Vancouver Area Cycling Coalition

VACC

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The Lower Mainland's Cycling Advocates

February 21, 2004

Doug Louie
Downtown Transportation Engineer
Vancouver City Hall
453 West 12th Ave.
Vancouver, BC V5Y 1V4

Cc: Mayor and Council

Dear Sir,

Over the last several months, the Vancouver Area Cycling Coalition (VACC) organized a series of visits to recently completed and future bicycle routes in the downtown. On the basis of these rides, we have identified three issues that we would like to see addressed in future downtown route designs:

- Lane painting issues
- Conflicts between right-turning vehicles and through cyclist traffic
- Conflicts between buses and cyclists

Many of these issues have been observed in other routes in Vancouver, but are particularly severe on the routes selected on the downtown peninsula. Most existing bicycle routes have been placed away from arterial roads (so-called "bicycle boulevards"), but this was not an option for many of the downtown routes, which will be designed as lanes on major roads. The design concerns we discuss here are a direct consequence of combining arterial traffic with bicycle routes.

Lane Striping

Clear striping of arterial bicycle lanes is necessary for the safety of cyclists. Lanes adjacent to the curb only need a single stripe to the left of the route, but different treatments should be considered when lanes leave the curb edge. This happens in many situations: when a bike lane runs adjacent to parked vehicles, when a dedicated right-turn lane is needed for motor vehicle traffic, or when traffic at bridge off-ramps merges onto the roadway. The VACC suggests that stripes on both sides of the lane would be an appropriate solution for these situations.

In the case of parked vehicles, this would achieve several goals:

- clearly mark bicyclist's route, keeping cyclist away from parked cars
- clearly mark parking position, encouraging parking close to the curb and away from cyclists
- encourage cyclist to follow a straight and predictable path
- when parking spots are not in use, clearly identify bicycle lane to motorists
- at intersections, make cyclist's path obvious to both cyclists and motorists, reducing conflicts

The last two issues are probably the most important. The visual identity of a bicycle lane is define primarily by bicycle stencils on the roadway, by proximity to the right-hand side of the roadway, and by the distinctive narrow width of the lane. If the lane is defined by a single stripe on the left and parking on the right, then the last two parts

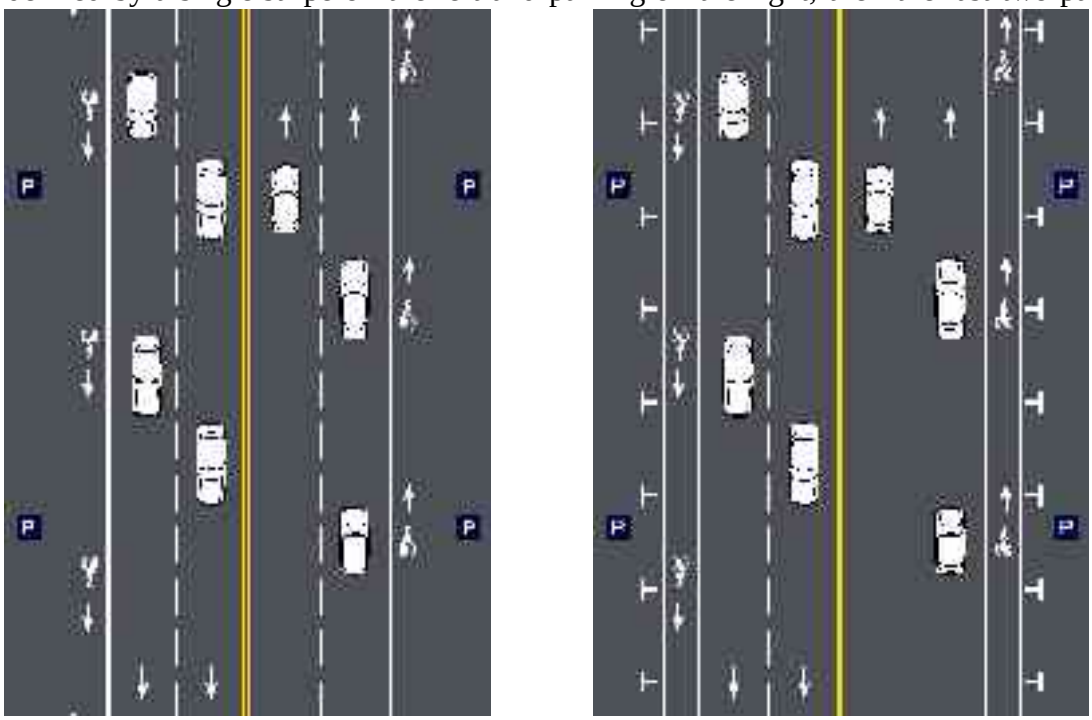


Figure 1: The effect of bike lane striping next to empty parking spots. Left: without right stripe, bike lane and parking look like an empty motor vehicle lane. Right: with right stripe, bike route is obvious due to width. Adapted from diagrams by Alta Planning, City of San Francisco Bicycle Master Plan.

of the identity rely heavily upon the presence of parked vehicles. However, parking use fluctuates from day to day, and within periods of a given day. There are many times of day when cyclists need to use the lane but the adjacent parking may be almost empty; at these times, the bike lane is not obvious on the right side of the roadway, and the bike lane width may not be apparent. Given these variations in parking use, we suggest additional visual cues to indicate that cyclists are at the edge of the roadway, and to indicate the width of the bike lane. A right-hand stripe to the bike lane achieves both of these goals, improving the visual identity of the parking lane. An example of the effect of a right-hand stripe is shown in Figure 1.

Finally, the striping of a bike lane must be continuous. Cyclists should be afforded the same courtesy as motorized vehicles: a dedicated lane that allows easy, low-conflict forward movement. The bike lane should not disappear near a conflict zone and then reappear further along; this is clearly unsafe. The cyclist's route must be continuous through conflict zones, and right-of-way should be obvious to both drivers and cyclists. In most (if not all) situations, cyclists should be given right-of-way, as is normally the case for through traffic. While it may present a challenging design problem at times, good design of conflict regions is key for the bike lane to attract and retain riders.

In the downtown, there are several types of conflict zones where continuity will be important, including vehicle right-turn lanes and the on-ramps and off-ramps of bridges and viaducts.

Figure 2 shows an example of both poor and good lane continuity, in a conflict zone with right-turning vehicles. This particular issue is discussed in more detail in the following section.

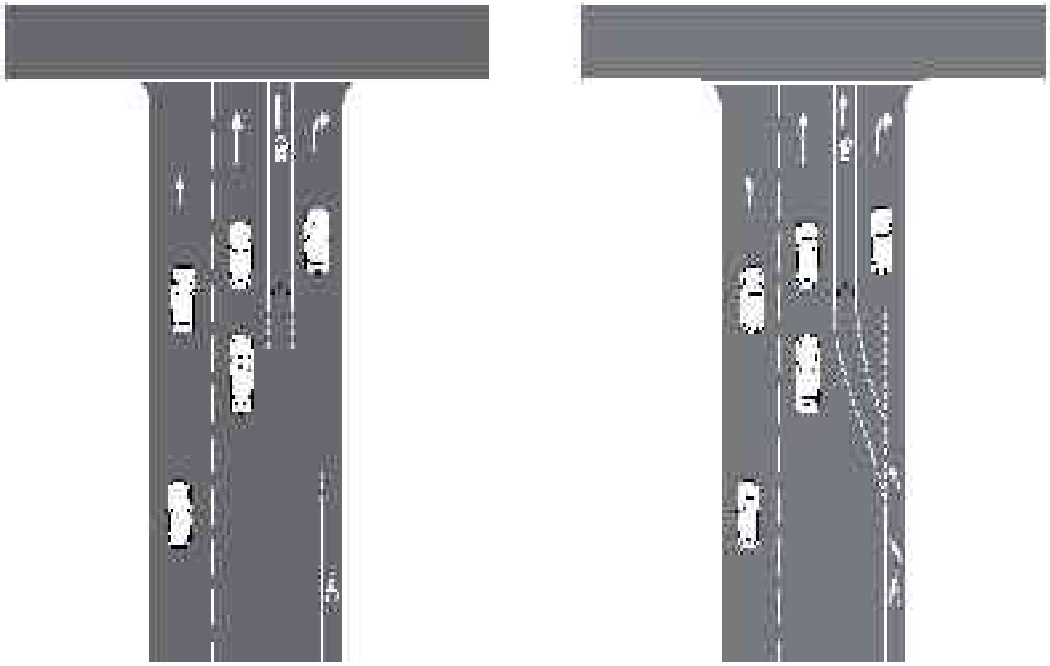


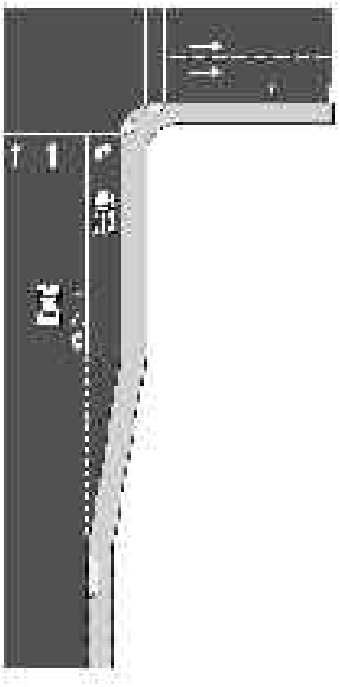
Figure 2: Left: an example of poor lane continuity. Right: a better design including a clearly marked, continuous bike lane. Source: adapted from Alta Planning.

Conflicts with Right-Turning Vehicles

There are many points in the anticipated downtown bicycle network where through cyclists and right-turning vehicles must cross paths. We have four requests for such crossings:

- through bicycle traffic should follow a straight line approaching the intersection, and through the intersection
- the correct location for right-turning vehicles to cross the bicycle path should be clearly marked
- if a dedicated right turn lane is provided (even a short one), right-turning vehicles should cross the bicycle route prior to the intersection
- the crossing point should be as short as possible

We found one example of bike lane design meeting these criteria from the City of Portland's website, reproduced below.



Right-turn lanes present special problems for cyclists because right-turning cars and through bicyclists must cross paths. To alleviate these concerns, the design [shown on left] should be used for bicycle lanes. The paths of the through bicyclist and the right-turning motor vehicle should cross prior to the intersection. This configuration has three advantages:
•It allows this conflict to occur away from the intersection where other conflicts could occur
•The difference in travel speeds is an advantage, as a motor vehicle driver can pass a bicyclist rather than ride side-by-side
•All users are encouraged to follow the rules of the road: through vehicles (including bicyclists) proceed to the left of right-turning vehicles

City of Portland, *Bikeway Design and Engineering Guidelines*, Part II.D, http://www.trans.ci.portland.or.us/designreferences/bicycle/appenda2.htm

The VACC recommends that similar design solutions be adopted for arterial bike facilities in Vancouver. The design shown above could be adapted to include parked cars prior to the right-turn lane, and the transition region at the start of the right-turn lane could be indicated using a curb bulge or bollards. The conflict region should, of course, be marked with coloured pavement.

Conflicts with Buses

Many of the new downtown bicycle routes share the road with bus traffic. On streets like Burrard, the bus traffic can be quite heavy. This creates a number of different types of conflicts:

- On streets without parking, buses both need access to the curb, where cyclists usually position themselves
- On streets with parking (where cyclists will consistently ride in a lane outside the parking, instead of riding adjacent to the curb), buses must weave back-and-forth across the bicycle lane to move around parked cars, or to access the curb.

Our proposed solution to these conflicts is as follows: on streets with high bus traffic, parking should be replaced by a curbside HOV/right turn lane. Cyclists can then be accomodated with a separate bicycle lane to the left of the HOV lane. This solution has some major benefits:

- Eliminates curbside weave between buses and bicyclists; both bicyclists and buses maintain a straight line of travel
- Bicyclists have more space; reduces potential conflicts with parked cars
- Reinforces safer cycling practices and gives bikes more visibility at intersections
- Increases awareness that bikes use the street

This design has been successfully employed by the city of Madison, WI on University Ave., as described below:

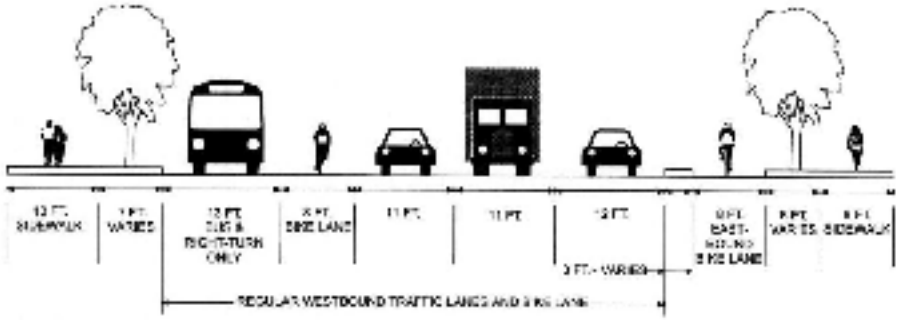


Figure 3: University Ave. in Madison, WI, USA

The project was completed in October 1984. At first bicyclists, motorists and pedestrians were surprised by it, but they quickly got used to it. Some bicyclists continued to ride along the curb. However, the Traffic Engineer for Madison, Tom Walsh, stated almost 13 years later that "if we had to do it all over again, we would probably do exactly the same thing."

Source: M. DeRobertis and R. Rae. "Buses and bicycles: Design alternatives for sharing the road." Institute of Transportation Engineers, *ITE Journal,* May 2001, 71(5):36-44.

In particular, this solution should be seriously considered for the proposed southbound bike route on Burrard St., where both bus and vehicle traffic are heavy. On this street, it is particularly useful since most bus traffic moves straight or turns right; very few buses need to make left turns which would require crossing the bike lane. It may prove difficult in some sections of Burrard St., particularly near Alberni where blocks are short and motor vehicles make frequent right turns, but this could be solved with a combination of restrictions on right turns and good design.

The VACC believes that these recommendations will improve the usability and safety of future cycling facilities in the downtown. We welcome further discussion of the issues brought forward in this letter.

Sincerely,

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:

David Pritchard