

APPENDIX G:

Enhanced Transit Policy

This document describes the Enhanced Transit Network in Vancouver and its relationship to the TSP.



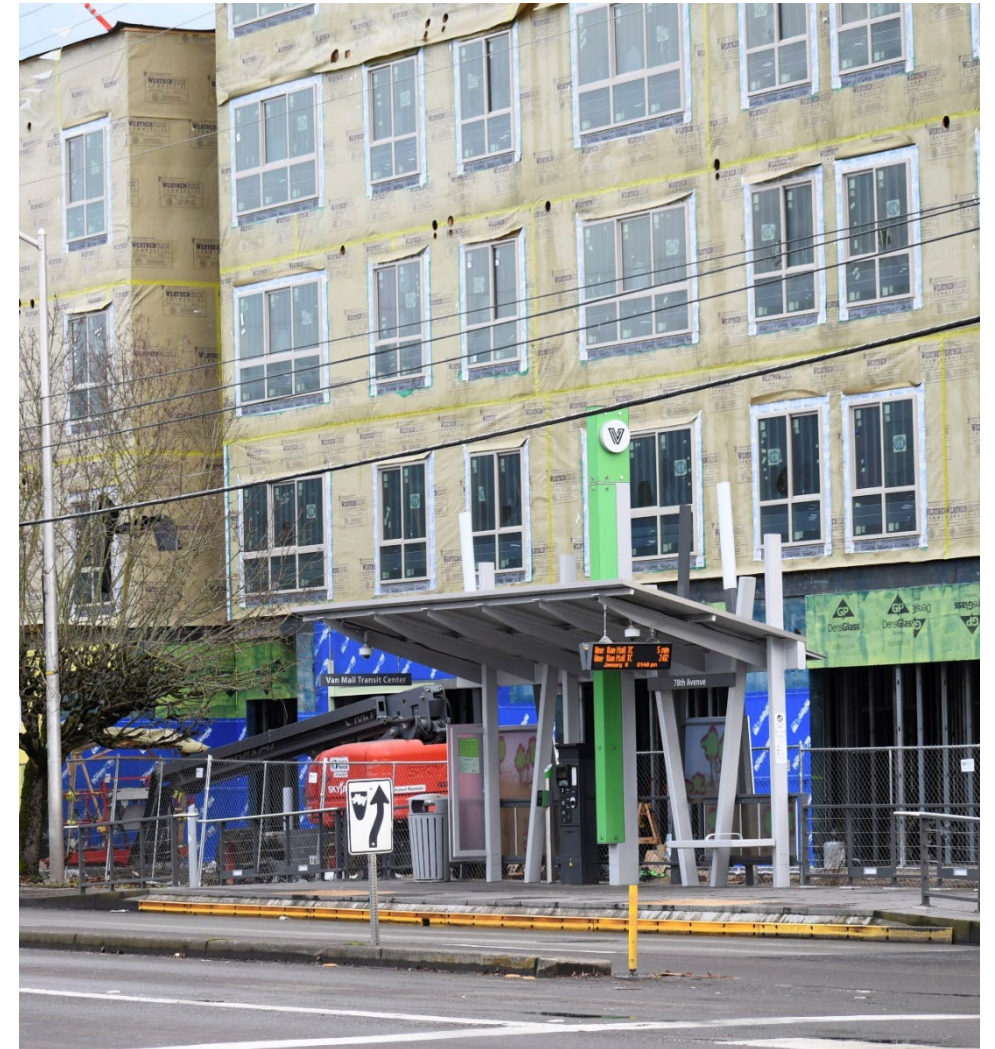
vancouver moves

Enhanced Transit

February 2022

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- 3 The Enhanced Transit Network
- 4 How Can the City Support Transit?



1

Introduction

What is Enhanced Transit?

1

Expanded frequent transit service that is fast, reliable, and permanent allows people to ride transit without a schedule and transfer with ease



2

Transit information and legibility lets riders know when transit will arrive and makes using the system intuitive



3

Safe and convenient pedestrian and bicycle access connect people to transit stops and key destinations



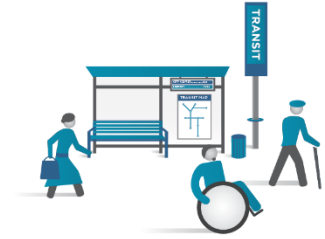
4

On-demand services (e.g., The Current) and bike share serve first and last mile needs and expand service hours



5

High-quality stops and stations make transit accessible, comfortable, and convenient



6

Flexible fare and pass programs make transit easy to use and affordable for families and low-income people



7

Coordinated land use, parking, and placemaking policies help transit connect people to destinations efficiently



8

Education and outreach improve awareness and understanding of how to use the transit system



Why an Enhanced Transit Network?

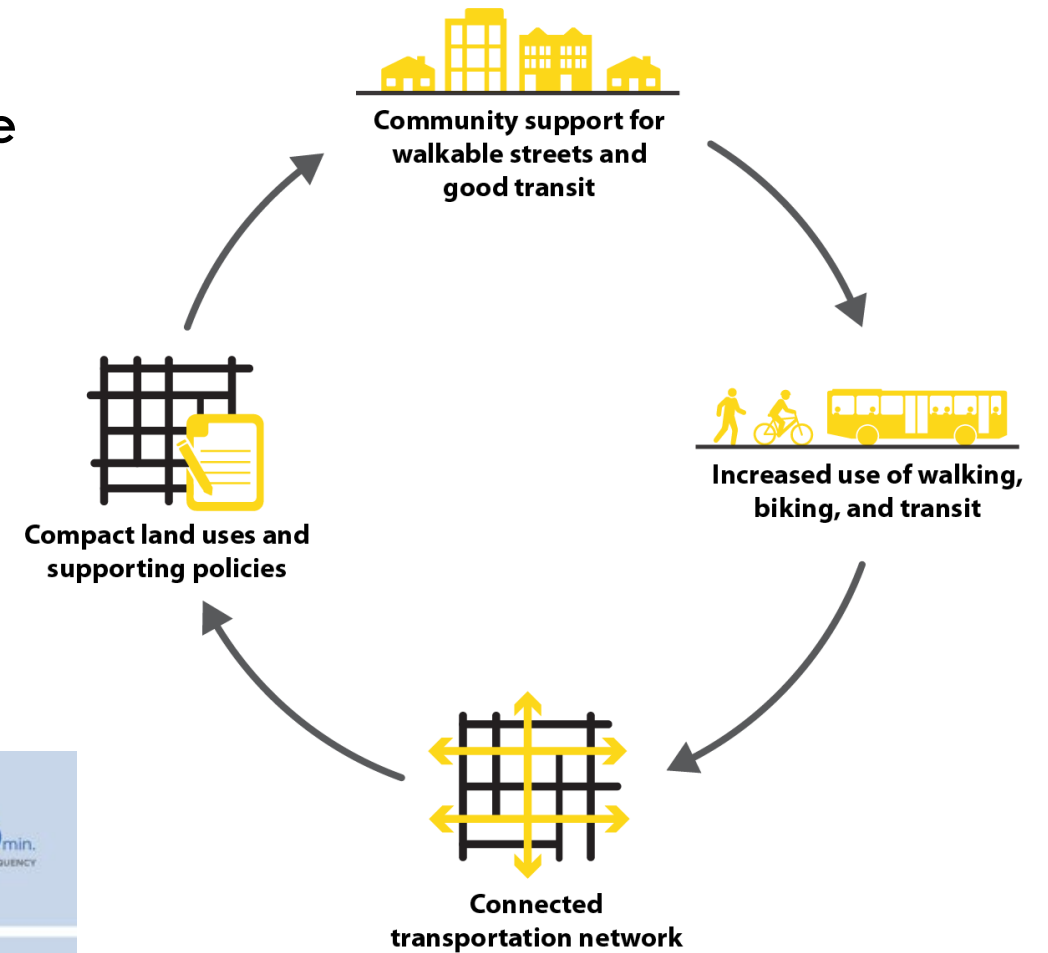
- Support the City's goals to improve the efficiency of the transportation system, improve safety for vulnerable road users, and reduce transportation emissions
- Guide decision-making about capital investments by:
 - Identifying a network of corridors where transit enhancements are merited
 - Analyzing barriers and solutions around access to transit
- Align City and C-TRAN priorities and needs for transit in Vancouver

Land Use and Transit

- Dense land use and transit are mutually supportive
- Density is a major factor in achieving high transit ridership
- Denser areas can support higher frequencies, which makes service even more convenient



Land use policies can create a virtuous cycle



What is the City's Role in Transit?

- The City plays an important role in shaping and supporting a local vision for transit, in collaboration with C-TRAN.
- The City is responsible for building and maintaining streets and sidewalks, as well as making decisions about how streets are used.
- The City can design streets that help transit service be faster and more reliable, and support access to transit with things like sidewalks and crosswalks.

1. STREET DESIGN SUPPORTING FAST AND RELIABLE SERVICE

2. PROVIDING SAFE AND COMFORTABLE ACCESS

3. MANAGING GROWTH

Quality Transit Takes a Partnership



Provide Frequent Service

✓ C-TRAN

City of Vancouver



Keep Buses Moving

C-TRAN

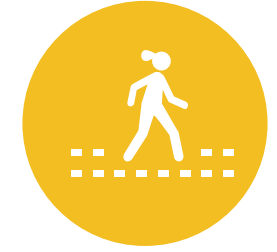
✓ City of Vancouver



Supportive Land Use

C-TRAN

✓ City of Vancouver



Safe, Comfortable Access

✓ C-TRAN

✓ City of Vancouver

Components of Enhanced Transit

OPERATIONS	SIGNALS	INFRASTRUCTURE	TRANSIT LANES
Stop Relocation or Consolidation	Turn / Movement Restrictions	Bus Platform Design	Curbside Bus Lane
Boarding Policy	Yield to Bus	Bus Bulbs	Interior / Offset Bus Lane
Route Design	Queue Jump	Boarding Islands	Median Bus Lane
	Transit Signal Priority	Roadway Channelization	Contra-flow Bus Lane
	Bus –Only Signals	Parking Removal	Queue Bypass

C-TRAN Responsibilities

OPERATIONS	SIGNALS	INFRASTRUCTURE	TRANSIT LANES
Stop Relocation or Consolidation	Turn / Movement Restrictions	Bus Platform Design	Curbside Bus Lane
Boarding Policy	Yield to Bus	Bus Bulbs	Interior / Offset Bus Lane
Route Design	Queue Jump	Boarding Islands	Median Bus Lane
	Transit Signal Priority	Roadway Channelization	Contra-flow Bus Lane
	Bus –Only Signals	Parking Removal	Queue Bypass

City or Shared Responsibilities

OPERATIONS	SIGNALS	INFRASTRUCTURE	TRANSIT LANES
Stop Relocation or Consolidation	Turn / Movement Restrictions	Bus Platform Design	Curbside Bus Lane
Boarding Policy	Yield to Bus	Bus Bulbs	Interior / Offset Bus Lane
Route Design	Queue Jump	Boarding Islands	Median Bus Lane
	Transit Signal Priority	Roadway Channelization	Contra-flow Bus Lane
	Bus –Only Signals	Parking Removal	Queue Bypass

2

Transit Service in Vancouver Today

Transit in Vancouver Today

This section describes:

- Existing transit service in Vancouver
- Transit ridership, including changes in ridership during the COVID-19 pandemic
- Locations where transit is delayed and where drivers have identified safety issues
- The pedestrian environment near transit stops
- The public's transit priorities from Vancouver Moves outreach



C-TRAN's Existing Service Types

- Transit agencies provide different types of service to meet various markets that travel for different purposes, at different times, and from different locations
- C-TRAN provides a series of fixed routes, flex routes, demand response, and microtransit services to meet a variety of needs

THE VINE - BUS RAPID TRANSIT

High frequency, high ridership; serving Fourth Plain corridor

FIXED ROUTE – FREQUENT

Local service prioritizing direct connections and fast travel times; peak and off-peak frequencies vary

FIXED ROUTE – COVERAGE

Local service prioritizing access to transit; frequency and span are more limited than frequent service

EXPRESS

Limited stops; serving peak only weekday time periods and all-day time periods on select routes

THE CURRENT

On-demand rideshare that provides door-to-door service; serves Rose Village, Camas, Washougal, La Center/Ridgefield, The Port of Vancouver, and WSU/Salmon Creek

PARATRANSIT (C-VAN)

A reservation-based shared ride service that provides origin to destination trips for eligible populations

VANPOOL

Small commuter groups traveling at least 10 miles in each direction with a start/end in C-TRAN's service area

Public Transit in Vancouver

C-Tran Transit Service

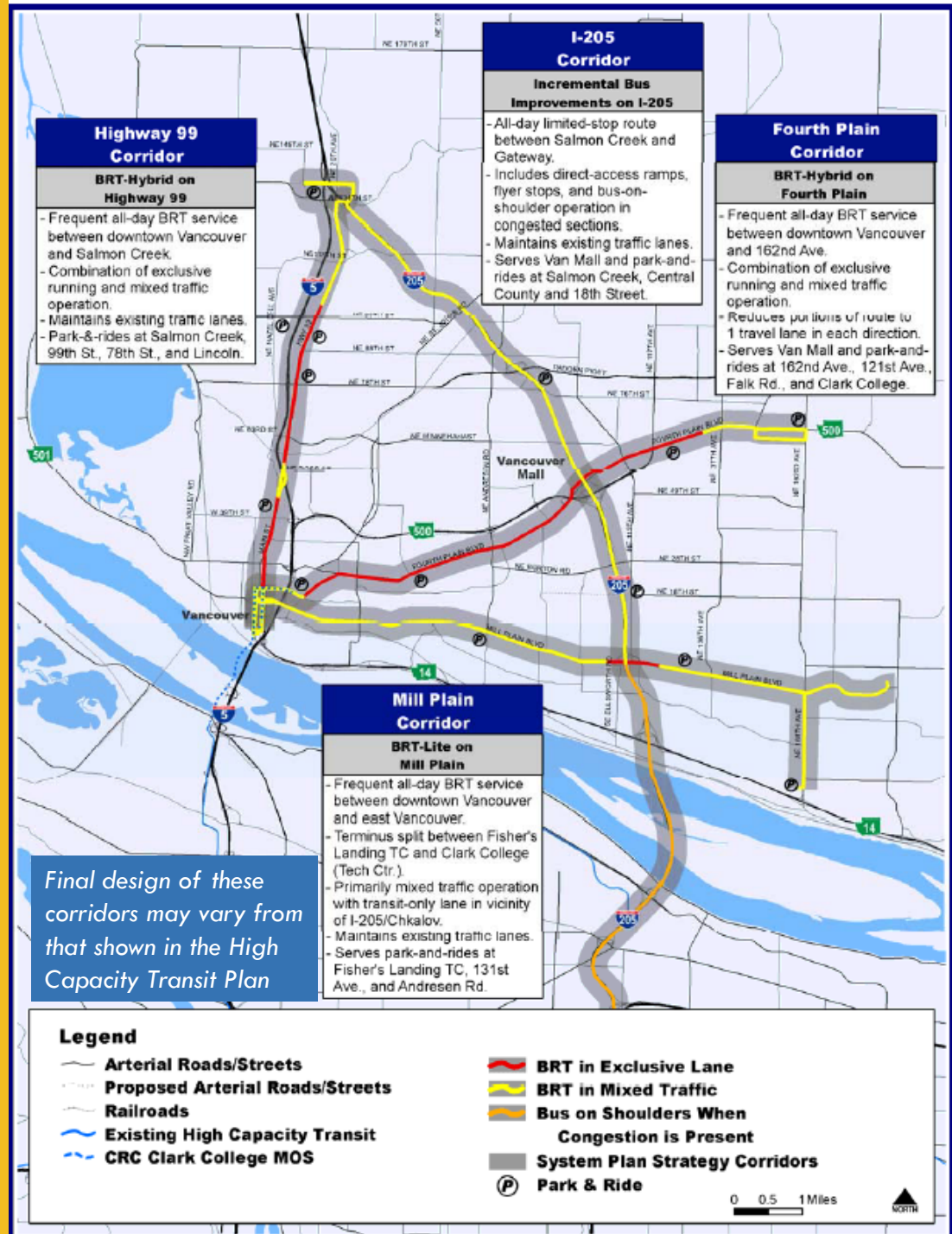
- Local Route
- Express Route
- Regional Route
- The Vine
- The Current Service Area
- T Transit Center
- P Park and Ride
- Vancouver City Limits
- Vancouver UGA



Bus Rapid Transit in Vancouver

- In 2017 C-TRAN launched its first BRT line, the Vine, on Fourth Plain from downtown Vancouver to the Vancouver Mall. It is C-TRAN's highest ridership route.
- Mill Plain Boulevard will be the next Vine BRT corridor. Service is anticipated to open in 2023.
- A potential third BRT line would run on Highway 99/Main Street.

Clark County High Capacity Transit Plan



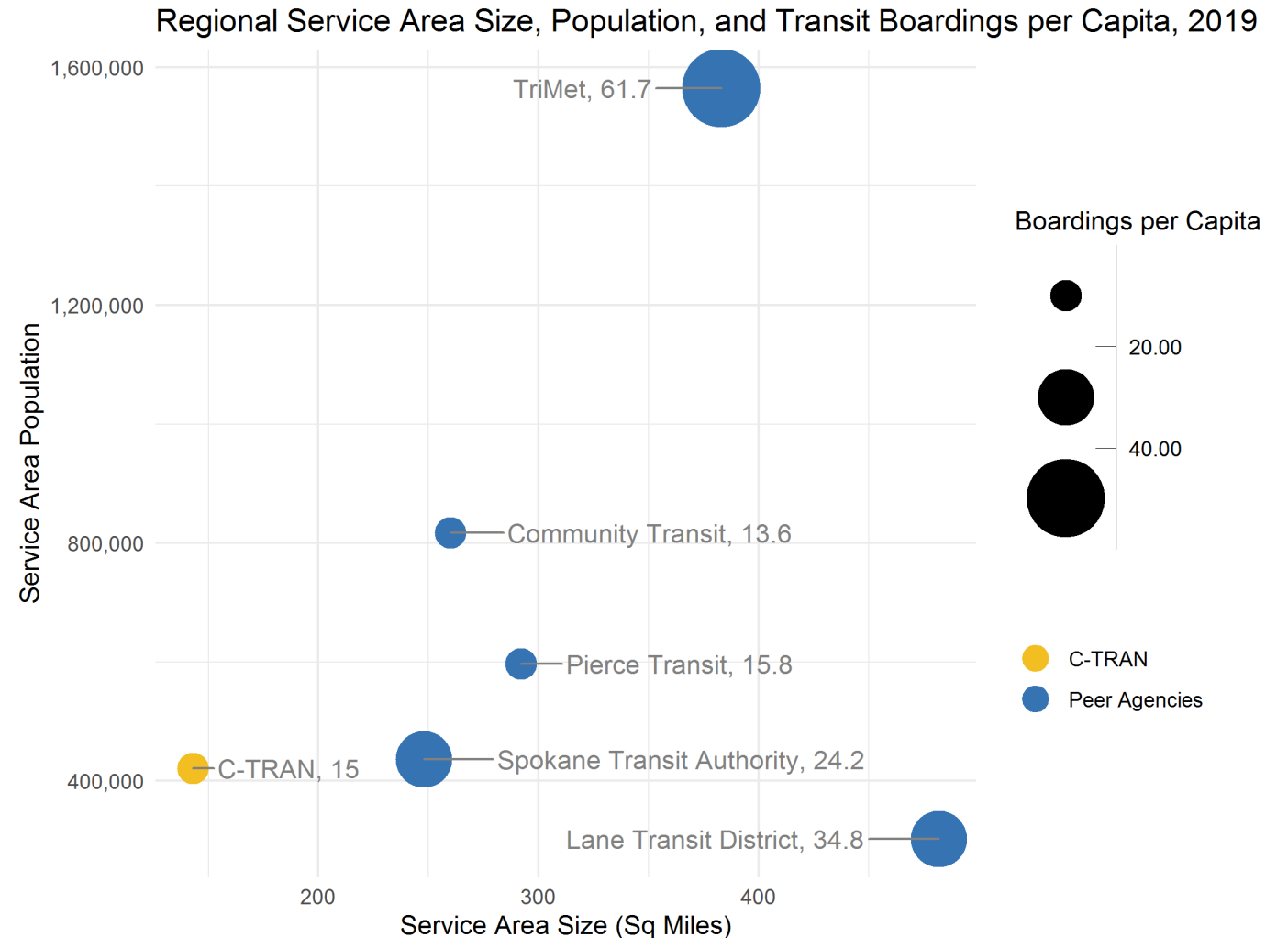
Transit Ridership and Population Served

- In 2019, C-TRAN carried 20,800 average weekday boardings
- 38% of the population in Vancouver's Urban Growth Area (UGA) lives within ½ mile of service with 15-minute peak frequencies
- 76% of the UGA population lives within ½ mile of service with 30-minute peak frequencies



How do C-TRAN Boardings Per Capita Compare to other Agencies?

- In 2019, there were nearly 6 million boardings on C-TRAN's fixed-route services (in which buses follow a set path and schedule)
- Boardings per capita is one way of understanding how much bus service is consumed by the 421,000 people who live in the C-TRAN service area
- Compared to similar agencies in the region, C-TRAN is on the low end of boardings per capita, but is comparable to Pierce Transit, which serves Tacoma



Highest Ridership Loss

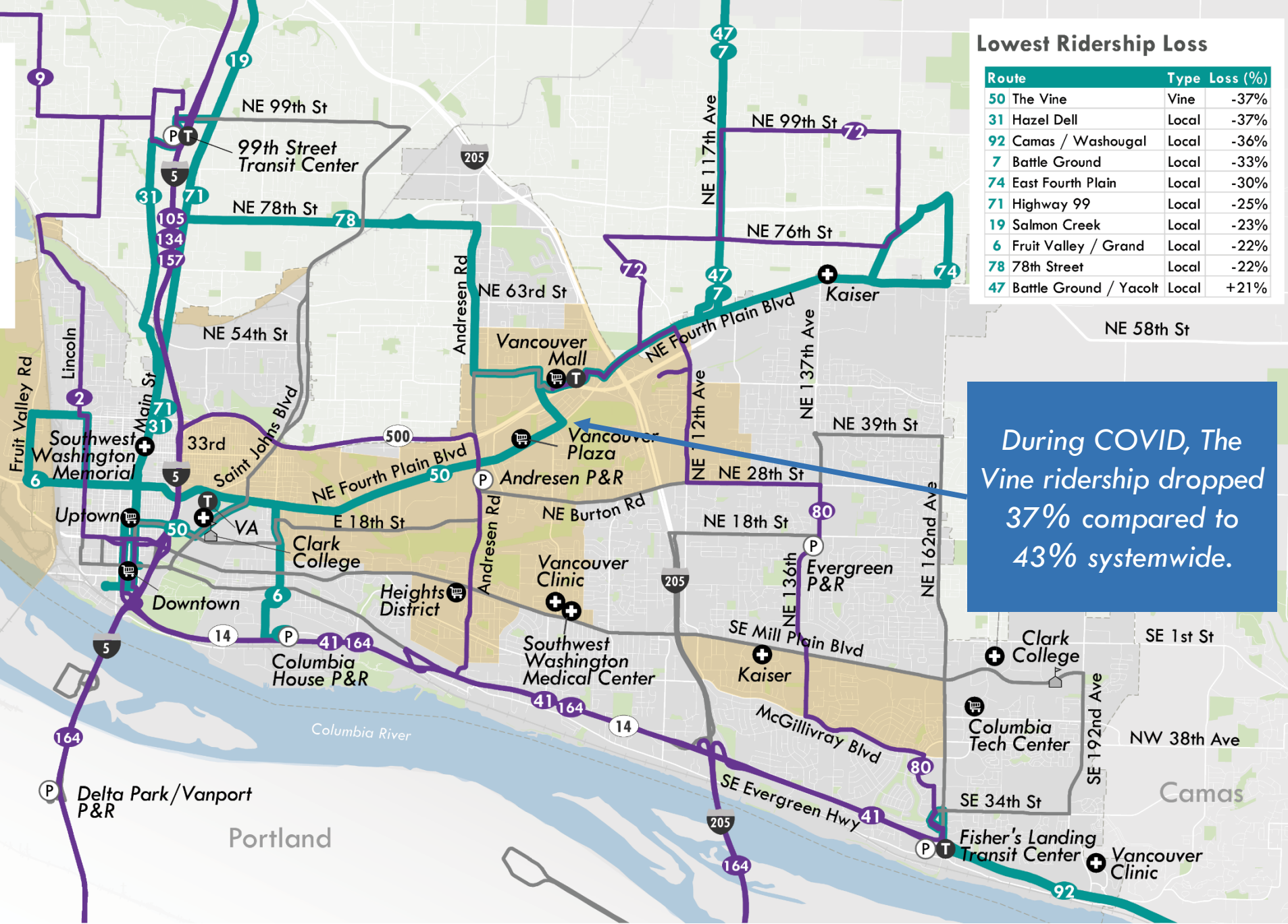
Route	Type	Loss (%)
164 Fisher's Landing Express	Express	-89%
157 Lloyd District Express	Express	-88%
134 Salmon Creek Express	Express	-79%
190 Marquam Hill Express	Express	-71%
105 I-5 Express	Express	-67%
41 SR 14	Local	-57%
2 Lincoln	Local	-55%
72 Orchards	Local	-54%
9 Felida	Local	-50%
80 Van Mall / Fisher's	Local	-48%

Lowest Ridership Loss

Route	Type	Loss (%)
50 The Vine	Vine	-37%
31 Hazel Dell	Local	-37%
92 Camas / Washougal	Local	-36%
7 Battle Ground	Local	-33%
74 East Fourth Plain	Local	-30%
71 Highway 99	Local	-25%
19 Salmon Creek	Local	-23%
6 Fruit Valley / Grand	Local	-22%
78 78th Street	Local	-22%
47 Battle Ground / Yacolt	Local	+21%

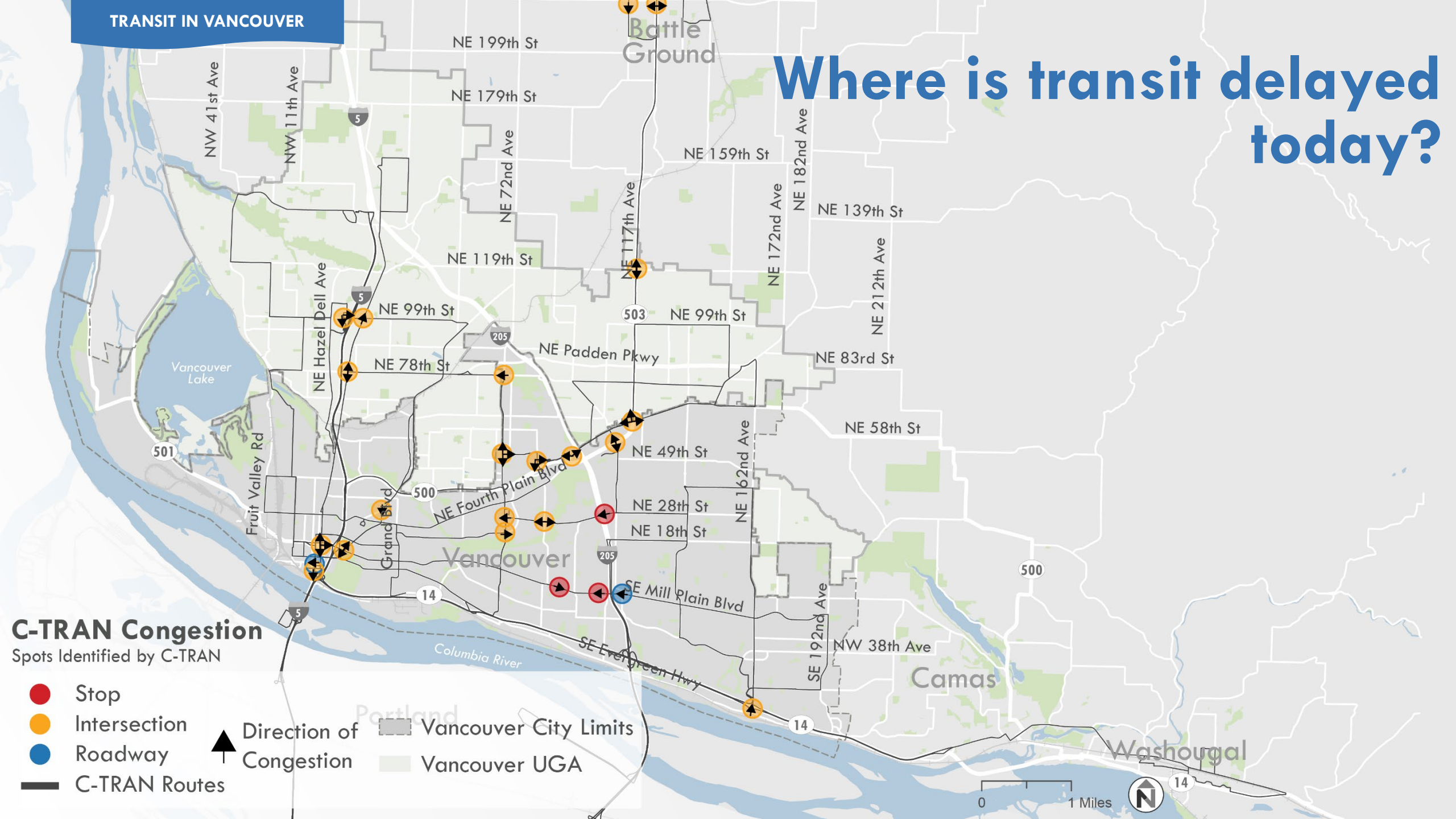
Change in Ridership June 2019 - June 2020

- Highest Ridership Loss
- Lowest Ridership Loss
- Other Routes
- T** Transit Center
- P** Park and Ride
- Equity Focus Area
- Vancouver City Limits
- Vancouver UGA



During COVID, The Vine ridership dropped 37% compared to 43% systemwide.

Where is transit delayed today?



C-TRAN Congestion

Spots Identified by C-TRAN

- Stop
- Intersection
- Roadway
- C-TRAN Routes

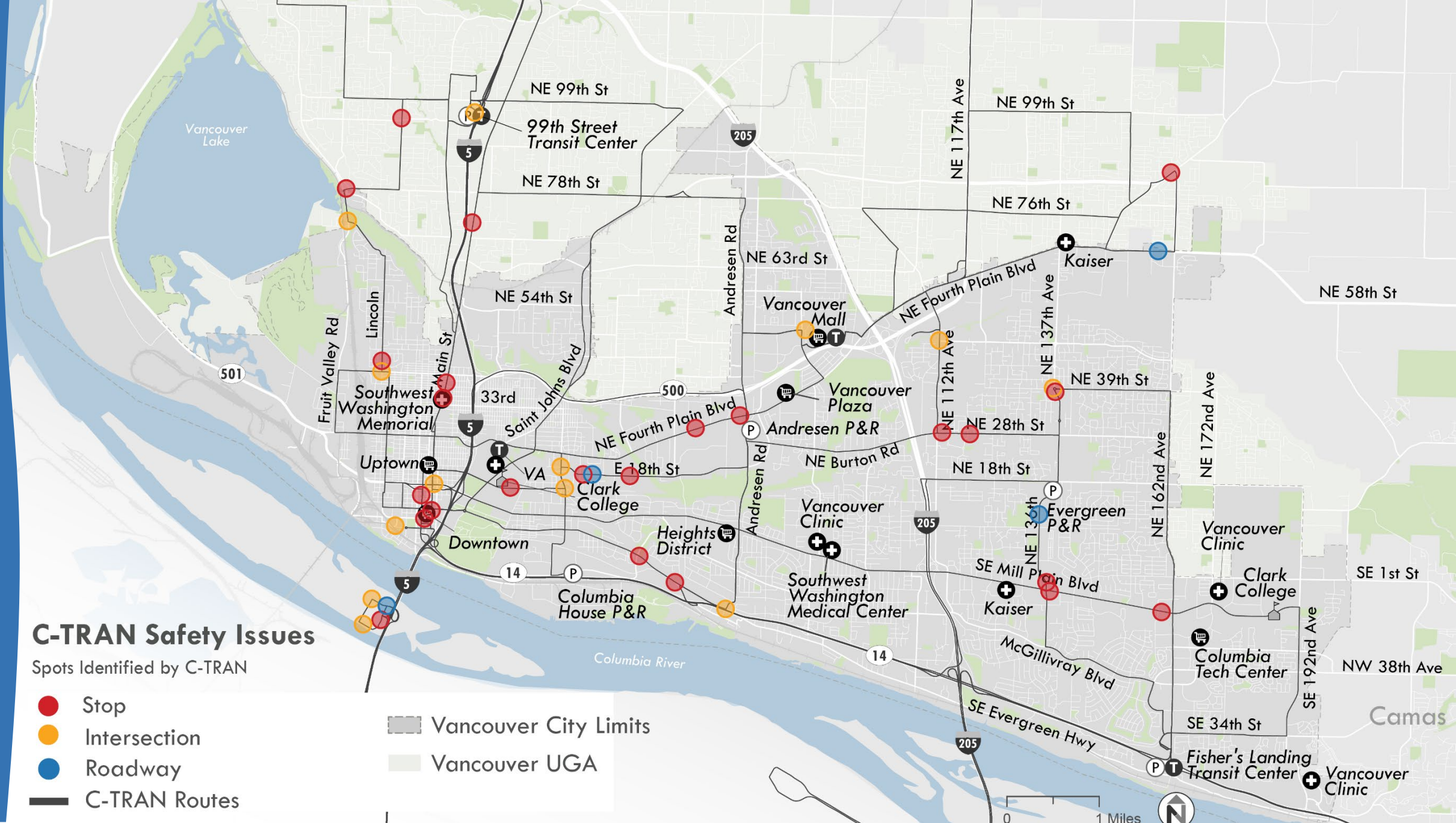
▲ Direction of Congestion

▭ Vancouver City Limits
▭ Vancouver UGA



Safety Issues in the Field

- C-TRAN operators identified safety issues such as:
 - Challenging turns and lane changes
 - Bus zones that are too small, too close to driveways, and/or frequently subject to parking violations
 - In-lane timepoints
 - Poor pavement quality
 - Lack of safe pedestrian access
 - Inadequate bike facilities



C-TRAN Safety Issues

Spots Identified by C-TRAN

- Stop
- Intersection
- Roadway
- C-TRAN Routes

- ▭ Vancouver City Limits
- ▭ Vancouver UGA

Getting to Transit

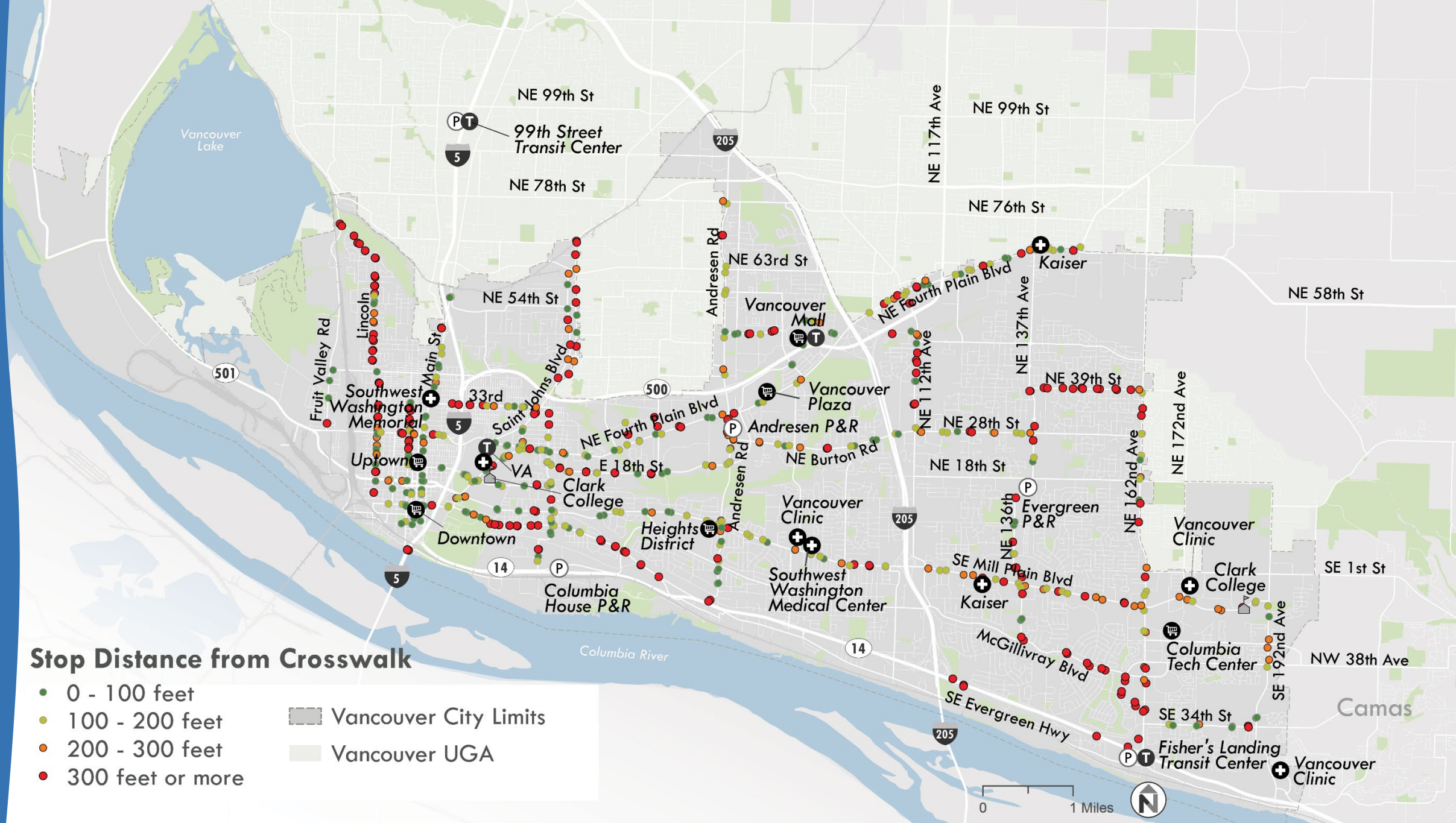
- All transit trips start and end with a walk, roll or bike ride.
- Vancouver's Pedestrian Crossing Improvement Policy specifies that locations that are frequented by pedestrians, including transit facilities, should be considered for marked crossings.
 - The policy does not provide guidance as to how far crossings should be from stops, and the City does not have a program or policy that specifically prioritizes crossings near transit stops

291 bus stops (49% of all stops in the City of Vancouver) are more than 200 feet from a marked crosswalk

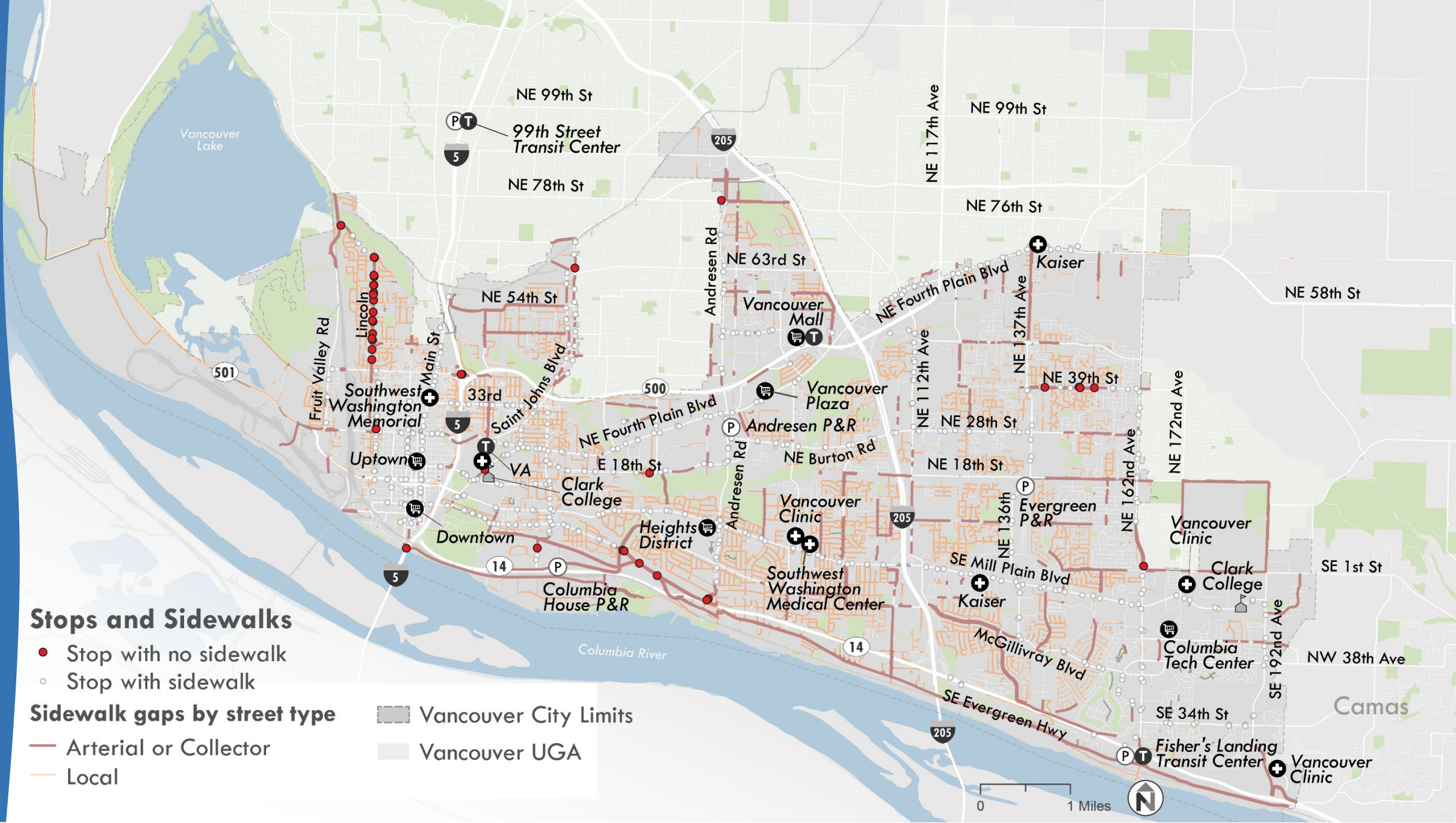
39 stops (7% of all stops in the City of Vancouver) are on a block with no sidewalk

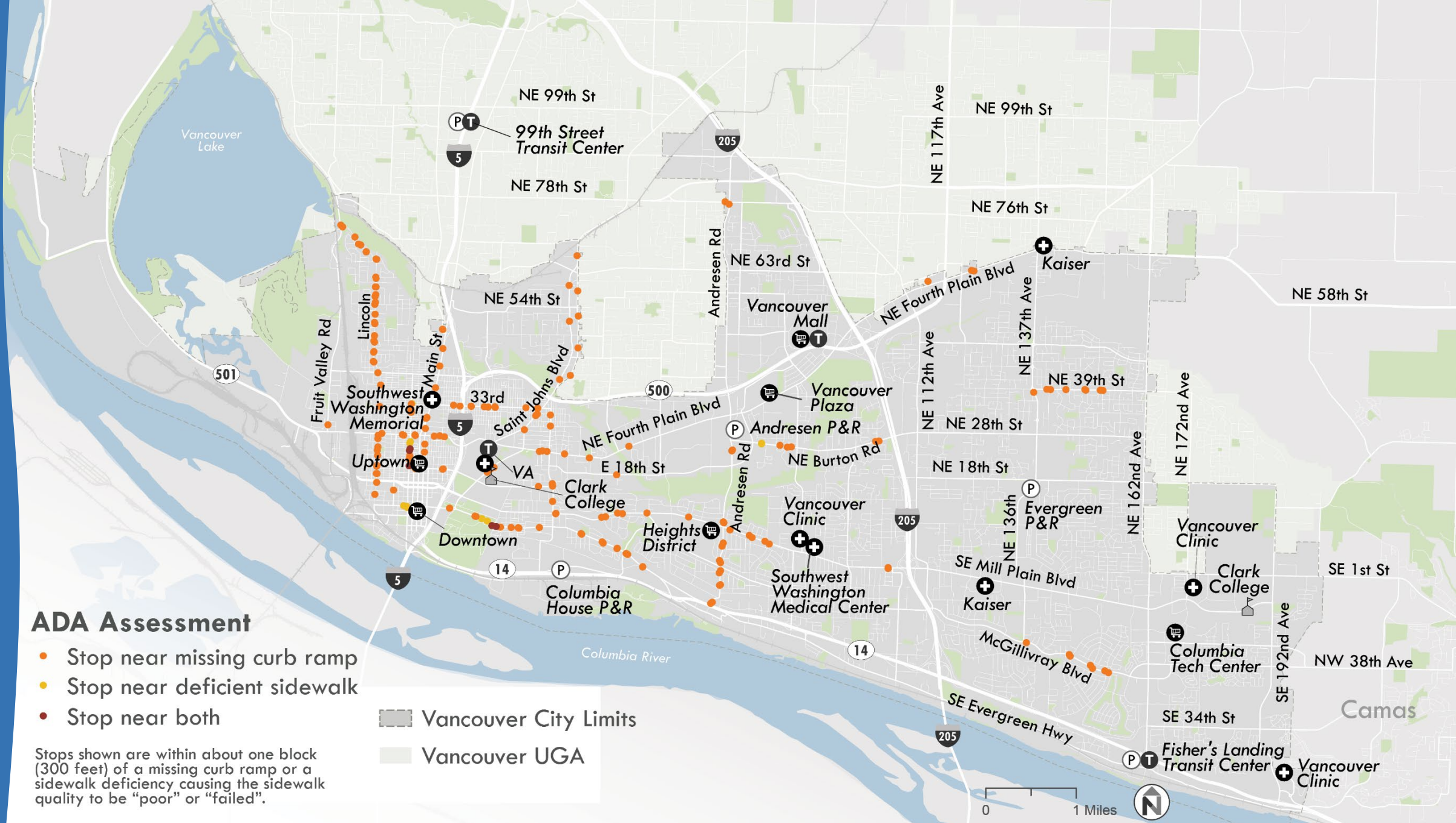
201 stops (34% of stops in Vancouver) are within a block of a missing curb ramp or a sidewalk in poor condition

Transit Stop Distance from a Marked Crossing



Transit Stops Without Sidewalks





ADA Assessment

- Stop near missing curb ramp
- Stop near deficient sidewalk
- Stop near both

Vancouver City Limits
 Vancouver UGA

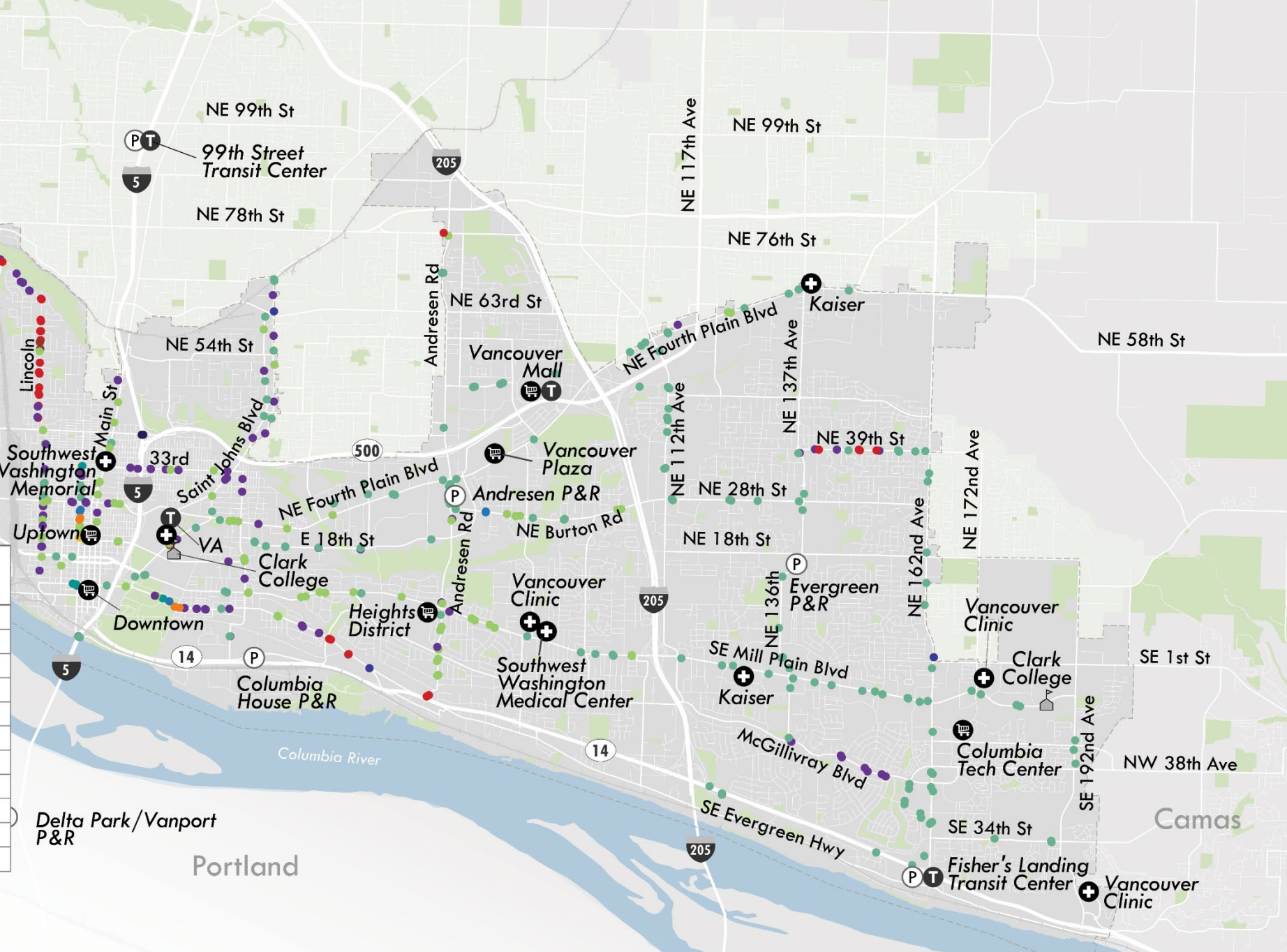
Stops shown are within about one block (300 feet) of a missing curb ramp or a sidewalk deficiency causing the sidewalk quality to be "poor" or "failed".

Stop Access Summary

Bus Stop Access Summary

Bus Stop	Distance to Marked Crossing	Curb Ramp*	Sidewalk Condition*
●	> 200 ft		
●		Missing	Deficient
●			Not present
●		Missing	Deficient
●		Missing	Not present
●	> 200 ft		Deficient
●	> 200 ft		Not present
●	> 200 ft	Missing	
●	> 200 ft	Missing	Deficient
●	> 200 ft	Missing	Not present

* Evaluated within 300 feet of stops



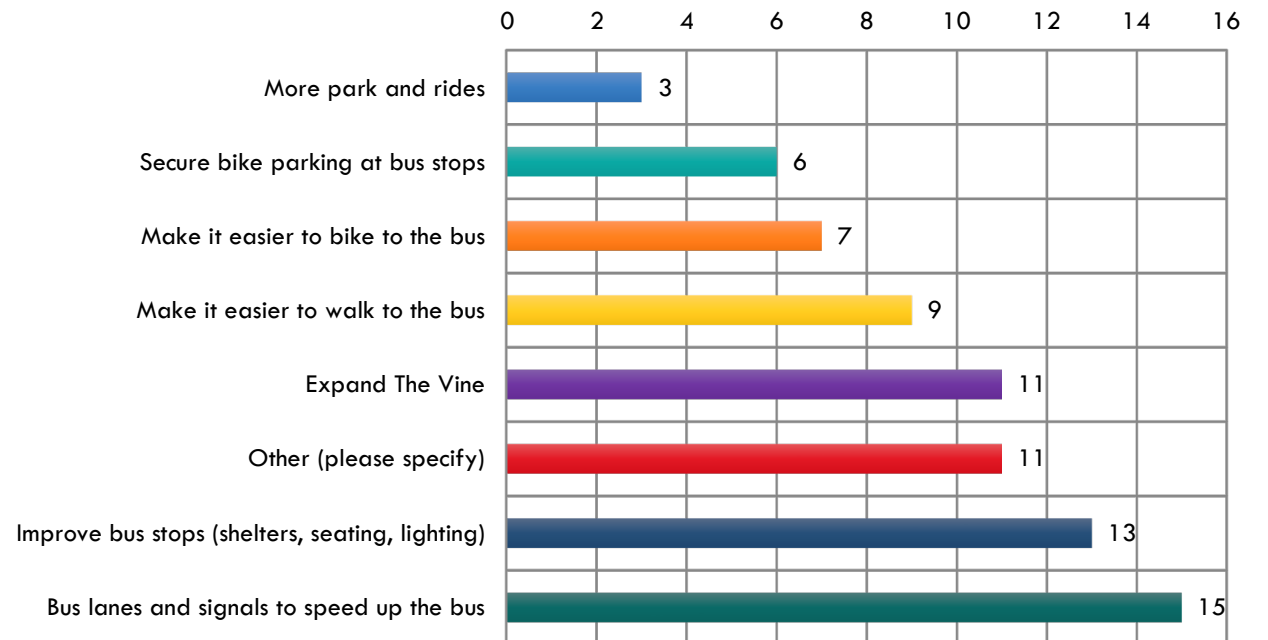
The Public's Transit Priorities

Comments about transit gathered during Vancouver Moves outreach are focused on a few key themes. People want:

- Increased frequency
- Longer hours of service
- Expanded commuter service
- More routes/expanded coverage

The Vancouver Moves Online Open House asked about top priorities for the transit system

What are your top priorities for improving the City's transit system?



3

The Enhanced Transit Network

The Enhanced Transit Network

This section describes:

- The process for identifying the enhanced transit network
 - Criteria and data used to select routes
- The proposed enhanced transit network

How was the Proposed Enhanced Transit Network Identified?

The analysis looks at four main elements:

Equity

- COVID ridership
- Equity Index areas

Regional Growth

- Population and Employment projections

Local Growth Priorities

- Centers identified in the Vancouver Comprehensive Plan

Congestion

- Where buses are delayed

Enhanced Transit Network

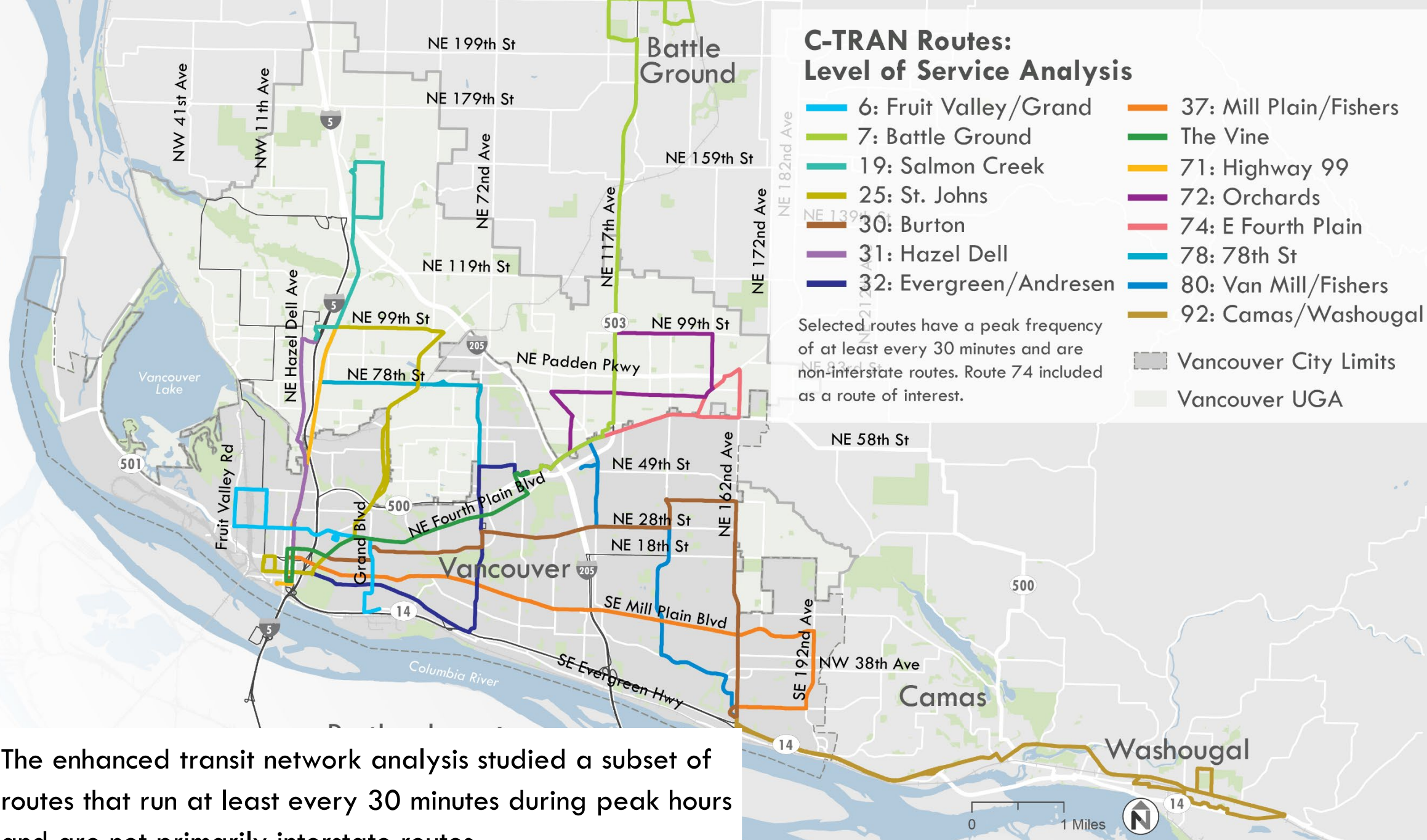
To identify a potential Enhanced Transit network, we started with a subset of C-TRAN routes that meet these criteria:

- Peak Frequency at least every 30 min
- Non interstate routes
- Routes of special interest*

Qualifying Routes

- 6: Fruit Valley/Grand
- 7: Battle Ground
- 19: Salmon Creek
- 25: St. John's
- 30: Burton
- 31: Hazel Dell
- 32: Evergreen/Andresen
- 37: Mill Plain/Fisher's
- The Vine
- 71: Highway 99
- 72: Orchards
- 74: East Fourth Plain
- 78: 78th Street
- 80: Van Mall/Fisher's
- 92: Camas/Washougal

*Route 74 is the baseline for what will be a future expansion of The Vine. Currently operating at a 60 minute headway.



The enhanced transit network analysis studied a subset of routes that run at least every 30 minutes during peak hours and are not primarily interstate routes

Equity

- Additional routes were added to the analysis based on equity considerations
- Equity Index areas are census tracts where a high proportion of residents are economically vulnerable and likely to rely on transit
 - These places might not see the highest ridership, but they do see the greatest need for transit service
- The COVID-19 pandemic helped reveal where people rely on transit the most, as people were asked to limit themselves to essential trips

During the first few months of the pandemic in 2020, C-TRAN ridership fell 43% compared to 2019

But many routes, particularly those that serve Equity Index areas and regional destinations, saw a less severe dip in ridership than the average

On other routes, overall ridership was down but the stops that serve Equity Index areas continued to see relatively steady boardings

Routes and Stops with Low Ridership Loss

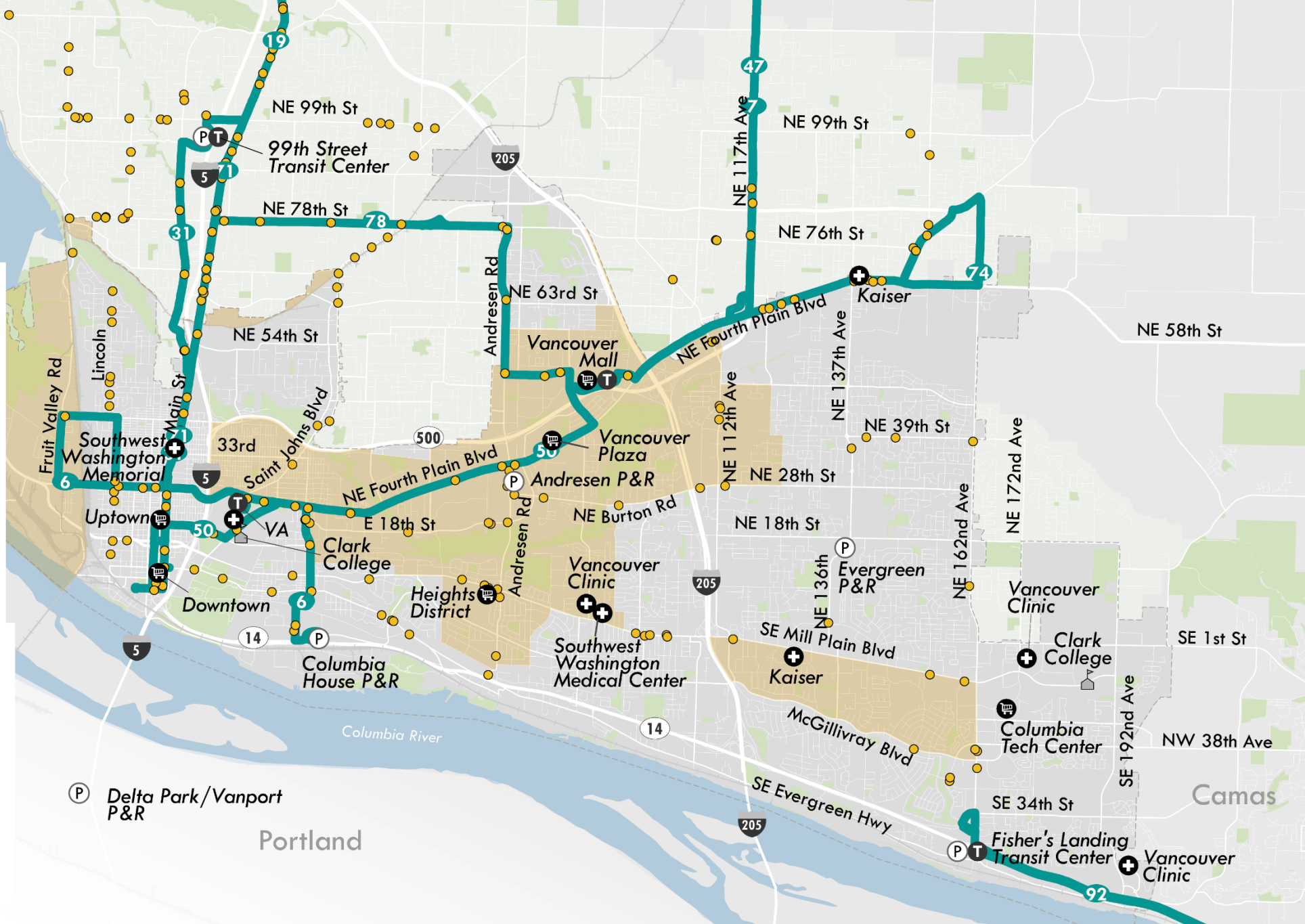
Essential Transit Trips

- Stop with least ridership loss (bottom 25%)*
- Route with least ridership loss (below average)*
- T** Transit Center
- P** Park and Ride
- Equity Focus Area
- Vancouver City Limits
- Vancouver UGA

* Percent loss of boardings in June 2020 compared to June 2019

Routes with Lowest Loss

Route	Type	Loss (%)
50 The Vine	Vine	-37%
31 Hazel Dell	Local	-37%
92 Camas / Washougal	Local	-36%
7 Battle Ground	Local	-33%
74 East Fourth Plain	Local	-30%
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6 Fruit Valley / Grand	Local	-22%
78 78th Street	Local	-22%
47 Battle Ground / Yacolt	Local	+21%



Equity Focus Routes

- The equity network includes the routes that saw the least loss in ridership during COVID (“essential” routes) plus an additional four routes that connect to Equity Index areas.
- Except for **Routes 2 and 47**, all routes identified as Equity focus routes were already identified as Enhanced Transit focus routes due to their higher frequency of service.
- Route 2 has a high need for transit access improvements

Essential routes

- 6: Fruit Valley/Grand
- 7: Battle Ground
- 19: Salmon Creek
- 31: Hazel Dell
- **47: Battle Ground/Yacolt**
- The Vine
- 71: Highway 99
- 74: East Fourth Plain
- 78: 78th Street
- 92: Camas/Washougal

Connections to Equity Index areas

- **2: Lincoln**
- 32: Evergreen/Andreson
- 37: Mill Plain/Fishers
- 30: Burton

Regional Growth

1

Calculate density of households and jobs at the TAZ level for current (2015)*

2

Calculate density of households and jobs at the TAZ level for projections (2040)

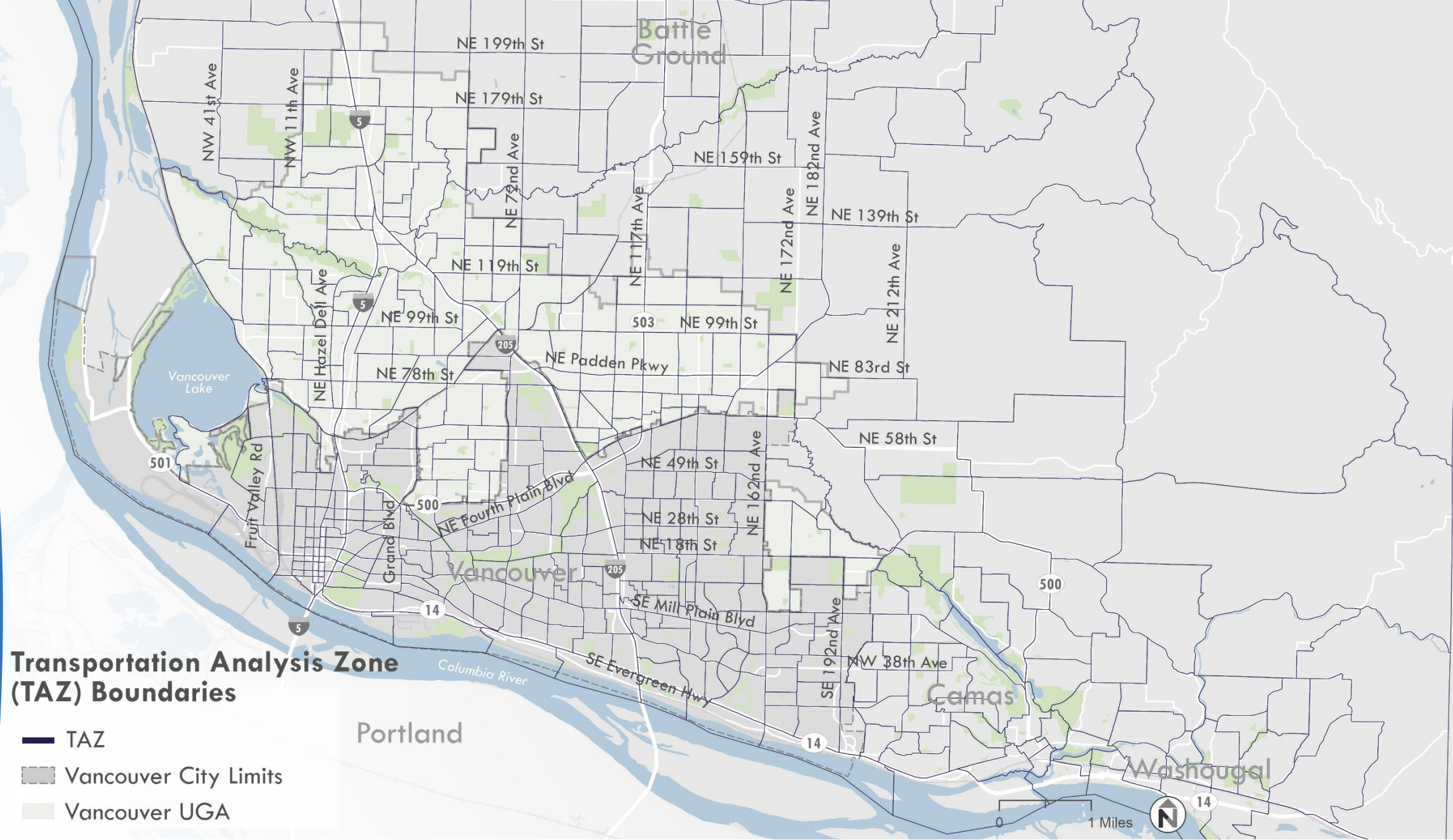
3

Evaluate growth based on C-TRAN service standards

4

Find areas that will require an increase in level of service in 2040

*TAZ data sourced from the SW Regional Transportation Council. 2040 projections were supplemented to include the Vancouver Innovation Center development located on SE 34th Street.



Transportation Analysis Zone (TAZ) Boundaries

- TAZ
- Vancouver City Limits
- Vancouver UGA

C-TRAN Existing Service Standards

- Existing level of service standards for C-TRAN are based on both residential and employment densities.
- Vancouver's residential densities range from less than one dwelling unit per acre to 33 units per acre. Employment density ranges from 0 to 105 employees per acre.
- The densest residential areas cluster around the I-5 and I-205 corridors, Fourth Plain Boulevard, Mill Plain Boulevard, Downtown, and pockets of density in the eastern half of the city
- Employment density is concentrated downtown with a few areas of higher density along Fourth Plain Blvd, Mill Plain Blvd, and Highway 99

C-TRAN Residential Density Standards

Frequency (20-hour service day)	Dwelling Units per Acre
1 bus/hour	4-5
1 bus/30 minutes	7
1 bus/10 minutes	15

C-TRAN Employment Density Standards

Frequency (20-hour service day)	Employees per Acre
1 bus/hour	50-80
1 bus/30 minutes	80-200
1 bus/10 minutes	200-500

Household Density: 2015

Household Density 2015

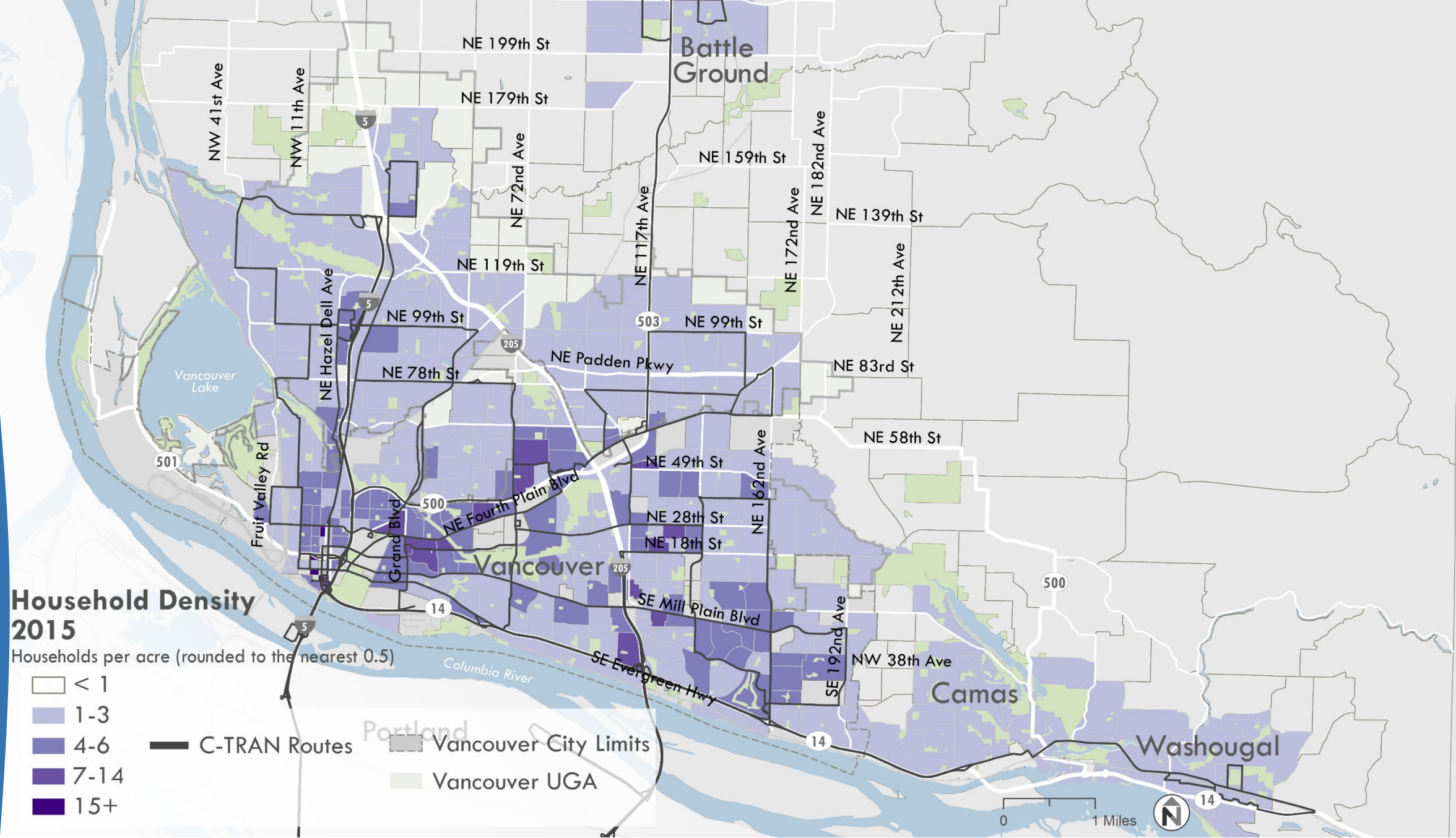
Households per acre (rounded to the nearest 0.5)

- < 1
- 1-3
- 4-6
- 7-14
- 15+

— C-TRAN Routes

▭ Vancouver City Limits

▭ Vancouver UGA



Household Density: 2040

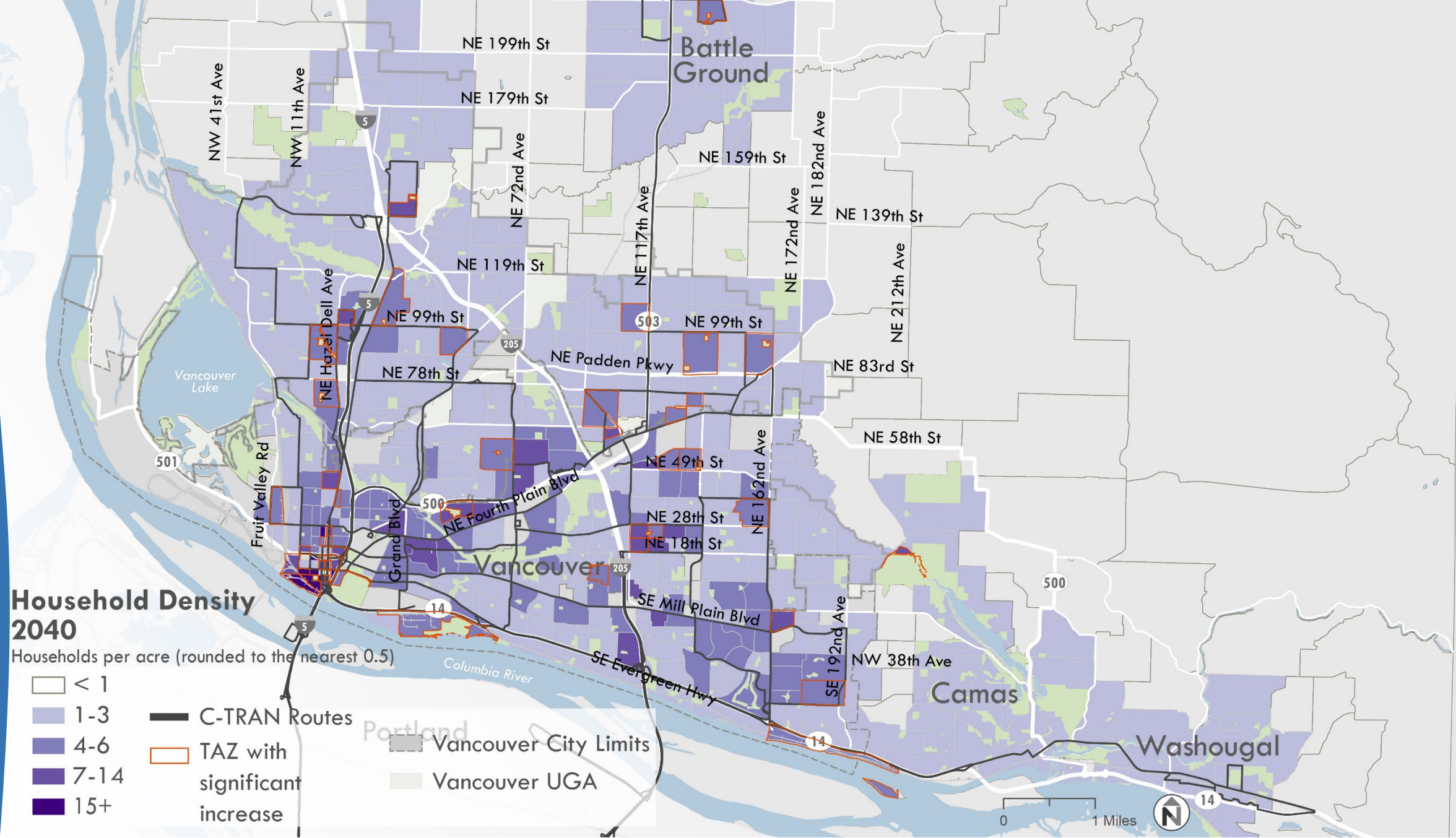
Household Density 2040

Households per acre (rounded to the nearest 0.5)

- < 1
- 1-3
- 4-6
- 7-14
- 15+

- C-TRAN Routes
- TAZ with significant increase

- Vancouver City Limits
- Vancouver UGA



Employment Density 2015

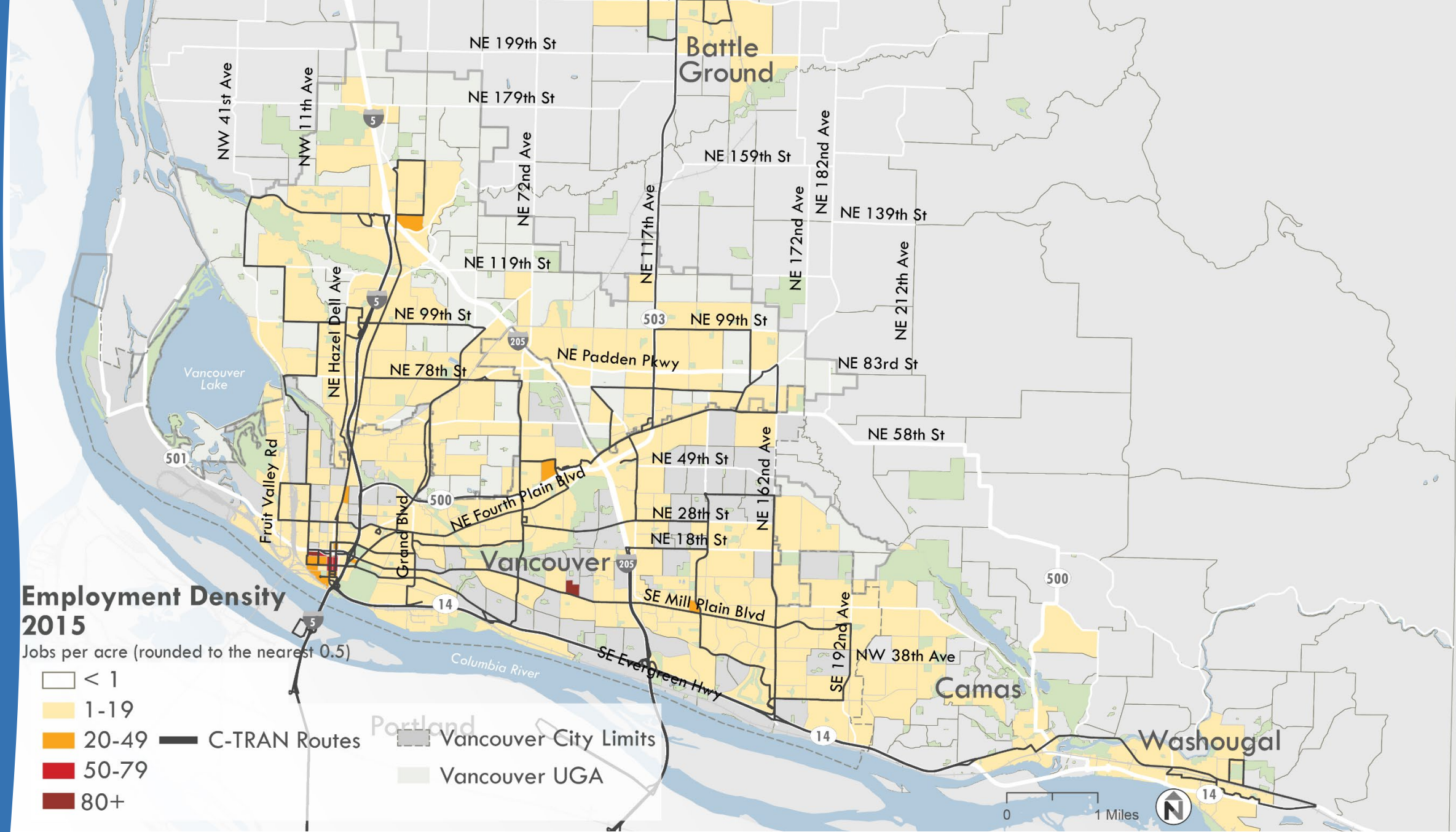
Jobs per acre (rounded to the nearest 0.5)

- < 1
- 1-19
- 20-49
- 50-79
- 80+

— C-TRAN Routes

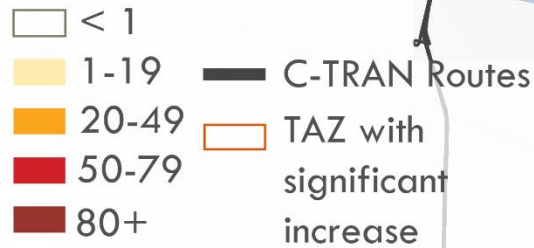
Vancouver City Limits

Vancouver UGA

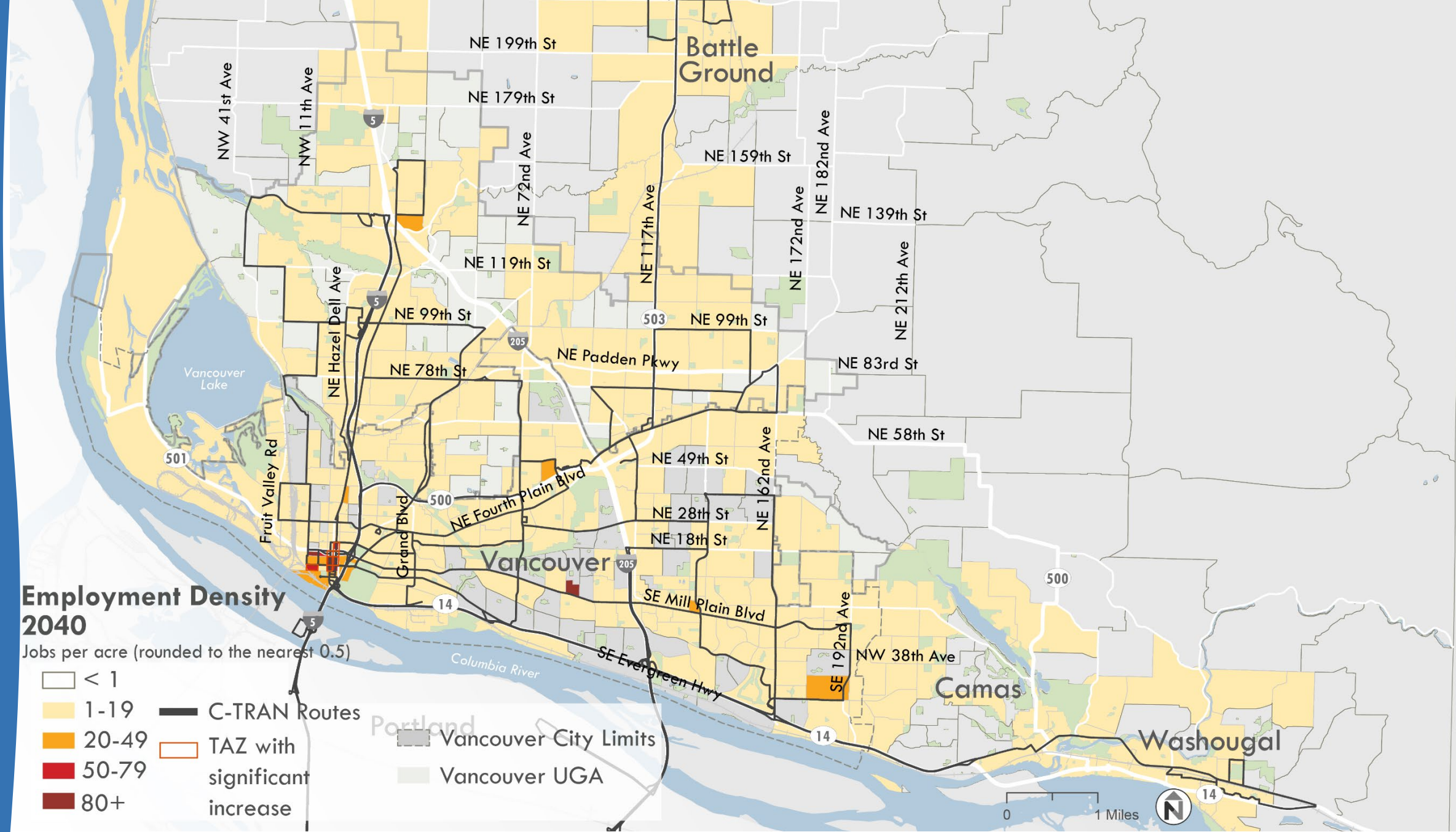


Employment Density 2040

Jobs per acre (rounded to the nearest 0.5)

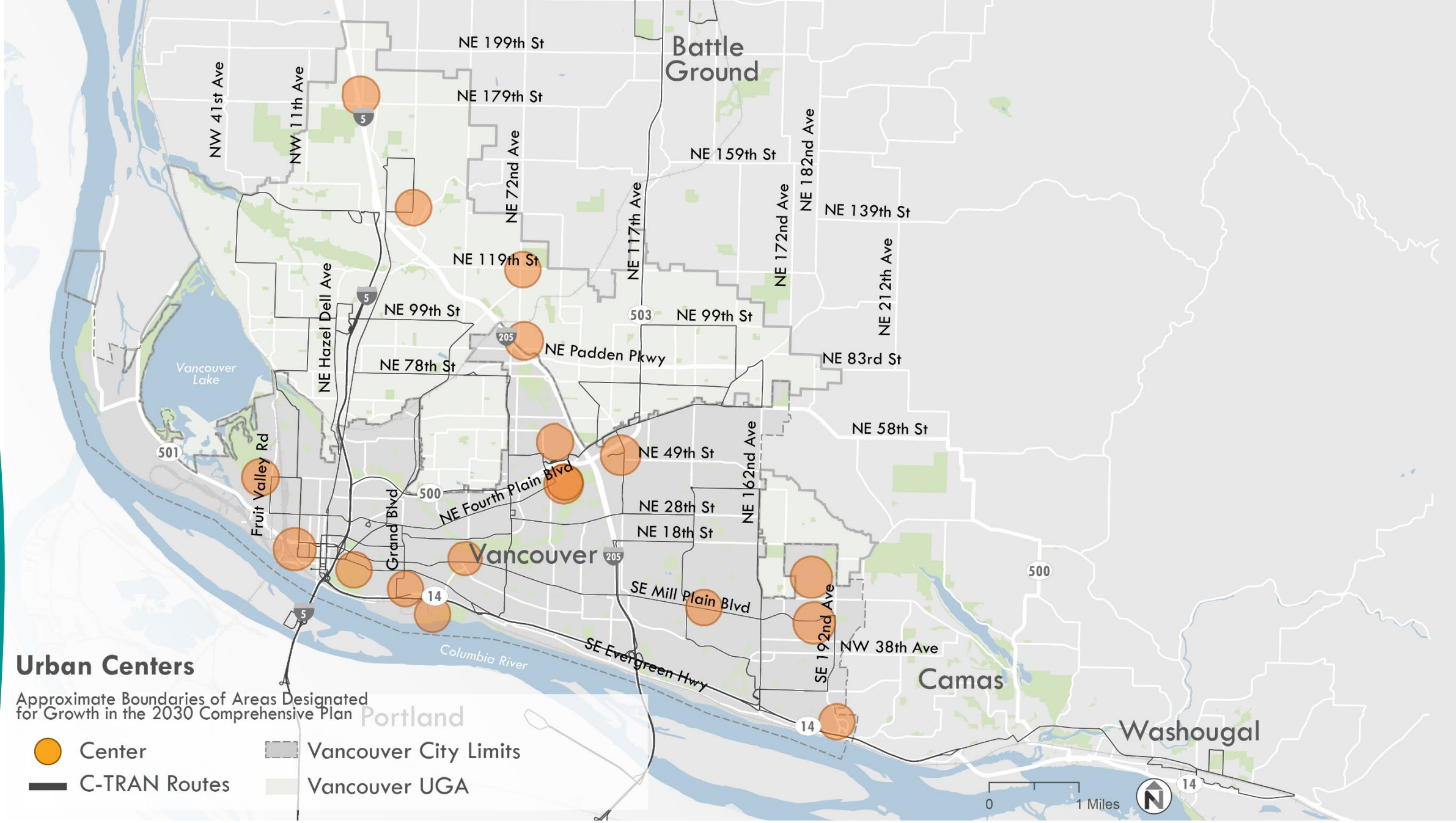


 Vancouver City Limits
 Vancouver UGA



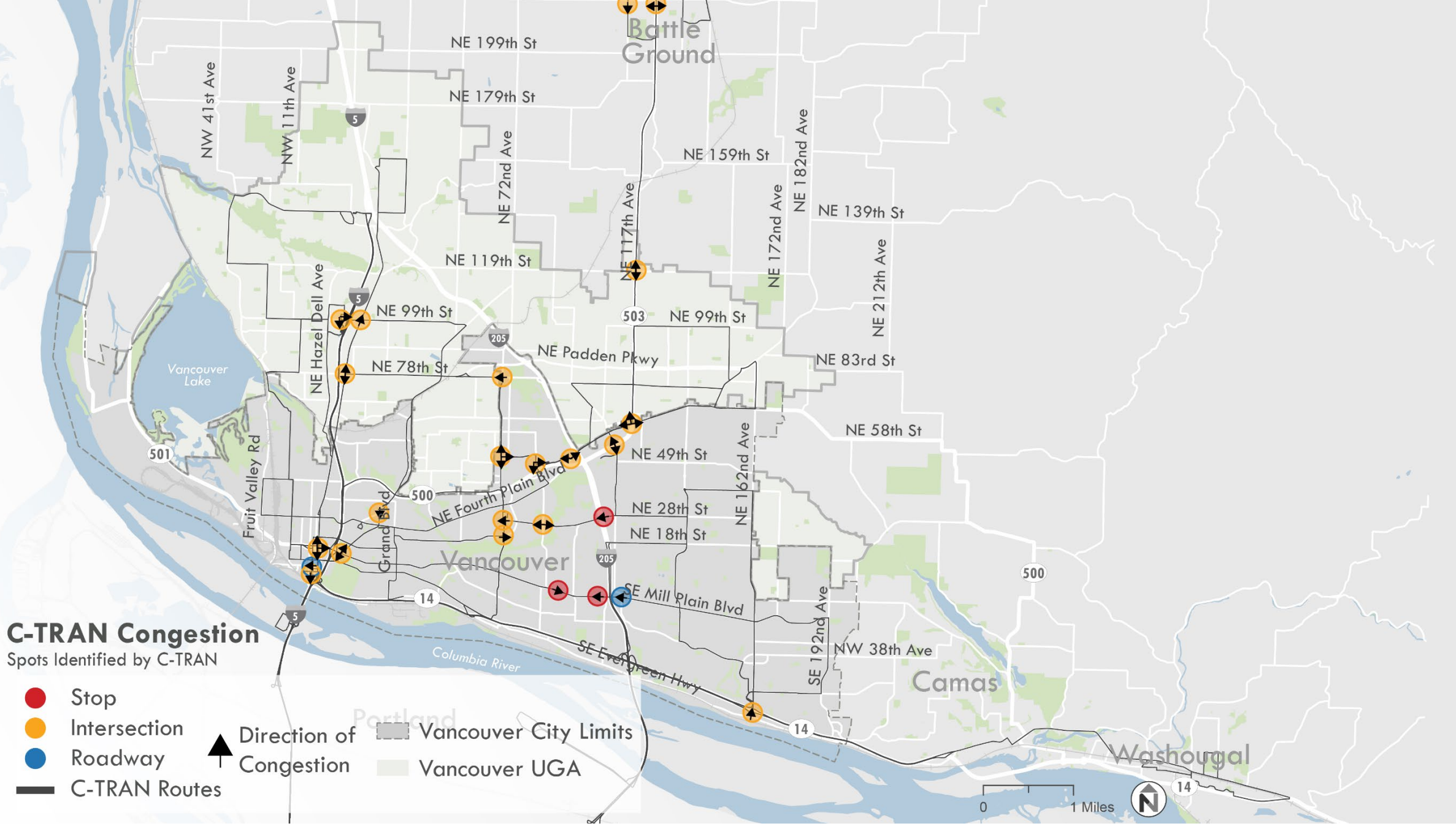
Local Growth Priorities

- To meet Vancouver's climate goals, many trips will need to use non-driving modes
 - Moving travel from driving to transit is key
- Denser development supports more frequent transit service, which in turn leads to higher ridership
- The Comprehensive Plan designates centers with the intent of:
 - Promoting livability and transit-supportive development patterns
 - Making efficient use of available land before greenfield development
 - Directing how future development should occur over the next 20 years
 - Focusing projected growth
- Each urban growth center will undergo, or has already undergone, sub area planning

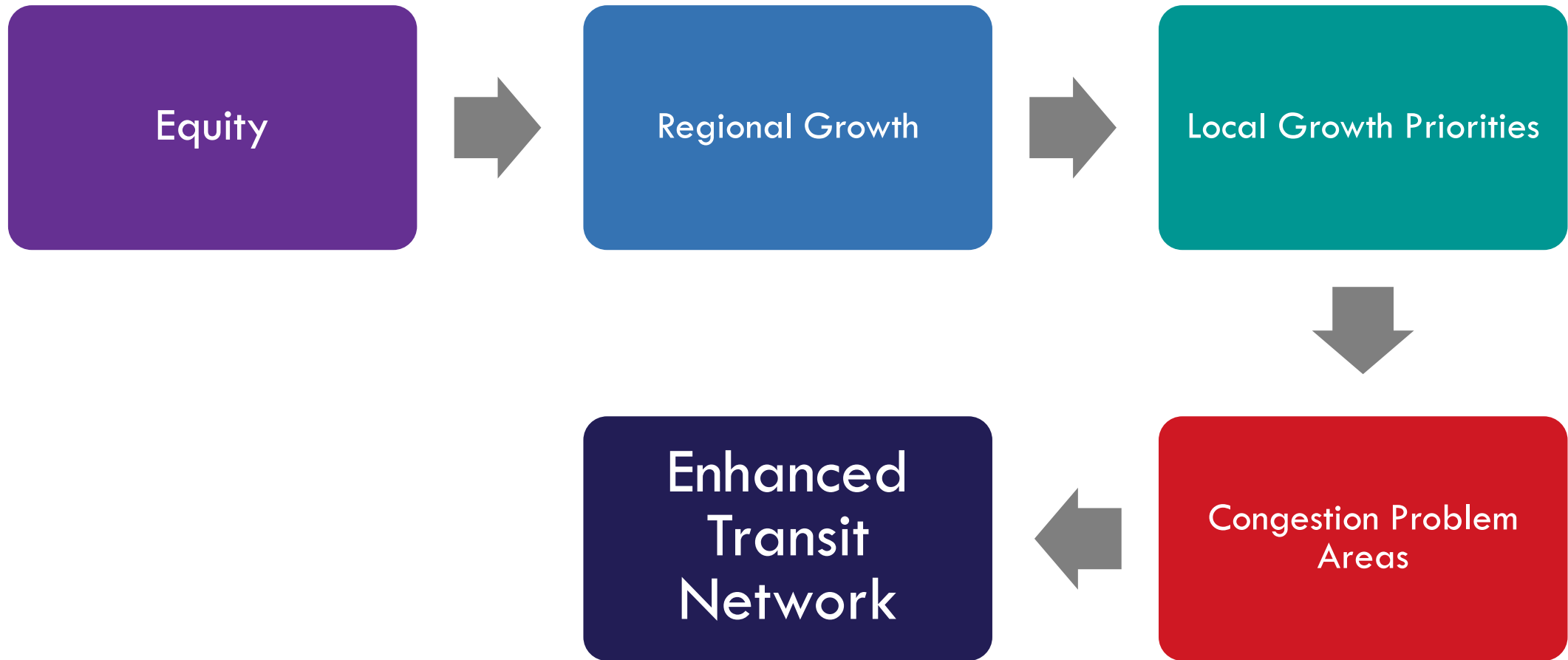


Congestion

- C-TRAN surveyed bus drivers to find out where they regularly encounter congestion that causes bus delay
- Highlighted Issues
 - Signal cycle time and priority vehicle movement
 - Bus pull-out causes delay in PM peak period
 - Intersection congestion
 - Delay caused by congestion on I-5
 - Fishers Landing Transit Center and Vancouver Mall cited as areas of delay



The Enhanced Transit Network

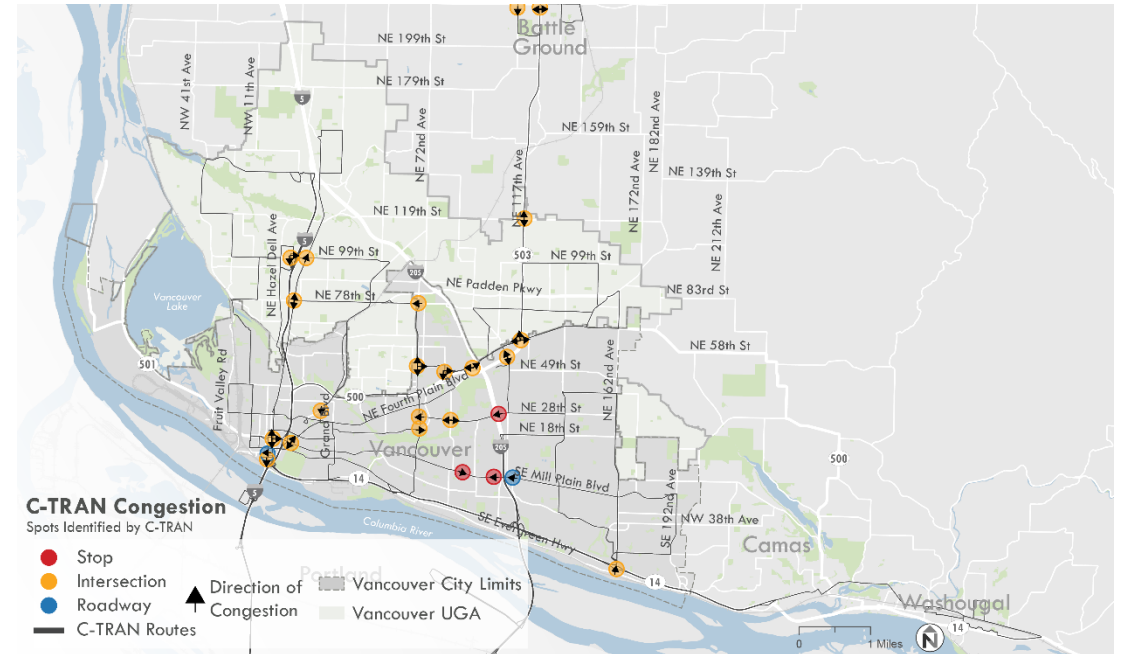
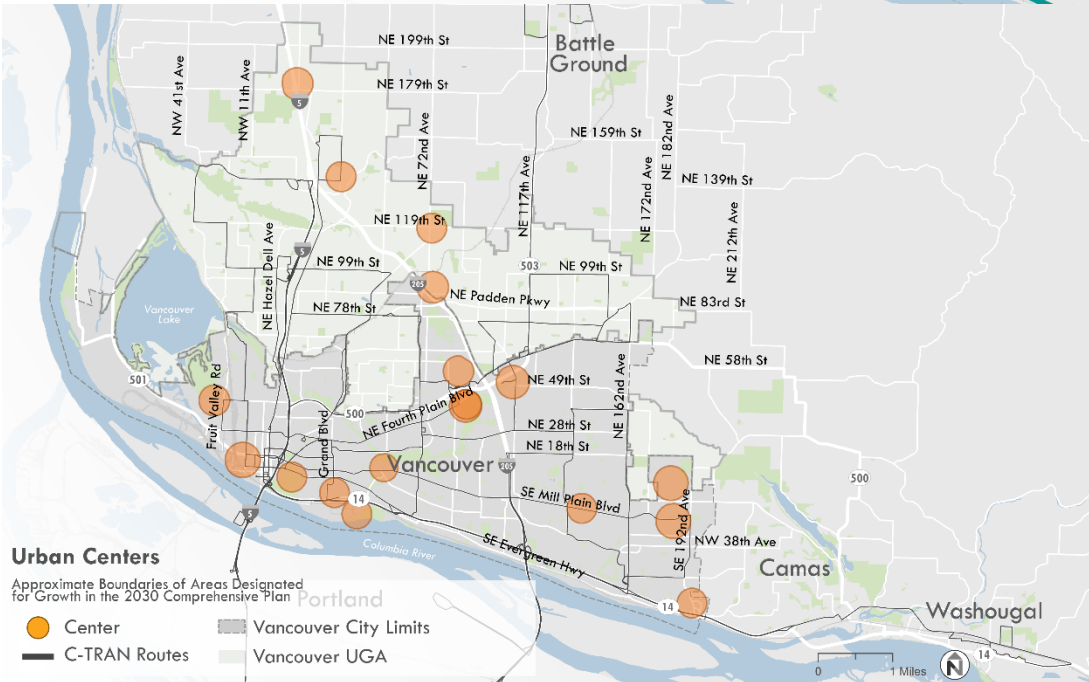
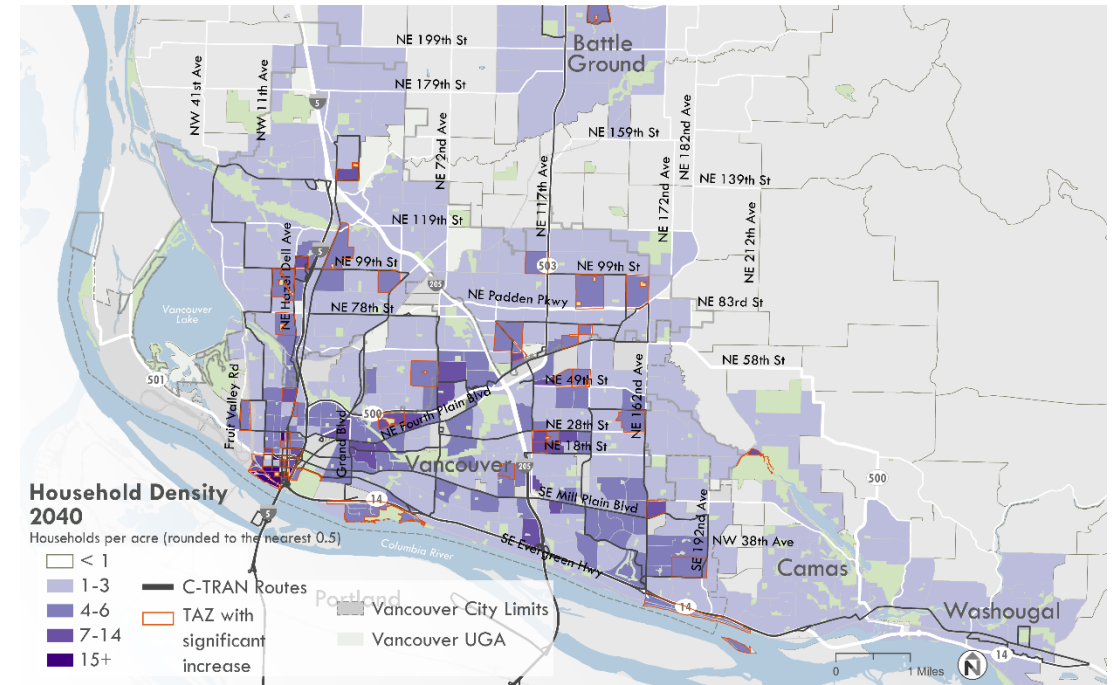
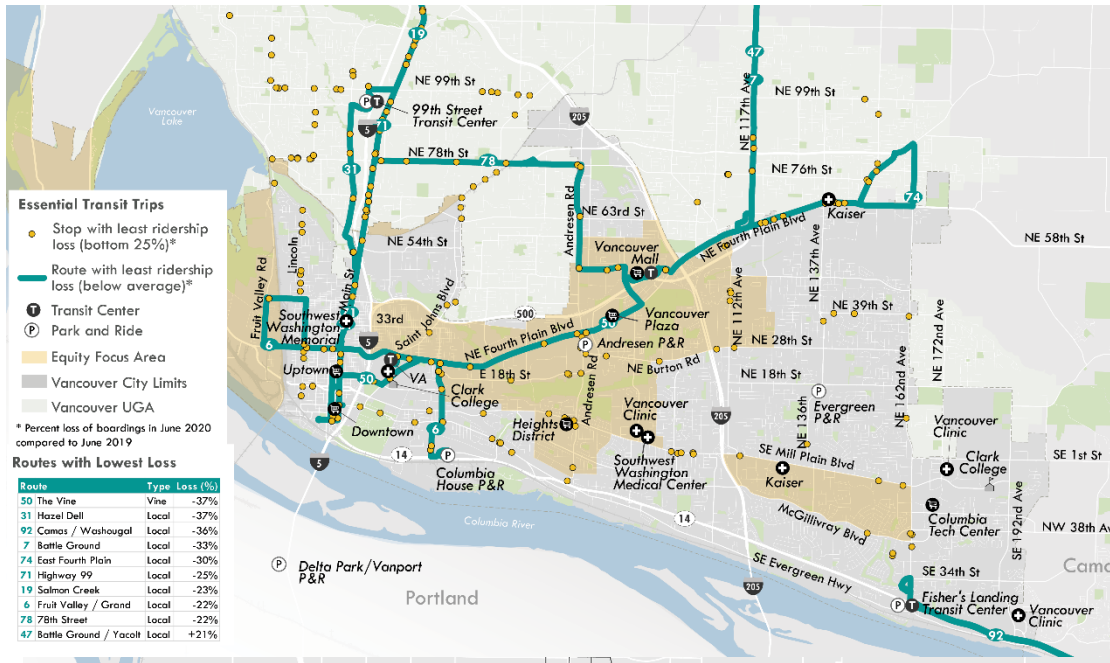


Proposed Enhanced Transit Network

- Enhanced transit corridors serve:
 - One or more existing frequent bus routes
 - Equity Index areas and essential routes
 - Areas where projected growth would require more service
 - Comprehensive plan centers
 - Congestion points
 - Areas of future interest to C-TRAN*
- The network is restricted to streets within the urban growth boundary

*Route 74, NE 162nd Ave, NE 136th Ave, NE 112th Ave, SE 1st Ave

Enhanced Transit Corridor Inputs



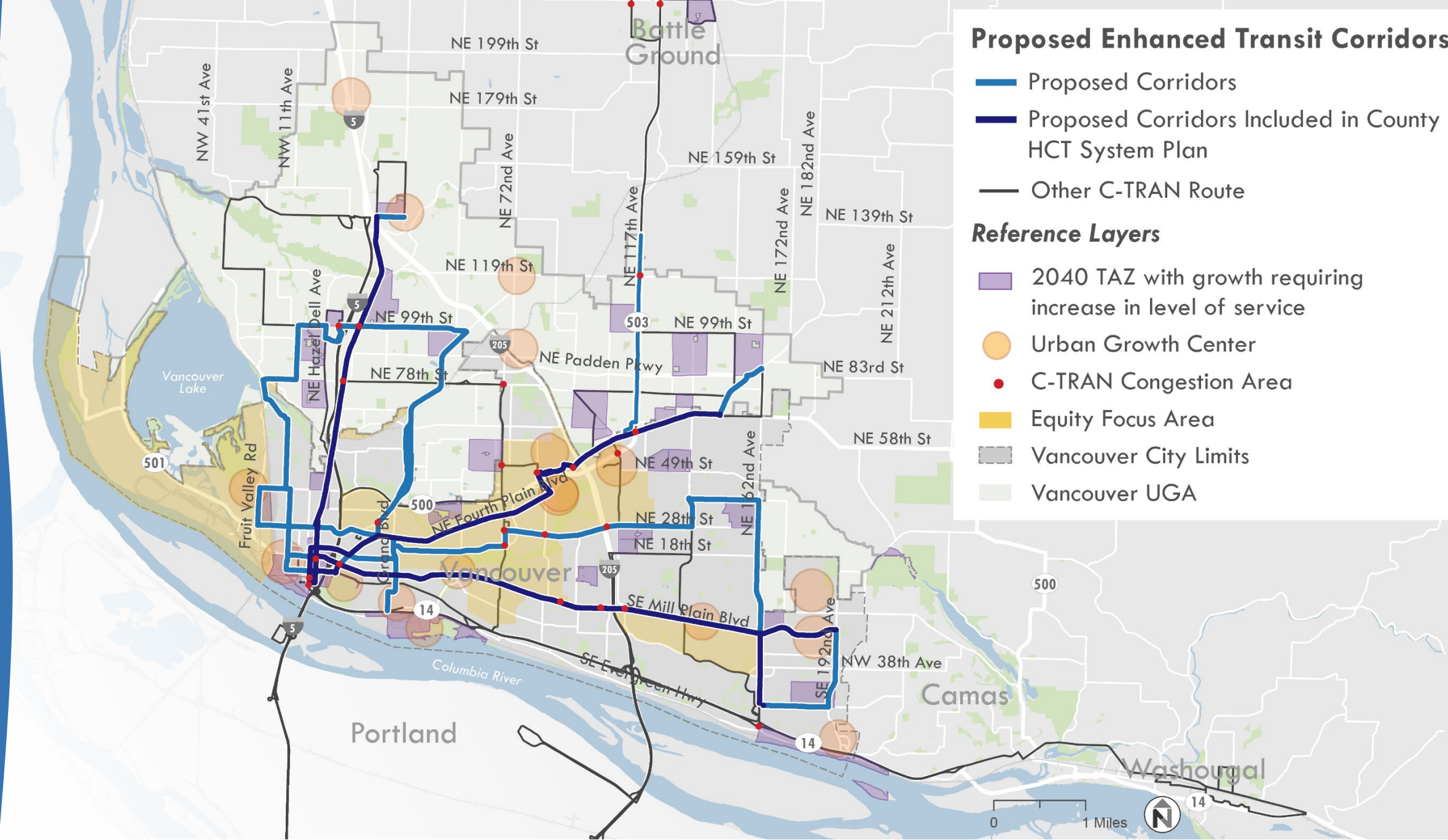
Enhanced Transit Corridors

Proposed Enhanced Transit Corridors

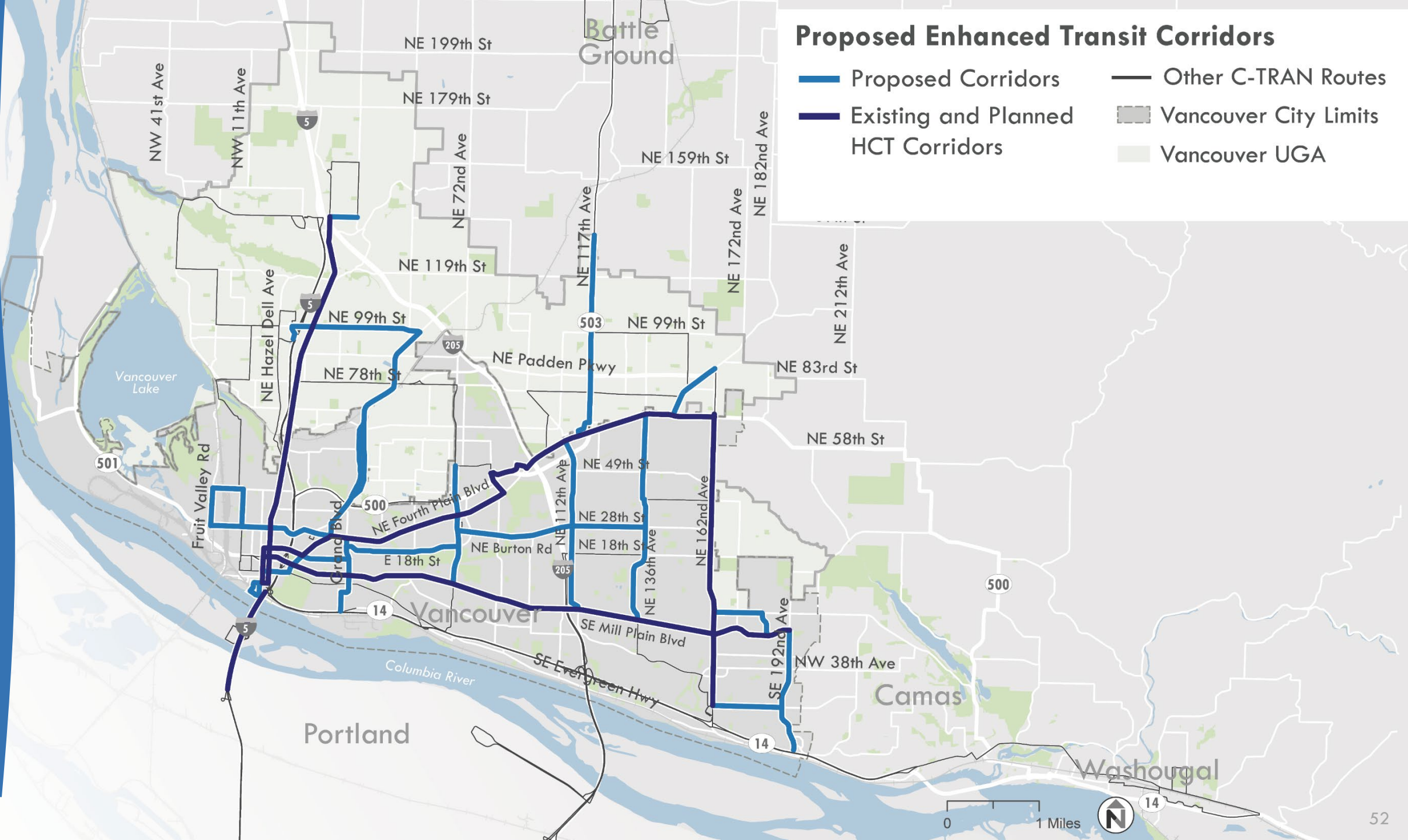
- Proposed Corridors
- Proposed Corridors Included in County HCT System Plan
- Other C-TRAN Route

Reference Layers

- 2040 TAZ with growth requiring increase in level of service
- Urban Growth Center
- C-TRAN Congestion Area
- Equity Focus Area
- Vancouver City Limits
- Vancouver UGA



Enhanced Transit Corridors



Proposed Enhanced Transit Corridors

- Proposed Corridors
- Existing and Planned HCT Corridors
- Other C-TRAN Routes
- Vancouver City Limits
- Vancouver UGA

Conclusion

- The City and C-TRAN should use this list as a starting point
- Corridors within the UGA but outside current City boundaries may be long-term priorities
- Mill Plain is the next Vine corridor; potential future enhancements and timeline should be considered
- Washington, Broadway, and Main reflect future Highway 99 BRT and Interstate Bridge Replacement (IBR) priorities

Proposed Corridors in Vancouver

Mill Plain Blvd

Hwy 99

Washington, Broadway, & Main

Fourth Plain Blvd

Andresen Road

St Johns Blvd

McLoughlin Blvd/18th St/Burton Rd/28th St

The Waterfront

112th Ave

136th Ave

162nd Ave

192nd Ave

4

How Can the City Support Enhanced Transit?

City-Supported Elements of Enhanced Transit

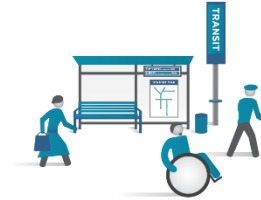
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4

On-demand services (e.g., The Current) and bike share serve first and last mile needs and expand service hours



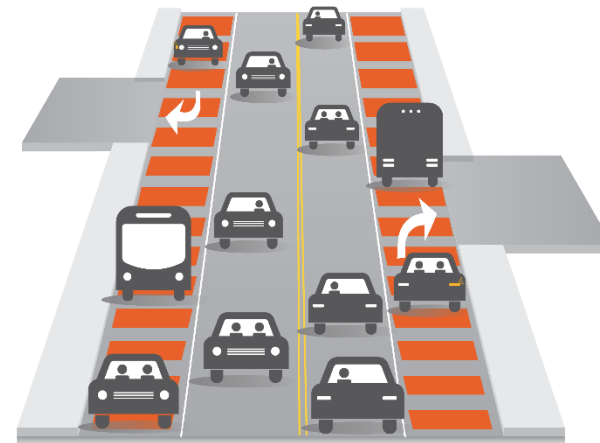
8

Education and outreach improve awareness and understanding of how to use the transit system

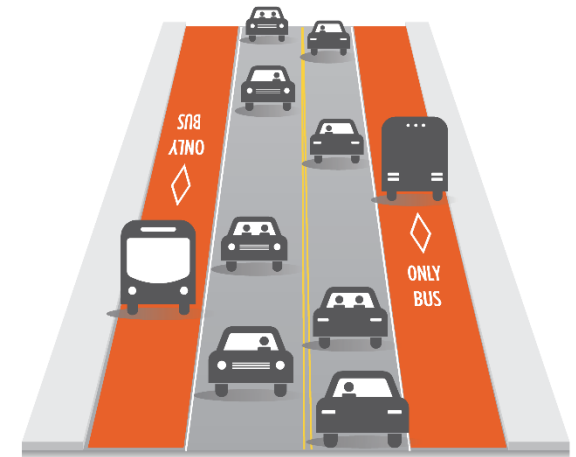


Speed and Reliability Solutions

Solution	Congestion Issue Addressed*
Queue jumps/right turn except bus	<ul style="list-style-type: none"> • Intersection congestion • Signal cycle time and priority vehicle movement
In lane stops	<ul style="list-style-type: none"> • Bus pull-out causes delay in PM peak period
Transit signal priority	<ul style="list-style-type: none"> • Signal cycle time and priority vehicle movement
Bus lanes (exclusive transit or bus + right-turn only)	<ul style="list-style-type: none"> • Intersection congestion • Bus pull-out causes delay in PM peak period



**BUSINESS ACCESS AND
TRANSIT (BAT) LANE**

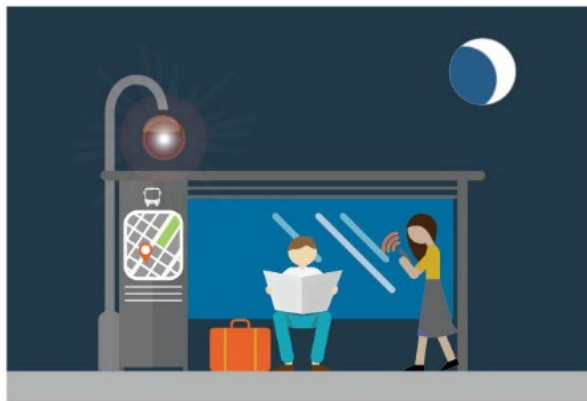


BUS-ONLY LANE

*Common issues cited by C-TRAN drivers

Building a Frequent Service Network

- Frequency is a top priority for riders – it adds convenience and reduces time spent waiting for the bus
- Increased service extending into early morning and evening supports nontraditional work hours and evening and weekend outings
- City can work with C-TRAN to identify priority routes for longer spans and more frequent service



Ability to travel at all times of day



Reduced time waiting



15-minutes or better



30-minutes or better



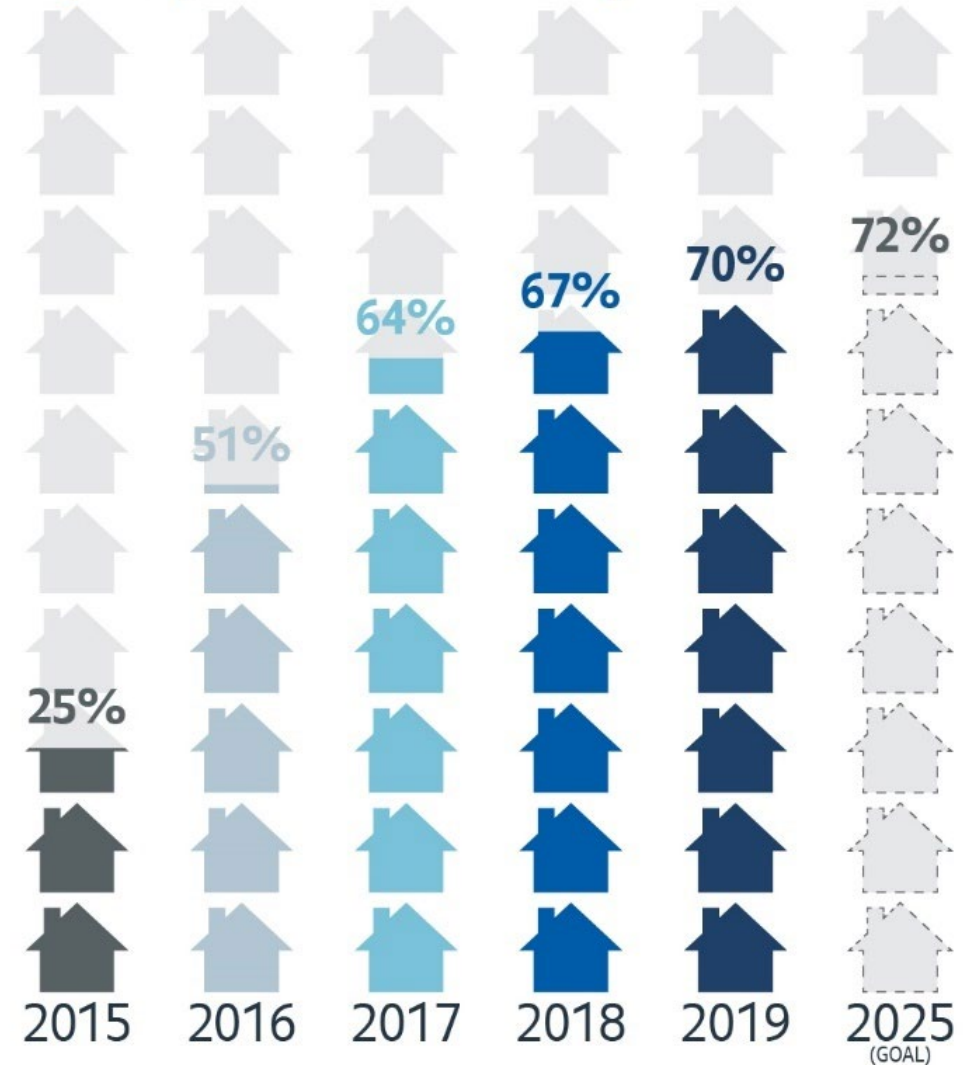
Greater than 30-minutes

Frequent enough that people don't need to consult a schedule

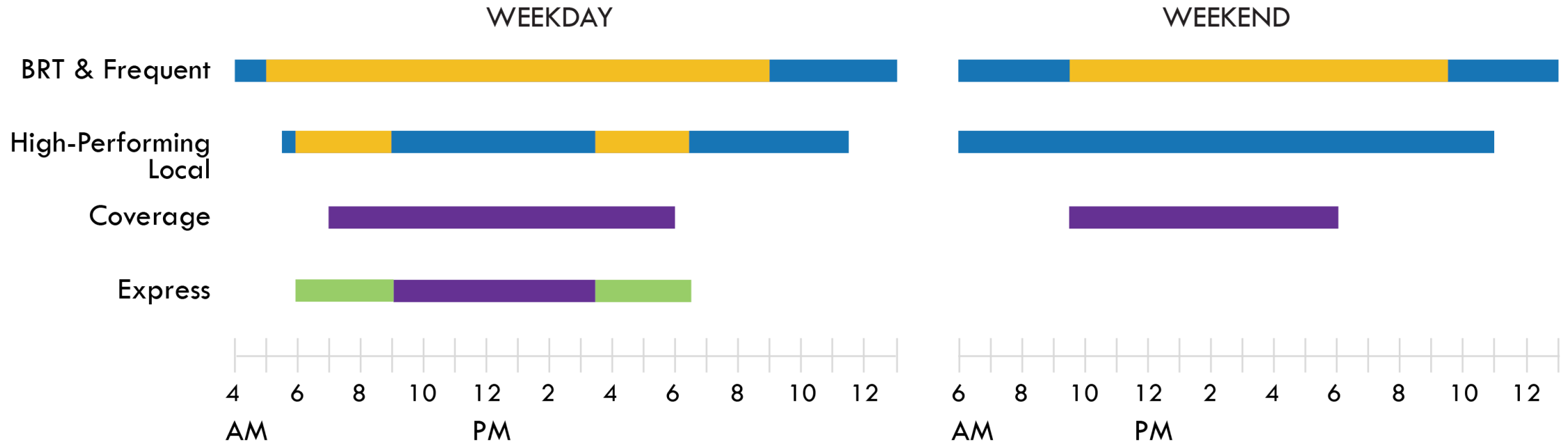
Access to Frequent Service Network

- Set policies to:
 - promote development along frequent transit
 - support expansion of frequent transit service

Percent of Households with Access to Very Frequent Transit Service, 2015 - 2019



Frequency and Span of Service



FREQUENCY

- 15 minutes or better
- 30 minutes
- 20 minutes
- 60-90 minutes

Frequencies shown are examples and do not represent C-TRAN's adopted service standards

Enhanced transit treatments could be applied on corridors with BRT, Frequent, and high-performing Local routes

Land Use Strategies

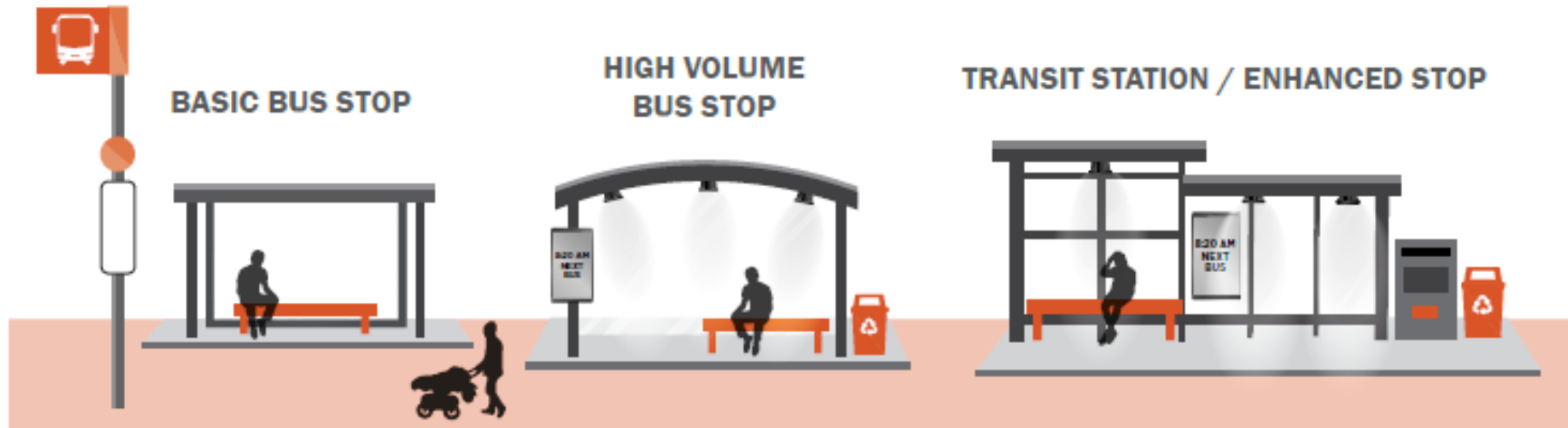
- Comprehensive Plan update encouraging growth along existing transit corridors
- Zoning code (new/expanded transit overlay districts?)
 - Reduce or eliminate parking minimums for development on frequent transit lines
 - Require transportation/parking demand management programs
 - Transit supportive frontages near stops/stations
- Incorporate C-TRAN standard plans into City Design & Construction Standards
- Explore partnership with C-TRAN on transit-oriented development projects
- Enforce compliance with bus zones and transit priority ROW
- Partner with C-TRAN to preserve ROW for transit enhancements
- Incentivize developers to build affordable housing near transit
- Actively include C-TRAN in the early stages of development review and capital projects
- Require pedestrian connectivity between subdivisions and from subdivisions to main streets

Access to Transit Solutions: Walking and Biking

- Aim for crosswalks within 100' of bus stops
- Crossing design according to the size, speed, and traffic volume of the street
 - May include signals or beacons, median islands, curb extensions, raised crosswalks, and supplemental signage and markings
- Curb ramps
- Sidewalk installation and repair on bus routes
- Greater separation between bicycles and buses



Access to Transit Solutions: Waiting Areas



■ Fixed Route

- Route sign
- Schedule
- Lighting
- Continuous pedestrian access

■ Enhanced Transit

- Route sign
- System map and schedule
- Lighting
- Continuous pedestrian access
- Shelter and seating
- Trash can
- Real time arrival information

■ BRT

- Route sign
- System map and schedule
- Lighting
- Continuous pedestrian access
- High-capacity shelter
- Trash can
- Real time arrival information
- Bike parking

Key Takeaways

- Look for opportunities to implement transit priority solutions where buses experience delay; this could include a Vancouver-specific toolbox and guidance
- Prioritize sidewalk infill near bus stops
- Create a strategy for new and improved pedestrian crossings citywide, with a focus on access to transit
- Encourage dense, mixed-use development on transit lines, creating a virtuous cycle where land use supports transit service and vice versa



