cyclingincities

bicyclists' injuries & the cycling environment

ABOUT THE STUDY

Using a bicycle for transportation offers personal health benefits, and is good for the environment. However, only about 2% of trips made by Canadians are by bicycle. One of the reasons for this is that would-be cyclists are concerned for their safety – and for good reason. Cycling injury rates in Canada are higher than rates in countries where cycling is common.

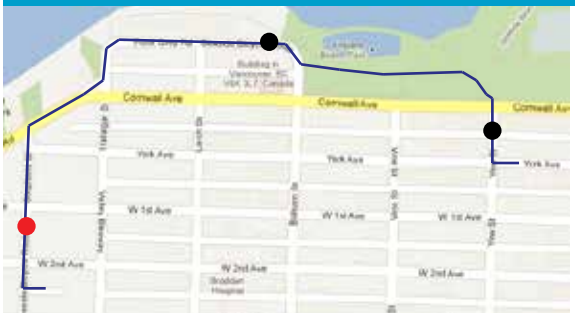
The very fact that cycling is more common in countries such as Germany and the Netherlands may help protect cyclists from injuries: there is evidence that cyclists experience "safety in numbers." However, European cities also tend to feature more bicycle-specific infrastructure (e.g., cycle tracks separated from traffic). Until now, no study had taken a comprehensive look at how route infrastructure might influence the risk of cyclist injury in North America.

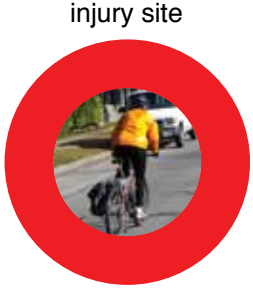
WHAT DID WE DO?

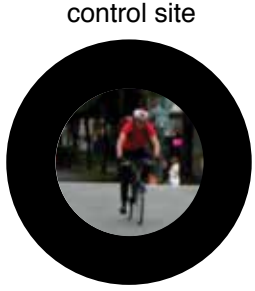
This study examined the relative safety of 15 different route types. Cyclists who experienced an injury severe enough that they visited a hospital emergency room in Toronto or Vancouver were invited to participate. We interviewed 690 cyclists to map the entire route they traveled when they were injured, and to gather information about the trip and the cyclist.

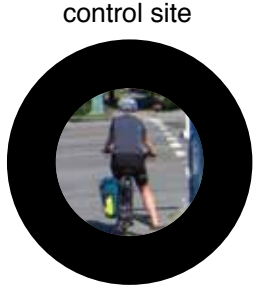
Next, we performed site observations at the injury site and at two randomly-selected "control sites" from along the injured cyclist's route. These extra two sites were included to compare the types of sites where injuries occurred to those where they didn't. Linking control sites to the cyclist is a method to eliminate bias introduced by personal characteristics (e.g. age) or trip conditions (e.g. weather). At each site, we gathered information about infrastructure and traffic volume. Finally, we performed statistical analyses to look at the relationship between route infrastructure and relative safety.

step 1: cyclist interview | **step 2: site observations** | **step 3: statistical analysis**









WHAT DID WE LEARN ABOUT THE SAFETY OF ROUTE TYPES?

We compared the various route types against the most commonly observed type: major streets with parked cars and no bike infrastructure. We found that certain route types were significantly safer than others. The graphic below illustrates each route type and shows which routes were safer.

Cycle tracks alongside major streets but separated by a physical barrier were by far the safest of the 15 routes. Most routes on quiet residential streets were relatively safe, especially where motor vehicle traffic was diverted away from these streets. Bike lanes on major streets, especially those without parked cars, were safer than major streets without bike lanes, with shared lanes, or with parked cars.

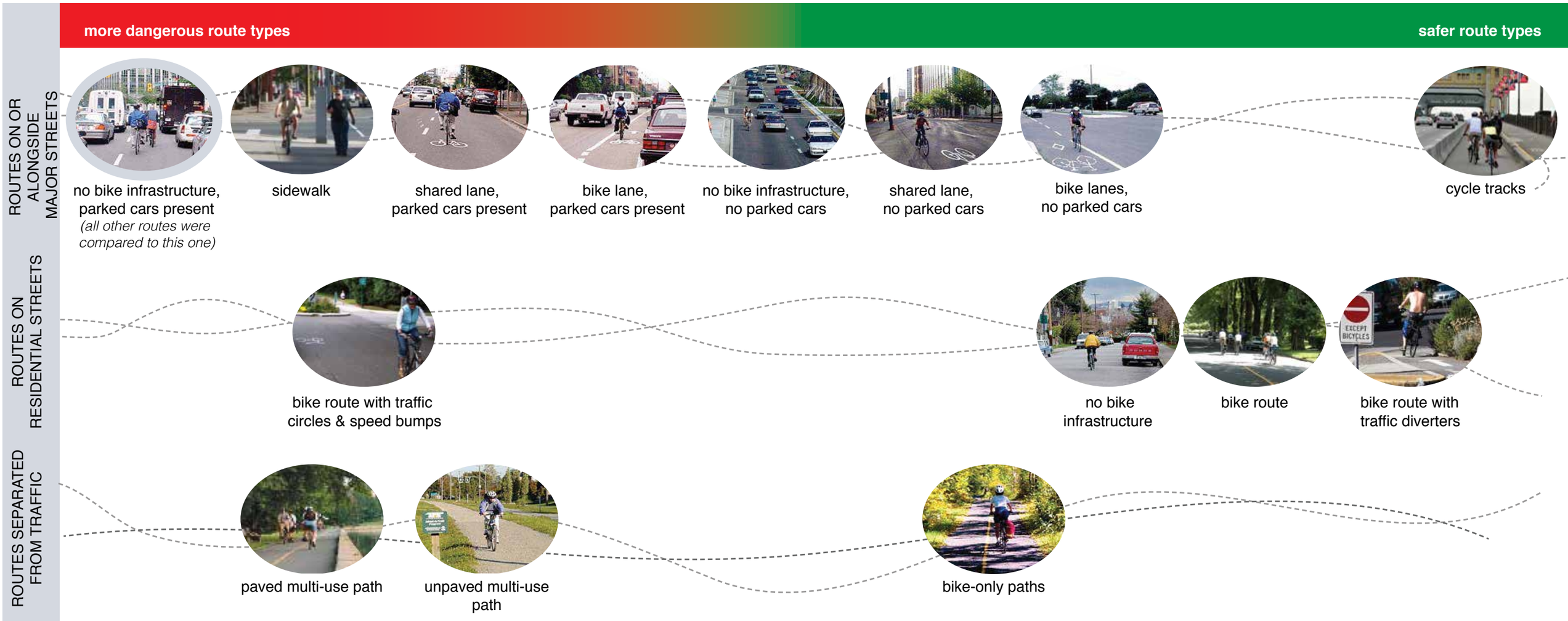
Three other infrastructure characteristics were significantly associated with increased injury risks: downhill grades; streetcar or train tracks; and construction.

WHAT ABOUT INTERSECTIONS?

We conducted a separate analysis to examine infrastructure risks specific to intersections.

We found that intersections of quiet residential streets were much safer than intersections of major streets.

Traffic circles on residential streets made these intersections more risky than they otherwise would be.



IMPLICATIONS FOR PLANNING

People may be deterred from cycling due to fear of being injured. Planners can use evidence from this study to build safer routes. Our study shows that:

- Route infrastructure is a strong determinant of cycling safety
- Bike-specific infrastructure is key: cycle tracks, bike lanes, and bike paths
- Separation from traffic is key: physical barriers alongside busy streets (i.e., cycle tracks) and traffic diversion from quiet streets
- Reduced speed is key: lower motor vehicle speeds and gentle grades on cycling routes
- Removing obstacles is key: e.g., streetcar tracks, construction, bollards, traffic circles, speed bumps

Our previous research shows that cyclists also prefer the safer route types, making them good choices to encourage cycling and to prevent injuries.

best route types to encourage cycling & prevent injuries

cycle tracks alongside major roads

bike routes with traffic diversion on local streets

bike only paths separated from traffic

FOR MORE INFORMATION

Much more information about this study, and the entire Cycling in Cities research program, is available on our website:

http://cyclingincities.spph.ubc.ca

A peer-reviewed article from this study can be found at:

Teschke K, Harris MA, Reynolds CCO, Winters M, Babul S, Chipman M, Cusimano MD, Brubacher J, Friedman SM, Hunte G, Monro M, Shen H, Vernich L, Cripton PA. Route infrastructure and the risk of injuries to bicyclists: A case-crossover study. *American Journal of Public Health* 2012; in press

If you have questions about this study, would like to know more, or would like a copy of one of our publications, please contact:

Kay Teschke
Professor
School of Population and Public Health
University of British Columbia
Phone: 604 822 2041
E-mail: kay.teschke@ubc.ca

Meghan Winters
Assistant Professor
Faculty of Health Sciences
Simon Fraser University
Phone: 778 782 9325
E-mail: mwinters@sfu.ca

a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

SFU SIMON FRASER UNIVERSITY
ENGAGING THE WORLD

UNIVERSITY OF TORONTO

STUDY FUNDERS

CIHR IRSC
Canadian Institutes of Health Research / Instituts de recherche en santé du Canada

HEART & STROKE™ FOUNDATION