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OFF-STREET BIKE PATHS AND MULTIUSE PATHS

Lessons in safe design from street engineering



ASK CANADIANS WHERE they want to ride their bikes and the most important features are to be away from traffic – its safety risk, noise and air pollution – and to be near beautiful scenery. Given those priorities, their top route choices are off-street bike or multi-use paths. In our research, paths were preferred over routes on city streets and rural roads, including those with bike lanes. BUT... in our route safety research, we were surprised to find that certain on-street bike facilities were safer. How could this be?

This is the type of question we've tackled in our Cycling in Cities (cyclingincities.spph.ubc.ca) research group at the School of Population and Public Health at UBC. Faculty and students have worked together to examine the relative safety of bike route types, the effectiveness of helmet laws and what factors attract more women to cycle.

Back to our question – first it's important to put bike and multiuse paths in context with other route types. The graph below does that by combining the results of our research on route preferences and route safety. You can see that overall, the most preferred route types are also the safest, and vice versa, the least preferred are the least safe. But look within the

green-banner group "bike-specific facilities" and you'll see that "bike only path" has the highest preference, but it is only moderate in safety. More worrisome are the multiuse paths (grey banner), next highest in preference, but towards the bottom in safety. Why?

We decided to have a closer look at the characteristics of off-street paths and the circumstances of injuries on them. We compared them to the safest route types that were also among the most preferred: "protected bike lanes alongside major streets" and "residential street bikeways with traffic diversion." Here's a list of the important differences in characteristics:

- Off-street paths were more likely to be curvy and have poor sightlines.
- Off-street paths were more likely to have obstacles like bollards, posts and street furniture.
- Off-street paths were less likely to have street lighting.
- Off-street multiuse paths mixed people walking and cycling.
- Off-street multiuse paths were more likely to be unpaved.

When we looked at the circumstances that led to crashes in our injury study, we found the following:

- Crashes on off-street bike paths and paved multiuse paths were more likely to involve obstacles and to involve other people (walking or cycling) or animals.
- Crashes on unpaved multiuse paths were more likely to involve uneven surfaces, for example potholes and tree roots

The good news is that the crashes along off-street paths almost never involved a motor vehicle.

Given these research results, what should we do? Should we just accept that off-street paths may not be as safe as people think? That would miss a huge opportunity. People love off-street paths. It is the job of designers to make them not only comfortable and inviting places to walk and ride, but also as safe (or safer) than the safest on-street routes. The research shows clearly what to do and what not to do.

The photo (lower right, facing page) illustrates a common problem in path design. The bollard narrows the path and increases injury risk to people biking from hitting both the bollard itself and the bridge railings. The purpose of the bollard may be multifaceted – but its presence over weights liability posed by a very low

probability event (a motor vehicle crossing the bridge) and in so doing, underweights liability from its ongoing hazard to people riding. If the bollard is also meant to slow cycling speeds, this is already well signalled by the visual narrowing of the path by the bridge railings.

In contrast, the photo on the upper right on the facing page shows a wonderful example of an off-street path, more in line with how we design city streets. One side is for people on foot and the other for people cycling – separating traffic with different masses and speeds. The bike path is wide enough for side-by-side riding and comfortable passing, the surfaces are paved, there is lighting for visibility at night, and there are no obstacles. The path is straight, making the sight lines good. As a bonus, the plantings make it a beautiful and welcoming space.

We hope this overview of our research and the two examples show how we can build Canadians' top choice cycling routes in a way that also makes them the safest. Off-street bike and multiuse paths could be in the top right corner of our preferences vs. safety graph if we were rigorous with their design using the safety experience of designing roads.

Route preferences vs. route safety. These usually align, but there are some surprising exceptions ... we need to understand why.

