OBT

ITEANZ Cycling Forum
Left-Turn Slip Lanes – Cycling Issues

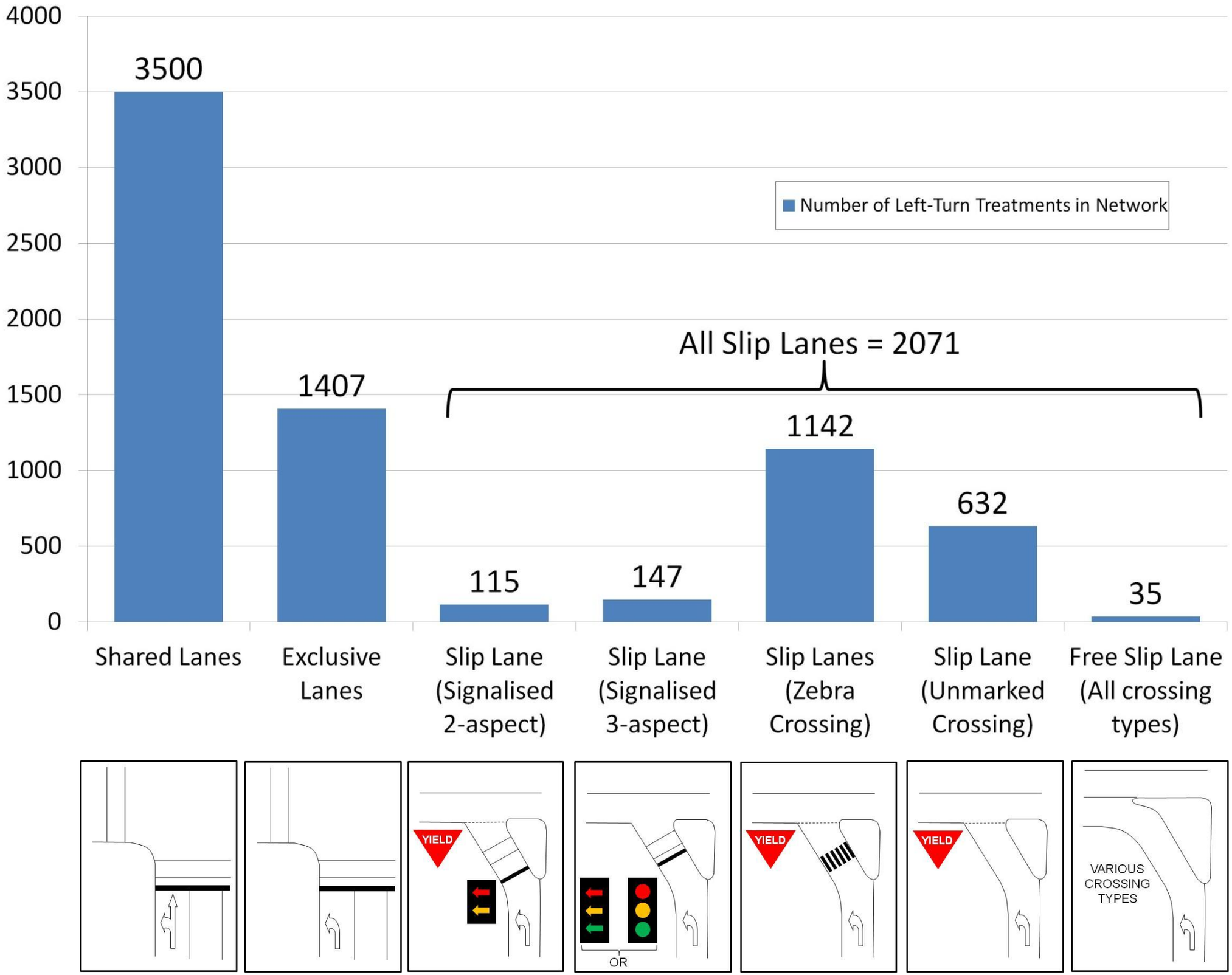
Presented: At Richmond Town Hall

Wednesday, 24 April 2013

Our Background on the Issue

- Research → safety of left-turn lane treatments at signals (inc. slip lanes)
  - mainly ped. vs. vehicles but;
  - literature review and mitigation assessment → considered issues for all users
- Subsequent design projects aimed at implementing:
  - on-road bicycle lanes
  - shared paths through signalised intersections

Left-Turn Treatments in Melbourne (2010)



Slip Lane Vehicle vs. Ped. Safety

Pedestrian vs. left-turn vehicle crashes:

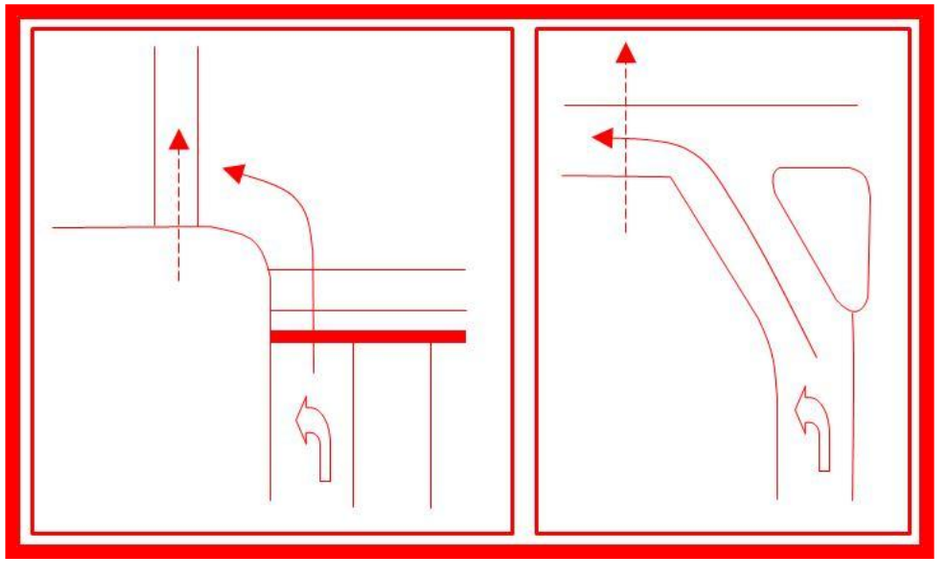
- 195 relevant crashes (& 212 injuries) recorded at traffic signals in 5 years

Proportion of crashes by treatment (main categories):

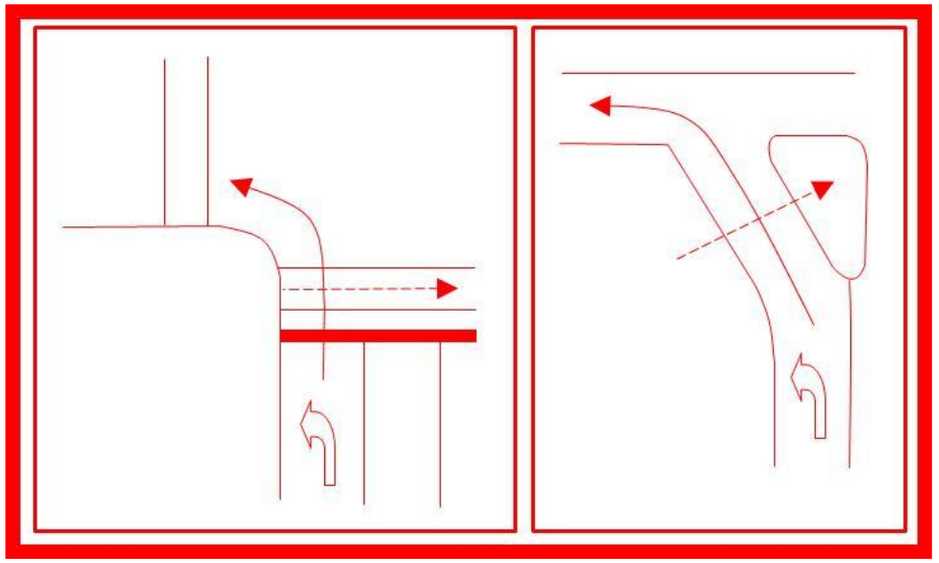
- **Shared lanes** → 60.0% of crashes vs. 50.2% of treatments
- **Exclusive lanes** →18.5% of crashes vs. 20.2% of treatments
- **Slip lanes** → 21.5% of crashes vs. 29.7% of treatments

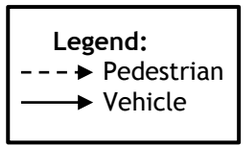
Ped. vs. Left-Turn Vehicle Conflict Types

Para B

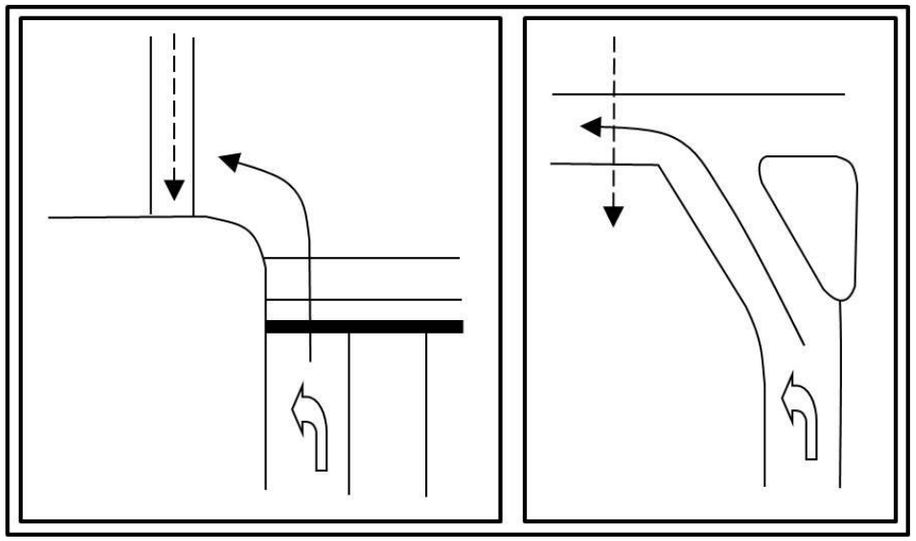


Perp L

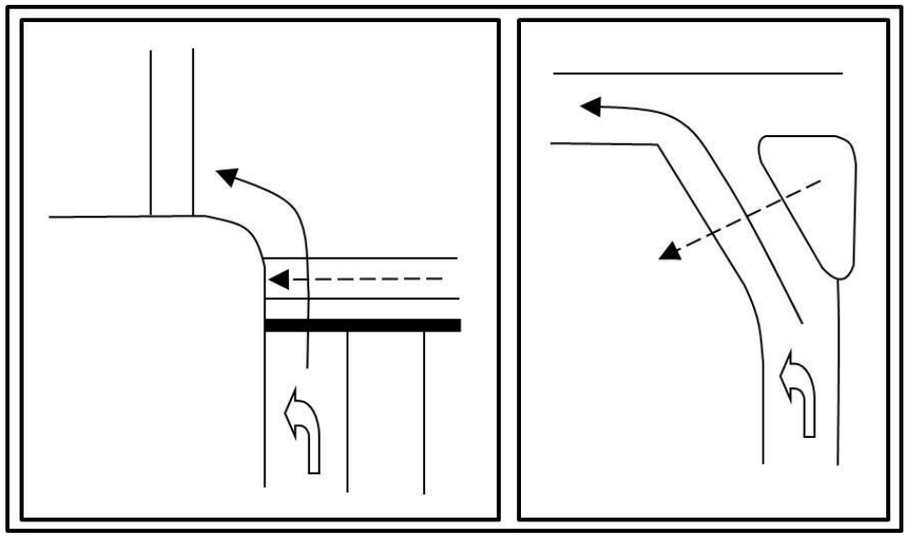




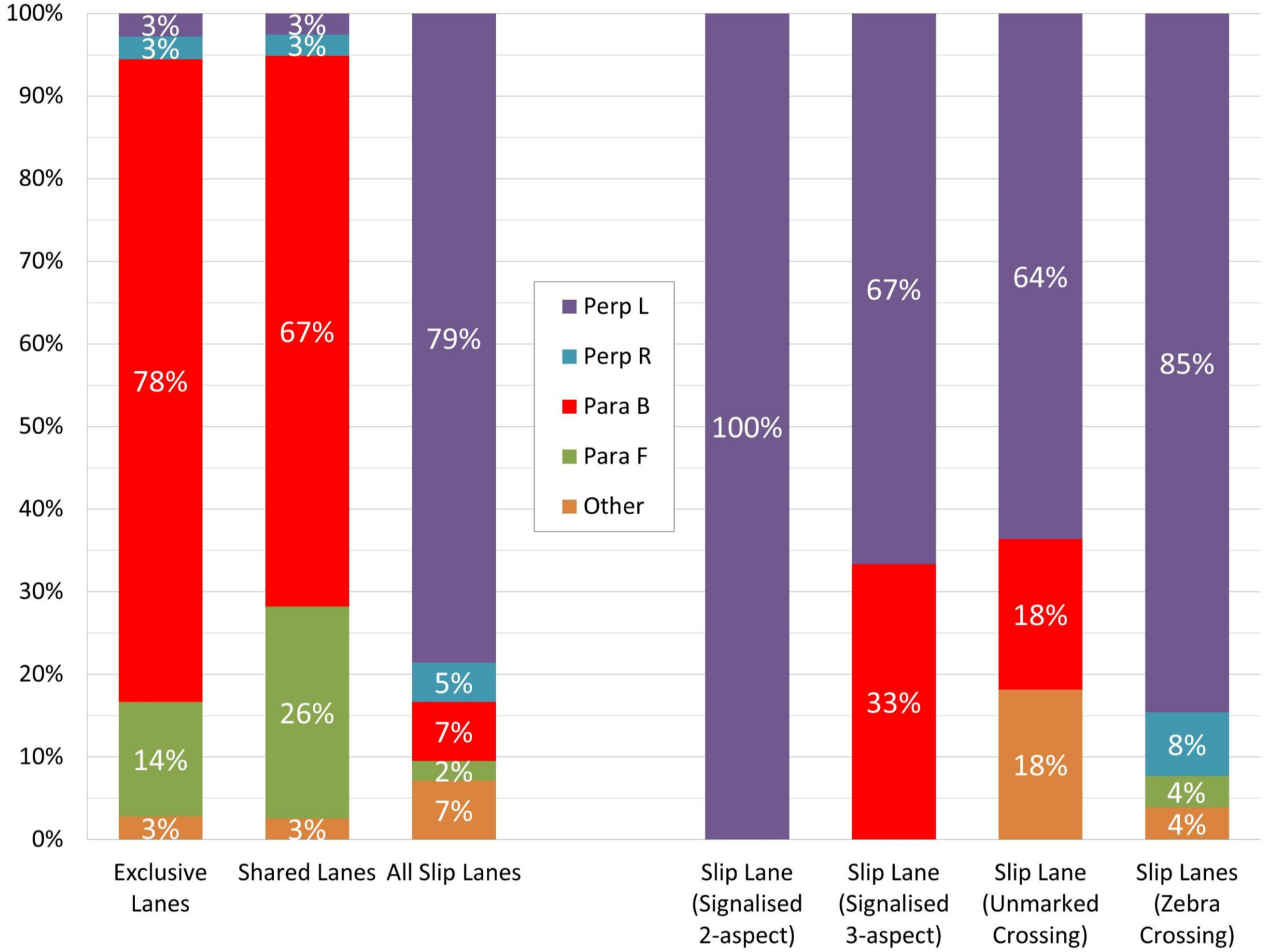
Para F



Perp R

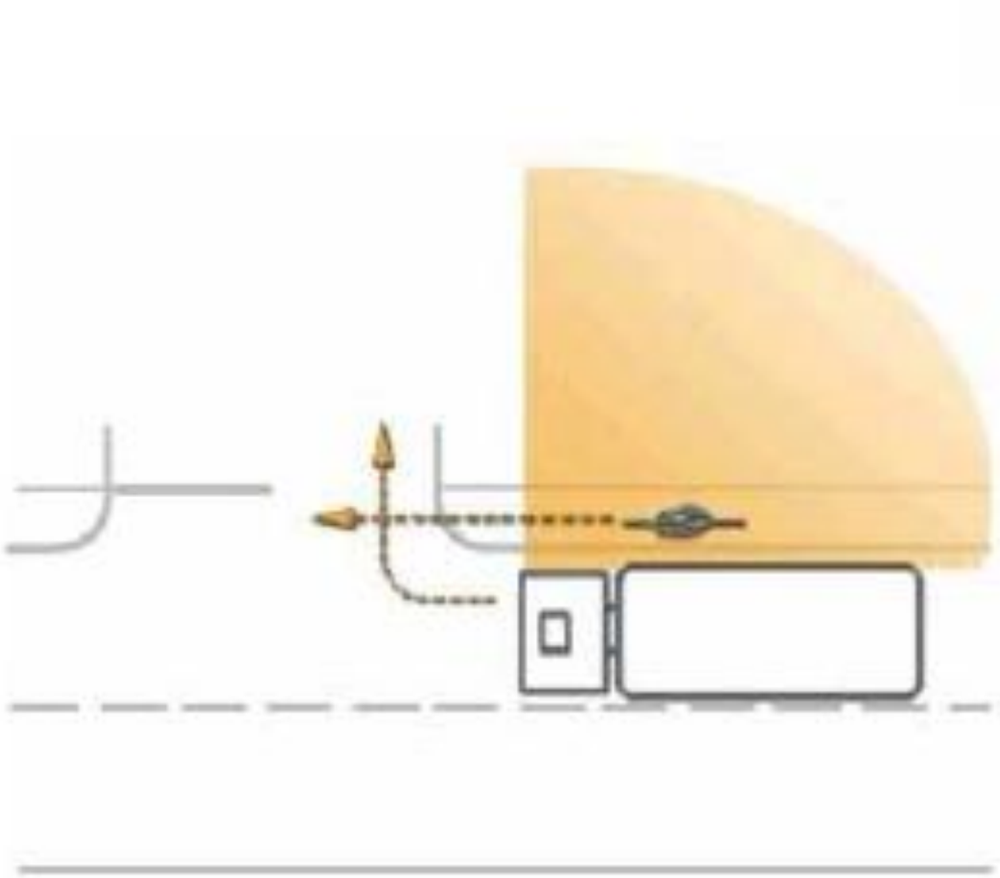


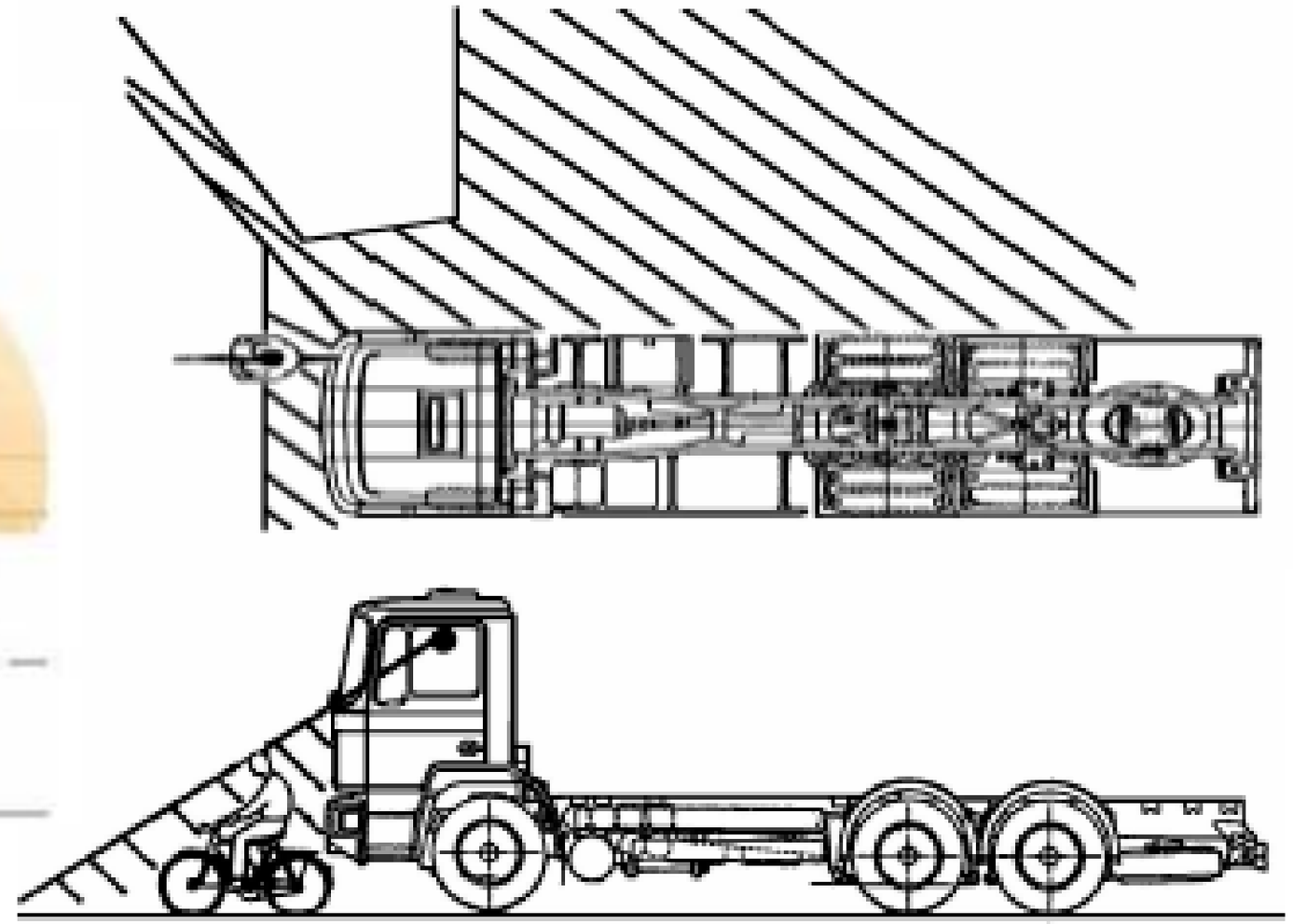
Ped. vs. Left-Turn Vehicle Conflict Types



Niewoehner Study – Field of View Issues

- German research → left-turning truck vs. ped./cycle crashes
  - ➢ 78 of 90 crashes involved cyclists (73% were Para B crashes)
  - ➢ Key factor identified was poor field of view





Niewoehner Study – Field of View Issues

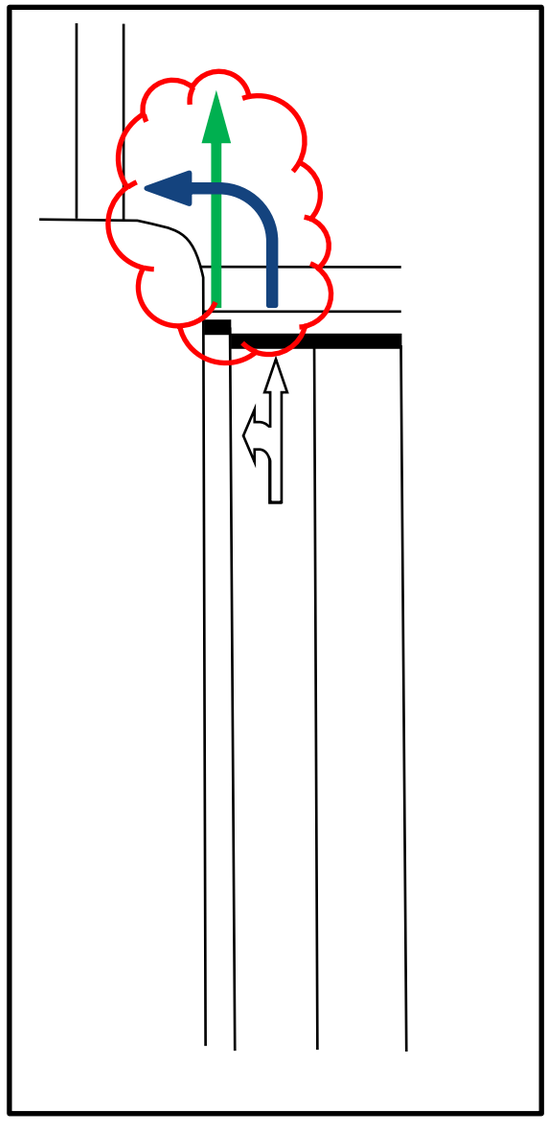
- Crash severity issue for two Para B scenarios:

  1. truck turns from stationary → fatal = 16 of 31 (51%)
     = MORE DANGEROUS

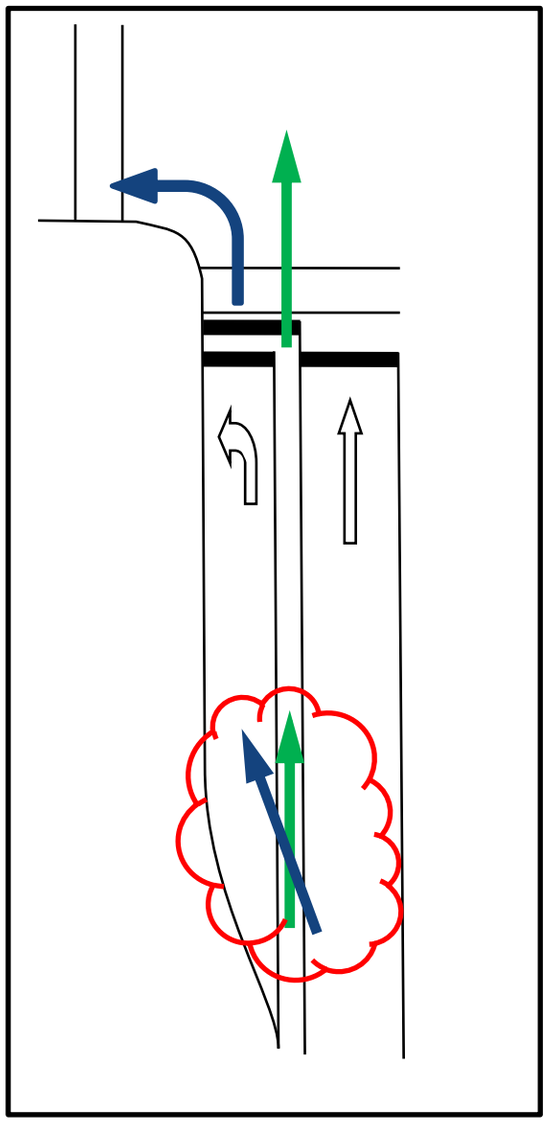
  2. truck turns without stopping → fatal = 11 of 35 (31%)

- Possible reason for severity difference → decelerating truck provides extra cue to cyclist

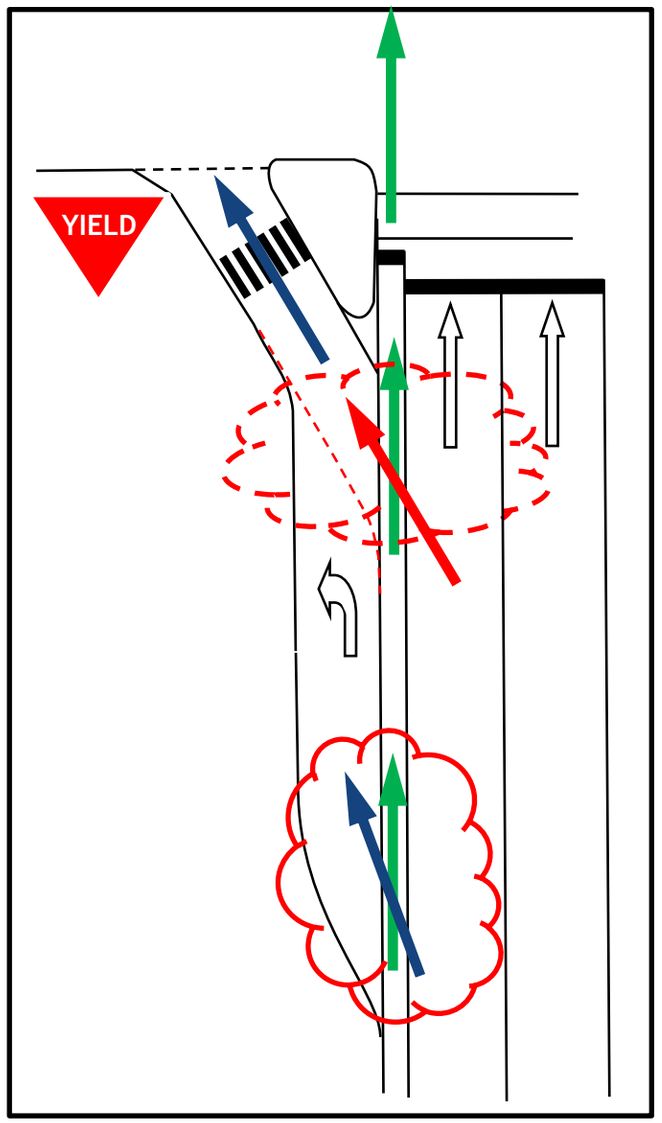
Through Cyclist vs. Left-Turn Vehicle



Point conflict at intersection



Weaving conflict upstream of intersection



With Deceleration Lane - Weaving conflict upstream of intersection

Without Deceleration Lane – Point conflict slightly upstream of stopline

Through Cyclist vs Left-Turn Vehicle

Whether **weaving or point conflict is better …**

- **… seems to depend on which cyclist you ask !!!!**
- … and on the actual layout detail of the roadway and the traffic characteristics (speed, queuing, etc)

Conclusions/Suggestions – On-Road Cycling

- My typical design preference → **slip lanes with deceleration lanes**
  - preferred (???) for on-road cyclists
  - preferred for pedestrians (*if modified to improve for vision-impaired peds.*)
- My conclusion depends on context such as:
  - traffic speeds;
  - demand levels and queuing; and
  - the ability to provide a good physical design.

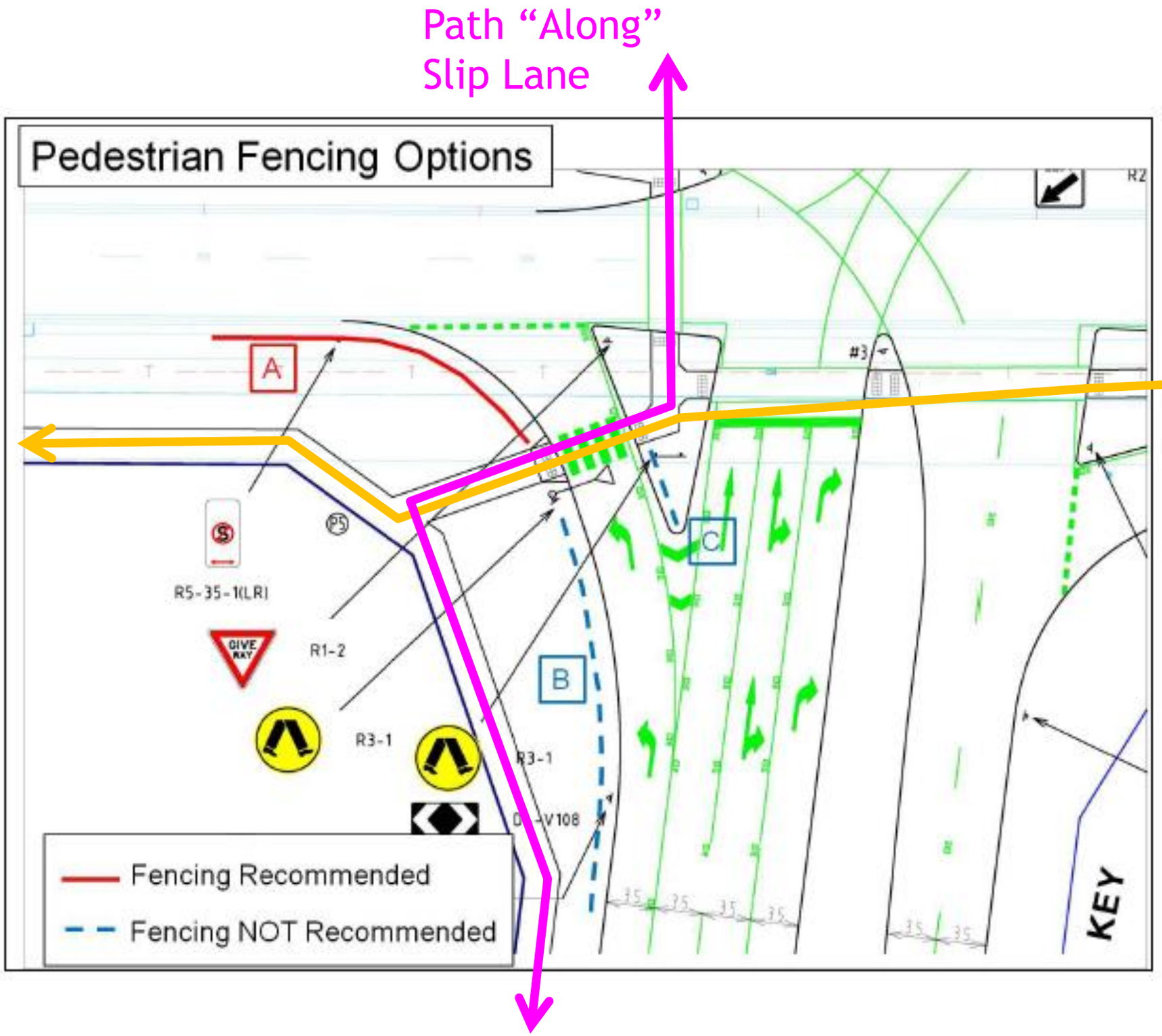
Shared Paths via Slip Lanes

- Shared paths across slip lanes → issues for cyclists include:
  - small island size
  - non-rideable path alignments
  - lack of hand-rails
  - wrong-side push buttons
  - traffic and bicycle speeds
  - cyclists legally required to dismount at zebra crossings
  - pram ramps **vs.** wombat crossings **vs.** flush paths across island **vs.** TGSI for disabled users

Shared Paths & Slip Lane Zebra Crossings

- Zebra crossings are found at most new slip lanes → legally cyclists are supposed to dismount
- Recommended → “green” zebra coupled with cycle symbol below walking legs sign:
  - tells drivers → to expect cyclists
  - confirms to cyclists → dismount not required
  - relatively simple to retrofit
- Restrict application to sites with suitable sightlines, vehicle speeds, island size, etc
- Can use at mid-block crossings → prevents need for creative (and possibly illegal) solutions

Importance of Shared Path Direction



Path "along" → difficult

Path "across" → easier

Both subject to Perp L & Perp R crashes

Footscray Road shared path → cyclist volumes important for suitability

Conclusions – Shared Paths vs. Left-Turns

- For shared path crossings of left-turns at signals → my typical design preferences are:

  Path Across:

  - low to mod. cyclist/ped. demand → **Slip lane**
  - high cyclist/ped. demand → **Exclusive lane**

  Path Along:

  - low cyclist/ped. demand → **Slip lane**
  - mod. to high cyclist/ped. demand → **Exclusive lane**

Conclusions – Caveats

- Slip lanes → only appropriate for shared path crossings where islands can accommodate:
  - ➢ physical facilities (e.g. hand-rails, path alignments, etc); and
  - ➢ likely cyclist and ped. queuing

- If slip lane design unsuitable, use an exclusive lane instead (rather than a shared lane).

- Exclusive lanes → have their own design and signal operations issues → particularly vulnerable to cyclist/ped. Para B type crashes