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Using evidence as part of the decision making pathway: A resource to assist practitioners in road safety

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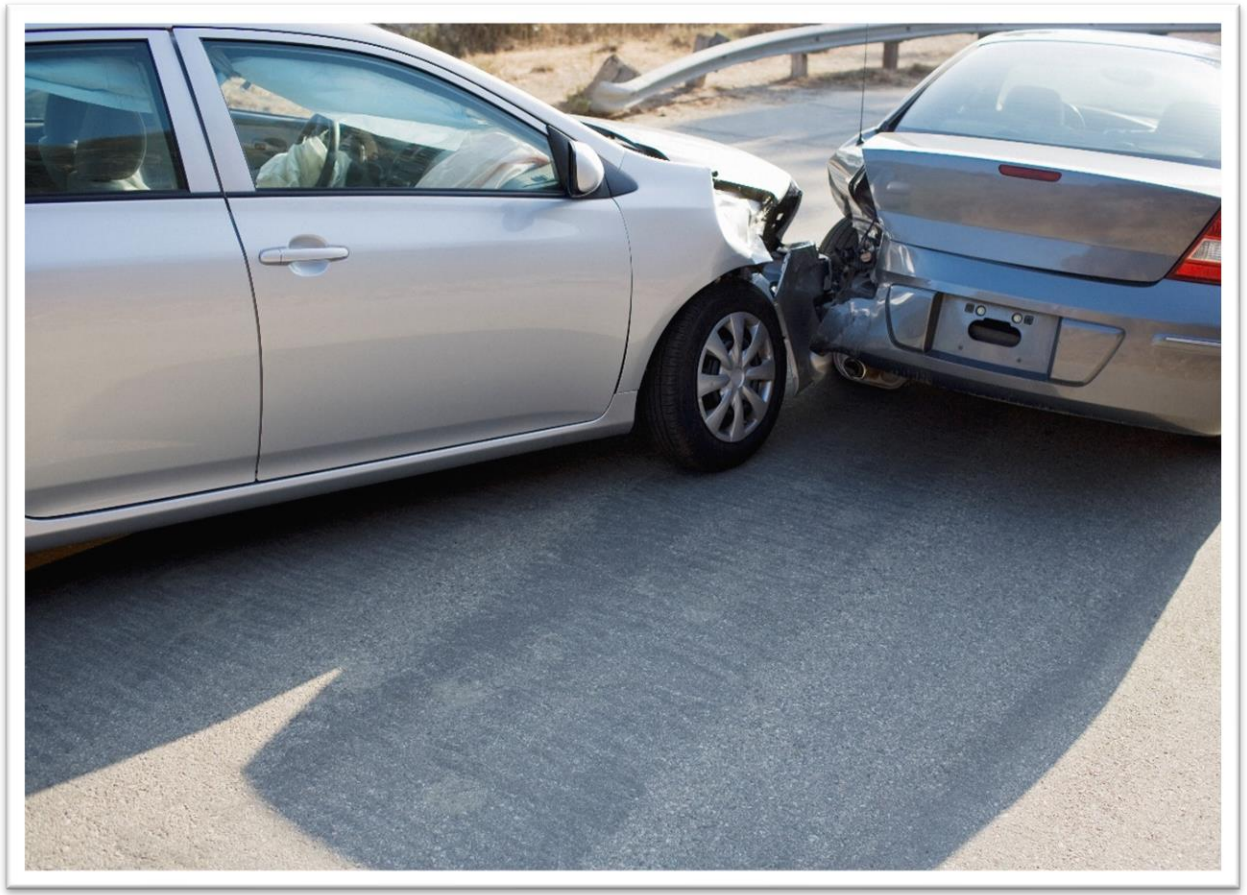
Background: Road Safety in Public Health

- Injuries and deaths from motor vehicle collisions pose a significant public health problem.
- In Ontario, the rate of ED visits due to injuries from motor vehicle collisions was 597.5/100,000.[1]

1. Ontario Agency for Health Protection and Promotion. Injury Snapshots. Accessed: August 20, 2021: https://www.publichealthontario.ca/en/data-and-analysis/injuries-data/injury-er-visits

Background: Road Safety in Public Health



- Public health practitioners are charged to use an evidence-informed decision making process both for building a program of public health as well as advocating for road safety policy.

Background: Road Safety in Public Health

- However, both public health and built environment practitioners cite the lack of accessible evidence and data as a significant barrier to developing a program of public health.[1]

1. Richmond et al., (2020) How can we support best practice? A situational assessment of injury prevention practice in public health. *BMC Public Health* **20,** 431 (2020). https://doi.org/10.1186/s12889-020-08514-x

Objective:

To develop an resource for road safety practitioners to access evidence on the effectiveness of built environment interventions from road safety policies in urban municipalities

Resource Development: Process

1. **Environmental scan**
2. **Iterative consultation process with end users and stakeholders**
3. **On-line content development with digital design team**
4. **Launch of tool, evaluation, future work**

Methods: Environmental Scan

- Environmental scan for 5 urban municipalities in Canada was completed to determine the types of interventions in road safety policies
    - Toronto, Peel, Calgary, Vancouver, Montreal

- Articles were retrieved from citations within the policies themselves, supplemented by a search of articles indexed in MEDLINE and grey literature searches in PubMed and Google Scholar.

Methods: Peer-Reviewed Literature Search

- **Inclusion**: examined BE intervention, collision or collision pathway outcome (i.e., vehicle speed, vehicle volume, yielding), all study designs, studies published less than 20 years ago.
- **Exclusion**: non-BE interventions, implementation/planning guides, modal choice, increasing physical activity.

Methods: Critical Appraisal

- For each tool, total scores were divided into three equivalent categories – **weak, moderate, strong**

AXIS [0-20]	**CASP – CC** [0-11]	**CASP – C** [0-14]	**TREND** [0-22]	**HE** [0-10]
0-6: Weak	0-3: Weak	0-4 Weak	0-7 Weak	0-4: Weak
7-13: Moderate	4-7: Moderate	5-9: Moderate	8-15: Moderate	5-7: Moderate
14-20: Strong	8-11: Strong	10-14: Strong	16-22: Strong	8-10: Strong

Methods: Data Synthesis

- Data were extracted from all studies and synthesized by intervention type:
  - Bicycle interventions
  - Vehicle interventions
  - Pedestrian interventions

Methods: Tool Development

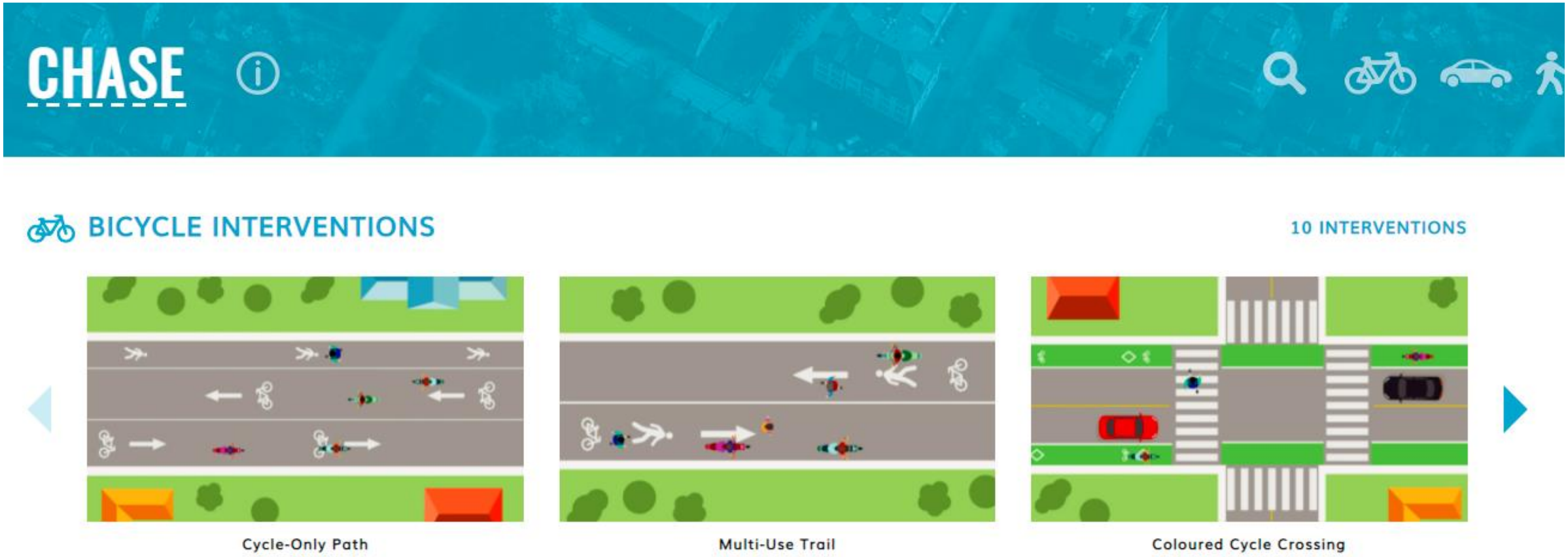
- Key informant interviews with end users
- Hosted several stakeholder team meetings during tool development
- Collected information on user perspective, interactivity and content at two time points
- Consulted with digital design team to assist in tool development

Results: Tool Development

- There were a total of **118** studies included from the environmental scan
- A total of **48** interventions were included in the tool

- Bicycle interventions = **10**
- Vehicle interventions = **26**
- Pedestrian interventions = **12**

Results: CHASE Tool



Results: CHASE Tool

HOW TO USE THIS TOOL

We have grouped the built environment interventions into three main categories: streets and sidewalks, intersections and crossings, and bicycle-related interventions. Streets and sidewalks and intersections and crossings both contain sub-groups including vertical and horizontal deflections, and an other category, and pedestrian focused and vehicle focused sub groups for intersections and crossings. Area-wide traffic calming interventions were placed in the 'other' sub-group in streets and sidewalks.

Each intervention includes a description of what the intervention is, the types of study designs that were found from the environmental scan and literature review, the number of studies that were included in the summary and results of the critical appraisal. For each intervention type, there is a summary of the outcomes presented in each study. Examples of outcomes in this tool include motor vehicle collisions (MVCs), traffic volume, traffic yielding, and speed. Each outcome is reported using the data from each study. For example, many studies report the percent reduction in motor vehicle collisions, pre to post implementation of the intervention. Locations in which the included studies took place are also provided for each built environment intervention. Some studies have implemented BE change outside of OECD (Organisation for Economic Co-operation and Development) countries and readers should take into consideration implementation location when interpreting results.

HOW TO INTERPRET EFFECT ESTIMATES:

Perfect reductions, odds ratios and incidence rate ratios

This data was extracted from the studies reported here. You can click on the reference for each study and be taken to its full citation. When we report a range of estimates, for example, several studies reported a change in the number of collisions, pre to post implementation as a percent reduction. We have summarized the range of reductions and presented them like this:

Summary of Evidence
Collisions [% reduction, range]: Serious PMVCs: [-22 to -23%][2] [3]

Discussion: Impact

- Key to development of a program of public heath is to use an evidence-informed decision making process.
- To do this important work, there is a need for accessible evidence on intervention effectiveness.
- Important to highlight the variability in effectiveness of interventions when making decisions for population level impact.

Discussion: Strengths/Limitations

Strengths

- First synthesis and accessible resource summarizing the evidence of effective interventions found in urban municipal road safety policies in Canada.
- The CHASE tool can have significant impact on decision making.
- Targeted literature search using a comprehensive search strategy.
- Critical appraisal process was used and integrated in translation.

Discussion: Strengths/Limitations

Limitations

- Unable to access collision evaluation reports.
- Inclusion of all study designs presents difficulty in comparing results across studies.
- Effectiveness of the tool(s) in determining quality for these designs.
- Limitations within the studies themselves; no control group, did not report measures of variability.

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