Road Safety Audits for Bicycle and Pedestrian Facilities

the devil is in the detail

26 July 2012
PedBikeTrans Seminar
Outline

- Road Safety Audits and THE checklists
- Devil in the Detail
  - Standards
  - Maintenance & Construction
  - Walkability & Bikeability
- Special Effects
  - Responding to the Audit
  - The Courts
  - Separated Cycleways
Road Safety Audits

**definition**
- a *formal* examination of a future road or traffic project or an existing road, in which an *independent* team reports on the project’s *crash potential and road safety performance*

**when**
- Feasibility
- preliminary design
- detailed design
- pre-opening
- operational
- (during construction)
THE checklist - pedestrians

• General Requirements
• Alignment & Cross Section
• Delineation, Signs, Lighting
• Walking Surface & Gradient
• Vegetation, Maintenance, Construction
• Pedestrian Crossings and Intersections
• Physical Objects & Fixtures
• Paths - Special Features
THE checklist - bicycles

- General Requirements
- Alignment & Cross Section
- Delineation, Signs, Lighting
- Riding Surface
- Vegetation, Maintenance, Construction
- Traffic Signals
- Physical Objects
- Paths - Special Features
- Path Alignment and Cross Section
- Path Intersections
- Roads - Special Features
- Road Intersections
Bottom Line:

Think Bike
Think Ped

In everything we do
Lazy engineers/designers/planners deal with single modes
We don’t have the resources to retrofit or do things twice
Standards – old and new

- Queensland Cycle Strategy 2011 - 2021
- Preventative Health Strategic Directions 2010-2013
- Sustainable Planning Act 2009
- Action Plan for Walking 2008-2010
- Cycling Infrastructure Policy - Organisational Policy
- QT Cycle Notes (2006)
- A guide to signing cycle networks - showing the way to more cycle trips
- DRAFT - Separated Cycleways Guidelines
  - GtRS, GtRD, Cycling Aspects
  - Other States ???
Walking & Cycling Strategies

more cycling, more often on safe, direct and connected routes

Cycling commute to work targets

2.8% 56,000 commute cycle trips per day

1.4% 21,000 commute cycle trips per day

2006 2021

No time / too busy Too far to travel Too lazy Already walk a lot Medical reasons No motivation Weather conditions Other
Preventative Health Strategies

Infrastructure Australia Workshop, September 2011

“If Queenslanders do not meet the National Physical Activity guidelines of 30min per day on most days, Queensland Health will be broke within a decade”

He who shall not be named

- NPA National Partnership Agreement
- Whole-of-government approach
- Partnerships: Health, Education, Transport, Sport & Rec, industry
- Access: bike paths, walking tracks, parks
- Programs: TravelSmart, Smart Moves, IMATCH, 10000 Steps
Standards

69 Giving way at a give way sign or give way line at an intersection, other than a roundabout

(2A) If the driver is turning left using a slip lane, the driver must give way to—
(b) a vehicle or a pedestrian on the slip lane.
Standards
Standards
Standards
Standards
Standards
Standards
Standards
Standards - AS1742.10 (2009)
Standards - Figure 7.4, Austroads GtRD, Part 6A
Standards - Figure 7.4, Austroads GtRD, Part 6A

A. Vertical fall

<table>
<thead>
<tr>
<th></th>
<th>X (metres)</th>
<th>Y (metres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fence not required*</td>
<td>&lt;2</td>
<td>&lt;0.25</td>
</tr>
<tr>
<td>Partial barrier fence required</td>
<td>&lt;5</td>
<td>0.25 to 2</td>
</tr>
<tr>
<td>Full barrier fence required</td>
<td>&lt;5</td>
<td>&gt;2</td>
</tr>
</tbody>
</table>

* Batter off the surface where fall is within 1 m of path.
Road Rule #62 - Giving way when turning at an intersection with traffic lights

(1) A driver turning at an intersection with traffic lights must give way to:
(a) any **pedestrian** at or near the intersection who is on the road the driver is entering
Standards

Regulatory signage

Educational signage

Blue Line (continuous educational tool)

Is 1.2m adjacent to a grass run-out space too little?
Standards or Walkability?
Definitely more than Walkability

Lawyer: is there a lawsuit in this?
Standards

Lawyer: It looks like a crossing, it feels like a crossing, ...mmm....$$$. ...???....

???? Use Caution ?????
Standards
Standards
## Maintenance & Construction
### GtRD 6A - Existing Surface Tolerances

<table>
<thead>
<tr>
<th></th>
<th>Width of groove&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Height of step&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parallel to direction of travel</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Perpendicular to direction of travel</td>
<td>-</td>
<td>20</td>
</tr>
</tbody>
</table>
Maintenance & Construction
Maintenance & Construction
Maintenance & Construction
Maintenance & Construction
Maintenance & Construction
Walkability & Bikeability

**Pedestrians**
- Connected
- Convivial
- Conspicuous
- Comfortable
- Convenient

**Cyclists**
- Coherent
- Attractive
- Safe
- Comfortable
- Direct
Walkability & Bikeability
Walkability & Bikeability
Walkability & Bikeability
Walkability & Bikeability
Walkability & Bikeability
Walkability & Bikeability
Walkability & Bikeability
Walkability & Bikeability
Walkability & Bikeability
Walkability & Bikeability
Walkability & Bikeability
Walkability & Bikeability
Walkability & Bikeability
Responding to the Audit

- Manhole cover has been reconstructed flush with cycleway
- Uneven surface (longitudinal cracking at gutter lip has been repaired)
Responding to the Audit

Tenant/owner confirms not a required fire door + it is bolted shut from inside
Responding to the Audit
The Courts

• High Court ca 2001
  • Case 1
    • Pedestrian trip and fall
    • Dismissed
    • Good news for Councils
    • BUT not the ultimate excuse
  • Case 2
    • Timber Bridge
    • “Non-feasance” vs “Misfeasance”
    • Obligation 1 – know your network (eg RSA, pavement inspections)
    • Obligation 2 – program to fix errors
    • NOT – fix all problems = tax
The Courts - QLD Supreme Court 2012

• The Site
  • Residential street (low speeds and volumes)
  • Kerb and gutter
  • No footpaths
The Findings

- “There was nothing negligent in the plaintiff initially walking along the far right hand side of the road”
- It is unreasonable for pedestrians and cyclists “to remove themselves from the bitumen surface of the roadway until the vehicle has passed”
- Kids under 15 do “not have the same degree of experience, understanding, judgment and thoughtfulness to be expected of an adult”
- “in pedestrian cases, typically a heavier share of responsibility falls on the motorist even if the degrees of departure from the standard of reasonable care be more or less equal”

Question Arising

- Would the judgment have been different if there has been a constructed footpath
- Does this finding have implications for Road Authorities to construct footpaths
Table 2.1 is an example of when footpaths may be required based on the general abutting land use, and illustrates the way in which the principles are applied in New Zealand.

<table>
<thead>
<tr>
<th>Land use</th>
<th>Footpath provision</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>New roads</td>
</tr>
<tr>
<td></td>
<td>Preferred</td>
</tr>
<tr>
<td>Commercial and industrial</td>
<td>Both sides</td>
</tr>
<tr>
<td>Residential (on arterial roads)</td>
<td>Both sides</td>
</tr>
<tr>
<td>Residential (on collector roads)</td>
<td>Both sides</td>
</tr>
<tr>
<td>Residential (on local streets)</td>
<td>Both sides</td>
</tr>
<tr>
<td>Three to ten dwellings per hectare</td>
<td>Both sides</td>
</tr>
<tr>
<td>Fewer than three dwellings per hectare</td>
<td>One side</td>
</tr>
</tbody>
</table>

Two-Way Separated Cycleways

- Exclusive for cyclists
  - not peds
  - not parked cars
  - not moving cars
- Off-Road “Path” in the “Road Related Area”
- Examples
  - RMS – SHB
  - RMS – Epping Road
  - CoS – Bourke Street
  - CoS – Bourke Road
  - CoS – College Street

no traffic lanes were harmed during the making of this facility
a) - Current design guidance in The Netherlands

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>width of cycle track</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>One-way track</td>
</tr>
<tr>
<td>rush hour</td>
<td>width (b)</td>
</tr>
<tr>
<td>intensity</td>
<td>in one</td>
</tr>
<tr>
<td>direction</td>
<td>width (b)</td>
</tr>
<tr>
<td>(b/h)</td>
<td></td>
</tr>
<tr>
<td>0 – 150</td>
<td>2.00 m</td>
</tr>
<tr>
<td>150 – 750</td>
<td>3.00 (2.50) m</td>
</tr>
<tr>
<td>&gt; 750</td>
<td>4.00 (3.50) m</td>
</tr>
</tbody>
</table>

(Further detail is provided in Appendix D)

c) - Dutch example (Breda)

d) - RTA example (Epping Road Cycleway)
Safety – Concerns in older research have been allayed

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Source</th>
<th>Separated Cycleways Increase Crashes</th>
<th>Separated Cycleways Reduce Crashes</th>
<th>Year of Publication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wachtel &amp; Lewiston*</td>
<td>Risk factors for cycle-motor vehicle collisions at intersections</td>
<td>Journal of Institute of Transport Engineers</td>
<td>✓</td>
<td>✗</td>
<td>1994</td>
</tr>
<tr>
<td>Linderholm*</td>
<td>Proceedings of conference - Sicherheit rund ums Radfahren</td>
<td>Online</td>
<td>✓</td>
<td>✗</td>
<td>1991</td>
</tr>
<tr>
<td>Jensen et al</td>
<td>Junctions and cyclists</td>
<td>Velo-city</td>
<td>✓</td>
<td>✗</td>
<td>1997</td>
</tr>
<tr>
<td>Rasanen &amp; Summala</td>
<td>The safety effect of sight obstacles and road markings at bicycle crossings</td>
<td>Traffic Engineering and Control</td>
<td>✓</td>
<td>✗</td>
<td>1998</td>
</tr>
<tr>
<td>Velo Secur</td>
<td>Issues of bicycle safety</td>
<td>German Cycling Federation</td>
<td>✓</td>
<td>✗</td>
<td>1990</td>
</tr>
<tr>
<td>Pasanen*</td>
<td>The risks of cycling</td>
<td>Online</td>
<td>✓</td>
<td>✗</td>
<td>1999</td>
</tr>
<tr>
<td>Berlin Police Department</td>
<td>Traffic accidents involving cyclists</td>
<td>Online</td>
<td>✓</td>
<td>✗</td>
<td>1987</td>
</tr>
</tbody>
</table>
## Safety – support in recent research

<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Source</th>
<th>Separated Cycleways Increase Crashes</th>
<th>Separated Cycleways Reduce Crashes</th>
<th>Year of Publication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lalonde, M.</td>
<td>Bike paths reduce injuries: study</td>
<td>Montreal Gazette</td>
<td>X</td>
<td>✓</td>
<td>2011</td>
</tr>
<tr>
<td>Lusk et al**</td>
<td>Risk of injury for bicycling on cycle tracks versus in the street</td>
<td>Injury Prevention</td>
<td>X</td>
<td>✓</td>
<td>2011</td>
</tr>
<tr>
<td>Franklin, J.</td>
<td>Cycle path safety summary of research</td>
<td>Online website</td>
<td>Summarised research providing support for both views</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reynolds et al</td>
<td>The impact of transportation infra-structure on bicycle injuries and crashes: a review of the evidence</td>
<td>Environmental Health</td>
<td>X</td>
<td>✓</td>
<td>2009</td>
</tr>
<tr>
<td>Jensen et al</td>
<td>Road safety and perceived risk of cycle facilities in Copenhagen^</td>
<td>Presentation to European Cycling Federation AGM</td>
<td>X</td>
<td>✓</td>
<td>2006</td>
</tr>
<tr>
<td>New York City Dept of Transport</td>
<td>Prospect Park West bicycle path and traffic calming</td>
<td>New York City Department of Transport</td>
<td>X</td>
<td>✓</td>
<td>2011</td>
</tr>
</tbody>
</table>
Safety concerns – work in progress

02/09/2008 ONE CRASH
25/11/2009 ONE CRASH
28/10/2010 ONE CRASH
(ALL LEFT TURN SIDE SWIPE)

26/06/2009 ONE CRASH
(LEFT TURN SIDE SWIPE)
Safety concerns – work in progress
Safety concerns – work in progress
Come and Join Us

TMR Training Course
Designing for Bicycle Riders and Pedestrians
Late 2012, details TBA

robyn.c.davies@tmr.qld.gov.au
michael.j.langdon@tmr.qld.gov.au
Thank You

Dick van den Dool
GTA Consultants
07 - 3113 5000
dvd@gta.com.au
Breaking News – from Holland Cycleland

Every year:
2500 treated injuries, 325 hospital admissions

Source: Vogelvrije Fietser, Jul/Aug 2012
UQ puts the zebra back into zebra crossing

• UQ’s Property and Facilities division engaged consultancy firm GTA to develop a report with a striking solution to raise awareness of safe and sustainable transportation.
• Mr Davin Brown, a consultant for GTA said that the crossing was part of an exciting worldwide trend.
• “These methods are being used more around the globe to promote awareness and fun around something that is usually quite standard,” Mr Brown said.

Breaking News – The Age

Source: The Age, 31 July 2012