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Transport Infrastructure Ireland

TII Publications

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National Roads – Active Travel Planning

PE-PMG-02045
October 2021

PE Planning & Evaluation

Technical

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TII Publication Title	*National Roads – Active Travel Planning*
TII Publication Number	*PE-PMG-02045*

Activity	*Planning & Evaluation (PE)*		**Document Set**	*Technical*
Stream	*Project Management (PMG)*		**Publication Date**	*October 2021*
Document Number	*02045*		**Historical Reference**	**N/A**

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TII Publications

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1. Introduction

1.1 Application

Requirements within Transport Infrastructure Ireland (TII) Publications pertaining to the design and provision of facilities for those walking, wheeling, and cycling are under review. This interim guidance is intended to provide advice on the planning, provision, and design principles to be considered by the Designer in relation to the provision of active travel infrastructure, or interventions, on or as part of National Road Projects in rural areas pending the update.

It is acknowledged and noted that the guidance set out in this interim guidance may depart from existing TII publication standards. These standards will be updated in due course as part of the ongoing review noted, and the redevelopment of the National Cycle Manual. **Until then, where the application of the guidance contained in this document departs from existing TII standards (e.g. cross section amendments), a departure from standards will be required in accordance with the requirements of GE-GEN-01005.**

This interim guidance applies to Rural National Roads only. This means roads where the posted speed limit exceeds 60 km/h.

1.2 General

This guidance interfaces with a swathe of complimentary documents including, but not limited to, the National Cycle Manual, the Design Manual for Urban Roads and Streets, DN-GEO-03084: The Treatment of Transition Zones to Towns and Villages on National Roads, etc.

This interim guidance is applicable to major and minor national road schemes (as defined in the TII Project Management Guidelines) but may be used in the design of other national road schemes subject to the approval of TII.

The provision of active travel infrastructure, or interventions, shall be plan led and the Designer needs to consider the most appropriate active travel facilities to be provided for their particular location, as set out in Chapter 2.

Active travel facilities may be provided in the following ways, or through a combination of same:

- Offline solutions in compliance with the TII Standard DN-GEO-03047 (Rural Cycleway Design (Offline))[1].
- Links to an existing or proposed active travel network.
- Cycle and pedestrian facilities adjacent to a proposed road upgrade.

It is the Designer's responsibility to determine the need for active travel infrastructure, or interventions, as part of the development of major and minor National Road Schemes. In this regard, consultation shall be carried out with the relevant Local Authority Cycling Representative/Agent to determine the most appropriate provision to be considered.

Active travel infrastructure and interventions contribute to the sustainable, safe, and efficient operation of the national road network. Necessarily, their planning and design will be central to project development and delivery from inception through to construction and operation.

[1] Transport Infrastructure Ireland. 2017. '*Rural Cycleway Design (Offline)'.* Available at <https://www.tiipublications.ie/library/DN-GEO-03047-02.pdf>

The requirements in this interim guidance will not be interpreted to exclude the need for economic and environmental evaluation. Moreover, it is the responsibility of the Designer to identify and determine necessary and appropriate development consenting requirements.

If this interim guidance is to be used for the planning and design of local or regional road projects, the extent to which the document is appropriate in any particular situation shall be agreed with the relevant Road Authority.

1.3 Scope

This interim guidance outlines requirements for the Designer to:

- Determine what factors are to be taken into account in the planning and design of active travel infrastructure, or interventions, on or as part of national road projects in rural areas;
- Determine what type(s) and level of active travel infrastructure or interventions should be provided;
- Understand the options available for active travel infrastructure and interventions and the current applicable standards and guidelines; and
- Have due consideration for how active travel provisions should be monitored, maintained, and evaluated.

This interim guidance applies to the development and delivery of new or improved active travel infrastructure, or interventions, developed or delivered on or as part of major and minor national road schemes in rural areas.

This interim guidance applies to rural roads only. This means roads where the posted speed limit exceeds 60 km/h. For active travel infrastructure or interventions in zones with a speed limit of 60 km/h or less on the national road network, the requirements of DN-GEO-03084 (The Treatment of Transition Zones to Towns and Villages on National Roads) – including the application of the Design Manual for Urban Roads and Streets and the National Cycle Manual - apply.

This interim guidance includes road cross section design requirements. These requirements, as indicated, amend requirements within DN-GEO-03036 Cross Sections and Headroom.

1.4 Definitions

For definitions of the general road terms used in this interim guidance, such as components of the road (central reserve, verge, hard shoulder, and hard strip, etc.), see DN-GEO-03036 Cross Sections and Headroom.

Particular definitions that apply to this interim guidance are as follows:

a) **Active Travel:** Walking, wheeling, and cycling for all users for all trip purposes where walking, wheeling, and cycling mean:[2]

   i. **Walking and Wheeling**: Engaging in the typical act of walking plus jogging, using mobility aids (i.e. manual and electric wheelchairs as well as motorised mobility scooters), and using non-motorised scooters; and

[2] Walking and wheeling are of equal importance to cycling as they are much more commonly utilised modes; they form part of all trips, even those where the primary mode is the private vehicle or public transport.

ii. **Cycling**: Cycling using any type of cycle, such as bicycles, electric cycles, adapted cycles and cargo cycles. Cycles must, except for specific situations, be treated as 'vehicles', not as 'pedestrians'.

b) **People Walking, Wheeling, and Cycling:** Pedestrians and cyclists, and other users (e.g. people with luggage, with children, with disabilities). This definition shall be interpreted to include non-motorised users and vulnerable road users where these are referred to in TII Publications documentation.

c) **Active Travel Infrastructure:** All types of pedestrian and cycle facilities which improve conditions for people walking, wheeling, and cycling.

d) **Offline Facility:** Element of active travel network catering for people walking, wheeling, and cycling that is not adjacent to the road carriageway (i.e. not incorporated into the road cross-section).

e) **Online Facility:** Element of active travel network catering for people walking, wheeling, and cycling that is part of the road carriageway (i.e. incorporated into the road cross-section). Online active travel facilities may be provided as on-road pavement or off-road pavement facilities:

i. **Off-road Facility**: Facility that is physically segregated from the road pavement by, for example, a verge;

ii. **On-road Facility**: Facility that forms part of the road carriageway without physical separation or demarcation from the road pavement / vehicular carriageway.

f) **Pedestrian Facilities:** All types of measures which improve conditions for people walking and wheeling, and include:

i. **Footpath**: A path, separated by a kerb, for use by pedestrians which does not form part of the road pavement;

ii. **Footway**: A path for use by pedestrians, separated by a verge, which does not form part of a road pavement;

iii. **Bridleway**: A road (surfaced or unsurfaced) for use on foot or horseback.

g) **Cycle Facilities:** All types of facilities which improve conditions for people cycling.

i. **Cycleway**: An offline public road reserved for the exclusive use of people cycling or people walking, wheeling, and cycling (see also definitions of 'Greenway' and 'Shared Use Active Travel Facility'). All mechanically propelled vehicles, other than mechanically propelled wheelchairs and electric bikes, are prohibited from entering except for the purpose of maintenance and access.

ii. **Greenway**: A cycleway that caters for people walking, wheeling and cycling in a mainly recreational environment.

iii. **Cycle Track**: A part of the road carriageway, including adjacency to a footway, which is reserved for the use of cycles and from which all mechanically propelled vehicles, other than mechanically propelled wheelchairs and electric bikes, are prohibited from entering except for the purpose of maintenance and access. A cycle track can be off-road, on-road (see definition of 'Cycle Lane') or shared (see definition of 'Shared Use Active Travel Facility').

iv. **Shared Use Active Travel Facility**: A cycleway or cycle track that is provided for people walking, wheeling, and cycling.

v. **Cycle Lane**: An on-road part of the road pavement reserved for use by cycles. The cycle lane forms part of the road pavement and it is thus located within the contiguous road surface. It is not a cycleway and therefore, generally not for the exclusive use of cycles.

vi. **Cycle Network**: A defined collection of routes which connect key origins and destinations in a specified area for cyclists.

h) **Designer:** The organisation responsible for undertaking and/or certifying the design.

i) **Express Road:** An Express Road is a legal category of road designed for motor traffic, which is accessible primarily from interchanges or controlled junctions and which:

i. Prohibits stopping and parking on the road pavement; and

ii. Does not cross at grade with any railway or tramway track.

j) **Maintaining Organisation:** The organisation which will be responsible for the maintenance of the road after construction.

k) **Road Authority:** The authority responsible for the road construction or improvement scheme. The Road Authority is the Maintaining Organisation. Refer to GE-GEN-01005 which outlines who the Road Authority is for various projects.

l) **Rural National Road:** A road outside of built-up areas with a speed limit of greater than 60km/h, including:

i. Single Carriageway roads;

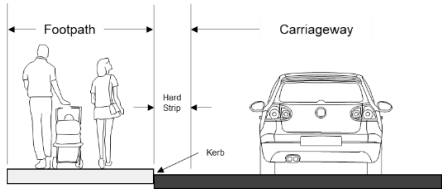
ii. All-purpose Dual Carriageway roads; or

iii. Motorways.

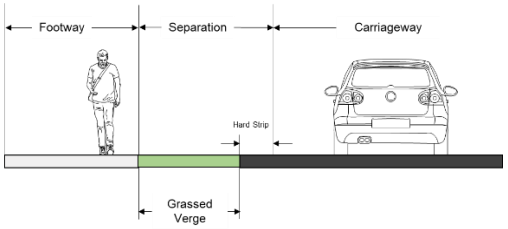
m) **Transition Zone:** Generally, element of road within a 50 to 60 km/h posted speed limit zone passing through areas of low density residential and commercial development and/or industrial areas.

Table 1.1 Facility Cross Sections

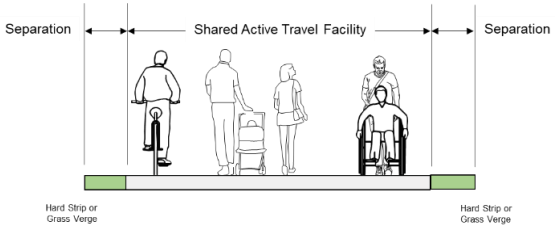
Footpath
A path for use by pedestrians, separated by a kerb, which does not form part of a road pavement



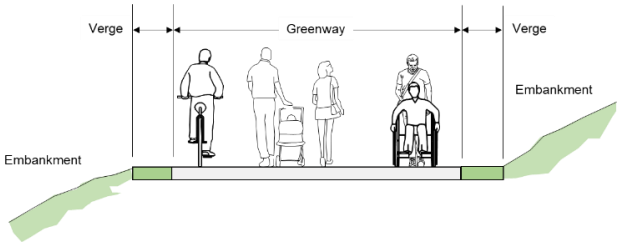
Footway
A path, separated by a verge, for use by pedestrians which does not form part of the road pavement



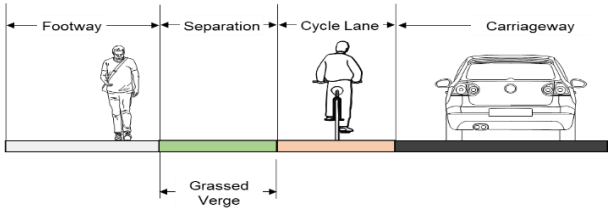
Shared Active Travel Facility
A cycleway or cycle track that is provided for people walking, wheeling and cycling



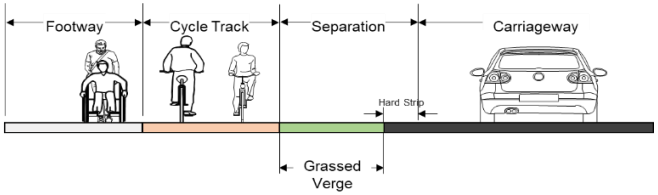
Greenway
A cycleway that caters for people walking, wheeling and cycling in a mainly recreational environment



Cycle Lane
An on-road part of the road pavement reserved for use by cyclists. The cycle lane forms part of the road pavement and it is thus located within the contiguous road surface



Cycle Track
A part of the road carriageway, including adjacency to a footway, which is reserved for the use of cycles and from which all mechanically propelled vehicles, other than mechanically propelled wheelchairs and electric bikes, are prohibited from entering except for the purpose of maintenance and access



2. Planning for Active Travel

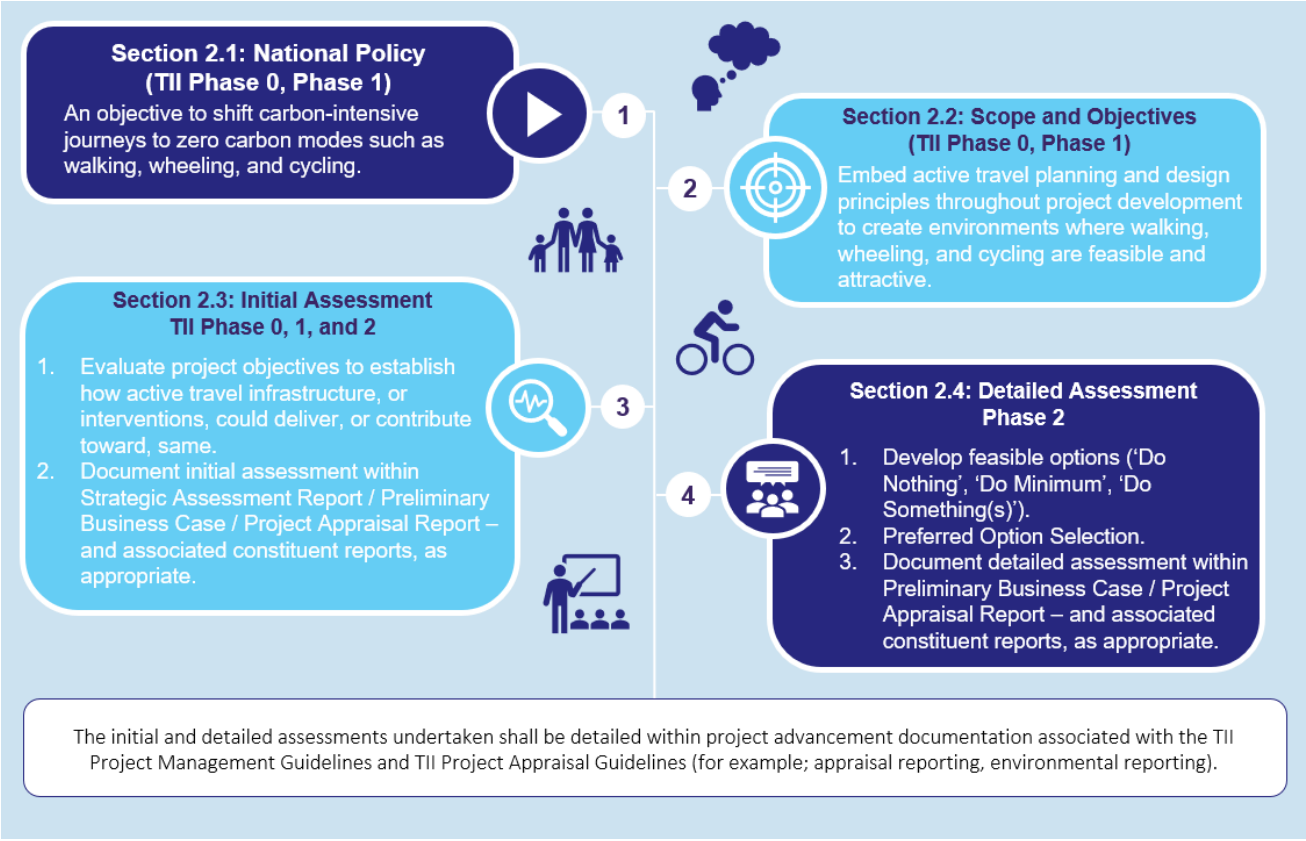


Figure 2.1 Planning for Active Travel Process

2.1 National Policy

Ireland's transport policy is centred around the efficient movement of people and goods and ensuring increased accessibility for all users of the transport network. A strong transport system enhances competitiveness, sustains economic progress, promotes balanced regional development, and contributes to social cohesion. This transport system should be inclusive of people walking, wheeling, and cycling and should place such users at the top of the hierarchy of road users.

The 'avoid-shift-improve' approach will be central to transport and mobility infrastructure planning. A key element of this approach is an objective to shift carbon-intensive journeys to zero carbon modes such as walking, wheeling, and cycling. Necessarily, to encourage more sustainable travel patterns and safer road networks, the Designer must place people walking, wheeling, and cycling at the apex of consideration as part of transport and mobility infrastructure planning.

2.2 Scope and Objectives

Active travel planning and design principles need to be embedded in all stages of a project from inception through to construction and operation to create environments where walking, wheeling, and cycling are feasible and attractive options to shift more activity towards more sustainable transport modes.

This chapter outlines determining factors which are to be taken into account in the planning and design of active travel infrastructure, or interventions, on or as part of national road projects in rural areas. An assessment procedure to aid consideration and application of same is provided.

The chapter is formulated so as to align with the project phases and project processes detailed within PE-PMG-02041 (TII Project Management Guidelines) and PE-PAG-02009 (Unit 1.0 Project Appraisal Guidelines).

2.2.1 Active Travel Planning and Design Principles

Active travel planning and design principles to be taken into account are set out below:

- The provision of active travel infrastructure, or interventions, should create, or contribute to the creation of, coherent walking, wheeling, and cycling networks.
- The provision of active travel infrastructure, or interventions, must be plan-led so as to maximise opportunities for potential benefits and usage.
- Engagement with appropriate stakeholders, including community groups, is key to successful active travel infrastructure, or intervention, development and delivery.
- The Designer will assess the appropriateness of providing active travel infrastructure or interventions, taking into consideration the active travel planning and design principles outlined herein. This review will aid and guide the determination of appropriate active travel infrastructure or interventions:
  - In determining whether the provision of active travel infrastructure or interventions is appropriate, the Designer will consider, but is not limited to, the following:
    - Is it appropriate to provide active travel infrastructure or interventions (economy, safety, environment, accessibility and social inclusion, integration, etc.)?
    - Does national/regional/county/local policy support active travel provision, taking cognisance of the project's location and context?
    - Is there potential demand? For example, links to schools, public transport, residential communities, amenities, links to existing infrastructure, and so on.
    - Are there other drivers, such as tourism?
    - Where and how should the active travel infrastructure or interventions be provided – online, offline, adjacent to the road carriageway, on the adjacent existing local and regional road network, via a network of cycle friendly routes, etc.?
    - Would active travel infrastructure or interventions connect to, or contribute to the development of, active travel networks in urban centres? That is, would rural provision complement urban active travel networks?
- Active travel infrastructure, or interventions, should be feasible and attractive options serving to encourage modal shift from private vehicles to active travel. In practice, this means that active travel provision will align with the following active travel planning and design principles:
  - **Inclusive:** Active travel provision should be designed so that anybody who may want to walk or cycle on the network can do so safely and comfortably taking cognisance of the project's context and location.

  - **Safe:** To be both proven and perceived to be safe for users of all ages, backgrounds and abilities and to aim to reduce the potential for collisions and severity of collisions involving pedestrians and cyclists.
  - **Connected:** Active travel provision should form part of a network, addressing local connectivity and be compliant with applicable design standards.
  - **Direct:** Active travel provision must minimise the time cost of choosing active travel. The network should serve all the main trip attractor destinations and seek to offer an advantage in terms of distance and journey time.
  - **Legible:** The physical features of all active travel provision must be logical to all people who use them. Networks should be continuous and easy to navigate.
  - **Attractive and Comfortable:** Active travel provision must be at least as attractive to people as any alternative journey by private vehicle including offering integration with the surrounding areas.
- Guidance on the interaction of transport and land use policy is available within PE-PDV-02046 (Area Based Transport Assessment (ABTA) Guidance Notes).

2.3 Initial Assessment

The initial assessment serves to answer the question as to whether there is a need for, and whether it is appropriate to, provide active travel infrastructure or interventions. This assessment culminates in a determination of whether there is a need for, and whether it is appropriate to, provide active travel infrastructure or interventions, with detailed assessment and options development to follow.

In identifying the need and appropriateness of active travel infrastructure or interventions, as part of the development of major and minor road projects, the initial assessment process outlined in **Figure 2.2** should be followed.

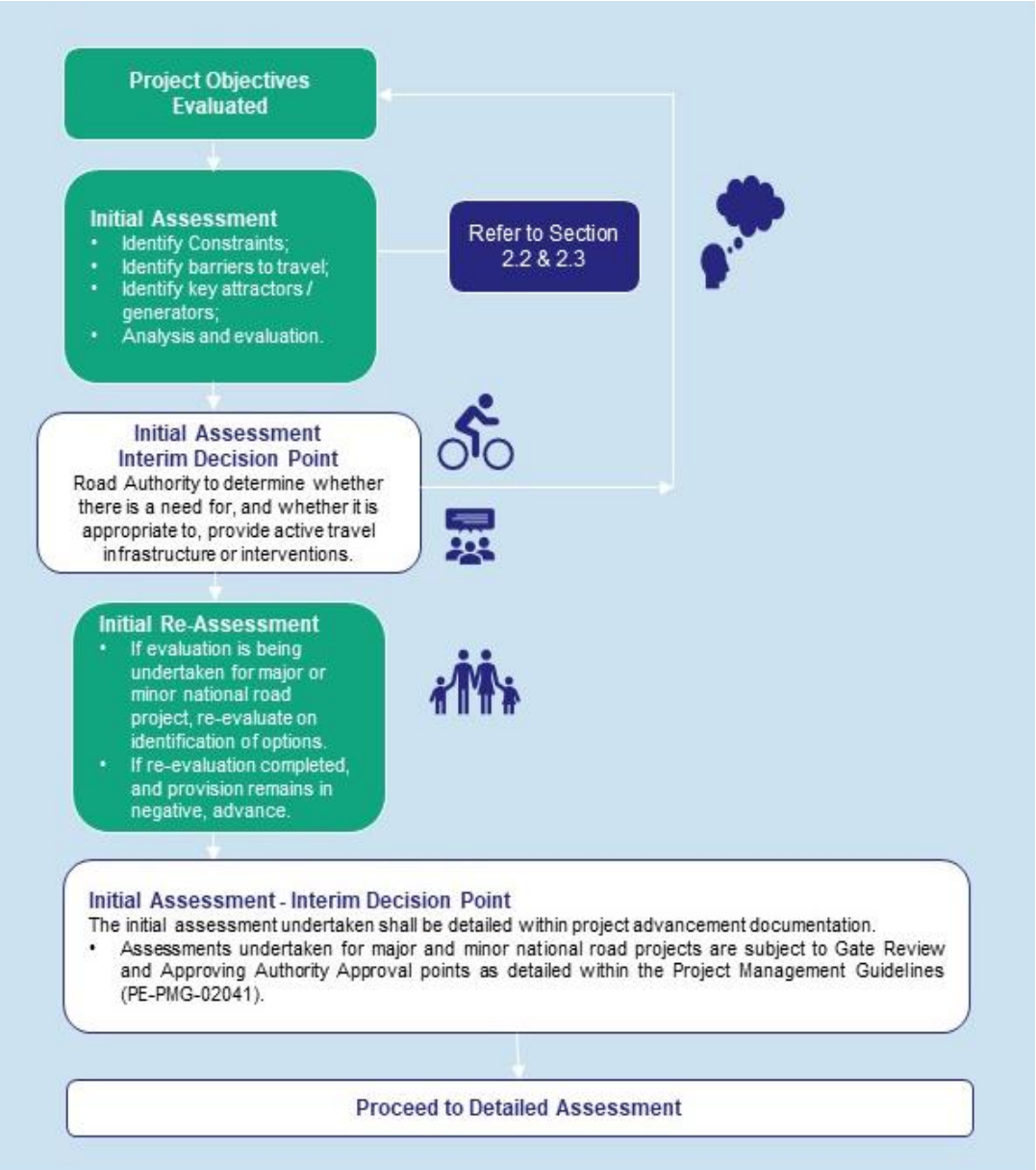


Figure 2.2 Initial Assessment

2.3.1 Project Objectives and Policy Context

Major and minor national road projects derive from TII and government policies and plans, strategic transport assessments and plans (for further information refer to PE-PDV-02046 - Area Based Transport Assessment), planning guidelines, and relevant county and local authority development plans. Such projects serve to deliver targeted strategic outcomes (e.g. enhance regional connectivity, improve road safety, alleviate transportation issues – urban or rural, deliver sustainable transport networks, and reduce transport emissions, etc).

Active travel facilities contribute to the sustainable, safe, and efficient operation of the national road network. Necessarily, the planning and design of such facilities will be central to national road project development and delivery from inception through to construction and operation.

The Project objectives will be evaluated as outlined within the TII Project Management Guidelines and the TII Project Appraisal Guidelines. It will be necessary to examine, and outline, how active travel provision contributes to delivering the project objectives which are identified as part of project advancement and development (refer to the TII Project Appraisal Guidelines).

2.3.2 Constraints, Barriers, and Trip Attractors / Generators

It is necessary to understand constraints, barriers, and trip attractors when planning active travel networks. Consequently, it is necessary to identify the nature and extent of constraints, barriers to travel, and trip attractors at an appropriate level of detail within the study area as part of the initial assessment. These will be documented, mapped, and evaluated such that, at a later date as appropriate, active travel options under consideration can be designed taking cognisance of constraints, barriers, and trip attractors / generators.

Constraints, barriers, and trip attractors / generators will initially be identified via desktop study. However, it may be necessary and appropriate to verify the nature and extent of constraints, barriers, and trip attractors / generators by means of site visits and user surveys to gain comprehension or insights re same. **Appendix A** herein provides guidance, and reference sources, relating to formulating user surveys and data gathering. In relation to user surveys, further regard may be had to guidance documentation prepared by the Department of Transport and the National Cycle Manual.

2.3.2.1 Constraints

In identifying and mapping constraints, they may be divided into three principal categories [3], namely:

- Natural Constraints (naturally occurring landscapes and features, including underground features);
- Artificial Constraints (forming part of the built environment including underground features, e.g. disused landfills, development patterns); and
- External Parameters (design standards, policy, procedural, financial, and legal issues).

2.3.2.2 Barriers to Travel

To encourage and enable more people to engage in active travel, the Designer will undertake an evaluation to understand why people may not currently use active travel modes.

Herein, a focus is placed upon physical barriers. Physical barriers may include distance, road safety, and lack of appropriate infrastructure. Notwithstanding, it is necessary that the Designer consider other barriers including, but not limited to, age, health, fitness, security, and gender barriers.

Distance

Travel distance influences travel mode choice, although the route distance cannot directly be addressed, notwithstanding, the design should **as an absolute minimum include active travel facilities within acceptable journey distances from key attractors**. The Designer may use 4km and 10km as approximate minimum acceptable journey distances for walking and wheeling and cycling respectively [4]. This does not absolve the designer of the need to consider active travel along the entire length of their scheme and to take cognisance of the fact that in rural areas in particular longer distances may be appropriate to facilitate opportunities for connecting locations which need to be served by multi-modal transport.

The Designer will have regard to the overall context of the study area and the advancement of **electric cycles,** which will increase the distance that people are comfortable to cycle. The Designer may use 15km as an approximate minimum acceptable journey distance for electric cycles.

[3] Transport Infrastructure Ireland; PE-PMG-02042 (Project Manager's Manual for Major National Road Projects). Available at <https://www.tiipublications.ie/library/PE-PMG-02042-01.pdf>.
[4] Based on the average journey distances stated in the National Travel Survey, 2019.

Additionally, the Designer should seek to bridge distance gaps between different elements of the network and improve levels of permeability and accessibility to facilities.

Road Safety (Actual and Perceived)

The Designer should seek to maximise road safety for active travel users. The Designer should consider, for example, appropriate maintenance regimes to ensure quality of surfaces and debris removal, 'location of furniture', drainage, physical separation between active travel and motorised traffic along the road and at crossings. Moreover, lighting and passive surveillance should be considered wherever possible in order to address perceived safety concerns.

In relation to the development of major road schemes the requirements of PE-PMG-02001 (Road Safety Impact Assessment) apply, requiring the Road Authority to demonstrate, on a strategic level, the effects on road safety of different planning alternatives including implications for active travel modes.

AM-STY-06044 outlines the requirements for Road Safety Inspections in the management of road safety on the Irish national road infrastructure. AM-STY-06044 sets out the procedures required to implement Road Safety Inspections on all national roads. Road Safety Inspection is a pro-active process, in that it seeks to identify the safety defects of the road and enable counter-measures to be provided before the problem manifests itself. The Road Authority will have regard to findings deriving from programmed road safety inspections on existing roads when identifying the needs and appropriateness for active travel infrastructure or interventions.

Lack of Appropriate Infrastructure

Lack of active travel infrastructure (e.g. such as lack of safe parking) or provision of facilities that serve only limited subgroups of people walking, wheeling, and cycling are barriers to active travel and contribute perceived safety concerns. Where interventions are identified as required, the Designer should seek to provide infrastructure, or interventions, that best accommodate active travel user and network needs.

2.3.2.3 Key Attractors

As noted, it is necessary to understand existing and potential user needs. This includes the reasons and attractors / generators for travel. Attractors / generators may include, but are not limited to, *Villages, Towns, and Cities*; *Everyday Journeys*; *Tourism*; and *Links to Public Transport*.

Active travel network enhancements such as provision of missing infrastructure and linkage of planned and existing infrastructure can serve to increase the level of active travel users by increasing network connectedness.

Villages, Town and Cities

Many trip attractors and generators are located in urban centres (i.e. villages, towns, and cities) with many journeys to/from/within these areas. The provision of active travel infrastructure, or interventions, to cater for journeys in, to, and from villages, towns, and cities for multivarious purposes should be considered.

The provision of active travel facilities should **be prioritised in areas where there are poor alternatives to private cars** where users may lack alternative transport options, or alternative options available to them are too expensive.

Everyday Journeys

Active travel infrastructure, or interventions, on or as part of national road projects in rural areas may aid in servicing everyday journeys to and from trip attractors / generators including, but not limited to:

- Places of work and education;
- Health facilities;
- Shopping centres and streets;
- Religious buildings;
- Sport venues;
- Theatres and cinemas;
- Cafes, restaurants, and pubs.

Tourism

Tourist attractions include distinct locations (e.g. historical monuments and sites, national parks, museums) as well as long-distance corridors attracting tourists (e.g. greenways, blueways). To support tourism across Ireland, the national road network often serves to facilitate connectivity to and between such attractions.

The provision of active travel infrastructure, or interventions, to cater for journeys to and from tourist attractions should be considered.

Links to Public Transport

Providing coherent and connected active travel infrastructure and interventions to service public transport plays a vital role in the attractiveness of both modes. Connectivity to public transport, and associated ancillary infrastructure such as safe parking, is important as it may serve to encourage and enable people to travel further distances to get to where they need to go without depending on private cars.

The provision of active travel infrastructure, or interventions, to cater for linkages to and from public transport should be considered.

Links to Existing or Planned Active Travel Infrastructure

Providing links to existing or planned active travel infrastructure helps with creating coherent, comprehensive, and connected networks which will be more attractive to users who will be able to better plan end to end journeys.

The provision of active travel infrastructure, or interventions, to link existing or planned active travel networks should be considered.

2.3.3 Initial Assessment - Interim Decision Point

The purpose of undertaking the initial assessment is to determine whether there is a need for, and whether it is appropriate to, provide active travel infrastructure or interventions. As noted, this assessment should follow the process outlined in **Figure 2.2,** and this section.

Following the process outlined within **Figure 2.2** and this section**,** and consequent necessary analysis and evaluation, it is necessary to conclude as to whether active travel infrastructure or interventions are needed and or appropriate as part of the development and delivery of a major and minor national road project. Consequently:

- If the decision is **Yes**, the Designer shall proceed to **Section 2.4** to identify options and carry out a detailed assessment when advancing as part of a major or minor national road project as part thereof.
- If the decision is **No**, and the evaluation is being undertaken as part of the development and delivery of a major or minor national road project, the Designer shall review the project objectives for appropriateness and re-evaluate the decision once options have been identified in line with the TII Project Management Guidelines and the TII Project Appraisal Guidelines during TII Phase 2.

The initial assessments undertaken shall be detailed within appropriate project advancement documentation. The TII Project Management Guidelines (PE-PMG-02041), and associated Project Manager's Manuals (PE-PMG-02042, PE-PMG-02043), and the Project Appraisal Guidelines provide details on the processes and deliverables required to deliver major and minor national road projects.

2.4 Detailed Assessment

The detailed assessment serves to answer the question as to the form and extent of active travel infrastructure or interventions. Further, the detailed assessment outlines how the identification of appropriate options, the refinement of those options into feasible solutions, and the evaluation of these to determine a preferred option should be advanced.

Where provision of active travel infrastructure, or intervention, is deemed appropriate - the identification of appropriate options, refinement of those options into feasible solutions, and the evaluation of same to determine a preferred option will be carried out as outlined in **Figure 2.3**.

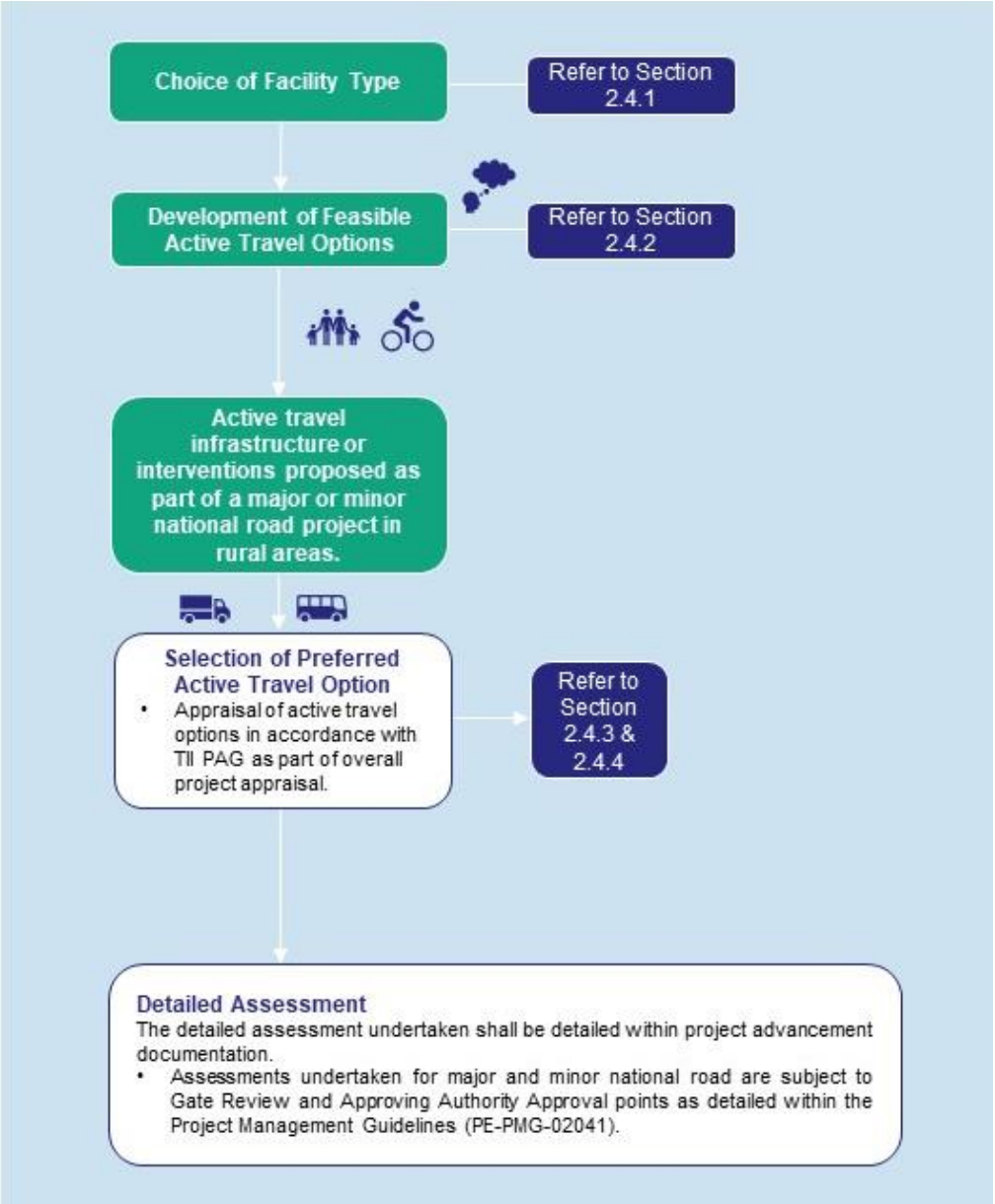


Figure 2.3 Detailed Assessment Flowchart

2.4.1 Choice of Facility Type

The permissible form of active travel provision in relation to road type and design speed have been provided in Table 2.1, Table 2.2, and Table 2.3 below.

It is important to consider how facilities, or indeed the delivery of a strategic national road project, could complement the delivery of local active travel networks via, for example, maximising opportunities through the provision of new infrastructure or interventions to bridge gaps or enhance operability and avoid severance.

Necessarily, this requires that the Designer examine the study area constraints, barriers, and trip attractors / generators to ascertain whether existing and planned active travel infrastructure, or interventions, interacts with and serves same – leading to the identification of infrastructure or interventions to bridge gaps or enhance operability and avoid severance.

Necessarily, a preliminary step is determining whether new or existing infrastructure is to be utilised.

Table 2.1 Permissible Form of Active Travel Provision for National Roads

Road Type	Mandatory Segregated Adjacent Active Travel Facilities (Y/N)	Permissible Form of Active Travel Provision	TII Publications Link *(Note 5)*
Type 1 Single Carriageway	N	**1. Footway** *(Note 1, Note 2, Note 3)*. **2. Cycleway** *(Note 1, Note 2)*. **3. Greenway** *(Note 1, Note 2)*. **4. Shared use active travel facility** *(Note 1, Note 2, Note 3)*. **5. Cycle track** *(Note 1, Note 2, Note 3)*. **6. Cycle Lane** *(Note 4)*.	CC-SCD-00001-07
Type 2 Single Carriageway	N		CC-SCD-00002-08
Type 3 Single Carriageway	N		CC-SCD-00003-05
Type 1 Dual Carriageway	N		CC-SCD-00006-07
Type 2 Dual Carriageway	N		CC-SCD-00005-07
Type 3 Dual Carriageway	N		CC-SCD-00004-06
Standard Dual Carriageway & Motorway	N		CC-SCD-00007-06
Wide Dual Carriageway & Motorway	N	**1.** Refer *Note 1*. **2.** Refer *Note 2*.	CC-SCD-00008-05

Notes:

1. *Note 1 – Motorway or Express Road offline facility shall be located outside lands adjoining the Motorway or Express Road in order to prevent direct access to the Motorway or Express Road as required under the Roads Act, 1993.*
2. *Note 2 – Where adjacent facilities are not provided, provision may be remote from the road on a suitable new route in accordance with the requirement of TII DN-GEO-03037 [5], within the maintenance strip or verge of the road, or using a suitable existing alternative route incorporating appropriate signage or intervention (the latter requires a departure from TII standards) [6].*
3. *Note 3 – Appropriate minimum horizontal separation is required per Table 2.2 herein.*
4. *Note 4 – The utilisation of cycle lanes is limited to their improvement.*
5. *Note 5 - Information pertaining to cross section may amend road type cross sections.*

[5] Transport Infrastructure Ireland, 2017. *'Rural Cycleway Design (Offline)'*. Available at <https://www.tiipublications.ie/library/DN-GEO-03047-02.pdf>.
[6] Transport Infrastructure Ireland, 2019. *'Cross Sections and Headroom'*. Available at <https://www.tiipublications.ie/library/DN-GEO-03036-08.pdf>.

Table 2.2 Minimum Horizontal Separation between edge of running lane and active travel facilities

Speed Limit (kph)	Desirable Minimum Horizontal Separation (m)	Absolute Minimum Horizontal Separation (m) *(Note 1)*
50	0.5	N/A
60	1.0	0.5
80	2.0 (including any hard strip) 1.0 (excluding any hard shoulder)	1.5 (including any hard strip) 1.0 (excluding any hard shoulder)
100	2.5 (including any hard strip) 2.0 (excluding any hard shoulder)	2.0 (including any hard strip) 1.5 (excluding any hard shoulder)

Notes:

1. *Utilising minimum horizontal separation distances is a relaxation from standards, utilisation of horizontal separation distances below the absolute minimum values is a departure from standard.*

Table 2.3 below outlines preliminary criteria to aid in determining appropriate minimum provision for new active travel infrastructure on rural national roads.

Table 2.3 Minimum Provision for New Active Travel Infrastructure on rural National Roads.

Speed Limit (kph)	Motor Traffic Flow (AADT--Average Annual Daily Traffic)	Provision for new active travel infrastructure on rural national roads need identified
60 and over	All Flows	Cycleway, greenway, shared use active travel facility, cycle track, Footway

Segregation of Walking & Wheeling from Cycling

Shared use active travel facilities will be provided as the default when new active travel intervention need is identified - in particular where the volumes of pedestrians will be low (less than 100 people per hour per metre width of unsegregated shared facility) and or where spatial constraints constrain provision.

Consideration will be afforded to segregating pedestrian and cyclist flows where flow volumes warrant same (greater than 100 pedestrians per hour per metre width of unsegregated shared facility). Additional guidance in relation to flow volumes is available within the *Design Manual for Roads and Streets* and the National Cycle Manual. Refer to Table 2.4 below which indicates the type of arrangement that may be suitable on the basis of density of cyclist and pedestrian activity.

Table 2.4 Pedestrian flow density.

Density of Pedestrians (users/hr/m) *	Recommended Arrangement
< 100	Shared use is usually appropriate (cycles give way)
101 – 199	Segregation may be considered
> 200	Segregation should be considered

**Based on CROW, Design Manual for Bicycle Traffic, 2016.*

Where separation of pedestrian and cyclist flows is deemed necessary and appropriate, a minimum level of separation should be provided through one of the following means:

- A level difference of at least 60 mm[7];
- A raised, bevelled kerb; or
- A grassed verge of minimum width 500mm.

Interaction of pedestrian and cyclist flows should be considered on links and at crossings. Where a route for pedestrians must cross a route for cycles, this crossing should be examined carefully to ensure that interfacing is safe for all users. Relating to the latter, reference and regard should be had to the requirements of the Irish *National Cycle Manual*.

2.4.2 Development of Feasible Active Travel Options

Following the determination of whether new or existing infrastructure is to be utilised it is necessary to develop feasible active travel options. As highlighted earlier, any options should seek to complement the delivery of local active travel networks via, for example, maximising opportunities to bridge gaps or enhance operability and avoid severance.

The mapped constraints, barriers, and trip attractors / generators will be evaluated such that active travel options can be designed taking cognisance of same. This includes the existing or proposed active travel network within the study area.

Where the development of feasible active travel options is being undertaken as part of the development and delivery of a major and minor national road project, the Designer will determine how best to integrate the national road with the existing or proposed active travel network within the study area. For major and minor national road projects, the appropriate active travel intervention (at an appropriate level of detail) will be determined for each option taking account of the requirements of the TII Project Appraisal Guidelines.

For major and minor national road projects, the emerging preferred option will include the appropriate active travel intervention. For the avoidance of doubt, it is not anticipated that it will be necessary to consider multiple options each containing the same road option but different active travel solutions.

[7] Research Commissioned by The Guide Dogs for the Blind Association *Guide Dogs). 2009. *'Effective Kerb Heights for Blind and Partially Sighted People'.* Available at <https://pureportal.strath.ac.uk/files-asset/67611542/Childs_etal_guidedogs2009_effective_kerb_heights_blind_partially_sighted.pdf>

Rather, it is envisaged that the appropriate active travel solution(s)[8] will be identified for the project using the guidance below.

Determining appropriate interventions may include ascertaining what benefits could be afforded to developing connected coherent active travel networks via:

- New infrastructure or interventions,
- Any potential residual infrastructure,
- The use of the national road network,
- The use of the wider existing road network.

Note, existing infrastructure may already facilitate active travel journeys, however, not all persons may be comfortable to use existing infrastructure in its current operational environment. As highlighted, it is necessary to consider the reasons for same. Ultimately, active travel networks should be designed to address each of the six requirements set out in **Section 2.2.1** to maximise user benefits. This will:

- Make active travel a credible and viable alternative to driving;
- Improve user experience serving to encourage people to walk, wheel, and cycle more often - including people who do not currently walk, wheel, or cycle; and
- Maximise efficiencies of the transport networks due to avoiding disjointed infrastructure that does not connect to a wider network.

Active travel options should be based on:

- Alignment with overarching planning requirements;
- The constraints, barriers, and trip attractors / generators study - as outlined in **Section 2**;
- The types of facilities - as outlined in **Table 2.1**;
- The design criteria requirements - as outlined in **Chapter 3**;
- The considerations outlined in PE-PAG-02013 Unit 4.0 Consideration of Alternatives and Options and PE-PAG-02036 Pedestrian and Cyclist Facilities.

Initially, there may be a wide range of possible active travel options. The development of options will begin with preliminary analysis (option sifting) to narrow to a short-list. Non feasible options, owing to constraints or not serving to deliver the project objectives, shall be eliminated. Further information regarding the narrowing of options is provided within PE-PAG-02013 Unit 4.0 Consideration of Alternatives and Options.

Care should be taken to ensure active travel options are significantly different and take account of potential differences in design standard and network characteristics. Options should be designed from the start with environmental considerations in mind. Further information regarding the development of options is provided within PE-PAG-02013 Unit 4.0 Consideration of Alternatives and Options. The development and examination of the Do-Minimum option will consider maximising the utility of the existing network of road infrastructure within the study area, including determining whether a network utilising cycle friendly routes is appropriate (refer to **2.4.1** for further information).

[8] In certain cases, e.g. bypass solutions, it may be the case that both an online and an offline active travel solution may need to be considered – online for road options close to the urban area and offline for road options at a distance from the urban area.

2.4.3 Evaluation of Options

Where active travel infrastructure or interventions are being provided as part of the development and delivery of major or minor national road projects, the evaluation of feasible active travel options will be carried out as part of the overall project appraisal process as outlined within PE-PAG-02009 Unit 1.0 – Introduction.

Where new or improved active travel infrastructure or interventions are proposed as part of major or minor national road projects it will be necessary and desirable to determine the active travel interventions appropriate for each proposed road corridor option, at an appropriate level of detail. Where such determination is necessary, a multi criteria analysis or PABS may be apt. Further information regarding the undertaking of multi criteria analysis and PABS is provided within PE-PAG-02031 - Unit 7.0 - Multi Criteria Analysis and PE-PAG-02032 - Unit 7.1 – Project Appraisal Balance Sheet. Criteria and sub-criteria for the assessment of active travel interventions must be defined. The headline criteria will be as outlined within the Common Appraisal Framework (CAF), namely:

- Economy;
- Safety;
- Environment;
- Accessibility & Social Inclusion;
- Integration; and
- Physical Activity.

The Project Appraisal Guidelines, PE-PAG-02031 Unit 7.0 – Conducting MCA, provides detailed guidance on the criteria and sub-criteria to be considered as part of the multi criteria analysis.

The active travel principles outlined in **Section 2.2.1** align with these CAF Criteria as follows:

Active Travel Principle	**CAF Criteria**
Inclusive	Accessibility & Social Inclusion
Safe	Safety
Connected	Integration
Direct	Integration
Legible	Accessibility & Social Inclusion
Attractive and Comfortable	Accessibility & Social Inclusion and Physical Activity

2.4.4 Active Travel Interventions & Major and Minor National Road Projects Option Selection

The initial assessment outlined in **Section 2.3.3** enables Road Authorities to conclude as to whether active travel infrastructure or interventions are required.

The detailed assessment outlined above outlines how the identification of appropriate options, the refinement of those options into feasible solutions, and the evaluation of these to determine a preferred option should be advanced. In instances where:

a) the initial assessment concluded that provision of active travel interventions was not appropriate or,

b) the emerging preferred road option differs from that developed and appraised as part of the option selection process, or

c) baseline information pertaining to existing or planned active travel networks has changed;

It will be necessary for the Road Authority to re-evaluate project development to ensure appropriate active travel infrastructure or interventions are identified, where necessary, and advanced as part of project development, as appropriate.

2.4.5 Selection of Preferred Active Travel Option

For major and minor national road projects, the preferred option will include the appropriate active travel intervention.

3. Design Considerations

3.1 General

This chapter outlines the design criteria to be used when designing new or improved active travel facilities developed or delivered on or as part of national road projects in rural areas.

For offline facilities the Designer shall refer to DN-GEO-03047 Rural Cycleway Design (Offline).

3.2 Select Applicable Standards

Standard Number	Standard Description
DN-GEO-03036	Cross Section and Headroom
DN-GEO-03047	Rural Cycle Design (Offline)
DN-GEO-03040	Subways for Pedestrians and Pedal Cyclists Layout and Dimensions
DN-STR-03005	Design Criteria for Footbridges
DN-GEO-03031	Rural Road Link Design
DN-PAV-03026	Footway Design
DN-LHT-03038	Design of Road Lighting for the National Road Network
DN-GEO-03060	Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade separated, and compact grade separated junctions)
DN-GEO-03084	The Treatment of Transition Zones to Towns and Villages on National Roads
DMURS	Design Manual for Urban Roads and Streets
National Cycle Manual	-
Greenways and Cycle Routes Ancillary Infrastructure Guidelines	-

3.3 Rural Active Travel Design

Table 3.1 Rural Active Travel Outline Design Requirements

Element	Application	Design Parameter	Reference
Design Speed	Approach to junction/obstacle: All cycleway facilities: Long downward slope (steeper than 5% and longer than 150 m).	10km/h. 30km/h. 50km/h.	**DN-GEO-03031** **DN-GEO-03047**
Dynamic Sight Distance	10km/h. 30km/h. 50km/h	15m. 65m. 110m	**DN-GEO-03047** **Refer to Table 3.2 of this document.**
Stopping Sight Distance	10km/h. 30km/h. 50km/h	15m. 35m. 60m	**DN-GEO-03047.** **Refer to Table 3.3 of this document.**
Horizontal Alignment	10km/h. 30km/h. 50km/h.	4m. 25m. 94m	**DN-GEO-03031.** **DN-GEO-03047.** **Refer Table 3.4 of this document.**
Vertical Alignment	Desirable Minimum (resultant) Desirable Maximum.	0.5%. 3%. 5%.	**DN-GEO-03047.** **National Cycle Manual.** **Refer to Table 3.5 of this document.**
Surface Crossfall / Camber	Maximum Rate of Change Minimum crossfall Maximum crossfall. One Step Below Desirable Maximum (confined to short sections of the cycle route and should be preferably less than 100 metres in length).	1%. 1%. 3.00%. 5.00%.	**DN-GEO-03031.** **DN-GEO-03047.**
Cross Section (information pertaining to cross section amends road type cross sections, including those outlined within **Table 2.1**)	Cycleway / cycle track / cycle lane (minimum)	2.0m – 5.0m	**DN-GEO-03047.** **DN-GEO-03036.** **Refer Table 3.6 of this document.**

Element			
	One-way subways and overbridges (minimum).	2.3m – 5.0m	**Refer to Table 3.7 of this document.**
	'Separation' distances (online facility). Lateral clearances (fixed objects).	-	**DN-GEO-03036.** **Refer to Section 3.3.5 & Table 2.2 of this document.**
Clearance and Headroom.	Pedestrian only subways (minimum).	-	**DN-GEO-03040.** **DN-STR-03005.** **Refer to Table 3.8 of this document.**
	Enclosed Footbridges (minimum).	-	**DN-GEO-03040.** **DN-STR-03005.** **Refer to Table 3.9 of this document.**
Overtaking	**Refer Dynamic Sight Distance.**		
Junction Visibility	'X' – Distance Desirable Min. 'X' – Distance One Step Below Desirable Min.	4.0m. 2.0m.	**DN-GEO-03031.** **DN-GEO-03060.** **DN-GEO-03047.** **Refer to Table 3.10 of this document.**
	'Y' – Distance.	Varies.	**DN-GEO-03031.** **DN-GEO-03060.** **DN-GEO-03047.** **Refer to Table 3.11 of this document.** **Refer to Table 3.12 of this document.**
Overbridge / Underbridge Requirements	**Refer Section 3.4.1 - Treatment at Junctions & Intersections.**		

3.3.1 Design Speed

Design speed requirements are provided below, as outlined within DN-GEO-03031 and DN-GEO-03047.

a) It is recommended that all cycleway facilities have a design speed of 30 km/h.

b) On approach to junctions and obstacles a reduced design speed of 10 km/h is acceptable over short distances.

c) On long downward slope sections (steeper than 5% and longer than 150 m), a design speed of 50 km/h should be implemented.

3.3.2 Visibility Parameters

3.3.2.1 Dynamic Sight Distance (DSD)

Desirable minimum values for Dynamic Sight Distance are shown in **Table 3.2** below, as extracted from DN-GEO-03047. DSD is the advance distance a cyclist requires to see ahead, to make the task of riding feel safe and comfortable and to pass slower cyclists and pedestrians safely. The distances specified below are those covered by the cyclist in approximately eight seconds when travelling at the speeds shown.

Table 3.2 Dynamic Sight Distance

	10 km/h	30 km/h	50 km/h
DSD	15 m	65 m	110 m

3.3.2.2 Stopping Sight Distance (SSD)

Desirable minimum values for Stopping Sight Distance are shown in Table 3.3, as extracted from DN-GEO-03047.

Table 3.3 Stopping Sight Distance

	10 km/h	30 km/h	50 km/h
SSD	15 m	35 m	60 m

3.3.3 Geometric Alignment

3.3.3.1 Horizontal Alignment

The desirable minimum horizontal radii for cycle facilities are outlined in **Table 3.4** below, as extracted from DN-GEO-03047 and DN-GEO-03031.

Table 3.4 Desirable Minimum Horizontal Radii for Cycle Facilities

	10 km/h	30 km/h	50 km/h
Minimum Horizontal Radius (m)	4 m	25 m	94 m

3.3.3.2 Vertical Alignment

Vertical alignment requirements for cycle facilities are summarised in **Table 3.5** below, as extracted - and amended - from DN-GEO-03047. The vertical profile allied with the horizontal alignment dictates the forward visibility.

Table 3.5 Vertical Alignment Requirements

	Gradients
Desirable Maximum	3%
One Step Below Desirable Maximum	5%

For effective drainage, a resultant gradient (combined effect of longitudinal and transverse gradients) below 0.5% shall be avoided. For further information, refer to DN-GEO-03047 and DN-GEO-03031.

3.3.3.3 Surface Crossfall

Surface crossfall shall lie between 1% - 3%, with 5% permitted over short sections, which shall be less than 100 metres in length. For further information, refer to DN-GEO-03047 and DN-GEO-03031.

Where possible the crossfall of cycle facilities should be directed towards the inside of a bend to prevent negative crossfall and its impact on cyclist safety.

Grassed verges adjacent to facilities must be constructed with a crossfall/grade of no more than 10%.

3.3.4 Cross Section - Including Separation Distances and Lateral Clearance

It is unusual for the dynamic envelope of any cycle to be any greater than 1.4m, and consequently, any one-way cycle lane or track should be at least 1.5m wide, or it will risk excluding some types of user.

When the preferred choice of provision is an online facility, the designer will refer to **Table 3.6** below, extracted from DN-GEO-03036, for adequate width for cycle and pedestrian facilities depending on estimated traffic volumes.

Low volume facilities are those considered to attract less than 1500 users a day and high-volume facilities are those expected to attract greater than 1500 users a day.

Table 3.6 Mandatory Widths for Cycle Facilities

		Desirable Min (m)	**One Step Below Desirable Min (m)**
One Way Cycle Facility	Low Volume	2.0	1.75
	High Volume	3.0	1.75
Two Way Cycle Facility	Low Volume	2.5	2.0
	High Volume	3.0	2.5

		Desirable Min (m)	One Step Below Desirable Min (m)
Shared Use One Way Cycle Facility with Pedestrians	Low Volume	3.0	2.0
	High Volume	4.0	3.0
Shared Use Two Way Cycle Facility with Pedestrians	Low Volume	3.0	2.0
	High Volume	5.0	3.0

For minimum dimensions at underbridges and subways the designer will refer to **Table 3.7** which have been prepared based on DN-GEO-03040.

Table 3.7 Minimum Width Dimensions for one-way subways and overbridges

Type of Subway	Length of Subway (m)	Width (m)
Wide	-	5.0
Normal	< 23	3.0
	≥ 23	3.3
Narrow	-	2.3

3.3.5 Separation Distance & Lateral Clearance

When providing active travel infrastructure within the maintenance strip or verge of a national road (online option) the designer shall provide a minimum carriageway separation distance.

Online segregated active travel facilities may be provided on Type 1, Type 2 and Type 3 Single and Dual Carriageways as outlined in **Table 2.1** above.

The desirable minimum carriageway separation distance for Type 1, Type 2 and 3 Single and Dual Carriageways will be as shown in **Table 2.2**. The designer will refer to section 4.17 of DN-GEO-03036 for further information.

A minimum lateral clearance of 0.5 m shall be provided to vertical objects (wall, fence or a VRS) where they are located adjacent to cycle facilities in accordance with section 4.17 of DN-GEO-03036.

3.3.6 Clearance and Headroom

A desirable minimum clearance / headroom shall be provided for active travel facilities at structures. Refer to **Table 3.8** below extracted from DN-GEO-03040 and **Table 3.9** extracted from DN-STR-03005 for further information.

Table 3.8 Minimum Height Dimensions for subways

Type of Subway	Length of Subway (m)	Height (m)
Wide	-	2.6
Normal	< 23	2.4
	≥ 23	2.7
Narrow	-	2.3

Table 3.9 Enclosed Footbridges Minimum Headroom Requirements

	Minimum Headroom (m) inside enclosure
Pedestrian Only	2.3
Pedestrian and Cyclist	2.4
Equestrian (dismounting provisions in accordance with DN-STR-03005 Section 12.14)	2.7
Equestrian (Mounted)	3.7

3.3.7 Junction Visibility

On a cycleway on the approach to a road, a desirable minimum setback as shown in **Table 3.10** below extracted from DN-GEO-03047 and DN-GEO-03060.

The appropriate visibility envelope 'Y' distance, depends on the design speed of the road which the cycle facility is intersecting with as shown in **Table 3.11** below and DN-GEO-03060.

Table 3.10 Values used as set-back distance (X) from edge of carriageway

X – distance (m)	Description of Use
4.0	Cycle route approach to a road – Desirable Minimum
2.0	Cycle route approach to a road – Absolute Minimum

Table 3.11 'y' Visibility distances from the minor road

Design Speed of major road (kph)	'y' Distance (m)
42	50
50	70
60	90
70	120
85	160
100	215

Where a cycleway intersects with another cycleway, the required visibility splay is dependent on the design speed of the cycle facility and the 'Y' distance will be the stopping sight distance (SSD) as shown in **Table 3.12** below extracted from DN-GEO-03047.

Table 3.12 Stopping Distance

Design Speed (kph)	50 kph	30 kph	10 kph
Minimum Stopping Sight Distance (m)	60	35	15

3.4 Other Design Details

3.4.1 Treatment at Junctions & Intersections

Given the higher risk for collisions involving cyclists at junctions, particular attention should be paid to measures to reduce this risk such as:

- Minor/side roads – cyclist priority and/or speed reduction across side roads.
- Major roads – separation of cyclists from motor traffic through junctions.

With the aim of providing an active travel network without any gaps in provision along a route, junctions should be given particular attention such as:

- Speed reduction and legibility.
- Clarity on the potential positioning and movement of all users.
- Communication lines between different road users through visibility and eye contact.
- Maximising priority for cyclists wherever possible.
- Particular attention at conventional roundabouts which pose the highest risk to cyclists.

Crossing types shall be as per the layouts presented within DN-GEO-03047 Rural Cycleway Design (Offline).

The type of crossing required where a cycleway crosses a trafficked road will depend primarily on the AADT of the road which needs to be crossed. As appropriate, the provision of a grade separated crossing should be considered, taking into account the projected number of users, the available land and the availability of suitable gaps in traffic to cross the road. The design of any grade separated cycle facility should be in accordance with DN-STR-03005 - Design Criteria for Footbridges and DN-GEO-03040 - Subways for Pedestrians and Pedal Cyclists.

3.4.2 Footway and Footpath Pavement Details

The structural design and materials of these surfaces must be in accordance with DN-PAV-03026 and the relevant Standard Construction Details in TII Standards.

3.4.3 Cycle Infrastructure Pavement Details

The Designer shall refer to DN-GEO-03047 for appropriate surfacing details for the provision of new or improved active travel facilities developed or delivered on or as part of national road projects in rural areas.

3.4.4 Lighting

The Designer shall refer to section 8.5 of DN-GEO-03047 and Chapter 5 of DN-LHT-03038 for requirements for lighting of active travel facilities.

3.4.5 Signage

The Designer shall refer to the Traffic Signs Manual (Department of Transport) for the provision of signage and road markings for active travel facilities.

3.5 Other Facilities

3.5.1 Cycle Parking

The Designer shall refer to Chapter 5 in the National Cycle Manual (NTA) and the DoT's Greenways and Cycle Routes Ancillary Infrastructure Guidelines as well as any other relevant TII guidance for the provision of appropriate cycle parking facilities.

3.5.2 Access Control

Any access control that may be considered should be decided at plan level by the Designer taking full cognisance of the relevant disability legislation. Where access control is deemed necessary, access control provision will be as per the layouts presented within DN-GEO-03047 Rural Cycleway Design (Offline). The Designer will have regard to the DoT's Greenways and Cycle Routes Ancillary Infrastructure Guidelines.

It is recommended that the Designer should avoid unnecessary use of access control (such as kissing gates, bollards, chicane fencing etc) as these cause difficulties to many legitimate users and may prevent the provision of a fully inclusive facility which caters for all users.

3.5.3 Ancillary Facilities

The provision of comfort facilities will encourage active travel and typically delivers excellent value for money. Required comfort facilities for people walking, wheeling, and cycling can be divided into the following categories:

a) Seating.

b) Resting areas (with water supplies) and trailheads.

c) Waiting shelters.

d) Public toilets.

e) Planting and litter bins.

f) Good quality and secure cycle parking – quantity of cycling parking, types of parking (for different types of cycles), parking at interchanges, paid-for cycle parking.

g) Signing for walking, wheeling, and cycling – route guidance, location and direction signing.

h) On-street maintenance facilities for cycles.

i) Cycle counters.

The designer will refer to DMURS, Greenways and Cycle Routes Ancillary Infrastructure Guidelines (DoT), any other relevant TII guidance and liaise with the appropriate Local Authority Active Travel representative for specific details on the provision and design of these facilities.

4. Maintenance and Management

4.1 General

When planning and designing new or improved active travel infrastructure, or interventions, on or as part of national road projects in rural areas it is necessary to take account of requirements pertaining to their maintenance and management. This chapter provides guidance on items to be considered pertaining to their management and maintenance.

4.2 Designing with Maintenance in Mind

Maintenance should be considered as part of the route development process long before construction starts. It is essential that the Designer consider maintenance and management requirements in the project's development.

4.3 Safety and Quality Audits

It is appropriate that audits of cycle and walking routes and related facilities are conducted at various stages from planning through to construction, and in relation to existing infrastructure.

The Designer should refer to the walking and cycle route Quality Audit Requirements in DMURS for guidance.

The Designer shall refer to the requirements of TII GE-STY-01024 Road Safety Audit for road safety auditing requirements.

4.4 Maintenance Responsibilities

Maintenance of active travel infrastructure, or interventions, developed or delivered on or as part of national road projects in rural areas is the responsibility of the Road Authority.

4.5 General Maintenance Tasks

Each Road Authority will be required to maintain their active travel infrastructure, or interventions, and establish inspection regimes based on the hierarchical status and functionality of each asset.

Some of the defect types that affect walking, wheeling, and cycling network safety and serviceability include:

- Footway, and cycleway surface defects;
- Drainage and utility covers maintenance;
- Guardrail, fencing, and restraint systems;
- Signing, road studs, and markings;
- Traffic systems and pedestrian and cycle crossings;
- Lighting;
- Verge, trees, and hedges;
- Cleanliness and weed growth,

4.6 Winter Maintenance

Walking, wheeling, and cycling routes are core tenets of a strong transport system and consequently form part of regular and ongoing winter maintenance programmes. It is essential that the Designer consider winter maintenance and management requirements pertaining to the proposed active travel infrastructure, or interventions during the project's development.

5. Monitoring & Evaluation

5.1 General

The type of monitoring and evaluation that is undertaken will depend upon factors relevant to the specific scheme.

5.2 Why Monitor and Evaluate

Understanding how active travel interventions function allows the Road Authority better manage and improve them. Additionally, this will aid the planning and construction of future interventions.

Gathering data around the usage and impact of interventions makes the case for new proposals and helps with exploring future options. Typically monitoring will be used to:

- Compare and prioritise design options;
- Compare active travel interventions with other local transport interventions;
- Demonstrate that interventions represent value for money;
- Review operation of experimental interventions to aid in continued operation or other;
- Assess the operation of innovative interventions to learn lessons on how their design might be developed/improved in future.

When planning a new route or network, or improvements to existing infrastructure, data from other similar routes and networks may be used as the basis for forecasting what usage and impact might look like following the intervention, and for helping to make the case to support the proposition. Noting that this data alone should not form the only basis for provision as interventions should be plan led with the aim to induce demand.

The case for future funding or providing support at public consultation can be enhanced by a quantified and qualitative examination of usage.

5.3 Limitations and Risks

When planning a new route or network, or improvements to existing infrastructure, data from other similar routes and networks may be used as the basis for forecasting what usage and impact might look like following the intervention, and for helping to make the case to support the proposition.

However, this information should not be solely relied upon when planning future interventions for the following reasons:

- Progress towards meaningful/aspirational modal shift will be incremental, so using historic data is not a complete baseline.
- It is very difficult to account for induced demand in users who do not currently consider themselves as ‘walkers’ or ‘cyclists’ – but if the right infrastructure was there, their thoughts and behaviours might change.
- Design for sustainable outcomes and for growth should be plan-led, not based on a survey-derived assumption that usage will be ‘low’.
- The intervention itself may be a limiting factor and not representative of potential growth if it is not part of a coherent network that is seen as attractive to people.

5.4 Process

A Monitoring and Evaluation Plan will be dependent on the intervention type as well as the extent of evaluation objectives. When setting up the Monitoring and Evaluation Plan, the Designer should:

i. Set S.M.A.R.T.[9] outcome targets (e.g. x% increase in active travel mode share at trip attractors adjoining an active travel route, y% annual improvement in user satisfaction, z% of utility trips along a route);

ii. Identify appropriate Key Performance Indicators for the evaluation (see **Section 5.5.1** – Datasets);

iii. Annually measure and evaluate changes to the indicators (i.e. capture incremental changes over time).

5.5 Data Collection

5.5.1 Datasets

The Road Authority will identify appropriate data sources to be used in the monitoring and evaluation process. Covering a broad range of information collection will ensure that any gaps in provision for user types is identified.

Potential datasets to be used in the monitoring and evaluation process, and indeed as part of the planning and design process, include but are not limited to the items described in **Table 5.1**.

Table 5.1 Potential datasets

Dataset	Reason for collection	Collection methods
Volumes of people walking, wheeling and cycling (incl. aggregation by time of day, day of week, season, year, etc)	Inform authorities and designers of the effects of installing an active travel facility Aid in planning and maintenance Understanding of daily, weekly and seasonal trends	Manual counting, automatic counters, video, crowd sourced datasets
Detailed information of people walking, wheeling and cycling	To better understand the user demographics and trip types (e.g. age, gender, ability levels, trip type, behaviour)	Manual counting, surveys, demographics from crowd-sourced data (if recorded/provided)
Cycle parking (incl. outside of designated facilities)	Provides end-trip data (popular destinations) and guides the planning of new facilities.	Manual counting, automatic counting at stations
User perceptions	To understand how people walking, wheeling and cycling experience the facilities (e.g. perceived safety in relation to other pedestrians, cyclists and motorised traffic). Characteristics such as age, gender and disability types (if any) are useful to understand effects on particular groups.	Surveys Stakeholder / public consultation

[9] S.M.A.R.T = Specific, Measurable, Achievable, Relevant and Time-bound

Dataset	Reason for collection	Collection methods
	Identifying positive and negative aspects to further improve the facilities and design better facilities in the future	
Expenditure	Understanding economic impacts of active travel facilities	User surveys, local business surveys
Modal shift	Establishing how new active travel infrastructure has affected the modal split.	Proxys: travel surveys, travel plans of large trip attractors along the corridor, collaboration with public transport operators

Low levels of active travel along a corridor can make effective collection of data, and thus trend identification, difficult. For the most effective evaluation process, the Road Authority should use several indicators to validate results.

The data to be collected should directly address the intended outcomes and impacts of the active travel interventions provided as part of the development and delivery of major and minor national road projects and should relate to what is available at the location. For example, is a suitable location for an automatic counter available on the route.

5.5.2 Data Collection Methods

Before deciding on a data collection method, the Designer should consider what outputs are already available from existing national and local datasets that may be used for the project's needs.

The Designer should select a data collection method based on the datasets which need to be generated in accordance with the Monitoring and Evaluation Plan.

The investment in data gathering should be proportionate to the project scale and it should address the outcomes and impacts in a cost-effective but worthwhile manner.

Monitoring and evaluation data can be collected through both qualitative and quantitative methods. Common data collection methods are outlined in **Appendix A** for reference.

Data analysis will be planned at the stage of designing the data collection approach, and it should respond directly to the requirements of the Monitoring and Evaluation Plan.

5.6 Outcome Targets

The Designer should be able to compare intervention outcomes to a baseline (i.e. ex-ante vs. post-ante evaluation). The Designer should also be able to understand and communicate the limitations and risks associated with undertaking and communicating the evaluation – see section 5.3.

Outcome targets may include, but are not limited to, the following:

- Total walking, wheeling, and cycling movements (volume) and increase (percentage);
- Walking, wheeling, and cycling movements (volume) and increase (percentage) – among different user groups;
- Perceptions of safety;
- Perceptions of place / sense of 'feeling' about the route and general surroundings;

- Health benefits (e.g. mental health and wellbeing, physical health etc.);
- Environmental and economic benefits (e.g. increased spending in town centres, reduced cost of congestion, reduced cost to healthcare, additional 'greening' from the scheme).

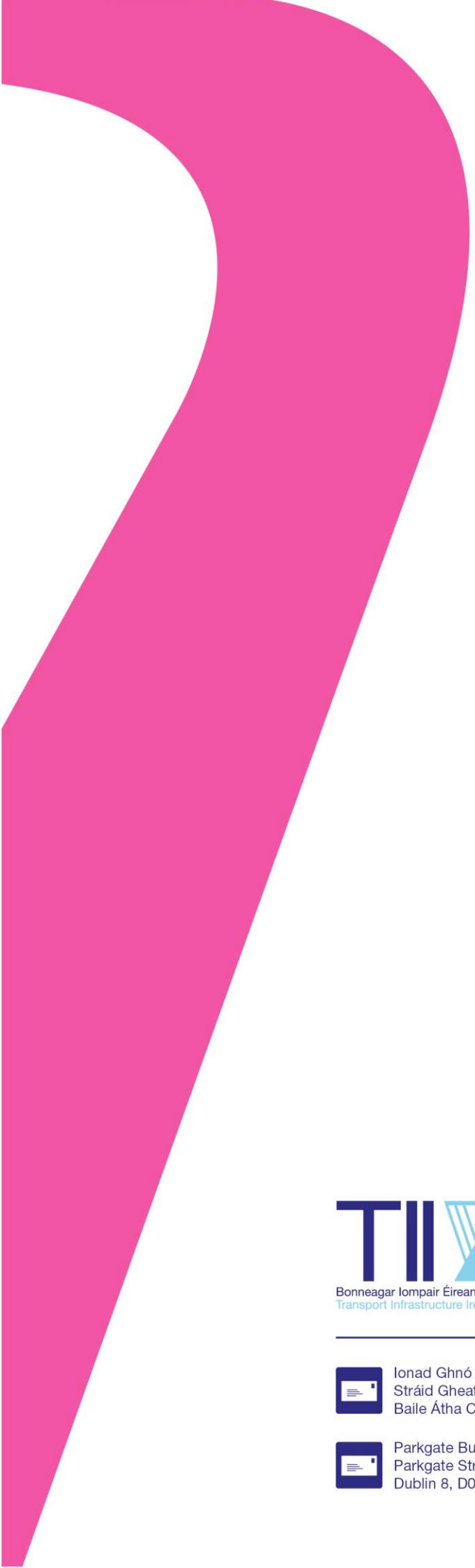
The outputs may also be used to feed into the calculation of a Cost Benefit Analysis (CBA) or Cost Effectiveness Analysis (CEA) of the scheme, if required.

Appendix A:

Evaluation and Monitoring Data Collection Methods

Type				
Quantitative	Automatic counters of movements of people walking or cycling	Machines that can count without requiring human assistance	Provision of continuous data over long time periods	No additional information of the users beyond numbers, speed and direction
	Videos	Video processing used to distinguish and count different user types, as well as identify behaviour	CCTV footage can be used, AI software could be used to enhance value	Requires installation in rural areas with few potential attachment points GDPR?
	Manual counting of movements of people walking or cycling	People recording volumes pedestrians and cyclists	More flexibility in terms of data coverage (e.g. gender, age, cycle type, helmet usage, etc)	Difficult to sustain for long periods. Generally, an expensive process
	Counts of cycle parking usership	People counting the number of parked bicycles at a pre-determined location		
	Route user intercept surveys	Interviewing people walking, wheeling and cycling along routes	Data can be specific to the study area.	Expensive process
	Household travel survey CSO Data?	In-depth survey about an individual, their household and a diary of their trips on a given day.	Expansive dataset, including information on socio-demographic indicators	Expensive to gain a very strong dataset
	Workplace travel surveys	Survey about how people travel to and from their place of work. Can include questions about what would encourage active travel.	Data can be specific to the study area.	Dataset is likely to not be large
	School travel surveys	Survey about how people travel to and from their place of education. Can include questions about what would encourage active travel.	Data can be specific to the study area.	Dataset is likely to not be large
	Crowd sourcing	Using computer or smartphone applications (e.g. Strava) that use mapping features such as GPS tracking to produce “heatmaps” of where people move.		

Type	Method	Definition	Benefits	Disadvantages
Qualitative	Community interviews	Surveying the members of community, for example at events organised by the local authority	Provides a focused look into the behaviour of individuals who are already engaged in active travel initiatives	The process ignores people are not actively participating active travel initiatives
	Evaluative exploitation of social networking sites	Analysing people's opinions and comments with regards to active travel	Only modest costs	The process excludes people without access to social networking sites



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