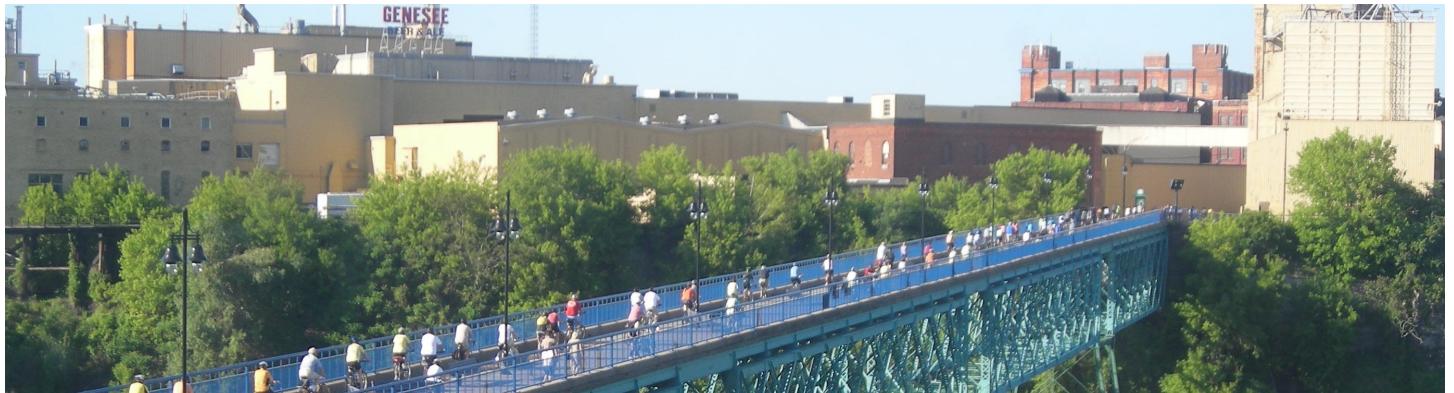


ROCHESTER BICYCLE MASTER PLAN



Final Report to the City of Rochester, NY



January 2011



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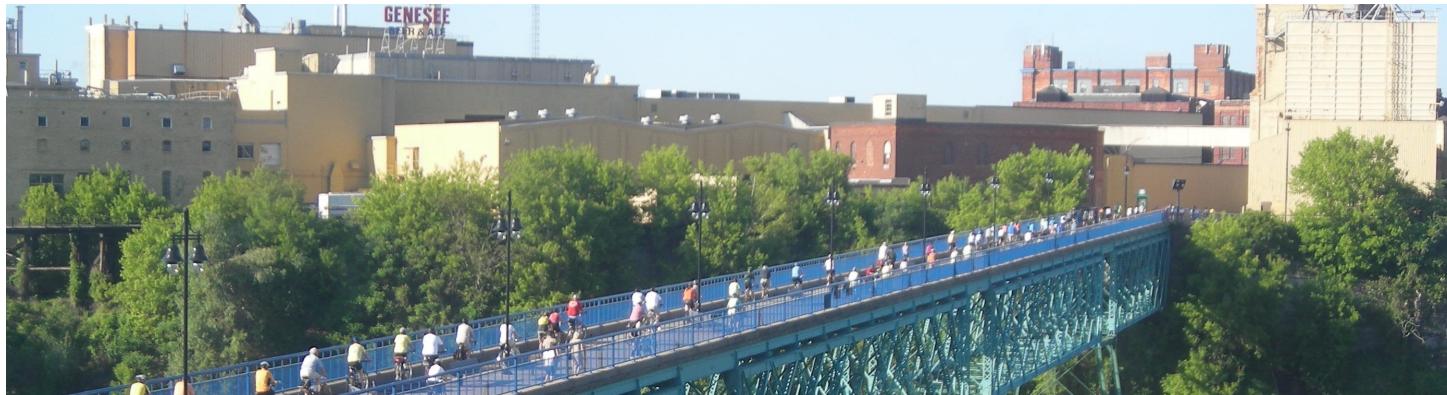
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Rochester Bicycle Master Plan



Chapter 1: Introduction and Summary

1. Introduction and Summary

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"Let me tell you what I think of bicycling," Miss Anthony said, leaning forward and laying a slender hand on my arm. "I think it has done more to emancipate women than anything else in the world. I stand and rejoice every time I see a woman ride by on a wheel. It gives woman a feeling of freedom and self-reliance. It makes her feel as if she were independent. The moment she takes her seat she knows she can't get into harm unless she gets off her bicycle, and away she goes, the picture of free, untrammeled womanhood."

-- Susan B. Anthony, interviewed by Nellie Bly
New York World, February 2, 1896

A. Introduction

Bicycling has long played a significant role in our nation's social and transportation history, as evidenced by the words of famous Rochesterian Susan B. Anthony. In 1896, when these words were spoken, the bicycle was a prominent mode of travel. In the intervening decades, the relative significance of bicycling decreased as the motor vehicle became the primary mode of choice. Nonetheless, increased environmental consciousness and the current economic situation have led many residents of the Rochester area to rediscover the bicycle as a practical way to get around.

It is against this backdrop of increased levels of bicycling that the City of Rochester has developed this Rochester Bicycle Master Plan. The objective of

the Plan is to identify long-range opportunities for improved bicycling infrastructure and services within the City. For the non-auto owning population, and for those who choose to bicycle as a primary mode of transportation, safe and accessible bicycle facilities are a paramount concern. While the Plan covers many bicycling-related topics, its two main areas of focus are a detailed evaluation of the City's existing on-street bicycle network and the creation of City-wide recommendations to both enhance and promote bicycling in Rochester.



The City of Rochester and the surrounding region is well-known for its off-road multi-use trail system. These trails provide valuable transportation and recreational opportunities for residents and visitors, and are the preferred facility type for many of those users. The multi-use trail system and potential expansions thereof have been widely studied, as demonstrated in Section III. On-road facilities, which frequently offer more transportation functionality than their off-road counterparts because of the access they provide to residences and businesses, are not nearly as well-developed within Rochester. While

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connectivity between the two systems is a goal, the intent of this Bicycle Master Plan is to assist in developing the on-road network and other bicycling-related services throughout the City of Rochester.

B. Benefits of Increased Bicycling in Rochester

It is easy to see why bicycling is becoming increasingly popular in the Rochester area as both a mode of transportation and a recreational activity. There are countless benefits from bicycling, both at an individual and community level. As succinctly stated by a citizen on the Plan's website, "What a great way to reduce congestion, pollution, and obesity." Some of the many benefits related to these and other aspects of life in Rochester are listed below.

Bicycling Helps the Local Economy

- Almost 20% of a family's budget is spent on transportation; more pedal power (and less fuel consumption) can mean real savings for Rochester's families
- Increased disposable income in turn stimulates the local economy when it is re-invested in local businesses
- Improving bicycling conditions is a cost effective way of optimizing existing public infrastructure

Bicycling Communities are Healthier Communities

- Adding bicycling to the daily routine helps us stay healthier; 60% of Americans are overweight or

obese, and bicycling is a great solution to the problem

- According to the Centers for Disease Control, 30 minutes of moderate exercise (like bicycling), five days a week, can reduce the risks for illnesses such as high blood pressure, heart disease, arthritis and depression
- Bicycle trips create zero emissions, contributing to better air quality for the Rochester region (and cleaner air for all of us to breathe)

Bicycling Communities are Strong Communities

- Improved bicycling conditions provide mobility for people who do not have cars, thereby increasing access to jobs, education, and health care
- Cities that promote bicycling tend to retain youth, attract young families, and increase social capital
- Improved bicycling conditions add to the vitality and quality of life of the community and provide access to recreational destinations across the region
- Better bicycling facilities provide access to public transit, thereby increasing transportation options

C. Structure of this Plan

The City of Rochester and other agencies throughout the broader region have been planning for improved bicycling conditions and access for many years; accordingly, this Plan begins with a summary of existing relevant planning documents and maps that provide context for this current study. In addition to work being done locally, there is naturally much to be

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learned from other communities throughout North America which are also striving to accommodate bicycling as a viable mode of transportation.

Accordingly, a peer city review was undertaken to learn some of the best practices in cities with populations and climates similar to Rochester that are noted for their promotion of bicycling.



Of significant interest to the City is an evaluation of Rochester's major roadways from a perspective of bicycling accommodation, and the subsequent identification/prioritization of potential bicycle facility improvements on those roads. The existing bicycling conditions analysis uses the leading national methodology, the Bicycle Level of Service Model. While bicycling conditions naturally vary widely throughout the City, analysis shows that the arterial and collector network provides an average bicycle level of service of "D" on an A-F scale, which is typical for communities throughout the United States but

lower than the Rochester community's articulated expectations.

On roads where bicycling accommodation is currently relatively poor, options for improving those conditions are identified, focusing on opportunities for roadway restriping. Roadway restriping options include reallocating existing pavement, frequently through the narrowing of existing travel lanes, to create space for new bicycle facilities. The analysis indicates that more than 60 miles, representing over 40% of the study network, indicate potential opportunities for restriping. Candidates for facility improvements are prioritized based on numerous factors, including existing bicycling conditions, public input, proximity to high demand destinations, crash history, and transportation equity.

Many major streets in Rochester do not have a readily apparent solution to improve bicycling accommodation, and local streets can sometimes be utilized to improve connectivity as well, so the Plan also includes broader City-wide recommendations in addition to the detailed location-specific analyses. These recommendations focus on the appropriateness of other bicycle facilities and treatments (including bike boulevards, shared lane markings, and bike parking) and changes to zoning language to promote public-private sector partnerships. No matter how well the City does with regard to improving bicycling conditions, it is equally important to encourage residents and visitors to get

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out and ride, so the Plan's recommendations also include outreach and education opportunities.

The findings of this Plan suggest that the City of Rochester is ideally suited to see a significant increase in the amount of bicycling that occurs. This increase in bicycle travel would help the City and its residents achieve the economic, health, and quality of life benefits outlined above. To help Rochester achieve its full bicycling potential, this Plan makes recommendations from the perspectives of improving on-street bicycling facilities/accommodation and taking advantage of existing initiatives/partnerships to encourage residents to get out and ride.

D. Bicycle Friendly Community Status

The League of American Bicyclists (LAB), a national bicycle advocacy organization, manages the Bicycle Friendly America program, one component of which is the identification of Bicycle Friendly Communities (BFCs) based on their support of bicycling. Community support of bicycling, as defined by the LAB for the purposes of evaluating BFC applications, consists of five categories ("the five Es"):

- 1) Engineering (including on-road and off-road bicycle network and bike parking);
- 2) Education (bicyclist and motorist education efforts);
- 3) Encouragement (including bike maps, incentive programs, and Safe Routes to School programs);
- 4) Enforcement (connections between the bicycling community and the law enforcement community); and
- 5) Evaluation & Planning (including the presence of a bicycle master plan and its implementation status).

In 2008, the City of Rochester submitted a BFC application and received an Honorable Mention for its efforts. The City of Rochester has a stated goal to take the next step and achieve full BFC status (awarded in the categories of Bronze, Silver, Gold, and Platinum). This Bicycle Master Plan, through both its adoption and its identified recommendations, provides a framework to help the City achieve that goal.

E. Project Advisory Committee

The development of the Rochester Bicycle Master Plan has been aided significantly by members of the Project Advisory Committee. This Committee includes members of the public, professional staff from the City of Rochester and other implementing jurisdictions, and other stakeholders. Committee members attended regularly scheduled progress meetings and provided valuable input on draft materials. Public agency members also participated in an air quality and health benefits training workshop led by the consulting team. This training was designed to equip the region's implementing jurisdictions with the latest available tools that can be used to tangibly quantify some of the many identified community benefits that

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result from the provision of improved bicycling accommodation in Rochester. A list of Committee members is shown below.



Project Advisory Committee Members

Steve Beauvais, *NYS DOT*

Bill Collins, *Citizen/Rochester Cycling Alliance*

Richard DeSarra, *Citizen/Rochester Cycling Alliance*

Andrew Dollard, *Citizen/Rochester Cycling Alliance*

Erik Frisch, *City of Rochester (Project Manager)*

Scott Leathersich, *Monroe County*

Dr. Scott MacRae, *University of Rochester/Rochester*

Cycling Alliance

Jeff Mroczek, *City of Rochester*

Richard Pifer, *University of Rochester*

Peter Siegrist, *City of Rochester*

Gail Stephens, *Citizen*

Chuck Thomas, *City of Rochester (Project Manager)*

Bob Torzynski, *Genesee Transportation Council*

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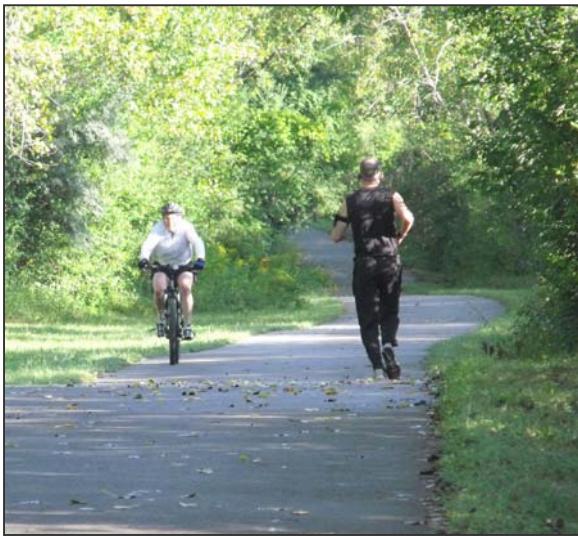
Chapter 2: Related Planning Initiatives

2. Related Planning Initiatives

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A review of existing bicycle and multi-use trail plans, studies and proposals, as well as other relevant City planning documents, provides context for the development of this Bicycle Master Plan. The following section includes summaries of those studies, details their relevance to bicycle and pedestrian issues, and identifies ways in which portions of the current study will clarify issues raised or complement recommendations made by the existing studies. Needs identified by these previous plans have been noted for integration into the needs and prioritization criteria developed in Chapter 4.



The City of Rochester has a thorough documentation of its off-street trails system. Connections and access to the off-street system will help fulfill the vision of the network across the region as a whole. The following list of documents represents both on- and off-street plans. Plans for on-street facilities and plans that identify intersections between the two networks are the focus of this review.

A. Trail Design Studies and Maps

- Eastman Trail Map (*Projected 2010-11 Study*)
- El Camino Trail (*Active Design, 2010*)
- Erie Lackawanna Railroad Bridge Conversion (*Feasibility Study, 2008; Active Design, 2010-11*)
- Genesee Riverway Trail (GRT) Feasibility Study: Downtown to Lower Falls Park, 2006
- GRT: Gateway Park Improvements Map (*Active Design, 2010-11*)
- GRT: Lower Falls to Corn Hill Connection (*Active Design, 2010-11*)
- GRT Neighborhood Connector: Genesee Valley Ice Rink (*Active Design, 2010-11*)
- GRT Neighborhood Connector: Harding Brewster Park (*Active Design, 2010-11*)
- GRT Neighborhood Connector: South Wedge (*Active Design, 2010-11*)
- GRT: South River Corridor Trail Rehabilitation Map (*Pending Funding Approval*)
- GRT: Troup Street Connector (*Active Design, 2010-11*)
- Highland Park-Canalway Trail Project (*Feasibility Study, 2004; Active Design, 2010-11*)
- Kings Landing to Turning Point Park Map (*Projected 2010-11 Study*)
- Lighthouse Trail Map (*Active Design 2010-11*)
- Regional Trails Initiative Final Report & Action Plan: Phase I – Rochester TMA, 2002
- River Street - Green Street Improvements Map (*Active Design 2010-11*)
- Running Track Trestle (*Active Study, 2010*)

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- Triple Divide Trail System (*2010 Strategic Plan*), Genesee River Wilds Project

B. Improvements to Neighborhood Infrastructure:

Recently Completed or in Active Design/Study

Many of the following projects may not have a bicycle-specific component, but a recently completed or planned project may influence the timeliness and potential for future infrastructure improvements. This is a sampling of key initiatives and is not intended to represent an exhaustive list of all recent and ongoing City projects.

ARTWalk Extension and University Avenue (Active Design, 2010). The existing area of ARTWalk along University Avenue is filled with public art in a number of forms: sculpture, benches, bus stations, mosaic light poles, and stamped sidewalks. The City needs to reconstruct streets and sidewalks along a portion of University Avenue from Union Street to Goodman Street. The ARTWalk public art concept will extend into this section of the corridor.

Atlantic Avenue Reconstruction (Completed 2007). Improvements included: Street reconstruction, new curbs, sidewalks, and street lighting on Atlantic Avenue between North Winton Road and the CSX Railroad Bridge.

Chili Avenue Gateway Improvements (Completed 2005). Improvements included: Street reconstruction, new curbs, sidewalks, sewers, signals, street lighting,

landscaped median, and gateway sign between West Avenue and the western city line.

City of Rochester Focused Investment Strategy (2008 to present). The City of Rochester initiated the Focused Investment Strategy (FIS) in the fall of 2008. The goal of the strategy is to markedly improve neighborhoods in the City within a three to five year timeframe by focusing federal Community Development Block Grant (CDBG) funding and leveraging other available resources. The following four targeted neighborhoods are currently designated as part of the FIS: Marketview Heights (Northeast Quadrant), Dewey Driving Park (Northwest Quadrant), Beechwood (Southeast Quadrant), and Jefferson (Southwest Quadrant).

Jefferson Avenue Revitalization Project (Active Design, 2010). Proposed improvements include: Street improvements, curbs, sidewalks, lighting, decorative crosswalks, a neighborhood gateway, and one intersection bump-out. Amenities may also include: Light pole banners, commemorative plaques, bicycle racks, benches, and sidewalk pillars.

Midtown Redevelopment - Midtown Rising (Active Design and Demolition, 2010). Midtown Rising is an 8-10 year development plan that includes redeveloping the nearly 9-acre former Midtown Plaza. Tentative agreements are in place for a new corporate headquarters building, as well as for adaptive reuse of the former Midtown Tower for

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luxury residential rentals and condos. The plan breaks the site down into seven development parcels with a re-established street grid. When complete, the site will accommodate about one million square feet of office, residential, hotel and retail space.

Mount Hope Avenue Reconstruction, Phase 1 (Elmwood Avenue to Rossiter Road). Full reconstruction of a five-lane Principal Arterial street that contains some of the most accident-prone intersections in the region. Plans call for a landscaped center median with turn lanes, on-street parking, wide sidewalks, enhanced lighting, access management, and a new signalized intersection coordinated with the planned University of Rochester Collegetown mixed-use development.

Plymouth Avenue Roundabout (Completed 2005). Improvements included a traffic roundabout from Barton Street to Ford Street on Plymouth Avenue.

Frederick Douglass-Susan B. Anthony Memorial Bridge (I-490) Over Genesee River (Completed 2007). The Douglass-Anthony bridge, a new triple steel-arch bridge, replaced the aging Interstate 490 (Troup-Howell) bridge across the Genesee River in downtown Rochester. NYSDOT sponsored the work as part of its Western Gateway project. The construction work occurred between April 2004 and June 2007. The bridge now handles 76,680 vehicles per day (2007 mean estimated figure). As a part of

Interstate 490, the bridge does not allow bicycles or pedestrians.

West Main Street Enhancements (Completed 2008). Improvements to the Susan B. Anthony neighborhood included: Street improvements, sidewalks, curbs, ornamental lighting, inlaid granite strips, pocket park and historic pillar markers between Broad Street and Jefferson Street.

West Ridge Road Reconstruction (Completed 2007). Improvements included: Complete street reconstruction, traffic management features, new signal phasing, landscaped median, public art, noise walls, a pedestrian bridge, and new roadway alignment between Hanford Landing and the Veteran's Bridge.



C. Plans, Studies and Technical Memorandums

- Bicycle and Pedestrian Action Plan for the Rochester Metropolitan Area, 1996
- Center City Circulator Feasibility Study (underway in 2010)

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- Dewey Avenue Corridor Traffic Calming Study, 2010
- Genesee-Finger Lakes Historic Transportation Gateway Inventory and Assessment, 2009
- Historic Erie Canal Aqueduct & Broad Street Corridor Master Plan, 2009
- Long Range Transportation Plan for the Genesee Finger-Lakes Region: 2007 - 2027 Update (Bicycle & Pedestrian Section)
- Marina Engineering Report and Feasibility Study: City of Rochester, NY, 2009
- Neighborhood Traffic Calming Manual: City of Rochester, NY, 2009
- Port of Rochester Transportation Evaluation and Support Study, 2009
- Project Green, Appendix I: Bicycle Access Strategy, 2009
- Rochester 2010: The Renaissance Plan, 1998
- Safe Routes to School Action Plan, Rochester City School District, School #19, 2009
- Safe Routes to School Guidebook for the Genesee-Finger Lakes Region, 2009
- Technical Memorandum: Bicycle & Pedestrian Supportive Code Language, 2007
- Technical Memorandum: On-Street Bicycle Facilities Opportunities Assessment, 2007
- Technical Memorandum: Overview of Currently Accepted Bicycle Facility Standards, Guidelines, and Practices, 2005
- Town of Penfield Bicycle Facilities Master Plan, 2009

- University of Rochester Campus Master Plan, 2008

While all of the listed studies and reports provide important information, the following summaries provide more detail about the planning documents that relate most to the Bicycle Master Plan.

Bicycle and Pedestrian Action Plan for the Rochester Metropolitan Area, 1996. This report was prepared in 1996 by the Genesee Transportation Council in response to the Federal policy to promote increased use of bicycling and walking as transportation. The Intermodal Surface Transportation and Equity Act (ISTEA) of 1991 required inclusion of these elements in Metropolitan Transportation Plans and Programs. The plan focuses on specific, achievable actions that would improve conditions for bicycling and walking in the Rochester Metropolitan Area.

This plan makes recommendations for bicycle transportation, pedestrian walkways and off-street multi-use trails. The action items for each of these areas are broken down into five categories: engineering, education, enforcement, encouragement and economic development. Despite having many important recommendations, in general this plan does not address specific locations for improvements. The plan does, however, propose on-street bicycle routes, including the following city corridors: East Avenue, Mount Hope Avenue, St. Paul Boulevard, Lake Avenue, West Main Street and Chili Avenue.

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The plan also references other local bicycle plans that were completed in the 1970s and 1980s. The plan's appendices list the status of the site-specific recommendations proposed in the 1979 City of Rochester Bikeway Plan and the 1982 GTC Bikeway Implementation Program, respectively.

Dewey Avenue Corridor Traffic Calming Study, 2010. This recently completed study identifies improvements to the Dewey Avenue Corridor in the City of Rochester and the Town of Greece. Improvements are targeted to calm traffic and improve safety and comfort for bicyclists and pedestrians. Proposed alternatives include on-street, off-street, and program/policy recommendations. Bicycle-related on-street recommendations include a road diet with bicycle lanes, bicycle boulevards where a road diet is not feasible, bicycle boxes, and signalization/signage improvements. Bicycle-related off-street recommendations include bicycle racks, bicycle lockers, shared-use driveways, and pedestrian/bicycle-oriented parking lots. Bicycle-related programs and policies include educational programs, code and zoning improvements, and maintenance programs.

Genesee-Finger Lakes Historic Transportation Gateway Inventory and Assessment, 2009. A reconnaissance-level survey has been conducted within the boundary of the Genesee-Finger Lakes Region, which includes Genesee, Livingston, Monroe, Ontario, Orleans, Seneca, Wayne, Wyoming, and

Yates Counties. The survey data identifies historic properties suitable for specific transportation improvements in the region, such as rehabilitation and adaptive reuse for welcome centers and/or pedestrian, bicycle, boater, mass transit, and/or motor vehicle facilities. Survey data will assist in future transportation-related projects that may include acquisition of scenic easements and scenic or historic sites, historic preservation, and the rehabilitation and operation of historic transportation buildings, structures, or facilities. Six structures/properties in the City of Rochester are already listed on the National Register of Historic Places, and three additional structures were identified.

Historic Erie Canal Aqueduct & Broad Street Corridor Master Plan, 2009. The Historic Erie Canal Aqueduct and Broad Street Corridor Master Plan serves as a guide for future development of the area and the adaptive reuse of the Erie Canal Aqueduct and the Broad Street roadway structure. The master plan creates a vision for the future of this underutilized district through rediscovering its past and its essence: the Genesee River and the Erie Canal. The plan establishes the Broad Street Corridor as a significant public realm defined by water, creating a distinctive new identity. The rediscovered Erie Canal becomes the heart of the new Canal District.

The master plan describes the public investments in infrastructure and amenity improvements required to establish an energetic new district including

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anticipating traffic impacts and improvements while accommodating anticipated future mass transit initiatives. Based upon 10-year market projections, the plan anticipates and creates a guide to private investment in conjunction with the phased public improvements.

The master plan calls for the transformation of the Broad Street Corridor from a primarily vehicular use to an amenity-enhanced concourse. Vehicular traffic volumes are accommodated and the street network is relatively unaffected with proper roadway mitigation. The study does not specifically address the impacts that the proposal would have on bicyclists who utilize the Broad Street Corridor.



Long Range Transportation Plan for the Genesee Finger-Lakes Region: 2007 - 2027 Update (Bicycle & Pedestrian Section). This plan focuses on the expansion of the multi-use trail network, while acknowledging the importance of integrating both the on- and the off-street networks. It identifies the

highway and bridge network as the main component of the bicycle and pedestrian network and describes the multi-use trail system serving as “an alternate expressway for non-motorized users of the transportation system.” With this in mind, convenient access to and from the highway and bridge network is seen as critical to the success of the system that provides a reasonable travel alternative to the car.

This plan also acknowledges five potential benefits of bicycling and pedestrian activity:

- Improved transportation choice;
- Reduced congestion/more efficient use of the transportation system;
- Reduced community health care costs;
- Increased attractiveness to residents and visitors; and
- Pollution reduction.

Port of Rochester Transportation Evaluation and Support Study, 2009. This report outlines various transportation studies conducted for the Transportation Evaluation and Support Study for the Port of Rochester Area Transportation Inventory project. The studies were initiated to understand current transportation operation issues within and immediately surrounding the Port Area. This information will provide a base to evaluate transportation operations at a later date of proposed redevelopment of the Port.

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Following an overview, the study provides counts of transportation elements including vehicles, pedestrians and other forms of transport of people.

This is followed by a description of the present parking occupancy at the Port Area during peak Port activities. Traffic operations are then described and followed by a discussion of alternative access options for Lot E, which is a free public parking lot adjacent to the beach. Alternative off-site parking areas to provide spaces needed for port activities subsequent to proposed redevelopment plans are then described. This is followed by a discussion of the proposed North River Street Extension in the redevelopment plan for the Port. A brief discussion of potential Intelligent Transportation System initiatives applicable to the Port Area are described next, followed by a summary chapter of project studies and discussions. Bicycle issues are generally not addressed, though bicycle trails exist that lead to the port from the south, east, and west.

Project Green: From Blight to Bright - Appendix I: Bicycle Access Strategy, 2009. Part of a larger strategy to “right size” or match the footprint of Rochester’s built environment with its existing and anticipated future population, this document details strategies to invest in the city to address the challenges of high vacancy rates and a shrinking population. Of particular interest for the Bicycle Master Plan is the Bicycle Access Strategy. This strategy would designate mostly local streets that satisfy particular criteria as bikeways and begin to

transform the existing bicycle facilities into a legitimate human scaled transportation network.

To be designated a Bikeway, streets must have:

- Certain structural characteristics that provide protection and separation between motor vehicles, bicyclists and pedestrians;
- Safe crossings at intersections;
- Appropriate signaling, lighting, signage informing motorists and cyclists of route information; and
- Be in good condition.

This study also includes a Downtown Bikeway Proposal that identifies specific locations for intersection improvements, connections, loops and pedestrian access viaducts.

Regional Trails Initiative Final Report & Action Plan: Phase I – Rochester TMA, 2002. While primarily a plan for the regional trails vision, this document states that its purpose is to develop a comprehensive and achievable action plan for community leaders to create and maintain a safe, accessible, and highly functional regional trail system that is fully integrated with the existing transportation system and constitutes a nationally recognized distinguishing feature of this region.

The plan acknowledges that in order to truly meet the transportation and recreation needs of the region, it will be necessary to fully integrate the region’s trails with its existing road network. It contains a list of on-

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street trail connection recommendations that were based on the 1998 *Greater Rochester Area Bike Map* and recommends that Roadway Corridor Feasibility Plans be undertaken to determine what type of improvements are needed and feasible on specific roadway corridors.

Rochester 2010: The Renaissance Plan, 1998. The 2010 Renaissance Plan, prepared in April 1998, was Rochester's first citywide comprehensive plan since 1964. To the extent possible, the plan incorporates the goals and visions of each of the ten sector plans that were prepared under the Neighbors Building Neighborhoods program. The plan uses three themes to articulate a renaissance of urban revitalization: Renaissance of Responsibility, Renaissance of Opportunity, and Renaissance of Community. The Renaissance of Responsibility seeks to renew Rochester's history of civic activism and philanthropy established by past famous residents Frederick Douglass, Susan B. Anthony, and George Eastman. The Renaissance of Opportunity promotes and develops Rochester as the economic, social, cultural, transportation and institutional center of the county and region. The Renaissance of Community seeks to identify Rochester's downtown as a place that will be redeveloped and perceived as the region's Center City, and will include an exciting mix of housing, retail, services, cultural venues, entertainment and night life. The Renaissance Plan identifies eleven goals, or campaigns:

- Campaign One: Involved Citizens

- Campaign Two: Educational Excellence
- Campaign Three: Health, Safety, and Responsibility
- Campaign Four: Environmental Stewardship
- Campaign Five: Regional Partnerships
- Campaign Six: Economic Vitality
- Campaign Seven: Quality Service
- Campaign Eight: Tourism Destination
- Campaign Nine: Healthy Urban Neighborhoods
- Campaign Ten: Center City
- Campaign Eleven: Arts and Culture

Safe Routes to School Guidebook for the Genesee-Finger Lakes Region, 2009. This guidebook is a plan to establish safe walking and bicycling programs for schools in the Genesee-Finger Lakes Region. In addition to describing the basic elements of starting a program, it discusses the opportunities and barriers to doing so, and describes how to implement a program.

Safe Routes to School Action Plan, Rochester City School District, School #19, 2009. This project was funded by the Genesee Transportation Council (GTC) and was part of a model Safe Routes to School (SRTS) program for the Rochester region. The Rochester City School District and Monroe County have had a successful school traffic safety program for many years and this document was intended to complement the community's existing efforts.

The Action Plan has two main themes. The first was to provide an overview of SRTS initiatives that could

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serve as examples for urban schools in Rochester. The second theme was to provide a review of the existing conditions surrounding the Dr. Charles T. Lunsford Elementary School #19 and suggest potential 'next steps' projects and programs to improve the safety, health, and wellness of the school's students. The goal of the action plan was to identify potential physical improvements and operational measures for the school site and its surrounding area, as well as prioritized follow-on activities to advance the recommendations.

Technical Memorandum: Bicycle & Pedestrian Supportive Code Language, 2007. This document examined local and regional zoning and development codes to identify exemplary codes and policies that enhance accessibility and safety for bicyclists and pedestrians. Of particular interest to the Bicycle Master Plan was the review of codes and policies related to bicycle parking.

As of 2007, the City of Rochester Charter and Code (Chapter 120-173, Off Street Parking) required that bicycle parking equal to 10 percent of the vehicle parking requirements for the property (for a minimum of two bicycles) be provided at all multifamily housing (over ten units), commercial, and industrial uses. Additional requirements include locating bicycle parking in a safe and convenient location, designing facilities to accommodate U-shaped locking devices and being able to support bicycles without damage on facilities that are stable and secure.



Technical Memorandum: On-Street Bicycle Facilities Opportunities Assessment, 2007. This document updates the work done on the *Regional Trails Initiative*, focusing on opportunities to incorporate bicycle accommodation per the accepted range of on-street bicycle facility types emphasizing low-cost applications and strategic improvements. Roads were categorized based on rural/urban classification, posted speed, pavement width, shoulder width, number of lanes and average daily traffic.

An additional suitability rating of near-, mid-, or long-term recommendation based on ratings developed by the Rochester Bicycling Club was applied. "Poor" or "fair/poor" rated segments were recommended for near-term study, "fair" segments were rated for mid-term study and those rated "fair/good" or "good" were recommended for long-term study. Of those near-term recommendations for further study in the Rochester Transportation Management Area, 14 of them are within the City of Rochester's jurisdiction. Based on the criteria listed in *Selecting Roadway Design Treatment*, the recommended facility

2. Related Planning Initiatives

Rochester Bicycle Master Plan



treatment for each of these roadways is a 5-6' bike lane.

Technical Memorandum: Overview of Current Accepted Bicycle Facility Standards, Guidelines, and Practices, 2005. This Technical Memorandum provides an overview of the current accepted national, state, and local bicycle facility standards, guidelines, and practices. It also provides information on liability as it relates to bicycle facilities and the accommodation of bicycling in our transportation system. This information serves as a basis for recommending bicycle facility treatments for the Rochester Transportation Management Area (TMA) roadway system. The Rochester TMA includes Monroe County and the adjacent developed areas of Livingston, Ontario and Wayne Counties.

To support municipalities and transportation agencies' efforts to improve bicycling conditions in this region, GTC staff surveyed and assessed existing roadway conditions for opportunities to provide on-street bicycle accommodations within the Rochester TMA. This survey utilized existing data and Geographic Information Systems (GIS) resources compiled by GTC staff. GTC staff employed current accepted bicycle facility standards, guidance, and practices to recommend potential bicycle accommodations for collector and arterial roads in the TMA.

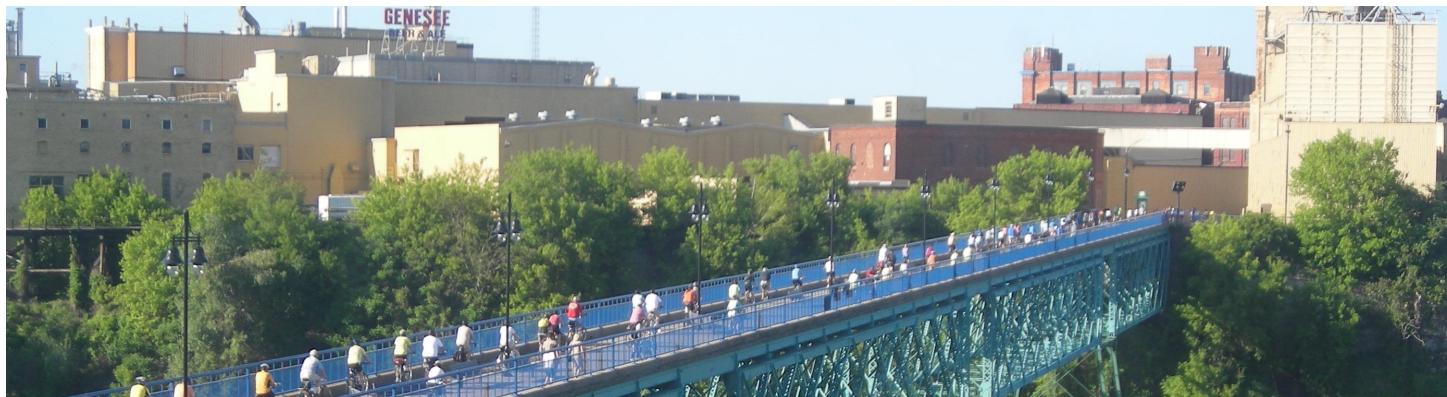
Town of Penfield Bicycle Facilities Master Plan, 2009.

This report summarizes the objectives, procedures

and products derived from the analysis and planning studies for the Bicycle Facilities Master Plan for the Town of Penfield. Based on input from the Penfield bicycling community, a list of Community Destinations was mapped. The best roadways accessing and connecting the Community Destinations were identified and mapped as Priority Bicycle Routes. The Priority Routes include roughly 61 miles of roadway, and fall under Town, County and State jurisdiction. An inventory and analysis process was then applied to the Priority Bicycle Routes. To help focus and prioritize implementation of improvements, input from the cycling community was solicited to identify areas along the Priority Routes that have problems in need of immediate attention or repair.

The Penfield Bicycle Facilities Master Plan emphasizes the requirements of the basic cyclist, while recognizing the needs of advanced cyclists and children. Recommendations for improvements were made in four categories: On-road Improvements, Off-road Improvements, Bike Facilities at Destinations, and Policies & Programs. A phasing plan and cost estimates are included to facilitate implementation of the Recommendations. An Education Plan provides tools and strategies to increase public awareness, enhance safety, and encourage bicycling among a diversity of user groups. The Education Plan recognizes that transportation networks are shared resources utilized by motor vehicles, bicycles, and pedestrians alike.

Rochester Bicycle Master Plan



— Chapter 3: Peer Cities

3. Peer Cities

Rochester Bicycle Master Plan



A. Introduction

For this task, project stakeholders identified four “peer” cold/snow weather cities whose bicycle programs may provide best practices from which Rochester can learn. These cities are Boulder, CO; Montréal, Québec; Minneapolis, MN; and Madison, WI. Other cities, as appropriate, were also reviewed. The results of the research will help the City of Rochester better understand the different approaches to successful non-motorized transportation programs.

The review examined the eight categories listed below, with much of the information available in the cities’ transportation plan or bicycle master plan. Additional information was added by interviews with the bicycle and pedestrian coordinators from the respective cities. A list of references for this peer city review is contained in Appendix A of this Plan.

1. Bicycle infrastructure including bike lanes, paved shoulders, shared use paths, sharrows, and bike boulevards
2. Bicycle services including bike parking, bike sharing, end-of-trip facilities, and route/wayfinding signage
3. Municipal code language that supports bicycling, including zoning changes/recommendations
4. Education and outreach programs
5. Municipal staffing commitment
6. Private sector partnerships and/or incentives
7. Snow removal strategies
8. Strategies for dealing with on-street parking when attempting to retrofit roadways

B. Bicycle Infrastructure

Bicycle infrastructure consists of many varying facility types. These include on-street facilities such as bike lanes (space designated for preferential use by bicyclists), paved shoulders (space similar to bike lanes that has not been so designated), and shared lane markings, sometimes called “sharrows,” which are pavement markings that help position bicyclists within the lane. Shared use paths are physically separated from the roadway and can be either adjacent to the roadway or operate as an independent alignment. Bike boulevards are roadway corridors (typically low-speed, low-volume roads) optimized for use by bicyclists through a variety of traffic calming and other treatments. The table below shows the existing bicycle infrastructure in Rochester’s identified peer cities.

City	Bike Lane/ Sharrow/ Paved Shoulder	Shared Use Path	Bike Blvd	Bike Route
Boulder	37 mi	9 mi	informal	43 mi
Montréal	25 mi	N/A	N/A	N/A
Minneapolis	44 mi	84 mi	6 funded	12 mi
Madison	63 mi	42 mi	3 (pilot)	134 mi
Rochester	6 mi	22 mi	0 mi	0 mi

1. Bike Network: Boulder

Boulder has over 305 directional miles of dedicated bike facilities (this includes on-street, contra-flow, designated routes, paved shoulders, and multi-use and soft surface facilities).

3. Peer Cities

Rochester Bicycle Master Plan



The City has a Complete Streets policy. Designing for complete streets that include pedestrian and bicycle facilities helps the City get more federal dollars per project than designing them without, according to their Bicycle and Pedestrian Coordinator. Bicycle projects are included in their restriping and resurfacing programs. As part of their Transportation Master Plan public outreach process, it was determined that the community likes both on- and off-street facilities. This leads to a blending of facilities, and the City attempting to incorporate sidewalks as part of their multi-use path system. The standard sidewalk is 8 feet wide, with 10-12 feet being the standard in more pedestrian congested areas.

The City has developed a Comprehensive Sign Policy in place to try to address sidepath/multi-use path conflict points. They also have developed and adopted Pedestrian Crossing Treatment Warrants as well as installed enhanced treatments on multi-use paths adjacent to or crossing roadways in the attempt to reduce conflicts between motorists, bicyclists and pedestrians. Their current treatments include:

- (1) Raised right-turn bypasses that serve as speed humps for motorists turning right and also facilitate a 90-degree approach for bicycles entering the crosswalk;
- (2) Pedestrian-activated crossing signals that trigger flashing beacon signs to allow bicyclists to cross more safely at unsignalized crosswalks. One of

these crossings can be activated by a bicycle-detecting loop in the bike lane;

- (3) Signing that informs right turning and left turning motorists that they will be crossing a bikeway adjacent to the roadway of which they are turning; and
- (4) Colored pavement markings to indicate bikeway crossings at driveways and raised right-turn bypasses.



Right turn bypass lane in Boulder, CO

Many motorists in Boulder are exposed to all or most of the treatments described above on a daily basis and the City is determining which are effective, and which are not. While Boulder has no formal bike boulevards, many of their local streets function as typical low traffic speed, low volume bike boulevards. Their Traffic Calming program, into which bike boulevards fall, is currently unfunded.

Boulder does not have a pre-set timeline for restriping roadways. The City reviews their assets each year and determines which crosswalks, legends, lane

3. Peer Cities

Rochester Bicycle Master Plan



Signage examples in Boulder, CO

lines, bike lanes, etc. are in need of restriping and they restripe as much as the budget allows. More significant changes (removing crosswalks, changing position of lane lines, etc.) may occur when a roadway is resurfaced and all pavement markings need to be newly applied. Major roadways are resurfaced every 7 to 10 years while lower volume/classification roadways are resurfaced much less frequently.

2. Bike Network: Montréal

Montréal has a 311-mile network. 32 new miles were added in 2010: 25 miles of bike lanes with symbols and 7 miles of cycletrack. Their goal is 497 miles of bike paths by 2015.

Montréal has developed a 19-mile network called the *White Network* that is maintained all year long. Since 2007, in addition to routine maintenance, this series of bike paths has been plowed and kept clear of snow allowing for use during all seasons. An additional 39 miles are planned for this network.

3. Bike Network: Minneapolis

Minneapolis has a 128-mile network consisting of 84 miles of dedicated bike paths and 44 miles of on-street bicycle facilities. The City has plans to install another 40 miles of designated bike lanes. The bicycle/pedestrian coordinator estimates that while 5-10% of the on-street facilities are shoulders or sharrows, the majority are marked bike lanes.

There is no Routine Accommodation policy but the *Access Minneapolis* plan clearly defines a process for including all modes. *Chapter 3, Design Guidelines for Streets and Sidewalks* details a process titled "Develop a Citizen View of the Street" which uses the following questions as a guide for the process:

- What are the things you like about this place, street, neighborhood, community?
- What are the problems?
- How is this place/street used?
- What works well and doesn't work well?
- How have you seen this place/street change in the past?
- How do you expect it to change in the future?
- What kinds of trips do you make and what modes of transportation do you use?

3. Peer Cities

Rochester Bicycle Master Plan



In Minneapolis, a grant from the federal government managed by the Non-Motorized Pilot Program has helped fund the building of a bike boulevard on Bryant Avenue and the planning of five others. These bike boulevards, which will include a combination of signage and traffic calming, range in cost from \$50,000 to \$400,000, and average one to three miles in length.

Minneapolis' extensive off-street system exists mostly along rivers and creeks and on old rail corridors with few street crossings. There are few conflict points, so mitigating the challenges of sidepaths is not a high priority.

4. Bike Network: Madison

Madison has 63 miles of on-street bicycle facilities (bike lanes, paved shoulders); 42 miles of bike paths and trails; 134 miles of signed bike routes and 12 miles of wide curb lanes that are being converted to bike lanes.

There are three bike boulevard pilot projects underway. These entail signage and paint markings, specifically Share the Road signage. Additional treatments such as speed bumps are typically part of a traffic management program. While all three bike boulevards (E. Wilson, E. Miflin, and Kendall Avenues) are pilot projects, the city has approved replacing a temporary barrier on Kendall Avenue with a permanent concrete curb to keep cars out, especially because some drivers are still turning onto

the avenue. The pilot program will study these areas for about a year before deciding if bike boulevards will be permanent and if others are needed. The signage and marking on Kendall Avenue cost the city about \$5,000.

The addition of any physical features to roadways will occur as part of the political process, the Neighborhood Traffic Management Program or reconstruction or development of the streets as part of another project, as there is no protocol for including the physical traffic calming features in the current bike boulevard program. Potential bike boulevards may be identified by neighborhoods.

C. Bicycle Services: Bike Parking, Bike Sharing, and Route/Wayfinding Signage

Bicycle services play an important role in a person's decision to ride a bicycle and should be provided at both the trip origin and the destination, providing a safe place to leave a bicycle for the needed time. Bicycle parking should be included to accommodate a variety of needs and can be addressed in several ways. Short-term bicycle parking, typically bicycle racks against which the bicyclist can lock both their frame and the wheels in a highly visible location, can be an option for cyclists needing parking during short stops. Long-term bicycle parking typically entails covered bicycle storage lockers and is common in parking garages or transit stations. These secure facilities are accessed by lock or combination.

3. Peer Cities

Rochester Bicycle Master Plan



Bicycle sharing is an increasingly popular option in cities throughout North America, with programs ranging from a few hundred to a few thousand bicycles. These on-demand systems offer inexpensive, convenient bicycle rentals, typically in a downtown or urban setting.

End of trip facilities, including showers and changing facilities, are desirable for encouraging bicycle commuting. These facilities may be available on a per office or per building basis. Occasionally, an arrangement with a local health club can be used to satisfy the needs of bicycle commuters.

Wayfinding/route signage is an important component in any bicycle network and can be used to identify key routes and offer destination information. There may or may not be a local identity component to the wayfinding system.

The following chart shows the bike services facility types and some of the cities in which they are found. End-of-trip facilities, while listed here, are addressed in Section 3 of this review because such facilities are frequently included in cities' zoning codes.

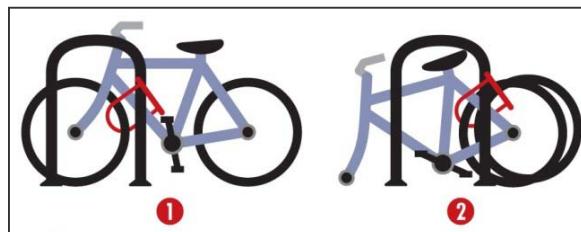
1. Bicycle Parking

Bicycle parking is a critical piece of a successful bicycle program. Having somewhere safe and secure to park a bicycle often influences the decision to make a trip by bicycle. There are a variety of strategies employed by the peer cities and frequently each element is part of a comprehensive parking program.

Boulder. Boulder offers a variety of parking options, including their parking corral pilot program.

The city offers two bike rack styles as well as covered parking:

Inverted U. Lean the bike along the side of the rack and secure with a U or cable lock. This bike rack provides two points of contact for a bike and accommodates two bikes.



Inverted U Style Bicycle Rack

City	Bike Parking	Bike Sharing	End-of-trip Facilities	Route/Wayfinding Signage
Boulder	x	x (in process)		x (43 miles)
Montréal	x	x (BIXI)		x (43 miles)
Minneapolis	x	x (BIXI)	x (zoning code)	x
Madison	x			x (134 miles)
Seattle	x		x (zoning code)	x
Denver	x	x		x

3. Peer Cities

Rochester Bicycle Master Plan



Cora Racks. Secure the bike perpendicularly to the rack by attaching your lock to one of the upright posts.



Cora racks on the University campus, Boulder, CO

Covered Parking. Secure bike parking is available and free at three garages.

Boulder relies on property owners to provide adequate bike parking for their buildings. Long- and short-term bicycle parking have recently been defined in the Design and Construction Standards, but required percentages have not been designated in the Zoning Code.

The Denver Regional Transportation District, which is responsible for public transit in the metro area, provides free bicycle storage lockers at many of its transit stations, including the downtown Boulder Transit Station and the nearby Table Mesa Park-n-Ride.

Boulder Corral Pilot Program. The City is installing bike corrals as a year-long demonstration project to evaluate use, maintenance, traffic safety and public

opinion of the treatment. Next steps would be based on the results of the evaluation.

A bike corral provides bicycle parking in the parking lane. Transportation and Downtown and University Hill Management Division/Parking Services (DUHMD/PS) are working in partnership to pilot bike corrals at two locations along Pearl Street:

- 1521 Pearl Street, at Cup Espresso Café
- 940 Pearl Street, at Trident Booksellers & Café

Installed in mid-September of 2010, each corral replaces an existing on-street parking space with four bike racks, which accommodate eight bicycles total within the parking space. The racks for each corral cost about \$1,000.



Bike corral in front of popular cafe in Boulder, CO

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Both locations have a documented need for additional bicycle parking and the adjacent business at each location is supporting the pilot project, having agreed to handle day-to-day maintenance, including debris and snow removal.

Montréal. The *Montréal Master Plan* (December 2005) identifies specific actions that the City plans to undertake in support of expanding its bicycle program. The following actions and policy statements are made outlining the strategy:

Action 3.4: Complete the City-wide bikeway network to provide access to activity areas and public transportation and infrastructure:

The City also plans to establish adequate, safe parking facilities for bicycles, especially in workplaces and educational institutions, either inside buildings or in areas that are sheltered from the weather. Ideally, cyclists would also benefit from changing rooms and showers. The City favours the integration of the bicycle and public transportation networks, by facilitating modal transfer through quality facilities that are adapted to the needs of cyclists. In light of this, the metro and commuter train stations that are served by a bikeway will have priority in the development of bicycle parking areas. To encourage cycling and mode transfer, it is important that cyclists feel that their bicycles are safe from theft. Metro and commuter rail

stations will receive priority consideration for lockers and secure enclosures for bicycles.

Action 3.5: Promote urban development and the use of public transportation and bicycles by taking action on the supply of parking:

- Plan for an adequate number of bike racks near metro stations, train stations, office buildings and public institutions and along commercial strips.
- Integrate bike parking in every newly-constructed indoor parking lot.

In the *2008 Transportation Plan*, item 2.3 Bike Parking set a goal to increase parking facilities by 500% and says the following:

Montréal intends to share responsibility for bicycle parking facilities with its partners (property owners and institutions) so that they make necessary efforts in areas falling within their jurisdiction. Montréal plans to amend its current by-law and require parking lot owners in downtown Montréal to set aside space for bicycle parking facilities and then to adopt such a by-law for the island as a whole. This new by-law would target owners and operators of parking lots and owners of residential and commercial buildings and would require them to provide a significant number of spaces for bikes. The boroughs are asked to play an important role

3. Peer Cities

Rochester Bicycle Master Plan



with these partners in getting them to shoulder such responsibility.

The City has created a network of Bike Stations and includes bicycle parking facilities at transit stations. Additional bike parking initiatives include amending the by-law (zoning code) to increase the number of bicycle parking spaces at City buildings to at least one for every 50 employees, to enforce the by-law requirements for bicycle parking in new or renovated buildings and create incentives encouraging private businesses to add new bicycle parking spaces. The City expects to use public/private partnerships to operate aspects of the bicycle parking project.

On-street parking (in the form of bike corrals) is proposed in Montréal and could be used from spring to the fall and removed in the winter to facilitate snow removal.

Minneapolis. Minneapolis has an extensive bicycle parking program and has published a Bike Racks and Lockers Map to help bicyclists find available parking. There are approximately 3600 racks, 16,000 spaces, 29 locker locations and 249 locker spaces. Showers are available with rental of bike lockers at two locations. Costs are as follows:

\$10 Key Deposit

\$30 Seasonal Locker (Apr 1-Nov 30)

\$50 Annual Locker

\$80 Seasonal Locker and Shower (Apr 1-Nov 30)

\$100 Annual Locker and Shower

Every office building in Minneapolis is required by law to provide bicycle storage.

The ongoing Bicycle Parking project will install bike racks in partnership with private business owners (such as restaurants and retail stores) and public agencies (such as schools and libraries). The project will pay 50% of the cost of rack purchase and installation at private locations, and 100% at public agency locations.

In addition, Minneapolis cyclists have access to the Freewheel Bike's Midtown Bike Center, a coffee house/repair center/bike shop on the Greenway that the City helped fund. Inside, there is bicycle storage (which costs \$110 a year) and low-cost showers for cyclists who commute to downtown. The Bike Center began as a joint effort of Allina Health Systems and the City of Minneapolis to provide the Midtown and larger Twin Cities community a full service bike transportation station, complete with long/short term bike storage, bike rentals, a cafe, repair classes and even a public repair shop where bicyclists can do their own maintenance. It also has a full service repair shop, bicycle and accessory sales, public restrooms and other ancillary uses.

Madison. Bicycle racks have been installed throughout the City, typically in the business districts. The racks are requested as part of the annual budget and are located in the public right of way.

3. Peer Cities

Rochester Bicycle Master Plan



Seattle. The On-street Bicycle Parking program has its roots in the Bicycle Master Plan. There is one current installation and six more planned for 2010.



SDOT will consider installing on-street bike parking upon the request of the adjacent business owner. Converting a motor vehicle parking space to on-street bike parking is typically warranted in locations where bicycle parking demand is high and sidewalks are constrained—for example, outside of restaurants with sidewalk cafes or in neighborhoods with narrow sidewalks flanked with tree pits and assorted street furniture.

2. Bike Share

Bike sharing programs are increasingly popular in cities across the U.S. They come in several forms and can be scaled to meet the identified market. A number of companies specialize in the program. Public Bike System Company (PBSC), based in Montréal, developed BIXI and runs the program there in response to the 2007 Réinventer Montréal mandate to create, install and market the first large-scale public bike system in North America. PBSC was then

chosen as the supplier for the bikes and kiosks for the program in Minneapolis. BIXI systems have also been implemented in Arlington, VA and nearby Washington, D.C. The other popular current option in North America is B-Cycle. Similar in nature to BIXI, this system has been implemented in Chicago, Denver, Des Moines, Louisville and San Antonio.

Funding sources for the programs range from outdoor advertising dollars or user fees to federal grants including Energy Efficiency and Conservation Block Grants, American Recovery and Reinvestment Act (ARRA) stimulus money and other public/private partnership options. In most cases, bicycles can be rented with a monthly membership or on an hourly or daily basis and can be returned to any available kiosk location.

Boulder. The City issued a Request for Proposals (RFP) to invite qualified organizations to submit proposals to develop, install, operate and maintain the public bike share program. They had four responses and chose the company that is also running the Denver Bike Share program. The system is planned to have 200 bicycles and 15-20 stations throughout Boulder. The City of Boulder received a \$250,000 federal Energy Efficiency Community Block Grant to support the bike share program implementation. The goal is to launch the program in May 2011.

3. Peer Cities

Rochester Bicycle Master Plan



Montréal. A system of 400 closely spaced stations offering 5000 bicycles has been implemented in Montréal. Users can purchase monthly, yearly, and daily use passes and the bicycles are available three seasons of the year. The program is city run, rather than using an outside operator, and funded with fees from users rather than advertising. City ownership has allowed for greater coordination with the city's bus and subway system. The development and operation of the program is handled by the city's parking authority. Many of the current bike-share programs are managed by non-profits, but Montréal already had the real estate and the infrastructure needed and was able to launch the program itself.

The BIXI system is solar powered meaning that because the base stations do not need any electrical connections, they can be dropped anywhere without any preparatory work and can be easily removed in the fall for the winter season. This ease of use also allows the city to respond to demand patterns.

Minneapolis. Launched June 2010, the system is planned for 700 bikes and will include 65 docking stations at full implementation, with 10 of those on the University of Minnesota campus. It opened with 450 bicycles and 58 rental stations. Named *Nice Ride Minnesota*, it uses the BIXI system and is run by a non-profit and had startup funding of \$3.2 million provided by a number of sources (\$1.6 million from a federal transportation grant, \$1 million from Blue Cross Blue Shield, and the remainder from the City of Minneapolis and local businesses). The system experienced 10,000 trips in its first month.

Bike availability can be checked real-time via smartphone or online; trucks redistribute bicycles among the kiosks throughout the day. The system runs from April to November, with stations being removed during winter.

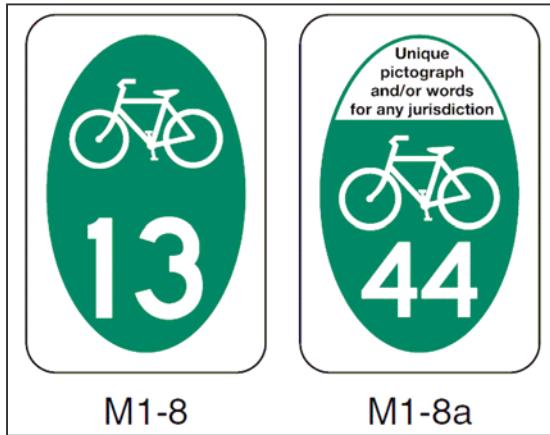


3. Wayfinding/Route Signage

While each of the reviewed cities has a route signage program, it is worth noting what the 2009 *MUTCD* says about Bicycle Route signs:

3. Peer Cities

Rochester Bicycle Master Plan



M1-8 and M1-8a 2009 MUTCD route signage

The Bicycle Route (M1-8) sign shall contain a route designation and shall have a green background with a retroreflectorized white legend and border. The Bicycle Route (M1-8a) sign shall contain the same information as the M1-8 sign and in addition shall include a pictograph or words that are associated with the route or with the agency that has jurisdiction over the route.

Boulder. Boulder maintains signs to their own local standard, which are funded through their Operational Budget. These signs are not *MUTCD* standard, but do integrate directional signage that includes the distance to destinations. Boulder has 43 miles of designated bike routes.

Minneapolis. Wayfinding and Signage Guidelines are in the *Minneapolis Bicycle Facility Design Manual*, Chapter 4 – On-Street Facilities. According to the Manual Bike Route signage should be placed at key decision points along the corridor and should be used

on designated bike routes that complete a comprehensive network. This network should consist of a grid of regularly spaced routes such that bicyclists are no further than one-quarter mile of any signed route from any point in the city. This program is in the process of being implemented and the *MUTCD* standard signage should be installed 2010-2011.

Madison. In the *Madison Mayor's Platinum Bicycling Committee Adopted Report*, a recommendation was made to convert the current bike route network and signage to a destination-based network. In addition to the Route Signage, Madison has developed map signage for their network. A total of 27 signs were installed at a cost of \$50,000. They estimate new signs to cost about \$2000 and will seek private sponsorship to defray the costs.

D. Bicycle Supportive Code Language Including Zoning Changes/Recommendations and End of Trip Facilities

1. Boulder

Certain percentages of bicycle parking are required by the zoning code for new construction and renovated buildings. Public demand for end of trip facilities has been historically low, with feedback gathered that fitness clubs fill the need or that the casual nature of the Boulder community creates little need for such facilities. There is currently discussion about adding bicycle parking requirements to the

3. Peer Cities

Rochester Bicycle Master Plan



menu of options available as part of their Transportation Demand Management Program. For the Design and Construction Standards, 2-32, see Appendix B of this Plan.

2. Minneapolis

As defined in the City's zoning code as it relates to new developments over 500,000 square feet:

549.170. Bicycle facilities in new developments. (a) *In general.* All developments containing five hundred thousand (500,000) square feet or more of new or additional gross floor area shall include secure bicycle parking spaces, shower facilities and clothing storage areas as provided in Table 549-3, Required Bicycle Facilities. Such facilities shall be for the use of the employees and occupants of the

building. Where a development includes automobile parking spaces that are monitored or are covered or weather protected, bicycle parking spaces required by this section shall be provided on the same basis. For the purposes of this section, a secure bicycle parking space shall include a bicycle rack that permits the locking of the bicycle frame and one (1) wheel to the rack, and that supports the bicycle in a stable position without damage to wheels, frame or components.

(b) *Exceptions.* This section shall not apply to buildings used primarily as hotels or for retail or residential purposes.

For Minneapolis' Bike Parking Regulations, zoning code, table 541-3, see Appendix B.

Table 549-3 Required Bicycle Facilities (*From the City of Minneapolis, MN Zoning Code*)

Minimum Required Facilities	Building Area				
	At Least 500,000 sq. ft.	At Least 750,000 sq. ft.	At Least 1,000,000 sq. ft.	At Least 1,250,000 sq. ft.	At Least 1,500,000 sq. ft.
Bicycle Parking Spaces	30	45	60	75	90
Showers*	4	5	6	7	8
Full-Size Lockers*	15	22	30	37	45

*The minimum required shall be distributed between men's and women's facilities.

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Rochester Bicycle Master Plan



3. Madison

All of Madison's Bicycle Parking requirements are detailed in the City of Madison General Ordinances (current as of June 15, 1997) 28.11 OFF-STREET PARKING AND LOADING FACILITIES. This ordinance covers the provision of off-street bicycle parking for new developments, expansion of existing developments, and changes in use that would require additional parking.

For expansions or changes in use, bicycle parking is required based only on the extra amount needed by the addition or change in use, not for the entire development. This is similar to the way in which off-street automobile parking requirements work. For the full Bike Parking Regulations, see Appendix B.

4. Seattle

Including end of trip facilities is an important part of the Zoning Code and was included following the adoption of the recent Bike Master Plan. Showers are required for buildings over 250,000 square feet but are not chargeable as part of the floor area ratio (FAR) of a project so there is no rentable square footage lost. The following is from the Seattle Municipal Zoning Code:

Bicycle Commuter Shower Facilities.

Structures containing two hundred fifty thousand (250,000) square feet or more of office gross floor area shall include shower facilities and clothing storage areas for

bicycle commuters. One (1) shower per gender shall be required for every two hundred fifty thousand (250,000) square feet of office use. Such facilities shall be for the use of the employees and occupants of the building, and shall be located where they are easily accessible to parking facilities for bicycles.

E. Education and Outreach Programs

Each of the reviewed peer cities has a number of programs that have been recommended or implemented. Some are known throughout the United States, such as the Safe Routes to School program. Others, such as Lighten up Boulder, have a very local flair. Typically in response to a problem or a goal, these programs can present opportunities to engage the community.

1. Boulder

Boulder has a number of education and outreach programs that it has developed. Further discussion of the programs listed below and the relevant section of the city's Bike Friendly Community (BFC) application have been included as Appendix C of this Plan. The BFC application highlights the range of programs, both formal and informal, that the City of Boulder has developed and implemented.

Unlike the other peer cities reviewed, the City's bicycle and pedestrian programs are managed by Great Options, or GO Boulder, a city department that has developed and promoted alternative modes of

3. Peer Cities

Rochester Bicycle Master Plan



transportation in the city since 1989. The mission of GO Boulder is to achieve the objective of the Updated Transportation Plan (TMP): stay the course of no long-term growth in auto traffic. To reach this objective, it was determined that single-occupancy vehicle trips need to be reduced from 44 percent of all trips to 25 percent by 2025, with no more than 20 percent of roadways congested. To that end, the department has developed a Community Transit Network with user friendly amenities; supports the use of public transit and partners with the Regional Transit District; develops, maintains and promotes the bike network; and develops long and short range planning to design an integrated multi-modal system.

Some of the programs it is responsible for are the following:

Boulder's Walk & Bike Month. This program features a month long calendar of events that offers organized rides for different ages and abilities, bike handling skills and maintenance workshops, and a Bike to Work Day Commuter Challenge.

Commuter of the Year Contest. Each spring extraordinary commuters are recognized for their dedication to finding, using and promoting Boulder's transportation options and award winning facilities.

Lighten Up Boulder. This is an annual campaign stressing the importance of using bike lights. GO Boulder/City of Boulder teams up with the University

of Colorado and local merchants to offer discounts on bike light accessories at participating merchants.

Safe Routes to School. The Colorado Safe Routes to Schools program addresses barriers that inhibit students from walking and biking to school.

Great Option Ambassadors. During warm weather months (June-Sept), GO Ambassadors raise public awareness of the importance of sharing the road through safety education and public outreach.

Every spring the city hires a team of Great Options (GO) Ambassadors who are responsible for educating the public about the many transportation options available to them and the rules and responsibilities associated with using those options. These ambassadors reach thousands of Boulder's residents and visitors from spring to fall by attending local events from the Boulder County farmer's market to local neighborhood meetings. They bring with them useful information and tools that help people move around Boulder safely and courteously. When high profile conflicts occur between roadway users the GO Ambassadors are available to perform on-site diplomacy by reminding motorists, bicyclists and pedestrians of the rules and responsibilities that, when applied, will prevent conflicts. Due to the high profiles of these circumstances, the resulting efforts are often highlighted in the local news allowing messages to reach a broad audience.

3. Peer Cities

Rochester Bicycle Master Plan



Beyond the Paths Bike Tour. This free self-guided tour showcases points of interest and organizations that helped Boulder earn a Platinum designation from the League of American Bicyclists.

2. Minneapolis

The *Minneapolis Bicycle Master Plan Chapter 7: Project/Initiative Identification and Prioritization* lists the following short and long term education and outreach programs.

Long-Term Initiatives. Below is the list of the top recommended long-term initiatives by category based on the needs analysis.

Safe Routes to School Program. Fully fund the Safe Routes to School Program for all schools within Minneapolis (Education); in process.

Minneapolis Bicycle and Pedestrian Ambassadors. Complete the Minneapolis Bicycle and Pedestrian Ambassadors work plan (Encouragement). The Bike Walk Ambassadors work throughout Minneapolis, as well as in 13 adjoining communities. The Bike Walk Ambassador program is an educational and outreach program which encourages people in Minneapolis and the neighboring communities to bike and walk more, and to drive less. The program is a community partnership led by the Public Works department, in response to a grant awarded to the City of Minneapolis (work plan completed; program implemented).

Toward Zero Deaths. Focus on a Toward Zero Deaths campaign designed to eliminate bicycle fatalities (Enforcement). This program was part of an unsuccessful grant proposal that would have allowed the implementation of a more specific public information campaign to reduce bicycle injuries and fatalities. Minnesota has a Toward Zero Deaths program that focuses on reducing the number of vehicle fatalities. This program was to be an offshoot of that effort and would have adapted some of the tools that the TZD program has created to reduce bicycle crashes.

Equal access to bicycle facilities. Ensure that all parts of the city have equal access to bicycle facilities (Equity).

Bicycle Counts. Conduct bicycle counts on a seasonal basis (Evaluation). Counts have been conducted each September for the last four years running.

Short-Term Initiatives. Below is the list of the top recommended short-term initiatives by category based on the needs analysis.

- Conduct public safety announcements on following the rules of the road (Education)
- Continue bike giveaways (Encouragement)
- Focus on targeted enforcement initiatives that result in everyone following the rules of the road (Enforcement)

3. Peer Cities

Rochester Bicycle Master Plan



- Ensure that all buses have a bike rack on them (Equity); ongoing
- Complete a quality bike map for mass distribution (Evaluation); published October 2010

3. Madison

The following encouragement ideas from the Madison Mayor's Platinum Bicycling Committee have been implemented.



Summer 2010 Ride the Drive in Madison, WI
(Photo Credit: Darryl Jordan)

Institute a Sunday Parkways ride once per month. Sunday Parkways are times set aside on weekends and holidays for traffic-free biking and walking on a

network of selected streets. In effect, streets are transformed into trails. Tens of thousands of cyclists use Sunday Parkways, a concept similar to events called Ciclovia in Bogotá, Colombia and Via RecreActiva in Guadalajara, Mexico. Sunday Parkways do not impact motorized traffic flow like other special events, since all cross-traffic flows normally. Participants stop at all traffic signals, so that only the closed street is affected. Often on a divided arterial, the Sunday Parkway uses one half of the roadway and motorized traffic uses the other half. Sunday Parkways provide close-to-home recreational opportunities for all ages and all types of active travel. Madison had one very successful event last year and two this year.

Create a Safe Routes to School plan for Madison. This plan would include education, enforcement, engineering, encouragement, and evaluation for children K-12.

Annual Meeting. Facilitate an annual meeting of all regional bicycle/pedestrian planners/engineers in Dane County. In order to assure that all communities and organizations are communicating their plans and programs, as well as sharing best practice information, an annual meeting should be held.

User Count Scientific Survey. Undertake a scientific survey to determine the level of bicycling in Madison and what the public feels can and should be done to improve bicycling conditions and to increase the

3. Peer Cities

Rochester Bicycle Master Plan



number of people bicycling. In addition to the fact that reliable figures are not available for the number of people bicycling in Madison, the Platinum Committee recognizes that there are issues that they do not have the answers for regarding bicycling. Among these issues is the question of how to get those who do not currently bicycle to bicycle more. The Committee hopes that some innovative solutions will emerge through the recommended mini-grant program, this scientific study, and the individualized marketing program. The city may be able to partner with the University of Wisconsin to complete the survey.

F. Municipal Staffing Commitment

The staffing commitment to bicycle and pedestrian planning varies widely depending on the goals of the municipality. In many cases, current bicycle and pedestrian coordinators have been in their positions for years, but just as often, the coordinator is an individual with more passion than experience. How Rochester shapes the potential role will depend on the goals of the City and perhaps the timeframe in which goals are to be achieved. As a result, pay scales vary widely with experience, ranging from \$42,000 to over \$60,000. Bicycle and Pedestrian planners can be Planner I through Senior Staff. In the case of the Minneapolis planner, the role was created by a grant award and is housed in Public Works; in Boulder it is a senior staff position housed in Transportation Planning. Education varies widely but common requirements are a Master's Degree in Urban and Regional Planning and some level of

bicycle interest or advocacy. In other cases, the position has a greater policy focus, may answer to the Mayor and the role is more administrative than about implementation or programs.

The level of decision-making varies widely, as determined by the coordinator's position in the hierarchy of the municipality. Regardless, the success of the position is frequently determined by relationships with other departments, as the effort is collaborative and there are myriad aspects to a bicycle and pedestrian program. While not a Bike Friendly Community requirement, it is generally acknowledged that having a staff person dedicated to bicycle issues is an important component of a successful program. The inspiration for a staff bike coordinator varies also, but typically correlates to an increasing demand for a better pedestrian and bicycle environment.

Day to day tasks may include public meetings, council member and neighborhood updates, the management of projects and consultants, training, education and outreach, collaboration for enforcement, research, report and grant writing, data management, facility planning, updating plans and designing/expanding programs such as bike parking, bike safety outreach, traffic calming and plan review to ensure compliance with City plans and goals for non-motorized transportation and accessibility.

3. Peer Cities

Rochester Bicycle Master Plan



A critical task for municipal staff, whether in the form of an officially designated bicycle coordinator or not, is to be dedicated to ensuring that bicyclists are routinely accommodated within the public right of way; as stated in a Rochester public comment, “anytime major or not so major roads are to be redone new bike lanes should be mandatory.”



G. Private Sector Partnerships and/or Incentives
Partnerships and incentives play different roles in the reviewed cities. Some cities do not maintain any. Others use the partnerships to add another dimension to their bicycle programs. A common partnership involves bicycle parking, where the city and the business split the cost or the business agrees to maintain the parking that the city has installed. Another common offering is Ride Home programs that mitigate the concern that a bike commuter may not be able to get home in an emergency. More

unique are the programs Boulder maintains such as the Employer Transportation Coordinator Program.

1. Boulder

Private property owners provide bike parking. The City partners with businesses to provide EcoPasses for employees. These passes give riders access to the complete Regional Transportation District system and are offered as a benefit to employees. The City also supports an Employer Transportation Coordinator Program where employees serve as resources for peer transportation guidance. About 200 businesses are part of this program.

2. Minneapolis

Businesses provide bicycle parking with a City reimbursement of 50% at eligible locations.

H. Snow Removal Strategies

Snow removal is a challenge in most of the cities reviewed and there are varying ways of addressing it. A number of the programs have a dedicated snow removal policy for their off-street systems, treating them much like streets.

1. Boulder

Formal snow maintenance policies have been in place since 1996. A crew dedicated to clear the off-street trail system (for trails adjacent to city property) is deployed at the same time the road clearing crew is dispatched. Trails that are on University or County property are the responsibility of that agency.

3. Peer Cities

Rochester Bicycle Master Plan



Because the primary route is towards the center of the road bike lanes may get secondary treatment but are still typically cleared within a day or two of a snow event. Wide sidewalks (Boulder designates some of them as multi-use paths) tend to be maintained by the City, though the city's code makes clearing a minimum five foot path the responsibility of the property owner.

2. Minneapolis

The on-street system gets plowed as the roads do, with no special treatment. Plowing the off-street system is a joint effort of the Public Works department, the City and the Parks and Recreation Board, and a formal policy exists to clear the paths within 24 hours of a snowfall.

3. Madison

In winter months, required parking areas, including bicycle parking areas, shall be cleared of snow within a reasonable time. Areas used for snow storage shall be approved by the zoning administrator.

I. Strategies for Dealing with On-street Parking when Attempting to Retrofit Roadways

A significant challenge to retrofitting roadways for restriping or road diets is on-street parking. Each of the reviewed cities acknowledged the challenge presented by removing parking. Typically the projects are handled on a case-by-case basis.

1. Minimum Widths for On-street Parking

Boulder. Boulder's minimum width for on street parking is 7', with an adjacent 5' bike lane. The ideal is 8' with a 5' adjacent bike lane.

Minneapolis. Minneapolis maintains a minimum 8' parking lane for streets with ADT of 40,000 or less and 10' for streets with ADT of 40,000 or greater. Lanes may be 7' with special permission. Most travel lanes are 11' wide, though 10.5' lanes have been successfully implemented.

2. Amount of On-street Parking

The appropriate amount of on-street parking is handled in each city on a case-by-case basis.

Boulder. On-street parking is addressed on a project by project basis, with an objective analysis of trade-offs done per project.

Minneapolis. Requirements for on-street parking are reviewed under the new Access Minneapolis guidelines.

Madison. On-street parking depends on the situation. It may be more appropriate in some neighborhoods or areas to reduce parking. In light of the interest in Complete Streets and the lack of room in the right-of-way, off-street common parking areas are something to be considered where there is available room.

Rochester Bicycle Master Plan



— Chapter 4: Study Network Analysis, Recommendations, and Prioritization

4. Study Network Analysis, Recommendations, & Prioritization

Rochester Bicycle Master Plan



A significant focus of this *Bicycle Master Plan* is to evaluate the City's major roadways to determine bicycle facility needs and then prioritize the identified potential facility improvements. The study network consists of the City's arterial and collector roadways, as they provide the greatest access to destinations (and as most local streets already provide good bicycling conditions because of their low traffic volumes and speeds). The relative importance of this network of primary roads is well-captured in the words of a Rochester citizen: "As a transportational cyclist, it is arterials and collectors that attract my attention, for the very same reasons they attract the attention of drivers. They provide direct routes between useful destinations, they facilitate the smooth flow of traffic, and they are well-maintained—swept in summer, and plowed and salted in winter."

The prioritization of candidate projects is based on numerous factors including existing conditions, public input, demand, environmental justice/transportation equity, and crash data, each of which is described in additional detail in this section.

A. Existing Bicycling and Walking Conditions

An analysis of existing bicycling conditions was conducted using the Bicycle Level of Service Model, based on data collected in July 2010. This model, which has been applied on hundreds of thousands of miles of roads throughout New York and the United States, is included in the 2010 edition of the national *Highway Capacity Manual*. The following sections

provide background information, model structures, and data descriptions for this evaluation tool.

1. Bicycle Level of Service

The Bicycle Level of Service (Bicycle LOS) Model, a bicycling conditions performance measure, is a "supply-side" criterion. It is an objective measure of the bicycling conditions of a roadway which provides an evaluation of bicyclists' perceived safety and comfort with respect to motor vehicle traffic and roadway conditions. This widely used criterion is classified as the quality or level of service (accommodation) for bicyclists that currently exists within the roadway environment. One of the greatest benefits of incorporating bicycle level of service is the indication it provides regarding which network segments have the greatest needs. It uses the same measurable traffic and roadway factors that transportation planners and engineers use for other travel modes. With statistical precision, the Bicycle LOS Model clearly reflects the effects on bicycling suitability or "compatibility" caused by variations in the following factors:

- bike lane or paved shoulder width;
- outside lane width;
- traffic volume, speed, and type;
- pavement surface condition; and
- presence of on-street parking.

This method is not limited to merely assessing conditions; it can also serve as an important and effective analytical tool in the identification of

4. Study Network Analysis, Recommendations, & Prioritization

Rochester Bicycle Master Plan



restriping candidates, development of street cross-section performance guidelines, and planning of bicycle routes.

The bicycle level of service analysis produces, for each study network segment, an objective score and “grade” which measures bicycle accommodation on that section of roadway, as shown in Table 1. For example, a particular segment without any type of bicycle facility (given other roadway characteristics detailed above) may provide a level of service “D.” Using this tool, it is possible to determine how much accommodation benefit would be achieved as a result of improvements. In the above example, retrofitting the roadway to include a designated bike lane might improve the segment’s level of service to “B.” Through this process, it is possible to simply and objectively determine which facilities have the greatest needs relative to the rest of the network.

Table 1:
Bicycle Level of Service Grades and Scores

Level of Service	Numerical Range
A	≤ 1.5
B	$>1.5 \text{ and } \leq 2.5$
C	$>2.5 \text{ and } \leq 3.5$
D	$>3.5 \text{ and } \leq 4.5$
E	$>4.5 \text{ and } \leq 5.5$
F	> 5.5

More information about the Bicycle Level of Service Model, including the model form and descriptions of the collected data items, is contained in Appendix D.



2. Existing Conditions Analysis Results

The collected data were used to perform existing bicycling conditions analyses for each of the more than 600 directional network segments. The distribution of bicycle level of service grades is shown in Figure 1. At a distance-weighted network-wide level, the City of Rochester was found to currently provide bicycling conditions that correspond to a bicycle level of service of 3.7 (“D”), which is generally comparable to many other North American cities of roughly the same size. A network-wide map of the existing bicycling conditions is shown in Figure 2. In the limited cases where one direction of travel along a segment has a different level of service grade than the other direction of travel, this figure shows the worse of the two grades. The full data collection sheets and the results of these analyses are included as Appendix E.

4. Study Network Analysis, Recommendations, & Prioritization

Rochester Bicycle Master Plan

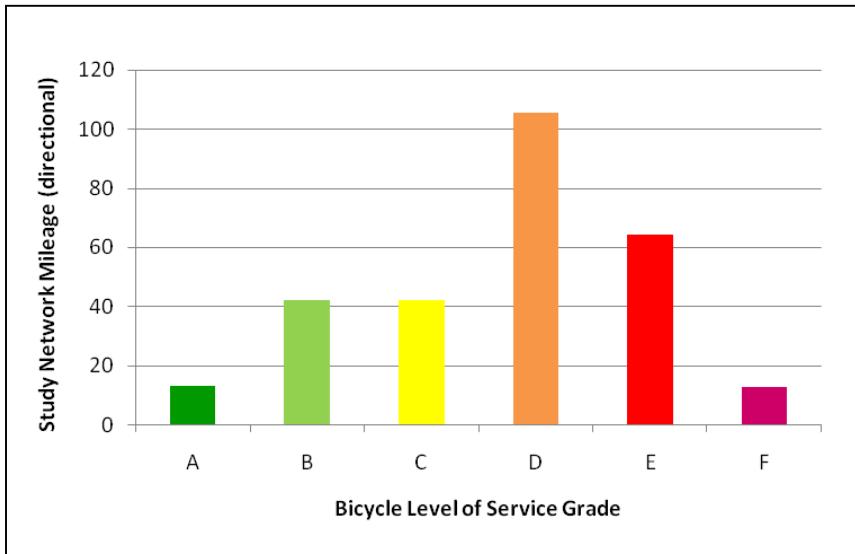


Figure 1: Network-Wide Bicycle Level of Service Results

This final workshop element, which represents a significant component of bicycle facility prioritization, used a "strings" methodology. Participants were given a limited "budget" of colored adhesive tape and were instructed to place it on a map in the locations that they perceive to be barriers to bicycling or where improvements are desired. The "votes" assigned to these identified barriers were tallied

B. Public Input

As with all City of Rochester planning projects, the Rochester Bicycle Master Plan includes a significant public involvement component. Public input was received and taken into consideration throughout the duration of the project, but was focused on a series of public workshops conducted in August 2010. Four workshops were conducted in geographically diverse locations, one in each sector of the City. These workshops included several interactive stations related to the Bicycle Master Plan. Participants viewed materials highlighting the benefits (both personal and community-wide) of bicycling, provided feedback on the draft existing conditions results, helped establish the regional target level of accommodation for bicycling and walking, and were given the opportunity to "vote" for locations on the study network where new bicycle facilities would be most beneficial from their perspectives.

after the workshops and incorporated into the development of a prioritized list of projects. An online version of the workshop materials, including this needs identification exercise, was made available for



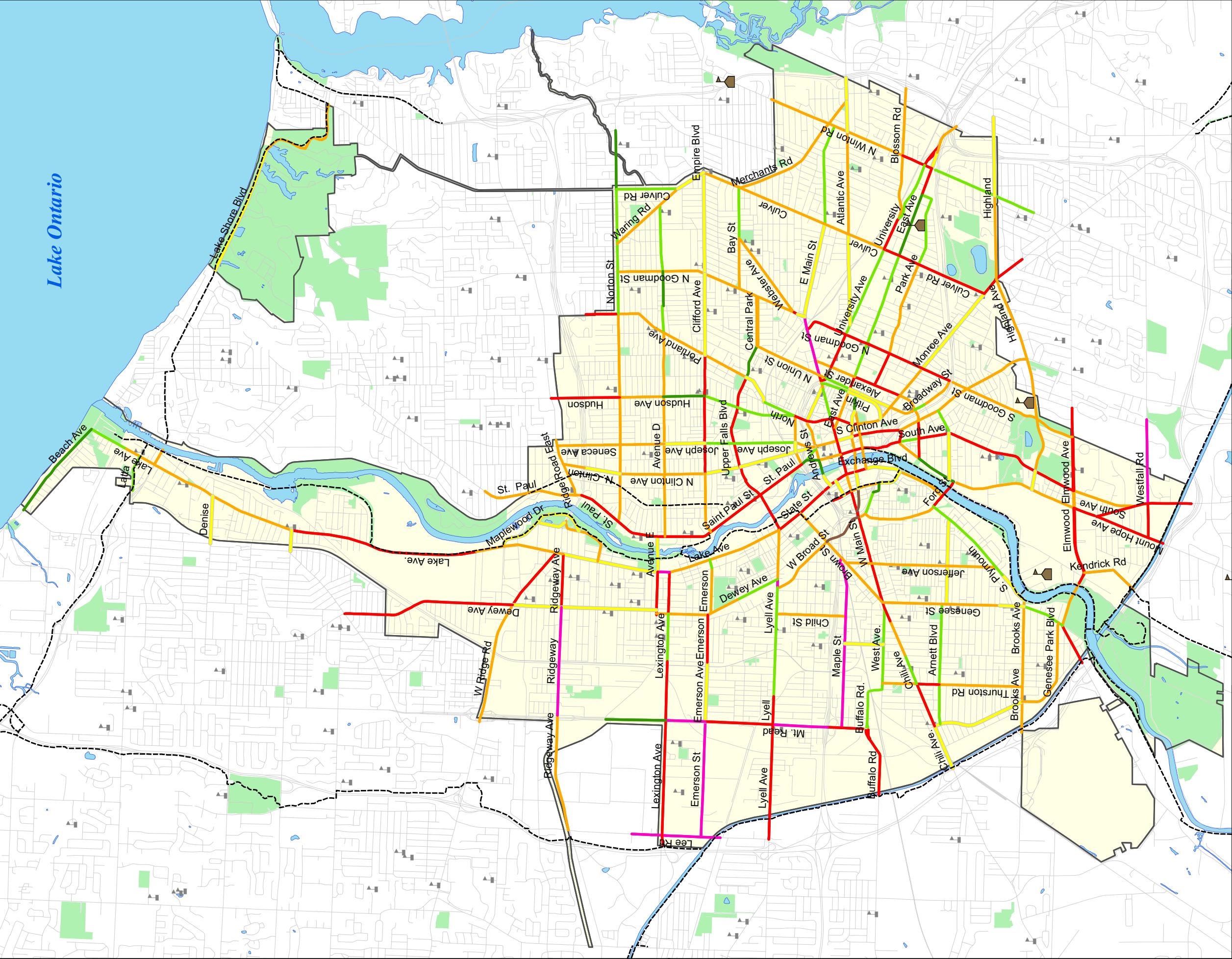
Figure 2
Existing Bicycling Conditions (Bicycle Level of Service)



adr
COMPANIES



Lake Ontario



Bicycle Level of Service Score

- | | | | | | | | |
|-----------------------------------|-----------|----------|---------|------------|-------|------------------------------------|------|
| Under Construction | No Design | F | E | D | C | B | A |
| Under Programmed Multi-Use Trails | Streets | Colleges | Schools | City Limit | Parks | Existing/Promised Multi-Use Trails | None |

Rochester Bicycle Master Plan



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a period following the workshops. All public comments received at the workshops are included in Appendix F.

From the 65 completed response forms and maps, there were 731 votes cast by participants. 327 corridor segments were provided as possible options. Nearly two-thirds of the segments received at least one vote, approximately 16% of the segments received at least five votes, and 13 segments received at least ten votes. These most frequently identified segments are shown in Table 2.

An additional public meeting was conducted near the conclusion of the planning process in December 2010, and public comments were solicited throughout the duration of the project on the City's website. These online comments are shown in Appendix G.



C. High-Demand Destinations

While some members of the public likely provided votes for study network segments in part because those segments serve important destinations, a separate effort was made by the Project Advisory Committee (PAC) to ensure that key bicycle destinations within the City were identified and accounted for in the prioritization of potential improvements. PAC-identified high-demand

Table 2: Participant Input – Most Frequently Identified Corridor Segments

Votes	Segment ID	Road Name	From	To
15	135	St. Paul Street	Upper Falls Blvd.	Central Ave.
14	94	Monroe Avenue	S. Union St.	Alexander St.
14	95	Monroe Avenue	Alexander St.	S. Goodman St.
14	96	Monroe Avenue	S. Goodman St.	Culver Road
12	146	State Street	Lyell Ave.	Andrews St.
11	145	Lake Avenue	Lexington Ave.	Lyell Ave.
11	134	St. Paul Street	Clifford Ave.	Upper Falls Blvd.
10	69	South Avenue	Court St.	Byron St.
10	149	Exchange Street	E. Broad St.	Court St.
10	194	West Main Street	W. Broad St.	S. Plymouth Ave.
10	198	East Main Street	S. Clinton Ave.	East Ave.
10	204	East Main Street	Alexander St.	N. Goodman St.
10	483	North Goodman Street	Park Ave.	Monroe Ave.

4. Study Network Analysis, Recommendations, & Prioritization

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destinations include the following:

- the University of Rochester/medical center area
- the Rochester Public Market;
- downtown Rochester;
- middle and high schools; and
- major grocery stores.

Segments adjacent to, or within a close proximity of, these identified high demand destinations were assigned an additional score beyond the votes cast at the public workshops.

D. Environmental Justice/Transportation Equity

The automobile is both the most dominant form of intra-city transportation and the most expensive. According to AAA, the average annual cost of a vehicle to a household is about \$7,000 and this is typically the second largest investment families make. This represents a very high percentage of an average family's income and frequently there is need for multiple vehicles. According to U.S. Census data¹ the City of Rochester has a per capita income of approximately \$18,000, well below the national average, making a lack of choice regarding transportation options a price that impacts quality of life for many of its residents.

Transportation equity is defined as the fairness with which the impacts of transportation costs are distributed. One implication of this concept is that transportation projects that only benefit automobile

users may not serve the City's population in an equitable fashion, while bicycle facility improvements can offset this potential imbalance.

Per capita income was used as a surrogate to measure the need for transportation equity. Each Census tract in the City was assigned a score of 5 (very low income), 4 (low), 3 (medium), 2 (moderately high), or 1 (high). Study network segments then received a score corresponding to the tract in which they are located. Figure 3 provides an illustration of per capita income by census tract.

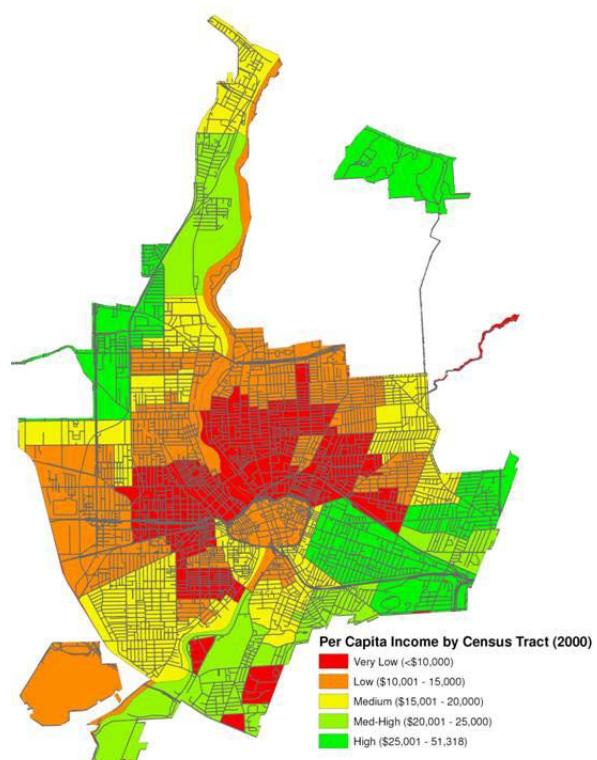


Figure 3: Per Capita Income by Census Tract

¹ www.census.gov, 2006-2008 American Community Survey 3-Year Estimates

4. Study Network Analysis, Recommendations, & Prioritization

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E. Crash Data

Locations of bicycle crashes represent a final component of the prioritization analysis. Crash locations between 1987 and 2008 from the NYS Accident Location Information System were provided by the Genesee Transportation Council and mapped, as shown in Figure 4. The number of crashes observed along each segment, excluding those that occurred at intersections with other streets, was tallied.

A couple of cautions regarding the use of bicycle crash data are worth noting. One is that only a small percentage of bicycle crashes in the United States are overtaking crashes, those in which a bicyclist traveling in the direction of traffic is struck from behind by an overtaking motorist. Far more common are crashes that involve a bicyclist riding against traffic or those that involve a bicyclist or motorist failing to yield at an intersection. As such, the provision of bicycle facilities, while a necessary step in providing transportation options for all users, may not necessarily lead to a reduction in bicycle crashes. Additionally, crashes occur more often where bicyclists are riding most frequently. A preponderance of crashes along a particular roadway segment is often tied more to the number of bicyclists (i.e., the bicycle exposure rate) than a safety problem that results from the roadway's geometric characteristics. Regardless, bicycle crash history is viewed as a key consideration in Rochester and is thus incorporated

into the prioritization of candidate bicycle facility projects.

F. Benefit-Based Prioritization Methodology

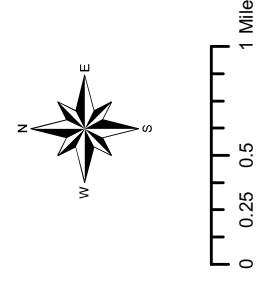
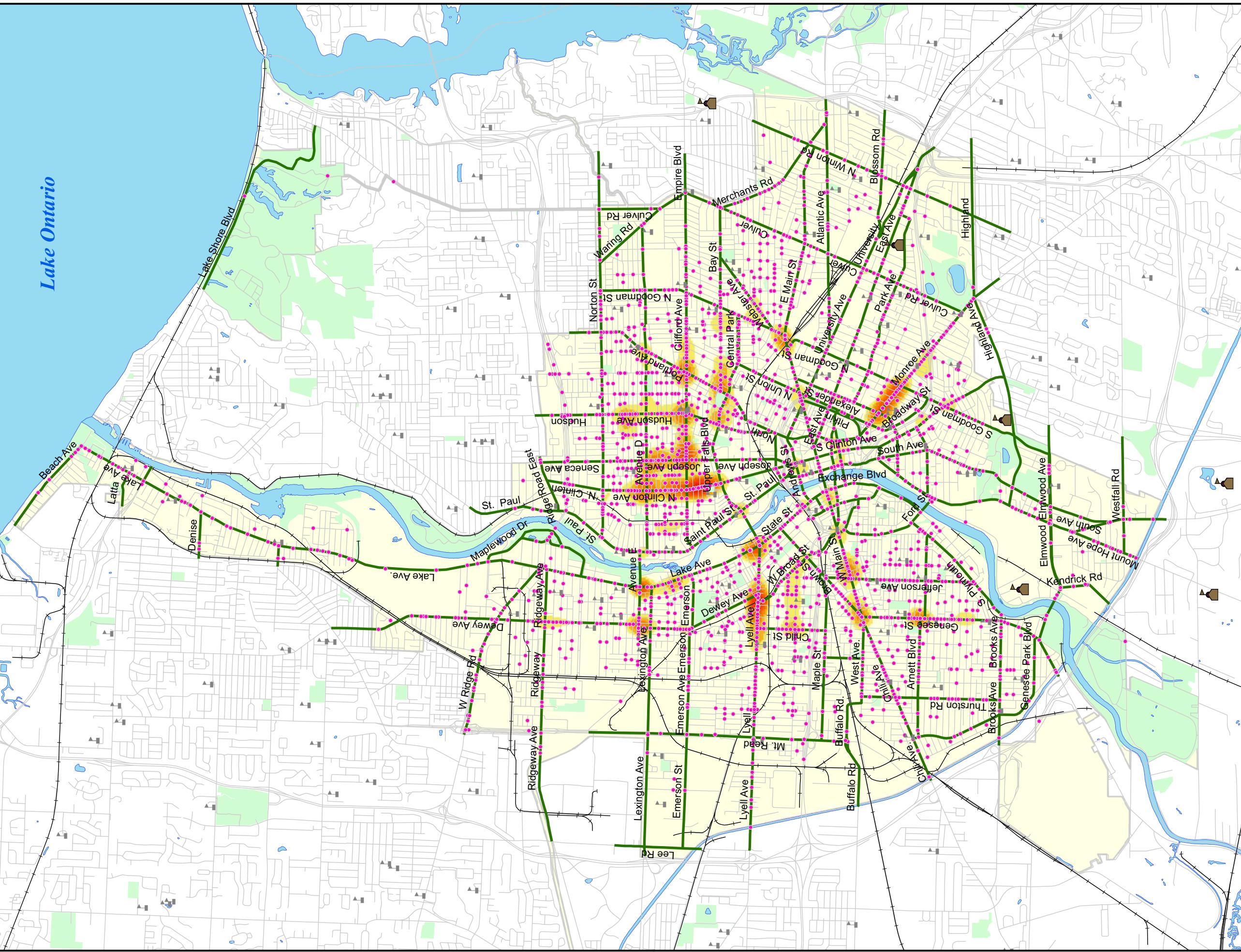
A methodology that takes into consideration all of the factors (i.e., benefits) described above has been used to establish priorities among candidate bicycle facility projects. The weighting of these benefits occurs as follows:

- 25% bicycling conditions improvement (the difference between the existing bicycling conditions and the established target);
- 15% public input;
- 30% high-demand destinations;
- 25% environmental justice/transportation equity score; and
- 5% prevalence of historical crashes.

Those segments with the highest weighted benefit score represent the highest priorities for improvement. This, of course, does not suggest that lower priority projects cannot be constructed before higher priority projects if, for example, a corridor is being widened or resurfaced through a regularly scheduled capital project. The benefit-based prioritization list is divided into two categories, roadway restriping projects and those segments involving more detailed corridor studies. These categories are described in the following section.

Figure 4
Bicycle Crash Map (1987-2008)

Data Source: NYS Accident Location
Information System as provided by the
Genesee Transportation Council,
May 2010



City Limit

Parks

Colleges

Schools

Streets

Railroads

City Limit



Rochester Bicycle Master Plan

Parks

Colleges

Schools

Streets

Railroads

City Limit

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G. Bicycle Facility Improvement

Recommendations

Based on existing conditions and roadway geometries, each study network segment is classified into one of several recommended bicycle facility improvement categories. Some segments, specifically those with existing facilities and those that provide good existing conditions, do not have an associated facility need. For all others, a recommended facility type is identified, ranging from relatively inexpensive projects to those that involve more significant financial and time commitments.

One of five potential outcomes has been identified for each of the analyzed roadway segments. These

outcomes include the following:

- No recommended improvement (existing bicycle facility);
- No recommended improvement (target bicycle level of service met);
- Roadway restriping (reduction of existing lane widths to create space for bike lanes);
- Road diet (reduction of the number of lanes to create space for bike lanes); and
- Detailed corridor study needed.

The decision tree shown in Figure 5 illustrates the steps involved in making the facility recommendation outcomes, each of which is discussed in more detail within this section.

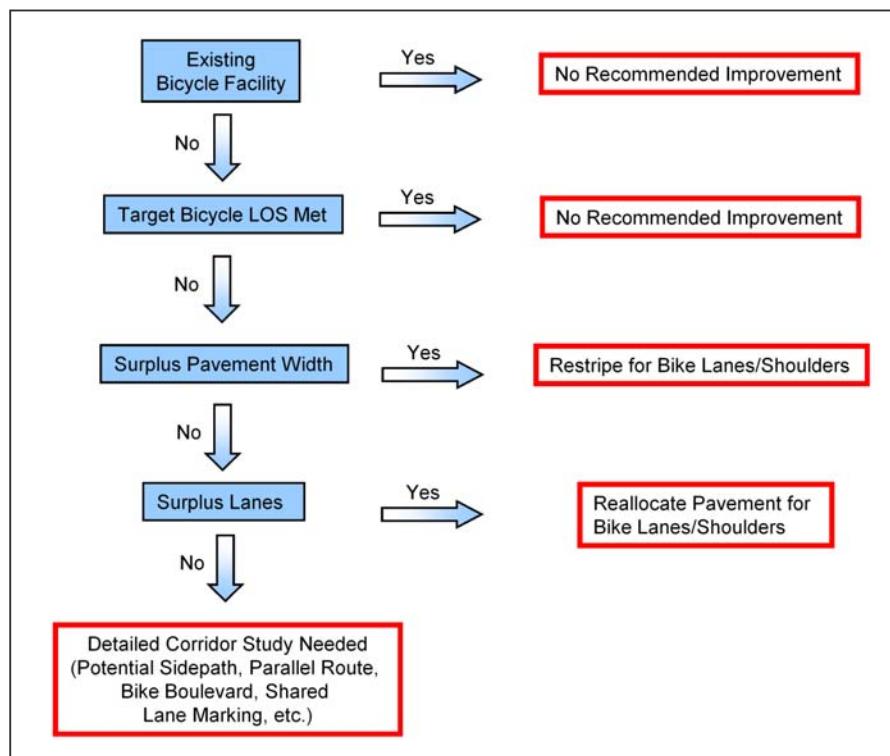


Figure 5: Bicycle Facility Decision Tree

4. Study Network Analysis, Recommendations, & Prioritization

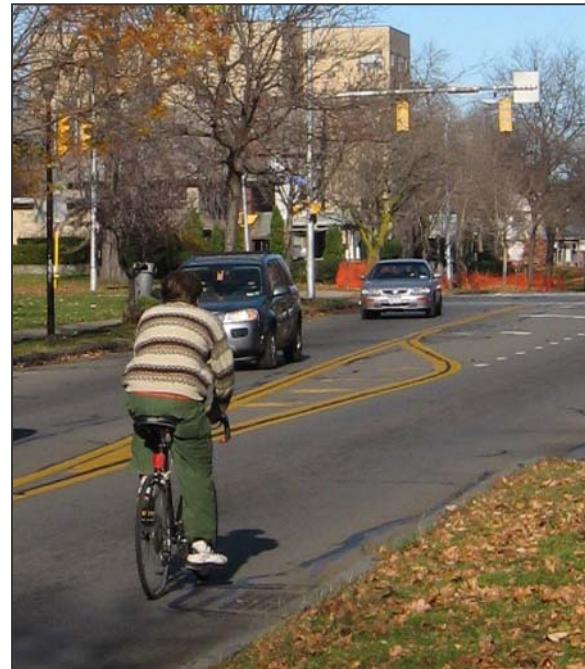
Rochester Bicycle Master Plan



Bicycle Facility Recommendation Types

Existing and Programmed Bicycle Facilities. One of the primary purposes of this Bicycle Master Plan is to identify locations for new on-road bicycle facilities. Accordingly, the first step in the facility recommendation process is to identify and filter out those study network segments where a bicycle facility already exists. For the purposes of this analysis, an existing bicycle facility is constituted by any designated bike lane or paved shoulder at least four feet wide (with a striped edge line) that is not intended for on-street parking. Programmed projects, those in which bike facilities have been identified for implementation within the next year, were also researched and noted. Segments falling into one of these two categories have been identified as having an existing bicycle facility for this Plan's purposes; the analysis of all other segments continued into the next step. A relatively small proportion of the study network (seven miles, or approximately 5%) falls into this category. To ensure that this mileage increases over time, it is recommended that the City of Rochester adopt a routine accommodation policy in which bike lanes are included as a part of all new roadway construction and major roadway reconstruction projects.

Target Bicycle Level of Service Met. As described in the Existing Conditions section of the Plan, an analysis of existing bicycling conditions was performed for the study network. A bicycle level of



service score, ranging from "A" (best) to "F" (worst), was calculated. There are many cases where a relatively high level of accommodation can be achieved even in the absence of a striped shoulder or bike lane. This situation frequently occurs on low-volume collector streets with typical or greater than typical lane widths, many of which have space for on-street parking that is largely unused. Members of the public provided direct input at the April 2010 public workshops that led to the establishment of a target bicycle level of service of "C" within the City. While there is no nationwide bicycle level of service "standard," this public-identified (and staff-approved) target is generally in line with targets established by numerous other communities similar to Rochester. All segments without an existing bicycle facility where the target level of service is nonetheless met (42 miles, or approximately 30% of the study network) are included

4. Study Network Analysis, Recommendations, & Prioritization

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in this category. This designation does not preclude the City from striving to achieve even better bicycling accommodation on these roads as opportunities arise or as community demand dictates.



Roadway Restripe Candidates. Among strategies commonly used to improve bicycling conditions, roadway restriping is frequently considered the most desirable solution. This is because of the very low (or effectively non-existent, if performed in concert with scheduled resurfacing) associated cost and the existence of excess lane width on many streets. For this reason, roadway restriping was the primary option analyzed for the study network after those segments with existing bicycle facilities and those where the target accommodation level has been met were filtered out of the process.

For the purposes of this Plan, the City has identified a minimum lane width of 10 feet.² The analysis spreadsheet was programmed accordingly to determine whether the total pavement width (TPW) of each roadway segment is sufficient to leave space for four feet of bicycle facility in each direction of travel while preserving the minimum lane width for all other travel lanes and parking. Several other specifications were considered in this portion of the analysis:

- The TPW is typically the width from one edge of the roadway to the other edge, but for divided roadways is only from one edge of the roadway to the raised median. This is done because roadway restriping assumes that no median reconstruction will occur.
- For segments that include a two-way left turn lane, a minimum width of 10 feet was designated to maintain the two-way left turn lane.
- For segments with existing striped on-street parking, a minimum width of eight feet in each direction was designated to maintain the parking lanes.

Preserving parking availability is a significant concern, and care has been taken to make note of restripe candidates where parking considerations exist. In this regard, five distinct categories of restripe candidates have been identified:

² As projects develop, wider lane widths may need to be considered. Specifically, lane widths of 11 feet are considered desirable for the outside lanes of 4-lane streets, but the 10-foot minimum has nonetheless been used for this initial screening.

4. Study Network Analysis, Recommendations, & Prioritization

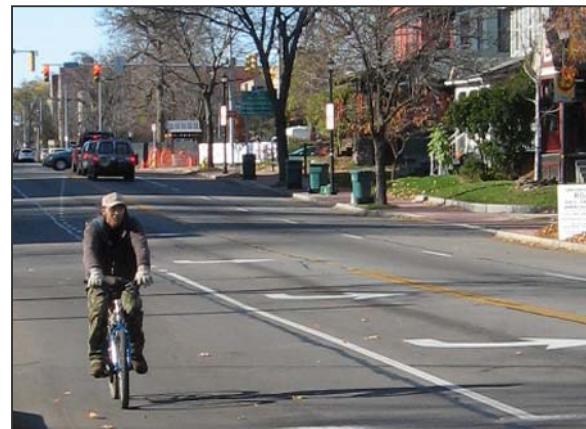
Rochester Bicycle Master Plan



- 1) those where on-street parking was not observed to any degree during the field data collection portion of this Plan, and where the roadway geometry suggests that on-street parking is infeasible (19 miles);
- 2) those where on-street parking was not observed to any degree during the field data collection portion of this Plan, but where the roadway geometry suggests that on-street parking may occur at certain times (2 miles);
- 3) those with observed on-street parking occupancy of no more than 50% where bike lanes could be created while still leaving space (eight feet) for parking on at least one side of the street (19 miles);
- 4) those where bike lanes could be created while leaving space (eight feet) for parking on one side of the street, but where the observed on-street parking occupancy is greater than 50% (4 miles); and
- 5) those with an observed on-street parking occupancy greater than zero where no space for parking can be maintained in the post-restripe condition (20 miles).

The first three categories show more promise for feasibility than the last two, but the City will examine parking needs on a case-by-case basis for all roadway restripe projects that are studied for implementation. To ensure that all candidates are identified, none that meet the general space requirements criteria have been excluded from this

screening. Collectively, the 64 miles (or approximately 45% of the study network) of roadway restriping candidates show a significant potential for making Rochester much more accommodating for bicyclists inexpensively (and potentially quickly as well depending on established roadway resurfacing cycles).



Road Diet Candidates. While the removal of travel lanes to create bicycle facilities (i.e., a road diet) is also relatively inexpensive to implement, restriping is typically a less noticeable change to a roadway and should generally be considered first. Road diets are frequently considered when a preliminary analysis indicates that sufficient capacity exists to effectively accommodate motor vehicle traffic for the foreseeable future with a reduced number of lanes. Such preliminary planning-level analyses have been performed for this project to identify road diet candidates.³ Significantly more detailed operational

³ The Monroe County Department of Transportation maintains a frequently updated "Multilane Conversion List," which also identifies road diet candidates. Several road diet

4. Study Network Analysis, Recommendations, & Prioritization

Rochester Bicycle Master Plan



analyses should be carried out for individual sections before moving forward with any of the identified projects.

The motor vehicle capacity analyses for this Plan used the projected 2027 model year volume for each segment, as developed by the Genesee Transportation Council. Planning-level estimates of future year motor vehicle capacity are feasible through the use of generalized level of service tables, which are based upon default values using the *Highway Capacity Manual*. The Florida Department of Transportation has developed a set of generalized motor vehicle level of service tables⁴ that is widely utilized throughout the United States. The tables use default values for different area types for many traffic variables such as K-factor, D-factor, peak hour factor, and g/C ratio. The lookup tables produce a level of service result based on roadway class (determined through average signal spacing, which was field-collected), traffic volume, and number of lanes. These lookup tables were programmed into the analysis database.

To identify road diet candidates, the number of lanes was hypothetically reduced (usually from 4-lane to 2-lane) to determine the resulting future year motor vehicle level of service. The results were compared

projects from the County's list have already been implemented.

⁴ 2009 Quality/Level of Service Handbook, Florida Department of Transportation.

against the identified motor vehicle level of service standard of "D" to see where excess capacity exists. Seven segments totaling approximately three miles were identified as road diet candidates;⁵ however, all seven of these segments are also roadway restripe candidates, so their primary designation (restripe candidate) has been maintained with a supplemental note that they are also road diet candidates.

Detailed Corridor Study Needed (DCSN). Many study segments present minimal opportunity for improving bicycling conditions through the identified roadway retrofit strategies discussed above. Specific bicycling-related improvements to these segments (the 29 miles representing the remaining 20% of the study network) will require extensive and detailed operational-level investigations of the constraints and opportunities along these corridors. Several specific options for these roads (including sidepaths, bike boulevards, and shared lane marking, or "sharrows") are discussed in Chapter 5 of this Bicycle Master Plan.

The network-wide bicycle facility recommendations are shown in Appendix H. This appendix also shows these recommendations divided into four priority groups, or tiers, as follows:

- Tier I: Roadway Restripe Candidates (upper half of associated benefit scores as described previously in this chapter);

⁵ All of these segments were also previously identified as part of Monroe County's 2010 "Multilane Conversion List."

4. Study Network Analysis, Recommendations, & Prioritization

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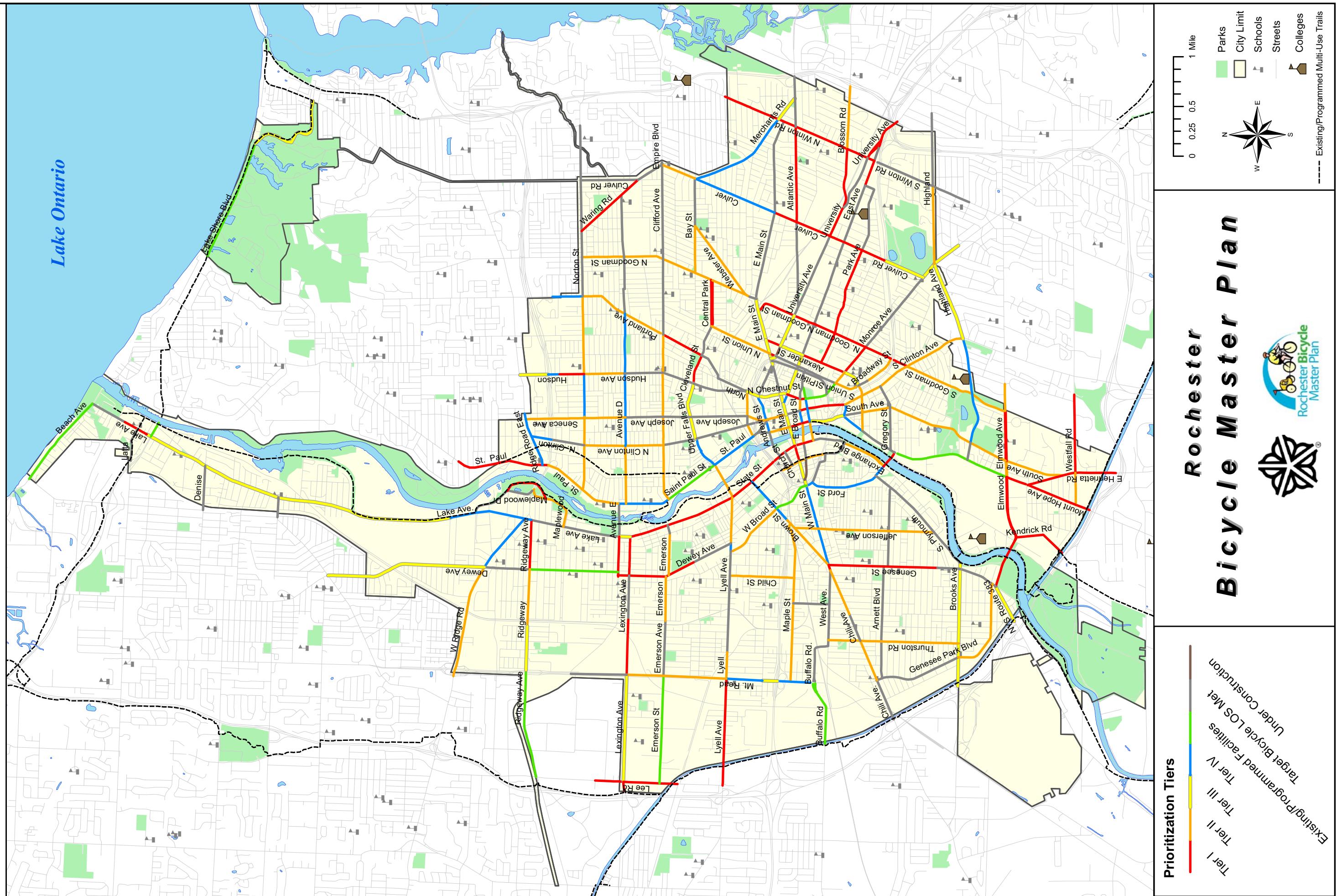
- Tier II: Roadway Restripe Candidates (lower half of associated benefit scores);
- Tier III: Detailed Corridor Study Needed (upper half of associated benefit scores); and
- Tier IV: Detailed Corridor Study Needed (lower half of associated benefit scores).

Figure 6 shows these priority tiers in map form. Again, it should be noted that implementation of these prioritized improvements need not necessarily follow the identified tier structure, and instead may occur as targets of opportunity are identified.

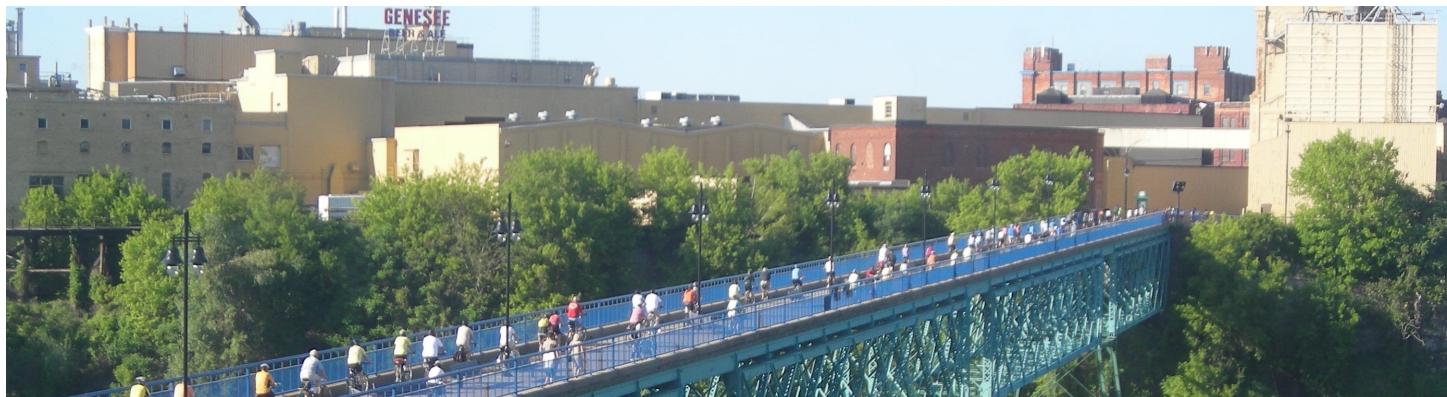
Figure 6
Bicycle Facilities Prioritization Map



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Transportation Engineering & Planning Consultants



Rochester Bicycle Master Plan



— Chapter 5: Additional Bicycle Facilities and Treatments

5. Additional Bicycle Facilities and Treatments

Rochester Bicycle Master Plan



A. Introduction

The preceding chapter provides a detailed examination of the bicycle accommodation within the City of Rochester's primary street network, and identifies opportunities to restripe many of those roadways to include new bicycle lanes. Naturally, bike lanes are not the only type of bicycle facility that can encourage bicycling in Rochester. Furthermore, while arterial and collector streets are important for providing access to many destinations, provisions along local streets can also improve connectivity and make Rochester a better city in which to ride. Toward that goal, this chapter shifts the focus from recommendations tied to particular streets to recommendations at a broader City-wide level, working toward the League of American Bicyclists' suggested goal that Rochester "continue to close gaps in the cycling network." Numerous bicycle facility types and other bicycle-related treatments, both long-standing and recently innovated, are discussed. In each case, the facility or treatment is described and recommendations are made regarding appropriate types of locations or settings for their implementation. Some combination of these facilities and treatments may be appropriate for some of the analyzed network segments indicated as needing more detailed study.

The following facility types and treatments are included in this section:

- Shared Lane Markings ("sharrows");
- bike boulevards;
- bike routes;
- bike parking;

- contra-flow bike lanes;
- buffered bike lanes;
- cycle tracks;
- bike boxes;
- colored bike lanes;
- bicycle traffic signals; and
- raised crossings.

B. Shared Lane Markings

On many roadways, usually because of a lack of adequate width, a bike lane may not be practical. A potential treatment that can be used on some of these roadways is the Shared Lane Marking, or "sharrow." Shared Lane Markings are intended to assist bicyclists with lateral positioning in the lanes, outside the door zone on streets with on-street parallel parking and away from the curb in lanes too narrow to share with a motor vehicle. Shared Lane Markings alert motorists to the position bicyclists are likely to occupy within the lane, encourage safe passing of cyclists by motorists and reduce incidence of wrong-way bicycling. Research also suggests they reduce the incidence of sidewalk riding. A Rochester resident



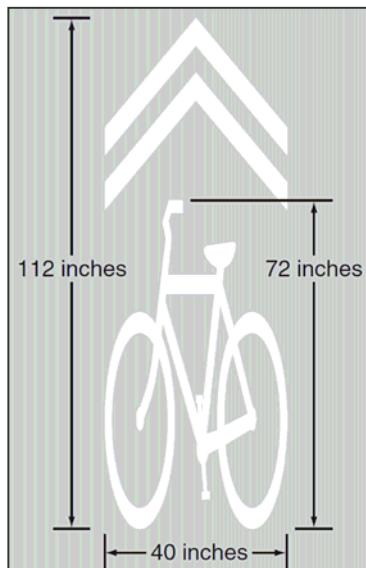
Left: Sharrows with on-street parking (City of Chicago DOT)
Right: Sharrows on narrow travel lane (City of San Carlos, CA)

5. Additional Bicycle Facilities and Treatments

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recently summarized the potential advantages to this treatment by stating that “placing shared lane markings – sharrows – on the street is a simple and extraordinarily cheap way of changing the dangerous and widespread opinion that bicyclists do not belong on the road.”



Shared Lane Marking

If used on a street with on-street parallel parking, markings should be placed so that the centers of the marking are at least 11 feet from the face of curb. On streets without parking, where streets are less than 14 feet wide, they should be placed at least 4 feet from the edge of the pavement. Shared Lane Markings should be placed after each intersection and at intervals not exceeding 250 feet.

Shared Lane Markings are usually used on collectors or minor arterials with speed limits of 35 mph or less, which is the norm in the City of Rochester. They may



Share The Road sign assembly (W11-2 and W16-1P)

be used in conjunction with wide outside lanes and in conjunction with the Share The Road sign assembly (W11-2 and W16-1P). On roadways with lanes less than 14 feet wide (the minimum considered safe for a motor vehicle and bicycle to share), a Bikes May Use Full Lane sign (R4-1) may be appropriate.

Another potential use of the Shared Lane Marking in conjunction with the Bikes May Use Full Lane sign is



Bikes May Use Full Lane sign (R4-1)

5. Additional Bicycle Facilities and Treatments

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on steep grades. On roadways with bike lanes it may be desirable to widen the climbing bike lane to accommodate a greater weave of a climbing bicyclist. The Shared Lane Marking and Bikes May Use Full Lane sign would be provided for the downhill bicyclists.

As with any traffic control device, overuse of the Shared Lane Marking may result in a reduced effectiveness of the treatment. Consequently, the placement of this facility should be with consideration of a need and not indiscriminate.

C. Bike Boulevards

Workshop participants and web respondents in 2010 enthusiastically requested the development of bike boulevards in Rochester. This desire for bike boulevards, as expressed by the public, is consistent with a growing desire for “low stress” bicycling facilities - facilities that appeal to a broad range of the public rather than just the higher end commuter cyclist.

A bike boulevard is a local street or series of contiguous street segments that have been modified to provide enhanced accommodation as a through street for bicyclists while discouraging through automobile travel.

Bike boulevards often make use of low volume, very low speed local streets. Frequently, streets are made more accommodating for bicyclists by keeping

motorists' speeds and volumes low. Often bike boulevards include bicycle friendly traffic calming treatments (speed pillows, mini traffic circles, chicanes with bike bypass lanes) to reduce speeds of motor vehicles along the roadway. While local motor vehicle traffic is maintained along the bike boulevard, motor vehicle traffic diverters may be installed at intersections to prevent through motor vehicle travel



1) Speed pillow (Photo credit: Dan Burden)

2) Mini traffic circle (Photo credit: FHWA)

3) Chicane with bike bypass lane (Photo credit: Dan Burden)

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while having bypasses for bicyclists to continue on along the bike boulevard. Bike boulevards can be facilitated by connecting the ends of cul de sac roadways with shared use paths. At intersections the bike boulevard should be given priority over side streets.

Because of low motor vehicle speeds and volumes, bike lane markings are often not necessary along bike boulevards. Shared Lane Markings may be used along bike boulevards. Alternately, larger than normal bike symbols supplemented with the text BIKE BLVD have been used to designate bike boulevards.

In some communities, bike boulevard networks begin as a “one-off” system of bikeways. When a primary arterial roadway cannot be improved to a point where most cyclists feel safe and comfortable using the facility, a parallel roadway - often one street off the main road (or “one-off”) - may be improved with bicycle facilities and traffic calming features to provide an enhanced cycling street. By paralleling the main road, the “one-off” network provides access to the businesses along the arterial using a pleasant cycling roadway. A “one-off” roadway can be improved in stages: initially with signage and shared lane markings and then into a bike boulevard by instituting more substantial features such as traffic calming and diverters.

The “one-off” system discussion should not be taken to mean that all bike boulevards must be parallel to

an adjacent arterial. Certainly, direct routes that serve to shorten trip lengths make cycling more viable for many people. The number of bike boulevards in a network is limited only by the number of streets a community is willing to direct traffic from and to calm. The more complete the grid network, the more



A planned “one-off” network in a U.S. metropolitan area practical a dense bike boulevard network becomes. Since bike boulevards typically serve as bike routes, wayfinding signage should be provided. This signage should include destination, direction, and distance (or travel time) information to attractors throughout Rochester. Wayfinding adds to the utility of bike boulevards because it educates cyclists and would-be cyclists that there are safe, comfortable ways of accessing Rochester by bike.

One potential obstacle to implementing bike boulevards is the crossing of major roadways.

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Rochester Bicycle Master Plan



Example wayfinding signage for bike boulevards

Improvements to signal timing and detection, or the provision of enhanced crossing treatments where no signals exist, will make a bike boulevard more appealing to cyclists. These enhanced crossings could include raised medians, activated flashing beacons, or even pedestrian hybrid signals. It's fairly simple: make the bike boulevard more convenient to use, and more people will use it.

Another challenge related to bike boulevards is the frequent opposition voiced by local residents. Those who live along the streets being altered are commonly hesitant about the bike boulevard concept. Other motorists who travel on the street may feel the same

way because of reduced mobility for the auto mode. Jurisdictions considering the implementation of a bike boulevard should be aware of these considerations and should accordingly plan for early and sustained public outreach to the project's neighbors.

The City of Rochester should pursue the implementation of bike boulevards, potentially employing a strategy of using low-impact components (signage and pavement markings) initially. Traffic calming treatments could be installed as a second implementation phase depending upon the success of, and community reaction to, the initial implementation.

D. Bike Routes

Bike routes are signed links between origins and destinations that have been improved for, or are for some reason considered preferable for, bicycle travel. By identifying and improving routes for bike travel, then informing the public of their existence, bike routes can encourage bicycle use in a community.

Bike routes can be developed either as individual routes or as a network. Bike routes could be identified one at a time, and signed as independent routes. More often, however, the development of a bike route network would include the identification of a set of specific destinations and an interconnected system of routes to connect them. Then public input (often from local bike clubs) should be solicited to identify potential routes. A system of routes should be



*Bike only through access in Vancouver, B.C.
(Photo Credit - Dan Burden)*

5. Additional Bicycle Facilities and Treatments

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identified for evaluation and improvement and then a final route signing plan developed.

Regardless of whether bike routes are developed individually or as a system, each route should be subjected to a thorough evaluation to ensure its safety and practicality for cyclists. Ideally, these evaluations would be conducted on bikes. At least one casual cyclist, one commuter cyclist, and one qualified traffic safety professional (preferably also a cyclist) should take part in the evaluation. Any potential obstacle, maintenance issue, or traffic control improvements that would improve the route for bicyclists should be noted. Traffic control recommendations should consider signage, markings, signalization and limited geometric improvements.

The most publicly apparent improvements to bike routes are wayfinding signs. Bike routes can be provided for general routes or number routes.

Regardless they should provide information on destination, direction and distance.

General Routes connect users to destinations within a community. Typical destinations include:

- Attraction Areas (i.e. stadiums, parks, etc.);
- Neighborhood Areas (i.e. downtown, historic neighborhoods, etc.); and
- Trail Networks or trailheads (i.e. Genesee River Trail).

Bicycle Guide signs may be provided along designated bicycle routes to inform bicyclists of bicycle route direction changes and to confirm route direction, distance, and destination. A typical sign that conveys the basic wayfinding information for general routes is illustrated on the following page. The *MUTCD* provides a number of different types of signs that can be used to provide wayfinding along bike routes.

Some communities may implement a numbered system of bike routes. These routes should be designated using

Route 4: Loop segment east entrance Maitland Community Park to Howell Branch Preserve (Howell Branch Entrance) via Arapaho Trail, Mohican Trail (EB) or Mohave Trail and Thunderbird Trail (WB), Mohican Trail, Thistle Lane, Mohawk Trail, Tuscarora Trail, Temple Trail, Howell Branch Rd		
Junctioning Routes: 3, 4A, 4B, 5, 6B		
Destinations served: Maitland Community Park, Howell Branch Preserve(Temple Trail Entrance, Howell Branch Entrance)		
Item	Location	Photo
Parking encroachments	Mohican Trail between Arapaho Trail and Mojave Trail	4.1
Inlet encroaches into bike lane	Mohican Trail between Parliament Road and Thistle Lane (at pathway crosswalk)	4.2
Inlet needs striping	Intersection EB Mohawk Trail and Tomahawk Trail	4.3
Possible sharrows	Temple Trail from Tuscarora Trail to Howell Branch Rd	4.4
Edge of pavement maintenance	Temple Trail, south of Cove Trail	
RPMs on edge line	Temple Trail, northbound and southbound, north of Howell Branch Rd	
Possible, sharrows,	Howell Branch Rd	
Notes: There is a pathway parallel to Thistle Lane, but it does not connect to Mohawk Trail, and so is not included on the route. It is worth noting, however, that the bollards at the center of the trail on its southern end (where it meets the service drive for Dommerich Elementary) is missing reflective tape and the trail surface should be striped in advance to warn users of their presence (photo 4.5).		

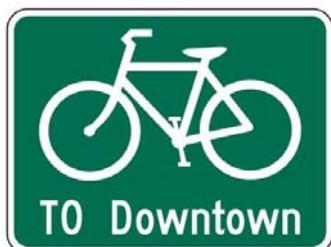
Example of a route evaluation report

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Bicycle Route signs. Bicycle Route signs can be customized by adding a specific community logo in the upper portion of the ellipse.



D11-1c



D1-2



D1-1

General bike route wayfinding signage



Bicycle Route signage

E. Bike Parking

The provision of secure bicycle parking is an important complement to the on-street facility types

described above. According to one member of the Rochester public, “If there isn’t safe, convenient bike parking you’ll never get bicyclists to go there no matter what kinds of street improvements you implement.”

Intended for short term storage periods between 2-4 hours, generally uncovered and unsupervised. Relatively inexpensive.

\$100-300 per unit
(parks 2 bikes)



Bike
Rack

Short-Term Bicycle Parking

Short-term bicycle parking is usually defined as being intended for two hours or less, such as might be necessary outside a store, or for visitors to an office building, park, or Government service center.⁶ This type of parking need can usually be accommodated by bike racks of varying designs, so long as the racks are supportive of the bike’s frame.

In early 2010, the City of Rochester made a sizeable purchase of bike racks; a mix of post-and-loop and inverted-U designs for installation throughout the City. The City accepts requests for bike rack installations, and if the location is feasible, installs the bike racks where requested.

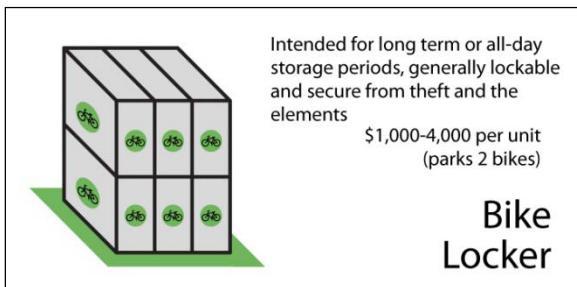
⁶<http://www.bicyclinginfo.org/engineering/parking.cfm>. Accessed November 8, 2010.

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This City-operated bike parking initiative will fulfill the existing need for more short-term bicycle parking in the City, as identified by several attendees of the public workshops. To request a bike rack at a specific location, residents can contact the Bureau of Architecture & Engineering's Development Division.



Long-Term Bicycle Parking

Long term parking usually suggests that the bicyclist is leaving the bike all day, or overnight, or for an even longer duration. This commonly takes the form of bicycle storage lockers. This long-term bicycle parking solution is generally secure from theft and other tampering. The City has bicycle lockers in most City-owned parking garages.



Covered bicycle shelters are another form of long-term bicycle parking. Bike shelters are intended for

periods of 4-10 hours, and are generally located in pedestrian oriented or festival areas due to their higher cost than other forms of bicycle parking. Despite the higher cost, bicycle parking shelters can be designed as attractive, aesthetically pleasing features of the streetscape, and serve to promote bicycling by including informational signage, messages, or route maps. Bicycle shelters should be outfitted with bike racks and should have a ceiling height that accommodates adult riders while not being excessively high to allow rain and snow to fall under the shelter.

In an effort to link bicycle trips with long distance regional trips, secure bicycle storage facilities should be provided at all transit hubs within the city; such locations include the planned RGRTA Transit Center on Mortimer Street and the Amtrak station on Central Avenue. This would allow commuters and other travelers to go between home, work, and other destinations without the use of a personal vehicle, should that be their choice, which effectively increases transportation options and reduces emissions and traffic congestion. Such a program would also leverage the existing bike racks provided on RTS buses. Bicycle storage lockers should also be considered at other high demand destinations, including office buildings and major retail areas.

According to the peer city review, Boulder, Colorado provides bicycle storage lockers at each of its transit hubs, free of charge to users. The city of Montréal is

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Recommended Bicycle Parking Locations

Short-Term Bicycle Parking	Long-Term Bicycle Parking
K-12 Schools	Transit Centers (RGRTA, Amtrak)
Libraries	Parking Garages
Recreation Centers	Large Office Buildings
Museums (The Strong, Rochester Museum and Science Center)	Multi-family Residential Buildings
Sports Stadiums (Frontier Field, Brown's Square Soccer Stadium)	Universities (U of R)
Event Centers (Blue Cross Arena)	Central Business District
Rochester Public Market	Tourist Destinations
Retail Areas	

also making an effort to provide bicycle storage facilities at all Metro stations. The City of Minneapolis, Minnesota has included minimum bicycle parking requirements in its zoning code for a multitude of uses. This resource can be used by the City of Rochester to determine appropriate amounts of bicycle parking for differing land uses. As noted in another section of this Plan, amendments to the zoning code should be made to encourage the installation of bicycle storage lockers at appropriate land uses.

Priority should be given to bicycle parking locations that coincide with high-demand bicycle routes or those with existing or planned bicycle facility improvements. The table above lists priority locations for bicycle parking.

F. Other Treatments

There are many new treatments being tried across the country to improve conditions for bicyclists. Some, like the bike boulevard concept, are almost universally believed to increase cycling and improve safety. Other treatments are still being evaluated. Before implementing any of these treatments the City should review the latest research. Short descriptions of some the more popular of these treatments are provided in this section.

1. *Contra-flow bike lanes* are bike lanes placed on one-way streets that provide for bicycle movements against the flow of the allowed direction of motor vehicle traffic on the roadway. Contra-flow bike lanes provide improved network connectivity for bicyclists. Contra-flow bike lanes must be placed on the right side of the street (with respect to the bicyclist's

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travel), typically separated from the opposing flows by double yellow stripes or a traffic separator. When implementing a contra-flow bike lane, all traffic control devices (stop signs, wayfinding, turning movement restrictions, signals, etc.) must be provided for the contra-flow bicyclists.



*Contra-flow bike lane in Washington D.C.
(Photo Credit – DDOTDC)*

2. *Buffered bike lanes* are bike lanes that are separated from the motor vehicle lanes by a wider separation striping. Usually the separation to a buffered bike lane is enhanced with chevron striping. The bike lane is still skipped at commercial driveways and on the approach to intersections - and discontinuous across intersections - just as regular bike lane striping. When striping any bike lane, the striping must accommodate the requirement for motorists to turn right from the right hand edge of the pavement and allow for left turning cyclists to exit the bike lane.

Buffered bike lanes are a nonstandard treatment. While not described by the *MUTCD*, they may be designed with striping consistent with the *MUTCD*.



Example of buffered bike lane striping

3. *Cycle tracks* are bikeways separated from the travel lanes by a physical separator. Often on-street parallel parking is placed between the cycle track and the general roadway travel lanes. Cycle tracks require very careful design. Providing adequate sight distances at conflict areas is critical. Ensuring that motorists yield to bicyclists on the cycle track, where appropriate, is problematic. Merging one-way cycle track bicyclists with motorists turning right at intersections (or vice versa) is a challenging design proposition. Some communities (including European cities) provide bicycle specific signals at the intersections with exclusive bicycle phases to accommodate turns across the roadway. New York City has implemented several cycle tracks with varying degrees of success. While they appear to be having a positive influence on safety, some cyclists have found them to be problematic (pedestrian conflicts, motorists using them as loading zones, and increased delays at intersections).

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Cycle track in Cambridge, MA
(Photo Credit - Cara Seiderman)

Two-way cycle tracks can be especially problematic as they place cyclists riding against traffic in a location where they are not expected by motorists. This concern may be mitigated by enhanced traffic control at conflict points and bike-specific phasing at signalized intersections. The City of St. Petersburg, Florida recently implemented a two-way cycle track along a one-way commercial street that was carefully designed to minimize the potential conflicts between bicyclists and motorists using innovative design treatments including chicanes and enhanced sight triangles.

Cycle tracks are a nonstandard treatment.



Cycle track in St. Petersburg, FL

4. Bike boxes are advanced stop bars that allow bicyclists to queue jump and move in front of motorists at traffic signals or stop signs. They are most frequently installed to prevent the “right hook” crash and so that bicyclists can more easily make left turns.



A bike box in San Francisco, CA
(Photo Credit - Michael Rhodes)

The opinions of cyclists are mixed on this device and conclusive research as to the safety benefits has not yet been published. Some transportation professionals have a concern about the treatment with respect to how it seems to contradict the rules of the road (in most states). For instance, in New York, “both the approach for a right turn and a right turn shall be made as close as practicable to the right hand curb or edge of the roadway or, where travel on the shoulder or slope has been authorized, from the shoulder or slope.” (Laws and Traffic, Vehicles and Traffic, Article 28, §1160) This law, which effectively requires right turning bicyclists attempting to reach the bike box to travel in the same space where right turning motorists should be stopped at a red light, is the reason bike lanes are typically skip-dashed or

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terminated on the approach to intersections without right turn lanes.

Another concern is conflicts that may occur as cyclists who are approaching the bike box on a green light, or just as the light changes from red to green, make a left turn.

Bike boxes are a nonstandard treatment and are not supported by the *MUTCD*.

5. *Colored bike lanes* can refer to one of two treatments. The first is a continuous treatment in a bike lane that makes it contrast with the general roadway travel lanes along its entire length. This treatment is intended to alert motorists to the presence of the bike lane and, perhaps, have a calming effect on the adjacent street by visually narrowing the roadway.

The *MUTCD* does not support the painting of bike lanes as a traffic control device, but the painting of



A continuous colored, buffered bike lane treatment in San Francisco, CA (Photo Credit - Matthew Roth)

existing bike lanes for aesthetic purposes is allowed.

AASHTO's *Policy on the Geometric Design of Streets and Highways* supports using contrasting pavement for shoulders and auxiliary lanes.

Another application of painted bike lanes is the painting of conflict zones only. The intent of painting conflict zones is to alert motorists who are crossing the bike lane to the potential presence of bicyclists. This treatment does appear to reduce conflicts. Some professionals have expressed concern that initial research has shown a reduction in bicyclists' over-the-shoulder scanning at intersections where this treatment has been implemented. Regardless, painted conflict zones are not appropriate in all locations (Portland, OR is removing at least one of its installations) and a careful evaluation of the intended travel paths for motorists and bicyclists - and the path's consistency with normal rules of the road - is required.

Painted conflict zones are a nonstandard treatment and are not supported by the *MUTCD*.

6. *Bicycle traffic signals* are signals used specifically to control bicycle movements at signalized intersections - either of roadways or of roadways and trails. Regular traffic signal heads may be used for controlling bike traffic and this treatment is completely consistent with the *MUTCD*. The use of the bicycle symbol on the signal face is not a standard *MUTCD* treatment. However, some professionals feel it is necessary to eliminate potential confusion where the signal head can be seen by motorists as well as

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bicyclists. Others prefer the use of a sign with the text "Bike Signal" mounted over a normal signal head.



Bicycle traffic signal in Washington, D.C.
(Photo Credit – DDOTDC)

7. Raised crossings have been used to provide enhanced bicycle (and pedestrian) crossings at midblock locations, right turn lanes, and bus bays. Raised crossings allow bicyclists to cross the motor vehicle travel stream without changing elevation. This is intended to reinforce the requirement that the motorist must yield at these locations.

These crossings can be designed to be consistent with the *MUTCD*.



A raised crossing in a right turn bypass lane in Boulder, CO (Photo Credit - GO Boulder)

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Chapter 6: Recommendations on Outreach, Education, and Zoning

6. Recommendations on Outreach, Education, and Zoning

Rochester Bicycle Master Plan



A. Introduction

This Bicycle Master Plan will help the City of Rochester provide safe, convenient routes for bicyclists to commute and recreate throughout the City, and connect to regional bicycle systems. The bicycle network's success depends on users being able to safely, appropriately and frequently utilize the network. To assist in creating an effective and safe bicycle network, outreach, education, and zoning enhancements will be necessary. Perhaps the most frequently received comment as part of this Plan's public input is a desire to educate roadway users (both bicyclists and motorists) about the rules of the road and safe bicycling behavior while also encouraging more people to get out and ride their bikes. One online comment sums up this hope: "One of the biggest challenges is getting people – both cyclists and motorists – to feel more comfortable on the streets when there aren't off-street bicycle facilities available ..."

B. Outreach and Education

The outreach and education recommendations in this chapter aim to increase the number of Rochester bicyclists while improving safe and appropriate behavior by bicyclists, motorists, and pedestrians. The bicycle network will attract bicyclists of different skill levels and ages, as well as provide opportunities for interaction with motorists and pedestrians. Education and outreach programs must consider all of these different user groups. AASHTO's *Guide for the Development of Bicycle Facilities* (1999)

recommends that an education plan address the following four groups:

- Young bicyclists;
- Adult bicyclists;
- Parents of young bicyclists; and
- Motorists.

This Plan recommends that the following groups be addressed as well:

- Senior bicyclists;
- Impoverished/underserved bicyclists;
- Immigrant bicyclists;
- Visiting bicyclists; and
- Pedestrians.

When developing the different programs, campaigns or information elements, it is important to make sure each group is addressed in multiple and suitable ways. For example, programs for young bicyclists should use age-appropriate curriculum and language to explain concepts and issues. In addition, the City of Rochester is home to people of many different ethnic backgrounds, including a large refugee population. Language barriers should be considered as educational materials are developed. The City of Rochester should seek partnerships that bridge cultural boundaries. Such partnerships would provide a valuable channel for distribution of educational materials and for general promotion of bicycling in underserved communities. This would also assist in the development of multi-language materials.

6. Recommendations on Outreach, Education, and Zoning

Rochester Bicycle Master Plan



One of the key things to keep in mind when planning outreach and education efforts is not to “reinvent the wheel”. Many successful programs, campaigns and resources are available. Locally, there are already many efforts underway. Other communities throughout the U.S. and Canada have already developed tools that can be adapted and modified for the City of Rochester. This adaptation is important in order to effectively localize the educational campaigns. Locally created campaigns that include materials with a local feel have been shown to have a more noticeable influence on motorist and bicyclist behaviors than generic FHWA-produced materials. The framework for the education and outreach strategy was crafted with all of this in mind.



Recommendation 1: Connect partners to maximize the effectiveness of existing resources, programs, and materials.

A list of potential partners has been developed, and their existing programs and partnerships have been inventoried to identify opportunities for new

partnerships and enhanced use of resources. Some of these partners are already working together, but there are new partnerships that can be nurtured and developed, and new ways for existing educational materials to be used. Not all of the potential partners are specifically focused on bicycle-related issues, but may still be a useful partner for their ability to communicate with a certain part of the Rochester population. See the following page for a summary of the current outreach and education programs, and Appendix I for a detailed catalog.

Examples:

- a. Coordinate different organizations that offer bicycle rodeos for young bicyclists to see what ways they can support each other and maximize existing resources. Organizations include City of Rochester Department of Recreation and Youth Services, Injury Free Coalition for Kids, and Monroe County Office of Traffic Safety.
- b. Utilize the RocCity Coalition to locate volunteers for bicycle rodeos and bicycle repair programs, and to distribute information about bicycling to young adults in Rochester.
- c. The Strong (formerly the Strong National Museum of Play) has an enormous audience of children and their families, and could partner with other interested organizations to help promote bicycling.

Partner Name	Existing Programs					Existing Partnerships					Highlights
	Bicycle Safety	Community Health	Environmental Concerns	Transportation Equity	Neighborhood Livability	Bicycle Safety	Community Health	Environmental Concerns	Transportation Equity	Neighborhood Livability	
AARP											Did not respond to request for information
Boys & Girls Clubs of Rochester, NY											Cyclopedia - connects bicycling to online documentation.
City of Rochester Dept of Rec & Youth Services											Bicycle rodeos, helmet giveaways, Recreation on the move
Finger Lakes Health Association											Did not respond to request for information
Genesee Land Trust											Working with city groups in 14621 to develop El Camino urban trail.
Genesee Regional Off-Road Cyclists (GROC)											Singletrack Academy to teach bicycle handling skills.
Genesee Transportation Council											Funds studies addressing key issues. Helmet brochure, bike map.
Greater Rochester Health Foundation											Did not respond to request for information
Visit Rochester											Distributes information to visitors.
Injury Free Coalition for Kids											Kohl's Pedal Patrol that provides bike rodeos and helmets.
Monroe Community College (MCC)											Curb Your Car program, LEED Projects/Bike Facilities.
Monroe County Health Department											Partnered w/ University of Rochester Center for Community Health
Monroe County/Rochester Public Libraries											Venue for education/outreach programs and distribution of materials
Monroe County Office of Traffic Safety											Programs are free and available to any school in Monroe County.
Monroe County Planning Department											Did not respond to request for information
RocCity Coalition											Many partnerships, not bicycle-related.
Rochester Area Community Foundation											Did not respond to request for information
Rochester Bicycling Club (RBC)											Dedicated to promoting cycling for health and well being
Rochester City School District (RCSD)											Did not respond to request for information
R Community Bikes, Inc.											Bike and helmet giveaways, bike repairs for underserved
Rochester Cycling Alliance											Did not respond to request for information
Rochester Institute of Technology (RIT)											Active Transportation Planning course
The Strong											Continual demand for programs, reaches many families & children
University of Rochester											On campus improvements, Active Transportation Symposium
Wegmans											Did not respond to request for information
YMCA											Did not respond to request for information

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Recommendation 2: Identify an organization that can act as a “clearinghouse” for all the existing bicycle-related programs and resources, and provide support for whoever is willing to take on this role.

Despite the fact that many programs and resources already exist locally, there is no central person or organization who is keeping track of all these efforts. One of the least expensive ways to improve the effectiveness of any existing or proposed education and outreach effort is through partnerships and connections. If one organization were to act as a clearinghouse, they could help different groups to build partnerships, catalog the campaigns and materials that are available for use, and enhance communication and coordination.

Recommendation 3: Develop new - or identify existing - educational materials that address key issues.

Whether there is an existing resource available, or a new resource is needed, some of the key issues that should be addressed in future education and outreach efforts include:

- a. Bicycle safety, particularly in regards to lights, helmets, and winter cycling
 - A bicycle light education and enforcement campaign, including giveaways. (The Boulder Bike Light campaign mentioned under Recommendation 4 is an example.)
 - A helmet use encouragement campaign.

- With Rochester's long season of inclement weather, a winter cycling safety campaign would be appropriate. This campaign could involve skills workshops.

- b. Rules of the Road – for bicyclists and motorists
 - A “Dangers of Riding Against Traffic” campaign.
 - An “Anti-Traffic Signal Violation” education and enforcement campaign.
- c. Encourage bicycling for short trip transportation
- d. Health benefits of bicycling

Recommendation 4: Learn from successful outreach and education examples in other bicycle-friendly communities.

As indicated previously in this section, many successful programs, campaigns and resources are already available. Other communities throughout the U.S. and Canada have already developed tools that can be adapted and modified for the City of Rochester. Of particular note are those campaigns and strategies identified in the Peer City Review.

Priority Examples:

- a. May is National Bike Month - Recognizes those who commute by bike and encourages people to become new bicycle commuters or increase their trips by bike during the season when spring has

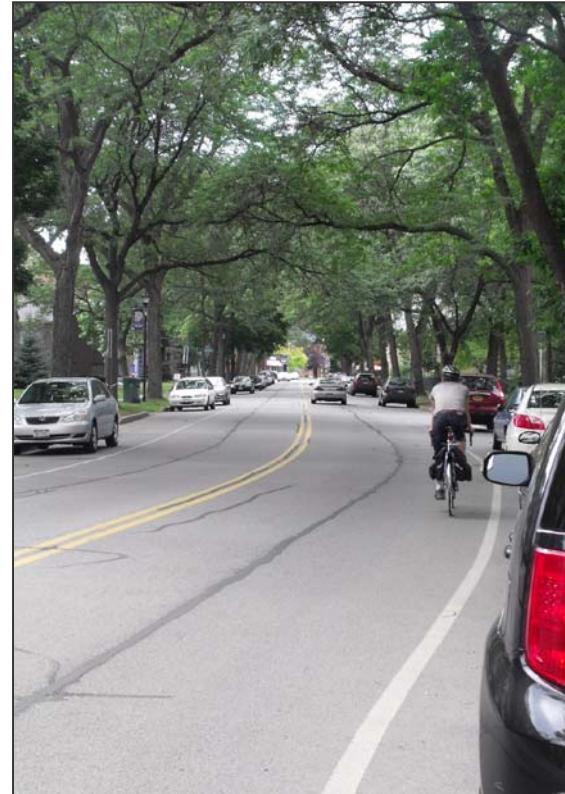
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sprung and new beginnings abound. This program features a month long calendar of events that offers organized rides for different ages and abilities, bike handling skills and maintenance workshops, and a Bike to Work Day Commuter Challenge. The program is most successful when led by a community-based organization with financial support from the City and greater business community.

- b. **Bicycle Ambassadors** - A team of at least two ambassadors encourages an increase in bicycling by engaging the general public to answer questions about bicycling and teach bicycle skills and rules of the road. Ambassadors attend community-based events throughout peak cycling season to offer helmet fits, route planning, bike rodeos and commuting 101 workshops. Community members also may request an appearance by a team of ambassadors at businesses, schools or a conflict zone location along the bikeway system. Such a program has been specifically recommended to the City of Rochester by the League of American Bicyclists. In addition, the Downtown Special Services "Red Shirts" already serve as ambassadors and often make their rounds on bicycles. This may be an opportunity for partnership if the Rochester Downtown Development Corporation (RDDC) were interested in such an endeavor, and if the effort was consistent with the RDDC's mission.



- c. **Bike Light Campaign** - With shorter days when it gets dark before commuters head home from the office, fall is a good time of year to remind cyclists that proper equipment is required when riding at night. A bike light campaign also offers the opportunity to introduce cyclists to bicycle shops and strengthen partnerships between the City and retailers. This program could offer discounts on bicycle headlights and rear red reflectors and lights. It is recommended that the campaign be rolled out in September with the return of university as well as K-12 students to school. The campaign should expire before peak holiday season when bike shops are busy and less interested in offering discounts.

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- d. League of American Bicyclists Bicycle Friendly Community status - The Bicycle Friendly Community (BFC) program created by the League of American Bicyclists (LAB) offers the opportunity to be recognized for achievements in supporting bicycling for transportation and recreation. It also serves as a benchmark to identify improvements yet to be made. As noted in this Plan's introduction, Rochester received an Honorable Mention from the LAB in 2008, and the City has a stated goal to achieve full BFC status.
- e. League Certified Instructor training course scholarships - The League of American Bicyclists offers certification courses to train those interested in teaching others to ride their bike safely and legally as a form of transportation. League Certified Instructors (LCIs) are a valuable asset to the community and can offer a variety of workshops for adults lacking confidence to ride in traffic as well as children learning to ride for the first time. LCI training courses require a two and a half day commitment and are offered through the LAB. To facilitate a cadre of cyclists to become LCIs, this program coordinates with the LAB to schedule training course offerings in the community and provide scholarships.
- f. Expand the Safe Routes to School (SRTS) program – SRTS is a national program that addresses barriers that inhibit students from walking and biking to school. The Genesee Transportation Council recently administered a regional study of the Safe Routes to School program. One of the four case studies was an elementary school in the City of Rochester. The City should work with the Rochester City School District (RCSD) to implement the recommendations from this case study, and consider how the program could be expanded to assess barriers at all city schools. Increasing the number of children that can safely walk and bicycle to school as well as protecting the safety of those that already do so requires a holistic approach. SRTS programs need to be neighborhood sensitive and cooperative efforts involving both the City and the RCSD would be useful in helping to build bridges between the City's schools and surrounding neighborhoods
- g. Ensure that all parts of the city have equal access to bicycle facilities.
- h. Conduct public safety announcements on following the rules of the road. For motorists, this campaign should address the need to look left prior to turning right, and provide clear passing space. For bicyclists, this campaign should address bicycle lights and lack of visibility when not riding in the road.

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- i. Targeted enforcement initiatives – Focus on targeted enforcement initiatives that result in everyone following the rules of the road.
- j. Mass distribution of a bike map – The Genesee Transportation Council has already created a regional bike map, but formatting and printing changes might allow for a bike map that could be more widely distributed. 20,000 copies of the regional map were printed and approximately 13,000 copies have been distributed. The map includes not only bicycle suitability ratings but extensive safety information for bicyclists, a listing of area bicycle shops and repair services, location of bicycle lockers and how to obtain access to use them, information about how to use the bike racks that are provided on all RTS buses, and a listing of multi-use trails in the region. The map is free and can be provided upon request. If the City published a map including only its corporate boundary, it could probably be produced in a smaller format than the GTC map, which covers a much larger area. An excellent example is the map and info guide produced by the City of Vancouver, British Columbia that illustrates bicycle routes in the city, and utilizes a compact, folded-into-wallet-size (Z-card) format.
- k. Institute a “Sunday Parkways” ride once per month - In Madison, WI, Sunday Parkways are times set aside on weekends and holidays for traffic-free biking and walking on a network of selected streets.
- l. Create a bicycle wayfinding program that includes identification of routes and signing plans (destination, distance, direction) as well as assessments of potential improvements along the proposed routes.
- m. Adapt Oregon program “Bike Wheels to Steering Wheels.” The program helps youth better understand the relationship between bicycle safety and motion, and ultimately gives students a better understanding of safety when traveling by all modes, including walking, biking, and driving. The concepts are learned through normal math or science curriculum in schools.

Other Possible Examples:

- a. Commuter of the Year Contest - This contest recognizes those who choose to bike, walk, or ride transit. An aim is to encourage others to reduce their drive alone motor vehicle trips. Nominated by their peers, contestants may be employees, residents, or students in the community and should also be asked to provide an inspirational story about their transportation choice and habits. Based on nominations, categories could recognize Youth, Student, Senior, and Family Commuters. Winners also should be encouraged to serve as role models and participate in events throughout the year to

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- mentor others and help them set goals to reduce their drive alone trips.
- contains instructions, diagrams and props necessary to host a bike rodeo.
- b. Business Pool Bike Program - Offering employees the opportunity to check out and ride a bike to meetings, lunch or run errands is a great benefit. Pool bikes are a form of bike sharing where an employer manages a fleet of bikes for this purpose. This program offers subsidies for the purchase and on-going maintenance of bikes as part of an agreement to track use and achieve the goal of reducing vehicle miles traveled and green house gases. Employees sign up, make reservations and log their trips using a web-based management tool.
 - c. Conduct bicycle counts on a seasonal basis to track whether there is an increase in bicycle activity, exploring new methods as suggested by the public and the League of American Bicyclists.
 - d. Bicycle Rodeo Kits - Children learning to ride should be confident with their bike-handling skills before riding in traffic. A Bike Rodeo is an interactive and controlled environment where cyclists practice a new skill at a series of stations. The number and difficulty of skills can be tailored based on attendance and number of instructors available to staff the event. This initiative will create a self-service bicycle rodeo kit that can be reserved by League Cycling Instructors (LCIs), Bike Ambassadors and community members. It
 - e. Participate in an annual meeting of all bicycle/pedestrian planners and engineers in Monroe County – An annual meeting should be held to allow local communities and organizations to communicate their plans and programs, as well as share best practice information. Note: City officials may not want to facilitate such a meeting, but it would be useful to participate if some other entity were to organize the event.
 - f. Identify proper enhanced visibility clothing for bicyclists and advise the local bicycling community of the associated safety benefits.
 - g. As part of a larger roadway safety campaign, develop an educational campaign to eliminate bicycle fatalities. In Minnesota, “Toward Zero Deaths” is a statewide partnership led by the Department of Public Safety, the Department of Transportation, and the Department of Health, in cooperation with the Minnesota State Patrol, the Federal Highway Administration, Minnesota county engineers, and the Center for Transportation Studies at the University of Minnesota. The mission is to create a culture in which traffic fatalities and serious injuries are no longer acceptable through the integrated application of education, engineering,

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enforcement, and emergency medical and trauma services.

Recommendation 5: Implement a targeted bicycle enforcement campaign.

The effort to enforce the traffic laws as they relate to bicycle safety should be addressed in an overall, countywide, coordinated, bicycle enforcement campaign. Such a campaign should be designed keeping in mind the League of American Bicyclists' recommendation that Rochester "make connections between the bicycling community and law enforcement." Sporadic enforcement will not result in significant improvements to bicyclist behavior and will likely result in resentment of law enforcement personnel. Those behaviors to be targeted should be determined at the outset of the law enforcement campaign. The following behaviors should be targeted in the City of Rochester (and Monroe County):

- Riding at night without lights;
- Violating traffic signals;
- Riding on sidewalks in Downtown Rochester; and
- Riding against traffic on the roadway.

These four behaviors were chosen for two reasons. First, they represent particularly hazardous behaviors which result in many crashes. Secondly, and very importantly, the enforcement of these behaviors is easy to justify to the public. When coupled with (and

in fact preceded by) a large-scale education campaign, the public will understand the importance of the campaign and consequently will accept the enforcement activity.

In addition to the need to educate bicyclists and motorists, some targeted training of law enforcement may also be appropriate. Some questions that could be covered in this training include: "When is it okay for bicyclists to "claim the lane?" "What width constitutes 'traffic lanes too narrow for a bicycle and a vehicle to travel safely side-by-side within the lane?'" "Why is it important for a bicyclist to use headlamps and tail lamps?" "Why is riding against traffic such a problem?" By answering these and other similar questions, and discussing what infractions are most likely to lead to bike crashes, cities can encourage law enforcement to help promote bike safety by targeting those behaviors most likely to result in crashes. Some communities educate local law enforcement through the enforcement agency's standing roll-call meetings, while others send officers to the League of American Bicyclists' Traffic Skills 101 courses.

Recommendation 6: Develop an education plan that builds upon the education and outreach recommendations identified in the Rochester Bicycle Master Plan.

The five prior recommendations outlined in this outreach and education section are a good foundation

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for a more detailed education plan for the City of Rochester. An education plan would provide additional resources to help the City create a safe and effective bicycle network.

C. Zoning and Private-Sector Partnership

Significant portions of this Bicycle Master Plan advance the accommodation of bicycling in the transportation network's public right-of-way. However effective this initiative, confined to the public rights-of-way, it is not enough for success in encouraging people's use of the bicycle for commuting or other utilitarian transportation - it will fall short of its investment goals unless it is coupled with partnership with the private sector. This partnership can be stimulated through changes in Rochester's land use, end of trip provisions within the destinations of bicycling trips, and transportation choice programs. A quarter century of nationwide research, opinion and behavioral surveys, and Rochester's very own experience underscores this. The private sector's role in the encouragement of bicycle transportation, particularly for commuting using end of trip provisions, is highlighted herein.

The two most influential end of trip provisions consistently cited by North Americans in nationally prominent opinion surveys as affecting their choice to bicycle for transportation are bicycle parking availability (and convenience) and, for commuting, the provision of locker/showers at their workplace. Rochester's codes outline these features as options

in land development; however, anecdotally, these are not frequently implemented throughout the City. Thus, changes to these codes are recommended in the form of stronger incentives, rather than mandates.

Bicycle Parking

In Rochester, the provision of bicycle parking for development is required in the Zoning Code, specifically Chapter 120, Sec. 173, which states that "bicycle parking shall be provided equal to 10% of the vehicle parking requirements, for a minimum of two bicycles, for all multifamily housing (over 10 units), commercial and industrial uses." It is recommended that a further zoning provision codify two additional bicycle parking components: 1) require bicycle parking regardless of zoning district (including those that currently do not have motor vehicle parking requirements), and 2) formalize developers' ability to reduce the number of required motor vehicle parking spaces by the number of bicycle parking spaces required (this option will become more of an incentive as gas prices continue to rise in the future). Furthermore, the design specification for bicycle parking should stipulate that the parking location be similar to that required for handicapped (motor vehicle) parking, and that the bicycle parking location be secure, covered, and at grade level.

In-building Bicycle Commuter Showers and Lockers

Workplace bicycle lockers, change and/or shower facilities are not generally being constructed in Rochester. It appears that the current zoning code's

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incentives, that of vehicular parking off-sets, are not inviting enough. Thus there are two options to be considered: increase the incentives or mandate the facilities. The first option of offering more effective incentives, is recommended; outlined herein are several approaches to this strategy.



Bicycle lockers in Rochester

The continued investment by the City in public bicycle transportation infrastructure can be complemented by developers and commercial property owners providing on-site showers and locker facilities. There are a number of incentives that can be offered to the (private) sector developing and managing commercial properties; many of these incentives can be offered at little or no actual expense to the City.

There are two phases in which the incentives can be effective: upon initial land development and during tenant build-out and/or remodeling or renovation. Among the compelling incentives for the construction

of bicycle locker/changing/shower facilities at initial land development (or during site re-development) are:

- Trip generation (hence traffic impacts) reduction during traffic impact assessments (e.g., up to five percent of total trip generation, depending on land use);
- Floor area bonus (equal to the space taken up by the bicycle commuter facility) for those districts and uses that specify maximum square footage;
- Reductions⁷ to required yard/setbacks (e.g., up to 20 percent for providing shower and locker facilities with capacity of serving up to five percent of employees);
- Administrative variances for more compact parking lot dimension(s); and
- Greenspace (for vehicle utilization area (VUA)) requirement reduction, (e.g., up to twenty times the building square footage dedicated to the bicycle facility).

Incentives for actions subsequent to initial development (i.e., tenant build-outs and internal building renovations) include ad valorem tax exclusion of at least two times the square footage of the building dedicated to the locker/changing/shower facility. This exclusion could be increased if the tenant businesses participated in additional transportation demand management programs offered by the City. Other incentives could include offsets to city collected user fees.

⁷ or internal (transfer) flexibility of required land use buffer yards

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A number of cities in North America have implemented these or similar incentive provisions for the private sector partnering with public agencies through provision of bicycle parking, commuter showers, and lockers. Among them are peer cities such as Boulder, Minneapolis, and Seattle.

As the City transforms its transportation system in the public rights-of-way, a concomitant partnership by the private sector will ensure the effectiveness of the public initiative. The end result will be increased opportunities for the residents of the City to choose bicycling for commuting and travel. Their choice will enhance workplace productivity and employee health, which will in turn improve the citywide economic well-being and overall quality of life in Rochester.