



Leading Pedestrian Intervals

Do they work?

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Leading Pedestrian Intervals

AKA “Pedestrian Head Start Signals”



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Pedestrian gets the crossing signal first



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AKA “Pedestrian Head Start Signals”

Pedestrian gets the crossing signal first

Then general traffic gets the green



Makes the pedestrian(s) more visible to turning vehicles

Discourages drivers from trying to turn *before* people cross

(you may also be interested in: *no right on red*)

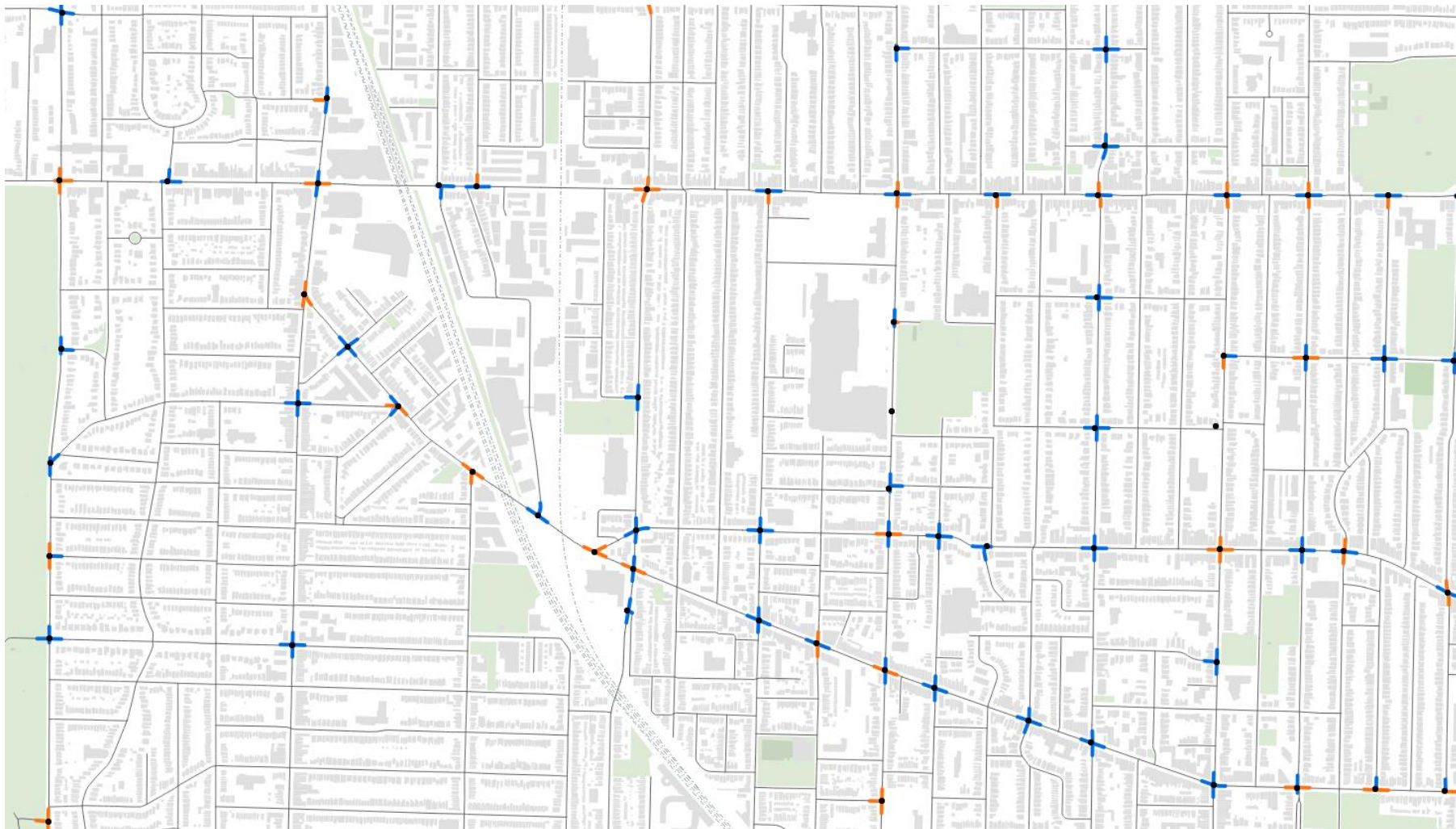
LPI IMPLEMENTATION

Implemented *per
signalized crossing*

Intersections with LPIs:
1,560 / 2,452

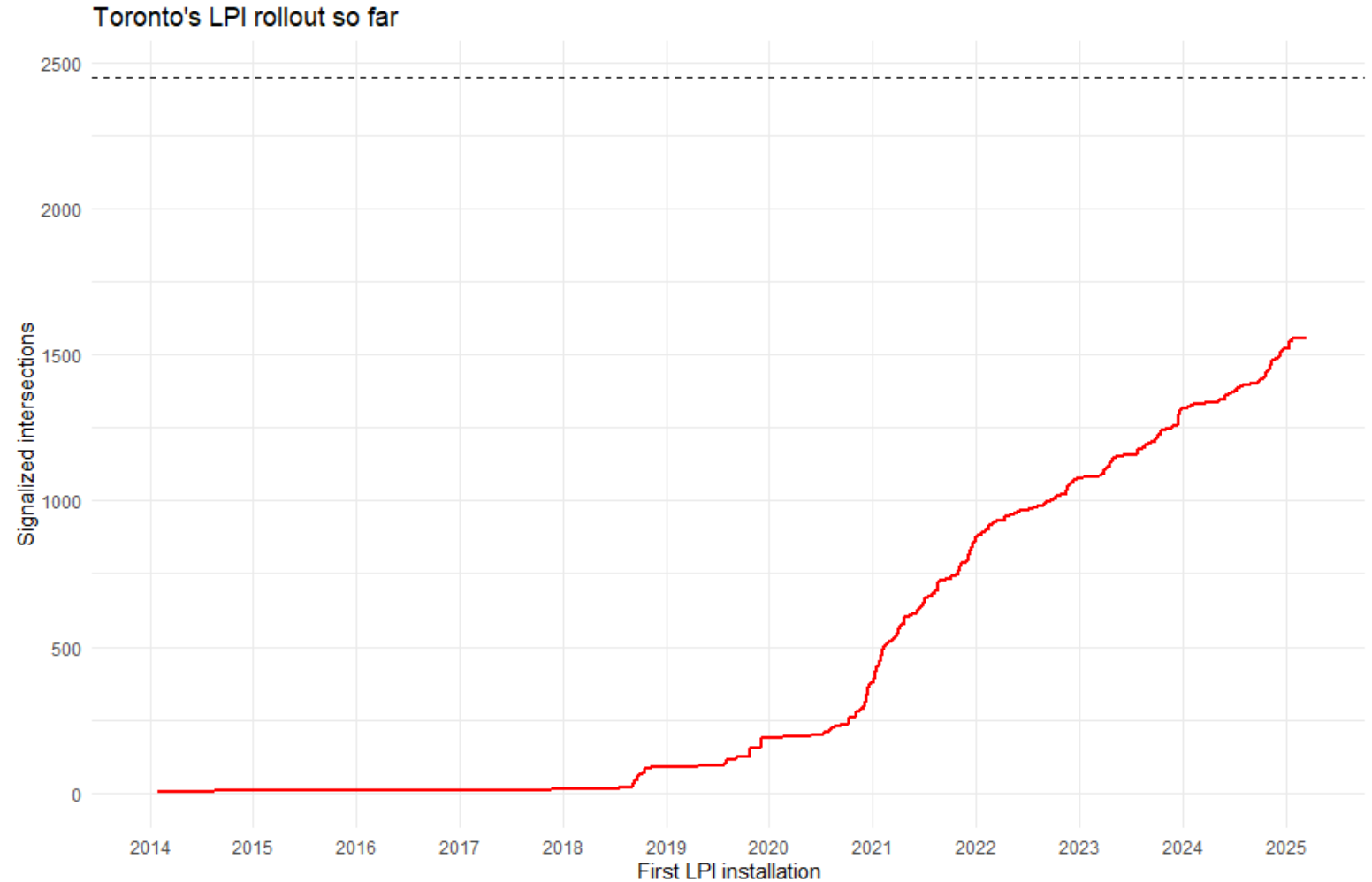
Crossings with LPI :
5,052 / 10,112

Not possible where traffic
has a signalled left turn



TORONTO'S LPI ROLLOUT

- A few early experiments
- Really started in 2018
- Took off during the pandemic
- Rollout continues as signals are retimed



BUT ARE THEY EFFECTIVE?

Evidence from other cities

- Long term studies of observed collisions
 - NYC
 - **37% reduction** in KSIs at 104 intersections
 - **9% reduction** in collisions with pedestrians
 - Pennsylvania: **59% reduction** at 10 intersections
 - Chicago: **19% reduction**
 - Charlotte: **46% reduction**
 - Toronto:
 - Collisions: **32% reduction**
 - KSIs: **47% reduction**
- Also: short-term video studies of conflict

COLLISION DATA

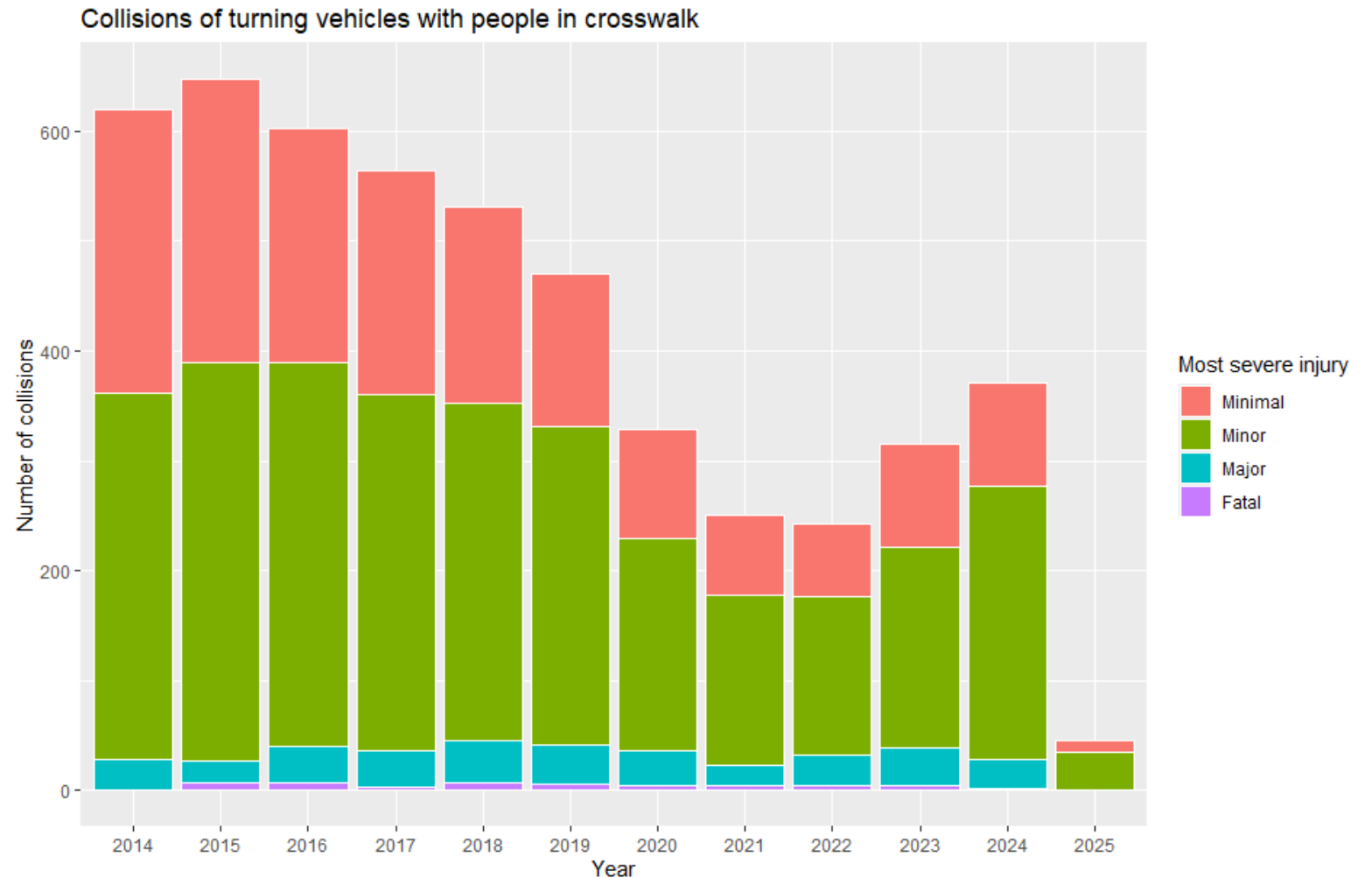
The Data and Analytics Unit manages the City's traffic collision data

Sourced from

- Toronto Police Services
- Collision Reporting Centres (self-reported)
- > 2M collisions over the last 40 years
- ~75k involve pedestrians
- ~52k of those are at intersections
- ...
- ~5k since 2014 where
 - a car turned, hitting a person in the crosswalk
 - we know which crosswalk

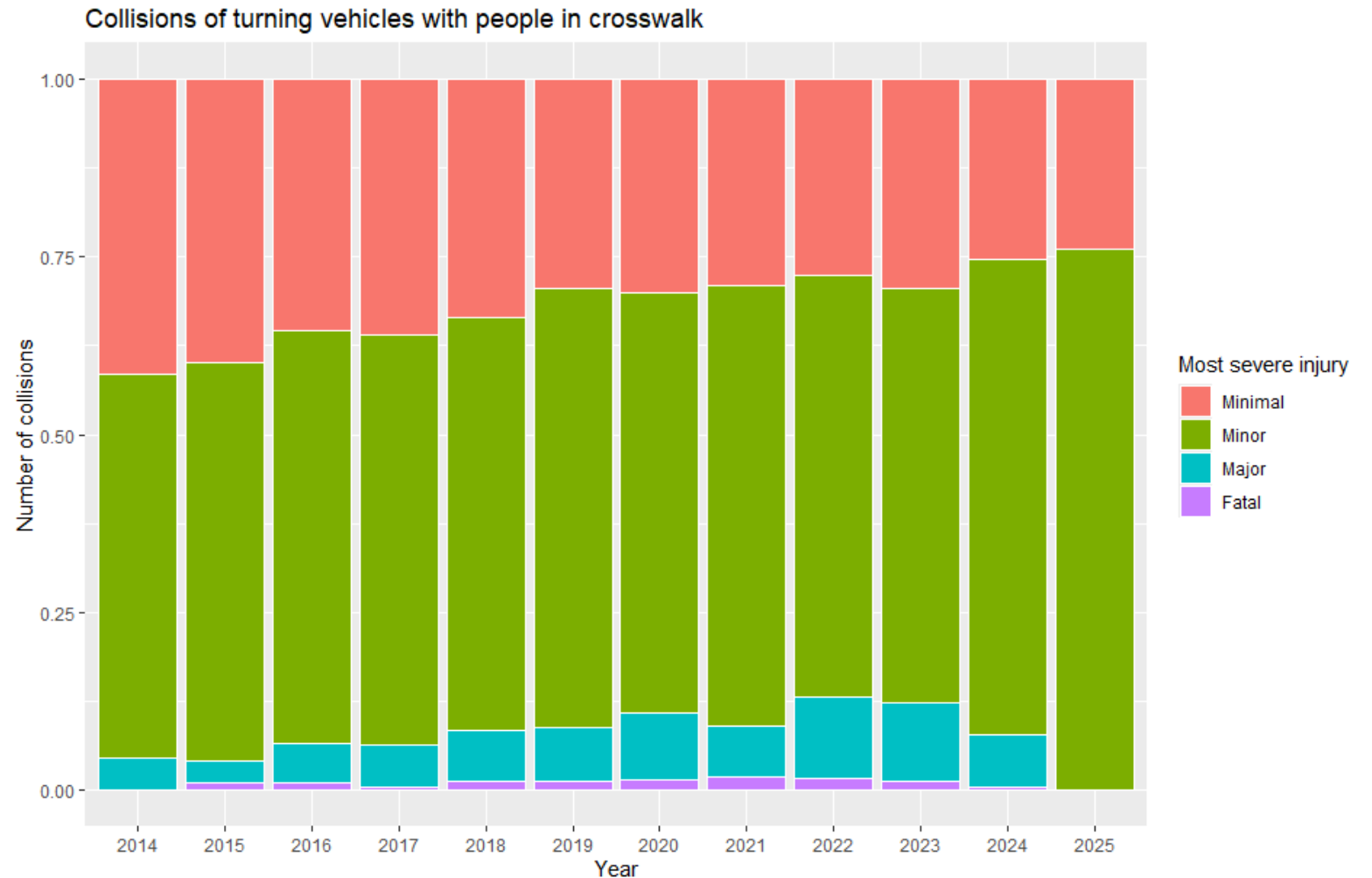
COLLISIONS DATA

- COVID happened
- Long-term declines?
- Fewer minimal injuries??
 - Likely changes in TPS reporting



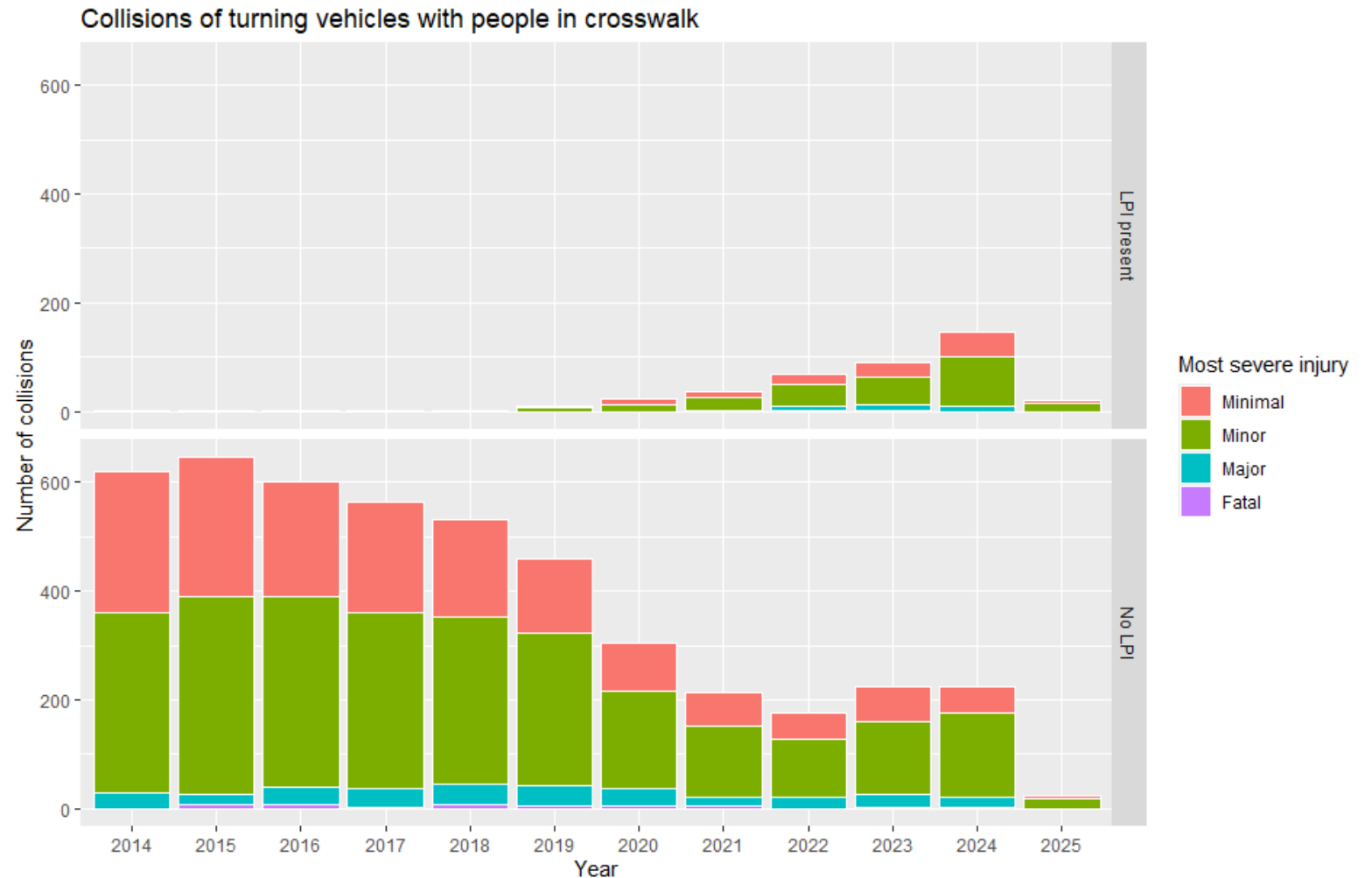
COLLISIONS DATA (PROPORTIONAL)

- Fewer minimal injuries??
 - Likely changes in TPS reporting



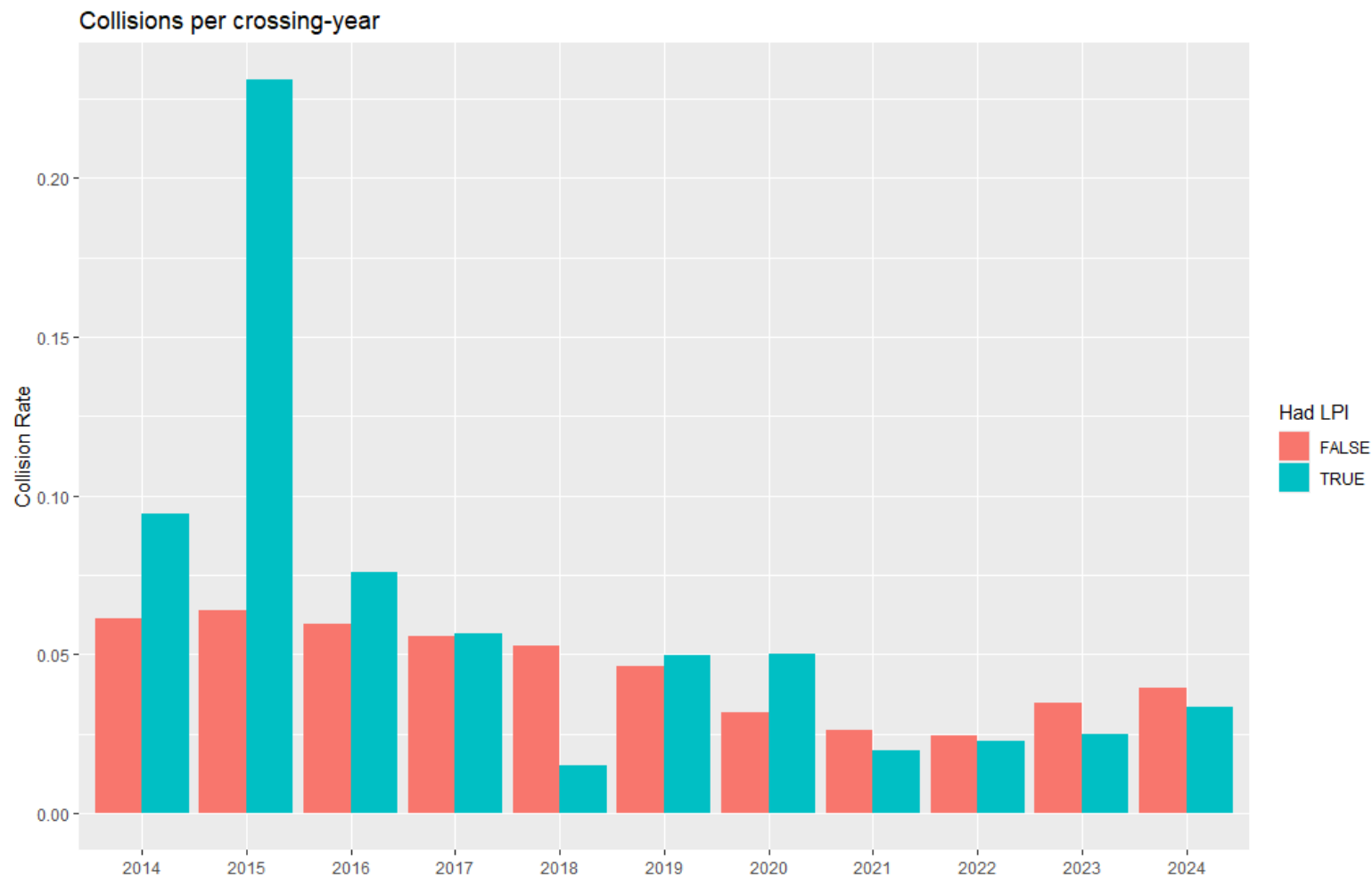
COLLISIONS DATA (SPLIT)

- Collisions at LPI-enabled crossings vs not



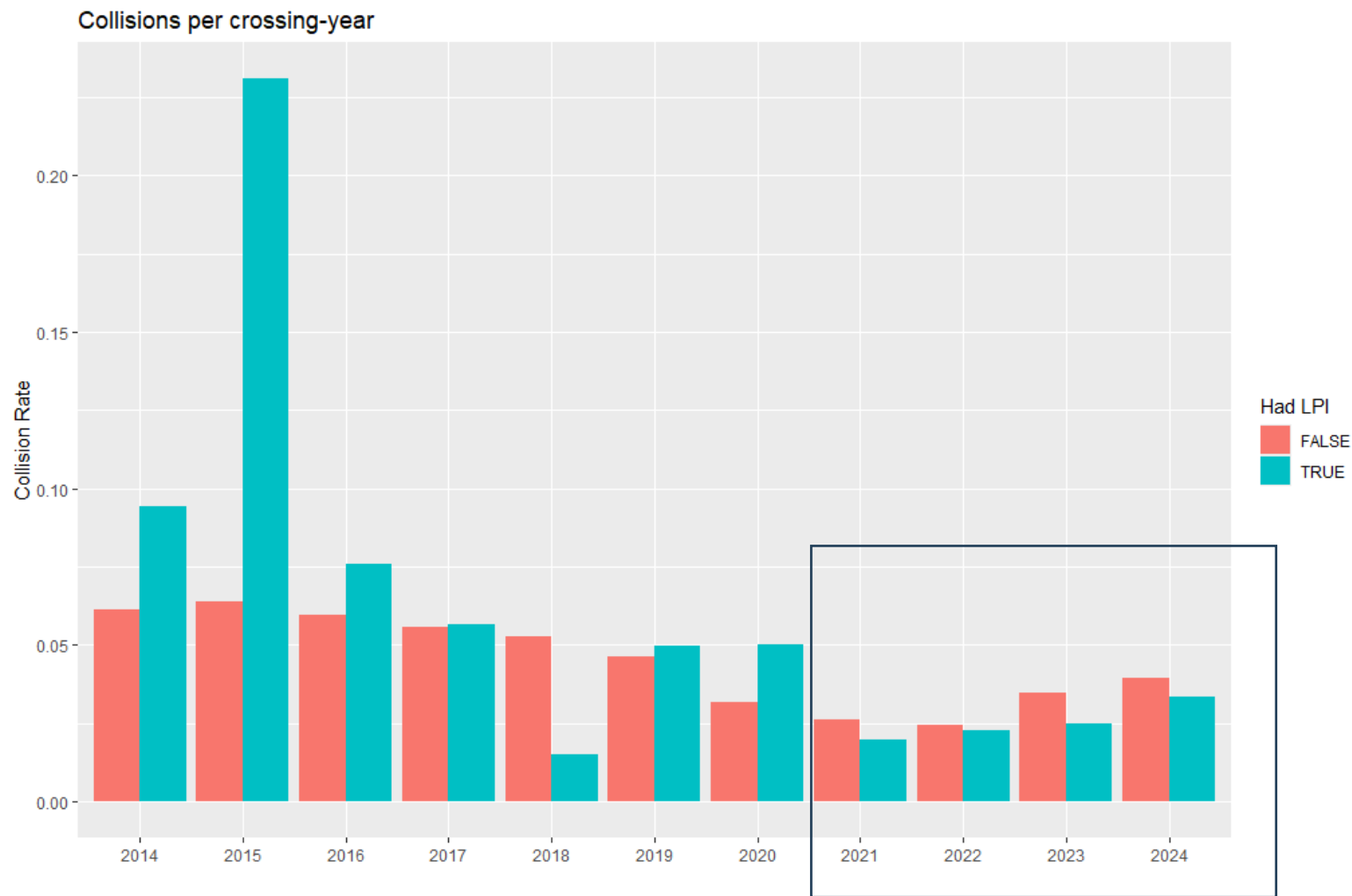
COLLISIONS DATA (RATES)

Collisions per crossing-year



COLLISIONS DATA (RATES)

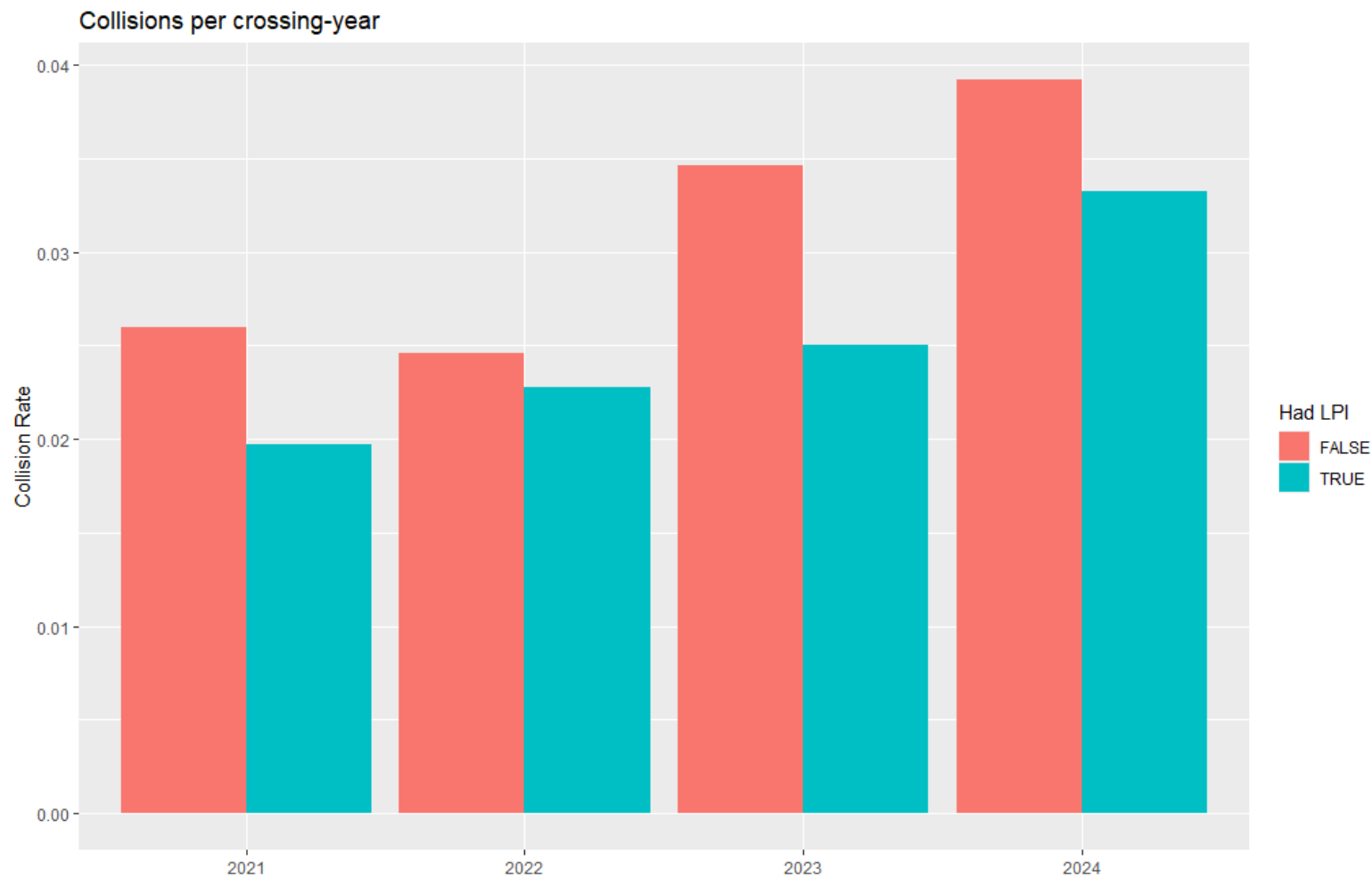
Only the last few years have enough data...



COLLISIONS DATA (RATES)

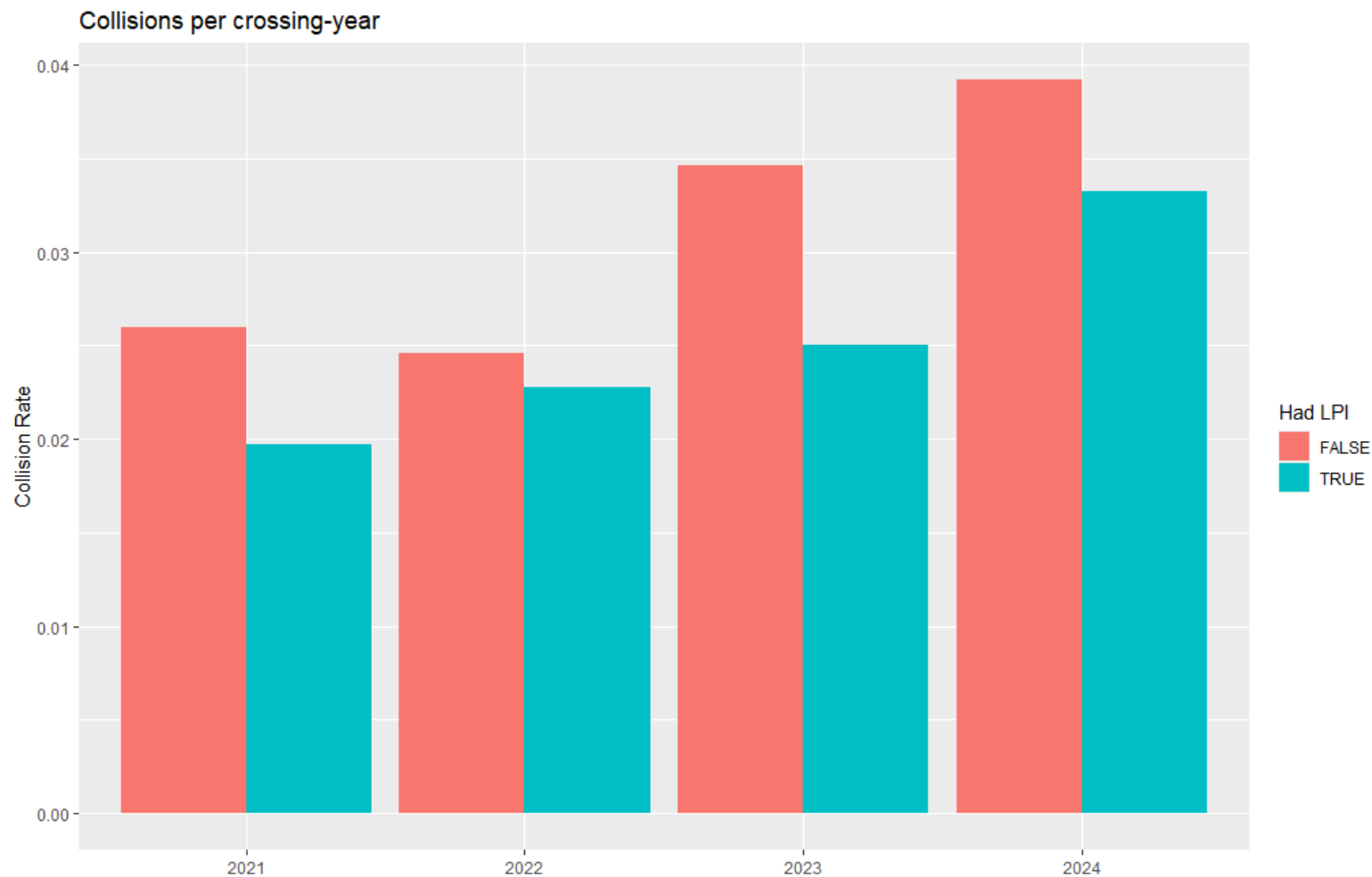
Relative collision rates:

- 2021: -24%
- 2022: - 7%
- 2023: -28%
- 2024: -15%



COLLISIONS DATA (RATES)

Selection bias?



MODELLING

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Leading Pedestrian Intervals

MODELLING

Could control for:

- Pedestrian & vehicle **volumes**
- Proportion of turning to straight **movements**
- **Infrastructure**
 - Turn radii
 - Crossing distances
- Presence of **crossing guards**
- **Right on red** restrictions



MODELLING

Mixed effects Poisson regression

Struggling to find great longitudinal control variables

Best guess at present:

20-30% reduction in collisions when controlling for other factors



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