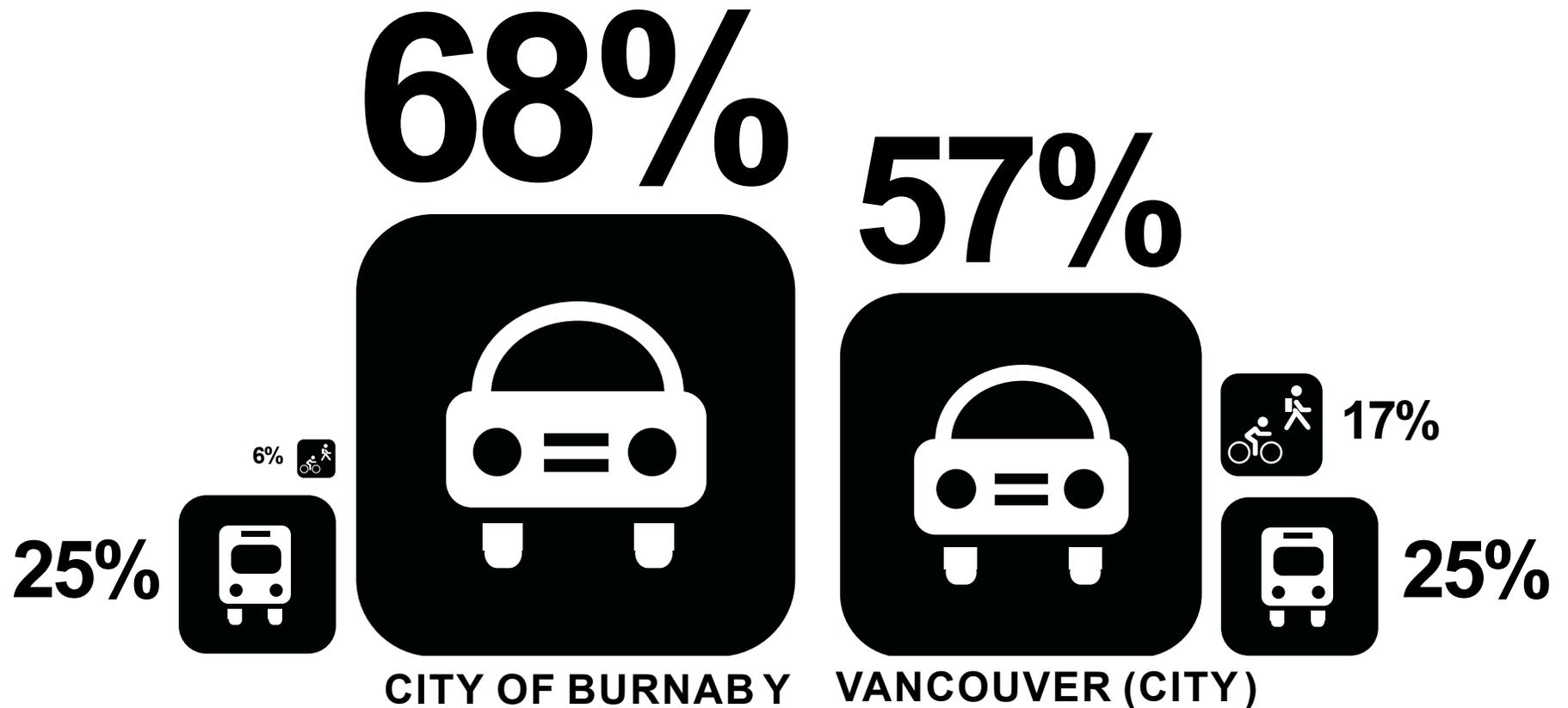


hastings corridor analysis movement

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sustainable urbanism : the hastings corridor

ubc urban studio : fall 2008



movement

Percentage of mode of transportation to work: Statistics Canada, 2006 Census Data

*Car passengers make up 6% of those who use cars to commute to work. Other modes make up 1% of the commute to work (not shown).

Hastings Street at a glance seems over powered by traffic, allowing for the ease movement of cars, buses and trucks throughout the rush hours. Pedestrians in this environment seem lost and cyclist non-existent. Through our study of movement we will evaluate cars, transit, cycling, walking and their interactions.

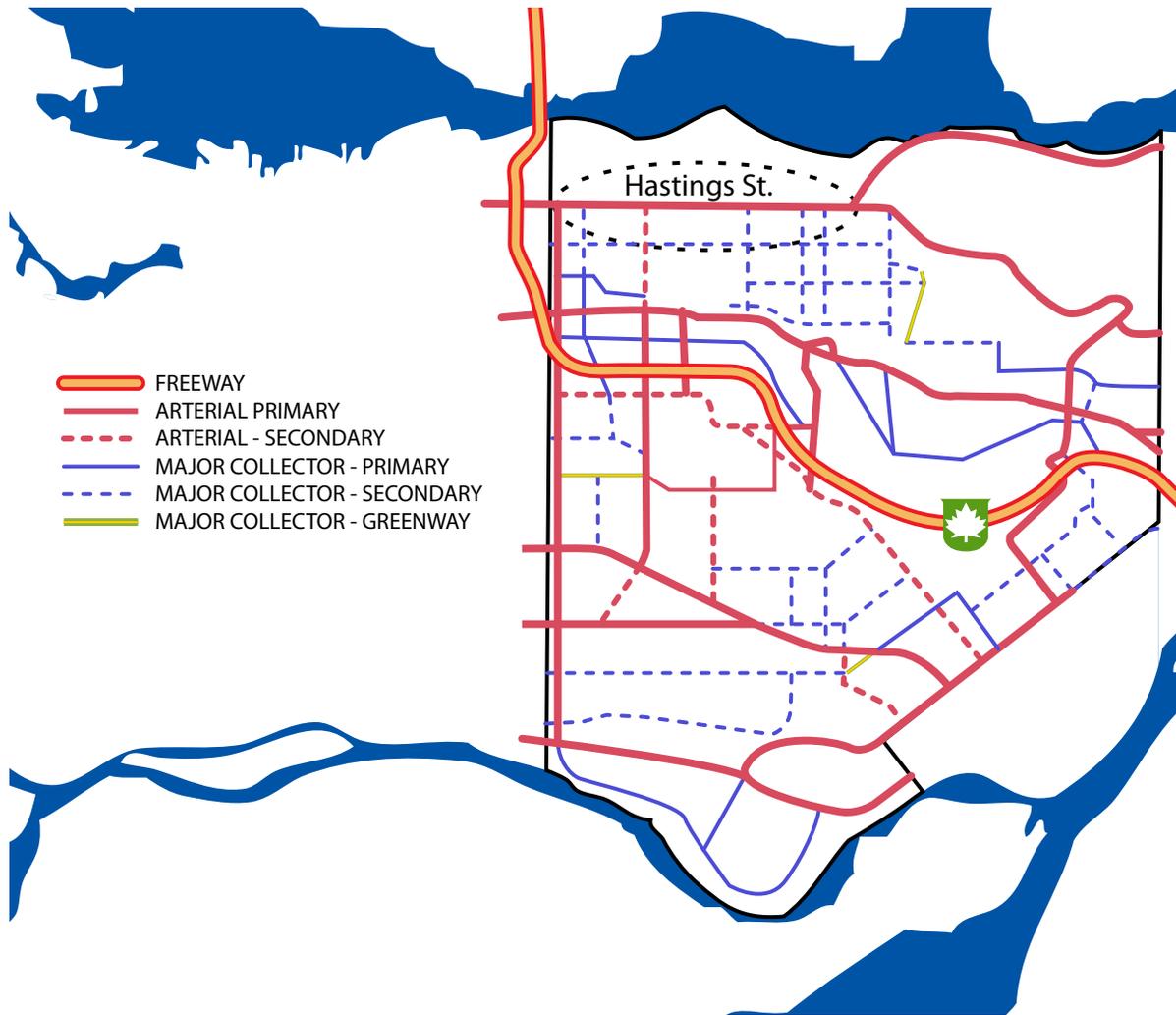


Fig 1: Burnaby Road Network (Source City of Burnaby web page 2008)

Burnaby Road Network

The Burnaby road system follows a concept that the City of Burnaby calls a "Road Network." Collector roads funnel all traffic into arterials which then connect to other municipalities.

In the Northern part of Burnaby all collectors feed into Hastings Street.

This immediately raises the question: What would be the consequences of a conversion to a true grid system for North Burnaby?

During the morning and evening peak traffic hours this use of Hastings Street as a highway creates tension between the need to support inter-subarea traffic flow and the need to access local business situated along Hastings Street. The HOV lane is especially heavily disputed.



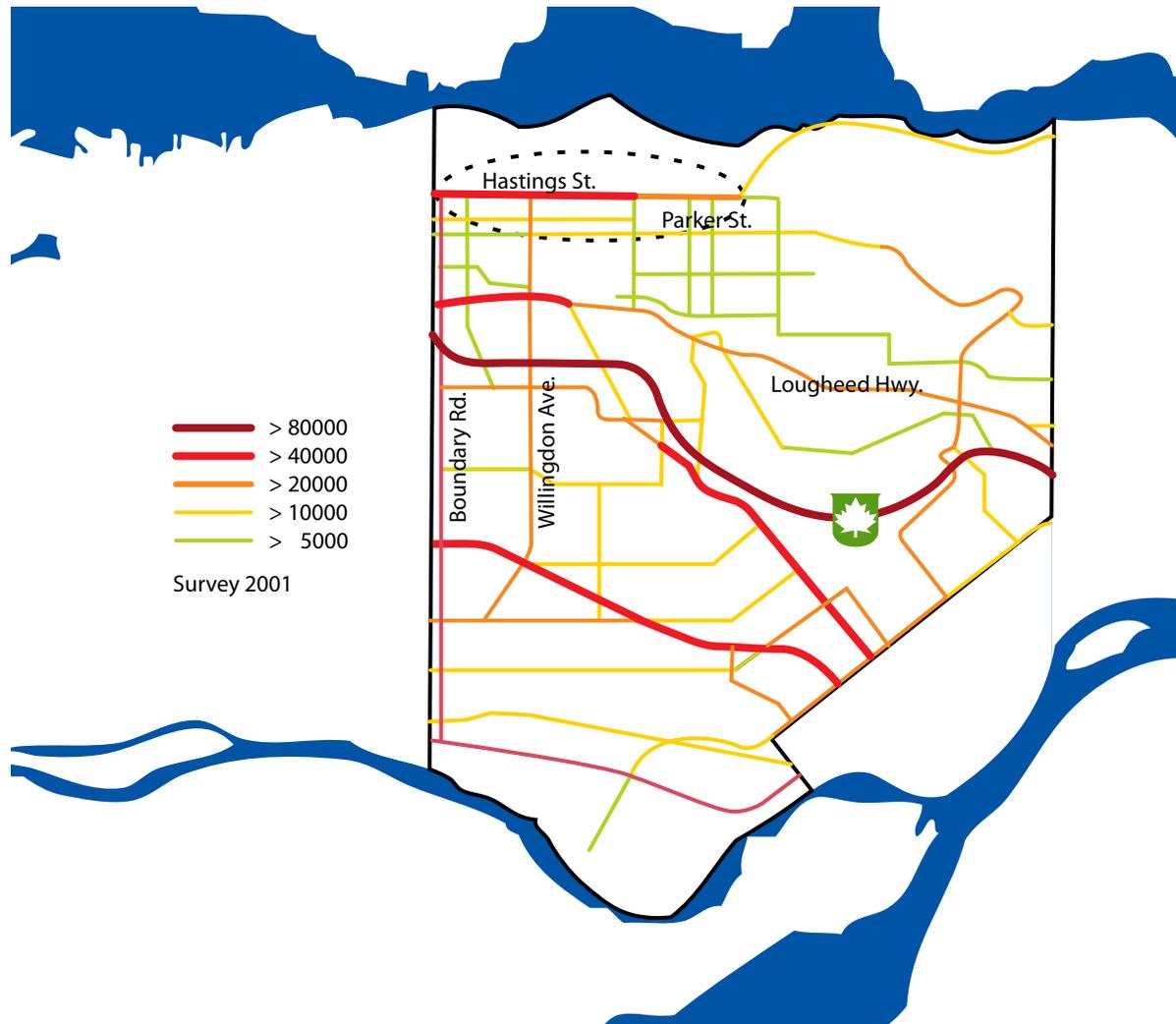


Fig 2: Traffic Count Burnaby 2001 Weekday Volume
Source: Burnaby Transportation Plan

Traffic Count

The traffic count shows the predominant East-West flow on Hastings Street. On average the car traffic on Hastings Street was approximately equal to 40% of the traffic on Highway 1.

Non-peak hour traffic has risen significantly more than peak hour traffic. Additionally, high traffic typically lasts one hour longer in the evenings.

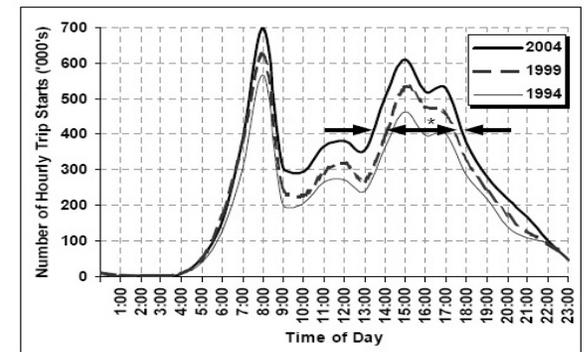


Fig 3 Traffic Trend Burnaby 1994 - 2004
Source: Translink " Trip Diary Survey 2004"

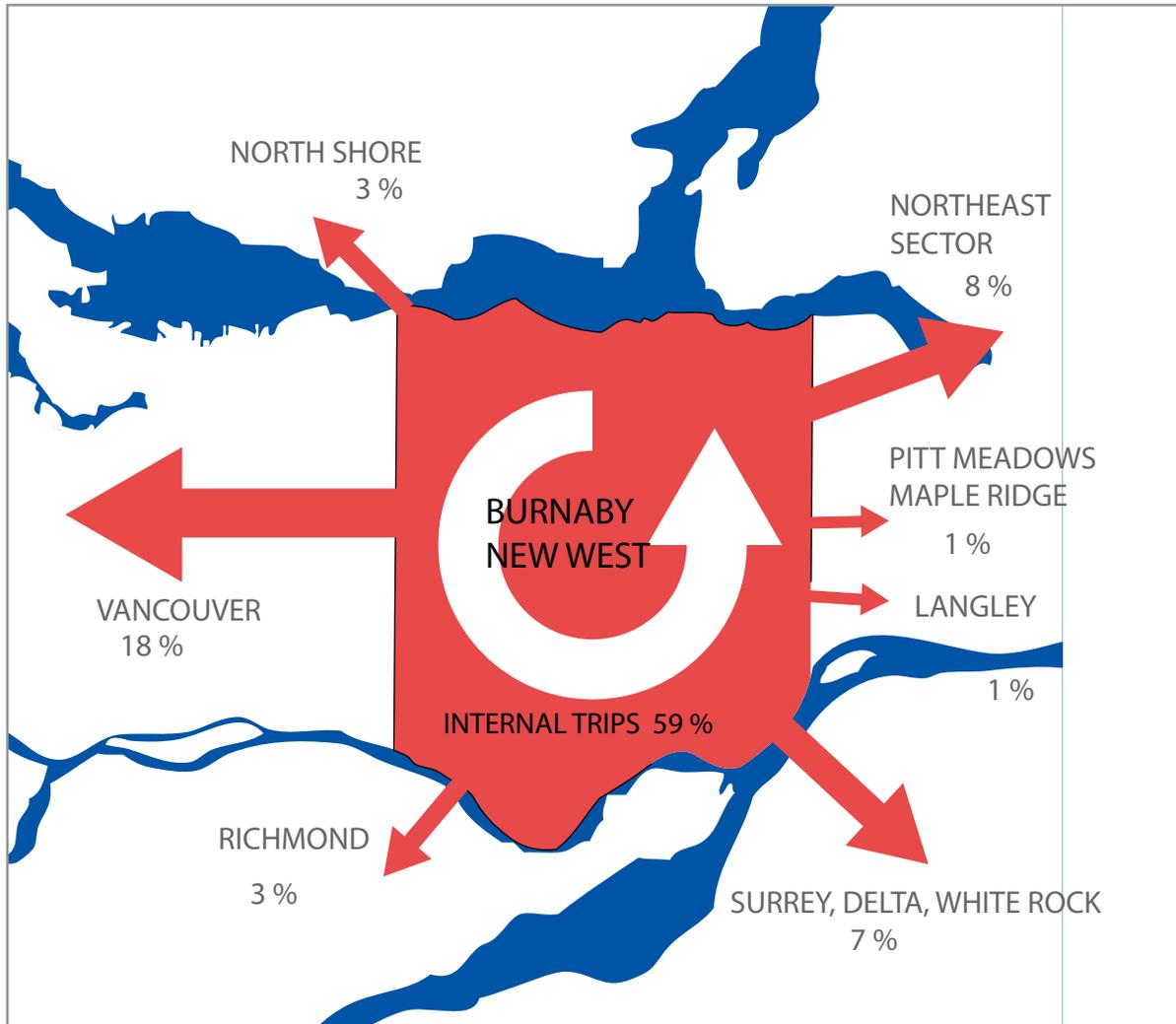


Fig 4 Daily Trips originating in Burnaby
Source: Translink Trip Diary Report 2004

Trip Destination

Burnaby's residents travel outside their municipality significantly more than any other GVRD resident.

Is this just due to the central location?

A different analysis shows that only 23% of traffic travels through Burnaby compared to 40% of traffic from outside, 25% traffic leaving and 12% within Burnaby.

(Burnaby Transportation Plan 2001)

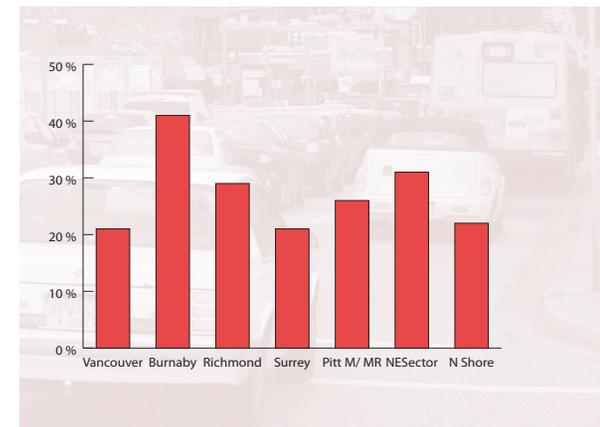


Fig 5 Percentage of daily trips leaving GVRD municipalities

Source: Metro Vancouver "Choosing a Sustainable Future for Metro Vancouver 2007"

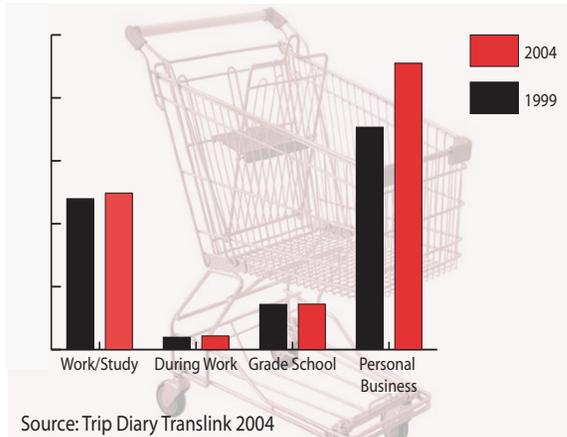


Fig 6 Reasons for trips in GVRD 1999 / 2004
Source: Translink Trip Diary Survey Report 2004

Trip Purpose

The overwhelming purpose for trips is not commuting, but for personal business, like shopping or recreational activities. This trend has increased since 1999; however, this is a common trend throughout North America.

Commuting Distance

Most commuting trips are short distance trips. The median commuting length in 2001 was 7.4 km for Greater Vancouver.

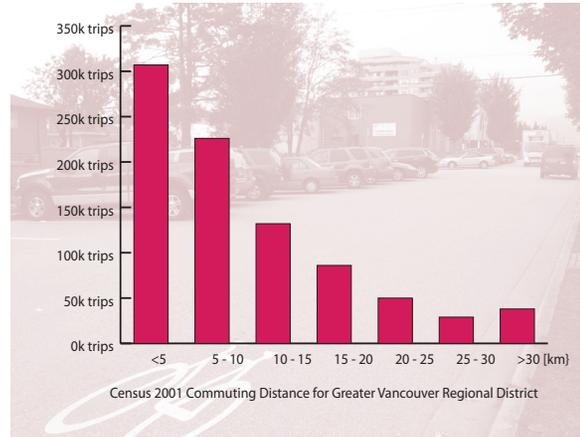


Fig 7 Commuting Distance for GVRD 2001
Source Census 2001

Outlook

The City of Burnaby Transportation Plan predicts almost a doubling of current traffic from 2001 to 2021 if increased density according to goals of the Livable Region Strategic Plans is realized. Figure 8 displays the future outlook for the number of trips in Burnaby during morning peak hour. To reduce the heavier traffic caused by increased population density, the City of Burnaby suggests Transport Demand Management (TDM) measures. These measures include the introduction of toll roads, more HOV lanes, and more transit options. Looking at the chart, it is obvious from the minor decline predicted for 2021, that the TDM would only produce a small improvement.

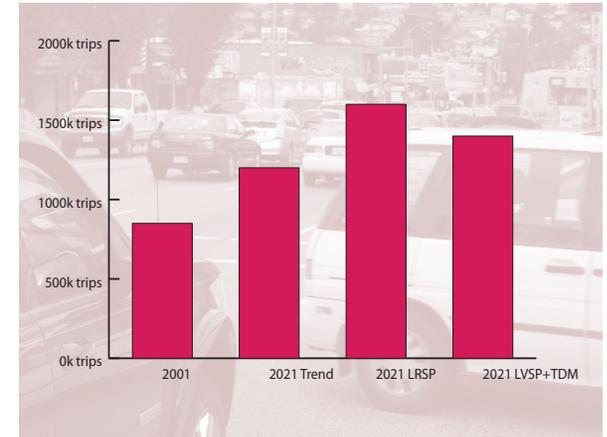


Fig 8 Traffic Prediction
Source Burnaby Transportation Plan

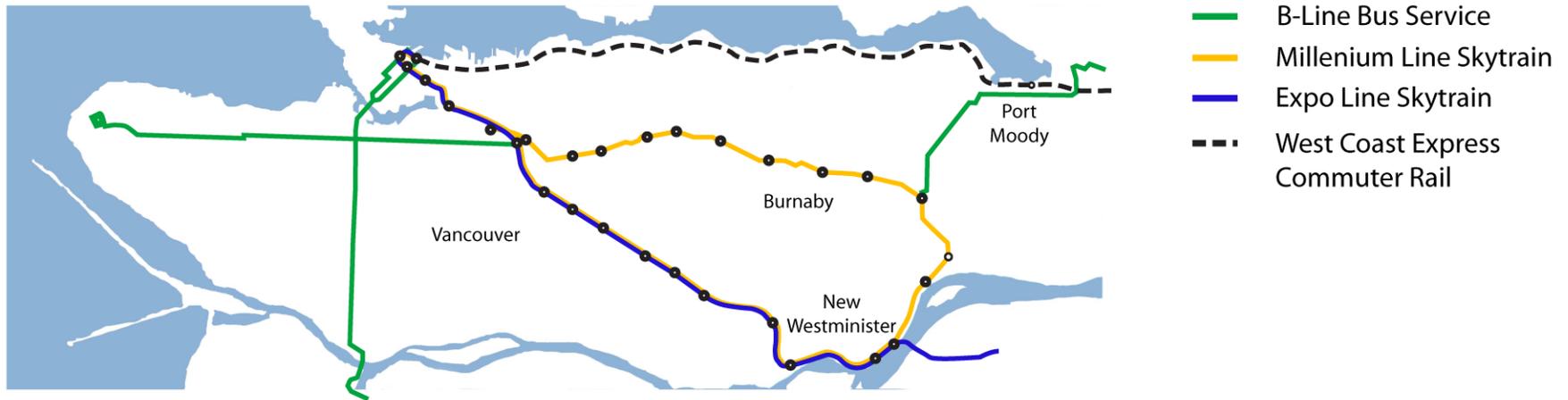
Conclusion

As the only arterial road in the Northern Part of Burnaby, Hastings Street accumulates significant traffic with an increasing trend. Although most of the trips are short distance trips, 41% of all trips leave the municipality of Burnaby. This rate is significantly higher than any other major municipalities in the GVRD. Statistics show that most trips are for personal business like shopping or recreation.

Regional Transit Systems

The Regional Transit System is characterized by high speed, segregated transit that supports high density nodes but fails to engage or service the urban matrix or major corridors. This systems is geared towards long distance travel.

Existing Regional Transit Systems



Proposed Regional Transit Systems

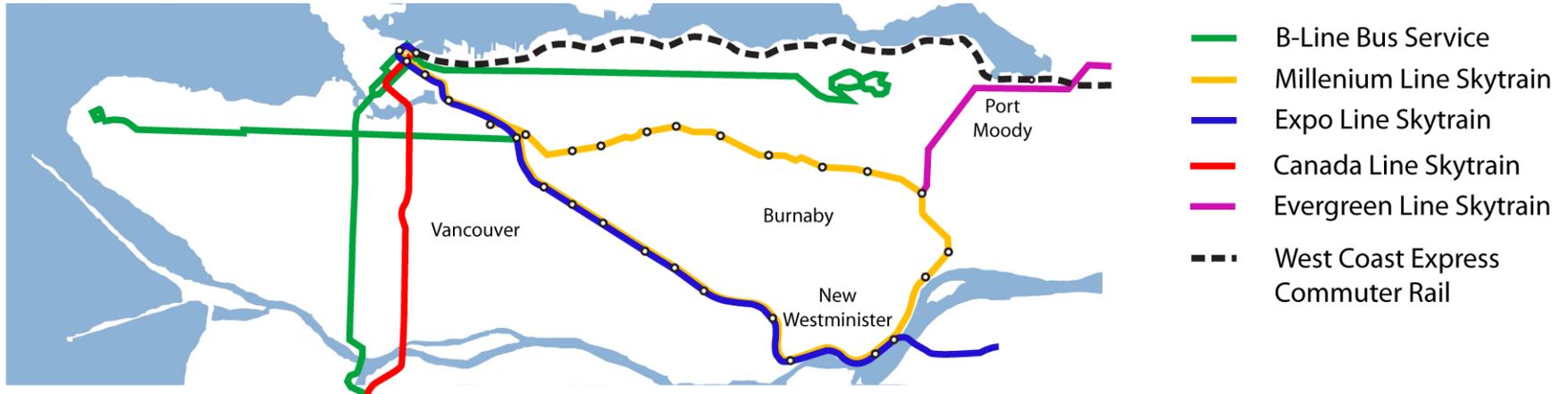


Figure: Shows the regional transit systems (present and proposed) which are comprised primarily of skytrain and express bus service but also include a commuter rail line linking eastern communities with the Metropolitan Core. Service between the Metropolitan Core and Regional Town Centres is provided by radiating skytrain routes, however, lateral linkages between Regional Town Centres are weak.

Hastings Bus Service

Bus service in the hastings corridor follows the logic of the regional transit system by focusing on service between distant destinations (ie. Downtown and SFU). The most frequent service is express routes with infrequent stops while local service for short trips is very infrequent.



Route 129 █
Peak headways: 15 min
Non-peak headways: 30 min



Route 130 █
Peak headways: 5-7 min
Non-peak headways: 15 min



Route 134 █
All headways: 30 min



Route 135 █
Peak headways: 3-8 min
Non-peak: 15-30 min



Route 160 █
All headways: 30 min



Route C1 & C2 █
Peak headways: 5-7 min
Non-peak headways: 15 min

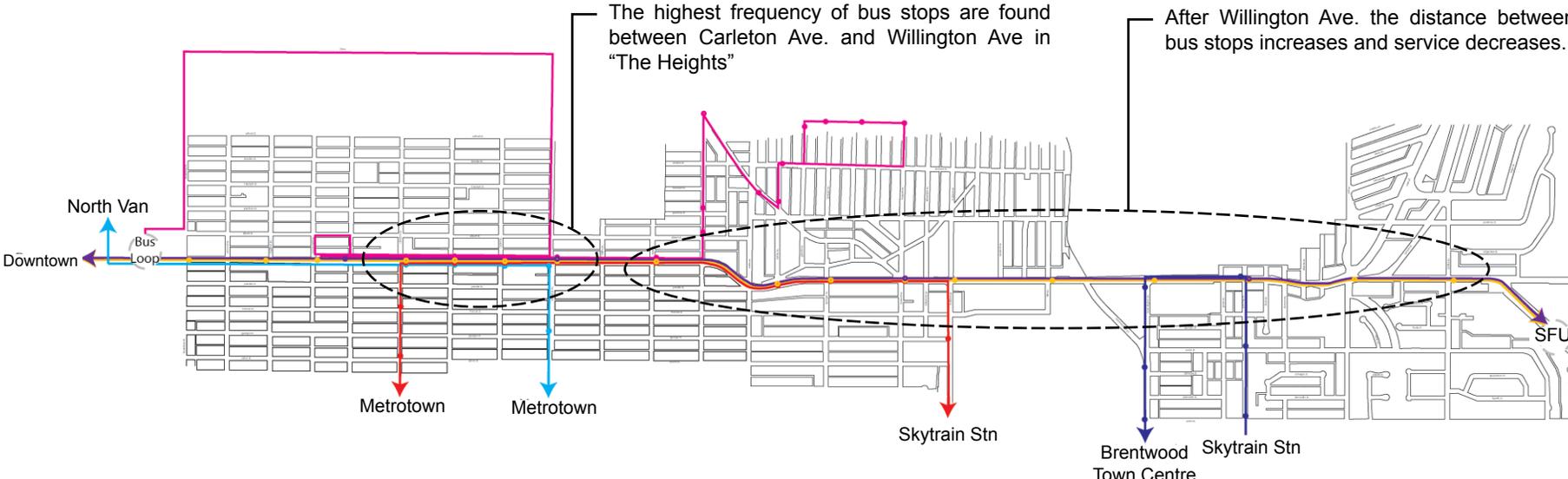
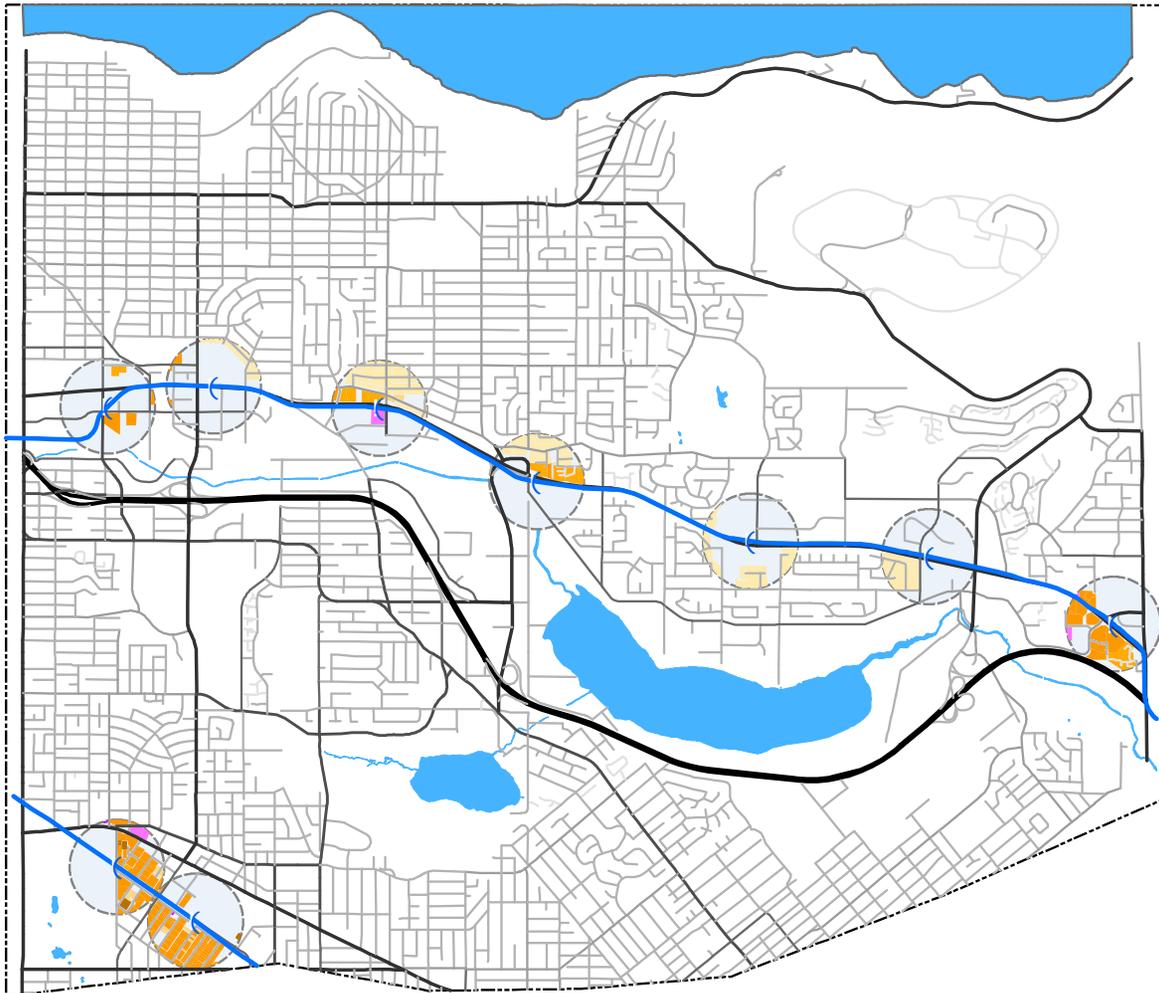
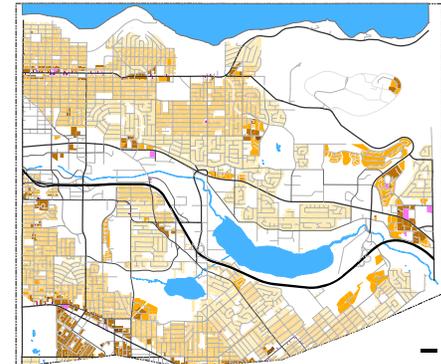


Figure: Shows the transit routes along the Hastings Corridor between Boundary road and Burnaby Mountain. Most North-South connections operate on 15-30 minute headways while more frequent service is provided along the Hastings corridor with routes linking SFU and Port Coquitlam to Downtown and North Vancouver. The Kensington Bus Loop located one block west of Boundary Road is a key transit interchange.

Population within 5 minute walk of skytrain stations



Current Population Density

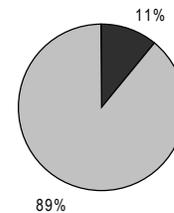


Legend

-  5 minute (1/4 mile) walking radius
-  Skytrain line

Residential Density

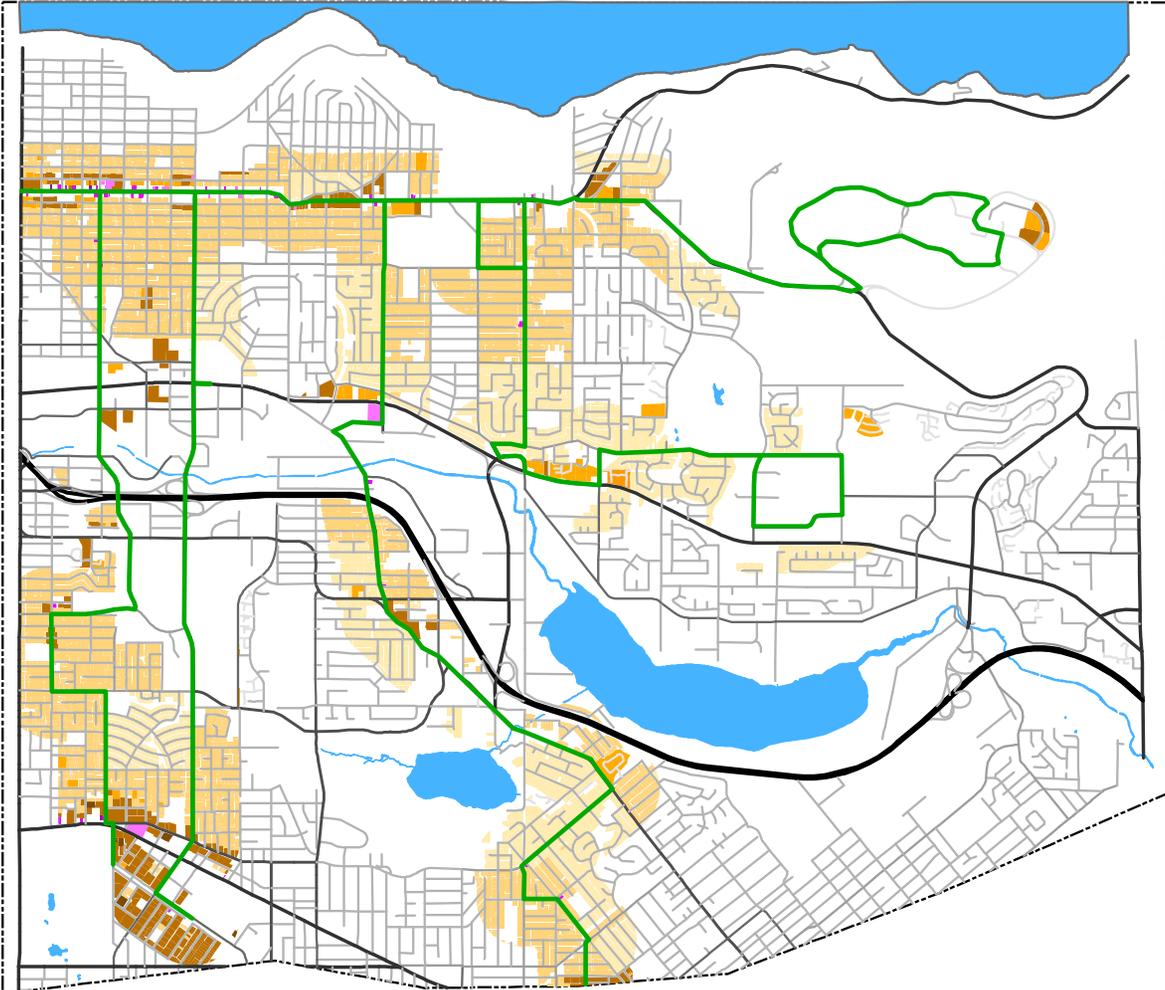
-  6 dwelling units per acre
-  10 dwelling units per acre
-  20 dwelling units per acre
-  55 dwelling units per acre
-  90 dwelling units per acre
-  20 dwelling units per acre (mixed-use)
-  55 dwelling units per acre (mixed-use)
-  90 dwelling units per acre (mixed-use)



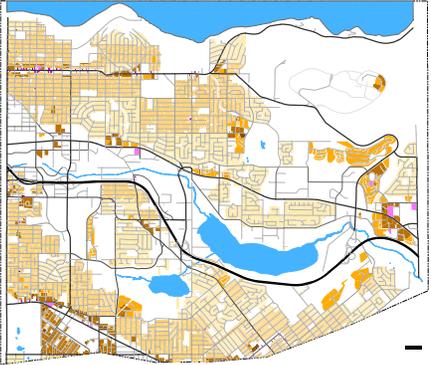
Analysis

Only 11% of the population lives within a 5 minute walk of a skytrain station.

Population within 5 minute walk of major bus routes

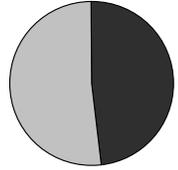


Current Population Density



Legend

- Major Bus Routes (<10 min headways)
- Residential Density**
- 6 dwelling units per acre
- 10 dwelling units per acre
- 20 dwelling units per acre
- 55 dwelling units per acre
- 90 dwelling units per acre
- 20 dwelling units per acre (mixed-use)
- 55 dwelling units per acre (mixed-use)
- 90 dwelling units per acre (mixed-use)



Analysis
 In comparison, 48% of the population lives within a 5 minute walk of a major bus route (headways less than 10 min)

Precedents: Toronto Streetcar System

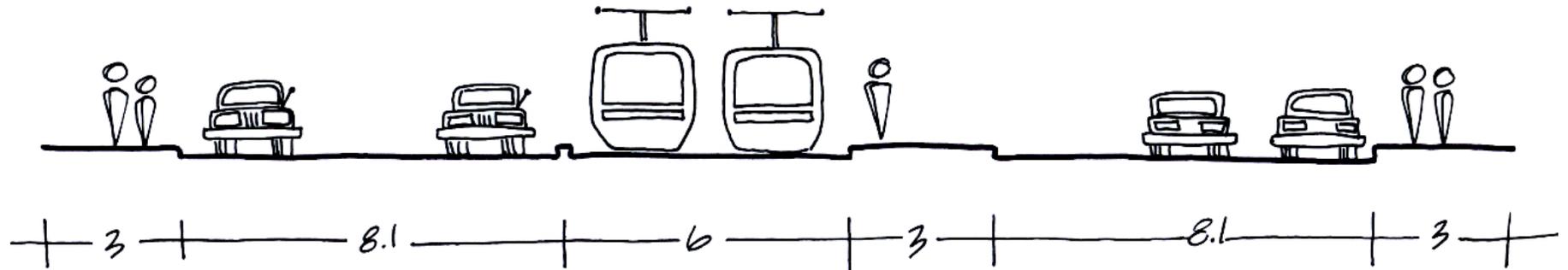


Figure: A cross section of Spadina Ave. in Toronto, Ontario. Here streetcars travel in dedicated right-of-ways down the centre meridian. Passengers load onto the streetcars from boulevards mid-block. Four lanes of through traffic and two lanes for on-street parking are also provided.

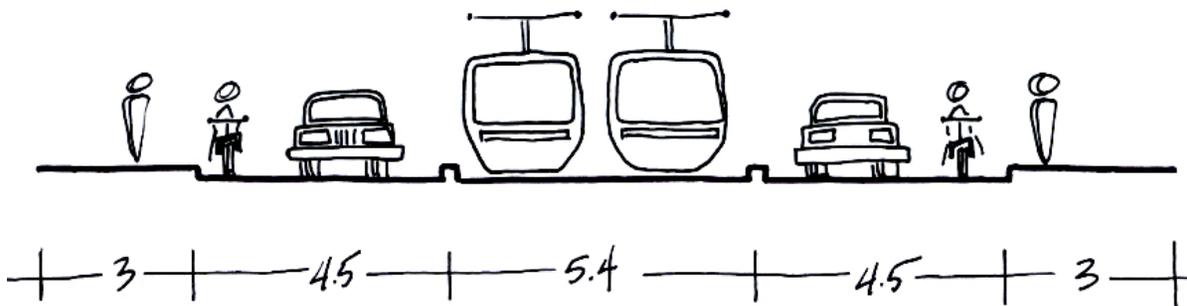


Figure: A cross section of a narrower street served by streetcar in Toronto with two lanes of through traffic and two bike lanes.



Figure: Streetcars in Toronto also operate in mixed traffic.

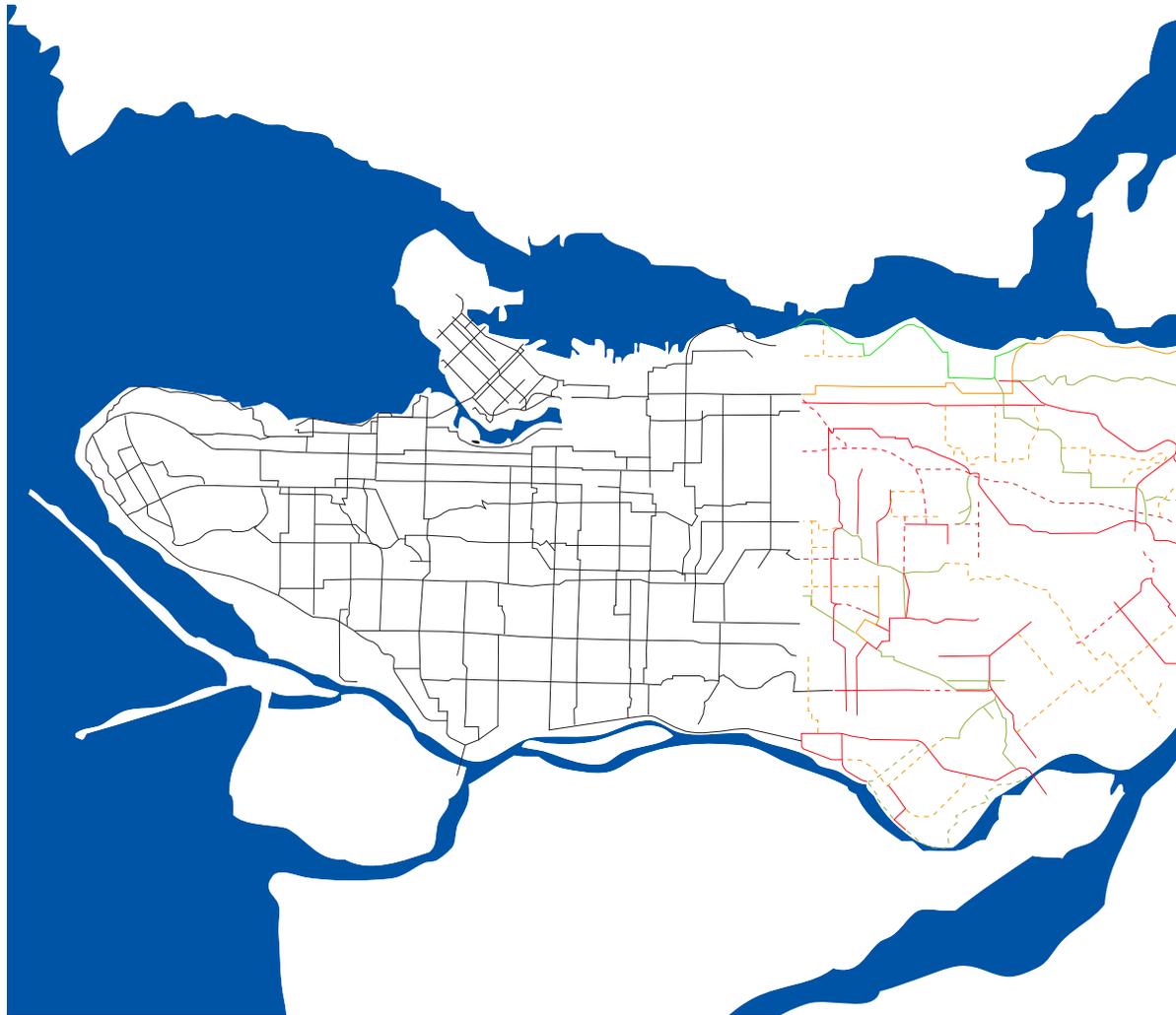


photo: Greater Vancouver Regional District Cycling Network

overview

The City of Burnaby is part of a greater network of bicycle paths, cycle roads and designated shoulder lanes that are used by much of the cycling population to get from point A to point B. As the Greater Vancouver Regional District continues to grow and moves towards cycling as a more dominant mode of transportation, the cycling connections between the cities will become increasingly more important.

Currently, the connections from the City of Burnaby into the City of Vancouver are very successful. The only problem that is pressing many cyclist is the lack of signage along the paths to inform changes in direction or addition paths that can be taken.

work trips

0.7% of work trips are by bicycle, with the maximum distance travelled being 5.1km. Similarly, the District of Maple Ridge, the City of Pitt Meadows and the Corporation of Delta also have work trips at 0.7%. The largest amount of bicycle work trips is within the University Endowment Lands at 5.7%, followed closely by the City of Vancouver at 3.6% (source: translink long range bicycle master plan)

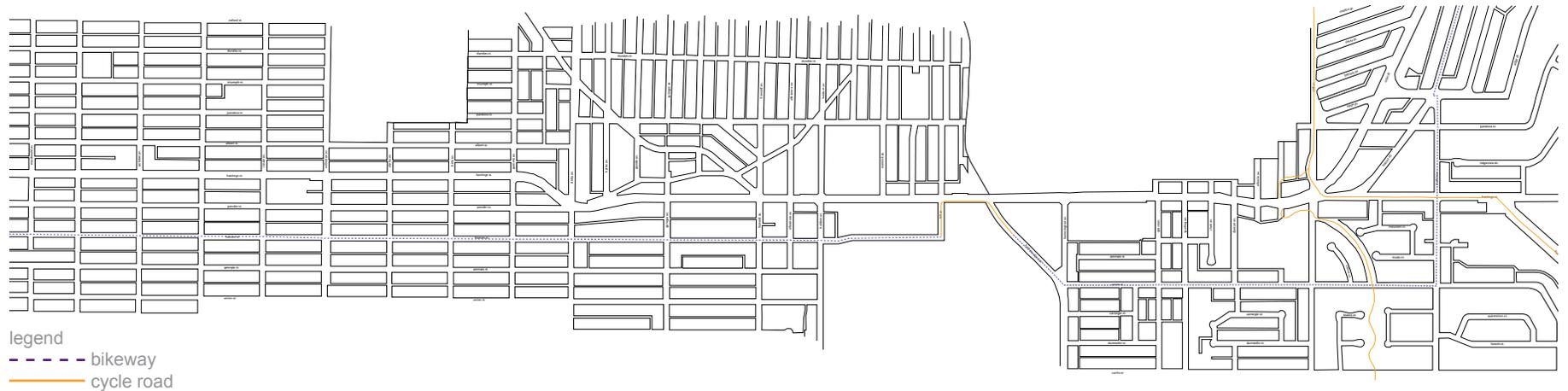
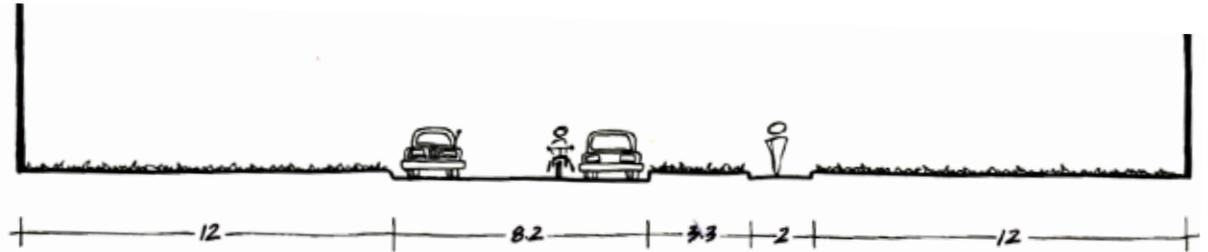


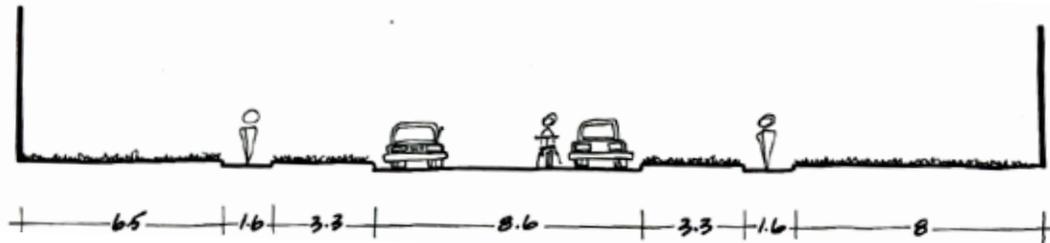
photo: Cycling Network within the Hastings Street Corridor
Hastings Street, City of Burnaby. Study Area - Hastings Street Corridor from Boundary to Burnaby Mountain including 400meters North and South.



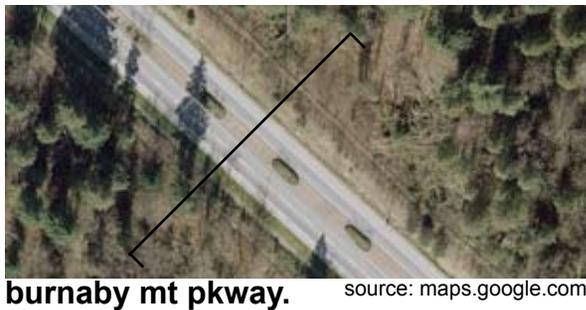
Photos: Images representative of the Hastings Street Corridor



bikeways are assigned routes, usually on quieter residential streets.



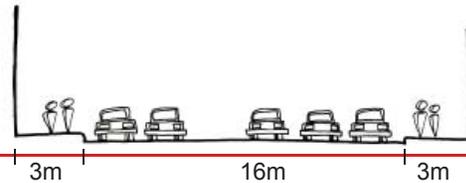
cycle roads accommodate cycling through wider curb lanes intended for longer distance trips.



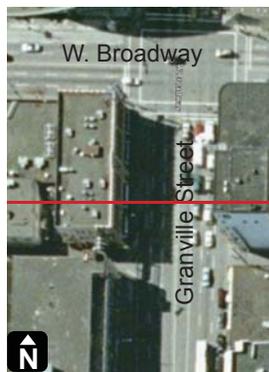
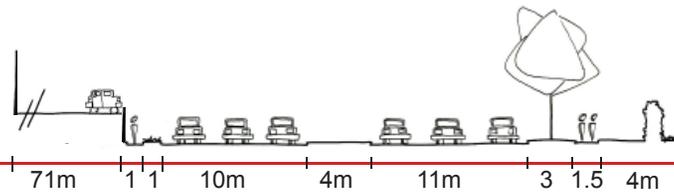
shoulder lane are a paved shoulder on busier roads, usually marked with a bike logo.



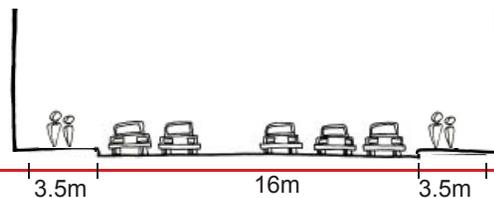
burnaby heights



kensington square



Granville St. @ W. Broadway



Transects of Hastings Street

The sections exhibit the two main commercial hubs of the Hastings Street corridor. The walking conditions (sidewalk width, street width, and denoted parking areas) are constantly changing. These inconsistencies make it difficult to create a pedestrian mental map.

The Granville Street corridor characterizes one of the most highly traveled streets in Vancouver mainland. The street dimensions are comparable to those of Hastings Street in Burnaby Heights. But the speed of traffic and scale of buildings is very different, creating an entirely different pedestrian environment. Because each stretch of Granville Street has identifiable consistency of character, pedestrian mental mapping the area is conceivably easier.

aesthetics



barriers to walkability

Photo: Lack of visual diversity, interactive facades, and beauty of the pedestrian experience.

topography



Photo: Steep slopes lead to Hastings St. North side of Hastings fronted with retaining walls, while the south side facades are below street level.

pedestrian connectivity



Photo: Sidewalk-less streets in neighborhood. Long blocks without mid way crossing points. Isolated pedestrian environments.

perceived safety



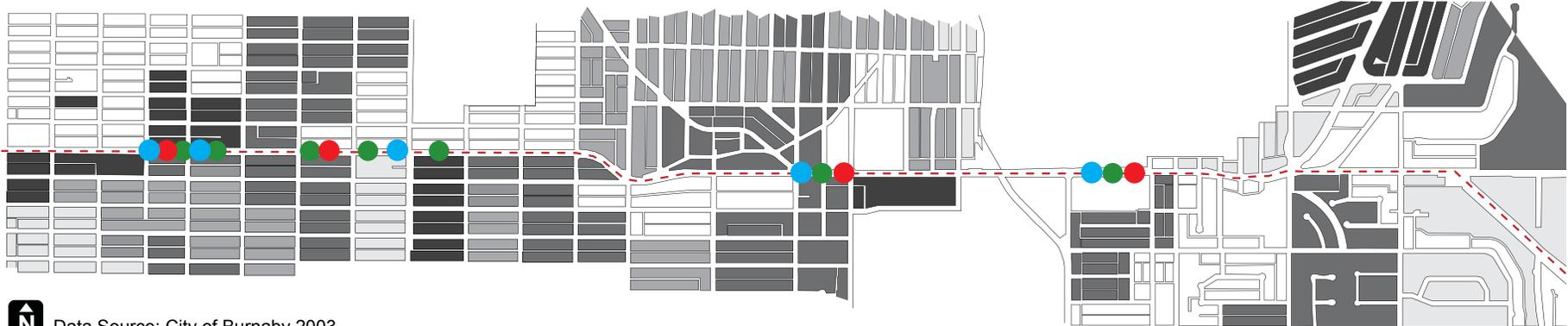
the pedestrian experience

Currently Hastings Street exists as a corridor moving people and traffic between its anchors Simon Fraser University and Downtown Vancouver. Sub anchors exist in the study site as Burnaby Heights and Kensington Square, but are too far apart to create an ongoing pedestrian mall. The aesthetics, topography, pedestrian connectivity, and perceived safety, and land uses of Hastings Street vary tremendously (also by time of day). Some blocks appear to be quaint while the next put their parking as street frontage, and the general exposure to climatic elements and traffic, changes continuously. Because of this lack of consistency within the environment and perceived safety risks, mental mapping this area as a pedestrian and desirability for walking becomes very difficult. The traffic also presents a barrier to the walkability of the entire surrounding community. Noise, pollution, and the speed of traffic limit a pedestrian's ability to use the street not just for utility but for enjoyment. The added problem of the truck route and large trucks moving through the side street to get to Hastings St. has created a visible barrier in which neighborhood can not be separated from arterial.

barriers to walkability

Photo: Widened lanes and lengthy intervals between stoplights dwarf pedestrians and increase traffic speed. Evening HOV lane on Hastings, eliminates barrier of parked cars which is perceived as separator for the pedestrian zone. The evidence of the truck route is apparent throughout the surrounding community.

burnaby is aging....



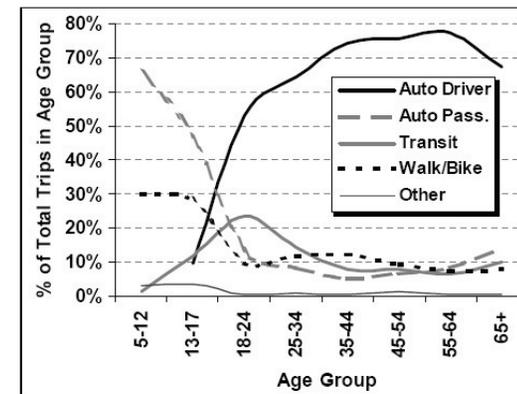
 Data Source: City of Burnaby 2003

Population % by age

- - Hastings Street
- 65+ 30% - 75%
- 65-79 10% - 15%
- 55-79 20% - 35%
- 55-64 10% - 20%
- medical/ pharmacy facilities
- grocery stores
- pet supply & vet



Mode of Travel by Age Groups (2004)



Translink: "Trip Diary Survey Report 2004"

Figure: As residents of Burnaby age it is clear that they will not be able to reach the services they need by foot or transit. Currently Burnaby Heights has a stability rate of 93%, as the baby boomers age (they represent a large portion of the single family home owners) they will be staying in this neighborhood. The hubs which provide necessary services for seniors are spaced out too far to be in easy proximity for most seniors to access without driving.

on the way to school....



- - - Hastings Street
- elementary school
- school district
- ⚣ intersection with crossing guard

Figure: North Burnaby School districts expand across Hastings Street. No school busses are supplied for these areas. Forcing many children to cross the busy intersections of Hastings Street during the morning commute. The school district provides crossing guards at two intersections along Hastings, Gilmore Ave. and Holdom Ave.

Parking

Burnaby Heights is distinguished from the rest of the Hastings corridor by a eleven blocks of shops between Boundary and Gamma. Movement along this route is expressed by an immense amount of parking, not only for cars but also for pedestrians and bikes. While the intended parking does not reflect the actual movement in the area, it shows the sometimes conflicting desires of the neighborhood to be walkable and bikable while simultaneously being a convenient drive-to location.

The bike racks are rarely used, most likely because of the difficulty of riding a bike along Hastings with fast moving traffic. The benches, while providing a momentary respite, are often located uncomfortably close to traffic or face an uninteresting facade.

While car parking is readily available off Hastings, merchants complain that the afternoon 3 hour HOV lane eliminates the most convenient parking used by clients who make unexpected shopping stops on the way home. There is visual support for this claim. Within 15 minutes of the 6pm HOV lane cutoff, the Hastings street parking is completely filled.



One of the primary concerns for pedestrians on Hastings is the noise levels experienced on Hastings. This diagram shows the change in noise levels between Macdonald and Carlton from Francis in the South, across Pender, Hastings and Albert to Pandora.

In addition to the noise on Hastings we can see that the feeder streets on both sides of Hastings are taking some traffic off the main corridor.

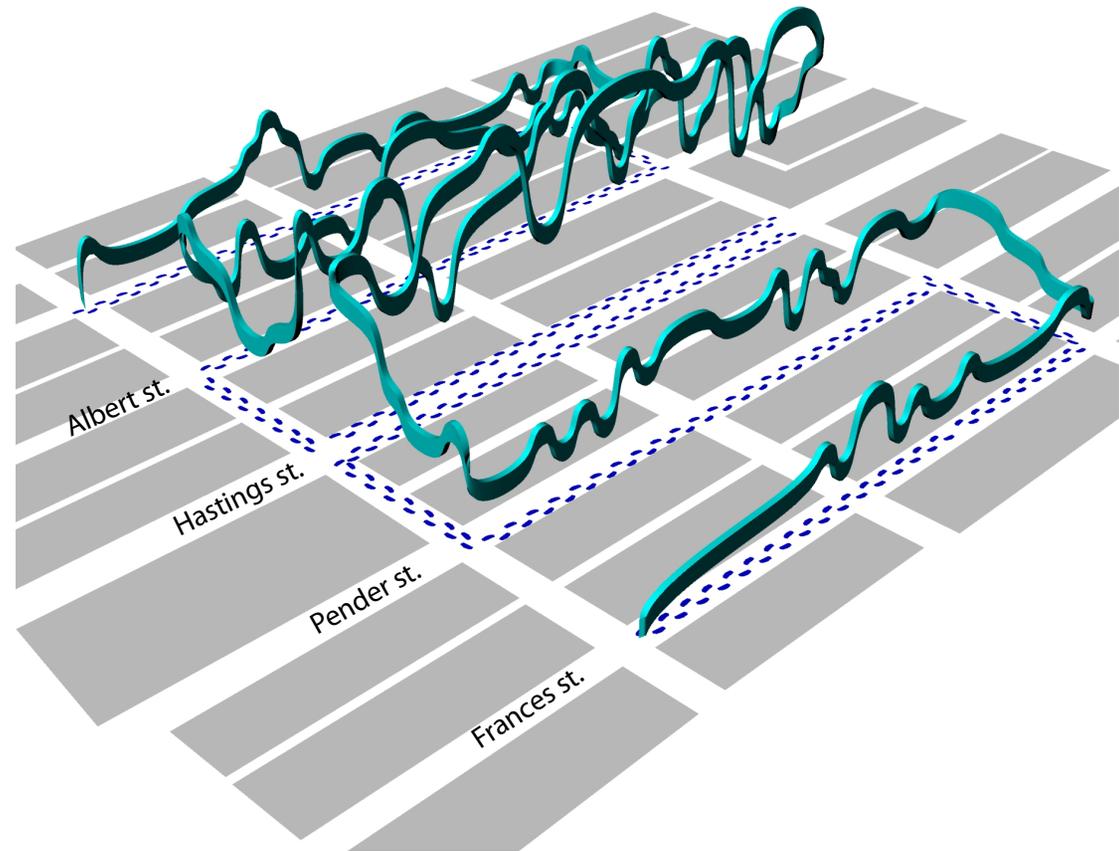
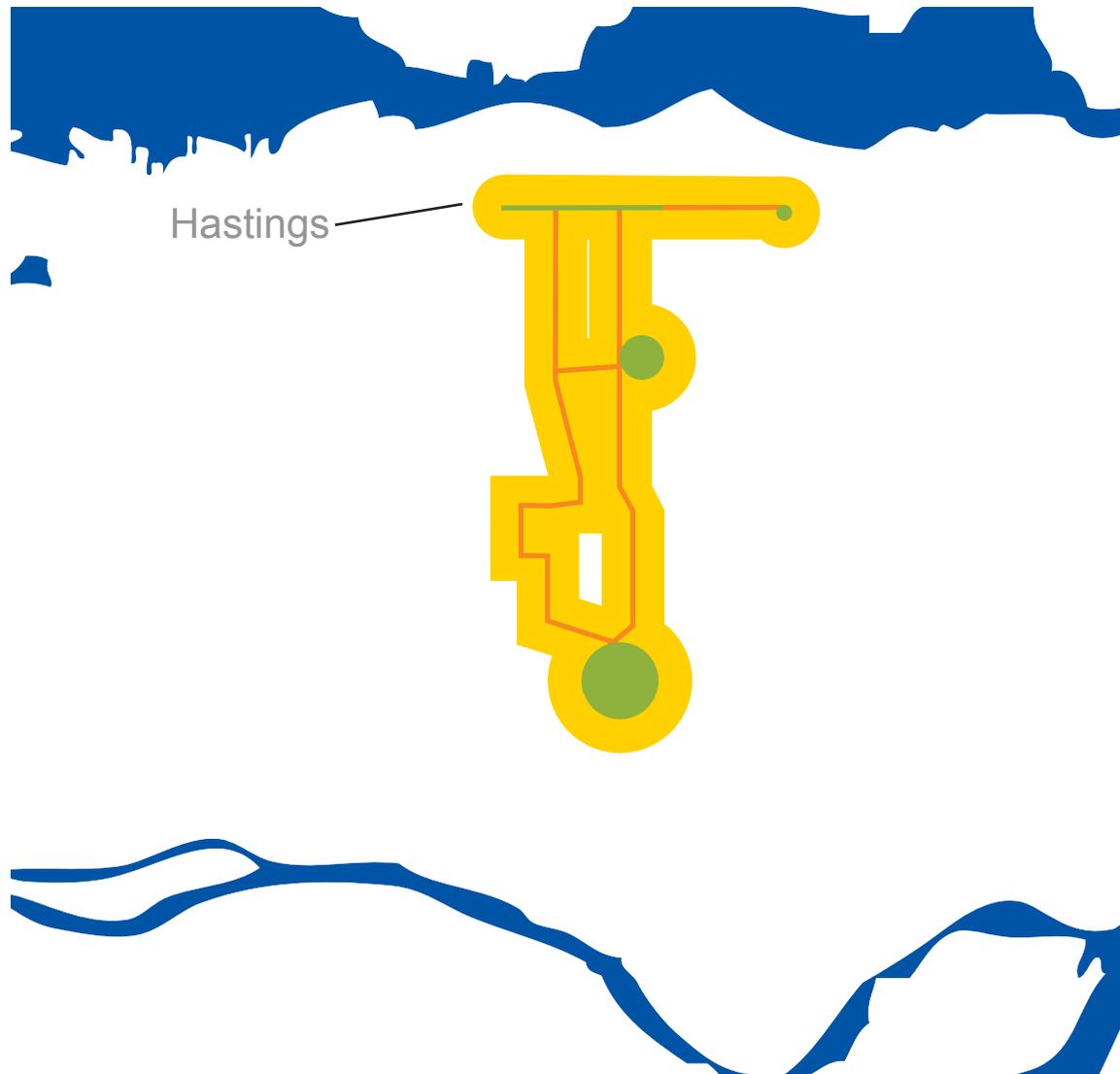
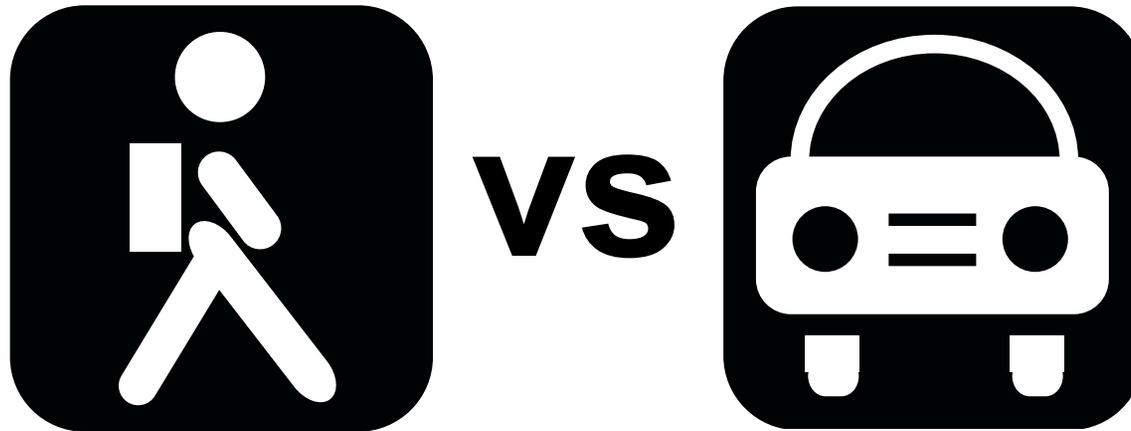


Photo: The pedestrian experience of sound is documented following a walker along a series of cross sections.



While a variety of shopping is available on Hastings and 80% of residents in Burnaby Heights shop there for some of their items, locals preferred Metrotown and Brentwood malls for shopping. While Hastings is within walking distance for many of these people, Brentwood and Metrotown are 2 and 7 km away respectively.

Photo: This image shows the primary shopping locations for residents in the Heights as well as the bus lines between them and the walking distance to all those points.



movement

Hastings Street is intended for a confluence of movement types: biking, busing, walking and driving. Unfortunately the street does not currently accommodate all of these modes particularly well and the intended use by cyclists and walkers is not as common as it could be. Cyclists on Hastings either risk their lives on the street or invade the limited space of the walker on the sidewalk, where as pedestrians fight the perceived safety of walking along such a busy road with only 1.6m between the building and the curb. Pedestrians may use the Hastings Street for shopping, but only when they have too. Most shoppers do their leisure shopping at Metrotown or Brentwood. Off Hastings there is much less movement of all types. Clearly there is a conflict of needs on this corridor.

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section 4 : movement

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