Best Practice Approaches to Public Transport
Amenity/Soft Factor Valuation

World Transit Industry Practice Review
[Draft for Discussion]

Prepared for Adrian Webb
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1. Introduction

The Public Transport Research Group (PTRG) at Monash University has been commissioned by Transport for Victoria (TfV) to undertake a review of best practice approaches to public transport amenity/soft factor valuation. The research aims to:

- Review evidence on measured values with regard to public transport customer experience initiatives
- Understand current practices in the use and adoption of these methods in Australia and internationally in public transport
- Understand what can and cannot be measured in terms of customer experience initiatives
- Explore methods used to measure amenity/soft factor values, their pros and cons and what is considered good practice.

The review includes the following key tasks:

1. Research Literature Review
2. Review of World Transit Industry Practice
3. International Practitioner Delphi Survey.

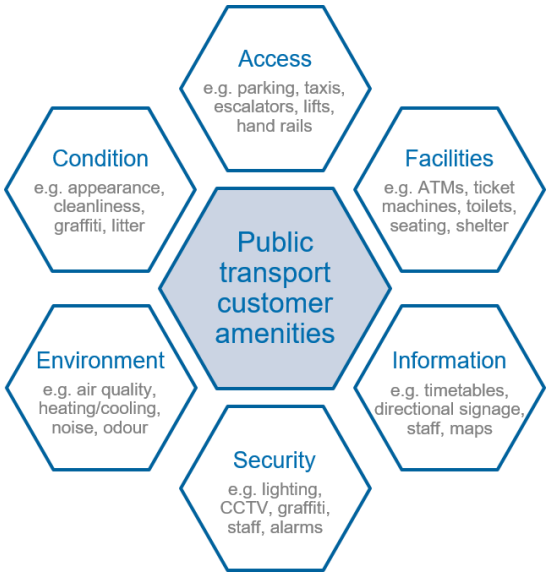
This report focuses on Task 2: Review of World Transit Industry Practice. This is the first draft of the report and is provided for comment and discussion. Research outputs associated with Task 1 (Research Literature Review) are available at www.ptrg.info.

2. This report

2.1 Context

A diverse range of factors can affect the quality of public transport, typically classified as 'hard' or 'soft' factors (Fearnley et al. 2015). Hard factors are physical measures that impact on journey times and reliability, and can also include changes to fares and service provision in terms of frequency, operating hours and spatial coverage (Robson 2009). In contrast, soft factors, or customer amenities as referred to herein, cover a range of ancillary improvements which are not directly related to operations or service quantity but can enhance the quality of the passenger experience (Currie et al. 2013). Examples of customer amenities include information provision, passenger facilities, station/stop quality and personal security measures. A classification of public transport customer amenities is shown in Figure 1.

Figure 1: Classification of public transport customer amenities



Source: Public Transport Research Group (2017)

Various studies have been undertaken to determine the value that public transport passengers place on different types of customer amenities (Douglas 2016; Outwater et al. 2014; Robson 2009; Steer Davies Gleave 2000), with selected values available in published guidelines (Australian Transport Council 2006; Transport and Infrastructure Council 2017; Transport for London 2014). However, there is a very limited understanding of current practice among public transport agencies in the use of customer amenity valuations in project appraisal and evaluation. In particular, the extent to which agencies estimate and apply customer amenity values when appraising and evaluating different types of public transport projects is not well understood.

2.2 Aim

This report aims to provide an overview of current practice among selected Australian and international public transport agencies in estimating and applying public transport customer amenity valuations. Key objectives to achieve this aim are:

1. To determine the **types of public transport projects** that have been planned or delivered by public transport agencies in the last 10 years
2. To understand typical levels of appraisal that public transport projects have generally undergone and **to what extent customer amenities have been included**
3. To understand the **types of studies** that have been undertaken for estimating the value of public transport customer amenities
4. To understand the extent to which customer amenity values from **previous studies** have been applied in the appraisal of public transport projects, including the use of any **published sources**
5. To identify **leading practitioners** in the field of public transport customer amenity valuation.

2.3 Structure

The remainder of this report is structured as follows. Section 3 outlines the method used in a survey of Australian and international public transport agencies to determine current practice in estimating and applying public transport customer amenity valuations. Section 4 details the results of the survey, with Section 5 providing concluding remarks and a discussion of implications. For reference purposes, a copy of the survey instrument is provided in Appendix A.

3. Method

In order to meet the aim and objectives of this study, a survey of Australian and international public transport agencies was undertaken during January – February 2018. The aim of the survey was:

To understand current practice among public transport agencies in estimating and applying public transport customer amenity valuations.

In consultation and agreement with Transport for Victoria (TfV), a total of 11 cities were initially targeted for the survey. These included five major cities in Australasia (Melbourne, Sydney, Brisbane, Perth and Auckland) and six international cities (London, Paris, Toronto, San Francisco, Vienna and Singapore). Oslo was subsequently targeted for the survey at a later stage resulting in a total of 12 cities. Cities were selected which were generally comparable to Melbourne.

Considerable time was spent in identifying the most appropriate agency and representative in each city for completing the survey. Existing professional industry contacts were used where possible, along with LinkedIn searches and the US Transportation Research Board (TRB) online directory. Some 'snowballing' to other contacts suggested by respondents also occurred. Follow up telephone and email communication were then used to confirm the relevant agency and contact person. Only one survey completion was sought from each city so the contacts generally had to have sufficient knowledge of what the cities' agencies do in terms of public transport project appraisal, particularly the extent to which customer amenity valuations are considered. This was difficult in practice and some respondents spent time discussing responses within their agencies.

Following identification of the appropriate representative in each agency, a link to an online version of the survey was sent via email. The survey included 11 questions and took each representative around 20-30 minutes to complete. Where necessary, representatives were encouraged to liaise with others in their agency to complete the survey as accurately as possible to be representative of overall activity within that city.

A copy of the survey instrument is provided in Appendix A. Survey questions were designed to align with the objectives of the study by asking agency representatives about the following:

- **Types of public transport projects** that have been planned or delivered in their city (with involvement from their agency) in the last 10 years
- Typical levels of appraisal that those public transport projects have generally undergone and **to what extent customer amenities had been included**
- **Details of any studies** that have estimated the value of public transport customer amenities in their city that their agency had been involved in
- The extent to which customer amenity values from **previous studies** (vs. new values) have been applied in the appraisal of public transport projects, and any **published sources** that had been used
- Views on who the **leading practitioners** are in public transport customer amenity valuation.

Table 1 list the cities and associated agencies that were targeted for the survey, and indicates which of these responded to the survey. As shown, a response to the survey was received from 11 out of the 12 cities. While a number of agency representatives had been identified for San Francisco, a response could not be achieved for this city within the timeframe available for the survey. Where responses were provided for other cities, agency representatives often had to coordinate input to the survey from a number of others within their organisation, with this process typically taking a number of weeks.

Table 1: Cities and associated agencies targeted for the survey

City	Agency	Response received?
Australasian cities		
1. Melbourne	Transport for Victoria (TfV)	✓
2. Sydney	Transport for NSW (TfNSW)	✓
3. Brisbane	Department of Transport and Main Roads (TMR)	✓
4. Perth	Public Transport Authority of Western Australia (PTA) & Department of Transport (DOT)	✓
5. Auckland	Auckland Transport (AT)	✓
International cities		
6. London	Transport for London (TfL)	✓
7. Paris	Île-de-France Mobilités	✓
8. Toronto	Metrolinx	✓
9. San Francisco	San Francisco Municipal Transportation Agency (SFMTA)	×
10. Vienna	City of Vienna	✓
11. Oslo	Ruter	✓
12. Singapore	Land Transport Authority (LTA)	✓

4. Results

This section details the results of the survey of public transport agencies. It is structured in line with the objectives of the study by focusing on the following aspects for each city:

- Types of public transport projects that have been planned/delivered
- Typical levels of appraisal of public transport projects
- Extent to which customer amenities are included in project appraisal

- Studies undertaken to estimate the value of customer amenities
- Extent to which customer amenity values from previous studies have been applied
- Published sources of customer amenity values that have been used
- Leading practitioners in public transport customer amenity valuation.

4.1 Types of public transport projects that have been planned/delivered

Agency representatives were asked firstly about the types of public transport projects that have been planned and/or delivered in their city with involvement from their agency in the last 10 years. For each public transport mode (train/metro, tram/light rail, bus, ferry), representatives were asked to select from the following project types:

- New or upgraded station/stop
- New or extended line/route
- New or refurbished rolling stock/vehicle
- Short range planning (e.g. changes in frequency, operating hours, fares)
- Other project type/s.

Table 2 details the results showing that agencies in all of the 11 cities had been involved in planning/delivering a range of train/metro and bus projects over the last 10 years.

Table 2: Public transport projects that have been planned/delivered in last 10 years with involvement from agency

Mode	Project type	City											Total
		MEL	SYD	BNE	PER	AKL	LON	PAR	TOR	VIE	OSL	SIN	
Train/metro	New or upgraded station/stop	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**11**
	New or extended line/route	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**11**
	New or refurbished rolling stock/vehicle	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**11**
	Short range planning*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**11**
	Other		✓			✓							**2**
Tram/light rail	New or upgraded station/stop	✓	✓	✓		✓	✓	✓		✓	✓		**8**
	New or extended line/route	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		**10**
	New or refurbished rolling stock/vehicle	✓	✓	✓			✓	✓	✓	✓			**7**
	Short range planning*	✓	✓	✓			✓	✓		✓	✓		**7**
	Other												**0**
Bus	New or upgraded station/stop	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**11**
	New or extended line/route	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**11**
	New or refurbished rolling stock/vehicle	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	**10**
	Short range planning*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**11**
	Other		✓			✓							**2**
Ferry	New or upgraded station/stop	✓	✓	✓	✓	✓					✓		**6**
	New or extended line/route		✓			✓					✓		**3**
	New or refurbished rolling stock/vehicle	✓	✓				✓				✓		**4**
	Short range planning*		✓	✓	✓	✓					✓		**5**
	Other					✓							**1**
Total		**14**	**18**	**13**	**11**	**16**	**13**	**12**	**10**	**12**	**15**	**8**	

MEL = Melbourne AKL = Auckland VIE = Vienna
SYD = Sydney LON = London OSL = Oslo
BNE = Brisbane PAR = Paris SIN = Singapore
PER = Perth TOR = Toronto
* Changes in frequency, operating hours and/or fares

In general, all agencies had involvement in a full range of train/metro projects and new/upgraded bus lines/extensions or new/upgraded bus stops. Involvement in different tram/light rail projects was found to be less common, although a number of agencies (Melbourne, Sydney, Brisbane, London, Paris and Vienna) reported their involvement in all main types of projects concerning tram/light rail. Ferry projects were the least common, perhaps to be expected given their association with the presence of waterways in cities.

When the results are viewed by city, agencies located in Sydney, Auckland and Oslo were found to have been involved in the greatest number of project types (18, 16 and 15 respectively) with representation across all public transport modes, mainly because of their interest in ferries. This is in contrast to the agency in Singapore (Land Transport Authority) with involvement in only train/metro and bus projects (total of 8 project types).

4.2 Typical levels of appraisal of public transport projects

For the types of public transport projects that agencies had been involved with in the last 10 years, representatives were asked about the typical levels of appraisal that those project types undergo. Response options for indicating the levels of appraisal included:

- Advanced (e.g. economic evaluation)
- Intermediate (e.g. financial evaluation)
- Basic (e.g. mostly qualitative)
- No appraisal or evaluation.

Table 3 details the results. Advanced (full economic) evaluations are more commonly undertaken for train/metro and tram/light rail projects than for bus or ferry projects. In addition, project appraisals for new or extended lines/routes for train/metro and tram/light rail have generally been more advanced than those for refurbished rolling stock or short range planning projects.

Table 3: Typical levels of appraisal of public transport projects in last 10 years

Mode	Project type	City										
		MEL	SYD	BNE	PER	AKL	LON	PAR	TOR	VIE	OSL	SIN
Train/metro	New or upgraded station/stop											
	New or extended line/route											
	New or refurbished rolling stock/vehicle											
	Short range planning*											
	Other											
Tram/light rail	New or upgraded station/stop											
	New or extended line/route											
	New or refurbished rolling stock/vehicle											
	Short range planning*											
	Other											
Bus	New or upgraded station/stop											
	New or extended line/route											
	New or refurbished rolling stock/vehicle											
	Short range planning*											
	Other											
Ferry	New or upgraded station/stop											
	New or extended line/route											
	New or refurbished rolling stock/vehicle											
	Short range planning*											
	Other											

	Advanced (e.g. economic evaluation)	MEL = Melbourne	AKL = Auckland	VIE = Vienna
	Intermediate (e.g. financial evaluation)	SYD = Sydney	LON = London	OSL = Oslo
	Basic (e.g. mostly qualitative)	BNE = Brisbane	PAR = Paris	SIN = Singapore
	No appraisal or evaluation	PER = Perth	TOR = Toronto	
	Project not considered / no response	* Changes in frequency, operating hours and/or fares		

When the results are viewed by city, London (Transport for London) was found to more commonly adopt an advanced level of appraisal across all relevant project types including bus projects. Melbourne comes a close second since it covers new/extended bus routes, stations/stops and short range bus planning. Other Australasian cities undertake advanced appraisals to a lesser extent; some cities such as Sydney tend to adopt only intermediate (financial) analysis of bus projects. This is true for most cities concerning ferry projects for those cities that do work in this area.

Vienna and Oslo typically undertake lower levels of project appraisal compared to other cities. All cities use advanced levels of evaluation for new/extended train/metro lines.

4.3 Extent to which customer amenities are included in project appraisal

For the types of public transport projects that agencies had been involved with in the last 10 years, representatives were asked about the extent to which customer amenities are typically included in project appraisal. Response options ranged from ‘never’, ‘up to 20% of the time’ through to ’80-100% of the time’. Table 4 details the results which reveal considerable variation in the extent to which customer amenities are included in the appraisal of given project types across cities.

Table 4: Extent to which customer amenities have been included in public transport project appraisal in last 10 years

Mode	Project type	City										
		MEL	SYD	BNE	PER	AKL	LON	PAR	TOR	VIE	OSL	SIN
Train/metro	New or upgraded station/stop											
	New or extended line/route											
	New or refurbished rolling stock/vehicle											
	Short range planning*											
	Other											
Tram/light rail	New or upgraded station/stop											
	New or extended line/route											
	New or refurbished rolling stock/vehicle											
	Short range planning*											
	Other											
Bus	New or upgraded station/stop											
	New or extended line/route											
	New or refurbished rolling stock/vehicle											
	Short range planning*											
	Other											
Ferry	New or upgraded station/stop											
	New or extended line/route											
	New or refurbished rolling stock/vehicle											
	Short range planning*											
	Other											

80-100% of the time
60-80% of the time
40-60% of the time
20-40% of the time
Up to 20% of the time
Never
Project not considered / no response

MEL = Melbourne, SYD = Sydney, BNE = Brisbane, PER = Perth, AKL = Auckland, LON = London, PAR = Paris, TOR = Toronto, VIE = Vienna, OSL = Oslo, SIN = Singapore

* Changes in frequency, operating hours and/or fares

Sydney, Brisbane and Auckland reported that they almost always (generally 80-100% of the time) include customer amenities in the appraisal of public transport projects. Melbourne, and to an extent Perth, stands out in contrast to these Australasian cities since they only do this 60-80% of the time for train/tram projects and 40-60% of the time for bus projects. **On this basis, Melbourne is out of step with Australasian practice.**

London and Singapore include amenities in project appraisal for new bus and train/metro stations and to an extent for bus/rail rolling stock. For London, this is done at lower levels for other public transport projects and is generally not considered in Singapore for other project types.

Paris and Toronto do not typically include amenities in project appraisals very much; Paris never, and Toronto a very small amount for train/metro station upgrades and new/refurbished rolling stock only.

The extent to which customer amenities are included in project appraisal in both Sydney and Brisbane are supported by the following comments made by the agency representatives in these cities:

> *'Transport for NSW espouses that "customer is the centre of everything we do in Transport. In every program or project the project proponent and the evaluators ask the question "how will this affect the customers". Thus my area always look for the best practice or method in defining and measuring customer amenity and CVP [Customer Value Proposition] so that this aspect is continuously included in cost benefit analysis (CBA).'* [Response from agency representative in Sydney]

> *'TMR values customer feedback which assists in the valuation of public transport customer amenities to improve the transport network.'* [Response from agency representative in Brisbane]

While customer amenities are considered in project appraisal in Perth, albeit not to the same extent as Sydney/Brisbane, the importance that is placed on customer amenities in this city was also highlighted:

> *'The vast majority of PT project assessment is undertaken within PTA is very focused on the many strands of customer amenity. At a high level, its strategic approach could perhaps best be described that PTA seeks to maintain high standards for amenity in many regards across its existing PT operations, and then ensure these equivalent standards are maintained. Some key points: passenger perceptions are annually measured through Canstar surveys; police are on all late night train services; Transperth has strong bustrain connectivity with fully integrated ticketing and timetables; there is a high quality of information available through various channels on timetables and other relevant issues*

such as major events, real-time disruptions; Old stations are slowly being upgraded to ensure full disability access.' [Response from agency representative in Perth]

Despite customer amenities being included in project appraisal less frequently in Vienna compared to most other cities, the agency representative noted the long history that the city has had in working with public transport customers:

'In Vienna our public transport operator "Wiener Linien" (100% owned by the City) has a long tradition of working with and reacting to customer complaints and suggestions. As the role of PT is totally different, the inclusion of customer amenities in the planning process may be different to your Australian standard. For example is a uniform ticket for all kind of PT inside the City quite common for decades. On the other side it could be that some typical approaches to some customer amenities are on a lower level than in Europe.' [Response from agency representative in Vienna]

Using the results from Table 3 and Table 4, Table 5 explores project types where an 'advanced' level of appraisal is used (Table 3) and assesses the extent to which customer amenities have been included in those appraisals (e.g. never, up to 20% of the time, through to 80-100% of the time). The aim is to help highlight the extent to which customer amenities are included in advanced levels of appraisal.

Table 5: Difference between advanced levels of appraisal and extent to which customer amenities are included

Mode	Project type	City										
		MEL	SYD	BNE	PER	AKL	LON	PAR	TOR	VIE	OSL	SIN
Train/metro	New or upgraded station/stop											
	New or extended line/route											
	New or refurbished rolling stock/vehicle											
	Short range planning*											
	Other											
Tram/light rail	New or upgraded station/stop											
	New or extended line/route											
	New or refurbished rolling stock/vehicle											
	Short range planning*											
	Other											
Bus	New or upgraded station/stop											
	New or extended line/route											
	New or refurbished rolling stock/vehicle											
	Short range planning*											
	Other											
Ferry	New or upgraded station/stop											
	New or extended line/route											
	New or refurbished rolling stock/vehicle											
	Short range planning*											
	Other											

Large Negative Difference (e.g. advanced appraisal with customer amenities included less than 40% of the time)
Moderate Negative Difference (e.g. advanced appraisal with customer amenities included 40-60% of the time)
Small Negative Difference (e.g. advanced appraisal with customer amenities included 60-80% of the time)
Negligible Difference (e.g. advanced appraisal with customer amenities included 80-100% of the time)
Project not considered / no response

MEL = Melbourne	AKL = Auckland	VIE = Vienna
SYD = Sydney	LON = London	OSL = Oslo
BNE = Brisbane	PAR = Paris	SIN = Singapore
PER = Perth	TOR = Toronto	

* Changes in frequency, operating hours and/or fares

In general, the share of appraisals using customer amenities for advanced project appraisals is either negligible or negative. They are illustrated in Table 5 shaded between:

- Negligible: where an advanced level of appraisal includes high levels of amenity adoption (80%-100%, dark green)
- Small negative: where advanced levels of appraisal are undertaken but with only 60-80% of projects including customer amenities (light green)
- Moderate negative: where advanced levels of appraisal are undertaken but with only 40-60% of projects including customer amenities (light red)
- Large negative: where advanced levels of appraisal are undertaken but quite low levels of amenities are included in appraisals (less than 40% including never, dark red).

The Australasian cities – Sydney, Brisbane, Auckland, and to an extent Perth – generally all have widespread inclusion of customer amenities as part of advanced appraisals for all relevant types of projects. Melbourne stands out relative to other Australasian cities as having customer amenities included less frequently in appraisals of train/tram projects. **Again, Melbourne seems out of step with Australasian practice in this respect.** Australasian practice tends to include customer amenities more frequently in project appraisal than London, who tend to incorporate amenities in a smaller share of their advanced appraisals.

Table 5 also highlights that Paris, Toronto and Vienna, although they adopt advanced evaluations for some projects, rarely include customer amenities in these appraisals, indeed Paris and to an extent Toronto do not typically include customer amenities in their advanced appraisals at all.

4.4 Studies undertaken to estimate the value of customer amenities

Representatives were asked if their agency had ever been involved in making its own estimates of the value of public transport customer amenities in their city, either through commissioning external providers or undertaking valuation studies in-house. The results revealed that valuation studies had been commissioned/undertaken by agencies in 7 out of the 11 cities that were surveyed, including:

- Melbourne
- Sydney
- Brisbane
- London
- Paris
- Oslo
- Singapore.

Agency representatives in Auckland, Toronto, Perth and Vienna did not report any original local primary research studies valuing amenities in their city.

Of the agencies who had commissioned/undertaken valuation studies, representatives were asked to provide details of up to five of the most recent studies. Table 6 provides a summary of the results.

Table 6: Studies undertaken to estimate the value of public transport customer amenities

City	Survey year/s	Public transport mode/s				Survey method/s						Who primarily undertook the valuation?		
		Train/ metro	Tram/ light rail	Bus	Ferry	Stated preference	Revealed preference	Customer ratings	Priority evaluator	Max-diff scaling	Other	Undertaken in-house	Consultant/ contractor	University/ research institute
Melbourne	2014	✓	✓	✓		✓		✓			✓		✓	
Sydney	2015	✓	✓	✓	✓	✓							✓	
	2012	✓									✓	✓		
	Annual	✓	✓	✓	✓			✓			✓	✓		
	2016	✓									✓		✓	
	2015			✓		✓							✓	
Brisbane	Ongoing	✓		✓	✓						✓	✓		
	Annual	✓	✓	✓	✓						✓	✓		
London	2016	✓	✓	✓		✓	✓			✓			✓	
	2014	✓	✓	✓		✓							✓	
	2013					✓							✓	
	2011	✓	✓	✓		✓							✓	
	2007	✓	✓	✓		✓							✓	
Paris	2005	✓				✓							✓	
	2013	✓	✓	✓		✓	✓			✓			✓	
Oslo	2015	✓	✓	✓	✓		✓				✓			✓
Singapore	2015	✓	✓	✓		✓	✓	✓					✓	
Total		**15**	**11**	**13**	**5**	**11**	**4**	**3**	**0**	**2**	**7**	**4**	**12**	**1**

Note: no valuation studies were reported for Perth, Auckland, Toronto or Vienna

Key observations include:

- Sydney and London reported the largest number of valuation studies (5 each), in addition to Brisbane which reported studies on an ongoing/annual basis, while other cities had only 1-2 studies each; a total of 17 studies were reported across all cities

- Most valuation studies had been undertaken within the last 5 years (13 out of 17 studies) with almost all studies undertaken within the last 10 years (15 out of 17 studies)
- Most studies considered customer amenities for train/metro (15 studies) and to a lesser extent bus (13 studies) and tram/light rail (11 studies); only 5 studies were concerned with ferry based customer amenities, perhaps reflective of the physical geography (e.g. waterways) of the cities
- Stated preference was the most common survey method (used in 11 out of 17 studies); while 'other' methods were used in 7 studies, these were often associated with utilisation and satisfaction surveys
- Consultants/contractors primarily undertook the valuations in 12 out of the 17 studies; the remainder were undertaken in-house (4 studies) or by a university/research institute (1 study).

While no valuation studies were reported for Perth, the importance of valuing customer amenities was highlighted by an agency representative in this city:

> *'I think it is important to value these elements as they are often undervalued in relation to people's perception and use of PT.'* [Response from agency representative in Perth]

Comments were also made regarding the use of ratings as part of valuing customer amenities, but also the usefulness of customer amenity valuations in public transport project appraisal:

> *'We do link some defined levels [for attributes] to a 0-100 scale rating and can undertake mystery shopper assessments to link to benefit realisation and see the actual improvement in ratings after implementing a scheme. Adds significantly to robustness in prediction and neatly links to benefit realisation and evaluation…Amenity scores are often quite small in the grand scheme of things but they are useful in deciding what people want / prioritise. They are useful for continually improving designs and for asset refurbishments. They are less useful for justifying line extensions but help refine the designs...'* [Response from agency representative in London]

4.5 Extent to which values from previous studies have been applied

For the types of public transport projects that agencies had been involved with in the last 10 years, representatives were asked about the extent to which customer amenity values from previous studies had been applied for project appraisal purposes (a technique known as benefit/value transfer). Table 7 details the results. Response options ranged from 'never', 'up to 20% of the time' through to '80-100% of the time'. Not all agency representatives had sufficient information/knowledge to be able to answer this question and as a result, responses could only be obtained for 8 out of the 11 cities.

In general, cities where customer amenities are used in appraisals (Table 4) more commonly adopt values from previous studies in the majority of cases. Paris and Toronto, where amenities are not typically included in appraisals, tend not to use values from previous studies (as might be expected).

While customer amenity values from previous studies are commonly adopted in some cities, one agency representative highlighted difficulties associated with doing so:

> *'It is difficult to gauge the extent of improvement in our project cases and relate them to the amenity improvements stated in the published research. There are framing effects and customer experience with alternative transport systems which no doubt play into stated preference responses. The combined effect of multiple simultaneous amenity improvements (e.g. halo effects) is difficult to accurately gauge. It is also a worry that published amenity research (either public or from consultants) tends not to publish full logit model specifications and standard errors, making it impossible to assess whether the amenity values quoted are statistically significant, and what the resulting forecasting error might be.'* [Response from agency representative in Melbourne]

A comment was also made regarding the lack of valuations for some customer amenities:

> *'There appears to be a lack of direct valuation of safety and security amenity.'* [Response from agency representative in Auckland]

Table 7: Extent to which values from previous studies have been applied in public transport project appraisal

PT mode	Project type	City							
		MEL	SYD	AKL	LON	PAR	TOR	VIE	SIN
Train/metro	New or upgraded station/stop								
	New or extended line/route								
	New or refurbished rolling stock/vehicle								
	Short range planning*								
	Other								
Tram/light rail	New or upgraded station/stop								
	New or extended line/route								
	New or refurbished rolling stock/vehicle								
	Short range planning*								
	Other								
Bus	New or upgraded station/stop								
	New or extended line/route								
	New or refurbished rolling stock/vehicle								
	Short range planning*								
	Other								
Ferry	New or upgraded station/stop								
	New or extended line/route								
	New or refurbished rolling stock/vehicle								
	Short range planning*								
	Other								

	80-100% of the time	MEL = Melbourne	PAR = Paris
	60-80% of the time	SYD = Sydney	TOR = Toronto
	40-60% of the time	AKL = Auckland	VIE = Vienna
	20-40% of the time	LON = London	SIN = Singapore
	Up to 20% of the time	* Changes in frequency, operating hours and/or fares	
	Never	Note: No response provided for Brisbane, Perth or Oslo	
	Project type not considered		

While valuation studies have been undertaken in Paris, as reported in Section 4.4, the agency representative in this city noted that the results were not sufficiently robust to be incorporated in project appraisal but that customer amenities are still considered in an indirect manner:

> *'We published two sets of papers during the last decade on the valuation of regularity…and crowding…Reference values of our appraisals come from these studies. Both are based on SP surveys. The last one include a set of questions displaying cleanliness, temperature, noise, accessibility, stability on board, using Best Worst Scaling methods…We considered however the results not robust enough to be implemented in our appraisal methods. Customer amenities as they are depicted in this survey are not directly taken into account for our evaluations. They take part indirectly in the generalized cost of trips estimated from our traffic model in a sense that it includes specific modal parameters for train, metro or aerial modes (bus/tram) in utility functions…Amenity valuations are becoming a great concern for us, mainly in the perspective of ex-post evaluations of several measures.'*
> [Response from agency representative in Paris]

4.6 Published sources of customer amenity values that have been used

Representatives were asked if their agency uses any published sources of public transport customer amenity values. The results revealed that published sources are used in 8 of the 11 cities (Melbourne, Sydney, Perth, Auckland, London, Toronto and Singapore) and include the following:

- *Australian Transport Assessment and Planning Guidelines* (Transport and Infrastructure Council 2017): used in Melbourne, Sydney and Perth
- *Business Case Development Manual* (London Transport 1997; Transport for London 2014): used in London, Toronto and Singapore
- *Economic Evaluation Manual* (NZ Transport Agency 2016): used in Auckland
- *Guide to Project Evaluation* (Austroads): used in Sydney
- *National Guidelines for Transport System Management in Australia* (Australian Transport Council 2006): used in Melbourne, Sydney and Perth
- *Passenger Demand Forecasting Handbook* (British Railways Board 1994): used in London

- *The demand for public transport: A practical guide* (Balcombe et al. 2004): used in Sydney
- *WebTAG Transport Analysis Guidance* (Department for Transport 2017): used in Sydney.

While agencies generally reported to using published sources specific to their country, it is noted that agencies located in Toronto and Singapore use customer amenity values from London (Transport for London 2014) with Sydney adopting values from both the United Kingdom (Balcombe et al. 2004; Department for Transport 2017) and Australia (Australian Transport Council 2006; Austroads; Transport and Infrastructure Council 2017).

A specific comment was made by the agency representative in Toronto regarding the use of customer amenity values from London, but also the desire to estimate local values in the future:

> *'We have only recently started incorporating customer amenity valuations into our appraisal practices. We have been relying on Transport for London's Business Case Development Manual to understand the value of platform canopies, Wi-Fi on trains, improvement in weather protection while waiting on train platforms, improvement in information provision, etc. We are hoping to undertake our own research in the near future to localize some of these willingness-to-pay parameters/time saving factors with respect to improvements in customer amenities.'* [Response from agency representative in Toronto]

4.7 Leading practitioners in public transport customer amenity valuation

Agency representatives were asked who they think are the leading practitioners in the field of public transport customer amenity valuation. A response to this question was provided by representatives in only 3 of the 11 cities (Melbourne, Sydney and Auckland) who identified the following practitioners:

- Neil Douglas (Douglas Economics): identified by Melbourne, Sydney and Auckland
- Mark Streeting (LEK Consulting): identified by Melbourne
- Ian Wallis (Ian Wallis Associates): identified by Auckland
- Colin Homan (Auckland Transport): identified by Auckland.

However, agency representatives (from London, Toronto and Sydney) also identified *organisations* who they felt represent leaders in the field, as follows:

- Transport for London: identified by London and Toronto
- Rail Delivery Group (United Kingdom): identified by London (this group is formerly known as the Association of Train Operating Companies (ATOC), owners of the Passenger Demand Forecasting Handbook)
- Transport for NSW Customer Services: identified by Sydney.

5. Conclusion

The aim of this report was to provide an overview of current practice among selected Australian and international public transport agencies in estimating and applying public transport customer amenity valuations. A survey of public transport agencies across 11 cities was undertaken to achieve this aim, with five key objectives. A summary of the results associated with each objective, including a brief discussion of their implications, is provided below. Implications for Melbourne are highlighted.

*Objective 1: To determine the **types of public transport projects** that have been planned or delivered by public transport agencies in the last 10 years*

> Agencies in each of the 11 cities have been involved in planning/delivering a considerable range of train/metro and bus projects. The extent of involvement in tram/light rail and ferry projects in cities is lower and likely to be related to whether a city has these modes of public transport.

*Objective 2: To understand typical levels of appraisal that public transport projects have generally undergone and **to what extent customer amenities have been included***

For train/metro and tram/light rail projects, the Australasian cities – Sydney, Brisbane, Auckland and to an extent Perth – generally all have widespread inclusion of customer amenities as part of advanced appraisals for all relevant types of projects. Melbourne stands out relative to other Australasian cities as having customer amenities included less frequently in appraisals of train/tram projects. **Melbourne seems out of step with Australasian practice in this respect.** Australasian practice tends to include customer amenities more frequently in project appraisal than London, who tend to incorporate amenities in a smaller share of their advanced appraisals. Paris, Toronto and Vienna, although they adopt advanced appraisals for some projects, rarely include customer amenities in these appraisals, indeed Paris and to an extent Toronto do not typically include customer amenities in their advanced appraisals.

Objective 3: To understand the types of studies that have been undertaken for estimating the value of public transport customer amenities

Information relating to 17 valuation studies was provided by agency representatives across 7 cities. Most of the studies were undertaken in the last 5 years suggesting a possible greater emphasis on customer amenities by public transport agencies. Consultants/contractors undertook most of the valuation studies which may highlight the need to ensure that agencies have sufficient in-house skills and resources available for correctly interpreting and applying the outputs of such studies. Agency representatives in Auckland, Toronto, Perth and Vienna did not report any original local primary research studies valuing amenities in their city.

Objective 4: To understand the extent to which customer amenity values from previous studies have been applied in the appraisal of public transport projects, including the use of any published sources

In general, cities where amenities are used in appraisals more commonly adopt values from previous studies in the majority of cases. Paris and Toronto, where amenities are not typically included in appraisals, tend not to use values from previous studies (as might be expected). Published sources of customer amenity values are used by agencies in 8 out of the 11 cities and while agencies generally use sources specific to their country, Toronto and Singapore (and to some extent Sydney) use values from London. This finding may suggest a lack of customer amenity values available in these cities and that local valuation studies are needed to fill this gap.

Objective 5: To identify leading practitioners in the field of public transport customer amenity valuation

A relatively small number of leading practitioners (Neil Douglas, Mark Streeting, Ian Wallis and Colin Homan) and organisations (Transport for London, Rail Delivery Group and Transport for NSW) were identified by agency representatives. The limited number may imply that the field of customer amenity valuation is highly specialised and therefore potentially hindered from being applied more consistently in project appraisal. The practitioners, along with others identified from earlier work, will be targeted in a future Delphi survey as part of the wider research project to help understand best practice in public transport customer amenity valuation.

While the survey underlying this report has provided an understanding of current practice among public transport agencies in estimating and applying public transport customer amenity valuations, it is limited to practice in only 11 cities. Furthermore, while considerable effort was taken to ensure each survey response represented practice across each agency, the responses are limited to the information and knowledge available by those completing the survey. Nevertheless, this report sheds important light on current practice in the field of public transport customer amenity valuation and helps to establish the current state of play in this area. The next and final step in this wider research project is to undertake a Delphi survey of leading practitioners with the intention of building an understanding of best practice in public transport customer amenity valuation.

Acknowledgements

Sincere thanks goes to each of the survey participants for their valuable input and time in supporting this research. Transport for Victoria are also acknowledged for funding the wider research project on public transport customer amenity valuation.

References

Australian Transport Council 2006, *National Guidelines for Transport System Management in Australia, Volume 4: Urban Transport*, Commonwealth of Australia, Canberra, Australia.

Austroads *Guide to Project Evaluation*, Austroads, Australia.

Balcombe, R, Mackett, R, Paulley, N, Preston, J, Shires, J, Titheridge, H, Wardman, M & White, P 2004, *The demand for public transport: A practical guide*, TRL, London, United Kingdom.

British Railways Board 1994, *Passenger Demand Forecasting Handbook*, British Railways Board, United Kingdom.

Currie, G, Scott, R & Tivendale, K 2013, *Experience with value-for-money urban public transport system enhancements*, NZ Transport Agency, Wellington, New Zealand.

Department for Transport 2017, *Transport analysis guidance: WebTAG*, Department for Transport, London, United Kingdom.

Douglas, N 2016, *Pricing strategies for public transport, Part 1*, NZ Transport Agency research report 565, New Zealand.

Fearnley, N, Aarhaug, J, Flügel, S, Eliasson, J & Madslien, A 2015, *Measuring the patronage impact of soft quality factors in urban public transport*, Institute of Transport Economics, Norway.

London Transport 1997, *Business Case Development Manual*, LT Corporate Planning, London, United Kingdom.

NZ Transport Agency 2016, *Economic Evaluation Manual*, NZ Transport Agency, Wellington, New Zealand.

Outwater, M, Sana, B, Ferdous, N, Woodford, B, Lobb, J, Schmitt, D, Roux, J, Bhat, C, Sidharthan, R, Pendyala, R & Hess, S 2014, *Characteristics of Premium Transit Services that Affect Choice of Mode*, Transportation Research Board, Washington, D.C., United States.

Public Transport Research Group 2017, *Best Practice Approaches to Public Transport Customer Amenity Valuation*, Monash University, viewed 24 January 2018, <http://publictransportresearchgroup.info/portfolio-item/best-practice-approaches-to-public-transport-customer-amenity-valuation/>.

Robson, S 2009, *The Role of Soft Measures in Influencing Patronage Growth and Modal Split in the Bus Market in England*, AECOM, Cheshire, United Kingdom.

Steer Davies Gleave 2000, *Rail Passenger Quality of Service Valuations*, Shadow Strategic Rail Authority, London, United Kingdomn.

Transport and Infrastructure Council 2017, *Australian Transport Assessment and Planning Guidelines: M1 - Public Transport (Draft for public consultation)*, Department of Infrastructure and Regional Development, Canberra, Australia.

Transport for London 2014, *Business Case Development Manual*, TfL Programme Management Office, London, United Kingdom.

Appendix A: Survey instrument

The Public Transport Research Group (PTRG) at Monash University in Australia has been engaged by Transport for Victoria to undertake a review of best practice approaches to public transport customer amenity valuation.

The aim of this survey is to understand current practices among public transport agencies in estimating and applying public transport customer amenity valuations.

Public transport customer amenities, also referred to as soft factors, cover a range of ancillary improvements which are not directly related to public transport operations or service quantity but can enhance the quality of the passenger experience. Examples of customer amenities include information provision, passenger facilities, station/stop quality, and personal security measures. A classification of public transport customer amenities is provided in Fig. 1 below.

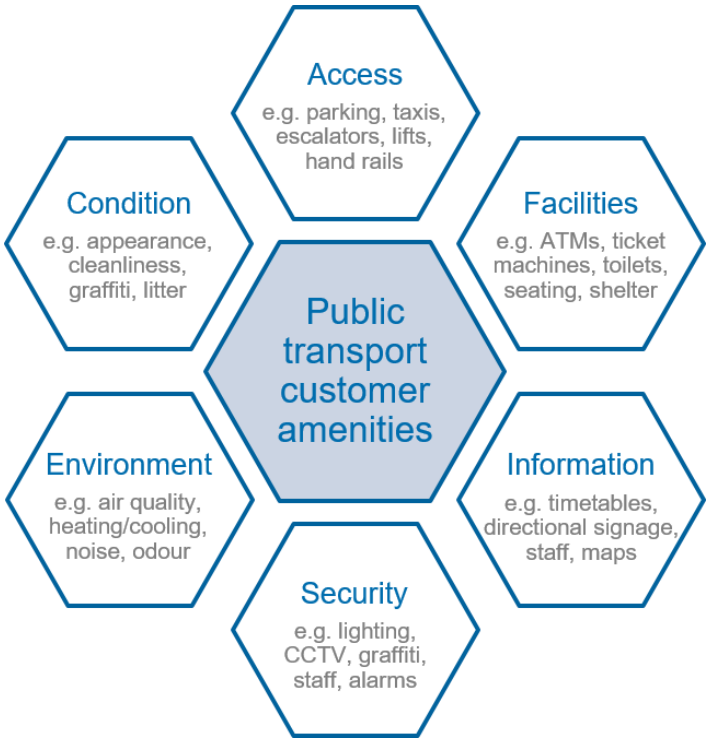


Fig. 1. Classification of public transport customer amenities
Source: Public Transport Research Group (2017)

This survey includes 11 questions and should take around 20 minutes to complete. Where necessary, we encourage you to liaise with others in your organisation to complete the survey as accurately as possible. As you progress through the survey, your responses will be saved automatically so you can return to the survey at a later stage if needed.

A summary of the results will be documented in a report to Transport for Victoria. The research findings may also be published in peer-reviewed journals and conference proceedings. While the survey is not considered to include any questions of a personal or sensitive nature, responses will be reported by city and may therefore be identifiable.

If you have any queries about this survey or the wider research project, please do not hesitate to contact the Chief Investigators:

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Thank you for your participation in this research. Further information about the research project can be found on the PTRG website.

Public transport projects in your city

1. Which **city** are you located in?

2. Over the last 10 years, which of the following public transport projects have been **planned or delivered** in your city with involvement from your organisation?

Public transport project	Train/metro	Tram/light rail	Bus	Ferry
New or upgraded station/stop	☐	☐	☐	☐
New or extended line/route	☐	☐	☐	☐
New or refurbished rolling stock/vehicle	☐	☐	☐	☐
Short range planning (e.g. changes in frequency, operating hours, fares)	☐	☐	☐	☐
Other project/s (please state):	☐	☐	☐	☐

Public transport project appraisal and evaluation practice in your city

3. Over the last 10 years, what is the **typical level of appraisal or evaluation** that public transport projects considered by your organisation in your city have generally undergone?

   [*Note: only those projects which were selected in Q2 will appear in the list below*]

Public transport project	No appraisal or evaluation	Basic (e.g. mostly qualitative)	Intermediate (e.g. financial evaluation)	Advanced (e.g. economic evaluation)
Train/metro: New or upgraded station/stop	○	○	○	○
Train/metro: New or extended line/route	○	○	○	○
Train/metro: New or refurbished rolling stock	○	○	○	○
Train/metro: Short range planning (e.g. changes in frequency, operating hours, fares)	○	○	○	○
Train/metro: Other project/s	○	○	○	○
Tram/light rail: New or upgraded station/stop	○	○	○	○
Tram/light rail: New or extended line/route	○	○	○	○
Tram/light rail: New or refurbished rolling stock	○	○	○	○
Tram/light rail: Short range planning (e.g. changes in frequency, operating hours, fares)	○	○	○	○
Tram/light rail: Other project/s	○	○	○	○

Public transport project	No appraisal or evaluation	Basic (e.g. mostly qualitative)	Intermediate (e.g. financial evaluation)	Advanced (e.g. economic evaluation)
Bus: New or upgraded station/stop	○	○	○	○
Bus: New or extended line/route	○	○	○	○
Bus: New or refurbished rolling stock	○	○	○	○
Bus: Short range planning (e.g. changes in frequency, operating hours, fares)	○	○	○	○
Bus: Other project/s	○	○	○	○
Ferry: New or upgraded station/stop	○	○	○	○
Ferry: New or extended line/route	○	○	○	○
Ferry: New or refurbished rolling stock	○	○	○	○
Ferry: Short range planning (e.g. changes in frequency, operating hours, fares)	○	○	○	○
Ferry: Other project/s	○	○	○	○

The remaining questions in this survey focus specifically on public transport customer amenities.

Also referred to as soft factors, public transport customer amenities cover a range of ancillary improvements which are not directly related to public transport operations or service quantity but can enhance the quality of the passenger experience. Examples of customer amenities include information provision, passenger facilities, station/stop quality, and personal security measures. A classification of public transport customer amenities is provided in Fig. 1 below.

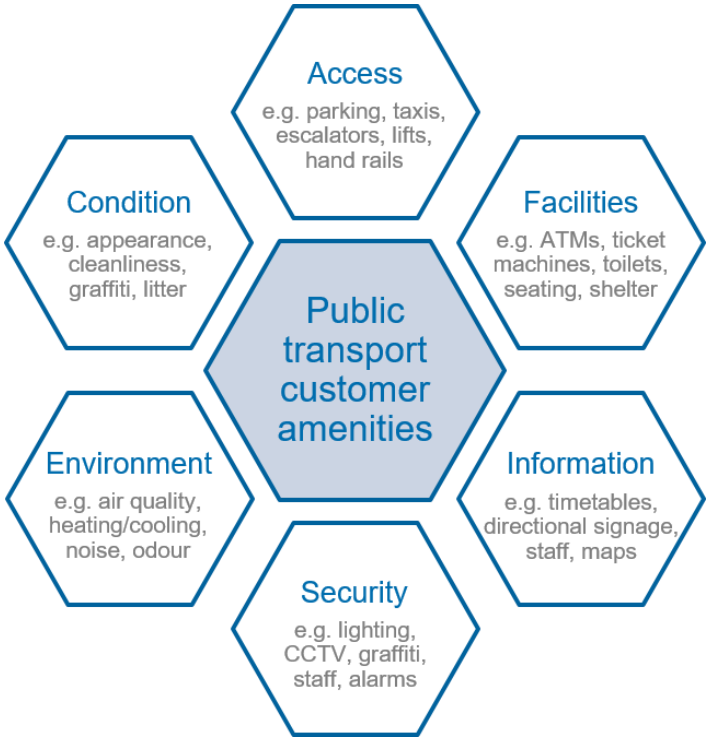

Fig. 1. Classification of public transport customer amenities
Source: Public Transport Research Group (2017)

4. Over the last 10 years, **how often have public transport customer amenities been typically included** by your organisation in the appraisal/evaluation of the following projects in your city?

   [*Note: only those projects which were selected in Q2 will appear in the list below*]

Public transport project	Never	Up to 20% of the time	20-40% of the time	40-60% of the time	60-80% of the time	80-100% of the time
Train/metro: New or upgraded station/stop	○	○	○	○	○	○
Train/metro: New or extended line/route	○	○	○	○	○	○
Train/metro: New or refurbished rolling stock	○	○	○	○	○	○
Train/metro: Short range planning (e.g. changes in frequency, operating hours, fares)	○	○	○	○	○	○
Train/metro: Other project/s	○	○	○	○	○	○
Tram/light rail: New or upgraded station/stop	○	○	○	○	○	○
Tram/light rail: New or extended line/route	○	○	○	○	○	○
Tram/light rail: New or refurbished rolling stock	○	○	○	○	○	○
Tram/light rail: Short range planning (e.g. changes in frequency, operating hours, fares)	○	○	○	○	○	○
Tram/light rail: Other project/s	○	○	○	○	○	○
Bus: New or upgraded station/stop	○	○	○	○	○	○
Bus: New or extended line/route	○	○	○	○	○	○
Bus: New or refurbished rolling stock	○	○	○	○	○	○
Bus: Short range planning (e.g. changes in frequency, operating hours, fares)	○	○	○	○	○	○
Bus: Other project/s	○	○	○	○	○	○
Ferry: New or upgraded station/stop	○	○	○	○	○	○
Ferry: New or extended line/route	○	○	○	○	○	○
Ferry: New or refurbished rolling stock	○	○	○	○	○	○
Ferry: Short range planning (e.g. changes in frequency, operating hours, fares)	○	○	○	○	○	○
Ferry: Other project/s	○	○	○	○	○	○

Estimating the value of public transport customer amenities

5. Has your organisation ever been involved in making its own **estimates** of the value of public transport customer amenities in your city?

   ☐ No
   ☐ Yes, external providers have been commissioned to undertake valuation studies
   ☐ Yes, valuation studies have been undertaken in-house
   ☐ Yes, valuation studies have been undertaken in-house and by external providers
   ☐ Unsure
   ☐ Other, please state: _____

6. [*If yes to Q5*] Where possible, please provide information below for **up to five of the most recent public transport customer amenity valuation studies** in your city that your organisation has been involved in.

   [*Note: Name of study and survey year/s to be typed by respondent; clickable options to be provided for all other fields. Options for public transport mode/s to include Train/metro, Tram/light rail, Bus, Ferry. Options for type/s of amenities that were valued to include Access, Facilities, Information, Security, Environment, Condition. Options for survey method/s used to include Stated preference, Revealed preference, Customer ratings, Priority evaluator, Maximum difference scaling, Other. Options for who primarily undertook the valuation to include Undertaken in-house, Consultant/contractor, University/research institute, Other*]

No.	Name of study	Public transport mode/s	Type/s of amenities that were valued	Survey year/s	Survey method/s used	Who primarily undertook the valuation?
1						
2						
3						
4						
5						

Applying valuations of public transport customer amenities from previous studies

7. In the last 10 years, has your organisation in your city ever been involved in **applying valuations of public transport customer amenities from previous studies** for project appraisal/evaluation purposes?

   ☐ Yes
   ☐ No
   ☐ Unsure

8. [*If yes to Q7*] Over the last 10 years, **how often has your organisation applied valuations of public transport customer amenities from previous studies** in appraising/evaluating the following projects in your city?

   [*Note: only those projects which were selected in Q2 will appear in the list below*]

Public transport project	Never	Up to 20% of the time	20-40% of the time	40-60% of the time	60-80% of the time	80-100% of the time
Train/metro: New or upgraded station/stop	○	○	○	○	○	○
Train/metro: New or extended line/route	○	○	○	○	○	○
Train/metro: New or refurbished rolling stock	○	○	○	○	○	○
Train/metro: Short range planning (e.g. changes in frequency, operating hours, fares)	○	○	○	○	○	○
Train/metro: Other project/s	○	○	○	○	○	○
Tram/light rail: New or upgraded station/stop	○	○	○	○	○	○
Tram/light rail: New or extended line/route	○	○	○	○	○	○
Tram/light rail: New or refurbished rolling stock	○	○	○	○	○	○
Tram/light rail: Short range planning (e.g. changes in frequency, operating hours, fares)	○	○	○	○	○	○
Tram/light rail: Other project/s	○	○	○	○	○	○

Public transport project	Never	Up to 20% of the time	20-40% of the time	40-60% of the time	60-80% of the time	80-100% of the time
Bus: New or upgraded station/stop	○	○	○	○	○	○
Bus: New or extended line/route	○	○	○	○	○	○
Bus: New or refurbished rolling stock	○	○	○	○	○	○
Bus: Short range planning (e.g. changes in frequency, operating hours, fares)	○	○	○	○	○	○
Bus: Other project/s	○	○	○	○	○	○
Ferry: New or upgraded station/stop	○	○	○	○	○	○
Ferry: New or extended line/route	○	○	○	○	○	○
Ferry: New or refurbished rolling stock	○	○	○	○	○	○
Ferry: Short range planning (e.g. changes in frequency, operating hours, fares)	○	○	○	○	○	○
Ferry: Other project/s	○	○	○	○	○	○

9. [*If yes to Q7*] Which of the following **published sources** of public transport customer amenity valuations does your organisation use?

   ☐ Business Case Development Manual (London Transport, 1997)
   ☐ Business Case Development Manual (Transport for London, 2014)
   ☐ National Guidelines for Transport System Management in Australia (ATC, 2006)
   ☐ Passenger Demand Forecasting Handbook (British Railways Board, 1994)
   ☐ The demand for public transport: A practical guide (TRL, 2004)
   ☐ Other, please state: _____

Leading practitioners

10. Could you please tell us who you think are the **leading practitioners** in the field of public transport customer amenity valuation? Provide their name/s and organisation/s below.

Other comments

11. Do you have any **other comments** in relation to the valuation of public transport customer amenities?

Thank you for your participation in this research. The results will be used to help understand current practices among transit agencies in valuing public transport customer amenities.

To submit your responses, please click on the arrow at the bottom-right corner of the screen.

If you have any queries about this survey or the wider research project, please do not hesitate to contact the Chief Investigators:

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Further information about the research project can be found on the PTRG website.