

USING EVIDENCE FROM INJURY STUDIES TO UPDATE CYCLING TRAINING MATERIALS IN CANADA

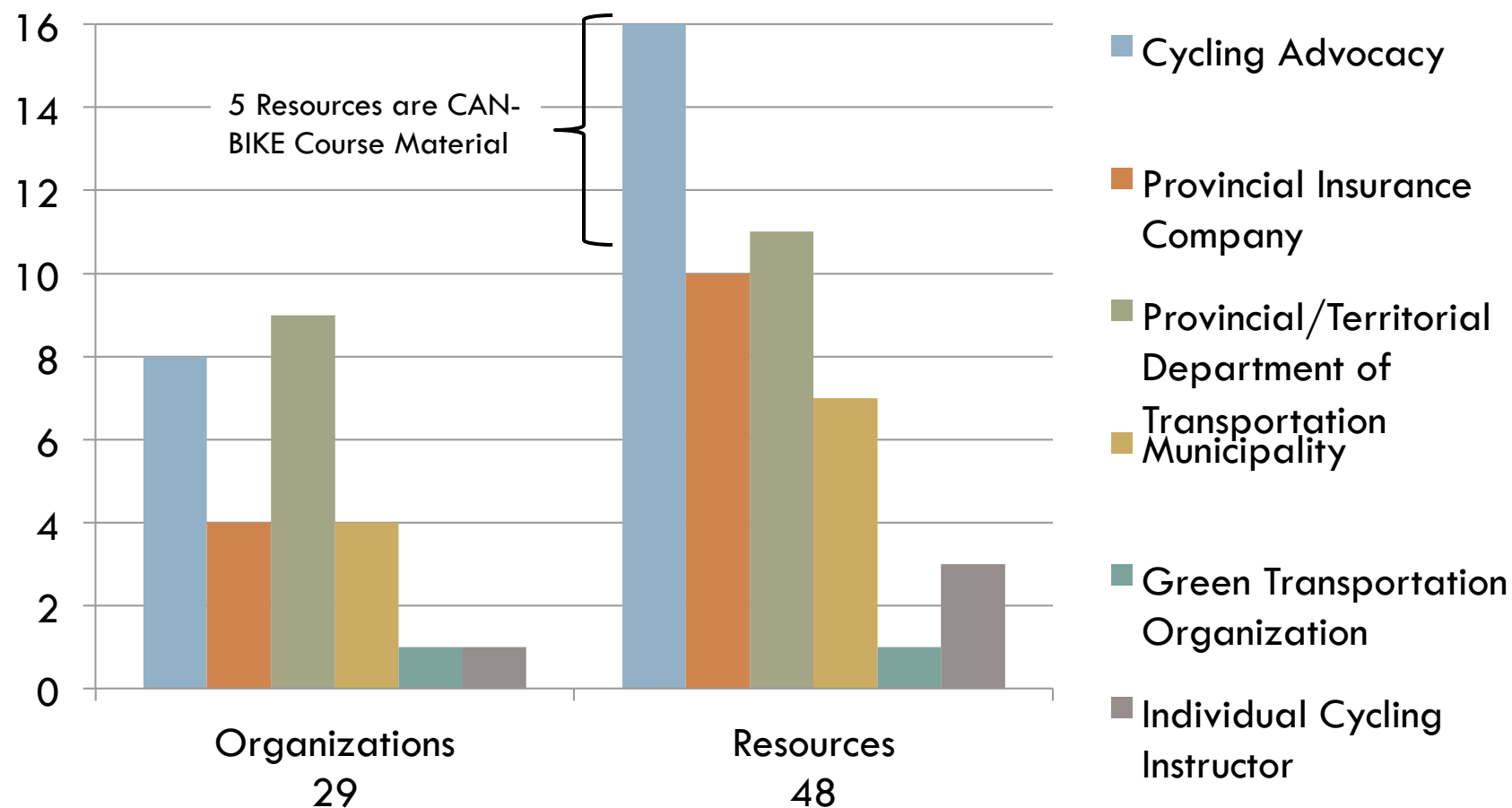
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Goal

- To improve cycling safety training by comparing cycling education materials to research on cycling safety.



Education Resources



Education Topics

- 
- ❑ Behaviours
 - ❑ Visibility
 - ❑ Riding on the Road
 - ❑ For cyclists & motorists
 - ❑ Intersections
 - ❑ For cyclists & motorists
 - ❑ Route Planning
 - ❑ Heavy Vehicles
 - ❑ Safety Gear
 - ❑ Signaling & Shoulder Checking
 - ❑ Road Conditions and Hazards
 - ❑ Controlling your Bike
 - ❑ Rules of the Road
 - ❑ Bike Fit & Maintenance

Scientific Literature Selection



- Search conducted using PubMed, Medline, and TRIS
 - ▣ Updated through January 2012

- Selection Criteria
 - ▣ Original research
 - ▣ Investigates the relationship between cyclist safety and a factor that can be affected by education
 - ▣ Uses a measure of relative risk to determine effect

Scientific Literature Selection

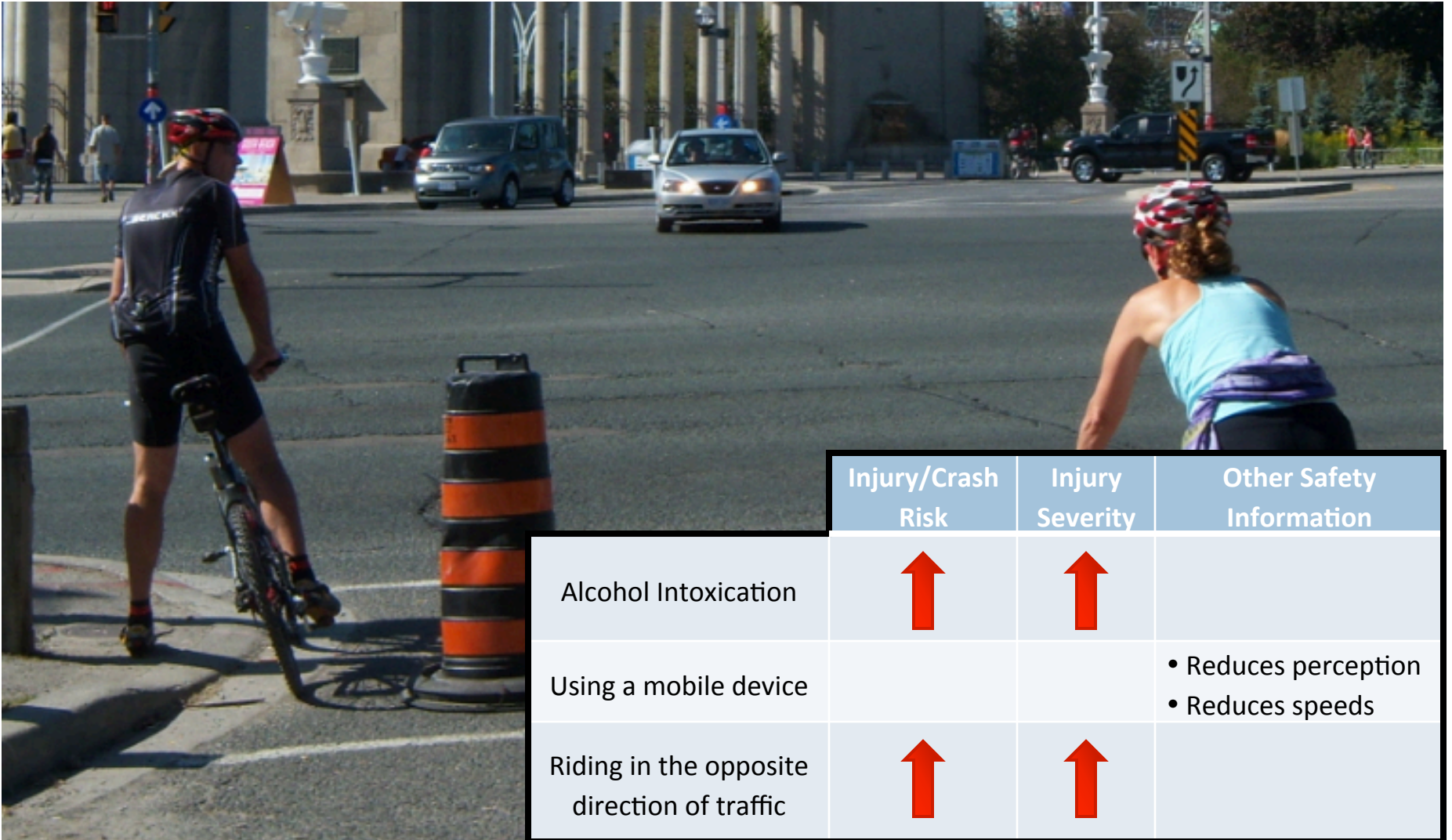


Topics Covered by Literature

- ❑ Cyclist Behavior
- ❑ Visibility
- ❑ Route Types
- ❑ Road Characteristics
- ❑ Bicycle-Motor Vehicle Collisions
- ❑ Heavy Vehicles



Cyclist Behavior



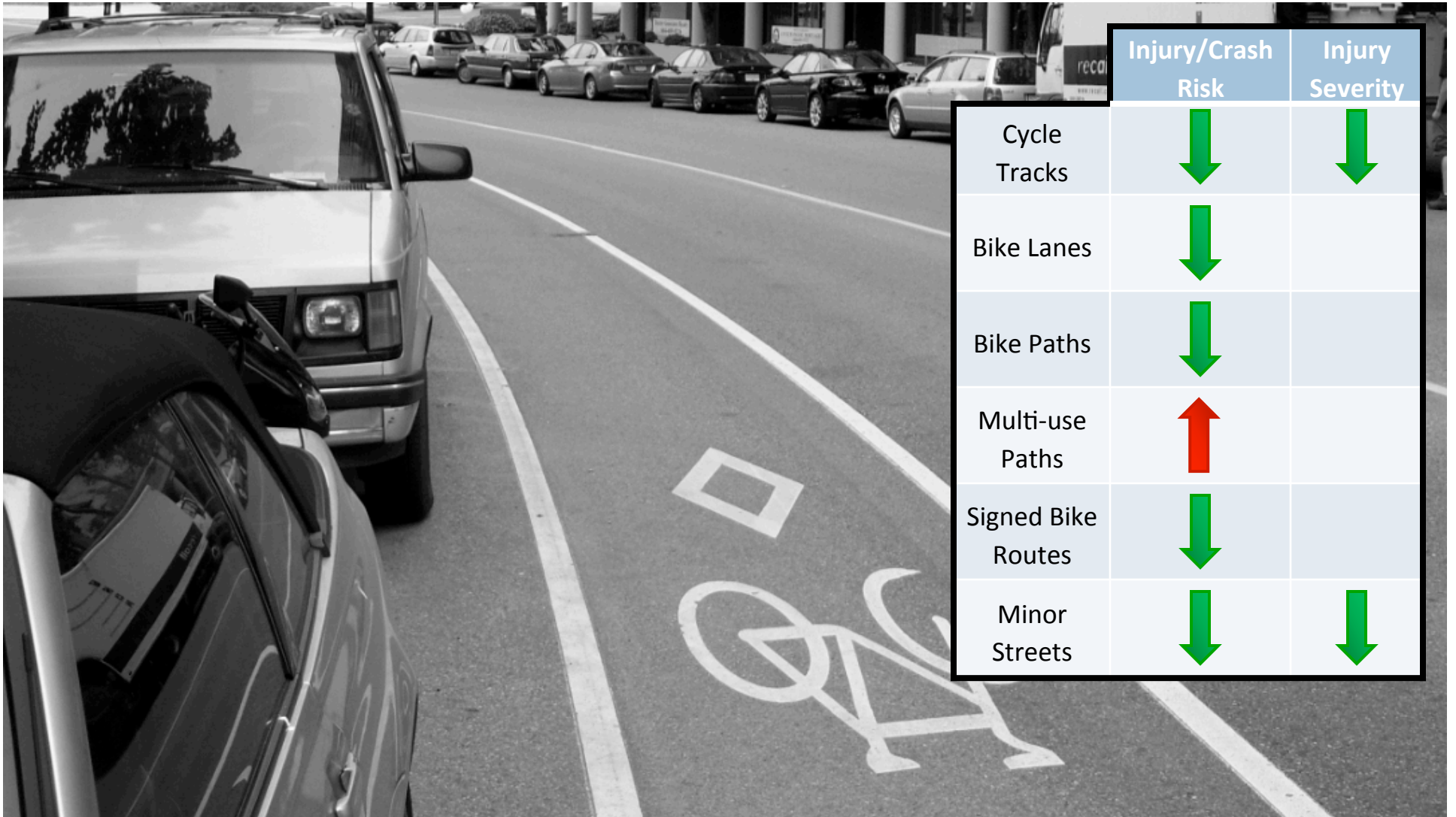
	Injury/Crash Risk	Injury Severity	Other Safety Information
Alcohol Intoxication	↑	↑	
Using a mobile device			<ul style="list-style-type: none">• Reduces perception• Reduces speeds
Riding in the opposite direction of traffic	↑	↑	

Visibility

	Injury/Crash Risk	Injury Severity
Dark, unlit conditions	↑	↑
Fluorescent Clothing & Reflectors	↓	↓
Inclement Weather Conditions		↑



Route Types



Route Types: No Cycling Infrastructure

	Injury/Crash Risk	Injury Severity
Sidewalks	↑	↑
Major Streets	↑	
Highways		↑



Passing Distances



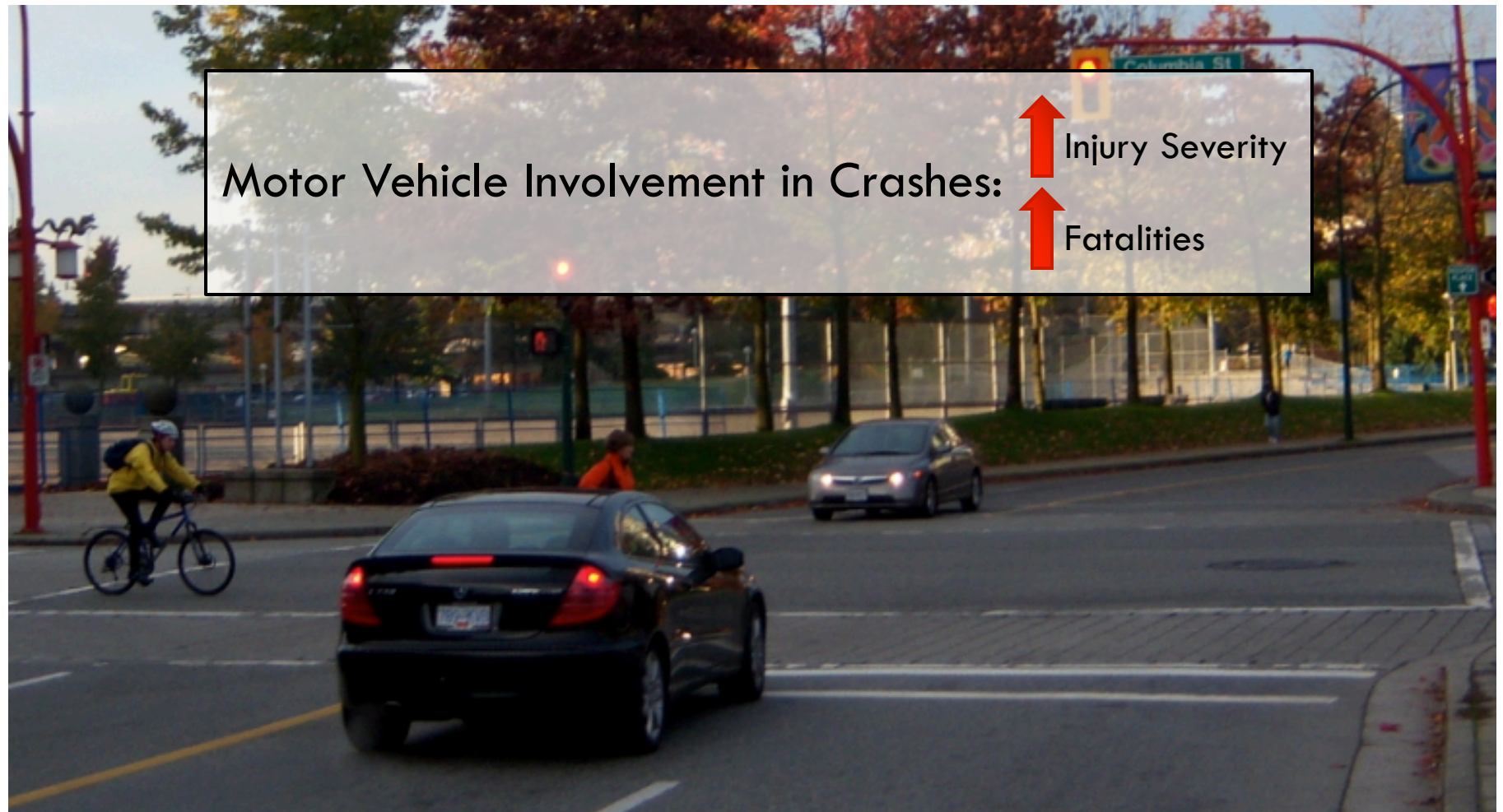
	Passing Distance
High Speed & Wide Roads	↓
Cyclists riding far from curb	↓
Bike Lanes	↓
Heavy vehicle passing	↓

Road Characteristics

	Injury/Crash Risk	Injury Severity	Other Safety Information
Grades	↑*	↑	*Downhill grades increase risk
Divided roadways		↓	
Roundabouts & Traffic Circles	↑	↑	• Those with separated cycling facilities are safer
High motor vehicle speeds	↑	↑	
Traffic Volumes	↑	↑	



Bicycle-Motor Vehicle Collisions



Heavy Vehicles



Heavy Vehicle Involvement in Crashes:

Injury Severity

Fatalities

Single Studies & Conflicting Evidence

Single Study

Behaviours

Risky Behaviours

Failing to Give ROW

Cycling Rapidly

Looking Away from the Road

Motorists Passing Too Close

Road Treatments for Cyclists

Bike Boxes

Coloured Cycle Lanes

Separated Left Turn Lanes

Visibility

Nighttime visibility at crossings

Conflicting Evidence

Route Types & Road Characteristics

Curved roads & sections

Recently paved roads

Children riding on sidewalks

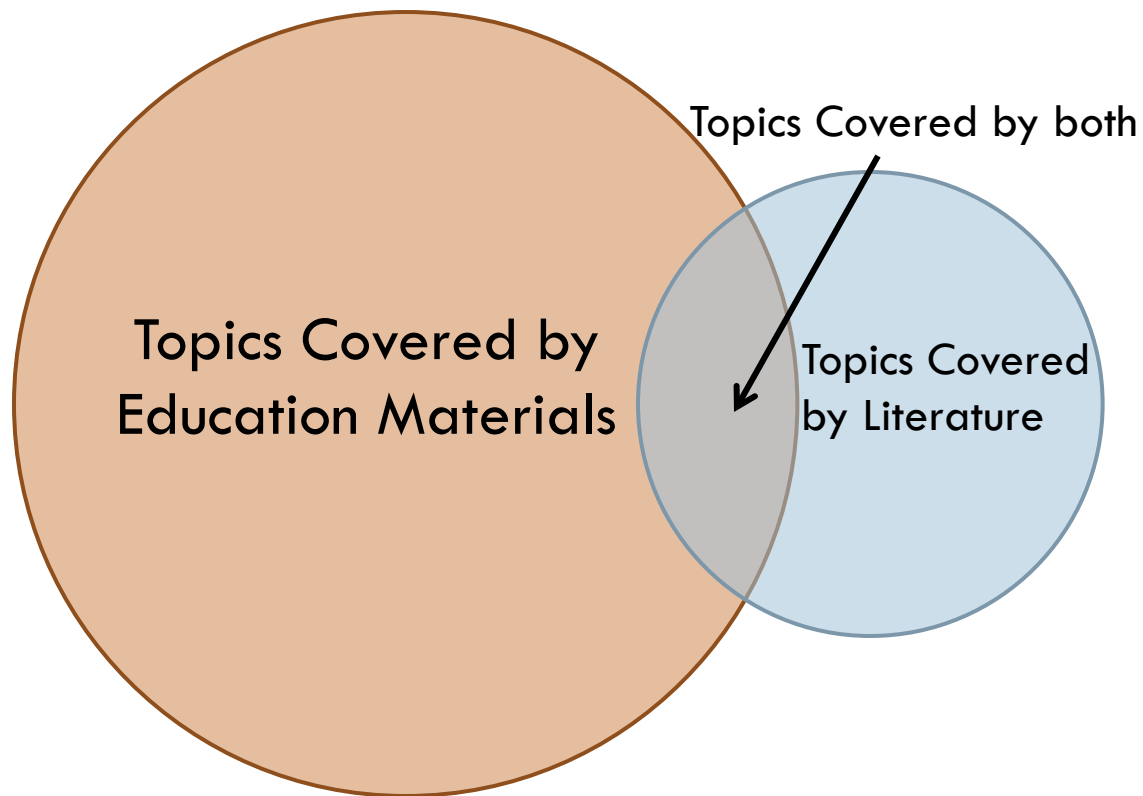
Train/Streetcar Tracks

Construction

Off road & unpaved paths

Intersections

Education vs. Scientific Literature



Education vs. Scientific Literature

Topics
Covered
by Both

Visibility

- Use lights after dark
- Wear reflective clothing & reflectors
- Wear fluorescent, bright, or white clothing during the daytime
- Equip your bike with reflectors
- Wear ankle and knee reflectors for best visibility

Intersections

- Stop and look before entering the street
- Yield to cross traffic
- Look for cars turning left across your path
- Make eye contact with drivers to communicate your intentions.

Riding on the Road

- Ride in the direction of traffic
- Be extra careful when cycling around motor vehicles

Road Conditions and
Hazards

- Ride slowly & break lightly in inclement weather

Controlling your Bike

- Gear down before starting up a hill
- Keep control of your bike

Route Planning

- Don't ride on sidewalks
- Avoid riding on major roads and highways

Behaviours

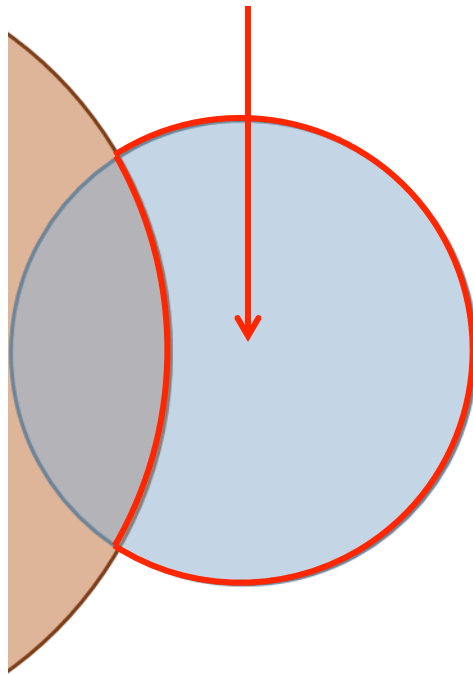
- Don't ride while intoxicated
- Don't use a mobile device while riding

Heavy Vehicles

- Stay away from large vehicles
- Ride far enough behind that the driver can see you in his side mirror
- Be extra cautious of heavy vehicles turning right

Education vs. Scientific Literature

Topics Covered only by
Scientific Literature



Cyclist Behavior

- Cyclists should not listen to music while cycling

Visibility

- Use lights in fog

Route Types

- Use cycling-specific routes
- Use routes separated from traffic or with low traffic volumes
- Vehicles pass closer to cyclists riding further from the curb

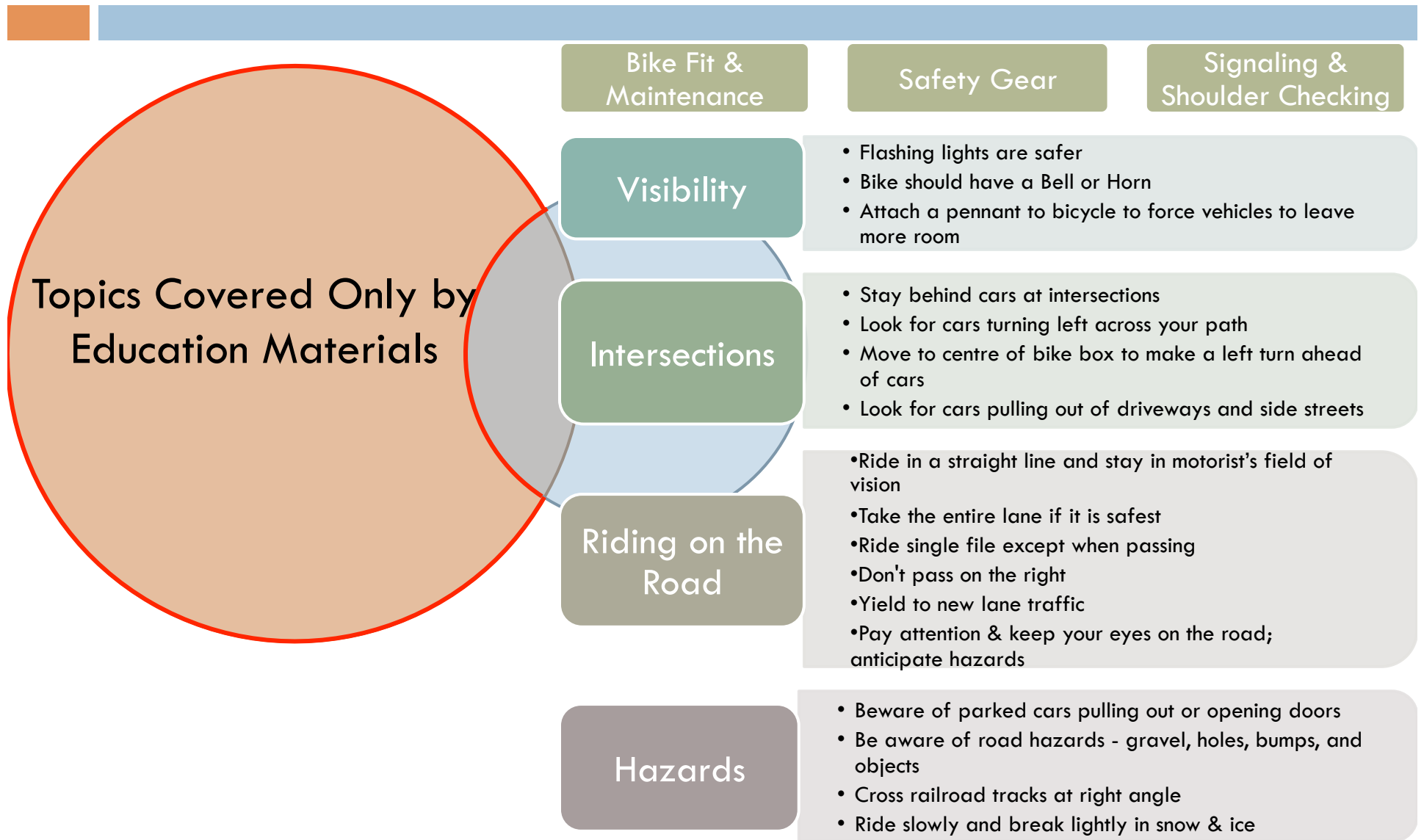
Road Characteristics

- Roundabouts present an elevated injury risk for cyclists

Heavy Vehicles

- Avoid routes with high bus or heavy vehicle traffic

Topics Not Covered by Literature



Information for Motorists

Intersections

- Look for cyclists at intersections and yield right-of-way
- Check for cyclists at intersections
- Don't underestimate bike speed
- Always signal turns
- Make eye contact with cyclists

On the Road

- Slow down & be cautious around cyclists
- Check for cyclists when opening vehicle doors & pulling away from the curb
- Leave ample room when passing cyclists & always signal
- Be aware of the hazards that may affect cyclists and anticipate actions they may take
- Do not follow cyclists too closely
- Dim your lights when approaching a cyclist
- Avoid honking at cyclists.

Uncited Facts in Education Materials

“75% of accidents happen at intersections”

“Most accidents occur at intersections”

“80% of accidents occur at intersections (in Vancouver)”

“Falls - 50%
of collisions”

Bike-Bike -
17% of all
collisions

“Car-Bike -
17% of all
collisions”

“Bike-Dog -
8% of all
collisions”

“Most car-bike collisions
involve vehicles
turning /crossing the
path of cyclists”

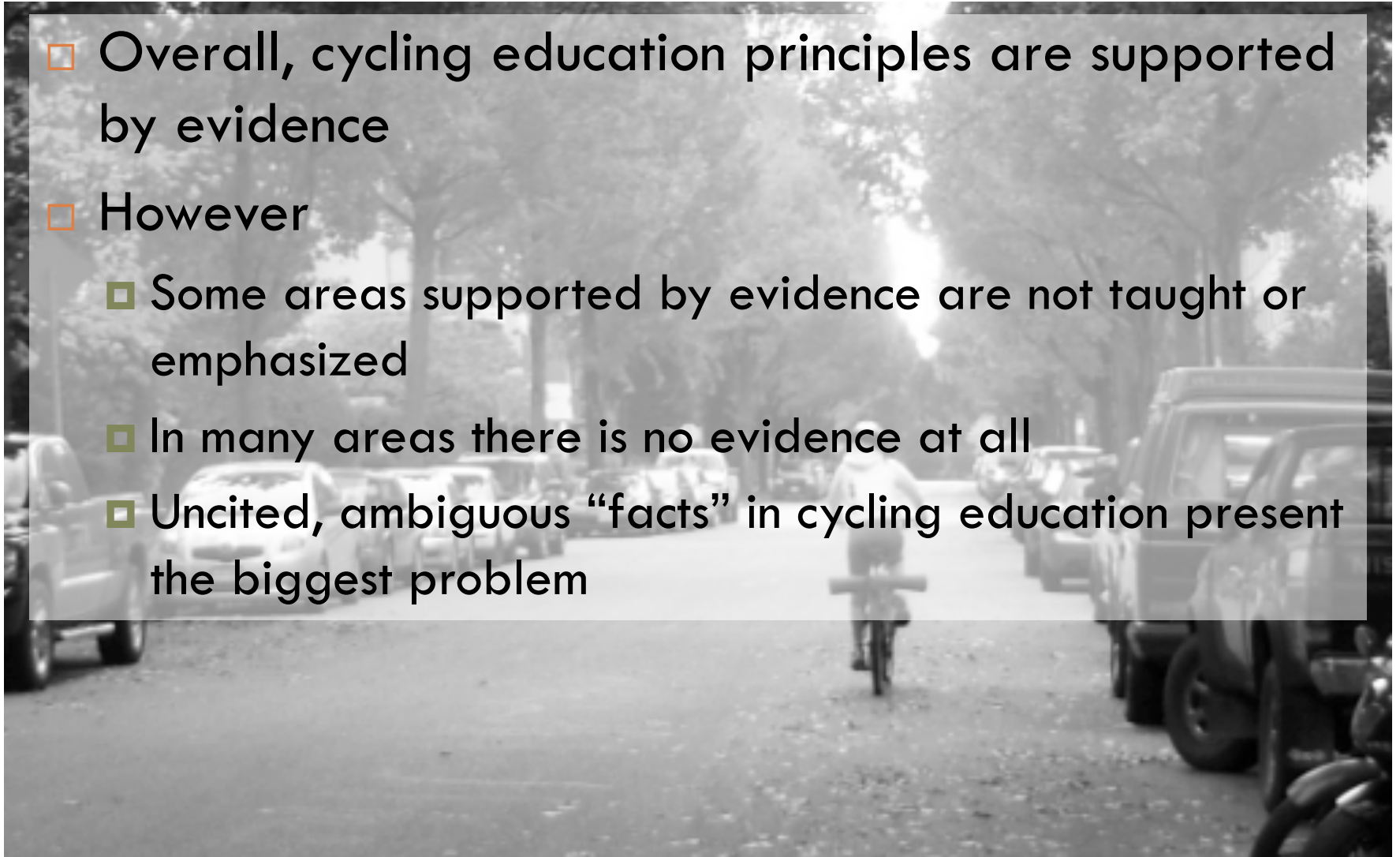
“Adults most likely
injured by motorist
error”
“Only 4% are motorist
error (0.8% of all
collisions)”

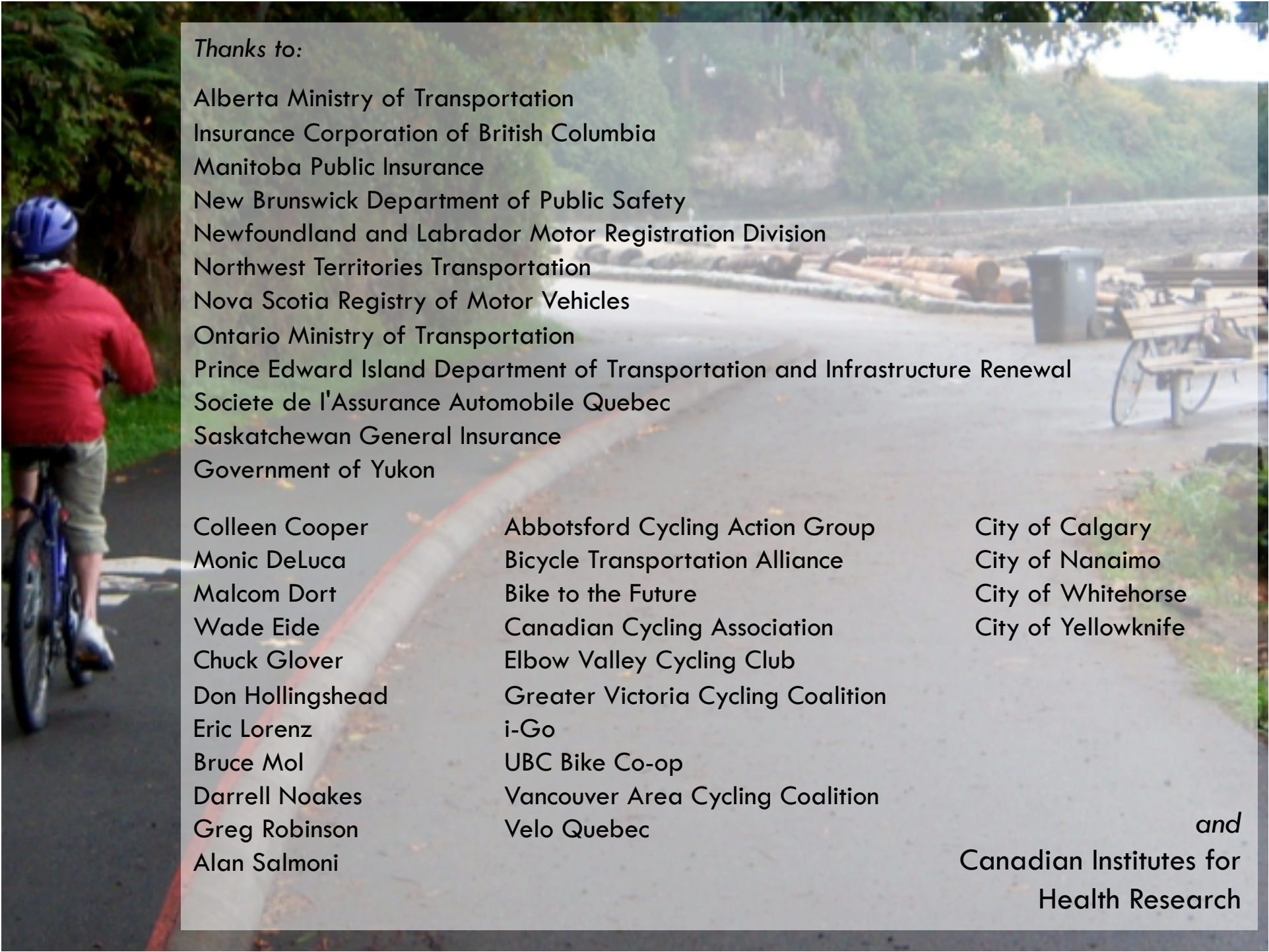
“Disobeying rules of the
road factor in 1/2 of
collisions (51%)”

“6% are caused by
cyclists swerving into
traffic”

Conclusions

- ❑ Overall, cycling education principles are supported by evidence
- ❑ However
 - Some areas supported by evidence are not taught or emphasized
 - In many areas there is no evidence at all
 - Uncited, ambiguous “facts” in cycling education present the biggest problem





Thanks to:

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