Developing the Minimum Bikeway Grid

5th Urban Streets Symposium Raleigh, NC May 21-24, 2017

Alta Planning + Design

*Creating active communities where bicycling and walking are **safe**, **healthy, fun** and **normal** daily activities*

www.altaplanning.com

Outline

- What is a minimum grid?
- Principles of minimum grid
- What are low-stress bikeways?
- Case study lessons learned: Examples of minimum grid planning & implementation

"The next step in the evolution of urban bikeway planning implementation **is moving beyond isolated projects to** improve cycling for a singular corridor or intersection **to complete, comprehensive networks of low-stress bike facilities** of separated bikeways, greenways, and bike boulevards that serve destinations and cyclist-types across the urban landscape."

GIL PENALOSA, Executive Director, 8-80 Cities

"**One bikeway is nothing.** A city needs a #MinimumGrid of protected bikeways and bike boulevards interconnecting origins and destinations . . . **The 'last kilometre' connecting the grid to final destinations must be 30km/h [20mph] max streets.** If riding a bicycle is not safe for an 8 year old or an 80 year old, then it's not safe enough; we must **make cycling safe for ALL**."

http://minimumgrid.ca/

Minimum Grid =

A grid of protected bike lanes supported by a network of bicycle boulevards . . . Ridership rises when biking is easy, safe and comfortable.

http://greenideafactory.blogspot.com/2011/03/seville-great-is-enemy-of-good.html

Seville/Sevilla

Successful Bikeway Network Principles

- Cohesion (connectivity and grid density)
- Directness (access to destinations, detour from shortest path)
- Safety (generally, this is facility design, but **avoiding major conflicts and complex intersections** can help)
- Consistency (legibility of design)
- Comfort (facility design attribute)
- Attractiveness (greenery, noise, scenery, etc.)
- Accessibility (FHWA)
- Alternatives (FHWA)

Based on Dutch & FHWA network and facility design principles

#COMFORTABLE

All Ages and Abilities

#COMPLETE

Connected Minimum Grid

#CONVENIENT

All Destinations

#DEMAND

#DOABLE

#BIKETORIA
a network that moves you

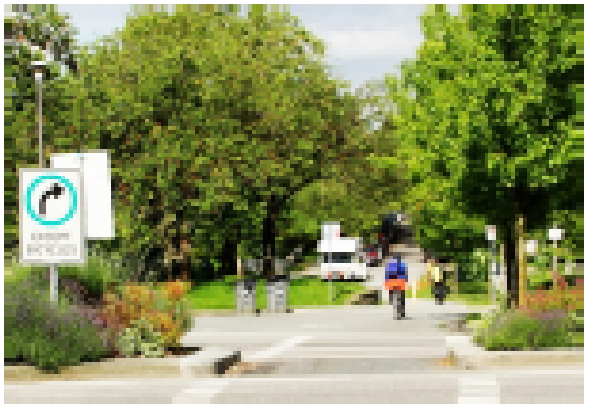
What Is All Ages and Abilities?

Protected Bicycle Lanes

on busy streets

Neighbourhood Bikeways

on quiet streets



Off-street Pathways

off-street

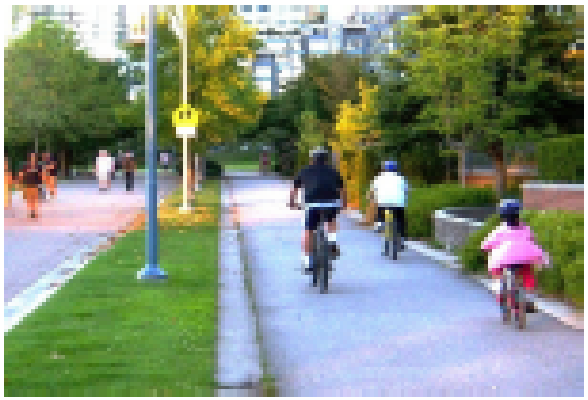
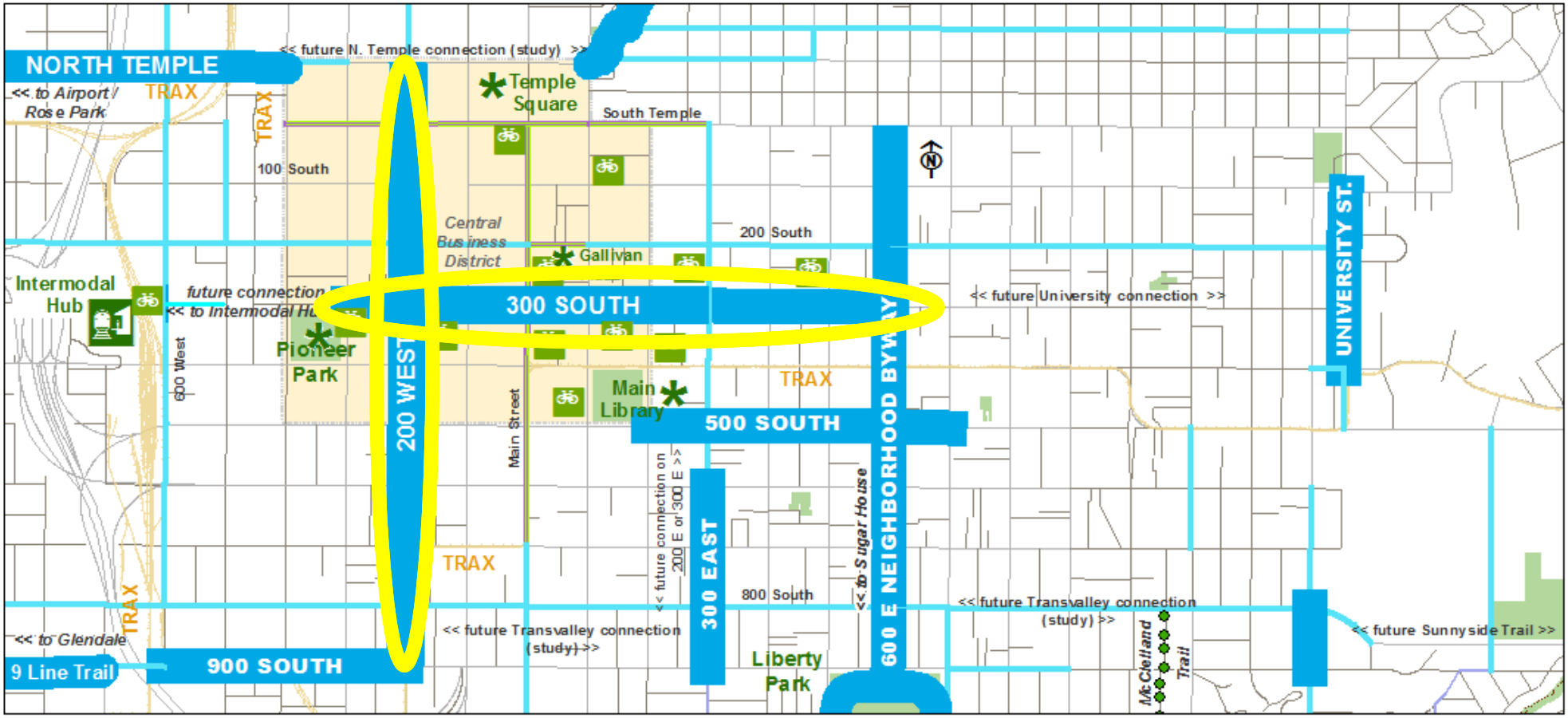


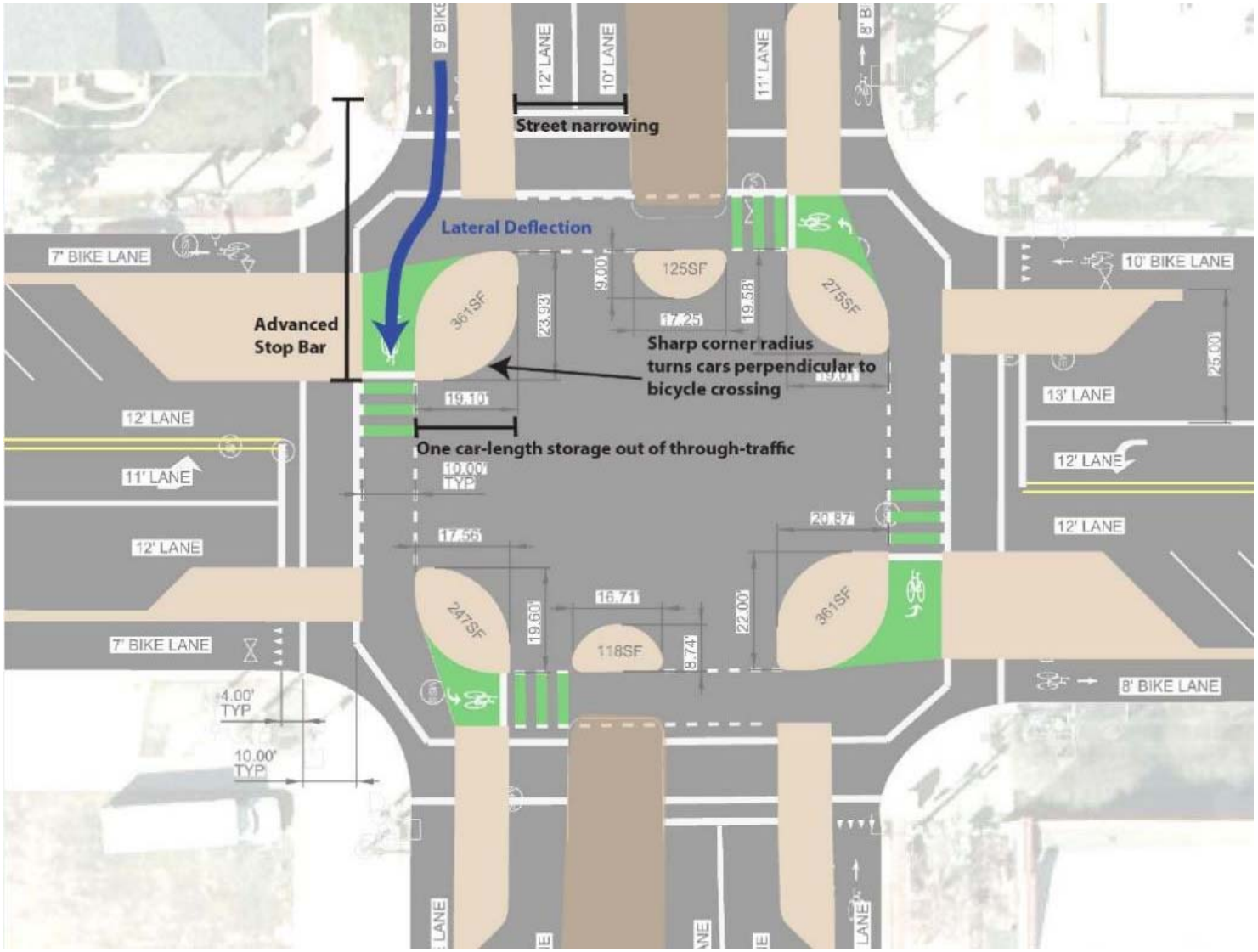
Photo Flickr Paul Krueger

#BIKETORIA
a network that moves you

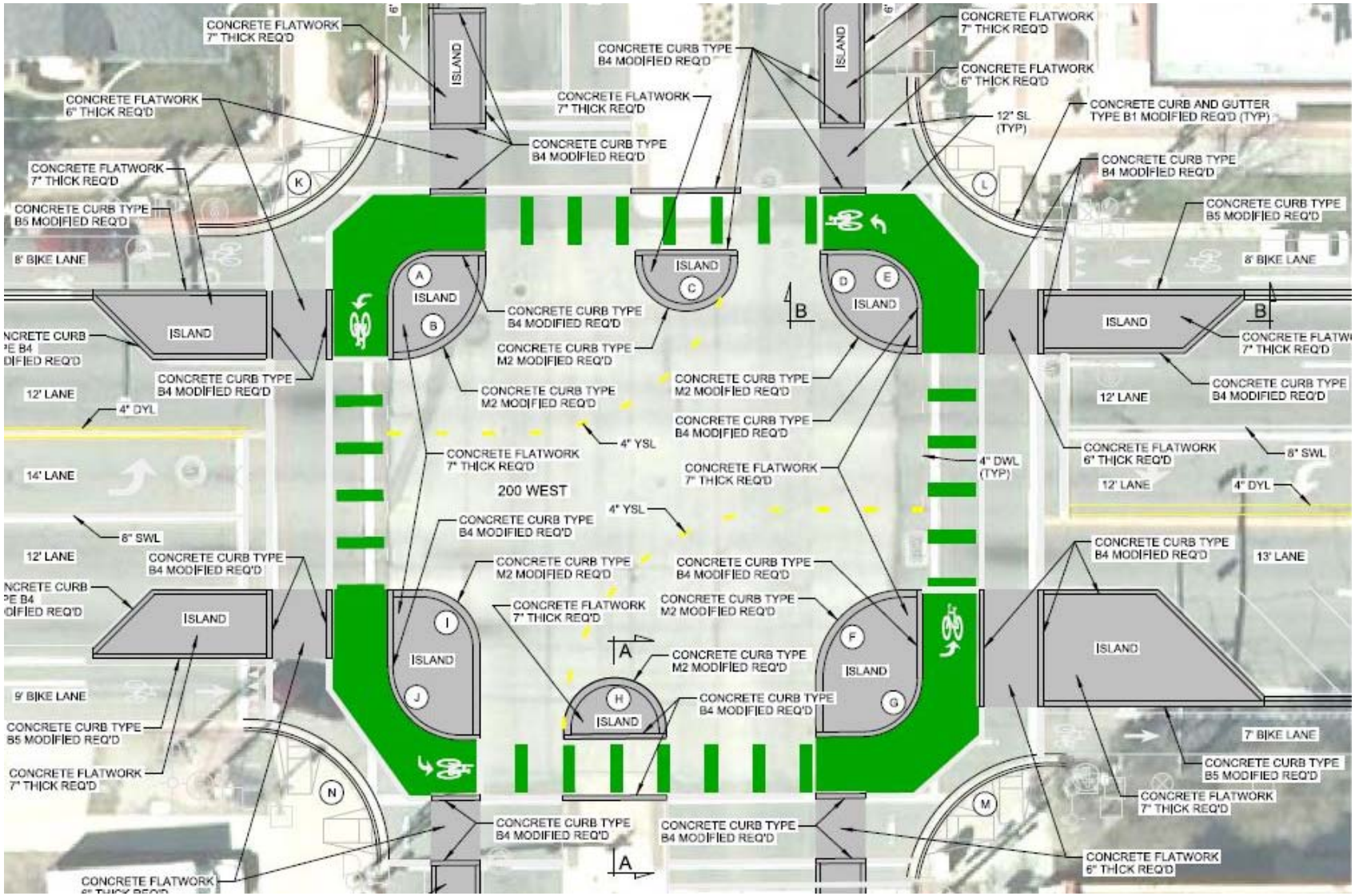
Comfort & Safety



Intersection Concept

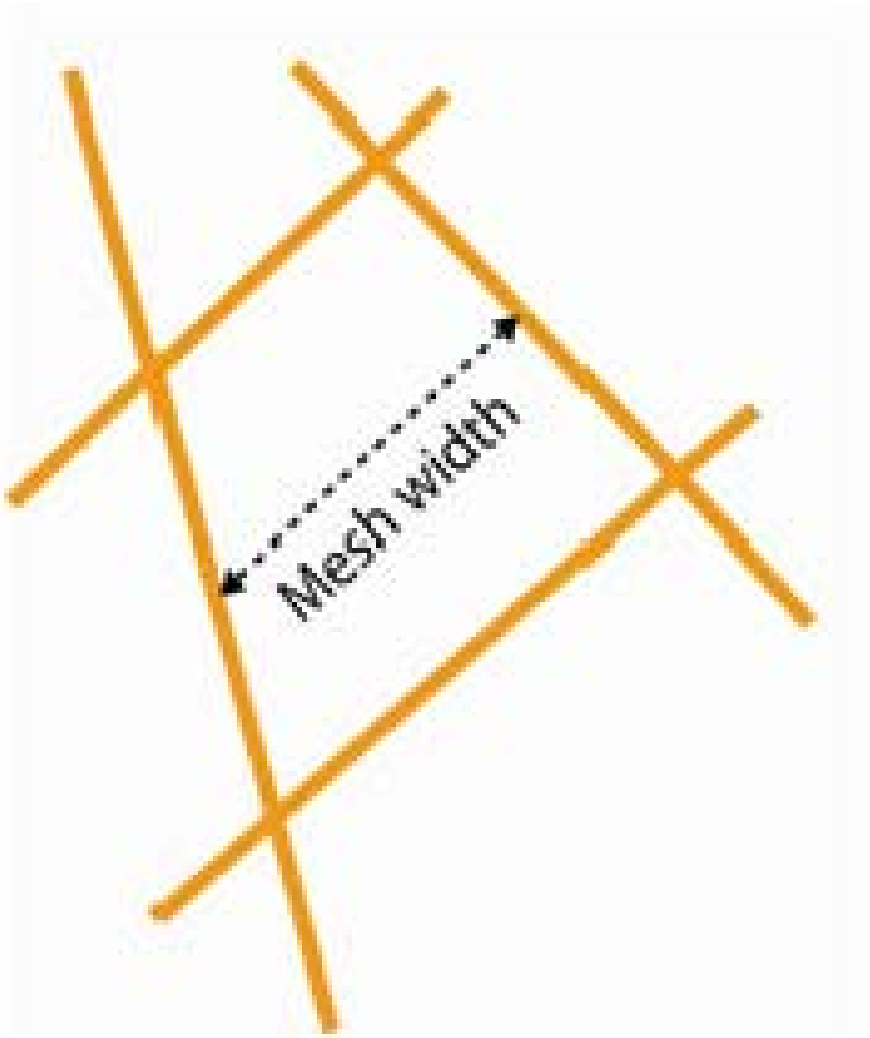


Final Concept Development



Protected Intersection

Bikeway Network Density Matters

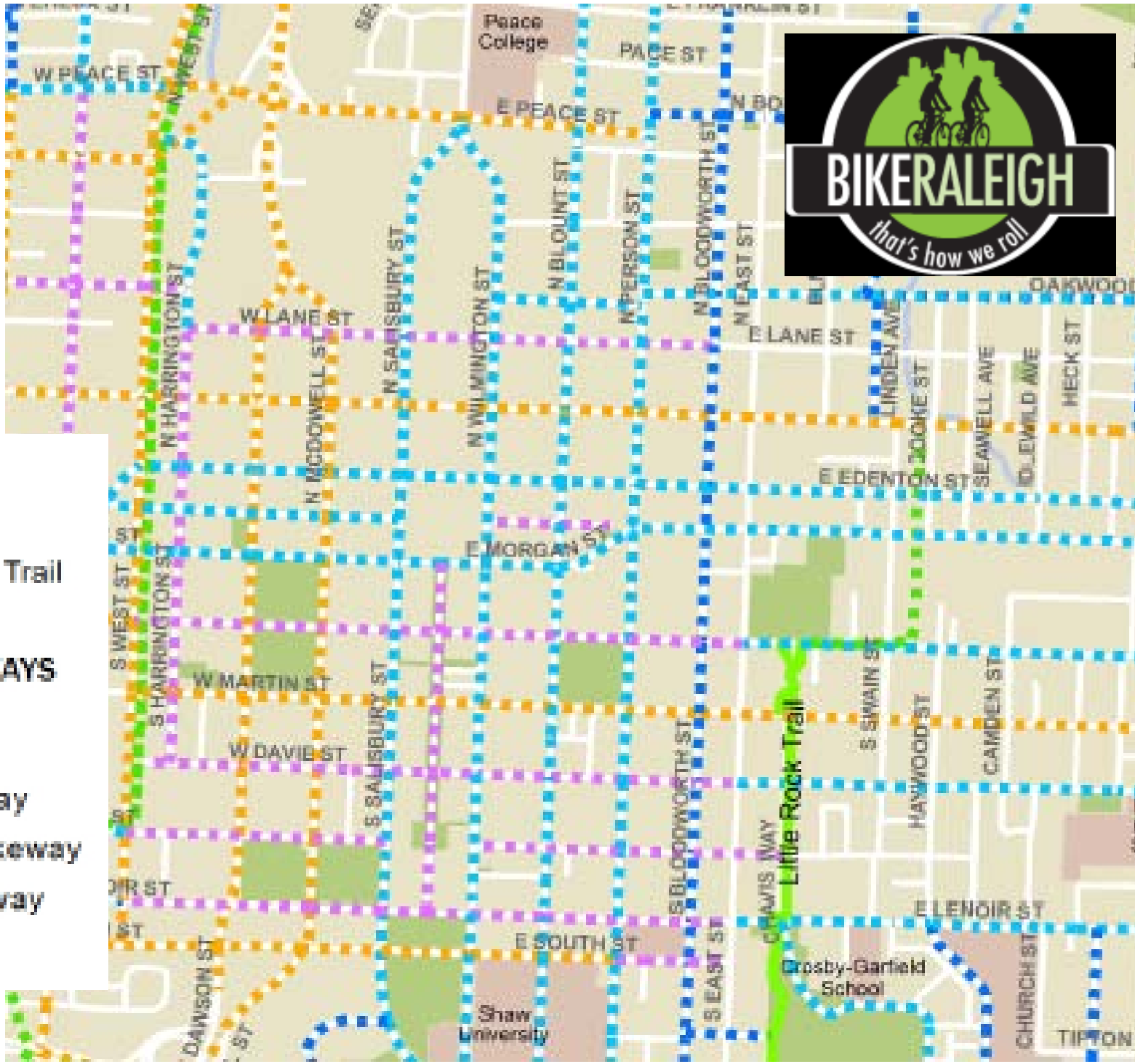


"In a built up area, a maximum mesh width of 250 meters (820 ft) is recommended."

¼ bikeway spacing is ideal in urban areas.

Sources: IEE. Presto Cycling Policy Guide. 2010.

Raleigh



BIKERALEIGH
that's how we roll

EXISTING BIKEWAYS

Paved Greenway Trail

RECOMMENDED BIKEWAYS

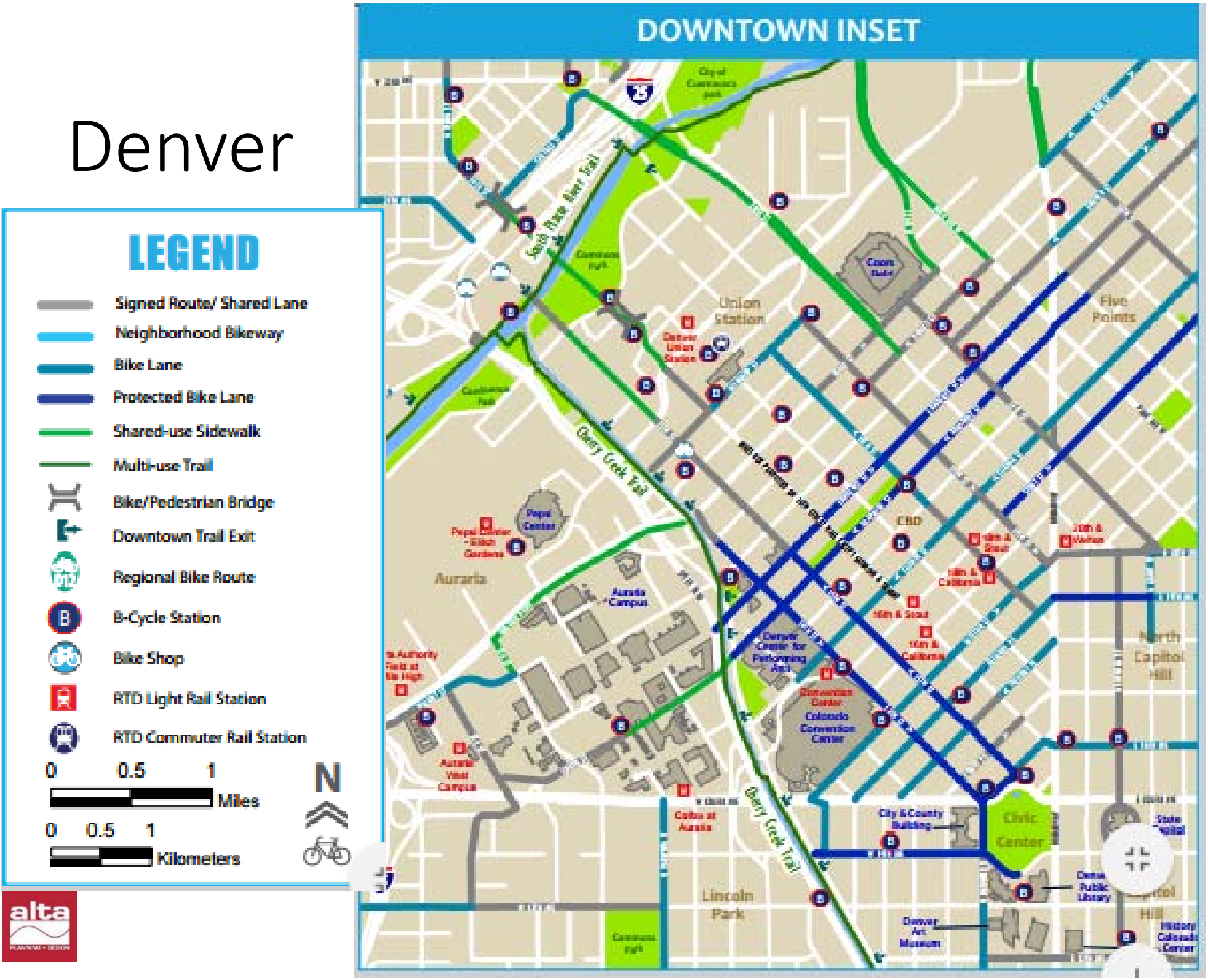
- Greenway Trail
- Separated Bikeway
- Neighborhood Bikeway
- Main Street Bikeway
- Bicycle Lane

alta PLANNING + DESIGN


POLICY 9.20 BICYCLE TRANSPORTATION
CREATE CONDITIONS THAT MAKE BICYCLING MORE ATTRACTIVE THAN DRIVING FOR MOST TRIPS OF APPROXIMATELY THREE MILES OR LESS.
PORTLAND 2035 COMPREHENSIVE PLAN

Minimum Grid Case Studies

Denver



alta PLANNING + DESIGN

d

Downtown Detroit Bike Network

Griswold at Capitol Park

#BIKETORIA

a network that moves you

City of Victoria

Committee of the Whole

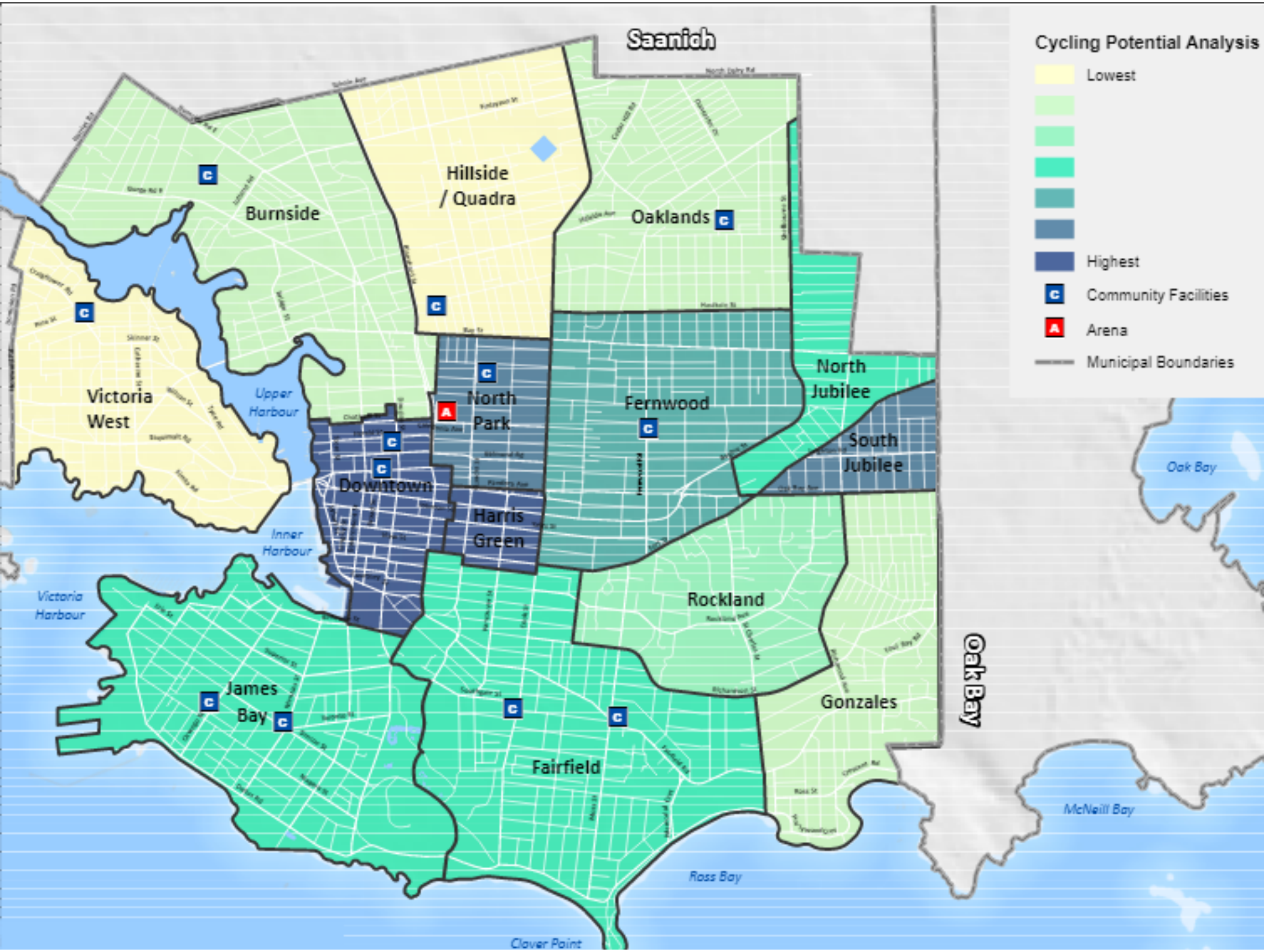
April 28, 2016

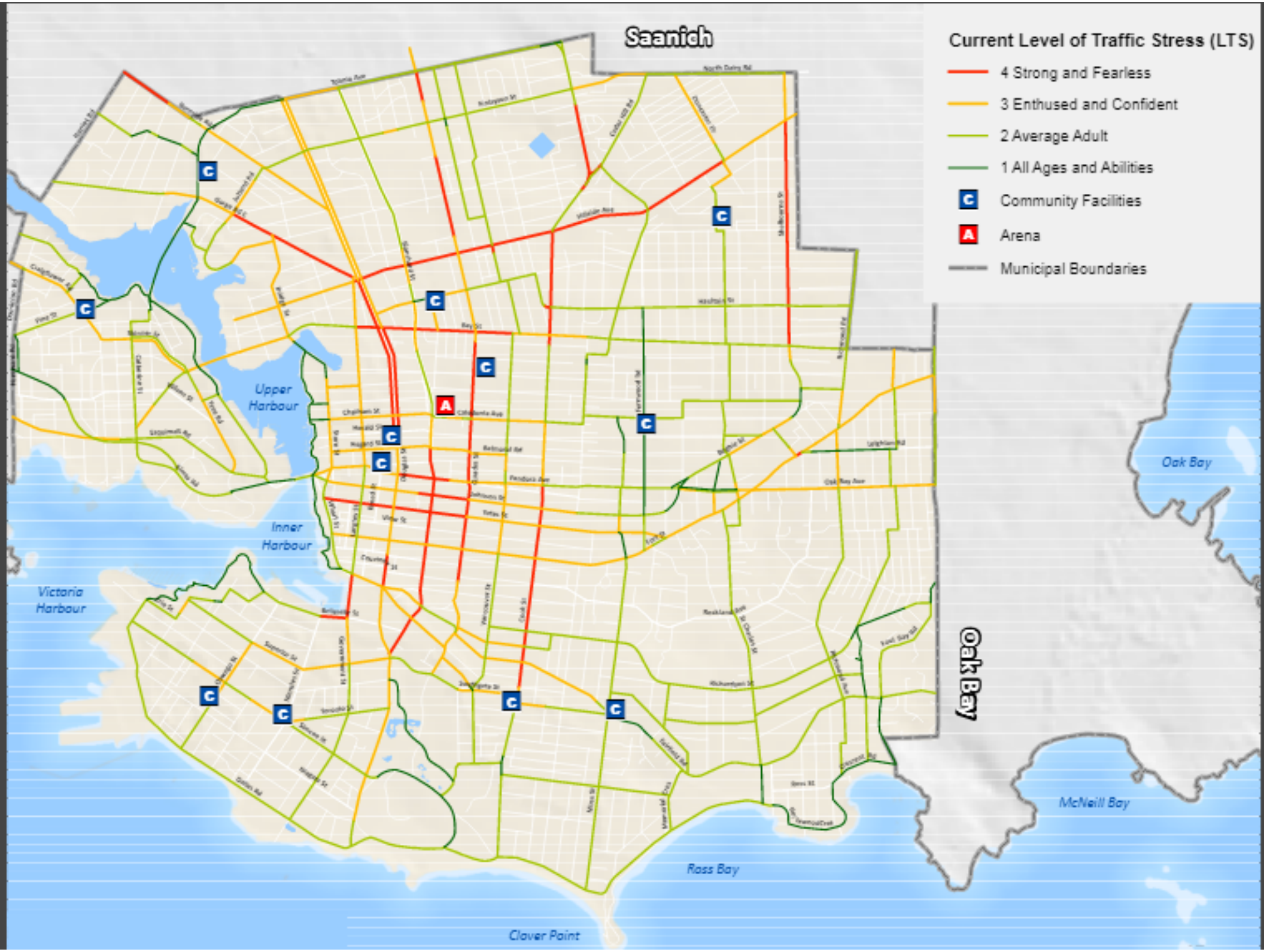
URBAN systems

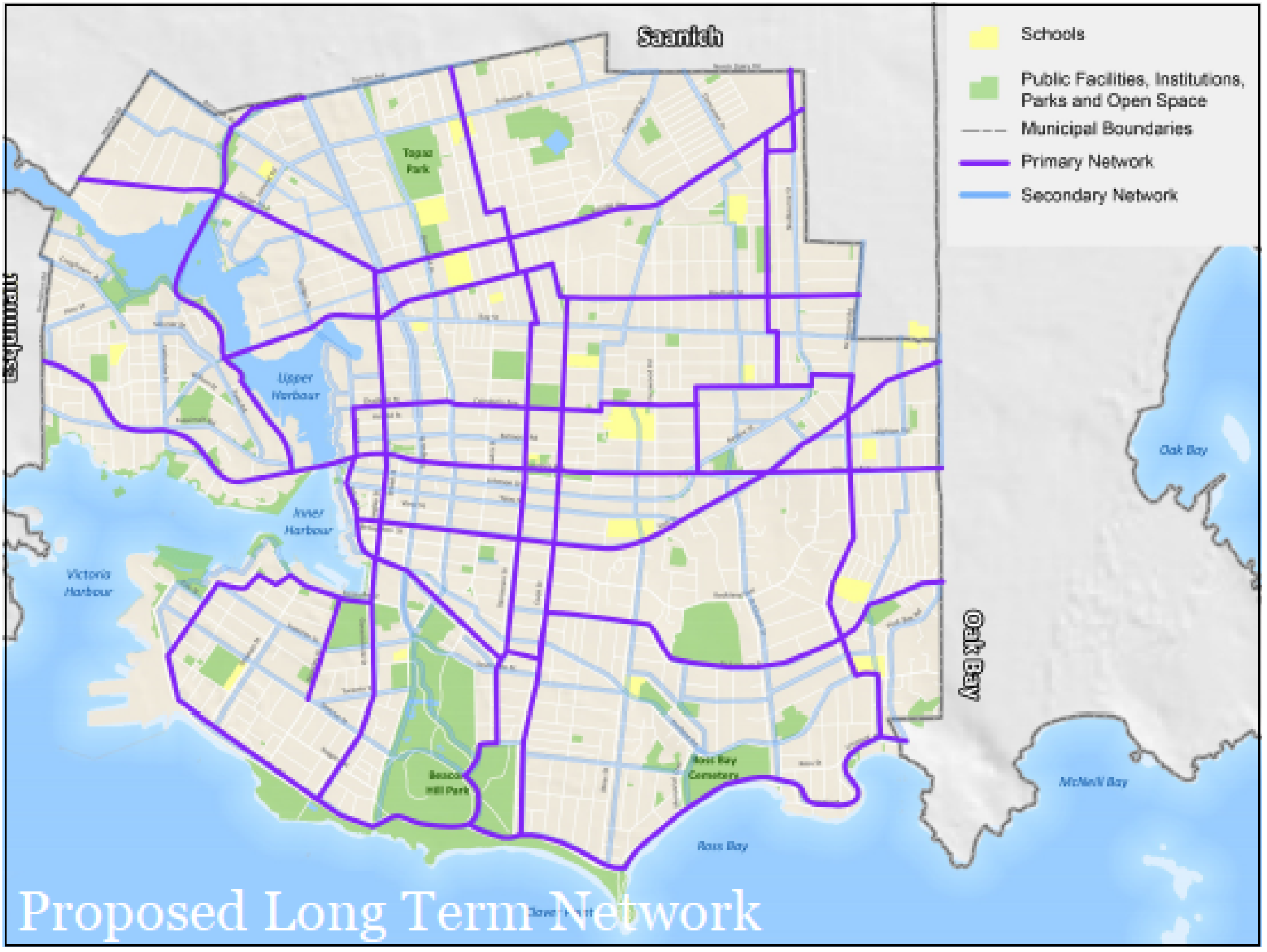
alta

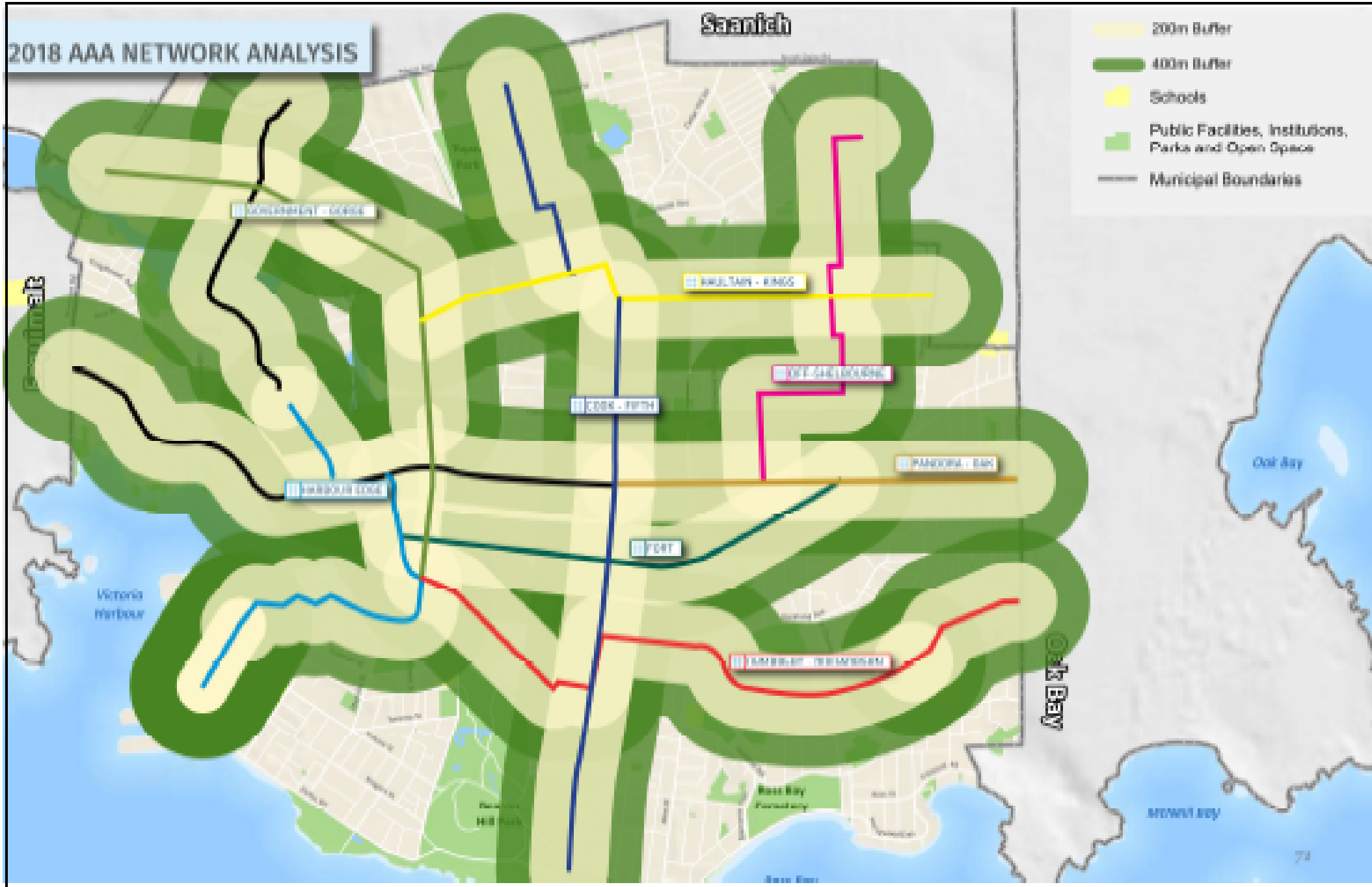
Gehl

880 cities


Saanich
Hillside / Quadra
Burnside
Oaklands
Victoria West
Upper Harbour
North Park
Fernwood
North Jubilee
South Jubilee
Downtown
Harris Green
Inner Harbour
Victoria Harbour
Rockland
James Bay
Fairfield
Gonzales
Oak Bay
Oak Bay
McNeill Bay
Ross Bay
Clover Point
Cycling Potential Analysis
Lowest
Highest
Community Facilities
Arena
Municipal Boundaries


Saanich
Current Level of Traffic Stress (LTS)
4 Strong and Fearless
3 Enthused and Confident
2 Average Adult
1 All Ages and Abilities
Community Facilities
Arena
Municipal Boundaries
Upper Harbour
Inner Harbour
Victoria Harbour
Oak Bay
Oak Bay
McNeill Bay
Ross Bay
Clover Point


Saanich
Saanich
Oak Bay
Tapas Park
Upper Harbour
Inner Harbour
Victoria Harbour
Beacon Hill Park
Ross Bay
Oak Bay
McNeil Bay
Schools
Public Facilities, Institutions, Parks and Open Space
Municipal Boundaries
Primary Network
Secondary Network
Proposed Long Term Network



URBAN systems

alta

Gehl

880 cities

Victoria, BC

5.4 km of protected bike lanes by 2018

24 Miles of “enhanced bicycle infrastructure”

http://www.victoria.ca/EN/main/residents/transportation/cycling/phase-1.html

Bertran Kuyrkendall, PE, CNU-A
City Transportation Engineer
Chattanooga Department of Transportation

CDOT

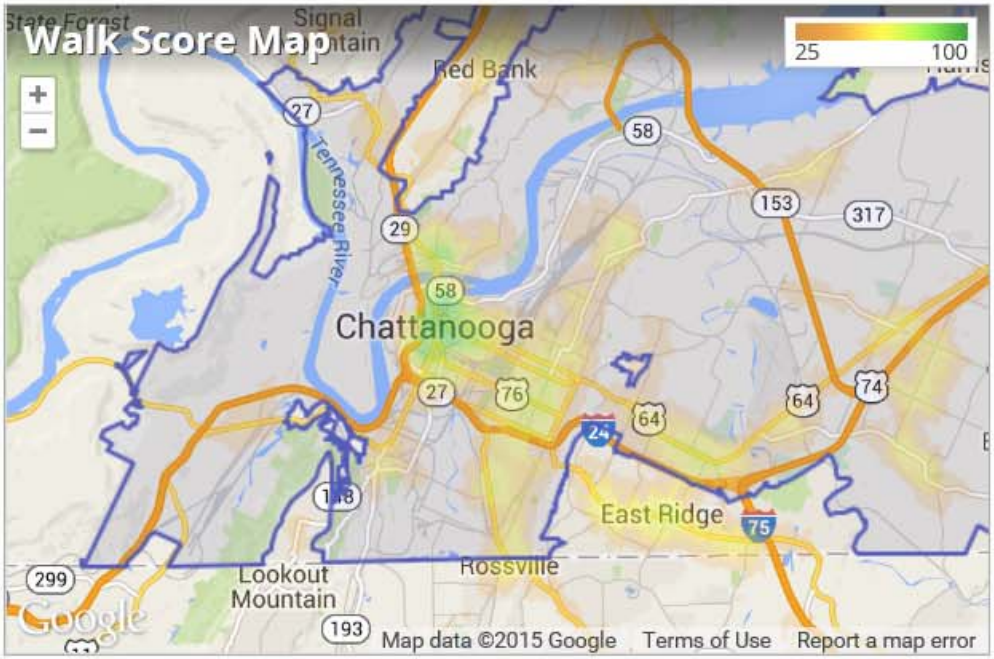
Walk Score® Find Apartments Get Scores My Favorites Log in

Type an address, neighborhood or city Go iOS Android Share

Walk Score 27

Chattanooga is a Car-Dependent city

Most errands require a car.



Walk Score 27

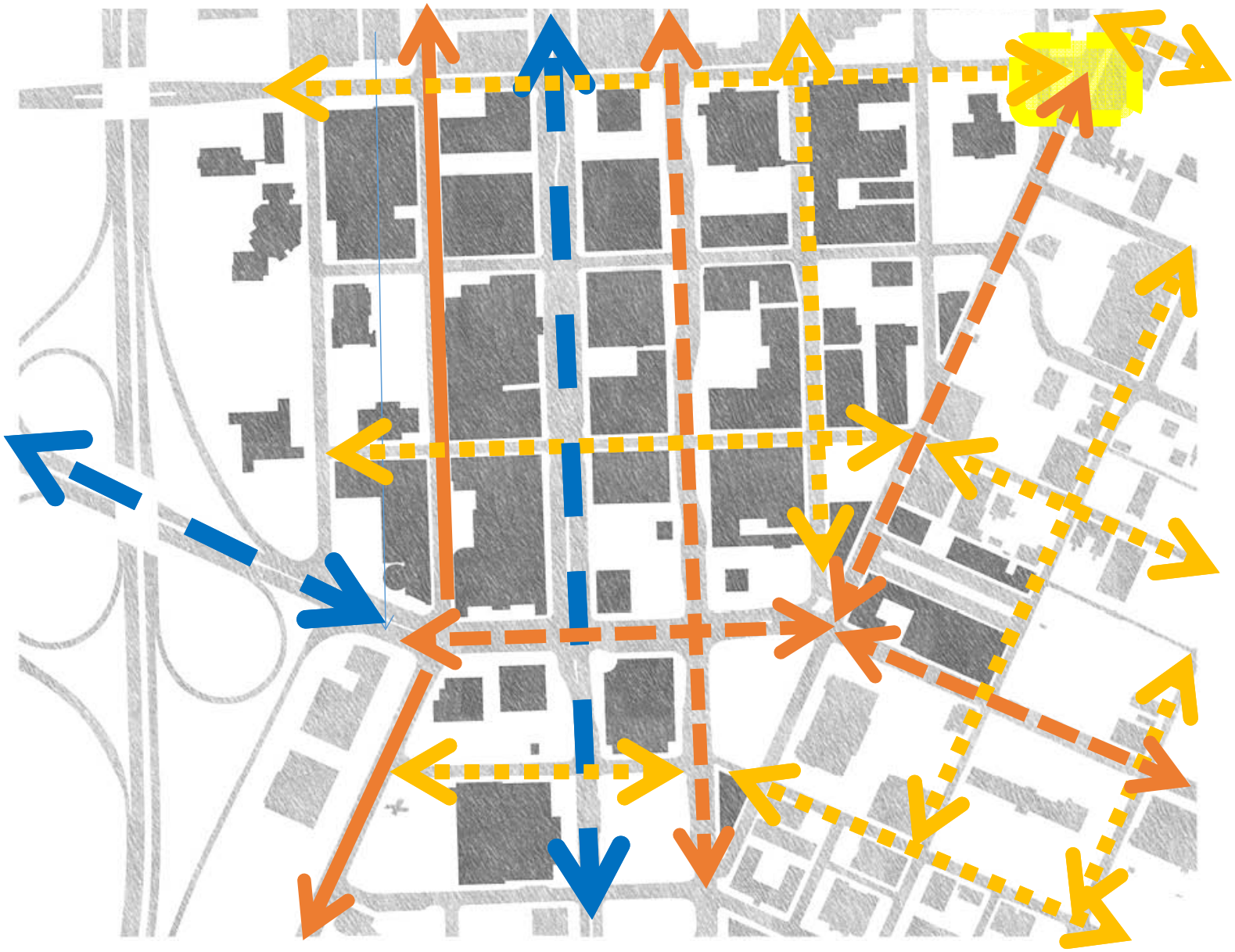
Bike Score 32

Chattanooga has an average Walk Score of 27 with 167,674 residents.

Chattanooga does not have many bike lanes.

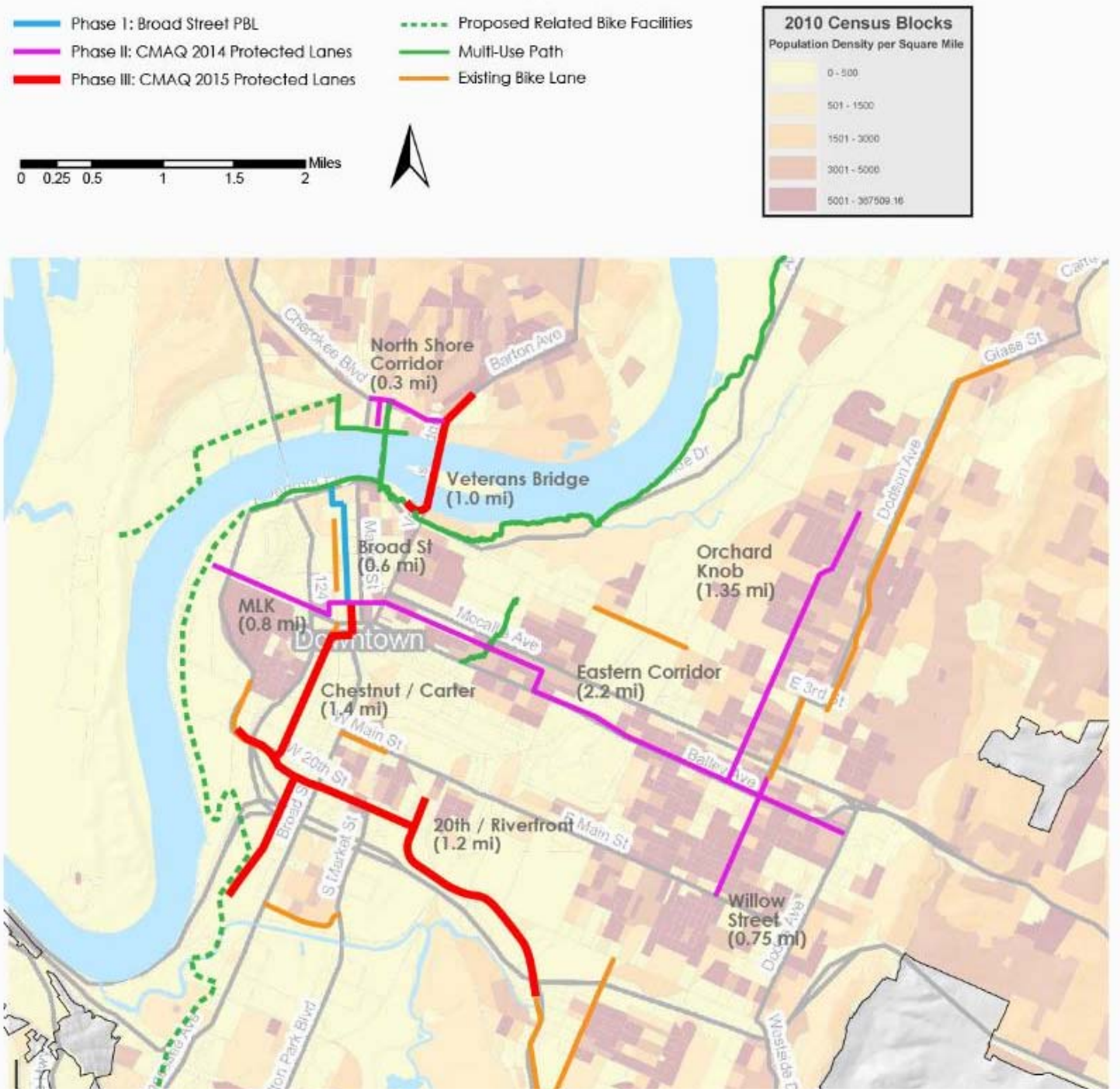
The most walkable Chattanooga ZIP codes are 37403, 37402 and 37408.

Chattanooga Proposed Center City Bicycle Network 2013

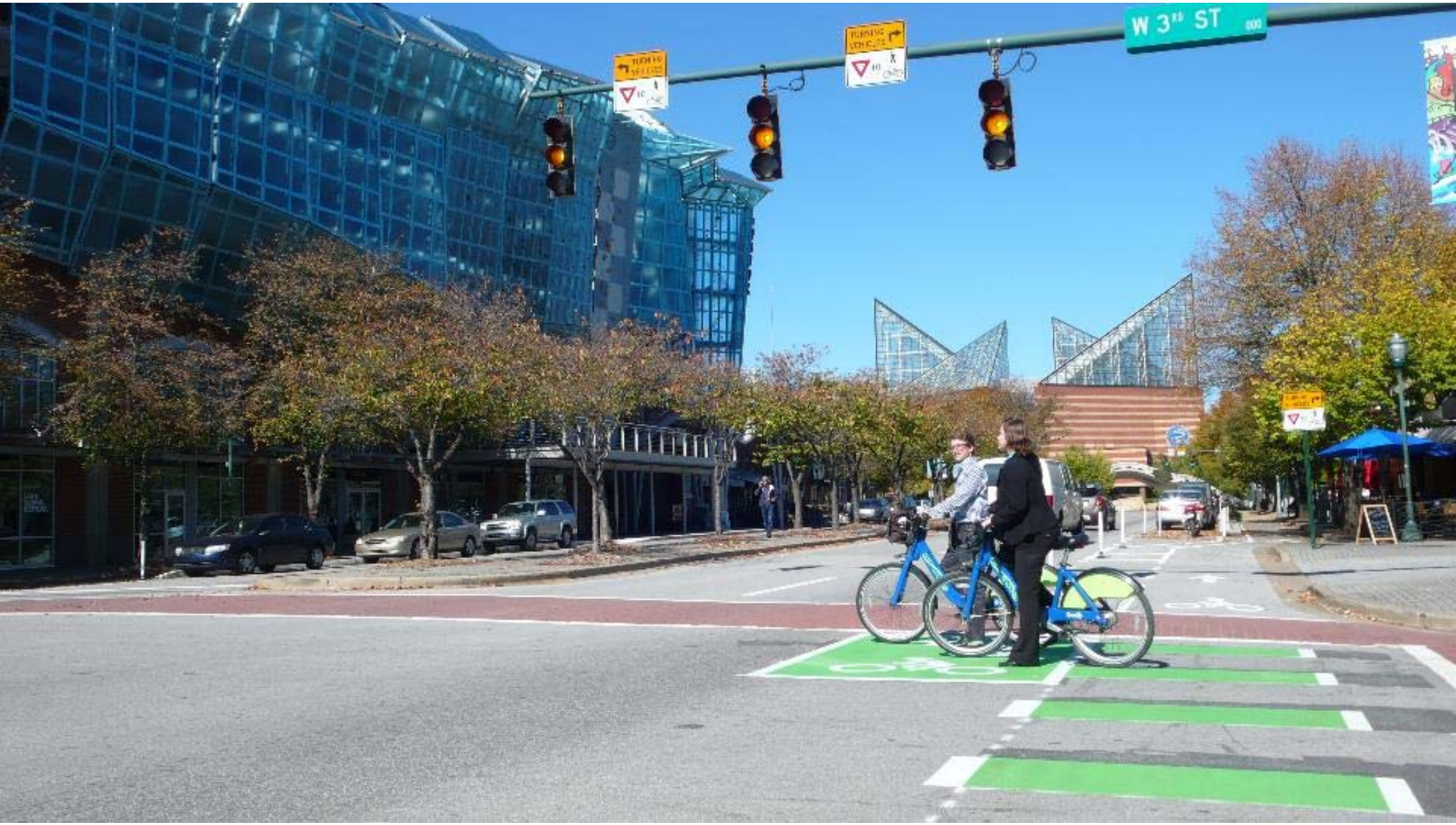



BB&T

City of Chattanooga
Protected Bicycle Lane Projects




STICKY
FINGER


W 3rd ST

CYCLE ATLANTA: PHASE 1.0 STUDY

A supplement to the Connect Atlanta Plan

PLANNING + DESIGN

Overall Study Goals

The *Cycle Atlanta: Phase 1.0 Study* represents **a strategy to create a complete and connected network of high-quality bicycle facilities in the core of the city**.

Cycle Atlanta 1.0

Connect Atlanta Alignments

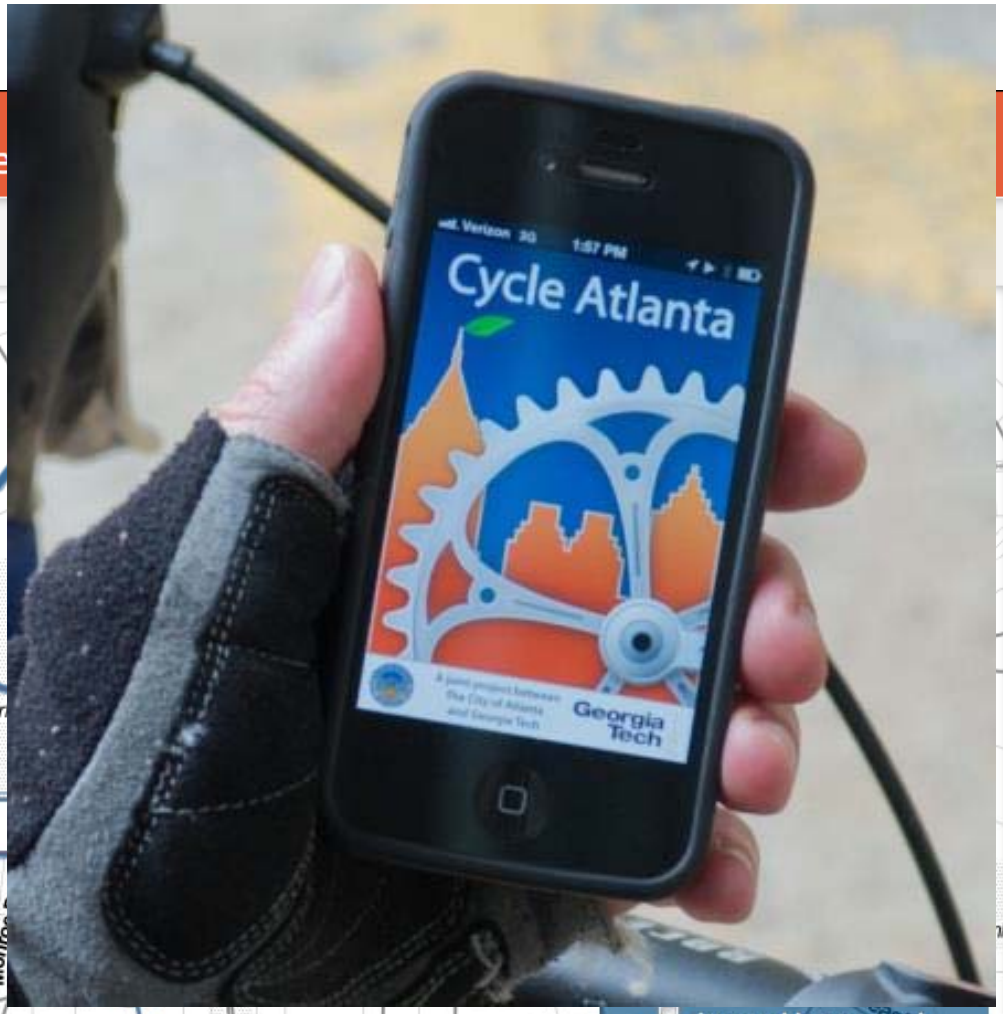
- 30 miles of existing bikeways
- 31 miles of proposed bikeways

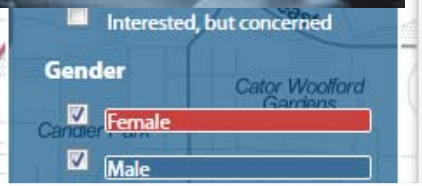
Cycle Atlanta Alignments

Cycle Atlanta

Mapping the ride to a bette

Visualizing rides collected by users of the Cycle Atlanta apps.





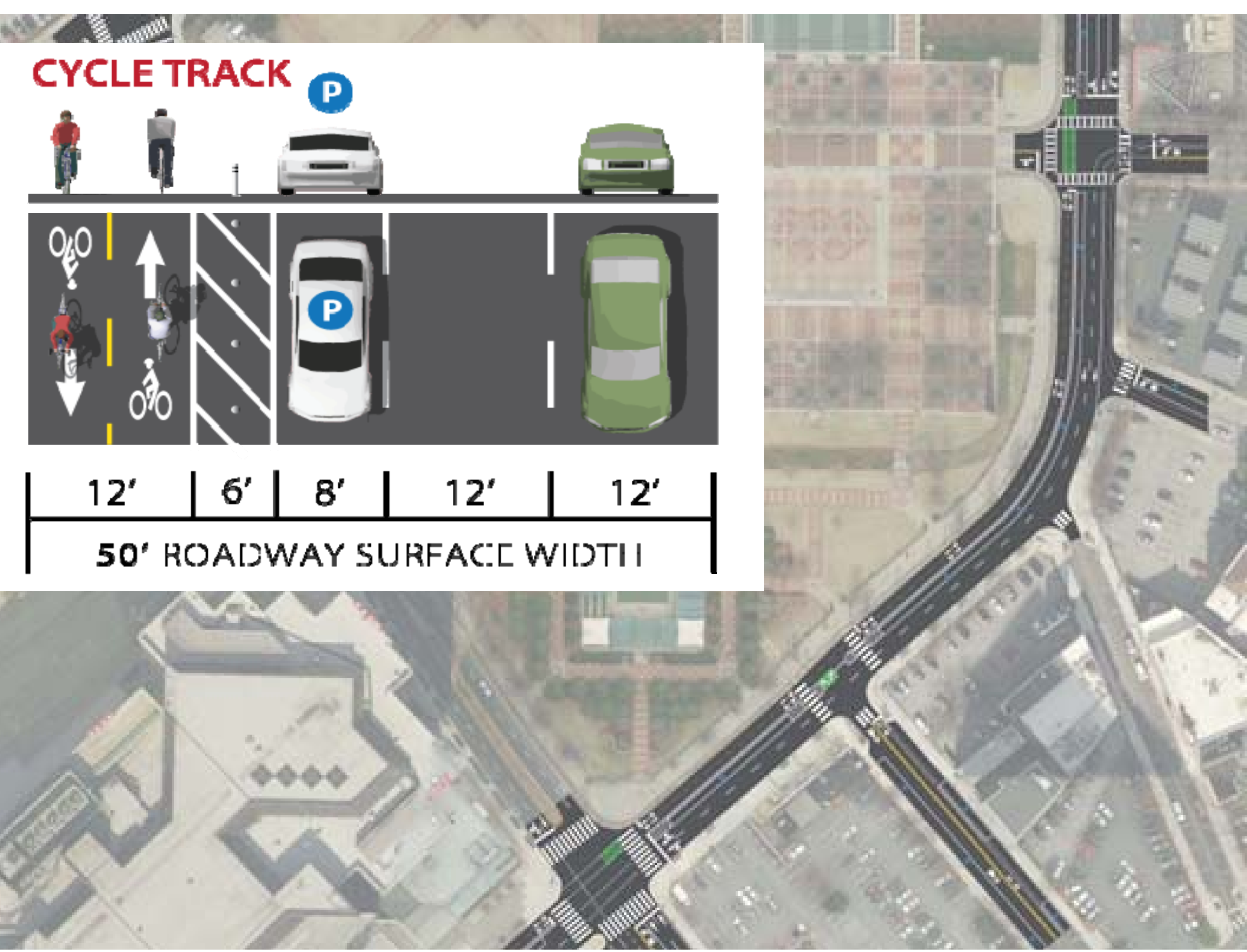
www.cycleatlanta.org/rides

Cross Section ID	Cross Section	Street	From	To	Existing Travel Lanes
A29	2 WAY CYCLE TRACK	Gilmer Street	Peachtree Center Avenue	Courtland Avenue	3
A30	2 WAY CYCLE TRACK	Courtland Street/ Washington Street	Gilmer Street	Memorial Drive	4

Additional Notes

1	The Atlanta Downtown Improvement District (ADID) is currently working on a streetscape and plaza projec Specifically, ADID is developing concepts for the segment of Peachtree Street from Martin Luther King Jr. Bo segment is to design a street environment that is more supportive of transit and pedestrians. With the emp the street will likely not need a dedicated bike facility. However as designs are developed, they should cons to the Five Points MARTA station.
2	Once the Atlanta Streetcar construction is completed, a bicycle facility connection should be developed to Avenue and Edgewood Avenue.
3	A new Georgia State MARTA station entrance has been proposed at Courtland Avenue. If this station entran the primary bicycle entrance for the station.

Detailed Corridor Recommendations

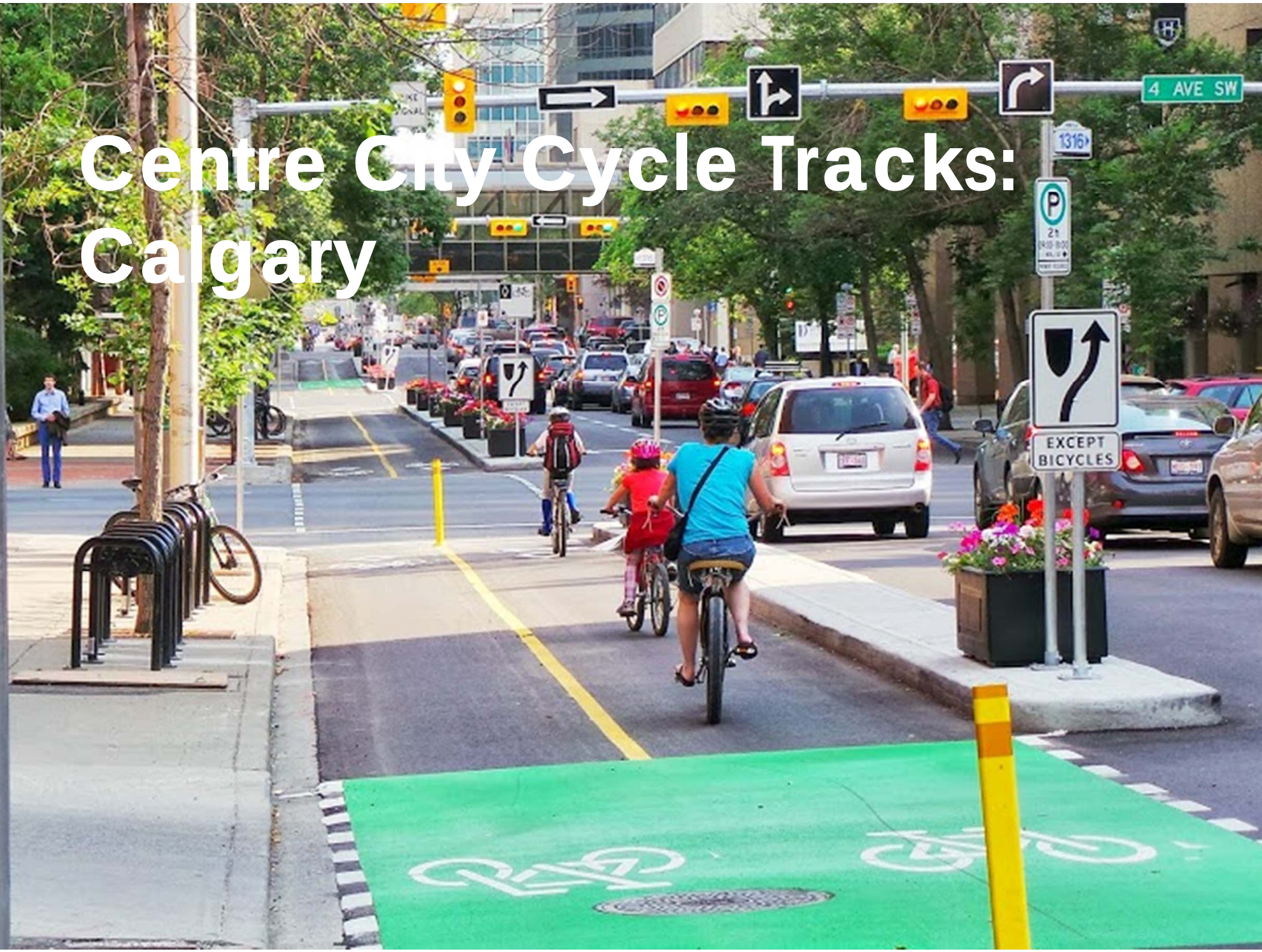

CYCLE TRACK
P
P
12′
6′
8′
12′
12′
50′ ROADWAY SURFACE WIDTH

10th

John Portman


Park Ave

Peachtree Center



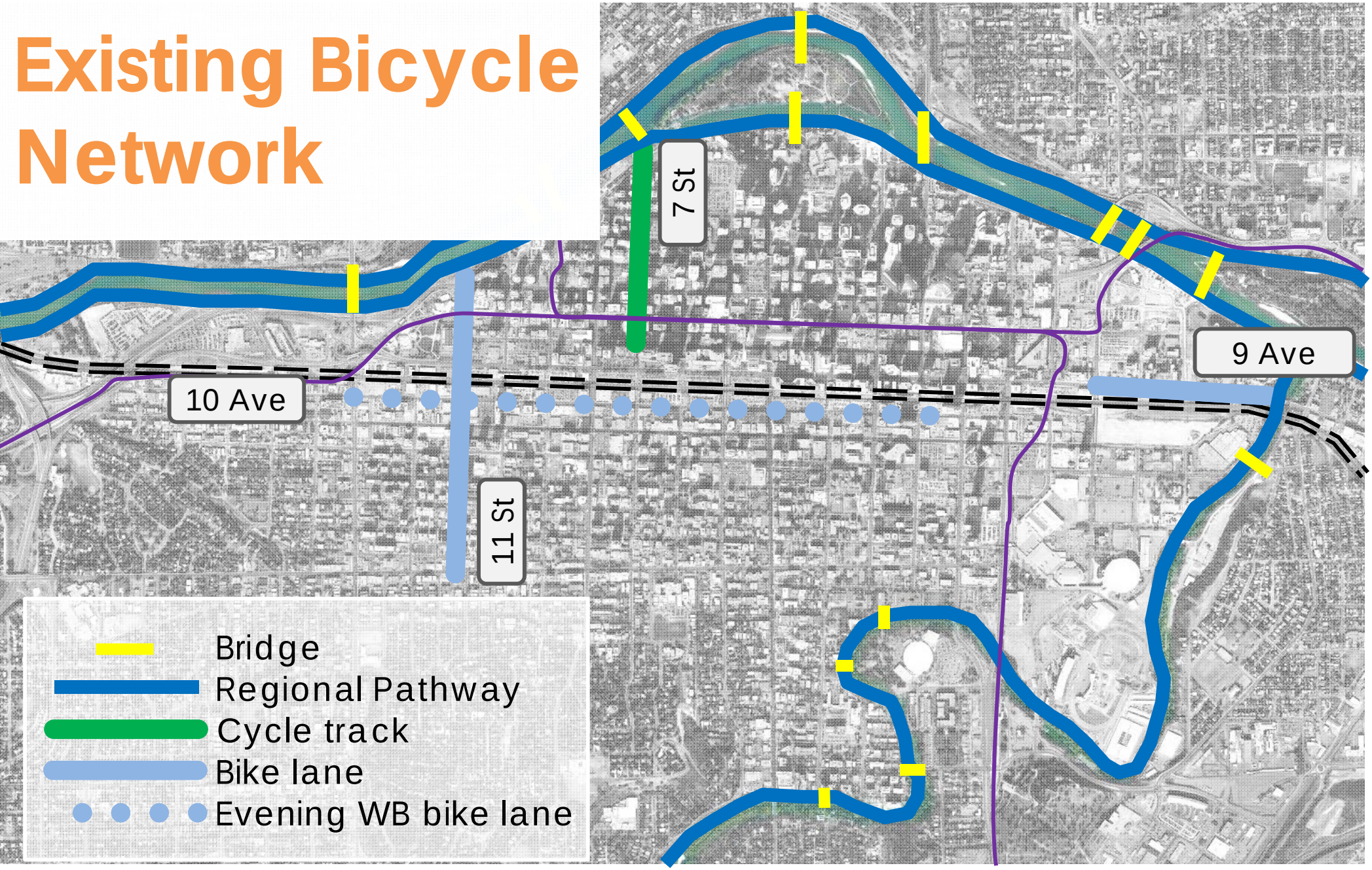
Centre City Cycle Tracks: Calgary

Council Motion (2011 July 4)

"Determine, through engaging with the Cycle Community, an **updated and East-West-North-South separated Cycle Route Network through the Centre City**, as part of the implementation plan for the Bike Strategy."

Stantec

Existing Bicycle Network



Network Guiding Principles

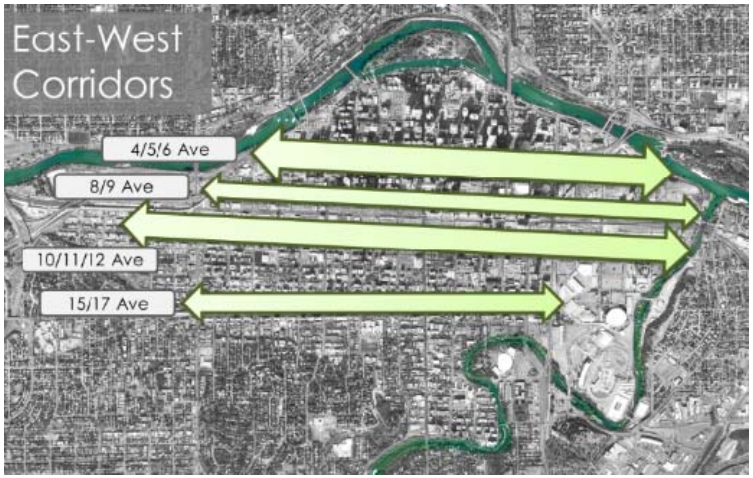
- Connectivity
- Directness
- Safety
- Comfort
- Community Context
- Constructability
- Operations

Network Attributes

- Grid Network / Mesh width
- Connect to pathways
- Connect to 7 Street cycle track
- Reach destinations
- Minimize impacts to other modes

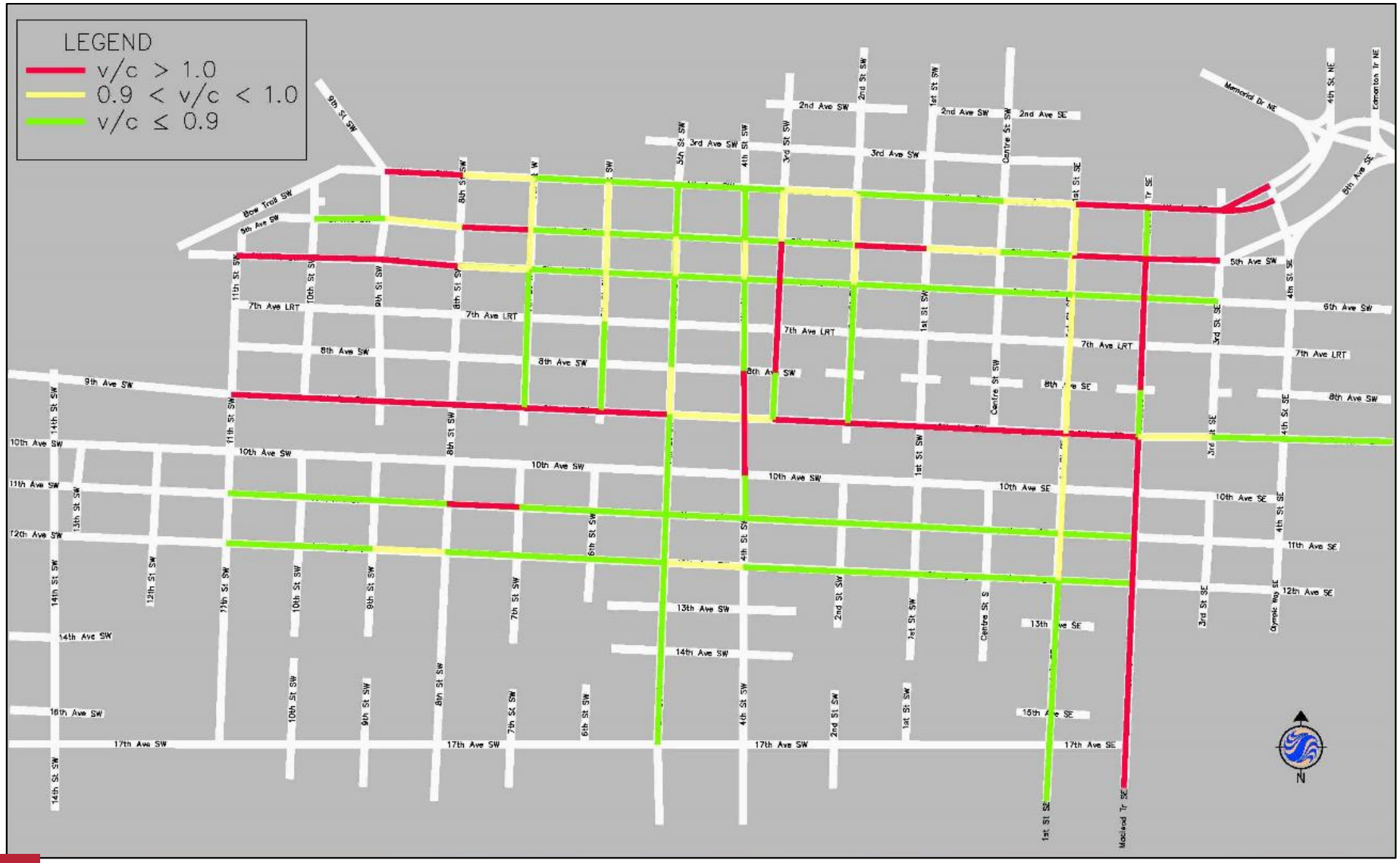
Corridor Identification

- Group streets and avenues into corridors based on location and potential use
- Each corridor would have a specific role in serving all ages, abilities, and trip purposes

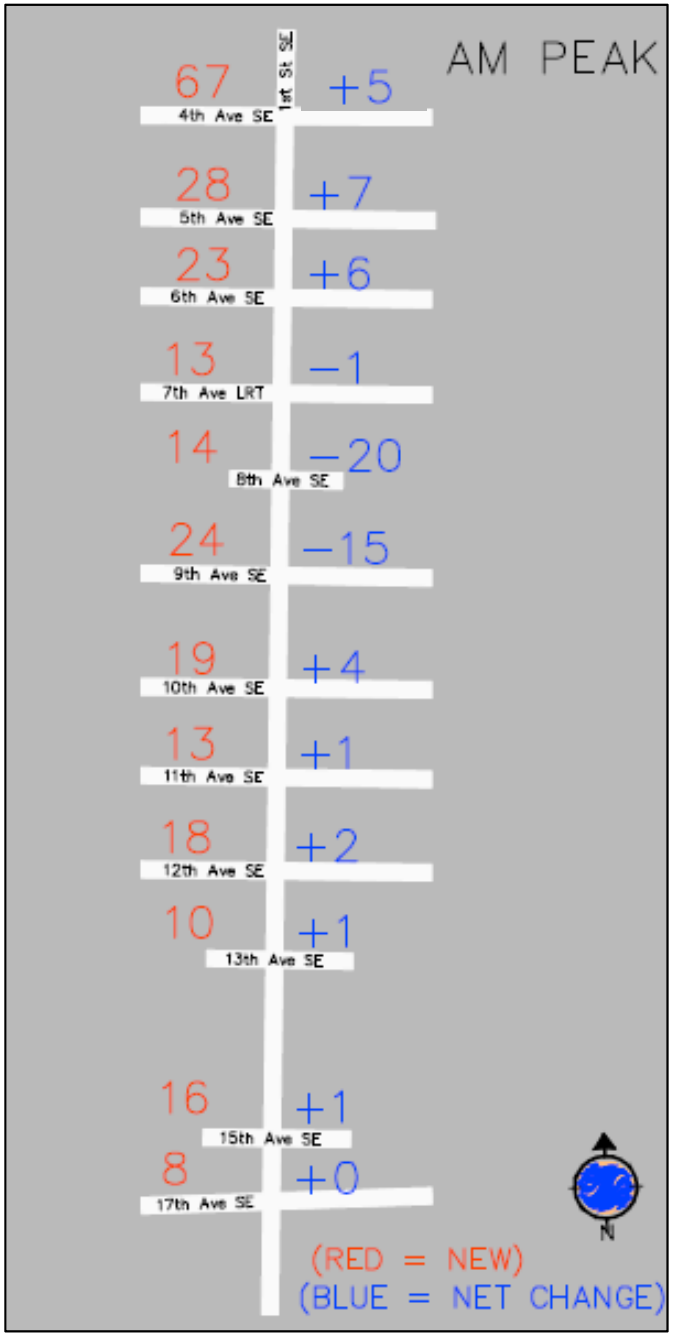


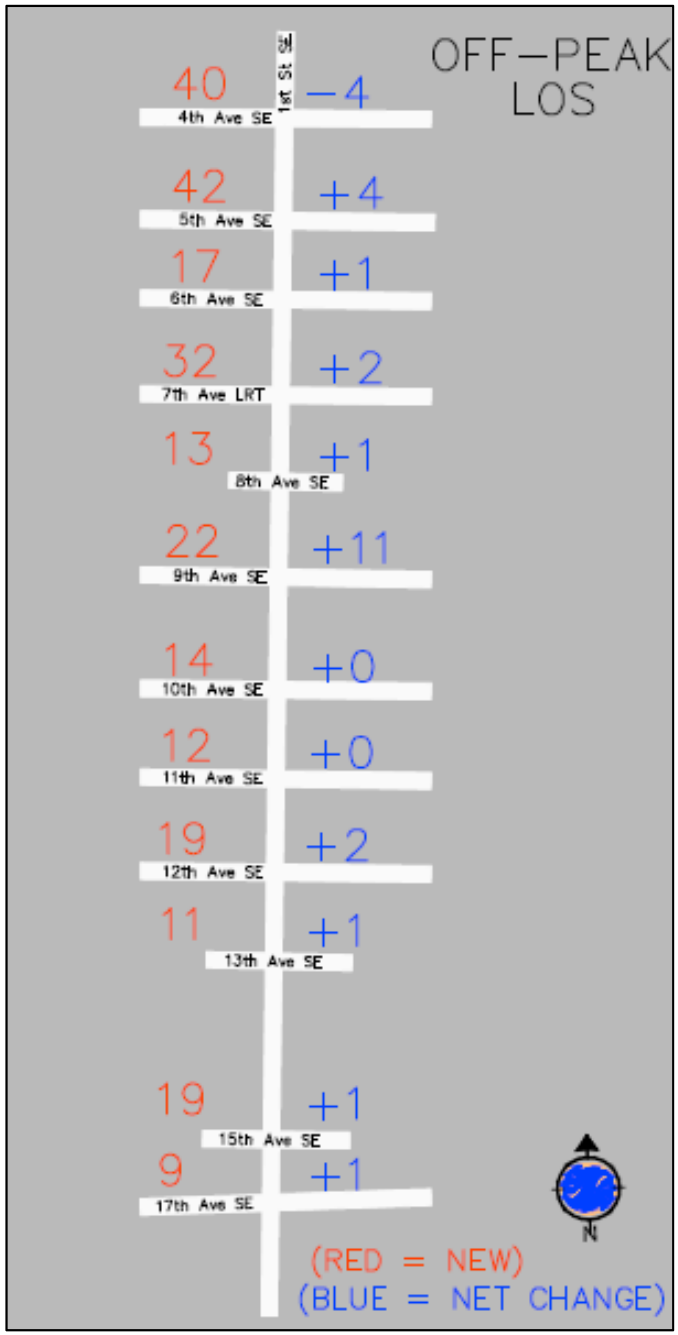
Downtown Traffic Opportunities

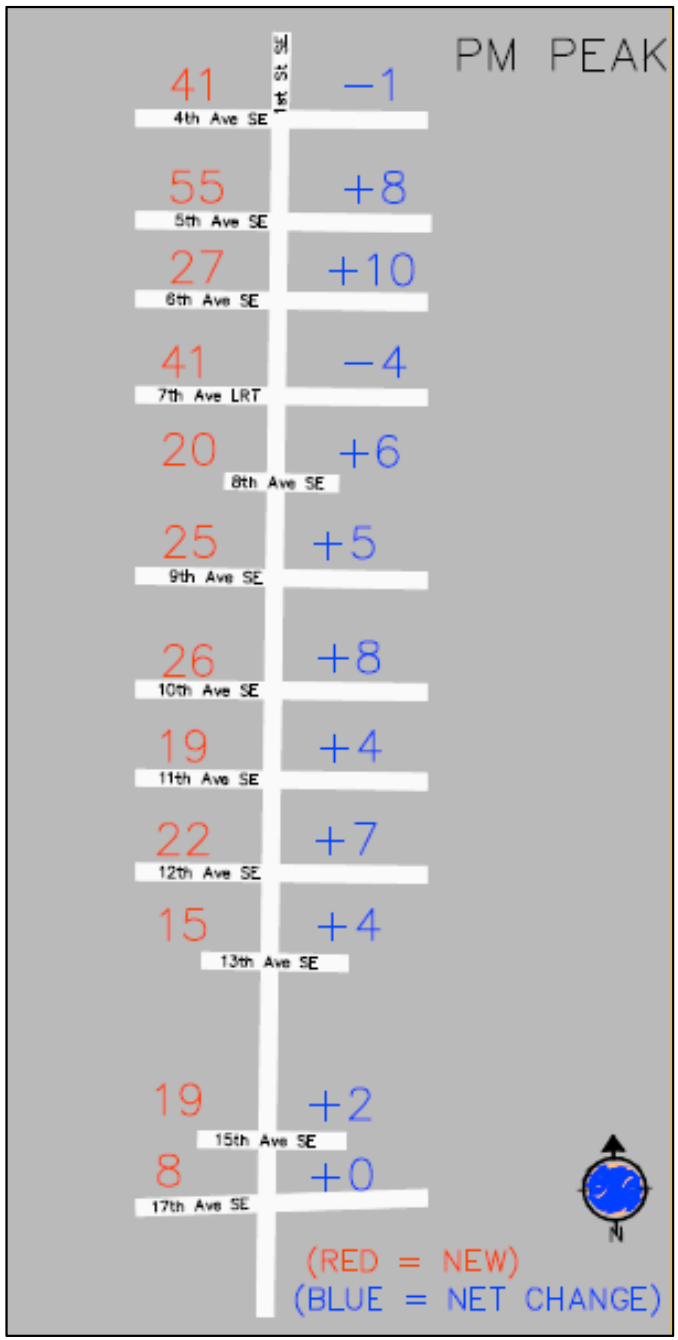
One lane removed from all multi-lane one-way streets in the study area



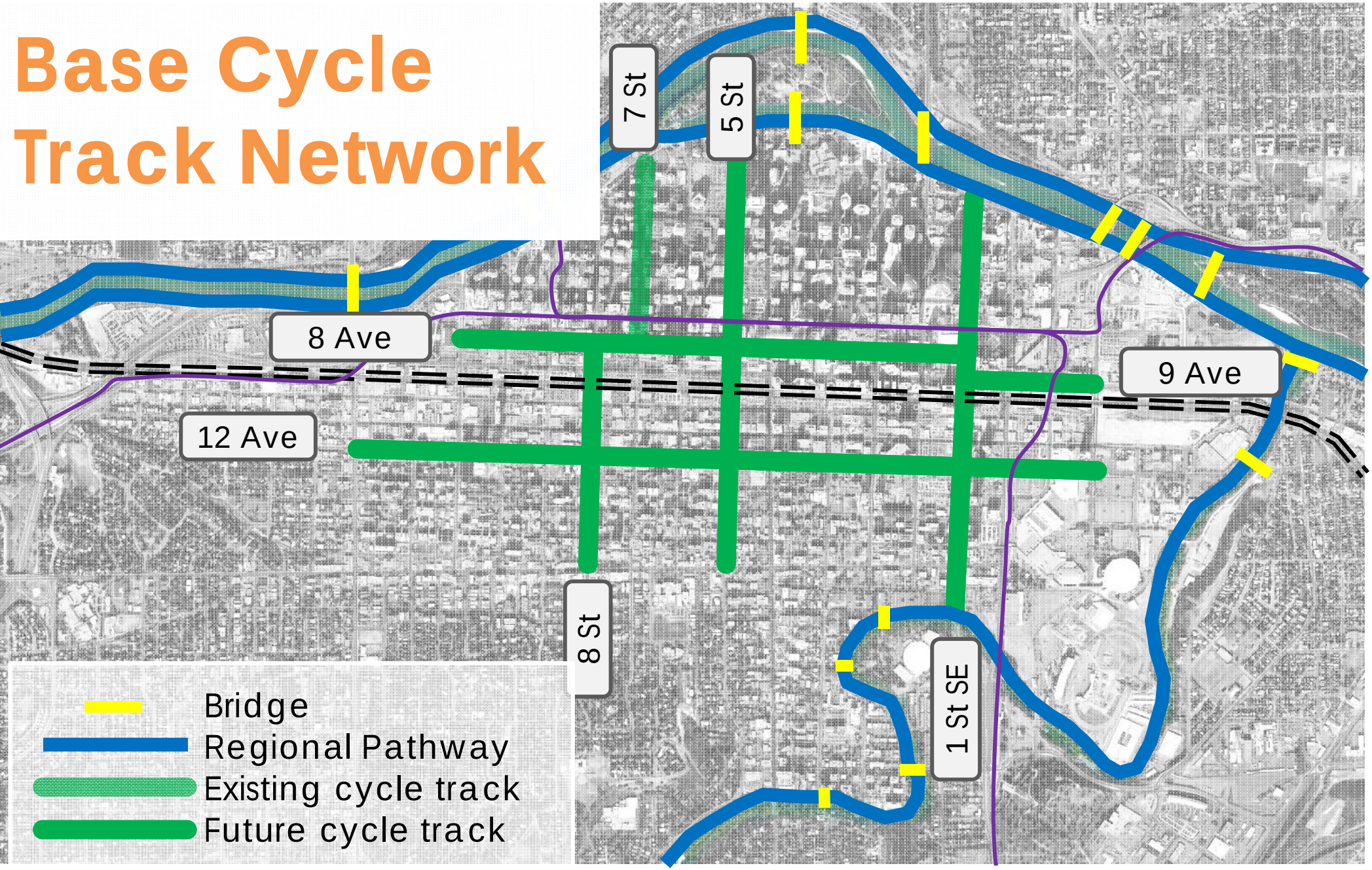
Auto Travel Time and Change







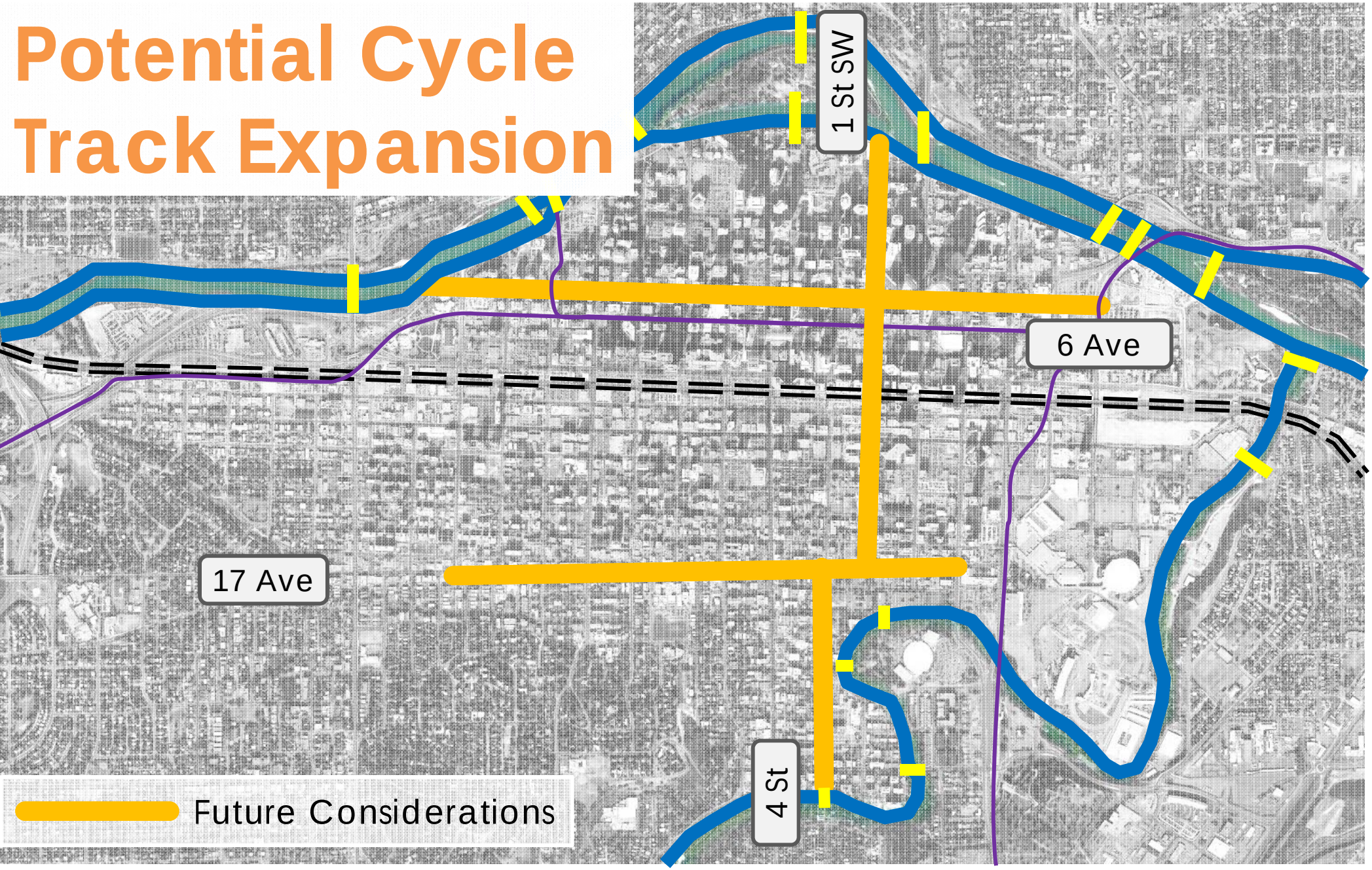
Base Cycle Track Network



alta PLANNING + DESIGN

Stantec

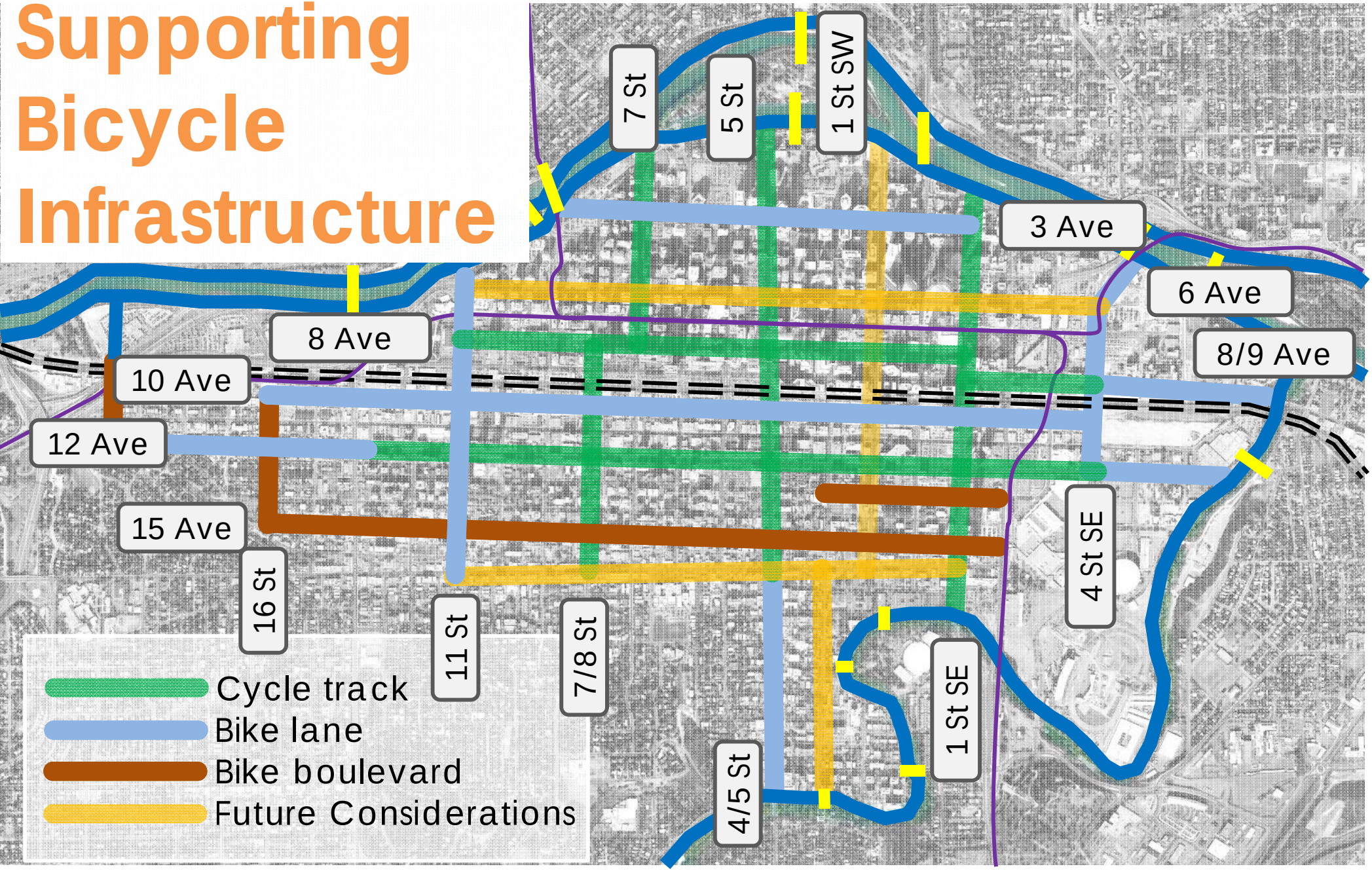
Potential Cycle Track Expansion



alta PLANNING + DESIGN

Stantec

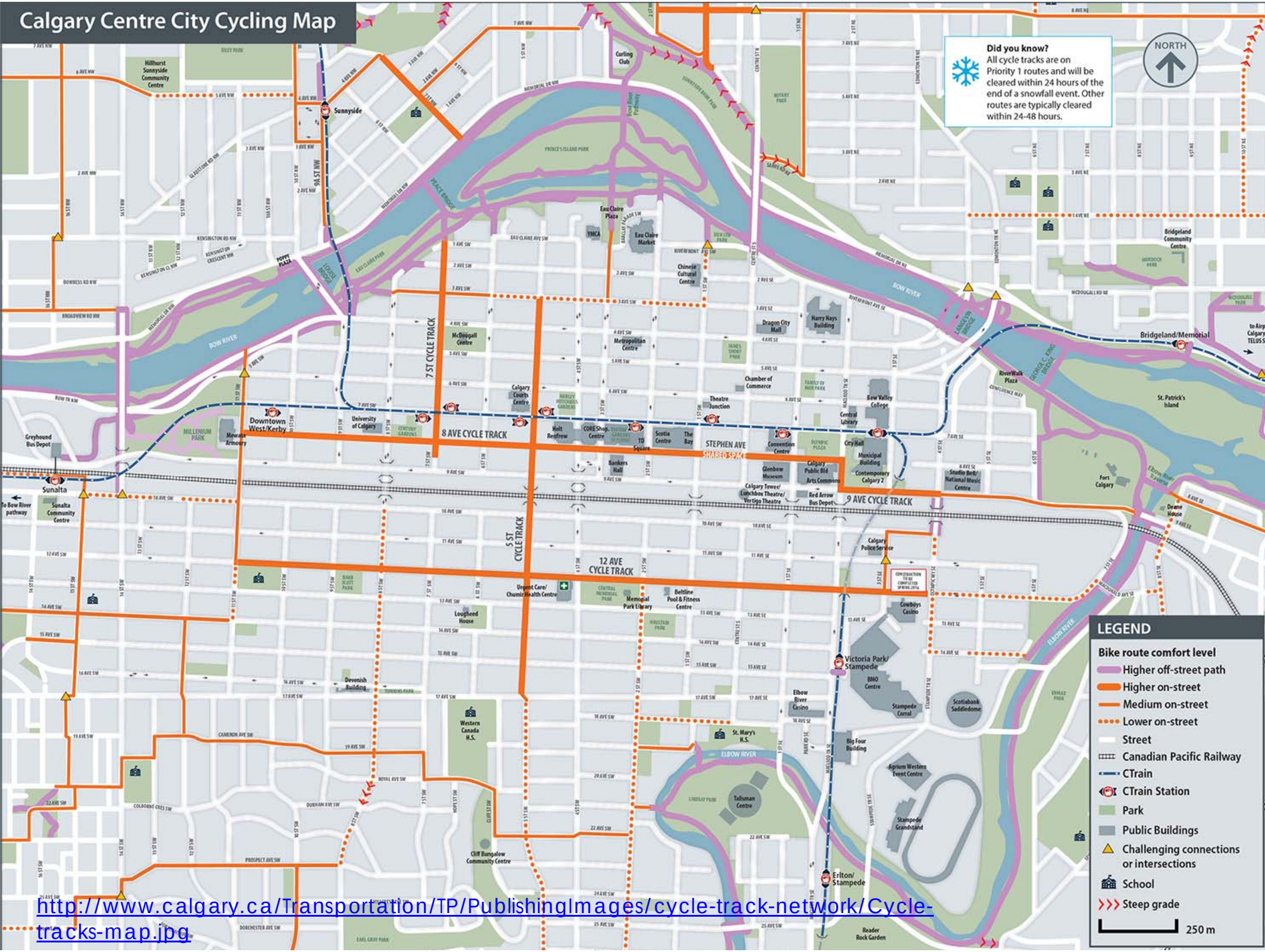
Supporting Bicycle Infrastructure



alta PLANNING + DESIGN

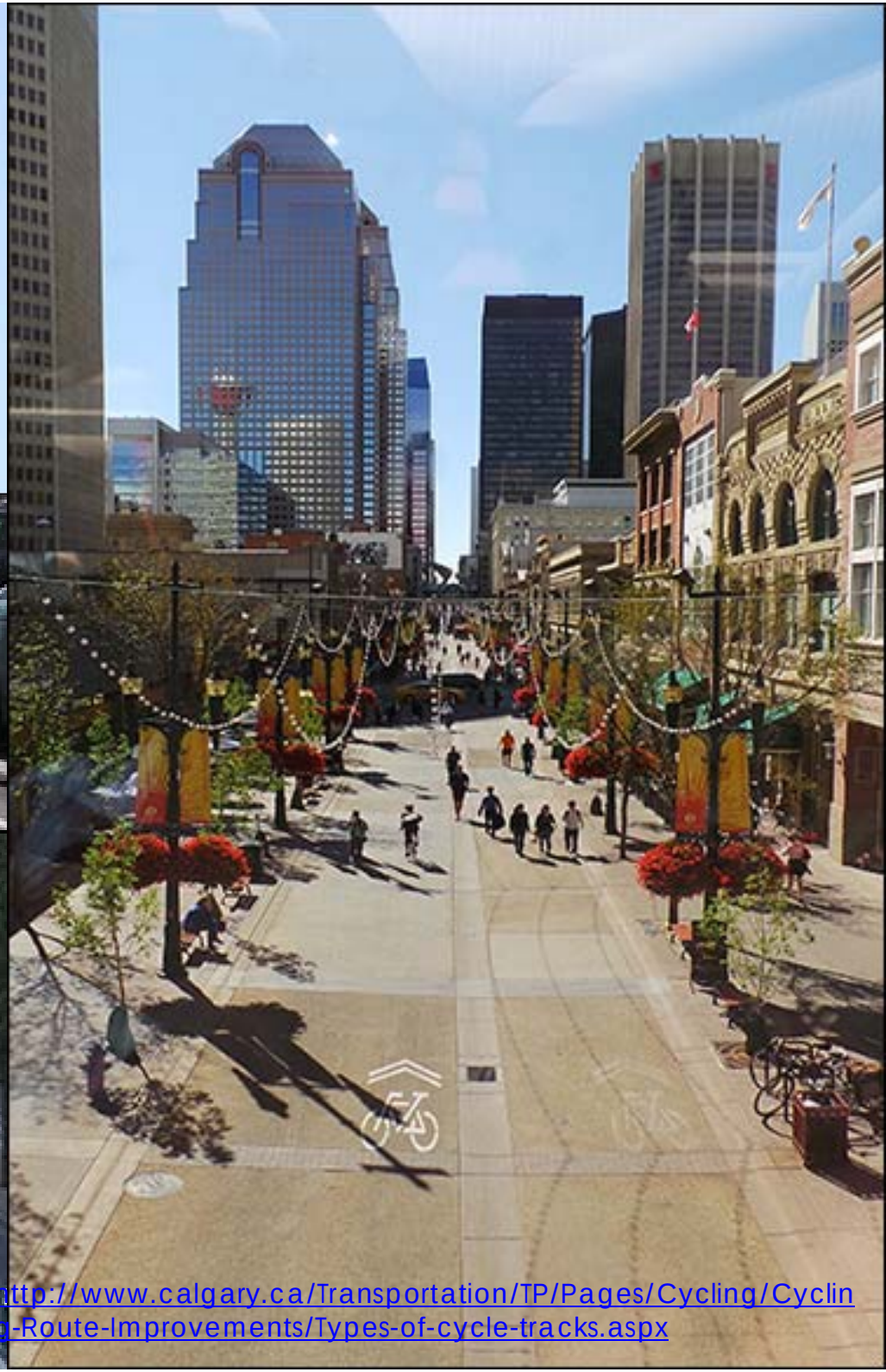
Stantec

Calgary Centre City Cycling Map



http://www.calgary.ca/Transportation/TP/PublishingImages/cycle-track-network/Cycle-tracks-map.jpg

Calgary



http://www.calgary.ca/Transportation/TP/Pages/Cycling/Cycling-Route-Improvements/Types-of-cycle-tracks.aspx

Fast facts about the cycle track pilot

% of 300 km of downtown travel lanes used for **6.5 km** of cycle tracks

allowing more people to choose to travel by bike.

1.2 million bicycle trips

between June 18, 2015 and November 20, 2016

90 seconds longest delay to people driving

travelling entire 12 Avenue cycle track corridor during morning peak period.

Council approved budget
$7.1M

Pilot cost (to date)
($1.65M under budget)
$5.45M

net increase of parking stalls created downtown to offset the loss of parking along cycle track routes.

30% **of people riding cycle tracks are women,** up from 22% before cycle tracks.

Unlawful sidewalk riding has decreased from an average of 16% (pre-cycle tracks) to **2%**

67% **of Calgarians support the pilot project.**
(2016 Ipsos survey)

100+ adjustments **made to improve traffic, loading and parking during the pilot.**

http://www.calgary.ca/Transportation/TP/Pages/Cycling/Cycling-Route-Improvements/Downtown-cycle-track-pilot-project.aspx

#COMFORTABLE

All Ages and Abilities

#COMPLETE

Connected Minimum Grid

#CONVENIENT

All Destinations

#DEMAND

#DOABLE

#BIKETORIA
a network that moves you

Happy Trails. . .and Bikeway Networks. . . to you!

John Cock

johncock@altaplanning.com