



March 16, 2004

Brigid Kudzius  
Downtown Transportation Plan Implementation Team  
Vancouver City Hall  
453 West 12<sup>th</sup> Ave.  
Vancouver, BC V5Y 1V4

Dear Madam,

We are pleased to see quick progress in the development of a Hornby St. bike lane, and we are certainly eager to see a lane in place before the summer. However, we wish to ensure that the facility that is built is as safe and comfortable as possible for cyclists. After discussions with yourself and other staff at the recent open house, we have a number of specific requests regarding the upcoming bike lane:

- 1) Divide the current width allocated to parking (2.5m) into two parts: a reduced width for the vehicle itself (2.0m) and a buffer between cyclists and parked vehicles (0.5m)
- 2) Clearly identify the bike lane to drivers by using two stripes on either side of the lane at all times, and colour in the lane surface
- 3) Select intersection designs that minimize conflicts between cyclists and right-turning vehicles
- 4) Select suitable designs for the start and end of the lane

We describe these requests in detail in the remainder of this letter.

## ***Buffer Cyclists from Parking***

From recent discussions within the VACC, one of the most important issues for cyclists is protection from parked vehicles. Cyclists perceive opening and closing doors as serious threats, and the presence of parked vehicles can be a real deterrent to use of an arterial bike lane. We considered two primary ways of protecting cyclists: complete removal of parking, and use of a buffer space between cyclists and parked cars.

Complete removal of parking on the east side of Hornby St. is certainly an attractive option. If *reverse angle parking* was adopted on the west side of the street, this could be accommodated with a relatively small reduction in total parking capacity, and no changes to lane widths. In addition to improving cyclist safety, reverse angle parking is also safer than parallel parking for drivers accessing parked cars. However, if pursuing this option would cause a delay in the implementation of the bike lane, the VACC would prefer immediate implementation of the bike lane, and we would encourage the City to consider such measures in future bike lane designs.

Instead, our recommendation is to design a buffer space between parked vehicles and the bike lane. The designs presented at the recent open house typically allocated 2.5m-2.6m of street width for parking, and 1.5m-1.8m of width to the bike lane. Some members of city staff have expressed reluctance to paint a stripe separating parking from the bike lane, arguing that this encourages cyclists to treat the entire 1.5m allocated to the bike lane as “safe” from danger, such as opening vehicle doors.

In our view, the entire bike lane *should* be safe from car doors, and marked as such. This is already typical of lanes dedicated to vehicle traffic, where drivers can expect clear progress without worrying about the doors of parked vehicles. Cyclists should expect no less, and the bike lane should indicate a safe travel region.

Fortunately, on Hornby St. it is not too difficult to reallocate width to achieve this goal. Most vehicles can be parked in as little as 2.0m-2.1m of width, if the vehicle is directly against the curb. By painting a suitable pattern on the street to mark the intended left edge of parking, motorists can be encouraged to stay out of the bike lane. This should be reinforced by striping the bike lanes on both sides, clearly marking the region where cyclists are allowed to pass.

We urge you to follow this suggestion by dividing the current parking allocation on Hornby (2.5m-2.6m) into actual parking space (2.0m) and a buffer (0.5m-0.6m) to assure the safety of cyclists, with the suitable paint on the road surface to separate the parking space from the buffer. We also request stripes on both sides of the bike lane, clearly defining a boundary between cyclists and both the buffer and parking. We believe this will ensure a much higher standard of safety for cyclists, with little or no inconvenience to motorists.

## ***Identify Bike Lane***

It is important that motorists using or entering Hornby St. realize immediately that a bike lane is present. Equally, cyclists unfamiliar with the city network should be able to quickly spot the presence of a lane intended for their use. For this reason, the VACC requests that the bike lane on Hornby St. have a clear visual identity, provided through striping, colouring and stencils on the road surface.

The VACC believes that stripes should be present on both sides of the bike lane for the entire length of Hornby St. This is particularly important in potential conflict regions: at intersections, across driveways, and where a dedicated right-turn lane is present. Motorists entering the roadway from a driveway have no way of knowing that they need to watch for cyclists, unless they see two lines cross their path, preferably with a bike stencil right at the driveway. We were pleased to see double-striping employed in the 700 block in the diagrams presented at the recent open house, and we urge you to use it for the entire length of Hornby St.

Coloured bike lanes have been tested by the city near the Burrard Bridge and in bike boxes around the city. The Hornby St. diagrams presented at the recent open house included a coloured section in the 700 block to indicate a “conflict region.” We believe it would be useful to colour the bike lane over the entire length of Hornby St. We understand that no national standards for colouring are yet in place, but we feel that coloured lanes alone will serve a valuable purpose, even if they do not match any future standard. Furthermore, it should be much less costly to colour the lane now, as the street is repaved, than to attempt colouring at a later date.

## ***Minimize Right-Turn Conflicts***

Most intersections along Hornby present opportunities for conflicts between cyclists and right-turning vehicles. The most problematic intersections are Hastings St., Nelson St., Georgia St. and Pender St., which all have high volumes of right-turning vehicles. According to the city data available through VanMap, all of these intersections had at least 120 vehicles/hour turning right during the most recent survey, with some much higher (Hastings p.m. peak was 450 vehicles/hour, and Pender p.m. peak was 250 vehicles/hour). However, even intersections with low right-turn volumes can present difficulties to cyclists.

Discussion of right turns at Hastings St. are deferred to the next section, where connections at the ends of Hornby are considered.

Georgia St. has one of the higher volume of right-turning vehicles on the route. The design for the 700 block of Hornby (including Georgia St.) presented at the recent open house was satisfactory to the VACC, pushing conflicts into a clearly defined zone, away from the intersection; our only refinement would be to paint solid stripes around the bike lane for a longer distance back from the intersection, discouraging lane changes close to Georgia St.

At both Nelson St. and Pender St., a better design is needed to cope with the high volume of right-turning vehicles. The design presented at the recent open house left only a small right-turn lane at the intersection, with no space for vehicles to queue in

preparation for making right turns. In this situation, the typical right-turning motorist will push their nose into the curb lane while they wait for space, blocking the bike lane completely. This is wasteful, since the motorist forces queuing in both the lane s/he is leaving and the bike lane. Furthermore, it gives right-turning vehicles priority over all cyclist traffic. Unlike motorists, most cyclists cannot safely use the leftmost “through” lane to bypass right-turning vehicles. Given the priorities established in the City's 1997 Transportation Plan (pedestrians, bicycles, transit and finally private automobiles), we believe a different design is required.

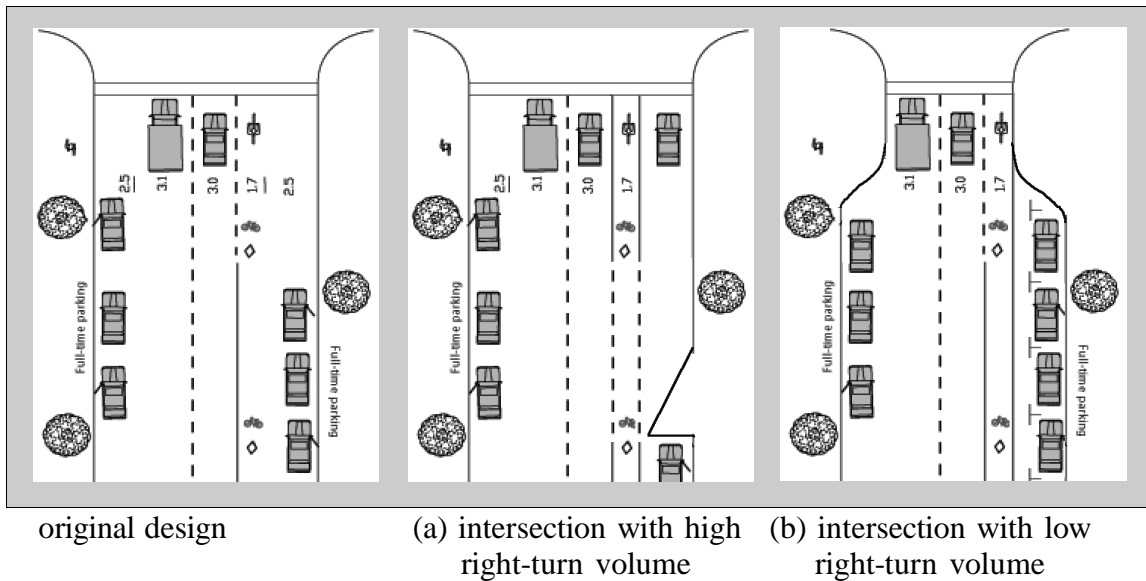


Figure 1: Different options for addressing right-turn conflicts (not to scale).

A better solution would be (a) to provide more queuing space in the curb lane by removing parking, or (b) to eliminate the curb lane (via a curb bulge) and force all queuing to occur in the main traffic lane, allowing cyclists to continue to the intersection, where they are more likely to be given a chance to obtain right-of-way.

With the high right-turn volumes found at Nelson St. and Pender St., we do not believe that design (b) will be a reasonable solution. This approach will result in many motorist/bike conflicts at the intersection, and force a lot of vehicle queuing in the main through lane. At these streets, we prefer design (a). This design must include sufficient queuing space for the typical peak volume of right-turning vehicles, and should include a solid curb to separate parking from the right-turn lane (shown as a triangular shape in the diagram above). At other low-volume intersections, however, design (b) could be quite suitable.

Most other intersections along Hornby have low right-turn volumes, including Drake St., Davie St., Helmcken St. and Pender St. The remaining intersections permit no right turns at all, at Robson St., Smithe St. and Dunsmuir St. We suggest the use of design (b) at all of these intersections. This design would prevent motorists from using the narrow curb lane for right-turns in a space with insufficient queuing, reducing conflicts with cyclists. It is also the design originally planned for Hornby St. in the Downtown Transportation Plan, presumably to aid pedestrian crossings (spot

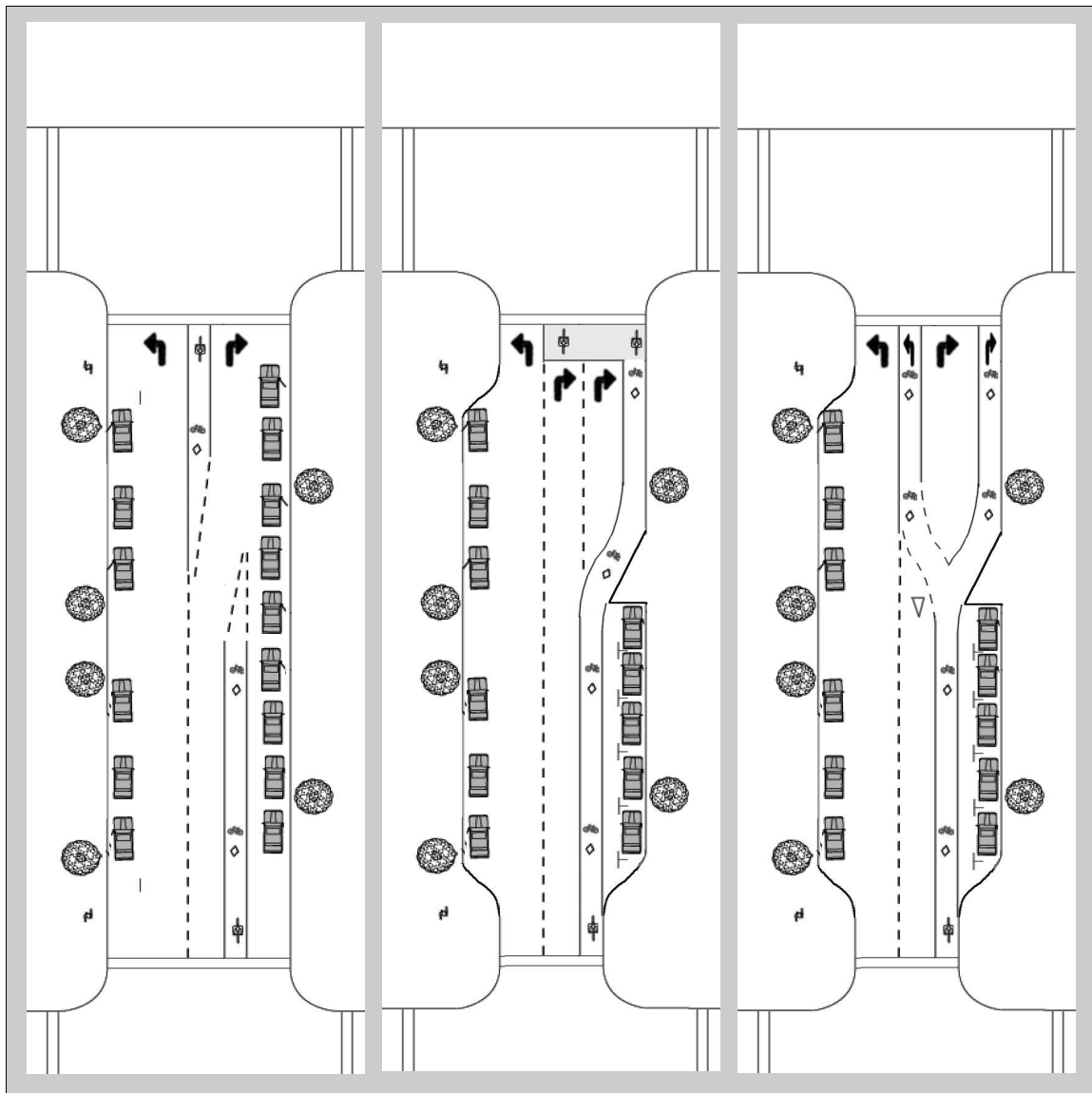
improvement 26, page 149).

When considering designs to mitigate right-turn conflicts, we encourage you to remember the bold language of the Downtown Transportation Plan:

The Downtown Transportation Plan will make progress towards achieving sustainability by providing recommendations that [...] increase safety by reducing the potential for conflicts between modes. [p. 16]

### ***Start and End of Lane***

From what we understand, the scope of the current Hornby St. project does not include the approach from the Burrard Bridge or the connection south from Pacific to the Seaside bike route. This work will be delayed until the Burrard Bridge project goes



open house design

(a) advance green for cyclists plus bike box

(b) twin left- and right-turn bike lanes

Figure 2: Different options for intersection of Hornby and Hastings (not to scale).

ahead, including resolving issues at the intersection of Pacific St. and Hornby St. At the recent open house, we were pleased to see that the initial 1300 block of Hornby St. included full-width bike lanes. Parking is slated to be removed from the west side of Hornby for the first half of the block, freeing up 1.7m of width for a bike lane on the east side, and 1.3m of width to extend the west sidewalk. Some VACC members have suggested that this space on the west side could be used as a short half-block bike lane, possibly reducing the number of cyclists waiting at the Pacific and Hornby intersection; we submit this for your consideration, as per discussions at the open house.

On the north end of the route, only rough ideas for the design have been presented to the VACC. Hornby St. terminates at Hastings St., and many cyclists will want to make both left- and right-hand turns. Left turns are important, as they allow cyclists to continue north along Burrard St. to the waterfront or to access the Seabus from Waterfront Road. A one-block bike lane is planned to connect Hornby traffic to Burrard St.

The difficulty of allowing cyclist left turns lies in shifting cyclists left of the right-turning vehicle traffic at Hastings. During the p.m. peak of a 2002 traffic count, Hastings St. recorded the highest vehicle right-turn volume of all of Hornby St. (450 vehicles in an hour) with its current configuration, which includes two right-turn lanes. From discussions at the open house, we understood one of two major changes was possible at the Hastings intersection: the addition of an “advance green” signal for cyclists, or the removal of a single right-turn lane. With this understanding, we propose two possible designs for the intersection, shown in Figure 2.

For the sake of comparison, the figure includes the interim design presented at the recent open house. We have two main problems with this design: it assumes that all cyclists are making left turns, and it makes these left turns both difficult and dangerous by granting motor vehicles right-of-way in a conflict region.

Our design (a) is based on a special “advance green” signal exclusively for the use of cyclists. In this concept, the signal at Pender St. is synchronized with the signal at Hastings St. to ensure that cyclists crossing Pender on a green signal and travelling at speeds of 10-20km/h will arrive at Hastings during the red signal phase. At the intersection, a bike box allows cyclists to shift left for a left turn or stay in position for a right turn. Motorist right turns are prohibited during the red phase, to avoid conflicts in the bike box region. Next, a special signal gives cyclists a green while still prohibiting right turns for motorists. This phase can be brief; most cyclists will be in the bike box already, prepared for their turns. Finally, the signal switches to a regular green phase, allowing motorists to make their right turns. The three key elements of this design are the advance green signal; the bike box (which allows many cyclists to turn simultaneously instead of requiring a long signal phase to allow all cyclists to clear the intersection); and the prohibition of motorist right turns during the red signal phase.

The benefits of design (a) are: highest safety, with no conflicts between vehicles and cyclists; simple, common solution for both left- and right-turning cyclists; conventional arrangement of bike lanes on street; larger motor vehicle right-turn capacity, with two

lanes. The disadvantages of this approach are: reduced parking capacity; driver education needed with novel signal system; synchronization required with Pender St. signal; no motor vehicle right turns on red. One potential modification of this design would be to substitute parking instead of a second motor vehicle right-turn lane, trading off right-turn volume for parking capacity.

Design (b) is quite similar to the open house design, with simple corrections to eliminate the problems we saw in the design. It includes two bike lanes, one for left turns and one for right turns. It also includes a transition region giving left-turning cyclists clear right-of-way over right-turning vehicles.

The advantages of design (b) are: simple separation of cyclists into left- and right-turning streams; no changes to signals required; motor vehicles may still make right turns at red signal; probable reduction in right-turning vehicle traffic due to reduction to one right-turn lane. The disadvantages are: all motorists must yield to left-turning cyclists, which will slow traffic and will be difficult to enforce; shift to left-turn position is potentially quite dangerous; reduction in parking capacity; reduction in capacity for motor vehicle right-turns.

Based on the pros and cons discussed here, we have a strong preference for design (a) at Hastings St. This design is the safest solution we have seen, while still allowing a reasonable volume of cyclists to make left- and right-hand turns. Of all the designs presented to date, this has the most potential to appeal to both confident commuter cyclists and novices. If this design is selected for implementation, we believe that it must include all of the key elements to succeed: an advance signal for cyclists, a bike box, and a prohibition of right turns on red. Design (b) is a distant second choice, but would also be acceptable provided that left-turning cyclists are guaranteed right-of-way over right-turning motorists. We do not consider the interim design presented at the open house to be acceptable.

In closing, we eagerly await the implementation of this bike lane. We hope that the design issues raised in this letter can be resolved in a satisfactory manner. We believe that these recommendations will improve the safety and convenience of Hornby St. for cyclists, making it a model for the rest of the downtown cycling network. Please continue discussions with us as design choices are narrowed down. Feel free to correspond with us directly, or through presentations to the Bicycle Advisory Committee.

Sincerely,

A handwritten signature in black ink, appearing to be 'JL' or similar initials, written in a cursive style.

H-JEH (Jack) Becker  
Chair, VACC Vancouver Committee  
Director, Vancouver Area Cycling Coalition

Please address future communications to the VACC contact person on this issue:

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