



August 21, 2016

Dale Bracewell, Manager of Transportation Planning, City of Vancouver

Re: Recent Improvements to King Edward Avenue Cycling Infrastructure

Dear Dale;

Following recent paving work on King Edward Avenue near Arbutus Street, we heard from several HUB members about their concerns with these changes. We then conducted an assessment ride with HUB Cycling committee members, to better understand the issues, on June 4, 2016. We understand that this paving project was not intended to bring this route up to an All Ages and Abilities (AAA) standard, and that it was done as part of planned pavement rehabilitation work. Still, we would like to comment on the changes, with the hope that these issues will be considered the next time a similar project is completed. Also, there are some relatively small changes that we feel would greatly improve safety for people on bikes along this route, and we have described those changes here.

## Background

The section of King Edward Avenue between Quesnel Drive and Angus Drive represents an important east-west connector in this area, with the Off Broadway and 10th Ave bike routes to the north, and the 29th and Midtown/Ridgeway (37th) bike routes to the south. It is an arterial street that has recently been repaved, with painted bike lanes added either next to the curb where no parking is allowed or on the outside of parked vehicles where parking is allowed. The route connects north/south bike routes at Dunbar, Balaclava, Ridgeway (Quesnel), Trafalgar (Valley) and Cypress (Angus).

## General Comments

During the Saturday morning of our assessment ride this route did not appear to be widely used by people on bikes, and was not observed to be used at all by children on their own or by adults with children. The assessment ride started at King Edward and Angus Drive, then west to Balaclava, and returned east to Angus Drive. The top issues we encountered were:

- The danger of having the painted bike lanes in the door zone
- A lack of comfort for cyclists due to the relatively high speed motor vehicle traffic
- The missed opportunity to significantly improve this route as part of road rehabilitation

## Specific Issues

### Westbound King Edward - Angus Drive to Arbutus Street

There is a painted bike lane, on the travel lane side of parked vehicles, with an approximate 12" buffer zone. Tall plastic pylons have been added in several locations along the curb (parking) lane, to prevent motor vehicles from using the parking lane as a second travel lane.



**Figure 1 - King Edward Westbound at Arbutus**

Approaching Arbutus there is an additional left turn lane, a straight through lane, the bicycle lane (permeable and with no buffer zones) and then a right turn lane, as shown in Figure 1.

Additionally, the Arbutus greenway crosses immediately before Arbutus, and there is an additional right turn possible into East Blvd, on the east side of the rail ROW. All of this creates a wide expanse of pavement, with multiple potential vehicle turning movements. It is not a comfortable cycling location for any but the bravest cyclists. Because right turns are permitted on a red light, at the light there is constant motor vehicle traffic passing on the right side of people stopped on bikes, and these vehicles are often moving quickly.

#### *Westbound King Edward - Arbutus to Yew*

There is a painted bike lane, on the travel lane side of parked vehicles, with an approximate 12" buffer zone. King Edward curves southward here, and there is a lane entrance, and then soon after an additional frontage street (23rd) on the north side of King Edward for a short distance, with a one-lane entrance to it at an oblique angle. This creates an additional intersection, and additional vehicle turning movements, over a very short distance.



**Figure 2 – Bicycle lane positioning to avoid the door zone**

The lane widths were measured just after this point, and were found to be 2.2 m (parking lane), 0.3 m (buffer), then the bike lane, then the motor vehicle travel lane (3.0 m). The door width of a parked compact vehicle was measured, and the safe riding distance (1.5 m from

the vehicle) was measured out. This is shown in Figure 2, above. Note the required bicycle position for safety from opening doors, as it relates to overtaking motor vehicle traffic.



**Figure 3 - A better riding experience with an increased buffer**

West of 23rd Ave, there is no parking permitted until Yew, as residents have 23rd for parking. Here the bike lane is positioned next to the curb, and there is a wide painted buffer zone between the bike lane and the motor vehicle travel lane, as shown in Figure 3. The difference is noticed immediately when riding, as vehicles are further away from people on bikes. This short stretch illustrates what could be accomplished with reductions in parking.

**Westbound King Edward - Yew to MacDonald**



**Figure 4 – Bicycle lane transition through the intersection at Yew**

Immediately after Yew, the bike lane transitions back to being on the travel lane side of parked vehicles. There is a danger zone here, shown in Figure 4, as overtaking motor vehicles have no cues to advise them to expect bicycles to come out from the curb. We recommend that lane markings be added here to alert drivers to people on bikes.





**Figure 5 - Bus pad creates a dangerous pavement seam**

Additionally, this transition happens at a transit stop, and there is a poured concrete pad for the buses instead of the standard pavement. The risk here is because the pad has been extended out to halfway through the painted bike lane, creating a seam down the centre of the bike lane that can catch tires, as shown in Figure 5. The concrete pad should be ended at either the inner edge of the bike lane, or the outer edge. We recommend that this detail be considered on future projects.



**Figure 6 - Vehicles overtaking on the right in the bike lane**

This stretch is flat, and higher motor vehicle speeds were observed. At Valley, motor vehicles travelling westbound were observed overtaking on the right, in the bike lane, as shown in Figure 6.



**Figure 7 - King Edward westbound approaching MacDonald**

Approaching MacDonald, there is a right turn lane, and green paint has been applied to the bicycle lane, as shown in Figure 7. We recommend that this same treatment be applied at Arbutus, and other key intersections along King Edward.

**Westbound King Edward - MacDonald to Balaclava**



**Figure 8 - King Edward westbound after MacDonald**

Immediately after MacDonald, the curb lane is marked with a diamond, then the bike lane is painted green, and to the left is the motor vehicle travel lane, as shown in Figure 8. There is also a slip road for vehicles southbound on MacDonald to turn right (westward) onto King Edward. Those vehicles must cross the curb lane, then the bike lane, to get to the travel lane, as they accelerate up the hill. Vehicles were observed travelling in the curb lane (diamond marking) for some distance. Road lane width reductions and channelization here would help by narrowing the lanes and clarifying where motor vehicles should be positioned. The diamond marking on the curb lane is presumably for the transit stop part way up the hill, but the buses could pull into the transit stop when necessary, without travelling up the hill in the curb lane on the inside of the bicycle lane. Normalizing the intersection could include removing the slip lane, as the wide radius results in motor vehicles taking the corner at

higher speeds and without a full view of the traffic on King Edward. The turn is less than 90 degrees, but could be managed with a standard intersection. The risk of the slip lane here is very similar to that at the slip lanes currently being removed from the Burrard/Pacific intersection. Moving the transit stop to the left of the bike lane could also be considered.



**Figure 9 - King Edward westbound after MacDonald**

After the transit stop, there is a curb lane for parking, then a painted buffer, then the bicycle lane, then another painted buffer, then the motor vehicle travel lane, as shown in Figure 9. The additional buffer spacing along this block results in much greater comfort and a sense of security for people on bikes, at least at times when no vehicles are treating the bike lane as a travel lane, as shown in Figure 10.



**Figure 10 - King Edward westbound after MacDonald**





**Figure 11 - King Edward westbound after MacDonald**

Vehicles were observed driving in the bicycle lane up the hill, especially when they had turned westward on King Edward from the slip lane, as shown in Figure 11.



**Figure 12 - King Edward westbound approaching Quesnel**

Approaching Quesnel, which has a traffic light, there is a left turn lane, a straight through travel lane, and a right turn lane. The painted bike lane disappears at this point, with sharrows painted in the right turn lane, as shown in Figure 12. Ride participants advised that the right turn lane was added in with the repaving work, as there were formerly two lanes (left turn and straight) and room for a painted bike lane. It is disappointing to see the elimination of a bike lane, even a painted one, simply to allow additional motor vehicle lanes. Vehicles were observed moving quickly at the right turn onto Quesnel, which is posted with a 30 km/hr limit, as the turn is not at ninety degrees due to the road geometry. This results in vehicles moving quickly in the shared lane zone on King Edward.



**Figure 13 - King Edward westbound after Quesnel**

After Quesnel, the painted bike lanes disappear and there are no road markings. There are two lanes of width, with parked vehicles and a travel lane, as shown in Figure 13. Extending the bike lanes three blocks westward to reach Balaclava and Dunbar (both of which are north/south bike routes) would provide significant network connectivity enhancements.

*Eastbound King Edward - Balaclava to MacDonald*



**Figure 14 - King Edward westbound after Balaclava**

There are no pavement markings for a bicycle lane on this stretch, as shown in Figure 14. The roadway is two lanes wide, with parked vehicles. Because the road descends, and is straight, vehicles were observed to be travelling at higher speeds. The pavement is not in good condition, creating the risk of a bicycle tire catching a groove. Approaching the Ridgeway bikeway on Quesnel, there are two apparent travel lanes, with a transit stop, although without lane markings. There is a caution sign indicating a bicycle crossing, but it is hidden in the trees and not visible. We recommend that this be addressed.





**Figure 15 - King Edward eastbound at Quesnel**

At Quesnel, there is a slip lane for northbound motor vehicles turning right (eastbound) onto King Edward. A permeable painted bicycle lane restarts just east of Quesnel, with the curb lane for parking, then a painted bike lane, then the motor vehicle travel lane, as shown in Figure 15. Additional risks are created as the curb lane appears to carry through the intersection, causing vehicles to drive in the painted bike lanes while they merge. We recommend that eastbound on King Edward from Quesnel, there be a single painted motor vehicle lane, and a painted bike lane with a buffer, to encourage motor vehicles to use the travel lane. Where the slip road crosses the bike lane, there should be green paint to indicate the conflict zone. Vehicles were observed using the slip lane without slowing sufficiently or yielding to parallel traffic in the bike lane or motor vehicle travel lane, despite the presence of two yield signs.



**Figure 16 - King Edward eastbound after Quesnel**

After Quesnel, the bike lane restarts on the travel lane side of parked vehicles, as shown in Figure 16. Vehicles were observed to be travelling at higher speeds on this downhill section.



**Figure 17 - King Edward eastbound approaching MacDonald**

Nearing MacDonald, the bike lane ends and there are two travel lanes, with sharrows in the curb lane, as shown in Figures 17 and 18. This continues through the intersection.



**Figure 18 - King Edward eastbound at MacDonald**

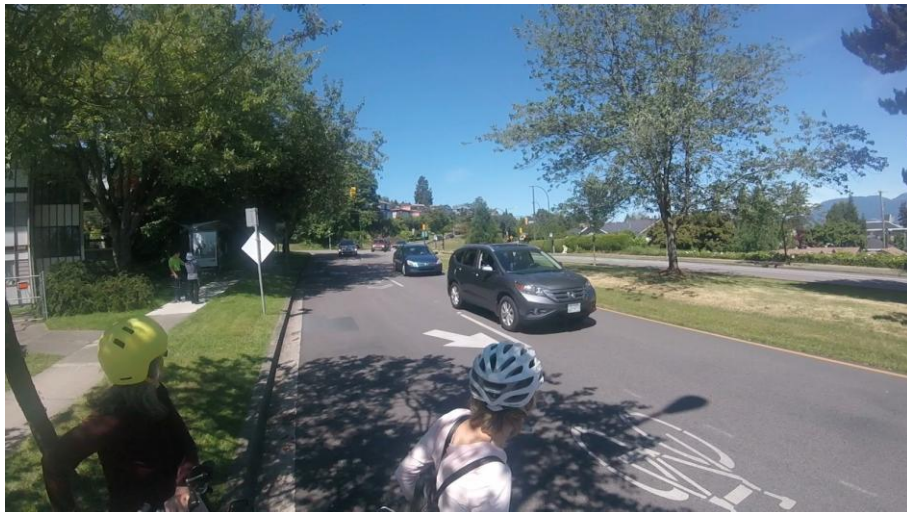
A significant number of eastbound vehicles were observed turning left on Macdonald, making the curb lane with sharrows the effective through lane for vehicles. As drivers noticed vehicles signalling to turn left, they merged to the right into the shared line, seemingly not aware of people on bicycles. Beyond the competition for road space here, an additional risk is that these vehicles need to move back to the left (travel) lane on the far side of the intersection.

Eastbound King Edward - MacDonald to Yew



**Figure 19 - King Edward eastbound after MacDonald**

Immediately after MacDonald, there is a transit stop, with the curb lane having sharrows. This continues until the painted bike lane and parking resume after the transit stop, as shown in Figures 19 and 20. This creates a danger zone as there are vehicles carrying through the intersection in the curb lane, and vehicles turning right off MacDonald northbound onto King Edward, as well as buses, all competing for space with people on bicycles.



**Figure 20 - King Edward eastbound after MacDonald**

Vehicles were observed driving in the painted bike lane after the transit stop, merging gradually back into the travel lane. It would be safer if eastbound vehicles merged before the intersection, and not in the conflict zone after the intersection. This could be accomplished by painting a left turn lane onto MacDonald northbound from King Edward, with through traffic being directed into the centre lane, and a painted bicycle lane at the curb.





**Figure 21 - Conflicts at transit stops**

All along the route, there are transit stops. Buses were observed pulling out immediately in front of people on bicycles in the bicycle lane, as shown in Figure 21. It was suggested by ride participants that many vehicle operators appear to not expect people on bicycles along this route, likely due to the low number of bikes encountered. These few users result in the opposite of ‘safety in numbers’ and could be a reflection of whether people on bikes feel safe using this route.



**Figure 22 - Bike lane jogs at driveways**

Near Yew, there are strata developments on the south side, with driveway entrances. These entrances have green paint applied, and the bike lanes jog towards the curb for the duration of the driveway entrance. This creates a wider turning space for vehicles entering or leaving the developments, but also creates a slalom for people on bicycles.

While not observed, it was reported by local residents that people on bikes coming from Arbutus Village avoid the intersection at King Edward by cutting through the park, and then salmoming westbound down the eastbound bike lane near the strata developments. This has reportedly caused conflicts at these intersections as drivers exiting the developments do not expect westbound bikes.



**Figure 23 - Bike lane narrows**

Both the curb (parking) lane and the painted bike lane are noticeably narrower at this point, as shown in Figure 23, likely due to the existing roadway width. This makes it more likely for parked vehicles to be partially obstructing the bike lanes. Also, plastic pylons have been erected, presumably to stop drivers from using the curb lane to jump ahead of the lineup at the Arbutus light.

*Eastbound King Edward - Yew to Arbutus*



**Figure 24 - King Edward eastbound approaching Arbutus**

Climbing the hill to Arbutus, there is a transit stop, then a right turn lane, as shown in Figure 24. This results in motor vehicles moving into the right turn lane early, and overtaking people on bikes on the hill where there is not sufficient width. This was found to be very uncomfortable for people on bikes. There are no painted buffer zones here.

Eastbound King Edward - Arbutus Street to Angus Drive



**Figure 25 - King Edward eastbound after Arbutus**

This block has a painted bike lane, with painted buffer zone, from Arbutus to Maple. However, the painted bike lane does not begin right at Arbutus, but some distance later, after King Edward crosses the new Arbutus Greenway. This encourages right turning vehicles from Arbutus to use the curb lane to merge into traffic. This will require improvement with construction of the future greenway paths. The intersection could be protected with northbound right turning vehicles on Arbutus having to turn into the main travel lane instead of the curb lane where the bike lane is. The eastbound bike lane on the west side of Arbutus could then continue through the intersection to this point, with green paint applied.



**Figure 26 - King Edward eastbound after Maple**

After Maple, parking is permitted, and the painted bike lane is positioned on the travel lane side of the parked cars, with no buffer zone for the first part, and then an approximate 12" buffer zone for the remainder. Vehicles were observed parking over the line into this zone. The decision here, as in other sections, comes down to whether the buffer zone is adequate, and whether a trade off should be considered with vehicle parking space. Note that all of these residences have rear lane access.



## Summary Comments

- This is not an AAA bicycle route, despite the recently painted bike lanes. None of the ride participants felt they would be comfortable taking children on this route.
- Some ride participants felt that they would be more likely to use this route now after the improvements, but that was due to the new and smoother pavement rather than the new pavement markings.
- None of the ride participants felt more comfortable on this route than prior to the new lane markings. Some remarked that the lane markings put them more frequently in the door zone than where they would have ridden without the lane markings.
- The sense of the ride participants was that the bicycle route improvements were designed and implemented more from a driver's perspective, and not from the perspective of a person riding a bicycle.
- It was noted that despite parking having been retained over much of the length of this route, there were few parked vehicles evident.
- The decision to put the painted bike lanes on the outside of the parked vehicles, instead of on the inside, is understood to be due to the lack of space for a buffer zone, required when bike lanes are positioned inside parked cars. Several ride participants commented that they would feel safer with the lanes inside the parked cars, even without a buffer zone, rather than when lanes are on the outside of parked cars in the door zone, and immediately next to moving motor vehicles. Both alternatives have door zone conflicts, but one has moving vehicles as well.
- While this project has been completed, there are multiple minor items that could improve safety even with the bike lanes on the outside of the parked vehicles, such as attention to key intersections, extending the painted lanes where they disappear, and elimination of the zones that have only sharrows. Also, extending the lanes to Dunbar would enhance usability from a network perspective.

Overall, it was felt by the ride participants that there was an opportunity lost here, given that roadwork was being done in any case. It is hoped that lessons from this project can be applied to future road rehabilitation projects, reducing the likelihood of putting in infrastructure that provides limited perceived benefit for people on bikes.

Thank you for considering these issues. We are available to meet and discuss these items at your convenience.

Sincerely,

Jeff Leigh  
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