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BUMP
VERTICAL
CLEARANCE

BICYCLE BOULEVARD NETWORK

Chapter Contents:

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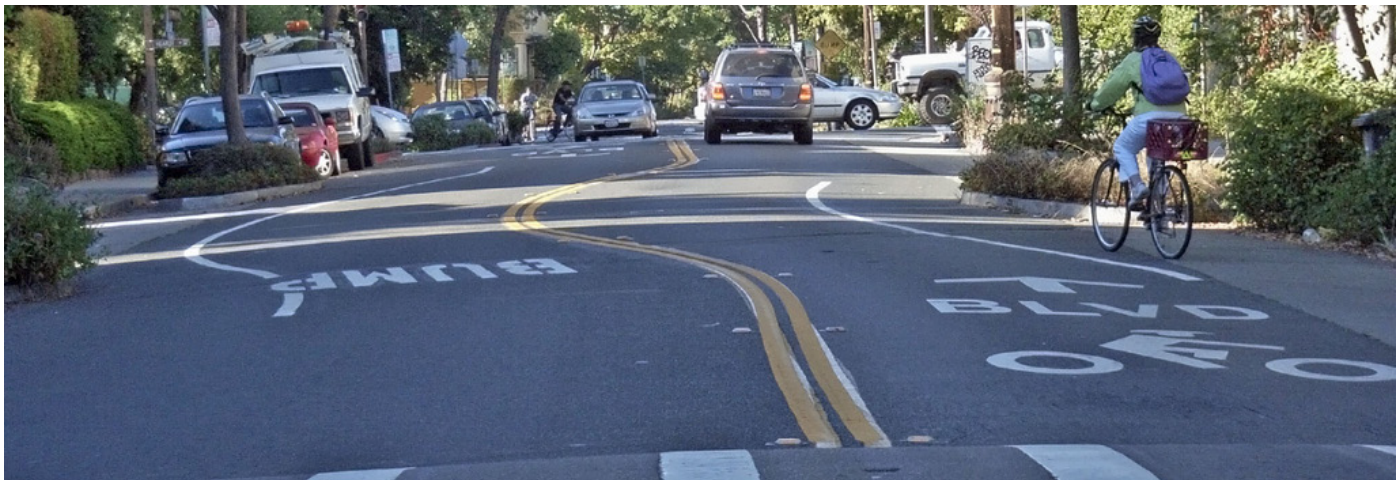
BICYCLING IN ROCHESTER

Bicycling in Rochester is constantly evolving; this plan is another important step of that evolution. In 2011, the City completed a Bicycle Master Plan focused on developing an on-street bicycle network that provided a framework for investments to improve conditions for bicyclists in the city. The plan was focused on developing a bicycle network that would qualify the City for full Bicycle Friendly Community status, a designation granted by the League of American Bicyclists. Since the plan's adoption, progress has been made on building the envisioned bicycling network and elevating the profile of bicycling as a viable part of Rochester's multi-modal transportation system. The City was recognized as a Bronze-level Bicycle Friendly Community in fall 2012; the City's goal is to achieve Silver or higher status in coming years.

As of winter 2014, the bicycle network in Rochester is over 72 miles, including 26 miles of bicycle lanes, 18 miles of shared lane pavement markings, and 28 miles of multi-use trails. Bicycle Boulevards are viewed as a way to better connect city neighborhoods with existing and proposed bicycle facilities and enhanced the attractiveness of bicycling as a means of transportation for all types of potential cyclists.

The following chapter provides information and analysis that was used to inform the selection of Bicycle Boulevard facilities within the City of Rochester.



A bicycle boulevard is a low-speed, low volume street ideal for bicycle travel (Photo: Payton Chung)

BICYCLE BOULEVARD ROUTE SELECTION

There are several factors that were considered in the selection of the Bicycle Boulevard Routes. These factors include:

- Existing and proposed bicycle infrastructure
- Annual average daily traffic (AADT)
- Street connectivity
- City and public input

EXISTING AND PROPOSED BICYCLE INFRASTRUCTURE

The primary objective of the bicycle boulevard network is to connect and supplement the existing and proposed bicycle infrastructure throughout the City of Rochester. There are several major transportation corridors that cannot accommodate other means of cycling accommodations such as bike lanes or a cycle track. The proposed bicycle boulevard network fills gaps in this system by providing a low stress bike route alternative to connect destinations within the City. A near term goal of Rochester's bicycle network is to provide quality bicycle accommodations within a half mile of every home and business within the City. The existing and proposed bicycle accommodations are shown in Map 3-1.

AVERAGE ANNUAL DAILY TRAFFIC (AADT)

Average annual daily traffic plays an important role in bicycle boulevards. The lower volumes result in cyclists being passed less frequently and a more comfortable environment. For the purpose of the route identification, roadways with less than 5,000 AADT were considered. 3,000 AADT or less is optimal; however, traffic diversion techniques can be utilized to reduce cut-through traffic on local streets, reducing the daily traffic volumes to more comfortable levels for cyclists. Map 3-2 shows the current counted or estimated daily traffic volumes on the City's streets.

STREET CONNECTIVITY

Navigating the bicycle boulevard network should be easy for users, and should provide the most direct route possible to one's destination. The current street network within the City of Rochester was considered closely to identify routes with the least amount of turning movements to get between destinations. Minimization of major roadway crossings was considered. If a portion of a higher volume roadway is needed to connect portions of the network, the shortest segment possible was identified.

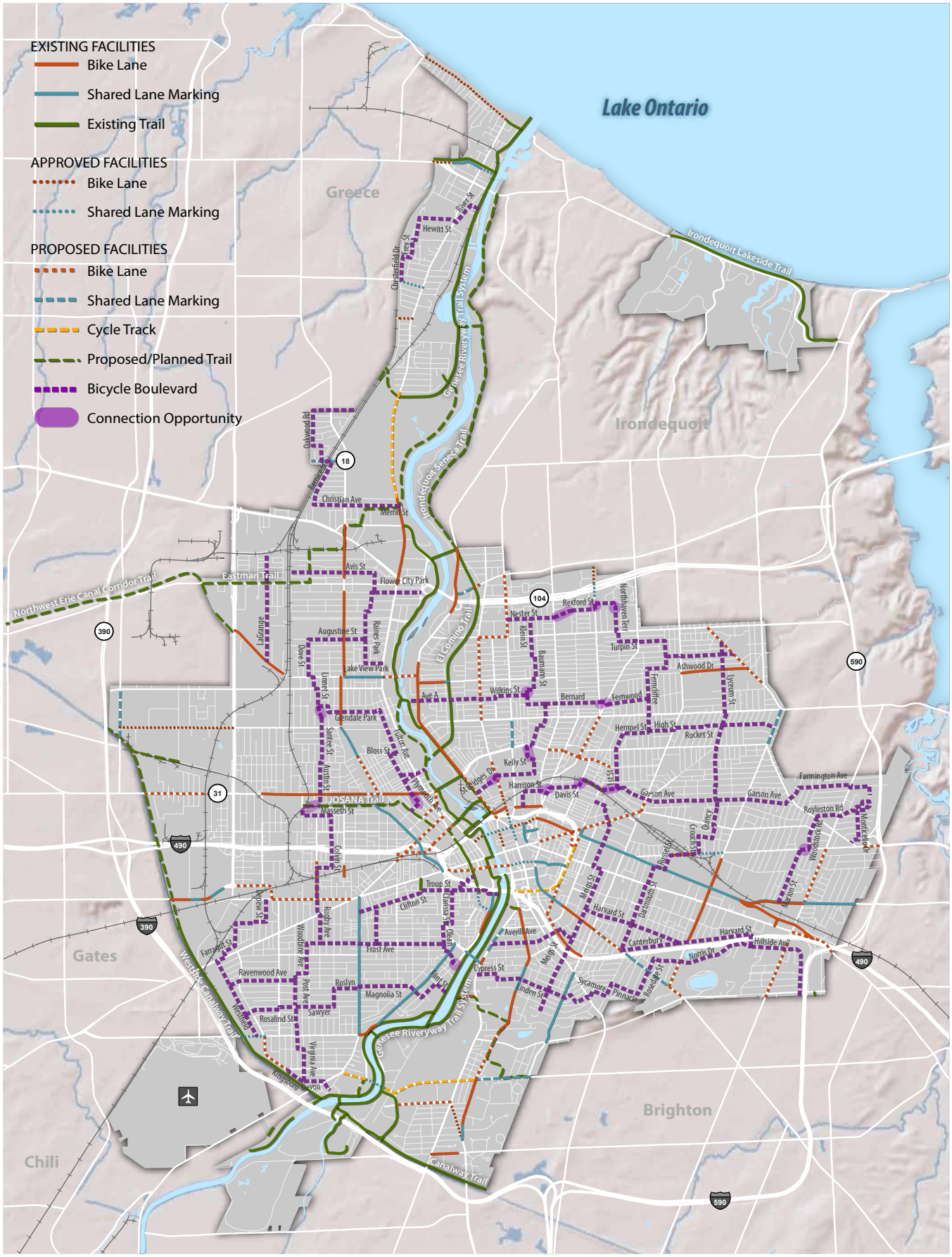
CITY AND PUBLIC INPUT

Roadway and route suggestions were solicited from City Staff, the Steering Committee, and the public. Public input was received during the February 2014 public meeting. Maps of the existing and proposed bicycle infrastructure, and current AADT were provided for residents to identify preferred and desired routes.

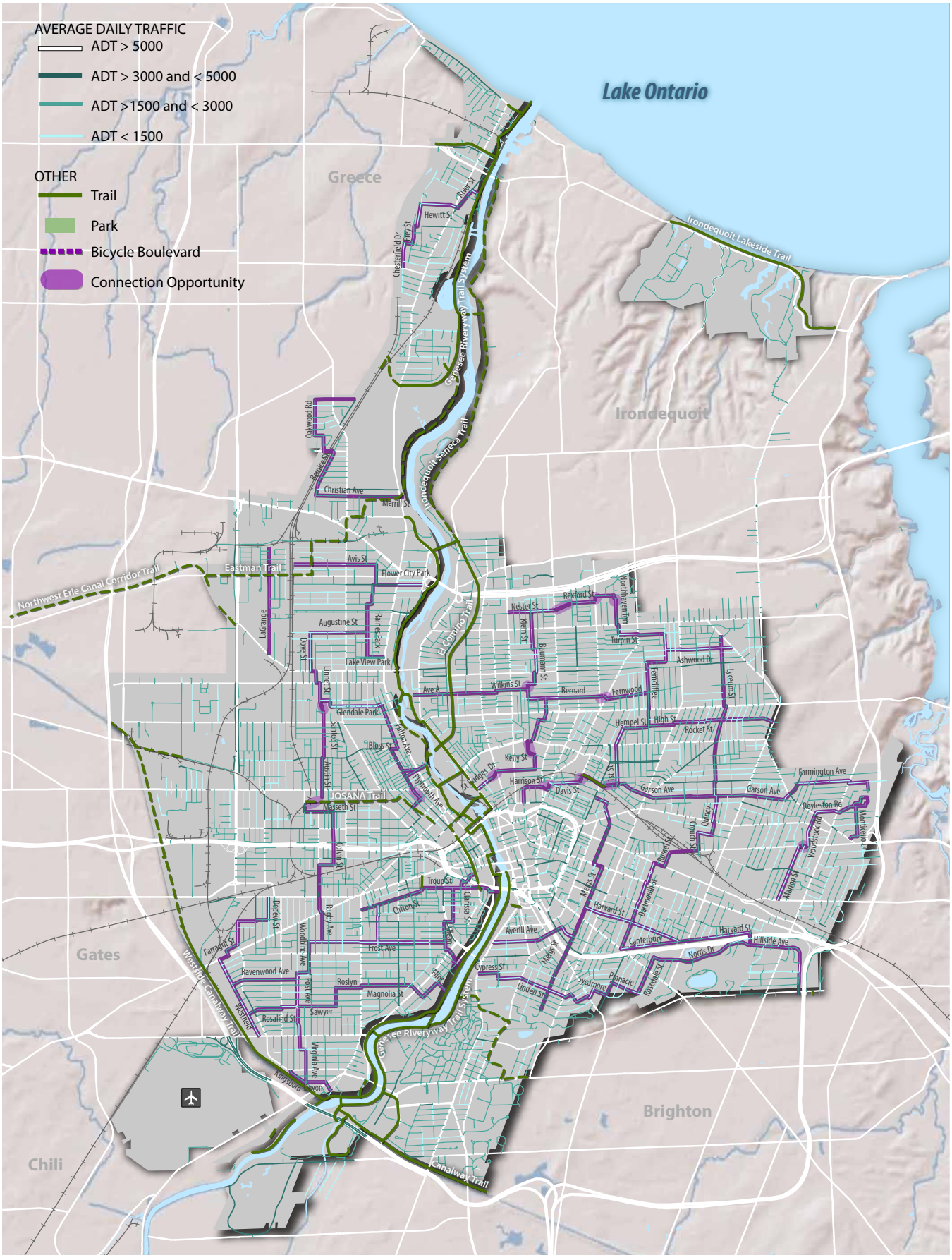
SUMMARY OF BICYCLE BOULEVARD ROUTE SELECTION

The combination of these elements resulted in a recommended bicycle boulevard network for the City of Rochester. When the system is built in full, it will result in approximately 50 miles of bicycle boulevards. The proposed bicycle boulevard network is shown in Map 3-13.

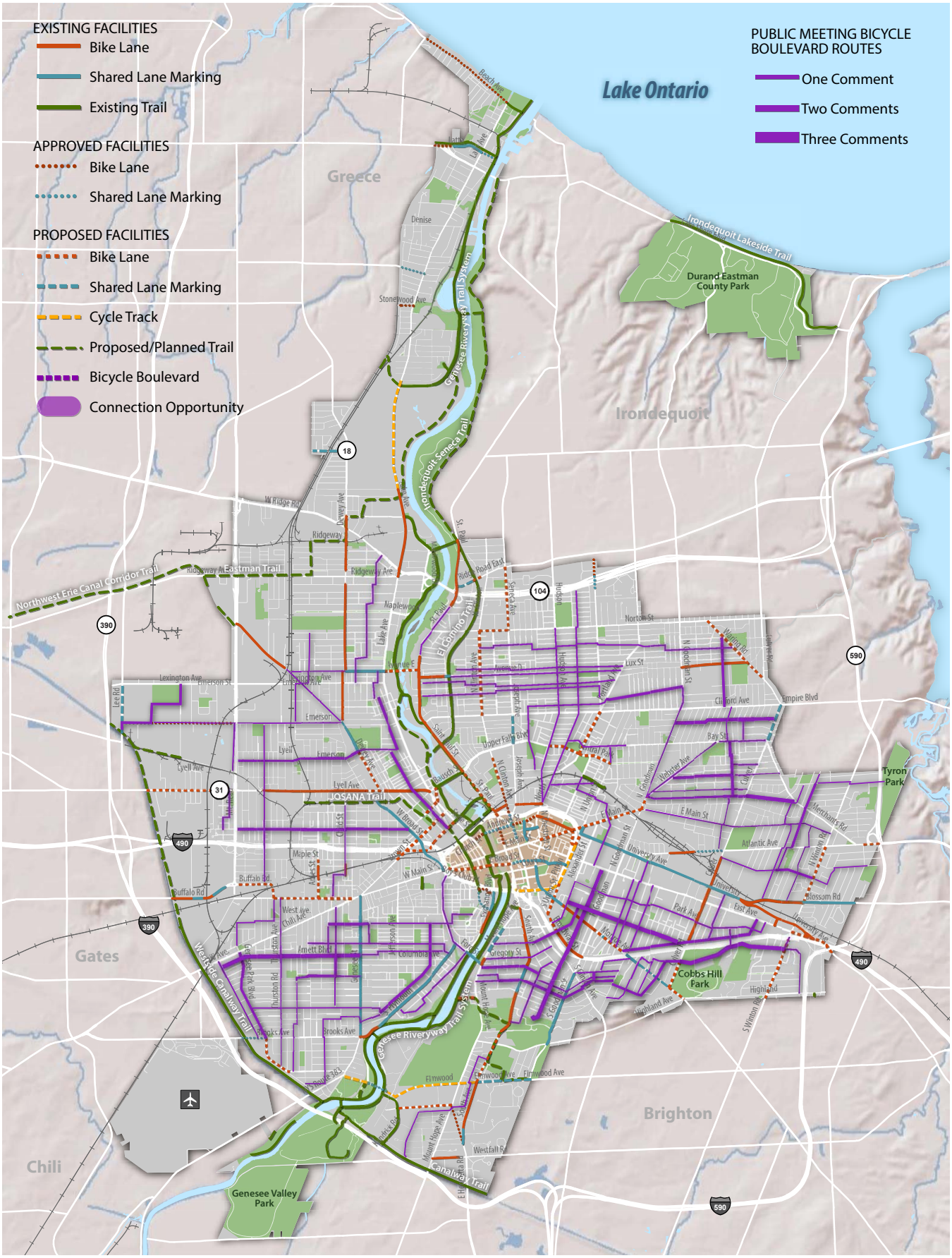
Map 3-1: Existing and Proposed Bicycle Infrastructure



Map 3-2: Annual Average Daily Traffic (AADT)



Map 3-3: Public Comments on Bicycle Boulevards



EQUITY ANALYSIS

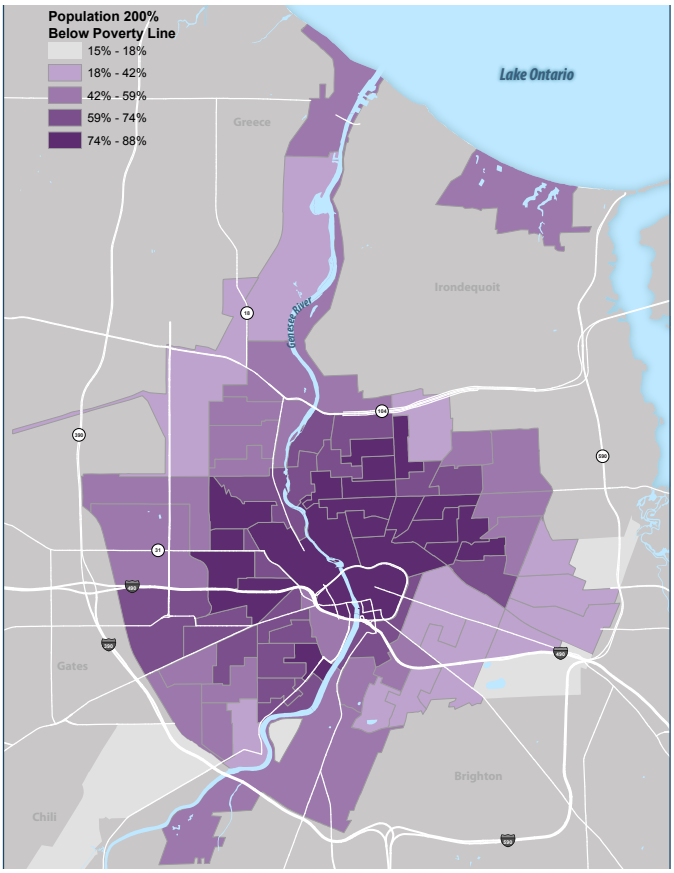
This plan develops a connected bicycle boulevard network that serves all areas of Rochester, including areas that have a high density of historically under served populations. An equity analysis examined the distribution of these populations.

DEMOGRAPHIC EQUITY SCORE

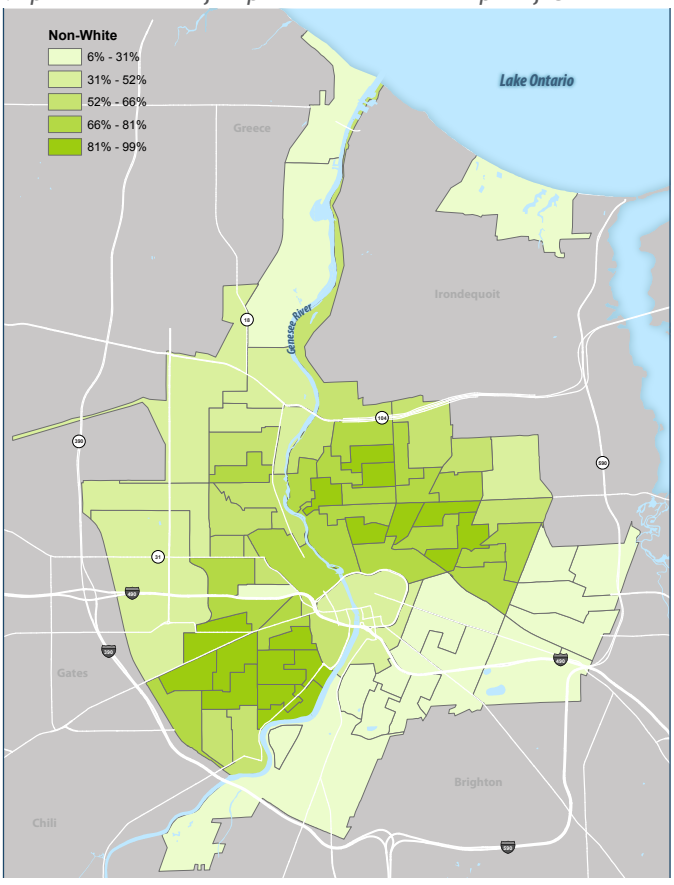
For purposes of analysis, the following socioeconomic indicators define under served populations, as shown on Maps 3-4 to 3-8. The scores of these indicators were summed to create the Demographic Equity Score Map (3-9).

- Percentage of population that are people of color
- Percentage of households below 200% of poverty level (defined by the U.S. Census Bureau)
- Percentage of households within the census tract with no automobile available for daily use
- Population of people under 18 years of age
- Population of people over 64 years of age

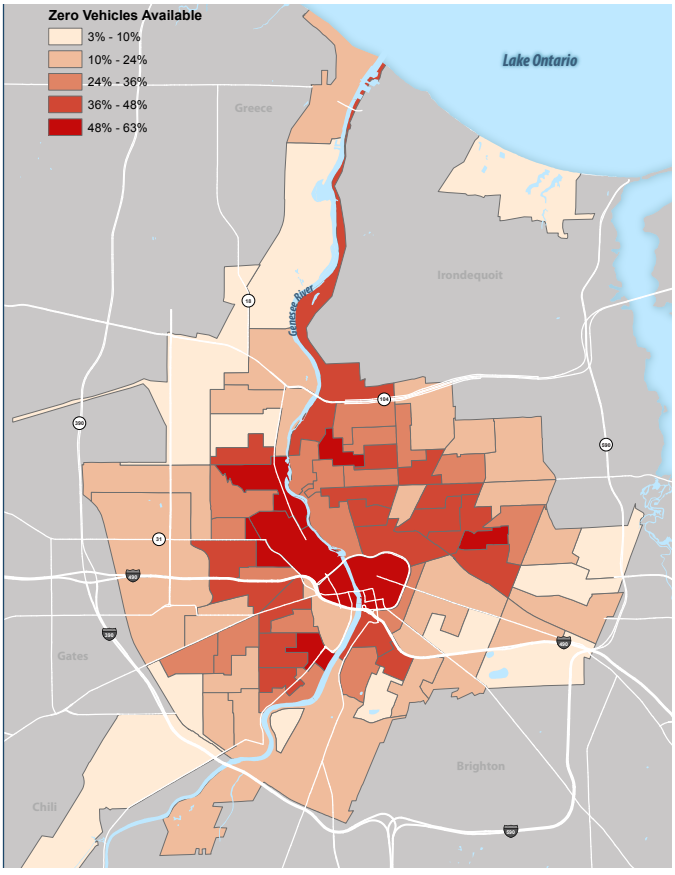
Map 3-4: Percent of Population Under 200% of Poverty Level



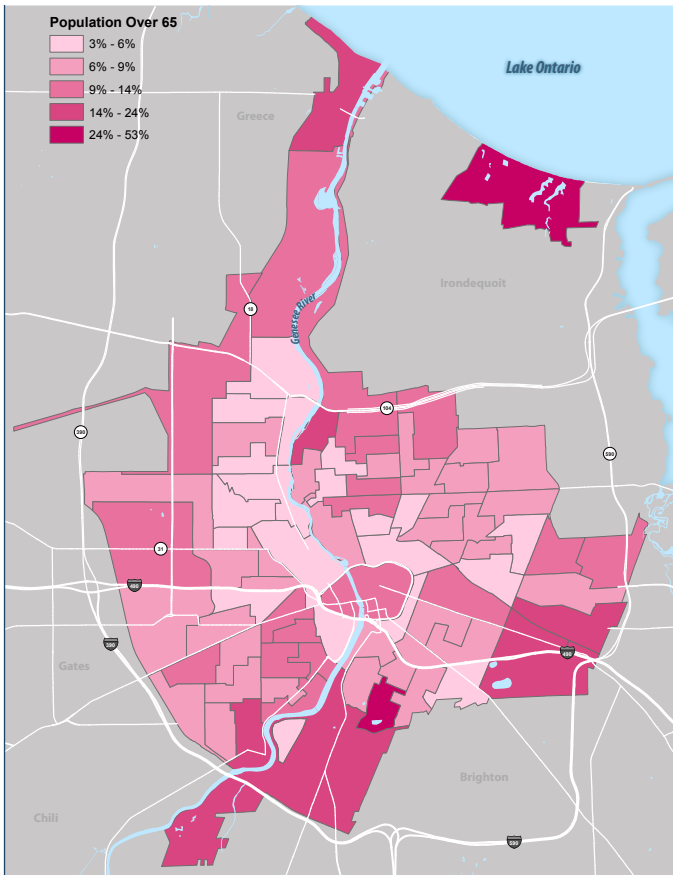
Map 3-5: Percent of Population that are People of Color



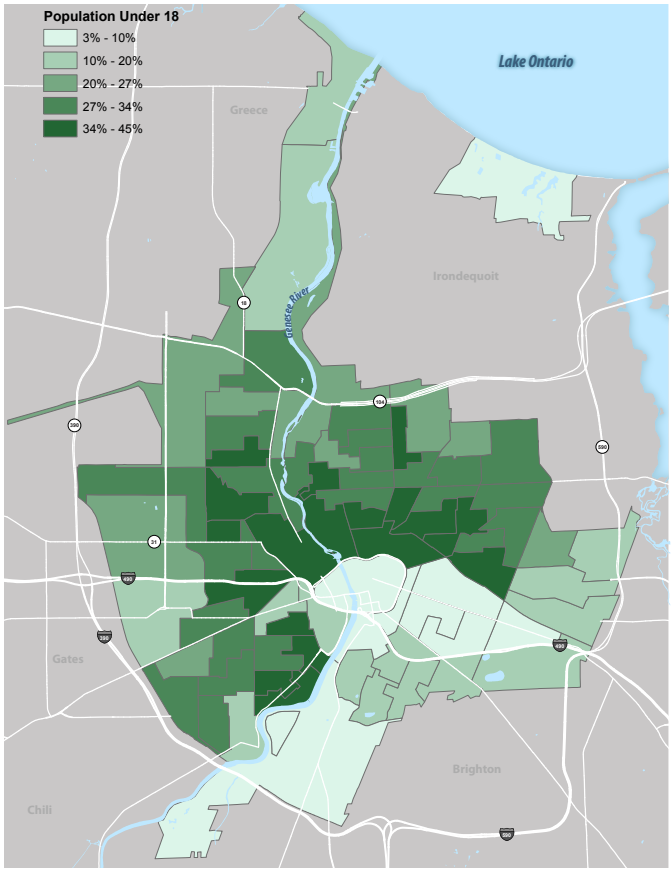
Map 3-6: Percent of Households Without Access to a Car



Map 3-7: Percent of Population that are Over the Age of 65

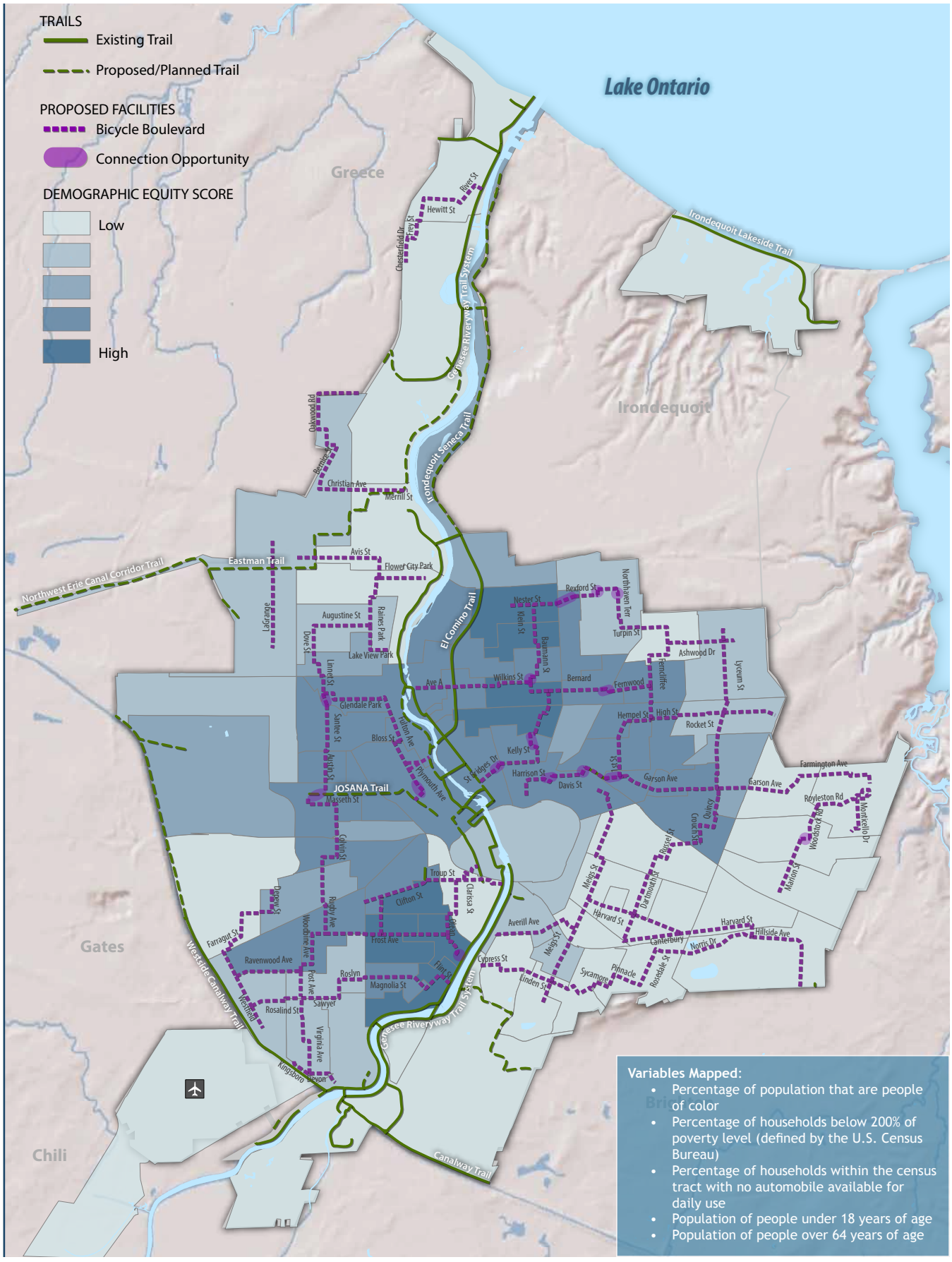


Map 3-8: Percent of Population that are Under the Age of 18



The analysis used a threshold for each of the above indicators, so that those census tracts that had a greater value than the mean value for any given indicator was given a score of one (1). For example, if a census tract had an above average number of people of color *and* an above average number of people 65 years of age or older, the census tract was given a score of two (2). The high equity score has a maximum possible value of five and a low equity score has a minimum possible value of zero.

Map 3-9: Demographic Variables Equity Score



BICYCLE BOULEVARD PRIORITIZATION

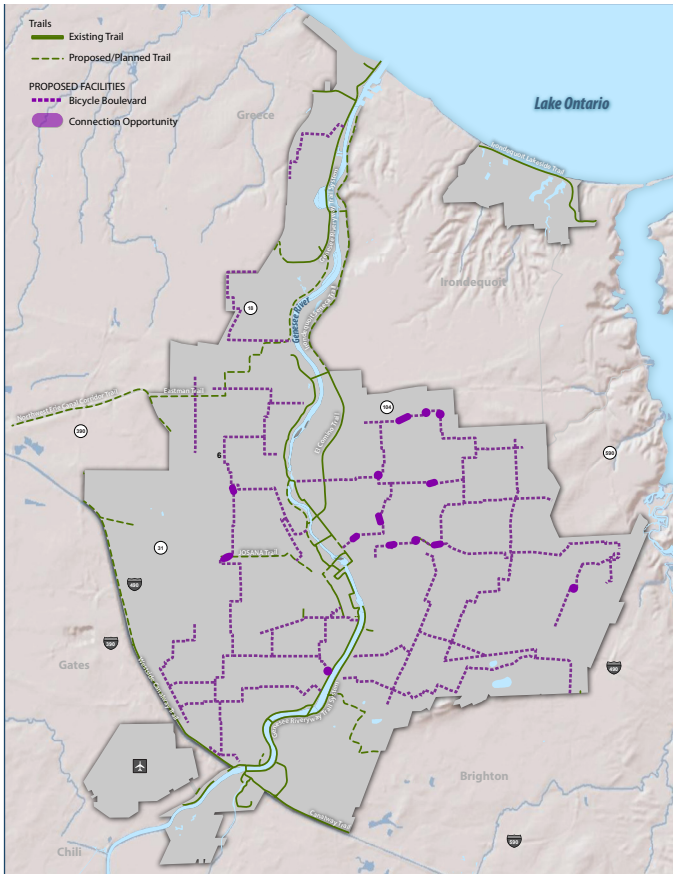
A total of 23 bicycle boulevard routes were proposed with varying lengths. A collection of 9 different factors have been selected to evaluate each route. The different factors have been given a weight corresponding with their importance to the City of Rochester and the proposed bicycle boulevard network. The bicycle boulevards will be ranked based on their score out of a total of 40 points. Each of these factors are described below:

- **Fills Gap:** The proposed bicycle boulevard network fills gaps in this system by providing a low stress bike route alternative to connect destinations within the City. Each bicycle boulevard is scored based on the length and difficulty of the gap that it fills in the network. The existing and proposed bicycle accommodations are shown in Map 3-1.

- **AADT:** Traffic volumes are an important consideration, as described previously. A lower volume roadway provides a higher level of comfort for users, which results in a higher score. Map 3-2 shows the AADT over the propsoed bicycle boulevards.

- **Public Input:** The public priority level is determined through public involvement efforts to date, including the public meeting and website comments. Many streets and routes were identified as opportunities and challenges. Destinations that are visited frequently, such as the Public Market, and destinations that are currently difficult to get to, such as the area's college campuses, were also discussed. The more frequently the bicycle boulevard opportunities were identified, the higher the score is, as shown in Map 3-3.

Map 3-10: Trail Connections

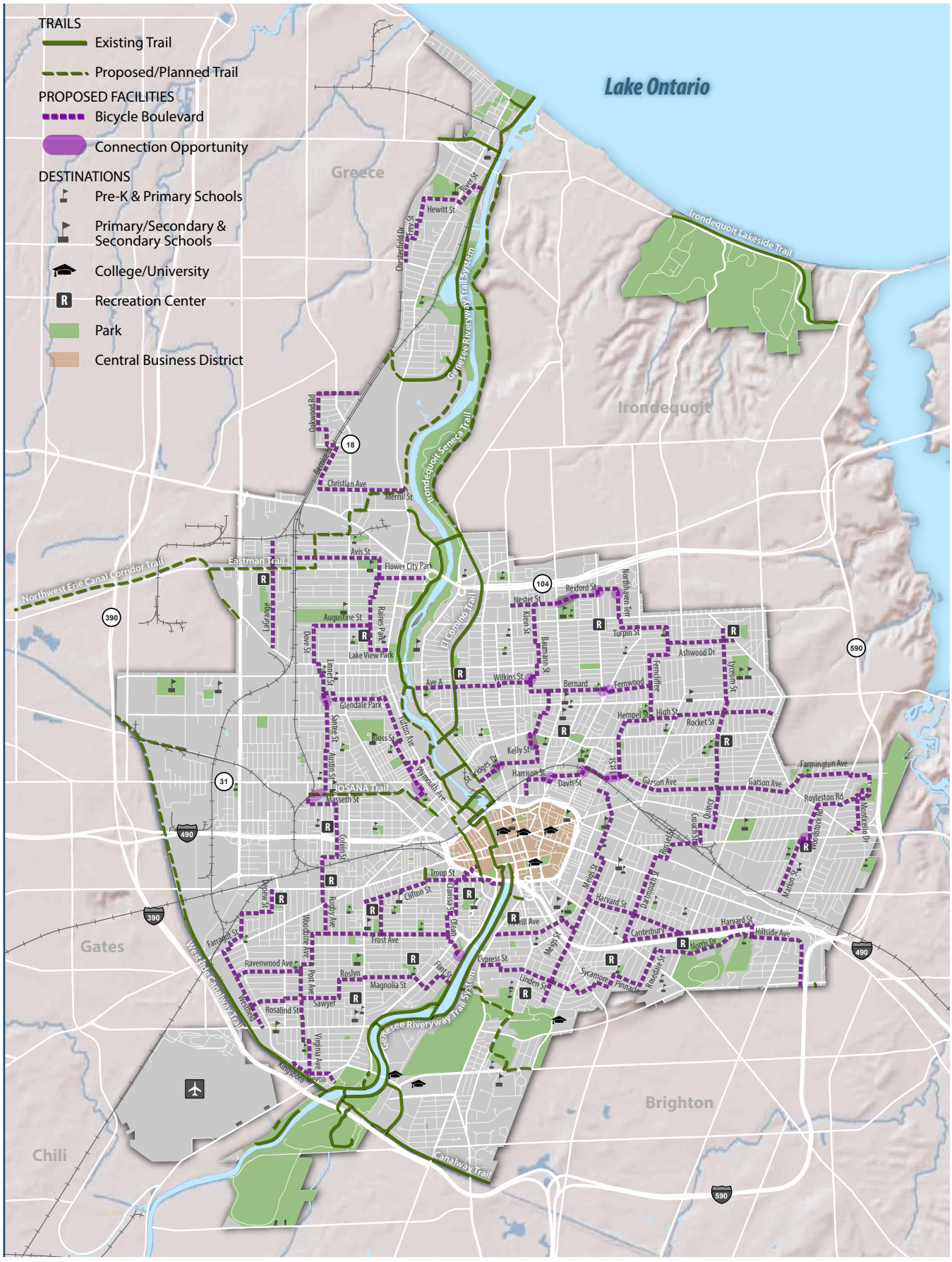


- **Priority Census Tract:** This factor refers back to the equity analysis performed. Under served and priority areas of the city are based on the demographic information described in the previous section, such as poverty levels and household with no vehicles. This score is determined by the equity score in the demographic variables analysis, shown in Map 3-9.

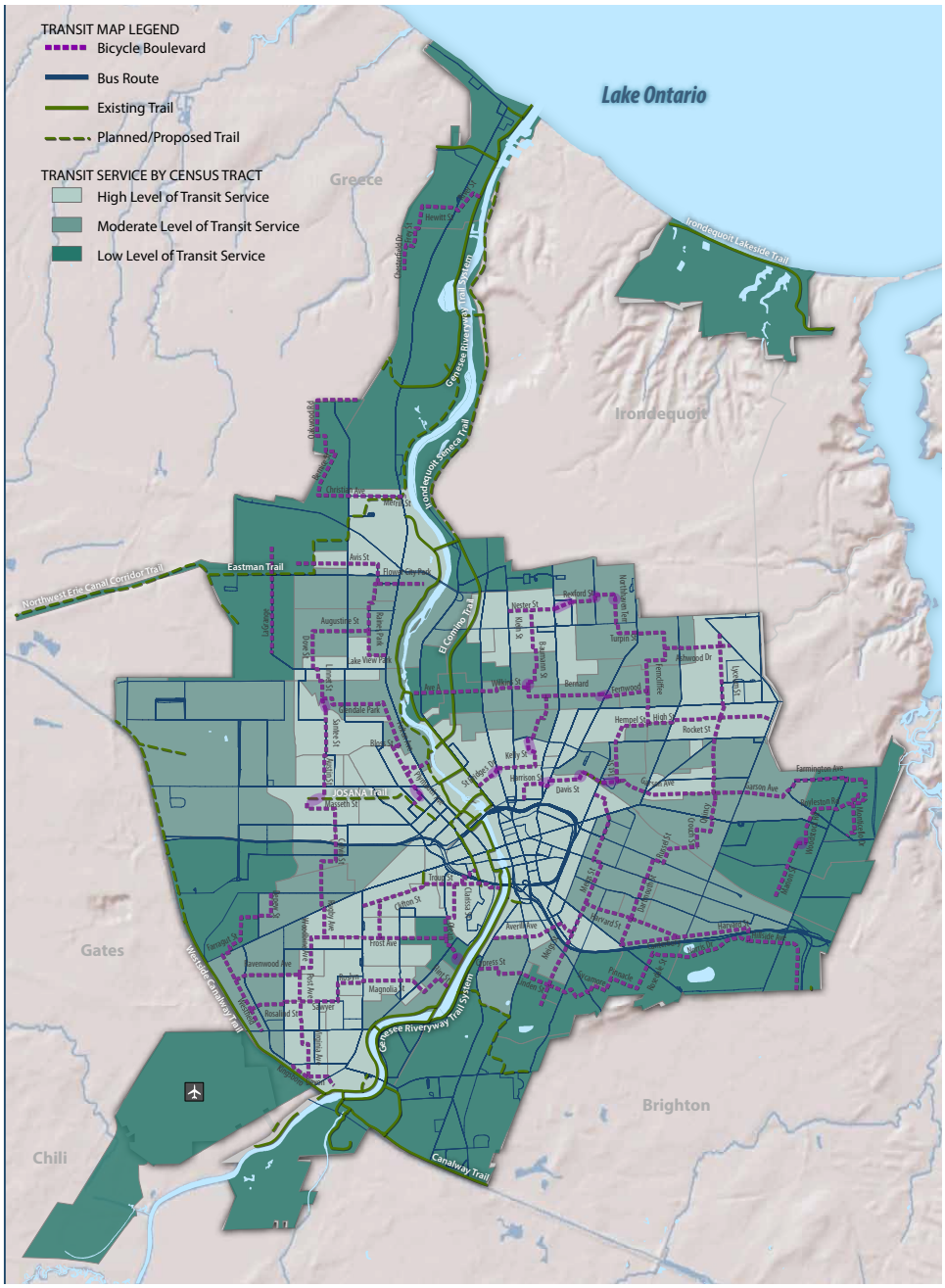
- **Connects Trails:** The City of Rochester has made great strides to build a first-class trail system, which continues to expand. If a bicycle boulevard connects to one of the City's trails, it will be given a score of 3. If the bicycle boulevard connects several trails, it will be given a score of 5. The potential trail connections are shown in Map 3-10.

- **Connects Destinations:** Connecting residential neighborhoods to parks, schools, retail, and employment centers is one of the primary goals of the bicycle boulevard network. How each route connects these destinations and how many destinations it connects determines a score between 0 and 5. These destinations are shown in Map 3-11.

Map 3-11: Destination Connections



Map 3-12: Transit Density Analysis



- **Proximity to Transit:** The City's bicycle network can work hand in hand with the City's transit system. Bicycle accommodations expand the reach of each transit stop and route. While it has been shown that bus stops typically have a half mile catchment area, with bicycle accommodations, this area is increased to between 1 and 2 miles. The score for proximity to transit will be determined by the influence of a bicycle boulevard route to extend the existing transit service area. Bus routes and the transit analysis are shown in Map 3-12.

- **Prior Traffic Calming Request:** The City's traffic calming program allows residents and neighborhoods to request traffic calming features, which is a primary component of bicycle boulevards. Local streets that already have traffic calming devices installed will be given the highest score, while streets where traffic calming has been requested, but narrowly missed qualifying, will be given the next highest score. A score of 1 or 2 will be given to streets that did not qualify for several reasons and 0 to streets that have not applied for traffic calming.

- **Route Quality:** The route quality will depend on several elements, such as the ability to implement traffic calming, roadway width, roadway grade, the number of major roadway crossings, and the clarity and directness of the route.

Map 3-13: Recommended Bicycle Boulevard Routes

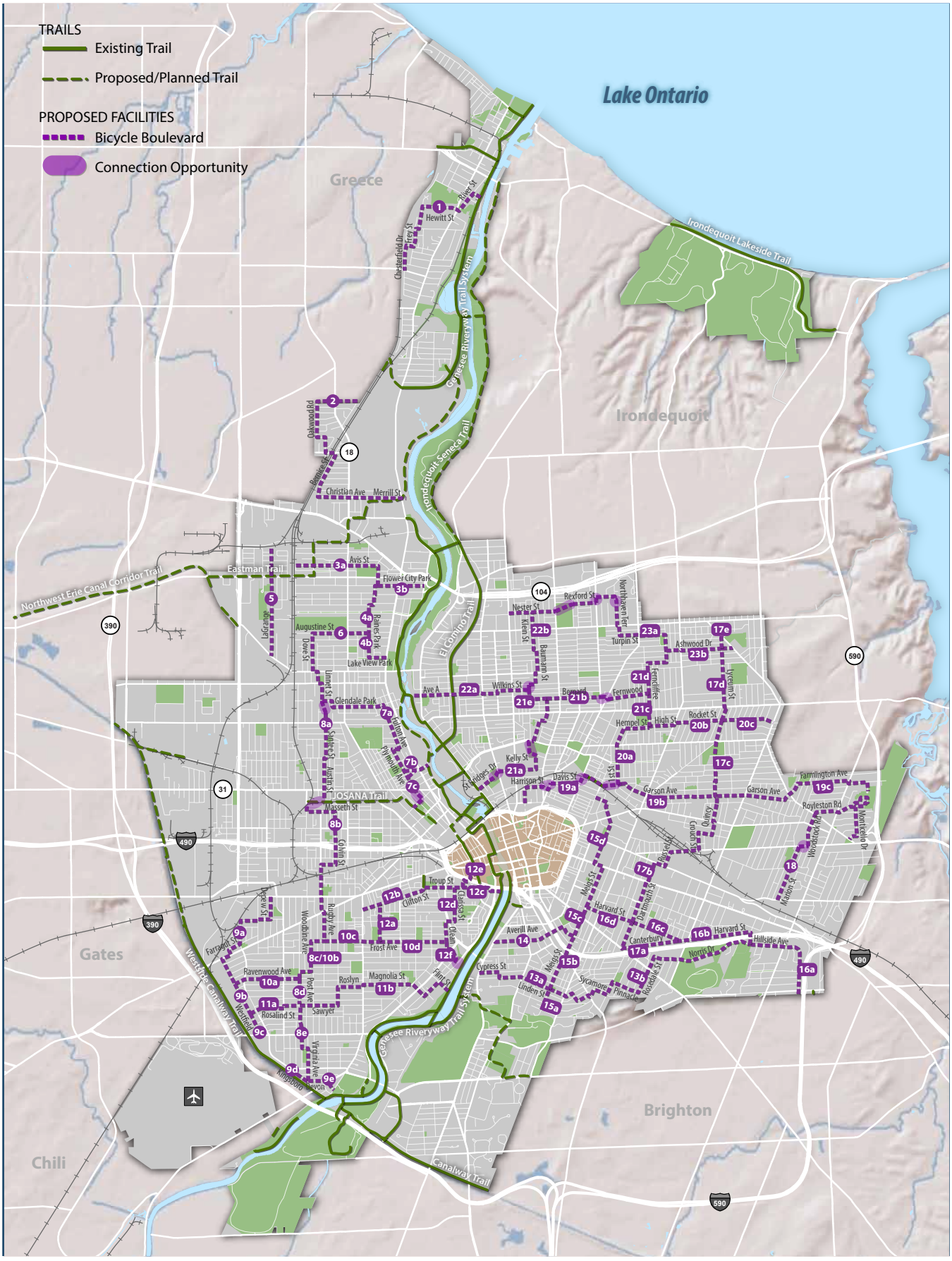


Table 3-1: Prioritization Matrix

Table 1: Bicycle Boulevard Prioritization Matrix												
			Fills Gap	AADT	Public Input	Priority Census Block	Connects Trails	Connects Destinations	Proximity to Transit	Traffic Calming Requests	Route Quality	Total
Route No.	Route Name	Length (miles)	5	3	3	8	5	5	3	3	5	40
1	River-Frey-Chesterfield	1.37	4	3	0	0	3	2	0	2	2	16
2	Merrill - Bernice - Oakwood	2.34	3	2	0	1	2	2	1	3	4	18
3a	Avis St	0.97	3	2	0	0	3	3	2	2	4	19
3b	Flower City Park	0.44	3	2	0	0	3	3	2	3	4	20
4a	Raines Park	0.53	2	2	1	2	3	3	2	0	4	19
4b	Raines Park - Lakeview Park	0.40	2	2	1	2	3	3	2	0	4	19
5	LaGrange	1.02	2	2	0	2	1	2	0	2	5	16
6	Augustine-Dove-Linnet	1.26	3	1	0	5	2	2	3	3	2	21
7a	Glendale - Fulton	1.09	2	2	3	6	2	3	3	2	3	26
7b	Fulton - Jones - Ambrose	0.60	2	2	3	6	3	3	3	2	2	26
7c	Bloss - N Plymouth	0.75	2	1	3	6	4	3	3	2	2	26
8a	Santee - Austin	0.83	3	2	0	6	2	2	3	2	2	22
8b	Masseth - Colvin - Ames - Rugby	1.71	3	2	0	5	2	2	3	2	2	21
8c / 11b	Frost - Woodbine - Aberdeen	0.59	5	2	0	4	3	3	1	2	3	23
8d	Post	0.26	5	3	0	5	3	3	1	2	4	26
8e	Post - Congress- Virginia	0.78	5	2	0	4	3	3	1	2	4	24
9a	Depew - Copley - Stanton - Farragut - Westfield	1.27	3	3	1	3	3	4	1	3	1	22
9b	Westfield (Ravenwood to Hillendale)	0.32	3	3	1	4	3	4	1	3	2	24
9c	Westfield (Hillendale to Brooks)	0.23	3	1	1	3	3	4	1	3	1	20
9d	Kingsboro - Devon - Mineola	0.20	3	2	1	2	3	4	1	3	1	20
10a	Ravenwood	0.63	4	2	1	5	2	3	3	2	2	24
10c	Frost	0.53	4	3	1	6	3	3	3	2	2	27
10d	Frost	0.64	4	3	1	8	4	3	3	2	2	30
11a	Rosalind - Seward	0.51	3	2	1	3	3	3	1	2	3	21
11b	Seward - Roslyn - Magnolia - Exchange - Flint	1.75	3	2	1	5	4	3	1	3	3	25
12a	Epworth	0.36	4	3	0	8	2	3	2	2	3	27
12b	Clifton - Troup	0.92	4	1	0	6	3	3	2	3	4	26
12d	Clarissa - Olean	0.60	4	2	0	3	3	3	2	2	4	23
12c	Troup	0.46	4	2	0	2	3	3	2	3	4	23
12e	Livinston Park - Ped Bridge - Spring	0.24	4	2	0	3	4	3	2	2	4	24
12f	Olean - Bartlett - Edith - Doran	0.27	4	2	0	6	4	3	2	2	4	27
13a	Cypress - Linden	0.75	4	2	3	1	1	4	0	2	3	20
13b	Linden - Howard - Raymond - Fountain - Sycamore - Field - Pinnacle - Rosedale - Hinsdale - Norris	2.43	4	2	3	1	1	4	0	3	3	21
14	Averill - Pearl	0.83	3	2	2	1	3	4	3	1	5	24
15a	Meigs	0.21	2	1	3	2	0	5	2	2	4	21
15b	Meigs - Pearl	0.55	2	1	3	1	0	5	2	2	4	20
15c	Meigs - Harvard	0.30	2	0	3	1	0	5	2	2	4	19
15d	Arnold Park - Prince - Champeney	1.25	2	2	3	2	0	5	2	2	3	21
16a	Hillside	0.90	5	2	3	0	1	2	1	3	5	22
16b	Harvard	0.81	5	2	3	0	1	2	1	2	5	21
16c	Harvard	0.48	5	1	3	0	1	2	1	2	5	20
16d	Harvard	0.39	5	1	3	0	1	2	1	2	5	20
17a	Cantebury - Dartmouth	0.81	4	2	2	0	0	4	2	3	2	19
17b	Dartmouth - Vick Park B - Portsmouth Terrace - Russell - Crouch - Leighton - Herkimer - Quincy	1.76	4	2	2	2	0	4	2	2	2	20
17c	Quincy - Denver - Pershing - Lyceum	0.82	4	2	2	5	0	4	2	1	2	22
18	Marion - Woodstock - Marsden - Edmonton -	2.01	2	3	1	0	0	3	0	2	2	13
19a	Ormond - Harrison - Davis	1.11	5	2	1	6	2	5	2	1	1	25
19b	Peck - Garson	1.01	5	2	1	6	2	5	2	1	3	27
19c	Garson - Wyand Cres - Farmington - Tryon	1.64	5	3	1	2	2	5	2	1	2	23
20a	1st - High - Hempel	0.79	4	2	2	6	0	2	2	2	3	23
20b	Hempel - Rocket	0.73	4	2	2	4	0	2	2	2	3	21
20c	Rocket	0.50	4	2	2	2	0	2	2	3	3	20
21a	St Bridgets - Kelly - Holland - Henry - Barons	1.10	4	2	1	7	2	3	2	2	1	24
21b	Bernard - Fernwood	0.90	4	2	1	5	2	3	2	2	1	22
21c	Ferncliffe - 6th	0.32	4	2	1	6	2	3	2	2	1	23
21d	Ferncliffe - Randolph - Midland	0.58	4	2	1	5	2	3	2	2	1	22
21e	Bernard - Thomas	0.26	4	2	1	8	2	3	2	2	1	25
22a	Ave A - Wilkins - Thomas	1.12	4	2	1	6	3	2	2	3	1	24
22b	Berlin - Bradford - Baumann - Klein	0.80	4	2	1	7	3	2	2	2	1	24
23a	Nester - Rexford - Northaven - Turpin - Pomeroy - Midland	1.85	4	2	0	5	3	4	1	3	2	24
23b	Perkins - Ashwood	0.64	4	3	0	3	3	4	1	2	2	22
		51.52										