

# Green Star Category Review and Update

Transport Category



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## Green Star Category Review and Update

Transport Category

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## Revision History

Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
A	31-Mar-2014	For Review	Chris Walker Senior ESD Consultant	

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## Executive Summary

As part of the continuing development of Green Star rating tools, the Green Building Council of Australia (GBCA) aims to simplify and update the Transport category.

Following is a summary of this review process highlighting key findings within each Transport credit throughout the Green Star Design and As Built tool.

Credits have also been summarised into the following three categories:

-  No recommendations made, credit has remained unchanged
-  Recommendations have been made to update the credit
-  It has been recommended to remove the credit

Credit	Credit status	Recommendation(s)
<b>Green Star Design and As Built – Prescriptive Path</b>		
Car Parking		<ul style="list-style-type: none"> <li>– Removal of reliance on local planning requirements</li> <li>– Inclusion of revised fuel efficient transport credit criteria</li> <li>– Prescriptive car parking allowance based on building type and accessibility</li> </ul>
Commuting Mass-Transport		<ul style="list-style-type: none"> <li>– Development of automated Commuting Mass Transport calculator</li> </ul>
Walkable Neighbourhood		<ul style="list-style-type: none"> <li>– Utilisation of the Walk Score® methodology and web based automation as an alternative approach for projects</li> <li>– Revision of the requirements for all building types if electing for the manual documentation methodology</li> </ul>
Alternative Transport		<ul style="list-style-type: none"> <li>– Alteration of bicycle and after trip facility calculation methodology</li> </ul>
<b>Green Star Design and As Built – Performance Path</b>		
Carbon Emissions from Transport		<ul style="list-style-type: none"> <li>– New credit / assessment methodology</li> <li>– Development of Carbon Emissions from Transport methodology, calculator, and associated guide</li> </ul>

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## 1.0 Introduction

The GBCA is currently developing an updated rating tool, Green Star - Design & As Built, which will be launched in October 2014 with the following key objectives:

- Applicable to all relevant building types;
- Updated credit compliance requirements; and
- Delivered online with less documentation.

The technical content of this rating tool is being developed in consultation with industry, under the management of the Green Star Development team. During this consultation, stakeholders have identified new credits to be included in Green Star - Design & As Built. Carbon Emissions from Transport is one of these new credits.

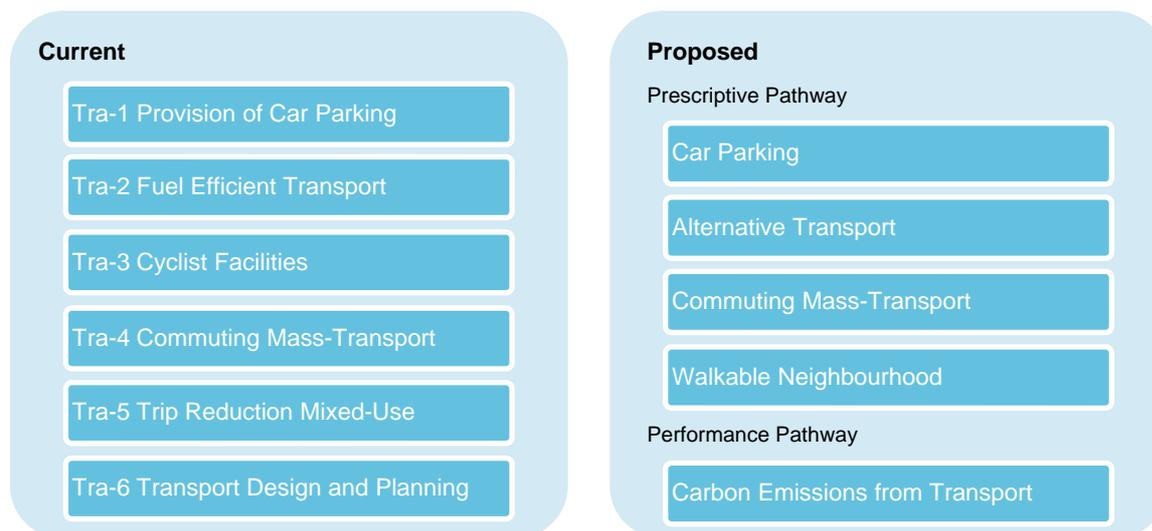
### Carbon Emissions from Transport

The GBCA has received feedback from industry that the current Transport category in Green Star for design and construction is overly prescriptive and puts suburban and rural projects at a disadvantage.

*“AECOM has had numerous experiences with this on Green Star projects where access to public transport is limited or bicycle parks will remain unused if installed due to the proximity of supporting services. However, a locally supported workforce would allow the project to benefit from a performance assessment to realise this reduced annual emissions profile”.*

It is therefore proposed that the Transport category will have two compliance pathways:

1. A Prescriptive Pathway containing credits similar to those in Green Star - Public Building v1; and
2. A Performance Pathway where projects can demonstrate reduction in carbon emissions from transport by comparing their design to a reference building.



Following is an assessment of the current credits, and recommendations for their revision, or development of new credit criteria.

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## 2.0 General Category Comments

### 2.1 Points

The number of points available for the Transport category across the current Green Star tools is inconsistent (see Figure 1); they range from 11 to 13 points. This is them normalised through the category weightings factors.

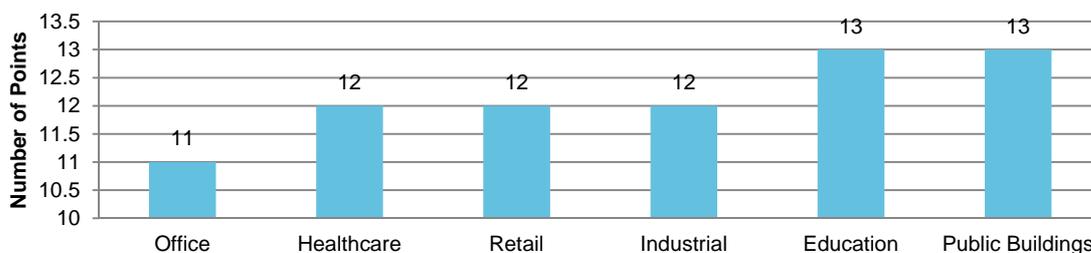


Figure 1 Transport category points across the Green Star tools

The proposed structure of the Transport category offers a consistent 12 points available to all building types and for both compliance pathways; according to the following structure:

Table 1 Proposed Transport category points structure

Prescriptive Pathway		Performance Pathway - Carbon Emissions from Transport	
Credit	Points	Credit	Points
Car Parking	2	Criterion 1: Emissions reduction	5
Alternative Transport	3	Criterion 2: Active mode encouragement	2
Commuting Mass-Transport	5	Criterion 3: Vehicle kilometres travelled reduction	2
Walkable Neighbourhood	2	Criterion 4: Walkable location	3
<b>Total:</b>	<b>12</b>	<b>Total:</b>	<b>12</b>

### 2.2 Weighting Factors

The state based weighting factors for the Transport category have remained unchanged over time with the release of new Green Star tools. Within the Transport category weighting remain consistent at 10% (see Table 2). It appears that the overall Transport category is weighted appropriately and reflects the relative importance or impact this category has within the Australian environment.

Table 2 Green Star Public Buildings v1 category weightings

Category	ACT%	NSW%	NT%	QLD%	SA%	TAS%	VIC%	WA%
Man	14	14	14	14	14	14	14	14
IEQ	18	18	18	18	18	18	18	18
Ene	22	22	22	22	22	17	22	22
<b>Tra</b>	<b>10</b>							
Wat	12	12	10	10	15	15	15	12
Mat	13	13	13	13	13	13	13	13
Eco	6	6	8	8	3	8	3	6
Emi	5	5	5	5	5	5	5	5
<b>Total</b>	<b>100%</b>							

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## 3.0 Credit assessment – Prescriptive Pathway

The initial phase of works for the Transport category review will entail a peer review of the prescriptive pathway credits across the suite of Green Star tools. This includes:

Current		Proposed
Tra-1 Provision of Car Parking		
Tra-2 Fuel-Efficient Transport	⇒	Car Parking
Tra-3 Cyclist Facilities		
Tra-6 Transport Design and Planning	⇒	Alternative Transport
Tra-4 Commuting Mass Transport	⇒	Commuting Mass-Transport
Tra-5 Trip Reduction Mixed Use	⇒	Walkable Neighbourhood

The focus of the review will be to examine the relevance of credit criteria and identify gaps against the current national and international best practices within the property development industry.

The review will also draw conclusions on the spread of points within the category and make recommendations regarding the weighting of credits relative to each other within the Transport category. It will also seek to identify new opportunities for additional criteria or new credits to 'raise the bar' within the category.

AECOM will draw upon its broad range of specialists, not only in the delivery of Green Star projects, but in transport and statutory planning, and master planning. As appropriate, the review will bring our international experience and expertise to the analysis of the Australian context. As part of this process, we will also examine the integration, simplification and alignment of these credits across the suit of tools resulting in a simplification of the documentation requirements whilst maintaining the integrity of the rating.

Project deliverables include a Report outlining:

- Peer review and gap analysis of existing Prescriptive Pathway credits across the suite of Green Star tools;
- The incorporation of feedback from technical working groups (including Technical Advisory Group and Expert Reference Panel);
- Outline of the process for points to be awarded and the environmental benefits; and
- Summary of additional research undertaken.

### 3.1 Car Parking

New form of the credit:

Current		Proposed
Tra-1 Provision of Car Parking		
Tra-2 Fuel-Efficient Transport	⇒	Car Parking

#### 3.1.1 Credit Aim

To encourage and recognise developments that minimise the impact of travel via motor vehicles, through minimising provision of car parking spaces and promoting the uptake of low-emission vehicles through car parking design.

#### 3.1.2 Review

A review was undertaken of:

- Current Green Star credits;
- DRAFT revised Green Star credits provided by the GBCA;
- Associated comments from various Green Star technical reviewers; and

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- Comparable credits found in other sustainability rating tools (i.e. BREEAM, LEED).

Comments were provided by the GBCA that were compiled from a number of external reviews of the DRAFT revised Car Parking credit based on the current form. A number of comments, issues and suggested changes were repeated by various reviewers, these included the following:

- Reliance on Council or planning authority as the benchmark for parking rates was identified as a significant weakness in the current credit's form;
- Conflicting views were expressed regarding the encouragement for small vehicle parking spaces. Critical issues include uncertainty around enforcement, equity and likely net environmental benefit. In general, it appears that a strong case exists for removing small vehicle parking provisions and focusing on vehicle efficiency, as well as hybrid and electric vehicles;
- Removal of the requirement to physically separate commercial and delivery vehicle spaces is widely supported; and
- The term 'suitable professional' was also criticised, and its relevance questioned.

AECOM's review of the current credits across the suite of Green Star tools revealed a range of areas for potential improvement. The Car Parking credit umbrella covers rates of car parking along with car parking designated to certain vehicle types. The central issues emerging from our review are outlined below for both these.

### Parking

The credit currently relies heavily on parking rates that are defined by local or state government, or a combination of both. This means these rates can significantly differ between states and municipalities, undermining the consistency of the credit. For example, in Victoria councils can choose to apply one of two standard rates for each type of use, defined by the State Government, or choose to develop an alternate rate through the use of the Parking Overlay.

Our review of other rating tools highlighted an alternative approach in BREEAM 2011 for non-residential buildings, and this tool provides the most advanced template for the consideration of car parking rates. Other tools generally include a credit approach that is similar to the current Green Star credits, and are reliant on parking regulations to provide the reference point for improvement, irrespective of how stringent or relaxed these requirements may be.

The BREEAM approach provides a schedule of parking ratings based on a combination of accessibility, building type and the number of points targeted, which AECOM recommends as an appropriate guide for the revised credit. Importantly, the tool also notes that "where the local authority requires a minimum car parking capacity that is higher than the maximum limit set by BREEAM, the BREEAM criteria will need to be met for the credit to be awarded".

This more consistent approach exemplified by BREEAM, using an accessibility rating and standardised parking rates defined for each development use, should be applied to the updated Green Star credit. This will reduce the likelihood of projects achieving points under this credit through virtue of a generous local government parking policy, and create a higher level of consistency.

However, setting appropriate rates of parking for different building uses presents a challenge. A review of planning requirements related to car parking across Victoria, ACT and South Australia demonstrated the variation that can be seen across different jurisdictions. It should be noted that it was necessary to utilise assumptions regarding standard occupancy rates for different building uses to produce a common metric to allow this comparison. In general the comparison shows that the BREEAM rates are above the minimum rates specified by Australian planning requirements, indicating that the tool requires above average performance to achieve credit for parking rates.

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**Table 3 Comparison of car parking rates for different uses across the BREEAM tool and a number of Australian planning jurisdictions**

Building space type use	BREEAM rate (1 parking space per x users – dependent on location and points targeted)	Victorian Planning Provisions rate (1 parking space per x users - approximate)	ACT Parking and Vehicular Access General Code (1 parking space per x users - approximate)	South Australia Development Plan 1 parking space per x users - approximate
Office	3-6	2	4.5	5
Residential	3-4	1.5	1.7	2
Education	15-30	2.5	6.7	16.7
Retail	3-6	3.5	2.8	2.8
Industrial	3-6	2	1.5	3.3
Healthcare	3	1.7	1	2.7

The revised Car Parking credit includes a schedule of car parking rates derived from the above comparison. The BREEAM rates have been used as a guide. However, they have been altered in some cases to ensure that the required rates strike a balance between being ambitious and achievable in the context of Australian planning regulations.

## Fuel efficient transport

Based on the review comments provided by GBCA and AECOM's own review of the current Green Star tools, it is proposed that fuel efficient vehicle provision should be based on performance outcome (i.e. fuel efficiency and fuel source), not vehicle size. The small vehicle provision is likely to be providing little tangible benefit and driving minimal change. A more straightforward approach encourages provision of priority spaces for fuel efficient and low-emission vehicles and charging infrastructure for electric vehicles (EV). The provision of dedicated spaces and charging infrastructure has been implemented through the BREEAM International Custom tool, which includes options under 'Alternative Transport' including minimum 3% parking spaces provided with EV charging points supplied by 100% renewable energy.

Car share vehicles represent a genuine means to reduce vehicle ownership and subsequently vehicle use. However, it has been determined that the greatest environmental benefit is realised in multi-unit residential developments only, as a car share vehicle has the ability to replace the need for personal car ownership. In other development types (i.e. office, education) a car share vehicle may only reduce emissions associated with at-work based car emissions. For this reason, car share vehicles will be included as compliance criteria for multi-unit residential developments only.

To determine an appropriate rate for inclusion in the revised credit the approaches of the three primary car share providers in Australia were assessed. This was based on either the recommended rates proposed by the provider or project examples. The results of this are identified in Table 4 below.

**Table 4 Number of building occupants per car share vehicle**

Car share provider	Number of occupants per car share vehicle
Flexicar	150
GoGet	40
Green Share Car	75
<b>Average</b>	<b>88</b>
<b>Potential stretch target</b>	<b>70 (~20% improvement)</b>

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The ratio of occupants to car share vehicle included in the revised credit should consider these rates to ensure the required rate can be delivered by the market. This noted, to ensure the credit is only awarded to developments that meet best practice it is recommended that the target ratio goes beyond the average, to drive industry demand for greater provision of car share vehicles.

### 3.1.3 Recommendations

We propose that the credit is redrafted to combine the previous Tra-1 and Tra-2 credits, given that in effect both relate to car parking. The redrafted credit should respond to the comments raised regarding the consistency of parking rates across different locations and net environmental benefit to develop a credit which is more robust and consistent.

The revised credit should respond to the following:

- 1) A new approach to rewarding parking rates should be related to building location and building type, rather than defined by the applicable planning requirements. This approach is adopted by BREEAM and represents a far more equitable and consistent approach.
- 2) A new approach to rewarding parking design that encourages low-emission vehicles should disregard vehicle size, which may not be an indicator of efficiency, and instead focus on vehicle efficiency or fuel source. This should also include an opportunity for multi-unit residential buildings to be awarded credits for the provision of a dedicated space for a car share vehicle.

## 3.2 Alternative Transport

New form of the credit:

Current	Proposed
Tra-3 Cyclist Facilities	⇒ Alternative Transport
Tra-6 Transport Design and Planning	

### 3.2.1 Credit Aim

To encourage and reward projects that implement initiatives to encourage the use of alternative transport other than private cars.

### 3.2.2 Review

A review was conducted of planning guidelines and green building rating tools both across Australia and internationally. The review compared the requirements of the current suite of Green Star Design and As Built tools with other industry best practice standards.

The following guidelines and rating tools were included in the review:

- Current Green Star Design & As Built tools
- Green Star Interiors PILOT
- BREEAM 2011 Non-Domestic Buildings
- LEED v4 New Construction
- Australian Bicycle Council, 'A Fact Sheet for Developers'
- Melbourne Planning Scheme
- NSW Planning Guidelines for Walking and Cycling
- Western Australia Workplace Fact Sheet
- Queensland Active Infrastructure Code
- Adelaide City Council Bicycle Facilities Guide
- Transport for London Workplace Cycle Parking Guide

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## Travel Plan

Some of the current Green Star Design and As Built tools reward projects for providing a dedicated pedestrian or cyclist path on the site, and developing a Travel Plan to reduce reliance on private cars. The Tra-6 Transport Design & Planning credit exists within the Education v1, Healthcare v1 and Public Building v1 rating tools. The only other guideline to require the development of a Travel Plan is BREEAM, which rewards project teams for developing a Travel Plan that includes a site-specific assessment, measures and recommendations for encouraging alternative transport use. BREEAM also requires the project team to demonstrate commitment from the building owner or occupier that the recommendations of the Travel Plan will be implemented during the operation of the building. It should be noted that this credit applies to all building types covered by the BREEAM 2011 Non-Domestic Buildings tool.

## Number of bicycle parks

The number of bicycle parks required for permanent building users (defined in this review as staff or residents) and short-term building users (visitors, shoppers or students) varies between the guideline documents and is dependent on building type. Table 5 summarises the variation of bicycle park requirements across guidelines for a selection of building types.

**Table 5 Comparison of bicycle parking spaces required for different guidelines and building types**

Guideline	Permanent users	Short-term users
<b>Office Buildings</b>		
Green Star Office v3	For staff: 5-10% of building staff, based on 15 m <sup>2</sup> NLA per person	For visitors: 1 per 750 m <sup>2</sup> NLA (equivalent to 2% of building staff)
Green Star Interiors	For staff: 7.5% of building staff	No requirement
BREEAM	For staff: 10% of building staff	For visitors: Included in staff allocation
LEED	For staff: 5% of building staff	For visitors: 2.5% of visitors
Australian Bicycle Council	For staff: 3-5% of building staff	For visitors: 1 per 1000 m <sup>2</sup> NLA (equivalent to 1.5% of building staff as per Green Star Office v3)
Melbourne Planning Scheme	For staff: 1 per 300 m <sup>2</sup> NLA (equivalent to 5% of building staff as per Green Star Office v3)	For visitors: 1 per 1000 m <sup>2</sup> NLA (equivalent to 1.5% of building staff as per Green Star Office v3)
NSW Planning Guidelines	For staff: 3-5% of building staff	For visitors: 5-10% of building staff
WA Workplace Fact Sheet	For staff: 5-10% of building staff	For visitors: 2% of visitors
Queensland Active Transport Infrastructure Code	For staff: 5% of building staff	No requirement
Adelaide City Council	For staff: 1 per 200 m <sup>2</sup> NLA (equivalent to 7.5% of building staff as per Green Star Office v3)	For visitors: 2 minimum, plus 1 per 100 m <sup>2</sup> NLA
Transport for London	For staff: 1 per 125 m <sup>2</sup> NLA (equivalent to 12% of building staff as per Green Star Office v3)	No requirement
<b>School Buildings (Primary and Secondary)</b>		
Green Star Education v1	For staff: 5-10% of building staff	For students: 20-40% of students over year 4
BREEAM	No requirement	For students:

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Guideline	Permanent users	Short-term users
		5 per form or class in a single year group
LEED	For staff: 5% of building staff	For students: 5% of students For visitors: 2.5% of visitors
Australian Bicycle Council	For staff: 3-5% of building staff	For students: 40-80% of students
Melbourne Planning Scheme	For staff: 5% of building staff	For students: 20% of students over year 4
NSW Planning Guidelines	For staff: 3-5% of building staff	For visitors: 5-10% of building staff No requirement for students
Adelaide City Council	For staff: 5% of building staff	For students: 0.5% of building staff
Transport for London	For staff: 10% of building staff	For students: 10% of students
<b>Tertiary Education Buildings</b>		
Green Star Education v1	For staff: 5-10% of building staff	For students: 5-10% of number of students at 75% occupancy
BREEAM	For staff: 10% of building staff	For students: 10% of students
LEED	For staff: 5% of building staff	For students: 5% of students For visitors: 2.5% of visitors
Australian Bicycle Council	For staff: 3-5% of building staff	For students: 40-80% of students
Melbourne Planning Scheme	For staff: 10% of building staff	For students: 5% of full-time students
NSW Planning Guidelines	For staff: 3-5% of building staff	For students: 5-10% of full-time students For visitors: 5-10% of building staff
Queensland Active Transport Infrastructure Code	For staff: 5% of building staff	No requirement
Adelaide City Council	For staff: 5% of building staff	For students: 10% of students For visitors: 5% of building staff
Transport for London	For staff: 12.5% of building staff	For students: 12.5% of students
<b>Multi-Unit Residential Buildings</b>		
Green Star Multi-Unit Residential v1	For residents: 1 bicycle rack or bicycle cage per dwelling	For visitors: 25% of dwellings
LEED	For residents: 30% of residents, with a minimum of 1 per dwelling	For visitors: 2.5% of visitors, with a minimum of four spaces for the building
Australian Bicycle Council	For residents: 20-30% of dwellings	For visitors: 5-10% of dwellings

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Guideline	Permanent users	Short-term users
Melbourne Planning Scheme	For residents: 20% of dwellings	For visitors: 10% of dwellings
NSW Planning Guidelines	For residents: 20-30% of dwellings	For visitors: 5-10% of dwellings
Adelaide City Council	For residents: 1-2 per dwelling, depending on scale	For visitors: 10% of dwellings
Transport for London	1 per dwelling	No requirement
<b>Retail Buildings</b>		
Green Star Retail Centre v1	For staff: 5-10% of building staff, based on 60 m <sup>2</sup> GLA per person	For shoppers: 1 per 500-1250 m <sup>2</sup> GLA, depending on total area
Green Star Interiors	For staff: 7.5% of building staff	No requirement
BREEAM	For staff: 10% of building staff	For shoppers: 5% of public car parking spaces
LEED	For staff: 5% of building staff	For shoppers: 2.5% of shoppers
Australian Bicycle Council	For staff: 3-5% of building staff	For shoppers: 1 per 1000 m <sup>2</sup> GLA
Melbourne Planning Scheme	For staff: 1 per 300 m <sup>2</sup> GLA (equivalent to 20% of building staff as per Green Star Retail Centre v1)	For shoppers: 1 per 500 m <sup>2</sup> GLA
NSW Planning Guidelines	For staff: 3-5% of building staff	For shoppers: 5-10% of building staff
Queensland Active Transport Infrastructure Code	For staff: 5% of building staff	No requirement
Adelaide City Council	For staff: 1 per 300 m <sup>2</sup> GLA (equivalent to 20% of building staff as per Green Star Retail Centre v1)	For shoppers: 1 per 600 m <sup>2</sup> GLA
Transport for London (non-food retail)	For staff: 1 per 300 m <sup>2</sup> GLA (equivalent to 20% of building staff as per Green Star Retail Centre v1)	No requirement

## Showers

Under the current Green Star Design and As Built tools, projects are required to provide one shower per 10 staff bicycle spaces for staff use. The only exception is Multi-Unit Residential v1, where end-of-trip facilities are not required for dwellings. This is consistent with the requirements of BREEAM, up to an upper limit of eight showers. Where eight or more showers are provided, the project complies regardless of the number of bicycle spaces. However, this is lower than the compliance criteria for LEED, which requires one shower for the first five bicycle spaces, then one shower for every 7.5 spaces thereafter.

A number of guidelines provide an alternative approach to stipulating shower requirements, using a sliding scale based on the number of staff in the building. An example of this is provided in Table 6, which summarises the guidance from the Australian Bicycle Council. Similar guidance is provided by the NSW Planning Guidelines and the Queensland Active Transport Infrastructure Code. The NSW Planning Guidelines also recommend an additional shower for every 250 staff above 500. It is clear that this sliding scale goes beyond the requirement for one shower for every 10 bicycle spaces.

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**Table 6 Sliding scale for providing showers, from the Australian Bicycle Council**

Number of building staff	Indicative number of bicycle spaces (assume 10% of staff)	Number of showers
1-12	1-2	1
13-49	2-5	2
50-149	5-15	4
150-299	15-30	6
300-500	30-50	8

## Changing facilities

Green Star and BREEAM currently allow unisex shower and locker amenities, provided these include sufficient privacy for male and female users to change. On the other hand, the Australian Bicycle Council and the NSW Planning Guidelines specify that two separate change rooms must be provided: one for males and one for females. This additional requirement may help prevent a situation where building staff feel uncomfortable sharing shower facilities with the opposite gender, or where projects do not allow sufficient private changing space in unisex facilities.

BREEAM also requires that a drying space be included in the changing facilities, which “must be a specially designed and designated space with adequate heating/ventilation”. This space can be used for towels or wet clothes on inclement weather days. The tool does not provide any further guidance on the design or size of the drying space.

## Lockers

The current Green Star approach to lockers is to provide one locker per staff bicycle space, which is consistent with BREEAM. The Australian Bicycle Council and the NSW Planning Guidelines recommend a lower number of lockers. However, the Queensland Active Transport Infrastructure Code states that 1.6 lockers should be provided for each staff bicycle space. The Code specifically states that its requirements allows for building users who participate in other active transport modes besides cycling, such as jogging or walking. Green Star and BREEAM do state that the end-of-trip facilities may be made available for non-cyclists. However, the current rating tools do not provide a specific allowance for the facilities to meet this additional demand.

## Cycling trends

The Australian Bicycle Council conducted a nation-wide survey during March-April 2013 to assess the rate of cycling participation<sup>1</sup>. Out of the 25,471 respondents to the survey, which was deemed to be a representative sample of Australia’s population, 5.1% had ridden a bicycle in the previous seven days for transport or commuting purposes. Across the capital cities, this ranged from 2.7% in Adelaide to 6.3% in Perth and 8.7% in Darwin. The results of this survey suggest that a target of providing cyclist facilities for approximately 5% of building users would correspond to a current practice baseline, and only an increase on this baseline should be seen as encouraging an increased rate of cycling.

### 3.2.3 Recommendations

Where it is reasonable, the recommended provision of bicycle parking spaces and end-of-trip facilities in the new Green Star Design and As Built tool should be:

- Equal to or greater than the current Green Star requirements; and
- Above the minimum planning guidelines and requirements and current baseline behaviour, where appropriate. Adhering to minimum guidelines should be considered standard practice in many cases. Points should be awarded for projects moving beyond standard practice.

## Travel Plan

The current Tra-6 Transport Design & Planning credit applies to Education, Healthcare and Public Buildings. However, the requirement for a dedicated pedestrian and cyclist path is unlikely to apply to other building types.

<sup>1</sup> Austroads / Australian Bicycle Council (2013), Australian Cycling Participation – Reporting for the National Cycling Strategy 2011-2016

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To ensure that the new Design and As Built tool is relevant for a wider range of projects, it is recommended that the requirement for a pedestrian and cyclist path be removed from the credit. This should instead be incorporated into the Travel Plan for projects where this would apply.

Development of a Travel Plan should be a minimum requirement for all projects that wish to target this credit. Projects should be encouraged to engage a transport consultant or an alternative transport design specialist to provide recommendations to the project on facilities and operational initiatives. The Travel Plan should be completed early in the design phase to ensure the outcomes are considered in the design. It would be important for the Travel Plan to address the design, location and size of alternative transport facilities (such as cyclist and end-of-trip facilities) to ensure maximum utilisation of these facilities by building users.

It is recommended that the Travel Plan also includes targets for mode share use by building owners, based on the design and operational initiatives in the Plan. These targets will allow the building owner or occupier to monitor the performance of their building against the design intent.

## **Bicycle parking for permanent users**

Generally, cyclist facilities guidelines across Australia and internationally recommend that bicycle spaces are provided for at least 3-5% of building staff in non-residential buildings, with a stretch target of 10%. For residential buildings, Green Star currently requires one parking space per dwelling, which is already at the high end of the requirements across the guidelines.

It is recommended that the new Green Star Design and As Built tool moves beyond the current Green Star requirements for non-residential buildings. For consistency with the Green Star Interiors PILOT tool:

- 1 point is proposed where bicycle parking is provided for 7.5% of building staff; and
- 2 points are awarded where spaces are provided for 15% of staff.

Although this is well beyond current Australian practices, it is in line with the Transport for London policy, which represents world-leading practice. It may be reasonable for Green Star projects that are aspiring to demonstrate world leadership in providing cyclist facilities to target this second point.

Given the current Multi-Unit Residential v1 requirements already exceed most of the other reviewed guidelines; it is recommended that the current criteria are maintained for residential buildings under the new Design and As Built tool.

## **Bicycle parking for short-term users**

Bicycle park requirements for short term users vary significantly across building types and guidelines. The recommendations are generally provided based on either visitor/student numbers, floor areas or staff numbers. A more consistent approach to different building types is recommended to ensure that the requirements are clear to project teams using the new Design and As Built tool.

A requirement based on a percentage of peak visitor/student/shopper numbers is recommended as this can be translated across a wider range of building types than requirements based on floor area or staff numbers. This is because the short term building user population better reflects the number of required bicycle spaces to serve building's function.

The project team could not find any studies on the utilisation of short-term bicycle parking or the impact of facilities on the uptake of cycling by short-term users. Thus, it is recommended that the numbers currently referenced by Green Star are maintained.

## **Showers**

The new Green Star Design and As Built tool should stipulate requirements for shower facilities that are at least at the forefront of Australian best practice. The current Green Star requirement for one shower for every 10 staff bicycle spaces is lower than the best practice guidelines provided by the Australian Bicycle Council and the NSW Planning Guidelines. Thus, it is recommended that the sliding scale in Table 6 is used for the new Design and As Built tool, with an additional requirement for one shower for every 250 staff members above 500 staff.

## **Changing facilities**

The provision of unisex changing facilities can be an appropriate solution for projects that only have a small number of showers and lockers. Although some guidelines recommend separate male and female change rooms, this requirement may not allow for necessary flexibility for smaller projects and buildings with space constraints.

# DRAFT

Thus, the current Green Star allowance for unisex changing and shower facilities is recommended for the new Design and As Built framework. However, the new credit should ensure that the requirement for private changing areas is emphasised. The appropriate size of the changing areas should be determined by the best judgement of the project team.

It is also recommended that the new credit includes a requirement for a specifically designed drying space. The drying space should be located within the changing facilities. As above, the appropriate size and design of the drying area should be determined by the project team.

## Lockers

Although the current Cyclist Facilities credit focuses on providing end-of-trip facilities for cyclists, the new Design and As Built tool should also focus on providing facilities for other active transport users. The Queensland Active Infrastructure Code recommends 1.6 lockers per staff bicycle space. However, the project team believes that this ratio is too high as it represents a significant increase compared with the current Green Star requirements.

A ratio of 1.2 lockers per bicycle space is recommended for the new tool, in order to allow for additional active transport users without imposing a significant increase on the current Green Star requirements.

## 3.3 Commuting Mass-Transport

New form of the credit:

Current	Proposed
Tra-4 Commuting Mass Transport	⇒ Commuting Mass Transport

### 3.3.1 Credit Aim

To encourage and recognise developments that facilitate the use of mass transport.

### 3.3.2 Review

The current credit assesses a proposed facility's location in relation to its access to public transport. This is a good measure based on the following variables:

- Proximity to public transport (i.e. train stations) and frequency of services during peak hour.

However, it does not take into account the size of the population that a service provides for, or how useful that service is (i.e. where does it go within an appropriate amount of time).

### 3.3.3 Recommendations

AECOM proposes to build a Commuting Mass Transport Calculator that would work by the user inputting a building address into a spreadsheet and pressing "Calculate". The score would then be automatically calculated and displayed.

The proposed calculator involves the use of a uniquely developed Public Transport Accessibility Index (PTAI); a widely used technique in transport planning. The PTAI is a score that reflects how well a particular destination is served by public transport.

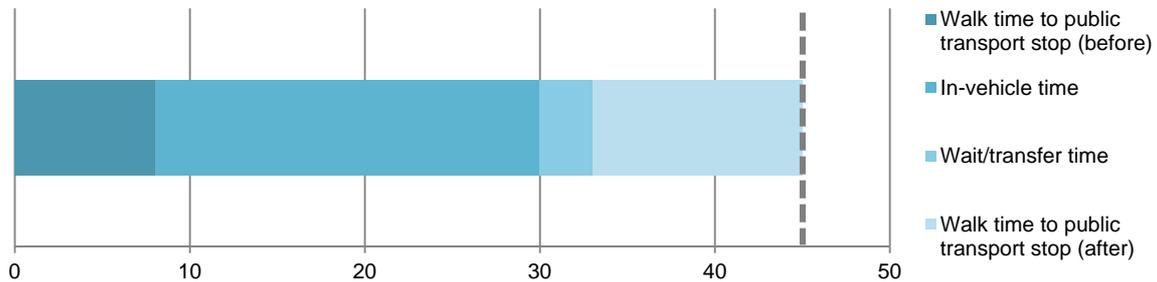
*Access to Public Transport → Access by Public Transport*

The measure in this case would be "the number of residents within a 45 minute public transport journey from the destination during the morning peak hour". The measure would be based upon scheduled public transport services rather than measured travel times.

The 45 minute threshold would include:

- Walk time to and from the public transport stop at both ends of the trip;
- In-vehicle time; and
- Wait/transfer times.

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**Figure 2 Example public transport time threshold**

The PTAI would then be divided into six bands according to the population serviced by public transport to the proposed facility. The bands represent 0 to 5 points achieved on the Public Transport Calculator. The band thresholds would be determined using observed correlations between public transport mode share and PTAI combined with statistical analysis of observed results.

The proposed approach is an improvement on the current measure which only considers access to public transport. The proposed methodology considers access by public transport. This distinction is particularly important in low density cities where the quality and directness of public transport services can vary significantly. AECOM proposes using SA2 (Statistical Area Level 2, a Census geographical unit representing a population of 3,000 to 25,000 people) level population data from the ABS 2011 Census. This is significantly higher resolution than what is currently used (postcodes) in urban areas

AECOM have been engaged to complete this component of work.

## 3.4 Walkable Neighbourhood

New form of the credit:

Current	Proposed
Tra-5 Trip Reduction Mixed Use	⇒ Walkable Neighbourhood

### 3.4.1 Credit Aim

To encourage and recognise developments that are integrated with or built adjacent to local amenities in order to reduce the overall all number of car trips taken by users of the development.

### 3.4.2 Review

Similar to the Public Transport Calculator, the current Tra-5 Trip Reduction Mixed Use is quite laborious. It requires extensive mapping and associated documentation to be provided. The revised credit will need to improve and possibly automate this process.

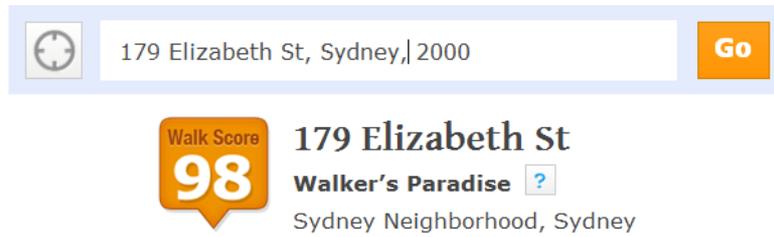
### 3.4.3 Recommendations

It is recommended to automate the credit through the use of the Walk Score® methodology and process. Walk Score® is available for any address within Australia, and generates a score based system of walkable neighbourhoods with access to:

- Public transport; and
- Proximity to amenities and facilities that result in a happier, healthier and more sustainable lifestyle.

Projects would be required only to input the project site’s address to receive their Walk Score®.

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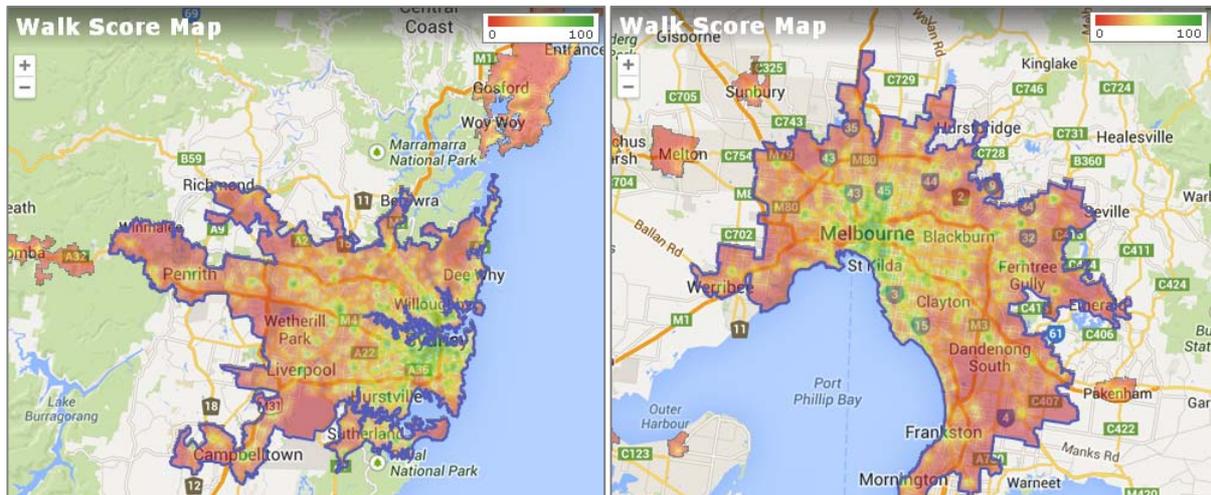
**Figure 3** Address entry window and Walk Score® result

Walk Score® points are designated into the following categories:

**Table 7** Walk Score® points categories

Score	Definition
90–100	<b>Walker’s Paradise:</b> Daily errands do not require a car
70–89	<b>Very Walkable:</b> Most errands can be accomplished on foot
50–69	<b>Somewhat Walkable:</b> Some errands can be accomplished on foot
25–49	<b>Car-Dependent:</b> Most errands require a car
0–24	<b>Car-Dependent:</b> Almost all errands require a car

Across major cities, walk scores have also been plotted onto a heat map (see Figure 4). The heat maps show that high walk scores are not exclusive to central business areas of a city, but are spread across the suburbs. A high walk score can be achieved in outer suburban, and even rural, areas with a high density of amenities and commercial activities. This demonstrates that Walk Score® is an appropriate tool for assessing the walkability of suburban as well as inner-city sites.



**Figure 4** Walk Score® heat map plots for Sydney and Melbourne

The previous DRAFT Walkable Neighbourhoods proposal included a Walk Score® of 90 (Walker’s Paradise). However, the general consensus is that this score is too high a benchmark. Comments also suggest to:

- Make the criteria specific to the building type. For example, an Industrial building’s location is unlikely to achieve the walkability of a location for a commercial office site. The criteria should embrace relevance; and
- Allow for a distinction to be made between regional, country and urban locations, as walkability is relative to a sites proximity to amenities.

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Overall, Green Star is aiming at best practice within the industry. Therefore, benchmarks should not drop below the category of “Very Walkable” regardless of the building type or location.

The current proposal includes:

Facility Type	Points	Requirement
1a – Facilities that apply to all space use types except industrial)	2	2 points are awarded where it is demonstrated that: <ul style="list-style-type: none"> <li>– At least 10 amenities are within 400m of the development; OR</li> <li>– The project achieves a walk score of at least 90, as determined by the website <a href="http://www.walkscore.com">www.walkscore.com</a>, using their ‘street smart’ method of calculation.</li> </ul>
	1	1 point is awarded where it is demonstrated that: <ul style="list-style-type: none"> <li>– At least 8 amenities are within 400m of the development; OR</li> <li>– The project achieves a walk score of at least 80, as determined by the website <a href="http://www.walkscore.com">www.walkscore.com</a>, using their ‘street smart’ method of calculation.</li> </ul>
1b – Facilities that apply to an industrial space use type	2	2 points are awarded where it is demonstrated that: <ul style="list-style-type: none"> <li>– At least 6 amenities are within 400m of the development; OR</li> <li>– The project achieves a walk score of at least 80, as determined by the website <a href="http://www.walkscore.com">www.walkscore.com</a>, using their ‘street smart’ method of calculation.</li> </ul>
	1	1 point is awarded where it is demonstrated that: <ul style="list-style-type: none"> <li>– At least 4 amenities are within 400m of the development; OR</li> <li>– The project achieves a walk score of at least 70, as determined by the website <a href="http://www.walkscore.com">www.walkscore.com</a>, using their ‘street smart’ method of calculation.</li> </ul>

The current point system allows for an achievable “Very Walkable” option (Walk Score® of 80 = 1 point), as well as a stretch target “Walker’s Paradise” (Walk Score® of 90 = 2 points) for favourably located non-industrial projects.

The benchmarks for an industrial space use types are slightly lower than for non-industrial projects. However, the proposed requirements still represent a significant increase on the current credit criteria within the Industrial v1 tool. To ensure that Green Star rewards projects for best practice, the industry should be encouraged to develop industrial sites in areas of high commercial activity or density. If the credit criteria cannot be met by the site selection alone, projects may develop on-site amenities in conjunction with the project to ensure that building users have access to appropriate facilities within walking distance of the building.

The approach to allow for a distinction to be made between regional, country and urban locations has not been adopted. A high Walk Score® can still be achieved in regional centres if the project is developed in an area with relatively high commercial activity and density. Regardless of whether a project is located in a regional, country or urban location, Green Star should still encourage either development in a high density area or the inclusion of amenities on-site as part of the development.

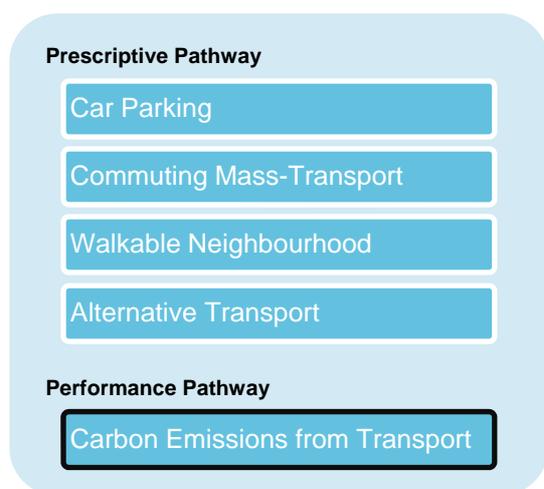
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## 4.0 Credit assessment – Performance Pathway

### 4.1 Carbon Emissions from Transport

AECOM has developed a Carbon Emissions from Transport Calculator ('the Calculator') that may be used to validate the Performance Pathway in all Green Star rating tools where projects can demonstrate a reduction in carbon emissions from transport by comparing their design to a reference building (see Figure 5).

As an alternative to the Transport category's Prescriptive Pathway, the Calculator determines the number of points awarded out of the 10 available for the Green Star Transport Category.



**Figure 5 Green Star Transport Credits**

The Calculator determines the number of points awarded based on the proposed emissions reduction, vehicle kilometres travelled reduction, active mode encouragement, and walkable location.

Compliance with the Carbon Emissions from Transport Performance Pathway requires a project to demonstrate the carbon emissions from transport generated from typical operations. This value is then compared to carbon emissions from transport for a comparable building of a similar type in a similar location (the 'reference building').

Points are rewarded according to the reductions determined by the calculator. The credit provides carbon emissions reductions as a result of transport design initiatives, such as removal of a car parking space, provision of cyclist facilities or carpooling initiatives

Please review AECOM's Carbon Emissions from Transport Calculator Guide (31/03/2014) to determine the use and functionality of the calculator.

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Appendix A

# Transport Category Credit Templates

## Car Parking

### Aim of Credit

To encourage and recognise developments that minimise the impact of travel via motor vehicles, through minimising provision of car parking spaces and promoting the uptake of low-emission vehicles through car parking design.

### Credit Summary

The Car Parking credit addresses the impact of the design and specification of car parking on the transport behaviours of building users. The rate at which car parking spaces are provided, and the designation of spaces for low-emission vehicles, can have a significant impact on the sustainability of transport behaviours. This credit responds to the reality that the context of a building influences how possible it is to reduce the use of motor vehicles in travelling to and from the building, and provides a sliding scale of car parking rates to account for this.

### Credit Criteria

Up to 2 points are available for this credit where the provision of car parking is limited to the rates identified.

<p>1a - Parking for low-emission vehicles, for all space types other than Multi Unit Residential</p>	<p>Up to 2 points are available where parking spaces and/or dedicated infrastructure is provided to support the uptake of low-emission vehicles, as per the following:</p> <ul style="list-style-type: none"> <li>- 1 point is awarded where 20% of total parking provided is designated for use by fuel efficient, hybrid or electric vehicles, or motorcycles. Fuel efficient vehicles are defined as those having an overall rated fuel efficiency of 5L/100km or better. A maximum of 5% of these parking spaces can be dedicated to motorcycle parking.</li> <li>- 1 point is awarded where 5% of total parking provided is designated for use by electric vehicles, and appropriate charging infrastructure is provided.</li> </ul> <p>To achieve both points a total of 25% of parking provided must be designated for use by low-emission vehicles including at least 5% of total parking provided designated for electric vehicles and accompanied by appropriate charging infrastructure.</p> <p>To achieve either point, 80% of the total designated parking spaces must be provided in a preferred location.</p>
<p>1b - Parking for low-emission vehicles for Multi Unit Residential space type</p>	<p>Up to 2 points are available where parking spaces and/or dedicated infrastructure is provided to support the uptake of low-emission vehicles, as per the following:</p> <ul style="list-style-type: none"> <li>- 1 point is awarded where 20% of total parking provided is designated for use by fuel efficient, hybrid or electric vehicles, or motorcycles. Fuel efficient vehicles are defined as those having an overall rated fuel efficiency of 5L/100km or better. A maximum of 5% of these parking spaces can be dedicated to motorcycle parking.</li> <li>- 1 point is awarded where 5% of total parking provided is designated for use by electric vehicles, and appropriate charging infrastructure is provided</li> </ul> <p>OR</p> <p>Dedicated car share space/s and vehicle/s are provided at the rate of 1 per 70 building occupants.</p> <p>To achieve both points a total of 25% of parking provided must be designated for use by low-emission vehicles including at least 5% of total parking provided designated for electric vehicles and accompanied by appropriate charging infrastructure OR provision of dedicated car share spaces and vehicles at the applicable rate.</p> <p>To achieve either point, 80% of the total designated parking spaces must be provided in a preferred location.</p>

## Compliance Requirements

This credit is applicable regardless of the location of the project or the nature of local planning requirements, as neither of these factors lessens the environmental impact of the use of motor vehicles.

If it can be demonstrated that no car parking will be provided as part of the project this credit is not applicable. Projects that provide no car parking may be eligible for points within Inn-2 Exceeding Green Star Benchmarks.

### 1 – Reduced car parking provision

Points are awarded where the number of parking spaces provided meets the maximum rates outlined in Table 1. Where a building has multiple uses a hybrid rate will be determined based on the proportion attributable to each use.

The project's Accessibility Rating is determined through use of the Commuting Mass-Transport Calculator, part of the Commuting Mass-Transport credit.

**Table 1 Maximum car parking rates by Space Use Type**

Space Use Type	Points	Maximum car parking to occupant ratio (1 car space to x building occupants)		
		Accessibility Rating 1	Accessibility Rating 2	Accessibility Rating 3 (highly accessible)
Multi Unit Residential	1	3	3	4
	2	4	4	5
Office	1	5	6	7
	2	7	8	9
Public Building	1	5	6	7
	2	8	9	10
Retail Centre	1	4	5	6
	2	6	7	8
Education	1	15	20	25
	2	20	25	30
Industrial	1	3	4	5
	2	4	5	6
Healthcare	1	2	3	4
	2	3	4	5

Disabled parking spaces may be excluded from the total number of parking spaces included in the submission.

Parking spaces designed to accommodate commercial vehicles required for the industrial or commercial activity in the building (i.e. vehicles not used to transport people to the building) may be excluded from the total number of parking spaces in the Green Star submission. Examples of such parking spaces include, but are not limited to:

- Parking spaces for heavy vehicles; and
- Parking spaces for delivery and distribution vehicles

To exclude these parking spaces they must be clearly marked, for example through use of different coloured line markings and highly visible signage.

Car parks on adjacent sites are generally excluded from the car parking spaces available for the project, whether public or commercial. If external car parking spaces are used to meet the requirements of the development approval, these should be included in the Green Star assessment.

To achieve points in this credit the project must meet the rates outlined in Table 1, irrespective of any local planning requirements for minimum car parking rates.

Total building occupancy is determined by the BCA Review Report prepared by a qualified Building Surveyor which must be provided as part of the credit submission.

## **2 – Low-emission vehicles**

### Parking for fuel efficient, hybrid and electric vehicles

Parking spaces for fuel efficient, hybrid and electric vehicles must be clearly designated, for example through use of different coloured line markings and highly visible signage. Designations must be supported by a management system to ensure use exclusively by fuel-efficient, hybrid and electric vehicles.

Appropriate electric vehicle charging infrastructure must be easily accessed by the users of dedicated electric vehicle charging spaces. It must comply with all relevant standards and health and safety legislation.

### Parking for car share vehicles (Multi Unit Residential space type only)

Parking spaces for car share vehicles should be provided at a rate of 1 per 70 building occupants, and must be clearly designated, for example through use of different coloured line markings and highly visible signage.

## **Guidance**

### **Standards and guidelines noted in this credit**

Electric vehicle charge points must be dedicated points specified in accordance with current best practice for charging infrastructure. This could be in accordance with either IEC 62196 Type 1 or Type 2, with a preference for the Type 2 standard as it allows for three-phase power and therefore faster charging.

### **Definitions**

Fuel-efficient vehicle: Vehicles with an overall rated fuel efficiency of 5L/100km or better.

Suitably qualified professional: Tertiary qualified sustainability professional.

Preferred location: Preferred parking spaces are defined as those located closest to the main entrance of the building or the lift core.

Building occupant: Refers to the total building population (i.e. staff+ visitors in an office building, and staff + student in an education facility) at peak occupancy as per the BCA Review Report.

## **Documentation Guidelines – Design**

Submit all the evidence and ensure it readily confirms compliance.

- Short Report
- Tender drawings showing allocation of car parking spaces, including low-emission vehicle spaces, electric vehicle charging infrastructure and car share vehicle spaces (where provided).
- A letter from a car share vehicle provider, confirming it has been engaged and has committed to providing the requisite number of vehicles for the site.

Where the credit is claimed as 'Not Applicable':

- Development Approval.

**Short report** prepared by a suitably qualified professional that describes how the Credit Criteria have been met by:

- Specifying the Commuting Mass-Transport Calculator Accessibility Score based on the project address.
- Indicating the number of spaces provided and the alignment of this to the rates outlined in Table 1, referencing BCA Review Report, Tender Drawings and Development Approval where relevant.
- Indicating the number and location of spaces provided for low-emission vehicles, referencing Tender Drawings and Development Approval where relevant.

**Tender drawings** of car parking provisions for the site showing the number of car parking spaces in the project, and the location and associated signage of the low-emission vehicle parking spaces.

**Letter** from a car share vehicle provider, confirming it has been engaged and has committed to providing the requisite number of vehicles for the site. This to include term and conditions of the agreement.

**Development Approval** from the relevant authorities stating approved car parking requirements (including if no car parking is to be provided).

## Documentation Guidelines – As Built

Submit all the evidence and ensure it readily confirms compliance.

- |   |
|---|
| <ul style="list-style-type: none"><li>- Short Report</li><li>- As-built drawings showing allocation of car parking spaces, including low-emission vehicle spaces, and electric vehicle charging infrastructure (where provided).</li><li>- A letter from a car share vehicle provider, confirming it has been engaged and has committed to providing the requisite number of vehicles for the site.</li></ul> |
|---|

Where the credit is claimed as 'Not Applicable':

- |   |
|---|
| <ul style="list-style-type: none"><li>- Development Approval.</li></ul> |
|---|

**Short report** prepared by a suitably qualified professional that describes how the Credit Criteria have been met by:

- Specifying the Commuting Mass-Transport Calculator Accessibility Score based on the project address.
- Indicating the number of spaces provided and the alignment of this to the rates outlined in Table 1, referencing BCA Review Report, As-built Drawings and Development Approval where relevant.
- Indicating the number and location of spaces provided for low-emission vehicles, referencing As-built Drawings and Development Approval where relevant.

**As-built drawings** of car parking provisions for the site showing the number of car parking spaces in the project, and the location and associated signage of the low-emission vehicle parking spaces.

**Letter** from a car share vehicle provider, confirming it has been engaged and has committed to providing the requisite number of vehicles for the site. This to include term and conditions of the agreement.

**Development Approval** from the relevant authorities stating approved car parking requirements (including if no car parking is to be provided).

## Alternative Transport

### Aim of Credit

To encourage and reward projects that implement initiatives to encourage the use of alternative transport other than private cars.

### Credit Summary

The Alternative Transport credit seeks to encourage projects to include adequate facilities for transport users other than those who use private cars. The credit requires projects to complete a Travel Plan at an early stage of the design process, and implement the recommendations of the Plan into the design and operation of the building. The purpose of the Travel Plan is to ensure that a suitable professional is engaged to advise the project team of the initiatives that should be considered in the design and provide targets for transport mode share during building operation.

The Travel Plan includes recommendations on the design of active transport facilities. The use of active transport modes requires the provision of appropriate infrastructure within, or in close proximity to, a building. The Alternative Transport credit awards points for the provision of cyclist and end-of trip facilities. These facilities are to be design for use by cyclists, joggers, walkers and other active transport mode users. The encouragement of active transport use can result in significant benefits to environmental, social and economic aspects of sustainability.

### Credit Criteria

There is one conditional item that must be addressed in order to claim any points in this credit. Three points are available for this credit. The point for Facilities for short-term users can only be awarded if at least one point is achieved for Facilities for staff or Facilities for residents.

Minimum Requirement	A Travel Plan is developed for the project that includes: <ul style="list-style-type: none"> <li>- A site-specific transport assessment; and</li> <li>- A report on sustainable transport initiatives.</li> </ul>		
1a – Facilities for staff (applies to all space use types except multi-unit residential)	One point is awarded where secure bicycle parking is provided for 7.5% of total staff, with associated end of trip facilities.  OR  Two points are awarded where secure bicycle parking is provided for 15% of total staff, with associated end of trip facilities.		
1b – Facilities for residents (applies to multi-unit residential projects only)	One point is awarded where one secure bicycle rack is provided per dwelling.  OR  Two points are awarded where one dedicated, enclosed bicycle locker is cage is provided per dwelling.  For apartment buildings classified as housing for seniors or people with a disability, the above requirements are reduced to one bicycle space per two dwellings.		
2 – Facilities for short-term building users	An additional point is awarded if Criterion 1 is met and secure bicycle parking is provided for short-term users as outlined below.		
	<b>Space Use type</b>	<b>Provided for</b>	<b>Number</b>
	Education (Primary or Secondary)	Students	For 40% of students over grade 4

	Education (Tertiary)	Students	For 10% of students, calculated at 75% of peak occupancy
	Multi-Unit Residential	Visitors	For 25% of dwellings
	All other Space Use types	Visitors/Customers	For 5% of peak visitors

Where the project includes a mixture of Space Use types, the requirements for cyclist and end-of-trip facilities shall apply for each Space Use type. For example, if a project is a mixed office and multi-unit residential building, then Criteria 1a and 2 (All other Space Use types) will apply for the office staff and visitors, while Criteria 1b and 2 (Multi-Unit Residential) will apply to the number of dwellings. All visitor bicycle spaces for both Space Use types can be located in the same area as the same general requirements apply to short-term bicycle parking for all projects.

## Compliance Requirements

### Minimum requirement

A Travel Plan must be developed early in the design phase to provide recommendations on initiatives and design features to be implemented in the project to encourage the use of alternative transport other than private cars. The Travel Plan must be based on a site-specific transport assessment and outline specific solutions relevant to the project.

The Travel Plan should be completed at a stage early enough in the design phase to ensure that the recommendations are considered in the project. The Short Report submitted as part of this credit must outline how the recommendations of the Travel Plan were included in the project.

The Travel Plan must include the items listed below:

#### Site-specific transport assessment

The assessment must be carried out before the development approval and reviewed at the final design stage (prior to or during construction). The assessment must consider:

- The local environment for pedestrians and cyclists;
- Public transport links serving the site;
- Facilities for cyclists; and
- Car parking provisions (with a view to minimise the use of cars).

#### Design features for alternative transport

This section is to be based on the site-specific transport assessment and, as a minimum, provide recommendations on the following issues:

- Provision of priority parking spaces for car share schemes;
- Provision of a dedicated path for pedestrians and cyclists from the site entrance to the major building entrance and bicycle parking facilities (where appropriate);
- Provision of dedicated cycle storage facilities and cycle lanes on-site, and adjoining lanes off-site where applicable;
- Improvements to bus services (where appropriate) e.g. altering bus routes or offering discounts;
- Restricting and/or charging (metering) for car parking; and
- Considerations in the location and design of all alternative transport design features to encourage maximum utilisation of these facilities

### Operational opportunities for alternative transport

This section must include a plan of measures that encourages travel options with low environmental impact during building operation. The plan must address the following as a minimum:

- Reduction in single occupancy car journeys to and from the facility e.g. car sharing;
- Promotion of walking;
- Promotion of cycling;
- Promotion of public transport;
- Deliveries and contractor vehicles;
- Visitors' transport; and
- Set targets for the mode share for building users' transport to and from the building. The targets must be based on design and operational initiatives recommended by the plan

### Building users' information

This section must provide recommendations on how information about alternative transport facilities, e.g. walking, cycling and public transport, will be communicated to the building users.

### **General requirements for cyclist and end-of-trip facilities**

#### Number of staff and short-term users

The number of staff and visitors shall be confirmed by the building owner.

The number of staff should be the maximum number of staff that will work in the building at the same time during a month of standard operation. The figures should include all staff i.e. not only staff employed by the main building user, but also staff such as temporary exhibitors, event staff, security personnel, staff in leased areas and cleaners.

The number of short-term building users (students, visitors or customers) shall be confirmed by the building owner. The number should be the maximum short term users within the building at the same time during a month of standard operation.

#### External cyclist and end of trip facilities

The following requirements must be met for cyclist and end of trip facilities located outside the site of the assessed building to be included in the assessment:

- External facilities can only be assessed and rewarded if they are provided for the life of the building to the same degree of service and certainty as internal facilities;
- The external facilities are in close proximity to the assessed building and the access route is clearly marked and sign-posted, convenient and secure;
- The assessed building and the external facilities are under the same ownership and cannot change ownership separately (i.e. they are on the same title or equivalent);
- The assessed building and the amenities are under the same management and cannot change management separately;
- The external facilities are completed by the date of practical completion of the assessed building; and
- The external facilities meet the Credit Criteria and are properly documented.

The scope of assessment is not extended beyond the assessed building, i.e. the building within which the external facilities are housed does not need to meet the Credit Criteria of any claimed credits; only the cyclist and end of trip facilities will be assessed against the Credit Criteria.

## 1a – Facilities for staff (applies to all building types except multi-unit residential)

### End of trip facilities

For the purposes of this credit end of trip facilities for staff include:

- Showers;
- Changing amenities with appropriate drying space; and
- Lockers

The number of showers and lockers must be calculated based on total staff numbers, as per the following table.

Number of staff	Showers	Lockers
0-12	1 (unisex)	1.2 per 1 bicycle rack
13-49	2	1.2 per 1 bicycle rack
50-149	4	1.2 per 1 bicycle rack
150-299	6	1.2 per 1 bicycle rack
300-500	8	1.2 per 1 bicycle rack
Greater than 500	Additional 2 per extra 250 staff	1.2 per 1 bicycle rack

Lockers must be located within the changing amenities. Lockers must be sized to accommodate normal work clothing, i.e. should not be significantly smaller than 80cm tall by 25cm wide (for box lockers) or 180cm tall by 40cm wide (for 'L-shaped' double lockers).

The changing amenities must be adjacent to the showers. To be deemed adjacent, changing amenities must be immediately adjacent to the showers or for refurbishments, be located on the same floor with direct access that avoids crossing of public spaces such as lift lobbies, reception areas or primary circulation spaces.

Unisex facilities can meet the requirements for the credit criteria if a level of privacy is provided for the showering and changing (i.e. opaque partitions and provide changing amenities adjacent to the showers). Project teams are advised to seek professional advice about whether unisex change amenities are compliant with the BCA.

Toilet facilities can only count as changing amenities if there is sufficient private space and lockers. The minimum number of toilets for people cannot contribute to the total number of changing amenities provided, as doing so may detract from their availability for use by people with disabilities.

The changing amenities must include a specifically designed and designated drying space for wet clothes with adequate heating/ventilation. The drying space must be adequately sized to allow users of the facilities to hang items such as towels and wet clothes on inclement weather days.

The total required number of showers and lockers does not have to be provided in one area.

### Staff bicycle parking

The following requirements must be met for a bicycle parking space to be considered secure:

- Security: The parking spaces must be designed to allow both a wheel and the frame to be locked securely to the structure in accordance with AS2890.3 Bicycle Parking Facilities;
- Protected from the elements: The secure bicycle parking spaces must be protected from precipitation;
- Convenient location: The secure bicycle spaces must be in a convenient location, i.e. either inside the building or outside on the site. The location must be clearly signposted, with directions from the main entrance of the building to the bicycle parking spaces. Refer to AS2890.3 Bicycle Parking Facilities for further guidance; and
- Lighting: Bicycle parking spaces located outdoors must be lit in accordance with AS1158 Lighting for Roads and Public Spaces, part 3.1 Pedestrian Area Lighting.

A bicycle shed or similar locked area with an impermeable roof and walls with access for staff only is deemed to comply with the safety and weather protection provisions, but must meet the provisions for convenient location outlined above. Refer to AS2890.3 Bicycle Parking Facilities for further guidance.

### **1b – Facilities for residents (applies to multi-unit residential projects only)**

The following requirements must be met for a bicycle parking space to be considered secure:

- Security (1 point): Where bicycle racks are provided for one point, the parking spaces must be designed to allow both a wheel and the frame to be locked securely to the structure in accordance with AS2890.3 Bicycle Parking Facilities;
- Security (2 points): Where bicycle cages or lockers are provided for two points, the facility must be locked with access for residents only;
- Protected from the elements: The secure bicycle parking spaces must be protected from precipitation;
- Convenient location: The secure bicycle spaces must be in a convenient location, i.e. either inside the building or outside on the site. The location must be clearly signposted, with directions from the main entrance of the building to the bicycle parking spaces. Refer to AS2890.3 Bicycle Parking Facilities for further guidance; and
- Lighting: Bicycle parking spaces located outdoors must be lit in accordance with AS1158 Lighting for Roads and Public Spaces, part 3.1 Pedestrian Area Lighting.

### **2 – Facilities for short-term building users**

The following requirements apply to bicycle parking spaces for short-term building users:

- Security: The parking spaces must be designed to allow both a wheel and the frame to be locked securely in accordance with AS2890.3 Bicycle Parking Facilities;
- Protected from the elements: The secure bicycle parking spaces must be protected from precipitation;
- Convenient location: The bicycle parking spaces must be located close or adjacent to a major public entrance in an accessible location that is clearly signposted. Refer to AS2890.3 Bicycle Parking Facilities for further guidance; and
- Lighting: Bicycle parking spaces located outdoors must be lit in accordance with AS1158 Lighting for Roads and Public Spaces, part 3.1 Pedestrian area lighting.

## **Guidance**

### **Standards and guidelines noted in this credit**

AS2890.3 Parking Facilities Part 3: Bicycle Parking Facilities

AS1158 Lighting for Roads and Public Spaces, Part 3.1: Pedestrian area lighting

### **Definitions**

**Major public entrance:** A public entrance to the building that is accessible from a public plaza, main street or avenue (e.g. not the entrance from a side street unless the side street is the only entrance to the building). Furthermore, the entrance to a multi-storey carpark will also be considered to be a major public entrance if the bicycle facilities for short-term users are clearly signposted at the entry to the carpark and the designated parking is no more than one split level away (in either direction).

**Close to a major public entrance:** Located in direct line of sight from a major public entrance of the building a no more than 50 meters away. Where the bicycle facilities for short-term users are not located within a direct line of sight from a major public entrance, then a sign indicating the location of the bicycle spaces must be posted at the major public entrance of the building.

## Documentation Guidelines – Design

Submit all the evidence and ensure it readily confirms compliance.

- Short report
- Draft Travel Plan
- Tender drawings
- Letter from the building owner (not required for multi-unit residential projects)

**Short Report** prepared by a suitable professional that describes how the Credit Criteria have been met by:

For the Travel Plan:

- Describing the timing and process of developing the site-specific transport assessment and the travel plan; and
- Justifying how the recommendations of the Travel Plan were included in the project's design.

For bicycle facilities for staff or residents:

- Calculating the number of cyclist facilities required to meet the Credit Criteria;
- Stating how many cyclist facilities are provided;
- Describing how the bicycle storage meets the credit criteria for security, weather protection and lighting;
- Justifying the convenience of the location of the secure bicycle storage; and
- Describing how the showers, lockers and changing facilities meet the compliance requirements.

Where the point for short-term user bicycle parking spaces is claimed:

- Calculating the number of short-term user bicycle parking spaces required to meet the Credit Criteria
- Stating how many short-term user bicycle parking spaces are provided;
- Describing how the short-term use bicycle parking spaces meet the criteria for security, weather protection and lighting; and
- Justifying the convenience of the location of bicycle parking for short-term users.

**Draft Travel Plan** including a site-specific transport assessment and transport improvements as outlined in the Compliance Requirements.

**Tender Drawings** showing the provision and location of cyclist facilities, end-of-trip facilities and other facilities as recommended by the Draft Travel Plan

**Letter from the Building Owner** (not required for multi-unit residential projects):

- Stating the maximum number of staff that will work in the building at the same time during a month of operation;
- Stating the maximum number of short-term building users (visitors or students) in the building at the same time during a month of standard operation; and
- Describing the methodology used to determine the number of staff and short-term building users.

## Documentation Guidelines – As Built

Submit all the evidence and ensure it readily confirms compliance.

- Short report
- Draft Travel Plan
- Tender drawings
- Letter from the building owner (not required for multi-unit residential projects)

**Short Report** prepared by a suitable professional that describes how the Credit Criteria have been met by:

For the Travel Plan:

- Describing the timing and process of developing the site-specific transport assessment and the travel plan; and
- Justifying how the recommendations of the Travel Plan were included in the project's design.

For bicycle facilities for staff or residents:

- Calculating the number of cyclist facilities required to meet the Credit Criteria;
- Stating how many cyclist facilities are provided;
- Describing how the bicycle storage meets the credit criteria for security, weather protection and lighting;
- Justifying the convenience of the location of the secure bicycle storage; and
- Describing how the showers, lockers and changing facilities meet the compliance requirements.

Where the point for short-term user bicycle parking spaces is claimed:

- Calculating the number of short-term user bicycle parking spaces required to meet the Credit Criteria
- Stating how many short-term user bicycle parking spaces are provided;
- Describing how the short-term use bicycle parking spaces meet the criteria for security, weather protection and lighting; and
- Justifying the convenience of the location of bicycle parking for short-term users.

**Travel Plan** including a site-specific transport assessment and transport improvements as outlined in the Compliance Requirements.

**As-built Drawings** showing the provision and location of cyclist facilities, end-of-trip facilities and other facilities as recommended by the Travel Plan

**Letter from the Building Owner** (not required for multi-unit residential projects):

- Stating the maximum number of staff that will work in the building at the same time during a month of operation;
- Stating the maximum number of short-term building users (visitors or students) in the building at the same time during a month of standard operation; and
- Describing the methodology used to determine the number of staff and short-term building users.

## Commuting Mass Transport

### **Aim of Credit**

To encourage and recognise developments that facilitate the use of mass transport.

### **Credit Summary**

TBC – AECOM is in the process of completing the calculator and documentation associated with this credit.

### **Credit Criteria**

Up to 5 points are available in this credit. There is one conditional item that must be addressed in order to claim any points in this credit.

TBC

### **Compliance Requirements**

TBC

### **Documentation Guidelines – Design**

TBC

### **Documentation Guidelines – As Built**

TBC

## Walkable Neighbourhoods

### Aim of Credit

To encourage and recognise developments that are integrated with or built adjacent to local amenities in order to reduce the overall all number of car trips taken by users of the development.

### Credit Summary

The Walkable Neighbourhoods credit addresses the importance of selecting sites that are located within walking distance of a variety of high quality amenities. Where amenities are located within close proximity, the likelihood of building occupants choosing to walk or cycle these short distances increases, and satisfaction increases due to increased convenience and reductions to travel time. Sites that are located within walkable distance to other amenities also result in significant environmental benefits such as reduced necessity for carbon-intensive private transport.

### Credit Criteria

Up to two points are available for this credit.

<p>1a – Facilities that apply to all space use types except industrial)</p>	<p>2 points are awarded where it is demonstrated that: At least 10 amenities are within 400m of the development OR The project achieves a Walk Score® of at least 90, as determined by the website <a href="http://www.walkscore.com">www.walkscore.com</a>, using their 'street smart' method of calculation.</p> <p>1 point is awarded where it is demonstrated that: At least 8 amenities are within 400m of the development OR The project achieves a Walk Score® of at least 80, as determined by the website <a href="http://www.walkscore.com">www.walkscore.com</a>, using their 'street smart' method of calculation.</p>
<p>1b – Facilities that apply to an industrial space use type</p>	<p>2 points are awarded where it is demonstrated that: At least 6 amenities are within 400m of the development OR The project achieves a Walk Score® of at least 80, as determined by the website <a href="http://www.walkscore.com">www.walkscore.com</a>, using their 'street smart' method of calculation.</p> <p>1 point is awarded where it is demonstrated that: At least 4 amenities are within 400m of the development OR The project achieves a Walk Score® of at least 70, as determined by the website <a href="http://www.walkscore.com">www.walkscore.com</a>, using their 'street smart' method of calculation.</p>

### Compliance Requirements

Examples of amenities for the purpose of this credit include, but are not limited to:

- Convenience stores;
- Pharmacies;
- Post offices;
- Restaurants, food and beverage;
- Gyms, pools and sports facilities;
- Hospitals, clinics and healthcare centres;
- Cinemas and theatres;
- Supermarkets and grocery stores;
- Libraries;
- Banks or ATMs;
- Public parks;
- Community centres;

- Childcare centres;
- Newsagencies;
- Retail centres;
- Churches; and
- Education facilities (i.e. schools and tertiary institutions)

Please note that this is by no means an exhaustive list, but rather can be used as a guide when submitting for this credit. If additional amenities are identified, the project team is encouraged to submit a Credit Interpretation Request to confirm that such amenity may be added to this list.

For the purposes of this credit, amenities may be located off-site, or be located on-site as part of the project's development.

A similar type of amenity to that of the development cannot be considered as such for purposes of this project. That is, a project with residential units cannot consider other residences as amenities. Where there are two or more of any one amenity this will count as only 2 amenities. (For example, 3 restaurants will only count as 2 amenities, 4 convenience stores will only count as 2 and so on).

## Documentation Guidelines – Design & As Built

Submit all the evidence and ensure it readily confirms compliance.

- Short report
- Where [www.walkscore.com](http://www.walkscore.com) is used to demonstrate compliance:
  - Printout from the Walk Score® website
- Where a manual calculation method is used:
  - Site plan
  - Evidence of location of amenities

**Short Report** that describes how the Credit Criteria have been met by:

- Stating how the development satisfies the Credit Criteria, referencing the evidence provided; and
- Including a summary table for all amenities, with the type and the distance to the building stated.

**Printout from the Walk Score®** website showing the result achieved for the project location and all recognised amenities.

**Site plan:**

- To scale, in context of the surrounding area showing the location of the development and the amenities.
- With the walking route highlighted, with the distance displayed

**Evidence of location of amenities** such as Google Maps printout, White Pages, Yellow Pages, 'Streetview' (image and map) or equivalent, showing the location and type of each local amenity including listing of addresses.

# Carbon Emissions from Transport

## Aim of Credit

To reward projects that implement design and operational measures to reduce the carbon emissions from staff transport to and from the project compared with a benchmark building.

## Credit Summary

The Carbon Emissions from Transport credit provides an alternative pathway for projects to be awarded points in the Transport category who do not wish to follow the prescriptive requirements pathway. Using the Transport Calculator, points are awarded for demonstrating that the project has implemented design and operational measures to reduce its transport-related carbon emissions.

The Transport Calculator also rewards projects for increasing the uptake of active transport modes (for example, by providing cyclist and end-of-trip facilities) and selecting a site with high walkability to a range of amenities.

This credit also requires projects to complete a Travel Plan at an early stage of the design process, and implement the recommendations of the Plan into the design and operation of the building. The purpose of the Travel Plan is to ensure that a suitable professional is engaged to advise the project team of the initiatives that should be considered in the design and provide targets for transport mode share during building operation.

## Credit Criteria

Up to 12 points are available in this credit. There is one conditional item that must be addressed in order to claim any points in this credit.

Minimum Requirement	A Travel Plan is developed for the project that includes: <ul style="list-style-type: none"><li>- A site-specific transport assessment; and</li><li>- A report on sustainable transport initiatives.</li></ul>
Carbon emissions from transport	Up to 12 points are awarded where the carbon emissions from staff transport to and from the building is predicted to be reduced compared with a benchmark building, as determined by the Transport Calculator

Note that this credit only refers to permanent staff within the building.

## Compliance Requirements

### Minimum requirement

A Travel Plan must be developed early in the design phase to provide recommendations on initiatives and design features to be implemented in the project to encourage the use of alternative transport other than private cars. The Travel Plan must be based on a site-specific transport assessment and outline specific solutions relevant to the project.

The Travel Plan should be completed at a stage early enough in the design phase to ensure that the recommendations are considered in the project. The Short Report submitted as part of this credit must outline how the recommendations of the Travel Plan were included in the project.

The Travel Plan must include the items listed below:

#### Site-specific transport assessment

The assessment must be carried out before the development approval and reviewed at the final design stage (prior to or during construction). The assessment must consider:

- The local environment for pedestrians and cyclists;
- Public transport links serving the site;
- Facilities for cyclists; and
- Car parking provisions (with a view to minimise the use of cars).

#### Design features for alternative transport

This section is to be based on the site-specific transport assessment and, as a minimum, provide recommendations on the following issues:

- Provision of priority parking spaces for car share schemes;
- Provision of a dedicated path for pedestrians and cyclists from the site entrance to the major building entrance and bicycle parking facilities (where appropriate);
- Provision of dedicated cycle storage facilities and cycle lanes on-site, and adjoining lanes off-site where applicable;
- Improvements to bus services (where appropriate) e.g. altering bus routes or offering discounts;
- Restricting and/or charging (metering) for car parking; and
- Considerations in the location and design of all alternative transport design features to encourage maximum utilisation of these facilities

#### Operational opportunities for alternative transport

This section must include a plan of measures that encourages travel options with low environmental impact during building operation. The plan must address the following as a minimum:

- Reduction in single occupancy car journeys to and from the facility e.g. car sharing;
- Promotion of walking;
- Promotion of cycling;
- Promotion of public transport;
- Deliveries and contractor vehicles;
- Visitors' transport; and
- Set targets for the mode share for building users' transport to and from the building. The targets must be based on design and operational initiatives recommended by the plan

#### Building users' information

This section must provide recommendations on how information about alternative transport facilities, e.g. walking, cycling and public transport, will be communicated to the building users.

#### **Carbon emissions from transport**

Additional compliance requirements for this credit are addressed in the Carbon Emissions from Transport Calculator Guide.

## Documentation Guidelines – Design

Submit all the evidence and ensure it readily confirms compliance.

- Short Report
- Draft Travel Plan
- Tender drawings

**Short Report** prepared by a suitable professional that describes how the Credit Criteria have been met by:

- Describing the timing and process of developing the site-specific transport assessment and the Travel Plan;
- Justifying how the recommendations of the Travel Plan were included in the project's design;
- Justifying the improvements in carbon emissions from transport and the inputs into the Transport Calculator. Refer to the Carbon Emissions from Transport Calculator for details on justifying improvements in carbon emissions.

**Draft Travel Plan** including a site-specific transport assessment and transport improvements as outlined in the Compliance Requirements

**Tender Drawings** showing the provision and location of transport facilities as recommended by the Draft Travel Plan, and justifying inputs into the Transport Calculator

## Documentation Guidelines – As Built

Submit all the evidence and ensure it readily confirms compliance.

- Short Report
- Travel Plan
- As-built drawings

**Short Report** prepared by a suitable professional that describes how the Credit Criteria have been met by:

- Describing the timing and process of developing the site-specific transport assessment and the Travel Plan;
- Justifying how the recommendations of the Travel Plan were included in the project's design;
- Justifying the improvements in carbon emissions from transport and the inputs into the Transport Calculator. Refer to the Carbon Emissions from Transport Calculator for details on justifying improvements in carbon emissions.

**Travel Plan** including a site-specific transport assessment and transport improvements as outlined in the Compliance Requirements

**As-built Drawings** showing the provision and location of transport facilities as recommended by the Travel Plan, and justifying inputs into the Transport Calculator