a place of mind
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October 23, 2014

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Dear Ms. Edwardson

Re: Development of the Ontario Municipal Cycling Infrastructure Program

I am a faculty member in the School of Population and Public Health at the University of British Columbia and lead a program of research "Cycling in Cities". I was alerted to your call for input by a number of people who thought our research results might contribute useful insights.

Our research has the most value for Question 1 "*What types of infrastructure would encourage cycling most?*" and the Question 3 goals: "*increasing ridership levels*" and "*improving rider safety*". Our research and that of others consistently show that concerns about safety are the primary deterrent to cycling in North America, so route safety and ridership are intimately linked.

We conducted two studies relevant to these issues:

- one investigating which route types motivate or deter cycling; and
- one investigating which route types reduce or increase cycling injury risk.

The results of each are outlined below, followed by a summary of which infrastructure types are best to both increase ridership and maximize safety.

Route types that motivate or deter cycling

We conducted an opinion survey in the Metro Vancouver region asking 1400 residents about 16 route types. We included 3 photos of each type, to ensure that respondents could visualize the infrastructure.

The bottom line (shown in the figure overleaf) is that route type makes a substantial difference to whether people are willing to ride. There were **only a few route types that received largely positive ratings** from **women**, a demographic that is under-represented in cycling. **People with children**, also under-represented, had the same results as women. Note that men (and people without children) agree on the positively rated route types, so this infrastructure attracts all demographics.

Bicycling infrastructure with positive ratings:

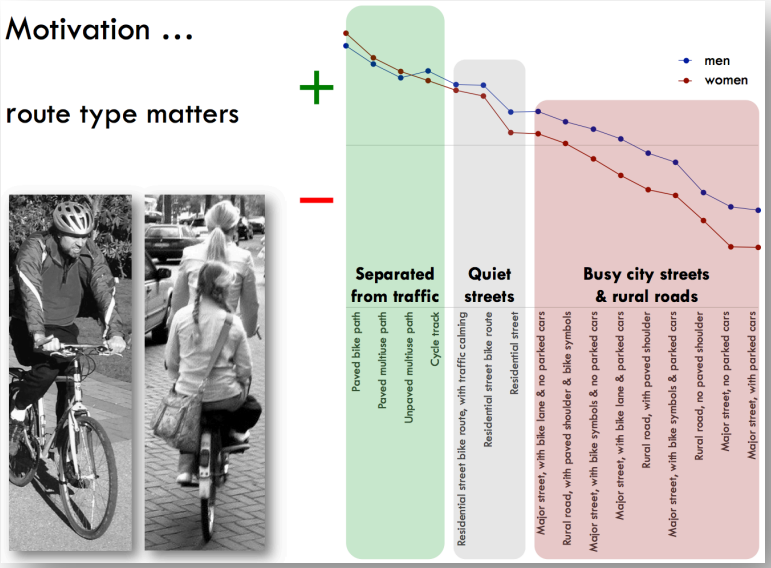
- off-street paved bike paths
- off-street paved and unpaved multi-use paths
- cycle tracks (i.e., separated bike lanes) alongside busy streets
- residential street bike routes, with or without traffic calming.

Some common types of cycling infrastructure had **neutral or negative** ratings by women, people with children and others.

Bicycling infrastructure with neutral or negative ratings:

- sharrows or other bike symbols indicating shared use on busy streets
- traditional painted bike lanes on busy streets.

Our survey assessed opinions about where people were willing to cycle in one region, so it is important to consider whether these results are generalizeable and consistent with evidence about actual ridership. Before-after cycling counts done in locations across North America support our survey results: on busy streets, little change in ridership is observed with sharrows or traditional painted bike lanes, but large increases have been observed with cycle tracks (separated bike lanes) alongside busy streets.



Route types that reduce or increase cycling injury risk

We conducted our injury study in the cities of Toronto and Vancouver. It included ~700 adults injured severely enough to require treatment at an emergency department. We compared injury risk of 15 route types.

For injuries too, route type makes a substantial difference. The **following bicycling infrastructure types decreased injury risk by 40% to 90%**, compared to cycling on busy streets with no bike infrastructure:

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- traditional painted bike lanes on busy streets *without* parked cars
- off-street bike paths
- residential streets with or without bike route designation
- residential streets with traffic diversion
- cycle tracks (i.e., separated bike lanes) alongside busy streets.

The **following bicycling infrastructure types provided little or no reduction in injury risk** compared to cycling on busy streets with no bike infrastructure:

- sharrows or other bike symbols indicating shared use on busy streets
- traditional painted bike lanes on busy streets, where the bike lane is between parked and moving cars
- off-street multi-use paths.

A disappointing element of our results is that off-street multi-use paths received strong positive ratings in the opinion survey, but were not as safe as many other route types. We found that obstacles like bollards, lack of street lighting, and curvy routes that shortened sight lines were problems on many multi-use paths (and some off-street bike paths as well). Because off-street paths

are so well loved, it is important to overcome these safety problems with improved design and engineering.

Bicycling infrastructure to both increase ridership and maximize safety

Our research has led us to **recommend that municipalities focus on 3 types of infrastructure to maximize the effectiveness of bicycling expenditures**. These 3 route types (shown in the figure to the right) motivate cycling, reduce injury risk, and provide facilities for three typical municipal cycling scenarios. Note that the off-street bike path shown to the right is well designed: obstacle-free, clearly delineated from the walking path, and with good sight lines and lighting at night.

Our research also indicates that there are route types that are are **not an effective use of resources**, because they are unlikely to increase ridership nor significantly reduce injury risk:

- sharrows or other shared use facilities on busy streets; and
- traditional painted bike lanes on busy streets.

I hope these study results are useful for your program. If you have any questions or would like to discuss these ideas, I can most easily be reached at kay.teschke@ubc.ca.

Thank you very much for the opportunity to send comments.

Yours sincerely

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