

PEDESTRIAN SAFETY AND ACCESSIBILITY AUDIT TOOLS

1 Purpose

To provide the methodology and the “tools” for use by road authorities to improve pedestrian safety, accessibility and amenity.

2 Background

To address the key actions from its Road Safety Action Plan, Queensland Transport contracted Main Roads to conduct a pedestrian safety and accessibility audit pilot program at four locations in South East Queensland in 2003. The four sites that were selected for the pilot program were chosen based on analysis of pedestrian crash data.

The project involved the development of a range of pedestrian safety audit tools such as a pedestrian behaviour observation sheet, a walking audit checklist and a pedestrian questionnaire. A survey company was contracted by Queensland Transport to conduct pedestrian and traffic volume counts at each of the four sites.

The initial audit tools were refined following feedback from an engineering consulting company which applied the tools to undertake audits in regional centres.

The information contained in this Note is the result of the above development and refinement.

3 Pedestrian Safety and Accessibility Audit Methodology

The pedestrian safety and accessibility audit methodology involves the following tasks:

- (1) identify the site for audit based on pedestrian crash history and / or community complaints;
- (2) obtain site characteristics (eg. geometry/plans, pedestrian and vehicle volumes if available, crash data);
- (3) review the crash data;
- (4) inception/entrance meeting with local traffic representative to obtain background (local) information about the site and reasons for the audit. In particular, the local input will be important to identify appropriate survey days/times and specific issues that should be considered. Local stakeholders could include representatives from Council, Department of Main Roads, Queensland Transport, emergency services and business operators;
- (5) initial inspection of the site;
- (6) review existing and future land use in the vicinity of the site (with local input) to assist in identifying pedestrian desire lines and the need for facilities;
- (7) conduct pedestrian behaviour observation surveys*;
- (8) conduct pedestrian interview surveys*;
- (9) conduct pedestrian and vehicle counts*;
- (10) conduct on site pedestrian audit by an accredited road safety auditor;
- (11) where conducted, review the results from the pedestrian behaviour observation surveys, the pedestrian interview surveys and the pedestrian and vehicle counts;

- (12) review the pedestrian safety and accessibility audit checklist;
- (13) prepare a report to document the audit findings. The report should identify appropriate countermeasures to address the identified deficiencies.

* Note that tasks 7, 8 and 9 do not need to be undertaken for every site. To reduce the time and cost of the audit, these tasks should only be undertaken on those sites known to have pedestrian safety problems.

The specifications for the pedestrian behaviour observation surveys, the pedestrian interviews and pedestrian and vehicle counts are provided below. Note that the day/time specifications are suggested as the standard in lieu of any better site specific information. Input regarding the peak times for pedestrian and vehicle activity should be sought from local stakeholders. Where the latter suggests that peak activity occurs outside the standard days/times, the survey limits should be extended accordingly.

Specifications for the various surveys are as follows:

(If the surveys mentioned in items 7, 8 and 9 above are not to be undertaken, disregard the first three dot points below.)

- conduct a minimum of 50 pedestrian behaviour observation surveys at each audit site location (25 observation surveys to be conducted during a weekday and 25 on a Saturday night) across a range of target groups. The target groups are younger/inexperienced pedestrians (under 16 years), senior pedestrians (over 60 years) and pedestrians under the influence of alcohol and/or drugs. The observation surveys are to take place during a weekday from 8:00am to 2:00pm and 3:00pm to 7:00pm and on a Saturday evening from 10:00pm to 6:00am at each site with approximately 3 to 4 surveys to take place each hour. These timings need to be reviewed at each site in light of crash times and periods of peak use;
- conduct a minimum of 25 pedestrian interviews using the pedestrian questionnaire at a specific crossing location within the audit site. The interviews are to cover a range of age groups, different genders and a range of walking abilities. The pedestrian interviews are to take place during a weekday from 8:00am to 2:00pm and 3:00pm to 7:00pm with approximately 3 to 4 interviews to take place each hour;
- conduct pedestrian and traffic volume counts at each site during the following times: 7:00am to 10:00am and 4:00pm to 7:00pm on a weekday and pedestrian and traffic volume counts on a Saturday evening from 10:00pm to 2:00am or as deemed necessary after checking crash data and peak use. The pedestrian and traffic volumes are to be recorded in 15 minute intervals in each direction of the specified intersection for each audit site. Pedestrians should be classified as less than 16 years, 17 to 50 years, over 50 years or vision / mobility impaired (vision impaired, wheelchair, cane/crutch/walking frame, pushing pram). Vehicles should be classified as light vehicles, heavy vehicles or cyclists;
- an accredited road safety auditor or audit team is to conduct the pedestrian safety audit of the specified route by walking and driving the site. This audit is to identify inadequate or unsafe pedestrian facilities, identify appropriate countermeasures and document the findings of good and bad pedestrian design features in an audit report. The audit check list shall also be completed and submitted with the audit report.

4 Pedestrian Safety and Accessibility Audit Checklist

The pedestrian safety and accessibility audit checklist listed below should be completed by an accredited road safety auditor or audit team. The auditor or audit team should also have experience in pedestrian facility design/planning or include someone in the team who has this experience.

This audit tool enables the road safety auditor to audit the road environment and its surroundings. The audit tool has been designed as a checklist and provides the auditor with the opportunity of recording comments whilst in the field.

Location:

Auditor / Auditor Team:

Date:

Note: If a deficiency in the road and/or surrounding environment is identified, the auditor should specify details of the problem and the location in the Comment column.

Key N/A = not applicable

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Issue	N/A	Yes	No	Comment
<p>1 Land use and pedestrian context</p> <p>1.1 What are the main land use patterns for the area around the study route?</p> <p>1.2 List the key pedestrian generating land uses in and around the study area.</p> <p>1.3 What, if any, are the special user groups that need to be considered here?</p> <p>1.4 What, if any, are the key land use changes in the future?</p> <p>1.5 Do/will changes in existing or future land use patterns affect the pedestrian facility?</p>				
<p>2 Footpaths</p> <p>2.1 Are footpaths provided on the audit route?</p> <p>2.2 How wide are the footpaths?</p> <p>2.3 Are the footpaths wide enough for shared use by bicycles?</p> <p>2.4 s there an on road bicycle lane?</p> <p>2.5 Are the footpaths continuous throughout the route?</p> <p>2.6 Is the general condition of the footpath good:</p> <ul style="list-style-type: none"> a) clear of obstructions (eg. poles, awnings, street furniture); b) no broken concrete or damaged paving etc.; c) clean surfaces (free of litter and dog mess); d) limited street furniture (that does not impede pedestrians accessibility). * <p>* Note: Vision impaired pedestrians prefer a free zone next to the building line (if fully paved footpath);</p> <ul style="list-style-type: none"> e) smooth surfaces, but 'anti-skid'; f) no uneven surface; g) no protruding tree roots; h) clear of overhanging foliage; i) no discontinuities in level or type/quality of construction. 				

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Issue	N/A	Yes	No	Comment
2.7 Are the footpaths wide enough to accommodate persons using mobility aids (eg. cane, wheelchair)?				
2.8 Is there a problem with vehicles parking on the footpath? If yes, please specify problem and location.				
2.9 What key destinations/facilities do the pathways connect with (e.g. public transport, school, CBD, recreation, other)?				
2.10 Are pedestrian facilities acceptable at set down points for example, bus stops, taxi ranks etc.? a) Is the footpath quality of a suitable standard for pedestrians queuing in this area? b) Is seating and shade provided?				
2.11 Are the walking networks designed to give good access to key destinations?				
2.12 Is head room sufficient for pedestrians? e.g. road signs are not mounted too low.				
2.13 Are there driveways with heavy vehicular traffic (volume or vehicle type) e.g. driveways to car parks and shopping centres? Are these driveways at th same level as the footpath? Also, are tactile ground surface indicators provided in accordance with AS 1428.4?				
2.14 Does this/these driveways pose a problem to pedestrians?				
2.15 Is there good pedestrian and driver visibility? If there is a problem, outline it.				
3 Pedestrian facilities and accessibility				
3.1 Are there pedestrian crossings within the subject site? If yes, what type (e.g. signalised, zebra, school, refuge, overpass, underpass, other)?				
3.2 Do pedestrians have difficulty in crossing the road safely in the audit route?				
3.3 Are appropriate travel paths and crossing facilities (refuges, zebra crossings, signalised crossings) provided for pedestrians?				
3.4 Does the pedestrian crossing/facility (for example, type and location) meet the needs of the users?				
3.5 Do the pedestrian ramps provide a smooth change in level between the footpath and the road pavement?				
3.6 Are kerb extensions used where appropriate?				
3.7 Are pedestrian facilities sited on 'desire lines' where people want to cross?				
3.8 Have important routes been given high priority, for example, where practicable, short waiting times at signalised crossings on routes to bus and rail interchanges?				

Issue	N/A	Yes	No	Comment
3.9 From on-site observations, are there sufficient gaps in the traffic to allow pedestrians to cross the road at this location and other locations e.g. mid-block?				
3.10 Is subway or overpass conveniently located?				
3.11 Does the subway or overpass provide for personal safety? (straight, open, well lit)				
3.12 At signalised crossings, do all pedestrians have adequate time to cross the road safely?				
3.13 Does the site have audio tactile devices for vision impaired pedestrians?				
3.14 Are all audio tactile devices working and audible?				
3.15 Can vision impaired people identify the crossing (for example, are tactile ground surface indicators provided in accordance with AS 1428.4)?				
3.16 Are signs and pavement markings installed in accordance with MUTCD?				
3.17 Is there a distinct boundary between the edge of the footpath and road surface?				
3.18 At sites without designated pedestrian facilities, are there median islands to allow pedestrians to cross the road in two stages?				
3.19 If kerb build outs are used, are they clearly delineated?				
3.20 Are there different types of pedestrian facilities in close proximity, e.g. signalised, zebra, refuge?				
3.21 Is there a problem because of an inconsistency in pedestrian crossing (or detection) types? Please specify.				
3.22 If a median or pedestrian refuge is provided, is this wide enough to accommodate a turning wheelchair?				
3.23 Is there suitable access for persons in a wheelchair?				
3.24 Can disabled persons (e.g. wheelchairs) reach the push button at pedestrian signals?				
3.25 Has the crossing access been provided on each kerb and any intermediate islands, so as to be conveniently negotiated by wheelchair users?				
3.26 Is the crossing pavement flush with the roadway surface?				
3.27 Is the pedestrian ramp slope appropriate?				
3.28 Is there sufficient space to turn wheelchair at top and bottom of ramp?				
3.29 Is visibility restricted for persons in a wheelchair? Please specify.				

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Issue	N/A	Yes	No	Comment
3.30 Does it appear that drainage of the road at / near pedestrian facilities is adequate so as not to cause water ponding?				
<p>4 Catering for pedestrian target groups</p> <p>4.1 Is the area one in which intoxicated pedestrians can be expected? For example, are there many hotels or night clubs?</p> <p>4.2 Is there a predominance of other special user groups (e.g. intoxicated, seniors, youths, young children, parents with prams, disabled, tourists)? If yes, what type?</p> <p>4.3 Are there problems specific to these special user groups?</p> <p>4.4 Are drivers able to clearly see potentially intoxicated pedestrians? For example, is lighting adequate?</p> <p>4.5 Does pedestrian fencing exist along the kerb line in front of hotel exits to channel pedestrians to a crossing facility?</p> <p>4.6 Are there pedestrian refuge islands on roads in front of liquor establishments to allow pedestrians to cross the road in stages?</p> <p>4.7 Are drivers able to clearly see young children or pedestrians with a disability? (e.g. review adjacent vegetation or other obstructions)</p> <p>4.8 Do pedestrians regularly misuse or ignore the pedestrian facilities? Please specify.</p>				
<p>5 Pedestrian and Traffic Volumes</p> <p>(The volume limits provided below are only a guide).</p> <p>5.1 What are the vehicular traffic volumes on roads in the study area – high (> 500 vehicles per hour), medium (100 – 500vph), low (< 100vph)?</p> <p>5.2 What are the pedestrian volumes – high (> 50 per hour), medium (20 – 50ph), low (< 20ph)?</p>				
<p>6 Around Schools</p> <p>6.1 Is there a school zone?</p> <p>6.2 What is the school zone speed limit?</p> <p>6.3 Is a school crossing provided?</p> <p>6.4 Is the crossing supervised?</p> <p>6.5 Are school gates appropriately located?</p> <p>6.6 Are appropriate advance warning signs provided?</p> <p>6.7 Is there any parking (legal and illegal) that causes visibility obstruction to the crossing?</p>				

Issue	N/A	Yes	No	Comment
<p>7 Traffic and road environment?</p> <p>7.1 What is the road hierarchy classification or type of roadway (e.g. highway, arterial, sub arterial, collector, local, main street)?</p> <p>7.2 What is the posted speed limit?</p> <p>7.3 How many travel lanes are on the roadway/s (in each direction)?</p> <p>7.4 Is the roadway divided by a median (how wide)?</p> <p>7.5 Are there parking lanes (or bus lanes) on the side of the road?</p> <p>7.6 Can parking be managed to maximise sight lines?</p> <p>7.7 Is traffic speed or volume a problem for pedestrians (for safety or amenity)? Please specify.</p> <p>7.8 If in a local traffic area, have devices been used appropriately to slow down the traffic?</p> <p>7.9 What devices have been used?</p> <p>7.10 Do these devices impede pedestrian movement?</p> <p>7.11 Are there any conflicts between vehicles (or bicycles and/or wheeled recreational devices) and pedestrians on footpaths? e.g. driveway accesses, cyclists riding on the footpath.</p> <p>7.12 Is a crash barrier necessary between the road way and the footpath for pedestrian safety?</p> <p>7.13 Are suitable pedestrian rails provided at bridges or other structures?</p>				
<p>8 Temporary Roadworks</p> <p>8.1 Have the effects of roadwork on pedestrians been considered?</p> <p>8.2 Are pedestrians warned of obstructions and temporary works hazards on their travelled path?</p> <p>8.3 Are alternative routes provided for pedestrians during temporary roadworks or construction that provide suitable access for all pedestrians?</p>				
<p>9 Signing</p> <p>9.1 Are walking routes clearly signposted to pedestrians?</p> <ul style="list-style-type: none"> • Is it obvious how to get to the shops, leisure facilities or bus stops? • Are street names clearly visible and are there sufficient repeater nameplates? <p>9.2 Are pedestrian routes and pedestrian facilities clearly signed to motorists for example, by the use of pedestrian warning signs?</p> <p>9.3 Are the signs in adequate working condition by day and by night?</p>				

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Issue	N/A	Yes	No	Comment
9.4 Is there clear signing for pedestrians and motorists as to their responsibilities in the road environment?				
9.5 Do the signs conform to the MUTCD?				
10 Pavement marking				
10.1 Are pedestrian facilities correctly marked with pavement marking?				
10.2 Is the pavement marking in good working condition?				
10.3 Is non-slip material used for the pavement marking associated with the pedestrian facilities?				
11 Lighting				
11.1 Is the pedestrian crossing adequately lit for pedestrians to see and for motorists to see pedestrians?				
11.2 Is the footpath adequately lit for pedestrians to see and feel safe?				
11.3 Are there dark places or hiding places which represent a personal security issue?				
12 Visibility / sight distance				
12.1 Is driver's sight distance to the pedestrian facilities adequate?				
12.2 Are pedestrians (including small pedestrians) waiting to cross the road visible to approaching motorists?				
12.3 Can pedestrians (including small children) see approaching vehicles?				
12.4 Are there temporary or permanent obstructions near the crossing facility e.g. parked vehicles, roadside furniture, vegetation, fences etc.?				
13 Pedestrian fencing				
13.1 Is there a need for pedestrian fencing to channel pedestrians to cross the road safely or to prevent them from crossing the road at a particular location?				
13.2 Does the pedestrian fencing create a hazard to motorists? (for example, horizontal rails becoming a spearing hazard when impacted by an errant vehicle).				
14 Pedestrian amenity				
14.1 Is the pedestrian environment pleasant? If not, please specify.				
14.2 Are there seats and/or rest spots for pedestrians?				
14.3 Are there drinking taps for pedestrians?				
14.4 Does the pedestrian environment provide sufficient shelter and/or shade against the elements?				
14.5 Is the pedestrian environment integrated with the adjacent land uses?				

5 Pedestrian Questionnaire

PEDESTRIAN QUESTIONNAIRE

Hello, my name is XXXX and I am from XXXX. I am doing a pedestrian survey as a road safety project. The questionnaire is voluntary and confidential. It will only take 2 minutes of your time. Would you like to answer a few questions?

(The answers to the questions listed below will provide information on the pedestrian's perception of the pedestrian crossing and surrounding facilities).

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1. What is the purpose of your walking trip today? Please circle or write in the response.

a. Travelling to work
 b. Travelling from work
 c. Health benefits
 d. Shopping
 e. Recreation
 f. Other _____

2. Gender? Female Male

What is your age? 0-5 6-12 13-18 19-25 26-30
 31-40 41-50 51-65 66-80 over 80

Walking aid used? Yes No Type _____

Are you a local or visitor? Local Visitor Overseas

Are you a regular user (more than once per week)? Yes No

3. Do you consider the pedestrian crossing/facility to be a satisfactory type/standard? Why or why not?
 Satisfactory Unsatisfactory Reasons: _____

4. Do you find crossing here safe? Why or why not?
 Yes No Reasons: _____

5. Do you find the crossing convenient? Why or why not?
 Yes No Reasons: _____

6. What do you think about the footpath along this street?

a. Adequate width? Yes No

b. Well designed and in good repair? Yes No Other comments: _____

7. Do you find the surrounding walking environment pleasant and convenient? Why/why not?
 Yes No Reasons: _____

Thank the respondent for his/her help: "Thank you very much for your help."

6 Pedestrian Behaviour Observation Survey

PEDESTRIAN BEHAVIOUR OBSERVATION SHEET

Location: _____ Date: _____

Observer's name: _____ Time: _____

Weather Conditions: _____

Equipment needed:

- Stop watch (to time pedestrians crossing the road).
- Clipboard
- Pen; Torch (for night surveys)

Place a tick beside the answer or write the details in the space provided.

1. Gender	Female <input type="checkbox"/>	Male <input type="checkbox"/>								
2. Is the pedestrian using a walking aid?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Type _____							
3. Age	0-5 <input type="checkbox"/>	6-12 <input type="checkbox"/>	13-18 <input type="checkbox"/>	19-25 <input type="checkbox"/>	26-30 <input type="checkbox"/>	31-40 <input type="checkbox"/>	41-50 <input type="checkbox"/>	51-65 <input type="checkbox"/>	66-80 <input type="checkbox"/>	over 80 <input type="checkbox"/>
4. Where did the pedestrian come from?	retail centre <input type="checkbox"/>	Hotel/pub/entertainment venue <input type="checkbox"/>	Other, please state: _____							
5. Did the pedestrian cross within the crossing?	Yes <input type="checkbox"/>	No <input type="checkbox"/>								
6. Number of people in the group	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	Other _____					
7. Did the pedestrian look at the traffic before crossing?	Yes <input type="checkbox"/>	No <input type="checkbox"/>								
8. Did the pedestrian wait for traffic to stop before crossing?	Yes <input type="checkbox"/>	No <input type="checkbox"/>								
9. Did it appear that the pedestrian's view was blocked at the start of the crossing?	Yes <input type="checkbox"/>	No <input type="checkbox"/>								
10. At signalised crossing, what was the walk signal at the start of the crossing?	Red <input type="checkbox"/>	Green <input type="checkbox"/>	Flashing <input type="checkbox"/>							
11. The number of times the pedestrian looked at the traffic while crossing?	0 <input type="checkbox"/>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>					
12. Did the pedestrian pause during the crossing due to traffic?	Yes <input type="checkbox"/>	No <input type="checkbox"/>								
13. Did the pedestrian hesitate or abort the crossing? Due to traffic?	Yes <input type="checkbox"/>	No <input type="checkbox"/>								
14. Did the pedestrians or vehicle collide, or have to stop or manoeuvre to avoid a collision?	Yes <input type="checkbox"/>	No <input type="checkbox"/>								
15. How did the pedestrian cross?	Direct <input type="checkbox"/>	Angle <input type="checkbox"/>	Jaywalking <input type="checkbox"/>	Other _____						
16. At signalised crossing, what was the walk signal at the finish of the crossing?	Red <input type="checkbox"/>	Green <input type="checkbox"/>	Flashing <input type="checkbox"/>							
17. How long did the pedestrian take to cross?	(in seconds) _____									
18. How did the pedestrian cross the road?	Walk <input type="checkbox"/>	Run <input type="checkbox"/>	Other <input type="checkbox"/>							
19. Does the pedestrian appear intoxicated or under the influence of a substance?	Yes <input type="checkbox"/>	No <input type="checkbox"/>								
If yes, please explain _____										

7 Further Advice

For further advice, or to make comment on the technical nature of this Technical Note please contact:

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