



**Land Transport NZ**  
Ikiiki Whenua Aotearoa

# Pedestrian Planning and Design Tools

Enabling better practice

Tim Hughes

# Guidelines

- *Austrroads Guide part 13: Pedestrians*
- *Traffinz Guide to pedestrian crossing facilities*
- *TR11*
- *Pedestrian planning and design guide*
- *Crossing type calculation spreadsheet*
- *Non-motorised user audit & review*
- *Community street review*
- *Benchmarking performance*

# Pedestrian planning and design guide

A summary of best practice:

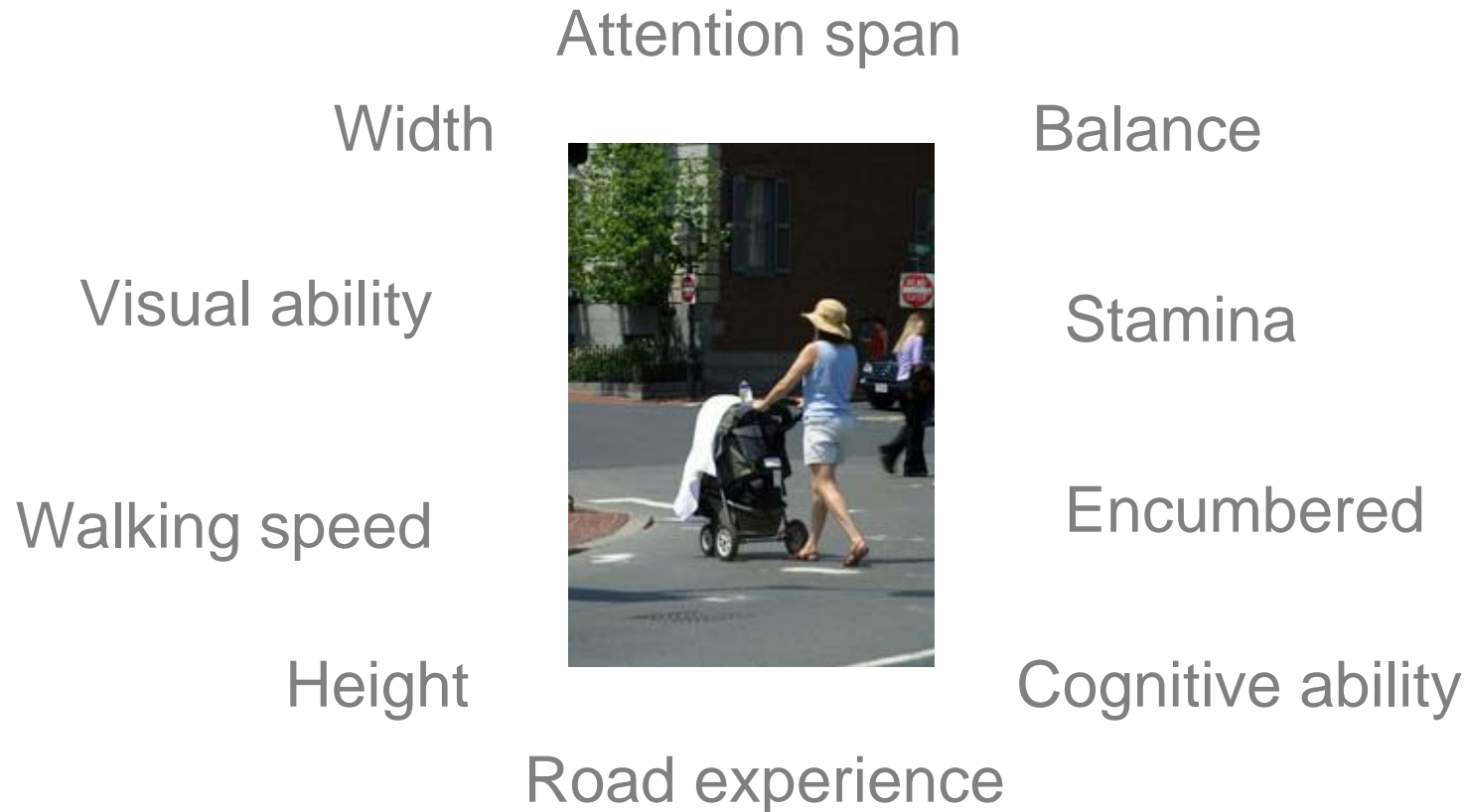
- Planning and policy context
- Principles of pedestrian network planning
  - Pedestrian needs
  - Selection criteria
- Pedestrian network planning process
- Design of walking infrastructure
  - Footpaths
  - Crossings

# The design pedestrian?

- Capable adults
- Children
- Elderly
- On small recreational wheels
- Mobility impaired;
  - sticks, wheelchairs, frames, scooters
- Vision and hearing impaired

All of the above

# Ways Pedestrians Vary



- The most diverse group of travellers
- Design for the more challenged

# Road User Hierarchy

- Ranks the importance of road users



# Footpath standards

- Continuous accessible path
- Reduce fall hazards: slips, trips and stumbles  
specs: trip height, friction, undulations
- Crossfall – Maximum 2%
- Driveways – cross footpaths not vice versa  
- crossfall maintained
- Kerb crossings - top and bottom landings,  
- gentle slopes
- Lowering footpaths adjacent
- Streetscape

## *Old NZ Warrants approach for priority pedestrian facilities*

### Pedestrian Operated Signals:

▪ Pedestrians x vehicles	> 200,000	(1 hr)
▪ Vehicle flow	> 500	(1 hr)
▪ Pedestrian flow should be	> 200	(1 hr)

### Zebra Pedestrian Crossings:

▪ Pedestrians x vehicles	> 45,000	(1 hr)
▪ Vehicle flow	> 300	(1 hr)
▪ Pedestrian flow should be	> 100	(1 hr)

### School Patrol Zebra Crossing Points:

▪ Pedestrians x vehicles	> 5,000	(1/2 hr)
▪ Vehicle flow	> 100	(1/2 hr)
▪ Pedestrian flow should be	> 50	(1/2 hr)

### School Patrol (Kea) Crossing Points:

▪ Pedestrians x vehicles	> 3,000	(1/2 hr)
▪ Vehicle flow should be	> 100	(1/2 hr)
▪ Pedestrian flow should be	> 50	(1/2 hr)

A Christchurch study concluded that pedestrian delay is a factor that should also be taken into account when assessing the need for priority pedestrian facilities. At uncontrolled crossing point facilities, adult pedestrians were prepared to accept average delays of 15 second on local and collector roads and 30 seconds on arterial routes.

If delays are greater than this, pedestrians take risks crossing the roadway.

# *Providing for pedestrians crossing roads*

## **Hierarchy of Pedestrian Solutions Consider in this order:**

- **Reduce traffic volume**
- **Reduce traffic speed**
- **Reallocate space (road diet?)**
- **At grade crossing facilities**
- **Grade separation**

# *Providing for pedestrians crossing roads*

**Then consider in this order:**

- **Road environment and land use context**
- **Physical aids to crossing**
- **Appropriate control**
- **Design Detail**

## **Road environment and land use context**

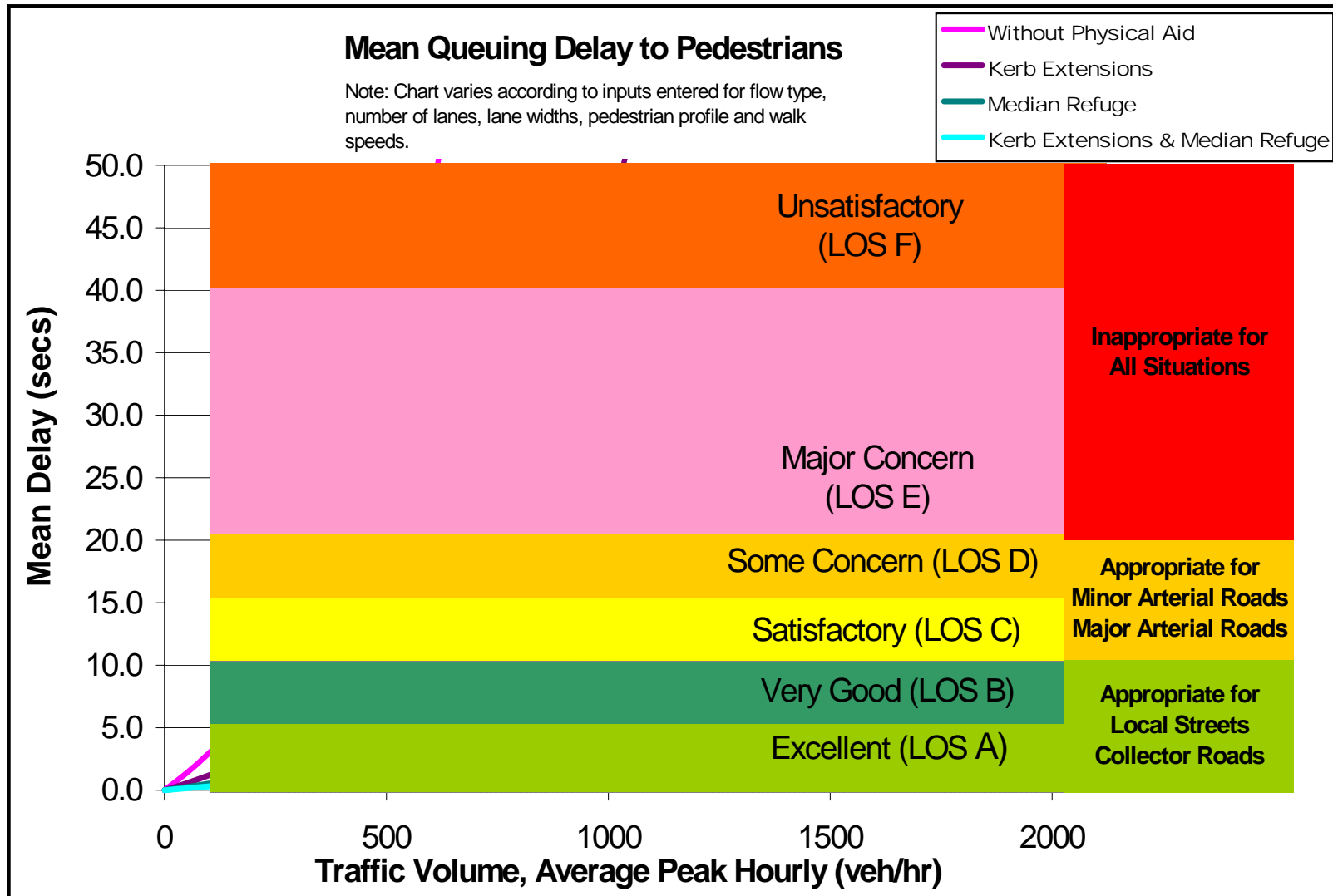
- **Traffic volume and composition**
  - Gaps in traffic, space needed
- **Speed of traffic**
  - Speed management / traffic calming needed,
  - Platform appropriate?
- **How many traffic lanes in each direction?**
  - Are zebras possible?
- **Road surrounds: CBD, commercial, residential**
  - What will users expect here?
- **Where do they cross and to where?**
  - One place? Spread out? In a hurry?
- **Who wants to cross, how many?**
  - Age, walking purpose, school, impaired, suppressed?
- **What type of facilities are appropriate here?**

# *Physical crossing aids*

- **Narrow roadway by kerb protrusions**
  - Average pedestrian delay below 15 seconds up to 300 vehicles per hour each way (600 2 way)
  - Safety benefit 36% crash reduction
- **Divide crossing into two parts**
  - **Central raised islands**
    - Average pedestrian delay below 15 seconds up to 900 vehicles per hour each way or (1800 two way)
    - Crash reduction 18%
    - Delay reduction - awesome !!!

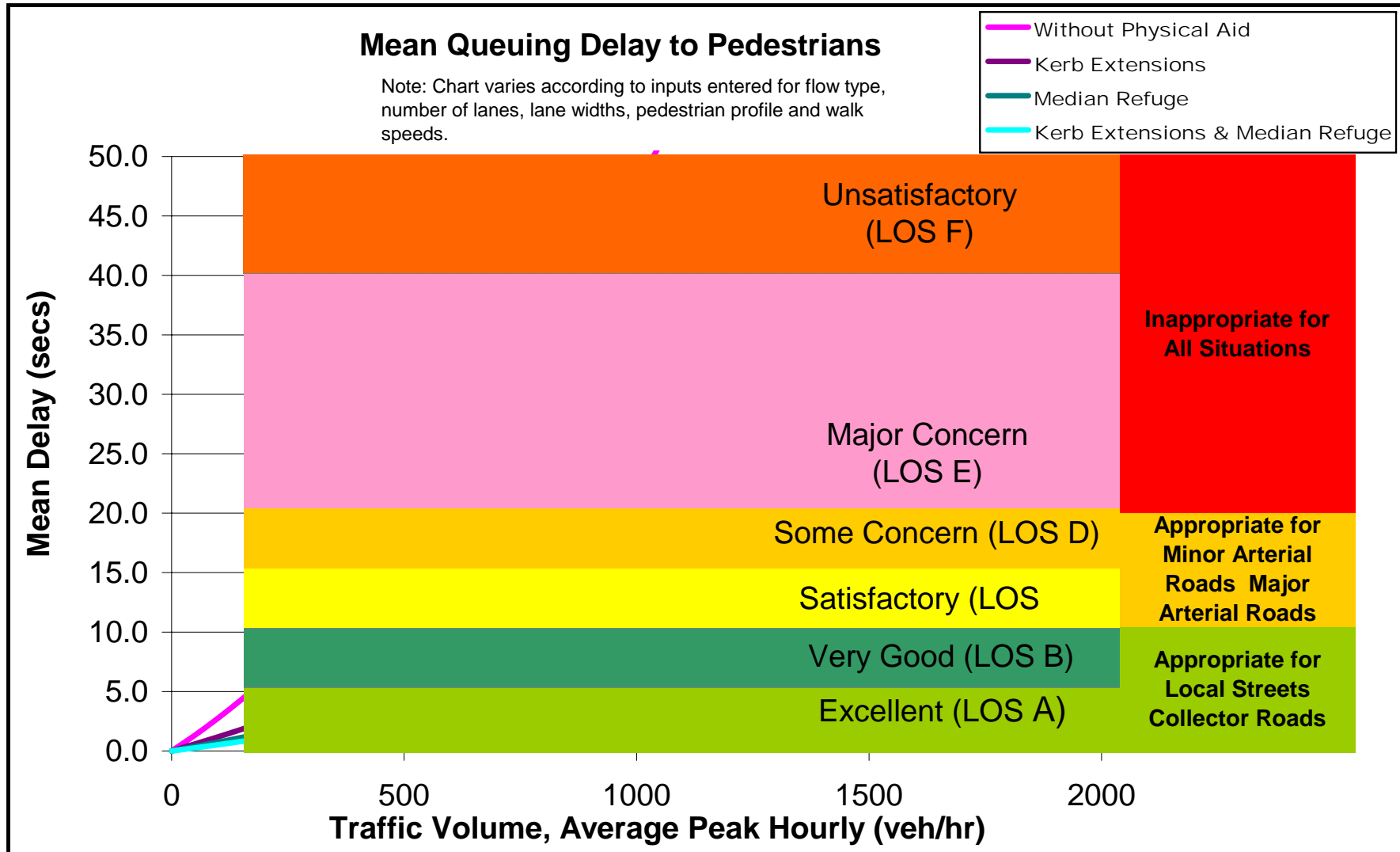
# Physical crossing aids

## – uninterrupted flow



# Physical crossing aids

## – interrupted flow



## *Calculation tool*

For all at grade options except signals:

- Excludes dumb options
- Calculates delays to motorists and pedestrians
- Estimates typical crash rates and reductions
- Summary sheet compares options
- Some assumptions require refinement

## Zebra Crossings

- Never use across two lanes of traffic in the same direction.
- Extra vehicle delay is usually greater than reduced pedestrian delay. (assuming road is first narrowed as accords with best practice)
- There are no safety reductions from zebra installation, often the converse.
- So, consider only where pedestrian delay is unacceptably high, physical aids are not sufficient and vehicle delay less important than pedestrian delay.

## *Typical safety benefits*

<b>Measure</b>	<b>reduction</b>	<b>pedestrians</b>	<b>overall</b>
<b>Kerb extensions</b>	<b>0.36</b>		
<b>Raised Median Island</b>	<b>0.18</b>		
<b>Kerb ext + Island</b>	<b>0.32</b>		
<b>Kerb ext at existing zebra</b>	<b>0.44</b>		
<b>Zebra plus Platform</b>	<b>0.88</b>		
<b>Midblock traffic signals</b>	<b>0.64</b>		<b>0.35</b>
<b>Zebra only</b>	<b>- 0.28</b>		<b>- 0.26</b>
<b>School patrols</b>	<b>0.35</b>		

## *Typical safety benefits*

<b>Measure</b>	<b>reduction pedestrians</b>	<b>overall</b>
<b>Intersection signals - parallel phase</b>	<b>-</b>	<b>-</b>
<b>Intersection signals – exclusive phase</b>	<b>0.29</b>	<b>0.22</b>
<b>Cycle lanes</b>	<b>0.30</b>	<b>0.30</b>
<b>Roundabouts</b>	<b>0.48</b>	<b>0.35</b>
<b>Flush medians</b>	<b>0.30</b>	<b>0.19</b>

# Implications

- Better planning concepts and processes for walking infrastructure
- More comprehensive and context sensitive guidance - choose best option don't just rely on warrants.
- Put the right facility in the right place
- Design it better
  - revise your standard drawings

**“Every project is a walking project”**

## Next steps

- NZ walking conference - Nov 3 & 4.

Plan training workshops.....

- Full day introduction course for practitioners?
- Half day intro. for managers?
- Cover all the tools together over 2 days?
- Or separate events?
- Potential for an advanced course?
- Tell me what you want?