Effect of neighbourhood proximity to safer routes on male & female bike commuting

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Photo: Ken Ohrn

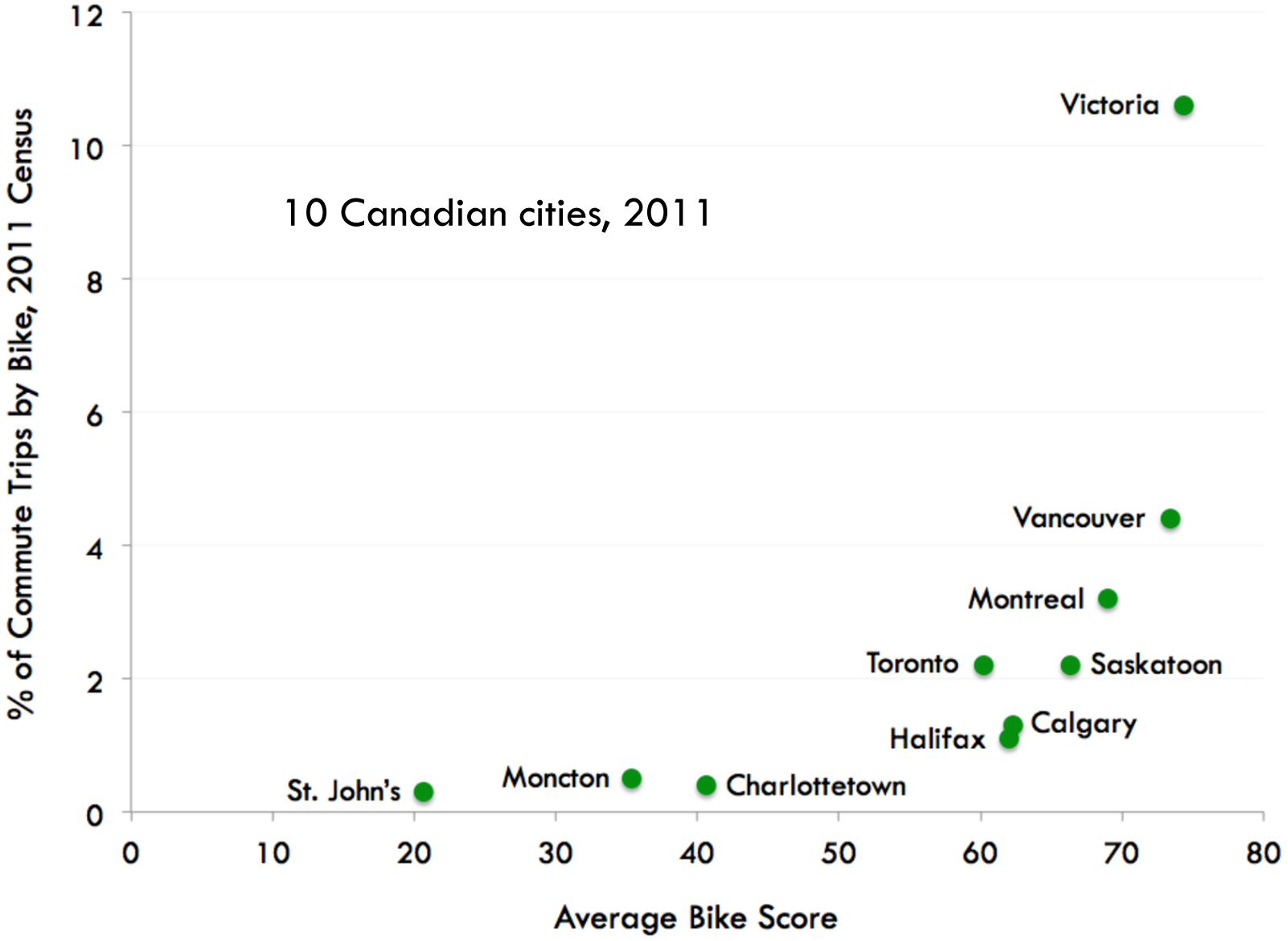
Photos: Ken Ohrn

Women & girls make up
½ the population

In typical Canadian cities they take
½ of motor vehicle trips
½ of walking trips
½ of transit trips

… but only
¼ of bike trips

Multiple studies: more bikeways, more cycling



Multiple studies: certain bikeway types preferred & safer

Cycle tracks

71% likely to cycle

0.1 risk
vs. no bike infra

Painted bike lanes

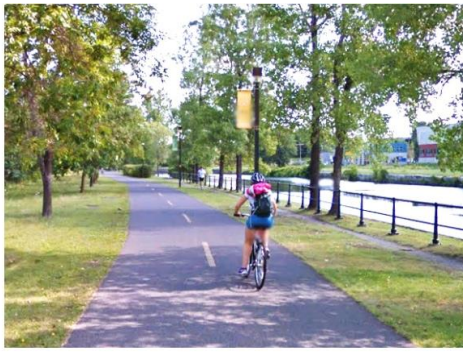
39% likely to cycle

0.7 risk
vs. no bike infra

Residential street bikeways

65% likely to cycle

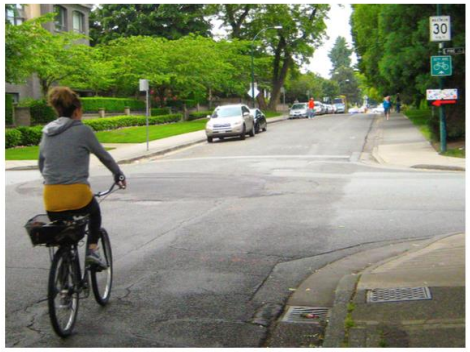
0.5 risk
vs. no bike infra

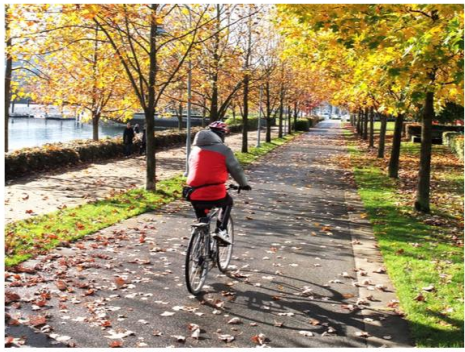


Off-street bike paths

85% likely to cycle

0.6 risk
vs. no bike infra





Methods

2011 GIS data

- bikeways
- proximity from residential parcels to bikeways (surface displacement, along network)

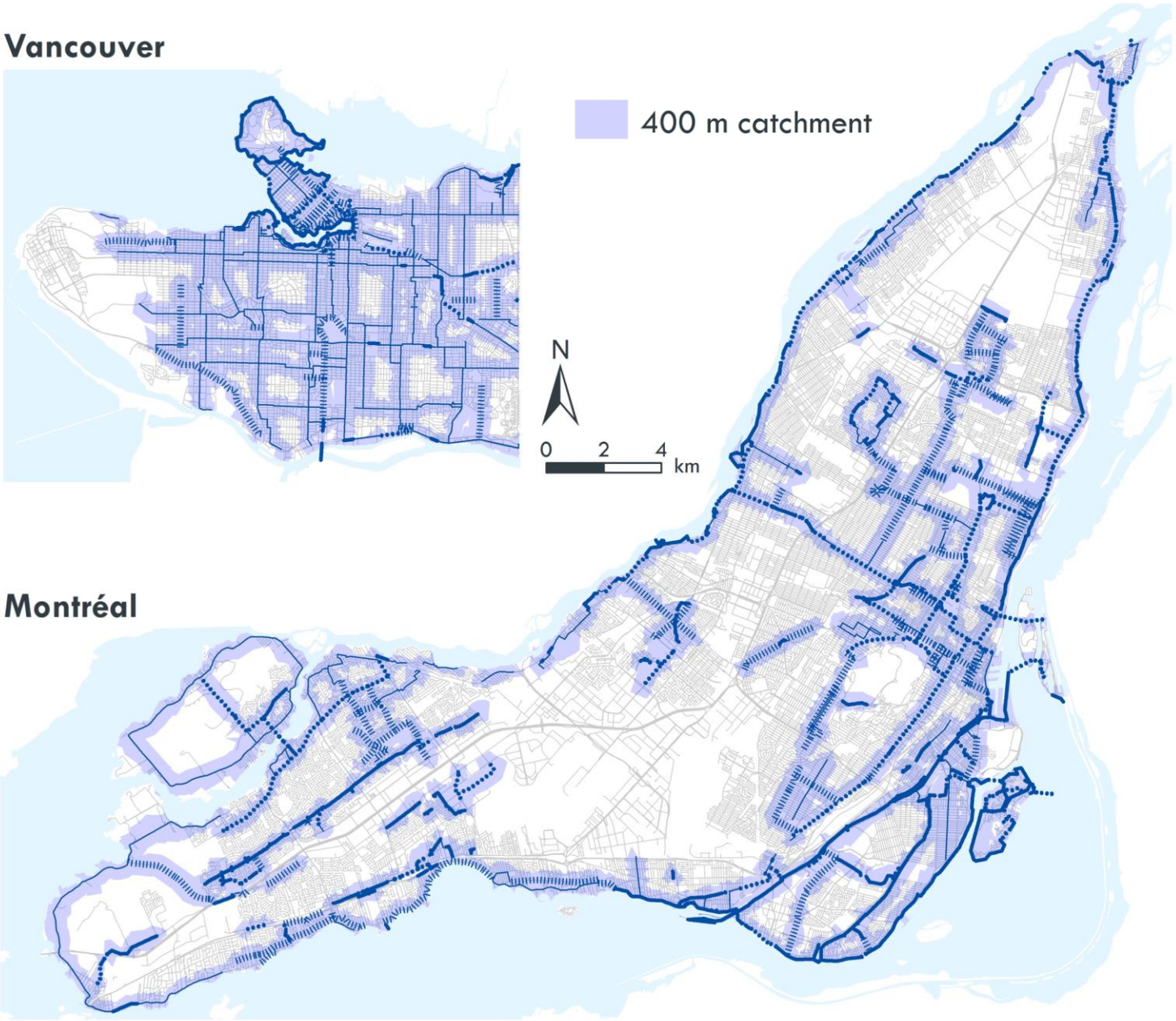
2011 National Household Survey

- 460,000 residents of Montreal
- 140,000 residents of Vancouver
- % of commute trips by bike

summarized & linked by census tract (~neighbourhood), unit of analysis, n=634

Photo: Ken Ohrn

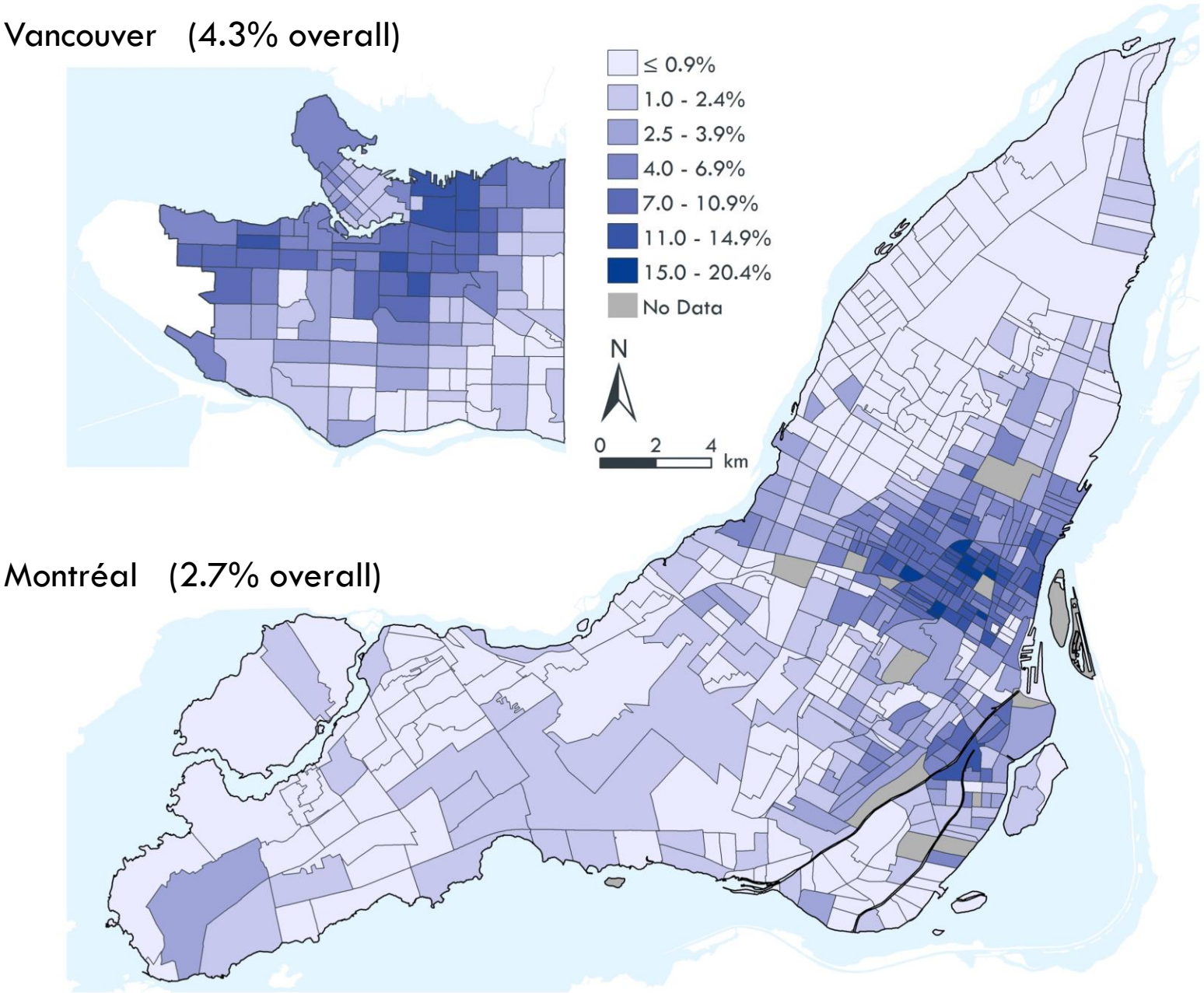
Bikeway coverage, 2011



Bikeway lengths & types, 2011

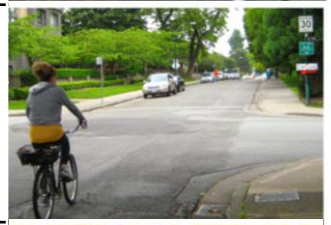
	Montréal	Vancouver
Any bikeway	448 km	241 km
Cycle track	25%	6%
Painted bike lane	24%	17%
Residential street bikeway	21%	65%
Off-street bike path	29%	12%

% of commute trips by bike, by neighbourhood (census tract), 2011



Did neighbourhood % of commute trips by bike vary by bikeway proximity?

		Relative increase per 1 km closer proximity
Any bikeway	Both cities	**3.9**
Cycle track	Both cities	1.5
Painted bike lane	Montréal	1.5
	Vancouver	-
Residential street bikeway	Montréal	1.4
	Vancouver	3.2
Off-street bike path	Montréal	1.3
	Vancouver	-



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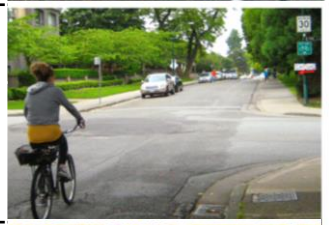
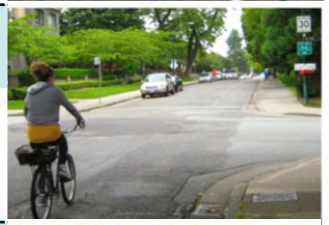
	Vancouver	-



Did neighbourhood % of commute trips by bike vary by bikeway proximity?

			Relative increase per 1 km closer proximity
Network in Montréal	Any bikeway	Both cities	3.9
	Cycle track	Both cities	1.5
	Painted bike lane	Montréal	1.5
		Vancouver	-
	Residential street bikeway	Montréal	1.4
		Vancouver	3.2
	Off-street bike path	Montréal	1.3
		Vancouver	-



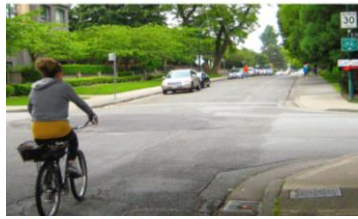
Did neighbourhood % of commute trips by bike vary by bikeway proximity?

Network in Vancouver

		Relative increase per 1 km closer proximity
Any bikeway	Both cities	3.9
Cycle track	Both cities	1.5
Painted bike lane	Montréal	1.5
	Vancouver	-
Residential street bikeway	Montréal	1.4
	Vancouver	3.2
Off-street bike path	Montréal	1.3
	Vancouver	-

Were there differences in associations for men & women?

		Relative increase per 1 km closer proximity	
		Male	**Female**
Any bikeway	Both cities	**3.3**	**5.7**
Cycle track	Both cities	1.4	1.9
Painted bike lane	Montréal	1.4	1.7
	Vancouver	-	-
Residential street bikeway	Montréal	1.3	1.5
	Vancouver	2.8	5.1
Off-street bike path	Montréal	1.3	1.5
	Vancouver	-	-



Did more women cycle in higher cycling neighbourhoods?

% of commute trips by bike of neighbourhood		% female of all cycle commuters
Low	0 – 2.4%	11%
Moderate	2.5 – 6.9%	30%
High	7.0 – 20.4%	44%

Photo: ECF

Photo: Ken Ohrn

Conclusions

Variation in cycling at census tract level in Montréal & Vancouver: 0 to 20.4%

- associated with proximity to any bikeway & cycle tracks (safe, preferred)
- associated with routes that form network
- proximity to bikeways much more important to women

In neighbourhoods where cycle commuting more common, % female approached parity with males

Journal of Transport & Land Use 2017

Cycling in Cities, UBC

@kteschke


Photo: The Alternative Department for Transport
Women = "indicator species" for cycling
If ½ of people cycling are female
→ you are building it right

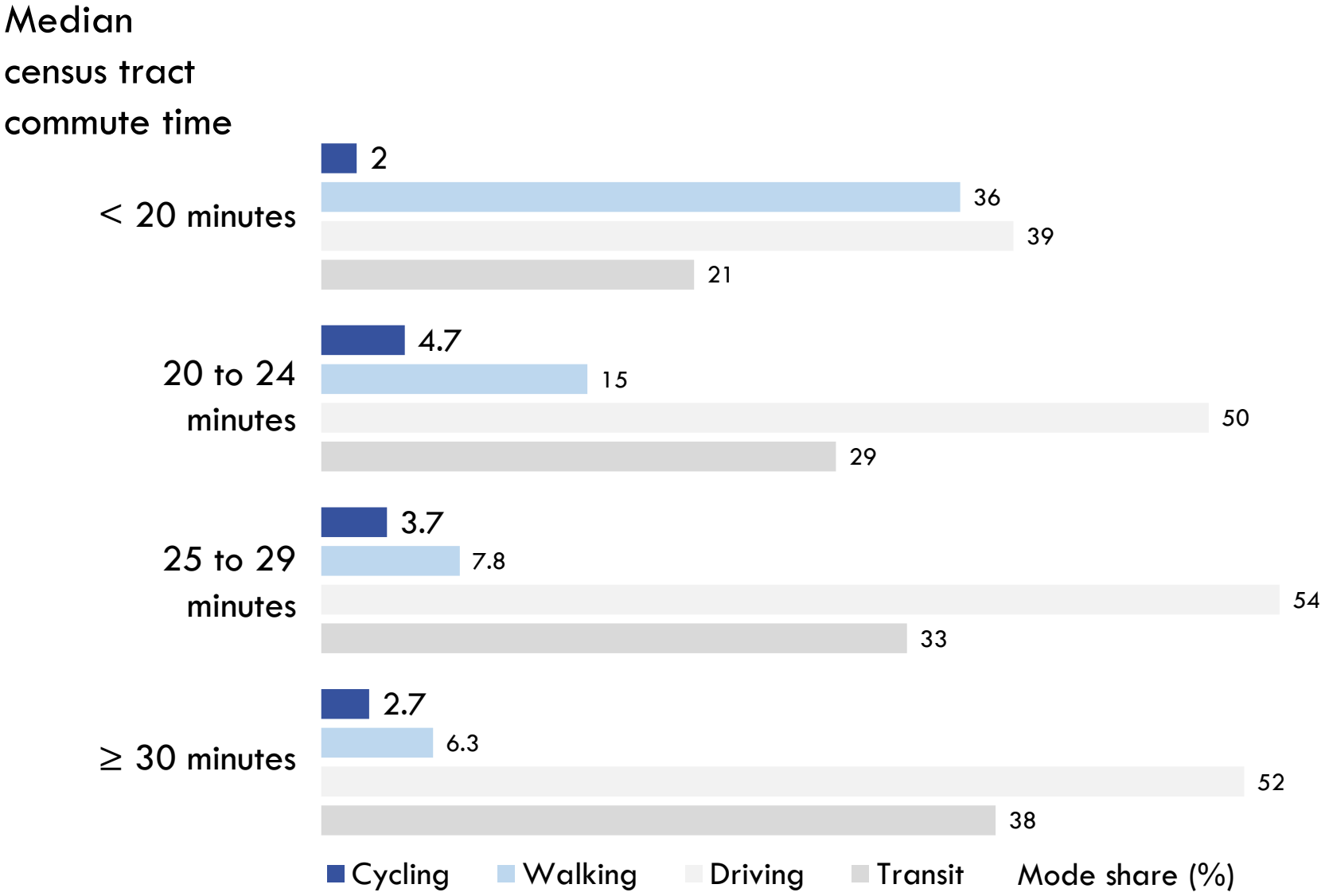
Did neighbourhood cycling mode share vary with slope to bikeways?

Uphill slopes from homes to any bikeway associated with mode share

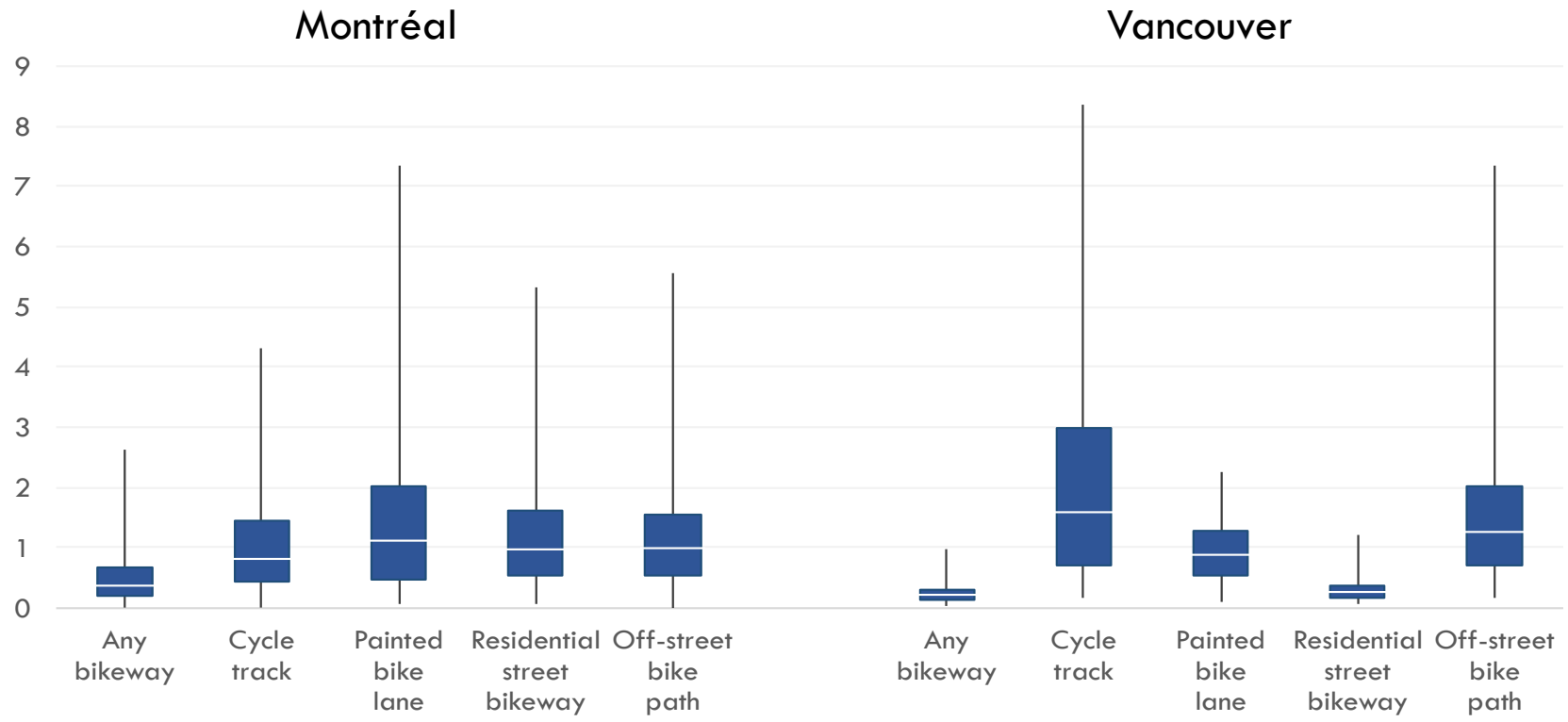
… but not absolute slope
… and not slope to specific bikeway types

… and only in unadjusted analyses

Did census tract mode share vary by commute time?



Census tract proximities to & available km of bikeways



Available kilometres of each bikeway type in each city										
448 km	113 km	107 km	96 km	132 km		**241 km**	15 km	40 km	157 kmm	29 km

Neighbourhood cycling mode share category *vs.* proportion female, bikeway proximity, uphill slope to nearest bikeway

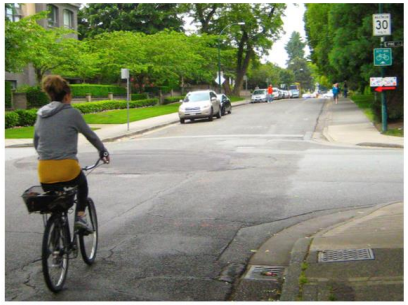
	Categories of cycling commute mode share (%)			
	0	0.5 to < 2.5	2.5 to < 7	7 to 20.4
% of bike commuters who were female	-	11.2	30.3	43.5
Mean distance (km) to				
Any bikeway	0.63	0.50	0.33	0.30
Cycle tracks	1.41	1.42	1.14	0.79
Painted bike lanes	1.68	1.39	1.06	0.84
Residential street bikeways	1.42	1.24	0.69	0.69
Off-street bike paths	1.35	1.27	1.20	0.94
Mean maximum uphill slope (%) on route to nearest bikeway	0.94	0.94	0.63	0.68

Bikeway types available in Montreal & Vancouver, 2011










	Cycle tracks	Painted bike lanes	Residential st. bikeways	Off-street bike paths
Montreal	113 km	107 km	96 km	132 km
Vancouver	15 km	40 km	157 km	29 km