



## **Evaluating Impact of 30 km/h Speed Limit Trial: Insights from Pedestrian and Cyclist Safety and Connected Vehicle Data**

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# Acknowledgement



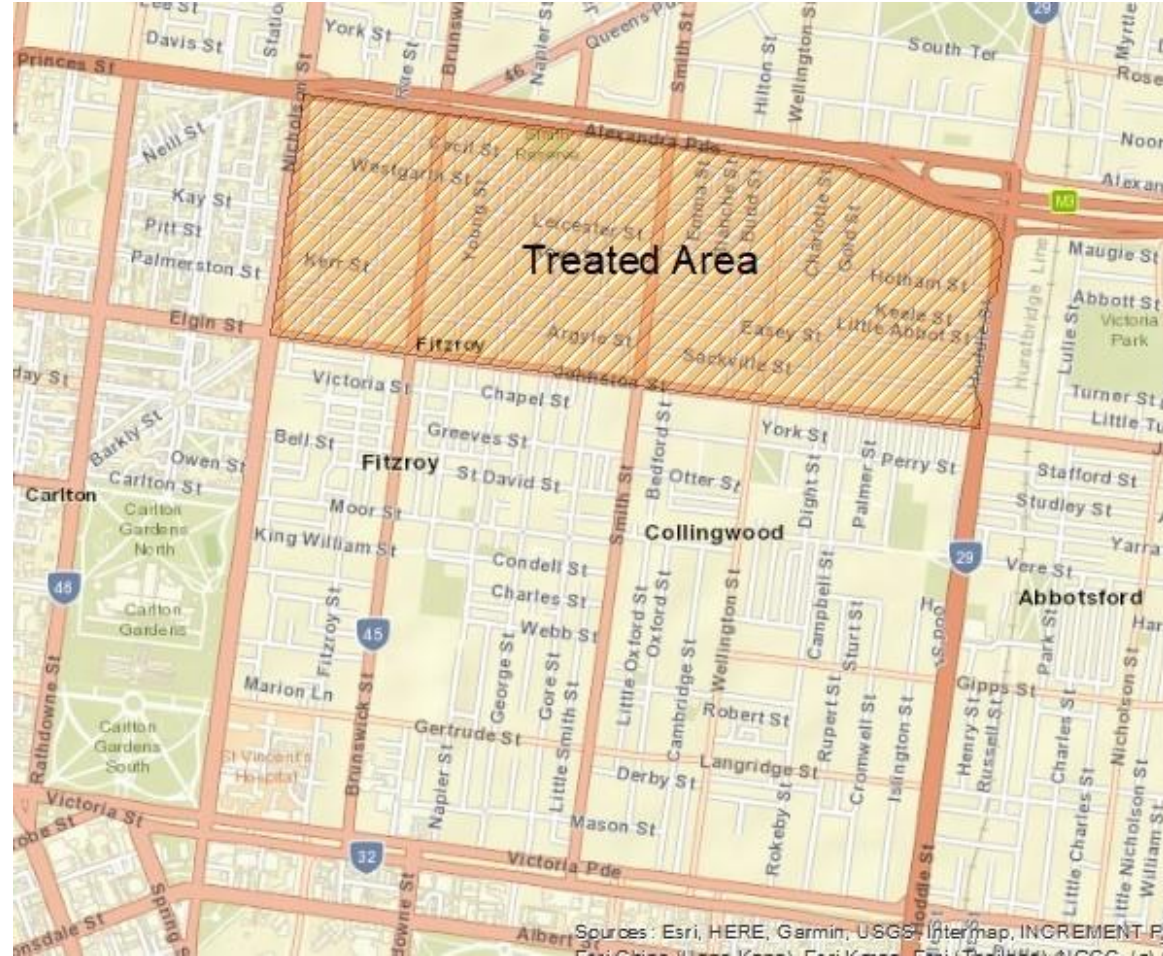
# The trial

## Treatment:

30 km/h speed limit (reduced from 40 km/h)

Year: 2018

**Treated network:** The area bounded by Johnston, Hoddle and Nicholson Streets and Alexandra Parade. Brunswick St and Smith St are excluded.





# Short term evaluation of the treated area

Key Results of short-term evaluation conducted by MUARC (Lawrence et al. 2020):

- Mean speed decreased by 1.1% in the treated area and by 2.7% in the control area.
- The odds of exceeding speed limits of 40 km/h and 50 km/h decreased by 11% and 25%, respectively.
- However, the study did not demonstrate a statistically significant difference in the odds of exceeding the 30 km/h speed limit following this reduction.

Table 6: Speed: Mean speed (and 85<sup>th</sup> percentile)

Group	Time-period		
	Before (baseline)	After 12 months	Reduction
<i>Mean speed (km/h)</i>			
Treatment area	27.6	27.3	-1.1%
Non-treatment area	29.4	28.6	-2.7%
<i>85<sup>th</sup> percentile speed</i>			
Treatment area	36.0	35.0	-2.8%
Non-treatment area	38.0	37.0	-2.6%

Source: Lawrence et al. 2020

# Evaluation approach

## Study design:

Before-after study with control sites

## Before period:

2014 – 2017 (calendar years)

## After period:

2019 – 2022 (calendar years)

## Data:

Victoria Road Crash Data  
(updated November 2023)

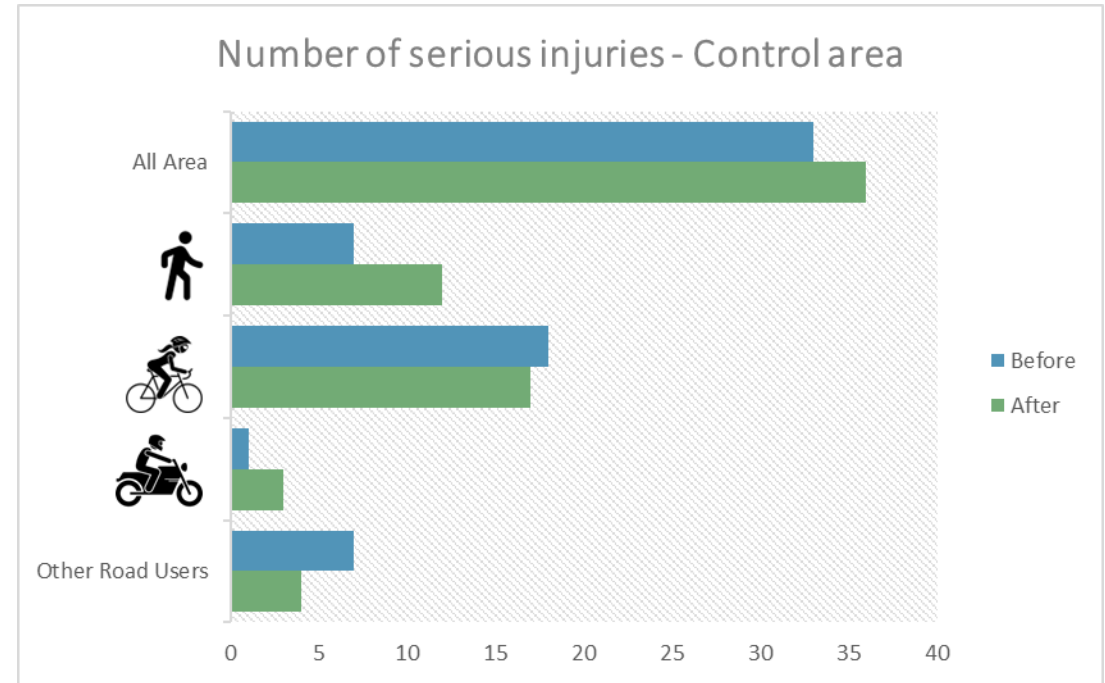
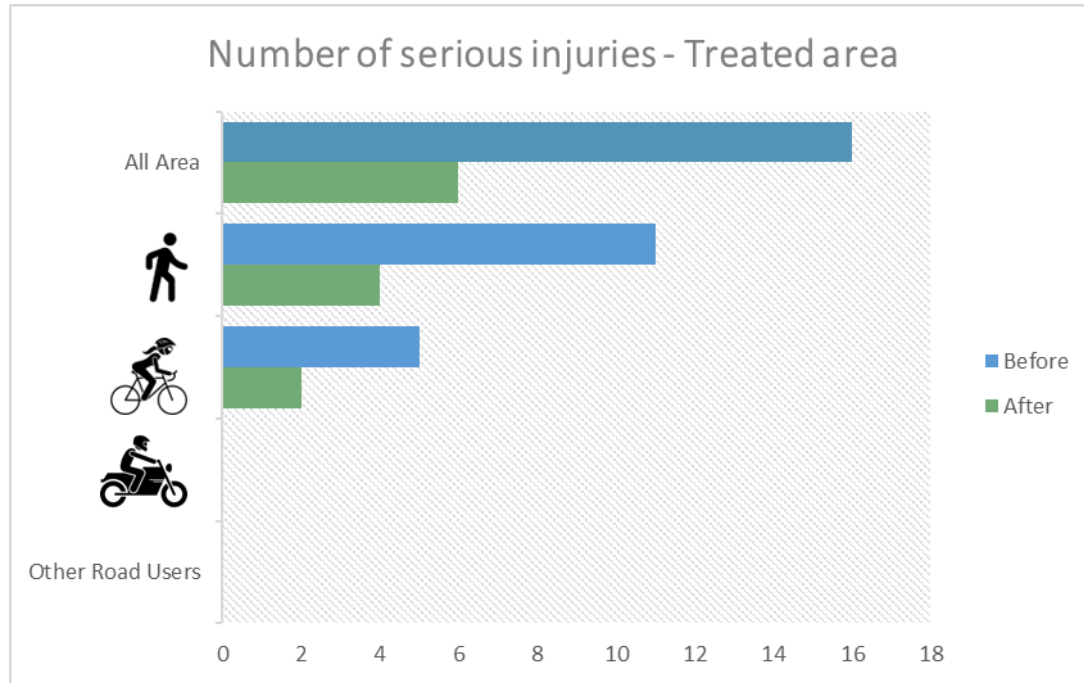
## Analysis:

Descriptive statistics

Poisson Log-Linear Model

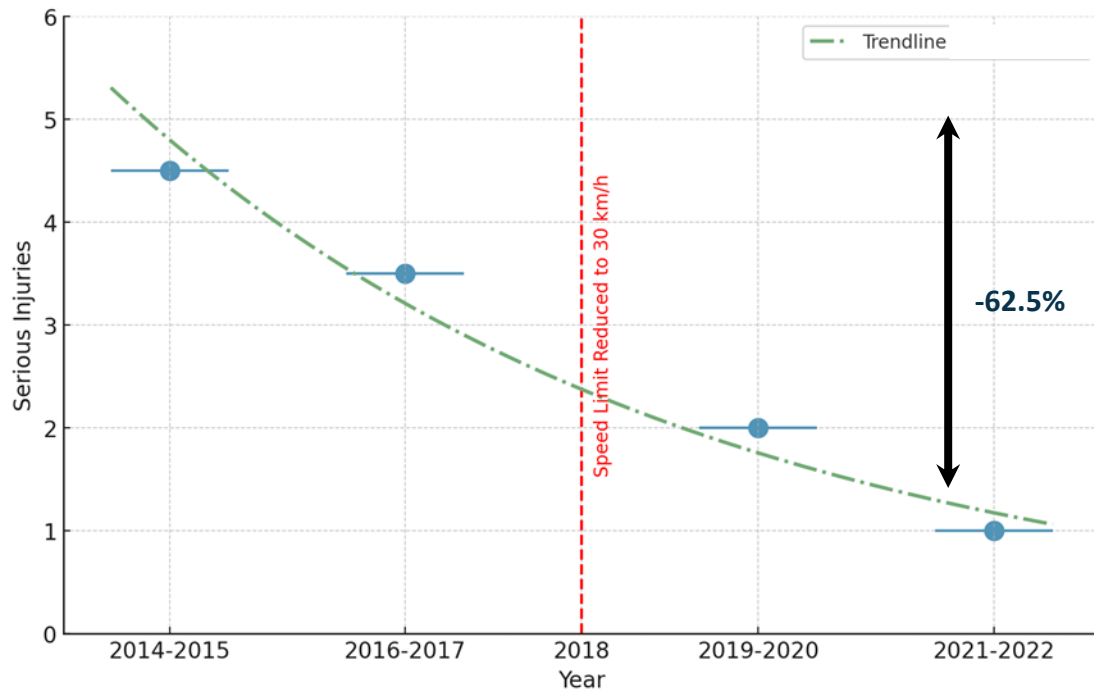


# Before-after comparison of number of serious injuries

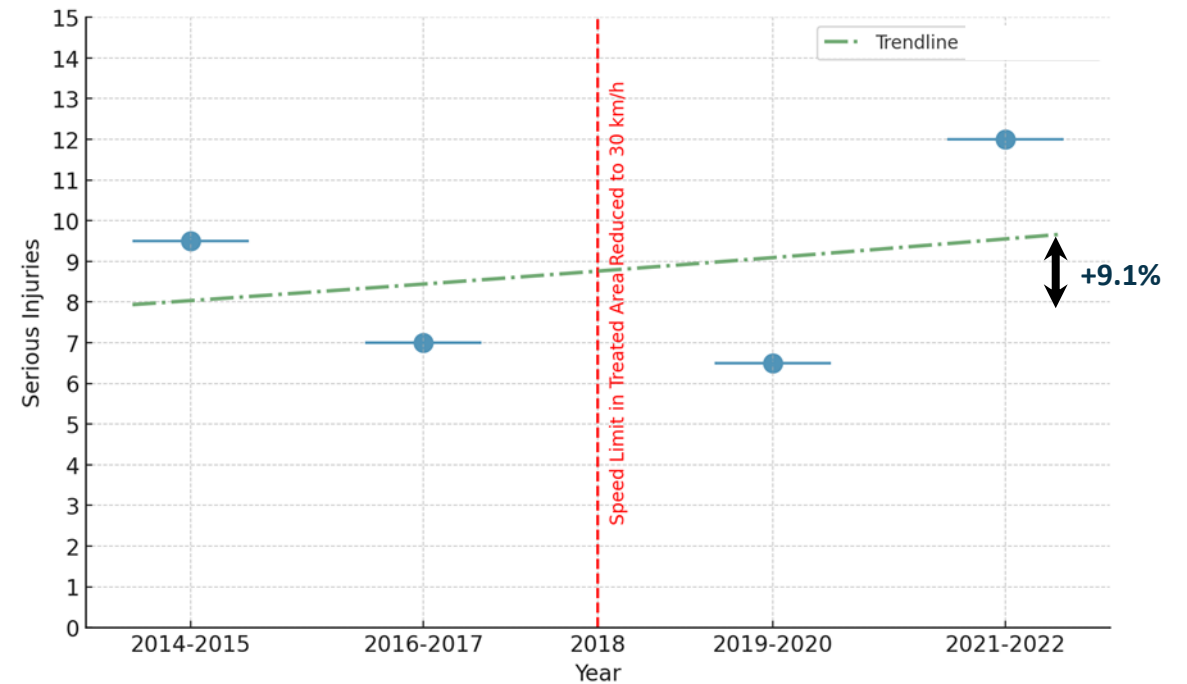


# Serious injury trends in treated and control areas

## Treated Area

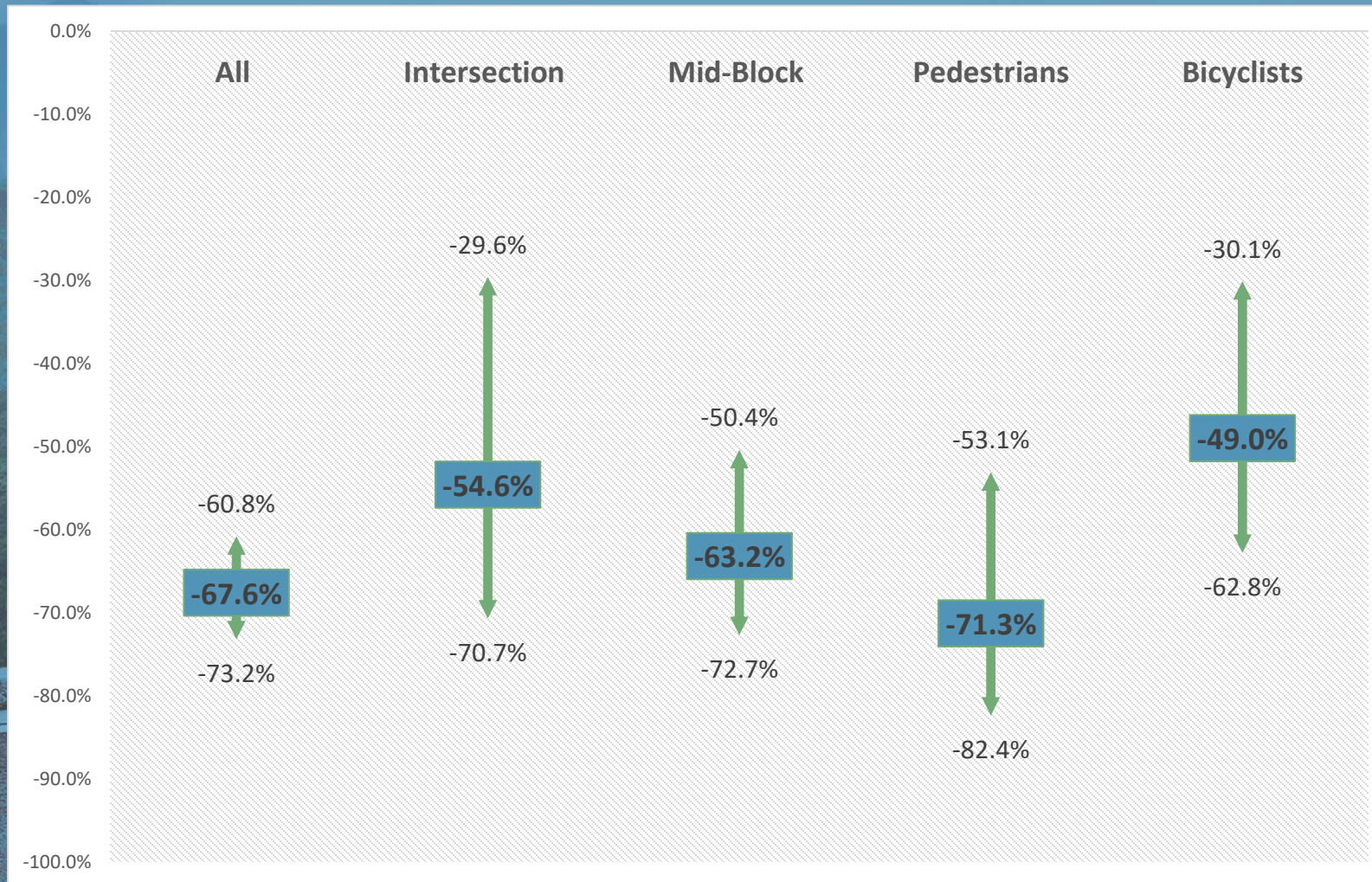


## Control Area





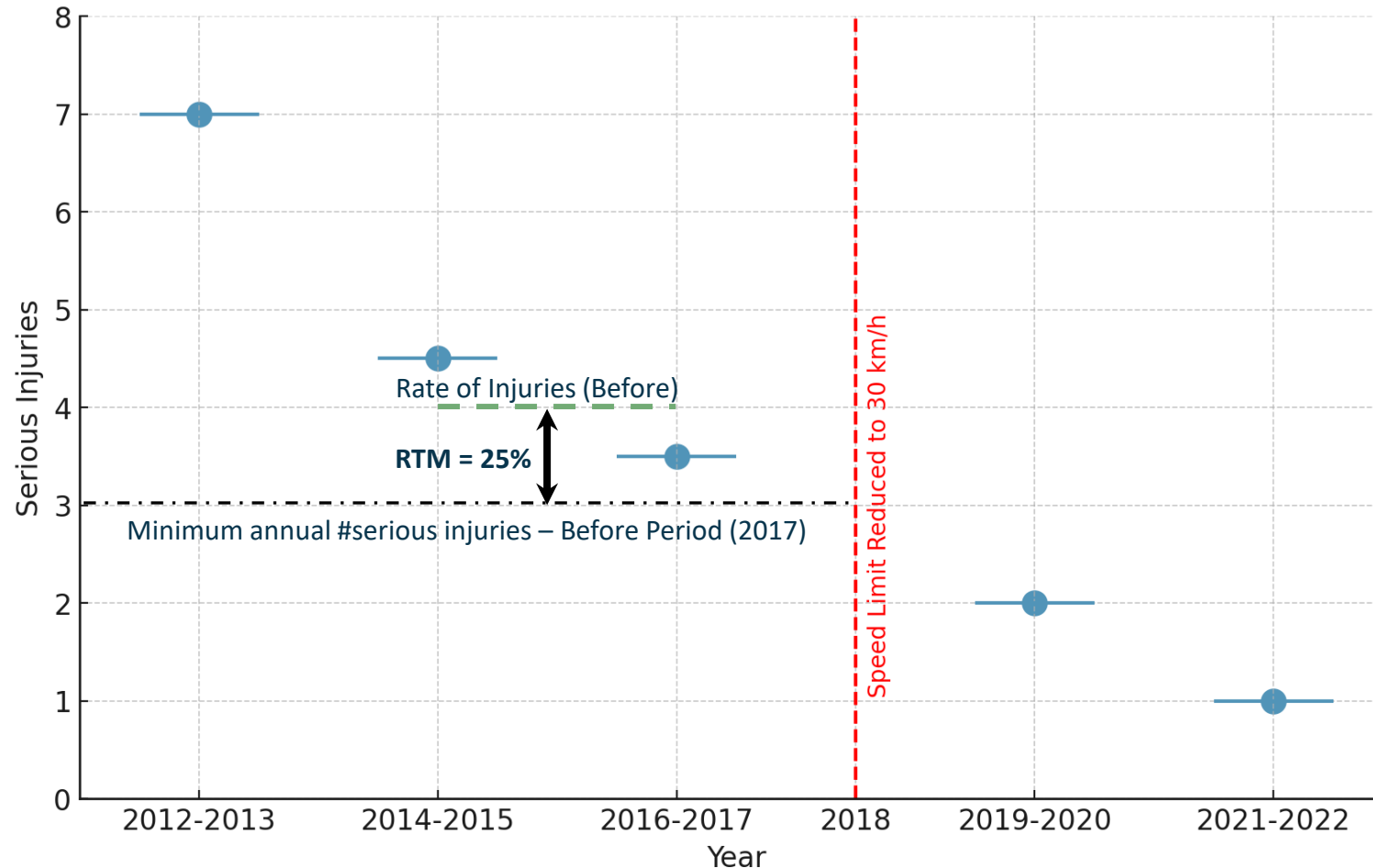
# Evaluation results





# Regression to the mean (RTM)

Effectiveness of 30km/h Speed Limit after addressing RTM =  $67.6\% - 25\% = 42.6\%$



Turner et al. (2020)

# Compass IoT data

- Years of data: 2020, 2021, 2022 and 2023
- Information extracted from the data:
  - Individual Speeds
  - Mean speed
  - Standard deviation of speed
  - Median speed
  - 85<sup>th</sup> percentile speed
  - Harsh braking proportion
  - Speed distribution



# Risk analysis using connected vehicle data

Measure	Description	Treated vs Control
Serious Conflict	Probability of Experiencing a Serious Conflict Given a Conflict Occurred	32.4% Lower in Treated Area
Risky Speed for Pedestrians and Bicyclists FSIs	Probability of Driving Over 20 km/h in a Conflict Scenario	12.7% Lower in Treated Area
Risky Speed for Pedestrians and Bicyclists Fatalities	Probability of Driving Over 30 km/h in a Conflict Scenario	38.5% Lower in Treated Area
FSI Risk (MAIS3+)	Risk of Serious Injuries or Fatalities for Pedestrians and Bicyclists in the Event of a Ped or Cyclist Crash	38% Lower in Treated Area
Kinetic Energy Risk (Peds and Cyclists)	Risk of Exceeding a Kinetic Energy Threshold That May Result in Serious Injuries or Fatalities for Pedestrians and Bicyclists in the Event of a Ped or Cyclist Crash	84% Lower in Treated Area

All results are statistically significant



# Conclusion

- A **before-after study** with control sites demonstrated **significant reductions** in serious injuries following the reduction of the speed limit from 40 km/h to 30 km/h.
- **In-depth Residual Analysis:** Residual analysis of speed and conflict data provides more valuable insights than central tendency analysis in complex urban environments.
- **Connected Vehicle Data:** Preliminary findings show potential for using **Compass IoT data** to assess urban safety. Further studies are needed to validate its applicability across diverse road network categories.
- **Future Research:**
  - a. **Broaden Control Sites:** Replicate the study with additional control sites for validation.
  - b. **Impact of COVID-19:** The influence of COVID-19 should be further examined as more crash data and relevant information become available for a comprehensive analysis.
  - c. **Focus on MAIS3+ Injuries:** Investigate the impact on high-severity injuries (MAIS3+).
  - d. **Advanced Statistical Methods:** Apply techniques such as **Empirical Bayes (EB)** or **Full Bayes (FB)** to mitigate the regression-to-the-mean effect.
  - e. **Meta-Analysis for 30 km/h Zones:** Conduct more evaluations to support a comprehensive meta-analysis and establish a reliable Crash Reduction Factor (CRF).



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