Shared Path Widths

Project Aim: to determine appropriate widths and develop a tool for off-road pedestrian and cyclist paths

Undertaken for VicRoads, Victoria, Australia

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Path Types

Shared
Pedestrians and cyclists both allowed on the same part of the path.

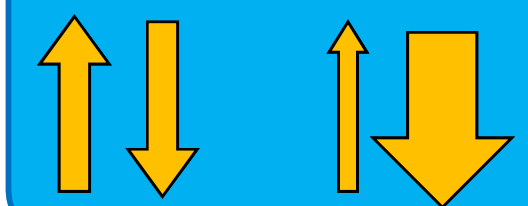
Segregated
Paint markings or different surface types used to delineate different areas for pedestrians and cyclists.

Separated
Different areas for pedestrians and cyclists divided by physical barriers or wide distances

Modelling Issues

Users
- Different characteristics and abilities.
- Diverse speed distributions.

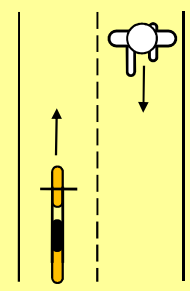
Travel Directions
- Directional split of flow affects the occurrence of user interactions



Existing Guidance
- Current path design generally based on empirical observations rather than scientific consideration of user interactions.

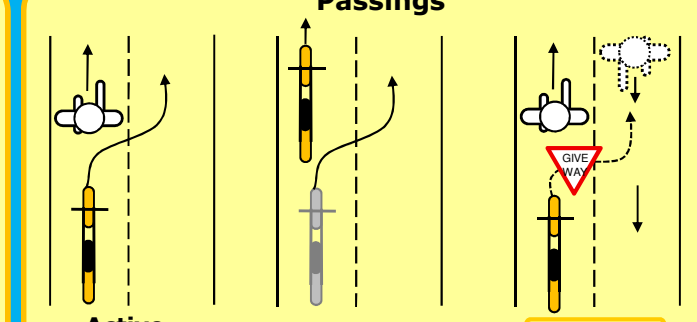
User Interactions

Meetings



Users encounters another in the opposite direction

Passings



Active
User overtakes another

Passive
User is overtaken by another

Delayed
User has to wait to overtake

Quantifying Safety
- Few data available regarding crashes and conflicts on shared paths
- Crashes on paths are relatively rare and of low severity
- Level of Service (LOS) used as proxy for safety

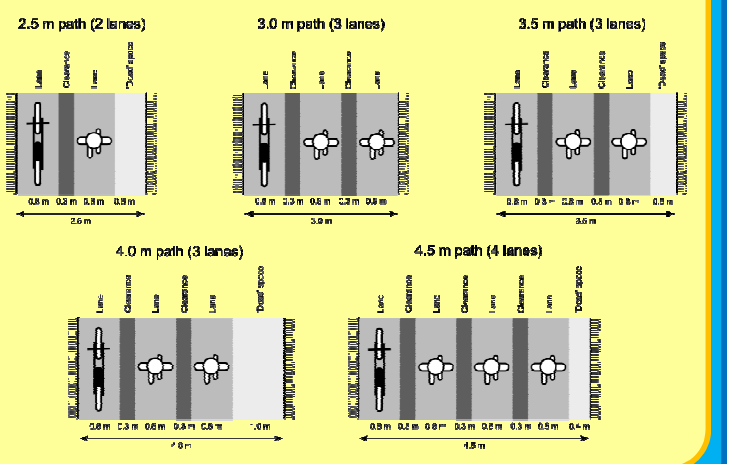
Level of Service
- A high LOS indicates plenty of room for path users to move safely and enjoy the experience
- A low LOS indicates users do not have sufficient space and may be likely to take evasive moves unsafely.
- Delayed passing the most critical component of LOS.

Model Development

Model Assumptions and Inherent Characteristics

User Types
- Two main modes:
  - Adult cyclists
  - Walkers
- Also allowance for child cyclists
- Determined from site surveys
- Simplifies modelling and design process

User Widths and Clearances
- Lane-based model
- No LOS increase for additional width less than required user width



User Speeds
- For each mode group
- Average speed
- Standard deviation

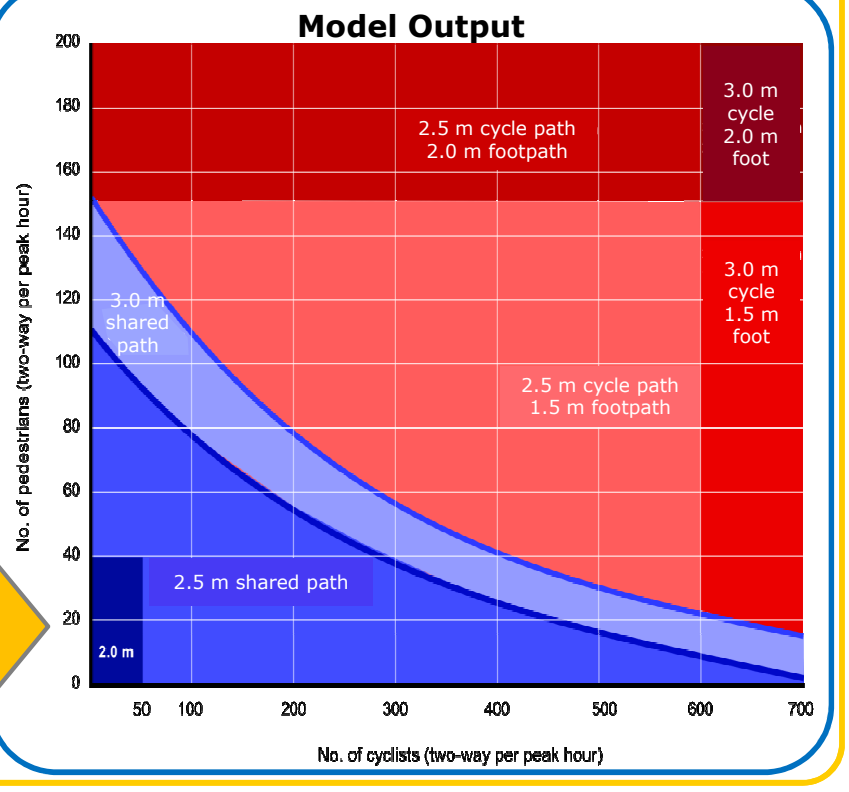
LOS Threshold
- LOS at which path is deemed sufficiently "safe"
- Taken as 12 delayed passings per hour (for average cyclist)

User Assumptions
- When is the design year?
- What growth rates will be experienced?

User Input
- Pedestrian volumes
- Cyclist volumes

Note that segregated paths are more suitable than shared paths at higher volumes!

Model Output



Conclusions

- There is currently little quantitative guidance available regarding the determination of shared path widths.
- Shared paths are complex due to their wide range of user characteristics, mode splits and directional splits.
- It is difficult to quantify safety.
- A simplified situation has been developed:
  - Two modes: walkers and adult cyclists
  - Conservative 50/50 directional split
  - LOS based on threshold of 12 delayed passing events per cyclist per hour
- The model shows that segregated paths require less total width and therefore are more appropriate than shared paths at higher volumes.
- We anticipate that this model will be of significant use in properly designing shared paths in Australia and, after some site-specific calibration, New Zealand.
- Designers must have a good appreciation of how to predict path volumes, including allowing for future growth.

Recommendations

- Determine the user widths, clearances, speed distributions and delayed passing threshold appropriate to NZ conditions and thus develop a NZ path design chart.
- Further research to understand how to identify design year and predict design volumes is needed.
- Further investigations to identify the most appropriate way of detailing segregated paths so that users are happy to comply with the segregation.

  We have observed that simple paint markings are ineffective and suggest research into colour and texture differentiation.

  This could be done by before and after surveys on a group of test treatments to determine the most effective.