross streets or any other specific information you wish to provide.

Most common responses:

- Want east/west connector
- Bike racks/parking needed.
- Prefer bikes on street rather than sidewalks.
- Facilities need to be clean and well maintained.
- Facilities must be safe

Destinations

Overview

Collecting and organizing data related to possible destinations for a non-motorized system within an urban area the size and density of the City of Detroit is a massive undertaking. It is, nonetheless, a crucial step in laying out a system that not only provides a means of travel for non-motorized users, but takes these travelers to places of interest or importance within the community.

Information pertaining to possible destinations was obtained from various sources and compiled as outlined below. The City of Detroit, through its individual departments, provided a large amount of data for use in this study. The project team supplemented this data with information from the Detroit Historical Society, the Southeast Michigan Council of Governments, local community development initiatives, general website research, and our experience as design professionals living and working in the community for years.



The Charles H. Wright Museum of African American History gracefully expresses the proud history and heritage of African-Americans.

As noted in the Public Involvement section earlier in this report, the inventory was further refined by resident input obtained during open meetings. The public workshops assisted the team in identifying the importance of destinations within individual neighborhoods as well as the preferred routes to reach them.

The information collected was organized into categories, and combined into a comprehensive inventory of possible destinations throughout the City of Detroit. By focusing on the categories, the design team was able to overlay maps and other graphic criteria to discern the areas of interaction and therefore the areas that present the greatest potential for success.

Destinations that provide a greater access to Detroit's cityscape were given priority. Those that possess historical or cultural significance, and are currently in use, were given further priority. As our catalogues of destinations were selected, the goal for the final destinations was to provide a composite cross-sectional tour of the city's significance based on topics that appear to have perceived value and interest. Applying the City of Detroit Community Reinvestment Strategy Boundaries created by the Planning and Development Department helped ensure that destinations were localized and spread throughout the 10 clusters of the city.

Using this process, preliminary destination plans were created to compare likely destinations to priority routes throughout the City. The preliminary destinations were then analyzed against the preliminary non-motorized routes developed by the team to verify the accessibility of destinations from the proposed network.

Access to a thorough system was a key criterion for determining the final destinations included in the plan. The interrelationship between where one arrives on the non-motorized system and how one gets there is perhaps the most critical assessment for completing the Master Plan.

Destination Analysis

One of the most respected researchers of urban planning, interaction, and navigation is Kevin Lynch. In his book *Image of the City*, Mr. Lynch defines landmarks, paths, edges, nodes and districts to be essential elements when creating a map of one's surroundings. His explanation of what makes a city identifiable to its users is an appropriate example to consider when selecting the final destinations for the City of Detroit's Non-motorized Transportation Master Plan.

While processing the physical environments within the City of Detroit and constructing the map of identifiable elements, perception and the other subjective concepts of what makes a great city are essential to the final product. The following general criteria played a vital

role in determining a way to better understand the environment and landscape of Detroit.

Scale

The destination's size, density and independent existence underscores why certain places are generally recognized while others are not. More specifically, where can one find easily identifiable places and sites, when looking at a map of Detroit? Where are large districts, centers, or landscapes that are identified as places in Detroit?

Profile

The destinations are of interest because of a presence of established, emerging, or reemerging value or character. In other words, where can one find the emerging or established identity and character that Detroit is looking to express? Where are the population centers that express the established and emerging character of Detroit?



Eastern Market has become a destination itself for thousands of people throughout southeast Michigan.

Impact

The destinations have significant importance to the City of Detroit's evolution into one of the great American metropolises. Historical information, along with cultural context and interest show that certain places have meaning to a broader level beyond existence and location. For instance, where would Detroit be if these sites did not exist during the past 300 years? What cultural impact does a site possess when compared to others within the City of Detroit?

Access & Connection

The destinations must be connected to the grid of transportation systems and city streets. Mass transit stations, City bus routes and alternative transit paths (i.e. non-motorized transportation), along with roadways and terminals (parking) are to be considered when interpreting a sites accessibility. In other words, what multiple methods of transit can one use to reach/access these places? Is it easy, safe, or is there quality infrastructure to gain transportation to the site? Is the



The original home of the "Motown Sound" which has clearly come to define one aspect of Detroit for the world.

destination open to the public, including those with bikes?

Definition

Some destinations have a perceived special value to the identity of a district, neighborhood, or place within the City. The defining landmarks and centers of recognizable identity illustrate the bigger parts of the whole for a particular section of the city. Due mainly to their interest, activity level, and density the sites are perceived as being a center or gateway to the city. In basic terms, where are the identifiable districts, centers, or sites of Detroit? How does one realize that these places are the centers or gateways to the city?



As Detroit's oldest neighborhood, Corktown has carved out it's own defined character.

Entirety

Destinations that helped encompass the entire City of Detroit, were of special importance, because of the need to reach all corners of the city and provide destinations and access to alternative transit throughout Detroit. Those sites that aided in widening the reach of destinations and the conceptual system of non-motorized transportation were given higher priority. In this approach we ask how a Non-Motorized system reaches all individuals that make up the collective usage of alternative transit in Detroit.

Inventory and Analysis

After reviewing the many assets of the City of Detroit that warranted consideration for linkage via the non-motorized system, the project team identified six major categories of destination types:

- Urban Districts/Neighborhoods
- Commercial/Job Centers
- Schools and Education Centers
- Parks and Recreation Centers
- Cultural Sites
- Connection Destinations

Please refer to the maps that follow this section for detailed information on all destinations considered for each category.

In addition to these six categories there are currently a number of non-motorized short-distance trails/greenways that are either under construction or proposed within the city. The team has provided the opportunity to connect to these systems as part of the destination analysis.

Urban Districts/Neighborhoods

Urban districts and neighborhoods are realizing the benefit of cycling and a pedestrian friendly environment on their level of redevelopment and enhancement. Through this redevelopment the “urban realm” of automobiles, concrete, and petroleum exhaust is being changed at a neighborhood level. More new developments support both sustainability and the community fabric, and are focusing more on the pedestrian.

Priority Urban Districts/Neighborhoods

New Center/Tech Town/Milwaukee Junction
Far East Side/East English Village
Jefferson/Chalmers
Rosedale/Grandmont/Rosedale Park
Eastern Market
Russell Woods/Livernois-Grand Elm
Old Redford
Mexicantown/Southwest Detroit
Palmer Woods/Sherwood Forest
Indian Village/English Village/Islandview
Arden Park/Boston Edison
Corktown
Midtown/Cultural Center/Brush Park
North Corktown/Briggs
Woodbridge
University District/Fitzgerald/Bagley
Downtown
Lafayette Park/Elmood Park
Harbortown/Rivertown/Riverplace
Conant Gardens/Grixdale
Mediterranean Village/Warrendale
Hamtramck
Highland Park
7 Mile-Gratiot/Mohican/Regent Park
Lasalle Gardens/Virginia Park
Oakman Boulevard
Barton-McFarland/Aviation Subdivision
Greektown
Boynton

The act of cycling in particular sets up the opportunity for interactions to emerge between neighborhood awareness and appreciation. In short, cycling provides another layer of city pulse, a level of transportation that illustrates the quality lifestyles afforded by residents of a district or city.

Established urban districts/neighborhoods are usually already well defined and have their own separate identities. They also tend to contain numerous smaller destinations that appeal to the local residents on a deeper, sometimes emotional level. These smaller

destinations, which might not meet criteria established on a city-wide basis, can still be accessed from the larger non-motorized system.

Commercial/Job Centers

Large commercial areas are important in two ways, as they potentially could attract a large numbers of shoppers as well as the employees needed to service them.

Likewise, office complexes, hospitals and manufacturing centers also already draw large groups of people.

Including these types of destinations will provide both potential customers and workers an easier commute. Furthermore, by connecting the non-motorized system to job centers we offer increased opportunities to individuals who do not own a vehicle.

Schools and Education Centers

Educational Sites include university campuses located within the City, as well as prominent sites of the Detroit Public School System. College campuses are typically very pedestrian friendly and provide both a destination and a possible pool of users.

Priority Schools and Education Centers

Area Collegiate Campuses
DPS High Schools and Middle Schools
DPS Adult Education/Vocational Centers

Colleges and Universities within the city of Detroit can gain from non-motorized traffic

Priority Commercial/Job Centers (within or adjacent to City)

Eastland Mall
Fairlane Town Center
Hamtramck CBD
Highland Park CBD
Avenue of Fashion
Mack/Alter Commercial District
Northland Mall
Riverbend Plaza
Warren/Conner Shopping Center
Downtown
Clark Street Industrial Park
Russell Industrial Center/GM Poletown
New Center
Medical Center
Belmont Shopping Center
Bel Air Shopping Center
Henry Ford Hospital
Gateway industrial Park
Eastern Market
Bonnie Brooks

because they allow for independent ease of travel between classes, from the campus to libraries or dormitories, or even expand the campus community and lifestyle to a much broader area around student centers, benefiting education, economics and development.

A new non-motorized system would also help provide a safe route to school for Detroit's youth. Our analysis of primary schools focused on Middle Schools and higher. Elementary schools are listed as a lower priority because of the potential danger regarding children riding bicycles within the roadway. Middle Schools students in grades 6 and above are more able to comprehend the concerns and issues associated with bicycle usage and safety.

School age children present an excellent target group to encourage safe, healthy living and transportation within the city. As these students mature, they can take with them the lifestyle gained from healthy, economical, and viable transit system well before they are able to either afford an automobile or gain the proper licenses and education for driving.

The analysis did not end with traditional K-12 schools. Adult Education and Vocational Facilities can also benefit from becoming non-motorized “stations”. A well defined and accessible non-motorized system will, in turn, increase the accessibility of these programs to those who might have felt shut out by geography, distance, natural barriers, and a limited public transit system.

Parks and Recreation Centers

Park systems and Recreational Centers are significant contributors to the quality of urban life. Access to these amenities typically has a positive effect on property values and the general “livability” of a community. Parks are specifically important because they will contain the bulk of the off road cycling and walking facilities to be found in an urban setting.

These sites include the numerous parks, green spaces and local community centers currently found around the city. Improved access to these destinations would help promote healthier living while providing residents with connection to a green, healthy, and progressive community. It is important to note that water trails can also be considered a

non-motorized activity and therefore access to rivers and streams becomes an important feature of a destination plan.

Priority Parks and Recreation Centers

Palmer Park
Chandler Park
Farwell Park & Recreation Center
Rouge Park
Belle Isle & Belle Isle Casino
Riverfront Promenade
O'Hair Park
Jayne Field & Lasky Recreation Center
Patton Park and Recreation Center
Romanowski Park
Stoepel 1
Stoepel 2
Eliza Howell Park
Chene Park
St. Aubin
Grand Circus Park
Campus Martius Park
Chene Park
St. Aubin
Grand Circus Park
Campus Maritus Park
Mt. Elliot Park
Gabriel Richard Park
Waterworks Park
Balduck Park & Recreation Center
Greening of Detroit Park
Riverside Park
Clark Park
Bishop Playfield
Erma Henderson Park
Hines Drive & Parkway
Dad Butler Park
Derby Hill
Adams/Butzel Recreation Center
Northwest Activities Center
Tindal Recreation Center
Clemente Recreation Center
Hawthorne Recreation Center
Lenox Recreation Center
Lipke Recreation Center
Young Recreation Center
YMCA-Downtown
Youthville Detroit
Artists Village
Heilman Recreation Center
Brewer Recreation Center
Considine Recreation Center
Delray Recreation Center

Cultural Sites and Destinations

The many layers of its cultural fabric best display the uniqueness and character of a City. Detroit has numerous social, cultural, economic, and historical layers that demonstrate the value of the City and the impact it has made on the world's culture over the past 300 years.

Cultural sites include the many museums, libraries, theatres and other places of assembly that form the backbone of the entertainment districts in the City. In addition to the arts, other sites in this category reflect the active social life of Detroiters. Ford Field, Comerica Park and State Fairgrounds, for instance, are already destinations for thousands of residents and visitors, and

Priority Cultural Sites and Destinations

Auto Related Sites:

Ford Assembly Birthplace
Henry Ford House
Ford Highland Park Model T Plant
Ford Piquette Factory
Rickenbacker Motor Car Company
Ford Rouge Plant
Fisher Body Plant
Detroit Public Library—Skillman Branch
Nation's First Concrete Highway
General Motors Building
Nation's First Striped Road
Henry Ford Museum & Greenfield Village

Labor Related Sites:

Faygo Soda Pop Plant
Better-Made Potato Chip Plant
First Kresge Store
Kresge World Headquarters
Parke-Davis Research Lab
Detroit News Building
Detroit Salt Company
Focus: HOPE

Priority Cultural Sites and Destinations

Civil Rights Related Sites:

Second Baptist Church
First Congregational Church
Monument to the Underground Railroad
Elmwood Cemetery
GAR Building
Soldiers & Sailors Monument
Charles H. Wright Museum
National Museum of Tuskegee Airmen
Hitsville USA
African-American Heritage Cultural Center

Famous Home Sites:

Moross House
James Smith House
Mary Chase & William Stratton House
Albert Kahn House
David Whitney Mansion
Manoogian Mansion
Charles Trowbridge house

Miscellaneous Sites:

Heidelberg Project
Ferry Street
Cultural Center
State Fairgrounds
Prescott Mall Boat
Tiger Stadium
Michigan Central Depot
Pewabic Pottery
Pope John Paul II Plaza
Landing of Cadillac Site
Detroit Yacht Club
Historic Fort Wayne
Comerica Park/Ford Field

therefore have a place in the non-motorized system.

Historical sites include buildings and locations that play a significant role in telling the story of the City of Detroit and its residents. Architecturally important buildings are easy to locate and appreciate. Sometimes more difficult to understand, though certainly as important, are sites that are not as well known or as obvious to the naked eye. Stops on the

City of Detroit Non-motorized Transportation Master Plan

Underground Railroad or key locations in the development of the automobile may no longer play the same important roles they once did, but nonetheless are vitally important to the character of the City of Detroit. Much like the Freedom Trail in Boston, incorporating these locations into the non-motorized plan will help knit the City together through our shared history.



The Detroit Institute of the Arts is just one of the many cultural destinations within the city.

Connection Destinations

In addition to providing accessibility, a non-motorized system should take the next step and provide connectivity as well. The obvious question is: connectivity to what?

Connecting a non-motorized system with the mass transit system provides additional travel opportunities to the entire metropolitan region. In general the interconnection of these systems promotes a reduction in the number of individual vehicle trips and an increased use of mass transit. The byproduct is a reduction in our dependency on oil, and a reduction in the emission of pollutants. A healthier, cleaner community is a clear draw for additional economic development and the accompanying increase in jobs. In addition,

the linking of these systems also provides increased mobility to economically challenged residents who don't own a vehicle of their own.

Connecting to potential non-motorized systems being developed in and around the city limits provides additional opportunities for residents of the City to visit and utilize the resources of the entire region. Connection points were based on the presence of an endorsed plan for a non-motorized path or the existence of the termination of an existing non-motorized path at the City limits as represented in plans obtained from Oakland County, Macomb County, Downriver initiatives, and other adjacent municipalities.

Priority Connection Destinations

- Northland Mall transit station
- Eastland Mall transit station
- State Fair transit station
- City Airport
- Belle Isle
- University of Detroit-Mercy
- Downtown Transit Station
- New Center Transit Station
- Rouge Park
- Various connections to regional systems

Conclusion

The team investigated an exhaustive amount of existing documentation in each category, interviewed residents, and used its understanding of the importance of specific sites within the metropolitan area to hone the initial list down to a grouping that is geographically and culturally diverse.

Transportation Network

Overview

Walking and bicycling are important transportation alternatives as outlined throughout this report. In spite of the many benefits, a large portion of the population perceives walking or bicycling in dense urban areas such as Detroit as inherently dangerous. A significant factor leading to overall safety has to do with the role of the cyclist/pedestrian within the overall transportation network. In instances where bicycle facilities, for instance, are well defined and users are educated in proper traffic rules the number of bicycle crashes is relatively low. When bicyclists are not afforded proper facilities and guidance however, unsafe behavior creates more potential conflicts with motor vehicles.

Safety, access, and an effective implementation are imperative elements for Detroit's success as a pedestrian and bicycle friendly community. Bicycle and pedestrian safety is one of the top concerns of citizens, whether they are regular or occasional users regardless of the purpose of their trip. In many cases, pedestrians and bicyclists must share narrow, high traffic roadways with high speed motor vehicles without a clear understanding of how to best operate safely.

The main focus of this portion of our analysis therefore dealt with identification of routes within the City that could allow the separation of pedestrians and bicyclists while clearly

delineating a safe relationship between bicycles and motor vehicles. Since pedestrians will remain safely on the well developed sidewalk network, the analysis quickly focused on the suitability of bicycle facilities. A more detailed discussion of pedestrian facilities is located later in this section.



What a pedestrian and/or bicyclist may experience currently in the City.

While specific destinations were being identified, the viability of the existing transportation network was analyzed in order to identify available routes. Information pertaining to possible routes was obtained from various sources and compiled for analysis. The City of Detroit, through the Department of Public Works, provided a large amount of data related to the existing corridor infrastructure.

The team supplemented this data with information from the Southeast Michigan Council of Governments, general website research, and our experience as design professionals living and working in the

community for years. As noted in the Public Involvement section earlier in this report, the inventory was further refined by resident input obtained during open meetings.

Providing a safe, well-connected system of bicycle facilities can significantly increase levels of bicycling. More important than actual mileage, however, is how well connected those facilities are. Gaps or lack of facilities in portions of the bikeway system, obstacles such as bridges and freeways, and the resulting need to detour around these situations can make bicycling much less attractive.

Often the roads that provide bicyclists the most direct routes are also the most unpleasant and perilous, even for experienced bicyclists. Adding Bicycle Lanes to existing streets or including them in new streets is usually the preferred way of improving the roadways for bicycle use. Bicycle Lanes provide a clearly demarcated space that is understandable for both bicyclists and motorists, and are often accomplished with a solid line striping, pavement stencils and pavement color treatments.

Bicycle Lanes, however, are not always possible, especially in roadways with limited lanes and lane widths. Shared Parking Lanes, Shared Curb Lanes and Signed

Routes are utilized in constrained areas and to connect discontinuous Bike Lanes.

Improving existing Bike Path facilities by widening the pavement, better separating bicyclists and pedestrians, improving signage and intersection controls and constructing new Bike Paths also may encourage and accommodate greater use of the non-motorized system. Bike Paths are preferred by novice bicyclists, and therefore, an important amenity to encourage people to take up bicycling.

It is important to note that by law, bicyclists are allowed on all streets and roads (except freeways) regardless of whether they are a part of the bikeway system. The bikeway portion of the non-motorized system is therefore a tool that allows the City of Detroit to focus and prioritize implementation efforts where they will provide the greatest community benefit.



Bike lanes (as above) can transition with parking. They safely provide for designated area for bicycles, while separating them from pedestrians.

Route Analysis

Obviously with an urban area the size and density of the City of Detroit, it is a practical impossibility to obtain detailed corridor information for every street. The team did not consider roads strictly residential in use, and rather focused on the larger collectors and arterials that will become the backbone of the city-wide system. Several sets of factors went into the determination of the most appropriate routes for inclusion in the Master Plan. These factors were analyzed prior to obtaining more detailed information for the most likely corridors.

Network Suitability Factors

In evaluating non-motorized transportation enhancements, the first level of analysis focused on assessing the suitability of the roadway network for bicycle and pedestrian facilities. SEMCOG has recently coordinated a regional effort to create a database of roadway, path and land use information relevant to safe bicycle travel. The two primary variables that impact bicycle and

pedestrian suitability are roadway volumes and travel speeds. Please refer to the Appendix for all figures referenced within this section.

Figure 1 illustrates how roadway volumes have been classified into high, medium, and low categories. These classes, developed by the SEMCOG working group, divide volumes at 2,500 and 10,000 vehicles per day thresholds.

In the City of Detroit, a significant proportion of the roadway grid operates at below 10,000 trips per day, providing many opportunities for non-motorized infrastructure. Furthermore, many of the corridors with higher volumes operate parallel to corridors with lower volumes, which would allow for alternate bicycle routes to be developed where higher volumes create a safety issue for bicyclists.

Figure 2 shows how speeds are classified for analysis relating to bicycle and pedestrian

Vehicle Speed	Daily Roadway Volumes					
	less than 2,500		2,500-10,000		over 10,000	
	A	B/C	A	B/C	A	B/C
less than 30mph	sl-12 wc-14	wc-14	sl-12 wc-14	wc-14	wc-14	bl-5
over 30 mph	wc-14/15	bl-5	wc-14/15	bl-5	wc-14/15	bl-5/6

Table 2: Facility Selection Matrix

Data Source: FHWA
Sl=shared lane
Wc=wide curb lane
Bl=bike lane

safety. The upper limit of safe roadway speed as designated by the SEMCOG working group is 35 mph. Based on national recommendations for roadway design treatments established by the Federal Highway Administration (FHWA), a facility selection matrix was created to balance the impacts of these two very important variables. Guidelines often vary based on the skill level of typical users, which are categorized as advanced (A), basic (B), or children (C).

As a general rule, improvements should meet standards for advanced users as a minimum goal, but should be designed for basic and child users wherever feasible. We can determine from comparing Figure 2 to Table 2 below that about half of the roadways in Detroit can safely accommodate bicycle travel with a wide curb lane, although higher volumes may warrant a designated bicycle lane in some cases. For the rest of the roadways, bicycle lanes should be

implemented where possible, especially when considering the safety of young or novice users.

Several other variables were useful in determining roadway suitability for bicycle and pedestrian facilities. The number of lanes and functional classification of a roadway, as illustrated by Figures 3 and 4, give important information about its operating characteristic.

Obviously, the fewer number of vehicle travel lanes that exist on a roadway the fewer potential conflicts with non-motorized modes. The same logic also applies to the function of the roadway. Local, collector and minor artery facilities are more favorable for bicycle and pedestrian travel than principal arteries and freeways, since the larger facilities generally have higher volumes and speeds. Detroit appears to have sufficient roadway facilities favorable to non-motorized travel with respect to these factors.



Wide, multi-laned streets such as Woodward Avenue provide opportunities to incorporate designated bike lanes with little impact on traffic.

In addition to roadway characteristics, it is also necessary to analyze potential corridors based on characteristics of the existing non-motorized network. Due to the urban character of the City of Detroit, we can operate under the assumption that standard pedestrian facilities (i.e. sidewalks) exist adjacent to most roadway facilities. Other non-motorized facilities, such as bike trails and shared-use paths, are shown in Figure 7. These trails and paths provide the core of

bicycle recreational function in the City of Detroit, and as so, should be connected to from adjacent neighborhoods and other public uses.

Also shown are roadways that prohibit any non-motorized travel, mainly interstate highways. Note that these prohibited roadways are mainly freeway facilities with high speeds and volumes, and therefore would have been excluded for non-motorized travel regardless of this designation.

User Perception Factors

Two additional sets of data were utilized for the analysis as well. As part of the efforts of the SEMCOG working group, bicycle users were asked to identify roadways based on two parameters. One question asked if a roadway was perceived to be a sufficient width for safe riding. Figure 5 shows roadways that were identified as being wide enough for safe bicycling. As we can see from the illustration, a significant portion of the Detroit roadway network is perceived as sufficient to accommodate bicyclists.

A second question was posed to users to determine which roadways were generally preferred for bicycle travel. Figure 6 shows the roadways identified by users as being preferred for bicycle use. Of interest here is that, although the overall number of preferred facilities is limited, these roadways provide significant connectivity and coverage throughout the city.

Demographic Factors

Information about the population of an area can also be useful in assessing a corridor. General demographic data, such as population density and age, provides a starting point for understanding the human characteristic of a city. Figure 10 shows population density, while Figure 11 illustrates one way in which age can be displayed by showing the breakdown of school-aged population in the city.

Two census variables give specific information about transportation characteristics of the population. Figure 12 shows occupied housing units with zero cars, and Figure 13 shows workers over 16 years old who commute to work by bicycle, walking, or public transportation.

Finally, three variables are shown as indicators of the “transportation disadvantaged” population. Because personal transportation choice is often related to income level, it is useful to look at the population that lives below the established poverty line, as outlined in Figure 14. Two other indicators of transportation disadvantaged are minority populations and disabled populations, shown in figures 15 and 16.

Based on general demographic and transportation-disadvantaged indicators, several corridors illustrated themselves as being significant to the population of Detroit.

Other Factors

Information regarding the transit network and infrastructure is also relevant to bicycle and pedestrian planning since this is how users mainly gain access to the system. Figure 8 illustrates the public transportation system, including routes and stops. As the operator of transit services in Detroit, the Detroit Department of Transportation (DDOT) is responsible for providing the supporting infrastructure to its system, such as bus shelters and other street furniture. A comprehensive list of all stops in the system designates certain stops as “hubs”, which can be classified as stops with a high level of activity and use. Every effort should be made to connect significant residential and employment uses to key access points into the transit system.

Finally, land use data can be used to determine if the adjacent built environment is appropriate for bicycle and pedestrian activity. Figure 9 shows existing land use classifications in the City of Detroit. A high proportion of single-family residential and vacant land mixed with commercial uses along major arterials indicates a lower-density urban pattern that favors bicycle use. If some of the existing vacant land develops as multi-family residential, commercial or mixed-use in the future, pedestrian travel may become more prevalent in the neighborhoods surrounding the downtown core of Detroit.

Inventory and Analysis

There is an established methodology for selecting a Bikeway ‘Non-Motorized’ System for any community. One of the major goals is to build an extensive local bikeway network to stitch together the neighborhoods, districts and corridors of the City; provide increased access and mobility to non-drivers; and link to trails planned in adjacent communities and connect users to important cultural, recreational, educational and historical sites in the City.

Another important criterion is input from the City’s Steering Committee and staff, as well as input from residents received through public workshops conducted in November and December 2005. In addition, the Team considered the following criteria in selecting the roadways that demonstrate the highest potential to serve non-motorized travel demand.

Access to important destination sites
Connectivity to these destinations
Traffic volumes and Travel speeds
Connectivity to the regional system
Available pavement widths

Finally, it is important to remember that the proposed non-motorized system serves as guidelines to those responsible for implementation. The system and segments themselves may change over time as a result of changing bicycling patterns and implementation constraints and opportunities.

	1	2	3
Volume	> 2,500	2,500-10,000	>10,000
Speed	> 14 mph	14-30 mph	30-35 mph
# of Lanes	1-2	3-4	5+
Functional Classification	Local, collector, minor artery	Principal artery	Freeway or prohibited facility
Wide Enough	Yes		No
Preferred facility	Yes		No

Table 3: Ranking Classification of Roadway Characteristics

The entire roadway network of the City of Detroit was evaluated to determine the most appropriate and suitable non-motorized network improvements. By establishing a ranking or hierarchy of safety related roadway characteristics, potential bicycle and pedestrian corridors could be assessed effectively. A potential bicycle corridor that is designated based on connectivity to significant destinations may or may not be suitable for bicycle use based on roadway characteristics.

As we saw in Table 2, a particular combination of roadway characteristics may warrant a particular type of facility such as a designated bike lane. However, the physical constraints of a corridor (right-of-way and adjacent land use, for instance) may not allow that type of facility to be implemented. In those cases, alternate parallel facilities have been pursued in order to balance connectivity and safety issues.

Table 3 below defines the ranking classification of roadway characteristics. For this analysis, the lower rating indicates a more

favorable characteristic. Each of the roadway variables is classified and the total score shows the overall ranking between the corridors.

In order to determine a classification of roadway priorities as they relate to their non-motorized function, a set of criteria was developed to evaluate roadways against one another. This matrix was used to determine degrees of access, connectivity and safety for roadways in the context of non-motorized function.

In a true application of this matrix, all roadways on the system would be evaluated and ranked, and an overall stratification determined so that parallel and adjacent roadways can be compared to one another to help in determining the most suitable facility to use for a particular connection. In a real world application however, other characteristics related to destinations and physical constraints are considered as part of the overall analysis of potential corridors. Significant features that were identified in the Destination Plans discussed earlier in the report provided the framework for this portion

of the analysis to identify potential demand for non-motorized travel within the city network.

The *Roadway Evaluation Matrix* (Figure 15 in the Appendix) scores these criteria for each of the major roadways in the City of Detroit. Based on this analysis, thirty-nine roadways demonstrated a high potential to serve non-motorized travel demand. This was defined as the ability of a roadway to provide access to at least five significant destinations and/or existing/planned non-motorized features.

Additional criteria were established in order to assess the degree of internal connectivity provided within the city by the roadway itself. When this criterion was compared to the preliminary scores from the destination access analysis, eighteen additional corridors were selected for inclusion into the non-motorized roadway network. Figure 15 illustrates the 57 corridors initially selected for the overall non-motorized roadway network.

During the development of the Non-Motorized Master Plan, the aggregate scores from the destination/access analysis were combined with additional demographic data as well as specific input received at public meetings to refine this analysis even further. The raw data for these criteria have been translated using a quantitative scoring methodology that ranks the data as “Low”, “Medium” or “High”. The range on which the basis of an attribute would get a point/score was derived from a

distribution of raw data values for each criterion.

Finally, two measures were included in the matrix to provide an additional level of analysis regarding safety. The two primary safety measures for roadways as they relate to non-motorized travel are volume and speed.

In cases where speeds exceed 30 mph and/or volumes exceed 10,000 vehicles per day, these potential safety conflicts require for the roadway configuration to include designated bike lanes where bike facilities are to be included. Unfortunately the inclusion of designated bike lanes is not always possible due to constraints regarding overall right-of-way and travel lane widths.

Recommended Routes

The recommended Non-Motorized System consists of a comprehensive network of functional bikeways connecting residential neighborhoods/districts with schools, parks, job centers, cultural sites, transit terminals/stops and other destinations. It focuses around a system of north-south and east-west corridors, developed into a classification using a combination of paths, lanes and routes. They are classified as:

- Regional Connector
- City Connector
- Neighborhood Connector
- Downtown-Midtown Connector
- City Loop

Regional Connectors are roadways in the City of Detroit that are classified as a State Trunk line, owned by the Michigan Department of Transportation (except for Jefferson Ave). These roadways provide direct connectivity to many destinations within the City as well as tie into the rest of southeast Michigan and the region's roadway network.

Arterial streets that are classified *City Connectors* are located throughout the City, providing direct connections from neighborhoods/districts to destinations.

Neighborhood Connectors are planned along streets that inter-connect multiple neighborhoods/districts and provide alternative parallel routes to many *City Connectors*.

Downtown-Midtown Connectors are classified along City and State Trunk Lines, many of which parallel each other and are located within the central business district that stretches from the Downtown area to Mid-Town. The significant repetition of Downtown-Midtown Connectors is due to the significant number of destinations, the increased volume of the day time population,



**Typical
designated bike
lane installed to
not impact on-
street parking.**

Recommended Routes by Classification

Regional Connector (90 Miles)

Van Dyke, Michigan, Fort, Gratiot, Grand River, 8 Mile, Woodward, Jefferson, Telegraph

City Connector (130 Miles)

Joy, Martin Luther King Jr., Mount Elliott, Schaefer, Evergreen, Harper, 7 Mile, McNichols, Mack, Warren, Rosa Parks Fenkel

Neighborhood Connector (100 Miles)

Davison, Schoolcraft, Forest, St Jean, Chalmers, Tireman, Trumbull, Brush, Cass, Lafayette, Vernor, Second, John R, Third, Puritan, Plymouth, Wyoming, Greenfield Oakman Blvd.

Downtown-Midtown Connector (30 Miles)

Cass, Second, Third, Woodward, John R, Brush, Warren, Mack, Grand Blvd., Atwater, Randolph, Congress, Washington, Larned, Lafayette, Jefferson, Michigan, Grand River, Fort, Gratiot

City Loop (45 Miles)

Inner Loop: Grand Boulevard

Outer Loop: Outer Drive and segments of Livernois, 7 mile Road, John R, Conner Ave, Conner Creek Greenway, Alter and Chandler Park Drive

and regional draw of many cultural, historical, recreational and educational resources.

These streets exhibit volumes of automobiles, pedestrians, trucks and buses with many points of potential conflicts between users. Special bicycle facility considerations must be given to these conditions, such as alternate color treatments for bike lanes, due to the shear number of possible conflict points.

The proposed non-motorized system plans for two *City Loops* located in the City. These loops provide a scenic and non-direct route to many of the City's established

neighborhoods, districts, and destinations while providing connections to Jefferson Avenue and the Detroit River.

Please refer to the Proposed Non-motorized System Map that follows this section for more details.

Recommended Facilities

This section provides recommendations for selecting roadway design treatments to accommodate bicycles based on the classification of the non-motorized roadway system. These recommendations reflect the current state of the practice in the design of bicycle-friendly roadways.

Implementation involving retrofitting existing roadways to accommodate bicycle use may make the project more complex. Existing streets built with a curb and gutter section will often be viewed as having a fixed width and improvements will likely be limited to re-striping the existing lanes.

Bike lanes can be completed by re-striping the roadway to provide the needed extra space. In reviewing Detroit's existing roadway system, many of the facilities proposed as part of this plan can be accomplished by re-striping the roadway. Furthermore, adequate space generally exists to allow for bike lanes without impacting existing traffic patterns. Designated bike lanes should therefore be located along the

roadways classified as Regional Connectors and the City loops.

In segments of the roadways that include on-street parking, the five foot bike lane would be located between the parking space and the adjacent travel lane. The plan does not propose to eliminate any on-street parking spaces along the Regional Connectors and City Loops. In areas where no on-street parking is allowed, the five foot bike lane is located adjacent to the curb.

Shared Parking Lanes or Shared Curb Lanes should be located along the roadways classified as City Connectors and Neighborhood Connectors. An 11 foot wide shared parking lane or 14 foot wide shared curb lane would be located at the outside edge of the roadway.



"Blue Lanes" are completely filled with a blue coloring to provide a dramatic visual for drivers in areas of numerous potential conflicts.

Blue Bike Lanes should be installed along roadways classified as Downtown-Midtown Connectors. The goal is to reduce conflicts with turning motorists, service vehicles and transit vehicles at the numerous intersecting drives and roadways. The blue bike lanes would be located in the roadway similar to the standard bike lane as noted above.

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The entire width of the Blue Bike Lane is marked with a thermoplastic tape, which has excellent durability and withstands significant volumes and turning movements.

The thermoplastic can be applied over asphalt, concrete and concrete brick pavers. The thermoplastic is applied by heat; it is self-cleaning by rain, snow plow resistant and holds colors.

These recommendations are preliminary findings and should be tested and refined over time. It is anticipated that these values would be revised to reflect the continuing evolution of the state of the practice in selecting design treatments for roadways to accommodate shared use by bicycle and motor vehicles. It is recommended that designers and engineers refer to the appropriate design reference guides for the most up-to-date treatments.



Types of Bicycle Facilities

Bike Path: A designated facility physically separated from vehicular traffic.

Bike Lane: A designated lane located within the traveled way for one-way bicycle travel.

Shared Parking Lane: A designated lane located within the traveled way for use for vehicular parking and one-way bicycle travel.

Shared Curb Lane: A designated lane located within the traveled way for use by vehicular traffic and one-way bicycle travel.

Signed Route: A non-designated route which bicyclists are encouraged to use to connect to nearby designated facilities.

Signed Routes (top) can be used as connections when adequate space does not exist for a designated lane. **Bike Lanes (middle)** will likely make up the bulk of Detroit's system due to right-of-way space constraints. **Off-road Bike Paths (bottom)** should be installed whenever possible, which most likely will occur in City parks and along the riverfront.

Design Guidelines

The types of non-motorized improvements that may be implemented are ultimately contingent on the existing configuration of a particular roadway corridor. As mentioned previously in this report, since almost all corridors possess pedestrian sidewalks on both sides of the street, the main objective is to provide a safe, separate area for bicycles.

Within the City of Detroit, the urban environment largely dictates that roadways are designed with curb-and-gutter configurations. Furthermore, on-street parking in the curb lane is a prevalent feature throughout the city. The options for integrating bicycle facilities in this environment are therefore limited to recommendations that mainly involve re-striping of the roadway.

Example of bike lane installed on major road in Chicago. Notice that neither parking nor the dedicated right turn lane were impacted.



Bikeway Design

By law, bicycles are allowed on all roadways in Michigan, though the State prohibits bicyclists from freeways. However, some roadways are better suited for bicycling than others.

National standards have already been developed for the accommodating bicycles through roadway development. The American Association of Highway and Transportation Officials (AASHTO) *Guide to the Development of Bicycle Facilities* and the

Federal Highway Administration Report *Selecting Roadway Design Treatments to Accommodate Bicycles* are recommended as guides for the implementation of this Plan. The Federal Highway Administration's *Manual on Uniform Traffic Control Devices* (MUTCD), as revised by the State of Michigan and the City of Detroit, should also be utilized for standard pavement markings and signage pertaining to bicycle facilities.

Improvements can be classified into three categories: marginal roadway improvements, roadway designations, and separated facilities. The choice of which improvement to utilize depends on the likely user group, the existing physical conditions, citizen input and the classification of the non-motorized system.

Marginal roadway improvements generally take the form of minor upgrades to the surface quality of the roadway pavement, the removal of minor barriers to bicycle travel, and improvement of traffic signal timing to better accommodate non-motorized travelers. Roadway designation involves the use of pavement markings to install an easily

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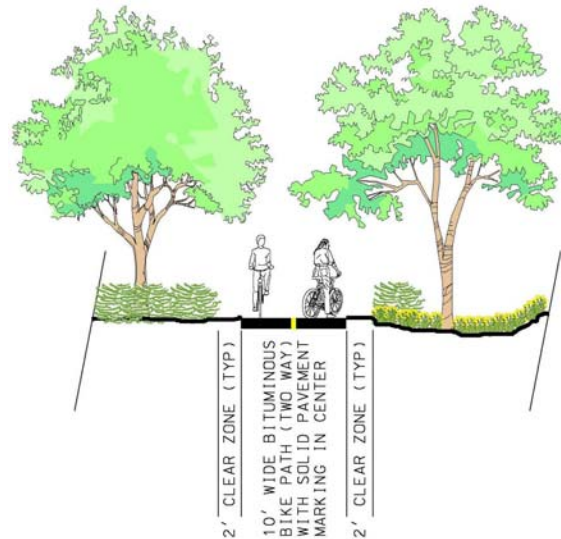
recognizable space for non-motorized users.

Separated facilities refer to pathways not adjacent to vehicular traffic, and usually include the construction of separate infrastructure for non-motorized traffic.

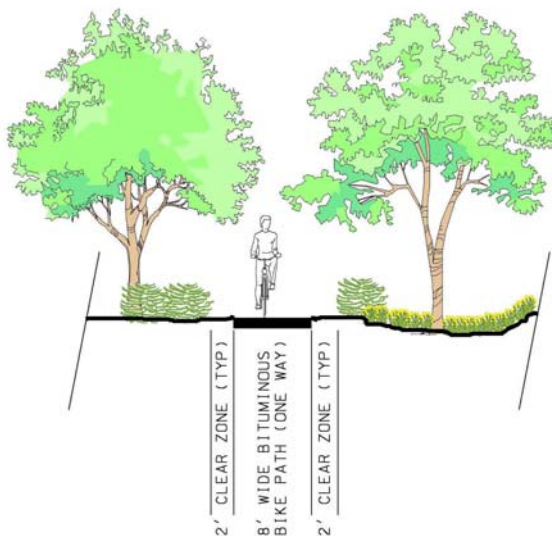
Bike Paths

A “Bike Path” provides bicycle travel on a paved right-of-way completely separated from nearby streets or highways. They are intended to provide opportunities not available on streets or roads, including recreation or high-speed bicycle commuting.

As opportunities arise, the City should acquire new easements or right-of-way for Bike Paths. Such opportunities may also exist along drainage channels or creeks and along abandoned railroad right-of-way as noted in *Greenways Initiative: Planning for Detroit's Rail-Trails* (October 2002).



Example off-road bike Path.



General Bike Path Standards

Minimum 8 foot wide for one-way travel.

Minimum 10 feet wide for Two-way bicycle travel. A yellow centerline stripe is recommended to separate travel on two-way paths.

Recommended 12 feet wide if more than 300 users per peak hour are anticipated and/or if there is heavy mixed bicycle and pedestrian use.

A minimum 2 foot wide graded area must be provided adjacent to the path to provide clearance from trees, poles walls, guardrails, etc.

Bike Lanes

A “Bike Lane” designates (through striping and stenciling) a lane for one-way bicycle travel on a street or highway. Bike lanes delineate separate areas for bicycles and vehicles to provide more predictable movement for both. In areas confined by existing pavement widths, a “Shared Parking Lane” and a “Shared Curb Lane” provide a wider area than a typical travel lane for shared operations.

“Signed Routes” are facilities shared with the motor vehicles when adequate space is not available to provide separate designated lanes. These are utilized only as connectors to other portions of the non-motorized system. There are no recommended minimum widths for Signed Route facilities, but when encouraging bicyclists to travel along selected routes, traffic speed and volume, parking,

traffic control devices and surface quality should be acceptable for bicycle travel.

General Bike Lane Standards

Minimum 5 feet wide when adjacent to marked parking stalls.

Minimum 5 foot wide when adjacent to curb. The width may be reduced to 4 foot wide without curb and gutter.

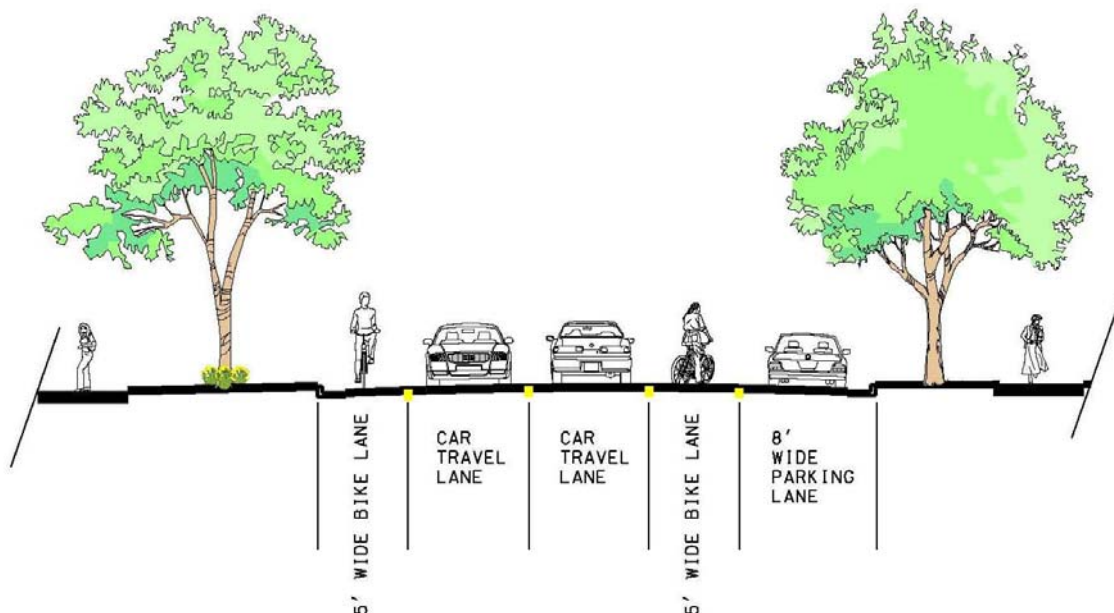
Minimum 11 foot wide shared lane where parking is permitted but not marked.

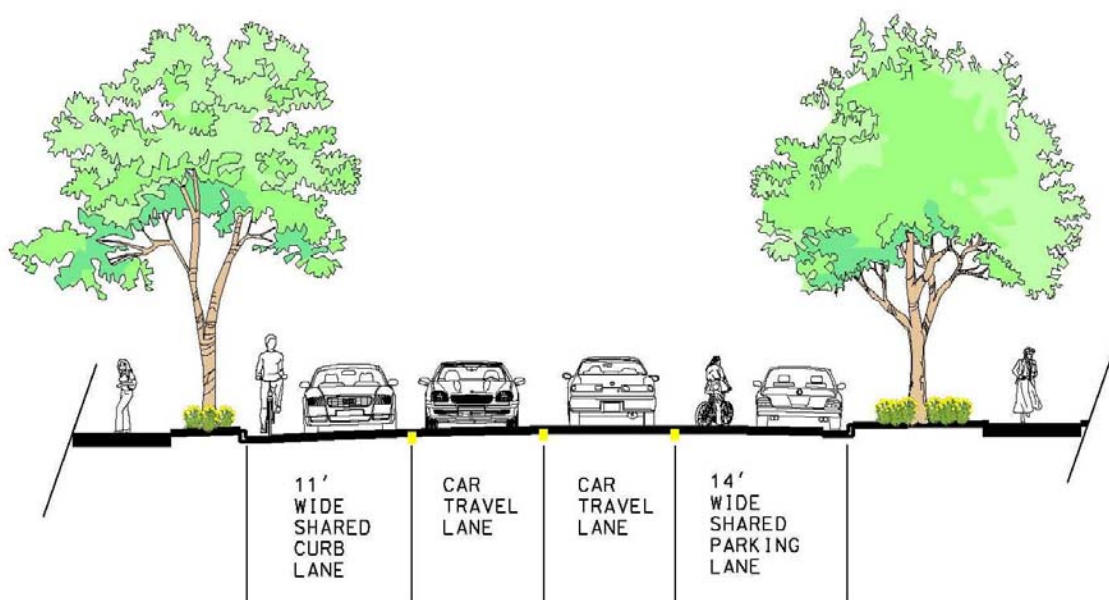
Minimum 14 foot wide shared lane is recommended where no parking is allowed.

A bike lane should be delineated from motor vehicle travel lanes with a solid 6 inch white line, per Manual on Uniform Traffic Control Devices (MUTCD) specifications.

Word and pavement stencils should be used to identify bicycle lanes per MUTCD specifications.

In compact, high-conflict areas, bike lane color treatments are an effective method to further delineate a bike lane.





Bike Parking

Most users of the bicycle system will ultimately stop at some point, and therefore will need facilities to lock and store their bicycles. Public bike racks should be installed liberally throughout the City to encourage use of the system. The ultimate goal should be to one day provide bicycle parking at every public facility within the City.

When choosing bike racks and locations, there are a number of things to keep in mind. The rack element (part of the rack that supports the bike) must keep the bike upright by supporting the frame in two places, allowing one or both wheels to be secured. Inverted “U”, “A”, or post and loop racks are therefore the recommended designs standards.

Racks should be positioned so there is adequate room between adjacent parked bicycles. A row of inverted “U” racks should be situated on 30 inch minimum centers. They should be in a covered area protected from the elements. Ideally, racks should be located immediately adjacent to the entrance to the building or park/open space. Racks must also be located in a clearly visible area to deter vandalism and other crime.



Example
bike racks.

Pedestrian Facilities

We are all pedestrians, whether strolling through a park, using a wheelchair, skateboarding or walking. All pedestrian facilities must be constructed to accommodate people with varying abilities. The Americans with Disabilities Act of 1990 (ADA) is a civil rights law that prohibits discrimination on the basis of disability.

Designing and constructing pedestrian facilities for people with disabilities is not only essential to people for their independence and safety, but it benefits all users. Curb ramps aid wheelchair users, strollers and children on bicycles. Visible crosswalks help people with low vision determine appropriate street crossings and warn motorists that pedestrians may be in the roadway. Wide clear zones on sidewalks allow all users to comfortably share the walkway. The City of Detroit must strive to meet and exceed minimum design standards for the benefit of all sidewalk users.

General Sidewalk Standards

Minimum 6 foot side for residential areas.

Minimum 8 foot wide for low intensity commercial areas.

Minimum 10 foot wide for higher density commercial and residential areas.

Minimum 15 to 20 feet wide for high intensity commercial area with high pedestrian traffic and a variety of outdoor sidewalk use such as shopping and/or dining.

The following section outlines techniques to create a safe, direct and well-connected system of pedestrian facilities needed to encourage more visitors and residents to walk.

Sidewalks

The sidewalk is the most obvious element of the pedestrian network. The functions of sidewalks and street rights-of-way influence how they should be designed and the appropriate width. Sidewalk widths should vary according to the number of pedestrians anticipated to use the sidewalks.

Naturally, a sidewalk along a residential street will be narrower than a sidewalk in the Downtown. For two people to comfortably walk side-by-side, a five foot sidewalk is sufficient, which is the recommended minimum width according to a number of pedestrian facility resources including the ADA requirements. A new development project should be required to construct or reconstruct sidewalks along the adjacent property lines.

Curb Ramps

Curb ramps provide access between the street and the sidewalk for people who use wheelchairs. People with vision impairments, however, rely upon the curb to identify the transition between sidewalk and street. Therefore, curb ramps must be designed to benefit both types of users.

The implementing regulations under Title II of the ADA specifically require curb ramps at all intersections and mid-block crossings, as well as for all new construction. Priorities for curb ramp installation on existing facilities should include access to government facilities, transportation, public accommodations, and schools and for employees to reach their place of employment.

When feasible, curb ramps should align with the crosswalk, with two ramps per corner. This provides orientation for visually impaired pedestrians by leading them to the opposite side of the street rather than the middle of the intersection.

Furthermore, recent changes in the design of curb ramps have been recommended by the United States Department of Justice. The City of Detroit should continuously update their standards to conform to new federal guidelines and incorporate the review and replacement of curb ramps, as required, in all maintenance activities.

Pedestrian Crossings

A pedestrian crossing is defined as any location where the pedestrian leaves the sidewalk and enters the roadway. Crosswalk markings may be used to define the preferred pedestrian path of travel across the roadway and to alert drivers to the crosswalk locations. All marked crosswalks should be designed in conformance with the Manual of Uniform Traffic Control Devices (MUTCD).

Although MUTCD provides for crosswalk design options, research indicates that the continental and ladder designs are the most visible to drivers and pedestrians with low vision and cognitive impairments. The continental and ladder designs consist of white (yellow in school zones) longitudinal lines perpendicular to the line of the crosswalk, 12 to 24 inches wide and spaced 12 to 24 inches apart. The use of a crosswalk design that is consistent in all applications is strongly encouraged.

General Locations for Crosswalks

At stop signs or traffic signals.

At non-signalized crossings in designed school zones.

Non-signalized locations where engineering judgment warrants a crosswalk in response to motor vehicle lanes, average daily traffic, speed limit, and geometry of the roadway.

Crosswalk markings must be visible, especially at night, and must be slip-resistant. Although paint is less expensive, inlay tape and thermoplastic are most cost effective in the long term and perform better in wet conditions. Both inlay tape and thermoplastic are slip-resistant, highly reflective and do not require much maintenance. Inlay tape is best for new or resurfaced pavement, while thermoplastic is more appropriate on rougher surfaces.

Other Crossing Treatments

A recent study by the Federal Highway Administration, *Safety Effects of Marked vs.*

Unmarked Crosswalks at Uncontrolled Locations (2002), found that crosswalk markings did not significantly improve pedestrian safety at uncontrolled (no stop signs or signals) crossings. More substantial treatments, such as refuge islands, curb extensions, and raised crosswalks, as well as enforcement and education, all contribute to pedestrian safety.



The use of “zebra” striping at crosswalks (above) or alternative pavement colors/textures (below) present a better visual for drivers.



Shorten Crossing Distance

One method to improve pedestrian crossing safety is to shorten the crossing distance. Pedestrian refuge islands, curb extensions, reducing curb return radii and eliminating a travel lane are popular measures used to reduce the width of the intersection. Refuge islands are placed in the middle of the street to give pedestrians a safe space to wait

before crossing the remaining half of the roadway. They should be at least four feet wide, though six or eight feet are preferred.

Curb extension (sometime called “build outs”) also minimize pedestrian exposure during crossing by shortening crossing distance and giving pedestrians a better chance to see and be seen before committing to crossing. These may be applied at intersections and mid-block crossings. They are most appropriate for any crosswalk where there is a parking lane adjacent to the curb.

Raised Treatments

Pedestrian visibility can be enhanced with two devices that elevate the pedestrian path. A tabelized or raised intersection involves building up the entire intersection, including crosswalks, to the level of the sidewalk. This decreases automobile speeds and enables pedestrians to cross the road at the same level as the sidewalk. While this eliminates the need for curb ramps, warnings need to mark the boundary between the street and sidewalk and some sort of barrier should be considered at the corners to keep vehicles off the sidewalk.

Raised crosswalks are similar to speed bumps but provide a flat surface 10 to 15 feet wide for pedestrian crossings. The crosswalk is also built level with the sidewalk and slows traffic speeds. Care must be taken in the design to not inhibit drainage. These

crosswalks are generally used in high pedestrian areas at mid-block locations.

Both raised intersections and raised crosswalks should be placed only with the approval of emergency personnel. Because these devices are designed to slow traffic, the design must address designated emergency routes where they could slow emergency response time.



Pedestrian crossing signs and signals, even those not as elaborate as shown, can help reduce incidents.

Signs and Signals

Another way to increase pedestrian safety may involve devices to warn motorists of the presence of pedestrians, such as signs, signals and lights. Studies have shown that signs are often ineffective in altering motorist's behavior and may be disrespected if overused. However, if used judiciously, they can be valuable. Cities have been using with different types of signs to alert motorists of pedestrian crossing the street. One inexpensive and effective device is the pedestrian safety pylon. They are placed in the middle of the intersection to remind motorists to yield to pedestrians. Overhead pedestrian crosswalk signs also increase pedestrian visibility, especially in locations where pedestrians may not be expected.

Traffic signal timing is an important aspect of pedestrian crossing safety. Some pedestrians, especially people with mobility impairments and the elderly, need additional crossing time. Longer crossing times should be considered in areas expected to serve slower pedestrians or larger volumes of pedestrian traffic. However, increased pedestrian crossing time must be balanced with traffic flow operations such that the increased crossing time does not come at the expense of excessively long wait times, which can cause pedestrians to grow impatient and cross during gaps in the traffic.

Pedestrian actuated signals are also an option to respond to pedestrian crossing demand. When a pedestrian pushes the pedestrian button, it sends a message to the traffic signal controller that a pedestrian needs to cross and will display the "walk" light when the lights change. Some pedestrian actuated signals are designed to change the traffic lights in favor of pedestrians. Accessible pedestrian signals provide audible (chirping, verbal or other tones) or vibrotactile information that is particularly helpful for individuals with vision or cognitive impairments.

Sidewalk Buffers

The level of comfort a pedestrian experiences while walking on a sidewalk can be enhanced with a planting strip or a buffer zone. Extra space between the sidewalk and the curb protects pedestrians from being hit by

opening car doors or splashed by water accumulated in the gutter. It also increases the sense of safety while walking beside heavy or fast traffic. This buffer space can be used for streetscape improvements, further enhancing the attractiveness of a corridor for all users, or as space for corridor amenities. Buffers should be two to four feet along residential streets and four to six feet along arterial or major streets.

Improve the Streetscape

In some areas, a higher level of attention to the details of the pedestrian environment is justified by expected high pedestrian use and to encourage pedestrian activity. Streets where the elements are scaled to human size rather than vehicle size are attractive to pedestrians. Streetscape improvements such as public art, benches, drinking fountains, trash receptacles, transit shelters and pedestrian-scaled lighting fixtures are amenities that help balance the pedestrian-motorist environment.

Alternative Sidewalk Materials

To meet ADA requirements, a walkway must be firm, stable, and slip resistant. Concrete is the most widely used sidewalk material for its versatility and durability. When properly maintained, it can last 100 years.

Asphalt is an alternative to concrete that is usually less expensive, but requires more maintenance and lasts about 40 years. Brick, aggregate, granite and other materials that are used most often for their decorative

properties are more costly and may not be as smooth or slip resistant.

Unpaved trails can still meet ADA requirements with materials like decomposed granite, packed soil and other natural surfaces with proper base material preparation. Soil stabilizers can also be applied to bind soils or aggregates into a hardened, durable surface.

Traffic Calming

Over the past several years, traffic calming has been widely used to improve both bicycle and pedestrian safety, especially in residential areas. Traffic calming devices are installed to slow motorists, increase awareness of bicyclists and pedestrians around them, reduce cut-through traffic and reduce the impacts of higher speed collisions.

Common Traffic Calming Devices

- Traffic circles/roundabouts
- Curb build-outs, chokers and neck-downs
- Diagonal diverters
- Speed Bumps
- Narrowed street widths

Implementation

Recommended Action

The installation of nearly 400 miles of bicycle facility improvements is no easy challenge to undertake, given budget constraints. This section attempts to outline recommendations aimed at the implementation and maintenance of the improvements identified by this plan.

Role of City Government

The City should designate a current staff member of the Traffic Engineering Division of the Department of Public Works as the Non-motorized Program Manager. The Traffic Engineering Division is the logical lead agency to plan bicycle-related improvements to roads and paths in Detroit, including coordination with other City departments and state agencies. The City of Detroit should also provide sufficient resources to conduct on-going bicycle transportation planning.

Furthermore, a Non-motorized Task Force, growing out of this project's Steering Committee, should be created by the Mayor to provide a valuable bridge between the City and the public. This group would coordinate the successful implementation, education and use of the new non-motorized system across departments, governmental agencies and the community at large.

The Non-motorized Program Manager would serve as a staff liaison to the newly formed Mayor's Non-motorized Task Force and

together they will assist in the implementation of all non-motorized facilities.

These members will meet regularly to track progress on action items, coordinate resources and assist in identifying outside funding sources. They would also assist in the development of the City's bicycle and pedestrian specific policies.

Mayor's Non-motorized Task Force

Traffic Engineering
City Engineering
Parks and Recreation
Planning and Development
City Planning Commission
Mayor's Office
Finance/Risk Management
Health and Wellness

The group will also regularly engage the public and user groups in meaningful discussions of the design and implementation of bicycle facilities to better understand user's concerns and desires. This might take the form of questionnaires and/or "frequently asked questions" flyer as used for the plan development process, community meetings, etc. Due to their experience in this matter, the Planning and Development Department and City Planning Commission should take the lead in the formation, organization and coordination of tasks with the public.

Lastly, the Traffic Engineering Division and City Engineering Division should jointly incorporate standards for non-motorized

transportation into the City's *Standards and Specifications for Paving and Related Construction*. This should include details and specifications available for use by the City and other designers for future improvements.

Maintenance of Facilities

Non-motorized travel conditions in Detroit could be significantly improved through maintenance to City streets, sidewalks and paths. The City should develop criteria and evaluate non-motorized related maintenance to City facilities and determine where improvements are needed. The City should coordinate this evaluation with the appropriate City and State departments.

Specifically review non-motorized facilities for deficiencies as a regular part of the City's maintenance efforts. Typical deficiencies may include potholes, shrubbery encroachment, sidewalk trip hazards, signage or pavement marking degradation, for example. This review should also include a review of all curb ramps to ensure compliance with ADA regulations.

Streets should be swept regularly, with priority given to those with higher bicycle traffic. Vegetation that overhangs or encroaches into the sidewalk area must also be monitored and trimmed on a regular basis.

Thermoplastic tape, such as that proposed for the Blue Lanes, will need to be reapplied every seven to ten years. The reapplication

of lane designations should be included in all City roadway maintenance plans.

Surface defects, signage and striping should be maintained for safe and effective use. We recommend that a spot improvement program be created with several prequalified contractors for such low-cost, small-scale improvements. For budgeting purposes, 2 percent of the current street maintenance budget should be designated specifically for non-motorized transportation facilities.

Construction Management Issues

Traffic Engineering should develop more specific requirements for ensuring safe passage of bicycles and pedestrians during roadway construction. Current policies dictate that an applicant provide vehicular traffic control plans to the City, depending on the scope of the project, in order to obtain a right-of-way permit.

The Traffic Engineering Division often also requires pedestrian detour routes and signage if appropriate, but does not have specific standards for these plans. Further complicating the issue in the future will be the presence of designated bicycle facilities within the roadway that must also be safely managed.

Clearly understandable requirements should be prepared to guide permit applicants and their professional consultants in the preparation of staging and detour plans for

both vehicular and non-motorized traffic. The Non-motorized Program Manager should be an integral part of the development of these standards and consulted during permit reviews.

Citywide Bicycle Parking

Bicycle parking is becoming a needed convenience for bicyclists. The Non-motorized Task Force should seek funding to purchase and implement a bicycle parking program.

Bicycle parking should be provided at all community facilities, including libraries, parks, schools, commercial centers and transit facilities. Parking areas should be coordinated with the ability to distribute brochures and other information to encourage maximum use of the non-motorized system.

The Planning and Development Department should also work with the business community to increase sheltered and secured bicycle parking facilities for existing uses. A bicycle rack purchase program should be considered, whereby the City negotiates a reduced cost for the installation of a standard bicycle rack to encourage their installation by local businesses.

The City Planning Commission should also encourage building owners to install bicycle parking (both indoor and outdoor) during their permit review and amend the Zoning

Ordinance as required to accommodate these improvements.

Transit and Intermodal Connections

The Non-motorized Task Force should work with SMART to increase awareness of the bike racks on fixed route buses. In addition, the Detroit Department of Transportation (DDOT) should include provisions for carrying bicycles on all buses to encourage intermodal transportation.



Implementation Methodology

The physical implementation of this plan will occur incrementally in a variety of ways. Many will happen as part of regular maintenance and road resurfacing projects.

Improvements to sidewalks, and the designation of bicycle lanes should be included in every routine street maintenance project. This includes those projects outlined in the City's yearly maintenance plan as well as any other projects that disturb street pavement, such as localized utility improvement projects. As a road is being programmed for repair, a thorough review of

the potential inclusion of non-motorized facilities should be made.

Redevelopment in areas of the City will present the opportunity to implement some of recommendations of this Plan as well. All future major development projects should be evaluated in term of how they affect non-motorized access and use. Developers should be pressed to provide rights-of-way for bicycle/pedestrian paths and/or incorporate non-motorized facilities along their property frontage whenever feasible.

Others will result from community based efforts funded by grants from state, federal or private sources. To be supportive of these proposals, the Traffic Engineering Division must determine when a traffic impact study should be required. Certainly we recommend that no study be required when the proposed improvements will not impact the number of travel lanes. The Traffic Engineering Division must consider carefully the requirement of traffic impact studies in these cases, as they typically can limit the ability of small community groups to become involved in the process.

Finally, it is important to realize that while those routes outlined in this plan have obvious importance, the above recommendations should not be limited only to them. The intent of this master plan is not to dictate the only locations where non-

motorized facilities should be developed. Indeed the hope is that the facilities installed as part of this plan will spur other efforts, thereby greatly increasing the density of non-motorized infrastructure. Every street has the potential for non-motorized improvements, and the same implementation methodology can apply.

City Sponsored Project Priorities

As mentioned above, the recommendations of this report will likely be implemented in a number of ways. When the City itself looks to implement these improvements separately from a typical maintenance project, priorities must be established to guide the decision making process.

City and Neighborhood Connectors will provide facilities that link neighborhoods across the city and connect to existing and planned destinations. As such these should be implemented as the first priority.

The second priority should be the Regional Connectors and City Loops, as they further develop these primary spines in the city with facilities linking neighborhoods, destinations and regional opportunities.

The Downtown Connectors provide highly visible facilities in the roadways to improve bicycle use in the revitalized central business district and midtown areas. Due to the local nature of the impacts of the improvements

however, they should be considered the third priority.

Probable Cost Estimate

The cost to implement the non-motorized transportation projects presented in this Plan were developed using unit construction costs obtained from the City, State and other sources. The costs to implement each bicycle facility are presented below.

Typical Non-motorized Unit Costs

Stripe shared lane and add signs/markings
\$20,000/mile

Add bike lanes and add signs/markings
\$25,000/mile

Re-stripe outside travel lanes and add bike lanes signs/markings
\$40,000/mile

Re-stripe full road width and add bike lanes signs/markings
\$75,000/mile

Add blue bike lanes signs/markings
\$140,000/mile

Construct separate bike path
\$250,000/mile

Construct non-motorized bridge overpass
\$5,000,000/each

It should be recognized that unit costs vary considerably depending on the size of the job and the location. These costs are hard construction costs in year 2006 dollars and do not include any soft costs i.e., contingencies, design and construction administration.

Typically 25 percent is added for contingencies and 15 percent is added for

design and construction administration. Utilizing these typical unit costs and the proposed improvements outlined in this report, we present the following Order of Magnitude Cost Estimate.

It is important to note that each construction project is unique and actual costs will vary according to the specific project, the type of bike facility and the existing roadway configuration. More precise estimates should be developed after preliminary engineering has been completed.

Possible Funding Sources

As outlined earlier in this report, many of the recommended improvements can be implemented without significant impact on City funds. This is certainly true of those installed as part of routine maintenance

Typical Non-motorized Unit Costs

Regional Connectors
90 miles @ \$40,000/mile = \$3,600,000

City Connectors
130 miles @ \$20,000/mile = \$2,600,000

Neighborhood Connectors
100 miles @ \$20,000/mile = \$2,000,000

Downtown-Midtown Connectors
30 miles @ \$140,000/mile = \$4,200,000

City Loop
45 miles @ \$40,000/mile = \$1,800,000

Total Hard Construction Costs= \$10,420,000

25% Construction Contingency = \$2,605,000

15% Design Contingency = \$1,563,000

Total Order of Magnitude Cost = \$14,588,000

projects, as well as those funded by private developers.

Funding for regular facility evaluation, maintenance and repair, as well as funding to review development proposals for effect on bicycle mobility should come from the annual staff, operations and maintenance budgets already allocated.

Developers should be required to provide certain facilities as part of the terms of allowing a new retail, office or residential development to move forward. Developers should be required to incorporate street improvements, sidewalks, trails, parking and other non-motorized amenities into their projects during permitting.

When the City looks to sponsor these improvements however, the identification of additional funding mechanisms becomes important. Maintaining a local capital improvement program that provides regular funding for the bicycle program to construct new facilities, retrofit inadequate facilities and refurbish older facilities may not always be feasible.

Various options have been identified as possible sources of funding to implement the Plan's recommendations. The sources noted below are not all inclusive but represent the primary funding sources currently available for non-motorized projects in this area.

Transportation Enhancement Funds

Federal Highway Administration guidance for transportation enhancement activities originally issued on December 17, 1999. FHWA periodically make minor corrections and clarifications as they did on August 10, 2005.

Public Act 51

Act 51 of the Michigan Public Acts of 1951 is the state law that distributes the primary state sources of transportation funding in Michigan. Additionally, this act includes provisions for facilities and services for non motorized transportation including bicycling.

Safe Routes to Schools program

The new federal transportation law includes \$612 million for a new national Safe Routes to Schools program that will provide at least \$1 million per year to each of the 50 states over a five-year time period. The City could use this funding to construct new bike lanes, bike paths, and sidewalks, as well as to launch Safe Routes education and promotion campaigns in elementary and middle schools.

Bikes Belong Coalition

National coalition of bicycle supplier and retailers working together to put more people on bicycles, through national leadership, grassroots support and promotion.

Land and Water Conservation Fund

Federal appropriation to the National Park Service who distributes funds to the Michigan Department of Natural Resources for land acquisition and development of outdoor recreation facilities.

Michigan Natural Resources Trust Fund

Provides funding for both the purchase of land for recreation or protection of land because of its environmental importance or scenic beauty, and the appropriate development of land for public outdoor recreation use.

Community Foundation for Southeastern Michigan

Solicits, receives and manages charitable contributions from individuals, families, corporation, other foundations and nonprofit organizations. The Greenways Initiative, started in 2001, is a five-year program which was to expire in 2006 depending on remaining funds and further support for continuing the program.

Possible Funding Sources Contact Info

Federal Highway Administration
www.fhwa.gov

Michigan Department of Transportation
www.michigan.gov/dot

Safe Routes to School
www.saferoutesmichigan.org

Bikes Belong Coalition
www.bikesbelong.org

Land and Water Conservation Fund
www.michigan.gov/dnr

Michigan Natural Resources Trust Fund
www.michigan.gov/dnr

Community Foundation for Southeastern
Michigan-Greenways Initiative
www.cfsem.org

A final possible funding route consists of private or corporate donations. The City should consider the creation of a program similar to “adopt and highway”, where individuals and corporations can donate funds for planning and construction of non-motorized facilities. Similarly, this program could be expanded to include the donation of time used to maintain the cleanliness of the route once completed.



A program similar to “adopt a highway” could provide funding for both construction and maintenance while boosting the public image of the system.

The Three “E’s”

The overall success of integrating non-motorized traffic into the local transportation network not only depends proper planning and construction, but relies heavily on supporting education, encouragement and

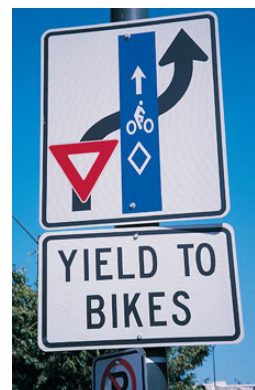
enforcement programs (The three “E’s”). In many instances these are grassroots programs that generate local interest in bicycle safety and promote the many benefits of bicycling.

Enforcement

Enforcement of state and local bicycle regulations is an important element in providing a safe non-motorized environment. Like any other transportation system, uniform rules and regulations define user expectations and reduce the risk of injury. Regulations need to be easily accessible and taught through education and encouragement venues to ensure that bicyclists and motorists are aware of and follow the “rules of the road”.

In Michigan, a bicycle is considered a vehicle when operated on a roadway. Thus,

bicyclists and motorists basically have the same rights and duties, and the laws governing



traffic regulation apply equally to both. Bicyclists must obey the same traffic laws as those who are operating motor vehicles and follow traffic signs, signals, lane markings, directions, etc. Bicycle laws and regulations must be readily enforced in a manner to encourage safe bicycle usage.

Developing and adopting easy to understand “rules of the road” at the local level is the first

step in any enforcement program. The MDOT web site provides a summary of state laws concerning bicycle and their use and safety tips that should be incorporated into local bicycle programs.

Bicycle “rules of the road” should target a wide audience including children, adolescents, adults and seniors from varying backgrounds. Provide targeted enforcement of traffic laws against bicyclists who commit

offenses most likely to cause injury, such as running red lights, wrong-way riding, riding at night without lights and endangering pedestrians.

Education

Once developed, these rules of the road should be highly publicized as part of the education process. Bicycling education programs form the foundation for the City to support bicycling. Comprehensive public information and education programs are often used to raise community awareness and improve both bicyclists’ riding and traffic skills and motorists’ attitude toward bicyclists. Ensuring that both bicyclists and motorists understand and practice the fundamental “rules of the road” is one way of accomplishing this goal.

To ensure a safer bicycling experience, public education programs frequently address effective riding principles and the use of safety equipment such as helmets and reflectors. The City should consider sponsoring bicycle driver education classes at local schools as well as community and vocational training centers.

Presentations at the public schools, as well as the recreation centers and community groups throughout the City would effectively get the message out. Furthermore, the rules should be included as part of an overall public health initiative featuring prominent residents of the City.

Example Safety Tips

Be responsible bicyclists: obey all traffic control devices and use proper hand signals. Always ride with the flow of traffic.

Dress safely: wear a helmet, wear bright colored clothing, and secure loose pant legs.

Ride defensively: anticipate the actions of other road users and watch for road hazards.

Pass vehicles with extreme care as turning vehicles may not see you.

Be aware of motor vehicle blind spots whether riding or stopped at an intersection.

Maximize your visibility at night: wear reflective clothing and apply reflective tape to your bicycle.

Walk your bicycle when you get into traffic situations beyond your cycling abilities.

Exercise great caution when riding in bus traffic: watch out for buses pulling to and from curbs and passengers getting on and off buses.

Park your bicycle so you do not block sidewalks, handicap and building accesses, or emergency drives.

Lock your bicycle-secure both wheels and the frame to a stationary object using a sturdy lock.

Source: MDOT

Encouragement

Programs and initiatives that encourage bicycling are also an important element of creating a bicycle friendly community. One way to promote and encourage bicycling is to provide assistance in the form of maps, brochures, and/or travel guides to make bicycling more approachable and enjoyable for novice and advanced bicyclists alike.



Easy to understand way-finding signage and downloadable bike maps can encourage use by those unfamiliar with the area.

comprehensive analysis of existing destinations and available route corridors, it provides the framework and hierarchy for the citywide system. Please refer to the Citywide Destinations and Path Map on the next page for a complete picture of this system.

Several bicycling pages should be developed on the City's website, including a bike map that is available for download. In addition to outlining available routes, this map may serve as an educational tool for safe bicycling practices and to provide information about bicycle clubs and stores.

The Non-motorized Task Force, working with the Planning and Development and Health and Wellness Departments should be at the forefront of these activities. The Task Force should strive to involve the numerous community groups throughout the City to effectively gauge the success of these programs.

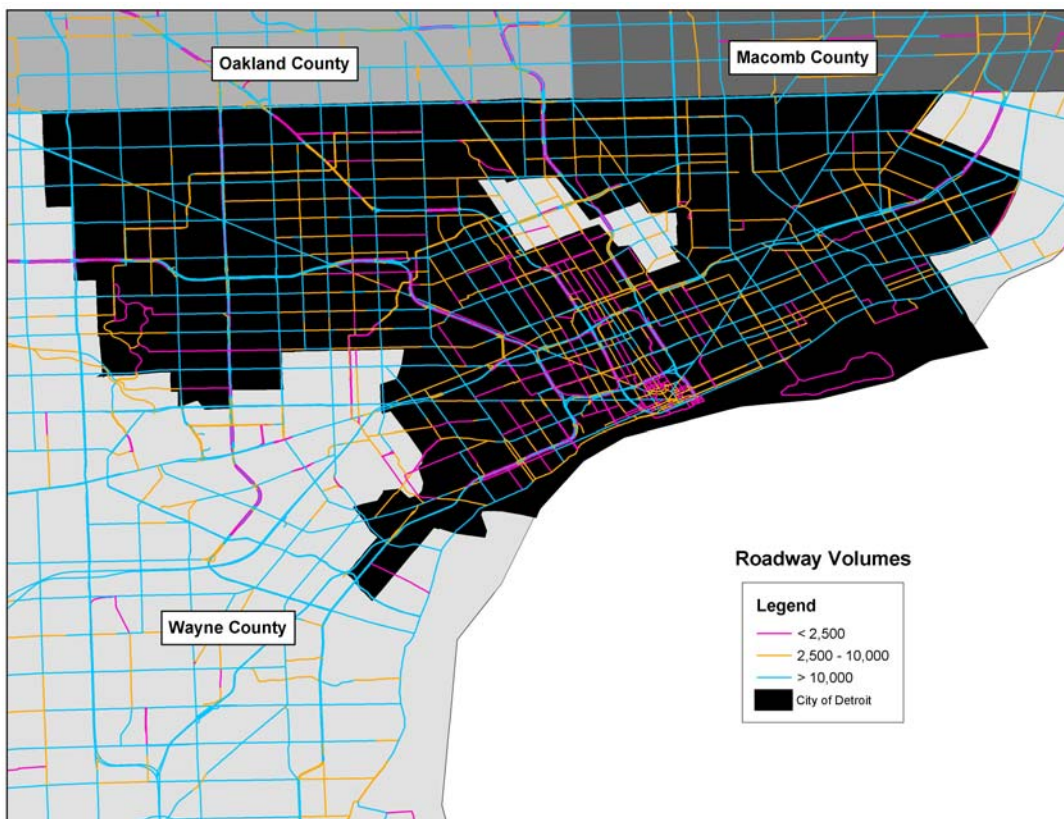
Conclusion

This plan outlines detailed recommendations related to the placement of non-motorized facilities within the City of Detroit. Through a

NON-MOTORIZED URBAN TRANSPORTATION MASTER PLAN

Appendix

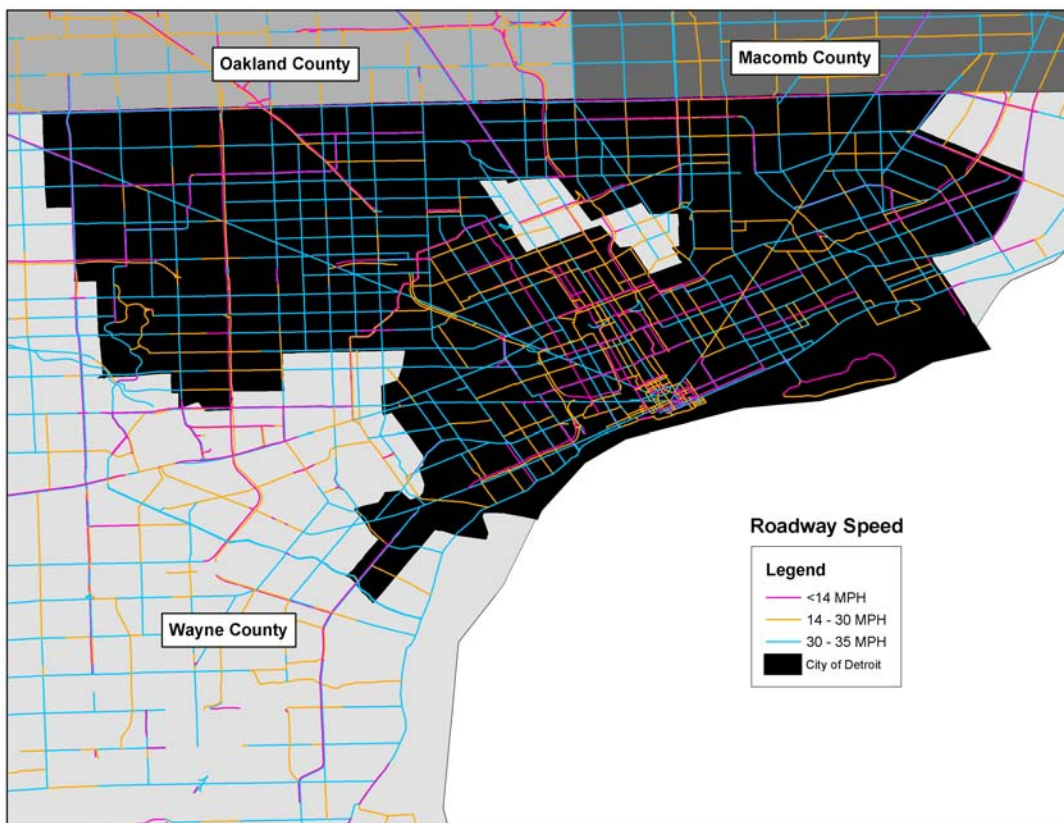




Data Source: SEMCOG Bicycle Travel Database

Map Source: Carter & Burgess, Inc.

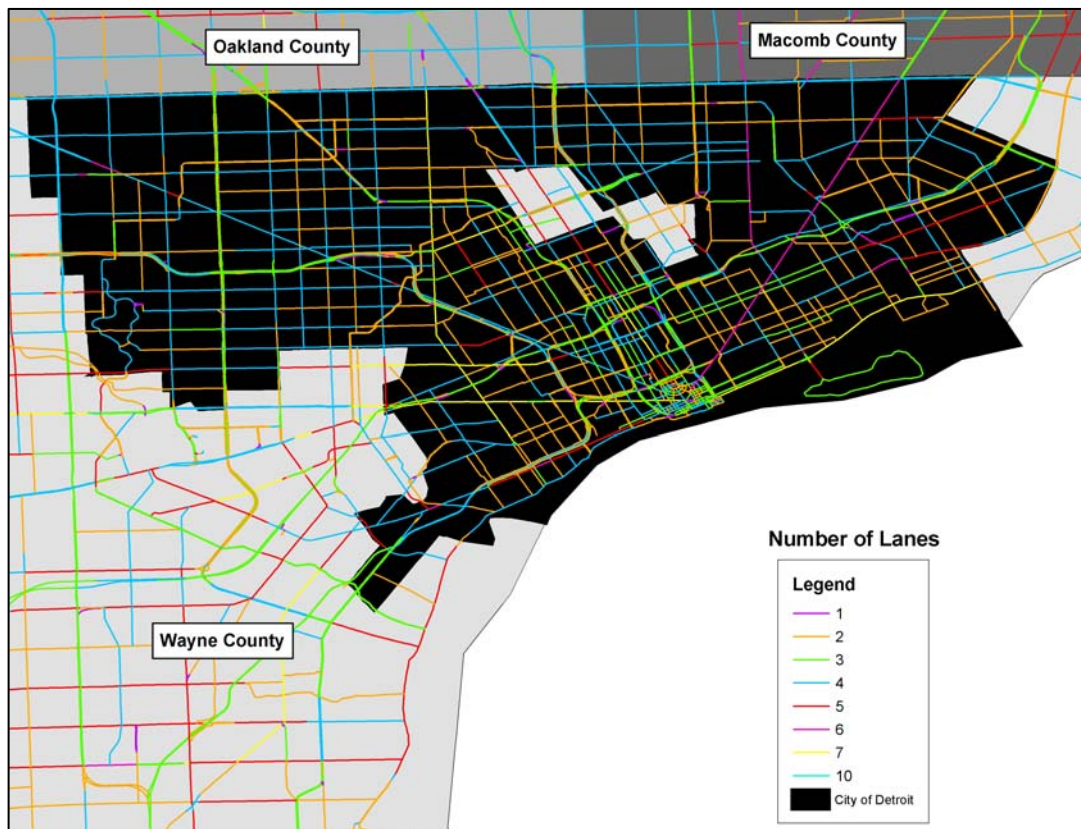
Figure 1: Roadway Volumes



Data Source: SEMCOG Bicycle Travel Database

Map Source: Carter & Burgess, Inc.

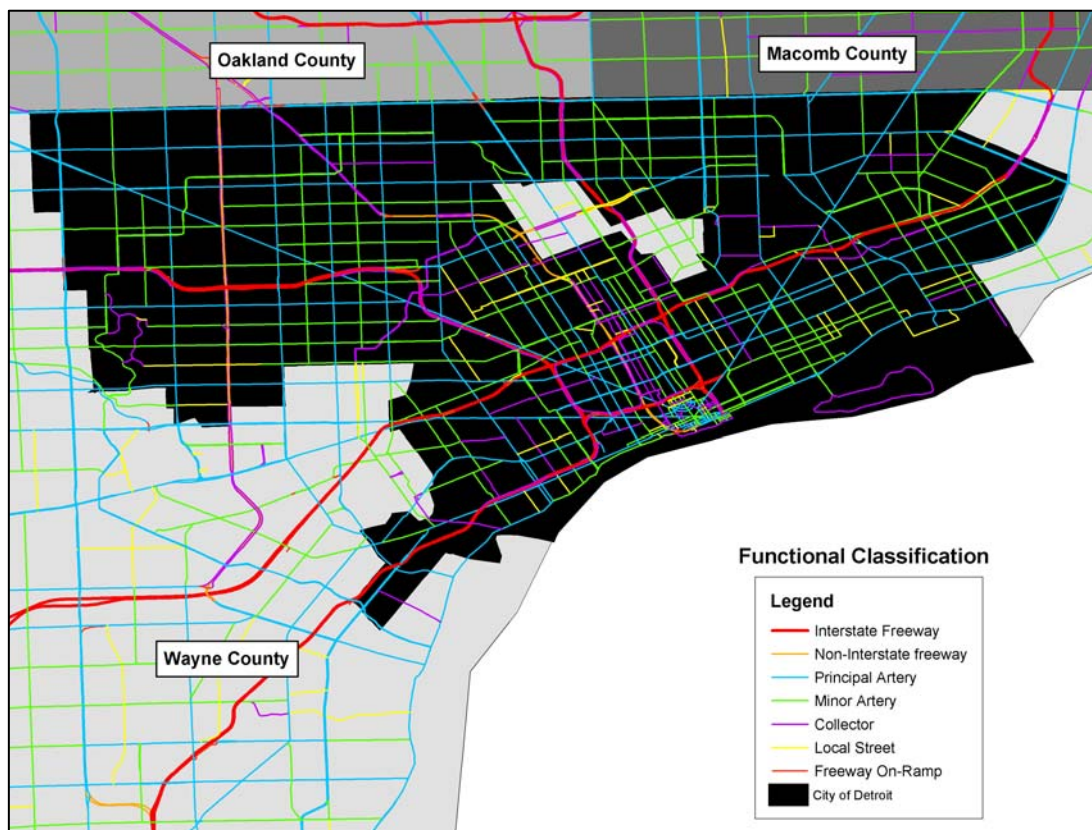
Figure 2: Roadway Speeds



Data Source: SEMCOG Bicycle Travel Database

Map Source: Carter & Burgess, Inc.

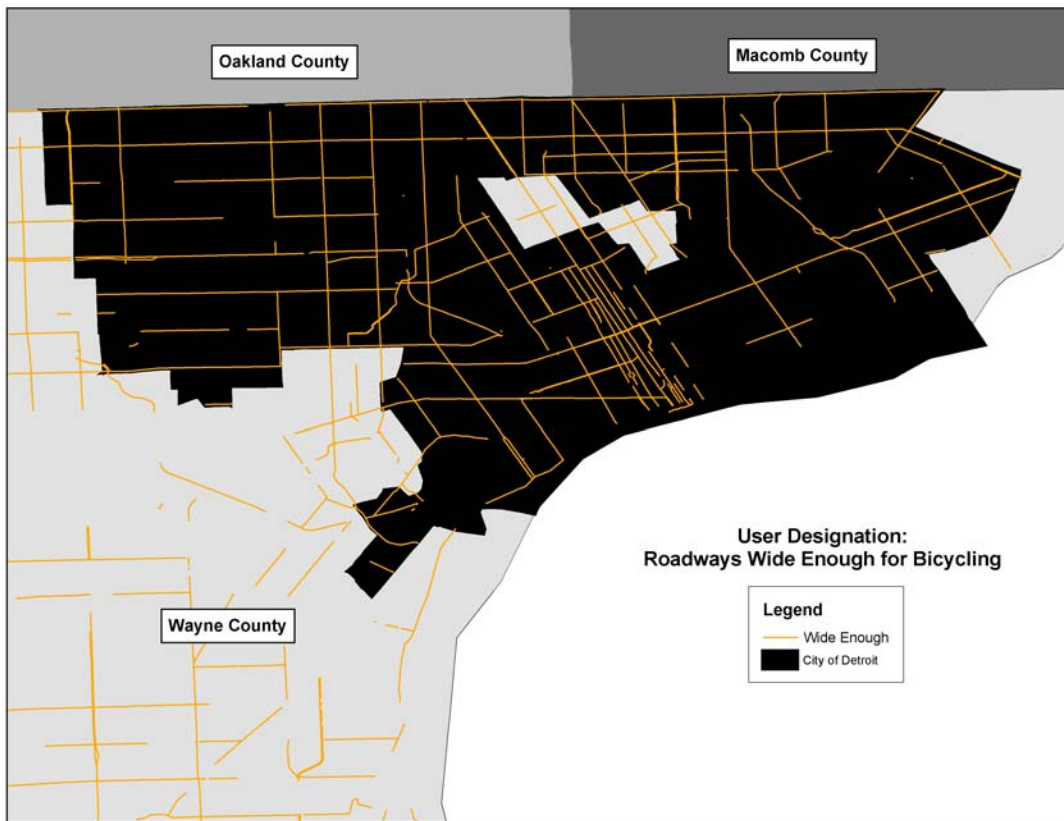
Figure 3: Number of Lanes on Roadways



Data Source: SEMCOG Bicycle Travel Database

Map Source: Carter & Burgess, Inc

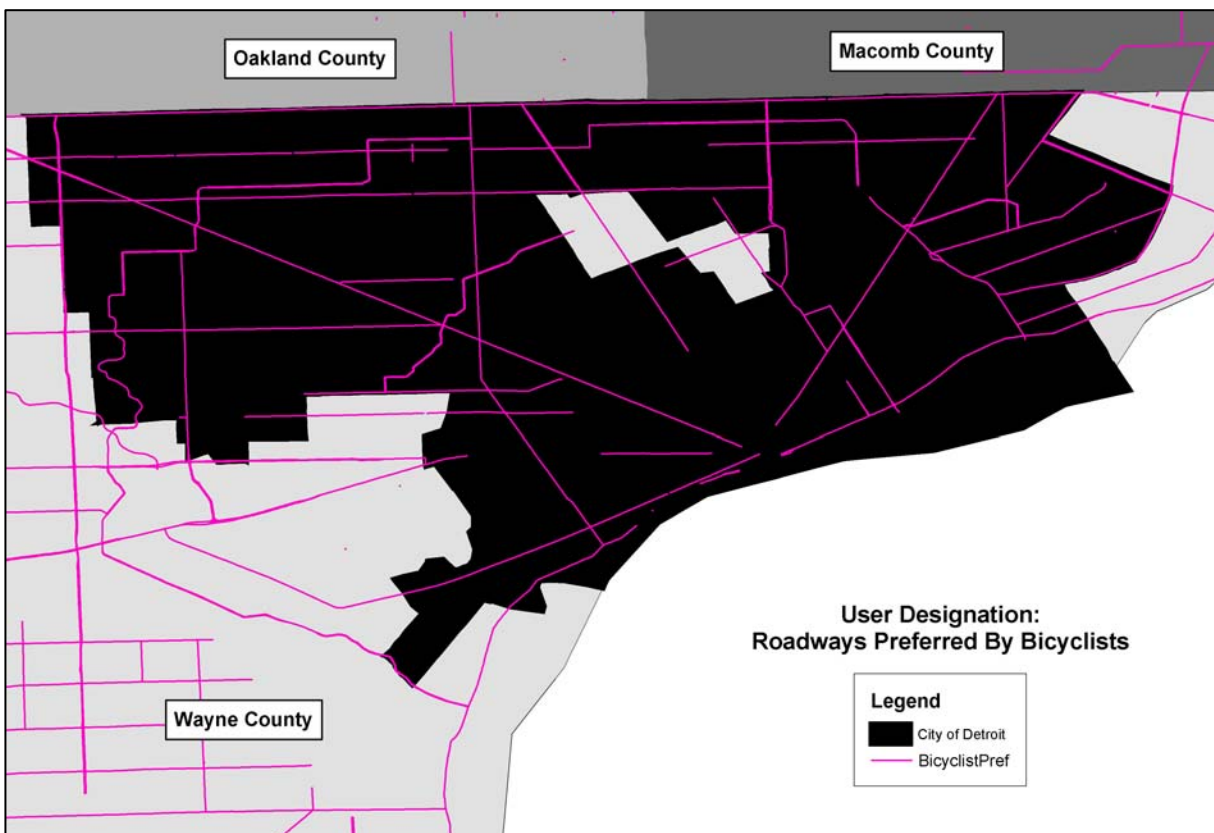
Figure 4: Functional Classification of Roadways



Data Source: SEMCOG Bicycle Travel Database

Map Source: Carter & Burgess, Inc

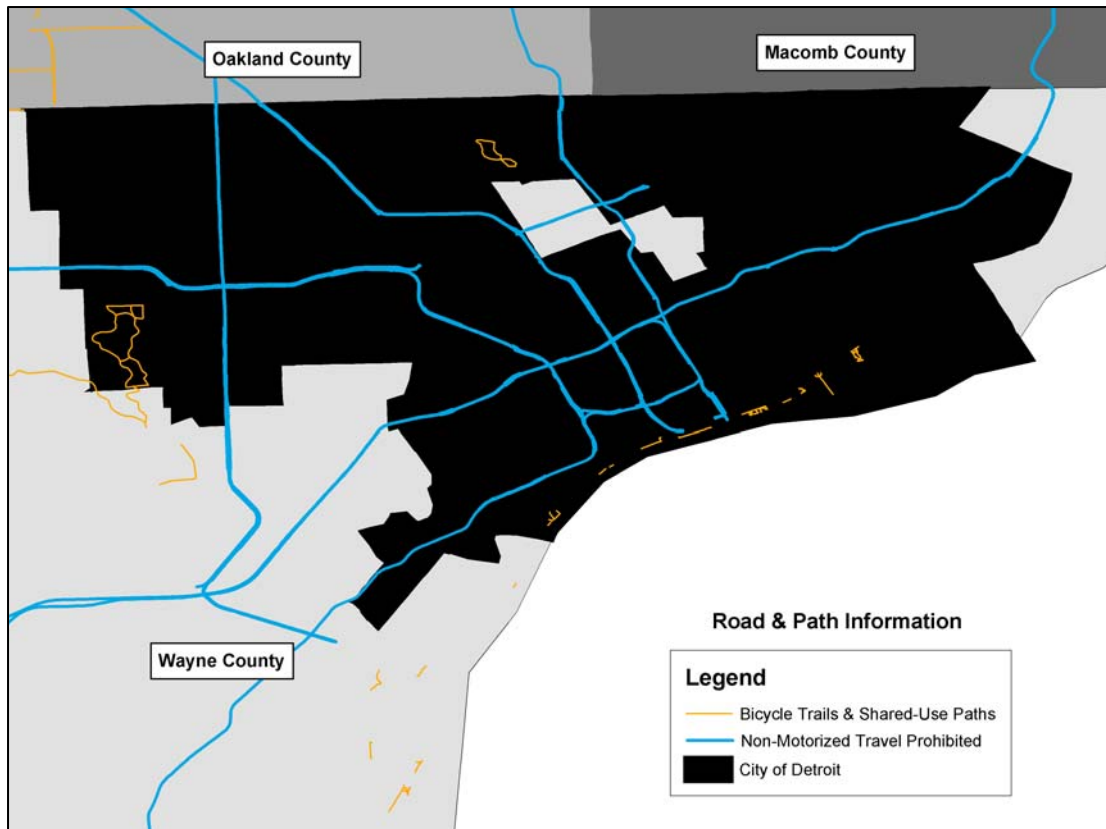
Figure 5: Roadways Designated as Wide Enough for Bicycling



Data Source: SEMCOG Bicycle Travel Database

Map Source: Carter & Burgess, Inc

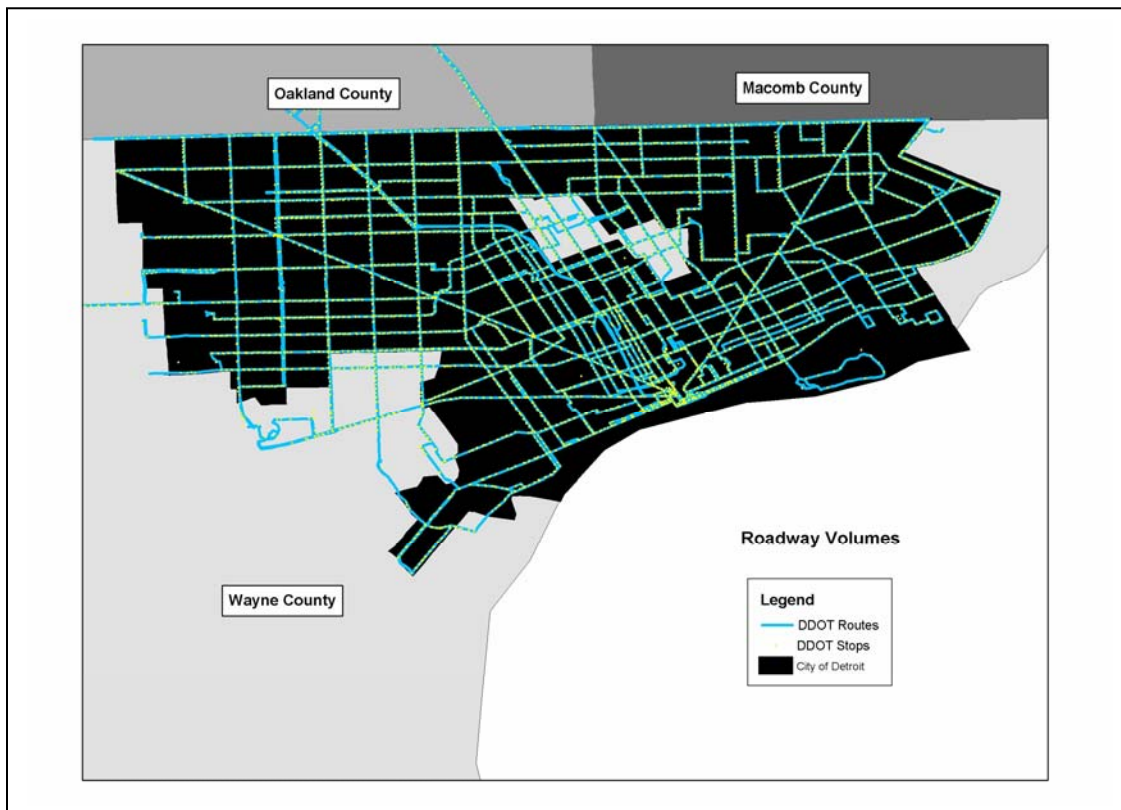
Figure 6: Roadways Preferred by Bicyclists



Data Source: SEMCOG Bicycle Travel Database

Map Source: Carter & Burgess, Inc

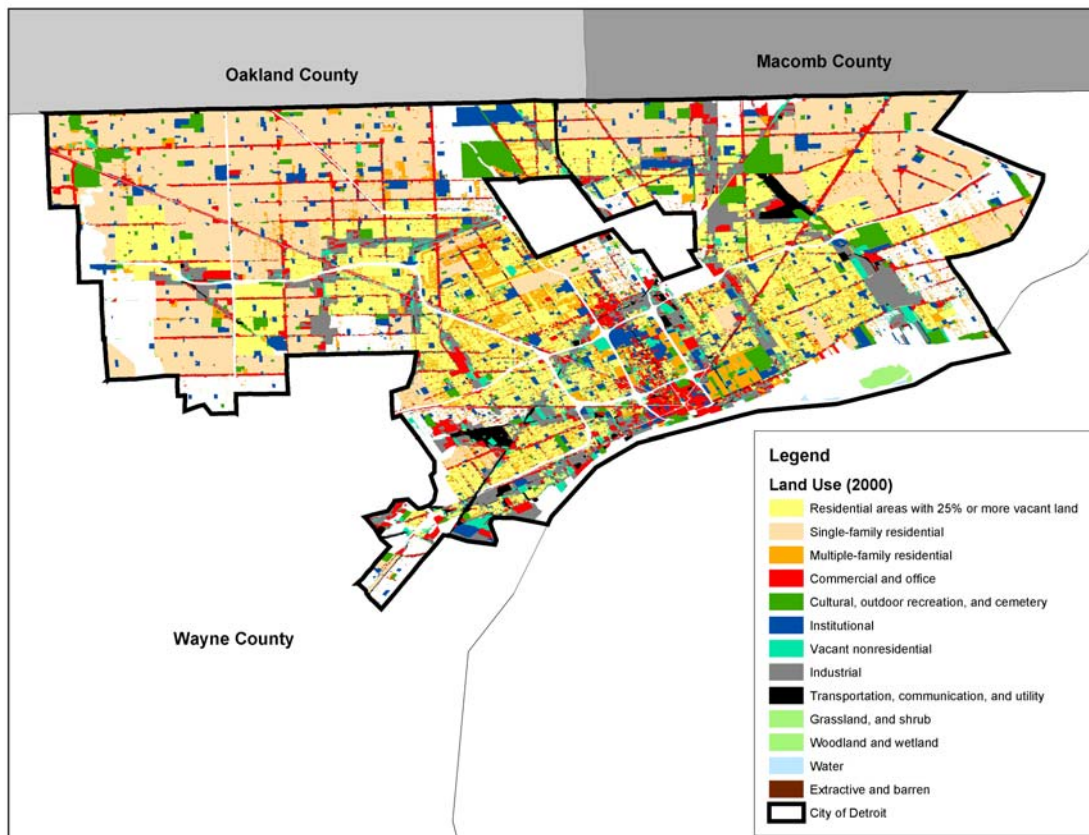
Figure 7: Non-Motorized Travel Information



Data Source: DDOT

Map Source: Carter & Burgess, Inc

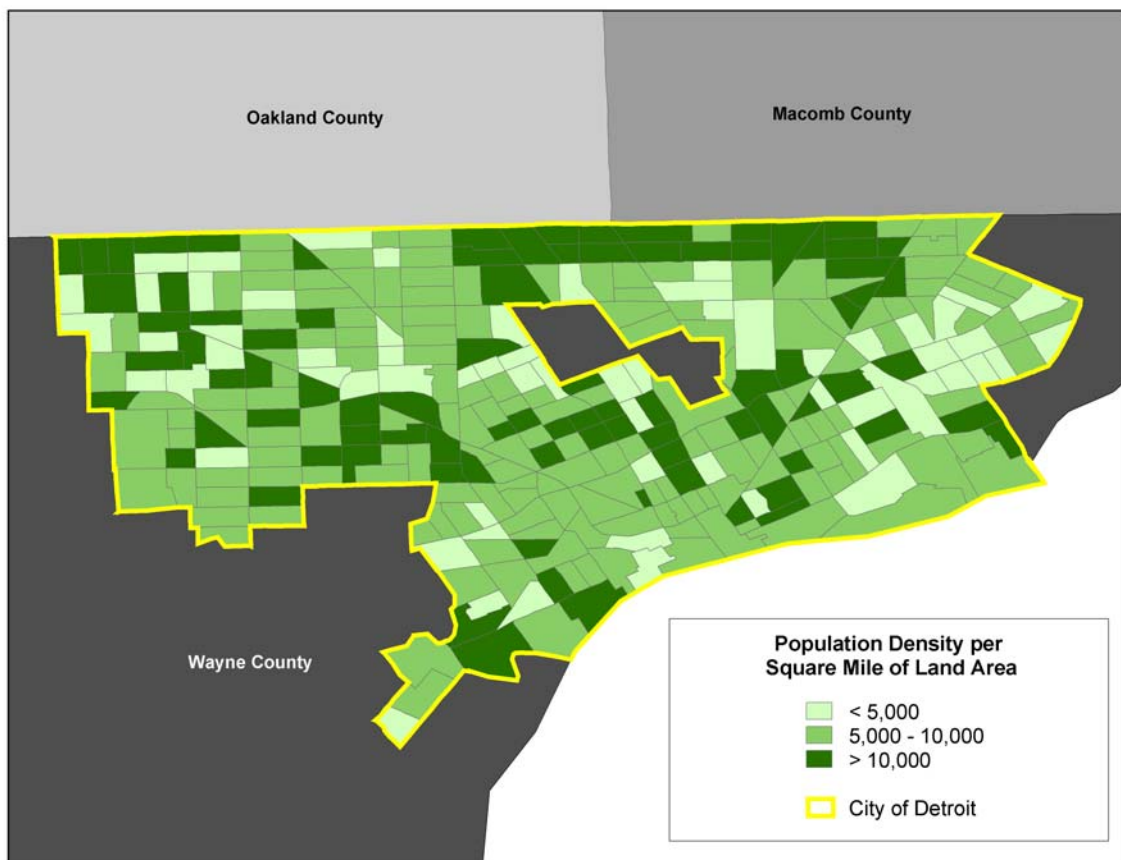
Figure 8: Transit Network Information



Data Source: SEMCOG

Map Source: Carter & Burgess, Inc

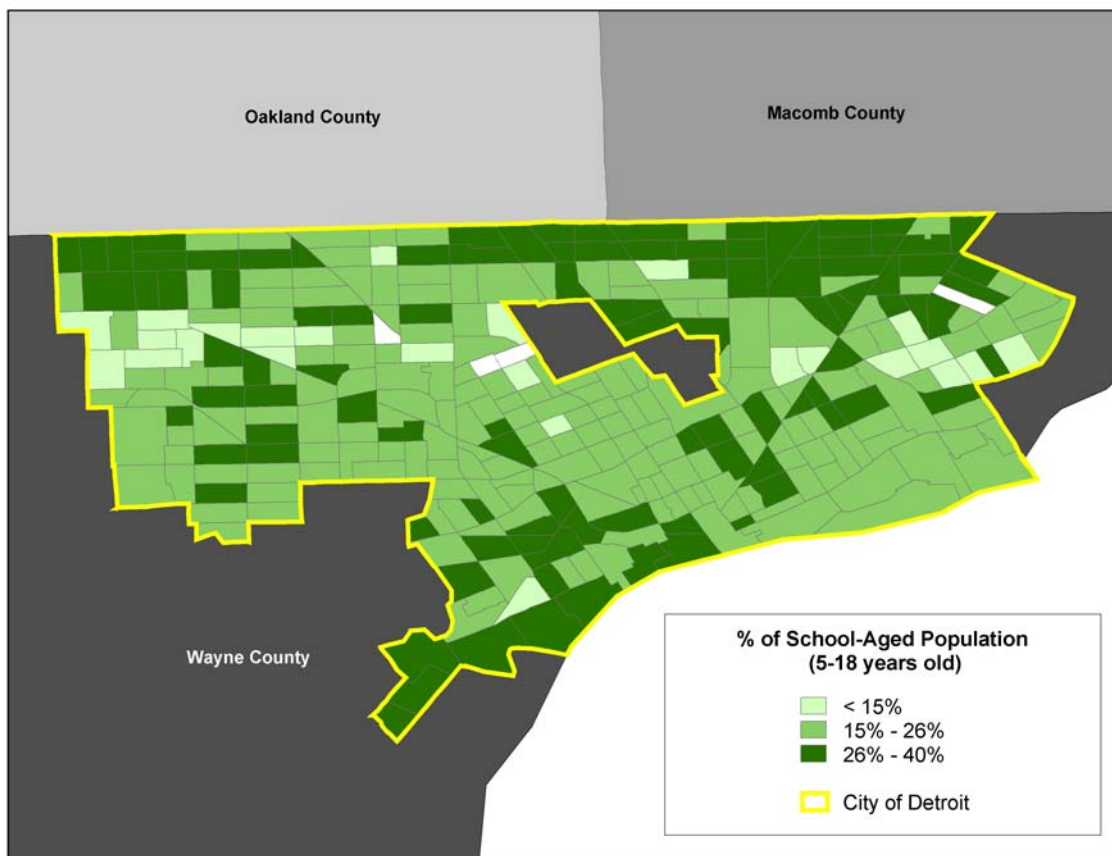
Figure 9: Land Use



Data Source: Census 2000

Map Source: Carter & Burgess, Inc

Figure 10: Population Density



Data Source: Census 2000

Map Source: Carter & Burgess, Inc

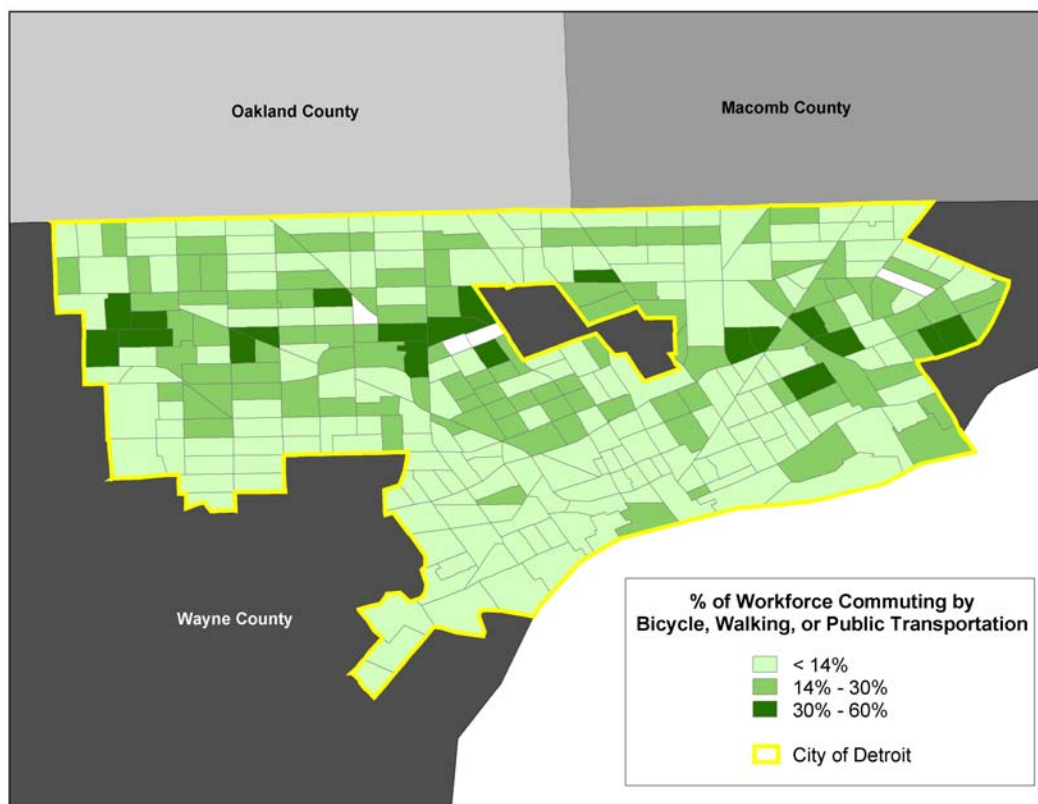
Figure 11: School-Aged Population



Data Source: Census 2000

Map Source: Carter & Burgess, Inc

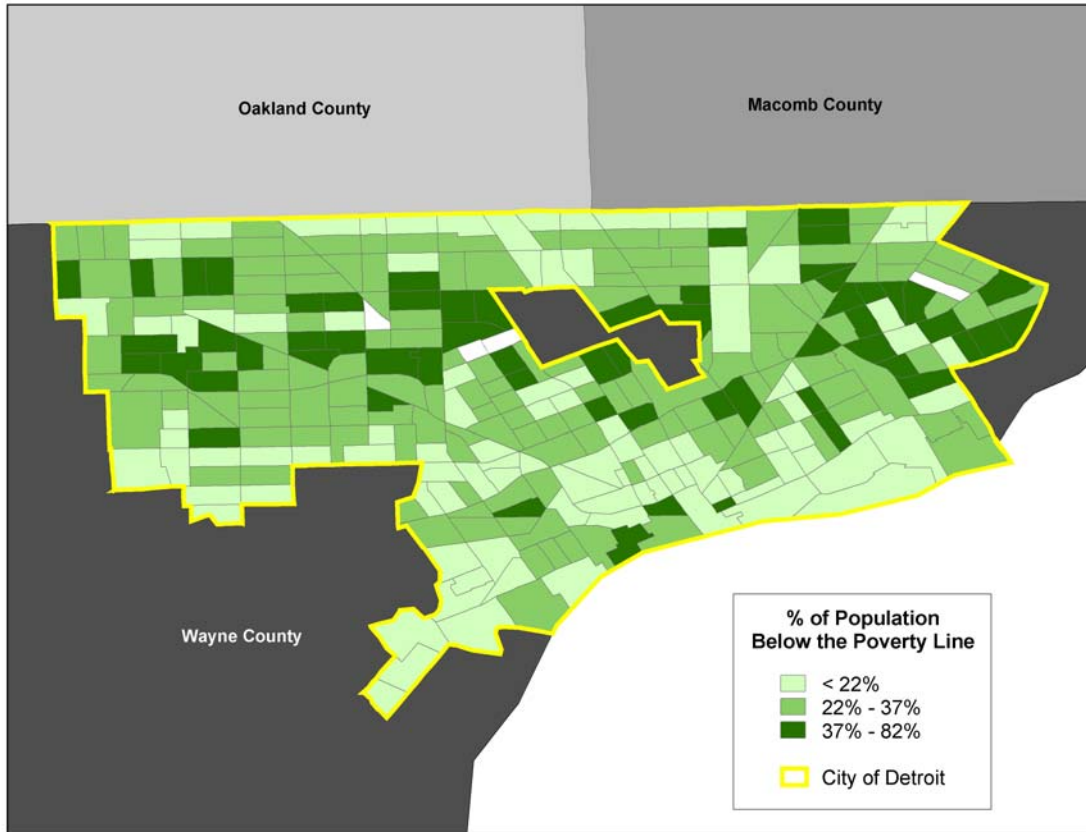
Figure 12: Zero-Vehicle Housing Units



Data Source: Census 2000

Map Source: Carter & Burgess, Inc

Figure 13: Commute Trips



Data Source: Census 2000

Map Source: Carter & Burgess, Inc

Figure 14: Population below the Poverty Line

Figure 15:
Roadway Evaluation Matrix

Roadway	Access to Disticts	Access to Job Centers	Access to Universities/Co lleges	Access to Parks	Access to Existing Connection Points	Access to Potential Connection Points	Access to Existing Paths	Access to Planned Paths	Access to Regional Transit Nodes	Proposed Rapid Transit Corridors	Aggregate Score of Destinations & Access	Degree of Internal Connectivity	>30 mph	>10,000 AADT
Berkshire	0	0	0	0	0	0	0	0	0	0	0	1	N	N
Cadieux	0	0	0	0	0	0	0	0	0	0	0	1	N	Y
Cadillac	0	0	0	0	0	0	0	0	0	0	0	1	N	N
Clairmount	0	0	0	0	0	0	0	0	0	0	0	1	N	Y
Grinnell	0	0	0	0	0	0	0	0	0	0	0	1	N	N
Hayes	0	0	0	0	0	0	0	0	0	0	0	1	Y	Y
Hoover	0	0	0	0	0	0	0	0	0	0	0	1	N	Y
Houston Whittier	0	0	0	0	0	0	0	0	0	0	0	1	Y	N
Miller	0	0	0	0	0	0	0	0	0	0	0	1	N	Y
Morang	0	0	0	0	0	0	0	0	0	0	0	1	Y	Y
Whittier	0	0	0	0	0	0	0	0	0	0	0	1	Y	N
Nevada	0	0	0	0	0	0	0	0	0	0	0	2	Y	N
Broadstreet	1	0	0	0	0	0	0	0	0	0	1	1	N	N
Broadway	1	0	0	0	0	0	0	0	0	0	1	1	N	N
Burt	0	0	0	1	0	0	0	0	0	0	1	1	Y	N
Central	0	0	0	0	0	0	0	1	0	0	1	1	Y	Y
Chene	0	0	0	0	0	0	0	1	0	0	1	1	N	N
Clifford	1	0	0	0	0	0	0	0	0	0	1	1	N	N
Dexter	0	0	0	0	0	0	0	1	0	0	1	1	Y	Y
Epworth	0	0	0	1	0	0	0	0	0	0	1	1	N	N
French	0	0	0	0	0	0	0	1	0	0	1	1	N	N
Lahser	0	0	0	0	0	1	0	0	0	0	1	1	Y	Y
Lakeside	0	0	0	1	0	0	0	0	0	0	1	1	N	N
Lonyo	0	0	0	0	0	1	0	0	0	0	1	1	Y	Y
Lyndon	0	0	0	0	0	0	0	1	0	0	1	1	Y	N
McDougall	0	0	0	0	0	0	0	1	0	0	1	1	N	N
McGraw	0	0	0	1	0	0	0	0	0	0	1	1	Y	N
Riverbank	0	0	0	1	0	0	0	0	0	0	1	1	N	N
Rough Park	0	0	0	1	0	0	0	0	0	0	1	1	N	N
Russell	0	0	0	0	0	0	0	1	0	0	1	1	N	N
Ryan	0	0	0	0	0	0	0	1	0	0	1	1	N	Y
Linwood	0	0	0	0	0	0	0	1	0	0	1	2	Y	Y
State Fair	1	0	0	0	0	0	0	0	0	0	1	2	N	N
Adams	1	0	0	1	0	0	0	0	0	0	2	1	N	N
Buchanan	1	0	0	0	0	0	0	1	0	0	2	1	N	N
Dequindre	0	0	0	0	1	0	0	1	0	0	2	1	Y	N
Dragoon	0	0	0	0	0	0	0	2	0	0	2	1	Y	N
Merrill Plaisance	0	0	0	1	0	0	1	0	0	0	2	1	Y	N
Montcalm	1	0	0	0	0	0	0	1	0	0	2	1	N	N
Moross	0	0	0	0	0	2	0	0	0	0	2	1	N	Y
Elmhurst	2	0	0	0	0	0	0	0	0	0	2	2	N	N
Fullerton	1	0	0	0	0	0	0	1	0	0	2	2	Y	N
Meyers	0	0	0	0	0	1	0	1	0	0	2	2	Y	N
Mound	0	0	0	0	1	0	0	1	0	0	2	2	N	Y
Oakland	1	0	0	0	0	0	0	1	0	0	2	2	N	N
Hubbell	0	0	0	0	0	2	0	0	0	0	2	3	Y	N
Beaubien	1	1	1	0	0	0	0	0	0	0	3	1	N	N
Clay	1	0	0	0	0	0	0	2	0	0	3	1	N	N
Douglas Mac Arthur	0	0	0	2	0	0	1	0	0	0	3	1	Y	N
John Kronk	0	0	0	0	0	1	0	2	0	0	3	1	Y	N
Kelly	0	1	0	0	0	1	0	0	1	0	3	1	Y	N
Telegraph	0	0	0	0	0	2	0	0	0	1	3	1	Y	Y
Chicago	0	0	0	1	0	1	0	1	0	0	3	2	Y	Y
Conant	0	0	0	0	1	0	0	2	0	0	3	2	Y	Y

Figure 15:
Roadway Evaluation Matrix

Roadway	Access to Disticts	Access to Job Centers	Access to Universities/Co lleges	Access to Parks	Access to Existing Connection Points	Access to Potential Connection Points	Access to Existing Paths	Access to Planned Paths	Access to Regional Transit Nodes	Proposed Rapid Transit Corridors	Aggregate Score of Destinations & Access	Degree of Internal Connectivity	>30 mph	>10,000 AADT
Plymouth	0	0	0	1	0	1	1	1	0	0	4	2	Y	Y
Oakman Blvd	2	1	0	0	0	0	0	1	0	0	4	1	N	N
Clark	1	0	0	0	0	0	0	3	0	0	4	1	Y	N
Junction	0	0	0	1	0	0	0	3	0	0	4	1	N	N
Fenkell	1	1	0	0	0	0	0	2	0	0	4	1	N	N
Pontchartrain	2	0	0	1	0	0	1	0	0	0	4	1	Y	N
Shoemaker	0	1	1	1	0	0	0	1	0	0	4	1	N	N
14th	3	0	0	0	0	0	0	1	0	0	4	2	Y	N
Chandler Park	0	0	1	1	0	1	0	1	0	0	4	2	Y	N
Dickerson	1	2	0	1	0	0	0	0	0	0	4	2	Y	Y
Puritan	2	1	1	0	0	0	0	0	0	0	4	2	Y	N
Saint Aubin	0	0	0	1	0	0	1	2	0	0	4	2	Y	N
Davison	1	1	0	0	0	0	0	2	0	0	4	3	N	Y
Joy	0	0	1	1	0	1	0	1	0	0	4	3	Y	Y
Martin Luther King Jr	3	0	0	0	0	0	0	1	0	0	4	3	N	N
Mount Elliott	0	0	0	1	1	0	1	1	0	0	4	3	Y	N
Schoolcraft	1	0	0	1	0	1	0	1	0	0	4	3	Y	Y
Wyoming	0	0	1	0	1	1	0	1	0	0	4	3	Y	Y
Atwater	1	1	0	1	0	0	1	1	0	0	5	1	N	N
Randolph	1	3	0	1	0	0	0	0	0	0	5	1	Y	N
Forest	2	0	0	0	0	0	0	3	0	0	5	2	Y	N
Saint Jean	0	1	1	2	0	0	0	1	0	0	5	2	N	Y
Schaefer	0	3	0	0	0	1	0	1	0	0	5	3	Y	Y
Van Dyke	1	0	0	1	1	0	0	1	0	1	5	3	Y	Y
Alter	2	1	0	1	1	0	0	1	0	0	6	1	N	Y
Congress	1	2	2	0	0	0	0	1	0	0	6	1	Y	N
Washington	1	2	0	1	0	0	1	1	0	0	6	1	N	N
Chalmers	2	2	0	1	0	0	0	1	0	0	6	2	Y	Y
Conner	1	1	1	2	0	0	0	1	0	0	6	3	Y	Y
Evergreen	1	3	0	0	0	1	0	0	1	0	6	3	Y	Y
Harper	0	0	1	1	0	2	0	2	0	0	6	3	Y	Y
Tireman	0	0	1	1	0	3	0	1	0	0	6	3	Y	N
7 Mile	2	1	0	1	0	1	1	1	0	0	7	2	Y	Y
Trumbull	3	0	1	0	0	0	1	2	0	0	7	2	Y	N
McNichols	2	0	2	1	0	0	0	2	0	0	7	3	Y	Y
Brush	3	3	0	1	0	0	0	1	0	0	8	2	N	N
Rosa Parks	3	0	0	0	0	0	1	4	0	0	8	3	Y	N
Larned	1	2	1	1	0	0	2	2	0	0	9	1	N	N
Michigan	2	2	0	0	0	0	0	3	1	1	9	2	Y	Y
Fort	1	3	1	1	0	0	0	3	0	0	9	3	Y	Y
Gratiot	1	2	0	0	0	0	0	5	0	1	9	3	Y	Y
Greenfield	0	4	1	0	0	1	0	0	2	1	9	3	Y	Y
Cass	3	2	1	1	0	0	1	2	0	0	10	2	N	N
Vernor	4	0	0	0	0	1	0	5	0	0	10	2	Y	N
Grand River	5	1	0	0	0	0	0	3	0	1	10	3	Y	Y
Lafayette	2	2	0	0	0	0	1	5	0	0	10	3	Y	N
Outer	3	1	0	2	0	2	1	1	0	0	10	3	N	N
Mack	3	2	0	0	0	2	0	4	0	0	11	3	Y	Y
Grand	2	1	0	1	0	0	2	6	0	0	12	3	Y	N
Second	3	4	1	1	0	0	0	3	0	0	12	3	N	N
Livernois	5	1	1	0	2	0	1	3	0	0	13	3	Y	Y
John R	3	3	1	0	5	0	0	2	0	0	14	3	N	N
Third	3	4	2	2	0	0	1	3	0	0	15	3	N	N
Warren	3	1	1	2	0	4	1	4	0	0	16	3	Y	Y
8 Mile	1	4	0	1	8	1	0	1	1	1	18	3	Y	Y
Woodward	4	5	1	2	2	0	2	2	0	1	19	3	Y	N
Jefferson	3	5	2	1	2	0	9	7	0	1	30	3	Y	Y

**City of Detroit Non-motorized Urban
Transportation Master Plan**

Prepared for the City of Detroit by

