Active Travel Toolbox

The Infrastructure Impact Tool

Guidance notes

Delivered by Sustrans in partnership with:

Written by Sustrans with support from Dr Adrian Davis, The TAS Partnership Limited and Living Streets.

About Sustrans

Sustrans is the charity making it easier for people to walk and cycle.

We are engineers and educators, experts and advocates. We connect people and places, create liveable neighbourhoods, transform the school run and a deliver a happier, healthier commute.

Sustrans works in partnership, bringing people together to find the right solutions. We make the case for walking and cycling by using robust evidence and showing what can be done.

We are grounded in communities and believe that grassroots support combined with political leadership drives real change, fast.

Join us on our journey. www.sustrans.org.uk

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Table of contents

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1. Introduction

This document provides guidance on how to use Sustrans' Infrastructure Impact Tool (IIT). The IIT estimates the impact, primarily in terms of increases in the number of cycle trips, of investments in specific types of cycling infrastructure.

It uses data from a range of previous interventions to develop a category model for different types of infrastructure, calculating the typical impact of those interventions[1]. This document details the inputs required by the tool, and explains the resulting outputs.

It should be noted from the outset that this tool does not attempt to provide a definitive measure of the impact of an intervention. It should be used as part of a range of sources for forecasting the impact of a proposed intervention and should have appropriate sensitivity testing applied to the outputs. The tool does not make any attempt to identify the extent of displacement from alternative routes so this should be considered when reporting the results. It is also important to note that the IIT does not take into consideration pedestrian usage and should not be used for this purpose.

Where appropriate optimism bias has been accounted for by using conservative assumptions.

1. The data has been collected from interventions making up the Connect2 (funded by Big Lottery), Linking Communities (2012/13 and 2013/14) (funded by the Department for Transport) and Cycle Safety Fund (funded by the Department for Transport) programmes of investment, totalling 112 separate interventions. Automatic cycle counters and manual counts were used to determine the level of usage while Route User Intercept Surveys (RUIS) were used to collect data on the user profiles.

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2. Inputs

There are four inputs required for the IIT (Figure 2-1). The sections below explain each of these in turn.

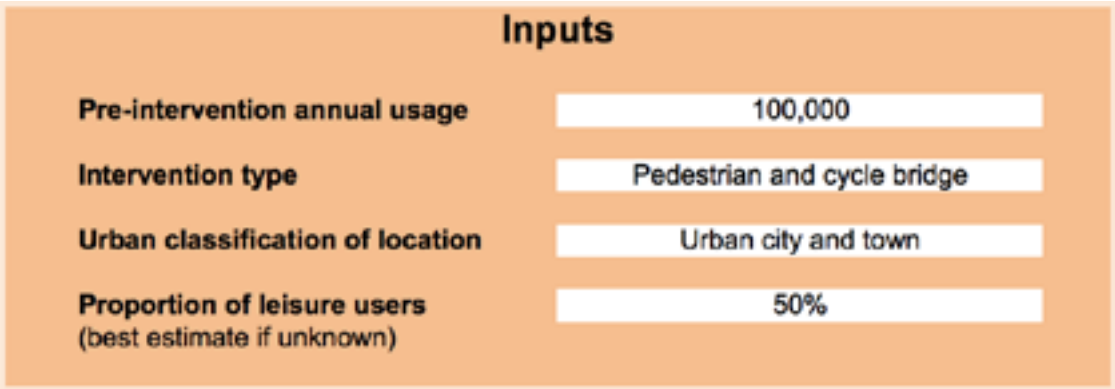

Figure 2-1 Model inputs

2.1 Pre-intervention annual usage

This input is a measure of the level of cycling at the intervention location prior to the intervention. Continuous counts from automatic cycle counters (ACC) are the most robust source of this data, but annualised estimates calculated from temporary counts can also be used. In all cases the data must be presented as the total number of trips taking place each year.

Estimating pre-intervention usage is more complicated when the intervention involves creating a new route that was not previously available (e.g. locations where a new bridge is being installed). In these case there is no pre-intervention usage so the IIT is unable to estimate a proportional increase in usage following the installation of the infrastructure.

In these situations the most robust approach is to estimate the number of existing cycling trips that would have used the proposed infrastructure were it in place. In effect, this is estimating the number of trips that would be displaced from existing routes onto the new infrastructure. This approach is used as this type of intervention is likely to be considered only in scenarios where comprehensive displacement to the new infrastructure is expected.

This approach to estimating pre-intervention usage can be done using a variety of methods. A GIS approach using network routing and some form of origin/destination data is recommended. In cases where this is not possible, a best estimate approach using data from nearby routes might be appropriate as long as it is supported by a clear explanation of the assumptions made.

2.2 Intervention type

Sustrans' experience indicates that different types of infrastructure interventions have an influence on the number of trips likely to be achieved from investment. Four intervention categories are included in the tool:

- Cycle and pedestrian tracks
- Pedestrian and cycle bridge
- On-road cycle lanes
- Other intervention types

Although more categories would be possible, most interventions can be characterised according to these categories. Interventions that feature multiple types of infrastructure should be categorised according to the main element of the proposed intervention.

2.3 Urban classification of location

To simulate the level of demand for active travel, the IIT groups intervention according to the urban/rural classification of the scheme location. The urban classification used in the tool is based on the Office of National Statistics 2011 rural/ urban classification for Lower Super Output Areas (LSOA) in England and Wales[2]. However, because of the relatively small number of LSOAs in some categories, the IIT combines some of the groups (Table 2-1).

Table 2-1 Rural/urban classification of LSOAs in England and Wales (2011)

Class	ONS classification	IIT classification
Urban	Major Conurbation	Urban conurbation (major and minor)
	Minor Conurbation	
	City and Town	Urban city and town
	City and Town in a Sparse Setting	
Rural	Town and Fringe	All rural
	Town and Fringe in a Sparse Setting	
	Village and Dispersed	
	Village and Dispersed in a Sparse Setting	

Different urban/rural classification systems are in use in Scotland and Northern Ireland. In these cases, the equivalences shown in tables 2-2 and 2-3 should be used.

2. http://webarchive.nationalarchives.gov.uk/20160105160709/http://www.ons.gov.uk/ons/guide-method/geography/products/area-classi cations/2011-rural-urban/index.html

Table 2-2 Scottish Government 8 fold Urban Rural Classification (2013-14)

Label	Name	Equivalent IIT classification
1	Large Urban Areas	Urban conurbation (major and minor)
2	Other Urban Areas	Urban city and town
3	Accessible Small Towns	
4	Remote Small Towns	
5	Very Remote Small Towns	
6	Accessible Rural Areas	All rural
7	Remote Rural Areas	
8	Very Remote Rural Areas	

Source: http://www.gov.scot/Topics/Statistics/About/Methodology/UrbanRuralClassification

Table 2-3 Northern Ireland Settlement Development Limits (2015)

Label	Name	Equivalent IIT classification
Band A	Belfast Metropolitan Urban Area	Urban conurbation (major and minor)
Band B	Derry Urban Area	Urban city and town
Band C	Large town	
Band D	Medium town	
Band E	Small town	
Band F	Intermediate settlement	All rural
Band G	Village	
Band H	Small village, hamlet and open countryside	

Source: http://www.nisra.gov.uk/geography/UrbanRural.htm

In scenarios where an intervention runs across several differently classified LSOAs, the highest level of urban classification of the relevant LSOAs should be used.

2.4 Proportion of leisure users

This input variable is used to estimate the proportion of trips that could have been made by car. In most cases the data for this input will be gathered from pre-intervention surveys of route users, but where this is not possible a best estimate can be used.

3. Outputs

This part of the document explains the outputs of the IIT.

3.1 Usage

The figures presented at the top of the results are the new cycling trips that will take place each year following the intervention. It is assumed that it represents the maximum level of post-intervention usage.

USAGE	
Annual pre-intervention cycling trips	100,000
Type of intervention	Pedestrian and cycle bridge
Estimated % increase following intervention	44%
Annual additional cycling trips	44,167
Annual post-intervention usage	144,167

Figure 4-1 Usage output

3.2 Mode shift

This section of the outputs details the proportion of the new trips that could have been made by car and the car kilometres that this removes from the road.

MODE SHIFT	
Annual additional trips	
Proportion of cycling trips that could have been made by car	32%
Car km removed from the road by pre-intervention cycle trips	123,600
Car km removed from the road by post-intervention cycle trips	178,191
Additional car km removed from the road	54,591

Figure 4-2 Mode shift output

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4. Conclusion

The Infrastructure Impact Tool helps to identify the possible impact of a proposed piece of infrastructure. Used correctly, although the outputs should be seen as indicative rather than precise estimates, the tool will help to simplify the appraisal of cycling interventions which in turn will help with the development of a successful strategy for investing in, and increasing, levels of cycling.

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