APPENDIX E:

Policy Opportunities & COVID Travel Patterns

This document focuses on how the community uses the transportation system and corresponding policy and program opportunities that could become part of the updated Transportation System Plan (TSP).

vancouver moves

Opportunities

November 2021

CITY OF
Vancouver
WASHINGTON

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PURPOSE

This document focuses on how the community uses the transportation system and corresponding policy and program opportunities that could become part of the updated Transportation System Plan (TSP). In addition, this analysis provides information that informs our understanding how long-term behavior changed during COVID-19 and what that implies for future transportation opportunities. This document is a companion to the existing conditions report which describes the city's physical transportation assets, like sidewalks and streets.

This document focuses on:

- Policy Review – summary of themes and gaps from existing policies
- Equity Analysis – way of determining highest-need areas of the city occur to address systemic racism
- Travel Patterns – where people go and when, using data from Streetlight, a vendor that collects anonymous travel data from personal and commercial vehicle GPS devices and mobile phones using location-based services (LBS)
- Travel during the 2020 pandemic – analysis of travel patterns during the time when much of the community was advised to stay home

The document concludes with a list of opportunity areas the TSP may address.

POLICY REVIEW

A city's policies – from high-level aspirations to operational guidance – affect macro-level decisions related to the prioritization of resources as well as micro-level considerations for daily operations and maintenance of infrastructure.

The City's existing plans were reviewed to identify overarching goals and themes. The following documents were reviewed:

- City of Vancouver Transportation System Plan (2004)
- Vancouver Comprehensive Plan (2011)
- Americans with Disabilities Act Self-Evaluation and Transition Plan (2012)
- Transportation Concurrency Management Administrative Manual (2012)
- What's Next Vancouver! Building Our City's Future (Strategic Plan) (2016)
- Vancouver Street Funding Strategy (2017)
- Sidewalk Infill and Deficiency Prioritization Process (2017)
- Safe Streets Vancouver, City of Vancouver Transportation System Safety Analysis (2018)
- Emergency Operations Plan (2018)
- Regional Transportation Plan for Clark County (2019)
- 2020 – 2025 Transportation Improvement Program (2019)

Overarching Goals

The review of existing City policies identified three overarching transportation goals:

1. Pursue a Balanced Multimodal System
2. Encourage Accessible and Connected Neighborhoods
3. Prioritize Transportation Safety

The following tables (Figure 1 through Figure 2) include a policy synthesis statement, developed from review of previous studies, identification of any conflicts found in the review of existing policies, identification of gaps and recommended next steps to advance City policy.

Figure 1   Policy Review: Overarching Goals

Overarching Goal	Policy Synthesis Statement	Conflict	Gap	Potential TSP Topic
Balanced mobility networks	Provide a balanced and multimodal transportation system that is safe and efficient for all users, abilities, and modes.	Complete Streets Policy does not emphasize balance (it emphasizes connected networks).	Definition of balanced is unclear.	Update to provide clarity to how balance can be achieved. Suggest prioritizing people (e.g., pedestrian and bicyclist safety, transit or person throughput) where there are conflicts or constraints
Accessibility and neighborhoods	Support access to essential amenities on foot or on bike (e.g., "20-minute neighborhoods").	Complete Street Policy states that the transportation network should be context sensitive. This could conflict with creating accessible neighborhoods throughout the city.	Need clarity on how to achieve this goal.	Update policy to prioritize connectivity and universal access. Corresponding land use policies are important to support this goal.
Transportation Safety	Ensure high safety standards for motorists, pedestrians, and bicyclists through the development and capital improvement processes.	N/A	How to prioritize safety for each street user.	Use policy to emphasize safety for all; prioritize vulnerable users.

Figure 2   Policy Review: Transportation Mode and Program Areas Table

Transportation Mode and Program Areas	Policy Synthesis Statement	Conflict	Gap	Recommendation
Freight	Provide multimodal, safe, and efficient freight transportation	N/A	Technology policy updates needed. Safety strategies such as local freight and parcel delivery on smaller vehicles/e-bikes can also be explored	Update to create an overarching technology goal. Maintain or expand policies and goals around freight transportation.
Pedestrian	Trails: provide a high-quality system of trails	N/A	Funding, prioritization, and policy	Continue to connect and build trail connections to improve City-wide access
	Safety: Ensure a safe transportation system and prioritize investment in high-injury network.	Neighborhood traffic calming may conflict with prioritizing improvements to high injury corridors	Funding, prioritization, and policy	Identify additional funding to prioritize improvements to high-injury corridors while maintaining neighborhood traffic calming program
	Walkability: Create a walkable community by providing convenient, accessible, and safe facilities.	N/A	Prioritization	Establish criteria for prioritizing investments in sidewalks, crossings, lighting, wayfinding
Bicycle	Design: Develop the bike network by investing in multimodal design and complete streets, including by narrowing or reducing vehicle parking or travel lanes	Difficult to navigate tradeoffs in space allocation for bikes versus other uses	Funding, prioritization, and policy	Formalize goal of updating bike network and network facility types. Designate and design facility types that support a broad range of options (scooters, mobility devices, etc). Create framework for prioritizing use of the ROW.

Transportation Mode and Program Areas	Policy Synthesis Statement	Conflict	Gap	Recommendation
Transit	Transit Improvements: Invest in transit system improvements and high frequency transit to improve corridor capacity and meet the mobility needs of those unable to drive	Question of focusing efforts on high-ridership corridors versus high-need neighborhoods	Funding, prioritization, and policy	Implement programs and policies that broaden the appeal of transit. Identify where and how the City can support transit reliability and access to transit with infrastructure improvements.
	Transit Service: Maintain transit service levels at no less than 2003 levels	N/A	How and where to expand service to attract more riders	Lay out citywide network of desired enhanced transit corridors; coordinate with existing and future land use and development
Transportation Demand Management (TDM) and Parking	Transportation Demand Management: Invest in TDM to reduce single-occupant vehicle demand and maximize efficient operation and management of the transportation system	N/A	TDM programs currently only required for large sites falling under statewide Commute Trip Reduction law	Fund management of a City-wide program to implement TDM programs beyond those affected by Commute Trip Reduction state law
	Parking: Adopt context-sensitive parking standards to facilitate provision of an appropriate parking supply	N/A	No curb management policy	Update to shift from providing appropriate parking to actively manage parking and the curb
	Transit-Oriented Development (TOD): missing policy on this topic	N/A	Not in existing TSP	Establish TOD policy and update TOD overlaps in coordination with the Comprehensive Plan update

Transportation Mode and Program Areas	Policy Synthesis Statement	Conflict	Gap	Recommendation
Electric and Smart Mobility	Neighborhood Electric Vehicles: missing	N/A	Not in existing TSP	Collaborate with Clark County on policies to encourage and accommodate Neighborhood Electric Vehicles. Establish Electric and Smart Mobility policies

EQUITY FOCUS AREAS

The City of Vancouver is committed to taking proactive steps to address the many manifestations of systemic racism in the community. This means actively focusing on equity and justice in institutions, policies, and programs. Transportation and equity are intertwined in many ways. Available transportation options can determine a person's ability to access jobs, housing, and education. Transportation is also an environmental justice issue – people of color and people with low incomes disproportionately bear the burden of motor vehicle emissions and their associated health impacts, a disparity that the COVID-19 pandemic has brought to the forefront.[1] Nationwide, low-income neighborhoods and communities of color experience a higher rate of traffic collisions, fatalities, and severe injuries.[2]

Understanding where economically vulnerable communities live will help guide transportation investment with the goal of rectifying past inequities.

Methods

Equity focus areas were identified using a methodology based on the 2018 Gentrification and Displacement Neighborhood Typology Assessment carried out by the Portland Bureau of Planning and Sustainability. Economic vulnerability measures from the assessment were customized for and applied to Vancouver, and additional measures were added.

Economic vulnerability is measured at the census tract level using six variables: households that rent, people of color, people without four-year degrees, low-income households, households with children, and people age 65 and above.

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[1] Washington, Harriet A. May 19, 2020. How environmental racism is fueling the coronavirus pandemic. *Nature*. https://www.nature.com/articles/d41586-020-01453-y

[2] Cotrill, Caitlin and Piyushimita Thakuriah. April 29, 2010. Evaluating pedestrian crashes in areas with high low-income or minority populations. *Accident Analysis and Prevention* 42 (2010), 1718-1728.

Each tract receives a vulnerability score based on the quintile it falls in for each variable. A quintile represents 20% of a sample. Each variable is scored from 0 to 4 depending on which quintile it falls within compared to the other tracts in Vancouver. For example, if the share of people of color in a certain tract is higher than in 80% of the tracts in Vancouver, that tract is in the top quintile and receives a score of 4 for that variable. If that same tract has a lower share of rental households than 80% of the tracts in Vancouver, it is in the bottom quintile and receives a score of 0 for the rental households variable. The map in Figure 3 shows the total score for all tracts. Tracts with higher scores are home to the greatest proportions of residents who are economically vulnerable.

Figure 3   **Equity Analysis Results**

2019 Displacement Vulnerability

Legend:

City Boundary

Vulnerability Score
- 5 - 8 (least vulnerable)
- 9 - 10
- 11 - 13
- 14 - 16
- 17 - 20 (most vulnerable)

Factors Used
- Communities of Color
- Holding Less Than a Bachelor's Degree
- Renter Populations
- Population Ages 65+
- Households with Children
- Median Family Income (Vancouver)

Data Source: American Community Survey, 5-Year Estimates

0   0.75   1.5   3 Miles

TRAVEL PATTERNS

Where, when, and how people travel informs system needs. Streetlight data from 2019 was used to provide a sample of transportation patterns before COVID-19. Streetlight is a vendor that collects anonymous travel data from personal and commercial vehicle GPS devices and mobile phones using location-based services (LBS). These data sources represent about 25% of the population of the US and Canada. Streetlight incorporates population data from the US Census and traffic counts from other sources to estimate total travel volumes based on the GPS data. Factors such as the speed at which a mobile phone moves and the daily patterns of a device's location are used to make assumptions about the vehicle (car versus bike) and home and work location of each trip. Data from Streetlight is often represented as percent of total or percent change, rather than absolute numbers, because it is an estimate rather than a full count.

Overall Travel Patterns

The city was split into 10 zones by aggregating transportation analysis zones (TAZ) into larger polygons using natural boundaries such as highways and major arterials. Streetlight data was then analyzed to understand how much travel is happening between zones. Figure 4 and Figure 5 show what percentage of City of Vancouver trips happening on a typical pre-COVID weekday start (origin) and end (destination) in each zone. What this shows, for example, is that from 7-9 am, of all the trips happening within the city limits at that time, 14% start in the downtown zone (west of I-5, Figure 4) and 23% are headed to that downtown zone (Figure 5). Findings include:

- Zones with the most overall activity are the downtown zone, the area between I-5 and I-205 (which has pockets of high population density), and the southeast zone including Columbia Tech Center.
- Generally, travel to and from zones is balanced in terms of percent of trips leaving and arriving. The main difference is the downtown zone, where a much larger percentage of people are arriving in the morning versus leaving — indicating that downtown is a job center and has more jobs than residents.

Figure 4   City of Vancouver Top Origins, 2019
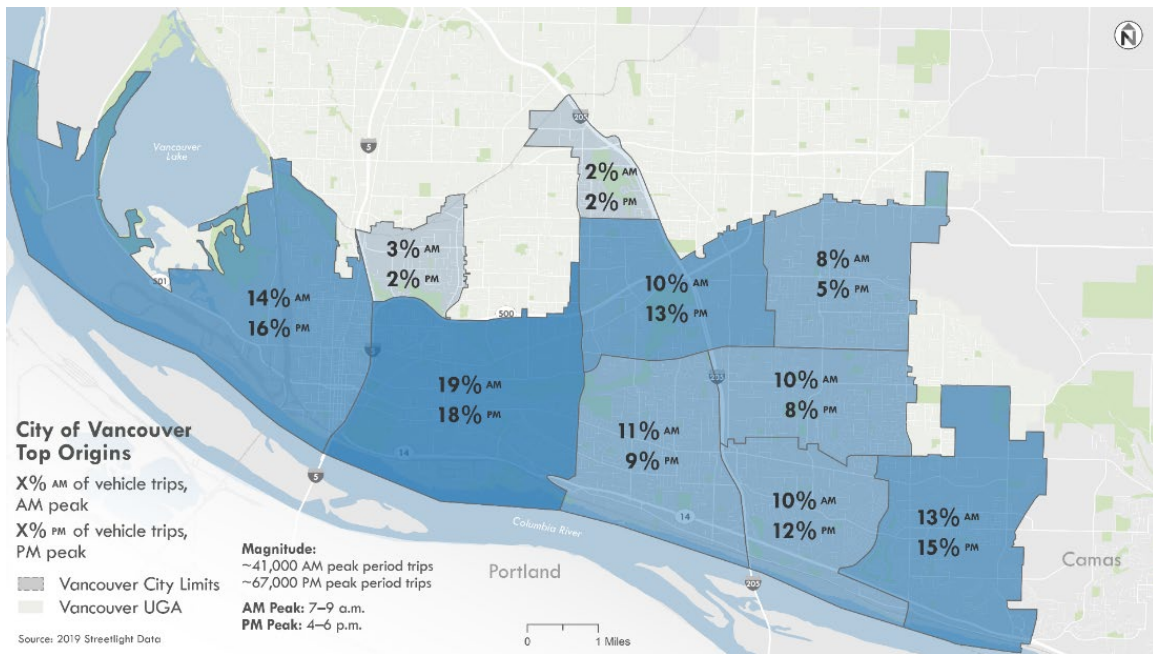
Figure 5   City of Vancouver Top Destinations, 2019
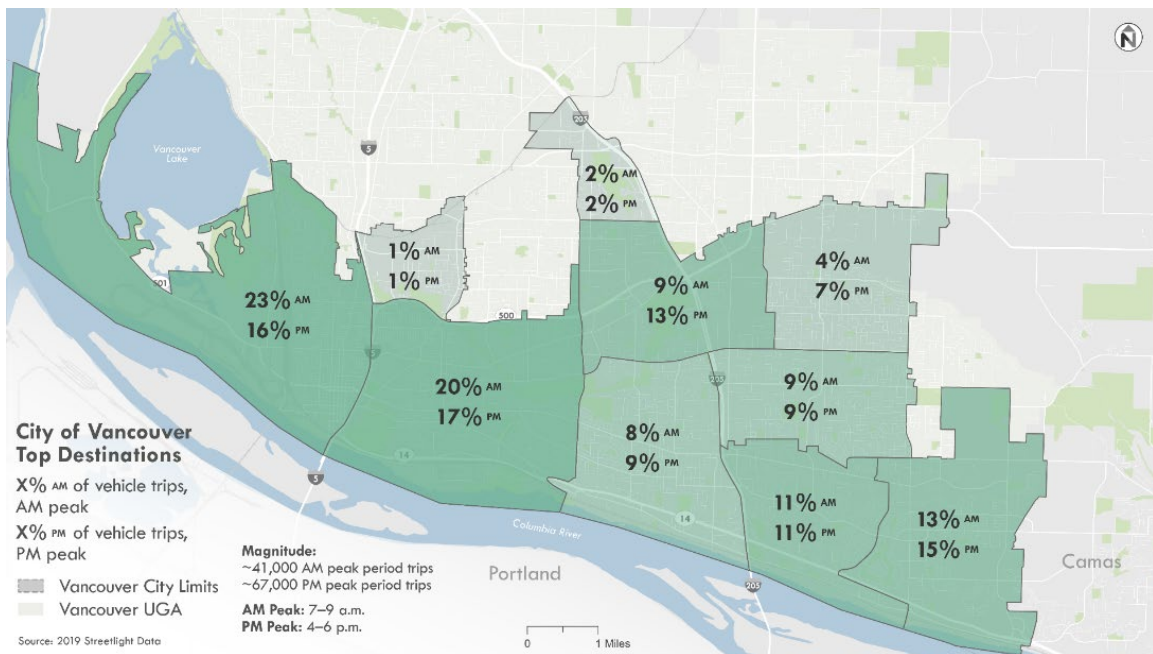
Travel flows between parts of the city sheds light on trip length and characteristics. The 10 zones shown above were grouped into three larger zones - Downtown, Central, and East. Figure 6 shows the proportion of total average weekday trips within the City of Vancouver going to, from, or staying within each zone. Approximately 401,000 trips travel entirely within the city each day, while 236,000 trips either start or end outside city limits or travel through the city (not shown in Figure 6).

Findings:

- A high percent of trips in the central and east zones stay within their zones, reflecting many short trips being made throughout the day
- There are high levels of travel between adjacent zones
- In general, trip distribution is fairly balanced across zones – downtown is not a major attractor for the entire city

Figure 6   Travel Between City Zones, 2019

Travel Patterns for Average Weekday

X magnitude of vehicle trips

Vancouver City Limits
Vancouver UGA

Source: 2019 Streetlight Data
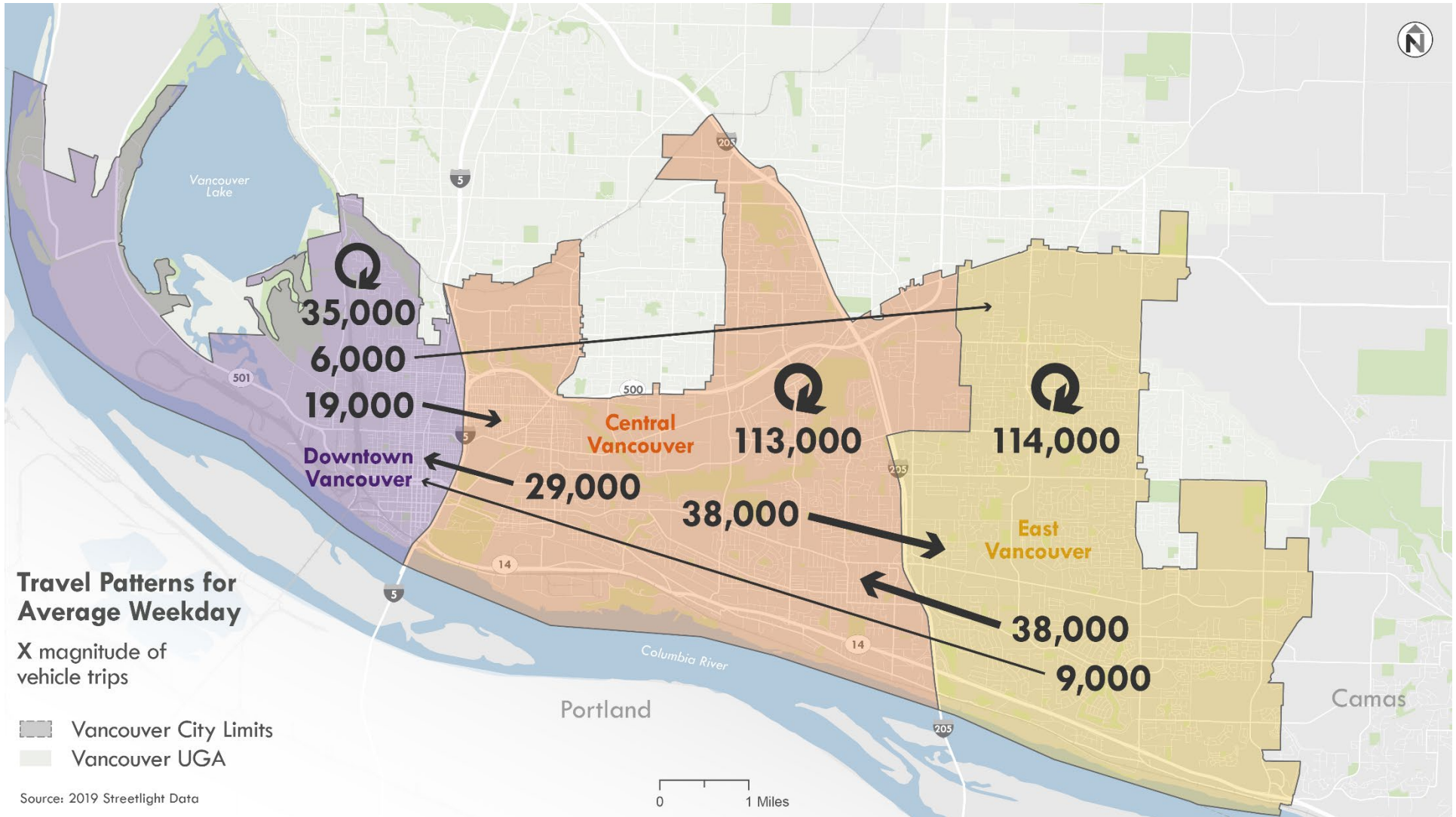
Gateways

Figure 7 shows the distribution of average weekday trips that use one of five key gateways on I-5, I-205, and SR-14. I-5 and I-205 carry nearly even amounts of traffic across the Columbia River. Earlier figures show a considerable amount of activity within Vancouver in the Central and East parts of the City (not just in downtown), thus it makes sense that travelers are using both bridges.

Figure 7   Average Weekday Trips using Key Gateways to the City of Vancouver, 2019
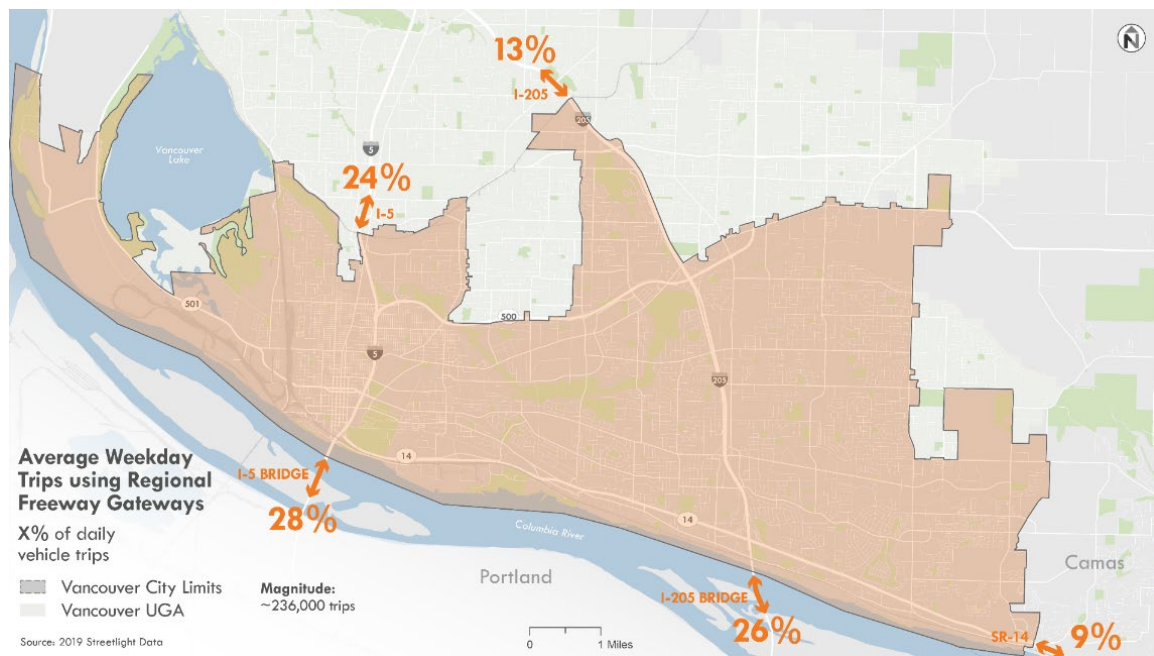
Travel Speed

Travel speeds indicate both where high speeds could create safety issues for vulnerable road users such as people walking or biking and where congestion may impact transit and freight. Streetlight data was used to assess travel speed during peak times on key corridors (such as arterials). Note that all corridors operate better than the current regional target speed of 10-12 mph during peak hours.

Figure 8 and Figure 9 shows travel speeds. Findings:

- Speeds during the PM peak are slower than the AM peak, indicating more congestion, which is common for urban areas
- Corridors with high average speeds likely feel uncomfortable for the majority of bicyclists and those using mobility devices unless a separated facility is present
- Two corridors – 162nd Avenue and 18th Street from NE 112th to NE 137th Avenues – have the highest speeds in both peak periods

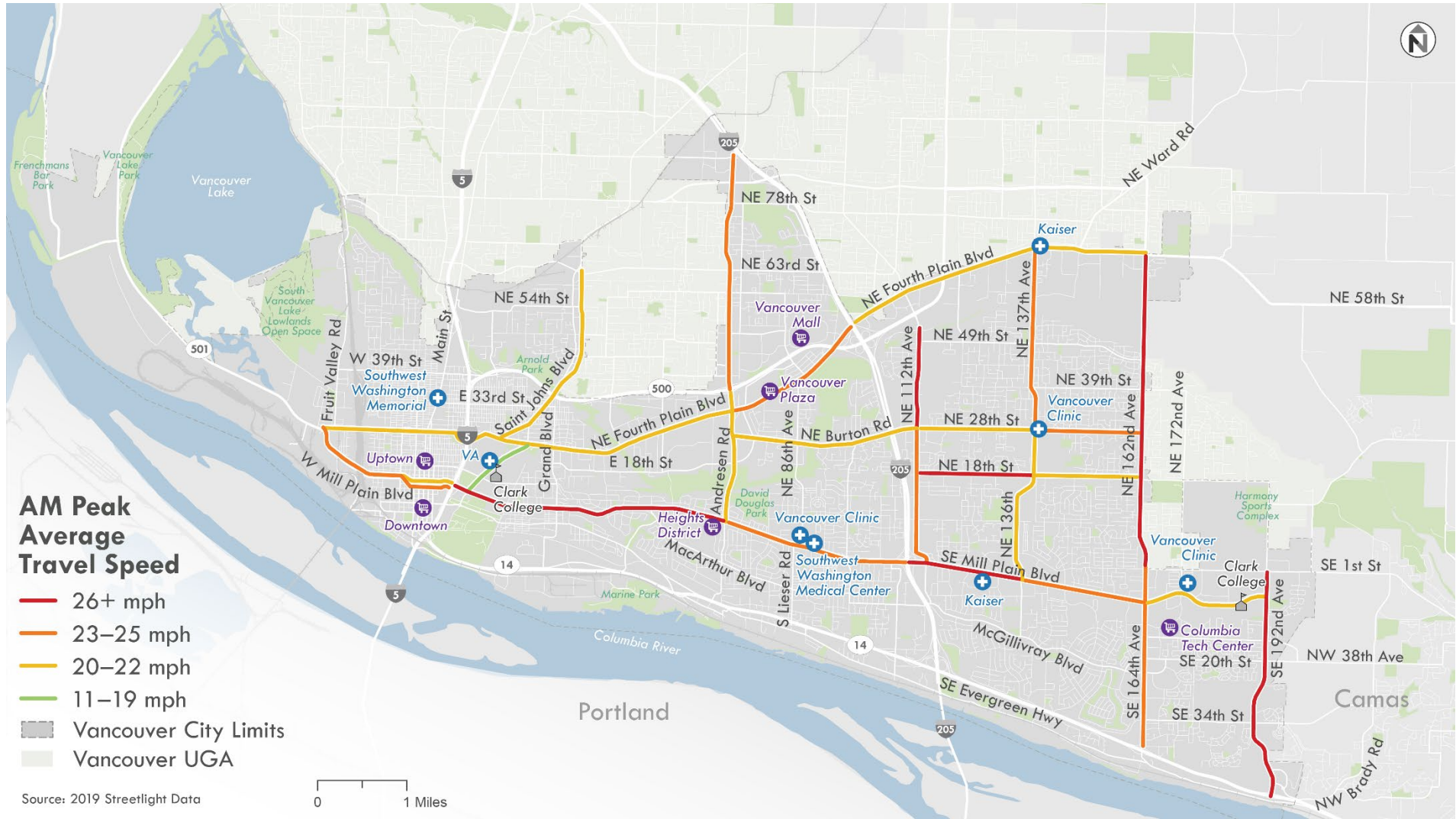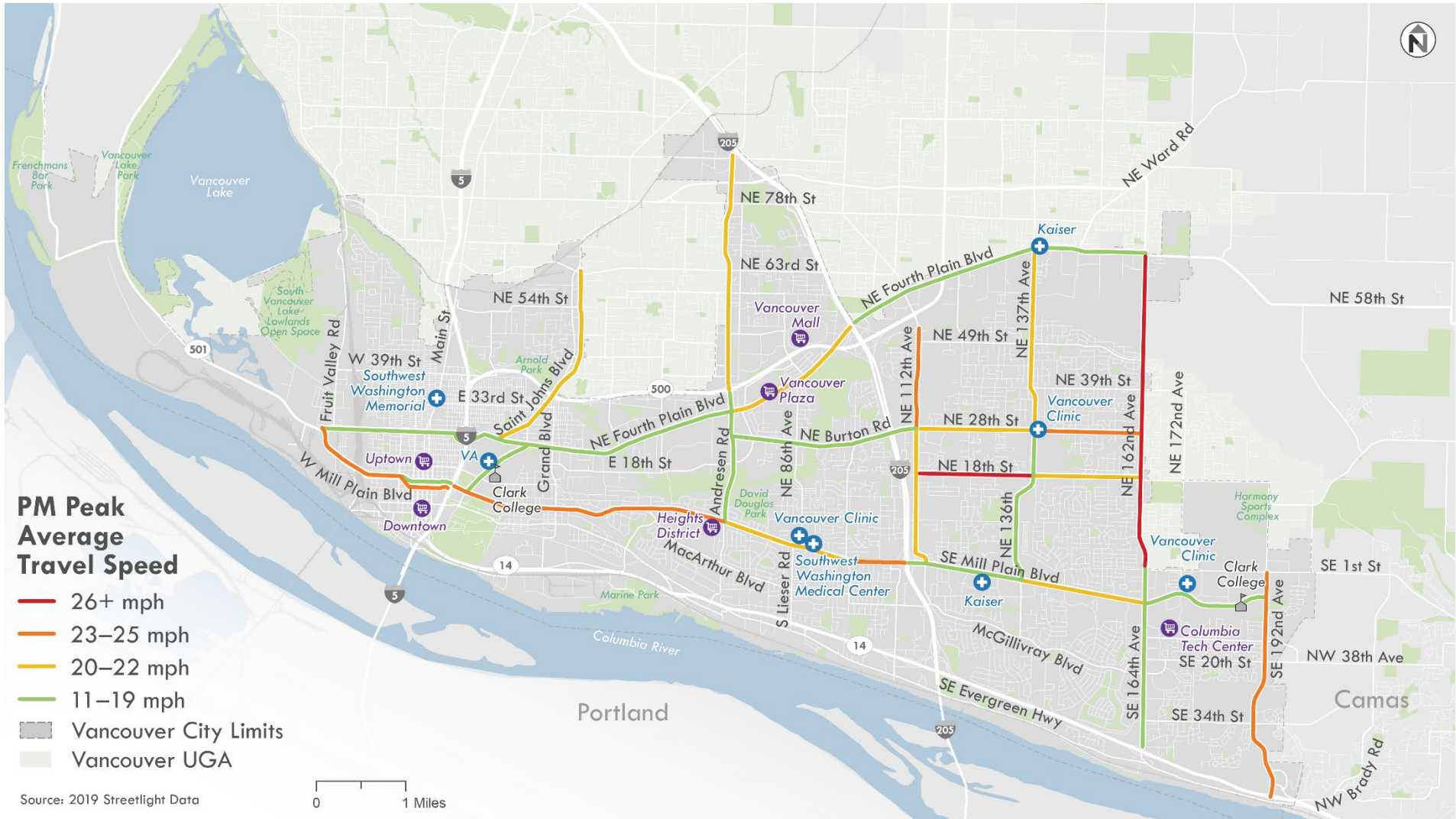**Figure 8   Key Corridor Average Travel Speeds – AM Peak, 2019**

Figure 9   **Key Corridor Average Travel Speeds – PM Peak, 2019**

Key Corridors

Arterial streets connect the city and therefore have high travel demand. But the nature of that travel reveals how the community uses the street. For example, are people using the street for many miles, connecting from one part of the city to another? Or for short trips, meaning the street may function like a neighborhood main street?

Streetlight data was used to analyze key corridor movements in two ways:

1. Count trips that pass through the entire segment

2. Count trips that pass through the segment midpoint

These methods help in understanding average trip length along arterials.

Across the corridor segments shown in the maps above (where long corridors are broken into multiple segments), an average of 20 percent of trips travel the entire length of a corridor segment (Figure 10). This figure holds true for AM and PM peak periods. This means there are a large amount of on and off trips along these corridors. This could indicate that people use these routes primarily to access destinations along them rather than for longer trips across town. It could also be related to the use of these segments to access highways, as almost all of them feed into an interstate or state route.

Figure 10   Corridor Travel Patterns

Corridor	Segment Bounds		Trips on Entire Segment
	From	**To**	
Higher Proportion of Trips Traveling the Entire Segment			
112th Ave	Burton Rd	51st Circle	56%
137th Ave	28th St	Fourth Plain Blvd	58%
18th St	138th Ave	162nd Ave	43%
15th Ave	Franklin St	I-5	35%
28th St	138th Ave	162nd Ave	32%
Higher Proportion of On/Off Trips			
164th Ave	SR-14	1st St	<1%
Andresen Rd	SR-500	I-205	<1%
Fourth Plain Blvd	I-5	Andresen Rd	4%
Fourth Plain Blvd	I-205	162nd Ave	1%
St Johns Blvd	Fourth Plain Blvd	Minnehaha St	3%

Freight

Freight travel patterns by zone look similar to passenger vehicle patterns, with the most activity adjacent to I-5, plus the zone around SR-500 and I-205, near the Vancouver Mall. When comparing all trips within or passing through the city on an average weekday, a much lower percent of freight trips both start and end in the city, which is to be expected. Slightly more freight traffic uses I-5 versus I-205 (Figure 11).

When looking at only freight trips that do not stop in the city, 27% use I-205 and 45% use I-5, showing that through freight volumes are much higher on I-5. This finding aligns with previous studies of regional freight travel patterns.

Figure 11   Passenger Car vs Freight Trip Distribution for All Trips

Trip Type	Passenger Car Trips	Freight Trips
Starts and ends in Vancouver	74%	46%
Starts or ends in Vancouver, passes through I-5 gateway	13%	28%
Starts or ends in Vancouver, passes through I-205 gateway	11%	24%
Starts or ends in Vancouver, passes through SR-14 gateway	2%	2%

Biking and Walking

Bicycle and pedestrian origins and destinations using the same 10 zones used for vehicle travel are shown in Figure 12.

The analysis shows high bicyclist and pedestrian activity in the downtown zone west of I-5, the zone bounded by I-5 and Andresen Road, and the far eastern zone. Trips tended to start and end in the same zone or the adjacent zone, which makes sense since trips made by bike or by foot tend to be much shorter than vehicle trips. The average bicycle trip length ranged from 2.5 to 4 miles, while walking trips generally were around 0.5-1 mile. The average passenger car trip length was 6.5-9 miles.

The decision to bicycle is based on many factors. But longer commutes due to lack of affordable housing near employment compounds challenges of adequate bicycling infrastructure. 30% of Vancouver commutes are less than 5 miles.

Figure 12   City of Vancouver Bicyclist and Pedestrian Activity, 2019
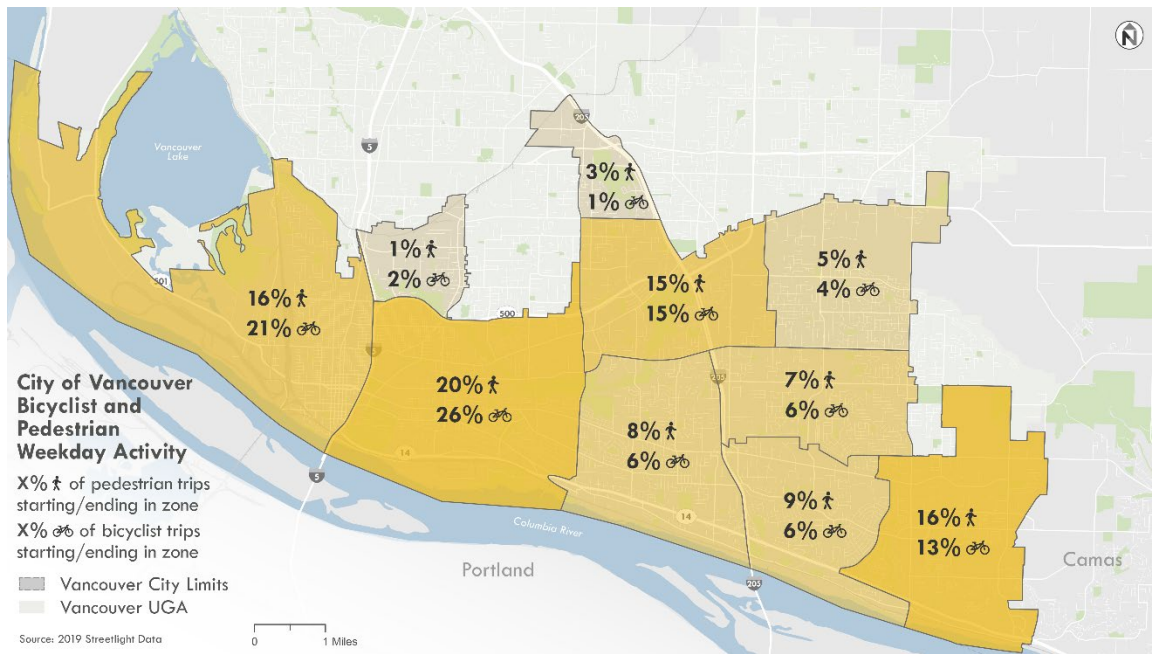
Figure 13 and Figure 14 break down bicycle and pedestrian activity in more detail to look at Census block groups with the highest activity in the city on an average weekday. Top activity tended to overlap in similar block groups, around commercial and employment areas such as the Vancouver Mall and Downtown. Additional high-use areas can be found in the eastern area near Columbia Tech Center.

Figure 13   Top Pedestrian Activity for Census Block Groups, 2019
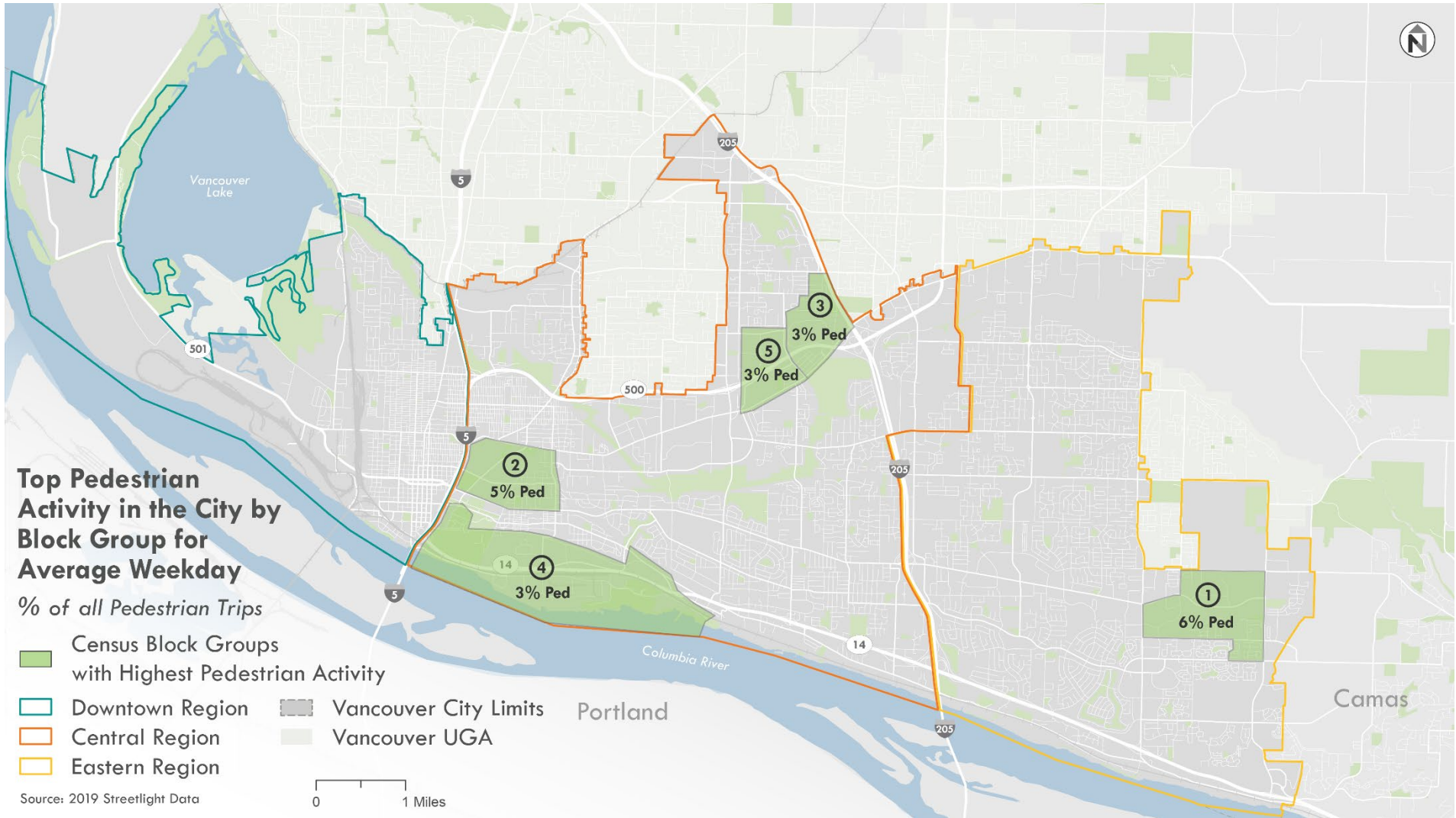
Figure 14   Top Bicycle Activity for Census Block Groups, 2019

Top Bicycle Activity in the City by Block Group for Average Weekday

% of all Bicycle Trips

Census Block Groups with Highest Bicycle Activity

Downtown Region

Central Region

Eastern Region

Vancouver City Limits

Vancouver UGA

Source: 2019 Streetlight Data

0   1 Miles
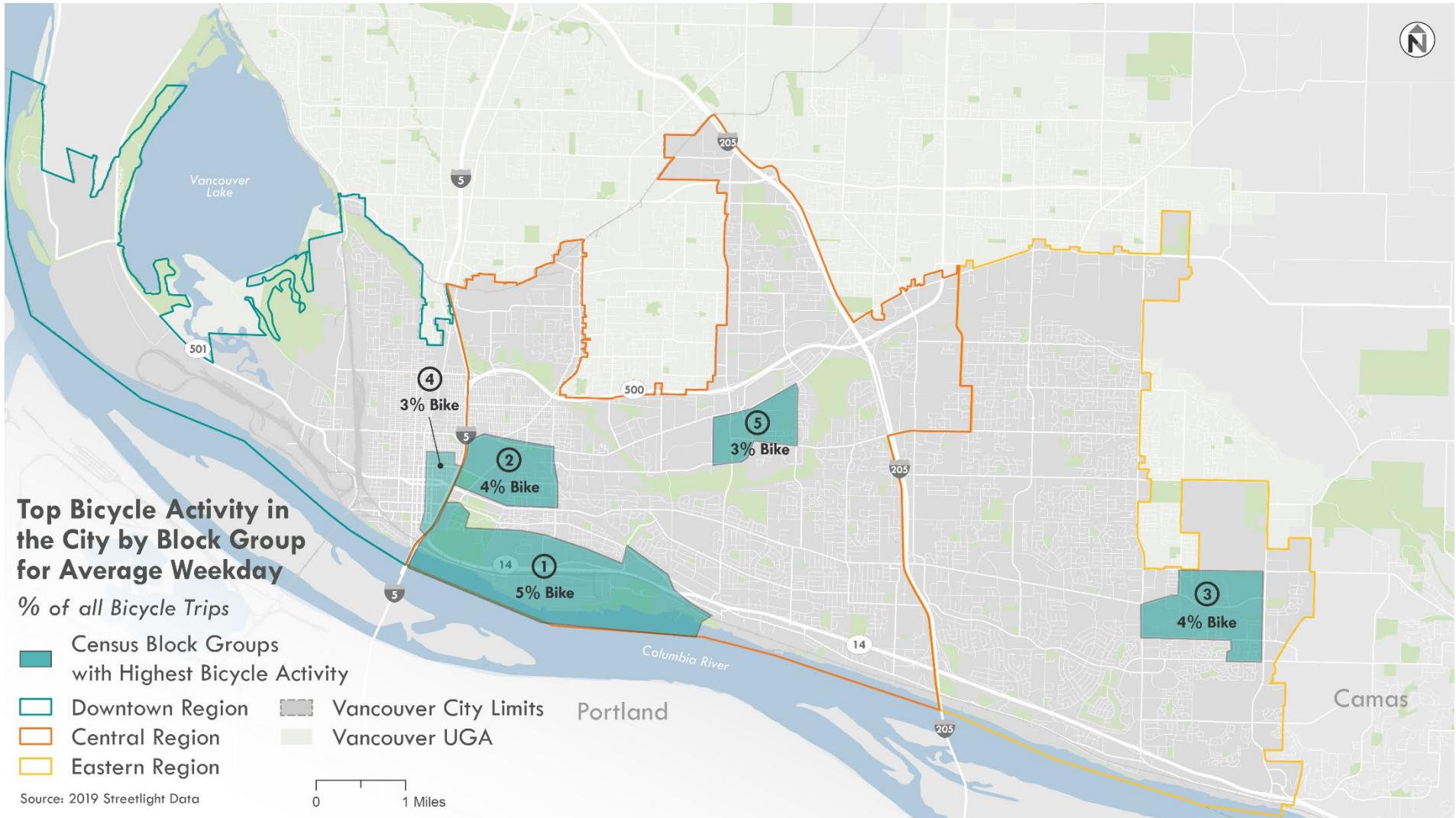
Equity Focus Areas

Streetlight data from 2019 was used to look at typical travel patterns of people who start their trips in Census tracts identified as equity focus areas. The analysis revealed that people who live in equity focus areas were less likely to take trips during the traditional commute periods of 6 am to 10 am and 3 pm to 7 pm. They took slightly more trips in the early morning, midday, and later evening hours, which may reflect the fact that many lower-income jobs do not have a Monday through Friday, 9 am to 5 pm schedule. To capture those schedules, the analysis of top destinations looked at all trips for all times of day and both weekdays and weekends.

The data shows that people who live in equity focus areas tend to travel to different parts of Vancouver compared to people who live in other parts of the city. As shown in Figure 15, the top destinations for trips starting in an equity focus area are generally in the area between I-5 and I-205. Most of the equity focus area Census tracts are within these two zones, so this probably reflects shorter trips. The area west of I-5, which includes downtown, is the third most common destination zone, at 15% of all trips. Top destinations for trips that begin outside of an equity focus area are the downtown and eastern part of the city (Figure 16).

Figure 15   Destinations of Trips Starting in Equity Focus Areas, 2019
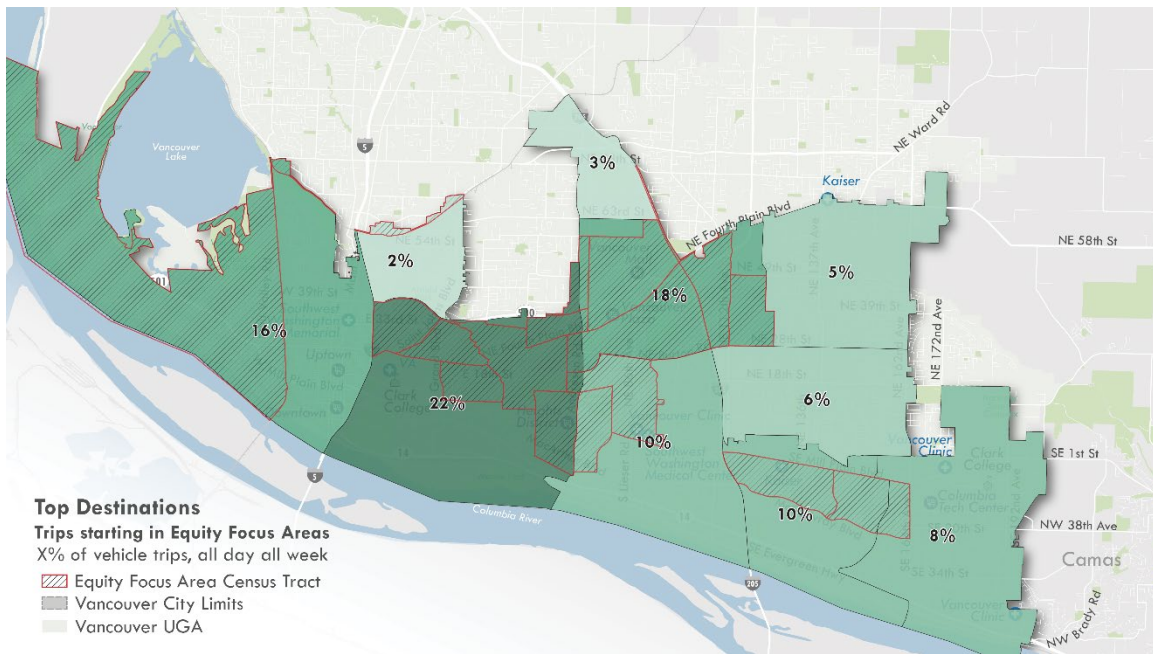
Figure 16   Destinations of Trips Starting outside Equity Focus Areas, 2019
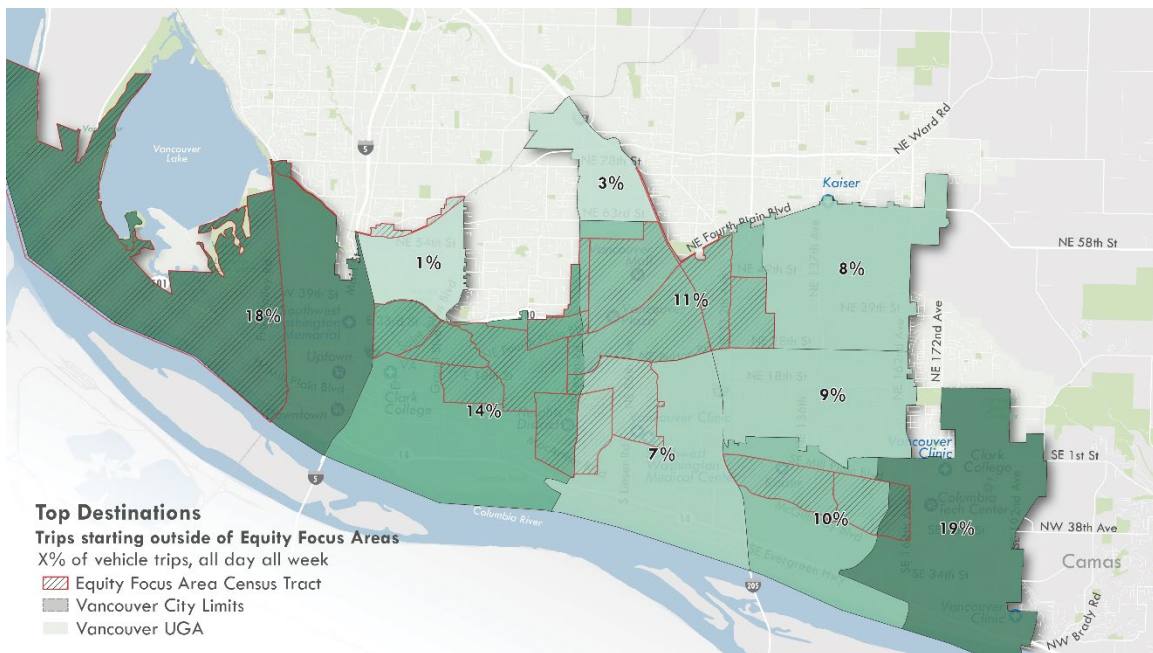
Demographic Trends

Several demographic measures such as race, income and family status are included in Streetlight data. Streetlight uses its network analysis to connect aggregated trip information to the Census based on inferred home and work locations. Based on the average weekday Streetlight analysis performed, several demographic findings are presented below:

- In general, zones had very similar racial distributions with about ~83% of trips being taken by white people. The zones with slightly higher minority populations include the one bounded by I-5 and Andresen Rd and the far east zone.

- The racial composition of people biking, walking, and driving was similar across modes for the zones in Vancouver.

- Trips taken by people with incomes lower than $50k/year tended to start or end in the Downtown and Central zones.

TRAVEL DURING THE 2020 PANDEMIC

Is COVID-19 Changing How People Move?

COVID-19 has caused unanticipated swings in travel behavior. Some Vancouver residents are replacing transit trips with driving, while other are walking and biking more because they have more time while working from home or are taking short trips around their neighborhood. This section provides an overview of how the pandemic changed travel patterns by comparing 2019 to 2020 data.

Challenges Getting Around

The pandemic has greatly affected transportation services operating in Vancouver. Services operated by C-TRAN, Uber, Lyft, and Ryd have either reduced their service levels or ceased operations. For those without a car, options are more limited than ever. Able-bodied travelers with means have access to many modes, while low-income individuals, those with mobility impairments, and folks needing mobility outside of commuting hours struggle to get around. Figure 17 highlights various travel needs and Figure 18 identifies the common challenges and shortfalls that exist for each travel need.

The transportation options included in Figure 30 are:

- Walking
- Biking
- C-TRAN – Bus service
- C-Van – Paratransit service for people with disabilities
- Vanpool – Shared commute service provided by C-TRAN
- Personal micromobility – Electric bikes, scooters, or other small mobility devices owned by an individual
- Shared micromobility – Electric bikes, scooters, or other small mobility devices available for short-term rental
- Ridehail/taxi – Traditional taxi or similar app-based service (such as Uber or Lyft)
- Microtransit – Transit service that uses a small vehicle and operates with greater flexibility than fixed-route bus service, often in response to demand
- Car share – Cars owned by a private company and available for short-term rental, usually using an app

Figure 17   Representative Travel Needs

(✓) Viable and currently available as a transportation option

(■) Viable but *not* currently available as a transportation option

Representative Travel Needs	Viable Transportation Options									
	Walking	Biking	C-TRAN	C-Van	Vanpool	Personal micromobility	Shared micromobility	Ridehail/taxi	Microtransit	Car share
Trips under Two Miles without a Car	✓	✓	✓	✓		✓	■		■	
Trips between Two to Five Miles without a Car		✓	✓	✓	✓	✓	■	✓	■	■
Trips over Five Miles without a Car			✓	✓	✓			✓		■
Options Designed for People with Disabilities	✓		✓	✓						
First- and Last-Mile Gaps to The Vine and Express Services		✓	✓			✓	■	✓	■	■
Late Night/Early Morning Trips	✓	✓				✓	■	✓		■
Low-Cost Mobility	▪ **No subsidy or existing subsidy:** Bus, ADA paratransit, walking, biking, microtransit ▪ **Requires additional subsidy:** Personal and shared micromobility, car share									

Figure 18   Challenges Associated with Travel Needs

Representative Travel Needs	Current Challenges					
	High-contact mobility/concerns over heightened COVID-19 exposure	Lack of available shared options	Limited service area (microtransit)	Expensive (car share and ridehail)	Reduced service levels and longer wait times (bus)	Lack of available options outside of public transit service span
Trips under Two Miles without a Car	✓	✓	✓			
Trips between Two to Five Miles without a Car	✓		✓	✓	✓	
Trips over Five Miles without a Car						
Options Designed for People with Disabilities	✓				✓	
First- and Last-Mile Gaps to The Vine and Express Services	✓		✓	✓	✓	
Late Night/Early Morning Trips						✓
Low-Cost Mobility	▪ Limited affordable options ▪ Low-income travelers spend more time on less efficient modes of transportation					

Driving Trips

During stay-at-home orders, only essential travel for jobs needed to keep the economy open and services to meet daily needs were permitted. This provides an opportunity to understand which streets are critical to Vancouver's basic functions and can be used to prioritize capital or maintenance projects. Streetlight data was used to compare traffic volumes in all of 2019 to April-October of 2020.

Weekday traffic volumes decreased 10% but morning peak volumes decreased 30% due to the absence of the traditional commute and school trips. Figure 19 summarizes the volume change.

Not all corridors saw a drop in volume. Roadways in the downtown core, such as sections of Mill Plain Boulevard and Fourth Plain Boulevard, experienced an approximately 20% daily increase in weekday volumes. Roadways that saw the greatest relative decrease in volumes during 2020 were on the northeast side of the city, including NE 18th Street, NE 162nd Avenue, and NE 137th Avenue.

Figure 19   Average Weekday Vehicle Volume Changes during COVID-19
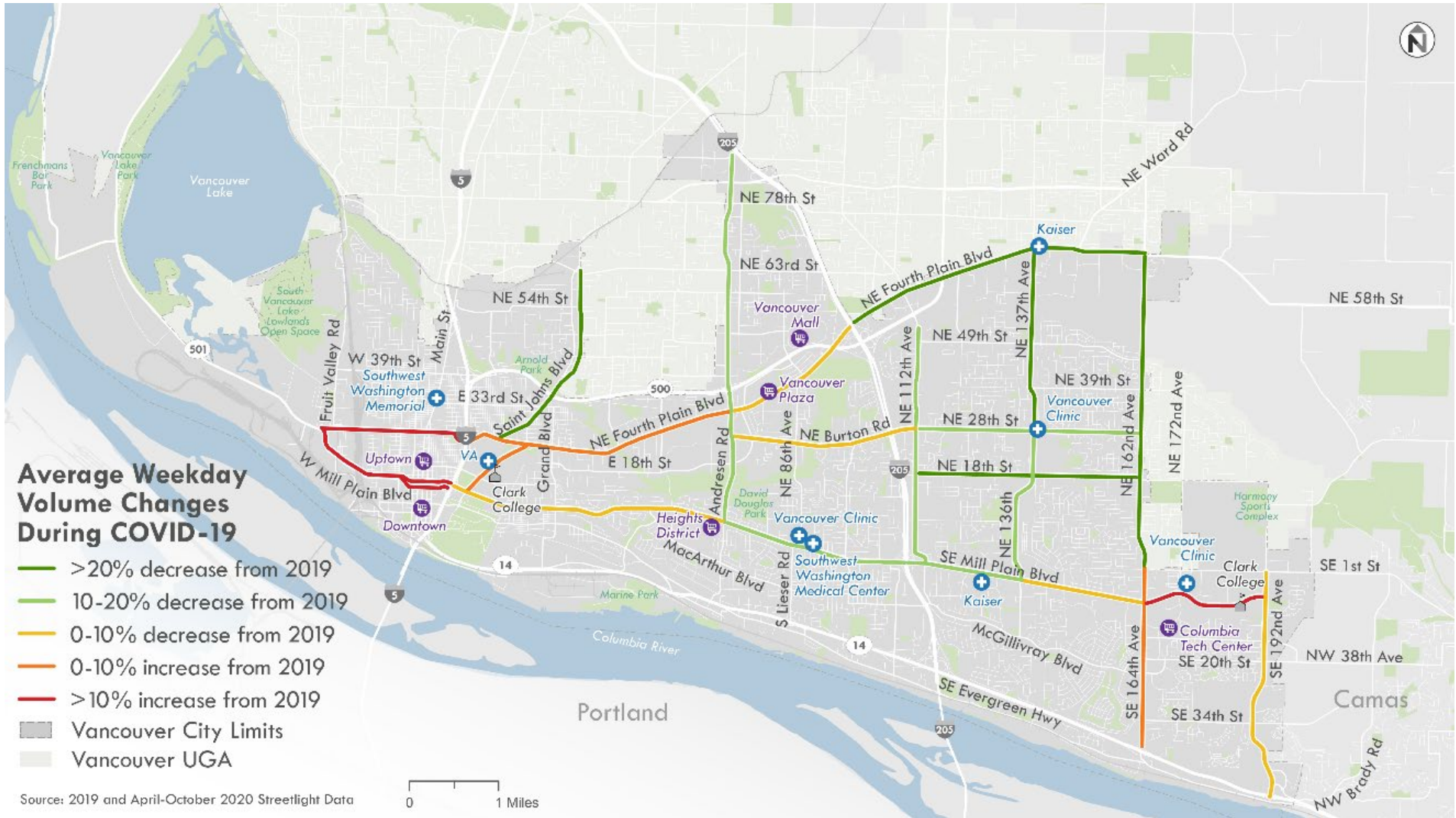
Bike Trips

Change in bicycle activity between 2019 and April-October 2020 is shown in **Error! Reference source not found.,** depicting increase or decrease in trips starting or ending in each Census block group. Overall biking activity increased, with 151 out of 233 block groups showing an increase in trips. On an average day bicycle trips were up 14% compared to 2019 and midday (12-2 p.m.) trips had the highest increase at 18 percent. Bike trips in the AM and PM peak periods remained constant or decreased slightly. This trend likely reflects an increase in recreational cycling and a decrease in commute cycling trips. For those fortunate enough to work from home, there has been a nationwide trend in households using their local business district and parks more.

Figure 20   Changes in Bicycle Activity During COVID-19
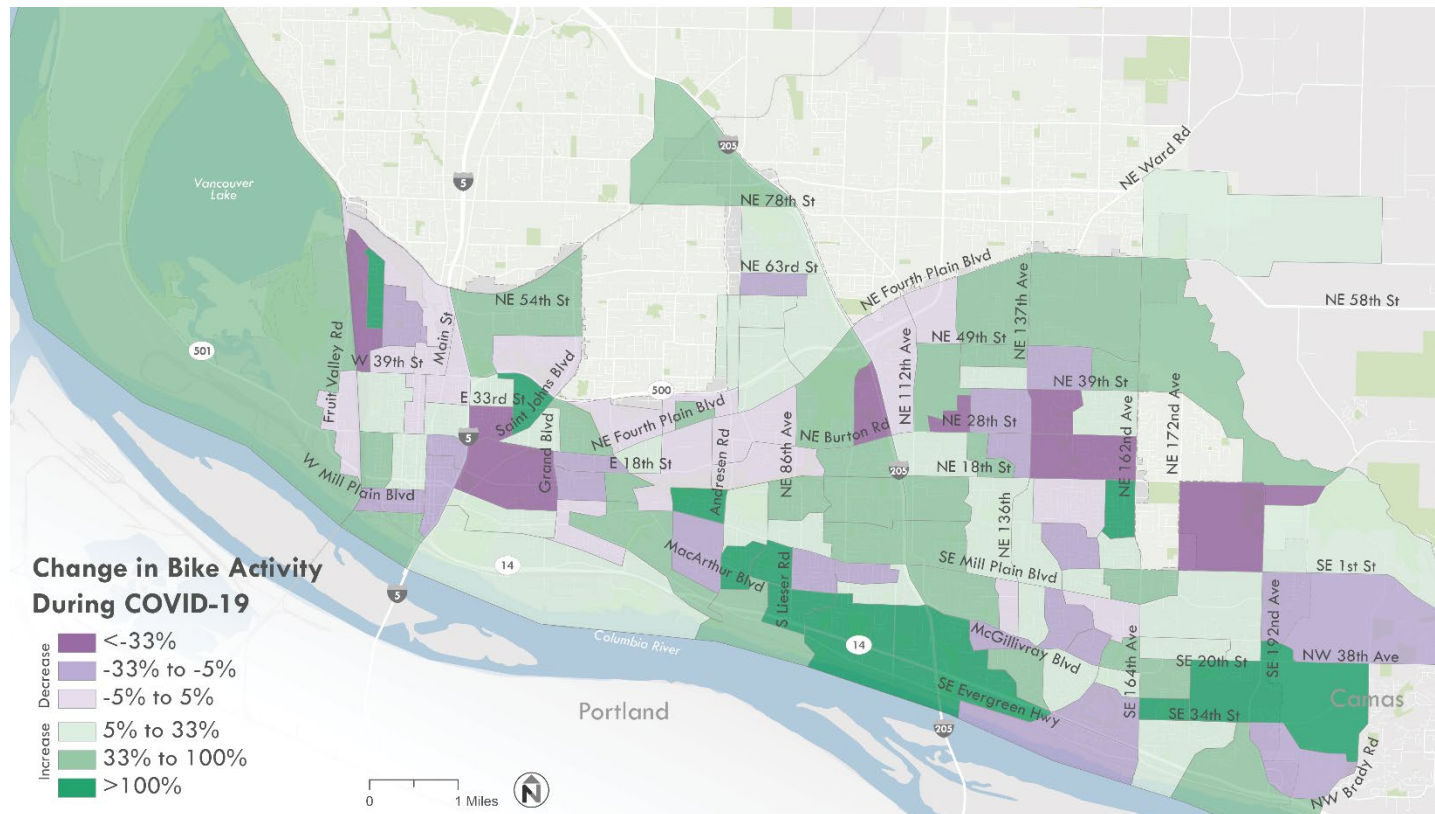
Transit Trips

During stay at home orders C-TRAN's monthly ridership numbers decreased 43% from June 2019 to June 2020. Riders during the pandemic likely included people that could not work from home (e.g., hospital, security, grocery store workers), people traveling for medical appointments (e.g., dialysis), and people traveling for errands (e.g., grocery shopping). This reflects C-TRAN's role as an essential service provider, particularly during the pandemic.

Fixed Route Ridership Analysis

Average daily ridership on C-TRAN's fixed-route network dropped by about 7,000 trips between June 2019 and June 2020. In June 2020, weekday average ridership was approximately 10,500 while Saturday and Sunday were approximately 6,100 and 5,100, respectively.

Ridership changes were analyzed at both the route and stop level using May 2019 and May 2020 data.

Figure 21 shows the top 10 routes with the highest ridership loss and the top 10 routes with the lowest ridership loss. A few takeaways:

- Route 47 (Battle Ground/Yacolt) is the only route to experience an increase in ridership (+21%)

- The routes with the highest ridership loss were the express routes providing service to Portland, which likely served primarily people who could work from home

- The Vine, C-TRAN's BRT route, was in the group with the lowest ridership loss, meaning the Vine remained an essential service to many

Collectively, Figure 21 highlights what are arguably C-TRAN's key routes, providing service to parts of the city that are most heavily dependent on transit service. If future service reductions are considered, these key routes should be lower on the implementation list than other routes in the network.

At the stop level, C-TRAN's fixed-route stops had an average of 51% fewer boardings in May 2020 than May 2019. Ridership activity at bus stops was generally lower systemwide; however about 2% of stops saw relatively no change (+/- 5% of the systemwide average) and another 7% saw modest ridership gains.[3] Figure 22 shows the change in boarding activity by stop, segmented into three categories: below the system

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[3] Some of the bus stops which recorded an increase in boardings were stops with relatively low average daily boardings (less than 1 per day). These small changes in fractional ridership can result in large percentage increases in ridership (e.g., a change from 0.1 to 0.9 daily boardings results in an 800% ridership gain).

average (i.e., less ridership loss), at the system average (+/- 5% of the systemwide average), and above the system average (i.e., more ridership loss). Stops with less ridership loss should be considered opportunities for the City to improve bus stop conditions and access.

Paratransit Ridership Analysis

Similar to the fixed route network, C-TRAN's paratransit network saw a decline in ridership. In June 2020, C-TRAN provided approximately 5,500 paratransit trips, or 16,200 fewer trips (75%) than were provided in June 2019.

One week of paratransit trips during June 2019 and June 2020 are presented in Figure 23. The results show that paratransit usage systemwide is down. However, grocery stores and medical facilities continue to be frequented by customers, with a few locations seeing little to no change in trip levels compared to a year prior. These locations with less ridership loss should be considered "priority destinations" for the paratransit system.

Figure 21   Top Routes with Least and Most Change in Ridership (2019 to 2020)

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
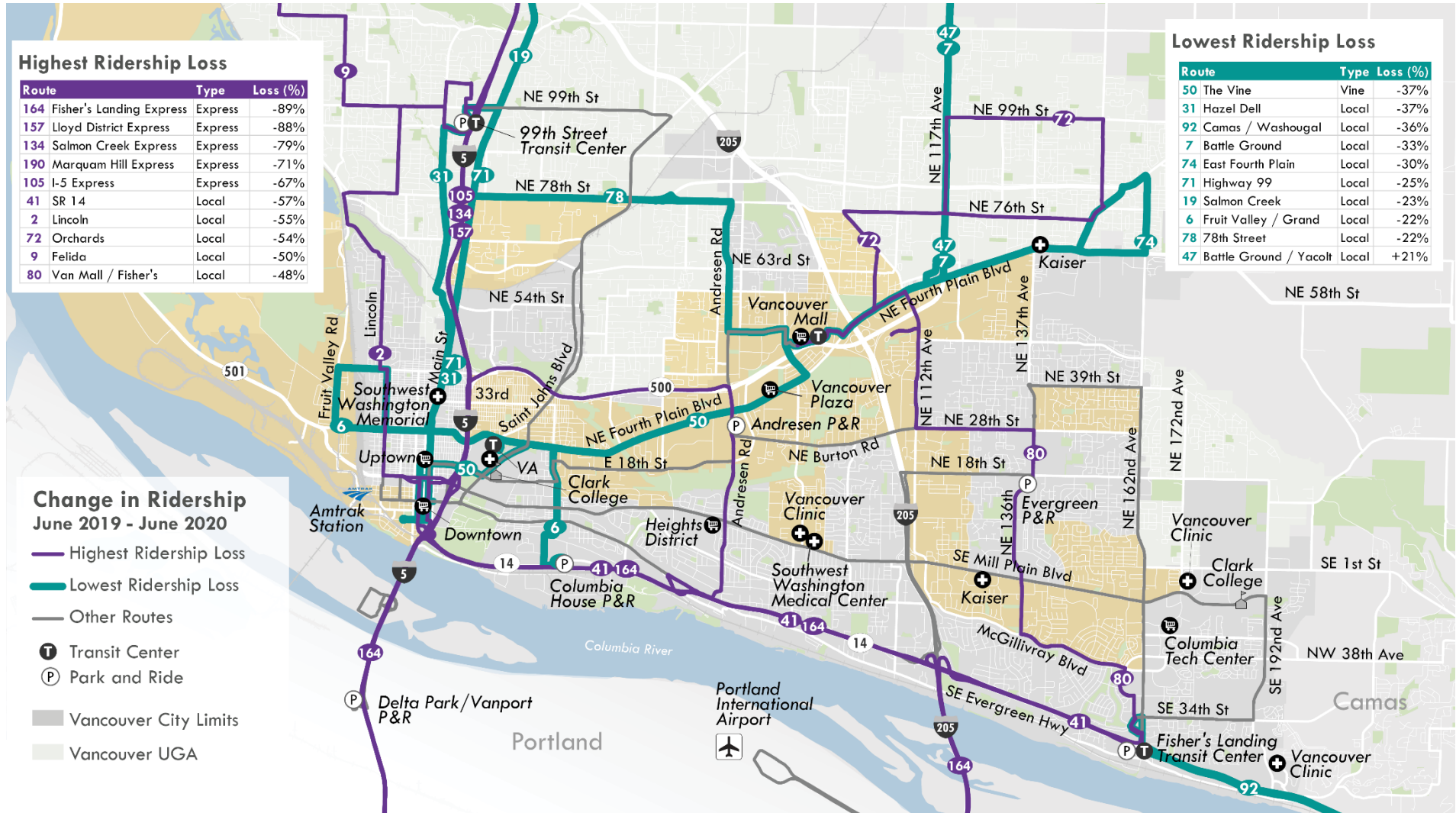- Vancouver City Limits
- Vancouver UGA

Figure 22   Change in Ridership by Stop (2019 to 2020)
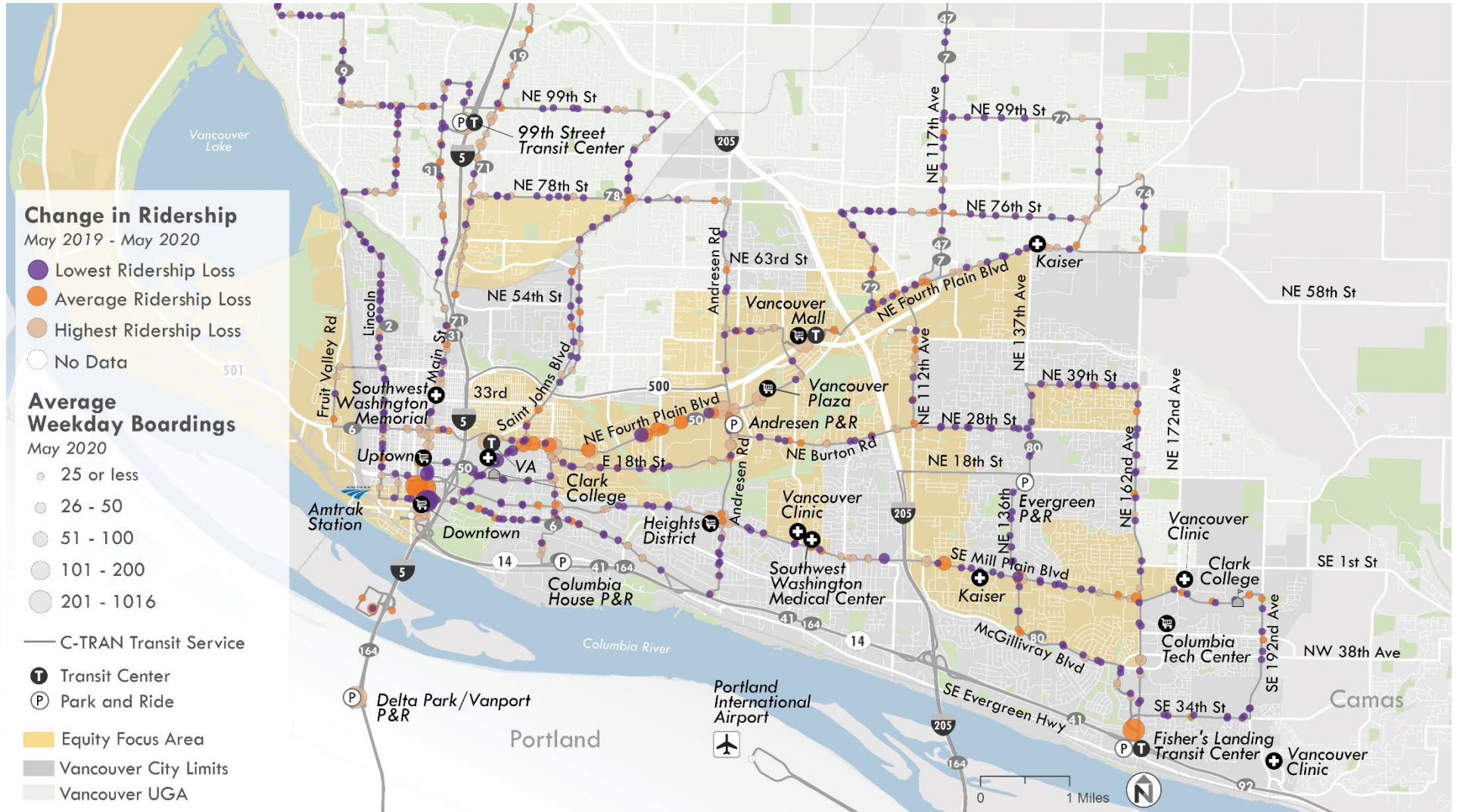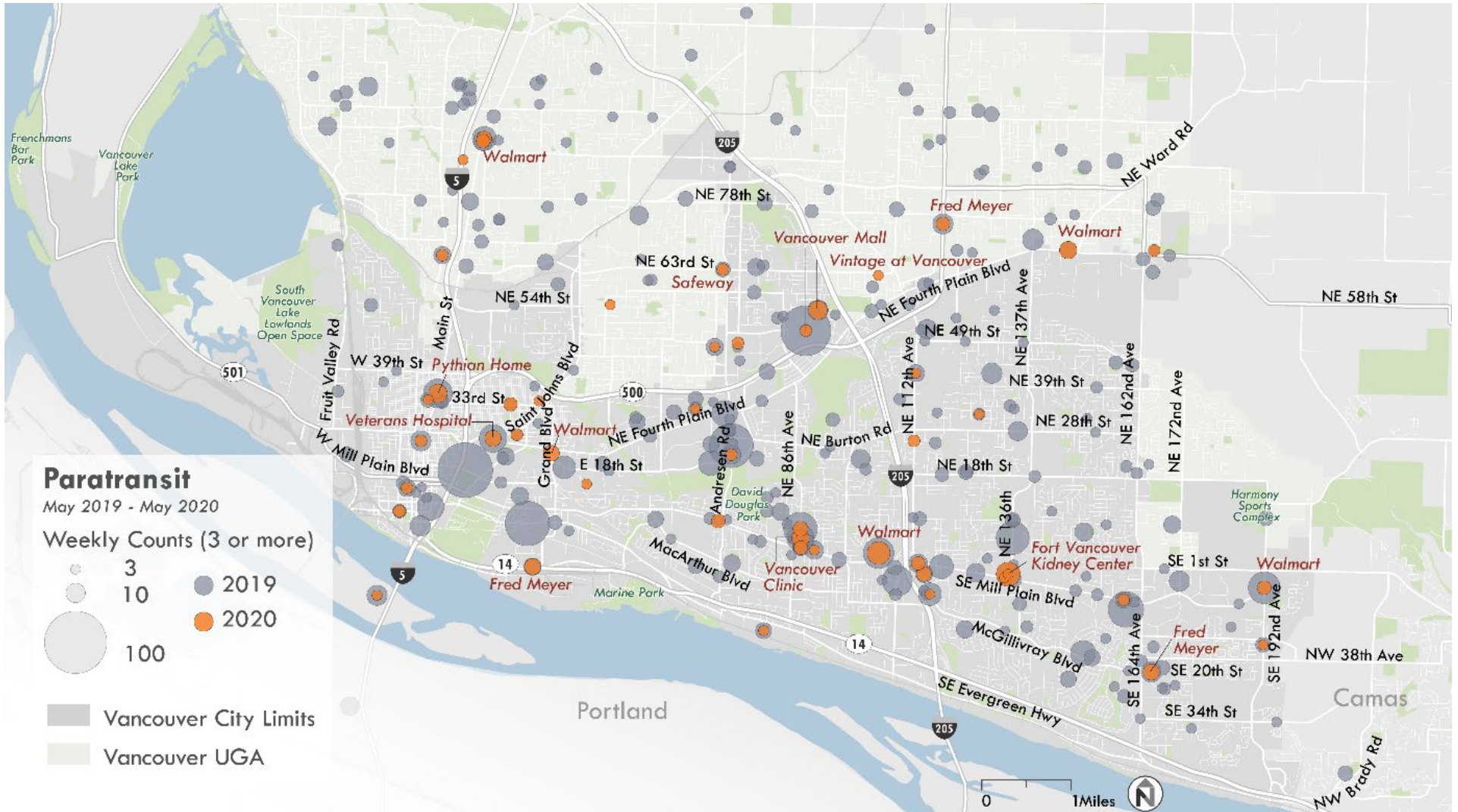
Figure 23   Change in Paratransit Trip Destinations (2019 to 2020)

Work Trips

Streetlight data was used to understand percent change in home-based work trips (or people traveling between home and work). Figure 24 shows the change in home-based work trips as a percent of all trips generated by each Census block group. In the entire downtown zone, home-based work declined significantly. Red and orange block groups, which are mostly in the eastern part of the city, indicate these could be the home-locations of employees who still had to commute to work. Note that this data covers April to October 2020; in Clark County, as restaurants and other services began reopening, this data would include more than essential employees.

Figure 24   Change in Home-Based Work Trips during COVID-19
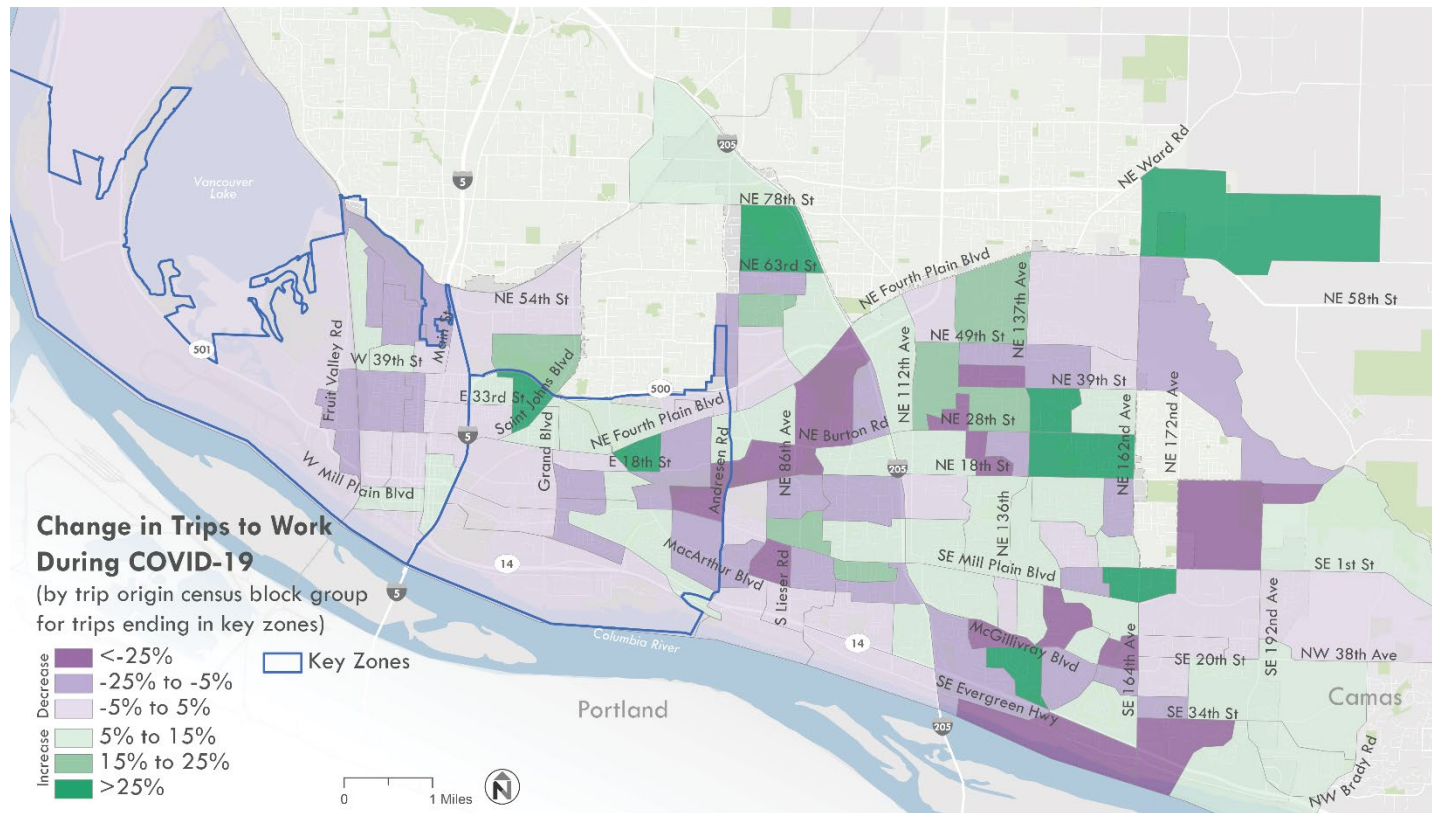
Essential Trips

To focus in on essential trips, a narrower time range was used for an assessment of origin-destination pairs in Vancouver that experienced less trip reduction during COVID-19 related shutdowns. Vehicle trip data for the months of March and April in 2020 was compared to average daily travel in 2019. Looking at travel activity in the earliest stage of pandemic restrictions helps to gauge where there may be a greater number of essential worker trips. Travel within the city overall reduced 39% during March and April 2020. Out of all zone-to-zone travel, the five origin-destination pairs that have the greatest number of trips between them (1,000 or more) and that experienced the least reduction in trips during COVID-19 shutdowns are shown on the map in Figure 26. The start and end zones for these trips include the two zones that are most visited by people who live in equity focus areas in Figure 15.

Essential jobs are often held by vulnerable populations. Demographic characteristics of top trip flow are described in Figure 25.

- On average, 41% of trips taken between these OD pairs are taken by people who have educational attainment of a high school diploma or less

- On average, 49% of trips taken between these OD pairs are taken by people who live in households earning $50,000 or less

- On average, 26% of total daily trips are home-to-work trips

Figure 25   Demographic Characteristics Associated with Top Five Essential Trip Flows

Demographic Variables	Map Label				
	1	2	3	4	5
% No High School Diploma	12.90%	12.70%	10.90%	13.20%	13.70%
% High School Diploma	27.20%	27.50%	28.20%	29.70%	30.10%
% Income Less than 20K	17.30%	17.60%	14.00%	13.70%	13.80%
% Income 20K to 35K	19.20%	19.60%	15.30%	16.90%	17.20%
% Income 35K to 50K	15.00%	15.20%	16.50%	16.30%	16.60%
% Black	2.80%	2.90%	2.70%	2.80%	2.90%
% Indian	0.90%	0.90%	1.00%	1.00%	1.10%
% Asian	3.60%	4.00%	4.20%	4.20%	4.30%
% Islander	0.70%	0.70%	0.80%	0.80%	0.90%
% Other Race	5.20%	5.40%	3.30%	4.10%	4.30%
% Multiple Races	4.50%	4.60%	4.60%	4.80%	4.90%
% Hispanic	11.40%	11.90%	8.50%	11.10%	11.40%
% of trips that are Homebased to Work	20.40%	18.30%	12.80%	38.60%	41.50%

Figure 26   Top Five Essential Trip Flows in Vancouver during COVID-19
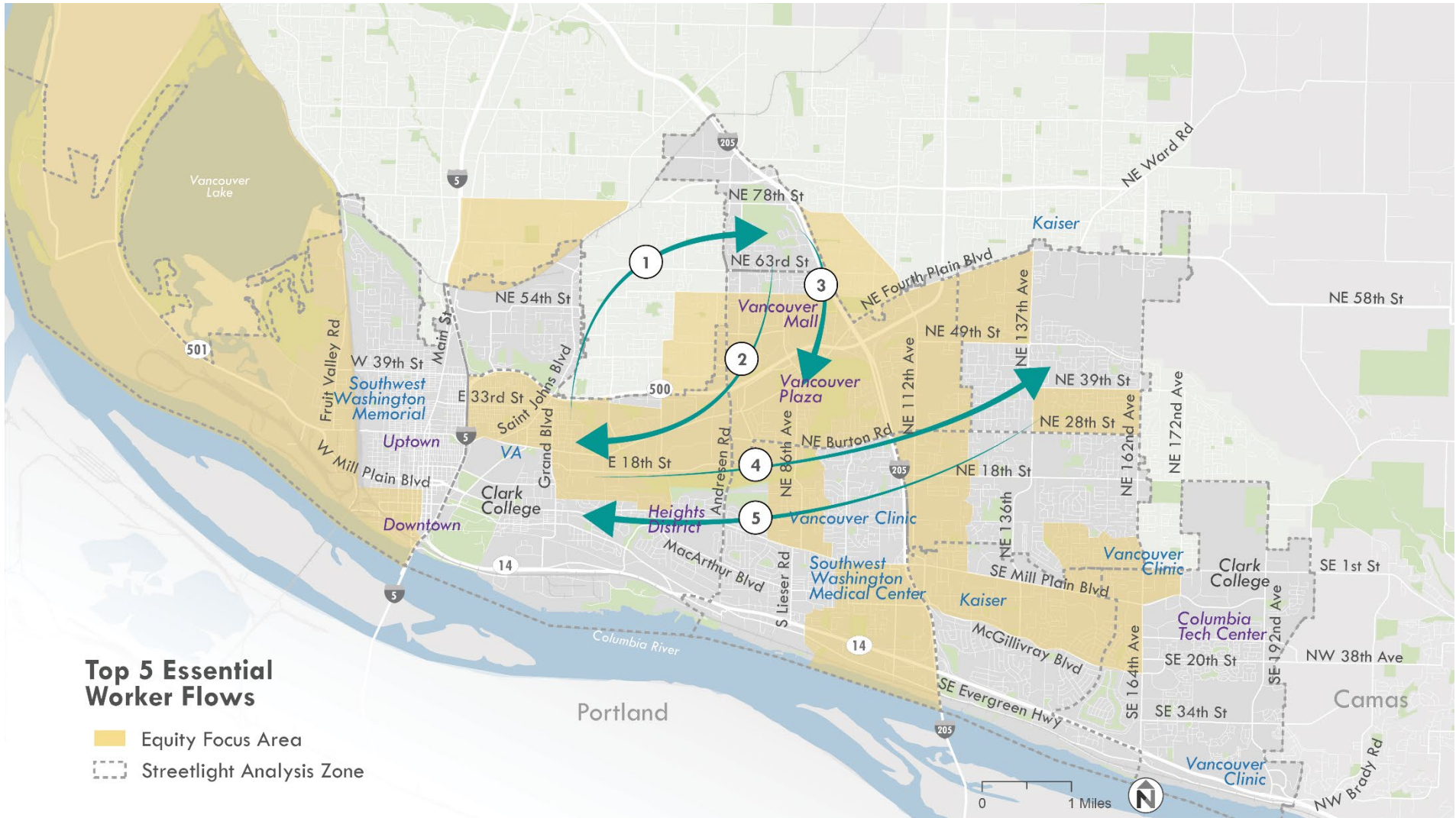
FINDINGS

Key findings from the equity focus area analysis, travel pattern analysis, and community input include:

- Black, Indigenous, People of Color, lower-income and other economically vulnerable populations are concentrated in multiple neighborhoods of Vancouver, including along SR-500, in Fruit Valley, and on either side of I-205 between Mill Plan and SR-14.

- People who live in the east part of the city and people who live in equity focus area do not take as many trips to Downtown as people in other parts of the city. Improvements in Downtown will not have as direct a benefit for this portion of the population.

- Many major arterials are used for relatively short trips, suggesting that people are going to destinations along them rather than using them as a through-route to cross the city.

- Some corridors have high travel speeds during the peak travel hours, indicating that there may be excess automobile capacity.

- Bike trips have increased during the COVID-19 pandemic. Many of these trips are short and are likely for recreational purposes or to get to neighborhood destinations.

- During the COVID-19 pandemic, there is less of a concentrated "rush hour," but there has not been a uniform decrease in travel. In some parts of the city, travel activity has actually gone up.

- Of all C-TRAN routes, the 6, 78, VINE, 47, and 74 saw the least ridership reduction during COVID-19 and also service equity areas.

- Several transit stop locations in equity areas saw steady bus ridership during the pandemic: on Lincoln Avenue (a major transit access point for residents of Fruit Valley), 78th St, St Johns Blvd, 76th St, Fourth Plain Blvd, Mill Plain Blvd, 18th St, 28th St, 39th St, and 162nd Ave.

- A high proportion of people who continued making trips during the early months of the pandemic had lower incomes and low educational attainment and were likely providing essential services.

OPPORTUNITIES

Based on this analysis, an initial list of policy and programmatic opportunities for integration into the TSP is listed below. Note this is not a comprehensive inventory, but a reflection of findings from the data analyzed.

1. Address Policy Gaps

Vancouver's adopted plans serve to guide City policy and practices on a range of topics including transportation and land use. The review of Vancouver's existing plans revealed a set of transportation-related policy gaps. The following list of recommendations aim to address those policy gaps and to guide subsequent work on the Vancouver Moves plan.

- Develop equity policies to address unequal access and disinvestment due to race/ethnicity, income, and other factors
- Formalize completion of the City's bicycle network as a goal
- Develop an electric and emerging mobility policy
- Update investment plans to prioritize universal access and multimodal street design
- Establish policy around making multimodal decisions – based on people throughput, climate, equity, or other goals
- Replace Level of Service standards, which only consider motor vehicles, with people throughput, which captures people moving by all modes
- Develop a transit-oriented development policy
- Monitor performance of transportation network
- Update ITS and system management policies

2. Advance Equity

The Vancouver Moves equity focus areas analysis provides a framework for orienting policy, programs, and capital investment recommendations around the City's goal of addressing systemic racism. Putting this framework into action could entail:

- Directing additional resources to public outreach and engagement efforts within equity focus areas, and building reciprocal relationships with community members and organizations in these areas to ensure investments meet their needs and avoid unintended negative consequences
- Developing transportation policies, programs, and capital projects that are specifically tailored to the needs of equity focus areas and BIPOC populations
- Examining existing transportation policies, programs, and project delivery processes and revising those that lead to inequitable outcomes; for example,

moving from a complaints or request-based process to a systemic, data-driven process for maintenance and improvement

▪ Using equity focus areas to prioritize a list of projects and programs by assigning a higher score to those that fall within a focus area boundary

3. Update Street Standards and Policies

Data from Streetlight shows that people across Vancouver have been biking more since the onset of the COVID-19 pandemic (See COVID travel, page 39). Bike trips are usually shorter, and many are for recreation, exercise, or to reach neighborhood destinations. The public bicycle survey found that the three biggest barriers to people bicycling were feeling unsafe on existing bike lanes, the lack of bike lanes, and aggressive drivers. The majority of respondents to the pedestrian survey indicated they would like to be able to walk for exercise, to their neighborhood park, to run errands, to socialize, or for fun. Respondents to both the pedestrian and bicycle surveys felt that the non-motorized network is lacking connectivity and in need of safety improvements.

The TSP will update street standards and other City policies to support a safe, comfortable, and well-connected biking and walking network. This could include:

▪ Adopting bicycle facility selection guidance and design standards to create a network that is comfortable for all ages and abilities, drawing from resources such as the Federal Highway Administration's Bikeway Selection Guide and National Association of City Transportation Officials Urban Bikeway Design Guide

▪ Adopting street standards that provide an ample pedestrian realm on all types of streets and require connectivity for people walking even where the street network is not a grid

▪ Updating and/or amending the City's pedestrian crossing guidelines, including school area crossing guidance

▪ Reducing posted speeds to 20 mph on neighborhood streets

4. Expand Vancouver's Mobility Menu

Expanding mobility choice is central to creating a more resilient and connected Vancouver. The pandemic is changing the way people think about transportation, accessing goods, and spending time in public space. Post-COVID, what will travel look like, and what can the City of Vancouver do to support or incentivize other transportation options? How might services be distributed across the city? Vancouver is in a unique position to turn positive trends into habits, while discouraging other negative behaviors.

Source: Visit Vancouver USA

The following policy, regulatory, and partnership opportunities could expand mobility in a time when people are most likely to make new habits.

- **Build a public interest-first regulatory environment for on-demand and equitable mobility:** Develop an umbrella mobility policy framework with rules and requirements for all permitted mobility services that use the public right-of-way. Develop a universal mobility permit that encodes adopted policy, service level agreements, and permittee expectations.

- **Make small vehicle mobility ubiquitous:** Open a shared micromobility permit program that enables a wide range of low-profile mobility services to take root. Fund and fast-track quick-build bikeway and micromobility parking infrastructure projects.

- **Establish cross-Columbia mobility services:** Align resources, mobility priorities, and policy objectives between the City, C-TRAN, TriMet, the City of Portland, and potential other regional partners to build mobility options that can be used or operated across the Columbia River. Issue a Mobility Challenge Request for Information (RFI), inviting interested parties to propose services as part of a team or as a single service model (e.g., free-floating car share).

- **Identify new funding sources to deliver mobility options:** Stay apprised of seed grant funding opportunities to fund public mobility options, such as WSDOT's
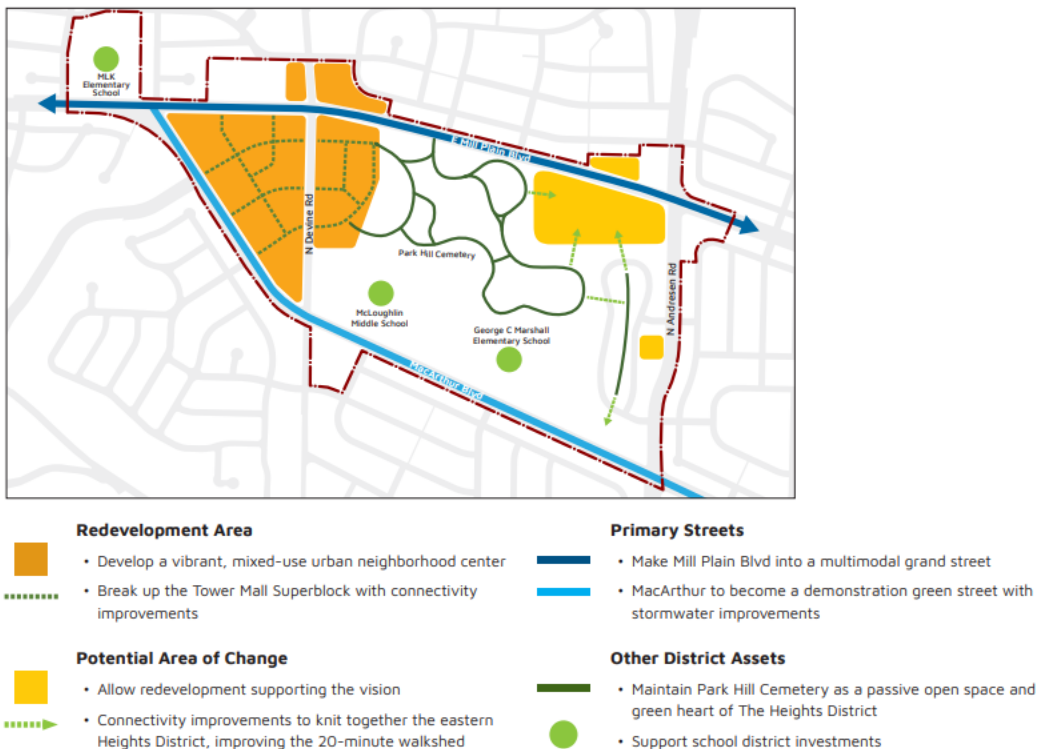
Clean Mobility Options Voucher Pilot Program (CMO), which had $21.15 million available in 2020.

5. Advance Twenty-Minute Neighborhoods

A twenty-minute neighborhood is a neighborhood where residents can access most basic goods and services within a 20-minute walk or bike ride of their homes. During the early pandemic, Streetlight data shows people making more short trips by bike and foot, a trend that can be supported into a post-pandemic future with an integrated transportation and land use strategy. Vancouver has adopted goals and policies around creating 20-minute neighborhoods in City planning efforts such as the Strategic Plan, the Comprehensive Plan, and the Heights District Plan. The TSP update should incorporate 20-minute neighborhoods as a framework for transportation planning.

Components of a 20-minute neighborhood include destinations such as a grocery store, school, retail, or dining, as well as infrastructure that makes it easy and comfortable for people to get around without a car. The Heights District Plan aims to create a 20-minute neighborhood through redevelopment and new connectivity improvements, as illustrated in Figure 27.

Figure 27   The Heights District Plan Big Ideas Map

Redevelopment Area
- Develop a vibrant, mixed-use urban neighborhood center
- Break up the Tower Mall Superblock with connectivity improvements

Potential Area of Change
- Allow redevelopment supporting the vision
- Connectivity improvements to knit together the eastern Heights District, improving the 20-minute walkshed

Primary Streets
- Make Mill Plain Blvd into a multimodal grand street
- MacArthur to become a demonstration green street with stormwater improvements

Other District Assets
- Maintain Park Hill Cemetery as a passive open space and green heart of The Heights District
- Support school district investments

6. Support Transit

While C-TRAN operates transit service in Vancouver, there are many things the City can do to support and enhance transit service. The City is responsible for most of the streets buses run on, the traffic signals on those streets, and the sidewalks and crossings that allow people to get to bus stops. Examples of improvements the City could make include dedicated bus lanes, transit priority at traffic signals, and installing new pedestrian crossings near bus stops.

The TSP is developing an enhanced transit network where the City and C-TRAN should collaborate on speed and reliability, transit access, and supportive land use efforts. The development of the enhanced transit network is informed by the findings outlined in this document regarding essential transit travel during the COVID-19 pandemic, the economic vulnerability analysis, and data on expected future growth in population and employment. Essential travel patterns and equity considerations should inform the "when" of transit service as well as the "where". Vancouver has seen trips less focused on the morning and evening rush hours and more spread across the day. Essential workers and people with lower incomes are more likely to have jobs with irregular schedules, and it is important to serve these workers with transit in the early morning and later evenings.