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Valuing Walking Amenity Benefits for Place-making Projects

Patrick Tsai[1]

[1]GTA Consultants, Level 16, 207 Kent Street, Sydney, NSW 2000

Email for correspondence: patrick.tsai@gta.com.au

Abstract

Valuing walking amenity benefits arising from place-making projects appears to be a major gap in the national economic appraisal guidelines in Australia. The purpose of this paper is to identify the limitations in appraising place-making projects and to provide an interim approach in the absence of primary research in Australia.

The paper reviews international evidence on the values of walking amenity and proposes a methodology which applies the international evidence to the Australian context. A case study is presented which quantifies the improved walking amenity for a complete street design project in Sydney. The case study results demonstrate that walking amenity can be potentially quantified and included in economic appraisals of place-making projects.

1 Introduction

The way we plan our road network is shifting away from a vehicle-oriented principle to a multi-modal and multi-objective approach. Recognising the different functions and users of the road network, transport planners have started applying a Movement and Place framework to assess which users and modes should be provided with priority on our roads and streets.

In recent years, there have been more “place-making” projects such as complete street design and precinct master planning in Australia with a common objective of building a more liveable place with a focus on “slow mobility” for pedestrians and cyclists. The Movement and Place framework (Department of Transport, 2019) has become an effective tool to identify which parts of our city should be prioritised for non-car users.

A more liveable and sustainable urban environment is expected to achieve better social, economic and environmental outcomes and hence there is a role for the government to facilitate the process. However, one of the challenges for government agencies in making more viable “places” is the investment justification. Many of the place-making projects that re-prioritise the role of our road network could inevitably cause a degree of negative impacts on existing car users. When taking into account the potential disbenefits to car users, sometimes it becomes difficult to justify the overall benefits of such projects particularly if impacts on other modes are not critically assessed.

In evaluating such place-making projects, practitioners are usually faced with the following challenges:

1. **The lack of differential values of time** – One of the key objectives of the Movement and Place framework is to identify the vision and the role of a specific corridor in supporting different road users. However, the current economic appraisal framework applies the same parameters (e.g. value of time) regardless of the corridor's role in the transport network. Arguably, a "place" corridor, which aims to prioritise active transport users, could place a higher weight on benefits to pedestrians and cyclists. However, the current project development process is still primarily focussed on the impacts on vehicle movements which tend to favour projects that support the movement function.
2. **Estimation of travel behaviour change –** whilst it is true that reduced capacity may lead to traffic delay, it should be acknowledged that the objective of place-making projects is to encourage mode shift from car to public transport and active transport. Unfortunately, the potential level of mode shift is usually difficult to estimate especially at a local level. Most of the time the decision makers use the "worst case" scenario (assuming no mode shift) from traffic modelling to assess the traffic impact, which could lead to an overstated traffic impact.
3. **Monetisation of walking amenity –** improved walking amenity arising from better street design would be perceived by pedestrians as a benefit. Valuation of walking amenity can be undertaken by examining pedestrians' willingness to pay for improvements in a range of street attributes such as width, safety and lighting. However, there is a lack of such primary research in Australia which impedes the estimation of walking amenity benefit.

This paper aims to address the challenge of quantifying walking amenity as introduced above, with a view to provide a method for quantifying walking amenity benefits in the absence of primary research in Australia.

2 Literature Review

For place-making projects which aim to improve urban amenity and liveability, pedestrians are expected to be the major beneficiaries. The ATAP Guidelines (2018) have developed a framework to quantify benefits to pedestrians, which broadly include:

- Change in users' willingness to pay for active transport infrastructure
- Health benefits
- Congestion reduction benefits
- Crash benefits
- Savings in vehicle operating costs
- Savings in parking costs
- Savings in public transport operating costs
- Environmental benefits
- Travel time benefits

While a range of benefits can be quantified using the methods and parameters recommended in the ATAP Guidelines (2018), many of the benefits listed above can

only be captured for new pedestrians shifting from other modes of travel, such as health, reduced congestion and savings in other resource costs.

As discussed in section 1, mode shift from a place-making project can be challenging in the absence of a fit-for-purpose demand model. Furthermore, mode switchers only account for a proportion of users, while an improvement in walking environment would also benefit existing pedestrians. Failure to quantify the benefits to existing users can lead to an under-estimation of project benefits.

In Australia, it appears that there is a lack of empirical research undertaken to value users' willingness to pay for improved walking amenity. This limitation is acknowledged in the ATAP guidelines (2018).

Internationally, a number of relevant studies have been undertaken to value the quality of walking environment. Heuman et al. (2005) applied a stated preference approach to valuing various aspects in pedestrian environment. The estimated values are presented in Table 1. These values have been subsequently adopted in the UK Department of Transport's Transport analysis Guidance (TAG) Databook (2018) for economic appraisals of transport projects.

Table 1: Value of aspects in pedestrian environment (UK examples, 2010 prices)

Scheme type	Value (pence/km)
Street lighting	3.7
Kerb level	2.6
Crowding	1.9
Pavement evenness	0.9
Information panels	0.9
Benches	0.6
Directional signage	0.6

Source: Heuman et al. (2005), adopted by UK Department of Transport (2018)

Colin Buchanan and Accent (2006) monetised various attributes of pedestrian environment for Transport for London, as part of the Pedestrian Environment Review System (PERS) developed by Transport Research Laboratory and Transport for London.[1] The study undertaken by Colin Buchanan and Accent quantified the willingness to pay values for improved walking amenity based on the road or street's function, similar to the Movement and Place framework applied in Australia. The estimated values of walking amenity for public spaces are shown in Table 2.

[1] PERS is a walking audit tool which applies a scoring system against various aspects in walking environment. (https://trlsoftware.com/products/road-safety/street-auditing/streetaudit-pers/)

Table 2: Amenity benefits for improvements to public spaces (UK examples, pence per person per minute, 2006 prices)

PERS Attribute	Description	-3	-2	-1	0	1	2	3
Moving in the space	Create convenient connections	0.000	0.045	0.091	0.136	0.152	0.168	0.184
Interpreting the space	Create clear and easy to understand routes and spaces	0.000	0.010	0.020	0.030	0.040	0.050	0.061
Personal safety	Create streets and spaces for everyone/Create active and engaging spaces	0.000	0.043	0.086	0.129	0.172	0.212	0.252
Feeling comfortable	Create streets and spaces for everyone	0.000	0.024	0.048	0.072	0.096	0.120	0.144
Sense of place	Create active and engaging space/Get the detail right	0.000	0.013	0.027	0.040	0.049	0.054	0.058
Opportunity for activity	Create active and engaging spaces	0.000	0.074	0.148	0.223	0.252	0.281	0.311

Source: Colin Buchanan and Accent (2006), cited in Atkins and University of Leeds (2011), prepared for Department of Transport

3 Methodology

In the absence of Australian studies on the value of walking amenity, this paper examines the economic benefits that can be quantified using the UK evidence. The values presented in Table 2 are considered more appropriate than Table 1 as the PERS system allows the practitioners to evaluate the scale of improvements against each attribute. The attributes defined in PERS are also more aligned with the journey experience that can be achieved by place-making projects.

This paper converts the UK willingness to pay values presented in Table 2 into Australian Dollars using the Purchase Power Parity[2]. The values were escalated to FY2018/19 prices based on the Australian Average Weekly Earnings. The converted values are presented in Table 3.

Table 3: Converted amenity benefits for improvements to public spaces (cents per person per minute, FY2018/19 prices, AUD)

PERS Attribute	-3	-2	-1	0	1	2	3
Moving in the space	0.000	0.119	0.241	0.360	0.403	0.445	0.488
Interpreting the space	0.000	0.027	0.053	0.080	0.106	0.133	0.162
Personal safety	0.000	0.114	0.228	0.342	0.456	0.562	0.668
Feeling comfortable	0.000	0.064	0.127	0.191	0.254	0.318	0.382
Sense of place	0.000	0.034	0.072	0.106	0.130	0.143	0.154
Opportunity for activity	0.000	0.196	0.392	0.591	0.668	0.745	0.824
Sum	**0.000**	**0.554**	**1.113**	**1.670**	**2.017**	**2.346**	**2.677**

[2] The purchase power parity is 0.69 for the UK and 1.43 for Australia, based on OECD (https://data.oecd.org/conversion/exchange-rates.htm#indicator-chart)

4 Case Study – Bondi Junction Complete Street project

This paper presents a case study using the "Bondi Junction Complete Street" project in Sydney. The project was initiated by the Waverly Council (2013) which involved a number of upgrades to improve the walking and cycling environment in Bondi Junction, which is a highly pedestrianised vicinity with around 3,860 pedestrians recorded during a one-hour peak period on a weekday. An artist impression of the complete street design is shown in Figure 1, which presents a significant improvement to the existing street landscape (Figure 2).

Figure 1. Arties impression of Oxford Street

Source: Waverly Council (2013), Bondi Junction Complete Streets Project, March 2013

Figure 2. Existing street landscape on Oxford Street

Source: Waverly Council (2013), Bondi Junction Complete Streets Project, March 2013

The economic benefit of the improved walking amenity arising from the project is quantified based on equation specified below.

$$\begin{aligned} &Value\ of\ improved\ walking\ amenity \\ &\quad = number\ of\ pedestrians\ during\ the\ peak\ hour \\ &\quad * average\ time\ spent\ in\ the\ study\ area \\ &\quad * (project\ case\ amenity\ score * value - base\ case\ amenity\ score \\ &\quad * value) * expansion * annualisation \end{aligned}$$

The key assumptions adopted to the benefit estimation is outlined in Table 4.

Table 4: Key assumptions and parameter values

Parameter	Value	Source
Number of pedestrians during peak hour (trips)	3,860	Waverly Council (2013), Bondi Junction Complete Streets Project, March 2013, p. 20
Average time spent in the study area (mins)	10	Assumption made for the analysis
Base case amenity score	0	Assumption made for the analysis
Base case amenity value (cents/min)	1.670	As per Table 3 (sum of all attributes)
Project case amenity score	1	Assumption made for the analysis
Project case amenity value (cents/min)	2.017	As per Table 3 (sum of all attributes)
Expansion factor (one hour peak to daily demand)	10.9	Estimated based on City of Sydney 24 hr walking counts across 100 sites, March 2017
Annualisation factor	345	Transport for NSW (2018), Principles and Guidelines for Economic Appraisal of Transport Investment and Initiatives, p. 292

Based on the above assumptions, the present value of the improved walking amenity is estimated to be $3.5 million over a ten-year appraisal period using a real discount rate of seven per cent. The estimated value of the walking amenity benefits is higher than the project capital expenditure (Waverly Council, 2013) at $2.74 million[3].

5 Conclusions

Valuing walking amenity for place-making projects is an emerging topic in Australia. As the “Movement and Place” framework is becoming more mature in the space of transport planning, the way the transport economic appraisals were undertaken should also take the “place” function into account to avoid an investment bias toward “movement” projects.

While there is a lack of primary research into this topic in Australia, international evidence has clearly suggested that people would value improved walking amenity. The methodology and case study presented in this paper demonstrate how the benefit of walking amenity can be quantified using the available international evidence. Notwithstanding a number of high-level assumptions made in the case study, the quantified benefits can be used to support the economic case of relevant place-making projects. Future research should be focused on developing an Australia-based framework and local parameter values to enhance the robustness of such economic appraisals.

More importantly, this paper is developed with a view to encourage relevant government agencies and industry practitioners to develop an unbiased appraisal

[3] Escalated to FY2018/19 prices based on a real escalation rate of 3.8% sourced from Raniga, P. (2015), Cost Escalation in Road and Rail Construction Projects-NSW Experience, Australasian Transport

framework shifting away from a car-oriented appraisal framework to multi-model assessments including active transport.

6 References

Accent and Colin Buchanan (2006), Valuing the Urban Realm – Business Cases in Public Spaces, Report to TfL.

Atkins Consultants and The University of Leeds (2011), Valuation of Townscapes and Pedestrianisation – Final Report, prepared for UK Department of Transport, 26th January 2011.

Australian Transport Assessment and Planning Guidelines (2018), O3 Urban Amenity and Liveability, May 2018.

Daniel Heuman, Paul Buchanan, Martin Wedderburn and Rob Sheldon (2005), "Valuing Walking: Evaluating Improvements to the Public Realm", Colin Buchanan and Accent MR.

Department of Transport (2019), Movement and Place in Victoria, the Victorian Government, February 2019, Mlebourne.

Transport for NSW (2018), Principles and Guidelines for Economic Appraisal of Transport Investment and Initiatives, p. 292.

UK Department of Transport (2018), WebTAG Databook, Table A4.1.7, May 2018 v1.10, London.

Waverly Council (2013), Bondi Junction Complete Street Project, March 2013.