

THE GREENLIGHT PROJECT

Re-directing pedestrian priority at
signalised crossings on major roads



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signalised crossings on major roads

Produced by:

City of Port Phillip

VicHealth

in partnership with:

City of Greater Geelong

City of Bayside

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are available from:

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The document is also available for download at
www.portphillip.vic.gov.au/walking_well.html



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Executive Summary

Re-directing Pedestrian Priority at Signalised Crossings on Major Roads

Walking as the choice for school travel journeys is promoted through the Walking School Bus program throughout Victoria. Community concerns about cross-ability of major roads led to a study of six signalised crossings in the municipalities of Port Phillip, Bayside and Greater Geelong on major roads used by Walking School Bus groups.

The study forms part of the Greenlight Project investigating the factors affecting people's decision to walk or not to walk in relation to school travel in Victorian primary schools.

The time allocated at signalised crossings for pedestrians to get across safely and comfortably at the lights has been found to be inadequate.

The study findings substantiate the project's endeavour to seek changes to traffic signal phasing and timings at pedestrian crossings used by school travel groups on major roads.

The study findings point to a need for longer green light times for pedestrians, and the introduction of a head start for pedestrians on turning traffic, at all signalised crossings on walking school bus routes throughout Victoria. There is also opportunity to extend the sought-for changes, to other locations where there are high pedestrian demands or more vulnerable pedestrians.

Conducted with support from VicHealth, the study timed how long it takes for people of all ages – in particular children in Walking School Buses – to cross major roads in the Cities of Port Phillip, Greater Geelong and Bayside. The views of adults choosing to or choosing not to use the pedestrian crossings at

the chosen study sites to walk to school were sought through a questionnaire and focus group sessions. Walking School Bus groups were filmed as they completed each of these pedestrian crossings. The crossing sites were measured and the light phasing was timed to gather further information about the pedestrian crossings.

The study report also recommends the continued phasing out of staged pedestrian crossings and the continued use of crossing supervisors at school crossings.

The study asserts that pedestrians, not cars, should have priority at signal crossings on major roads. Long waiting times at traffic lights frustrates pedestrians and encourages them to walk against the light, endangering themselves. If pedestrians had priority, the lights would change as soon as they pressed the button.

Other barriers to crossing the road safely and easily were found to include the size and speed of vehicles, the volume of traffic and driver behaviour.

Study recommendations:

1. The adoption of a pedestrian crossing speed of 0.7 metres per second¹ to determine the crossing time at pedestrian crossings on major roads used by school travel groups
2. Automatic call-up at the pedestrian phase as part of the signal cycle operation. Where automatic call-up is not appropriate, the introduction of a two-second 'early-green' advance for pedestrians over vehicles performing turn movements across the cross walk to allow pedestrians to establish crossing priority
3. Continue to eliminate staged pedestrian crossings
4. Continue the presence of crossing supervisors at school crossings on major roads for all signalised crossing locations on Walking School Bus routes.

A summary of the issues and suggested responses are included in table 1 on the following page.

¹This figure has been arrived at through reviewing the AUSTRROADS Pedestrian Guide as well as international information on pedestrian behaviour and walking speeds (AUSTRROADS, 1995: 2; ADONIS, 1998: 61)





Issue	Suggested Response
Ensuring sufficient time is allocated to complete crossing	<ul style="list-style-type: none"> • Adopt a pedestrian crossing speed of 0.7 metres/sec
Feelings of insecurity and reduced safety due to vehicle size, volume of traffic, motorist speed and driver behaviour	<ul style="list-style-type: none"> • Adopt a pedestrian crossing speed of 0.7 metres/sec • Apply automatic call-up • Introduce a two second 'early-green' advance for pedestrians over vehicles performing left & right turn movements across the cross walk
Perception that pedestrians at signalised crossings are less important than vehicles, resulting in insufficient pedestrian priority	<ul style="list-style-type: none"> • Apply automatic call-up • Introduce a two second 'early-green' advance for pedestrians over vehicles turn movements across the cross walk
Feelings of anxiety and vulnerability	<ul style="list-style-type: none"> • Eliminate staged pedestrian crossings • Introduce pedestrian responsive 'call up' mid cycle which interrupts the phase in favour of the pedestrian request • Apply automatic call-up • Adopt a pedestrian crossing speed of 0.7 metres/sec Introduce a two-second 'early-green' advance for pedestrians over vehicles performing left & right turn movements across the cross walk

Table 1

1. Introduction

Current levels of car dependence for transport are very high. Car ownership is still increasing. There is increased freight projected on our roads. The state government's Melbourne 2030 metropolitan planning strategy sets out the blueprint for a more compact city, with increasing density of urban population. These factors are assumed for the purposes of this report.

There is evidence of community desire to walk more, both for recreation and travel. This is partly evidenced with the level of take-up of the Walk to School program, the Walking School Bus (48 Victorian councils are now committed to running the program).

This study is part technical and part non-technical and presents information relating to the school journey undertaken by groups of children and adults associated with Victorian primary schools.

VicHealth's Walking School Bus (WSB) Program is a partnership between local government councils and community agencies, which work with local primary schools to establish WSBs in their municipalities. The purpose of the program is to create change in school travel patterns for Victorian primary school children.

Basically it is not a bus at all but a group of children and adults who walk to school together along a set route. There are 'stops' or pick up points where children can join the group and walk with them. Parents volunteer to 'drive' the bus on a roster basis - each walking bus has an adult 'driver' at the front and an adult 'conductor' bringing up the rear. It is a method of reducing car travel, increasing physical activity and having lots of fun.

A WSB provides children and parents with exercise on the school journey, as well as some time for neighbourhood children and parents to socialise. Because volunteer parents supervise it, it's a safe fun way for kids to get to school. A walking bus also reduces congestion and pollution.



2. Background/ Context to Study

In November 2003 the City Of Port Phillip in the process of reviewing traffic management works generated by WSB operations, identified high frequency of complaint regarding crossings on major² roads. The traffic management works have centred on parent complaints about feeling unable to safely escort the WSBs across 10 identified signalised crossings.

In order to gauge the seriousness of the problem a site visit to the locations in question was conducted to measure the following intersection attributes:

- Distance from kerb to kerb (or kerb to storage space)
- Waiting Time – Solid Red
- Green Time – Walk Time
- Flashing Time – Clearance Time

A preliminary investigation was conducted. Results indicated a more detailed study was needed to establish clearly what factors were at play.



Pickles and Ingles Streets, Port Phillip.

Funding for an investigation were obtained from VicHealth with equivalent funds supplied by the City of Port Phillip. Partnerships for the study were negotiated with the cities of Greater Geelong and Bayside with the City of Port Phillip leading the investigation. A reference group (see APPENDIX I) comprising representatives of the following stakeholders was set up to provide guidance and feedback to the study VicHealth, VicRoads, Department of Infrastructure, Department of Education & Training, School Principal, Bayside City Council, Greater Geelong City Council and Port Phillip Council.

² Major roads are arterial roads as classified by VicRoads with vehicle volumes of greater than 10,000 vehicles per day

3. Project Goals

1. To investigate pedestrian behaviour in the context of groups of pedestrians, such as Walking School Bus, navigating major roads at signalised intersections.
2. To provide recommendations in relation to the existing crossing operation and community requirements for safety, mobility and access.

4. Project Methodology

The data collection involved two distinct methods:

- 1 Observation, Measurement and Video Data Collection
2. Personal Questionnaires and Focus Group Interviews

In both methods the primary group under analysis was WSBs associated with the six partner schools to this study. The attitudes, crossing speeds and behaviour were the key information outcomes sought. Other groups of pedestrians using the crossings were also recorded to obtain as broad and applicable set of observations as possible.

4.1 Observation, Measurement and Video Data Collection

Observation and video data collection were designed to gather quantitative data on the crossing times and behaviours of groups at the crossings under consideration.

The following details the steps for the gathering of empirical and video data.

1. Site Selection (Table 2)
2. Site Set-Up
3. Data Collection
4. Research / Environmental Controls and Variables





Site Selection

City of Greater Geelong

1. Chilwell Primary Noble and Pakington Streets – north to south
2. St Mary's Primary Myers and Swanston Street – east to west

City of Bayside

1. Elsternwick Primary Rusden Street across Nepean Highway – west to east
2. St Finbars Primary Nepean Highway - north to south

City of Port Phillip

1. St.Kilda Park Primary Grey/Fitzroy Streets and Canterbury Road – north to south
2. Albert Park Primary Dorcas/Pickles and Ingles Streets – west to east

Table 2

Site Set-Up

Site set up ensured:

- An appropriate location for the video camera and researcher
- A clear and unhindered view of the crossing in its entirety
- The filming of all three elements listed in data collection below
- Maintenance of a suitable distance from the crossing / walking group to limit intrusion / impact of the observations on the behaviour of the subjects.

Data Collection

Empirical data collection was designed to be as objective as possible within the time and budgetary constraints of the project. Data on crossing times and light phasing was collected both in peak and non-peak times in conjunction with the use of several controls (see Research/ Environmental controls).

Sites were not selected at random. Sites were identified through anecdotal evidence as presenting concerns. These sites were used by WSB groups.

The sites were:

1. Measured for road distance kerb to kerb
2. Timed for allocated crossing time which included green (Walk) and flashing red (Clearance)
3. Timed for journey completed by Walking School Bus group on regular journey to or from school
4. Video filmed for the journey completed by Walking School Bus group on regular journey to or from school.

Research / Environmental Controls and Variables

In order to control for variation the following are indicated. Timing of data collection, human error, staffed vs unstaffed crossings, weather conditions and vehicle volume. (see APPENDIX II for detail)



Grey and Fitzroy Streets, Port Phillip.



4.2 Personal Questionnaire and Focus Group Interviews

Personal Questionnaires and Focus Group Interviews were designed to gather qualitative data on the perceptions of pedestrians in regard to the use and safety of the intersection under consideration.

A preliminary interview seeking perceptions of the pedestrian associated with crossing main roads were conducted with parents of children participating in the Walking School Bus Program. It aimed to identify which issues about the particular crossing parents felt most anxious about and what kinds of problems they feel were important.

One of the most important reasons to conduct this preliminary research is to record initial perceptions so that if in the future there are changes to signalised crossings their perceptions can again be measured.

Surveys were directed at adults accompanying children on the school journey. Twenty-five (25) surveys (see APPENDIX II) were distributed at each site. WSB co-ordinators at each site managed the distribution and collection of surveys.

Although not originally proposed in the methodology, it was decided to 'expand the net' to capture perceptions and responses from the current non walking group who may choose not to walk, or more specifically would be deemed potential users of the crossing site.

Focus groups were established to hear from others especially those who don't or have doubts about using the crossing, to hear about community feelings towards choosing to or not to walk to school.

While the project is setting out to tell the technical story, the complete story involves the activity of people, which by definition is unpredictable and non-technical. The project goal includes effort to uncover the issues involved in the subjective factors contributing to the decision not to walk to school and in particular not to use the particular crossing and hear from a wider range of people. A methodology for the operation of the focus groups is contained in APPENDIX II.

5. Supporting Information & World Practice

The pressure from many organisations to increase the numbers and frequency of walkers is not an Australian, Victorian or even local initiative. Internationally there are organisations that are tackling the disincentives to walkers from many angles. The State Government increased the profile of walking as a legitimate form of transport through its Melbourne 2030 framework and associated Linking Melbourne Transport Strategy. Major initiatives include the TravelSmart program to try which attempts to reduce private vehicle dependency. On the local level, the City of Port Phillip is committed to increasing walking levels and has many projects focused on this desire.

The information below provides the impetus for changes to be made to the disincentives to walking. Disincentives such as the difficulty of crossing certain roads discourage walkers and these need to be addressed to be in line with the policies, strategies and documents below.

(see APPENDIX III for further detail)

6. Results

Walking school bus group comprise school children varying in ages from five to twelve years, younger siblings and adult supervisors. The group often includes bicycles and prams. Total group size can be from six to more than twenty individuals. Usually the number of school aged children would be between six and fifteen.

The group moves in a single mass through the crossing. In this sense it functions as one entity and could be referred to as a platoon or single movement. This characteristic of the group is relevant to the needs of groups of school children on their journey to and from school. It is also relevant when considering the needs of other groups of pedestrians queuing at signalised intersections.

A summary of the results follows on the next page.





6.1 Quantitative Data

The summary results of the data gathered for this study are presented below for each of the study sites.

1. Noble Street / Pakington Street intersection, Newtown, Geelong - Chilwell Primary School (Greater Geelong)

Crossing distance (m)	Allocated time# (sec)	Measured crossing speed (m/s)	Nominated crossing speed (VicRoad)* (m/s)	Measured WSB time (sec)	WSB speed (m/s)	Shortfall^ (sec)
14	16.99	0.82	0.82	22.03	0.63	5.04

2. Myers Street / Swanston Street intersection, East Geelong - St Mary's Primary School (Greater Geelong)

Crossing distance (m)	Allocated time# (sec)	Measured crossing speed (m/s)	Nominated crossing speed (VicRoad)* (m/s)	Measured WSB time (sec)	WSB speed (m/s)	Shortfall (sec)
17	19.49	0.85	0.89	20.08	0.82	0.59

3. Rusden Street / Nepean Highway intersection, Brighton - Elsternwick Primary School (Bayside)

Crossing distance (m)	Allocated time# (sec)	Measured crossing speed (m/s)	Nominated crossing speed (VicRoad)* (m/s)	Measured WSB time (sec)	WSB speed (m/s)	Shortfall (sec)
51	28.77	1.78	1.8	42	1.22	13.23
51	36	1.42	1.46	42	1.22	6.0

4. Centre Road / Nepean Highway north to south, Brighton - St Finbar's Primary School (Bayside)

Crossing distance (m)	Allocated time# (sec)	Measured crossing speed (m/s)	Nominated crossing speed (VicRoad)* (m/s)	Measured WSB time (sec)	WSB speed (m/s)	Shortfall (sec)
42	34.87	1.05	1.27	40.16 Grp 1**	1.05	5.29
42	34.87	1.21	1.27	35.01 Grp 2**	1.21	0.14

5. Fitzroy Street / Grey Street / Canterbury Road intersection, St Kilda Park Primary School (Port Phillip)

Crossing distance (m)	Allocated time# (sec)	Measured crossing speed (m/s)	Nominated crossing speed (VicRoad)* (m/s)	Measured WSB time (sec)	WSB speed (m/s)	Shortfall (sec)
28	21.28	1.32	1.35	31.93	0.88	10.65

6. Pickles Street / Ingles Street intersection (Port Phillip)

Crossing distance (m)	Allocated time# (sec)	Measured crossing speed (m/s)	Nominated crossing speed (VicRoad)* (m/s)	Measured WSB time (sec)	WSB speed (m/s)	Shortfall (sec)
20	17.03	1.18	1.18	22.05	0.91	5.02

Detailed data is contained in Appendix III

All data in the above table was collected during morning and afternoon school travel periods.

#Allocated time - walk plus clearance.

*Data provided by VicRoads Regional Office.

^Shortfall - difference between "Allocated time" and "Measured WSB time".

**Grp 1 / Grp 2 - WSB spits in two groups.



6.2 Qualitative Data

The themes identified through collection of responses from survey and focus group method have been analysed thematically. Five themes have emerged. They are:

- Theme 1: Time allocated to complete crossing
- Theme 2: Vehicle size, volume, speed, driver behaviour
- Theme 3: Early green'/Pedestrian priority
- Theme 4: Presence of crossing supervisor
- Theme 5: Feelings of anxiety and vulnerability



Pickles and Ingles Streets, Port Phillip.

A selection of representative responses is given below. These combine response from survey and focus group sessions. While responses often relate to more than one issue or theme as they are presented here to illustrate the themes identified as representing the main ideas raised by respondents.

Respondent comments

Summary qualitative data findings

Qualitative data	Total Distribution per site	Total responses	Pak/Noble Geelong	Myers/Swan Geelong	Rusden/ Nepean Bayside	Centre/ Nepean Bayside	Fitzroy/Grey Canterbury Port Phillip	Pickles/ Ingles Port Phillip
Questionnaire	25 100%	76 68%	13 52%	12 48%	15 60%	10 40%	17 68%	9 36%
Focus Group	-	28	7	6	-	2	9	4

Whole school community invitation to attend. Publicised through school newsletter, flyers, and assembly meetings.

Responses – survey and focus group

“People who choose to Walk & people who choose not to Walk”

Theme 1	Total response	% response
Time allocated to complete crossing	51	34%

‘More time needed to cross is essential but does nothing to alleviate the huge volume of traffic’

‘There’s not long enough time at lights to cross’

‘I can’t get across on green signal. It has 2/3 sequences of the green signal. I have worked out that if you bang it twice or three times it goes green again. It is simply not green long enough. It is the difference between on time or late’

Theme 2	Total response	% response
Vehicle size, volume, speed, driver behaviour	41	27%

‘Drivers do tend to zip around in front of pedestrians if they feel they can turn in time. This is not such an issue for adults, but children are less aware of the potential danger as they see the ‘green man’ with a bit of tunnel vision’

‘We don’t walk as it is hard to cross Pickles Street. Traffic is too much. It doesn’t give way’

‘No school staff use this intersection – it is dangerous, too congested, with too many other commercial cars/ trucks delivering goods etc’

Far worse since bike lanes introduced in Pakington Street (Geelong) three years ago’





Theme 3	Total response	% response
'Early green' pedestrian priority	22	15%

'It is disconcerting that traffic turns towards pedestrians from 2 directions. Also the final service lane is more frightening than the actual highway as the lights are close to changing and we have to look out for people who don't stop'

'Trucks still cross on their red when pedestrian crossing light is green'

Theme 4	Total response	% response
Crossing supervisor presence	17	11%

'We used to use this crossing (Canterbury/Fitzroy) every morning. I have stopped because it is too dangerous for me to cross with my five children.'

'The age of the children prevents me walking. Having the pusher makes me feel more vulnerable especially supervising other children'

'Feel very intimidated standing on the service lane median strip but can't get all the way across without standing there'

Theme 5	Total response	% response
Overt feelings of anxiety, vulnerability	21	14%

'I find Princess Street and Fitzroy Street better for crossing but there are no supervisors so we don't often use it'

'Being manned [by crossing supervisor] is very helpful'

'Parent who lets 11 yr old go on her own to walk with peer friends worried about whether they ('friends group') will be concentrating on other things. Hijinks. If crossing supervisor wasn't there would hesitate even more with letting 11 yr old go on her own'

For detailed respondent comments download a copy of 'The Greenlight Project, Appendix V' in pdf format from www.portphillip.gov.au/walking_well

7. Discussion

Walking School Bus (WSB) groups comprise primary school aged children as well as younger siblings and adults. Groups move as one entity and as such should be referred to as a platoon for traffic management purposes.



Noble and Pakington Streets, Greater Geelong.

The adults supervising WSB groups and other adults associated with walking as a mode of school travel³ have expressed feelings of anxiety and vulnerability in relation to use or contemplation of use of the crossings at the Greenlight project sites. Adults accompanying children on the school travel journey say that they are choosing to walk to school but that the current signal crossing provided does not always provide a safe and comfortable way to cross the road to complete the travel journey. For example some survey respondents indicated that they had tried walking and using the crossing on their way to school but that they had since stopped walking as a consequence of not feeling safe (see APPENDIX IV).

Safety and comfort are key factors in the maintenance of walking as the mode of choice for school travel. Responses indicated that lack of time to complete the crossing was a major factor in the decision to walk or not to walk to school. Other factors identified were in relation to the size, volume and speed of vehicles and the behaviour or perception of the behaviour of vehicle drivers. This indicates a level of anxiety and a feeling of vulnerability especially for the adults who responded to surveys or participated in the focus groups. At those crossing sites included in the study where crossing supervisors are currently deployed, adults offered a positive response to this feature of school crossing programming. Some respondents strongly expressed the opinion that crossing supervisors were essential to the decision to Walk and to use the pedestrian crossing.



Detailed examination of signalised crossings at six sites has revealed that WSB groups do not complete the crossings in the allocated Walk and Clearance time. The amount of time allocated and the amount of time required for the WSB group to complete the crossing does not correspond. More importantly the perception of lack of time to complete the crossing comfortably is identified by respondents as impacting on their decision to walk.

While the focus of this study has been school travel, it must be noted that the requirements of other groups who do not move quickly may be addressed by the findings of this study. These groups could include older people and those with a physical disability. As such the findings of this study will have relevance to these groups. This is also in the context of the projected needs of an aging society.

8. Conclusion

The community desire to walk to school is strong. This is partially evidenced in the take-up of the behaviour change program, the Walking School Bus. An investigation of the six sites detailed in this study report and attachments including DVD footage have revealed concerns by the community about the current configuration of the signal phasings and times at intersections on major roads. Walking School Bus groups at these six sites and other members of the community have expressed concerns about the time allocated to cross and feelings of anxiety and vulnerability. Other concerns are also revealed as detailed in the report. It is the conclusion of this study that these issues act as a disincentive to the community to make the decision to walk to school.



Noble and Pakington Streets, Greater Geelong.

³ Sustrans 2001 6

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Appendices

- I Steering committee charter/membership
- II Project methodology
- III World Best Practice
- IV Detailed Results
- V Respondent Comments (available on request)

Appendix I

Steering committee charter/ membership

Project Leader

City of Port Phillip

Project Partners:

City of Bayside

City of Greater Geelong

Project Manager: Meg Selman

Sustainable Transport City of Port Phillip

Project technical officer: Nick Dunstan

Sustainable Transport City of Port Phillip

Project sponsor: Paul Smith

Sustainable Transport City of Port Phillip

VicHealth: Rita Butera

Senior Project Officer

VicRoads: Elizabeth Knight

Road Safety Program Consultant

DOI: Brian Peddie

Manager TravelSmart Education

DE&T: Conrad C Remenyi

Health Physical & Sport Education

Student Learning Division

St Kilda Park Primary School: Sue Knight

School Principal

City of Port Phillip: Chris Ellard

Community & Health Development

City of Bayside: Allison Ridge

Community Well Being Unit

City of Greater Geelong: Genivieve Sutherland

Community Development

Appendix II

Project methodology

A. Quantitative Data

1. Site selection

Site selection was based on a two criteria:

1. Firstly the site must be located on a walking school bus route
2. Anecdotal evidence must have been received highlighting it as a site of concern

This process is not a random one and it is acknowledged that as this project will observe specific crossings its findings will only be applicable to those crossings. However it should be recognised that should any upgrading or improvement of the crossings be recommended /conducted that the community would expect the same level of high service from all of its crossings.

The sites selected were located in the three municipalities of the Port Phillip, Greater Geelong and Bayside.

Measuring crossing distance

(7.30am – 7.45am or 2.30pm - 2.45pm)

Arriving well before the crossing of the WSB (minimum half an hour) the intersection to be analysed was measured using a trundle wheel. This involved three repeat measurements from kerb to kerb to ensure an accurate measurement and allow for the calculation of variance/error in the results.

Timing of light phases: pre crossing measurement

(7.45am – 8.00am or 2.45pm – 3.00pm)

After the measurement of the crossing distance, timing of the current light phasings was conducted. Three measurements were taken, for accuracy and precision, at each of the crossing locations. Timings included a breakdown of green time and red flashing time. This was achieved by using two separate stopwatches.

- Stopwatch 1 timed the period from the initialising of the green man signal to the beginning of the red flashing man signal
- Stopwatch 2 timed the period from the initialising to completion of the red man-flashing signal.



Timing of pedestrian groups

(8am- 4pm)

Pedestrian group crossing times: The main focus of the investigation concerns the WSB group, therefore this was the main group under investigation. The method for recording this groups crossing was a three-stage process as follows:

Stage 1

Walking school bus approached the crossing and assembled at the kerb.

Stopwatch 1 timed from the initialisation of the green man signal to the time at which the first crosser left the kerb (crossing lag time).

Stage 2

Stopwatch 2 started as the first member of the group left the kerb.

Stopwatch 3 started as the last member of the group left the kerb.

Stage 3

Stopwatch 2 stopped as the first member of the group reached the opposite kerb.

Stopwatch 3 stopped as the last member of the group reached the opposite kerb.

The above process was repeated for other non-WSB groups and individual pedestrians to broaden the scope of the results. The above process was carried out during two times at all six locations. These times were:

The Walking School Bus hour

(either 8am-9am or 3pm-4pm)

This was the main testing time focusing on the crossing of the walking school bus groups and other groups walking to or from the school.

Control Hour

(anytime from 10am – 2pm i.e. Non-peak)

This timing period gathered control data out of the peak period form comparison to the recordings made in the Walking school bus hour

Furthermore, the time, date, weather conditions and nature of the group/individual crossing the intersection were recorded at each location

Video recording of pedestrian behaviour

(8.00am – 4.00pm)

Pedestrian behaviour recorded via the video taping of the crossings in conjunction of the pedestrian timings listed above. The camera had the time display enabled and was positioned to include:

- The entire crossing of the group from kerb to kerb
- The pedestrian crossing signal (the green man)
- The traffic light for traffic running parallel to the crossing
- The directly adjacent road space to capture any vehicle interaction with the pedestrians on the crossing.
- The camera enabled for each crossing recorded in the data collection process. It recorded from the approach of the groups to the intersection to the leaving of the group from the intersection.

Secondary filming also conducted on control WSBs outside the intersection environment. This captured WSB behaviour in a non-intersection environment to allow for comparison/control of the main recordings.



Centre Road and Nepean Highway, Bayside.

N.B. Consideration to relevant privacy issues, filming of individuals and car registrations, has been given and has been addressed through the film editing process and the formulation of information disclosure statements.

Furthermore, the crossing of groups in different formations (threes, fours) was not tested. This is due to the fact that crossings are a community resource to facilitate the crossing of pedestrian groups. Therefore a pedestrian group should be able to use this resource within the bounds of practicality and the law. It is deemed, for the purpose of this study, that the crossing of a group of 10-20 escorted school children is a practical demand on such a piece of infrastructure.

For more detailed qualitative data, focus group information and surveys, download a copy of 'The Greenlight Project, Appendix IIB' in pdf format from www.portphillip.gov.au/walking_well





4. Research/Environmental controls and variables

The following variables are provided as controls to allow for variation in the results:

Timing of data gathering – This influences the time of day on results to be controlled via timing during both peak and non-peak traffic times as well as recording data from both morning and afternoon walking school bus groups.

Human error – Human error in the measuring process is an inevitable factor. To control the influence of this all care was taken to ensure accurate results and error/variance factors calculated from multiple readings and comparison with known timing standards.

Staffed vs. unstaffed crossings – the influence of a crossing officer at the sites was controlled for via the recording of data at one site that does not have an officer present.

Group behaviour at non-intersection locations – to control and allow analysis of the influence of the intersections on walking group behaviour, control groups were filmed outside the intersection environment.

Weather conditions – while the scope of the project may not allow weather conditions to be controlled for they will be noted and their influence considered in result analysis.

Other variables: Crash data and traffic volume data will be collected for as many of the sites as possible to allow consideration of traffic and safety concerns in results interpretation.

B. Qualitative Data Collection

The following guided the set up and conduct of the focus group session:

1. Identify the major objective of the meeting.
2. Develop questions in accord with project goals.
3. Plan session in accord with project goals.
4. Target and invite potential respondents to meeting.
5. Plan meetings to be one to 1.5 hours long.
Times chosen to maximise attendance
6. Setting and Refreshments – Sessions held in well known community space and refreshments advertised.

Appendix III

Supporting Information - World Best Practice

The pressure from many organisations to increase the numbers and frequency of walkers is not an Australian, Victorian or even local initiative. Internationally there are organisations that are tackling the disincentives to walkers from many angles. Federally, the government has instituted the TravelSmart program to try to reduce the dominance of car-based transport and at the State level there are several examples of both strategic and practical walking initiatives. On the local level, the City of Port Phillip is committed to increasing walking levels and has many projects that facilitate this desire.

The information below provides the impetus for changes to be made to the disincentives to walking.

A. International

The countries that lead the world on the topic of walkability are countries such as: Denmark, England, the Netherlands, Spain, Switzerland and Belgium.

The following information is from the Analysis and Development Of New Insight into Substitution of short car trips by cycling and walking (ADONIS): Best Practice to Promote Cycling and Walking which was developed by the traffic authorities of The Netherlands, Spain, Belgium, and Denmark.

- “Pedestrian traffic lights are basically used to give pedestrians leading green. Leading green implies that pedestrians get the green light before vehicles get their green light. The idea behind giving pedestrians a leading green is to increase pedestrians’ visibility, especially for right turning vehicles, when both start after a light” (ADONIS, 1998: 48).
- “The problem for pedestrians in traffic controlled intersections is that they are detected manually by a push button. If pedestrians are not attentive to the fact that the intersection is traffic actuated and that pedestrians themselves have to indicate their arrival by pressing a push button, unnecessary time can arise, and pedestrians can become so impatient that they cross at a red light” (ADONIS, 1998: 48).
- On a major walking route in the city of Mechelen in the Netherlands, traffic lights have been altered after complaints from pedestrians that the waiting times were too long and crossing times too short. These traffic lights are situated on a road that has a width



of 7 lanes (Brighton Rd has 8 lanes as well as a tram line) (ADONIS, 1998: 53).

- On the above intersection the green phase was extended for pedestrians can so that they can cross in one phase (ADONIS, 1998: 53).
- Another example of extended green times for special groups of pedestrians is the example of the Municipality of Copenhagen where they have given teachers access to a key which initialises a special longer sequence where children can cross the crossing in one turn (ADONIS, 1998: 73).

The Insurance Corporation of British Columbia through its publication *The Recovery Magazine* publishes research materials from around the world. The following from Volume 11 states,

- A measure found to improve pedestrian safety is delaying the green light for vehicles until 3 seconds after the “Walk” signal is lit. This allows pedestrians to get partway across the intersection—where they’re more visible to drivers—before vehicles begin to move. This information combined with the average start-up time (from the lighting of the “Walk” signal to the moment the pedestrian steps off the curb and begins crossing) being determined as **1.93 seconds** for younger pedestrians. Clearly, “Walk” signals should be adjusted to meet these limitations.
- Children’s behaviour as pedestrians differs from that of adults in a number of important ways. To begin with, a child’s conception of safety is poorly formulated, and many collisions involving young pedestrians result from unsafe or illegal actions on the part of the child. Statistics show that road collision rate is a function of age among young pedestrians, being greatest for those in the **three to eight year** age range.
- Several factors appear to contribute to the child pedestrian problem.
 - Their small stature makes it difficult for them to see what’s happening on the road.
 - They can be easily preoccupied or distracted in hazardous traffic situations.
 - They have difficulty evaluating the distance and speed of vehicles.
 - Many believe the safest way to cross the street is to run.
 - Some believe it is safe to cross against a red light
 - They have a poor understanding of the use of traffic-control devices and crosswalks.⁴

B. National

A. *TravelSmart Australia*

TravelSmart Australia brings together the many community and government based programs that are asking Australians to use alternatives to travelling in their private car. More information about TravelSmart can be found at www.travelsmart.gov.au

TravelSmart programs by Commonwealth, State and Territory Governments ask people to make voluntary changes in their travel choices, encouraging people to use other ways of getting about rather than driving alone in a car. For example - using buses, trains and ferries, carpooling or by cycling or walking, or by tele-working.

TravelSmart also recognises the importance of behaviour change in younger people. It recognises that children now tend to be transported to and from many places and activities by car. One third of children in Melbourne spend less than five minutes walking per day. Children who are inactive are more likely to be overweight with the proportion of Australian children who are overweight now reaching 25%. (VicHealth, 2002. Education, Local Government and Health. *The Walking School Bus Program Funding Guidelines*.)

Apart from the negative health aspect from physical inactivity, observations overseas indicate that children who are accustomed to being driven to school are missing out on important life skills - they may be less motivated to get out and find their own way around, they can be unaccustomed to navigating and being comfortable in public places, they may less street-wise and, having less experience in personal road safety, at risk of more severe accidents.



Myer and Swanston Streets, Greater Geelong.

⁴ Dear 2000





B. State

B. Melbourne 2030

The below is information from the Melbourne 2030 document which seeks to plan for sustainable growth. It is a 30-year plan to manage growth and change across metropolitan Melbourne and the surrounding region. Melbourne 2030 is available at www.dse.vic.gov.au/melbourne2030online [accessed 11.09.04]. The sections that are relevant to walking are Directions 5 and 8.

Direction 5: A Great Place to Be

Policy 5.1: Promote good urban design to make the environment more livable and attractive

The physical environment affects people's ability to participate in community activities, access services and facilities, and undertake their daily lives. It also affects their sense of community and security. Urban design, including the design of buildings, streets and neighbourhoods, can foster or discourage interaction and participation in civic life.

Policy 5.3: Improve community safety and encourage neighbourhood design that makes people feel safe

Concerns about safety may restrict people's mobility and level of activity and may exclude them from some places, particularly at night. Such concerns can lead to loss of independence, isolation or constraint on some activities.

Addressing safety concerns is fundamental to achieving the objective of increased public transport usage, walking and cycling. Current traffic conditions make travel by car seem a safer option than walking and cycling in terms of personal injury. Many people feel unsafe traveling on public transport and getting to it from it. Initiatives undertaken will provide safer walking and cycling routes and improve safety for people accessing and using public transport.

Initiatives

- 3.1 Set up programs to improve the safety and security of people in public places and while using public transport, walking or cycling.

Direction 8: Better Transport Links

Policy 8.7: Give more priority to cycling and walking in planning urban development and in managing our road system and neighbourhoods

For many trips, walking and cycling are the most energy-efficient and effective means of mobility, minimising the environmental impacts of travel and providing direct benefits for personal health and social wellbeing.

Much urban development in past decades has discouraged the use of walking and cycling. People are put off cycling by traffic and by the lack of end-of-trip facilities including parking, storage and showers. Pedestrians, people with prams and pushers, and people using wheelchairs and scooters are discouraged by the poor quality of the pedestrian environment. The design of many newer subdivisions locates neighbourhood facilities such as local shopping centres and community facilities beyond convenient walking distance.

These barriers will be removed to create an environment that is safe and attractive for all people, including pedestrians and cyclists, and particularly for the young and other vulnerable users. Local cycling networks and new cycling facilities will complement the metropolitan-wide network of bicycle routes – the Principal Bicycle Network – which will be completed, resources permitting, by 2015.

Initiatives

- 8.7.1 Continue to develop the Principal Bicycle Network – to be completed (resources permitting) by 2015 – and give priority to sections that link with activity centres
- 8.7.2 Implement a walking action plan (for the whole of Victoria) that includes provision for footpath-bound vehicles such as wheelchairs, prams and scooters
- 8.7.3 Amend planning and/or building controls so that end-of-trip facilities for bicycles are provided in commercial buildings
- 8.7.4 Provide improved facilities, particularly storage, for cyclists at public transport interchanges and rail stations
- 8.7.5 Develop a bicycle action plan which brings together all elements needed to substantially increase bicycle use

Action 2 of Integrated Transport under the heading of Implementation Plans is the future Department of Infrastructure development of a Walking Action Plan to encourage sustainable travel.



Develop a Walking Action Plan

A Walking Action Plan would promote walking for short trips, with benefits in terms of health, building social connections and reducing environmental impacts. This Action Plan is being developed by several government departments and organisations such as: VicHealth and local government. Consultation shows that many people would walk more for health and recreation - particularly for short trips presently made by car to school, public transport and local shops - if they were given an urban environment that is conducive to walking.

The Walking Action Plan will address the need for coordination of walking initiatives, better information, improved road safety, better pedestrian access and facilities, and skills and training for council planners and engineers.

Linking Melbourne – Metropolitan Transport Plan

‘Providing for the safe movement of people and goods is a fundamental transport system requirement.

The Government aims to reduce the number of transport-related deaths and serious injuries, the associated trauma for those involved and their families and friends, and the costs to the community, business and the economy.

It also aims to improve safety on the public transport system and to provide better conditions for pedestrians and cyclists, so that people will be more at ease when travelling by these modes and will choose to use them more often.’

Strategy 1.2 Improving Safety and Access for pedestrians and cyclists

- ‘Improve pedestrian safety near schools located on arterial roads through a Statewide program of school speed limits.
- Improve safety and provide more equitable access for pedestrians in high-use areas such as Transit Cities and multi-modal facilities via the Walk Safe program and other innovative and cost-effective measures.
- Establish a program to provide greater priority for pedestrian access across busy arterial roads which sever community activities.’



Myer and Swanston Streets, Greater Geelong.

AUSTROADS Standards

These quotes have been taken from the **AUSTROADS Standards**. The stated intention of AUSTROADS is “to promote national uniformity and harmony, to avoid unnecessary duplication, **and to support identification and application of world best practice in the management of Australia’s roads**” (1995: title page).

- “Pedestrian devices are often designed to cater for the ‘average’ or ‘normal’ pedestrian. It is generally assumed that the pedestrian has satisfactory eyesight, and hearing, is paying attention and is not physically hindered in any way. By virtue of these implicit assumptions, pedestrians under 12 years old and generally those over 50 are misrepresented, as also are...people with prams” (AUSTROADS, 1995: 4).
- “Hoffman (1978) has shown experimentally that children do not reach an adult level of performance in traffic, i.e. do not have the perceptual and cognitive capacity to make sound judgments about traffic safety, until about the age of 12” (AUSTROADS, 1995: 4).
- “In contrast to younger pedestrians, elderly people are aware of their limitations and will compensate for these” (AUSTROADS, 1995: 6). So younger children don’t know to compensate for their limitations.
- “Young pedestrians who are involved in road accidents tend to have them on the school trip; typically the trip home from school” (AUSTROADS, 1995: 6).
- “Design for pedestrians, especially on arterials, requires that the nature of the pedestrian demand be ascertained initially and a strategy incorporating all aspects of pedestrian comfort, convenience and safety then needs to be developed” (AUSTROADS, 1995: 15).





D. Local

The City of Port Phillip

People in the City of Port Phillip already do a lot of walking. Port Phillip is just behind the cities of Stonnington, Yarra and Melbourne in the percentage of all trips we do by walking. On weekdays, about 46.6 per cent of all our trips are walked (a journey into town by public transport will normally involve 3 trip legs - a walk to the public transport stop, the tram trip, and the walk from the tram stop to the destination). Nevertheless, only 56 per cent of all the trips we do shorter than 800 metres are done by walking. We still have considerable room for improvement.



Grey and Fitzroy Streets, Port Phillip.

The City is particularly interested in pedestrian crossings and believes that Ideally pedestrian crossings should:

- Be in the right place
- Start changing in favour of the pedestrian as soon as the button is pressed
- When at intersections controlled by traffic lights automatically show the green man when appropriate. People should not have to press a button
- Give pedestrian long enough time to cross without having to scurry

City of Port Phillip's Walking Strategy

The council is currently developing a walking strategy working with the following principles:

Guiding Principles

Walking is a choice, not a necessity, for many people in the City of Port Phillip. Encouraging people to make that choice requires safe, connected streets and a council that puts the needs and desires of walkers first. The four principles, Priority, Safety, Connections

and Profile are the key areas where change and improvement need to be made. If we get these things right, then walking will become the first travel choice in the city.

Delivering Priority

The needs and desires of pedestrians will be the highest priority for all design and maintenance work in the city. Where transport/travel modes mix walkers will have priority over all the other in terms of space, time, and facilities. This principle extends to the 'feel' of our streets and walkways with priority given to walker's desires for generous, uncluttered, connected, well-serviced places to walk.

Improving Safety

Pedestrians must be able to walk safely and confidently through the city, free from fear of traffic, pollution or crime. Fear whether it is based on real or perceived danger will discourage people from walking, particularly at night. Narrower roads with slower traffic are easier for walkers to understand, are more pleasant for walking and are safer to cross. Calm, clean, well-lit, and well-maintained streets and public places attract walkers whose presence contributes to the escalating safety of these places.

Increasing Connections

People need shops, schools, work places, parks, public transport, friends and other essential and desirable places within easy walking distance, they also need the footpaths, walking tracks and laneways to get there. The right mixture of facilities and services in residential areas with high pedestrian permeability needs to be a priority in the urban planning process and any infrastructure changes should enhance pedestrian access and connectedness in the city.

Raising Profile

Finding ways to raise the profile of walking as a travel choice is one of the most important roles the council can play. The council will explore and promote new and innovative ways of getting the community on their feet, from signage, maps and other information to behaviour change programmes. Educating council officers to see 'as walkers' and to make the walking priority shift is also an essential part of the success of this strategy.



Appendix IV Detailed Results

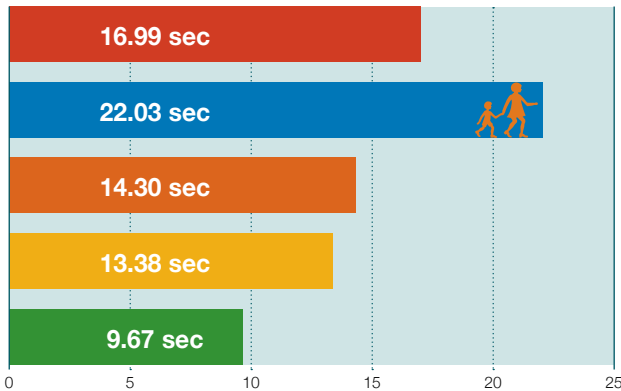
Statistical Sample – Greater Geelong

1. Noble Street / Pakington Street

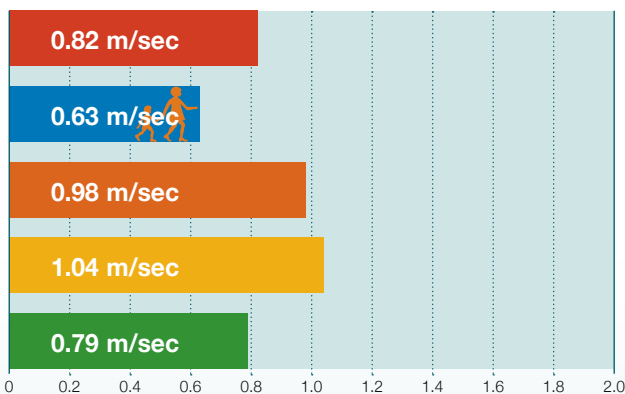
Period	Peak
Weather	Fine
Supervised	Yes
Date / Time	23/06/04 / 8-9am

- Allocated Crossing Time
- 2 Adult and 3 Children, Pram
- Walking School Bus
- 2 School Children
- 2 Adult and 2 Children

Time Comparison (seconds)



Crossing Speed Comparison (metres per seconds)

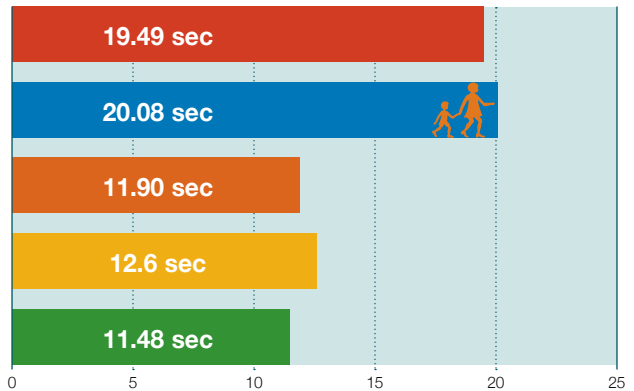


2. Myers Street / Swanston Street

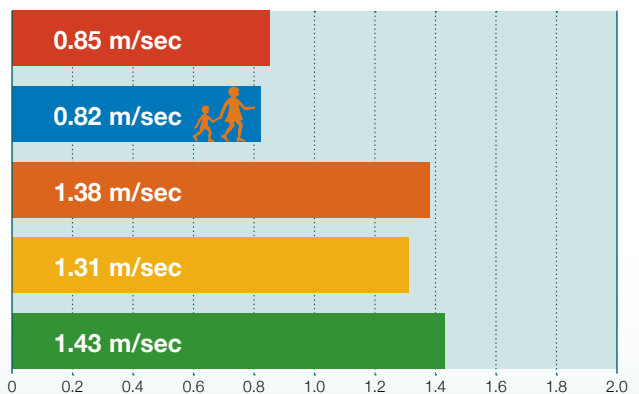
Period	Off peak
Weather	Overcast (showers)
Supervised	Yes
Date / Time	04/08/04 / 2.45-3.45pm

- Allocated Crossing Time
- 1 Adult
- Walking School Bus
- 1 Adult
- 1 Adult and 1 Adult Skateboarding

Time Comparison (seconds)



Crossing Speed Comparison (metres per seconds)





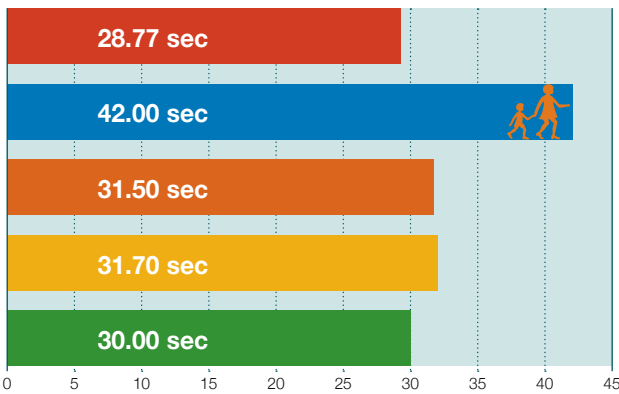
Statistical Sample – Bayside

3. Rusden Street / Nepean Highway

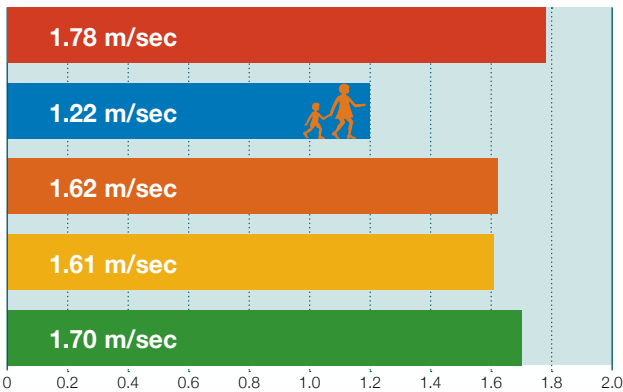
Period	Peak
Weather	Fine
Supervised	No
Date / Time	23/07/04

- Allocated Crossing Time
- 2 Adults
- Walking School Bus
- 1 Young Adult
- 1 Adult and 1 Juvenile

Time Comparison (seconds)



Crossing Speed Comparison (metres per seconds)

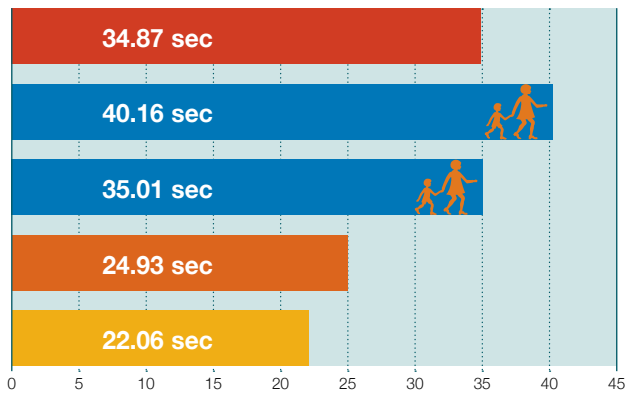


4. Centre Road / Nepean Highway

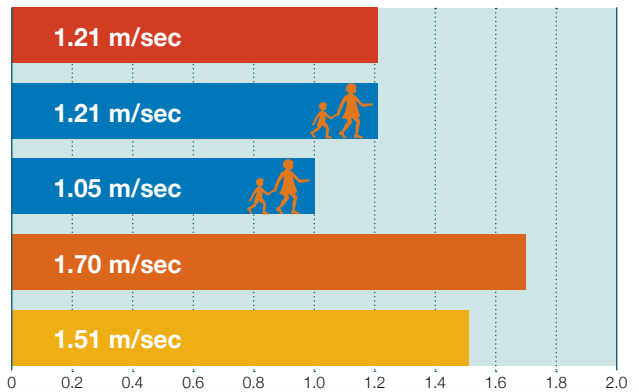
Period	Peak
Weather	Fine
Supervised	Yes
Date / Time	12/08/04 / 8-9am

- Allocated Crossing Time
- 1 Adult
- Walking School Bus 1
- 2 Children
- Walking School Bus 2

Time Comparison (seconds)



Crossing Speed Comparison (metres per seconds)



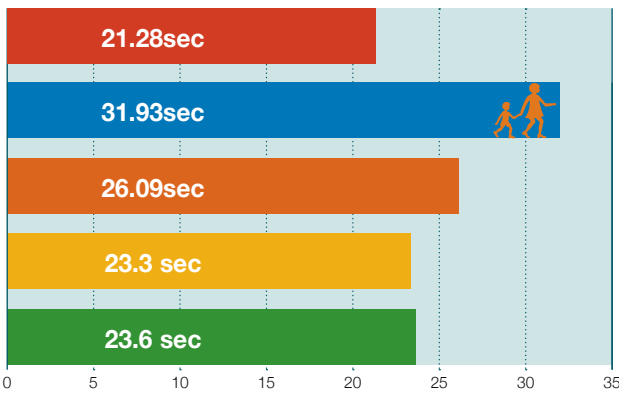
Statistical Sample – Port Phillip

5. Fitzroy Street / Grey Street

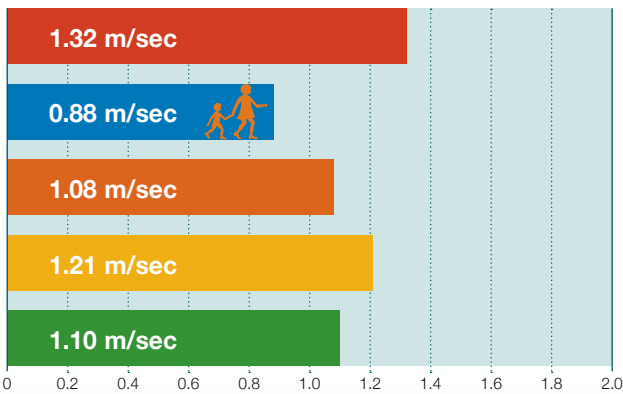
Period	Peak
Weather	Fine
Supervised	Yes
Date / Time	30/07/04

- Allocated Crossing Time
- 2 Adults, 2 Children and Dog
- Walking School Bus
- 1 Elderly Person
- 7 Children (2 on bikes) and 7 Adults

Time Comparison (seconds)



Crossing Speed Comparison (metres per seconds)

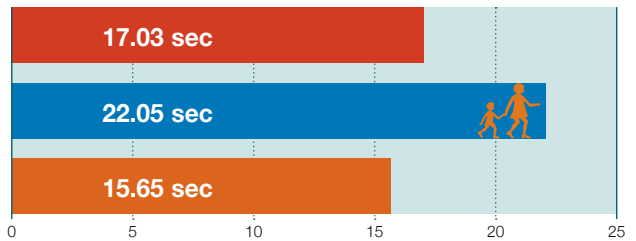


6. Pickles Street / Ingles Street

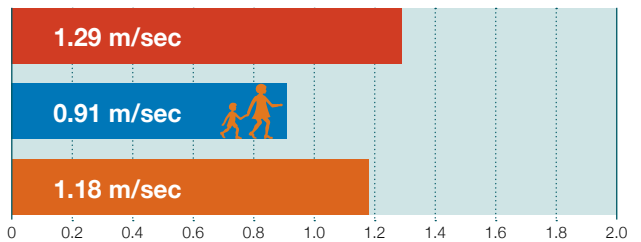
Period	Peak
Weather	Fine
Supervised	Yes
Date / Time	04/08/04 / 8-9am

- Allocated Crossing Time
- Walking School Bus
- 1 Adult and 1 Child

Time Comparison (seconds)



Crossing Speed Comparison (metres per seconds)



For more detailed statistical data download a copy of 'The Greenlight Project, Appendix IVB' in pdf format from www.portphillip.gov.au/walking_well





Appendix V

Respondent Comments

For detailed respondent comments download a copy of 'The Greenlight Project, Appendix V' in pdf format from www.portphillip.gov.au/walking_well



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THE GREENLIGHT PROJECT

Signal crossings on major roads demand particular pedestrian behaviour to complete the road crossing safely and comfortably. Parents accompanying the school travel journey have reported difficulties completing these crossings

The City of Port Phillip examines why children and adults on their school journey have difficulty getting across these busy roads.

Walking School Bus groups are studied at six locations in three Victorian local government areas – Port Phillip, Bayside and Greater Geelong.

This report analyses crossing conditions and proposes changes to signal timings and phasing. These changes will improve crossing safety and comfort for walking road users and increased pedestrian priority.

