Alan Shi

Pedestrian safety - left turns at signals

The Changing Face of Transport in New Zealand

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NZ TRANSPORT AGENCY WAKA KOTAHI

JACOBS

Pedestrian and Cycle Crashes at Left Turn lanes at Traffic Signals

By Traffic Engineering Solutions (TES)

Presented by Alan Shi

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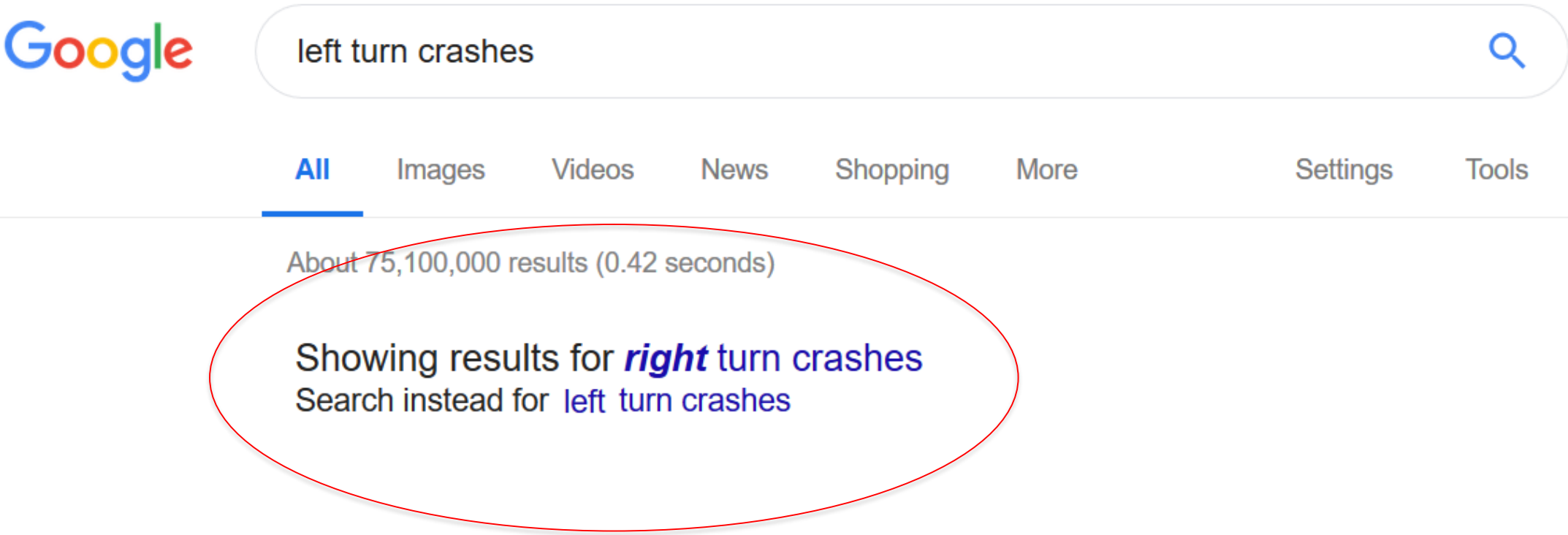

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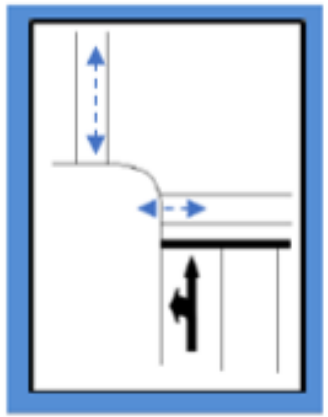
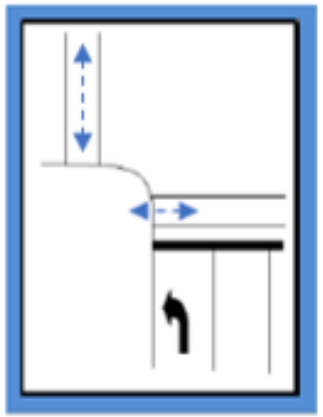
BACKGROUND

- Pedestrians and cyclists (dismounted) are vulnerable at intersections;
- Slip lanes are often perceived to be less safe for pedestrians;
- Some studies have contradicted this view;
- Study the pedestrian & cyclist (dismounted) crashes at left turn lanes at signalised intersections in Auckland.

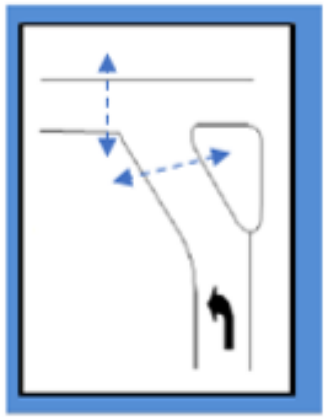
METHODOLOGY



(a) Shared lane



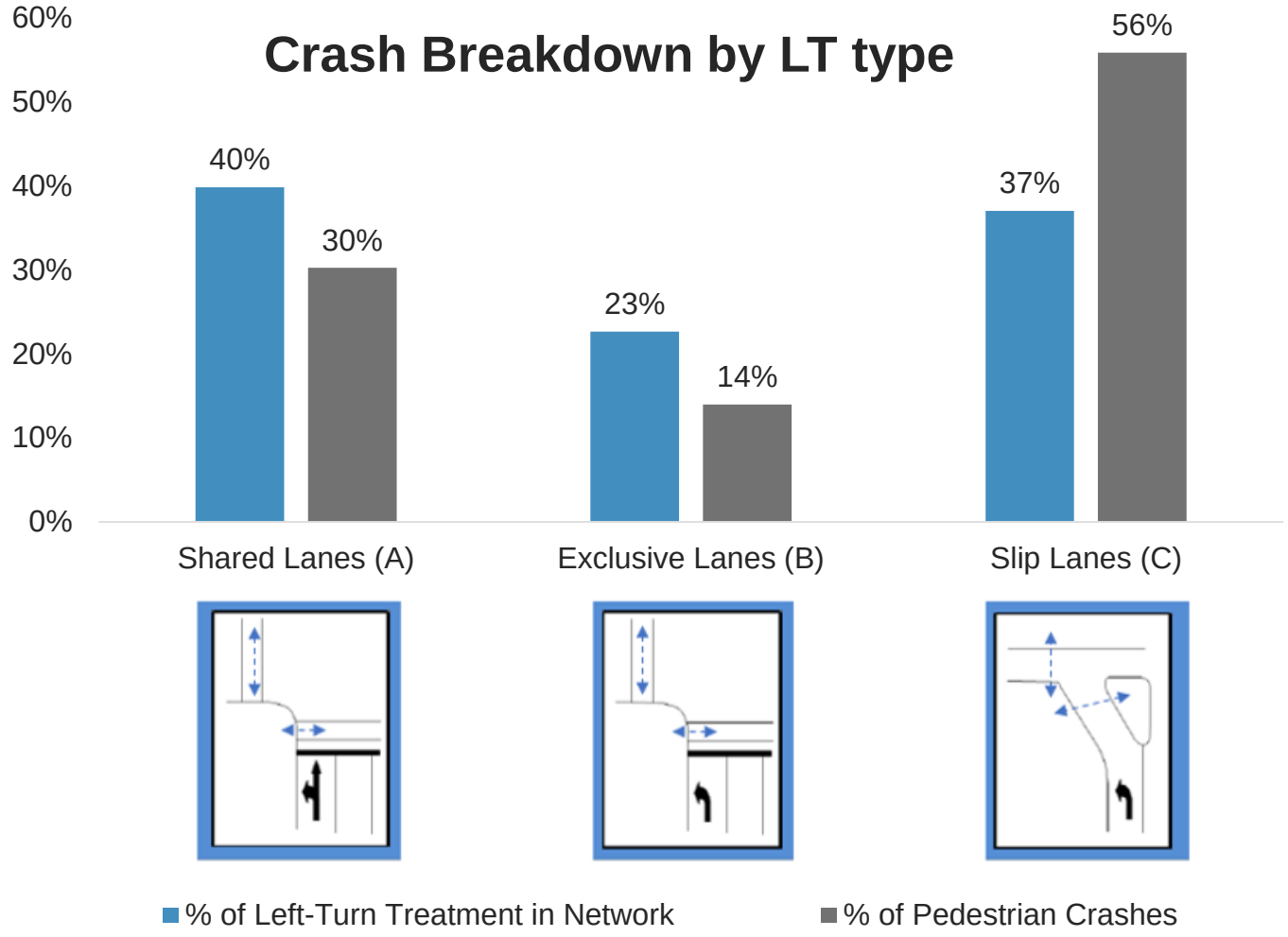
(b) Exclusive lane



(c) Slip lane

- 5 years CAS analysis (2013-2017);
- 43 crashes (5 serious) in 600 intersections 1,700 left turn lanes;
- Compare the frequency of left turn treatments to their share of crashes.

Left Turn Types



Conclusions

- Slip lanes performed poorly;
- Shared and exclusive lanes are similar in safety performance.

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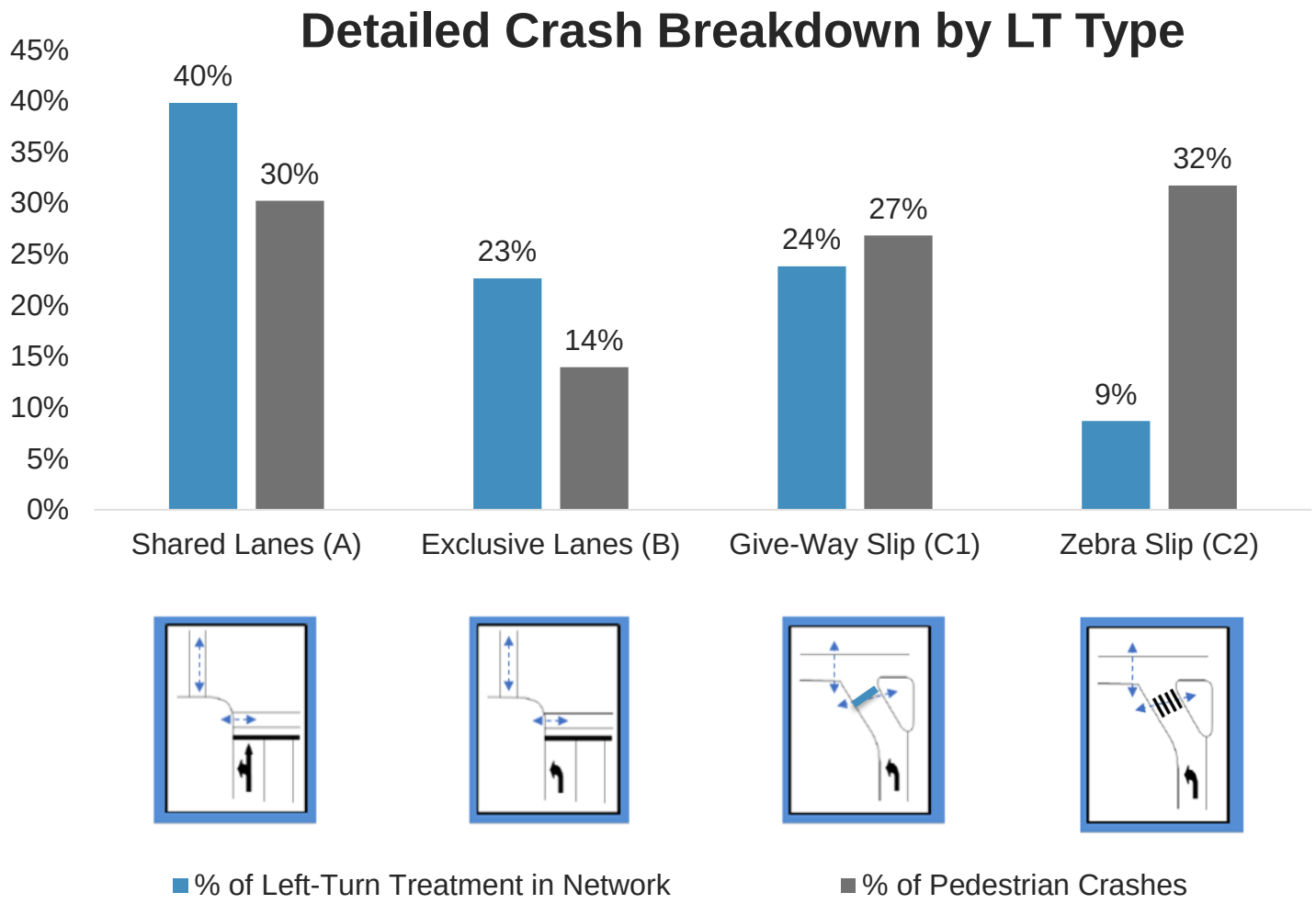
Left Turn Types 2



Conclusions

- Zebra slip lanes performed poorly;
- Give-way slip lanes not as bad;

Note

Zebra slip lanes are likely to have higher exposure.

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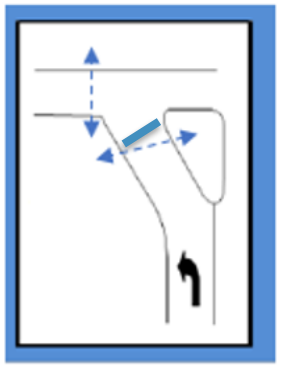
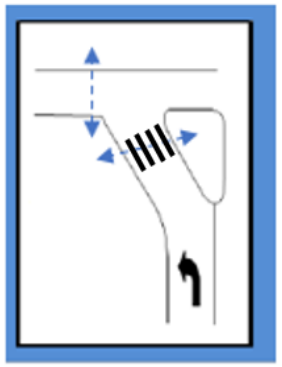
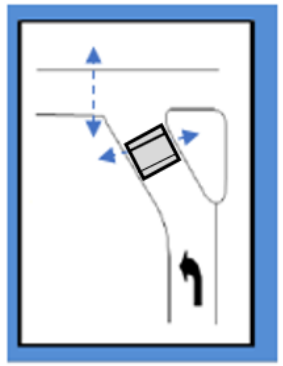
Slip Lanes Breakdown



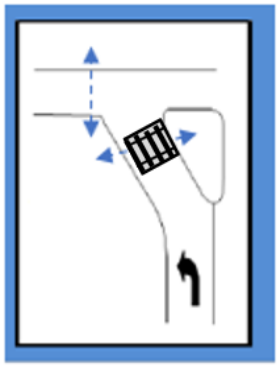
(c1) Standard slip lane



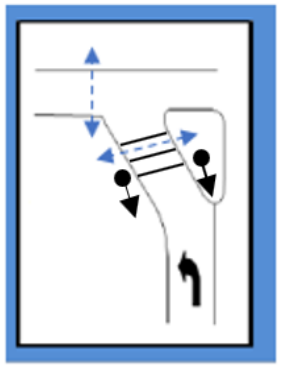
(c2) Ped Xing



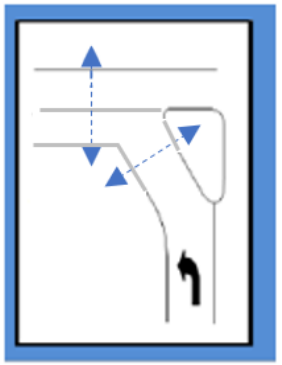
(c3) Raised Platform



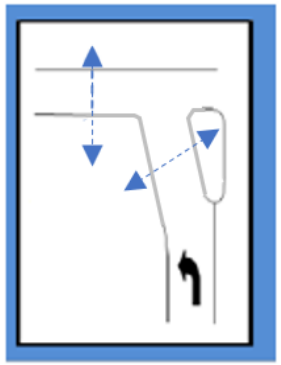
(c4) Ped Xing Platform



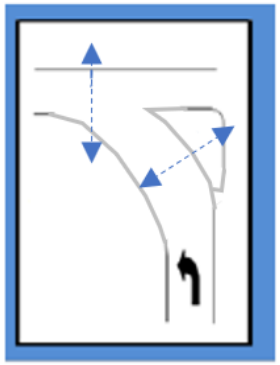
(c5) Signals



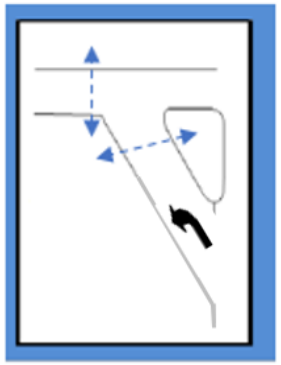
(c6) Free Flow



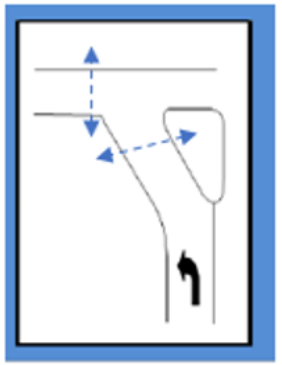
(c7) Sharp Angle>70^0



(c8) Gentle Angle<70^0



(c9) Short Length<30m



(c10) Long Length>30m

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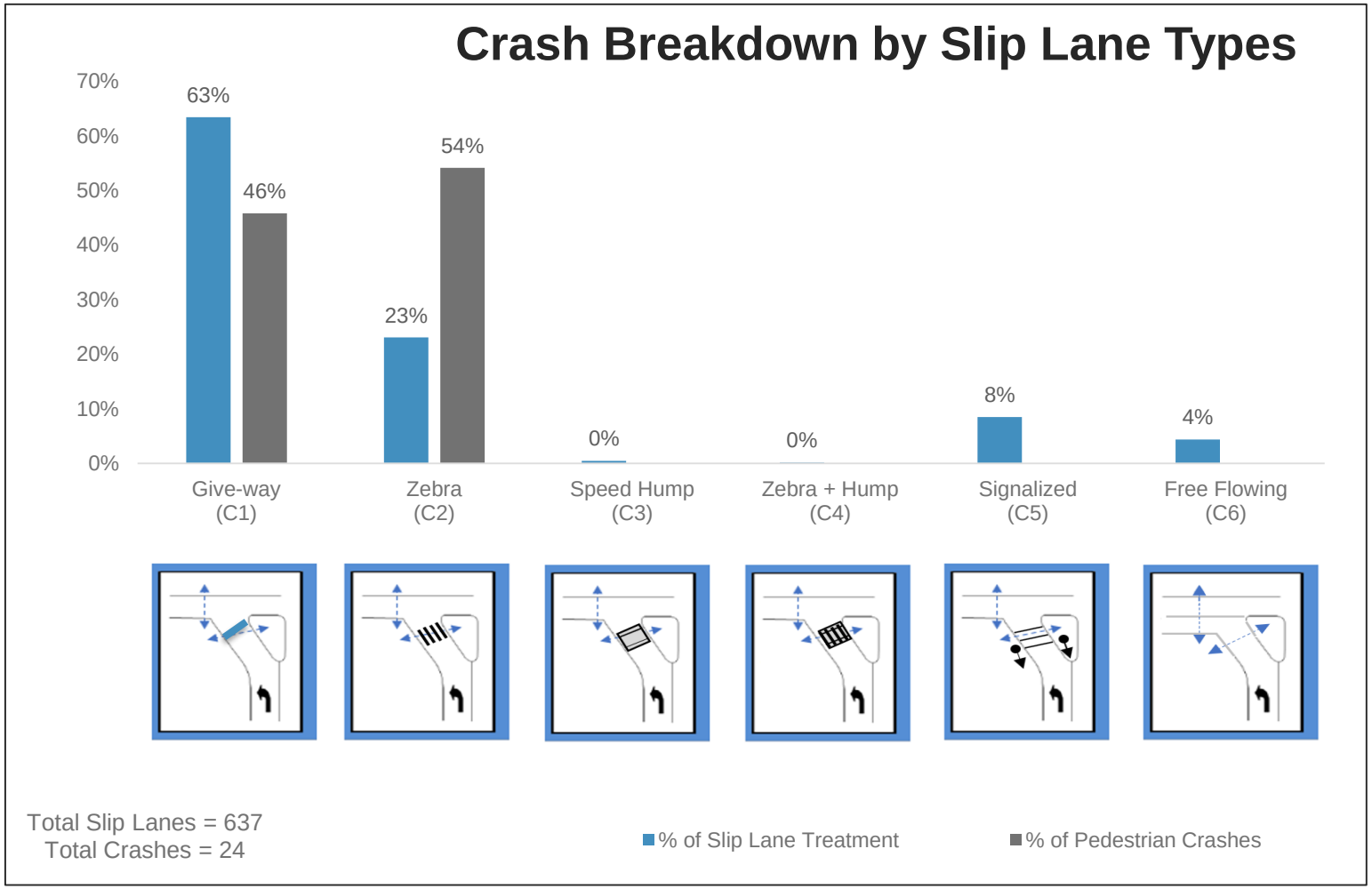
Slip Lane – Control Type



Conclusions

- Speed tables, signals and free flowing performed well;
- More data needed

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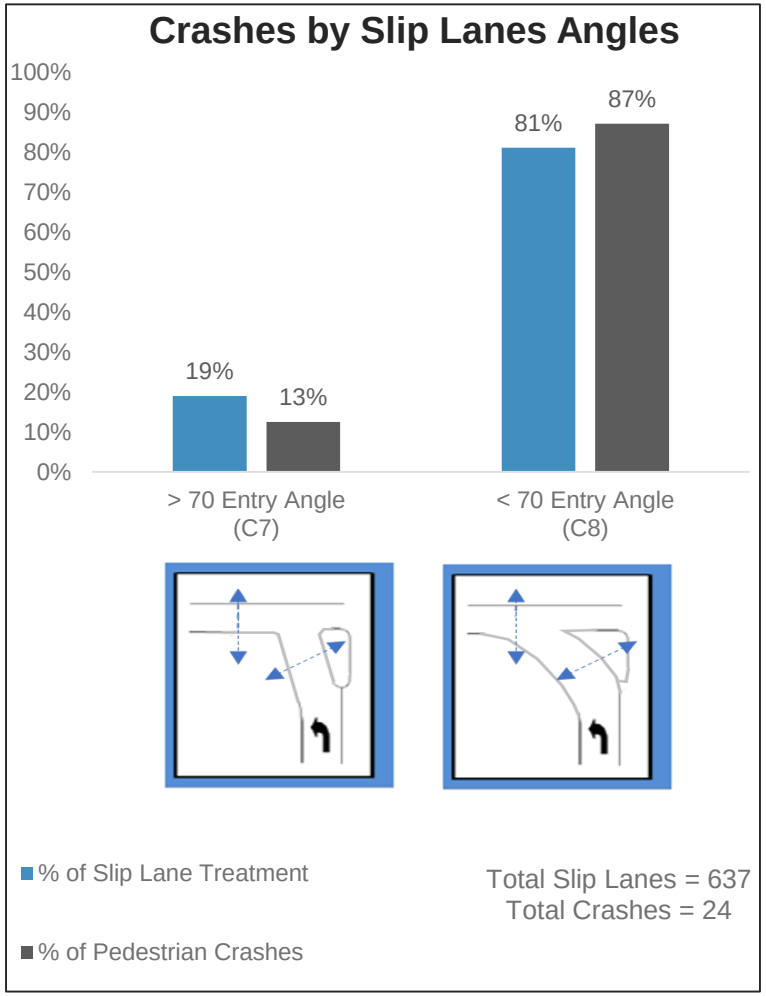
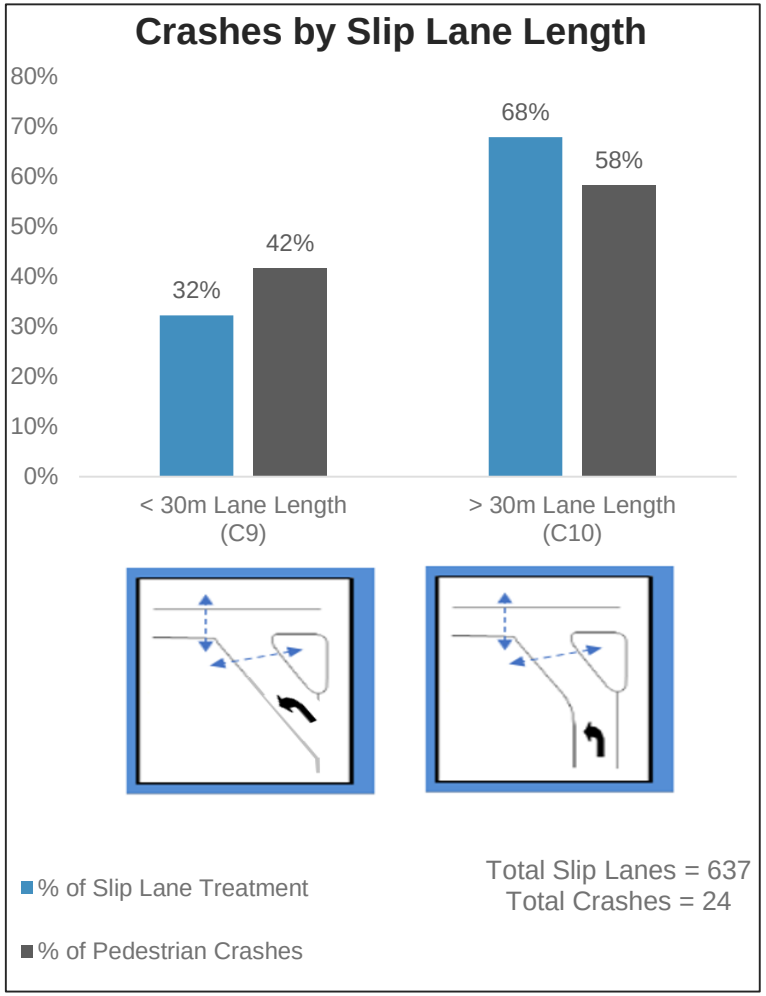
Slip Lane - Geometric Elements





Conclusions

- Slip lane angle does not affect crashes
- Slip lane length does not affect crashes

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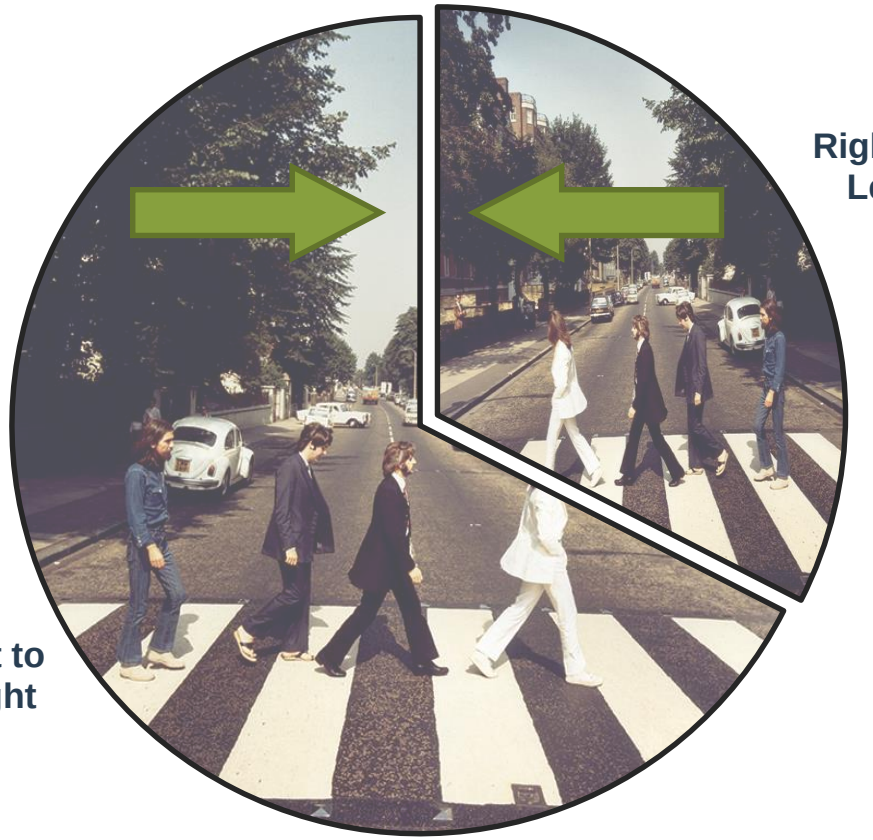
Ped/Cyclist Crossing Direction

Crashes By Pedestrian Direction



- 66% of crashes involved pedestrian/cyclist crossing from the left;

Why?

- Forward visibility;
- Driver attention.

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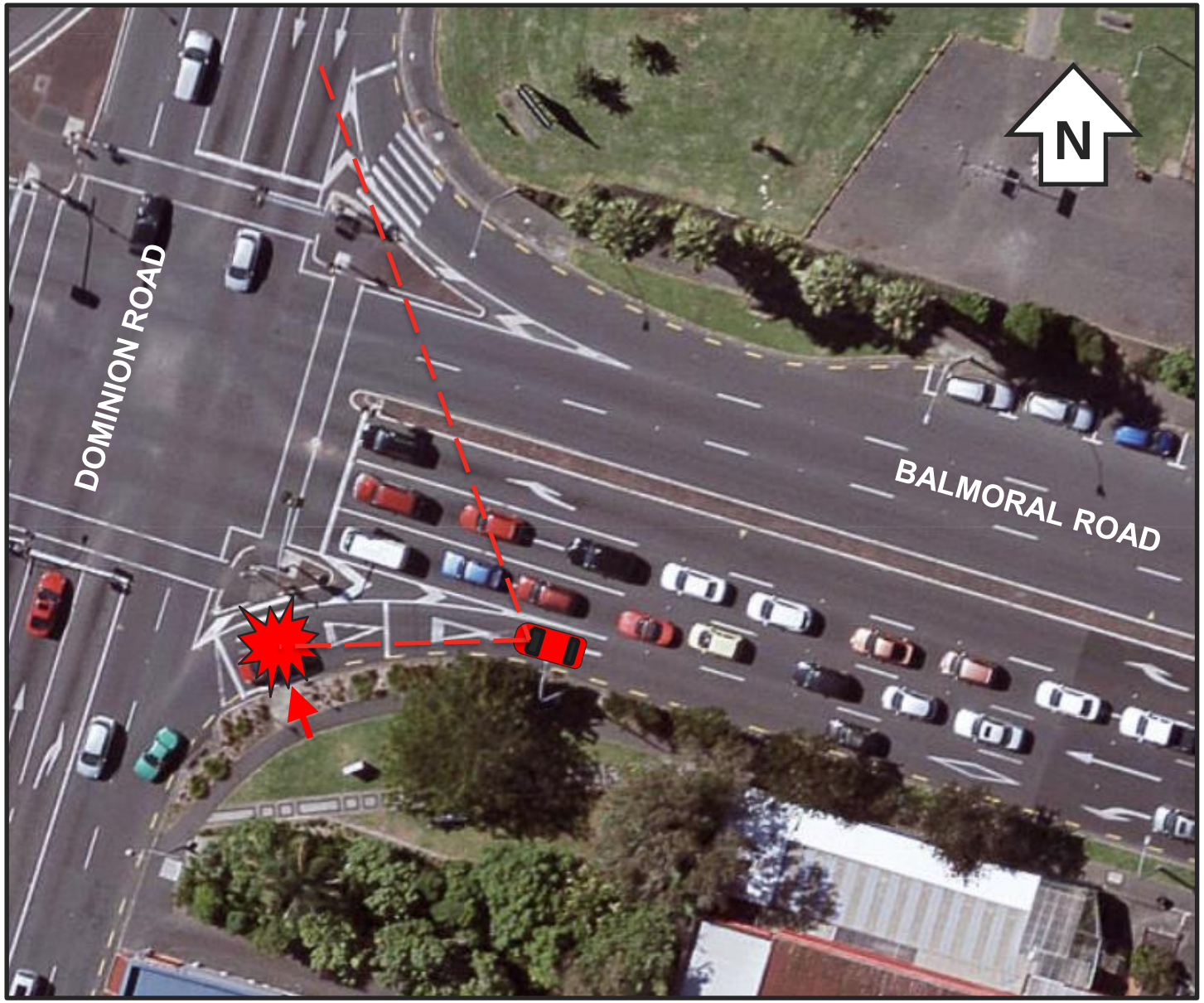
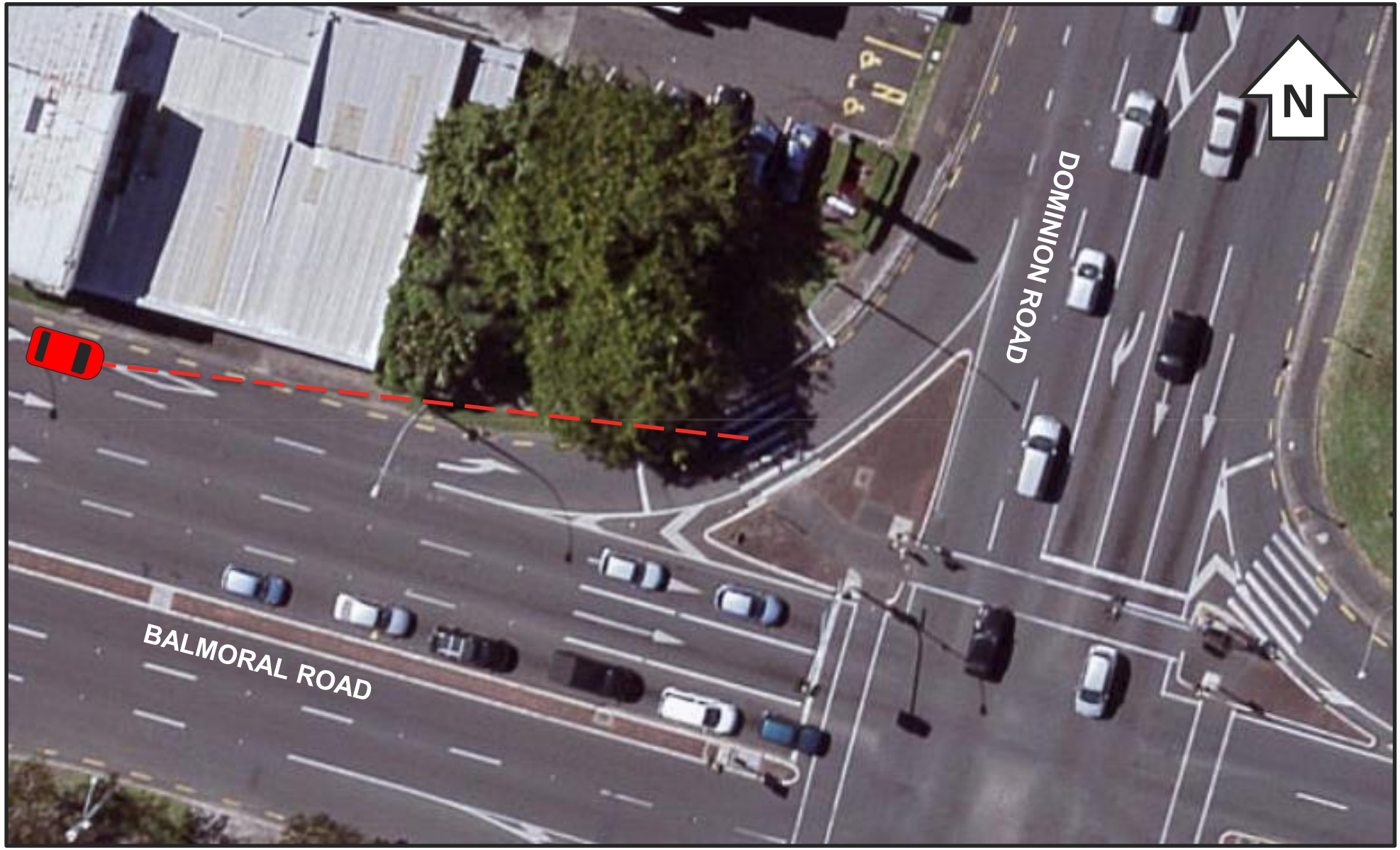

N
DOMINION ROAD
BALMORAL ROAD


N
DOMINION ROAD
BALMORAL ROAD

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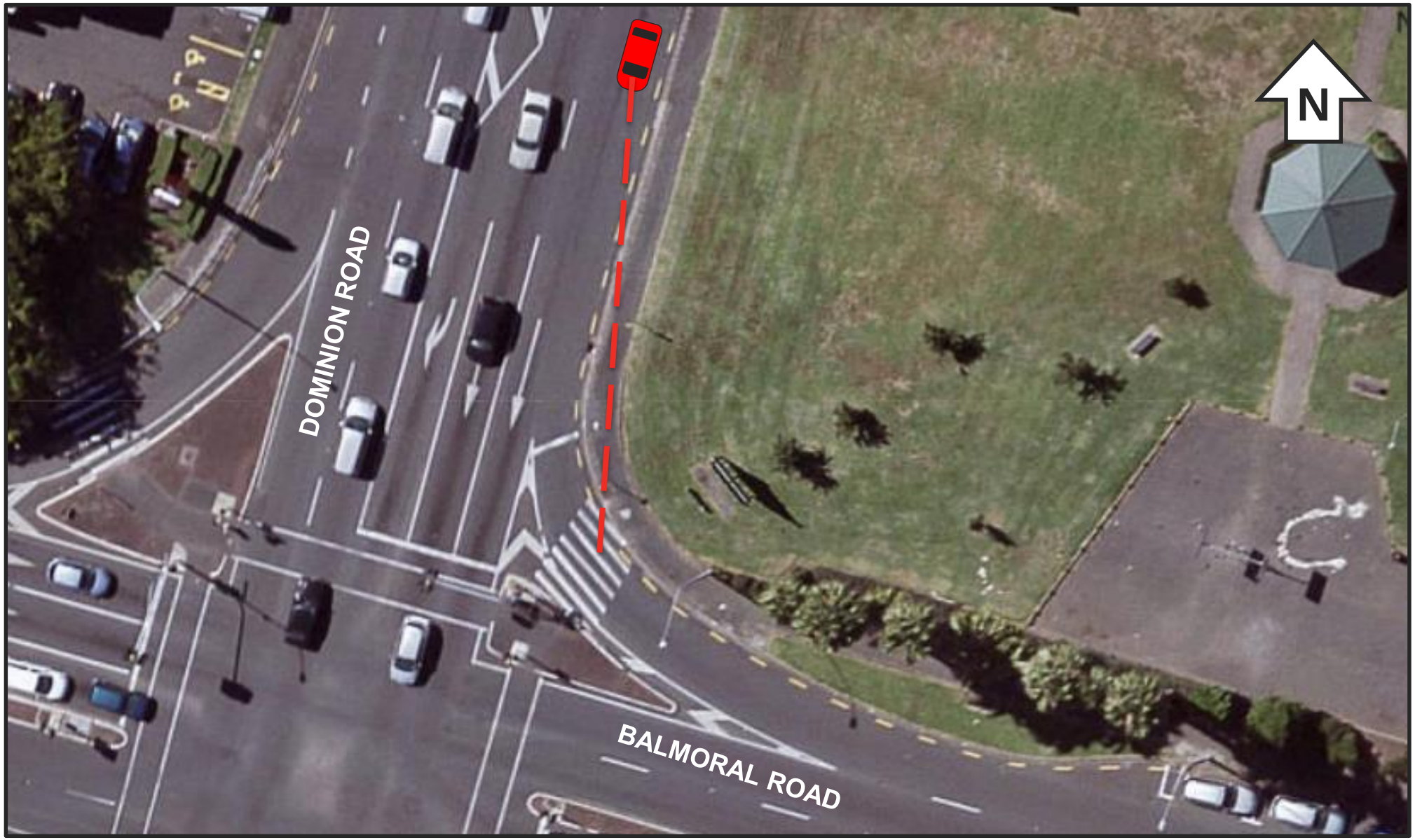

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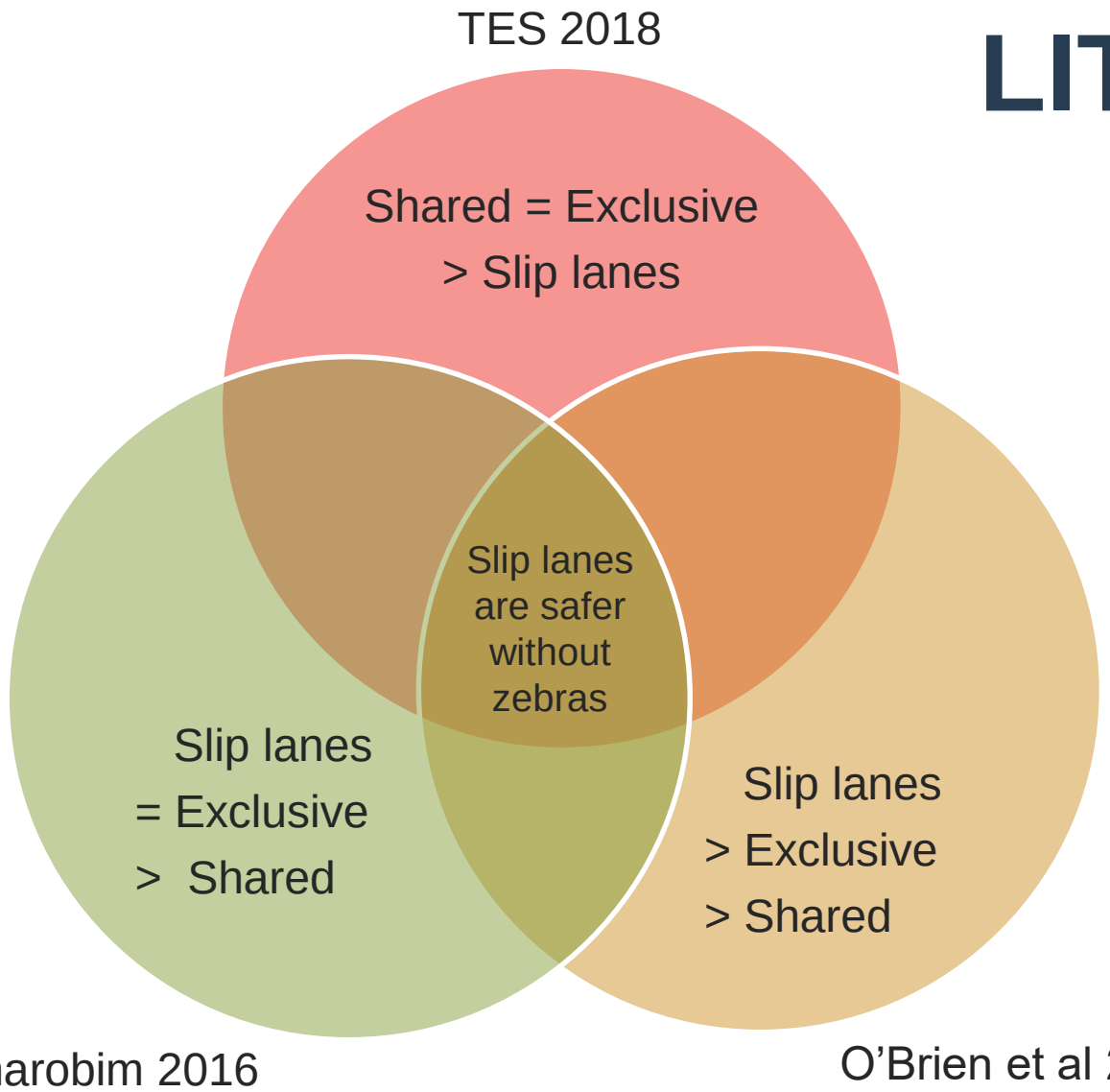
LITERATURE REVIEW



- Location of study;
- Time period;
- Method of analysis.

CONCLUSION

- Shared and exclusive lanes are similar in safety performance;
- Slip lanes had more crashes, mostly from zebra slip lanes;
- Caution should be exercised when designing zebras on slip lanes:
  - NZTA warrant;
  - Vulnerable users;
  - Raised table;
  - Compliancy.
- Ensure adequate forward-visibility at all slip lanes.

FURTHER STUDY

- Crashes vs pedestrian volume
- Crashes vs slip lane layout
- More data

THANK YOU

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