



# Green Star

# Public Transport Calculator Guide

11 April 2019

## Changelog

Date	Release	Change
11/04/2019	NZv1.0	Initial release in New Zealand.

## Contents

Changelog.....	1
Contents.....	2
1.0 Introduction.....	3
1.1 Rating tools & credits .....	3
2.0 Distance to Site .....	4
2.1 Number of services for each route .....	4
2.2 Compliant routes .....	5
2.3 Proximity to a public transport interchange .....	5
3.0 Industrial Project.....	8
3.1 Compliant public mass transport services.....	8
3.2 Compliant private mass transport services .....	9

## 1.0 Introduction

Using the Public Transport Calculator involves three steps:

1. Determine the types of public transport stopping within 1000m walking distance of the building.
2. Determine which routes are 'compliant routes'.
3. Determine the number of services during peak morning (6.30am to 8.30am) and peak afternoon (4.30pm to 6.30 pm) periods on Monday to Fridays that occur in the following intervals:
  - Number of services  $\leq$  15 minute frequency
  - 15 minute frequency  $<$  Number of services  $\leq$  30 minute frequency

Notes:

If more than half of the services during the peak morning and afternoon period have a frequency of less than or equal to 15 minutes then this is a compliant route and should be entered in the 15 minutes frequency column of the calculator.

Similarly, if more than half of the services during the peak morning and afternoon period have a frequency greater than 15 minutes and less than or equal to 30 minutes, then this is a compliant route and should be entered in the 30 minutes frequency column of the calculator.

If the site is within 15 minutes of a public transport interchange that is connected by a mode of public transport, then the compliant route available from the interchange can be included in the calculator with the following modifications:

- The number of routes going to the interchange for each type is to be halved;
- The distance to be entered for interchange services is equal to the distance from the site to the connecting service plus 250m; and
- Any connecting route from the interchange that terminates within 1000m of the site only counts as half of one route (e.g. enter 0.5 instead of 1 for that service).

Public transport interchange can be further defined as a location where passengers are exchanged across several modes of transport. To be compliant, an interchange must connect two alternate modes of transport.

### 1.1 Rating tools & credits

Please review this table to understand how this guide applies to your project.

Rating Tool	Credit / Criterion	Notes
Green Star – Design and As Built NZv1.0	17	<b>Up to 10 points</b> are available where projects provide access to sustainable transport infrastructure as demonstrated using specified prescriptive criteria.
Green Star – Interiors NZv1.0	17	<b>Up to 7 points</b> are available where projects provide access to sustainable transport infrastructure as demonstrated using specified prescriptive criteria.

## 2.0 Distance to Site

The distance to a mass transport node is to be measured as actual pedestrian walking distance (not as 'the crow flies') from a major building entrance.

### 2.1 Number of services for each route

The project team needs to determine the number of services for each compliant route during weekday peak hours from current timetables with a frequency of less than either 15 minutes or 30 minutes as appropriate.

The calculator does not assess the number of services outside of peak periods as there is generally a good correlation between peak and off-peak services, indicating the overall quality of the available mass transport. The morning peak period is 6.30am to 8.30am and the afternoon peak period is 4.30pm to 6.30pm.

The number of services and its frequency for a particular route during the peak periods is calculated as shown in the example below:

Between 6.30 am and 8.30 am the times for a particular service route are:

Time	Time between services (minutes)
7.25am	-
7.45am	20
8.00am	15
8.15am	15
8.25am	10
8.35am	10
8.50am	15
9.05am	15
9.25am	15
9.40am	20

Table 1: Example of times for a particular service

Between 4.30am and 6.30 am the times for a particular service route are:

Time	Time between services (minutes)
4.20pm	-
4.40pm	20
4.55pm	15
5.05pm	10
5.15pm	10
5.25pm	10
5.35pm	10
5.45pm	10
6.00pm	15
6.15pm	15
6.30pm	15

Table 2: Example of times for a particular service

Number of morning peak services = 9 (7 services ≤ 15minutes, 15minutes < 2 services ≤ 30minutes)

Number of afternoon peak services = 10 (10 services ≤ 15 minutes)

## 2.2 Compliant routes

A compliant route must provide service during the morning and afternoon peak period.

In the example above more than half its services during the peak morning interval occur at less than a 15 minute interval and all its peak afternoon services occur less than or equal to a 15 minute interval. Therefore this is classified as a compliant route.

The project team needs to determine the type of mass transport services available within 1000m of the site. Available bus, tram, ferry or train services can be counted. Airplane travel is not considered a form of mass transport.

The project team also need to determine the number of mass transport services stopping at each stop within 1000m walking distance of the building. If a transport route provides services in two directions, it is to be counted as two services. Please note that in some locations the services in each direction may not have the same frequencies. However, any route that terminates within 2km of the site is to be counted as half of one service (enter 0.5 instead of 1 into the calculator).

Only the services which arrive at the stop can be used to calculate the average interval for the morning peak period. Conversely only the services that depart from the site can be used to calculate the afternoon peak period.

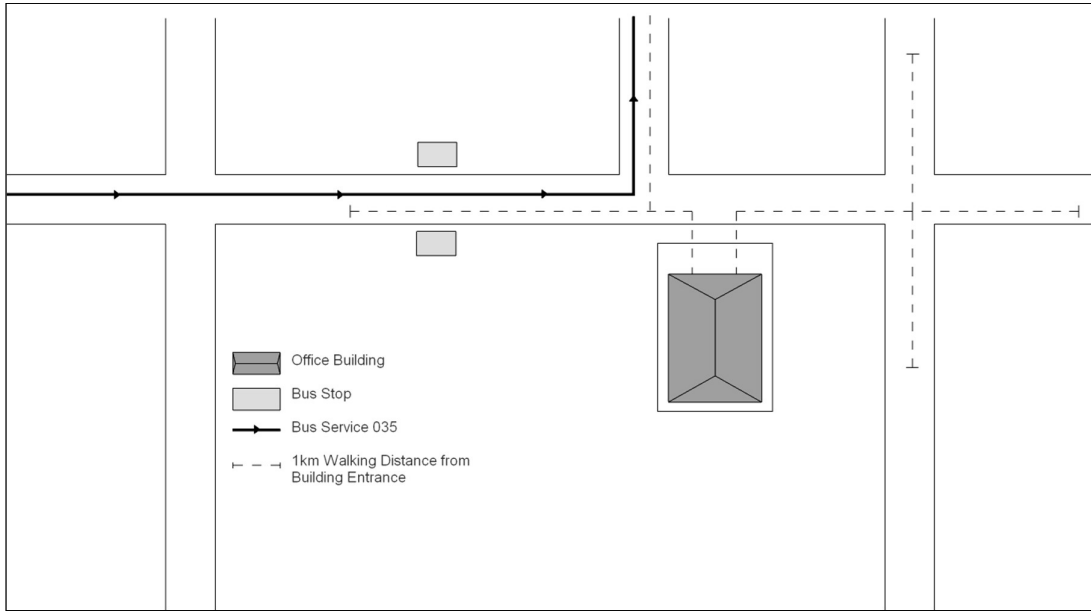
In addition, only one stop per route can contribute to calculations. Even if a service stops at more than one stop within 1000m from the site, it is to be counted once as the building occupants are most likely to catch this service closest to the site.

## 2.3 Proximity to a public transport interchange

The services available to building occupants at an interchange that is further than 1000m away from the site can be entered into the calculator if the interchange is accessible by mass transport with service intervals of no greater than 30 minutes and stop(s) within 1000m from the site. The services available at that interchange must be entered with the following modifications:

- The number of services available at the interchange are to be halved; and
- The distance to be entered for interchange services is equal to the distance from site to the connecting service plus 250m.

To assist with completion, a worked example is provided below.



The average frequency of the 035 service during peak periods is calculated as shown in the table below.

The frequency of service 035 between 6:30am and 8:30am:	
Time	Time between services (minutes)
6:45am	-
7:00am	15
7:15am	15
7:40am	25
8:00am	20
8:15am	15
8:25am	10

Table 3: Example of morning peak period frequency for a particular service

The frequency of service 035 between 4:30pm and 6:30pm:	
Time	Time between services (minutes)
4:40pm	-
4:55pm	15
5:10pm	15
5:20pm	10
5:35pm	15
5:55pm	20
6:15pm	20
6:30pm	15

Table 4: Example of afternoon peak period frequency for a particular service

Once the area of the zone of compliance has been calculated the percentage of compliant nominated area can be calculated.

The intervals between each time that the service stops (at the closest stop) during both the morning and afternoon peak periods is totalled and an average attained e.g. the intervals between all morning service stops (15+15+25+20+15+10) + the intervals between all afternoon service stops (15+15+10+15+20+20+15) = 210 minutes, which is then averaged (÷ 13). The average frequency of service 035 is 16 minutes.

It is the average frequency that a particular service stops at the closest stop that determines in which column it is accounted for in the Public Transport Calculator. In this example the average frequency for the 035 service across both morning and afternoon peak periods is 16 minutes. Therefore 1 would be entered into the 15 < f ≤ 30 min column of the Public Transport Calculator. The row in which the 1 is inputted would be determined by the distance between the building and the closest stop.

The following notes covered under Compliant Routes still apply:

If a compliant service passes a particular stop in two directions, it is to be counted as two services within the Public Transport Calculator. Please note that in some locations the services in each direction may not have the same frequencies.

If a public transport service terminates within 2km of the building entrance then that service only counts as half of one service (i.e. enter '0.5' instead of '1' into the Public Transport Calculator for that service).

Only one stop per service can be accounted for within the Public Transport Calculator, despite a service stopping at more than one stop within 1km from the building entrance. Each service stopping within 1km of the building entrance is only counted once as building users are most likely to catch the service at the stop closest to the building.

### 3.0 Industrial Project

This section of the guide demonstrates compliant mass transport services.

#### 3.1 Compliant public mass transport services

For public mass transport services to be considered compliant the following must apply:

- All public mass transport services must connect with the closest public transport interchange centre.
- Each particular service must run during both the morning and the afternoon peak periods.
- The relevant stop must be located within 1km of the building entrance.

Guidance to calculating compliant public mass transport services:

- Determine the types of public transport stopping within 1km walking distance of the building entrance.
- Determine which services are 'compliant'.

The project team needs to determine the type of mass transport services available within 1km of the building entrance. Available bus, tram, ferry or train services can be counted. Airplane travel is not considered a form of mass transport.

A service that arrives at (in the morning) and departs from (in the afternoon) a stop within 1km of the building entrance, and connects with the closest public transport interchange centre, is considered to be a compliant service.

Only one stop per service can be accounted for despite a service stopping at more than one stop within 1km from the building. Each service stopping within 1km of the building is only counted once as the building users are most likely to catch the service at the stop closest to the building.

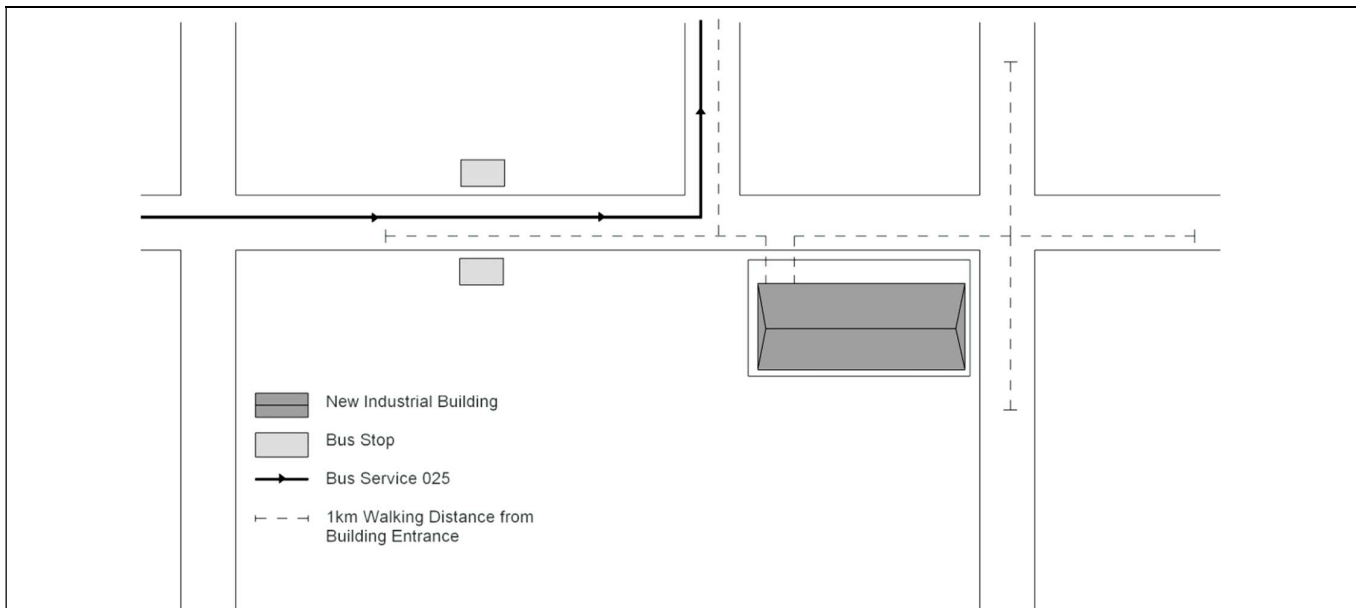


Diagram 1: Example of compliant public transport service

The 025 service has a frequency of  $\leq 30$  minutes during both peak periods and is located within 1km walking distance. The service also connects with the closest public transport interchange.



### 3.2 Compliant private mass transport services

For private mass transport services to be considered compliant the following must apply:

- All private mass transport services must connect with the closest public transport interchange centre or be demonstrated as adequately servicing the transportation needs of building staff, who may not necessarily live within the local area.
- Private mass transport services must serve at least 10% of building staff at the beginning and end of each shift associated with the building.
- All services must originate and terminate at the entrance of the building and be contracted for a minimum of two years from initial occupancy of the building.