University students' attitudes towards using public transport to and from university: exploring attitude change strategies

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Abstract
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This paper addresses some of the issues which face public transport providers when trying to promote a service which is much-maligned in the media and by the public as being inefficient, unreliable and costly. By combining the results of the exploratory research with knowledge of current marketing theories on attitude change this paper examines opportunities for providers and other stakeholders to better promote the usage of public transport networks and services.

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University Students’ Attitudes Towards Using Public Transport to and from University: Exploring Attitude Change Strategies

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According to the NSW Department of Infrastructure, Planning and Natural Resources’ “Metropolitan Strategy Discussion Paper” an average of 76% of all trips are made by private vehicle, with less than 20% of trips being made by public transport in the general community. Limited primary research on this area was completed last year as a part of a minor study on constructing a local version of the “TravelSmart” program for implementation at the University of Wollongong.

This paper addresses some of the issues which face public transport providers when trying to promote a service which is much-maligned in the media and by the public as being inefficient, unreliable and costly. By combining the research already done in this field with a study of current marketing theories on Attitude Change this paper examines opportunities which may present themselves to providers and other stakeholders to better promote the usage of public transport networks and services.

As this paper is a product of an Honours topic in progress, there is no definitive conclusion on the most appropriate way forward for attitude change, however initial research and findings will be presented.
University Students' Attitudes towards using Public Transport to and from University: Exploring Attitude Change Strategies

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Abstract

According to the NSW Department of Infrastructure, Planning and Natural Resources’ (DIPNR) “Metropolitan Strategy Discussion Paper” an average of 76% of all trips are made by private vehicle, with less than 20% of trips being made by public transport in the general community. A successful solution to this imbalance is the “Travel Smart” program, which was initiated by the Western Australian Government and has since been adapted to various other metropolitan areas in both Australia and overseas. A preliminary investigation has been undertaken to determine the likely acceptance and feasibility of a similar program being implemented at a regional Australian University that is currently experiencing traffic congestion and parking problems.

This paper addresses some of the issues which face public transport providers when trying to promote a service which is much-maligned in the media and by the public as being inefficient, unreliable and costly. By combining the results of the exploratory research with knowledge of current marketing theories on attitude change this paper examines opportunities for providers and other stakeholders to better promote the usage of public transport networks and services.

Introduction

According to the NSW Department of Infrastructure, Planning and Natural Resources’ “Metropolitan Strategy Discussion Paper” (2004) there are 269,000 residents in the Illawarra region, a number which has grown by 24,700 since 1991. With an average of 1.4 cars per household, 76% of all trips are made by car, with less than 20% of trips being made by public transport in the general community. The 2001 ABS Census found that 60% of NSW residents travelled to work by car, with 15% of residents travelling to work by other forms of transport – bus, train, bicycle or walking. Put simply, car usage enjoys a 4-to-1 ratio of usage over public transport.
Research undertaken at the University of Wollongong in 2004 and 2005 identified a similar pattern to the ABS and NSW DIPNR statistics with 73% of respondents travelling to university by car and 27% of respondents travelling by either bus, train, bicycle or walking.

**Table 1 – Main Transport Mode when Travelling to and from the University of Wollongong**

<table>
<thead>
<tr>
<th>Mode of Transport Respondents</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car (alone)</td>
<td>45</td>
</tr>
<tr>
<td>Car (share)</td>
<td>29</td>
</tr>
<tr>
<td>Bus</td>
<td>10</td>
</tr>
<tr>
<td>Train</td>
<td>5</td>
</tr>
<tr>
<td>Bike</td>
<td>1</td>
</tr>
<tr>
<td>Walk</td>
<td>11</td>
</tr>
</tbody>
</table>

The University of Wollongong currently has 20,404 students enrolled, an increase of 5% over 2002 enrolments and a statistic which is expected to rise. In addition to this there are nearly 1,500 staff employed by the university, mostly working at the Wollongong campus. There are approximately 2,700 parking spaces (University Student Guide, 2004) available on university grounds. The University operates a limited “ride share” initiative, whereby private car drivers with 3 or more passengers entering the Short-term Parking Station between 8:00am – 9:30am Monday to Friday are issued with a specially validated ticket that provides a 50% discount on hourly parking rates. The University of Wollongong also allows parking by a permit system which whilst it does not guarantee a parking space to students, it gives them access to around 2,000 parking spaces, the remainder of which are either reserved or are “pay-for-parking”. Two levels of permit exist – with Red permits allowing greater access for $200.00 per annum whilst Yellow permits give access to outlying parking areas (as shown in Table 1) for $120.00 per annum.

Currently the University suffers significant parking congestion in peak times, yet regular bus and train services arrive at or near the University with few passengers on board. As a result an opportunity exists for public transport to be promoted to the majority of students as an alternative method of transport to university.

In addition to the problem of congestion there is also the environmental dilemma of pollution. Researchers are finding that “inner city residents (have) more respiratory problems because of greater exposure to pollution.” (Townsend, in Gibbons, 2004), with Government papers – such as the NSW State Government’s Metropolitan Strategy Discussion – looking towards sustainable growth and growth in public transport usage as one answer to reducing pollution. Research by the Sierra Club in America has reported that “US cities spending most on public transportation rather than on motor vehicle infrastructure have the least smog.” (as cited in Donovan & Henley, 2003), whilst Newman
and Kenworthy (1996) state a long list of the environmental, economic and social problems which automobile dependence produces.

Briefly stated, the problems faced by the University of Wollongong are pollution and parking congestion, underpinned by students’ lack of inclination towards using public transport to travel to and from the University. The purpose of this paper is to present strategies of attitude change which will subsequently change student responses to public transport and hence help to remediate the problems faced by the University at this point.

**Background and relevant literature**

Neal, Quester and Hawkins (2004) define an attitude as “a learned predisposition to respond in a consistently positive or negative way to a given object or event.” For this particular study, the attitude object is public transport, in particular bus transport. Exploratory research undertaken in this study has revealed that the majority University students hold strong negative (unfavourable) attitudes towards public transport.

Neal, Quester and Hawkins (2004) consider attitudes to have three major components – affect (i.e. how a person feels about public transport, for example “I dislike catching buses”), cognition (i.e what a person thinks about public transport, for example “I believe that public transport is unreliable”) and behaviour (for example, “I intend to catch the bus to University next week”). Attitudes are formed through direct and past experience, word-of-mouth and influence of family and friends, direct marketing and exposure to mass media. This study focuses upon how advertising influences attitude formation and attitude change.

No previous public transport campaigns specifically targeting Australian universities have been identified, however other campaigns run specifically to encourage public transport usage for the general population have been successful. Examples of these include:

- **TravelSmart WA** – a Western Australian State Government initiative (http://www.dpi.wa.gov.au/travelsmart) to encourage increased public transport awareness and usage;
- **TravelSmart Australia** – an expansion of the Western Australian project which has been adapted into a joint initiative of the Federal, State and Territory Governments (http://www.travelsmart.gov.au);
- **TravelSmart UK** – various County Councils in the United Kingdom have recently been awarded GBP50,000 grants from the UK Government to pilot TravelSmart plans similar to the Western Australian project;
- **Unlimited Access** – a system used by some universities in the United States, whereby the university pays a “shadow fare” to the operator with students receiving fare-free access to the transit system;
The “TravelSmart” initiative was introduced to Australia by the Western Australia government, as “an adaptation of the individualised marketing developed and implemented by Socialdata...in several European countries.” (Donovan & Henley 2003) The focus of TravelSmart on changing the behaviour of those who expressed an interest in choosing alternative modes of transport has resulted in dramatic increases in the usage of public transport in Perth. Public transport patronage grew by 24% over two years whilst car trips shrank by 8% to 74% of trips taken. Donovan & Henley (2003) comment that TravelSmart attempts to assist change by “facilitating behaviour change among those already positive towards the desired behaviour.” The advantages of behaviour change programs such as TravelSmart are that they “can play a key role in the strategic management of transport assets by both influencing demand for greater use of existing assets...and deferring asset provision.” (Travelsmart 2010, 1999)

Research by Stewart (1999) into the dearth of public transport option for Auckland’s UNITEC Institute of Technology and the high usage of the private car highlights similar parallels to University of Wollongong. UNITEC is a “drive-in campus” where parking is free (compared to Wollongong’s relatively low permit fees), however there had been problems with peak loads of students not being able to access a car space. Stewart’s research into public transport alternatives revealed that whilst Aucklanders had a “strong preference...for private vehicle access”, if free or subsidised public transport were provided approximately 62% of students would “sometimes or all the time” use it.

An innovative approach to increasing patronage of public transport is identified in Brown, Baldwin & Shoup’s (2001) research into the “unlimited access” to public transport which is provided by several universities in the US. To allow students to travel free of charge the university pays the transport provider a “shadow fare” every time the student uses a transport service. This approach has been shown to increase student patronage by “71 percent to 200 percent in the first year.” (Brown, Baldwin and Shoup 2001) Based on figures garnered by my primary research this would increase the number of students using public transport to between 22 and 30 percent and decrease motor vehicle usage. According to Brown, Baldwin and Shoup (2001) the cost of this scheme ranges from $5 to $99, depending on actual usage by students. University officials who promote the “Unlimited Access” model stated that “it reduces the need for parking, increases students’ access to housing and employment, helps universities recruit and retain students, reduces the cost of attending college, and increases transportation equity.” The results achieved by “Unlimited Access” are all objectives of this social marketing campaign.

Another issue identified is frequency of service, which Boyer (2003) found was a driver of demand “when more buses run more frequently, ridership picks up along with convenience.”

An excellent example of an integrated internet and face-to-face public transport initiative is provided by Arlington County, Virginia, USA, whose service “CommuterPage.com” (http://www.commuterpage.com) provides quick access to timetables and fare information, supplemented by information dispensed from three physical locations around Arlington.
Through constant consumer research and innovations such as online ticket purchasing, Arlington County have increased “ridership” substantially in the years since CommuterPage was launched. As such it is imperative that an integrated internet and face-to-face presence is established at the University of Wollongong for public transport.

Recent developments in England (Boyer 2004) have meant that universities such as the University of Durham have foreshadowed banning student’s cars within a five (5) mile radius of campus. Whilst this is a draconian measure that would be difficult for a university such as Wollongong to achieve, with co-operation from Wollongong City Council it could be a feasible way of reducing motor vehicle usage and increasing public transport patronage.

Liden and Edvardsson’s (2003) research into the public transport system of Stockholm defined a service guarantee as “a means to make the service tangible and to reduce the customer-perceived risk.” They also note that previous research has found that for a service with negative industry reputation and when the outcome has “great personal impact on the customer” (such as public transport) that customers “(do) not favour an unconditional guarantee; instead they prefer a guarantee with clear and precise conditions.”

Currently none of the public transport providers to the University of Wollongong give a specific service guarantee, with only one provider – CityRail – giving a specific service target. CityRail’s target of “at least 92 out of every 100 peak services to arrive at their terminus within 3 minutes and 59 seconds of their scheduled arrival time [5 minutes and 59 seconds for Intercity services]” is currently not met on a regular basis. On-time running of train services on the South Coast line has fallen for the past three years, such that over 20% of train services are at least 6 minutes late at their destination, well short of the target of 92% on-time running.

**Figure 1 - Yearly On-Time Running - South Coast Line**
<table>
<thead>
<tr>
<th>Year</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004-2005</td>
<td>78.6</td>
</tr>
<tr>
<td>2003-2004</td>
<td>79.9</td>
</tr>
<tr>
<td>2002-2003</td>
<td>90.5</td>
</tr>
<tr>
<td>2001-2002</td>
<td>92.4</td>
</tr>
</tbody>
</table>

Target: 92%


Research undertaken into the bus services to and from the University of Wollongong showed an on-time running performance (arriving within 4 minutes 59 seconds of schedule) of 89% over a survey period which included five separate surveying periods of three hours each. Whilst all three bus companies which service the University of Wollongong do not have service performance guarantees that are published, if a similar standard of on-time running to CityRail (92%) is applied, they also fall short.

**Research Objective**

The specific objective of this research project is to gain insight into student perceptions and attitudes towards public transport and to discover factors which would encourage students to make public transport their primary transport option.
Method

Questionnaire

A preliminary questionnaire was undertaken which asked respondents eight questions about their primary mode of transport and their perceptions of both that mode of transport and of public transport.

Recruitment of Participants

Recruitment was via a convenience sample in all cases, with participants within a second year undergraduate marketing lecture being asked to complete the questionnaire. 100 questionnaires were distributed, with 75 being completed and returned for analysis.

Focus Group and Discussion Groups

In addition to this a focus group and two discussion groups were conducted, with respondents asked to discuss their usage of public transport to and from the University of Wollongong and the reasons why public transport was not utilised.

Recruitment of Participants

Participants of the discussion groups were again selected via convenience sample, with students within two tutorials of the same marketing class cohort being utilised, the size of the groups being 25 and 17 respectively.

For the focus group there were 12 participants, who were from a university-wide sample. The focus group was run in conjunction with another focus group which asked students questions on their perceptions and attitudes towards the administration of the university, with questions on perceptions of public transport being asked in the final quarter of the one hour focus group.

In all situations no incentive was offered to the participants for their participation.

Results

Results of the Questionnaire
In the questionnaire, respondents were asked nine questions about their travelling 
behaviours and perceptions towards both their current mode of transport and public 
transport.

The first question asked respondents how often they attended the University of 
Wollongong, the results being:

- No respondents attended 1 day per week;
- 12% of respondents attended 2 days per week;
- 49% of respondents attended 3 days per week;
- 27% of respondents attended 4 days per week; and
- 12% of respondents attended 5 days per week.

No respondents in this questionnaire attended just a single day per week, however due to 
the timing of this questionnaire (taken at 1.30pm in a non-compulsory lecture) there may be 
bias against part-time students who work during the day (therefore unable to attend the 
lecture), and who are more likely to attend the University only one or two days per week.

The second question asked respondents about their primary method of getting to and from 
the University. Travelling by private motor vehicle was the most common method, with 
45% of respondents travelling by car alone and 29% travelling by car, sharing with 
someone else. A total of 25% of respondents used sustainable modes of transport – 11% 
used a bus, 9% of respondents walked to university, and 5% of respondents used a train. 
These percentages correlate with both prior research undertaken in 2004 where 31% of 
respondents in a smaller sample of 26 used sustainable modes of transport, and research 
within the general population by DIPNR which states that 76% of all trips are made by car.

The third question asked respondents about their reasons for choosing their desired mode of 
transport, with multiple responses allowed, and qualitative responses being summarised and 
coded for analysis. The results of this question showed that:

- 64% of respondents chose their method of transport for “convenience”; 
- 24% of respondents chose their method as it was “quickest”; 
- 12% of respondents chose their method as there was “no viable alternative”; 
- 12% of respondents chose their method as it “allowed flexibility”; and 
- 12% of respondents chose their method as it was “reliable”.

The fourth question asked respondents about whether they would consider using one (or 
more) of the other modes of transport as opposed to their primary method of transport. 69% 
of respondents were receptive to choosing other modes of transport with varying degrees of 
conditions placed on that choice, whereas 31% of respondents answered no for varying 
reasons. This correlates with research done by the Western Australian Department of 
Transport for TravelSmart (2000), which found that 39% of households contacted were not 
interested in receiving information about public transport options.
The fifth question asked respondents about their general perceptions of public transport. Respondents were again allowed to make multiple responses and these were categorised. 73% of respondents held negative perceptions of public transport, with 11% holding both positive and negative perceptions, 10% holding positive perceptions, and 7% of respondents having neutral perceptions to public transport. The most common perceptions of public transport were that it was: “unreliable” (33% of respondents); negative comfort factors (27%); “late” (25%); “inconvenient” (17%); and “slow” (16%). No single positive perception of public transport was given by any more than 12% of respondents, who made “general positive comments”.

The sixth question asked respondents about what factors needed to change with public transport. The responses mirrored the fifth question, with 41% of respondents stating “on-time running/reliability”; 36% stating comfort factors; 27% stating frequency of services; 20% stating improved scheduling of services; and 13% stating that cost needed to be improved in the area of public transport.

The seventh question required respondents to state what would encourage them to make public transport their primary option. Multiple responses were allowed, with a total of 131 responses made and 4 respondents not giving any response. The main factors which would encourage respondents to make public transport their primary option were:

- 35% of respondents stated cheaper services;
- 27% of respondents stated improved on-time running and reliability;
- 17% of respondents stated increased services;
- 15% of respondents stated improved scheduling; and
- 11% of respondents stated improved comfort factors.

It is interesting to note that only 7% of respondents stated that “nothing” would encourage them to make public transport their primary option, while an additional 7% stated that they would only choose public transport if there was “no viable option”. Whilst 24% of respondents already chose public transport, their responses were still counted.

The final question asked respondents whether they would consider utilising a carpooling service if it were provided by an external body, such as the University or the Wollongong University Students Association (WUSA). Slightly more than one-third of respondents (38%) answered no, whilst the remainder were split between varying degrees of positivity. 33% of respondents stated they would consider utilising a car-pool service without reservation, whilst 17% stated they would use it occasionally, and 13% stated that they would use a car-pool service only if it were with people they were familiar with.

**Results of Focus Group and Discussion Groups**

A total of three discussion group sessions were conducted, querying students about their method of transport to the university, their reasoning behind using their method, their
perceptions towards public transport, and whether making public transport free-of-charge to and from the University of Wollongong would change their behaviour. The responses to each question are presented in order they were asked.

The first question asked how many students drove to university that day, with 21 out of 25 respondents in Discussion Group 1 (DG1), 13 out of 17 respondents in Discussion Group 2 (DG2), and 9 out of 12 respondents in the Focus Group (FG) stating that they either drove or were driven – a response rate of 80%, slightly higher than the response for the similar question in the questionnaire administered.

The second question for discussion asked respondents to discuss the reasons why they drove (or were driven) to university. The main responses were: convenience, time, distance from University (most lived in Sydney), flexibility, scheduling, and unreliability of public transport. These answers were almost identical between all three groups conducted, with only scheduling of public transport not being mentioned in all three groups (it was mentioned in DG2 and FG).

The third question asked students why they did not use or consider public transport for coming to the University. The main responses centred on: cost, reliability, lack of direct services to University, and the relative disadvantage when compared to the speed and perceived cost of driving to and from the University. Again, the responses given correlate with the responses within the questionnaire which was administered.

The final discussion group question asked students whether the act of making public transport free of charge to and from the University would change their behaviour and encourage them to use public transport rather than a car. Responses given indicated that approximately 50% of the participants would switch from motor vehicle to public transport, however there were several conditions which several of the respondents placed on this. These conditions were: competitiveness to car on speed and cost, and the need for the service to be reliable and reasonably direct.
Discussion

So having now identified the attitudes of university students towards public transport, what do we need to do to change the status quo? Do we need to be changing incorrect perceptions about public transport, or do we need to improve the quality of service that is provided to the customer?

To gain a better understanding of some of the theories applicable to the marketing of public transport we can look at the areas of both services marketing and social marketing. Public transport is a service, and also requires attitude and behaviour change in favour of public transport to improve the well-being of our society (particularly in regard to the environment and alleviating the strain on public infrastructure).

Social marketing is defined by Kotler and Roberto (1989) as a “process that promotes the voluntary behaviour of target audiences by offering benefits they want, reducing barriers they are concerned about, and using persuasion to motivate their participation in program activity”. Anti-smoking advertisements that aim to get people to quit smoking and road safety campaigns that encourage drivers to not drink and drive are examples of social marketing.

Services marketing involves the marketing of “those economic activities whose output is not a physical product or construction, is generally consumed at the point time it is produced, and provides value added in forms (such as convenience, amusement, timeliness, comfort or health) that are essentially intangible concerns of its first purchaser” (Quinn, Baruch and Paquette 1987 in Zeithaml and Bitner 2003).

Public transport has competitors – this being other modes of transport – overwhelmingly the private car. Public transport operators need to identify the strengths of their competition – convenience, comfort and privacy – all of which consumers will be unable to put a price on.

A strategy which may be effective is to undertake comparative advertising, pitting public transport against the private motor vehicle. Most advertisements for commercial products and services are one-sided, as they only present the positive or supportive arguments about the brand. Using a two-sided argument (also referred to as refutational arguments), which entails mentioning both the negative and positive aspects of a product or service, is useful when marketing to target audience’s who: hold negative attitudes towards a product or service; are sceptical about the product or service or; are not loyal to the product or service (Golden and Alpert 1987 in Belch). Obviously any negative aspects of the product service that are mentioned in the ad should be only minor, while the positive attributes that are used to refute these drawbacks should be important and believable (Solomon 2004).

Research by Crowley and Hoyer (1994, in Schiffman 2001) concurs with this, stating that “if the audience is critical or unfriendly (eg if it uses the competitive products), if it is well educated, or if it is likely to hear opposing claims, then a two-sided message is likely to be more effective”
Advertising showing a car with a slot machine, stating the average expense of driving to include fuel, parking and associated maintenance costs, and then showing a bus and its’ lower cost may assist in eliminating the perception that public transport costs more than the motor vehicle. Within the research conducted at the University of Wollongong, students noted that their perception of the cost of public transport was that it was relatively expensive, however the cost of a $4.00 train ticket (each way) is relatively inexpensive when compared to the total cost of driving – approximately $42.00 (each way).

This strategy for changing student’s cognitive beliefs about using public transport involves attempting to influence student’s attitudes towards competitors of public transport, in terms of their ratings of competitors (namely the private car), by using comparative advertising.

This form of persuasive message involves a marketer comparing their company’s product or service to a specific competitor’s product or service offering, or alternatively, to many competitors’ offerings, either by directly naming competing brands, or simply implying (indirectly) who the competition is, and claiming superiority. There is debate regarding the effectiveness of comparative advertising and the conditions in which it should be used - “comparative ads are only credible if they don’t reach too far by comparing a brand to a competitor that is obviously superior (eg Nissan v Mercedes)” (Halliday, in Solomon 2004)

Pechmann and Stewart (1990) give the following guidelines for the implementation of a comparative advertising campaign – the market “challenger”, follower, or underdog is best to use it, to show the “differential advantage” of their service; it requires higher levels of cognitive processing; and requires a well-educated target audience – all qualities of a university student population.

Whilst comparative advertising rates well for generating attention, awareness and better recall, there is a risk that by aggressively attacking a competitor the advertising strategy can backfire as consumers find that the comparison may not be entirely truthful. The end result for public transport promotion is that comparative advertising can be effective, however caution as to the extent of the comparison, and emphasis on the main positive elements of public transport, such as the much reduced cost when compared to the private car are the keys.

Using a two-sided argument or comparative advertising may be effective, however in doing this, we must ensure that the service is actually improved to meet the new promises that are made.

Another relevant theory that could be applied to improve the service quality of public transport is Zeithaml, Parasuraman and Berry’s (1990) gaps model of service quality. The GAPS model of service quality enables service organisations to identify the gap between customer expectations and perceptions in the service which is offered.
The GAPS model (Figure 2) provides five gaps to be assessed and improved on:
- Provider Gap 1 – not knowing what customers expect
- Provider Gap 2 – not having the correct service quality designs and standards
- Provider Gap 3 – not delivering to service standards
- Provider Gap 4 – not matching performance to promises (i.e. external marketing)
- Provider Gap 5 – the total gap between perceived and expected service (i.e. the sum total of the four gaps)

Figure 2: The GAPS Model of Service Quality

By implementing the GAPS model and identifying the “gaps” which are required to be closed, public transport providers would can identify opportunities for improvement which will lead to a better service being provided, and consequently higher patronage of public transport, which is the aim of this study.

There are multiple strategies which are open to both university management and public transport operators, however without co-operation between all stakeholders the probability of success will be reduced. Within all strategies the main issues identified by students need to be addressed – unreliability, negative comfort factors, on-time running, inconvenience, and journey speed.
Currently there is little promotion of public transport options to students at the University of Wollongong, however research by Rose and Ampt (2001) indicates that travel awareness programs (Travel Blending, Travel Smart) result in a 10% reduction in car driver kilometres. As such, implementation of a similar program may see similar changes in the behaviour of university students.

A common issue raised by students was that speed and time taken to access the University of Wollongong by public transport was excessively sub-standard when compared to the private car. As such, by improving public transport links to/from main destinations – such as improved pedestrian access, improved bus routing, and improved cycleways – there may come an increase of public transport patronage. Each of these improvements would require assistance from local council, state government departments (such as the Roads & Traffic Authority) and public transport operators, and as noted earlier co-operation between these bodies and the University of Wollongong would be required.

There are other strategies which may not be readily available to public transport operators and/or the university, however they are still avenues by which lobbying may be made to higher bodies, such as Federal, State and local government. These measures may include increasing costs of competing modes of transport (i.e. the private car) - While they are an essential part of any long-term strategy, large increases in fuel costs or parking charges are not easily introduced and have immediate equity impacts (Newman & Kenworthy, 1996). Research by Jakobsson, Fujii & Garling (2002) suggest that “economic disincentives do not directly lead to car use reduction but affects motivation to plan car use reduction”, and as such should be used in conjunction with assistance or education on how to use public transport.

**Future Research**

Future research in this area will concentrate on more accurately gauging student’s attitudes towards public transport and on evaluating the effectiveness of different courses of action that may be taken in co-operation with both the University of Wollongong and the relevant public transport providers. With over 70% of students accessing the university by motor vehicle, even a 10% reduction in this figure would reduce the problems of pollution and congestion. The main challenge is to find the optimal combination of strategies to enable this to occur.
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