ROCHESTER COMPREHENSIVE PLAN 2040

Non-Motorized Transportation Analysis

April 2015

NELSON
NYGAARD

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Introduction

Rochester has in recent years shown a commitment to increasing opportunities for walking and bicycling through a mix of supportive policies and infrastructure investments. In recognition of these efforts, Rochester has been designated a Bronze level walk friendly community and a Bronze level bicycle friendly community. This memorandum provides a summary of existing conditions for non-motorized transportation modes in Rochester (also sometimes referred to as 'active transportation' modes). Documenting existing conditions will lay a foundation for the development of projects and policies supportive of walking and bicycling that will be included in the updated Rochester Comprehensive Plan.

The focus of the analysis is on those conditions that affect either the amount of walking or bicycling or the quality of the experience. Walking and bicycling are considered separately because they tend to be different in terms of factors such as the facilities used and trip lengths. Where applicable, findings from the recently completed Rochester Bicycle Master Plan (2012) plan are incorporated into this analysis. The memo concludes with a combined non-motorized transportation section which includes an analysis of city programs and policies and supportive non-motorized transportation facilities.

Summary of Key Findings

- Demand for walking and bicycling is highest in the downtown area, though a crash analysis presented in the motor vehicle section indicates bicycle and pedestrian crashes happen throughout the city, including near commercial and employment centers.
- Crashes are over-represented on the arterial network, which constitute approximately 40% of pedestrian and bicycle crashes but make up less than 15% of the lane miles in the city.
- Most crashes occur at intersections. Common non-motorized transportation crash types include bicycle crashes with right turning vehicles and pedestrian crashes with left turning vehicles.
- A Pedestrian Environmental Quality Index (PEQI) analysis provides an assessment of the comfort of walking along and across arterial roadways in Rochester. Many arterials are wide and with high vehicles speeds, exposing 'vulnerable' non-motorized transportation users to risk in the event of a crash. The PEQI analysis is overlaid with a demand map to identify areas along the network where potential demand for walking is limited by uncomfortable walking conditions, presenting potential opportunities to focus investments.
- Rochester has an extensive and well maintained sidewalk network as a result of policies requiring sidewalks in new developments, the clearing of sidewalks shortly after a snowfall, and regular reviews of sidewalk quality to ensure they are maintained in good condition.
- Opportunities for further improvement include enhancing the visibility of marked crossings by increasing the width of some marked 'zebra' crossings that can be hard to see as well as providing additional crossing enhancements for mid-block crossings of larger streets.
- Efforts to make arterial roadways more human scaled, as was recently completed on a portion of 2nd Street SW and consistent with the city's Complete Streets Policy, could be extended to other arterials in Rochester.
- Rochester's extensive trail system serves as an extremely strong foundation for creating a citywide network of bicycle facilities. Trails are predominantly used for recreation today due to a lack of on-street facilities to connect to employment or commercial destinations.
- The 2012 Rochester Bicycle Master Plan identifies a network to create needed connections. The city has begun implementing on-street facilities such as bike lanes, but use remains low due to the incomplete nature of the network. Opportunities exist to incorporate innovative bikeways treatments to increase user comfort (such as buffered bike lanes on major roadways, bicycle boulevard treatments to enhance low volume local streets, and green paint to identify conflict areas such as at driveways or freeway entrances), but will require education about and promotion of the benefits of these treatments to city staff, elected officials, and residents.
- Rochester policies compare well with those of reviewed peer cities. A summary of non-motorized transportation policies is found in the Combined Non-Motorized Transportation Analysis Section. One opportunity is to expand requirements for bicycle parking as part of new developments.

Pedestrian Analysis

This section describes the elements influencing the comfort and accessibility of the pedestrian network, population and land use characteristics that generate high levels of pedestrian activity, and the quality of Rochester's overall pedestrian environment relative to the demand.

Elements of the Pedestrian Network

The pedestrian network in Rochester is comprised of sidewalks, multi-use trails, marked pedestrian crossings, curb ramps, pedestrian amenities at signalized intersections, as well as subways and skyways.

Sidewalks

Sidewalks are the most basic element of the pedestrian realm, providing a place to walk that is physically separated from motorized traffic, serving as an extremely effective collision reduction strategy. As illustrated in Figure 1, Rochester has an extensive sidewalk network. At the time of the last sidewalk inventory, approximately 60% of the sidewalk network is complete. Notable areas lacking sidewalks include residential subdivisions that were originally developed outside the city limits but which have been annexed, included significant neighborhood areas in southwest and southeast Rochester. As per city policy, many short cul-de-sacs and private streets are not required to provide sidewalk facilities.

Subways and Skyways

Both the City of Rochester and the Mayo Clinic have made a concerted and long-standing investment in the subway and skyway network in the downtown core. These additional layers of pedestrian circulation are not typical of cities the size of Rochester, but are well utilized due to the concentration of medical, retail, office and entertainment uses in downtown. The subways provide access between Mayo Clinic facilities, while the skyways connect a number of buildings generally east of the Mayo Clinic and as far away as the Government Center and Mayo Civic Center.

Multi-Use Trails

Rochester has an impressive network of multi-use trails, with over 85 miles of bituminous or concrete surfaced trails available for pedestrian, bike, in-line skate, wheelchair, and stroller use according to the Parks and Recreation website. City data indicates that in total there are approximately 100 miles of pedestrian and bicycle trails, with another 10 miles of paved and unpaved trails in city parks. The Parks and Recreation website includes a link to a map that identifies which trails are maintained through snow removal year-round.

Curb Ramps

Curb ramps facilitate the transition between the sidewalk and the street at intersections and mid-block crossings for users with physical disabilities as well as people pushing strollers. Curb ramps are present at all existing intersections. Curb ramps with detectable warning strips, which alert vision impaired people that they are transitioning onto or off of the sidewalk, are implemented in all new construction as a matter of current policy.

Pedestrian Amenities at Signalized Intersections

Marked crosswalks and pedestrian signal heads are the most basic form of pedestrian accommodation at signalized intersections. These serve to alternately allocate the right of way to pedestrians and motorists, reducing the probability of a collision. Pedestrian countdown signals, which indicate the remaining time to cross a street are increasingly common in Rochester, and are the national standard for new signal installation. Additional features to improve the pedestrian experience include:

- **Curb extensions or bulb outs** to shorten the crossing distance and increase visibility (e.g. along 2nd St SW between Broadway Ave and 6th Ave SW, and along 1st Ave SW between Center Street and 4th St SE)
- **Audible walk indicators** for pedestrians with visibility impairments have been installed in several high activity areas downtown
- **Pedestrian recal**l where pedestrians receive a walk signal during every phase without using a push button is present at intersections in the downtown area
- **Right turn on red restrictions** are in place at high pedestrian locations in downtown and in other areas of the Central Business District
- **Leading Pedestrian Intervals** which provide pedestrians a walk signal a few seconds advance of motorists receiving a green phase are in place at select locations in the Central Business District and high pedestrian activity areas

The following conditions can create risk for pedestrians at some signalized intersections in Rochester:

- **High speed roadways**, including those that lack on-street parking or planted medians which tend to slow traffic, sometimes result in vehicles making turns at high speeds.
- **Areas with relatively few pedestrians** can result in motorists failing to notice pedestrians.
- **Insufficient crossing times** at signalized intersections are reported by some pedestrians and can be a particular issue for the elderly, disabled, or youth populations who tend to walk at a slower rate.
- **Permissive left turns** describes a situation where vehicles are permitted to turn left simultaneous to crossing pedestrians. Many intersections on major roadways in Rochester include a flashing yellow signal that allows motorists to turn left across two or more lanes of traffic. It is a national phenomenon that motorists sometimes fail to notice pedestrians in the crosswalk as they try to judge when there is a sufficient gap in oncoming traffic to make a left turn. Crashes with left turning vehicles is a common pedestrian crash type in the crash analysis presented in the motor vehicle memo.

Marked Pedestrian Crossings

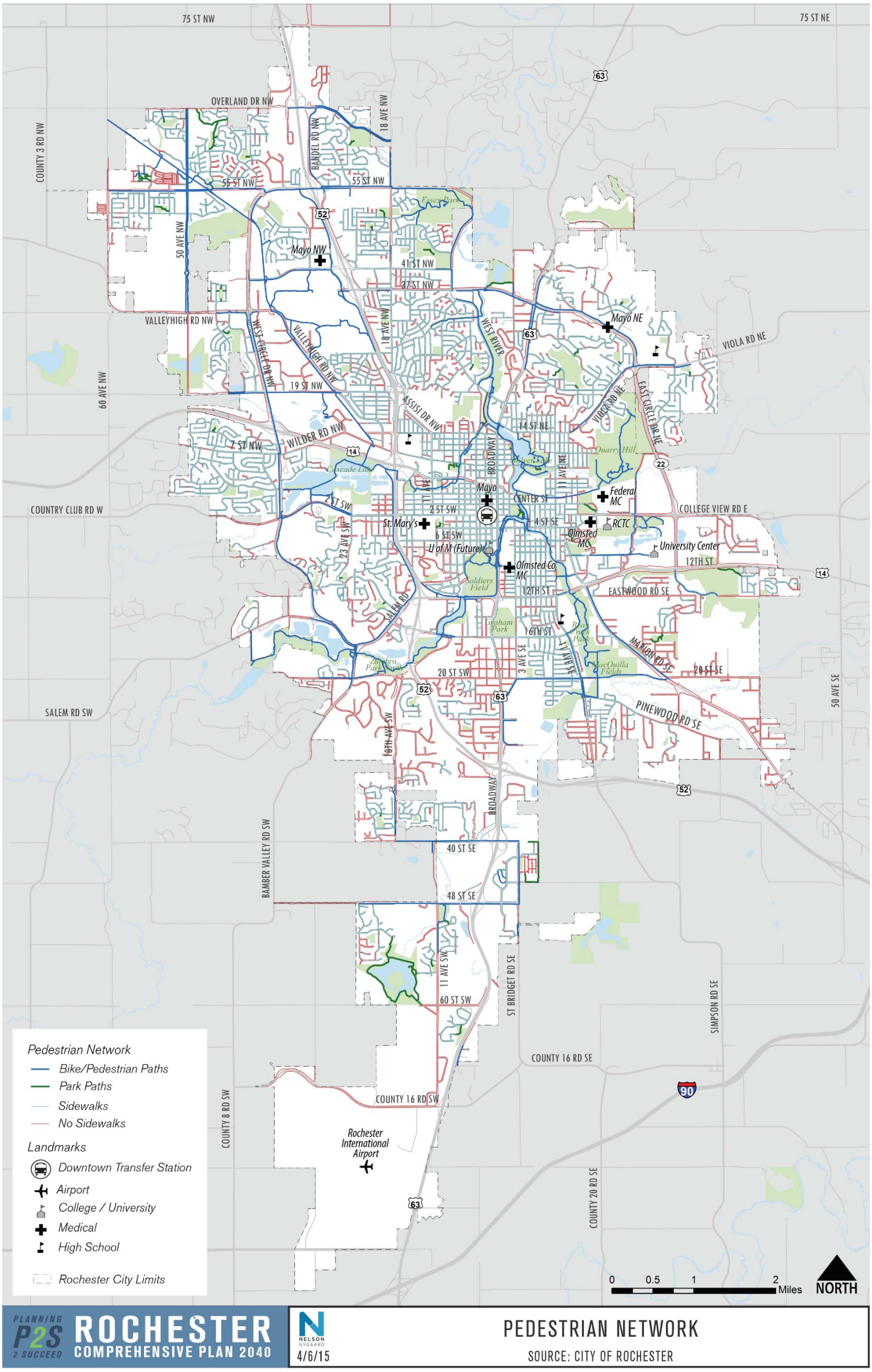
Intersections and mid-block crossings are the areas where pedestrians must interact with motorists and vehicles on the roadway network to get from one side of the street to the other. For this reason, they have the potential to be very dangerous locations for pedestrians, who as vulnerable roadway users, are very likely to sustain injuries in the event of a crash with a motor

vehicle. Marked crosswalks are present at most signalized intersections, with some utilizing higher visibility ‘continental’ or ladder style crosswalk markings. Crosswalk markings are sometimes narrow, such as the mid-block crossing in front of the Government Center. This makes them harder to see.

Mid-block crossings provide crossing opportunities between signalized intersections. These may be present at areas with a lot of pedestrian activity (such as across from the Rochester Government Center), where trails cross a street, or where there are long distances between signalized intersections. As roadways increase in number of lanes and posted speed, additional enhancements beyond a marked crosswalk (such as flashing beacons or median refuge islands) are appropriate to provide a safe crossing opportunity. Rochester is increasingly using state-of the practice pedestrian design treatments such as flashing beacons (present at select locations in Rochester with high pedestrian volumes) and curb extensions which shorten the crossing distance and increase visibility between the pedestrian and motorized traffic, increasing the probability that a driver will yield to a pedestrian attempting to cross the street. .

Outside of the downtown area, pedestrians can face very long distances between marked pedestrian crossing opportunities.

Figure 1 – Existing Pedestrian Network

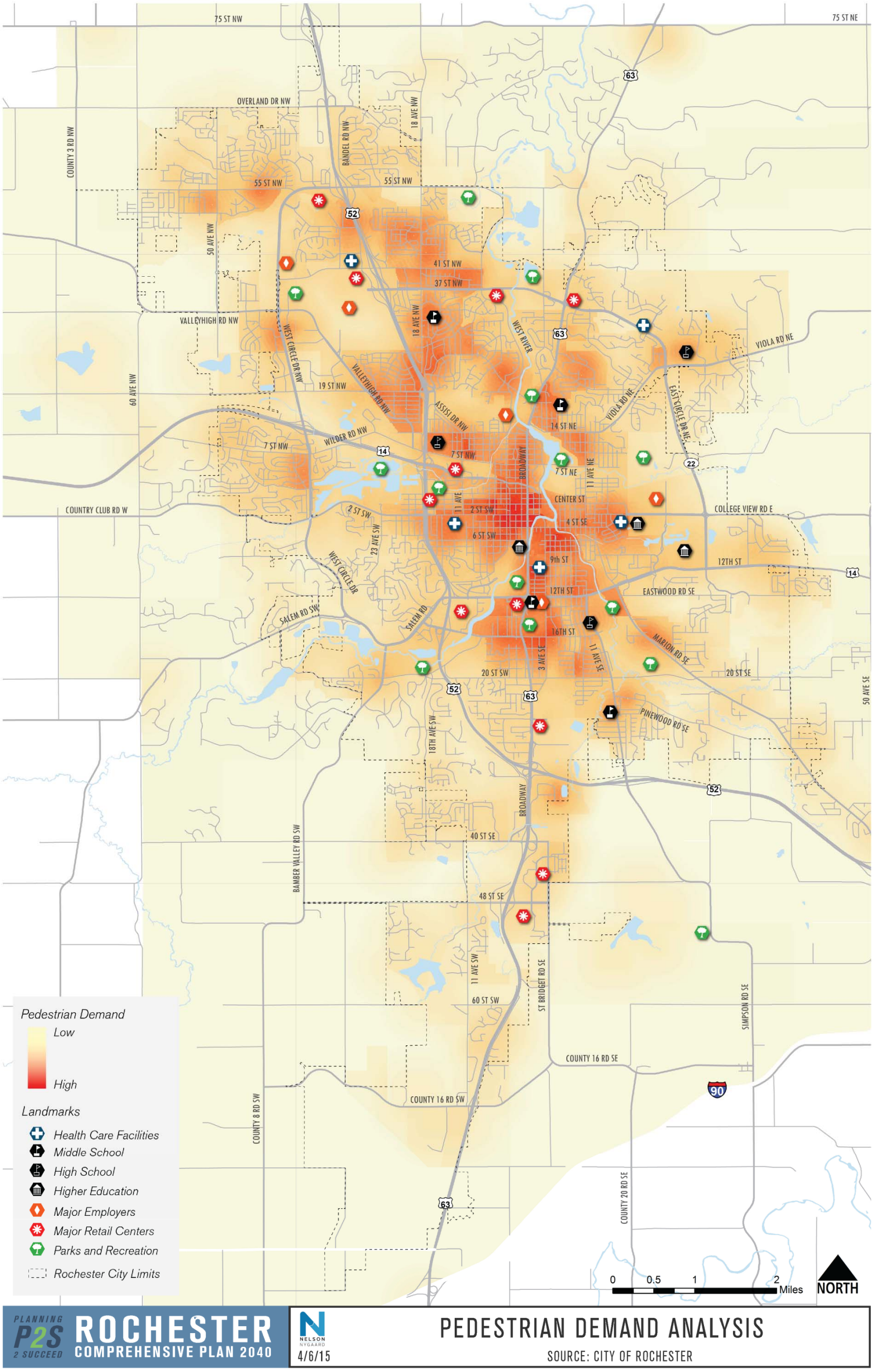


Key Pedestrian Trip Generators

A variety of destinations have the potential to generate large numbers of walkers in Rochester. Figure 2 on the following page identifies the results of the demand analysis based on Rochester data reflective of the following factors:

- **Population density** – Higher density residential areas tend to be more supportive of having destinations within a walkable distance, with a mix of land uses located in close proximity to each other.
- **Employment density** – Major employment centers such as the Mayo Medical Center, St Marys Hospital, the IBM campus, or the Government Center can generate walking trips both on the journey to and from work (including in connection with other modes) as well as mid-day activity for lunch, errands, etc.
- **Schools** – Children are potential walkers. The city has developed Safe Routes to School maps for all elementary schools. This work is intended to increase the number of children walking to school safely.
- **Transit stops** – Most transit trips in Rochester begin or end with a walking trip.
- **Parks** – Neighborhood and community parks are a major destination for recreational activity in Rochester.
- **Medical Facilities** – Medical facilities are an important driver of visitor activity in Rochester, whose walking potential would not be captured in the employment density category above.
- **Commercial land uses** – Rochester has many commercial areas including downtown as well as retail centers such as Barlow Plaza, Apache Mall, and Northwest Plaza.

Figure 2 – Pedestrian Demand



How Comfortable is it to Walk on Major Streets in Rochester?

To complement the demand analysis, pedestrian conditions along Rochester's primary (arterial) street segments and intersections were assessed using a Pedestrian Environmental Quality Index (PEQI) analysis. Modified from the San Francisco Department of Public Health's version of PEQI, this tool provides a qualitative method for assessing the quality of the pedestrian experience along street segments and at intersections. The assessment evaluates pedestrian environmental categories related to Traffic, Street Design, and Intersection Safety to estimate the overall quality.

Indicators included in the analysis are described below. Each indicator is given a numerical value ranging from 1 to 5 according to the visual and physical qualities tied to each indicator, along with weights for each factor.

Figure 3 illustrates the results of the analysis, illustrating the composite PEQI score, based on the factor score and weights. Higher scores indicate a higher supply of pedestrian facilities (i.e., a more comfortable environment), while lower scores indicate lower provision of pedestrian facilities and amenities relative to the roadway context.

Factors considered for street segments:

- Vehicle Lanes – roads with more lanes tend to enable higher vehicle speeds, which reduces comfort for pedestrians.
- Posted Speed – higher speed roadways are noisier and less comfortable to walk along.
- Traffic Volume – higher volumes create noise and pollutants that reduce pedestrian comfort.
- Sidewalk Presence – sidewalks provide a dedicated facility separated from the roadway.
- Presence of Buffers – on-street parking or a landscaped buffer serve to create separation between pedestrians and adjacent traffic, which increases pedestrian comfort.
- Number of Driveway Cuts – frequent driveways interrupting the sidewalk create potential conflict points with motor vehicles and reduce comfort for pedestrians.

Factors considered for intersections

- Vehicle Lanes – more lanes increase the crossing distance and the length of time a pedestrian is exposed to motor vehicles on the street.
- Posted Speed – higher speeds make it more difficult for pedestrians to judge when it is safe to cross and results in more severe injuries in the event of a crash.
- Traffic Volume – busier streets are more difficult for a pedestrian to cross.
- Presence of Traffic Signal – traffic signals provide a designated time for pedestrians to cross the street.
- Presence of Crosswalks – crosswalks provide a dedicated space for pedestrians to cross and alert motor vehicles to expect pedestrians.
- Flashing beacons – flashing beacons are a pedestrian crossing enhancement that tends to result in increased yielding by motorists to pedestrians attempting to cross the street.

Results of the PEQI analysis are found in Figure 3, with green indicating the most comfortable and red being the least comfortable. Each side of the street was evaluated separately, so one segment can have different color 'scores' if, for example, one side of the street has a barrier (e.g., planted median) separating pedestrians from adjacent traffic. The analysis was performed on all arterial intersections; signalized intersections are identified by circles with a black border.

This figure serves to illuminate both the comfort of walking along different corridors in Rochester as well the relative ease of crossing the street, including away from signalized intersections. The least comfortable segments appear in red and include US 14, West Circle Drive north of US 14, and Hwy 63 south of US 52. The most comfortable segments are found in and around the downtown area where speeds are lower and roads tend to have fewer lanes. Signalized crossing opportunities are also the highest the downtown core while the distance between crossing opportunities increases on the periphery. The following section combines the demand mapping analysis with the PEQI analysis to illustrate those areas where pedestrian comfort is lower coincides with existing or potential demand.

Comparison of Pedestrian Demand with Infrastructure Supply

Figure 4 on the following page illustrates the result of overlaying the PEQI results (a measure of user comfort based on the supply of pedestrian infrastructure) for the arterial network with the pedestrian demand map. This map indicates areas where there is a mismatch between walking demand and infrastructure supply. The colors on the map are as follows:

- Red indicates high demand and low supply.
- Orange indicates high demand and high supply.
- Yellow indicates low demand and high supply.
- Green indicates low demand and low supply.

Areas with low supply and high demand might be prioritized for additional investment over, for example, areas with low supply but low demand. Areas highlighted in red on the map include:

- West Circle Drive in the vicinity of Cascade Lake, Harriet Bishop Elementary School, and the residential neighborhoods to the west.
- 37st Street NW near Gage Elementary school and nearby commercial activity. This section of the median divided road also has a relatively long distance between signalized crossings.
- Marion Road SE near Bear Creek Park, Rochester Armory and Longfellow Choice Elementary School.
- Civic Center Drive near the Greenway Co-op, hotels, Family Service Rochester and other activity.
- Broadway and 3rd Avenue SE near the Olmsted County Fairgrounds and the concentration of surrounding commercial, school and employment activity.
- There may be opportunities for additional pedestrian crossing opportunities along Broadway north of downtown between 7th Street NW and 13th Street NW.

- West Circle Drive near the Mayo Medical Laboratories, though this area is already served by an adjacent trail.

Figure 3 – Pedestrian Environmental Quality Index for Arterial Segments and Intersections

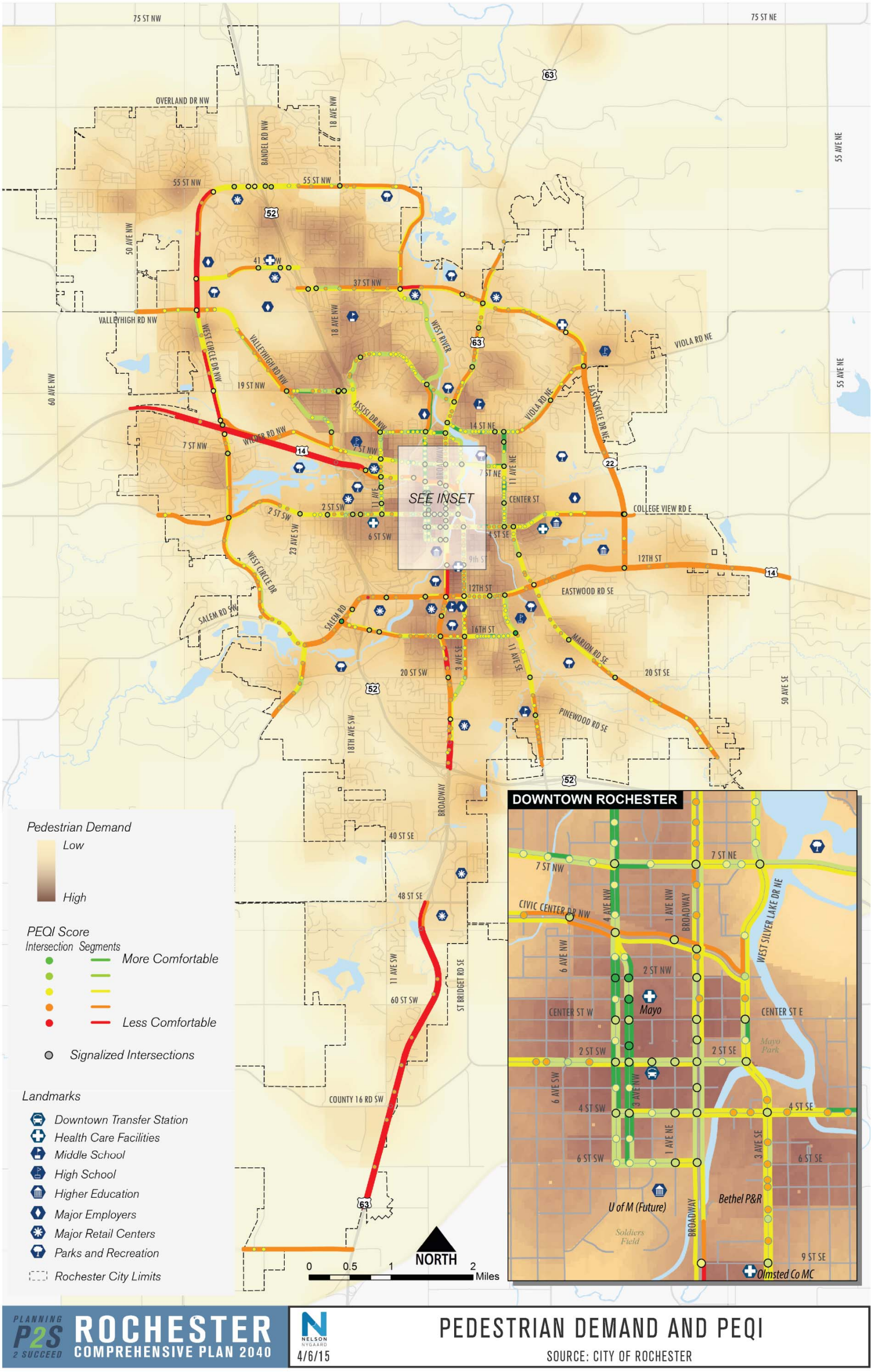
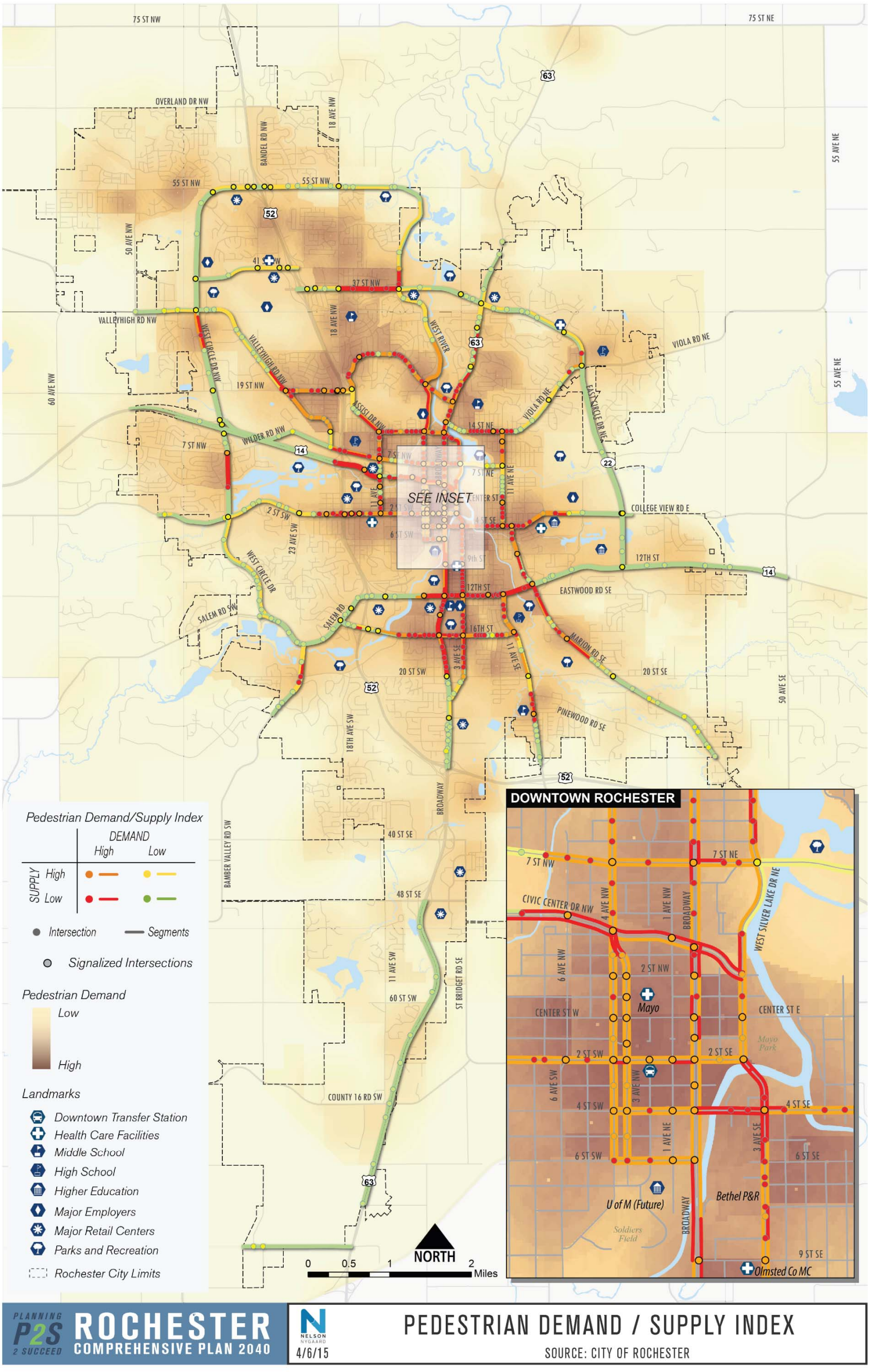


Figure 4 – Comparison of Pedestrian Demand and Supply on Arterial Roads



Challenges and Barriers to Safe and Comfortable Walking in Rochester (Gap Analysis)

Rochester has been designated as a Bronze level Walk Friendly Community as part the FHWA sponsored national recognition program. This section provides a brief overview of the strengths of the existing pedestrian network, followed by followed by opportunities for continued improvement to practices that will further enhance the walkability of Rochester.

Strengths

Extensive and well-maintained sidewalk network. Sidewalks are cleared shortly after a snowfall, supporting the ability of people to walk year round.

Extensive trail network, with many regularly cleared of snow, facilitating year round use.

State-of-the-practice infrastructure being installed over time, including countdown timers and audible signals at traffic signals, mid-block crossings, flashing beacons, and high visibility 'zebra' style crosswalks.

Road reconstruction projects (e.g., 2nd Street SW) have made roadways more pedestrian-scaled.

The city has developed Safe Routes to School maps and works closely with MNDOT, Olmsted County and the Rochester School District to assess school route travel options and identify the need for crosswalks and other safety devices on primary walking routes to school.

The City has identified increased non-auto mode share to downtown a policy priority.

Opportunities for Improvement (Gap Analysis)

Wide, high speed roads can be uncomfortable to walk along and difficult to cross. Additional crossing opportunities appropriate for the roadway context are needed where long distances exist between marked crossings, including near activity centers or transit stops.

High posted speeds on major roadways create risk for pedestrians involved in collisions.

Large intersections are areas where left and right turning vehicles may conflict with pedestrians. Vehicles with a flashing yellow arrow may not notice pedestrians in the crosswalk when looking for gaps in oncoming traffic to make a left turn.

Insufficient walk time at some signalized intersections, due to an assumed walk time that may be too fast to allow pedestrians to complete their crossing. This is an issue where there is a large population of older adults or visitors to medical facilities who may need more time

Visibility of pedestrian crossings could be increased through striping maintenance; the relatively short length of marked zebra crossings at some locations makes them hard to see.

Cyclists often present on downtown sidewalks due to lack of on-street bicycle infrastructure.

Missing sidewalks, particularly in areas more recently annexed into the City.

Insufficient pedestrian accommodation on some state highway corridors due to former state policies that did not include pedestrian or bicycle facilities as standard improvement items.

Development patterns in some areas not conducive to walking. As Rochester grows, there is an opportunity to promote compact development to allow people to be closer to destinations.

Mid-block crossings should provide protection appropriate to the roadway context. For example, median refuge islands enhance crossings of roads with more than two lanes.

Walk Friendly Community Recommendations

The reviewers of Rochester's application for Walk Friendly Community status made the following primary recommendations to further improve conditions for walking:

- **Hire a full or part time pedestrian coordinator** to focus on walkability and pedestrian safety issues (a similar recommendation for a full-time bicycle/pedestrian coordinator position was provided by reviewers of Rochester's Bicycle Friendly Community application).
- **Develop an action plan to focus on some areas beyond the downtown core.**
- **Launch a traffic safety unit within the Police Department to improve compliance with yielding and other laws related to pedestrians.**

The full set of recommendations in the application response will be reviewed when developing the policies and actions section of the Rochester Comprehensive Plan.

Funding

Below is a description of existing funding levels for pedestrian Capital Improvement Projects.

- Every year the city focuses on one of five subareas in the community to review and identify improvements needed to existing sidewalks as part of the annual sidewalk improvement program. The program is funded on a 50/50 basis with half of the cost assessed to the abutting property owners. Each year's program must be approved along with the levying of assessments by the Rochester City Council, with property owners having the right to appeal assessments. The city programs up to $250,000 for the program each year.
- The city budgets approximately $20,000 per year for sidewalk infill where there are no existing sidewalks. The selection of locations is based in part on need and anticipated use. For projects to move forward, abutting property owners must agree to participate in funding a project at a 3:1 ratio of private to public funding.
- The city also budgets annually for maintenance of various traffic operations features:
    - A pavement marking program to update durable pavement markings, funded at an annual level of approximately $125,000 per year
    - The city has a program to install Audible Pedestrian push buttons (APS) funded at $50,000 per year, which funds 2-4 intersection locations per year.
    - An LED replacement program funded at $120,000/yr to provide for a 10 year replacement cycle for traffic signal lights.
    - A program to upgrade traffic signals over 25 years in age is funded at $250,000 per year, which is sufficient to replace one intersection signal system per year.
    - A Pedestrian Ramp program is funded at $25,000 per year to provide for the installation of ADA compliant curb ramps at intersections primarily in new development areas; ramps have been installed at all intersections in existing areas.

Bicycle Analysis

Elements of the Bicycle Network

The bicycle network in Rochester is comprised of shared-use paths (including park paths), bike lanes, and signed on-street bike connectors. The miles of each facility type is listed in Figure 5.

Figure 5 – Summary of Existing Bike Facilities

Bike Facility Type	Distance (Miles)
Bike/Pedestrian Trail/Path	100.0
Park Path (paved and unpaved)	10.0
Bike Lane	20.1
Bike Connector (On-Street)	2.5
Total	132.6

Source: City of Rochester

The 2012 Rochester Bicycle Master Plan envisions a network of nearly 220 miles of bike routes within the city. The proposed network is defined in terms of a Functional Classification rather than facility type, and envisions a highly connected system of routes throughout Rochester[1]. The plan identifies Preliminary Improvement Recommendations (i.e., the recommended facility type) for most of the corridors on the Bikeway Classification Map, with the understanding that further engineering analysis will be required to determine a final design. The recommended improvements are summarized in Figure 6.

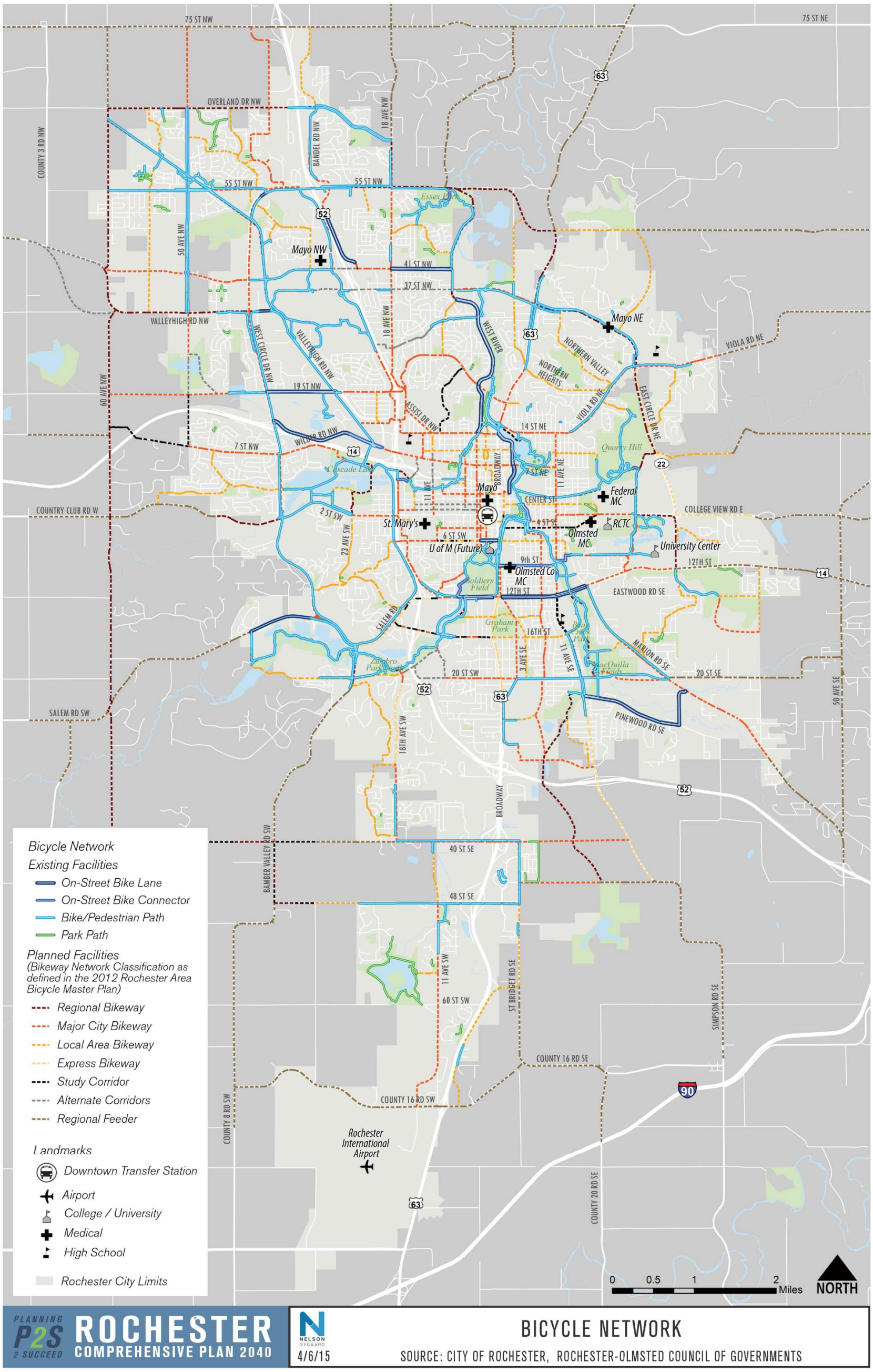
Figure 6 – Summary of Recommended Improvements from the 2012 Bicycle Master Plan

Corridors	Miles		Crossings	Locations
Signed Bike Route	29.84		Median Refuges	2
Bike Lanes	22.19		Two Stage Lefts	2
Sharrow Routes	11.02		Shared right Turns	12
Advisory Bike Lane	4.16		Intersection Markings	25
Bike Boulevard	2.97		Bicycle Boxes	2
Cycle Track	0.28		Ramp Markings	7
	-		Advisory Beacons	8
Path	41.79		HAWK	3
Trails	8.46		Grade Separation	2

Planning for bicycles was also done prior to the bike plan as part of Chapter 7 (Bicycle and Pedestrian Accommodations) of the ROCOG Long Range Transportation Plan.

[1] Regional Bikeway, Major City Bikeway, Local Area Bikeway, Express Bikeway, Study Corridor, Alternate Corridors, Regional Feeder

Figure 7 – Existing and Proposed Bicycle Network



Key Bicycle Trip Generators

Major destinations for bicycle travel were identified in Table 5-4 of Chapter 5 (Bicycle Infrastructure Assessment) of the Rochester Bicycle Master Plan. An adaptation of this map is provided in Figure 8 and illustrates the location of large employers, major retail centers, educational facilities, cultural centers as well as parks and recreational sites. This map includes existing trails and on-street bicycle facilities to illustrate how these destinations might be better served by filling key gaps in the existing network.

Potential Bicycle User Groups

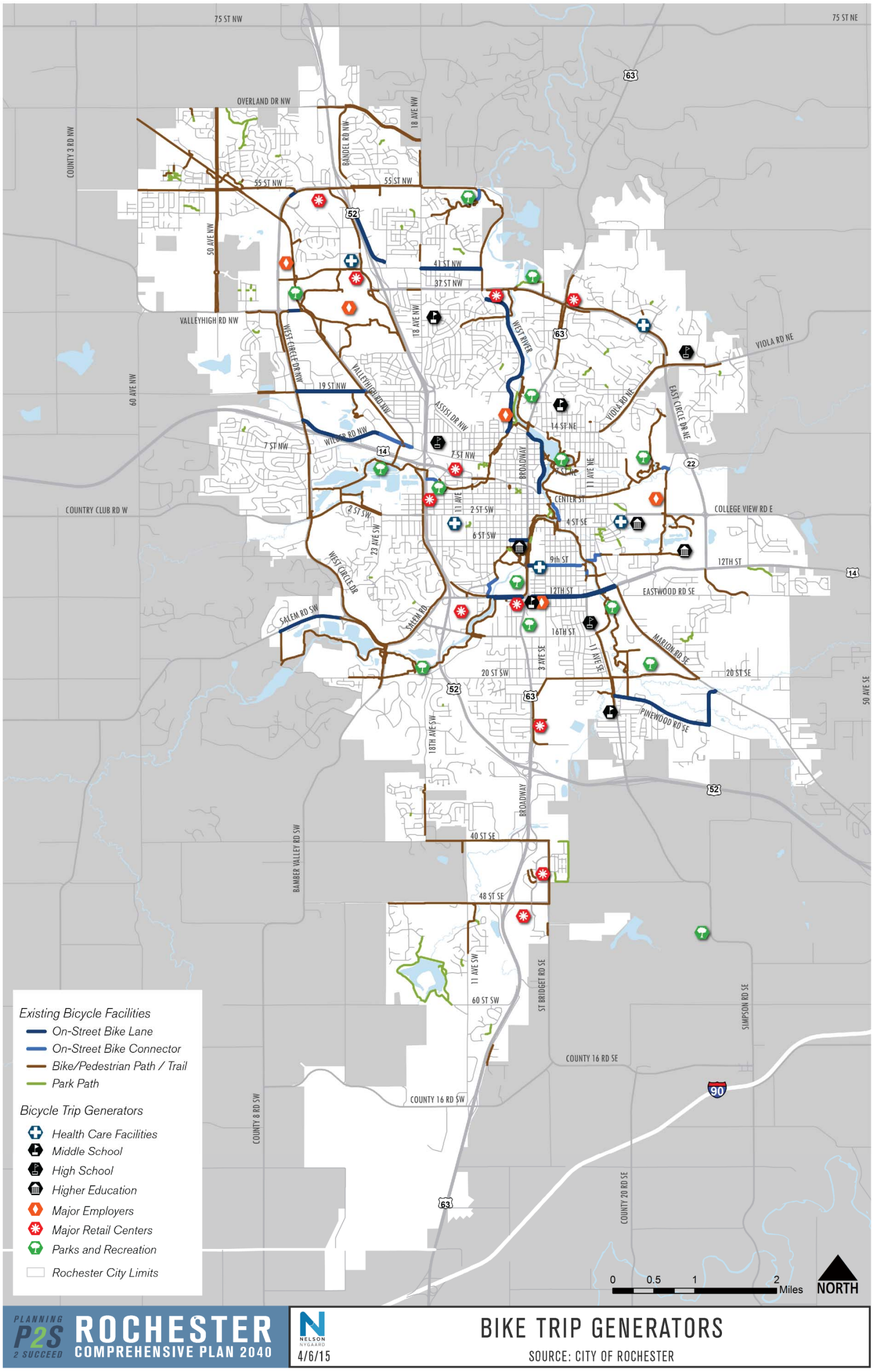
Designing a bicycle network in Rochester should consider the following general user groups:

- **Employees** that would use a bicycle for their commute as well as mid-day for errands or meetings.
- **College students** who are more likely not to drive due to cost as well as generational preferences for non-auto travel
- **Recreational users** who, while likely to make use of the extensive trail system, would benefit from on-street connections to allow them to reach the trails from home or work.
- **Visitors** including families of medical patients who would like to ride for recreational purposes
- **Transit users** who could use a bicycle to connect to destinations (including their home) not immediately served by the transit network. The option to bicycle would also increase flexibility for people that may not currently use transit for any trip purpose because they need to travel on one end of their trip in the evening after existing service ceases.
- **People accessing commercial destinations** including downtown as well as major commercial centers throughout the city.
- **School children** and their parents who may accompany them if safe routes to school were provided

Bicycle Travel and its Role in Downtown Mobility

Employment and labor projections for the year 2030 indicate a large increase in the number of commuters to downtown Rochester. The increase in the number of jobs, residents, and visitors will make finding parking more challenging and result in an increased demand for bicycle circulation. Downtown bicycle and walk access is projected to make up approximately 13% of all peak period commute trips by 2035. The concentration of cultural, retail, and recreational amenities will generate even more non-motorized transportation trips outside of the commute period. The bicycle is likely to become an increasingly attractive commute option and will also be used for mid-day trips such as errands and meetings for people that either arrived downtown without a vehicle or that will not be able to find convenient parking at their destination. Implementation of a bike share program would support this type of trip making for visitors as well as local residents.

Figure 8 – Bike Trip Generators (adapted from Rochester Bicycle Master Plan)



Challenges and Barriers to Safe and Comfortable Bicycling in Rochester (Gap Analysis)

This section summarizes the Rochester Bicycle Master Plan's assessment of the existing bicycling network, with additional observations from the consultant team. Bullets marked with an asterisk are taken from the Plan. Figure 9 lists the Plan's recommended high priority actions. Additional recommendations to improve bicycling from the League of American Bicyclists' Bicycle Friendly Community application process are provided at the end of this section.

Strengths

- **Existing River Trails system provides a significant backbone** for a network connecting many activity centers and neighborhoods in the community.*
- **Topography is generally conducive to bicycle travel**, though in certain areas (such as the Northern Heights neighborhood) there are difficult grades to content with.*
- **Many trails are regularly cleared of snow** by the City**.** Bike lanes also appear to be cleared when roads are plowed.
- **Existing trails typically pass over or under major roadways** that would otherwise be difficult to cross.

Weaknesses

- **Numerous major gaps in the cycling network** exist that need to be closed.*
- **High speed and wide roads are a significant barrier.** Speeds within the city vary dramatically and can **be over 50 mph**.
- **Bicycle parking is lacking at many commercial destinations.**
- **Bridge structures that lack dedicated bicycle space** or shoulder area are a barrier.*
- **Many streets in older areas lack sufficient right of way** to permit construction of dedicated bicycle facilities.*
- **Climate provides seasonal challenges that need to be overcome** to make cycling a year round option for travel.*

Opportunities

- **On-street connections to key destinations** are needed to leverage the extensive trail system to serve utilitarian trip purposes such as work commute, errands or transit access.
- **Develop facilities that generally follow the major street network** to take advantage of travelers' inherent understanding of how to reach destinations based on the high level of connectivity in the street network.* Because these roads often are the shortest path, enhance separation for bicyclists through the use of facilities such as buffered bike lanes.
- **Accommodate bicyclists on roadways with excess motor vehicle capacity** through relatively simple treatments such as signing and roadway re-striping (i.e., road diets).*

- **Provide different accommodations to serve different types of cyclists in a corridor** (where needed and feasible), such as an improved arterials for skilled/advanced cyclists and quite, side-street routes for novice and slower speed cyclists.*
- **Develop a network of routes on low volume streets** (i.e. bicycle boulevards) to provide comfortable bicycling routes for less confident riders or those who prefer not to ride on busier roads.*
- **Install wayfinding** that directs bicyclists to bicycling routes and key destinations.*
- **Integrate innovative or best practice techniques to better accommodate bicyclists at intersections and driveways,** including bike lanes at intersections (placing bike lane on the inside of right turn lanes), green paint to highlight conflict areas, and bicycle signal detection.
- **Provide training for city staff on innovative bicycle design treatments.**

Bicycle Friendly Community Recommendations

The League of American Bicyclists (LAB) application review team identified six measures the city should take to improve conditions for bicycling:

- **Fully implement the comprehensive bike plan and continue to close gaps in the cycling network**. Also, expand the encouragement, education, and enforcement programs to increase usage. Set an ambitious, attainable target to increase the percentage of trips made by bike in the city.
- **Increase the amount of secure bicycle parking throughout the community** – in addition implement a regulation that requires bike parking.
- **Increase the number of arterial streets that have wide shoulders or bike lanes**. Continue to expand the bicycle network and increase network connectivity through the use of bike lanes, shared lane arrows and signed routes.
- **Continue to increase educational opportunities for motorists, children, and adults**. Plans to expand Smart Cycling Classes and Bicycle Diversion Program in the Municipal Court system are excellent and should be complimented by more regular offerings for law enforcement personnel, potential bicycle commuters, students, professional drivers, and city staff.
- **Expand the bicycling encouragement efforts throughout the year** with more community ride(s)/events, mayor's ride(s), and encourage more local businesses to promote cycling to the workplace. The city itself should be the model employer. During Bike to Work Week set up a commuter challenge or bike to work pit stop. For more information on encouragement ideas please visit http://www.bicyclefriendlycommunity.org/tech.htm
- **Partner with local employers such as the Mayo Clinic and IBM to promote cycling during Bike Month and throughout the year**. Consider forming a business partnership program that will use businesses as a tool to bring cycling to the community http://www.cabq.gov/transit/business/business-partners

The full set of recommended actions in the League of American Bicyclists' response to Rochester's Bicycle Friendly Community application as well as those found in the Rochester Bicycle Master Plan will be reviewed when developing the policies and actions section of the Rochester Comprehensive Plan.

Figure 9 – High Priority Activities Identified in the 2012 Rochester Bicycle Master Plan

Table ES-3	1st Priorities among New Activities
	Partnerships for Plan Deployment
	• Establish a **Bicycle Plan Coordinator** or **Coordination Team** to spearhead work related to implementation of the Bicycle Master Plan • Work with the proposed Downtown Rochester **Transportation Management Association (TMA)** to deliver bicycle programs and services for travelers with downtown destinations • Support the establishment of a Non-Profit Bicycle Advocacy Organization to provide a means for individuals motivated to actively work on implementation of the plan a forum to do so.
	Planning & Policy
High Priority Planning Studies	• **Chester Woods Regional Trail Connection Study** • **4th Ave West Corridor Alternatives** • **3rd St NW / West Circle Drive Crossing Alternatives**
Programming	• Utilize **Fact Sheets** & other media to disseminate information about new bikeway network projects to the community, particularly those involving improvements types new to Rochester
Development Policy	• Conduct a review of Land Development Regulations to identify possible changes that would advance implementation of the Bicycle Master Plan
	Programs and Promotion
Safety & Education	• Complete a Rochester **Safe Routes to School Plan**
Information	• Develop a high quality Rochester area **Bike Map** • Develop a comprehensive **"Bike Rochester" web site**
Encouragement	• Develop a **Commuter Support Program** for downtown Rochester in collaboration with a downtown TMA
Events	• Develop an **Annual Bicycle Recognition Program** • Organize an **Annual Bicycle Summit**
Enforcement	• Expand efforts to educate cyclists about the rules regarding **sidewalk riding in Rochester** and the need for more visible **Bicycle Dismount Program**.
	Built Environment / Supporting Infratructure
Bicycle Parking	• Conduct a **Comprehensive Parking Survey** to quantify the location and availability of bicycle parking
Wayfinding	• Complete deployment of the first phase of wayfinding signage along the River Trails System
Bike Share	• Work with the Downtown TMA to investigate market for Bike Share system in Rochester
	Built Environment / Bikeway Network
Bikeway Network Development	• **Make Public consultation** a priority as part of the planning & design process for all bikeway routes • Assess the **balance of investment** between larger trail/path projects and smaller on-street signing or striping projects to determine how best to maximize bicycle network development given constrained resources
Bikeway Maintenance	• Develop and deploy a **Bicycle Network Maintenance Request System**

Funding

The annual City adopted Capital Improvements Program includes funding for path and trail projects through a variety of funding sources. Property tax levy is used to fund minor projects such as reconditioning of existing bikeways and short trail system connections to provide links from neighborhood areas to the River Trails system. More specifically, this includes:

- The city public works department has responsibility for a bike path maintenance program funded at $40,000 per year to provide for repair and overlay of bike paths that are located in highway rights of way parallel to major streets in the city.
- The city parks department has responsibility for a trails maintenance program that is funded at $10,000 per year to provide for the overlay of existing trail facilities that are not located within highway right of ways or riparian corridors that are part of the Rochester flood control project
- An additional $25,000 per year is budgeted for repair and overlay of trails that are located within the flood control corridors in the city.
- The city budgets $25,000 per year to fund short sections of paths or trails that are needed to connect the city path system to trails that are constructed by other agencies or private parties.

In addition to these maintenance and trail connections programs, the city provides funding for larger bicycle and pedestrian improvement projects to match grant dollars that the city receives for major trail infrastructure such as trail underpasses or overpasses, or for major corridor improvement projects. These outside funds include federal Transportation Alternatives funds, trail funds for local projects available through the state Department of Natural Resources or funds from the State Legacy program, which is a 3/8 cents sales tax levy used to fund environmental projects across the state. Local matches for these funds typically are provided through use of property tax levy or flood control project reserves, for which trails providing river access are eligible.

The Rochester five-year capital improvement program (2014-2018) had a total of more than $7.8 million in local public funds targeted for trail and path development maintenance. This included $2.45 million in property tax levy and $1.5 million in flood control funding.

Combined Non-Motorized Transportation Analysis

Review of City Programs and Policies

A review of peer city transportation policies and programs that impact the provision of bicycle and pedestrian facilities and access are provided in a separate document. Below is a summary that compares existing practices in Rochester to those of peer cities (Boulder CO, Ann Arbor MI, Iowa City IA, Madison WI, and Sioux Falls SD).

- **Responsibility for Sidewalk Maintenance / Repairs** - City policy requires the installation of sidewalks along streets except short cul de sacs as part of new developments. Rochester, like most other cities, puts the burden of repairing sidewalks onto the adjacent property owner. Sidewalk quality in Rochester is preserved through pro-active city efforts to inspect sidewalks in different parts of the city each year and notify property owners of their responsibility to make needed repairs. Rochester's sidewalk ordinance requires residents to clear their sidewalk of snow and ice within 24 hours of snowfall ending. Several of the peer cities have chosen to take over the responsibilities for sidewalk repair or to share the cost of repairs between the property owners and the local government to assure their completion.
- **Sidewalk Infill Program** - Rochester has a budget of approximately $20,000/yr for sidewalk infill where there are no existing sidewalks. Abutting property owners must agree to participate in funding a project at a 3:1 ratio of private to public funding. Some cities have funded sidewalk infill programs that do not require a public match, while others require residents to petition the city for sidewalk installation and property owners pay the cost.
- **Curb Ramp Installation Program** – Rochester has a Pedestrian Ramp program to provide for installation of ADA compliant curb ramps at intersections, primarily in new development areas. Several peer cities have programs in place for installing and repairing curb ramps.
- **Bike Parking Requirements** - All peer cities have requirements for bicycle parking, either as a percentage of total car parking spaces, or related to a land use category and the intensity of development. Rochester has bike parking requirements that apply only to medium and large scale developments. There remains a lack of bicycle parking near many commercial and employment destinations that were developed prior to this policy.
- **Pedestrian Crossing Standards** – Existing research suggests that additional treatments beyond a marked crosswalk (e.g. pedestrian refuge islands or flashing beacons) are necessary as roadways increase in size, speed and volume of motor vehicles. Rochester does not have a formal document that guides the selection of the appropriate type of pedestrian crossing treatment based on the roadway context. Of the peer reviewed cities, only Boulder has such a document.
- **Trail Maintenance and Snow Removal Practices** – 50 miles of Rochester trails are prioritized for routine snow removal. Some property owners are also required to keep trails adjacent to their property clear. The peer cities with winter weather and a trail network have similar practices.

- **Complete Streets** - Most cities, like Rochester, have adopted a Complete Streets Policy to encourage safer roadways that provide options for people using various transportation modes.
- **Parking Management** - Rochester and its peers all manage on-street parking through a combination of pricing and permit systems. Rochester, like other cities, has specific zones where parking is managed through pricing due to a mix of high demand and low supply, while residential parking permit programs are utilized extensively in the vicinity of the Central Business / Medical District to manage spillover parking impacts on residential areas.
- **Transportation Demand Management (TDM)** - The Destination Medical Center (DMC) Development Plan calls for greater use of TDM measures such as the creation of a transportation management association that will manage access and parking for the downtown area. Several peer cities have developed TDM policies and strategies to encourage more diverse transportation mode shares and to educate the public on ways to improve their commutes and access information to help them make transportation decisions.

Supportive Non-Motorized Transportation Facilities

A "complete" active transportation network includes not only infrastructure investments such as off-street trails, on-street bicycle facilities, sidewalks and marked crossings, but is supported by facilities and amenities that allow people walking and bicycling to comfortably complete their trip. Sometimes termed "end-of-trip facilities," bike parking for short-term (less than two hours) and long-term trips (between two and eight hours), locker and shower facilities, and maintenance support are critical to making active transportation attractive for a broad segment of the population. The City of Rochester currently only requires bicycle parking as part of medium scale[2] and large scale[3] developments.

Bike parking (short-term and long-term)

The City of Rochester provides bicycle parking on the street level of all downtown city parking ramps, with approximately five to ten spaces provided in each ramp and bicycle lockers provided in the 3rd Street Ramp. Bicycle parking is also provided at all public facilities such as schools, the public library, city recreation facilities, and the Mayo Convention Center in downtown. The Rochester Park and Recreation Department is responsible for providing parking at non-school facilities while the Rochester School District is responsible for facilities at elementary and secondary schools. The Mayo Medical Center has multiple locations throughout its campus where indoor and outdoor bike parking is provided.

Short-term bike parking (i.e., a simple bike rack) is uncommon in the vicinity of commercial destinations, which impacts the ability of people to use the bicycle for non-recreations trips. Long-term parking that would provide added security and weather protection at locations such as worksites, college campuses and student residences, major transit hubs, and apartment buildings/residential complexes is also uncommon.

[2] Developments over one acre in size and individual buildings in excess of 40,000 square feet.
[3] Developments over five acres in size and individual uses in excess of 80,000 square feet.

Showers and changing rooms

Basic shower and locker facilities for both genders provide the opportunity to clean up or change into or out of work attire. Locker rooms should be key or code accessed for enhanced security. At present there are few buildings that provide this opportunity for employees.

Bicycle maintenance facilities

The provision of basic bicycle repair tools can further remove barriers to bicycling and help ensure safe operation of bicycles. The City of Rochester recently purchase five public bike repair stands for installation at a downtown 3rd ST city ramp near the bike parking, the parking lot of the Douglas Trail, Soldiers Memorial Field, Silver Lake Park and Quarry Hill Nature Center. The public bike stands include the wrenches, screwdrivers, and air pump needed for basic bike maintenance and an attached Air Kit pump for tire inflation.

Bikes on Buses

All Rochester Public Transit buses are equipped with bike racks on the front of the bus that accommodate up to 2 bicycles. Bikes are permitted inside the vehicle if the bike racks are full.

Bicycle and Pedestrian Counts

Figure 10 illustrates the results of September 2012 bicycle and pedestrian counts. These counts were conducted as 'screen line' counts, which document the number of people that cross an imaginary line at the count location[4]. The highest locations for pedestrians were 1st/2nd St NW and 4th St SE / South Broadway. The highest bike volumes were both at North Broadway (1300 block and the north side of the Zumbro River Bridge, respectively).

Automatic Counter Pilot Program

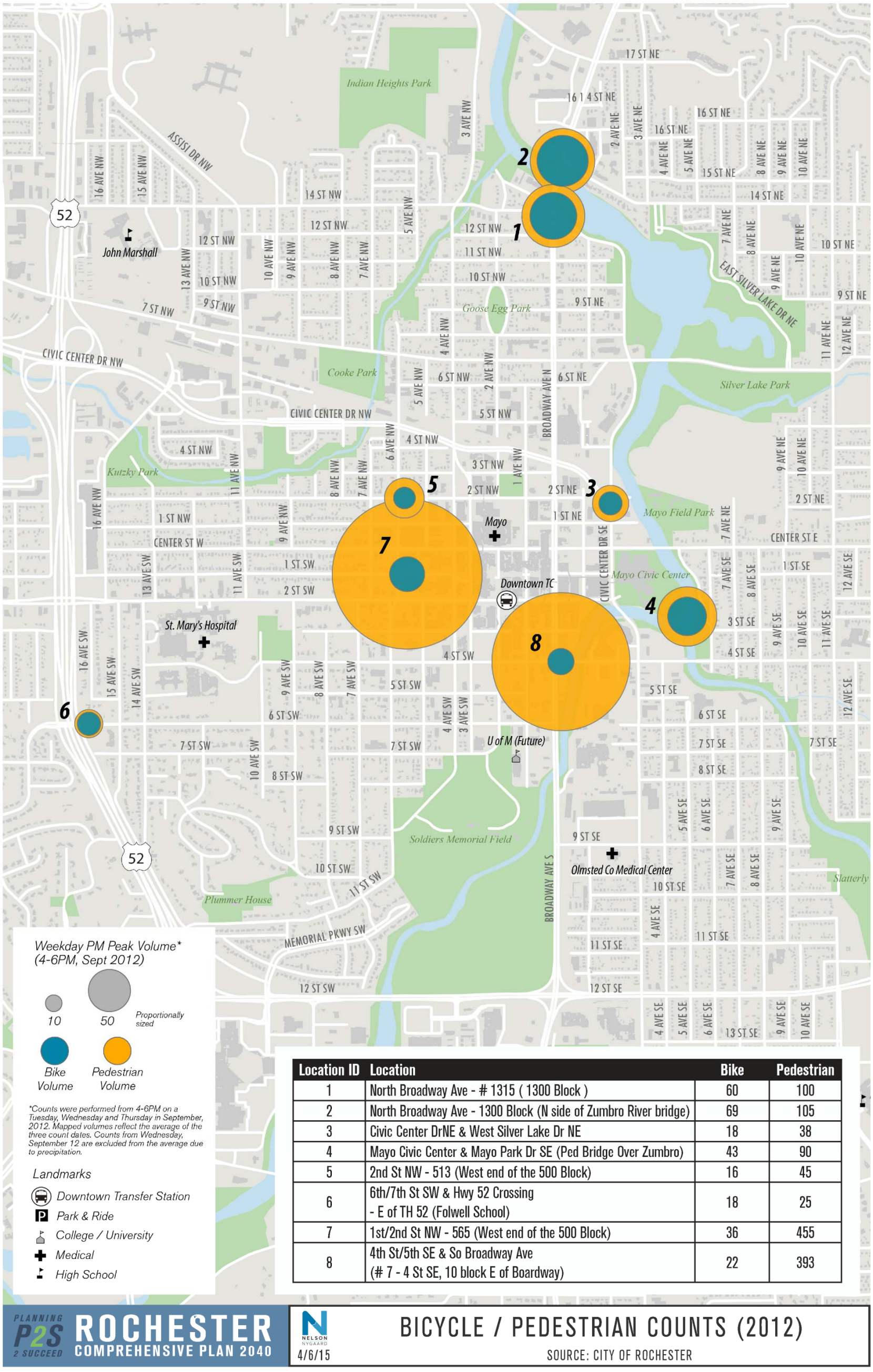
Automatic counters, which document walking and bicycling activity 24 hours a day, 365 days a year, are an excellent way to track trends in walking and bicycling.

Automatic counters have been installed at Silver Lake and Cascade Lake as part of a pilot program. During September 2014, the equipment documented nearly 3,000 pedestrians and nearly 6,000 cyclists at Silver Lake. Over 30,000 pedestrians and bicyclists were counted between July 1 and September 30, 2014 at the Cascade Lake location.

The pilot counters installed on the trail system can identify relative use at different times of year, which can inform decision-making around maintenance issues such as snow plowing. Trends in daily activity as well as time of day can provide valuable insight into trip purpose. For example, as Rochester expands its network of bicycle facilities that connect to destinations, the data may show increased weekday peak hour travel indicative of commute trips.

[4] Intersection counts are another type of count which documents the number of people passing through an intersection. The National Bicycle and Pedestrian Documentation Project, which provides guidance for conducting non-motorized transportation counts, recommends using screen line counts to identify trends in walking and bicycling.

Figure 10 – Bicycle and Pedestrian Counts (2012)



Location ID	Location	Bike	Pedestrian
1	North Broadway Ave - # 1315 (1300 Block)	60	100
2	North Broadway Ave - 1300 Block (N side of Zumbro River bridge)	69	105
3	Civic Center DrNE & West Silver Lake Dr NE	18	38
4	Mayo Civic Center & Mayo Park Dr SE (Ped Bridge Over Zumbro)	43	90
5	2nd St NW - 513 (West end of the 500 Block)	16	45
6	6th/7th St SW & Hwy 52 Crossing - E of TH 52 (Folwell School)	18	25
7	1st/2nd St NW - 565 (West end of the 500 Block)	36	455
8	4th St/5th SE & So Broadway Ave (# 7 - 4 St SE, 10 block E of Boardway)	22	393

PLANNING P2S 2 SUCCEED ROCHESTER COMPREHENSIVE PLAN 2040

NELSON NYGAARD 4/6/15

BICYCLE / PEDESTRIAN COUNTS (2012)

SOURCE: CITY OF ROCHESTER