

Troy Trails Plan – Project Maps

July 24, 2009

Inventory and Analysis Maps

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- Potential Bike Routes
- Bike Route Facilities
- Priority Bike Routes / Neighborhood Greenways
- Connection to Regional Trails

Sidewalk Facilities

- Sidewalk Improvements

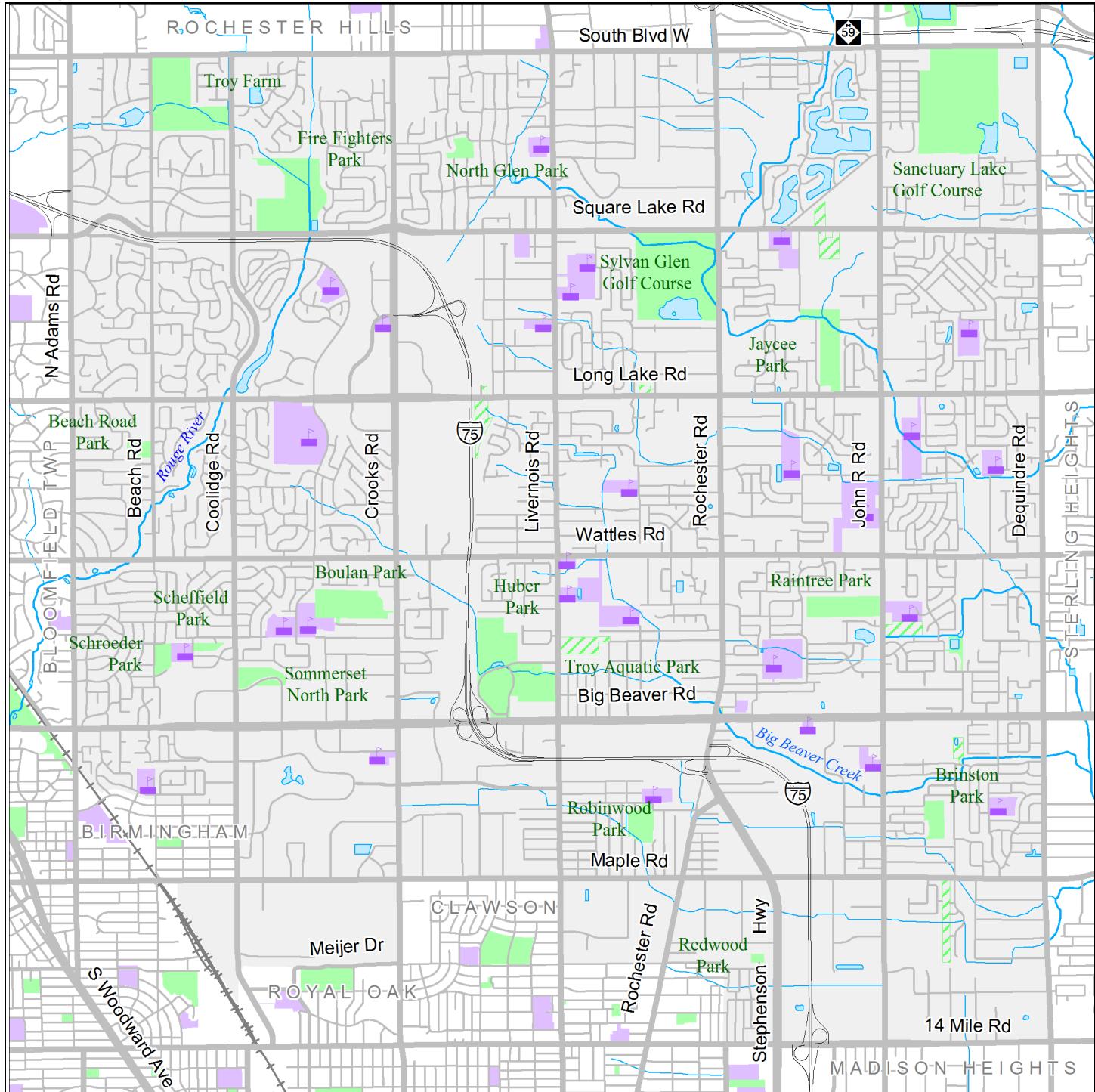
Road Crossing

- Road Crossing Improvements
- Road Crossing Difficulty

Impact of Proposed Improvements

- Proposed Improvements Impact on Difficult to Cross Blocks
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- Proposed Priority Routes Relation to Relative Demand

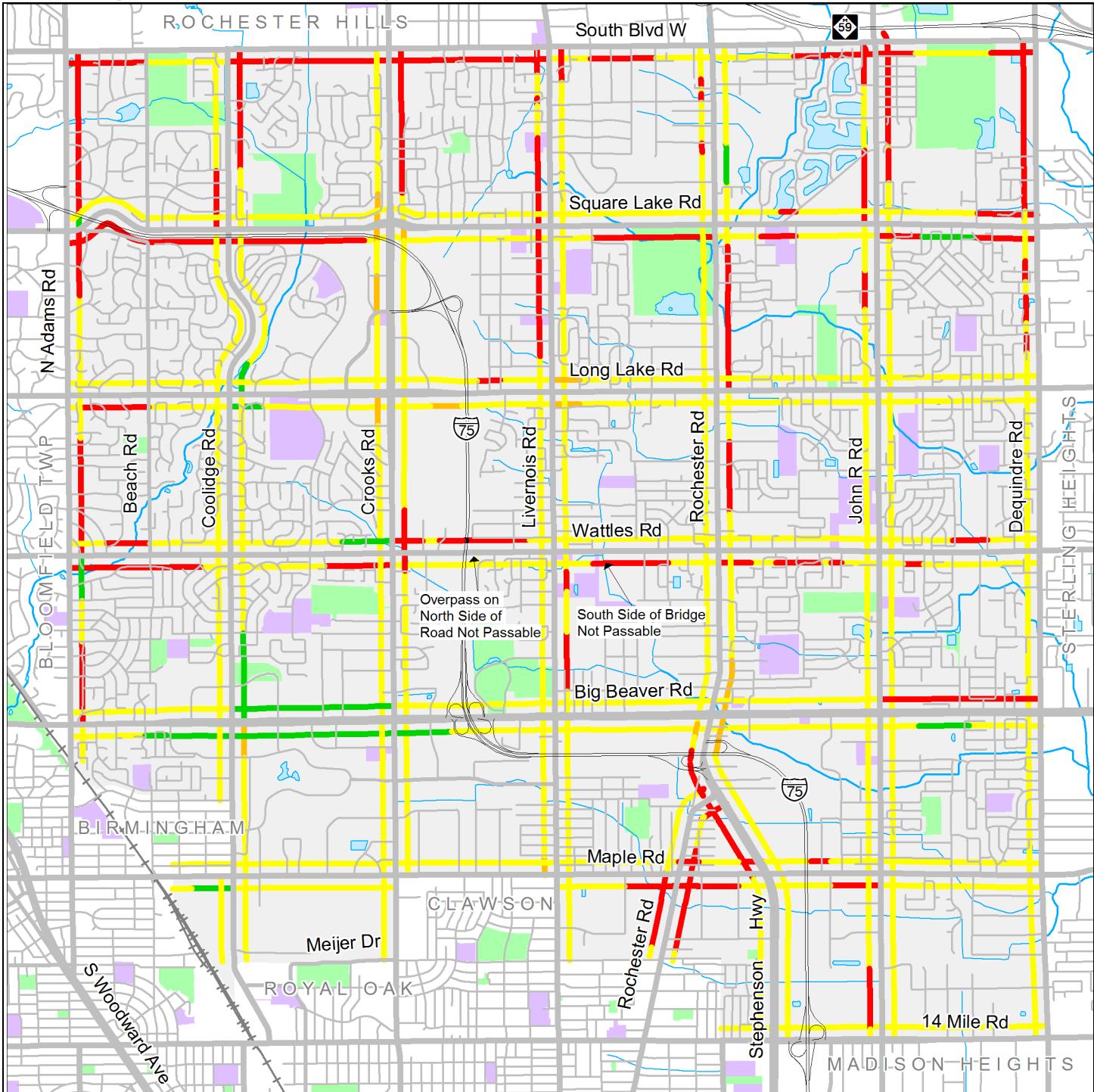
Project Overview



Legend:

	Schools		City of Troy
	Freeways		Water
	Arterials		Parks and Recreation
	Collectors		Proposed City Parks
	Local Roads		Educational Facility
	Railroads		

Existing Sidewalk Quality

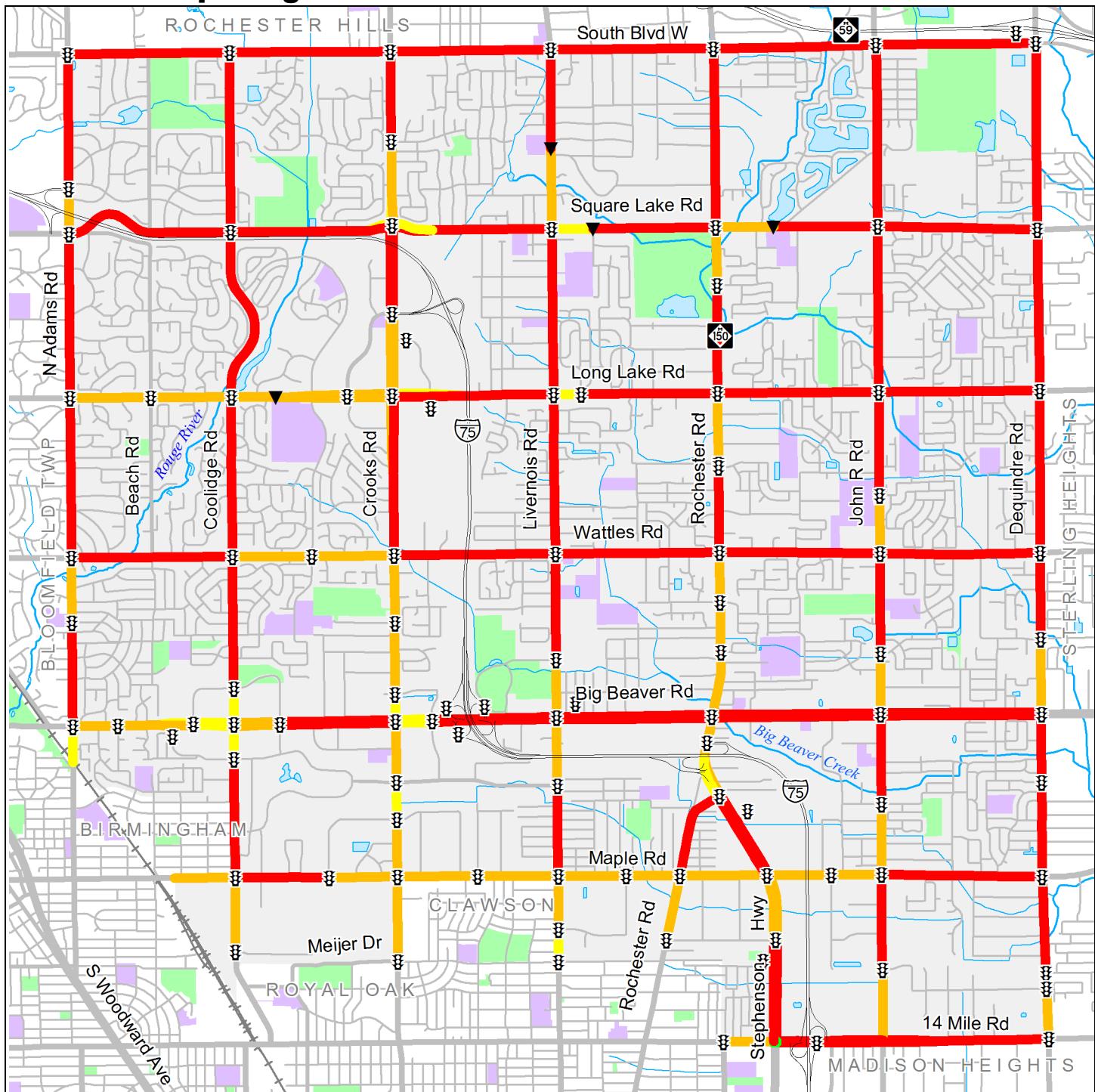


Legend:

- Sidewalk Rating:**
- A - Buffered from roadway with vertical elements:** Green line
 - B - Buffered from roadway:** Yellow line
 - C - Adjacent to roadway:** Orange line
 - D - No sidewalk but passable:** Red line
 - E - Not passable:** Black line

A key factor to a pedestrians comfort on a sidewalk is the degree of separation from the roadway. Buffers (lawn extensions) and vertical elements such as trees and light poles increase the pedestrians comfort level.

Crosswalk Spacing

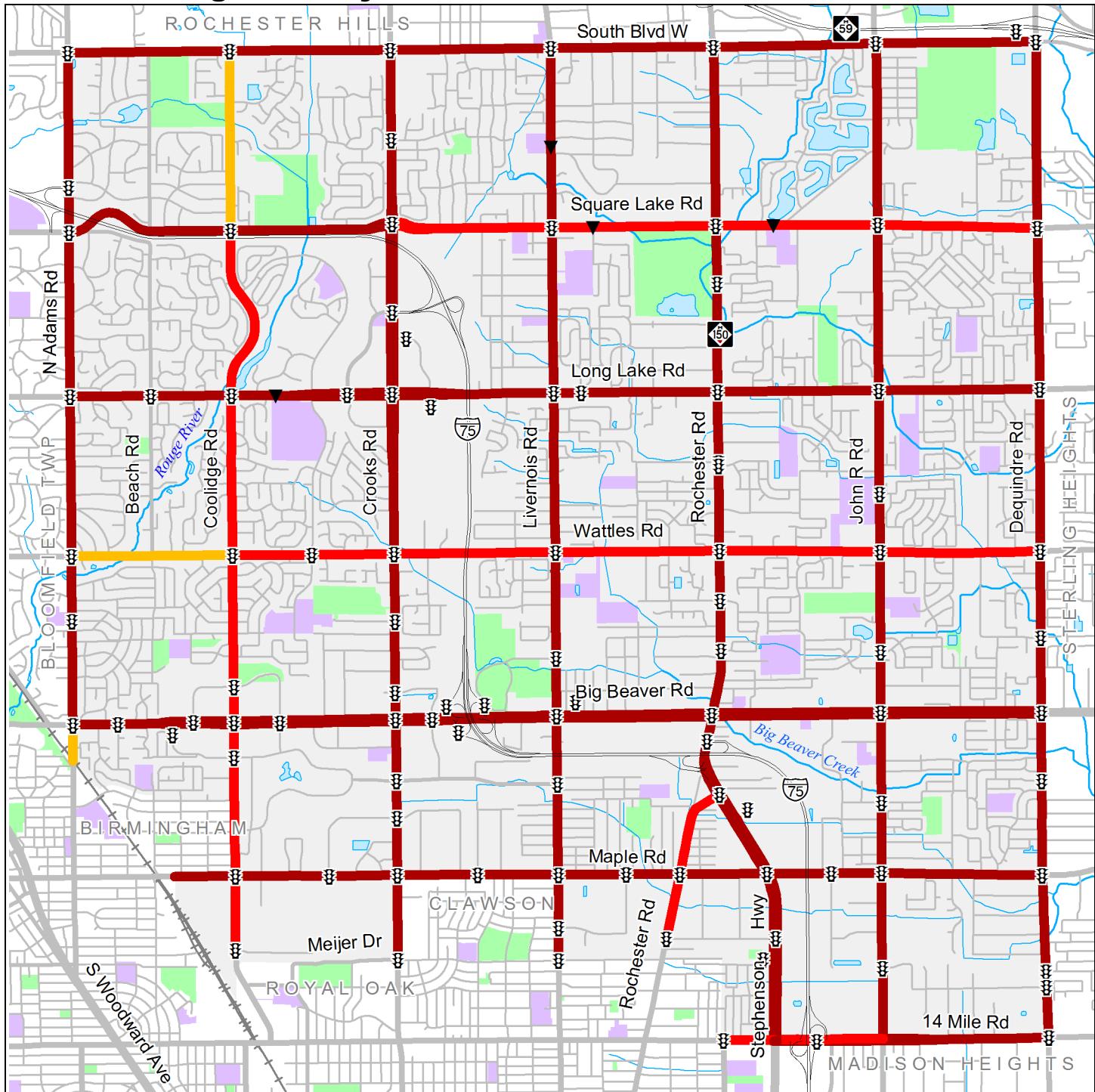


Legend:

Distance Between Crosswalks	
0 to 1/8 Mile	Green
1/8 Mile to 1/4 Mile	Yellow
1/4 to 1/2 Mile	Orange/Yellow
Over 1/2 Mile	Red

Crosswalk spacing is a key factor in directness of travel. Most pedestrian trips for personal business (like walking to the store) are about $\frac{1}{2}$ a mile long. Where there is demand to cross the road and crosswalk spacing is over $\frac{1}{8}$ of a mile apart, mid-block crossings are likely to occur.

Road Crossing Difficulty



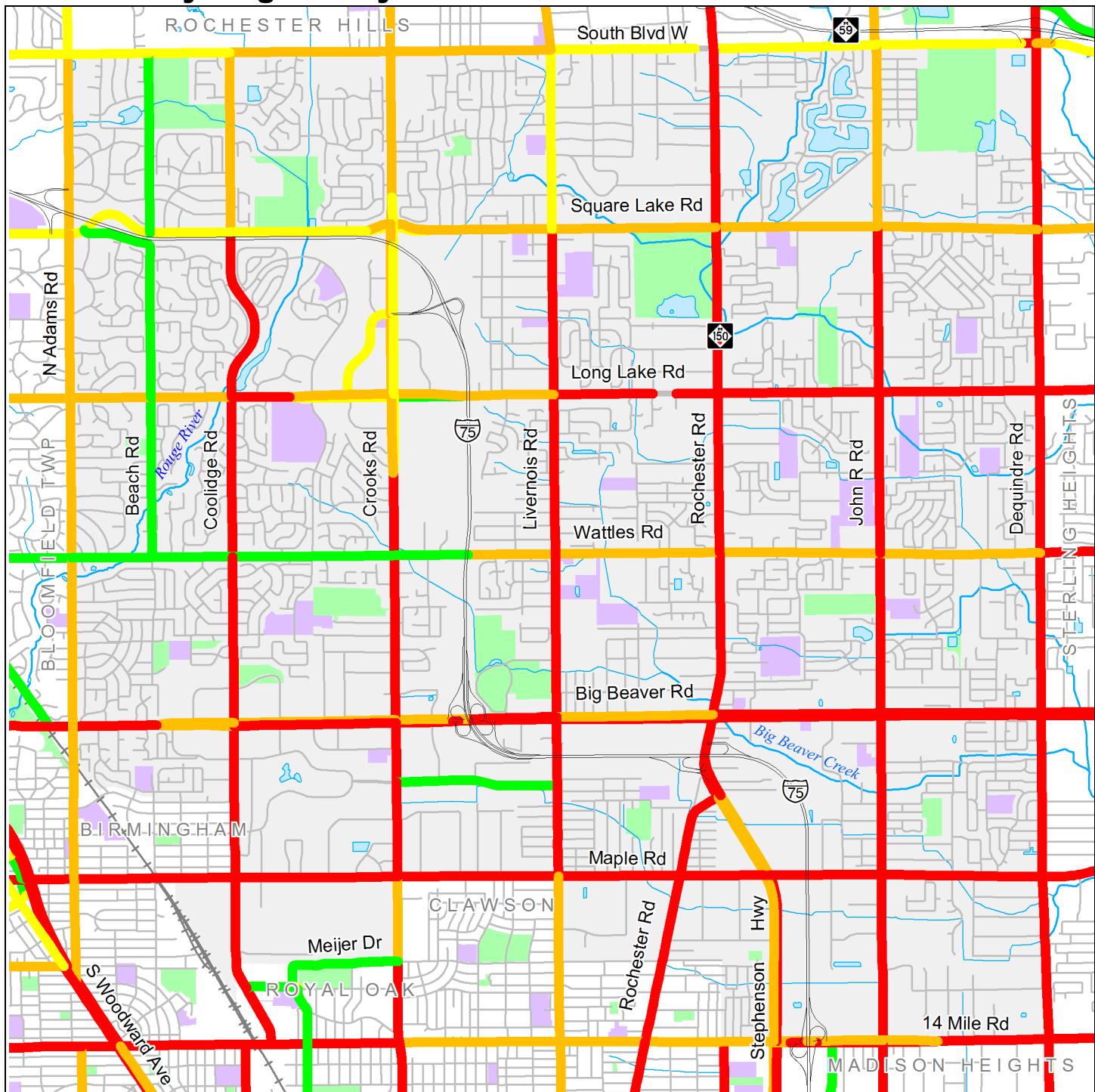
Legend:

Road Crossing Difficulty
(Speed, No. Lanes & ADT)

- C
- D
- E

Road crossing difficulty is a measurement of how difficult a person would typically find it to cross a road at an unmarked mid-block crosswalk. It is based on the number of lanes, speed and average daily traffic.

In-Road Bicycling Quality



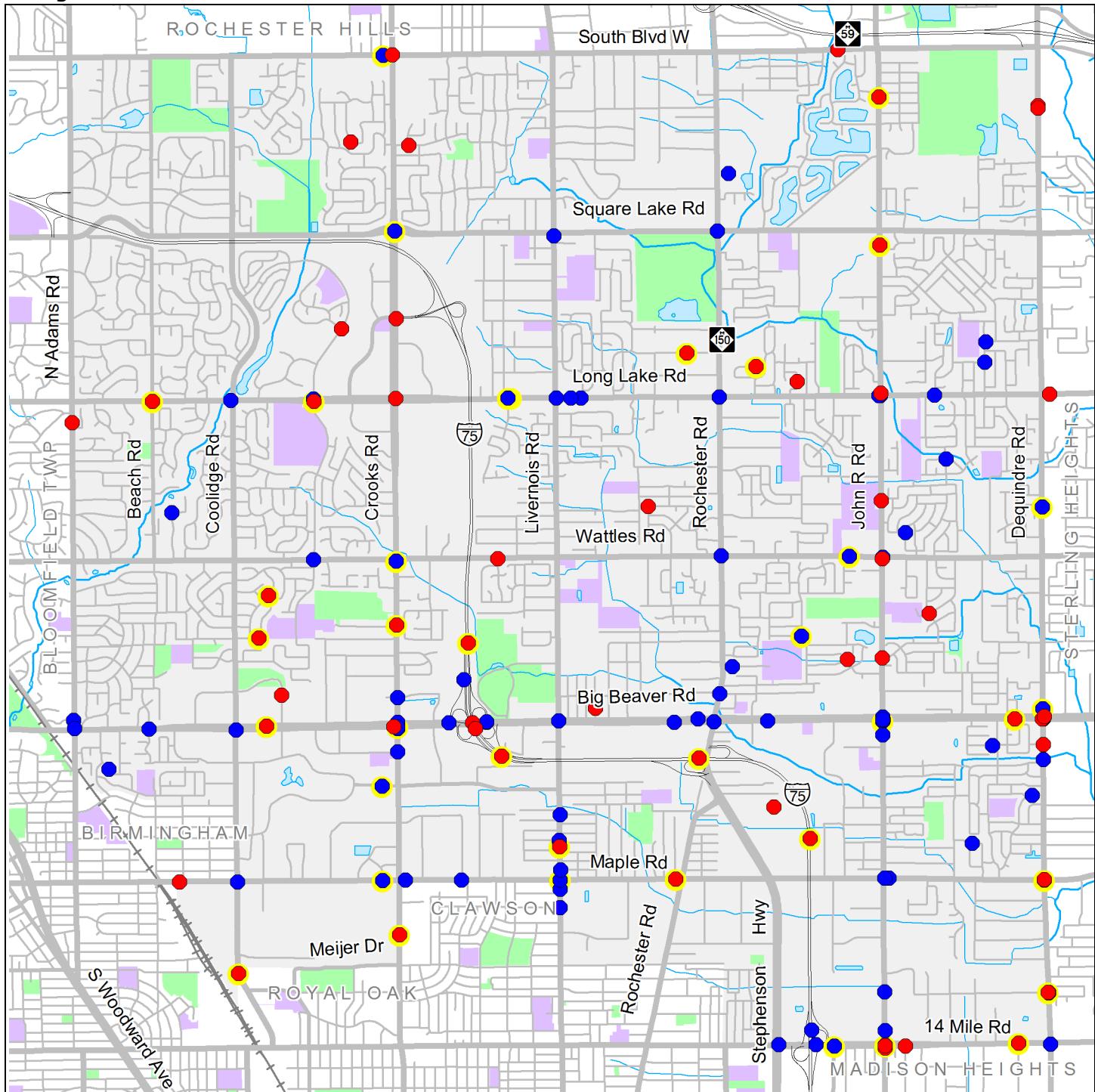
Legend:

In-Road Bicycling Quality
(Average Daily Traffic Volumes)

- A) 0 to 5,000
- B) 5,000 to 10,000
- C) 10,000 to 15,000
- D) 15,000 to 102,000

At this time there are no in-road bicycle facilities such as bike lanes or paved shoulders. Such facilities improve the quality of the bicycling experience on busy roads.

Bicycle and Pedestrian Crash Locations



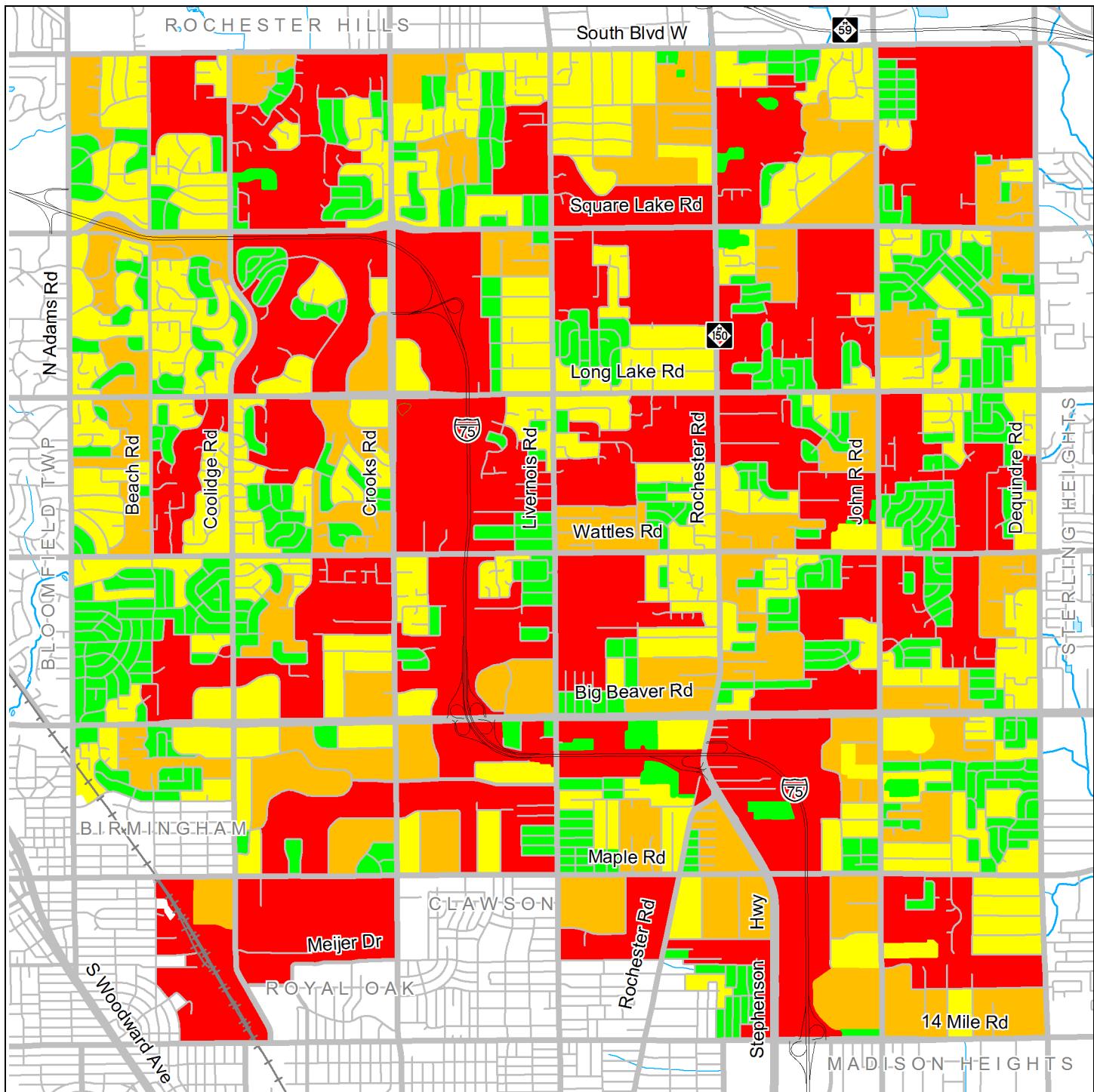
Legend:

Bicycle & Pedestrian Crashes
2002 - 2007

- Pedestrian (55)
- Bicycle (92)

Fatal and severe injury crashes have been highlighted

Block Size



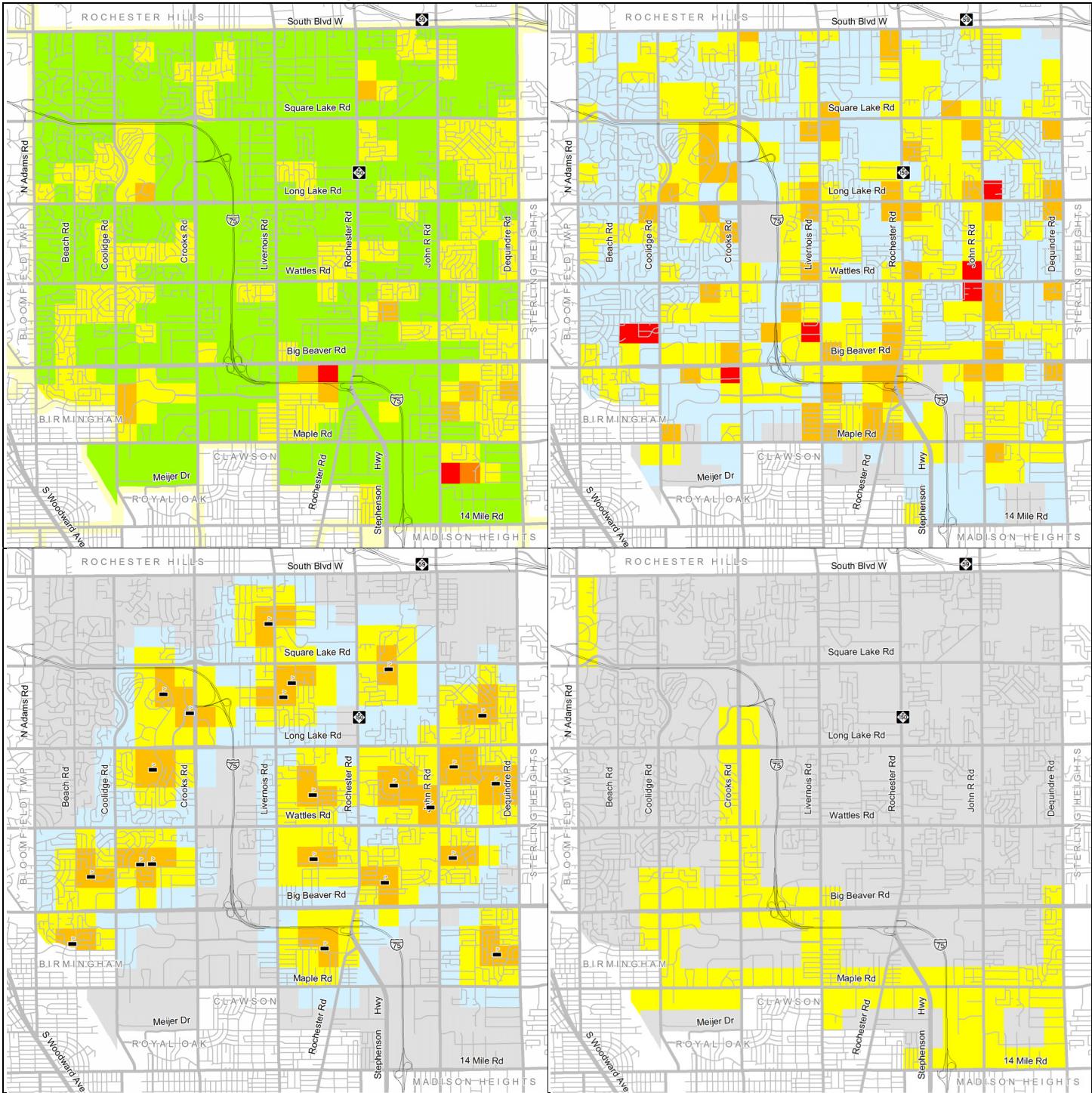
Legend:

Block Size
in Acres

- 100 to 513
- 50 to 100
- 15 to 50
- 0 to 15

Block size is an excellent measurement of directness of travel. Blocks under 15 acres permit relatively direct of travel.

Relative Demand Analysis Components

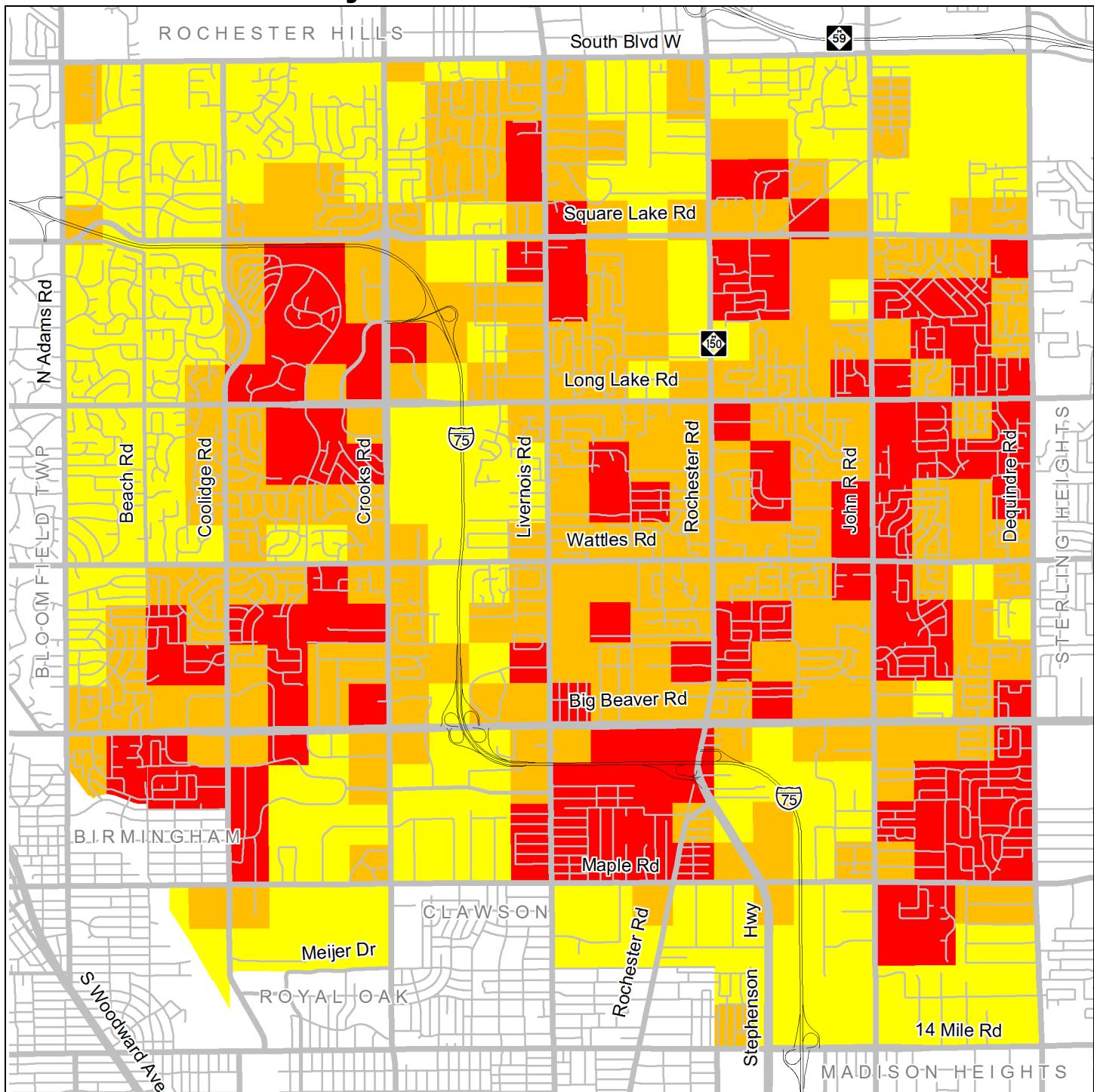


Population Density
(Persons Per Acre)

- 15 to 21.6
- 15 to 20
- 10 to 15
- 5 to 10
- 0 to 5

To determine the relative amount of pedestrian traffic in an area a number of factors were considered. Clockwise from the top left are the components that went into creating the Relative Demand Analysis on the following page: Population Density, Land Use Diversity, Adjacency to Public School Facilities, and Adjacency to Transit Routes.

Relative Demand Analysis



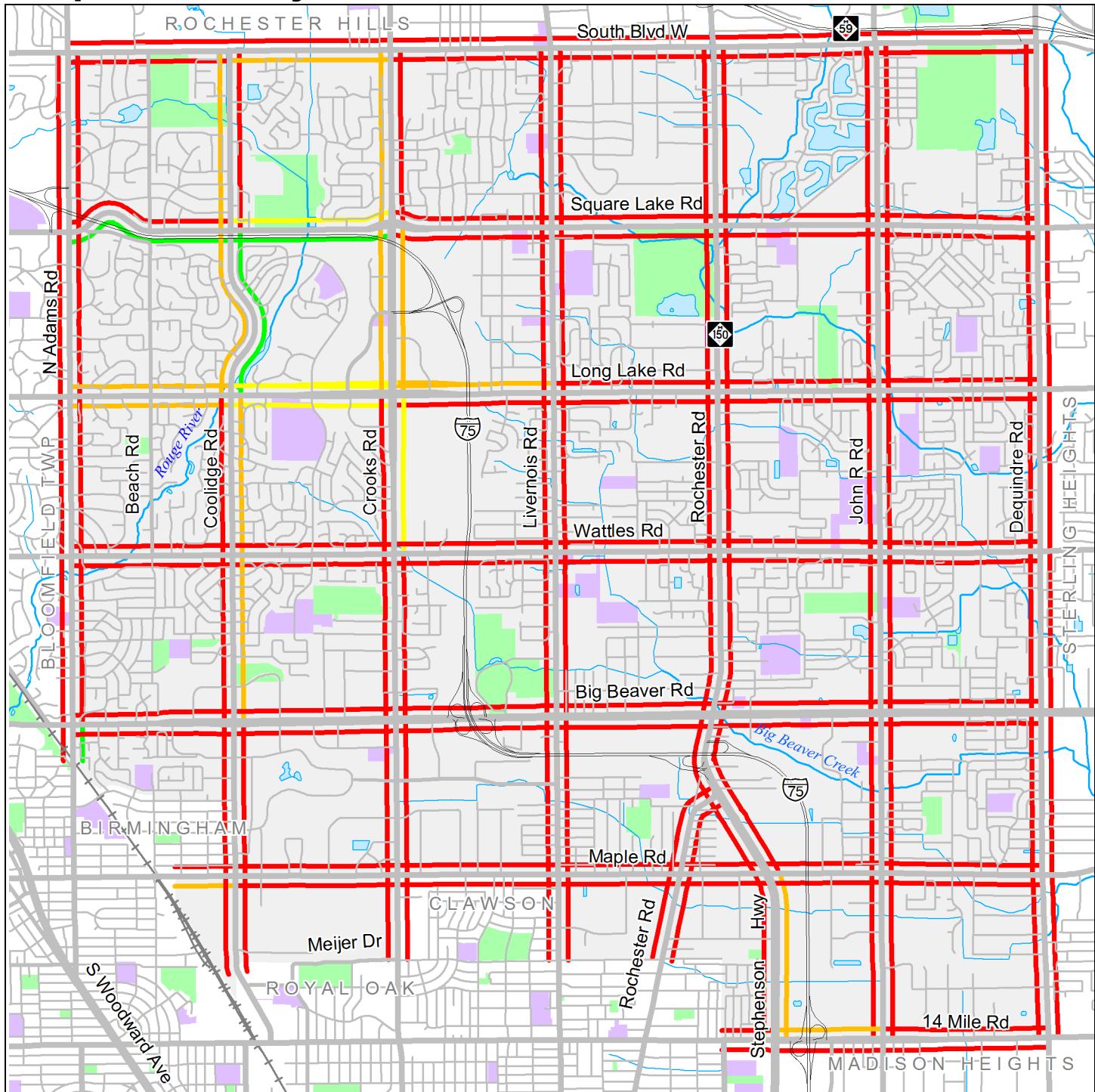
Legend:

Relative Demand

- Lowest Demand
- Moderate Demand
- Highest Demand

The Relative Demand Analysis is an approximation of the latent pedestrian demand. Factors such as Sidewalk Quality, Distance Between Crosswalks , Road Crossing Difficulty and Block Size influence the actually amount of pedestrian travel that takes place. Thus this may be used as a general guide to contrast relative demand against existing conditions to help locate and prioritize new facilities.

Sidepath Suitability



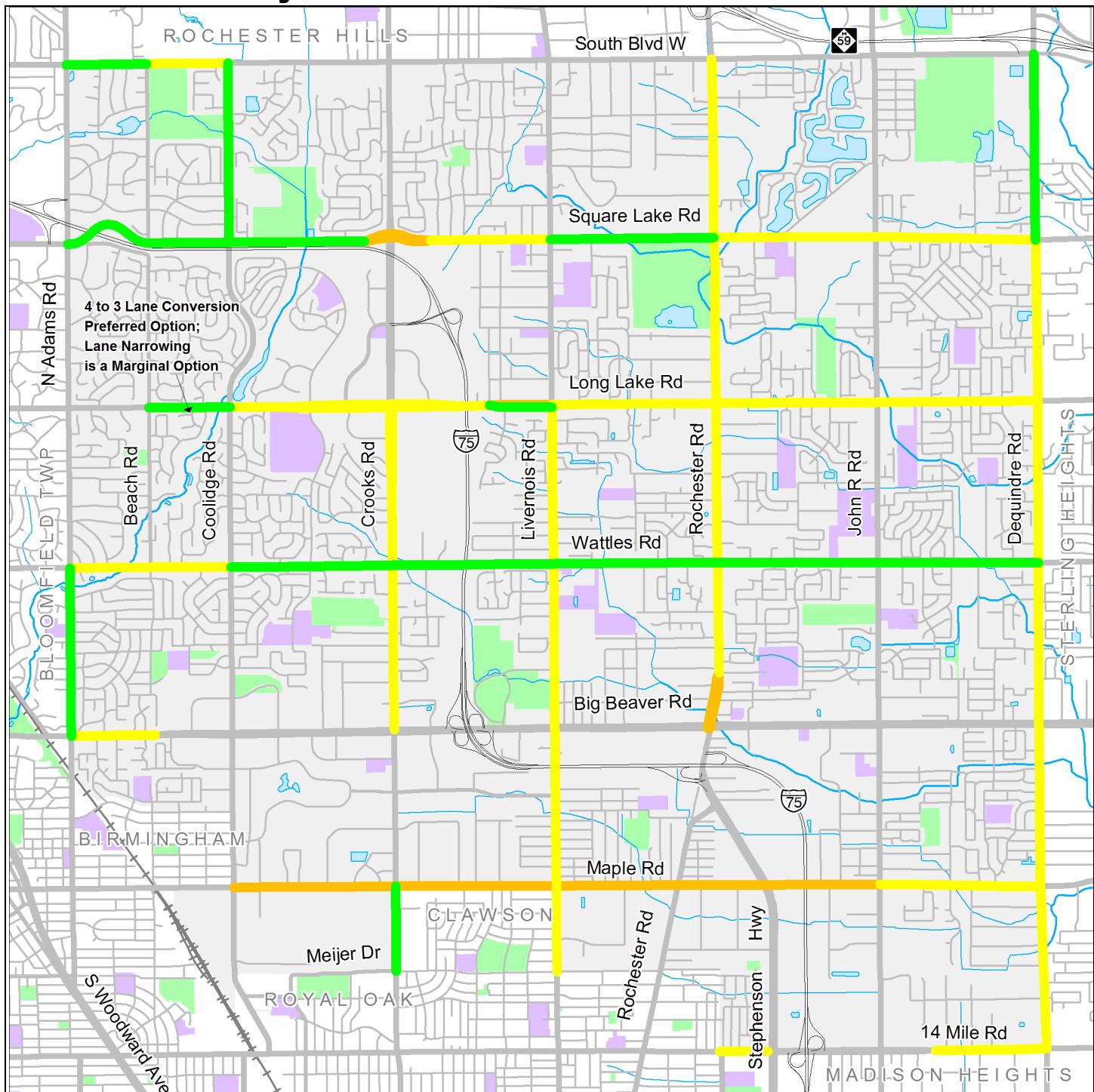
Legend:

Driveway Crossings
Per Mile

- 0 to 2
- 2 to 4
- 4 to 8
- 8 to 49

The AASHTO Guide for the Development of Bicycle Facilities generally considers sidewalks undesirable as Shared-use Paths. This is due to the inherent conflicts between bicycles and motorists where a pathway intersects with driveways and roads. Suitable sidepath locations are uninterrupted by driveways and roadways for long distances and provide safe and convenient road crossing opportunities to destinations on the other side of the road.

Potential Roadway Conversions

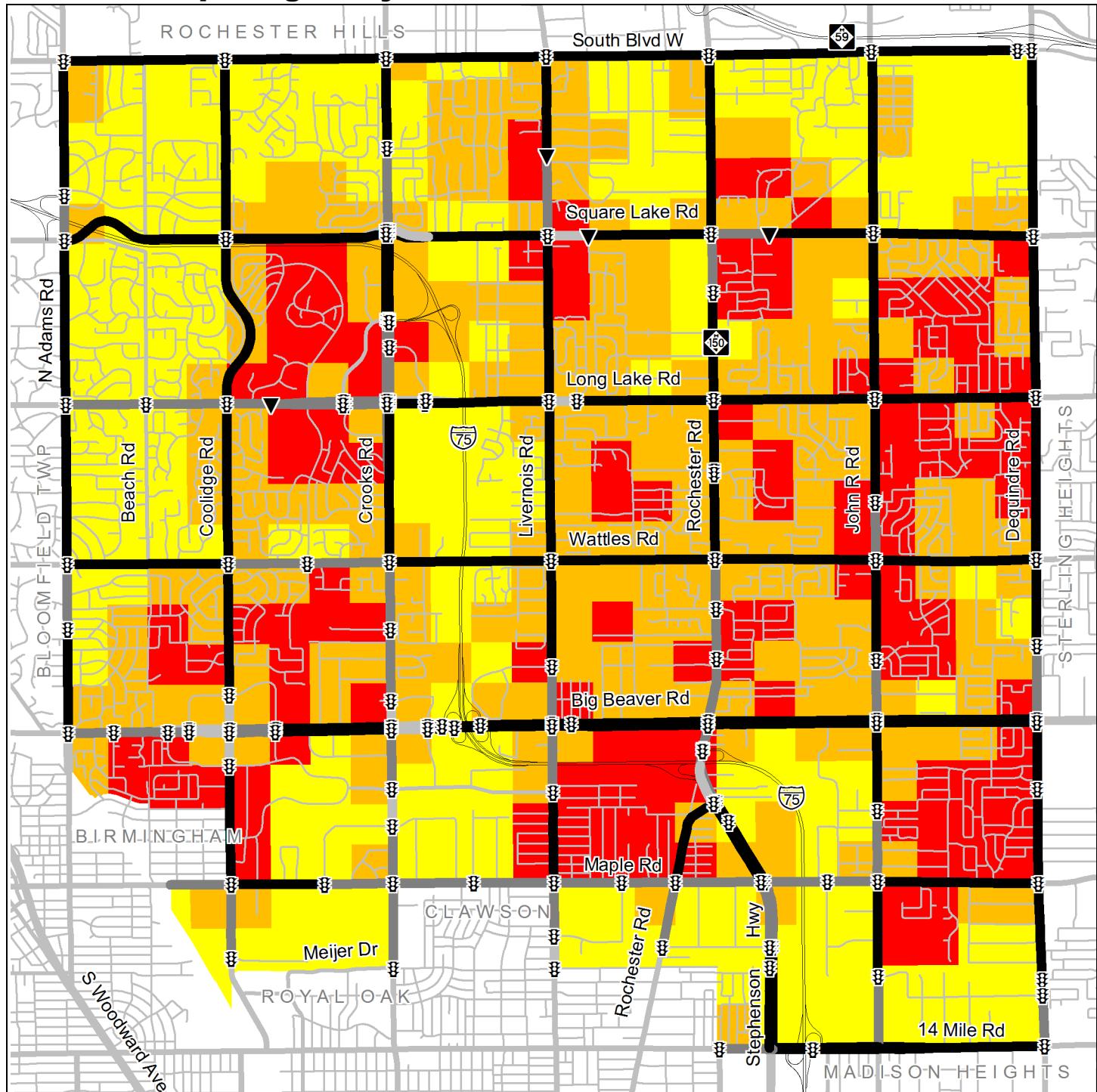


Legend:

- Potential Road Conversions To Add Bike Lanes
 - High Potential
 - Moderate Potential
 - Marginal Potential

High potential road conversions are roads where a bike lane may be added to the roadway and the motorized travel lanes are a minimum of 11' wide. Other high potential road conversions are four lane roads with ADT's below 15,000 VPD. Moderate potential road conversions include narrowing lanes to between 10 and 11' to add bike lanes. Marginal potential conversions require travel lanes to be 10' wide to add bike lanes.

Crosswalk Spacing Analysis



Legend:

Signalized Intersection

Mid-block Crosswalk

Crosswalk Spacing

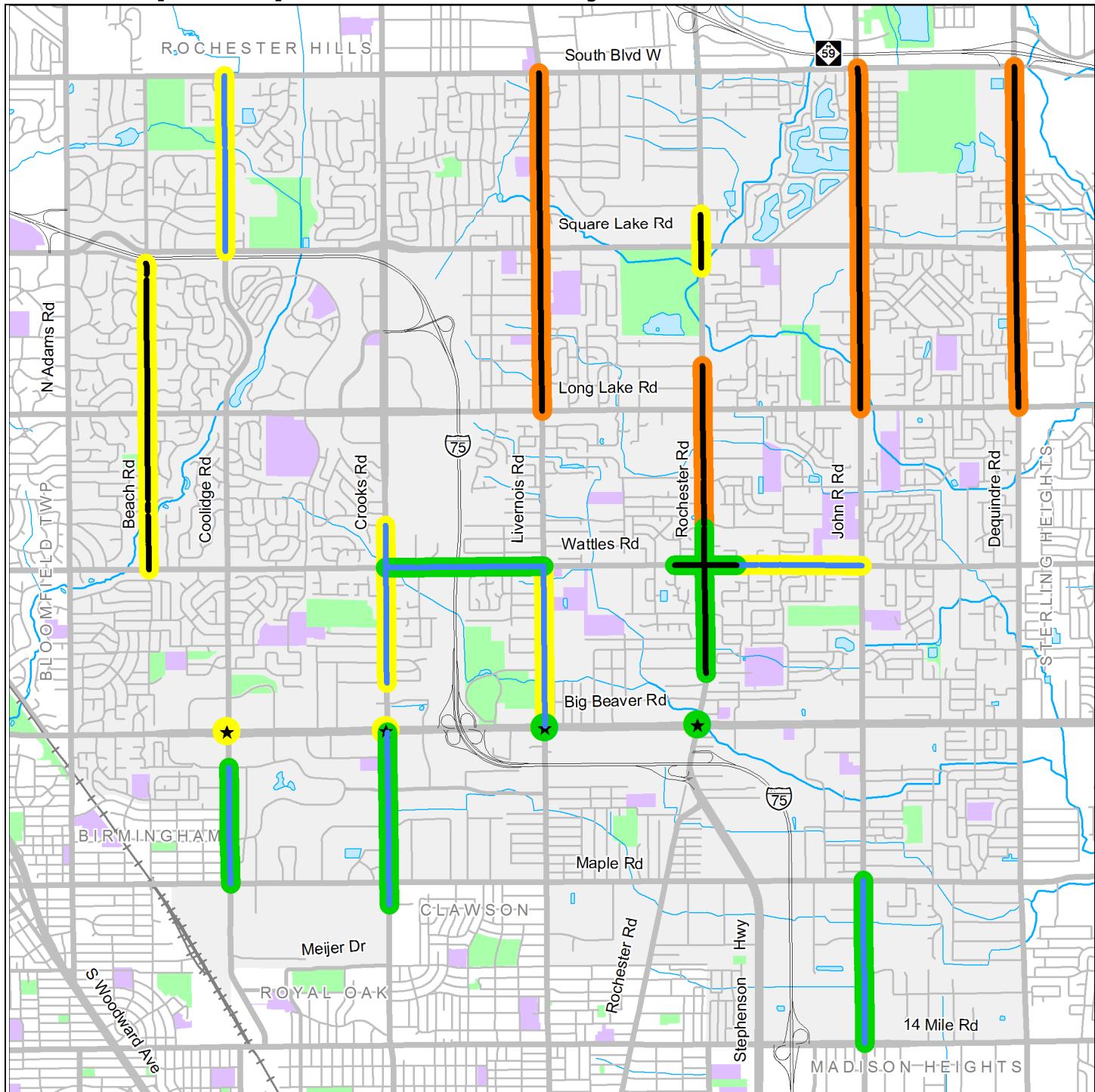
1/8 Mile to 1/4 Mile
1/4 Mile to 1/2 Mile
Over 1/2 Mile

Relative Demand

- Lowest Demand
- Moderate Demand
- Highest Demand

The crosswalk spacing and the relative demand help to determine where crossings improvements are needed.

6 Year Capital Improvement Plan - Major Roads

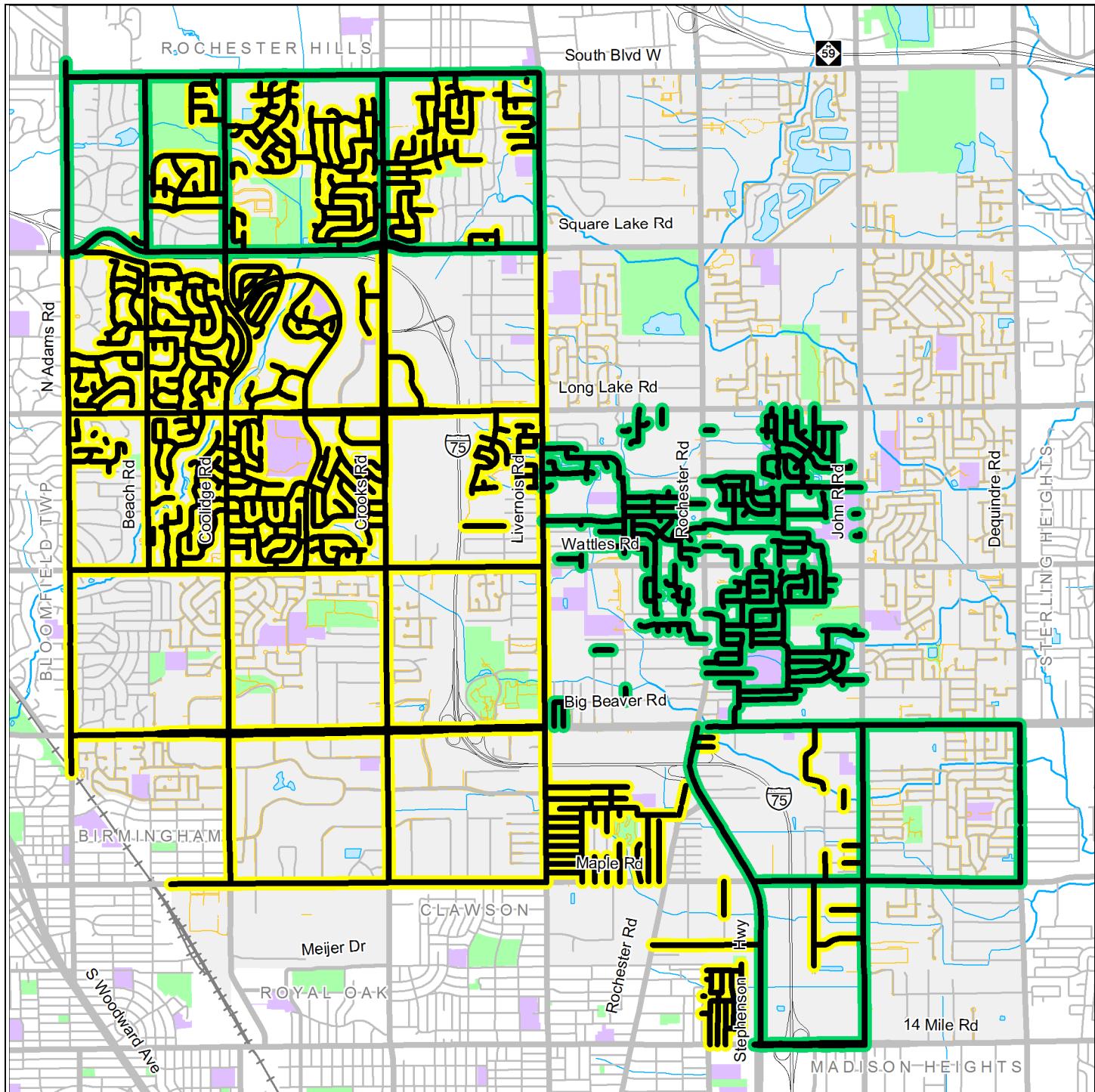


Legend:

Type
Overlay
Reconstruction
Intersection Enhancement
Proposed Construction Date
0-2 Years
2-6 Years
6+ Years

The Capital Improvement Plan is a list of priority projects that are planned to be undertaken within approximately 10 years depending on the availability of funding. The sooner the proposed construction date is the better defined a project is and the more likely that project funding has been identified and/or secured.

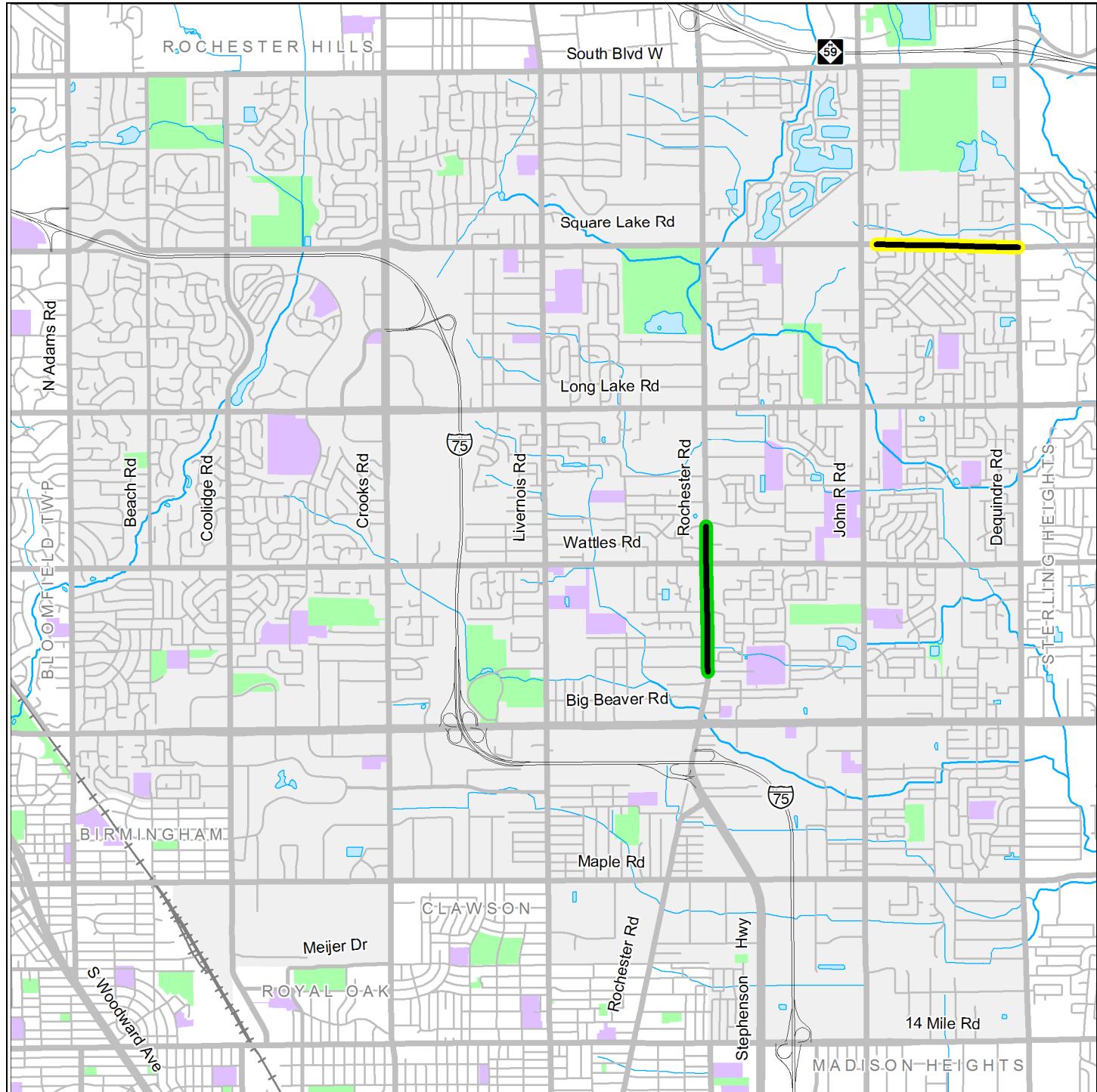
6 Year CIP- Sidewalks



General maintenance and repair are done in each area based on sidewalks condition.

- | Type | Proposed Date |
|------|---------------|
| — | Resurfacing |
| — | 0-2 Years |
| — | 2-6 Years |

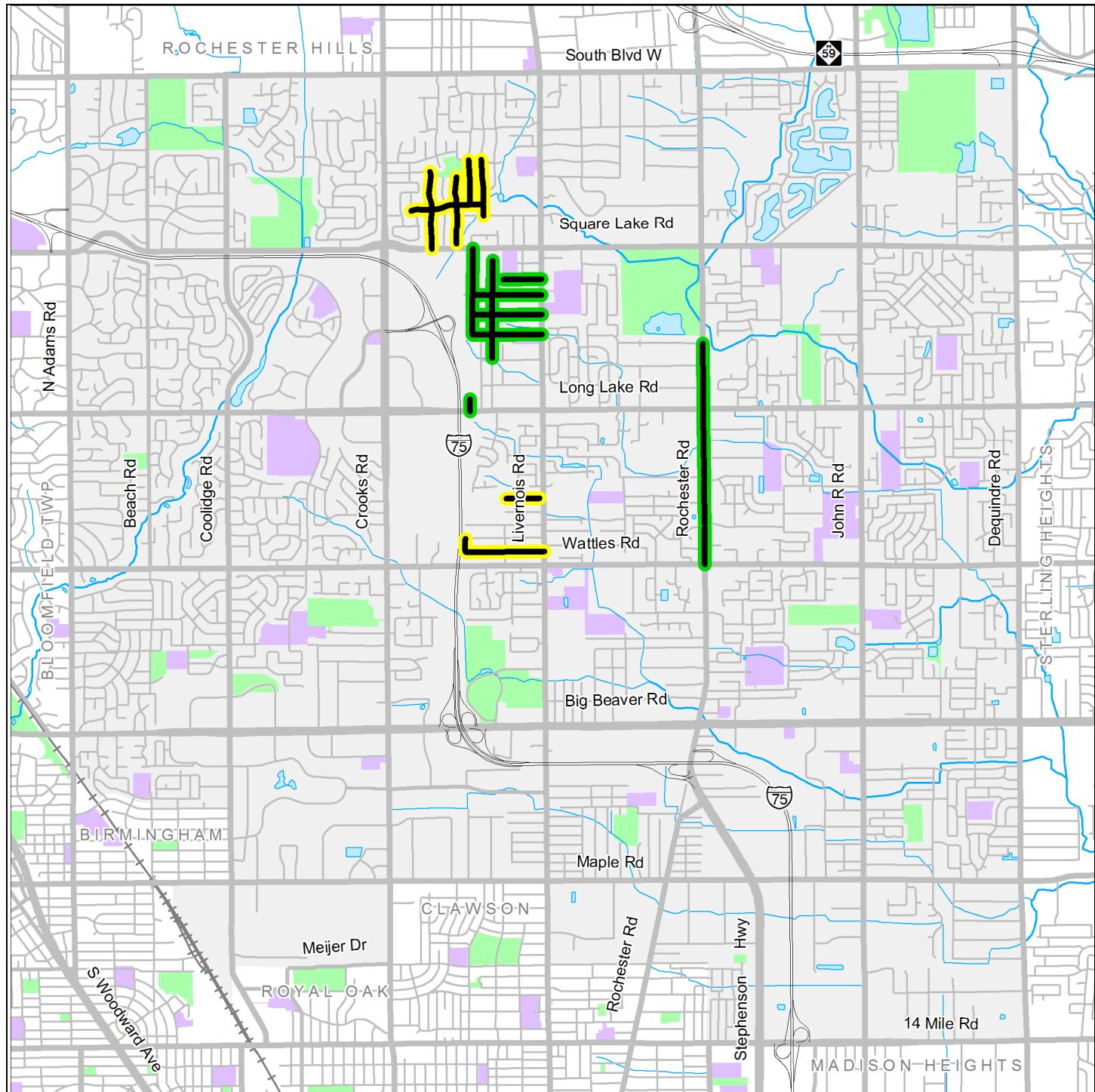
6 Year CIP- Drain



Legend:

- | | |
|----------------|--|
| Type | |
| Reconstruction | |
| Proposed Date | |
| 0-2 Years | |
| 2-6 Years | |

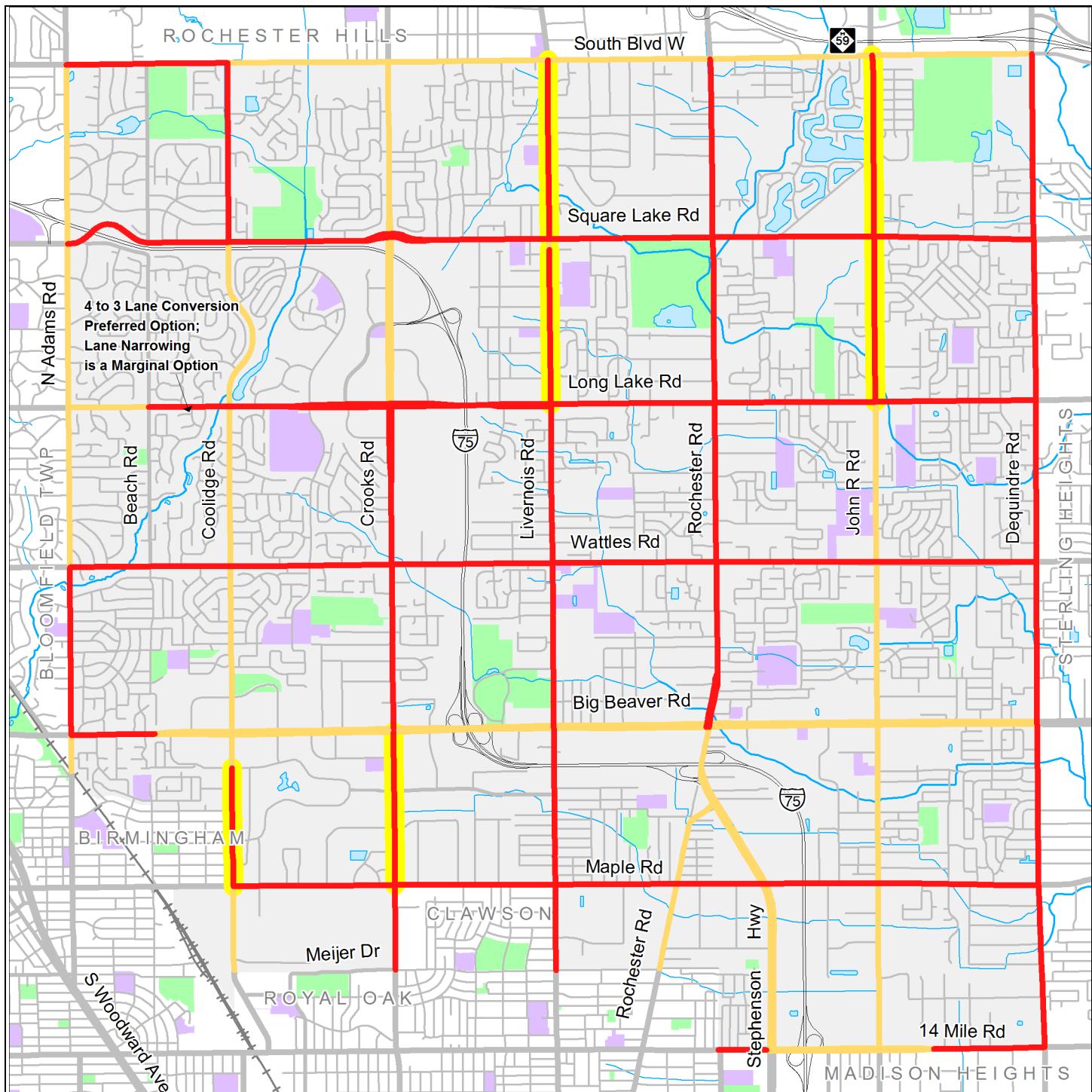
6 Year CIP- Water



Legend:

- | Type |
|------------------|
| — Reconstruction |
| Proposed Date |
| — 0-2 Years |
| — 2-6 Years |

Potential Bike Lanes

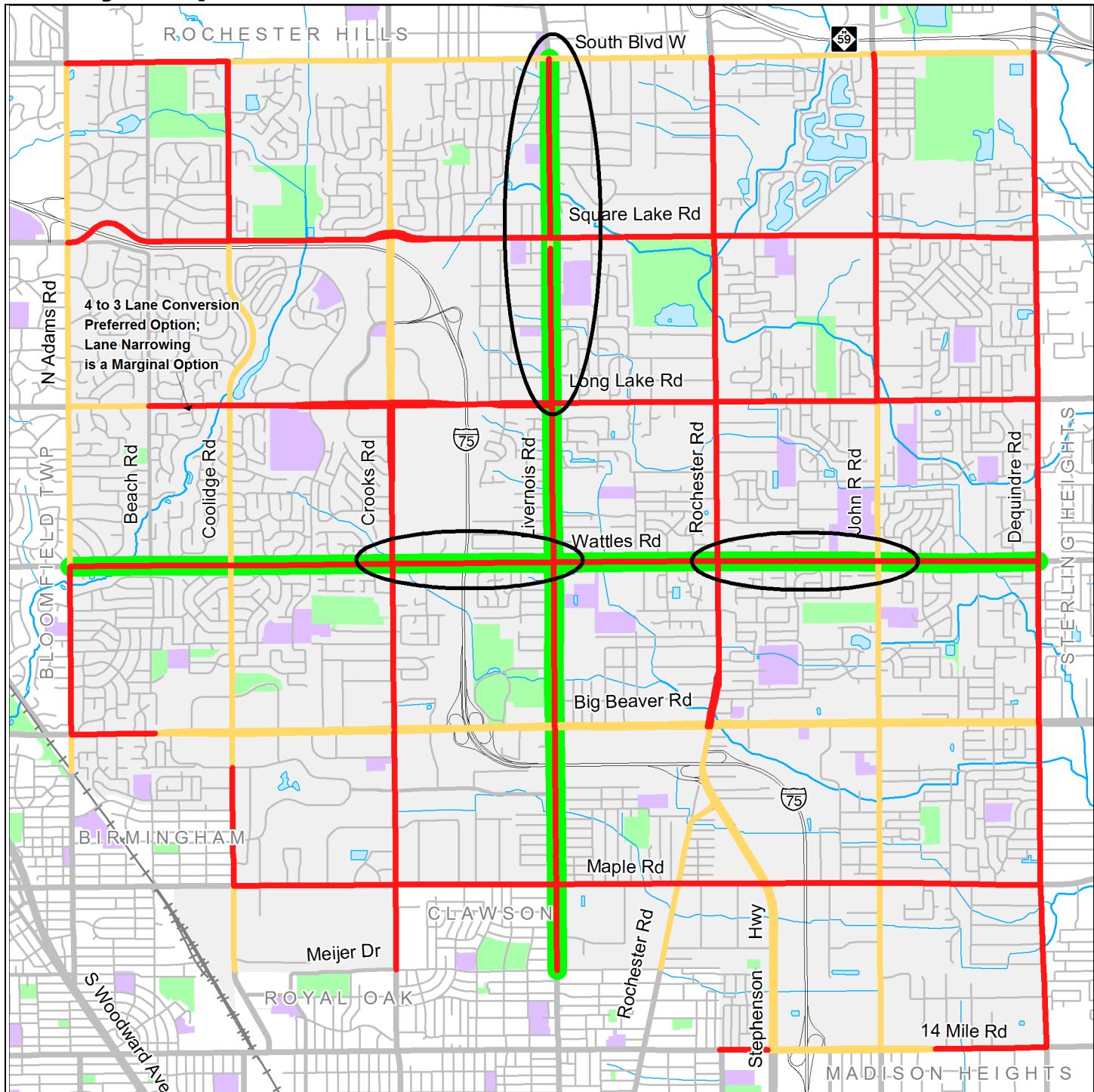


Legend:

- Near Term Bike Lanes
- Long Term Bike Lanes
- Road Reconstruction Project

Bike lanes should be constructed on every primary road. Over 60% of the primary roads have potential for bike lanes in the near future. The concrete surface of many of the potential roads though is problematic for restriping efforts. Current resurfacing practices call for grinding down the top surface of the concrete and resurfacing with asphalt. It may be advisable in some cases to wait until the road is resurfaced to add bike lanes.

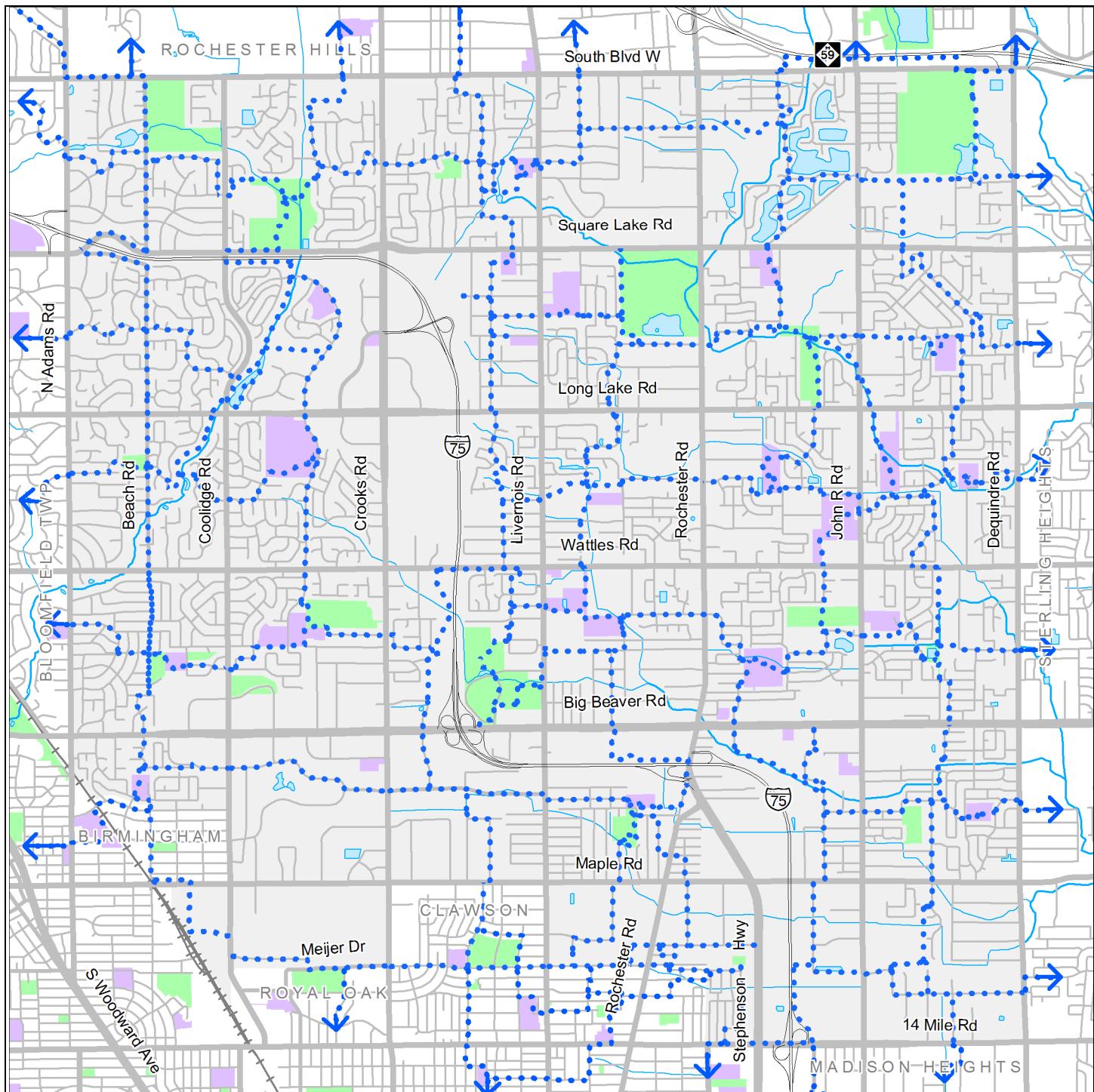
Priority Complete Street/ Green Streets



Wattles Rd and Livernois Rd are both identified as high priority corridors due to their centralized location and near term potential.

The road segments circled above are planned road construction projects where immediate implementation should take effect.

Potential Bike Routes

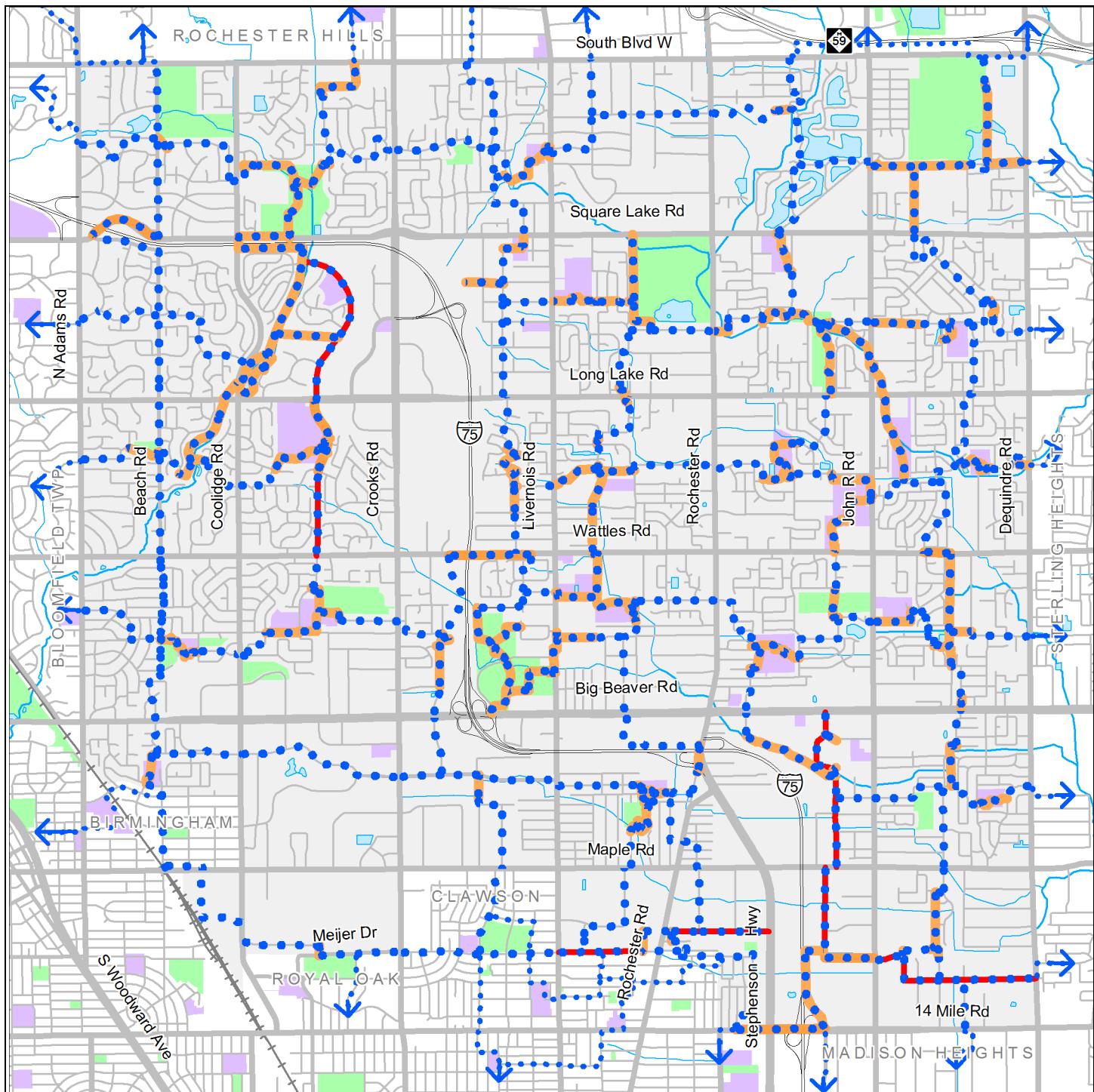


Legend:

• • • Bike Route

The bike route system helps bicyclists and pedestrians navigate through the local neighborhoods to the schools and parks without having to go along busy arterial roads.

Bike Route Facilities

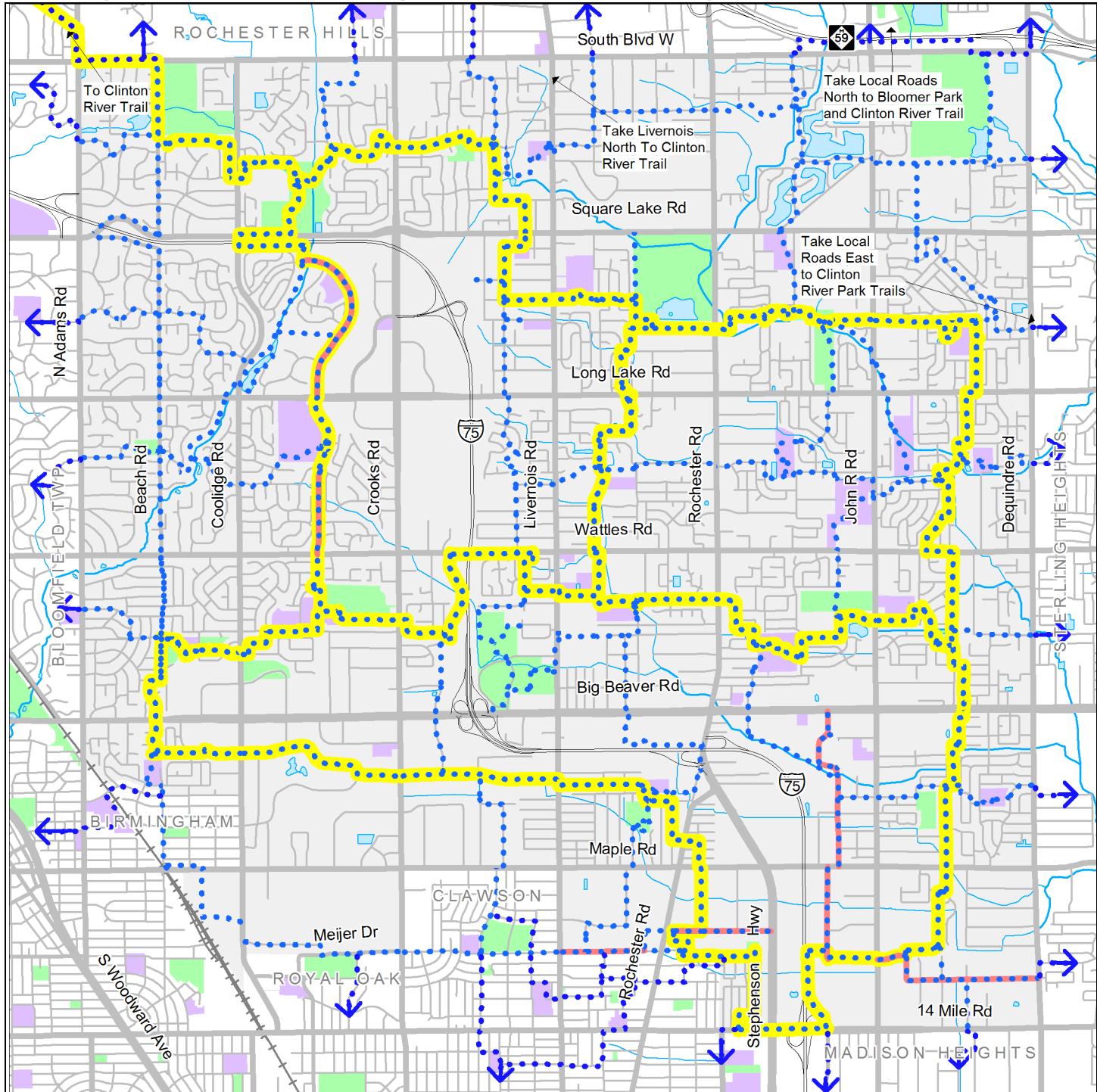


Legend:

The bike route system is a combination of shared-use paths, bike lanes and local roads.

- • • Bike Route
- Shared-use Path
- Bike Lanes

Priority Bike Routes / Neighborhood Greenways

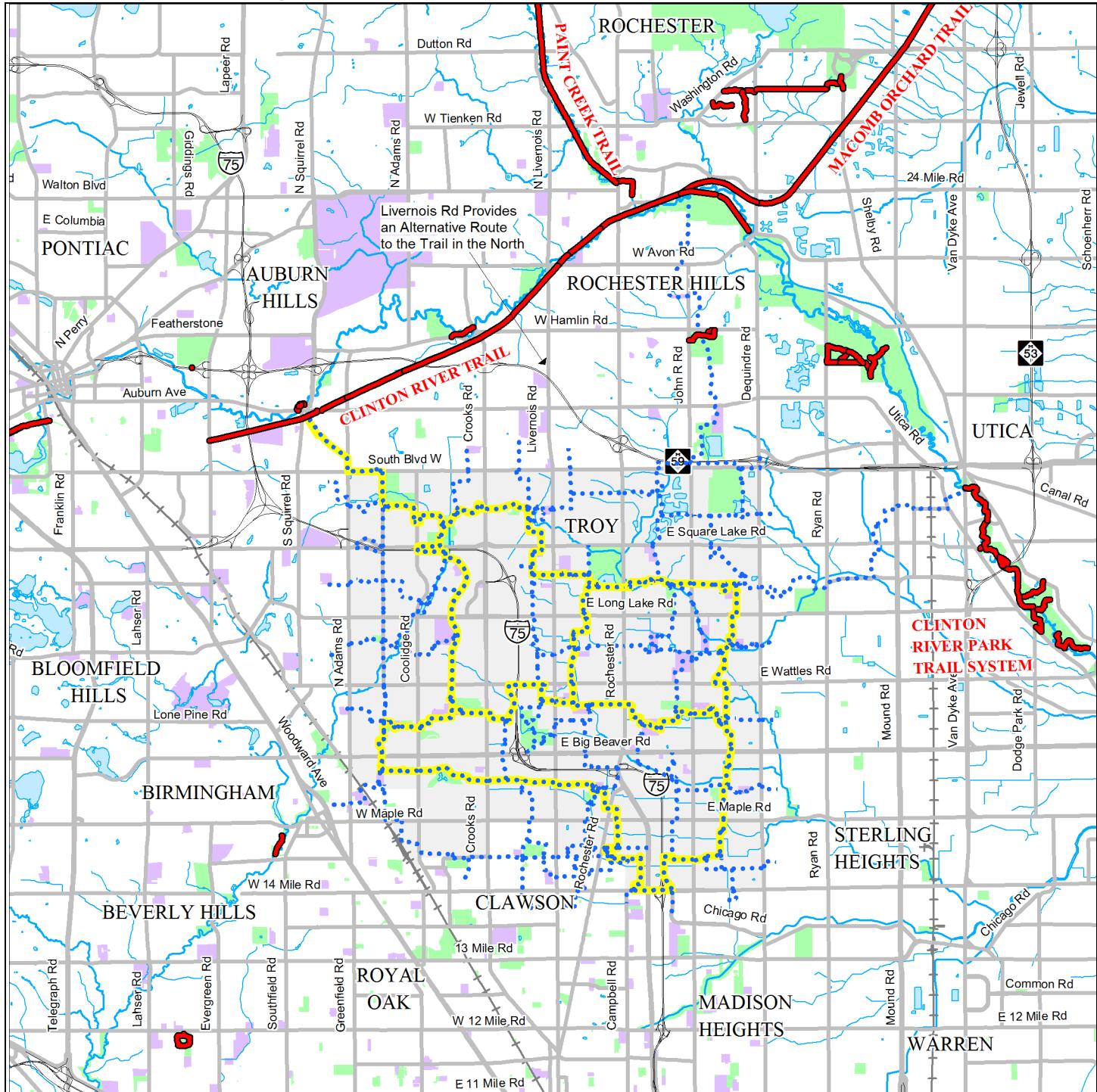


Legend:

- • • Bike Route
- Yellow Priority Bike Route
- Bike Lanes

The priority bike routes were selected based on their location, relative demand and connections to major destinations and regional trails. These priority bike routes may be enhanced to become neighborhood greenways through the incorporation of traffic calming measures, green street elements, wayfinding and beautification efforts.

Connection to Regional Trails

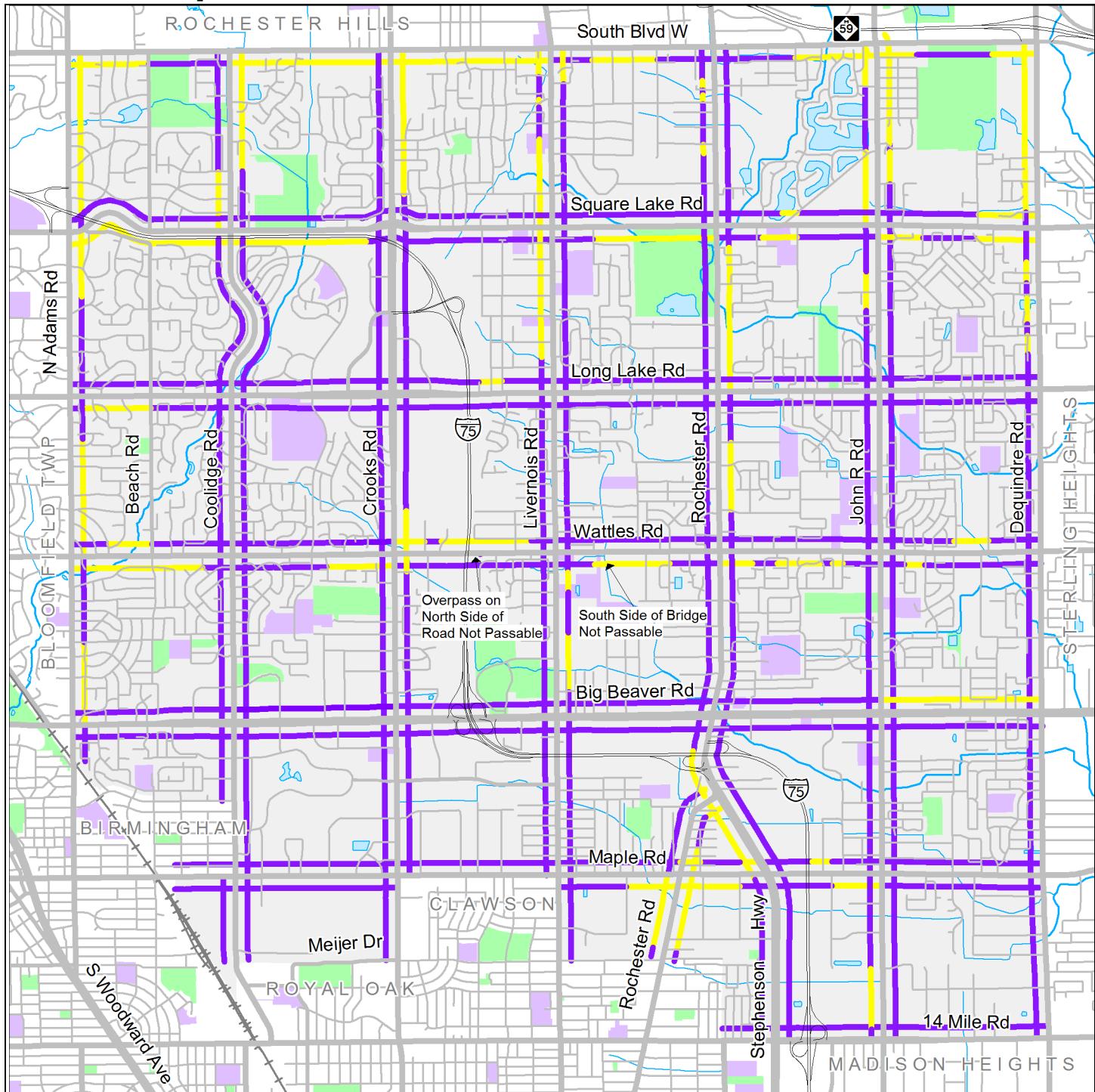


Legend:

- • • Bike Route
- Yellow bar Priority Bike Route
- Red line Regional Trails

The proposed bike route system may be expanded into neighboring communities to provide links to the surrounding regional off-road trail system.

Sidewalk Improvements

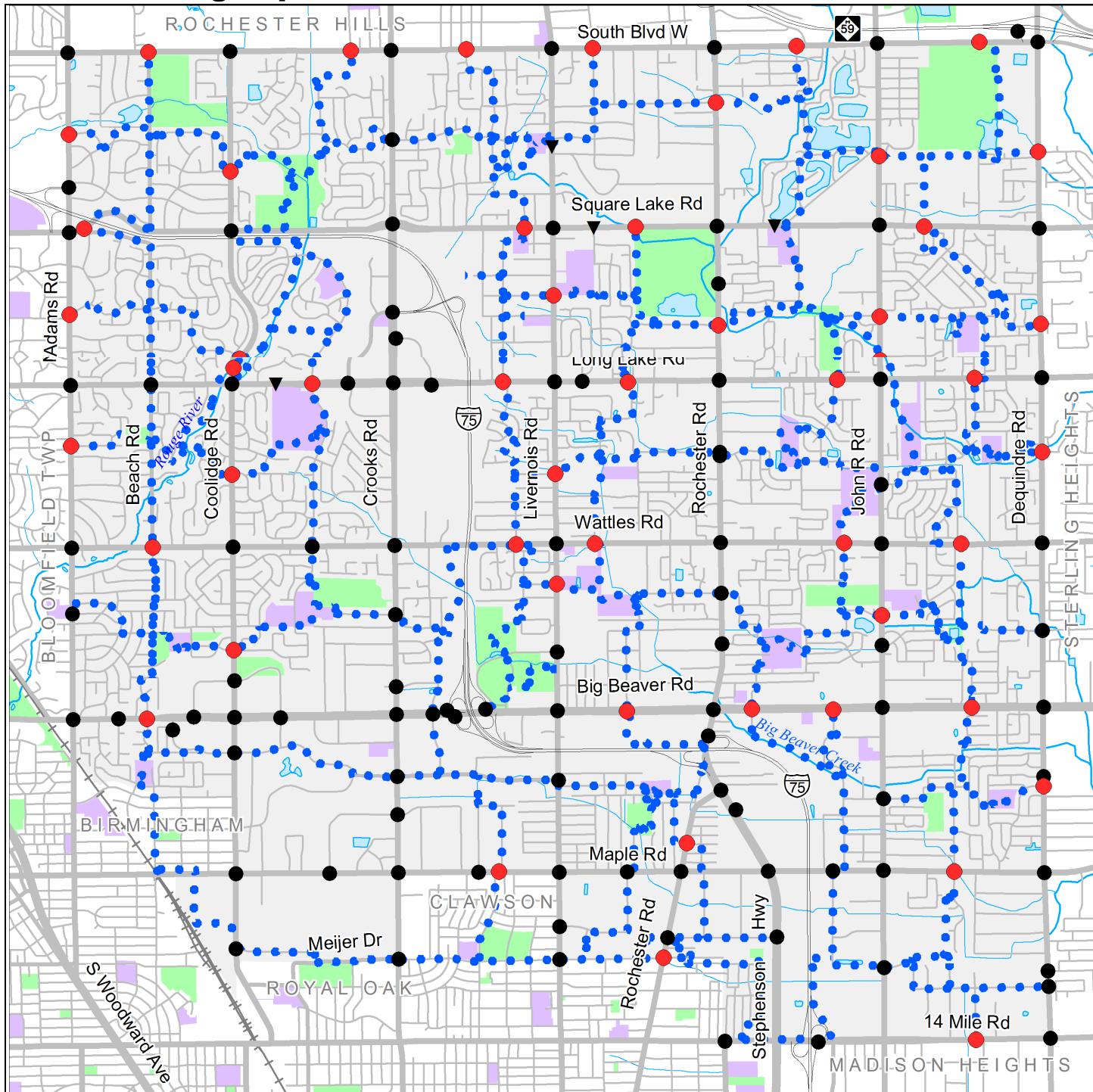


Legend:

- Existing Sidewalk
- Proposed Sidewalk

Sidewalks should be built on both sides of all primary roads. Sidewalks should be a minimum of 6' wide along collector roads and 8' wide along primary roads to accommodate bicyclists who are not comfortable riding in the roadway. The sidewalks though should not be signed or designated as bicycle facilities. Where ever possible a planned buffer should be provided between the sidewalk and the roadway.

Road Crossing Improvements



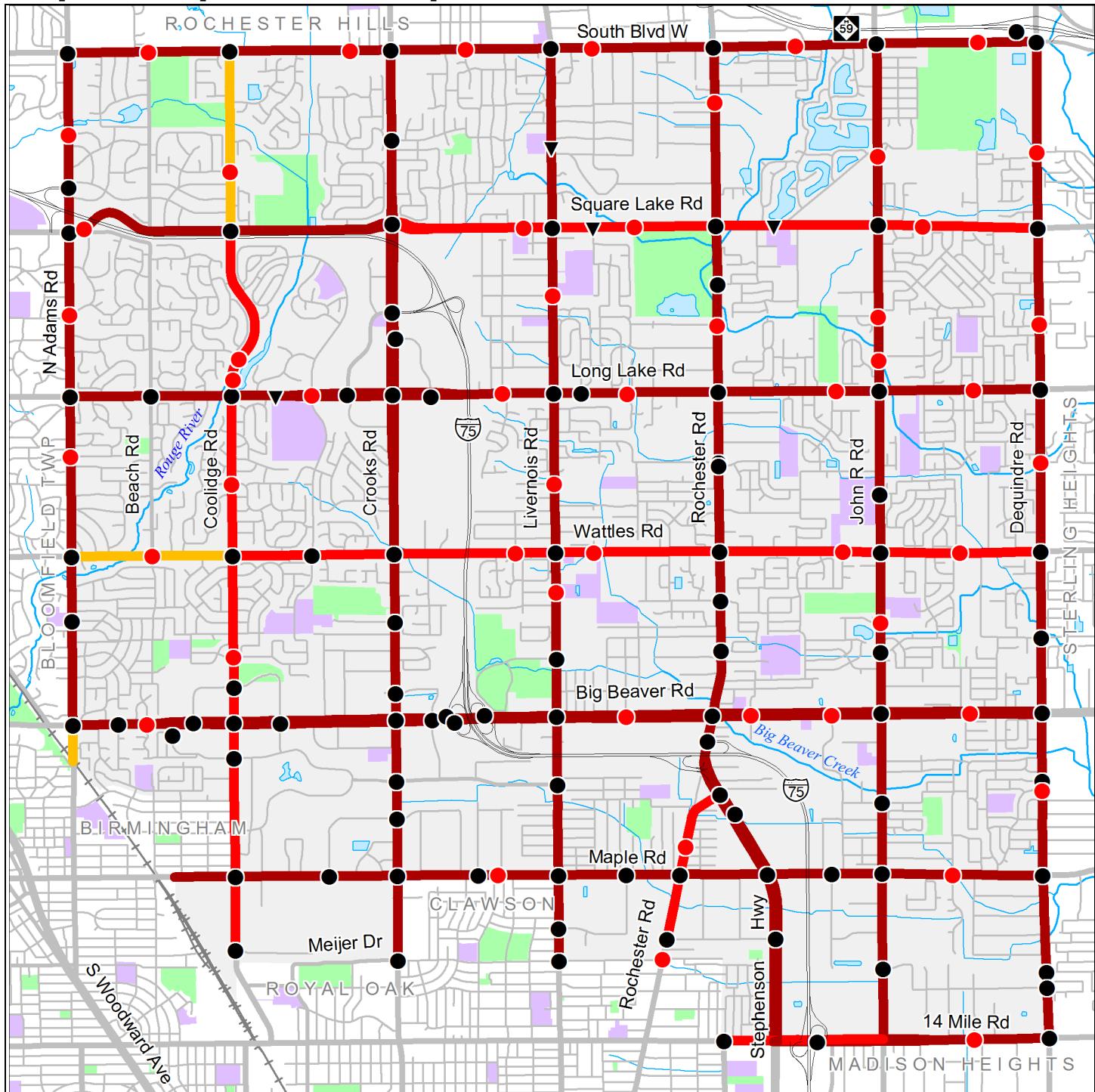
Legend:

Road Crossings

- Signalized Road Crossing
- ▼ Unsignalized Midblock Crossing
- Road Crossing Improvements
- Bike Route

Road crossing improvements are recommended where the bike routes intersect primary roads where ever existing crosswalks do not exist. The crossing improvements may be unsignalized mid-block crossings that include elements such as Crossing Islands and Rectangular Rapid Flash Beacons. Where unsignalized crossings are not appropriate, Hybrid Pedestrian Signals should be considered.

Proposed Improvements Impact on Difficult to Cross Blocks



Legend:

Road Crossings

- Signalized Road Crossing
- ▼ Unsignalized Midblock Crossing
- Road Crossing Improvements

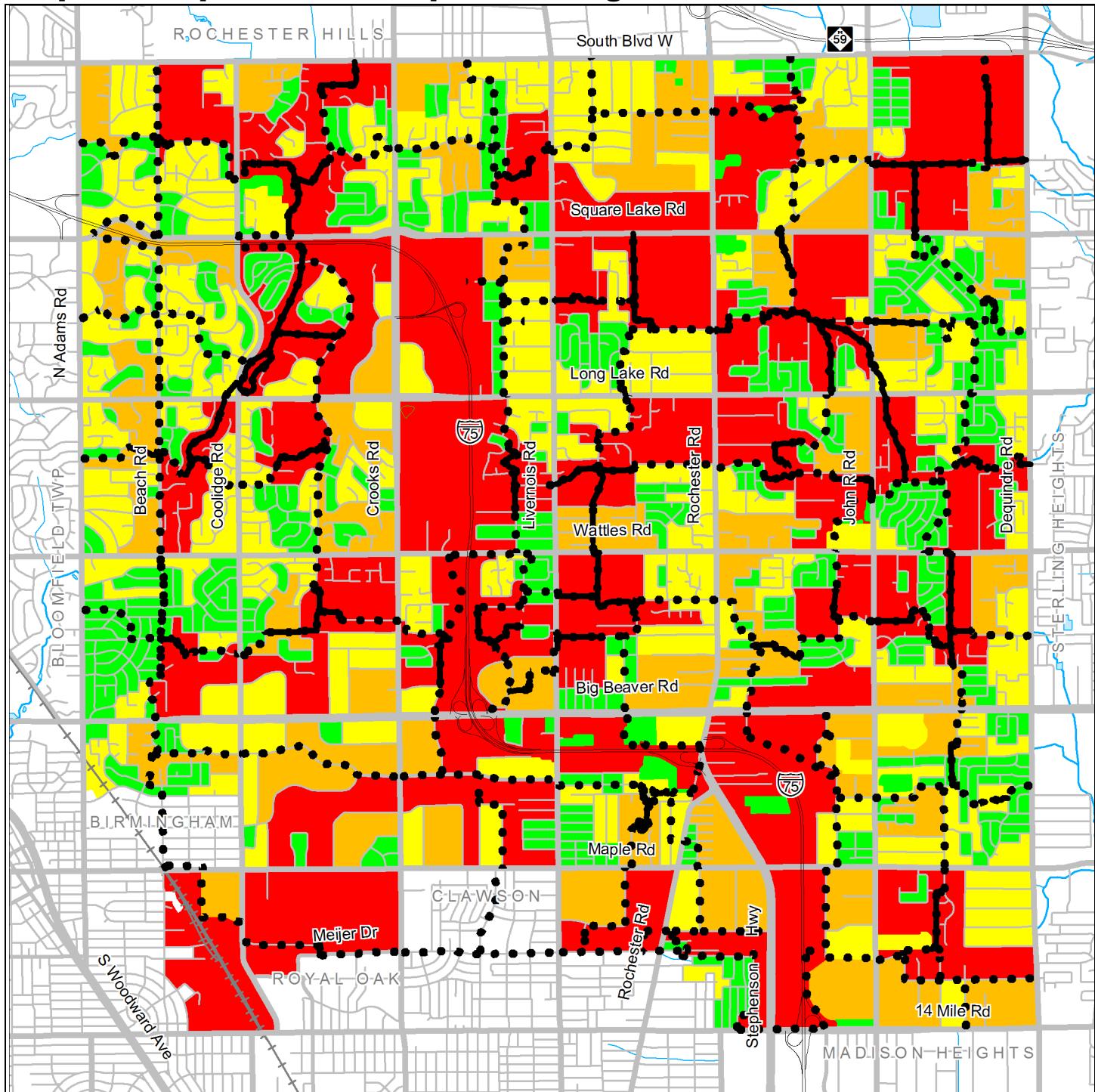
Road Crossing Difficulty (Speed, No. Lanes & ADT)

- C
- D
- E

In this illustration, the proposed road crossing improvements have been overlaid on top of the road crossing difficulty assessment. This illustrates how the road crossing improvements for the bike route system help address many of the most difficult to cross roads.

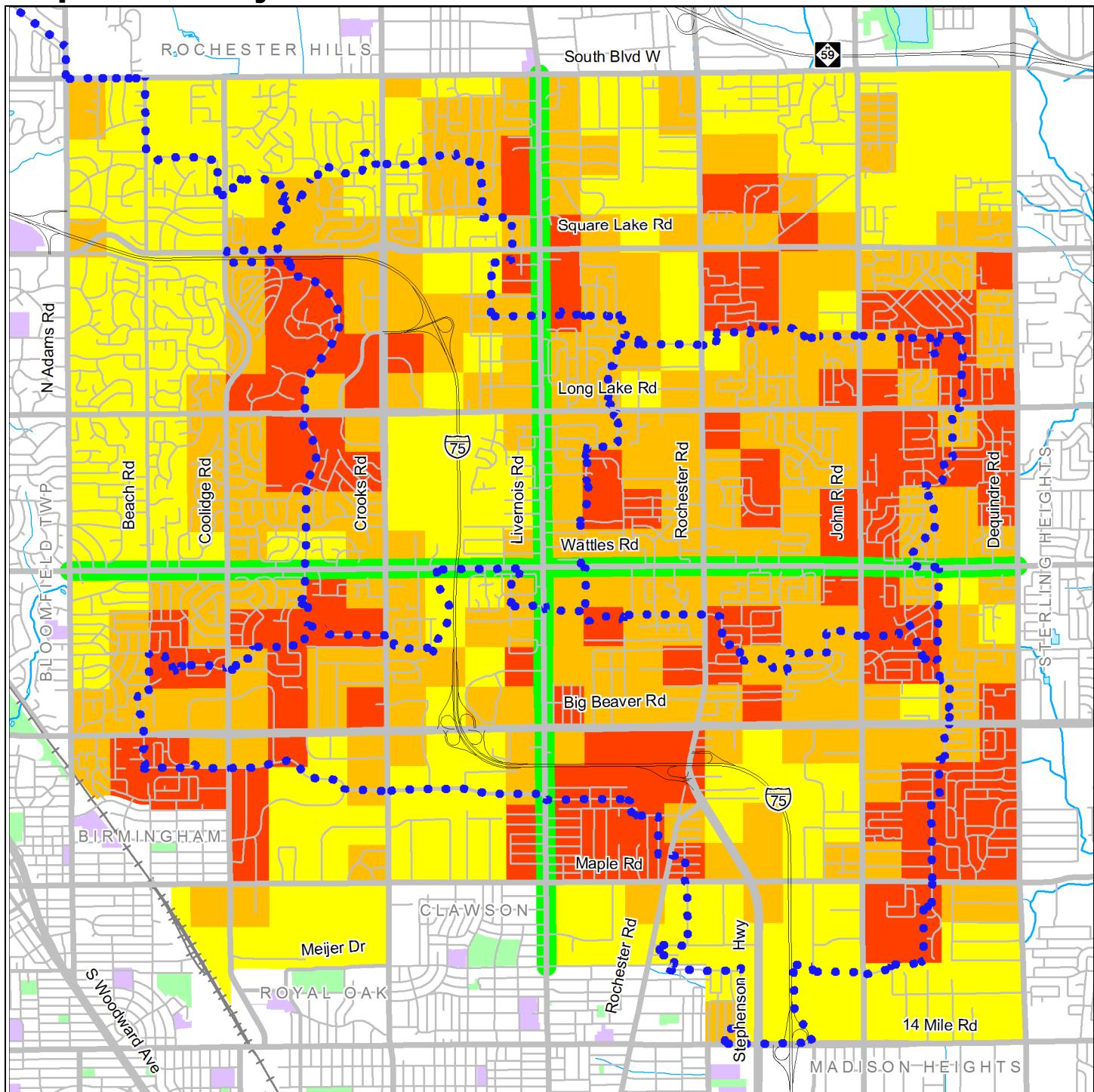
Additional

Proposed Improvements Impact on Large Blocks



In this illustration, the proposed bike route and off-road trail routes have been overlaid on top of block size analysis. This illustrates how the proposed off-road trail segments help to reduce some of the large blocks.

Proposed Priority Routes Relation to Relative Demand



Legend:

- Relative Demand
- Highest Demand
 - Moderate Demand
 - Lowest Demand

• • • Primary Bike Route

■ Priority Complete Street/Green Street

In this illustration, the proposed priority bike routes/neighborhood greenways and priority complete streets/green streets related to the relative demand analysis.