

University of British Columbia

Social Ecological Economic Development Studies (SEEDS) Sustainability Program

Student Research Report

# Parking Policy for Sustainable, Accessible Communities

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# Parking Policy for Sustainable, Accessible Communities

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## Executive Summary

Wesbrook Place is a growing residential neighbourhood. The influx of new residents and planning for future residents has effects on how the neighbourhood grows as a sustainable neighbourhood. To reduce future environmental impacts and increase livability in the area, our report provides insights on existing transportation modes and their availability, literature reviews and case studies as precedence for successful planning. Our specific area of study in this report is the residential parking policy and parking demand within the Wesbrook Place residential neighbourhood.

The existing alternative modes of transportation in the vicinity of Wesbrook Place were also examined, which ranges from public transit, car-share operators, and cycling infrastructure. From a cursory review, one would suspect there are sufficient alternative modes of transportation serving Wesbrook Place. However, there are limitations with each of these modes of transportation including frequency of transit trips, availability of car-share vehicles and/or bike-share bicycles and cycling infrastructure.

We decided to study case studies across British Columbia, the City of Darmstadt in Germany, and the US cities of Miami, New York, and Seattle to get a broader outlook of how the developments of different urban planning initiatives took shape and have achieved success. The opportunities identified which could be relevant for Wesbrook Place include the use of incentives through policy to reduce parking requirements in exchange for access to alternative modes of transportation, manage parking needs based on peak demand times between different building occupancy types and practice stakeholder engagement to understand the resident's future outlook for Wesbrook and what their insight as a collective means to the growth of the neighbourhood.

Based on the results of the literature review and case study review, we have noted a number of innovations and/or incentives programs that have been successful in other jurisdictions and can be applied to some extent to Wesbrook Place. The depth of our research and insight from our survey results has given us the opportunity to develop key performance indicators to measure the use of vehicle for transport and the frequency of visitors to the neighbourhood in order to provide feedback in developing new parking policy.

Our final recommendations are outlined with a short term and long term outlook. The short term actions include an action plan towards identifying key KPI's that can deduce a data analysis based on resident behaviour and actions. Our long term outlook proposes to include stakeholder engagement and draft tiered policy changes. The incremental changes with resident champions will allow for a smoother transition towards enacting new policies while still working with UBC's initiatives e.g. UBC's Green Building Action Plan.



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# 1. Introduction

Sustainable urban developments are designed to offer social livelihoods, mitigate negative environmental impacts and create self-sufficient neighbourhood economic hubs. The challenges that arise with the promotion of sustainable urban developments is how to balance densification with new spatial environments that limit ease of mobility and constrain accessibility, specifically parking. Can we find creative ways to discover new ways of using and sharing our existing parking spaces and possibly reduce the regulated volume of parking allocated to a building for future developments? Would we ultimately be able to shift away from the status quo of car use to alternative modes of transportation or even a car free zone? To understand residential parking demands in the South Campus area of the University of British Columbia (UBC), we decided to explore how often and for what purpose cars are used by residents in the Wesbrook Place neighbourhood.

This study includes literature reviews, data collection and analysis, evaluations, and reviewing plans for future developments. Several opportunities exist to evolve the status quo of making significant investments in providing parking to support our car reliance and instead drive sustainable solutions. Transportation via car shares, bicycle use, walking and public transit provide the opportunity to pivot towards the direction for a sustainable living environment. Further, we explore how planning, incentives, and innovations can resolve car dependency and therefore reduce the need for parking.

## 1.1 Planning

In the context of a sustainable urban development, neighbourhood planning at the forefront of development can facilitate change. It must take into account the lived environment and living reality of its residents to ensure equitable transport practices and availability. Car reduced neighbourhoods need to consider the means to continue the upkeep of lived and sustainable lifestyles and its effects on wider geographical configurations that may unintentionally redesign mobility patterns.

## 1.2 Incentives and Innovations

Participating in stakeholder engagement to understand the residents' and broader audiences' perspectives on mobility can motivate the creation of an integrated and transformative built environment. Our team has put forward multi-modal strategies for sustainable mobility based on case studies and best practices.



### 1.3 Project Scope

The scope of this project explores parking demand, especially visitor and accessible parking, in Wesbrook Place's residential neighbourhood. Our team will further assess current policy and parking guidelines to inform decision making.

#### **Primary Objectives**

- Conduct a literature review of parking policies across North America that support and encourage more sustainable transportation choices while still meeting accessibility requirements (e.g., Vancouver considering removing parking minimums for development).
- Analyze UBC's current parking regulations for development and conduct interviews with key stakeholders (developers and regulators) to identify existing data to analyze, and to determine gaps and opportunities in policy.
- Based on literature review, analysis, and interviews, propose recommendations for how parking policy can be enhanced in UBC residential areas.

#### **Secondary Objectives**

- Explore the need for Electric Vehicle (EV) parking spaces with charging stations
- Explore best practices for reducing parking spaces requirements in other jurisdictions

The goal is to develop recommendations for new development parking requirements that are commercially viable, support modal shifts to reduce emissions and promote accessibility.

## 2. Project Background

### 2.1 Site Context

Wesbrook Place is the UBC's largest neighbourhood located at the Point Grey campus. It is located within the South Campus area of UBC and spans across 37 acres. The neighbourhood offers an all-encompassing community for residents with access to a range of amenities from a secondary school, grocery store, shops, parks and restaurants to a community centre.



*Figure 1 - Wesbrook Place Neighbourhood Boundary (GoogleEarth, 2021)*

Wesbrook Place as shown on Figure 1 is bounded by West 16th Avenue to the North, Pacific Spirit Regional Park to the East, UBC Farm to the West and a convergence of streets to the South.

## 2.2 Wesbrook Place Development Timeline

Wesbrook Place was initially established in the mid 2000s and has undergone a series of developments and policy changes since then. The timeline below highlights the key developments of the neighbourhood and associated policy changes.

2005	South Campus Neighbourhood Plan was first adopted, guided by the Official Community Plan, 1997
2010	UBC Land Use Plan adopted, replacing the Official Community Plan
2011	UBC Land Use Plan and Wesbrook Place Neighbourhood Plan amended Development shifted from UBC Farm to Wesbrook Place
2013	University Hill Secondary School opens
2015	Wesbrook Community Centre opens with fitness, recreation and event spaces
2016	Wesbrook Place Neighbourhood Plan amended to enable new forms of development and urban design
2019	South Campus Greenway receives Development Permit integrating between UBC Farm and the neighbourhood
2020	Minor Plan Amendment approved to reconfigure 4 lots to enable up to 500 faculty-staff units.

From the timeline above, despite Wesbrook Place's relatively young age, a number of policy changes for the area have occurred to accommodate the changing needs of the community.

### **3. Methodology**

To complete this study, a number of research methods were used. A literature review of existing policies and plans pertaining to Wesbrook Place was completed. A literature review of policies that permits reduced parking requirements in other jurisdictions was also undertaken. Finally, a survey was developed and deployed to residents of Wesbrook Place to understand their parking needs.

#### **3.1 Review of Literature Pertaining to Wesbrook Place**

The current plans and policies that pertain to residential parking in Wesbrook Place was undertaken for this study. The following documentation was reviewed:

- University of British Columbia Development Handbook (University of British Columbia, 2020)
- Wesbrook Place Neighbourhood Plan (University of British Columbia, 2020)
- University of British Columbia Green Building Action Plan (University of British Columbia, 2018)
- University of British Columbia Transportation Plan (University of British Columbia, 2019)
- University Neighbourhoods Association parking documentation (University Neighbourhoods Association, 2021)

A summary of the findings from the plan and policy review is provided in Section 4.

#### **3.2 Review of Policy in other Jurisdictions**

To review the evolution of parking policies, several case studies were reviewed - one in the Lower Mainland, one in the United States, and one in Europe. The case studies are as follows:

- Case Study 1: Parking Requirement Reductions in British Columbia
- Case Study 2: Parking Sharing and Building Use in the United States
- Case Study 3: Traced Narratives of Car Reduced Neighbourhoods in Darmstadt, Germany

#### **3.3 Survey Development and Deployment**

A survey was developed with input from UBC Campus + Community Planning, Village Gate Homes, University Neighbourhoods Association, and Urban Systems instructor Dr. Martino Tran. The survey includes 21 multiple choice questions and 2 open feedback questions. The survey was distributed to residents of Wesbrook Place in all housing types via Village Gate Homes and the University Neighbourhoods Association. The survey is hosted on UBC's survey tool called Qualtrics. It is intended to collect data to help understand the following:

- Parking demand difference between housing types in medium and low-density parcels in Wesbrook Place
- Parking demand for reserved visitor and accessible parking spots
- If COVID-19 has impacted some of the existing behaviors with regards to transportation and parking
- Various modes of transportation demand and frequency of use
- The potential impact of incentives to use alternative modes of transportation that may ultimately reduce parking stall demand
- General feedback

A copy of the survey is provided in Appendix A.

## **4. Literature Review**

This section summarizes the points relevant to parking and alternative transportation methods in Wesbrook Place from the documentation listed in Section 3.1.

### **4.1 Housing Types and Parking Availability in Wesbrook Place**

Wesbrook Place has been designed in line with UBC's ambitious green building rating system REAP - Residential Environmental Assessment Program. "REAP provides a sustainability framework to ensure all UBC residential development responsibly addresses water conservation, energy-use reduction and reduce environmental impact on both the building site and the larger community" (Village Gate Homes, 2021).

The lands within the Wesbrook Place boundary are managed and leased by UBC Properties Trust. UBC Properties Trust was developed between 1991 and 1994 to serve UBC's growing faculty and staff who required short-term accommodation and to optimize land available for development. Currently, UBC Properties Trust oversees the housing that is constructed and sold on the open market. This housing is termed "market housing".

Market and non-market rental housing in Wesbrook Place is managed and/or leased by Wesbrook Properties and Village Gate Homes. Village Gate Homes is a subsidiary of UBC Properties Trust who manage and lease rental homes for UBC's staff and faculty. Fifty percent of the homes managed by Village Gate Homes in Wesbrook Place are designated to an active staff, faculty, or student UBC member. These rental residences range from rental apartments to townhomes.

### **4.2 Wesbrook Place Street Parking**

The University Neighbourhoods Association (UNA) was established in 2002 to support the residents of UBC's residential neighbourhoods. The association is responsible for local regulations which include noise, parking, animal control, community programs, recreation,



policies, by-laws, landscaping, and acts as a body similar to what a typical municipality requires.

In addition to street permit parking available for residents and guests of residents, street parking is also allocated to accessible parking (Figure 2), car share parking (Figure 3), 1 and 2 hour pay parking for shoppers (Figure 4), and all of the aforementioned designated parking is illustrated on Figure 5. Figure 5 demonstrates the extent of parking availability around Wesbrook and its limitations to increase parking availability as future developments continue to be erected.

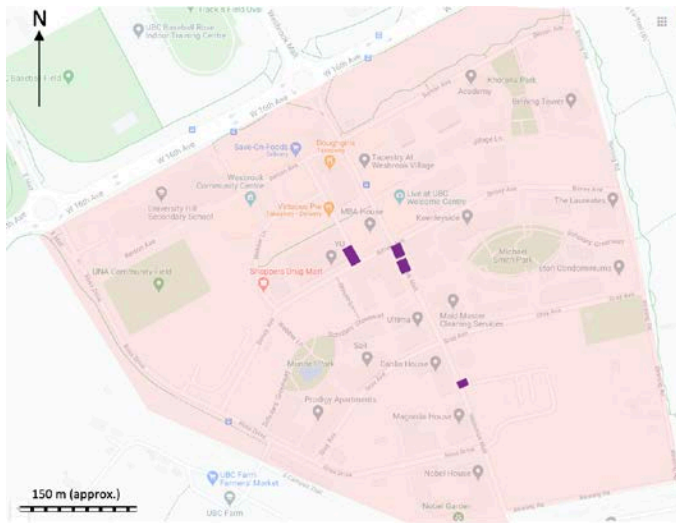


Figure 2 - Accessible Street Parking (marked in violet)



Figure 3 - Car Share Street Parking (marked in blue)

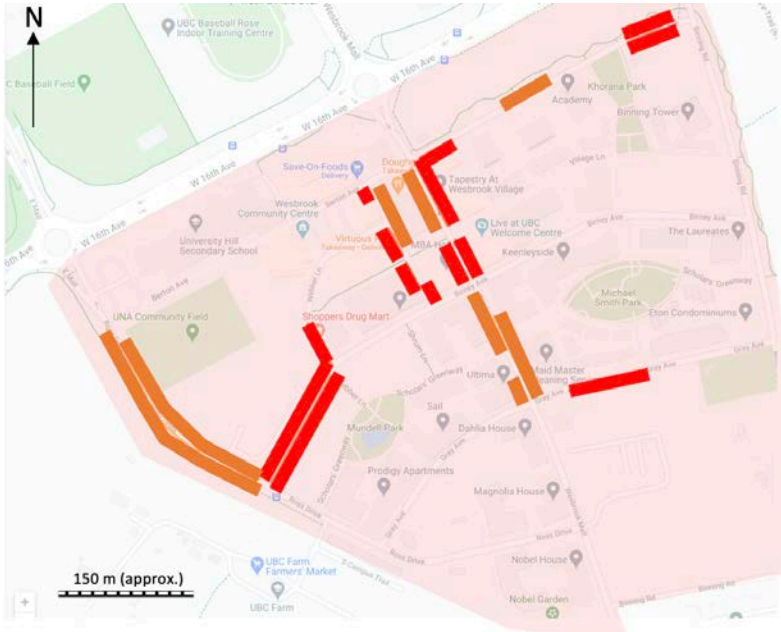


Figure 4 – Street Pay Parking for shoppers and visitors (red -1 hour parking, orange – 2 hour parking)

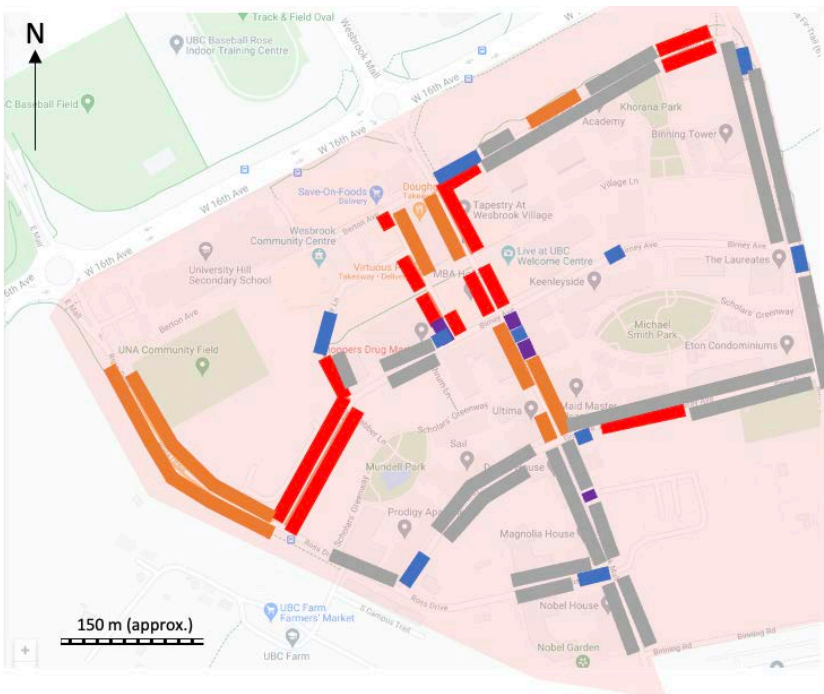


Figure 5 - All designated street parking in Wesbrook Place

## 4.3 Current State of Parking Policies and Regulations

Residential developments at Wesbrook Place generally fall within two categories – market housing and rental housing. The regulatory requirements for residential parking differ slightly between these two development types. There are currently five documents that provide some descriptions of residential parking policy and regulations for both development types within Wesbrook Place. The residential parking contents relevant to Wesbrook Place from each document are summarized in the following sub-sections.

### 4.3.1 University of British Columbia Development Handbook

The *University of British Columbia Development Handbook* [Handbook] (University of British Columbia, 2020) is the primary document that provides the specific requirements for the provision of parking for developments within Wesbrook Place and UBC neighbourhoods. The parking requirements provided in the *Handbook* are as follows:

- Market Housing
  - Townhouses, stacked-town houses, semi-detached: 2.0 spaces maximum for every principal dwelling unit
  - Condo: 1.0 space maximum for 70 m<sup>2</sup> of building area or 1.8 spaces maximum for every principal dwelling unit (whichever is less)
- Rental Housing
  - Faculty/staff: 1.0 parking space maximum for every principal dwelling unit (portion may be on road)
  - Student family: 1.0 parking space maximum per dwelling unit
  - Single student: 0.25 parking space maximum per bed
- Visitor (applicable to both market and rental housing)
  - 0.1 parking space minimum per principal dwelling unit
  - If excess visitor parking is created the developer must show how this parking remains visitor parking for the building only
- Accessible (applicable to both market and rental housing)
  - 0.1 parking space minimum per principal dwelling unit
  - These stalls may be included in the visitor or resident parking if “effective allocation and administration” (University of British Columbia, 2020) is demonstrated

### 4.3.2 Wesbrook Place Neighbourhood Plan

The Wesbrook Place Neighbourhood Plan (University of British Columbia, 2020) defers to The *University of British Columbia Development Handbook* with regards to residential parking requirements.

### 4.3.3 University of British Columbia Green Building Action Plan

The *University of British Columbia Green Building Action Plan* [GBAP] (University of British Columbia, 2018) provides minimal context for parking requirements for developments within Wesbrook Place and UBC campus. However, the GBAP provides a summary of amendments to UBC's Residential Environmental Assessment Program (REAP), which is similar to the Government of British Columbia's Energy Step Code (University of British Columbia, 2018). Within the amendments to the REAP are the following requirements for parking for electric vehicles (EVs):

- 50% of parking stalls within rental housing developments shall have EV charging
- Market housing developments will have one (1) EV charging station per unit

### 4.3.4 University of British Columbia Transportation Plan

The *University of British Columbia Transportation Plan* [Transportation Plan] (University of British Columbia, 2019) provides the framework and recommendations for achieving policy goals for various transportation related initiatives at UBC campus. The language around parking goals provided in the *Transportation Plan* is summarized below:

- Provide excess parking to residents at an additional charge (if requested by the resident)
- Work with the University Neighbourhoods Association to develop universal parking regulations and provide incentives to reduce the use of private vehicles
- Ensure that accessible parking stalls are installed as per the BC Building Code and are located within 100 metres (m) of new developments
- Review the existing accessible parking stalls to confirm there are no obstacles to payment machines and building entrances
- Determine what how the current accessible parking inventory compares against the projected future demand

### 4.3.5 University Neighbourhoods Association

The UNA oversees the parking bylaws in the residential neighbourhoods at UBC including Wesbrook Place. Beginning in August 2020, UNA has provided street permit parking for residents and guests of residents in Wesbrook Place.

The resident's non-transferable parking permit, in the form of a decal, allows residents to street park in their own neighbourhood. Each resident is further allocated one Visitor Parking Permit and 15 Parking Day Passes annually, between April 1st and March 31st. Figure 6, illustrates the location of the reserved resident street parking.



Figure 6 - Residential permit parking and residents' visitor parking, 8am until 5pm, Monday – Friday

Furthermore, all residents of Wesbrook Place have access to a secure and reserved underground parking spot, at a monthly cost of \$65. Townhomes have access to two spots for each household at no extra cost. The street parking, at an approximate annual cost of \$150 is more economical and convenient for residents than their underground reserved parking.

### 4.3 Existing Alternative Modes of Transportation

Wesbrook Place has a wide offering of alternative modes of transportation including cycling infrastructure, public transit, and car share programs. A brief overview for each of these alternative modes of transportation are provided in this section.

#### 4.3.1 Cycling

UBC has a variety of cycling infrastructure and resources across campus including cycling routes, bike share program, bike lockers and cages, and two bike repair/maintenance shops (University of British Columbia Campus + Community Planning, 2021). The cycling infrastructure available at UBC is briefly summarized in the following subsections.



#### 4.3.1.1 Cycling Routes

UBC has a series of bicycle routes across campus. The bicycle routes are classified in terms of how segregated they are from vehicle traffic. In Wesbrook Place, the bicycle routes are located along Berton Avenue, 16<sup>th</sup> Avenue, and Ross Drive as illustrated on Figure 7.

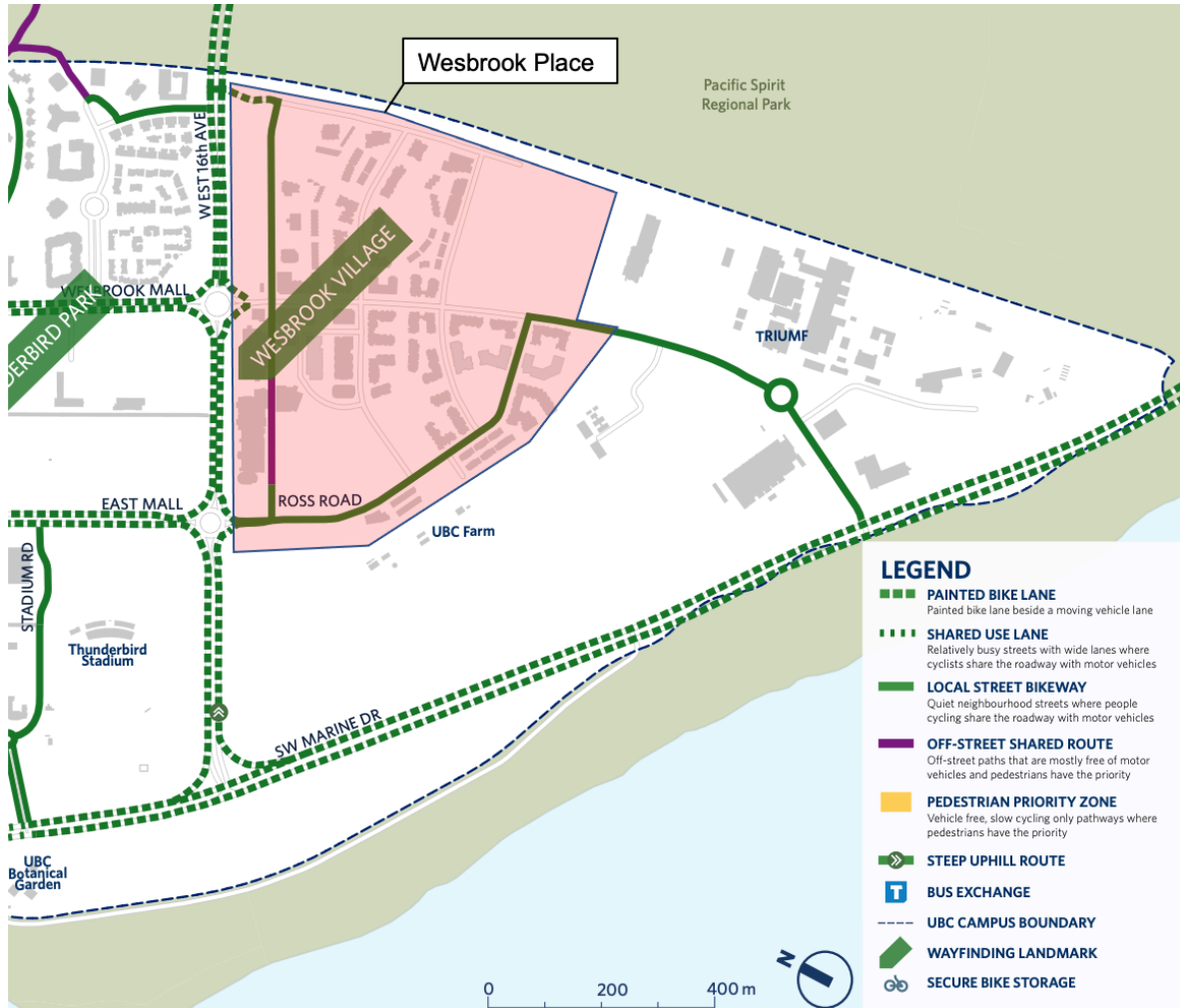


Figure 7 - Bicycle Routes Around Wesbrook Place (University of British Columbia Campus + Community Planning, 2021)

From Figure 7, it appears that there are established cycling routes around the perimeter of Wesbrook Place, but limited cycling routes within the neighbourhood.

#### 4.3.1.2 Bike Share

A bike share program is operated by HOPR, which is a North American wide bike share operator. HOPR operates exclusively within UBC lands and permits one-way trips across campus (CycleHop LLC dba HOPR, 2021). Bikes are retrieved and returned to designated parking hubs, which are scattered around campus. Bike users must book and unlock bikes using the HOPR mobile app. The HOPR bike parking locations within Wesbrook Place are illustrated in Figure 8.

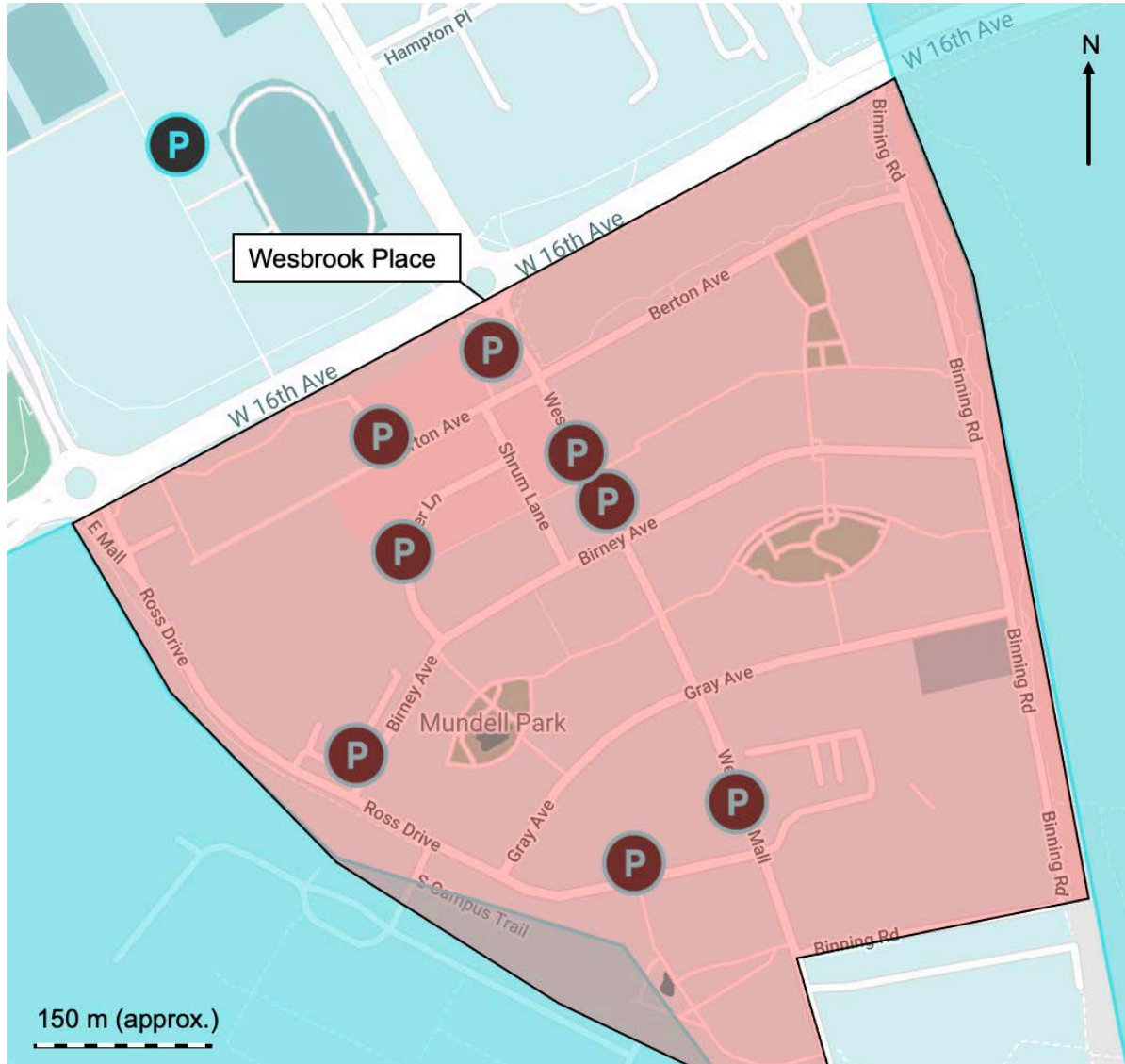


Figure 8 - Locations of HOPR Bike Share Bike Parking in Wesbrook Place (CycleHop LLC dba HOPR, 2021)

From Figure 8, it appears that the HOPR bike parking locations are widely distributed around the arterial roads and commercial areas of Wesbrook Place. Residents of Wesbrook Place need to walk up to 300 metres to access a HOPR bike parking location.

### 4.3.1.3 Bike Parking

There are a number of bike parking options at UBC including traditional bike locking stations, individual secure bike lockers, and communal secure bike cages. The latter two options are operated by the Bike Kitchen, which is a bicycle repair/service shop on UBC campus. There are no bike lockers or bike cages operated by the Bike Kitchen within Wesbrook Place. Traditional bike locking stations are available throughout Wesbrook Place and are generally located in front of all residential and commercial buildings (Google, 2019). There are also private bike lockers within the residential buildings in Wesbrook Place. The extent and effectiveness of the private bike storage at Wesbrook Place is currently being investigated under another SEEDS study.

### 4.3.2 Public Transit

Public transit services at UBC are provided by TransLink. TransLink operates five bus routes that service the Wesbrook Place area as follows:

- R4 – 41<sup>st</sup> Ave Joyce/UBC
- 25 – UBC/Brentwood Station
- 33 – 29<sup>th</sup> Avenue Station/UBC
- 49 – UBC/Dunbar Loop/Metrotown Station
- 68 – Wesbrook Village/UBC Exchange

Figure 9 illustrates the route of each bus and the bus stop locations in the vicinity of Wesbrook Place.

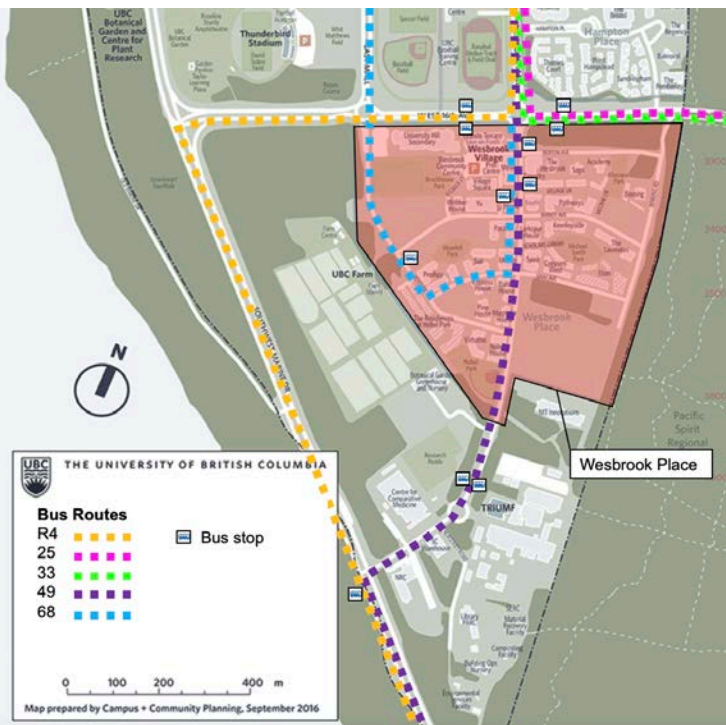


Figure 9 - Bus Routes Around Wesbrook Place (University of British Columbia - Campus + Community Planning, 2016) (TransLink, 2021)

From Figure 9, it appears Wesbrook Place is well serviced by public transit with a variety of transit destinations to off-campus locations. It is noted that none of the bus routes in the vicinity of Wesbrook Place have destinations within Vancouver’s downtown core. Transit users at Wesbrook Place will either need to take a different bus from the UBC Bus Exchange or transfer buses elsewhere within Vancouver to travel to the downtown core.

The R4, 25, 33, and 49 are all bus routes that leave from/arrive at UBC campus to/from various destinations in the Vancouver area. These bus routes generally have a higher frequency of trips during weekdays, more specifically during morning commuting hours from approximately 7:00am to 9:30am and afternoon commuting hours from approximately 3:30pm to 7:00pm. The bus route #68 does not leave UBC campus and stops at various destinations across campus including the UBC Bus Exchange. The frequency of trips for the 68 bus is generally consistent throughout the day and does not increase during commuting hours. Table 1 summarizes the start and end times for each bus route as well as the maximum and minimum frequency of trips for each bus route. Note that this timetable is effective at the time of writing this report.

*Table 1 - Wesbrook Place Bus Route Operating Hours and Frequency (TransLink, 2021)*

Bus Route	Weekday Start/End	Saturday Start/End	Sunday Start/End	Peak Period Frequency	Off-peak Period Frequency
R4	5:50 am/1:01am	5:48 am/1:01am	5:48 am/1:01am	Every 5 minutes	Every 15 minutes
25	5:45 am/12:08 am	6:38 am/12:08 am	6:45 am/12:08 am	Every 5 minutes	Every 30 minutes
33	6:02 am/10:59 pm	7:00 am/10:57 pm	8:00 am/10:00 pm	Every 15 minutes	Every 30 minutes
49	6:47 am/12:15 am	6:52 am/12:15 am	6:48 am/12:15 am	Every 6 minutes	Every 30 minutes
68	7:00 am/12:30 am	8:00 am/12:30 am	8:00 am/12:30 am	Every 20 minutes	Every 30 minutes

From review of Table 1, Wesbrook Place appears to have a variety of bus route options between the hours of 8 am to 10 pm. Outside of these hours, the frequency and availability of bus route options becomes more sparse and other modes of transportation may be needed to access or leave the Wesbrook Place area.

### 4.3.3 Car Share

There are currently two car share companies operating at UBC – Modo and Evo. Each of the car shares that operate at UBC have different user experiences. The way in which each car share operates is briefly summarized below:

#### **Modo** (Modo Co-operative, 2020)

- User pays a monthly fee
- Vehicle rentals must be roundtrips and vehicles are returned to reserved Modo parking spots
- Vehicles can be booked up to one year in advance
- Since rentals are round-trip, vehicles are always available at designated parking spots (unless the vehicle is in use)

#### **Evo** (Evo Car Share, 2021)

- User pays per vehicle use
- Vehicle rentals can be one-way and vehicles can be returned to legal street parking spots within the Evo “home zone” or reserved Evo parking spots
- Vehicles can be booked 30 minutes in advance
- Since rentals can be one-way, vehicles are not always available at designated parking spots

Both Evo and Modo have designated parking spots within Wesbrook Place. Modo has three parking spots spread around three locations in Wesbrook Place. Evo has 25 parking spots spread around eight locations in Wesbrook Place. The locations for the designated parking areas for each car share operator is illustrated on Figure 10 for Evo and Figure 11 for Modo.

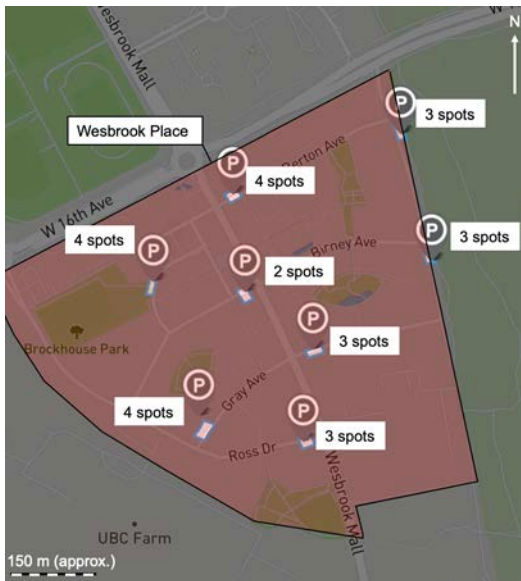


Figure 10 - Evo Designated Parking Spots in Wesbrook Place (Evo Car Share, 2021)





*Figure 11 - MODO Designated Parking Spots in Wesbrook Place (MODO Co-operative, 2020)*

From Figure 10, Evo has a number of parking spots throughout Wesbrook Place, however the availability of cars is unpredictable as a majority of Evo car trips are one-way trips.

From Figure 11, MODO has a maximum of three cars readily available also in various locations throughout Wesbrook Place. It appears Wesbrook Place's 12,500 residents (University of British Columbia, 2020) may be under served by car share options.

## 5. Case Studies

A series of case studies were evaluated to understand how parking policy has evolved in other local, continental, and international locations. The case studies were selected to demonstrate different horizons of change ranging from minor adjustments to parking policy to car-free based communities. The key takeaways from the case studies are noted following each case study and possible suitability doing something similar at Westbrook Place is evaluated.

### 5.1 Case Study 1 – Parking Requirement Reductions in British Columbia

A number of parking requirement reductions have occurred in the Greater Vancouver area and throughout the province over the last 3 years. A sampling of the recent parking requirement reductions are:

- Richmond Centre re-development
- Condominium re-development at 104 Avenue and Whalley Boulevard, Surrey
- City of Coquitlam parking reduction in the vicinity of Skytrain stations
- City of Kelowna Zoning Bylaw (Section 8 Parking and Loading)

Each of these parking requirement reductions is described in further detail below.

#### **Richmond Centre**

Cadillac Fairview Richmond Centre (CF Richmond Centre) submitted an application to the City of Richmond to re-develop a portion of the Richmond Centre shopping mall in two phases (City of Richmond, 2018). The re-development includes the expansion of the retail space and creation of residential units by constructing mixed use high-rise buildings. For each phase of the re-development, it was proposed to reduce the amount of residential parking provided from the standard 1.5 spaces per unit to 1.0 space per unit. To account for the reduced parking request, it was proposed to construct a “mobility hub” which will provide easy access to EV charging, public transit, taxis, bike storage, car share programs, and bike share programs (City of Richmond, 2018). The provision of the “mobility hubs” to reduce volume of parking from 1.5 spaces per unit to 1.0 spaces per unit supports the goals provided in Richmond’s *Affordable Housing Strategy* (City of Richmond, 2018), which was considered a point in favour of the application to get it approved. The first phase of the re-development application has been approved by the City of Richmond and construction is currently underway. The second phase of the re-development application is scheduled to be submitted in 2022.

#### **104 Avenue and Whalley Boulevard, Surrey**

The City of Surrey received a re-development application from a property developer to construct a high-rise mixed use condominium development near the intersection of 104

Avenue and Whalley Boulevard (City of Surrey, 2020). The application included the request to decrease the required amount of residential parking from 382 stalls to 308 stalls for 424 residential units (studio, 1, 2, 3 bedroom). The application also proposed to use the residential visitor parking as shared parking for the commercial units in the development, which results in a 100% reduction of commercial parking. To off-set the reduced parking, the developer was required to provide the following:

- Pay \$20,000 for every reduced parking spot as per the Off-Street Parking Reserve Fund By-law (City of Surrey, 2019)
- Invest in hosting a car share company in the development as per the “Alternative Parking Provision” in the Zoning Bylaw 12000 (City of Surrey, 1993). To meet this requirement, the developer proposed to create an agreement with a car share operator to install 16 designated parking stalls for the car share in addition to funding the purchase of EVs for use by the car share.

The initial re-development application has been approved and detailed design is currently underway.

### City of Coquitlam

The City of Coquitlam recently reduced their residential minimum parking requirements in the vicinity of the Evergreen Skytrain line. The areas that the new reduced parking requirement apply to are defined in the Part 7 and Schedule O of the *Zoning Bylaw 3000, 1996 and amending Bylaws* (City of Coquitlam, 2020). The previous minimum parking requirements as compared to the current residential parking requirements are listed in Table 2.

*Table 2 - Summary of Previous and Current Minimum Residential Parking Requirements Near the Evergreen Line (City of Coquitlam, 2020)*

Residence Type	Previous Minimum Requirement (stalls per unit)	Current Minimum Requirement (stalls per unit)
Studio/1 bedroom condo	1	0.85
2+ bedroom condo	1.35	1.25
Market rental	0.86	0.75
Below market rental	0.75	0.65
Visitor	0.2	0.1

From review of Table 2, the new residential parking minimums are generally similar to UBC's residential parking requirements as outlined in the Handbook (University of British Columbia, 2020). The key different between the City of Coquitlam's and UBC's parking requirements is the City of Coquitlam has parking minimums and UBC has parking maximums.

### City of Kelowna

The City of Kelowna has a number of incentive programs built into the parking section of its zoning bylaw (City of Kelowna, 2020) that allow for reduced off-street parking. The incentive programs allow developers to provide reduced occupant and/or visitor parking in exchange for the provision of car share services, construction of rental housing, and/or the provision of bicycle parking. The three incentive programs are summarized in the table below.

*Table 3 – Summary of Parking Reduction Incentives in Kelowna*

Incentive Name	Conditions	Parking Reduction
Rental housing	Development must be sub-zoned as “residential rental tenure”	20% reduction from the base parking requirement of resident and visitor spaces if the development is located in the “urban centre” 10% reduction from the base parking requirement of resident and visitor spaces if the development is located outside the “urban centre”
Car-share	Provide a car-share parking spot, at grade, within 100 m of the development that can be accessed 24 hours a day. A car must be purchased for the car-share operator to park in the new parking spot. This incentive can be used for multiple dwelling housing developments or commercial use developments Development must be located in the Urban Core, University South Village Centre, or Glenmore Valley Village Centre areas	Reduction of five (5) resident/occupant parking spots for every car-share spot provided up to a 20% reduction of the base parking requirement

Incentive Name	Conditions	Parking Reduction
Bicycle	Provide bicycle parking that is greater than the minimum bicycling parking requirement Development must be located in the Urban Core, University South Village Centre, or Glenmore Valley Village Centre areas	20% reduction up to five (5) parking spaces from the base parking requirement

### 5.1.1 Case Study 1 Takeaways and Suitability

From Case Study 1, the Richmond example illustrates the use of other policy programs that the developer was able to leverage to reduce the required resident parking in exchange for access to alternative modes of transportation. It is noted the development site is located within 100 metres of a rail-based rapid transit station (i.e. Canada Line). This was taken into account as the City of Richmond approved this re-development.

From our literature review, it appears there are no policy programs in place that permit parking reductions in exchange for other transportation amenities in Wesbrook Place or UBC in general. This may be an opportunity for UBC Community + Campus Planning to explore. On the other hand, there is no rail-based rapid transit currently available at UBC and the future UBC Skytrain station will likely be 1.7 km northwest of Wesbrook Place in the vicinity of the UBC Bus Exchange. This will likely be a point against using proximity to rail-based rapid transit as justification to reduce parking requirements.

The City of Surrey example illustrates the use of other policy programs that the developer was able to follow to reduce the required resident and commercial occupant parking in exchange for car share investments and a monetary contribution to fund the City of Surrey's alternative transportation programs. The Surrey development also provides an example of how parking can be shared and reduced by allowing the parking to be allocated to multiple users (e.g. commercial and visitor). It is noted that the Surrey development is located within 650 metres of a rail-based rapid transit station (i.e. Expo Line). This likely was taken into account as the municipality approved this development.

From our literature review, it appears there are limited mixed-use lots and/or developments within Wesbrook Place. This may be an opportunity for UBC Community + Campus Planning to consider with the lots that have not been developed yet. This would require an amendment to the *Wesbrook Place Neighbourhood Plan* (University of British Columbia, 2020).

From the Coquitlam case study, this example demonstrates how a municipality provided a blanket reduction in residential parking requirements in the vicinity of a rail-based rapid transit line. At this time, there is no rail-based rapid transit at UBC, therefore doing something similar using rapid transit as a backing rationale is not feasible at this time.



From the Kelowna zoning bylaw, this provides an example to reduce both resident/occupant as well as visitor parking through policy programs for the developer to provide other transportation amenities in place of parking or to encourage the construction of developments that Kelowna is interested in (e.g. rental housing).

The car share and bicycle parking incentives may be opportunities for UBC Community + Campus Planning to explore as it currently has no similar incentive programs or Wesbrook Place or UBC in general. With regards to a development incentive program, UBC Community + Campus Planning may want to review the current housing stock in Wesbrook Place and determine if there are categories of housing that are underserved in the neighbourhood.

## 5.2 Case Study 2 – Parking Sharing and Building Use in the United States

The parking share case study in the United States brings a different perspective to sustainable parking. It recognizes the different parking demand patterns in urban settings and discusses synergies in establishing a parking sharing framework. The study refers to a framework developed by the Urban Land Institute (ULI) for shared parking. This approach is more efficient in mixed-use applications. For this context, mixed-use does not need to be applied to a single building, but it can be expanded to one block or even a small neighbourhood like Wesbrook Place. The idea here is to benefit from the different peak demand for parking for different uses. As an example, the peak demand for residential parking is usually from 6:00 pm to 6:00 am while the demand for retail / office is from 8:00 am to 5:00 pm. Sharing those parking spaces can reduce the overall requirements with the right policies in place.

“Studies suggest that there are four to five government-mandated off-street parking spaces per motor vehicle, including structured and residential parking” (FINE, 2019). This kind of mandate is adding huge strain on developers and communities alike. Building mandated off-street parking increases the overall cost and, in many instances, has negative aesthetic impacts to the community (e.g., having unattractive concrete parking structures like the West Parkade located on Lower Mall at UBC campus).

Other studies also suggest that the occupancy type of a building should be considered when mandating “car storage” (Fried, 2016). This was noted in senior and subsidized housing. In Seattle, there is a city proposal for parking reforms to benefit from existing parking structures not currently designated towards a particular use and brand it as “Flexible-Use-Parking” towards short-term and long-term parking (Fesler, 2017). Seattle is also looking into factors like median income and proximity to frequent transit when mandating parking requirements.

### 5.2.1 Case Study 2 Takeaways and Suitability

The primary takeaway from this case study is that parking needs were managed based on peak demand times between different building occupancy types (e.g. commercial versus residential). Using this approach, the neighbourhood was able to reduce the total amount of parking provided while still providing parking to those who require it. Our study has focused on residential parking in Wesbrook Place, therefore we are unable to evaluate how the total balance of parking in the neighbourhood may be able to be reallocated. This may be an opportunity to be investigated in a future study.

Furthermore, parking policies in this case study were enacted based on the proximity of residences and businesses to frequent public transit services. Wesbrook Place is relatively well serviced by public transit as five bus routes travel in the vicinity of Wesbrook Place. This may be an opportunity for UBC Campus + Community Planning to explore in future policy development.

### 5.3 Case Study 3 – Traced Narratives of Car-Reduced Neighbourhoods in Darmstadt, Germany

K6-Kranichstein (K6) and Lincoln are two neighbourhoods in the City of Darmstadt, Germany where car reduced concepts were developed by a multi-disciplinary group of academics and professionals with a “background in human geography, political sciences, and urban and transport planning, as well as practitioners from the local government with a background in urban and transport planning” (Selzer, 2019).

The City of Darmstadt’s population grew approximately 19% between 2000 and 2009, increasing housing demand and traffic.

#### **K6 Neighbourhood**

750 housing units across 17 hectares were developed between 1998 and 2015 as part of a social and ecological concept. Dwellings included passive house and low energy apartment buildings. The objective of this development, designed by architects and cooperative housing groups, was to ensure a quiet living environment. They enabled this action by:

- Eliminating car traffic within the neighbourhood and provide the residents with more space.
- Cars owned by residents were provided a collective garage along the perimeter of the residential neighbourhood to aid in reducing the land used by private vehicles within the neighbourhood and prioritize non-motorized road use.
- Traffic calming measures were enacted.
- On-street metered parking were installed.

A tram connection to the nearby City Centre (approximately four kilometers away) is available to residents with a stop located at the center of the neighbourhood. This provided an option for residents to travel to the nearby city to purchase groceries, access medical services, etc.

#### **Lincoln**

Lincoln, a 25 hectare site three kilometers from the city centre is under construction with a completion anticipated in 2025. As of March 2019, 851 people live in Lincoln, but it anticipates a population of 5,000 residents by completion. Its master plan “combines high density residential and low-energy buildings, as well as passive houses<sup>1</sup>” (Selzer, 2019). Its narrative of sustainable mobility was recognized with the National Transport Planning Prize of the German Association for Urban, Regional and State Planning in 2018.

Its mobility concept objectives are to:

- Support independence from cars
- Implement the ‘city of short distances’ idea, thus, to strengthen non-motorized mobility
- Increase the quality of life in the neighbourhood (Selzer, 2019)

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<sup>1</sup> A “Passive House” is concept developed in Europe in the early 90’s that reduces (almost eliminates) the need for heating the space by having higher insulation, eliminating air leakage or thermal bridges, triple glazing windows and following sustainable architectural means.

Parking management strategies undertaken were to:

1. Reduce minimum parking requirements from the usual 1.2 parking spaces/dwelling, as implemented in the City of Darmstadt, to 0.65
2. Develop a parking allocation system for parking lots instead of a first come, first serve basis
3. Residents are offered alternative mobility options i.e., bike and car sharing, cargo bike sharing and public transit within walking distance
4. An onsite mobility hub is available to residents to provide advice on mobility services

### 5.3.1 – Case Study 3 Takeaways and Suitability

For Case Study 3, the K6 neighbourhood was built to maintain low energy and passive house standards. Similarly, Wesbrook Place has the opportunity to insist on new developments being erected with types of building certifications that enact the future sustainable outlook of the neighbourhood, for example, Envision or the Living Building challenge certifications. Each of the aforementioned certifications encourage livability (while being sustainable) through regenerative design solutions and improve the environment surrounding the infrastructure, inevitably assisting in the reduction of parking requirements by the increase of green practices and infrastructure.

The Lincoln car reduced neighbourhoods were designed for a specific audience. The developments were created to suit a sustainable and livable environment for those seeking that particular type of lifestyle. It would be to Wesbrook Place's benefit to practice stakeholder engagement to understand the resident's appeal for Wesbrook and what their insight as a collective means to the future growth of the neighbourhood.

Each of the case studies in Germany had a plan and a clear direction on how to achieve its goals and what objectives were required in order to uphold those sustainable goals. As Wesbrook is enacting changes in the midst of development, the UNA can facilitate incremental changes that have the potential for long term impacts, for example, introducing car and bike sharing initiatives, a neighbourhood hub that has 'slow' bus that can encourage mobility for grocery shopping and/or appointments to reduce the use of private vehicles.

## 6. Survey Results and Interpretation

Selected survey results that highlight the resident, accessible, and visitor parking demands are summarized in Section 6.1. Further interpretation of these survey results and potential areas for future work are outlined in Section 6.2

### 6.1 Survey Results

An online survey was distributed to the residents of Wesbrook Place and responses were gathered between April 1, 2021 and April 10, 2021. Seventy-eight (78) survey responses were received. The survey responses were received from the following housing-type and employment splits:

- 80% UBC staff/faculty rental housing
- 20% condo or townhome owner

Twenty percent of the residential buildings Wesbrook Place are designated UBC staff/faculty housing; 82% of the respondents presented themselves as UBC staff/faculty member or as a UBC student. Therefore, we must acknowledge that the survey responses are skewed towards UBC staff/faculty living in housing managed by UBC's Village Gate Homes. As a result, we would like to disclose that the responses to the survey may not accurately capture all the views on parking from the various residents at Wesbrook Place.

The survey results that highlight the resident, accessible, and visitor parking demands are summarized in this section. The final question of the survey asks respondents to provide any other comments or feedback they may have. Some responses from the final question are included with the discussions below with a complete summary of the survey results available in Appendix B.

Question 4 asked how many vehicles were owned by each household. Question 6 asked how many parking spots were allocated to each household. The results are summarized in Figures 12 and 13.



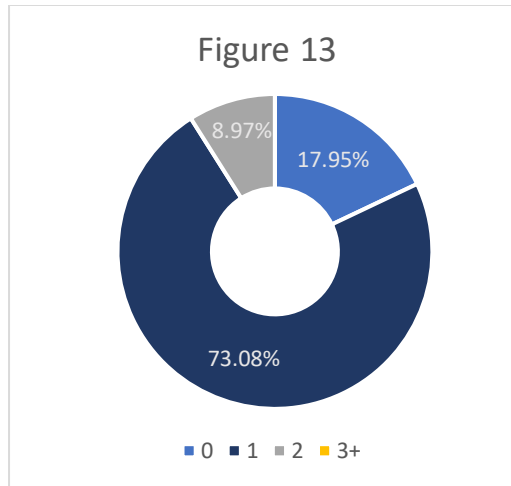
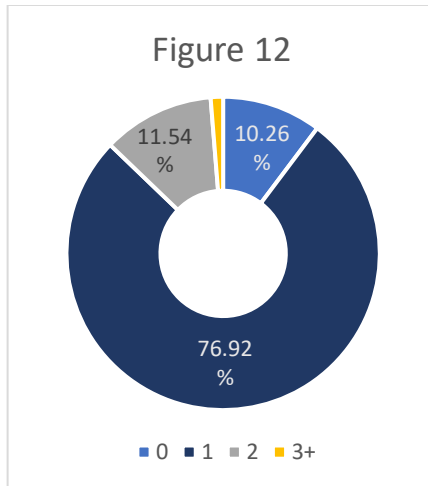


Figure 12 - Question 4: Number of vehicles per household

Figure 13- Question 6: Number of parking stalls per household

From the results from questions 4 and 6, it appears most households own one car and have 1 designated parking spot. Based on this, it appears most respondents are using their allocated underground parking spots.

Rental buildings charge their tenants an additional \$65.00 monthly fee for their parking spot, however the University Neighbourhoods Association provides street permit parking at a lower annual rate. Some residents are foregoing the building parking in favour of the more affordable street parking option, as indicated from the open-ended survey question responses, see respondent quote below. The survey did not explicitly ask if respondents are using their building’s underground parking or the street permit parking.

*“You can pay \$60ish dollars a month to park in my buildings underground, or you can pay \$120ish/yr for a Westbrook street parking pass. We just have the street parking pass and are saving money while not worrying about hitting other cars or support pillars.”*

*“I park on the street with a Westbrook parking decal \$150/year, just thought I’d mention because it wasn’t listed as an option”*

*“Not enough parking in buildings, not enough parking on street, no cycle path between street and sidewalk, as neighbourhood keeps growing getting more and more congested.”*

Question 7 asks if any of the parking spots allocated to a household are accessible parking spots. Question 8 asks how often each household has visitors that use the visitor and/or accessible parking spots. The results are summarized in Figures 14 and 15.

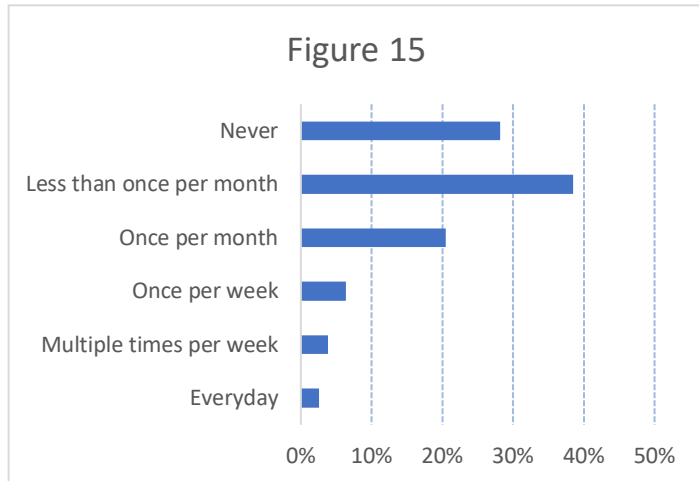
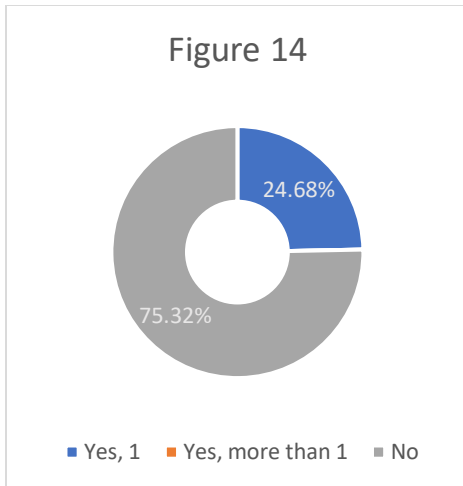


Figure 14 - Question 7: Number of accessible parking stalls per household

Figure 15 – Question 8: Frequency of using visitor or guest accessible parking stalls on a monthly basis

From the results from questions 7 and 8, it appears most residents or guests of residents are not using the accessible or visitor parking spots. It is noted that the UBC Development Handbook permits accessible parking spots to be used as resident parking spots as long as “effective allocation and administration” is demonstrated (University of British Columbia, 2020). Our survey did not cover if the accessible parking stalls were assigned to people who require an accessible parking stall. With regards to the number of visitors using the visitor parking stalls, these results are likely inconclusive given the current province-wide ban on indoor social gatherings due to the COVID-19 pandemic.

From the open-ended survey question, some respondents noted that there is a lack of visitor and/or accessible parking at their building or it is being abused by other residents.

*“Please note that my building does not have visitor parking (Keenleyside)”*

*“Village Gate homes has some underground guest parking in their lots, but it is not monitored, so people have been parking there for free instead of renting a parking spot. Village Gate Homes is not able to figure out a solution to this.”*

*“There are no accessible parking spots for visitors to cypress. You have limited parking during day outside the front door. The accessible visitor spots are nowhere near the elevator for cypress. The accessible spots are all used by residents. I have infrequent visitors who require accessible parking. It really cannot meet legislated requirements.”*

*“24H parking for visitors is extremely limited, it is unfortunate”*

*“I just want to add that the reason we never use the guest parking in our building is because there's only one spot and it's always full!”*

The responses to Question 9 identified what the primary purpose of the household's personal vehicle was used for. Question 13 asks how often a personal vehicle is used on a weekly basis. The results are summarized in Figures 16 and 17.

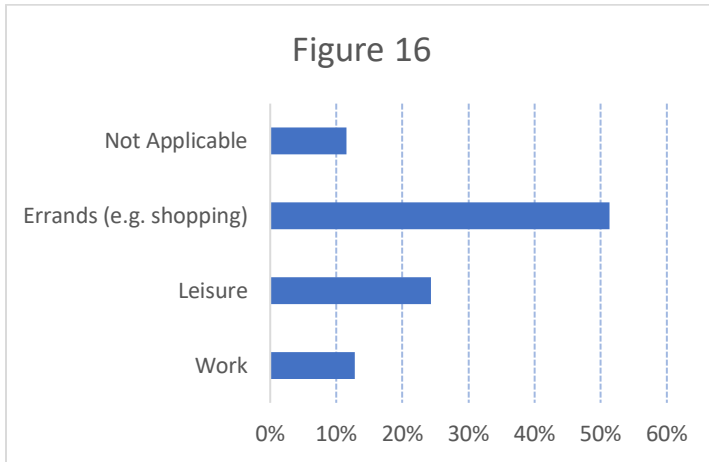


Figure 16 - Question 9: Vehicle primary use

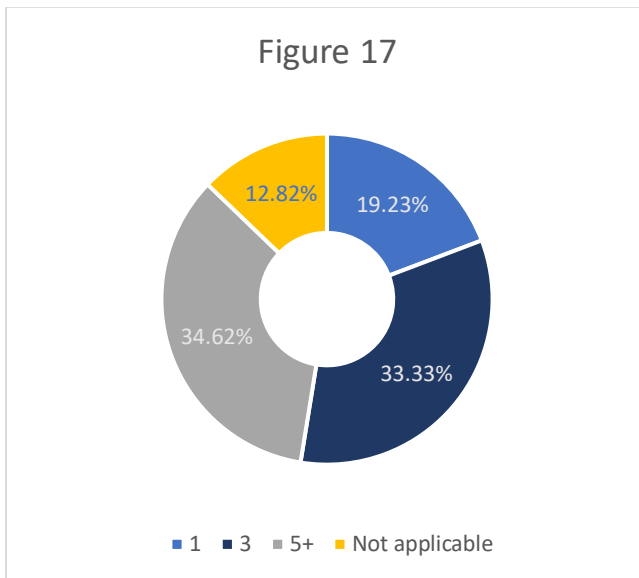


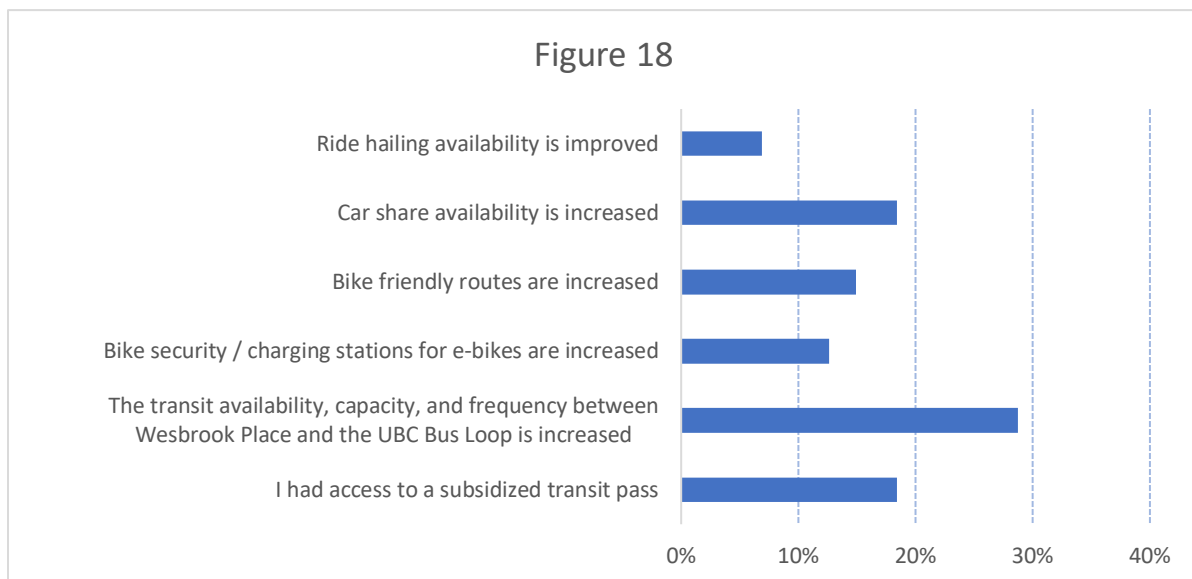
Figure 17 - Question 13: Frequency of using personal vehicle on a weekly basis

From questions 9 and 13, it appears most survey respondents are using their personal vehicles most commonly for errands and are using them at least 3 times per week. The survey did not capture if the errands were taking place on-campus or off-campus. A majority of the respondents indicated they are using their vehicles at least 3 times per week - this indicates the respondents are primarily car reliant in terms of transportation modes. From the open-ended question, some survey respondents noted that they use their personal vehicles to access amenities, services, or activities not offered in Westbrook Place.

*“Would not change use of personal vehicle ... recreation/sport all occurs off campus and so does work.”*

*“We probably wouldn't reduce the amount of times we use our vehicle per week. We are practically at a minimum usage already, even before the onset of the pandemic. The only thing that might reduce our vehicle usage is if UBC/Wesbrook got a better grocery store, more family doctors and varying health clinics.”*

Question 21 asks what would be needed in order for the survey respondents to consider decreasing the number of cars they own. Respondents are asked to select all the options they felt applied to them. The results are summarized in Figure 18.



*Figure 18 - Question 21: Would consider reducing the number of personal vehicles if...*

From question 21, the most popular response was increasing the availability, frequency, and capacity of public transit between Wesbrook Place and the UBC Bus Exchange. It appears that although there are five (5) bus routes in the vicinity of Wesbrook Place that travel to the bus exchange, Wesbrook Place residents feel the current transit availability is not sufficient. The survey did not cover if Wesbrook Place residents are using all of the five bus routes mentioned or if residents are only relying on the local shuttle bus (bus route #68) to travel between the neighbourhood and the bus exchange. From the open-ended question, respondents provided some further insights into the current transportation habits and how transportation in the neighbourhood could be improved.

*“Car share vehicles are very difficult to get in Wesbrook Village - I would like to see more availability of these cars in the area.”*

*“Should have more car share like EVO In Wesbrook Village.”*

*“It's expensive. It seems silly to have a huge neighbourhood at the other side of campus without reasonable access to buses ie out 16th, toward 10th and the city.”*

*“I would not support increased bus traffic on Wesbrook ... was not built for buses. Road already needs repair ... 11 years it was a dirt road. When condo was purchased, no plan for Wesbrook to be a bus line with speed of buses, blocking traffic when picking up passengers (no pull-offs) + noise.”*

*“Car is primarily used for getting kids to school and running errands; often to places further than I can walk, bike or without transit options. I wouldn't consider going without a car at this time. Ride Hailing and Car Share are more expensive than owning a car for the amount of driving we do.”*

*“the assumptions made in the development of the current parking in building and on street have been underwhelming. On top of that really poor and dissapointing traffic, parking, bike and pedestrian plans throughout the neighbourhood for how walkable everything is for the day to day stuff in the neighbourhood. I get the balance and wanting to promote sky train one day when it arrives, more buses, walk bike - but the reality is sky train is a long way away and even then if families are here they need cars, i'm not taking my kid to hockey with all their gear on sky train (there's a UBC rink here but most games practices aren't here for example).”*

## **6.2 Survey Interpretation – Visitor and Accessible Parking**

The survey was distributed to all residents of Wesbrook Place, however the survey results received were primarily from UBC staff and/or faculty living in UBC staff/faculty rental buildings. As noted above, the UBC staff/faculty rental buildings only account for 20% of the residential buildings in Wesbrook Village. Based on this, it is difficult to determine if the survey results show a true representation of all the views on parking held by residents of the neighbourhood. It may be worth revisiting this survey to further promote it to residents not living in the UBC staff/faculty rental housing in Wesbrook Village to determine if they hold similar views compared to what was observed in our survey.

The survey results provide some insights into who is using the accessible and visitor parking provided in the residential buildings. A data gap that exists with accessible parking is that the survey did not ask if the respondent had mobility issues, which required them to need an accessible parking spot. This question was not posed in our survey due to potential privacy concerns. Another data gap that arose from reviewing the survey results is that there seems to be a disconnect between survey respondents indicating they use the visitor parking once a month or less and the anecdotal comments provided indicate the visitor parking is rarely available or being abused. To address both of these data gaps, a series of site visits could be completed to see how often visitor parking is available and if vehicles parked in the accessible stalls have an accessible parking permit on their vehicle. The series of site visits could be completed in the short term as well once the COVID-19 pandemic has come to an end to understand how the pandemic has impacted parking habits.



## 7. Future Planning

Based on the literature review, case study investigations, and survey results, areas of policy innovation and possible incentives to decrease car reliance have been identified. The areas of policy innovation may be enacted by UBC Campus + Community Planning to help drive the change to reduce parking. The incentives identified are actions that will promote residents of Wesbrook Place to use alternative modes of transportation and become less reliant on personal vehicles. To potentially move these policy innovations and/or incentives forwards, some Key Performance Indicators (KPIs) have been developed that can be used to determine which innovation or incentive will best suit Wesbrook Place.

In our review of background literature, we identified policy discrepancies. Section 7.4 distinguishes these inconsistencies between the various policies and plans.

### 7.1 Policy Innovation

We thought it would be beneficial to explore how innovative strategies, based on the results of the background documentation, case study reviews and survey results could provide us with new ways of viewing parking strategies. The following four points have potential to be used as policy or service changes:

- Develop a tiered approach to residential parking requirements based on the development's use and/or proximity to frequent transit.
- Flexible parking requirements within mixed-use developments. The intent is to allow for parking sharing between the various occupants of the building that have different parking demands (e.g. visitor and commercial)
- Construct residential buildings that will not have parking allocations to specific units; instead, whoever purchases or rents these units will sign a no-car clause in their agreement. The perk for them is that the price of the unit will be acquired at a reduced cost compared to the units with parking. This policy may be more suitable for long term planning as currently multiple parking providers (UNA and building parking) exist within Wesbrook Place. Coordination between the aforementioned parking providers would need to be planned for to engage with this innovative approach.
- Provide a 'local' Wesbrook Place shuttle specifically for the neighbourhood. The purpose of this shuttle would be to provide transportation for Wesbrook Place residents to the commercial centre of the neighbourhood for grocery trips, shopping and other errands.
- Introduce and test a diverse set of programs to potentially adapt in the *Wesbrook Place Neighbourhood Plan*. Initiatives can be arranged for short durations so as to not inconvenience residents but to be able to evaluate reactions and results that can help in forming future scenarios. For example, experiment with how streets can be used as walking pathways on weekends to increase neighbourly interactions and reduce vehicular mobility.

Our survey did not capture if this is a desired service, however this may be a point of investigation in a future study.

From the British Columbia and United States case studies, most of the reduced parking requirements resulted either from developments being in close proximity to frequent transit (i.e. Skytrain) or being mixed-use developments that share parking between different users (e.g. visitor, commercial or senior and low income occupants). Similar scenarios may be applicable to Wesbrook Place as some of the residential buildings within the neighbourhood are mixed-use buildings. This also may be an opportunity to review the current neighbourhood land allocation for future residential developments and determine if mixed-use developments are a viable possibility.

From the German case study, the neighbourhoods were voluntary car-free neighbourhoods. In the short term, this is highly unlikely to be a possibility for Wesbrook Place, however some residents who already do not own a car may appreciate the option of reduced housing costs by not paying for parking.

## 7.2 Incentives

To support the reduction of parking requirements and support sustainable transportation choices, based on literature reviews and our case studies, we decided to put forward possible incentives that can be enacted in Wesbrook Place to review their long-term parking management strategies. Our team proposes car, bike, public transport and general incentives to reflect the diverse ways Wesbrook Place can enact initiatives. Alternative modes of transportation are a manageable way to introduce Wesbrook residents to adjusting their mobility patterns and being more sustainable. Bicycles are an environmentally friendly mode of transportation and promote health and wellbeing. Public transport and car sharing will reduce the environmental impact and compel new ways of developing parking management strategies.

### VEHICLE

- Developers can fund alternative modes of transportation within their developments and in exchange reduce the amount of parking to move towards decreased car dependency. In order to do this, the UBC Development Handbook may need to be revised to provide these incentive options for developers to consider when designing a new development.
- The UNA can inform and familiarize residents on the benefits of car sharing. Knowing the process, protocols, costs and regulations of the use of car sharing can encourage residents to use car share services for errands and leisure, which are two of the activities that residents most use their personal vehicles for.
- Increasing charging stations for electric vehicles will allow residents to know that they are provided with the means to charge their car and make more sustainable choices. Survey respondents indicated that the availability to car charging portals has an impact on their purchasing mindset.

## **BICYCLES**

- Increase bicycle sharing in lieu of car ownership. Our study did not investigate the usage of the HOPR Bike Share at Wesbrook Place, however it may be a topic of interest for future studies.
- Test e-bike charging stations within residential developments to encourage more bicycle use for various fitness levels. Currently, 47% of respondents use their bicycle more than once a week, 13% of them indicated that if accommodations were made for more bike security and charging stations, they would be inclined to reduce vehicular ownership.
- Provide rental incentives or discounts for bike use to support a sustainable means of mobility. In encouraging this direction in alignment with car share initiatives and policy innovations, an increase in bicycle use has the potential to invariably reduce car ownership.
- Make available bicycle storage and service stations in residential buildings to ensure ease of maintenance and upkeep.
- Increase/build more bike pathways.

## **PUBLIC TRANSPORT**

- Increase transit access around the neighbourhood and the variety of destinations from transit routes that run near the neighbourhood. The current transit framework around Wesbrook Place primarily routes passengers to the UBC Bus Exchange before they are able to take another bus off campus. If the route destinations could be expanded, this would remove the extra step of travelling to the bus exchange in order to leave campus.
- Subsidized Compass cards can prompt residents to use Transit services. The shift towards sustainable travel has the potential to further motivate residents to gradually use car sharing as a means of long distance travel and eventually (and hopefully) eliminate the use of personal vehicles.

## **GENERAL**

- All parking fees to be routed towards neighbourhood sustainability actions related to mobility. This is an encouraging way for the UNA to show support towards the sustainable change they hope to initiate within the neighbourhood.
- Designated parking garage for residents. This would remove the necessity of designated parking for each development and assist with aligning the parking availability between different providers (e.g. UNA street permits versus building specific parking).

### **7.3 Key Performance Indicators**

Wesbrook Place has the opportunity to learn from its neighbourhood. Key performance indicators (KPI) for parking services can provide insight to initiate change. The KPI's that relate to enforcement and management of parking are:

- The number of parking citations issued
- The number of residents that purchase visitor parking passes

- The number of day passes used on an annual basis
- The number of extra day passes requested
- Monitor how often charging infrastructure is used

By monitoring these indicators, UBC will be able to collect the data required to help shape the development of new parking policy.

- The number of parking citations issued can provide data towards identifying if there are underlying patterns to where citations are typically issued and/ or if there are consistent patterns within types of households or specific buildings that the car is registered to by a resident, for example, a family household of five.
- The data collected for the number of visitor and day passes purchased by residents can assist with projections for future development and land use planning. Monitoring the use visitor parking can help inform future development and make sure accommodations are made in alignment with how visitor parking is used.
- The monitored use of EV charging stations has the potential to inform if EV car share use is evolving. Alternatively, it could dictate if future parking should shift towards more EV charging stations.

## 7.4 Policy Discrepancies

From our review of the various policies, we have noted some discrepancies between the various policies and plans. The discrepancies are as follows:

- The UNA provides additional street parking, at an annual cost of approximately \$150 per parking pass. This appears to contradict reduced parking initiatives as there is now an option to get additional parking on top of the allocated residential building parking. Furthermore, the low cost of this parking pass may deter residents in rental buildings with paid underground parking to purchase the street parking pass instead as it is more affordable than the underground parking.
- The GBAP indicated that future market housing developments will have one EV charging station per unit. Providing one EV parking stall per residential unit does not appear to align with parking reduction initiatives, as the one EV stall per unit creates a threshold that cannot be changed.

## 8. Recommended Next Steps

Based on the results of our study, we recommend the following next steps:

### Short Term

- Re-promote the survey to Wesbrook Place residents living in market housing as limited responses were received from this demographic.
- Complete a series of site visits to see how often visitor parking is available and if vehicles parked in the accessible stalls have an accessible parking permit on their vehicle. The series of site visits could be completed in the short term as well once the COVID-19 pandemic has come to an end to understand how the pandemic has impacted parking habits.
- Select KPIs can be monitored and provide data to inform decision making and change. It will assist with understanding how the current policy is working, not working, or can transform into a new direction. This will further help to understand what potential policy changes may work best for Wesbrook Place. Potential KPIs to monitor to help create a tiered parking policy are:
  - Number of residents that purchase visitor passes
  - Number of day passes used on an annual basis
  - Number of residents purchasing the UNA street parking pass rather than building rental parking
  - Number of parking citations (e.g. residents using visitor parking)
  - Collaborate with Modo and Evo to understand how often cars are available or not available in Wesbrook Place
  - Collaborate with HOPR to understand how often bikes are or are not available in Wesbrook Place
  - Number and nature of parking reduction variances requested by developers



## Long Term

UBC's Campus and Community Planning with University Neighbourhoods Association should develop a roadmap as a guide towards policy change, see Figure 19. Stakeholder engagement and introducing a draft tiered parking policy can help align different members who are the actions of change to understand how the parking policy will be received by the public and by developers. It further allows a dialogue to commence that can become an oncoming communication channel in relation to neighbourhood priorities, financial planning and sustainability – while keeping the net-positive goals of UBC's Green Building Action Plan in mind that are part of a cyclical framework that addresses health and wellbeing, energy, biodiversity, water, place and experience, materials and resources, climate adaptation, and quality. It is imperative for a clear direction to be established with the neighbourhood by introducing relaxed parking requirements for the most commonly used alternative mode of transportation. Revisions to parking policies should be based on stakeholder feedback, staff's input and a financial plan before enacting new policy.



Figure 19 - Wesbrook Place neighbourhood's high level roadmap

## References

- City of Coquitlam. (2020, December 14). *Zoning Bylaw*. Retrieved from City of Coquitlam: <https://www.coquitlam.ca/562/Zoning-Bylaw>
- City of Kelowna. (2020, November 12). *Section 8 - Parking and Loading*. Retrieved from City of Kelowna Zoning Bylaw No. 8000: <https://www.kelowna.ca/city-hall/city-government/bylaws-policies/zoning-bylaw>
- City of Richmond. (2018). *Affordable Housing Strategy*. Richmond: City of Richmond.
- City of Richmond. (2018). *Proposed CF Richmond Centre South Development Plan*. Retrieved from Current Planning Projects: [https://www.richmond.ca/\\_\\_shared/assets/ricctrdispbd50367.pdf](https://www.richmond.ca/__shared/assets/ricctrdispbd50367.pdf)
- City of Richmond. (2018, March 23). *Proposed Official Community Plan (City Centre Area Plan) Amendment at 65531 No. 3 Road*. Retrieved from City of Richmond Current Planning Projects: [https://www.richmond.ca/\\_\\_shared/assets/\\_14\\_OCP\\_Amendment\\_6551\\_No3Rd\\_Consultation\\_CNCL\\_04091849949.pdf](https://www.richmond.ca/__shared/assets/_14_OCP_Amendment_6551_No3Rd_Consultation_CNCL_04091849949.pdf)
- City of Surrey. (1993, September 13). *Surrey Zoning By-Law 12000*. Retrieved from City of Surrey: [https://www.surrey.ca/sites/default/files/media/documents/BYL\\_Zoning\\_12000.pdf](https://www.surrey.ca/sites/default/files/media/documents/BYL_Zoning_12000.pdf)
- City of Surrey. (2019, February 25). *Bylaw No. 19768 Off-Street Parking Reserve Fund*. Retrieved from City of Surrey Bylaws: [https://www.surrey.ca/sites/default/files/bylaws/BYL\\_reg\\_19768.pdf](https://www.surrey.ca/sites/default/files/bylaws/BYL_reg_19768.pdf)
- City of Surrey. (2020, April 6). *Planning and Development Report Application No. 7919-0060-00, 7919-0060-01*. Retrieved from City of Surrey: [https://www.surrey.ca/sites/default/files/planning-reports/PLR\\_7919-0060-00.pdf](https://www.surrey.ca/sites/default/files/planning-reports/PLR_7919-0060-00.pdf)
- City of vanocuver. (n.d.). *rest123*.
- CycleHop LLC dba HOPR . (2021). *Frequently Asked Questions UBC*. Retrieved from HOPR: <https://gohopr.com/faq-ubc/>
- CycleHop LLC dba HOPR. (2021). *Hop Around UBC with HOPR Bike Share*. Retrieved from HOPR: <https://gohopr.com/ubc/>
- Evo Car Share. (2021). *How It Works*. Retrieved from Evo: <https://evo.ca/how-it-works>
- Fesler, S. (2017, September 22). *Deep Dive: SDCI's Draft Proposal to Improve Parking Availability*. Retrieved from The Urbanist: <https://www.theurbanist.org/2017/09/22/deep-dive-sdci-draft-parking-proposal/>
- FINE, A. D. (2019, April 30). *CASE STUDY SERIES: BENEFITS OF CORAL GABLES SHARED PARKING ORDINANCE*. Retrieved from Bilzin Sumberg's New Miami Blog: <https://www.newmiamiblog.com/2019/04/30/case-study-series-benefits-of-coral-gables-shared-parking-ordinance/#page=1>

Fried, B. (2016, March 17). *Parking Requirements Will Be Reduced in a Huge Chunk of NYC*. Retrieved from Streets Blog NYC: <https://nyc.streetsblog.org/2016/03/17/parking-requirements-will-be-reduced-in-a-huge-chunk-of-nyc/>

Google. (2019, July). *Google Maps*. Retrieved from Google Street View: [https://www.google.ca/maps/@49.2555311,-123.234207,3a,75y,151.17h,103.04t/data=!3m6!1e1!3m4!1sm-45P5UpuW\\_nnSIW1F4aXw!2e0!7i16384!8i8192](https://www.google.ca/maps/@49.2555311,-123.234207,3a,75y,151.17h,103.04t/data=!3m6!1e1!3m4!1sm-45P5UpuW_nnSIW1F4aXw!2e0!7i16384!8i8192)

GoogleEarth. (2021, Retrieved March 14). GoogleEarth.

Modo Co-operative. (2020). *Modo*. Retrieved from Individual Plans: <https://modo.coop/how-it-works/individual-plans>

TransLink. (2021, January 4). *Bus Timetable Vancouver Book 2*. Retrieved from TransLink Schedules By Region: [https://www.translink.ca/-/media/translink/documents/schedules-and-maps/schedules-by-region/vancouver2\\_p1-52.pdf](https://www.translink.ca/-/media/translink/documents/schedules-and-maps/schedules-by-region/vancouver2_p1-52.pdf)

University Neighbourhoods Association. (2021). *Parking*. Retrieved from University Neighbourhoods Association: <https://www.myuna.ca/parking/>

University of British Columbia - Campus + Community Planning. (2016, September). *Wayfinding at UBC Vancouver*. Retrieved from University of British Columbia: <http://www.maps.ubc.ca/PROD/index.php>

University of British Columbia. (2018). *University of British Columbia Green Building Action Plan*. Vancouver: University of British Columbia.

University of British Columbia. (2019). *University of British Columbia Transportation Plan Vancouver Campus*. Vancouver: University of British Columbia.

University of British Columbia. (2020). *University of British Columbia Development Handbook*. Vancouver: University of British Columbia.

University of British Columbia. (2020). *Wesbrook Place Neighbourhood Plan*. Vancouver: University of British Columbia.

University of British Columbia Campus + Community Planning. (2021). *Cycling*. Retrieved from UBC Transportation: <https://planning.ubc.ca/transportation/cycling>

University of British Columbia Campus + Community Planning. (2021). *UBC Cycling Map*. Retrieved from UBC Cycling: [https://planning.ubc.ca/sites/default/files/2019-11/MAP\\_Transportation\\_UBCCyclingMap.pdf](https://planning.ubc.ca/sites/default/files/2019-11/MAP_Transportation_UBCCyclingMap.pdf)

Village Gate Homes. (2021, March 13). *Sustainably built rental homes UBC | Vancouver | Village gate homes*. Faculty & Staff Housing at the University of British Columbia (UBC) | Village Gate Homes. <https://www.villagegatehomes.com/about-us/sustainability/>

## **Appendix A – Survey**

# UBC SEEDS Sustainability Program - Wesbrook Place Parking

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Start of Block: Default Question Block

Hello,

We are graduate students in UBC's Master of Engineering Leadership program specializing in Urban Systems. In partnership with the UBC SEEDS Sustainability Program, we are looking to understand the current residential parking demands in the Wesbrook Place neighbourhood as well as preferred alternative methods of transportation for Wesbrook Place residents.

Thank you for taking the time to complete this survey. Your response to this survey will help to shape future parking and transportation initiatives for UBC south campus. The survey should take no longer than 5 minutes to complete and your responses are anonymous.

If you have any questions regarding this survey, please contact Dr. Martino Tran at [martino.tran@ubc.ca](mailto:martino.tran@ubc.ca). If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this survey, please contact the Research Participant Complaint Line in the UBC at 604-822-8598 or email [RSL@ors.ubc.ca](mailto:RSL@ors.ubc.ca). By completing this survey, you are consenting to participating in this research.

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Page Break

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Q1 What kind of residence are you living in?

- Owner - townhome (1)
  - Owner - condo (2)
  - Rental - townhome / city home (3)
  - Rental - apartment (4)
- 

Q2 Are you UBC staff/faculty or a student at UBC?

- Yes, UBC staff (1)
  - Yes, UBC faculty (2)
  - Yes, UBC student (3)
  - No (4)
- 

Q3 How many people are in your household?

- 1 (1)
  - 2 (2)
  - 3 (3)
  - 4+ (4)
-

Q4 How many vehicles does your household own?

- 0 (1)
  - 1 (2)
  - 2 (3)
  - 3+ (4)
- 

Q5 Do you have an electric vehicle (EV) and/or plug-in hybrid vehicle (PHEV) or plan to buy one in the next 2 years?

- Yes, own an EV/PHEV (1)
  - Yes, plan to buy an EV/PHEV (2)
  - No (3)
- 

Q6 How many parking stalls do you currently have?

- 0 (1)
  - 1 (2)
  - 2 (3)
  - 3+ (4)
-

Q7 Is one (or more) of your parking stall an accessible parking spot?

- Yes, 1 (1)
  - Yes, more than 1 (2)
  - No (3)
- 

Q8 How often does your household or guests of your household use your building's visitor and/or accessible parking spots?

- Everyday (1)
  - Multiple times per week (2)
  - Once per week (3)
  - Once per month (4)
  - Less than once per month (5)
  - Never (6)
- 

Q9 When do you most use your personal vehicle? (where applicable)

- Work (1)
  - Leisure (2)
  - Errands (e.g. shopping) (3)
  - Not Applicable (4)
-

Q10 What modes of transportation do you use? (select all that apply)

- Personal vehicle (1)
  - Transit (2)
  - Bicycle (3)
  - Walk (4)
  - Carpool (5)
  - Carshare / ride hailing (6)
- 

Q11 Of the modes of transportation that you use, what is your preferred method of transport?

- Personal vehicle (1)
  - Transit (2)
  - Bicycle (3)
  - Walk (4)
  - Carpool (5)
  - Carshare / ride hailing (6)
- 

Q12 Does the change in seasons affect your method of transport?

- Yes (1)
  - No (2)
-

Q13 How often do you use your personal vehicle per week? (where applicable)

- 1 (1)
  - 3 (2)
  - 5+ (3)
  - Not applicable (4)
- 

Q14 Please enter your total average weekly driving milage:

\_\_\_\_\_

---

Q15 Fill in the blank to this statement: Since the onset of the COVID-19 pandemic, I've used my personal vehicle \_\_\_ times per week.

- 5 (1)
  - 2 to 3 (2)
  - 1 (3)
  - 0 (4)
- 

Q16 Fill in the blank to this statement: Since the onset of the COVID-19 pandemic, I've used public transit \_\_\_ times per week.

- 5 (1)
  - 2 to 3 (2)
  - 1 (3)
  - 0 (4)
-

Q17 Fill in the blank to this statement: Since the onset of the COVID-19 pandemic, I've used my bicycle \_\_\_\_ times per week.

5 (1)

2 to 3 (2)

1 (3)

0 (4)

---

Q18 Fill in the blank to this statement: Since the onset of the COVID-19 pandemic, I've carpooled \_\_\_\_ times per week.

5 (1)

2 to 3 (2)

1 (3)

0 (4)

---

Q19 Fill in the blank to this statement: Since the onset of the COVID-19 pandemic, I've used a carshare / ride hailing service \_\_\_\_ times per week.

5 (1)

2 to 3 (2)

1 (3)

0 (4)

---



Q20 Does your household plan to change the number of owned vehicles in the next few years?

- increase (1)
  - decrease (2)
  - no change (3)
- 

Q21 React to this statement: I would consider reducing the number of vehicles I own if... (select all that apply)

- I had access to a subsidized transit pass (1)
  - The transit availability, capacity, and frequency between Wesbrook Place and the UBC Bus Loop is increased (2)
  - Bike security / charging stations for e-bikes are increased (3)
  - Bike friendly routes are increased (4)
  - Car share availability is increased (5)
  - Ride hailing availability is improved (6)
- 

Q22 Please provide any feedback / comments you may have regarding residential parking at Wesbrook Village

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End of Block: Default Question Block

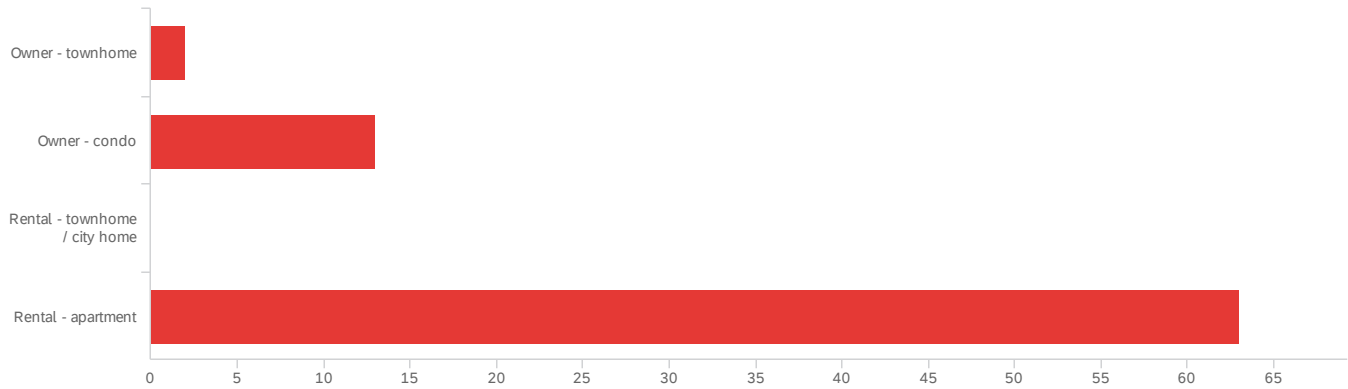
## Appendix B – Survey Responses

# Default Report

UBC SEEDS Sustainability Program - Wesbrook Place Parking

April 15, 2021 10:36 AM PDT

## Q1 - What kind of residence are you living in?



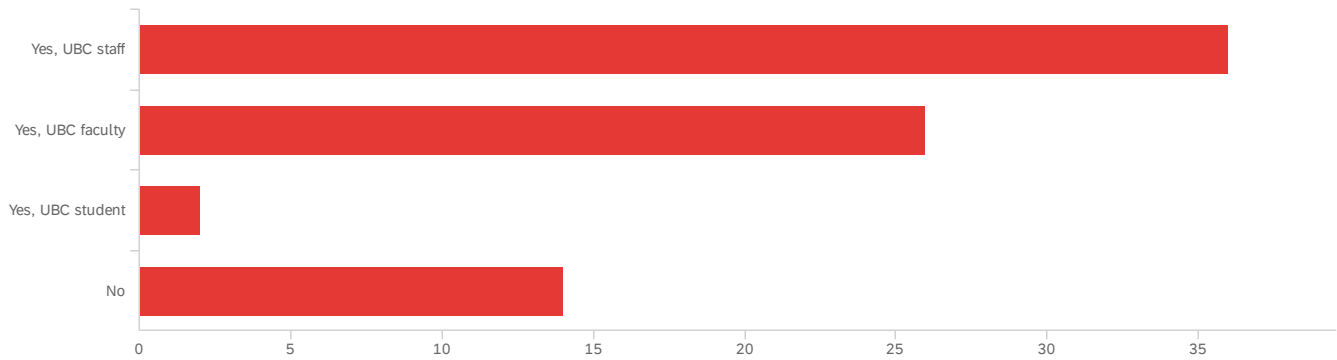
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	What kind of residence are you living in?	1.00	4.00	3.59	0.85	0.73	78

#	Field	Choice Count
1	Owner - townhome	2.56% 2
2	Owner - condo	16.67% 13
3	Rental - townhome / city home	0.00% 0
4	Rental - apartment	80.77% 63

78

Showing rows 1 - 5 of 5

## Q2 - Are you UBC staff/faculty or a student at UBC?



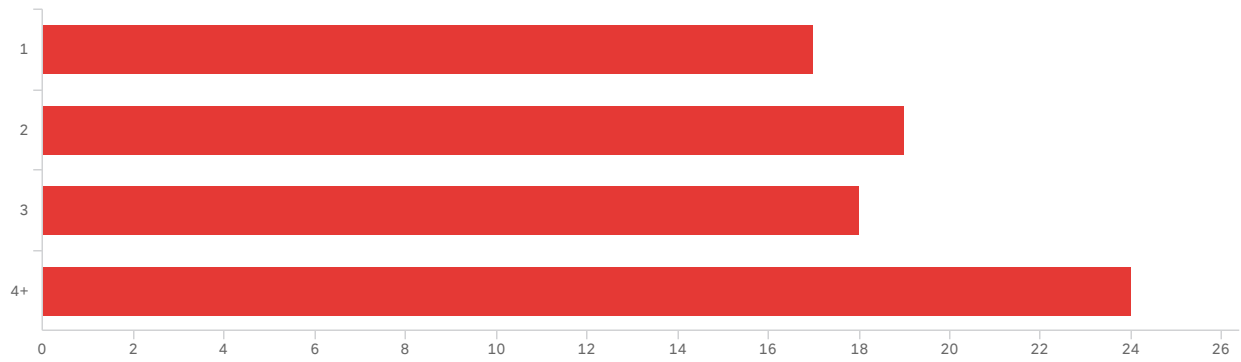
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Are you UBC staff/faculty or a student at UBC?	1.00	4.00	1.92	1.10	1.20	78

#	Field	Choice Count
1	Yes, UBC staff	46.15% 36
2	Yes, UBC faculty	33.33% 26
3	Yes, UBC student	2.56% 2
4	No	17.95% 14

78

Showing rows 1 - 5 of 5

### Q3 - How many people are in your household?



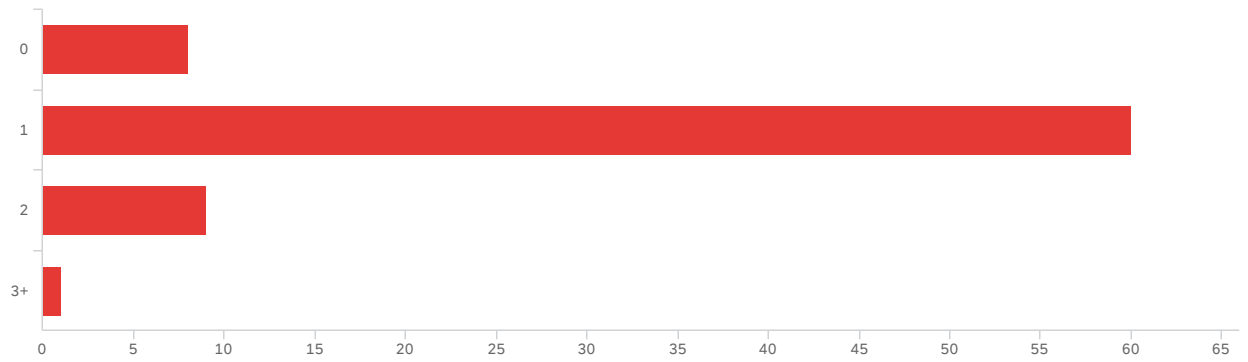
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	How many people are in your household?	1.00	4.00	2.63	1.13	1.28	78

#	Field	Choice Count
1	1	21.79% 17
2	2	24.36% 19
3	3	23.08% 18
4	4+	30.77% 24

78

Showing rows 1 - 5 of 5

## Q4 - How many vehicles does your household own?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	How many vehicles does your household own?	1.00	4.00	2.04	0.52	0.27	78

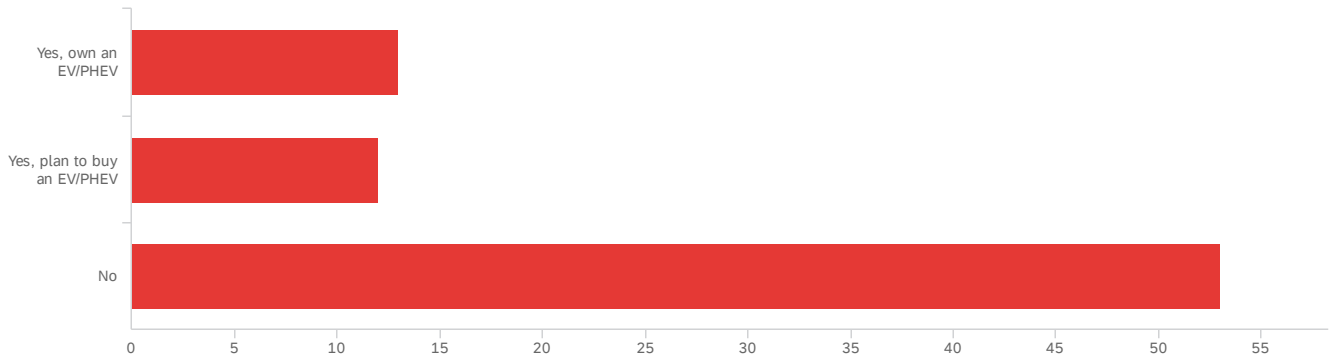
#	Field	Choice Count
1	0	10.26% 8
2	1	76.92% 60
3	2	11.54% 9
4	3+	1.28% 1

78

Showing rows 1 - 5 of 5



Q5 - Do you have an electric vehicle (EV) and/or plug-in hybrid vehicle (PHEV) or plan to buy one in the next 2 years?

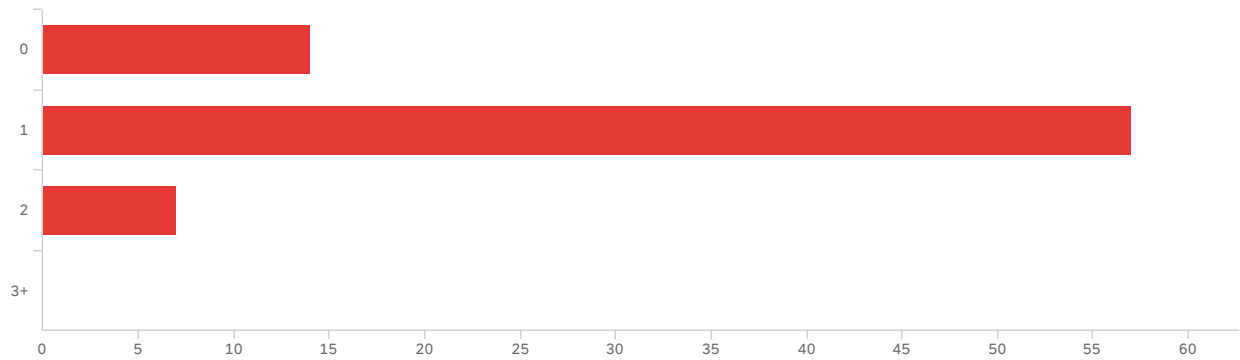


#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Do you have an electric vehicle (EV) and/or plug-in hybrid vehicle (PHEV) or plan to buy one in the next 2 years?	1.00	3.00	2.51	0.76	0.58	78

#	Field	Choice Count
1	Yes, own an EV/PHEV	16.67% 13
2	Yes, plan to buy an EV/PHEV	15.38% 12
3	No	67.95% 53
		78

Showing rows 1 - 4 of 4

## Q6 - How many parking stalls do you currently have?



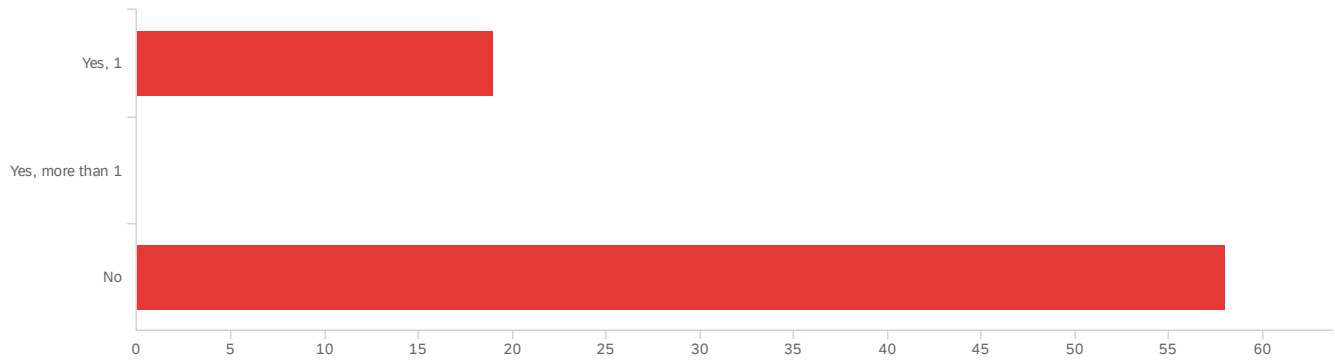
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	How many parking stalls do you currently have?	1.00	3.00	1.91	0.51	0.26	78

#	Field	Choice Count
1	0	17.95% 14
2	1	73.08% 57
3	2	8.97% 7
4	3+	0.00% 0

78

Showing rows 1 - 5 of 5

## Q7 - Is one (or more) of your parking stall an accessible parking spot?

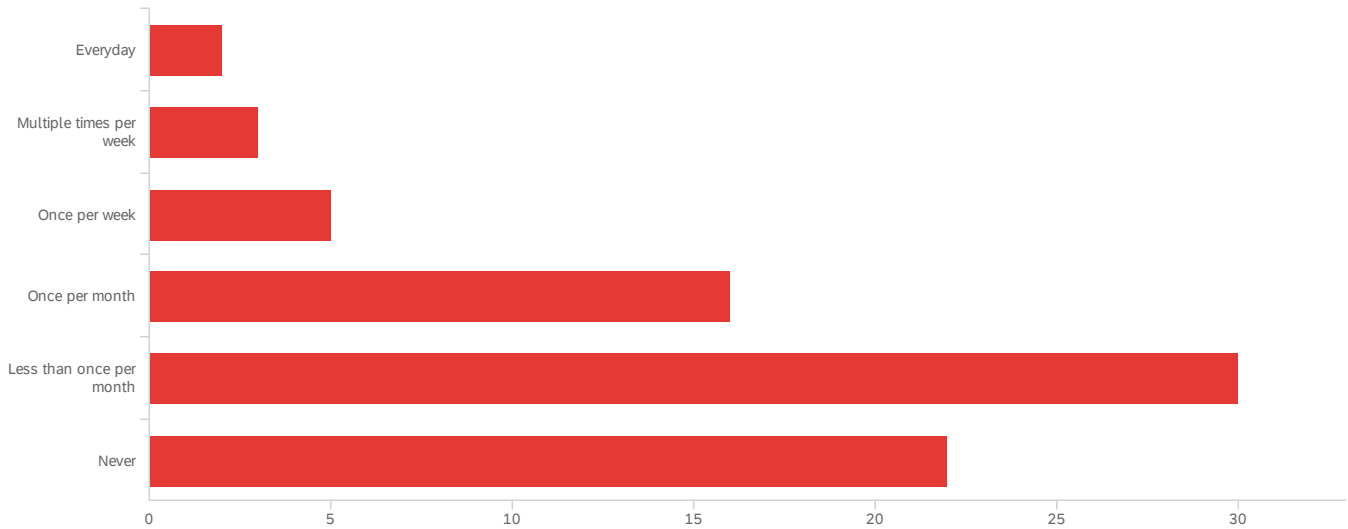


#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Is one (or more) of your parking stall an accessible parking spot?	1.00	3.00	2.51	0.86	0.74	77

#	Field	Choice Count
1	Yes, 1	24.68% 19
2	Yes, more than 1	0.00% 0
3	No	75.32% 58
		77

Showing rows 1 - 4 of 4

Q8 - How often does your household or guests of your household use your building's visitor and/or accessible parking spots?

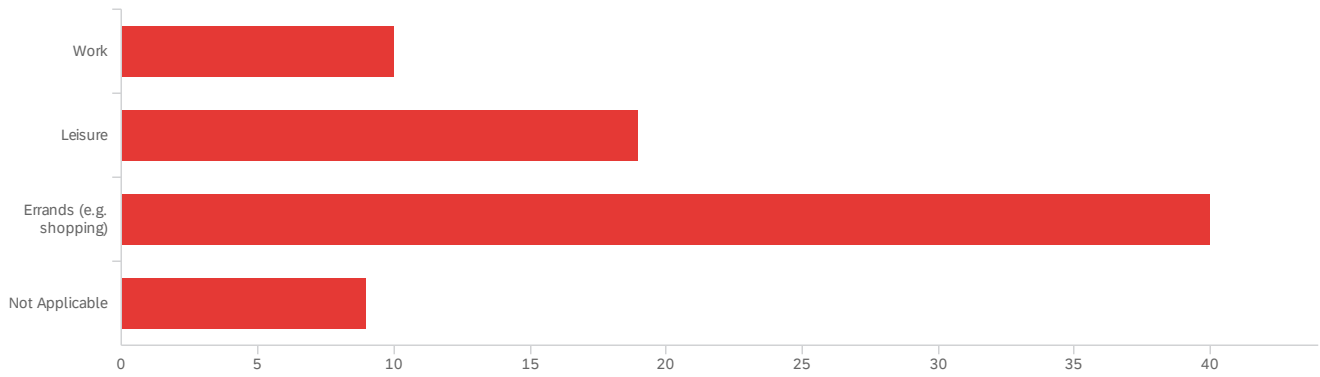


#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	How often does your household or guests of your household use your building's visitor and/or accessible parking spots?	1.00	6.00	4.73	1.19	1.43	78

#	Field	Choice Count
1	Everyday	2.56% 2
2	Multiple times per week	3.85% 3
3	Once per week	6.41% 5
4	Once per month	20.51% 16
5	Less than once per month	38.46% 30
6	Never	28.21% 22

78

## Q9 - When do you most use your personal vehicle? (where applicable)



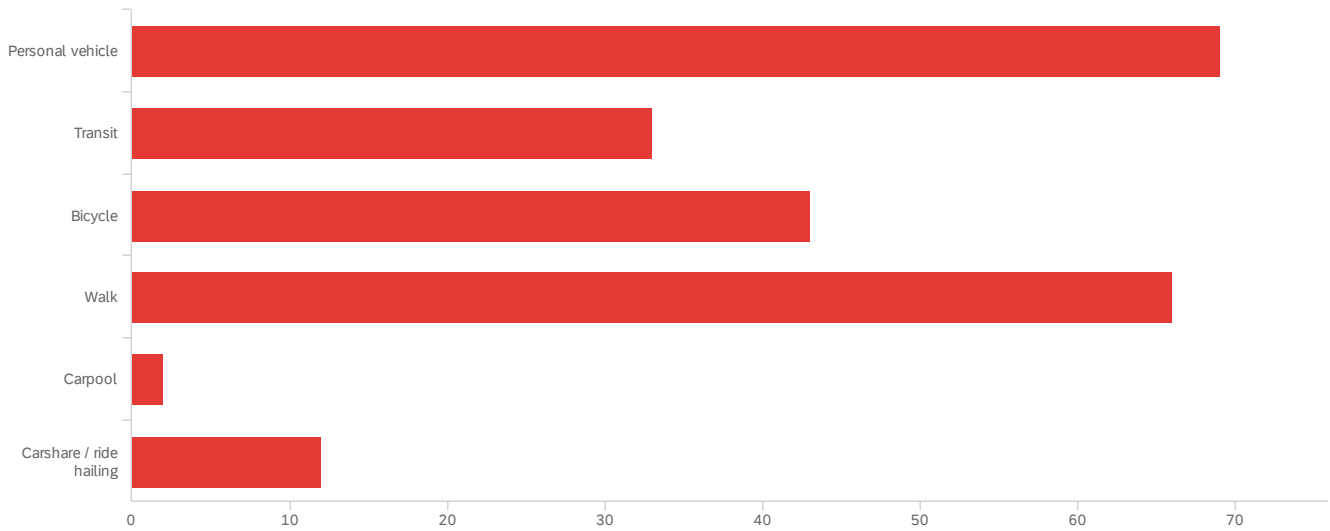
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	When do you most use your personal vehicle? (where applicable)	1.00	4.00	2.62	0.85	0.72	78

#	Field	Choice Count
1	Work	12.82% 10
2	Leisure	24.36% 19
3	Errands (e.g. shopping)	51.28% 40
4	Not Applicable	11.54% 9

78

Showing rows 1 - 5 of 5

## Q10 - What modes of transportation do you use? (select all that apply)

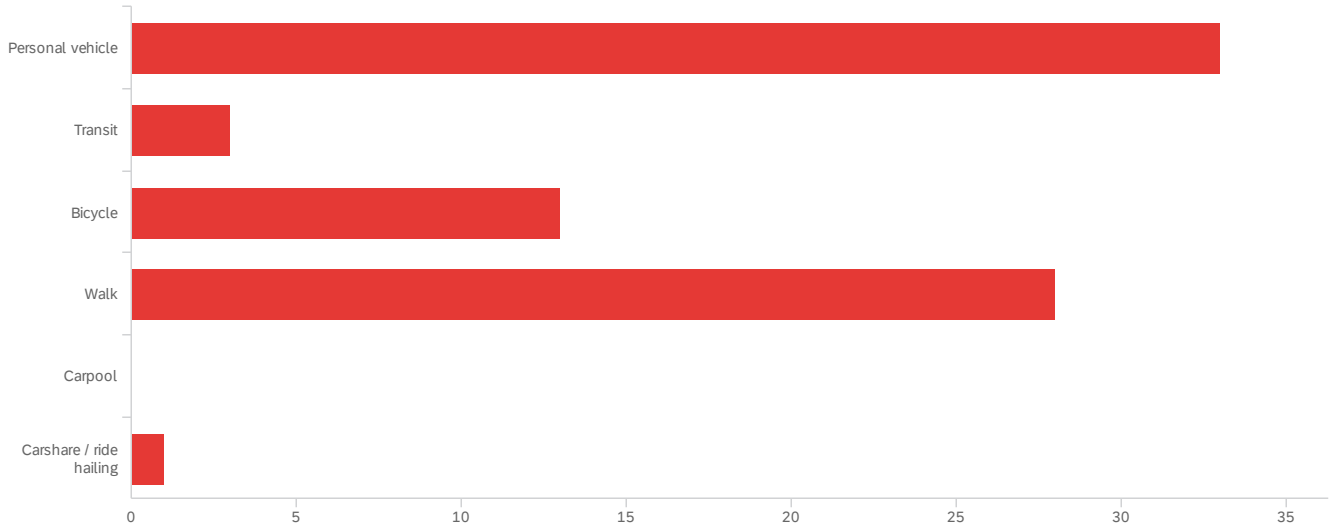


#	Field	Choice Count
1	Personal vehicle	30.67% 69
2	Transit	14.67% 33
3	Bicycle	19.11% 43
4	Walk	29.33% 66
5	Carpool	0.89% 2
6	Carshare / ride hailing	5.33% 12

225

Showing rows 1 - 7 of 7

# Q11 - Of the modes of transportation that you use, what is your preferred method of transport?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Of the modes of transportation that you use, what is your preferred method of transport?	1.00	6.00	2.51	1.40	1.97	78

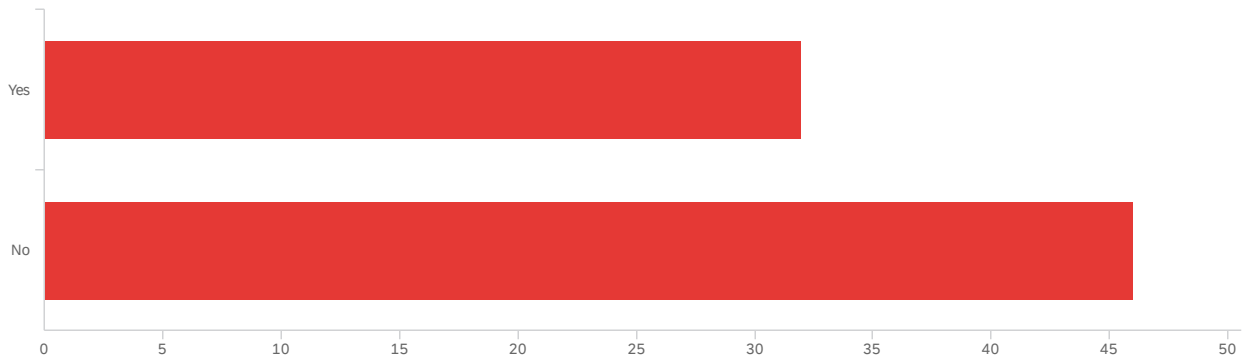
#	Field	Choice Count
1	Personal vehicle	42.31% 33
2	Transit	3.85% 3
3	Bicycle	16.67% 13
4	Walk	35.90% 28
5	Carpool	0.00% 0
6	Carshare / ride hailing	1.28% 1

78

Showing rows 1 - 7 of 7



## Q12 - Does the change in seasons affect your method of transport?



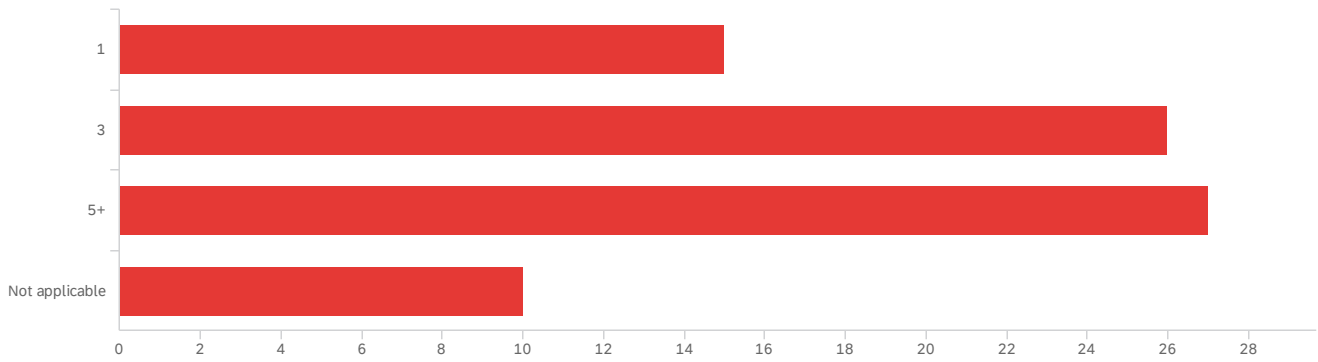
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Does the change in seasons affect your method of transport?	1.00	2.00	1.59	0.49	0.24	78

#	Field	Choice Count
1	Yes	41.03% 32
2	No	58.97% 46

78

Showing rows 1 - 3 of 3

### Q13 - How often do you use your personal vehicle per week? (where applicable)



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	How often do you use your personal vehicle per week? (where applicable)	1.00	4.00	2.41	0.94	0.88	78

#	Field	Choice Count
1	1	19.23% 15
2	3	33.33% 26
3	5+	34.62% 27
4	Not applicable	12.82% 10

78

Showing rows 1 - 5 of 5

## Q14 - Please enter your total average weekly driving milage:

Please enter your total average weekly driving milage:

100

30km

100 km

50 K

2k

100km

Not sure

350 km

5 km

I use my car less than 1/week, and I do 100 miles to go hiking.

100 km

200

200

100

120k

50

Daily usually ... working from home due COVID ... milage not usual ... 25 - 50 km / day

50

150 km

60 kms

10

1-2

Please enter your total average weekly driving milage:

5

only a few miles a day, perhaps around 25 a week, but I'm not sure

50km

300

100 km

200km

300 km/week

300 during covid

100

40km

Unsure

10

100

500

100km

40 miles

20

20

50

12km

50

100k

80 miles

50

Please enter your total average weekly driving milage:

150 km

500

0

100

40 km?

200km

50kg

5 km

100

30 km

40

75 km

0

n/a

50-150

100

20km

20 kms

no clue

30 km

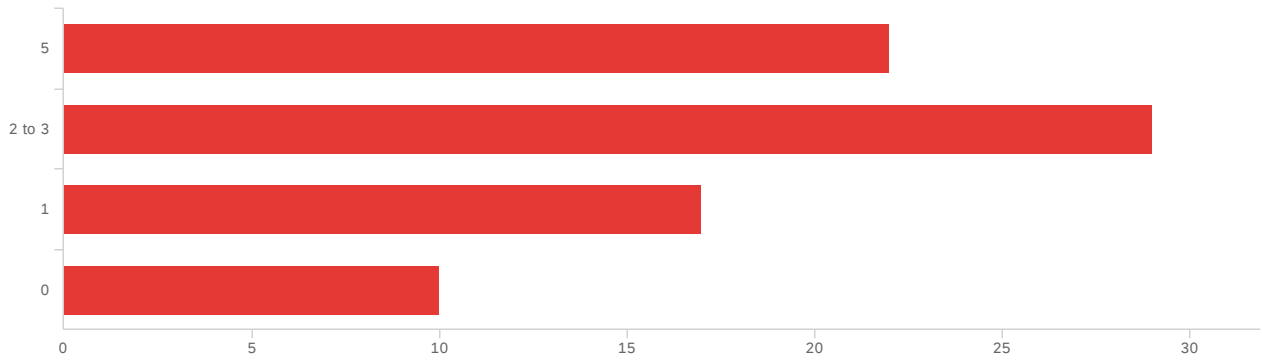
5

20

15km

40

Q15 - Fill in the blank to this statement: Since the onset of the COVID-19 pandemic, I've used my personal vehicle \_\_\_ times per week.



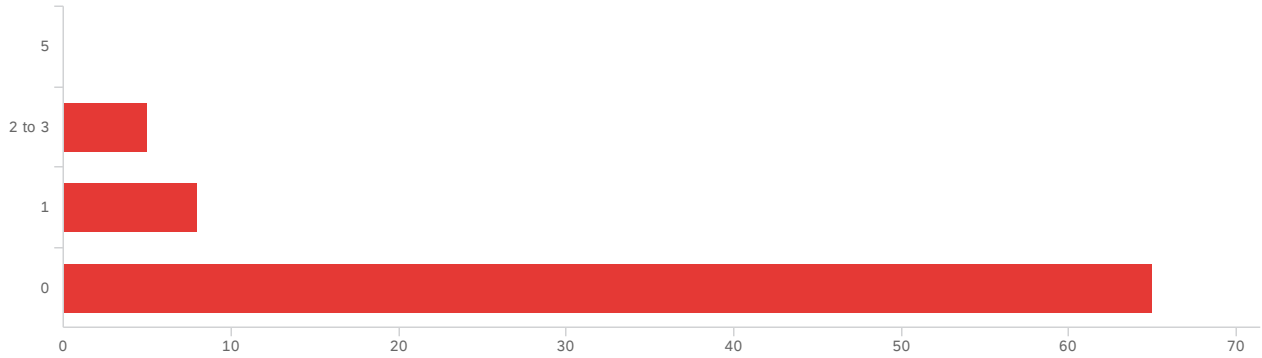
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Fill in the blank to this statement: Since the onset of the COVID-19 pandemic, I've used my personal vehicle ___ times per week.	1.00	4.00	2.19	0.99	0.98	78

#	Field	Choice Count
1	5	28.21% 22
2	2 to 3	37.18% 29
3	1	21.79% 17
4	0	12.82% 10

78

Showing rows 1 - 5 of 5

Q16 - Fill in the blank to this statement: Since the onset of the COVID-19 pandemic, I've used public transit \_\_\_ times per week.



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Fill in the blank to this statement: Since the onset of the COVID-19 pandemic, I've used public transit ___ times per week.	2.00	4.00	3.77	0.55	0.31	78

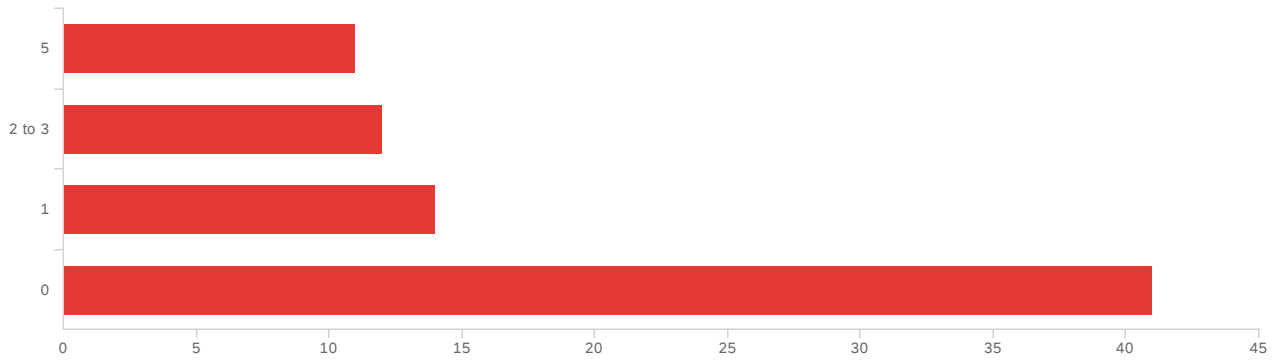
#	Field	Choice Count
1	5	0.00% 0
2	2 to 3	6.41% 5
3	1	10.26% 8
4	0	83.33% 65

78

Showing rows 1 - 5 of 5



Q17 - Fill in the blank to this statement: Since the onset of the COVID-19 pandemic, I've used my bicycle \_\_\_ times per week.



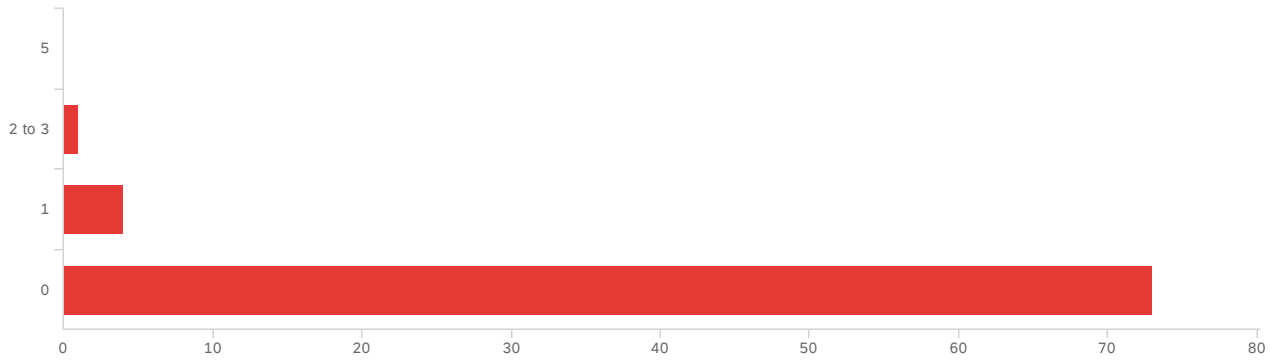
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Fill in the blank to this statement: Since the onset of the COVID-19 pandemic, I've used my bicycle ___ times per week.	1.00	4.00	3.09	1.11	1.24	78

#	Field	Choice Count
1	5	14.10% 11
2	2 to 3	15.38% 12
3	1	17.95% 14
4	0	52.56% 41

78

Showing rows 1 - 5 of 5

Q18 - Fill in the blank to this statement: Since the onset of the COVID-19 pandemic, I've carpoled \_\_\_ times per week.



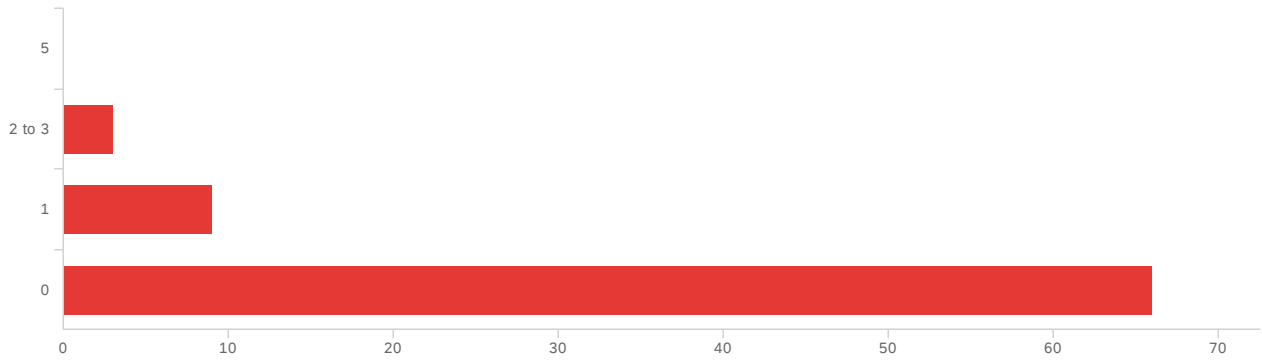
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Fill in the blank to this statement: Since the onset of the COVID-19 pandemic, I've carpoled ___ times per week.	2.00	4.00	3.92	0.31	0.10	78

#	Field	Choice Count
1	5	0.00% 0
2	2 to 3	1.28% 1
3	1	5.13% 4
4	0	93.59% 73

78

Showing rows 1 - 5 of 5

Q19 - Fill in the blank to this statement: Since the onset of the COVID-19 pandemic, I've used a carshare / ride hailing service \_\_\_\_ times per week.



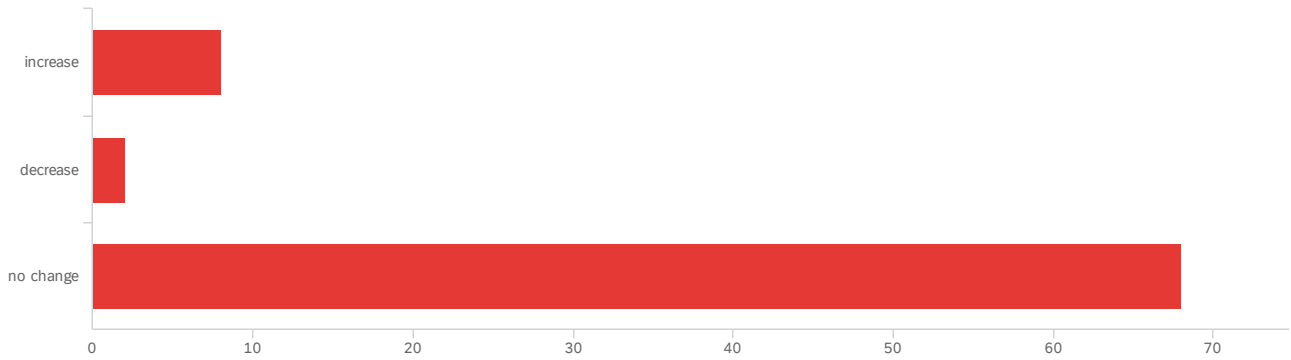
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Fill in the blank to this statement: Since the onset of the COVID-19 pandemic, I've used a carshare / ride hailing service ____ times per week.	2.00	4.00	3.81	0.48	0.23	78

#	Field	Choice Count
1	5	0.00% 0
2	2 to 3	3.85% 3
3	1	11.54% 9
4	0	84.62% 66

78

Showing rows 1 - 5 of 5

# Q20 - Does your household plan to change the number of owned vehicles in the next few years?



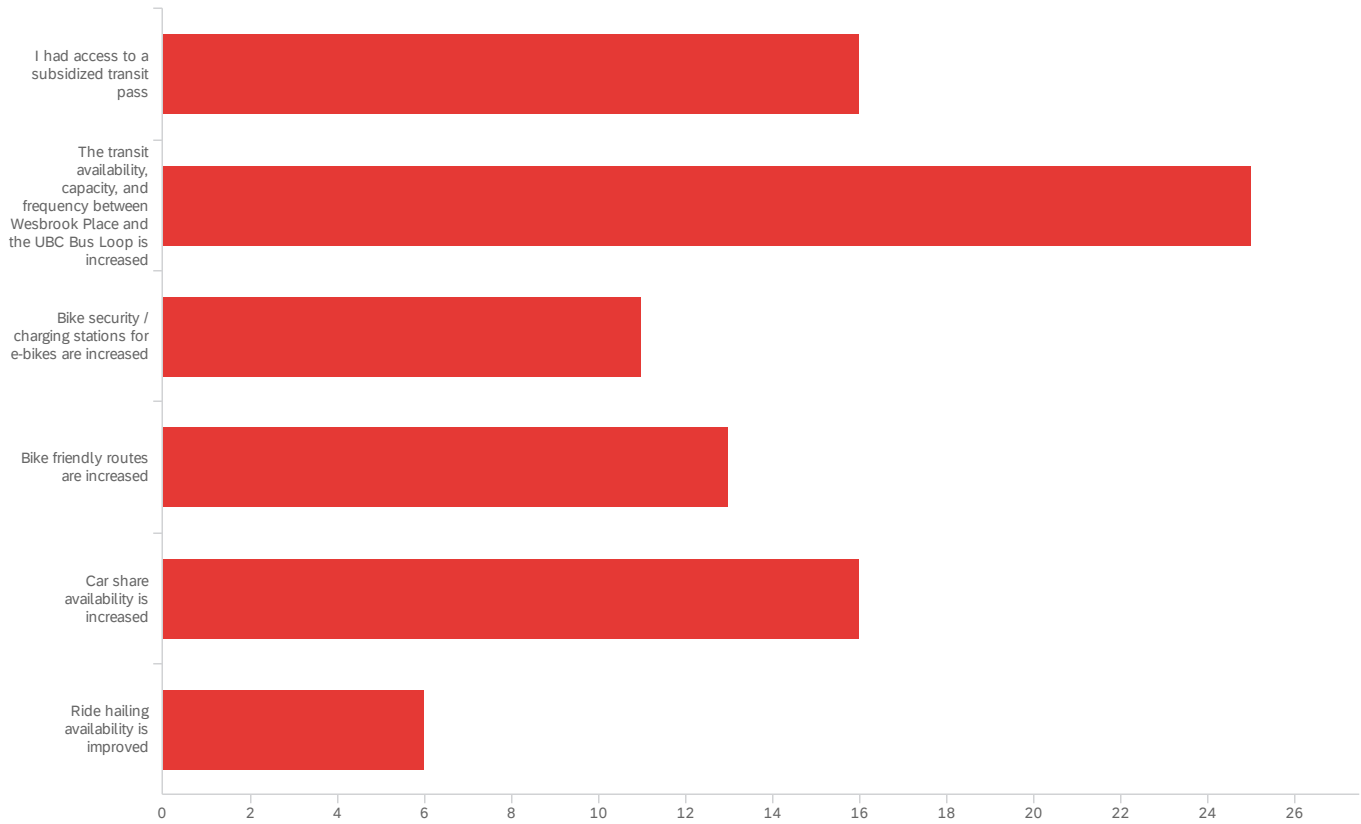
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Does your household plan to change the number of owned vehicles in the next few years?	1.00	3.00	2.77	0.62	0.38	78

#	Field	Choice Count
1	increase	10.26% 8
2	decrease	2.56% 2
3	no change	87.18% 68
		78

Showing rows 1 - 4 of 4

## Q21 - React to this statement: I would consider reducing the number of vehicles I own

if... (select all that apply)



#	Field	Choice Count
1	I had access to a subsidized transit pass	18.39% 16
2	The transit availability, capacity, and frequency between Wesbrook Place and the UBC Bus Loop is increased	28.74% 25
3	Bike security / charging stations for e-bikes are increased	12.64% 11
4	Bike friendly routes are increased	14.94% 13
5	Car share availability is increased	18.39% 16
6	Ride hailing availability is improved	6.90% 6

## Q22 - Please provide any feedback / comments you may have regarding residential parking at Wesbrook Village

Please provide any feedback / comments you may have regarding residential p...

We own a plug-in hybrid car and a motorbike (considered as second vehicle).

Q21 intentionally left blank. Car is primarily used for getting kids to school and running errands; often to places further than I can walk, bike or without transit options. I wouldn't consider going without a car at this time. Ride Hailing and Car Share are more expensive than owning a car for the amount of driving we do.

Posted Parking regulations should be enforced so that service vehicles, such as garbage trucks, can access the exteriors of buildings they are servicing. Daytime parking regulations are not being enforced and they should be.

Our daughter borrowed our vehicle and took it to Victoria before the pandemic and we haven't got it back yet. I answered these questions as an owner, but not an operator of a vehicle for more than a year.

Village Gate homes has some underground guest parking in their lots, but it is not monitored, so people have been parking there for free instead of renting a parking spot. Village Gate Homes is not able to figure out a solution to this. Carshare (Evo) are limited to a few spots around UBC campus. This lack of parking makes using car share inconvenient. Sometimes there are no spaces left to park in my neighbourhood

Could use more free, 2h parking.

In Q21, you should have provided an option for working from home. Since the start of the pandemic, working from home reduces the need to commute, and if this trends continues (e.g. working from home a few days a week), it will affect commuting needs.

na

There are no accessible parking spots for visitors to cypress. You have limited parking during day outside the front door. The accessible visitor spots are nowhere near the elevator for cypress. The accessible spots are all used by residents. I have infrequent visitors who require accessible parking. It really cannot meet legislated requirements.

Car charging seems limited on campus and in the residential parkades. This would impact our purchase of an electric vehicle. We have decided instead to downsize to a Honda Fit which is cheap on gas.

Would not change use of personal vehicle ... recreation/sport all occurs off campus and so does work. I would not support increased bus traffic on Wesbrook ... was not built for buses. Road already needs repair ... 11 years it was a dirt road. When condo was purchased, no plan for Wesbrook to be a bus line with speed of buses, blocking traffic when picking up passengers (no pull-offs) + noise.

With new buildings continuing to go up, there's going to be a shortage of street parking in the neighborhood soon. Already some buildings (Mundell House is an example, I think) are being built with fewer parking spaces than apartments, so they're relying on on-street parking.

Parking stalls are too tight

None

my bicycle usage vary a lot by season. some questions are difficult to answer, so a neutral, like "I'm not sure", option would have been helpful.

Please provide any feedback / comments you may have regarding residential p...

Not enough parking in buildings, not enough parking on street, no cycle path between street and sidewalk, as neighbourhood keeps growing getting more and more congested. Lack of planning/insight with contradictory messaging for Campus Planning - they're pushing for families in the neighbourhood families have cars 1-2. They have guests come, UBC isn't centrally located even if bikes, buses, increase etc there is a need for vehicles and the need for people to come here with vehicles. the assumptions made in the development of the current parking in building and on street have been underwhelming. On top of that really poor and dissapointing traffic, parking, bike and pedestrian plans throughout the neighbourhood for how walkable everything is for the day to day stuff in the neighbourhood. I get the balance and wanting to promote sky train one day when it arrives, more buses, walk bike - but the reality is sky train is a long way away and even then if families are here they need cars, i'm not taking my kid to hockey with all their gear on sky train (there's a UBC rink here but most games practices aren't here for example). I'm not for cars or saying other methods of transportation aren't valid and don't have a place but we have to be both practical and realistic and make sure decisions are driven by people that live here not just those that have ideas of how great this or that would be but don't experience it firsthand day to day. appreciate the project!

You can pay \$60ish dollars a month to park in my buildings underground, or you can pay \$120ish/yr for a Wesbrook street parking pass. We just have the street parking pass and are saving money while not worrying about hitting other cars or support pillars.

n/a

Re: above question, one of the factors in our life right now is having a young child. Under other circumstances, improvement in car share options (specifically, increase in convenience/decrease in cost of using a car for day trips and/or overnight trips) would make us seriously consider not owning a car. Existing car share options would fulfill most of our needs (e.g., running errands), except that the current necessity of having to switch over a child's carseat currently makes relying solely on car shares too inconvenient.

University Neighbourhoods Association street parking pass purchase and other such like admin. services should be entirely available online. The requirement for in-person visits for such services are superfluous and should be eliminated.

N/A

Parking is fine in Wesbrook Village. No changes needed.

We probably wouldn't reduce the amount of times we use our vehicle per week. We are practically at a minimum usage already, even before the onset of the pandemic. The only thing that might reduce our vehicle usage is if UBC/Wesbrook got a better grocery store, more family doctors and varying health clinics.

I just want to add that the reason we never use the guest parking in our building is because there's only one spot and it's always full!

my building does not have electrical outlets for my vehicle unless I park in visitor parking - the building is only 10 years old!! seems like that could have been foreseen. I wish Village Gate Homes would move more quickly to install the infrastructure for EVs

better undergrpund parking

Not enough parking for residents

I park on the street with a Wesbrook parking decal \$150/year, just thought I'd mention because it wasn't listed as an option

Should have more car share like EVO In Wesbrook Village.

Q 21 should have "None of the Above" Does Q 7 mean personal or building accessible stalls Many buildings have designated stalls for residents/visitors Q 8 is not applicable in these covid times, with visitors restricted

n/a

24H parking for visitors is extremely limited, it is unfortunate



Please provide any feedback / comments you may have regarding residential p...

---

Car share vehicles are very difficult to get in Wesbrook Village - I would like to see more availability of these cars in the area.


It's expensive. It seems silly to have a huge neighbourhood at the other side of campus without reasonable access to buses ie out 16th, toward 10th and the city.

n/a

Please note that my building does not have visitor parking (Keenleyside)

**End of Report**

## Appendix C – Presentation Slides



# Parking Policy for Sustainable, Accessible Neighbourhoods

Ayman Fahmy  
Farrah Olegario Nazareth  
Michaela Dyck

URSY 520 – Dr. Martino Tran

# Agenda

**01**

**Introduction**

**02**

**Methodology**

**03**

**Background Literature Review**

**04**

**Case Study Investigation**

**05**

**Survey**

**06**

**Analysis**

**07**

**Next Steps**

# Introduction

- Wesbrook Place residential neighbourhood at UBC South campus area
- Housing offering mix of market and rental facilitated by Village Gate Homes



Source: (Wesbrook Properties, 2021)



# Project Scope

*“The scope of this project explores parking demand, especially visitor and accessible parking, in Wesbrook Place’s residential neighbourhood.”*

*Our team will further assess current policy and parking guidelines to inform decision making.”*



## **BACKGROUND LITERATURE REVIEW**

Plans, policies, documentation pertaining to  
Wesbrook Place

## **CASE STUDY INVESTIGATION**

Parking policies that have been implemented  
in other jurisdictions

## **SURVEY**

Survey completed by Wesbrook Place  
residents

# **Methodology**

# Background Literature Review



## UBC Development Handbook

Details residential parking requirements



## Neighbourhood Plan

References UBC Development Handbook



## Green Building Action Plan

- 50% of parking stalls should have EV charging
- 1 EV stall per market unit for future market housing developments



## Transportation Plan

Provide excess parking  
Review accessible parking stalls and future demand



## UNA Parking Info

- Provides residents with permit street parking
- Provides residents with visitors passes and day passes.



# Background Literature Review

## Available Alternative Modes of Transportation

### Car Share

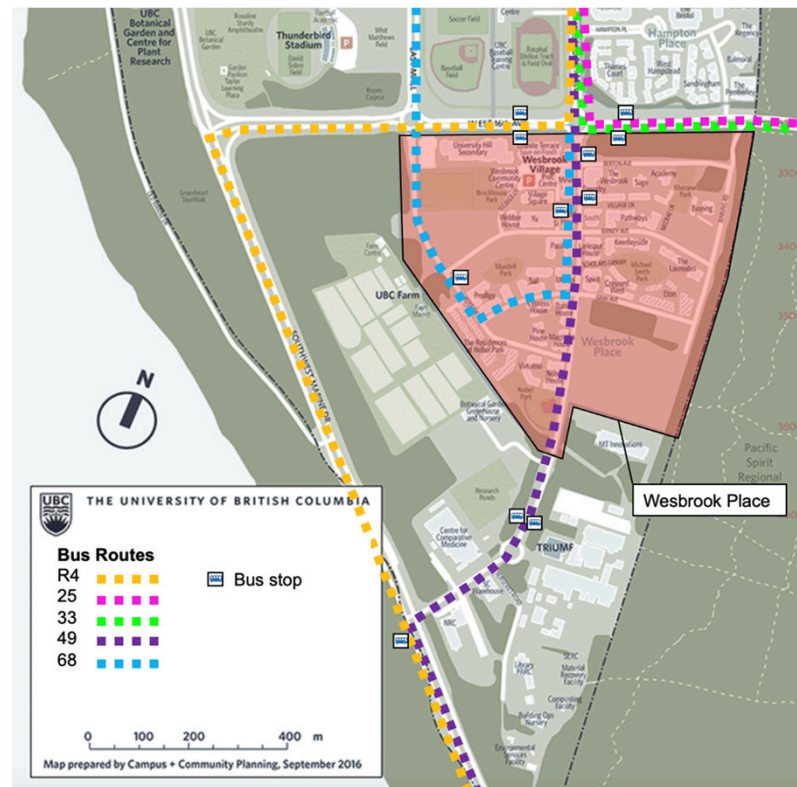
Local operators

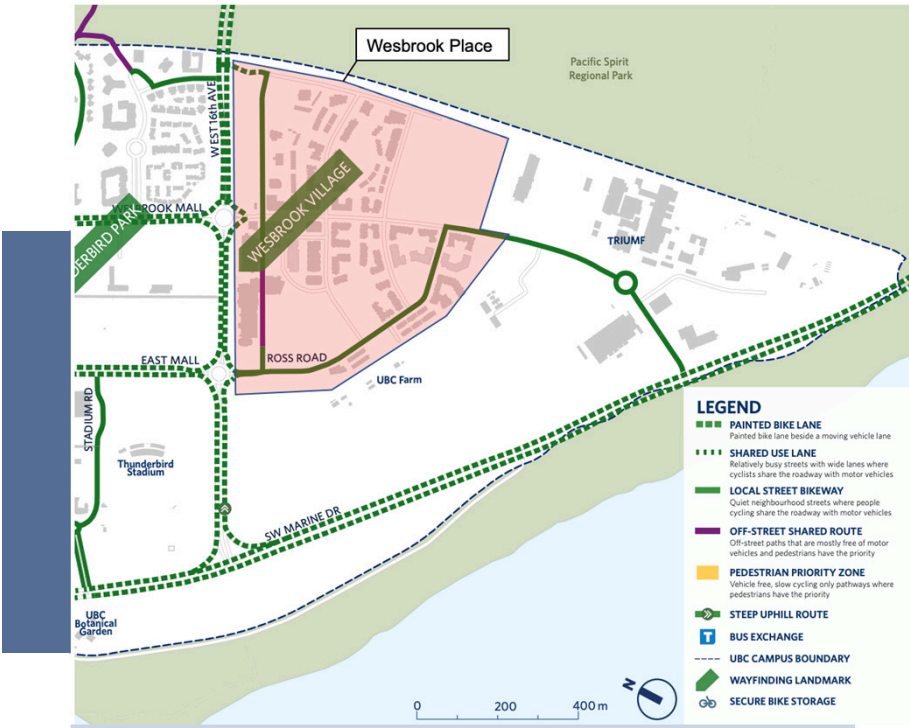
### Cycling

Cycling routes, cycling amenities

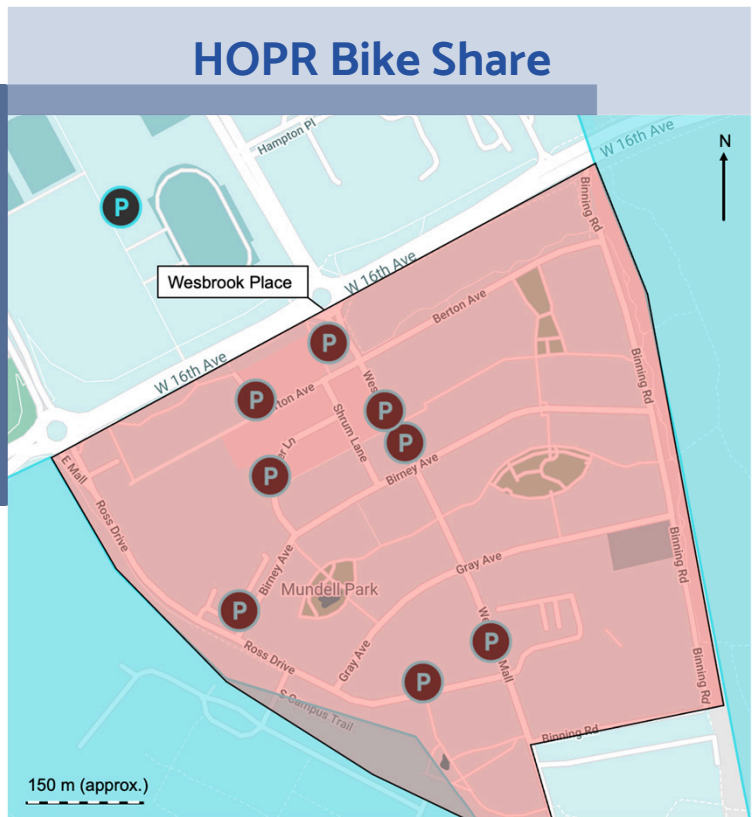
### Public Transit

Bus routes, frequency



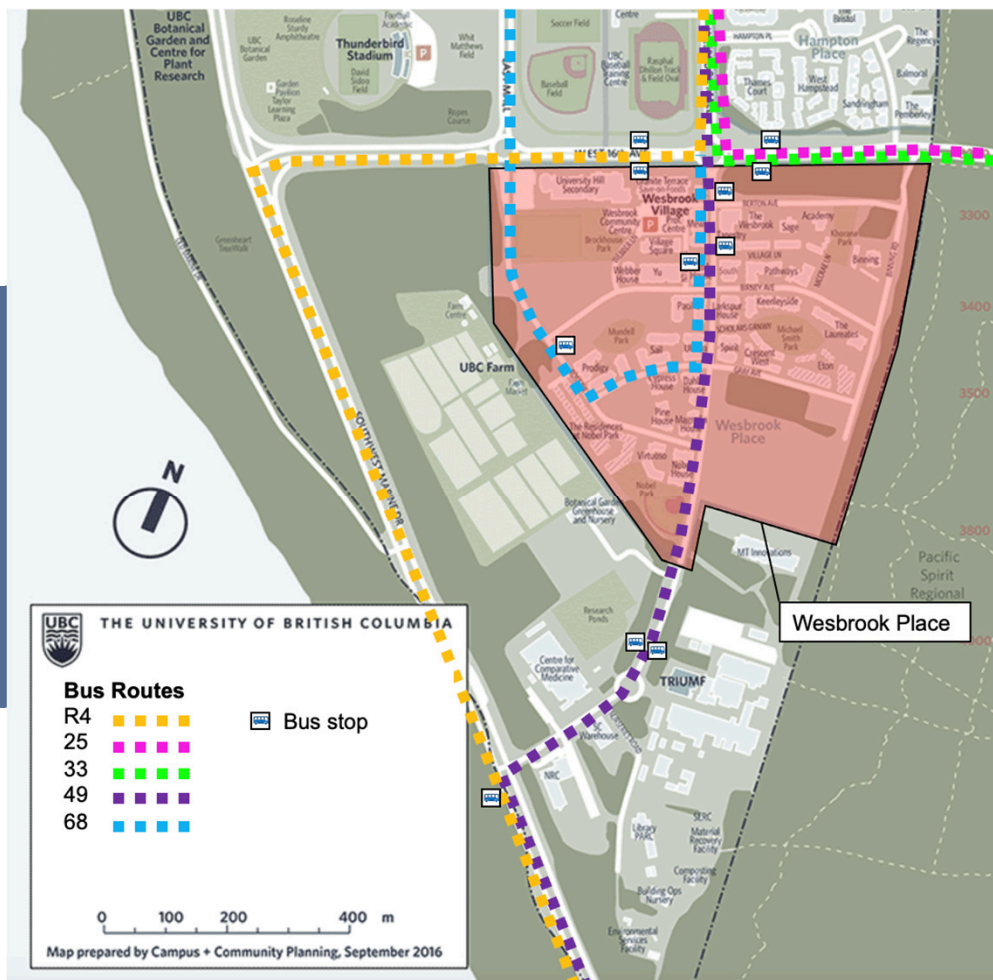


## Designated Cycling Routes



150 m (approx.)

# Public Transit



# Public Transit

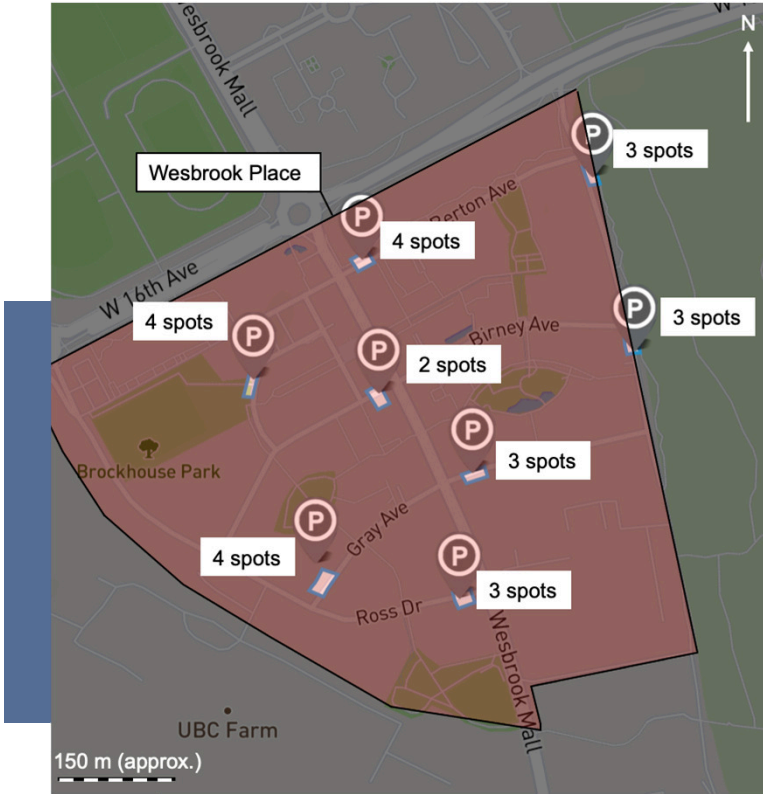
5 routes

- R4 – 41st Ave Joyce/UBC
- 25 – UBC/Brentwood Station
- 33 – 29th Avenue Station/UBC
- 49 – UBC/Dunbar Loop/Metrotown Station
- 68 – Wesbrook Village/UBC Exchange

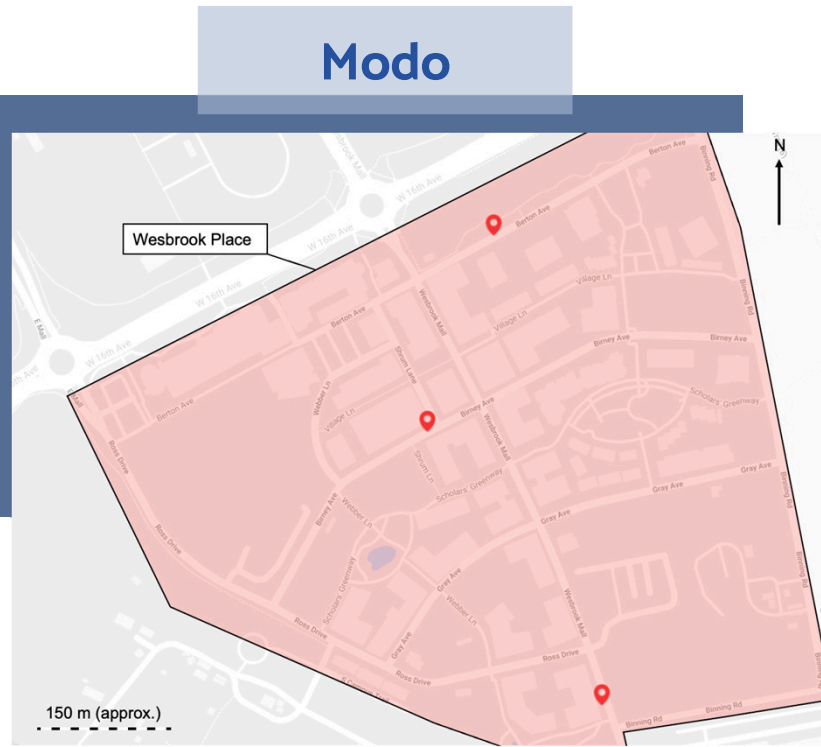
covering 18-20 hrs of day  
frequency 5 min on peak and 30 mins off peak.







Evo



Modo

Car Share

## Sustainable Parking in other Jurisdictions

### British Columbia

Richmond Centre  
Surrey  
Coquitlam  
Kelowna

### United States

Urban Land Institute (ULI)  
Seattle

### Europe

Germany



## **Case Study 1 (British Columbia)**

- Reduce parking requirements in the vicinity of frequent transit (Skytrain)
- Policy programs to reduce parking requirements in exchange for other transportation amenities
- Reduce parking requirements to encourage the construction of desired development types (e.g. middle market rental)
- Share parking purposes to reduce total building parking in mixed-use developments



## **Case Study 2 (United States)**

- Urban Land Institute (ULI) – Car parking sharing in mixed use neighbourhoods
- Building Occupancy – parking reduction based on occupancy (e.g. senior homes)

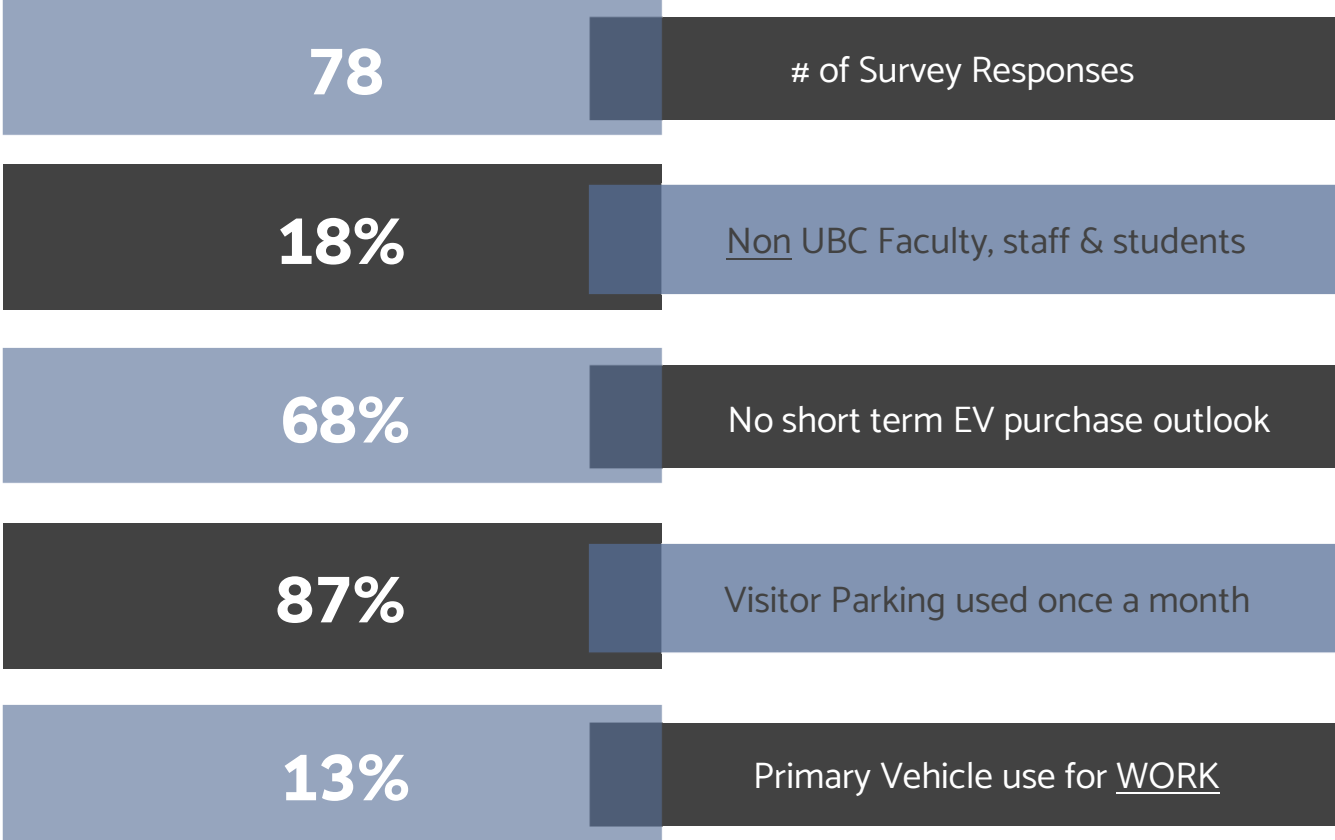


A light blue silhouette map of Europe is positioned in the upper right corner of the slide. The text 'Case Study 3 (Europe)' is overlaid on the map, oriented vertically.

## Case Study 3 (Europe)

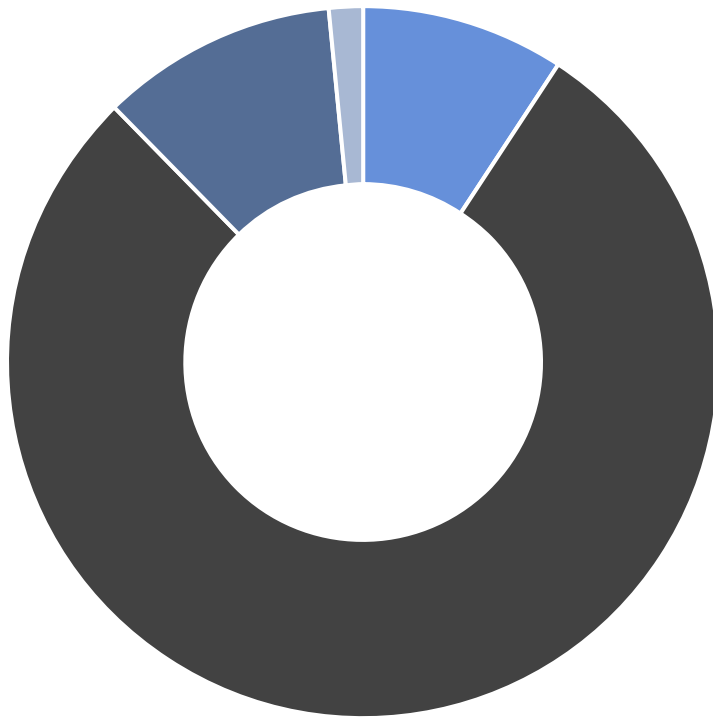
- Car-free Community from day one
- Adopted by “sustainable practitioners”

# SURVEY INSIGHTS



# SURVEY RESULTS

## # of Car Ownership per Dwelling



0 VEHICLES **10%**

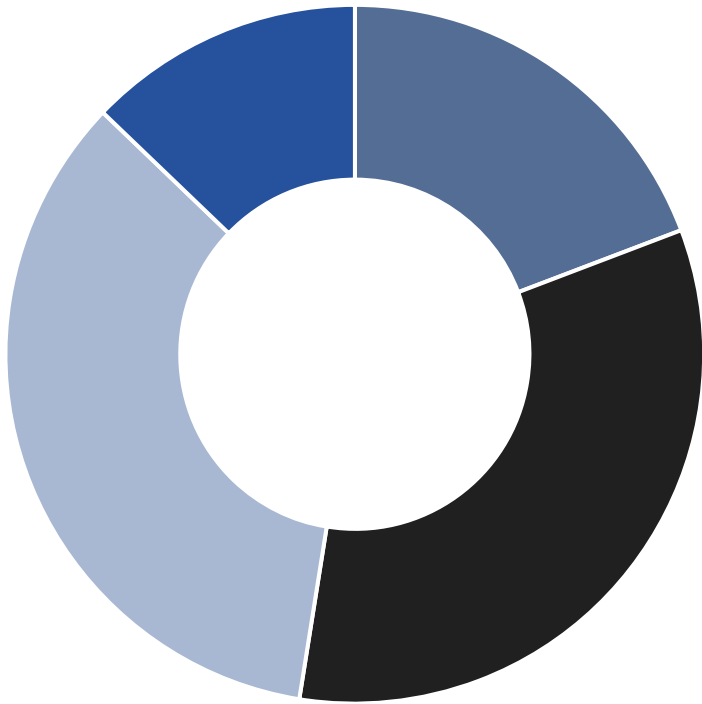
3+ VEHICLES **1%**

2 VEHICLES **12%**

1 VEHICLE **77%**

# SURVEY RESULTS

## Vehicle Frequency of use weekly



1 time

**19%**

3+ times

**33%**

5+ times

**35%**

N/A

**13%**

## Incentive to Reduce # of Vehicles



Subsidized  
Transit **18%**

Transit A/F/C **29%**

In building  
Bike Support **13%**

Bike Friendly  
Routes **15%**

Car Sharing **18%**

Ride Hailing **7%**

## SURVEY RESULTS

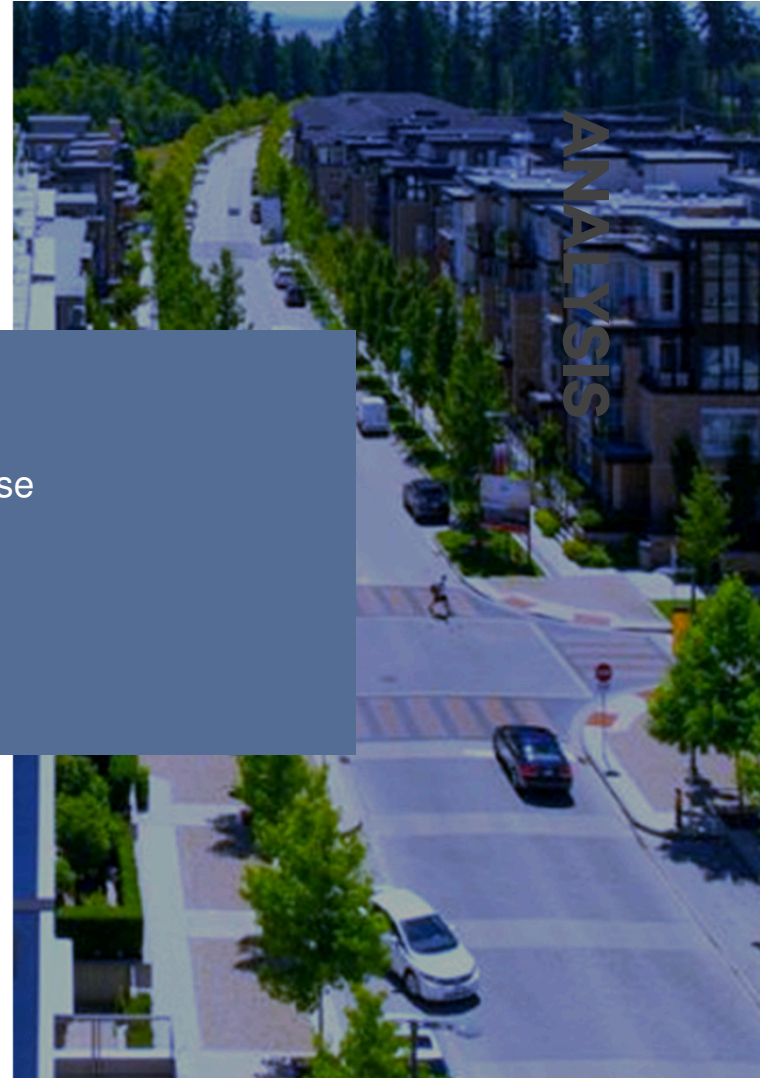
## Innovation

- Develop a tiered parking requirement approach
- Flexible parking requirements
- Introduce no car ownership contracts for a certain percentage of dwelling contracts
- Local Wesbrook shuttle



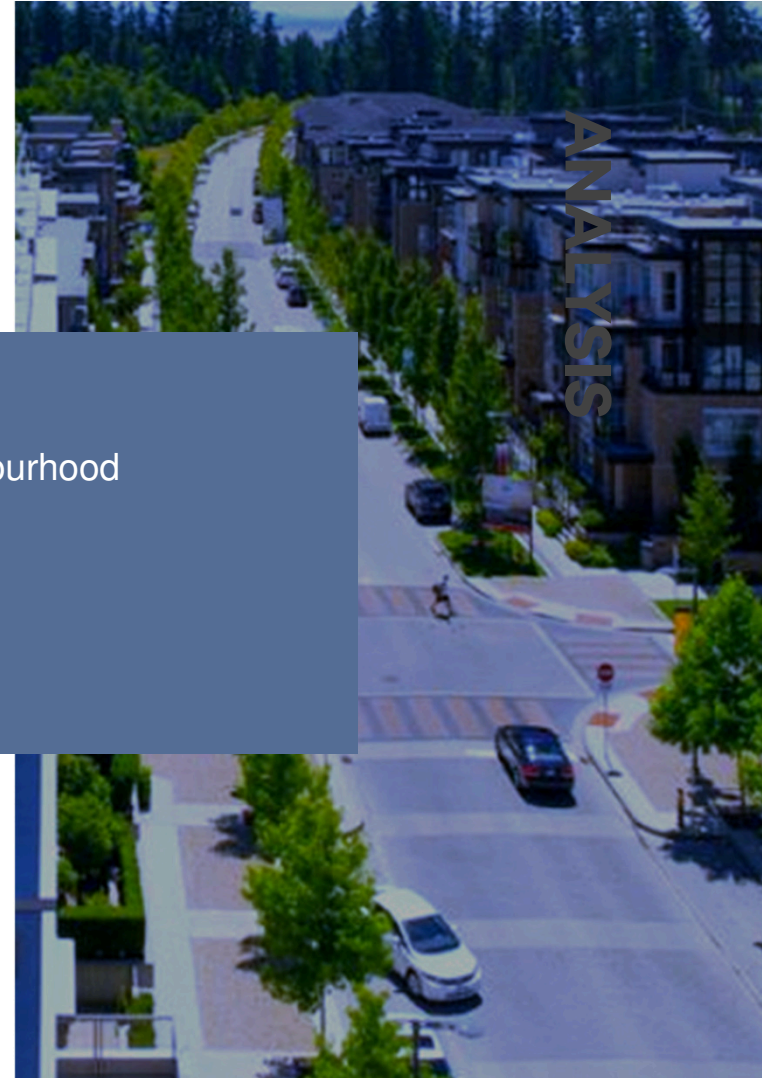
## Incentives

- Subsidize transit or other modes of transportation & increase frequency/capacity



## Policy Discrepancies

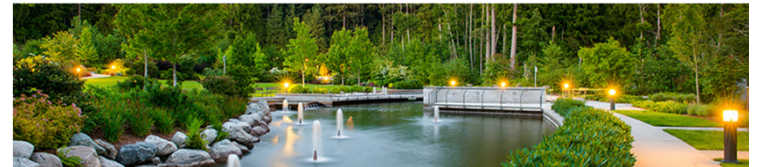
- Secure parking provided at a higher cost than the neighbourhood annual parking pass
- New EV parking mandates



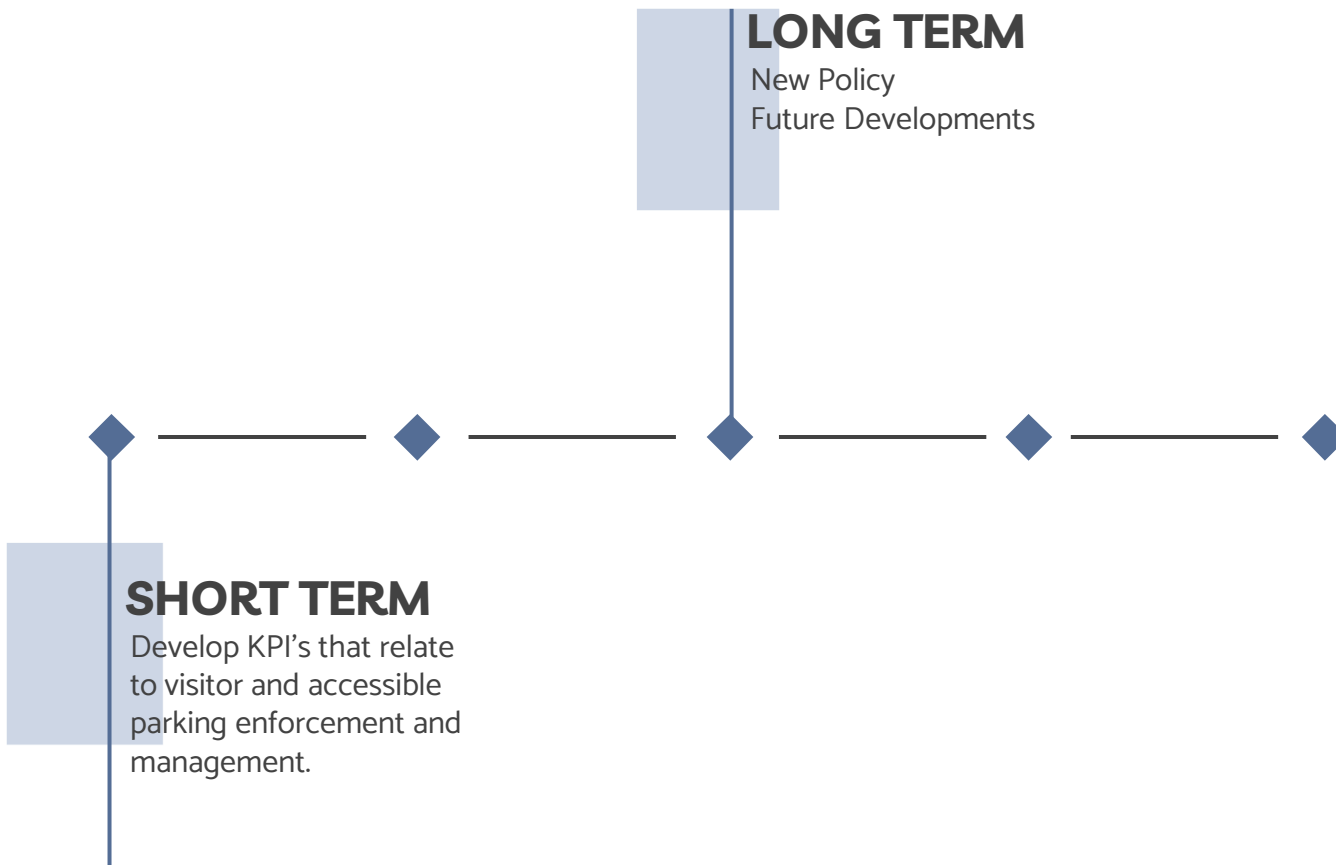


## Next Steps

- Develop Key Performance Indicators
- New Policy
- Future Developments



# TIMELINE



**THANKS**



# CREDITS

- Presentation template by [Slidesgo](#)
- Icons by [Flaticon](#)
- Infographics by [Freepik](#)
- Images created by [Freepik](#)
- Images (<https://www.wesbrookproperties.com/parks-recreation/>)
- <https://students.ubc.ca/ubclife/commuters-guide-not-hating-bus-rides>

## SURVEY RESULTS

“I just want to add that the reason we never use the guest parking in our building is because there's only one spot and it's always full!”

“24H parking for visitors is extremely limited, it is unfortunate”

“There are no accessible parking spots for visitors to cypress. You have limited parking during day outside the front door. The accessible visitor spots are nowhere near the elevator for cypress. The accessible spots are all used by residents. I have infrequent visitors who require accessible parking. It really cannot meet legislated requirements.”

“Village Gate homes has some underground guest parking in their lots, but it is not monitored, so people have been parking there for free instead of renting a parking spot. Village Gate Homes is not able to figure out a solution to this.”

“Carshare (Evo) are limited to a few spots around UBC campus. This lack of parking makes using car share inconvenient. Sometimes there are no spaces left to park in my neighbourhood”

“Car share vehicles are very difficult to get in Wesbrook Village - I would like to see more availability of these cars in the area.”

“It seems silly to have a huge neighbourhood at the other side of campus without reasonable access to buses i.e. out 16th, toward 10th and the city.”

“Not enough parking in buildings, not enough parking on street, no cycle path between street and sidewalk, as neighbourhood keeps growing getting more and more congested. Lack of planning/insight with contradictory messaging for Campus Planning” ... “On top of that really poor and disappointing traffic, parking, bike and pedestrian plans throughout the neighbourhood for how walkable everything is for the day to day stuff in the neighbourhood.”