

## **Old neighborhoods showcasing new urbanism principles to promote walking for transport**

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### **Abstract**

The built environment shapes our transport choices and has a significant impact on the environmental, economic and social wellness of communities. Compact land use patterns, as opposed to urban sprawl, can improve public health by providing the environment to make walking a feasible mode of transport. Toowoomba's traditional inner city suburbs have the built form characteristics of compactness, connectivity, density, lot layout and mix of uses to be walkable. Using existing literature, geographic information systems, data, survey results and a walkability scoring tool, this paper will show that although being walkable and exhibiting New Urbanism characteristics very few people walk to work in Toowoomba's urban centre for a variety of reasons. This paper will argue that personal value propositions and attitudes are as influential for walking for transport as physical urban environments.

### **Keywords**

Walkability, new urbanism, public health, built environment, psycho-social barriers

### **1 Background**

New Urbanism advocates claim that this urban design theory can reduce both travel distance and time, increase the use of public transport and reduce dependence on the private vehicle (Cozens and Hillier, 2008). Much of the literature debates the benefits of a grid pattern over a cul-de-sac neighborhood layout (And and Ahn, 2003). Many contend that very few newly built New Urbanism environments have been critically or systematically evaluated to prove or disprove the claims of improved walkability and that they suffer generally from methodological problems. (Randall and Baetz, 2001). Much of the debate is driven by an aversion to what is perceived as a one size fits all codified stance by new urbanism based on a grid pattern as opposed to a cul-de-sac pattern or any acknowledgement that there is no one kind of planning that will promote walkability (Cozens and Hillier, 2008).

Given that very few actual levels of pedestrian activity were studied in the literature to ascertain if urban design factors such as grid or cul-de-sac connectivity necessarily result in increased levels of walking, I have looked to an existing older neighborhood that I contend displays the characteristics of a connected and walkable design to determine if levels of walking to work attain a high percentage of mode share. In valuing what already exists and putting aside the new urbanism debate surrounding grid layouts, the real message for planners may be to look beyond the natural environment attributes and focus on the psycho-social correlates of walkability as policy makers.

New Urbanists, following the congress of New Urbanism in 1998, generally subscribe to a set of core principles and code provisions including:

- compact, walkable neighborhoods with clearly defined edges;
- a clearly defined centre with public space, public buildings , a transit stop, and retail businesses;

- an interconnected street network, forming coherent blocks and lined with building fronts rather than parking lots;
- a diverse mix of activities and housing options;
- civic spaces in prominent places; and
- open spaces in convenient locations throughout neighborhoods (Lund, 2003).

## 2 Purpose

The purpose of this paper is to establish that the inner city areas of East Toowoomba are highly walkable and then to identify what share walking has of available modes of journeys to work. The paper will explore a multi-disciplinary approach to increasing the mode share of walking for journeys to work by identifying the various correlates of walkability identified in existing literature and placing new emphasis on the psycho-social correlates of various modes. The fundamental question this paper asks is if old, existing neighborhoods that are displaying all of the characteristics espoused by new urbanists are not experiencing higher levels of people walking to work what are the correlates that as planners and policy makers we can identify, understand and influence? The paper will discuss an existing theory of the correlates of walkability proposed by Saelens et al (2003) and then contribute to that theory by developing it further by attributing equal importance to other psycho-social correlates for walking for transport. In order to understand why people are not walking in highly walkable environments the paper will also suggest a number of paradigm shifts required for transport policy planners that take into account the psycho-social factors that influence travel behaviours.

## 3 Method

This paper is a desk top study based on existing literature, geographic information systems, census, survey results and a walkability scoring tool.

There exists a large volume of literature about walkability from a variety of disciplines and some literature that provides a cross-disciplinary approach. Systematic reviews (Giles-Corti et al., 2013, Cervero and Kockelman, 1997, Duncan et al., 2010, Frank et al., 2003) have concluded that built environment attributes, especially land use patterns, are consistently related to physical activity in general and to walking for transport in particular. Different factors impacting on walking for transport, including proximity, connectivity, land use mix and infrastructure have been identified (Duncan et al., 2010, Frank et al., 2006a, Frank et al., 2006b). Reviews of the public health and preventative medicine literature indicate that access to recreation settings and the aesthetics of activity settings are related to walking. Reviews of the transport and urban planning literature indicate that ease of pedestrian access to nearby destinations is related to walking (Saelens et al., 2003).

The census and the Toowoomba household travel survey conducted by the Department of Transport and Main Roads in 2012 are the primary data sources for the paper. The survey collected comprehensive travel behavior information from a sample of 2000 households in private dwellings. The data contains both quantitative and qualitative responses. Survey results are representative of personal travel by Toowoomba residents on a typical school term weekday. Results are based on sample data benchmarked to the 2011 census data results about number of private dwellings and estimated resident population living in dwellings by age and gender (ABS, 2012).

The walkability audit tool used for the paper is Walk Score. Walk score is a freely available product that was founded by a private company in 2007. The stated mission of the company is to promote walkable neighborhoods with the idea that this is one of the simplest and best solutions for the environment, our health and our economy. According to the walk score webpage, the walk score algorithm awards points based on the distance to the closest amenity in each category. If the closest amenity in a category is within 400 metres it assigns the maximum number of points. The number of points declines as the distance approaches 1.6 km—no points are awarded for amenities further than 1.6 kilometres. Each category is weighted equally and the points are summed and normalized to yield a score from 0–100. The number of nearby amenities is the leading predictor of whether people walk. Relevant amenities include "businesses, parks, theaters, schools and other common destinations (Score, 2013). Walk score does not take into account pedestrian infrastructure, road type, weather nor criminal activity statistics. Carr, Dunsiger and Marcus (2010) have validated the use of walk score as a reliable measure of access to walkable amenities and identify that it is a convenient and inexpensive option for research into the correlated between walkability and physical activity.

## 4 Results

### 4.1 Walkable neighborhoods – Toowoomba inner city suburbs

Using the walk score tool the area of Toowoomba Central (3 464 people), East Toowoomba (7 154 people) and South Toowoomba (6 826 people) score 82, 68 and 62 respectively. These three areas represent the older, traditional and first settled areas of Toowoomba. Toowoomba as a city (96,567 people) has an overall walk score of only 46, illustrating that ironically the older neighborhoods of Toowoomba are exhibiting more walkable urban design characteristics than the new. The most walkable cities in Queensland according to walk score are Brisbane, Gold Coast and Toowoomba. The least walkable cities are Bargara, Hervey Bay and Warwick (Score, 2013).

Figure 1 shows the score as a colour ranging from green for a hundred to red for a zero walk score.

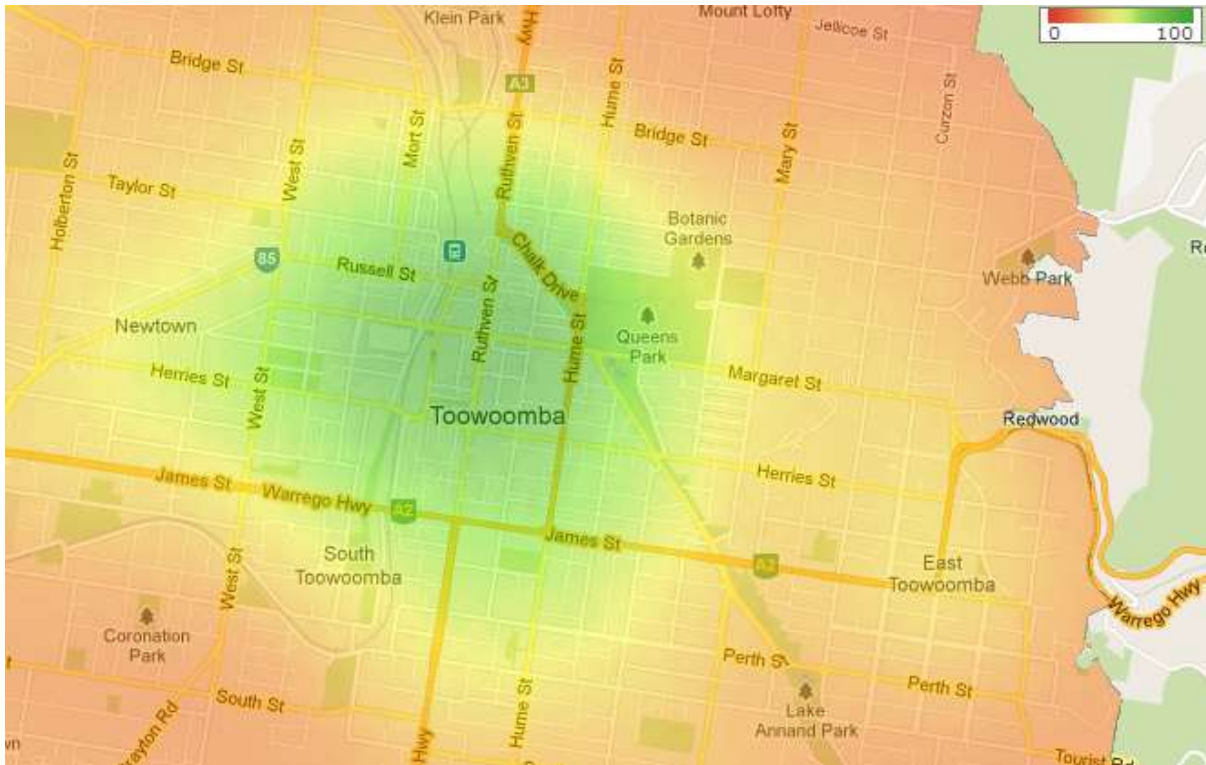


Figure 1: Toowoomba City, South Toowoomba and East Toowoomba walk score retrieved from [http://www.walkscore.com/AU-QLD/Toowoomba/Toowoomba\\_City](http://www.walkscore.com/AU-QLD/Toowoomba/Toowoomba_City) 7 May 2013

Further analysis of the inner city suburbs by evaluating how they perform against the new urbanism design principles contained in the Next Generation Planning Handbook also reveal a high correlation between these traditional, older suburbs and new urbanism criteria (Queensland, 2011)

### New Urbanism Principle

compact, walkable neighbourhoods with clearly defined edges

### Evaluation by Next Generation Planning Handbook

Compact urban form

Edges formed by East and West Creek, James Street and the Great Dividing Range



a clearly defined centre with public space, public buildings, a transit stop, and retail businesses

Toowoomba city centre clearly defined with civic buildings, transit stops and retail

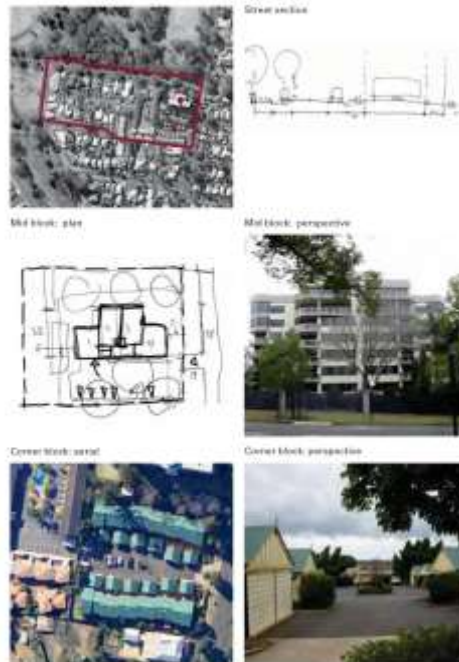
an interconnected street network, forming coherent blocks and lined with building fronts rather than parking lots

Grid street network with rear lanes in Caledonian Estate



a diverse mix of activities and housing options

Diversity of housing and land use mix



civic spaces in prominent places

Queens Park and East Creek Mothers Memorial

open spaces in convenient locations throughout neighbourhoods

Queens park, East and West Creeks

Figure 2: New urbanism evaluation of Toowoomba (Queensland, 2011)

#### 4.2 Who is walking to work in these highly walkable neighborhoods?

Only five percent of the population walks to work in Toowoomba's inner city neighborhoods and an overwhelming 95% rely on a private vehicle for their journey to work. Toowoomba does have a high proportion of medium distance trips (two – five kilometres) in comparison to other regional centres in Queensland due to its compact built form. Approximately 17% of all commuter journeys to work are short, less than two kilometres and end relatively close to home. Of all journeys to work fifty-eight percent are less than five kilometres (QTMR, 2012).

Analysis undertaken for Setting the Transport Scene in the Darling Downs indicates that around 36% of residents live within one and a half kilometres of a commercial activity centre and/or major employment hubs.

Toowoomba urban area consists mainly of a grid street layout making connectivity and permeability high for walking. The pathways within creek networks do provide linear networks in a park setting for walking within the urban area. One in three commuters travel less than four kilometres to work in the Toowoomba urban area. These figures would indicate that at least some of these journeys could possibly be converted to walking if we started to understand and address the reasons for private vehicle use more comprehensively and started to compete in that space for mode share.

The estimated average time spent travelling in a return trip by car Toowoomba residents each day is fifty-two minutes. For those walking trips recorded in the 2012 Toowoomba household travel survey the average distance recorded was one kilometre and the duration was fifteen minutes (QTMR, 2012).

In 2012 Toowoomba Regional Council area had 536 kilometres of existing pathways. 149 kilometers of these have been constructed over the last ten years, with 85% of all pathways located in the Toowoomba urban area.

A Toowoomba regional transport user analysis survey on attitudes towards travel modes conducted in 2010 found that four percent of all respondents said walking was not available in their local area and fifty percent did not consider walking as an option for journeys to work. Of the fifty percent, barriers or reasons for not walking included 45% said too far, 25% not comfortable, 23% said not fit enough and 16% no paths. Respondents were given thirteen possible associations with various transport modes including environmentally friendly, cheap, value for money, enjoyable, flexible, comfortable, easy, popular unreliable, stressful, unappealing and quick and were asked to nominate five of those in no particular order for each mode of transport.

Respondents cited the following top five associations with walking:

Top associations with walking	Association	% of respondents who nominated this particular association
1	Environmentally friendly	82%
2	Cheap	76%
3	Value for money	58%
4	Enjoyable	50%
5	Flexible	45%

Figure 3: Top five associations with walking

While most of the respondents identified very positively with the idea of walking and showed a clear understanding of the environmental and financial benefits of it, fewer viewed enjoyment, flexibility and value for money as positive associations. These lower scoring positive associations for enjoyment of walking are linked to the barriers identified for walking being the “journey is too far, walking is not comfortable, I am not fit enough and no paths have been provided”. The lowest scoring positive association relates to flexibility and can be linked to the value attached to the freedom and choice associated with the private car. The value placed on these positive association with the car are key to identifying as planners and policy makers what else needs to be done to promote healthy places and compete with perceptions and psycho social correlates of physical activity.

Respondents cited the following top five associations with the private vehicle:

Top associations with the private vehicle	Association	% of respondents who nominated this particular association
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1	Comfortable	89%
2	Flexible	80%
3	Easy	78%
4	Popular	77%
5	Quick	76%

Figure 4: Top five associations with the private vehicle

The barriers identified by respondents to using a private vehicle include “congestion, impact on the environment, I don’t have a license and parking is too expensive”. These barriers are also critical clues for policy makers who have the political will to compete with the car and reclaim streets for people. Trends indicate that congestion will get worse not better and that the flexibility offered by the car will also decrease correspondingly with people spending longer and longer in the car due to congestion. All of the top associations cited by respondents for private vehicles are placed under serious threat if congestion increases including quickness and ultimately popularity.

## 5 Discussion

Planners have and do traditionally follow a number of key design principles that they believe by their application will promote walkability and create a healthy community. The principles include active transport, aesthetics, connectivity, environments for all people, mixed density, mixed land use, parks and open space, safety and surveillance, social inclusion and supporting infrastructure (ALGA et al., 2009). Extensive research exists to suggest that physical activity including walking is influenced by environmental variables and neighborhood context (Lund, 2003; Ross, 2000) (Saelens et al., 2003). Land use mix, density, connectivity and streetscape design are well documented built environment factors that can influence active transport to a degree in preference to private vehicle use.

The physical environment barriers to walking have traditionally been related to gaps in pedestrian infrastructure including partial or non-existent walking paths, poor quality walking surfaces, non-existent or inappropriate crossing treatments, speeding traffic, high speed traffic and high volume heavy vehicle traffic. The evidence demonstrates that there is an inherent contradiction in traditional responses to walkability and that even when the built environment is conducive in terms of compactness, proximity, connectivity, density, lot layouts and use mix there are other factors that are barriers to walking for transport in Toowoomba. Personal, social and perceptual barriers include people’s attitude to walking and these attitudes may be influenced by climate, topography, convenience, comfort, doubt about ability to walk, safety and status and are what we need to know more about in walkable environments where people are not walking.

The theory developed by Saelens, Sallis and Frank considers neighborhood environment factors, individual factors and walking and cycling purpose. The model, “*proposes next possible steps in the evaluation of environmental and psycho-social variables involved with physical activity and their interaction. For instance it is possible that the collective psycho-social factors of social support, self-efficacy and positive beliefs about physical activity are more closely related to the behavior in the presence of a more walkable physical environment.*” (B.Saelens, Sallis & Frank, 2003)

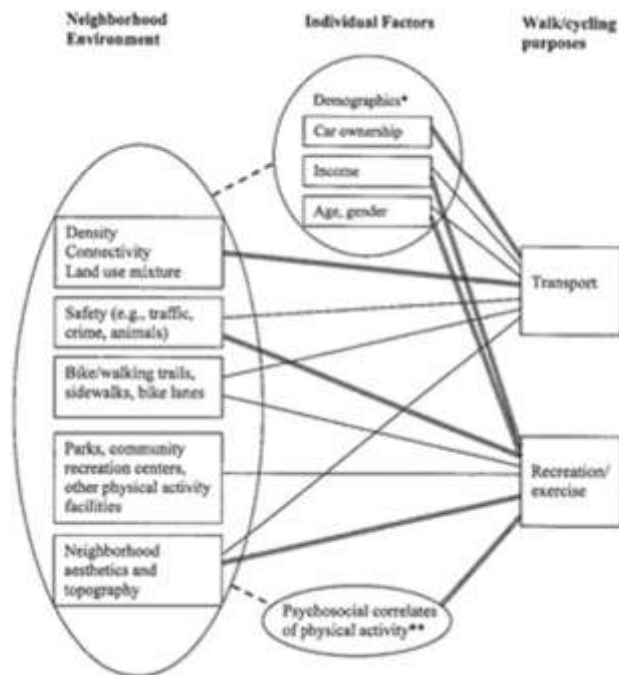


Figure 5: Saelens, Sallis and Frank Model (Saelens et al., 2003)

The model also attributes differing levels of importance to various environmental and individual factors depending on the purpose of the walking. The model attributes most important correlates for walking for transport to density, connectivity, land use mix and car ownership. The model does not attribute any importance to the psychosocial correlates for walking for transport. It does however show a dashed line between the psycho-social and neighborhood environment as a mediated relationship.

From the evidence presented not enough is understood about why people don't walk to and from work when the journey is walkable. As planners and policy makers we can influence, facilitate and provide the environment both physically and socially to overcome some real and perceived barriers to walking and contribute to the health and well-being of communities. The role of the planner can impact on the design and redevelopment of spaces and advocate for a greater priority on pedestrian infrastructure to influence changes in behaviour to create healthier places. The evidence in this paper suggests that it is not enough to create an environment for walking without understanding what motivates people to prefer the private vehicle when all of these design principles are in place. The less researched influences that this paper attributes equal significance are personal value positions, and attitudes to walking. These psychosocial attributes include variables such as self-efficacy, value attached to private vehicle, perceived benefits, perceived barriers, social support and a lack of enjoyment of physical activity (Saelens et al., 2003).

There is a lot of mixed thinking in the data collected to suggest that while people think walking to work is a good thing there a number of reasons that they won't or don't do it. In addition to the built environment incentives already understood, planners and policy decision makers need to have a much better understanding of the actual value people place on the perceived freedom and choice a private vehicle gives in order to propose a viable alternative that competes with this deeply held attachment (Litman, 2006).

Figure 6 proposes the psycho-social considerations of walking for transport that should be weighted as importantly as the environment and individual factors by urban planners working within multi-disciplinary teams of public health, transport, urban design and infrastructure providers



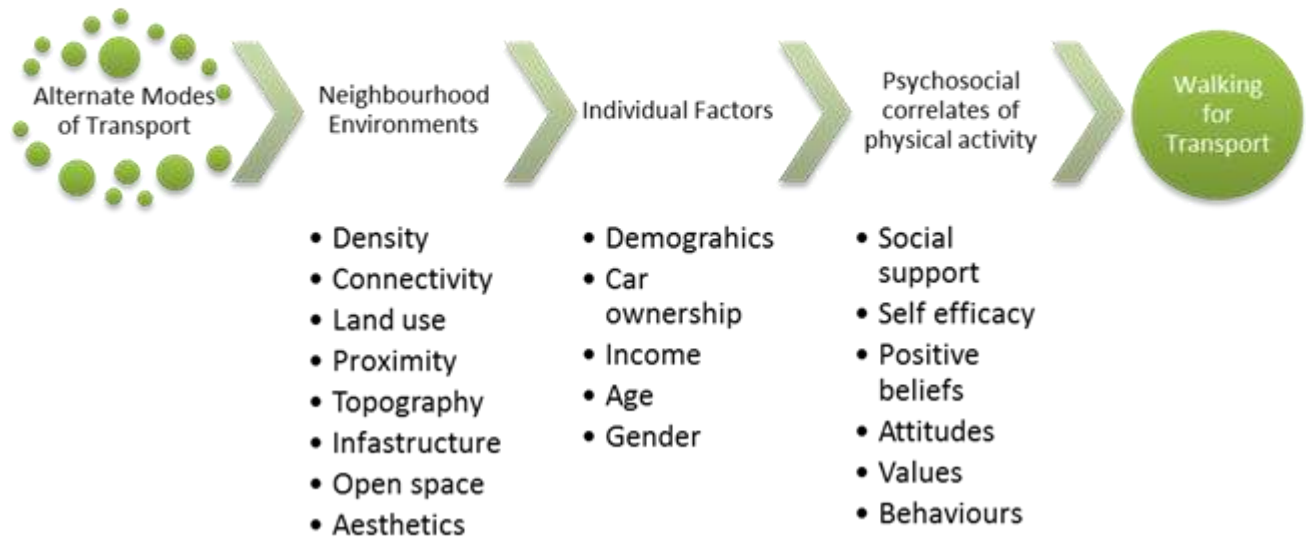


Figure 6: Correlates for walking for transport

Education won't necessarily change behavior as noted by Newhouse (1990) however planning frameworks and governance models can provide incentives and disincentives for vehicle use and walking. Making it harder for people to take cars to work and making it easier for people to choose to walk is within the sphere of influence for planning. Critically Newhouse identifies attitude as one of the most important influences on behavior, amongst others including locus of control, sense of responsibility and knowledge. In this case attitude can be defined as an enduring positive or negative feeling about private vehicles and walking. Beliefs based on information also come into play as either factual or personal opinion about different modes of transport. (Newhouse, 1990, De Vos et al., 2012, Elias and Shiftan, 2012)

According to Litman (2006) motor vehicle travel has started to peak in most developed countries because of demographic and economic trends of aging population, rising fuel prices, travel speeds, increased urbanisation, improved travel options, increased health and environmental concerns and changes in consumer preferences. For many their own car is not just a way to get around it is a symbol of success and freedom. For these reasons people buy more expensive cars, drive more and avoid using alternatives. McGucking and Lynott (2010) provide evidence using travel data and consumer surveys that there are significant attitudinal differences between older and younger generations. Hymas (2011) believes those born after 1980 aspire more to the urban lifestyles and are more interested in electronic devices than cars. The stigma once associated with walking, cycling or catching a bus has lessened as urban living becomes more popular.

Changing demands will require new transport policy and planning responses. A paradigm shift is required to move from the old paradigm of motor vehicle dominance to a new paradigm of multi-modal travel.

	<b>Old paradigm</b>	<b>New paradigm</b>
<b>Transport</b>	Mobility	Accessibility
<b>Transport planning goals</b>	Travel speed	Accessibility
<b>Transport measurement</b>	Levels of service, road type, traffic speed, congestion delay	Level of service, multi-modal, time and money required to access services
<b>Transport affordability</b>	Minimise vehicle costs (fuel, parking)	Minimise total transport cost, Supports affordable modes and affordable accessible housing
<b>Analysis</b>	Quantitative e.g. speed	Qualitative e.g. convenience and comfort
<b>Modes</b>	Car	Walking, cycling, public transport
<b>Solutions</b>	Roadway expansion	Transport demand management
<b>Land Use</b>	Sprawl	Smart growth
<b>Funding</b>	Dedicated funds for roads and parking facilities	Least cost planning allocates funds to the most cost effective and beneficial option

*Figure 7 : Paradigm shift for multi-modal travel (Litman, 2006)*

This shift in thinking will require all of the elements shown in figure 6 to be considered equally and from the various perspectives of urban planners, designers, engineers and public health specialists.

## 6 Conclusions

The value placed on older, traditional neighbourhoods in close proximity to high quality urban spaces with a mix of residential, commercial and retail uses is widely recognized. New urbanism is in part about getting back to the village or the older design ideas about land use mix, permeable lot layouts and housing diversity on which the community and market places significant value. This paper has identified that despite displaying new urbanism characteristics and being walkable fewer people than expected living in these areas in Toowoomba's inner suburbs are walking for transport. Further research is required to identify attitudinal and behavioral reasons why people are not walking for transport in these highly walkable environments. Linking these results to transport, public health and urban planning policies and programmes to increase mode share is as important as reviewing the neighbourhood's physical elements or individual demographic profiles.

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