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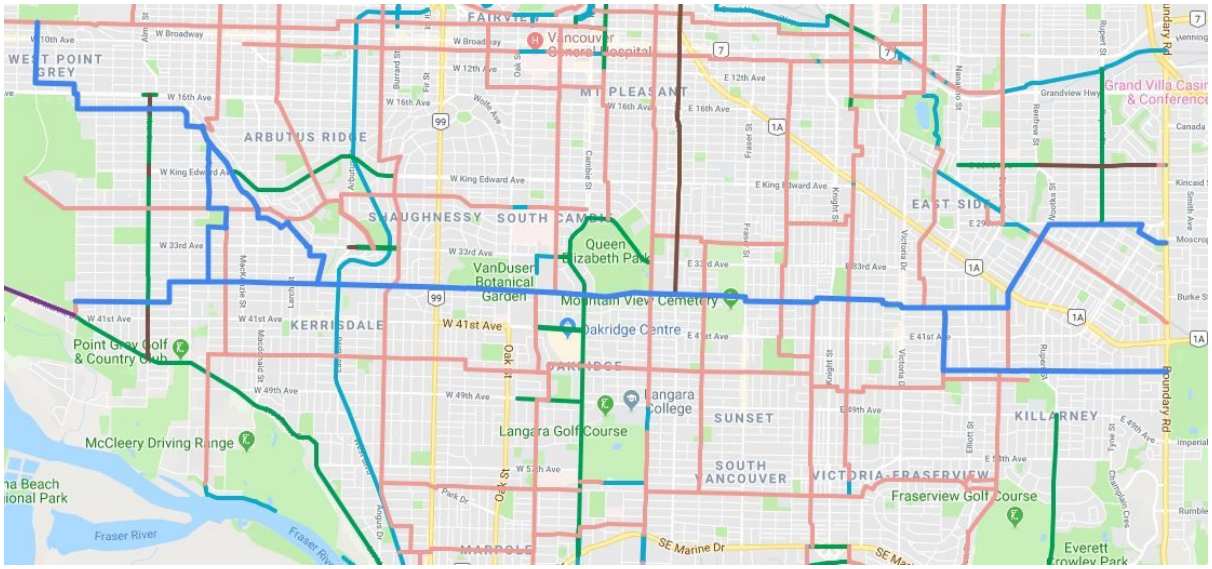
Proposal for Improvements to the Midtown and Ridgeway Bikeways



Combined Midtown/Ridgeway Bikeways (Routes in Blue)

March 5, 2019

Vancouver-UBC Local Committee

HUB Cycling

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Introduction

The Ridgeway Bikeway, and the Midtown Bikeway which runs along much of the same route, provide important east-west connectors in Vancouver. These routes run from the Vancouver/Burnaby border at Boundary Road, to the University Endowment Lands near UBC. The routes minimize hills by prioritizing a relatively constant elevation over maintaining a straight connection. They cross practically all of the north-south bikeways in the City. The routes were two of the earlier Vancouver local street bikeways, and while the main routes have been completed and are well used, there are opportunities to bring multiple safety and comfort details up to the standards of more recently constructed infrastructure. This has been recognized by City of Vancouver staff who have discussed spot improvements to these routes in recent months. The Ridgeway bikeway follows the same route as the Ridgeway Greenway, and so issues identified should be considered from the standpoint of both walking and cycling.

This document summarizes key issues identified on multiple assessment rides conducted by local committee members between October 2018 and January 2019. Issues have been grouped into five theme areas in the following sections. Detailed ride notes are included in Appendices 1 and 2. Traffic volumes are included in Appendix 3, and available crash data is included in Appendix 4

High Vehicle Volumes in Key Sections

The Midtown/Ridgeway Bikeways run along generally calmed local streets with frequent crossings of busier arterial streets. Traffic calming and the use of diversions is not consistent along the route; as a result, some sections are far busier than others. This is made worse in sections with a narrow roadway and vehicles parked on both sides of the street. There are specific sections that were observed to have relatively high vehicle volumes. These include, from east to west:

- Sections of 45th east of Nanaimo (figures 16, 18)
- 37th near Arbutus (figures 35, 37)

Where the roadway is sufficiently wide, consideration should be given to implementing protected bicycle lanes, including along parts of 45th. Given the constrained width of

some sections, consideration should be given to implementing one way streets, particularly for the blocks immediately west of Arbutus Vehicle counts contained in Appendix 3 support the need for reductions in vehicle volumes. The section of 37th from Arbutus to Larch was observed to have the highest number of motor vehicles during the assessment rides, and combined with the narrow roadway and parking permitted on both sides of the street, was the most uncomfortable section assessed related to vehicle volumes.

High Vehicle Speeds in Key Sections

While much of the route is posted at 30 km/hr, some sections were observed to have vehicles travelling at relatively high speeds, with drivers not appearing to be aware of the posted 30 km/hr speed limit. These sections tended to be excessively wide, and in some cases provide direct connections between two arterial streets. Specific sections that were observed to have relatively high vehicle speeds include, from east to west:

- Sections of 45th near Rupert (figure 17)
- 37th east of Knight (figure 9)
- 37th between Cambie, Oak, Granville, and Arbutus (figures 26, 28, 30)

Consideration should be given to implementing painted speed signs on the street, as many pole-sited signs are difficult or impossible to see given the tree canopy. Raised crosswalks may also be appropriate in places. The implementation of traffic diversions along 37th in between Arbutus and Cambie may also reduce average speeds by discouraging people from using this street as an arterial and alternative to 41st.

Intersection Issues

There are a number of key intersections that require crossing improvements. While arterial crossings have generally been addressed, there are busy streets that could be classified as collectors that have no crossing controls or pavement markings, and it is often uncomfortable to cross these streets. Specific intersections that should be reviewed include, from east to west:

- 38th and Clarendon
- Angus Drive, Pine, and 37th (figures 31, 32)

- 37th and MacKenzie (figure 40)
- 37th and Blenheim (figures 43, 44)

The intersection at Clarendon would benefit from the implementation of a four way stop similar to other nearby cross streets along Clarendon. Angus Drive, Pine, and 37th is a 6 way intersection with a significant span in the east-west direction. Consideration should be given to closing Pine to vehicles from 37th to Angus, and moving the eastbound stop sign from Pine to Angus, normalizing this as a 4 way intersection. 37th and MacKenzie requires some form of crossing improvement, potentially with a 4 way stop similar to Clarendon. 37th and Blenheim has a small traffic circle, but with high vehicle speeds observed along Blenheim is uncomfortable and unsafe to cross. A recent crash with an overturned vehicle along this local street indicates how quickly some vehicles are travelling.

Wayfinding

The Ridgeway and Midtown bikeways include multiple turns, including some into back alleys and parklets through the eastern section. HUB members have reported becoming lost while attempting to travel the length of the route. Consideration should be given to the increased use of stencils with arrows. Appendix 1 provides numerous examples, including in figures 5, 7, 10, 11, 12, 13, 14.

Confusion is also created by the existence of multiple arms of these two routes. Consideration should be given to standardizing on a single name for a single route, perhaps eliminating the name Midtown; giving a unique name to the eastern and western extensions of Midtown; and renaming the north and west arms of Ridgeway with unique names. At the same time, the routing of the Balaclava bikeway (along Carnarvon) and the Ridgeway bikeway (along Carnarvon) should be clarified.

Once the above naming is resolved, additional wayfinding signage is required, including stencils and arrows on the pavement.

Shared Paths requiring improvements

There are frequent shared multi use paths (MUPs) in the parks and parklets, more so on the eastern section, generally without separation between people walking and

people cycling. The paths are generally narrow, with narrow curb cuts, and as user volumes have increased, conflicts between people walking and people on bikes are becoming more frequent. Examples of these paths are shown in Appendix 1, in figures 4, 5, 6, 13, 14. Consideration should be given to marking areas for people walking and people cycling. Where there is insufficient space for mode separation, directional arrows should be added to reduce the likelihood of conflict (figure 6)

Recommendations

While the basic structure of the Midtown and Ridgeway Bikeways exists, there are many opportunities to bring these older routes up to current standards, improving both comfort and safety for users. We recommend a series of spot improvements that address the five subject areas noted above. This work should start off with the determination of current vehicle counts and crash data. We would be pleased to review these recommendations with City staff, and suggest that a shared ride may help to establish a common view of the priorities we have identified.

For further details, please contact:

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Appendix 1
Assessment Ride 1 (Eastern Section) Ride Notes

This first assessment ride started at Ontario and 37th, and went east to Boundary Road, returning along the same route. The Midtown bikeway east of Earles (and along 29th to Boundary) was not ridden. A second assessment ride (Ride 2) started at Ontario and went west to Camosun (Midtown), and north from 37th towards Discovery (Ridgeway), and is included as Appendix 2.. The eastern section of the Midtown/Ridgeway routes are shown in blue in Figure 1, below.

Figure 1 - Midtown/ Ridgeway Bikeways from Ontario to Boundary Road, shown in blue.

37th Ave - Ontario to Main St.

HUB Cycling has received public feedback on dangers and near misses at the Ontario and 37th traffic circle (figure 2). ICBC reports 6 crashes involving motor vehicles at this intersection, which is a crossing of two busy bikeways. There are two downhill slopes to the traffic circle, resulting in some users travelling quickly into the roundabout, both in vehicles and on bicycles. Signs warning of a bike route crossing, posted uphill of the intersection on both routes, may help. The traffic island has the lowered Keep Right signs, to help improve visibility through the intersection, but the vegetation has not been trimmed to maintain that visibility. Given the volumes of users at this crossing, a raised crosswalk instead of the traffic circle should be considered. A relatively higher volume of vehicle traffic was observed along this stretch of 37th. The pending Little Mountain residential development from Ontario to Main is expected to bring more local traffic to

this neighbourhood. At Main St a push button for people on bikes crossing Main St is placed in the centre island along 37th (figure 3). Traffic islands are marked to prevent vehicles from travelling straight through on 37th, with only right turns out of 37th, and right and left turns in to 37th permitted. Vehicles have been observed travelling straight through on 37th in violation of these signs; a centre island on Main would curtail this, and together with an elimination of left turns in to 37th from Main, would also serve to reduce vehicle traffic on 37th. Painting the islands, or at least the curbs around the islands, would improve their visibility at night

Figure 2 - 37th and Ontario traffic circle looking west

Figure 3 - 37th at Main St looking west

37th Ave - Main St to Fraser St

We observed relatively low vehicle volumes along this stretch, making it comfortable for people on bikes. The traffic circle at Prince Edward has lowered Keep Right signs, but has had a tree planted on the centreline of the two roadways which will impact sightlines. At Mountain View Cemetery, the road is closed to motor vehicles. There is a path through the parklet to carry on along 37th, but this path is not marked for people on bikes and people walking, there is simply a Bikes Only (Vehicles do not enter) sign (figure 4). As there is no continuous north crosswalk on 37th, people walking were observed to be proceeding along the bike path instead of the sidewalk. It is not clear whether this is intended to be a multi use path or not; it should be so marked to direct users, and consideration should be given to directing people walking to the sidewalk that runs parallel to it, especially as it is at the bottom of two descents and people on bikes may be moving more quickly. Through the cemetery there is a wide paved road closed to vehicles (apart from cemetery use). At Fraser St, 37th is not aligned, but is offset to the south. The connector along Fraser St is situated on a widened sidewalk, with little separation of modes (figure 5). There are multiple signs at tree level indicating that people on bikes should ride next to the vehicle lanes, and people walking should be next to the cemetery, but there are few markings at ground level where people will see them, and there are no indications when turning into this lane as to where a person on a bike should position themselves. Painted lines for people on bikes, with the turn lanes marked with arrows, would improve safety here for all users. There is a crosswalk and cross bike on Fraser St. An east-facing bike route sign on the west side of Fraser at the crossing, with an arrow pointing right would be helpful. Similar for EB cyclists when they get to Fraser (if there is not one already).

Figure 4 - 37th at Mountain View Cemetery showing the Multi Use Path (MUP)

Figure 5 - 37th at Fraser St showing the MUP on the sidewalk. Painted lanes on the MUP along with turn arrow stencils, would improve safety for users of all modes at this corner, as the bike/walk signs are located in the trees along the path, but not at the start of the MUP.

37th Ave - Fraser St to Knight St.

Heading east from Fraser St, the road is closed to motor vehicles with a parklet, and the path is clearly a multi use path as there is no sidewalk. The path is well marked, and is an example of the markings that are required on the other paths along this route.

Along this stretch, 37th has curb bulges installed to indicate parking spaces. The street is relatively narrow, but vehicles were observed to be travelling at slower speeds, making the street relatively comfortable for people on bikes. At Windsor, there is no traffic circle installed despite the intersection being the crossing of two bikeways. There are a pair of stop signs on the Windsor bikeway.

At Ross St, 37th is closed to through motor vehicle traffic with a parklet. There is a multi-use path (MUP), clearly marked for the safety of all users. Due to the relatively narrow entry and exit paths and curb cuts, with separate curb ramps for entry and exit, this path would benefit from the addition of directional arrows on the pavement at the entry and exit points. It would be preferable to have a single wide curb cut.

In December 2018, an experienced cyclist travelling west along 37th died at the Ross St parklet, with his bike hitting the curb. The rider was very familiar with the route, but the sequence of events for this single bike crash are unknown.

At Inverness, 37th is closed to through motor vehicle traffic with a parklet (figure 6). The multi-use path is marked as at Ross St, and similarly, would benefit from the addition of directional arrows on the pavement at the entry and exit points.

Immediately east of Inverness, at Culloden St, 37th jogs to the north. This happens at a point where two back lanes join the cul-de-sac. It is not readily apparent to people on bikes travelling eastbound that the Ridgeway and Midtown routes turn to the north here. There is a small green bikeway sign on the curb opposite the parklet exit, and a faded bike stencil on the pavement (figure 7). The stencil requires repainting, with a larger arrow, and the green bikeway sign should be reviewed for visibility. This is more of an issue eastbound, as people on bikes westbound come to a T intersection and are less likely to lose the bikeway route. Northbound on Culloden, there are street signs but a bike stencil and arrow would assist with wayfinding for people on bikes.

Approaching Knight St, a higher volume of vehicle traffic was observed along the Ridgeway bikeway. There is a push button crossing at Knight St, but there are no vehicle restrictions whether for through traffic on 37th, or turning movements in to or out of 37th St (figure 8). This intersection should be considered for additional traffic diversions to reduce vehicle traffic on 37th, and improve comfort and safety for people on bikes.

Figure 6 - 37th Ave at Inverness St. showing parklet

Figure 7 - 37th Ave at Culloden where the Ridgeway Bikeway jogs to the north. The stencils and arrows require repainting.

Figure 8 - 37th Ave at Knight St. This busy intersection has no traffic diversions to reduce shortcutting along 37th Ave.

37th Ave - Knight St to Victoria Dr.

As with 37th west of Knight, a relatively higher volume of vehicle traffic was observed, and potentially due to the wider roadway, people in vehicles were observed travelling at a higher speed (figure 9). This may also relate to the 30 km/hr signs being posted along with playground signs, and not as standard speed limit signs. As playground signs are only in effect from dawn to dusk, this practice provides no benefit for people on bikes travelling outside of these hours.

At Commercial St, the Ridgeway Bikeway jogs south to connect to the multi-use path through Jones Park. There is a green bikeway sign in the trees, but no pavement stencil or arrow (figure 10). The two turns require far clearer signs. This turn is frequently missed by those unfamiliar with the Ridgeway Bikeway. There is another turn from Commercial St into the back lane, to access the park path (figure 11). There is a faded stencil here that requires repainting. To access the multi use path through the park, there are no stencils or signs, and there are two bollards (figure 12). Directional arrows should be painted on either side of the bollards. Once on the multi-use path in the park, well after the entrance, there are signs indicating the path use (figure 13). These signs should be moved to be at the path entrance. The path should be painted with walking and cycling stencils along its length, indicating direction of travel. At Victoria St, the multi-use path enters a confusing mini plaza, with the multi-use path, a

separate sidewalk, and two separate entry/exit points to the cross bikes painted on Victoria Dr (figure 14). These cross bikes are very narrow and should be repainted at a standard width. A review of traffic movements (people walking and people on bikes) should be done by City staff for the plaza, to improve safety and comfort for all users.

Figure 9 - 37th east of Knight St. The wider built roadway and lack of traffic diversions at Knight St. result in higher apparent vehicle speeds along this stretch, and more vehicle volume, both combining to make people on bikes less comfortable here.

Figure 10 - 37th Ave at Commercial St requires a stencil and arrow to improve wayfinding where the Ridgeway Bikeway jogs to the south.

Figure 11 - Commercial St at Jones Park requires a turn into a back lane to connect to the MUP in the park. The stencils and arrows require repainting.

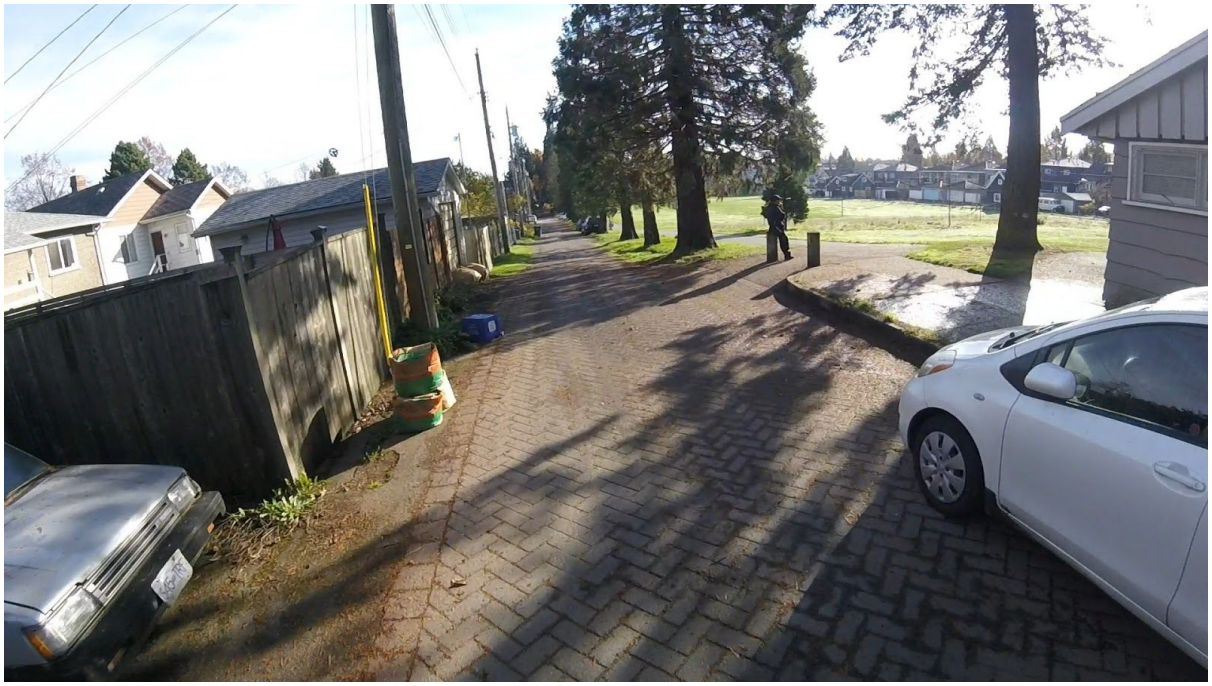

Figure 12 - From the back lane, there is an unsigned jog into Jones Park. This turn requires wayfinding signage, preferably stencils and arrows. The bollards require better reflectors that are visible from the direction of travel.

Figure 13 - Along the MUP in Jones Park there are signs for people walking and people on bikes. These signs should be relocated to the start of the path near Commercial St. Stencils should be applied to the pathway.

Figure 14 - Where the MUP in Jones Park meets Victoria Drive there is a small plaza with people walking, and people on bikes. Traffic flow is confused, and the path through the plaza does not appear to be appropriate for the volume of users along the Ridgeway Bikeway..

38th Ave - Victoria Drive to Nanaimo St

Along this stretch of the Ridgeway and Midtown bikeways, a higher volume of vehicle traffic was observed (figure 15). There are no traffic diversions along this stretch; it extends to Earles St, which connects to Kingsway, thereby providing a shortcut for people in vehicles. Traffic counts should be reviewed along this section, and consideration given to additional diversions to reduce vehicle volumes.

At Nanaimo St, the Ridgeway Bikeway is not continuous travelling east along 38th, but rather jogs south along Nanaimo to 45th, while the Midtown Bikeway continues along 38th to Earles.

Figure 15 - Along 38th near Victoria Drive, higher volumes of vehicles were observed, and with parking permitted on both sides of 38th space was limited with oncoming and overtaking vehicles.

Nanaimo St - 38th to 45th

A relatively high volume of vehicles was observed along Nanaimo, particularly approaching 41st, and north of 41st. Crossing 41st was uncomfortable for ride participants due to the number of queued vehicles waiting to turn at 41st. Traffic counts should be reviewed along this section, and consideration given to additional diversions to reduce vehicle volumes.

At Nanaimo and 45th there is a relatively small traffic circle situated in a wide roadway. A truck was observed turning left by travelling the wrong way around the traffic circle,

immediately in front of oncoming people on bikes (figure 16). While large trucks may need to make special movements at traffic circles, they should be done after oncoming and intersecting traffic has cleared, or come to a stop.

Figure 16 - Traffic circle at Nanaimo and 45th, with a vehicle travelling in the wrong direction in front of oncoming bicycles.

45th Ave - Nanaimo to Rupert

From Nanaimo to Elliott St, speed bumps have been installed along 45th, indicating a concern with vehicle travel speeds. At Elliott, there is a very wide roadway, and a four way stop. The crosswalks are faded. Cross bike markings should be considered across Elliott. Proceeding eastbound from Elliott, a relatively higher number of vehicles were observed. This section was one of the least comfortable sections along the eastern portion of the Ridgeway bikeway, due not only to the volume but also to the speed of the vehicles (figures 17 and 18). Travel speeds may be correlated with a wider roadway along this stretch. Additional calming is recommended.

At Killarney St, there is a raised crosswalk at the elementary school, park, and high school. The stretch of 45th from Killarney to Rupert includes curb bulges, speed bumps, no stopping zones, and three minute parking zones for drop off and pickup. HUB members have written about their frustrations with this block; as the assessment ride was on a Saturday morning there was no school traffic. However, approaching Rupert, there was a queue of vehicles turning left onto Rupert, and no way to proceed

through the intersection as the vehicles blocked it. Consideration should be given to adding protected bike lanes on each side of 45th up to the intersection, and altering the curb bulges at Rupert to make them permeable for bikes, possibly maintaining them as pedestrian refuges. (figure 19). People on bikes were observed trying to squeeze through on the right of the left turning vehicles, despite the curb bulge blocking the way.

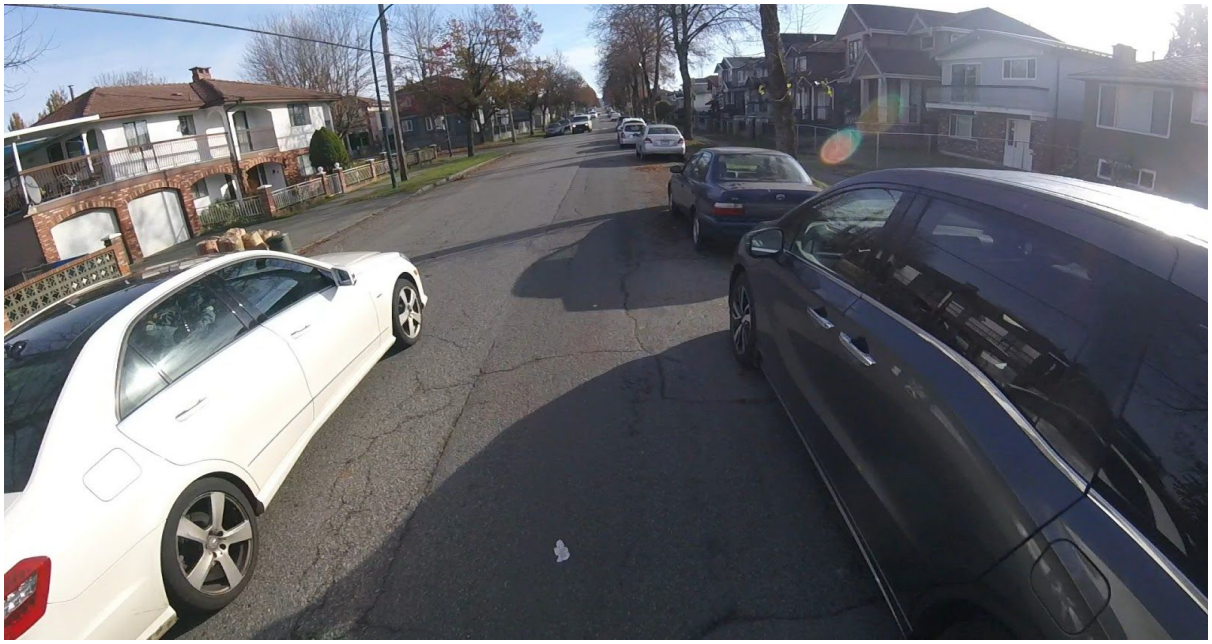

Figure 17 - 45th Ave near Nanaimo showing a vehicle overtaking at high speed

Figure 18 - 45th Ave near Nanaimo showing the overtaking vehicle braking to avoid oncoming vehicle traffic

Figure 19 - 45th Ave at Rupert

45th Ave - Rupert to Boundary Rd

Along 45th eastbound from Rupert, relatively high vehicle volumes were observed. Traffic counts should be reviewed along this section, and consideration given to implementing additional diversions to reduce vehicle volumes.

In between Joyce and Tyne, 45th is a transit route.

Proceeding eastbound to Boundary Road, we noted that the built roadway width varies, and that vehicle speeds seemed to correlate with the wider roadway sections. Especially along the wider lengths of 45th, there appear to be opportunities to install protected lanes for people on bikes.

At Boundary Road, there is a signalized crossing to reach Central Park (figure 20).

Figure 20 - 45th Ave at Boundary Road

Alternate route - Midtown along 38th Ave to Earles, Earles to 45th Ave

Earles St provides an alternate connection from 38th to 45th. It is part of the Sunrise bikeway. Earles St. had higher vehicle volumes, particularly near 41st (figure 21).

Along 38th, there is a crossing required at Clarendon. Consideration should be given to installing a four-way stop here, with a cross bike with green paint marked on Clarendon.

Figure 21 - Earles St at 41st Ave, showing a high volume of vehicles on the local street bikeway.

Appendix 2
Assessment Ride 2 (Western Section) Ride Notes

This second ride started at Ontario and 37th, and went west to Arbutus St. After Arbutus, the Midtown Bikeway carries on along 37th (and 39th) to Camosun, while the Ridgeway Bikeway branches off to the north, on multiple local streets, ending on Discovery. The Ridgeway bikeway north of 29th was not ridden. The extents of the Midtown and Ridgeway bikeways west of Ontario are shown in blue in Figure 22, below.

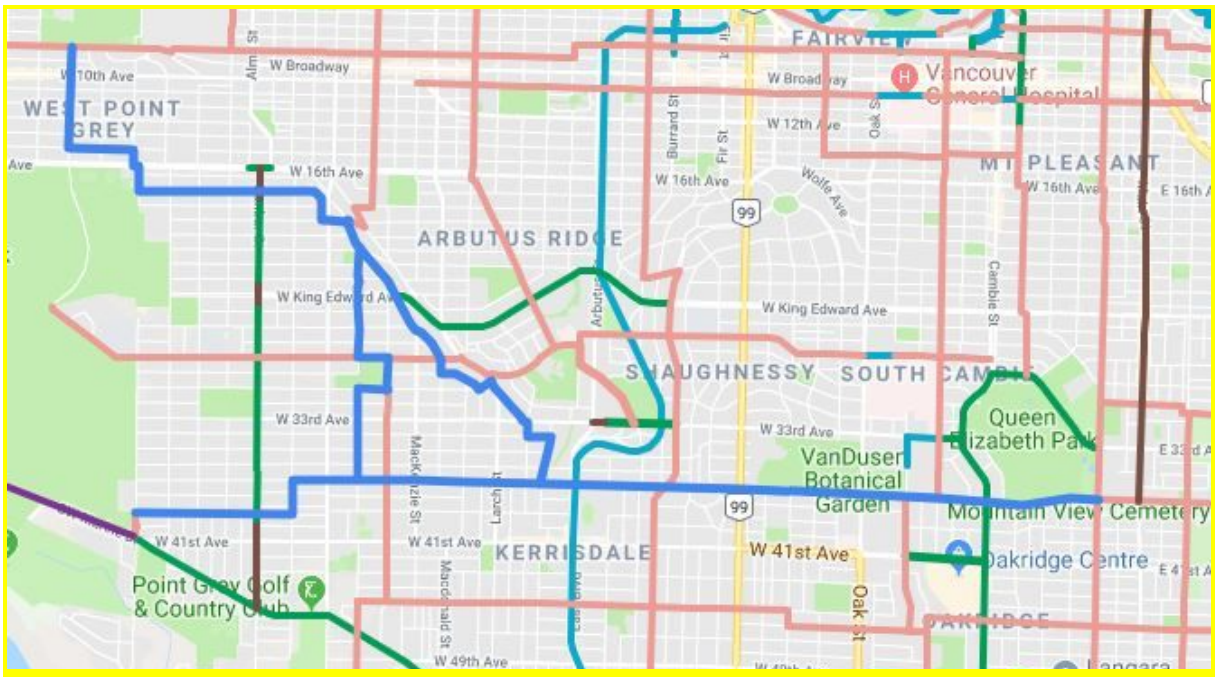

Figure 22 - Midtown/Ridgeway Bikeways from Ontario to Camosun and Discovery, shown in blue

37th Ave - Ontario to Cambie St.

This section runs along the north side of Queen Elizabeth Park. Vehicles were observed travelling at relatively high speeds, despite the speed bumps (figure 23). This section appears to be used as a cut through to access Cambie St. Parking is permitted on both sides of the street. This section is in the Eric Hamber Secondary catchment up until Granville St. Consideration should be given to removing parking from alongside the park on the north side of 37th (figures 23 and 24). If parking is removed, it is recommended that the street be narrowed by putting in a protected bikeway - otherwise even higher speeds would result

Figure 23 - 37th looking west from Ontario showing an overtaking vehicle braking for the speed bump.

Figure 24 - 37th Westbound alongside Q.E. Park

37th Ave - Cambie St. to Oak St

Along this section there is a centre boulevard island (figure 25). This creates narrow lanes that are not wide enough for overtaking. Signage (at least some of which should be on the street) is required indicating where people on bikes should be positioned in the lane, preferably in the centre. Redevelopment in this area has significant potential for impact on traffic patterns. Portions of this section are wide and straight, leading to higher vehicle speeds (figure 26).

Figure 25 - 37th Westbound from Cambie showing the centre boulevard island.

Figure 26 - 37th Westbound between Cambie and Oak

Figure 27 - 37th Westbound at Oak

37th Ave - Oak St. to Granville St.

From Oak St west, the roadway is straight and relatively wide (figure 28). Vehicles were observed travelling at higher speeds along this stretch, presumably cutting in between Oak and Granville. There are no traffic diversions at either Oak or Granville to reduce the incidences of vehicles cutting through this section (figures 27 and 29). The Van Dusen Gardens abutting this route holds events which cause significant traffic and parking issues when they are being held. During our ride, a film crew was observed taking down their equipment here.

Figure 28 - 37th Westbound from Oak

Figure 29 - 37th Westbound at Granville

37th Ave - Granville St to Arbutus St.

From Granville St west, the roadway is straight and relatively wide (figure 30). Vehicles were observed travelling at higher speeds along this stretch, presumably cutting in between Arbutus and Granville. There is a single traffic diversion into this stretch (no left turn from Granville northbound). From Granville west is the Point Grey Secondary catchment zone.

Figure 30 - 37th Westbound from Granville

The 37th Midtown/Ridgeway bikeway intersects the Cyprus bike route on Angus Drive. The six way intersection at 37th, Angus Drive, and Pine is too large, especially considering the presence of two bike routes (figures 31 and 32). Normalizing the intersection by closing the southernmost section of Pine, with a bike-permeable parklet, would assist here. Relatively heavy vehicle traffic was observed travelling eastbound on 37th. Investigation of vehicle counts is recommended and may support adding traffic diversions to 37th to reduce these volumes.

Figure 31 - 37th Westbound at Angus Drive

Figure 32 - 37th Eastbound at Angus Drive

The stretch of 37th from Laburnum to Arbutus (West Boulevard) was observed to have heavy vehicle traffic, inappropriate for a local street bikeway (figure 33). This stretch

includes two schools (Quilchena and Point Grey Secondary) and East Boulevard, which was observed to be used as a bypass for the light at 41st and Arbutus at West Boulevard), in both directions (figure 35). These vehicle turning movements also create additional danger at the Arbutus Greenway crossing of 37th (figure 36). Repeated conflicts were observed at this intersection with cyclists and cars making left and right turns. It was not comfortable to get off the Arbutus Greenway and onto 37th, to travel in either direction.

Figure 33 - 37th Westbound near Laburnum and Quilchena School

Figure 34 - 37th at the Arbutus Greenway temporary path crossing (West Blvd)

Figure 35 - 37th at the Arbutus Greenway showing East Blvd traffic

Figure 36 - 37th Westbound at Arbutus (West Blvd)

37th Ave - Arbutus St. to MacKenzie St.

Very heavy vehicle traffic was observed on the stretch of 37th from Arbutus to Yew (figure 37), and heavy vehicle traffic on the stretch from Yew to Larch (figure 39). The roadway is narrow, with vehicles parked on both sides of the street. Consideration should be given to implementing traffic diversions, allowing parking on only one side, or implementing a one way street.

At Yew, a northerly option for the Ridgeway Bikeway begins (figure 38)

Figure 37 - 37th Westbound from Arbutus

Figure 38 - 37th Westbound at Yew

Figure 39 - 37th Westbound from Larch

At most intersections, there are traffic circles or four way stops. Mackenzie is a transit route and collector route to Macdonald and hence has a greater volume of all types of vehicle traffic, with some vehicles observed to be travelling at higher speeds. The intersection has no crossing infrastructure lacking even a marked pedestrian crossing. It is recommended that some form of traffic control be considered for the crossing of MacKenzie on 37th.

Figure 40 - 37th Westbound at MacKenzie

37th Ave - MacKenzie St. to Collingwood St.

It was noted by ride participants that younger elementary aged students use this stretch to go to Kerrisdale Elementary School. Sections are also used by students attending Kerrisdale Annex, and Crofton School. From Larch to Dunbar, 37th is in the Kerrisdale school catchment. Conflicts with fast moving vehicles are regularly observed along 37th Ave.

At Carnarvon, there is a sign for the Balaclava bikeway, which crosses 37th (figure 41). There is confusion because it is not on Balaclava St. At the next intersection, Balaclava, there is a sign for the Ridgeway bikeway heading north (figure 42). This section is discussed subsequently. It is not clear why there are two bikeways located on adjacent streets, with one of them being discontinuous at 31st. It is recommended that bikeways be assigned unique names, and that there not be multiple options for routes with the same name.

Figure 41 - 37th Westbound at Carnarvon

Figure 42 - 37th Westbound at Balaclava

The intersection of 37th and Blenheim was observed to be dangerous, with vehicles travelling on Blenheim appearing to assume that they had the right of way over vehicles in the traffic circle. Sightlines are not good. Yield signs have been erected in each direction, presumably to help address this issue. Given the size of the intersection, the

need for additional signs, the additional yellow paint that has been added, and the history of crashes, it is recommended that this intersection be reviewed and alternate designs be considered. The need for this can be seen in Fig 44, showing a crash at the intersection.

Figure 43 - 37th Westbound at Blenheim

Figure 44 - December 2018 crash at 37th and Blenheim

At Collingwood the Midtown Bikeway heads south towards 39th (figure 45) The pavement is rough at this intersection.

Figure 45 - 37th Westbound at Collingwood

37th Ave and 39th Ave - Collingwood St. to Camosun St.

Heading south on Collingwood there is a sign posted at 38th. It is located next to 38th, and is confusing (figures 46 and 47). Text has been added to the sign to indicate that this is not the turn, but it would be preferable to move the sign to 39th and avoid this confusion. The pavement is in poor condition on Collingwood.

Figure 47 - Collingwood Southbound at 38th

Figure 47 - Collingwood Southbound at 38th showing mispositioned sign

Figure 48 - Collingwood Southbound at 39th

Along 39th the roadway is narrow, and this is made worse by vehicles being parked on both sides of the street (figure 49). Ride participants noted that this section of 39th is used as a shortcut from SW Marine and 41st, due to the delays in turning left onto Dunbar at SW Marine and at 41st, for vehicles northbound on Dunbar.

Figure 49 - 39th Westbound from Dunbar

At Camosun the Midtown Bikeway ends, with a short connecting local street bikeway on Camosun running down to SW Marine. There is a school located on Camosun, and conflicts with pick up and drop off have been observed.

Ridgeway North - 37th Ave and Yew to Balaclava and Quesnel Dr.

This is the north arm of the Ridgeway Bikeway, connecting with the west arm at Quesnel Drive. It was not ridden.

Ridgeway West - Balaclava from 37th Ave to Quesnel Dr

We returned to 37th and Balaclava, and headed north on the west arm of the Ridgeway Bikeway (figure 50). As noted previously, the Ridgeway Bikeway is located on Balaclava (from 37th to 31st), while the Balaclava bikeway is located on Carnarvon. At 31st the Ridgeway Bikeway intersects Balaclava Park (figure 52). There is a clear desire line across the park, as the Ridgeway Bikeway carries on along Balaclava north of the park. However, there is a detour posted around the park, taking people back to Carnarvon (eastbound), up to 29th (northbound), and then back to Balaclava (westbound).

Figure 50 - 37th Eastbound at Balaclava showing multiple branches of the Ridgeway Bikeway

Figure 51 - Balaclava Northbound at 34th

Figure 52 - Balaclava Northbound at Balaclava Park showing detour around the park and the desire line path through the park.

Figure 53 - Carnarvon Northbound at 31st showing detour around Balaclava Park

Ridgeway - Balaclava and Quesnel Drive to Discovery St

This section was not ridden.

Appendix 3
Vehicle Counts from the City of Vancouver

The majority of the data available on VanMap[1] dates back to 2010 and 2013 for these streets. Maximum daily vehicle volume for a local street bikeway is targeted by the City of Vancouver at 500, with an upper limit of 1000. Given the potential traffic volume growth in recent years, it is recommended that counts be refreshed.

37th, Arbutus to Yew, May 2010

Eastbound:	Peak hour 260 (8 am).	24 hour 2108	(1719 in June 2006)
Westbound	Peak hour 152 (3 pm)	24 hour 1427	(1443 in June 2006)

37th, Balsam to Larch, May 2010

Eastbound:	Peak hour 212 (8 am)	24 hour 1587
Westbound:	Peak hour 149 (3 pm)	24 hour 1334

45th, Lancaster to Kerr, Sept 2010

Eastbound:	Peak hour 188 (8 am)	24 hour 1877
Westbound:	Peak hour 166 (5 pm)	24 hour 1400

45th, Kerr to McKinnon, June 2013

Eastbound:	Peak hour 320 (8 am)	24 hour 2929
Westbound:	Peak hour 291 (3 pm)	24 hour 2880

The HUB State of Cycling Benchmarking project is working to measure the quality of cycling infrastructure. Proposed local street bikeway metrics (non protected lanes) are a maximum of 1000 ADT for Class A, 2000 ADT for Class B, and 3000 ADT for Class C. Infrastructure not meeting those criteria would be unclassified. The potential exists that sections of the Midtown/Ridgeway bikeways would not meet Class C, and would therefore be unclassified.

[1] Van Map data for Traffic and Transportation, Directional traffic volumes, available at https://vancouver.ca/your-government/vanmap.aspx

Appendix 4

ICBC Bicycle Crash Data

From ICBC's Crash Map[2] for crashes involving people on bikes, crashes are listed along this route for the period 2013 - 2017. This list does not represent a complete count of crashes, as it does not include either crashes with parked vehicles, nor unreported crashes. The City of Vancouver is reported to have access to hospital emergency room visit data related to bike crashes, and it is recommended that that data be used to identify any higher risk areas along this route. The ICBC data does serve to highlight the intersections with relatively more crashes reported. Crashes are recorded for the following intersections:

Ontario and 37th	6 crashes
Arbutus and 37th	4 crashes, 1 near miss on BikeMaps.org
Blenheim and 37th	3 crashes, 2 near misses on BikeMaps.org
Cambie and 37th	2 crashes
Oak and 37th	2 crashes
Carnarvon and 37th	2 crashes
Connaught and 37th	2 crashes
Camosun and SW Marine	4 crashes
Nanaimo and 45th	2 crashes
Clarendon and 45th	3 crashes
Crown and 37th	1 crash
Main and 37th	1 crash
Prince Edward and 37th	1 crash
Fraser and 37th	1 crash
Windsor and 37th	1 crash
Knight and 37th	1 crash
Victoria and 38th	1 crash
Clarendon and 38th	1 crash

[2] ICBC Crash Map for Cyclists, 2013-2017, available at https://public.tableau.com/profile/icbc#!/vizhome/BC-CrashesinvolvingCyclists_2017/CyclistsDashboard