



# Sustainable Mobility

TII Position Paper

November 2020

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# 1 | Introduction

TII's purpose is to provide sustainable transport infrastructure and services, delivering a better quality of life, supporting economic growth and respecting the environment. In fulfilling this purpose, TII strive to be leaders in the delivery and operation of sustainable transport infrastructure and to ensure that Ireland's national road and light rail infrastructure is safe and resilient, delivering sustainability mobility for people and goods. Sustainability is one TII's core values that permeate our way of working, playing our part in addressing the climate and biodiversity crisis. This purpose, vision and value is set out in the TII Statement of Strategy 2021 to 2025 which makes an overt commitment to supporting the transition to a low-carbon and climate resilient future, through enabling active travel and prioritising sustainability in decision making,

TII operates, maintains and renews national roads and light rail infrastructure. We deliver new infrastructure for road, light rail, Metro and Active Travel. We operate light rail, tolling and traffic control systems that contribute to the electrification and digitalisation of transport. TII plays a key role in supporting sustainable mobility and decarbonisation of

transport in Ireland.

The purpose of this paper is to outline TII's position on Sustainable Mobility, in terms of:

- The importance of sustainable mobility;
- The current issues that need to be overcome to provide for sustainable mobility; and
- The vision for what sustainable mobility can be and can deliver, and key themes through which it can be achieved.

Sustainable mobility is a complicated, multi-faceted issue and this paper is not intended to address every single element of the topic. Rather, it focuses on particular issues and opportunities relating to sustainable mobility where TII can provide a valuable contribution to the discussion on how sustainable mobility can be achieved.



**TII Statement of Strategy**  
2021 to 2025

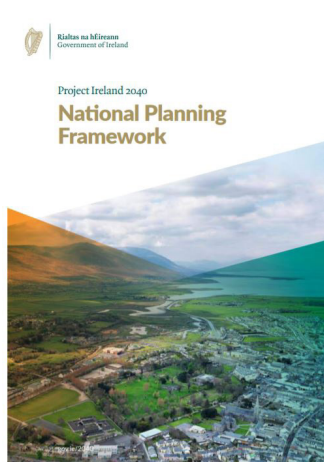
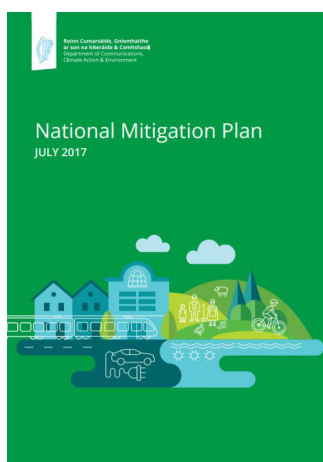
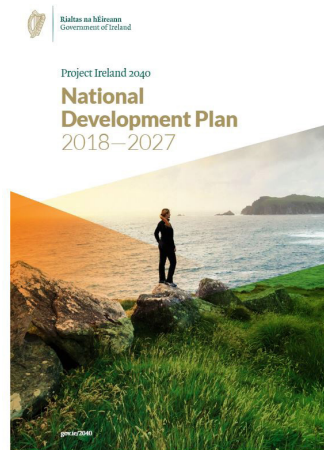
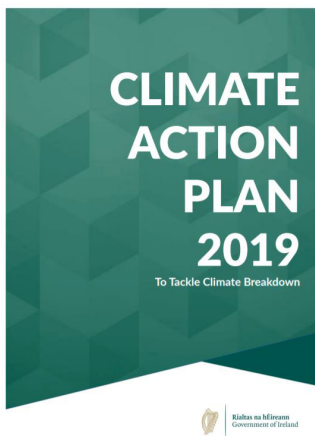


**“ provide high quality transport infrastructure and services, delivering a better quality of life and supporting economic growth**

## 2 | Definition of Sustainable Mobility

At an international level, many organisations are implementing plans to meet the commitments of the United Nations 2030 Agenda for Sustainable Development and to implement the UN Sustainable Development Goals (SDGs). These much-publicised goals represent a globally accepted perspective on “what better looks like” and provide direction for everybody. This translates to governments developing plans and mandating public and private sectors to face up to sustainability issues and embed sustainability principles into core business activities.

Sustainability has therefore been placed at the heart of long-term planning and this is reflected in four key recent policy documents produced by the Government, which outline the need to manage our future growth in Ireland in a planned, productive and sustainable way:



The 2018 National Planning Framework (NPF) is the Government’s high-level strategic plan for shaping future growth and development over the next 20+ years. The NPF sets out a shared set of goals expressed as ten National Strategic Outcomes (NSOs), illustrated in **Figure 1**, which the framework aims to deliver. Sustainable Mobility is one of these NSOs.

The National Development Plan (NDP) is a ten-year capital investment plan published by Government together with the NPF, which outlines the public investment that is proposed to enable the NSO of sustainable mobility.

Current definitions of sustainable mobility, however, are mostly limited to active travel and public transport. TII’s position, however, considers the definition of sustainable mobility to be broader, as illustrated below.

The EU Transport Council defines a sustainable transport system as a system that:

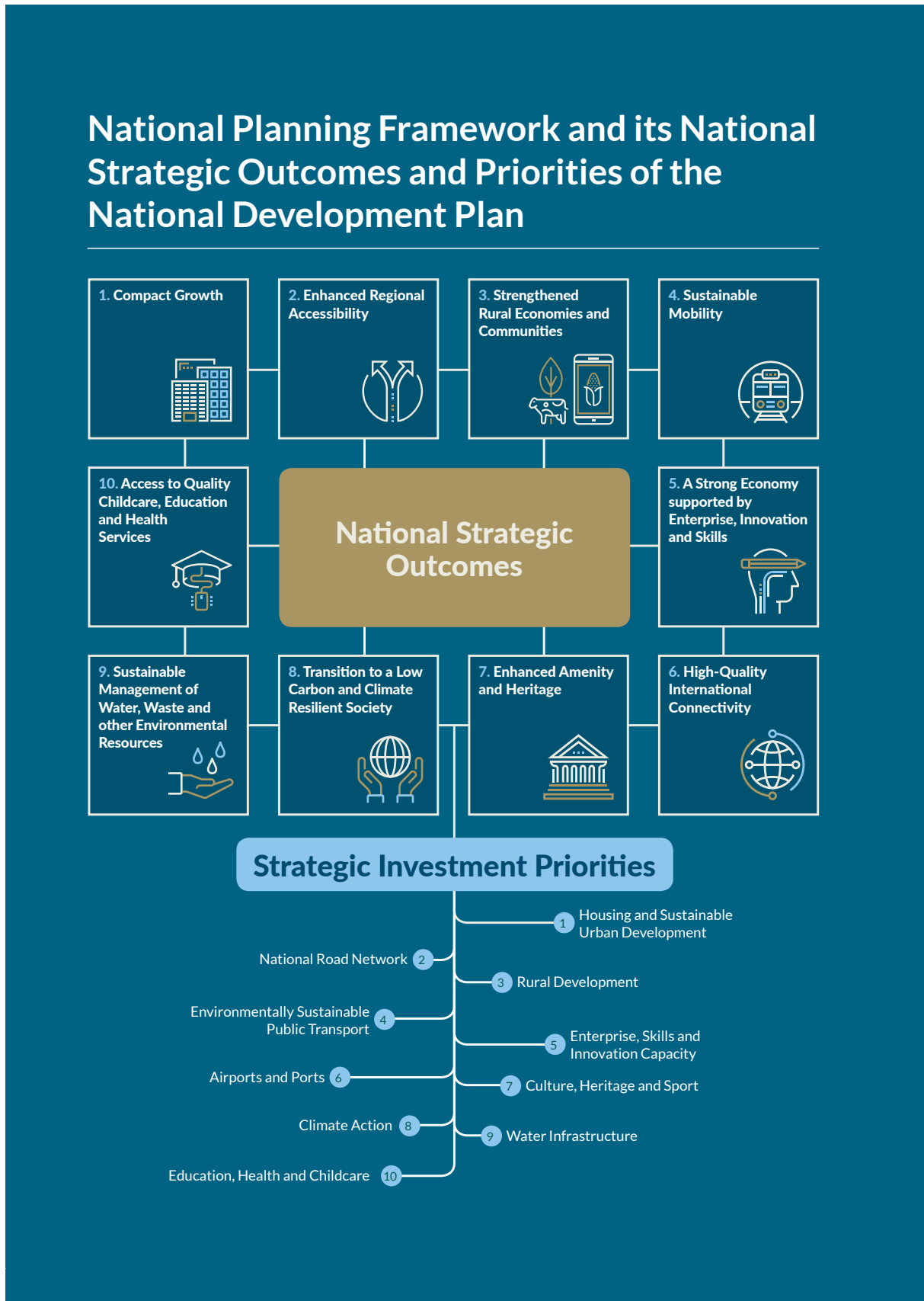
- Allows the basic access and development needs of society to be met safely and in a manner consistent with human and ecosystem health and promotes equity within and between successive generations;
- Is affordable, operates fairly and efficiently, offers choice of transport mode, and supports a competitive economy, as well as balanced regional development; and
- Limits emissions and waste within the planet’s ability to absorb them, uses renewable resources at or below their rates of generation and uses non-renewable resources at or below the rates of development of renewable substitutes while minimising the impact on the use of land and the generation of noise.

TII recognises the most effective provision of sustainable mobility is through an integrated Sustainable Transport System, where each mode of transport has its own role to play, but also complements the other modes within that system.

The choice of transport mode for transport system users will be toward options that minimise their costs (e.g. time, money) and maximise their benefits (e.g. safety, health, comfort). The goal for public bodies is to enable trip-makers to choose the combination of modes that serves them best. However, public bodies must also ensure economically efficient provision of transport services and infrastructure, as well as enabling and encouraging sustainable travel choices.

TII believes that the context for Ireland’s transport system changes between rural and urban areas. Where there are high levels of trip demand, the economic case for provision of public transport alternatives to car travel increases. Where there is dispersed population in rural areas it may not be economically sustainable to provide bus services that meet the mobility needs of all users. For example, a trip from a rural area of low population density to a busy urban centre could ideally be composed of multiple parts whereby a trip-maker switches mode from car to public transport at the earliest opportunity and completes the final portion of the trip through walking or cycling. Car dependency is reduced but an acceptable level of personal mobility is retained.

Figure 1 National Strategic Outcomes



## 3 | Current Issues

Some of the key issues that will need to be addressed if a sustainable transport system is to be achieved in Ireland, are highlighted hereunder.

### 3.1 Transport Inequity

A sustainable transport system allows trip-makers to choose the mode, or combination of modes that serves them best for the journey they wish to make. There are a number of issues of transport inequity that need to be overcome for this to be realised, particularly in relation to:

- **Geography:** Opportunities to undertake trips by modes other than private car are, understandably, more readily available in urban areas, compared to rural areas in terms of services. However, in rural areas, for example, the lack of safe access to bus facilities and connectivity / interchange with other modes is a major barrier to public transport accessibility.
- **Gender:** Women and men have different transport needs, constraints and expectations. Safety is the biggest issue for women when travelling and this impacts how they travel, how often they travel, when they travel and if they travel at all. Evidence from the International Transport Forum shows that failure to take account of women's safety may prompt them to prefer private car use to public transport or active modes. Evidence from the 2016 Census<sup>1</sup>, which showed the number of men cycling to work was more than twice the number of women, suggests that there are similar issues in Ireland.



- **Ability:** At present, transport is not equally accessible to wheelchair users, people with sight or hearing loss, the elderly and infirm and people with buggies and luggage. Current issues that contribute to this include circuitous routing, difficult road crossings, poor signage, confusing street layouts and poor waiting environments (for public transport). With Ireland forecast to undergo significant population changes in the medium term, moving from a relatively young demographic profile to one with a higher proportion of older people, these issues will need to be addressed.

### 3.2 Severance and Poor Permeability

Two of the most significant barriers to sustainable mobility, and the take-up of active travel modes in particular, are severance<sup>2</sup> and poor permeability<sup>3</sup> in urban areas.

Severance caused by roads can make travel within urban areas by bicycle and on foot unattractive, with pedestrians and cyclists unable to cover relatively short 'crow-fly' distances without taking complex and lengthy routes.

An example of such severance can be found in the vicinity of Junction 14 on the M50. Pedestrians and cyclists wishing to travel between housing estates south of the M50 and the Beacon Hospital/Sandyford Business Park north of the M50 are challenged with having to navigate lengthy routes through a vehicle-intensive environment.

Severance can also be caused by natural barriers. The lack of pedestrian and cyclist crossing points over the River Liffey between Chapelizod and Lucan prevents orbital pedestrian and cyclist movement between the western suburbs of Dublin. To complete trips in these areas many travellers, who would otherwise walk or cycle, switch to the car and contribute to road congestion on the local and national road network.

TII recognises that busy urban motorways, ring roads and town bypasses can be hostile environments for pedestrians and cyclists wishing to cross. TII is committed to improving provision of pedestrian and cycle facilities in urban areas as can be seen with recent TII projects such as Bóthar na dTreabh (N6 Galway) and the Dunkettle Interchange Upgrade scheme (N8/N25 Cork). Our standards department is now developing a new set of standards for Active Travel schemes.

For access to public transport such as Luas, and buses on the national road network, as well as access to services and amenities, there is also a need to address lack of "permeability" through many developments, especially suburban housing estates, which leaves pedestrians and cyclists facing overly-lengthy routes as part of their journeys.



1 <https://www.cso.ie/en/releasesandpublications/ep/p-cp6ci/p6cii/p6mtw/>

2 "A phenomenon that is caused by traffic, barriers, and roads that has physical, psychological, local and social effects on people, pedestrians, movement, and access". [https://discovery.ucl.ac.uk/id/eprint/1527807/1/Anciaes\\_ucl\\_streetmobility\\_paper04.pdf](https://discovery.ucl.ac.uk/id/eprint/1527807/1/Anciaes_ucl_streetmobility_paper04.pdf)

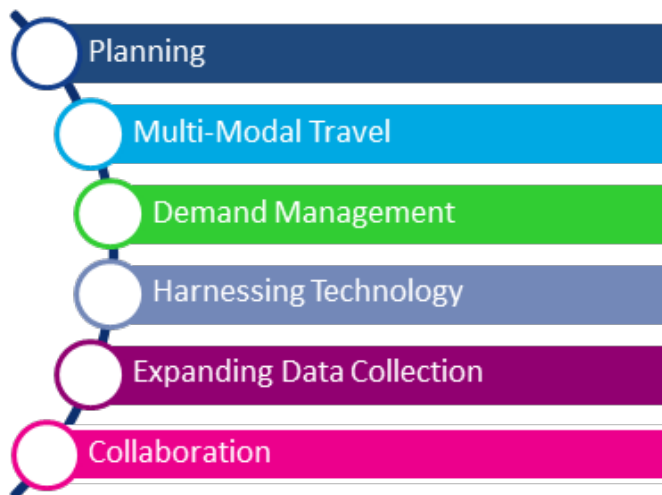
3 "The extent to which an urban area permits the movement of people by walking or cycling". [https://www.nationaltransport.ie/wp-content/uploads/2011/12/NTA\\_Permeability\\_Report\\_-\\_Web.08.20151.pdf](https://www.nationaltransport.ie/wp-content/uploads/2011/12/NTA_Permeability_Report_-_Web.08.20151.pdf)

## 4 | Vision for Sustainable Mobility

TII's vision for sustainable mobility entails an integrated and sustainable transport system, that:

- Provides a truly multi-modal transport network that enables trip-makers to choose the combination of modes that serves them best;
- Improves mobility and accessibility for all citizens, in a way which is much more sustainable, equitable and environmentally friendly; and
- Reduces car dependency but retains an acceptable level of personal mobility.

TII considers the key themes, outlined below, to be important in delivering this vision.



### 4.1 Planning

There are a number of planning practices that can contribute to the delivery of a sustainable transport system, including:

- Placing sustainable mobility at the forefront of spatial planning decisions;
- Effective governance to ensure implementation as intended;
- Granting statutory consultee status to a national body to ensure nationwide adherence to sustainable mobility principles; and
- Changing how transport projects are assessed at the scheme appraisal stage.

These are discussed hereunder.

There is a need to ensure that sustainable mobility requirements are at the forefront of spatial planning decisions. TII welcomes the important policy instruments, design standards and strategic guidelines that have been created to support the integration of land use planning and transport planning over the past years such as:

- Project Ireland 2040, including the National Planning Framework (NPF) and the
- National Development Plan 2018-2027 (NDP);
- Design Manual for Urban Roads and Streets (DMURS);
- Regional Spatial and Economic Strategies (2019/2020);
- Spatial Planning and National Roads (2012);
- Transport Strategy for the Greater Dublin Area 2016-2035;
- Smarter Travel: A sustainable transport future (2009);
- The formation of the Office of the Planning Regulator;
- The legislative requirement of RSES strategy to be consistent with Transport strategy for the GDA;
- Metropolitan Transport Strategies prepared by the National Transport Authority (NTA) in collaboration with local authorities and TII;
- TII Design Standards; and
- Area based transport assessments (ABTA).

While recognition of the important link between transport and land use in planning is an imperative step, there is also a need for effective governance to ensure that future land use and transport plans are implemented as intended.

TII has a statutory consultee role under the Planning Acts to make submissions for development plans and planning applications to all planning authorities including the three Regional Assemblies. Outside the Greater Dublin Area (GDA), TII is the only national transport agency with which planning authorities are legally obliged to engage. TII can only engage where the plans would have an impact on existing and national road infrastructure. Outside the GDA there is no statutory requirement to consult or engage with any national transport agency to ensure sustainable mobility is considered in the development of county development and local area plans. As such, it is imperative that a national body has nationwide statutory consultee status for sustainable mobility. At the same time, it is also important to increase the provision of sustainable mobility expertise at local authority level. This combined ‘top-down, bottom-up approach can ensure that national policy is implemented at all levels within the planning system.

Changes to how transport projects are assessed at the scheme appraisal stage of planning can also contribute to the provision of a more sustainable transport network. Currently, appraisal of transport projects places a heavy emphasis on

economic sustainability as articulated through the economic and financial appraisal. Economic benefits are quantified largely through monetising the economic productivity benefits brought about by journey time savings. Reductions in accidents and greenhouse gas emissions savings are also quantified. However, for most schemes, the value of the emissions savings or increases tends to be a fraction of the value of journey time savings. If decarbonisation is a primary policy driver for an investment, it could be more highly prioritised within the appraisal process. Equally, other elements of sustainability – environmental, social or economic – that provide the policy context for an investment could be elevated in importance within the appraisal. Consideration also could be given to deploying the social and natural capitals used by other sectors and in other jurisdictions for transport policy and project assessment.

In terms of longer-term planning, it is important to note that a truly sustainable transport system cannot be delivered overnight and sustained levels of investment are required over sustained periods of time. It is therefore important to look beyond the 2027 horizon of current proposals, such as Luas, MetroLink, and road-based projects such as BusConnects, to develop a comprehensive and well-grounded long-term transport infrastructure ‘pipeline’ to enable Project Ireland 2040 and beyond. TII considers that ambitious targets for the transport project pipeline are crucial for the long-term development of sustainable transport system.





## 4.2 Multi-Modal Travel

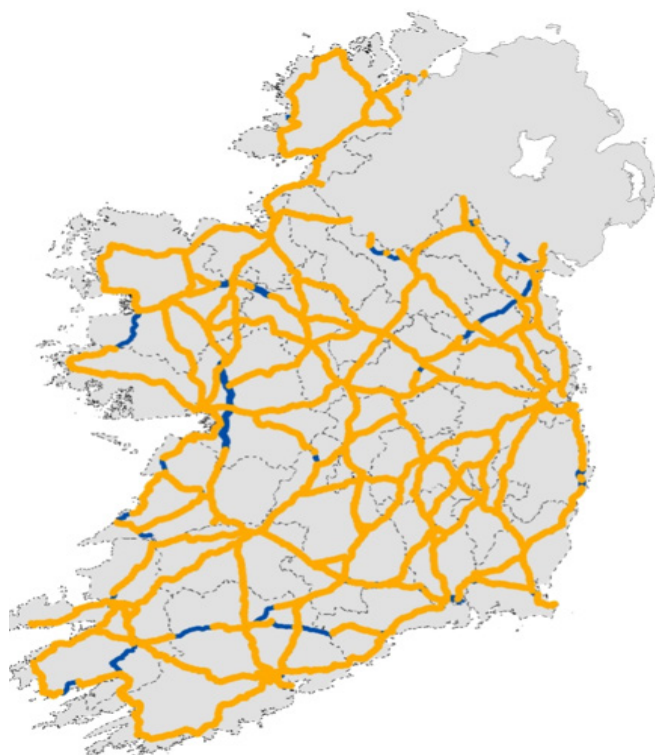
Multi-modal travel is the key component of sustainable mobility and the core principle underlying the concept of a sustainable transport system, where each mode of transport has its own role to play, but also complements the other modes within that system.

Multi-modal trips can be made more convenient and attractive to travellers through effective policy and design measures, as outlined below. The design standards for active modes which are currently being developed by TII will facilitate the introduction of measures on a consistent and efficient basis.

### Making More Efficient use of Existing Road Space

Approximately 70% of all public transport trips occur on roads. Most bus services operating in the state avail of national roads for some part of their journey and TII analysis of NTA bus statistics shows that between 10 and 15% of all bus vehicle kilometres travelled are on national roads. This is reflected in the fact that the majority of national roads in Ireland facilitate at least one bus service, as illustrated in Figure 2, below.

**Figure 2** Bus and Coach Services on National Roads



### Bus and Coach Services on National Roads

- Bus and Coach Services on National Roads
- National Roads with no Bus or Coach Services

Over the last 25 years, development of the motorway network has facilitated growth in bus and coach operations and improved service levels through reduced and reliable journey times that can compete effectively with the private car. Bus/coach services now operate across 121 routes on national road radial corridors (M1, M2, M3, M4, N7 and M11) in the GDA.

National roads play a particularly important role in providing for sustainable modes in rural areas, with most local and regional bus services, including the LocalLink services, operating on them.

With major public transport proposals such as BusConnects increasing the provision of dedicated bus priority and cycle facilities, it is clear that going forward, roads will have an increasingly important role to play as part of a sustainable transport system. Making more effective use of existing road space can provide benefits in this regard. For example, where space permits and there are no adverse safety risks, consideration could be given to allowing buses to operate on hard shoulders of National Roads.

In some cases, especially in rural areas, national roads will be required to provide access to more sustainable modes as part of multi-modal trips. It is important, therefore, that more initiatives such as Park and Ride (P&R) and car sharing are facilitated on the road network.

## Cycle Network Enhancements

TII emphasises the importance of providing an ambitious level of segregated cycle network nationally. This involves, for instance, implementation of the Galway-Dublin Greenway project, the NTA's GDA Cycle Network Plan (2013) and the cycling infrastructure associated with BusConnects, as well as development and implementation of cycle network plans for the regional cities. TII also recognises that, as well as implementing new design standards to facilitate active travel in new infrastructure, retrofitting of existing infrastructure is also necessary. The principles outlined in the Design Manual for Urban Roads and Streets (DMURS)<sup>4</sup>, for example, while being applied to new developments could also retro-actively be applied to established urban areas.



## Safety Improvements

Concern around safety is the most significant barrier to increasing participation and has discouraged active travel, resulting in significant age and gender imbalance in cycling uptake. Evidence from the Central Statistics Office (2016) shows that only 27% of the cyclists in Ireland are women, which contrasts with figures from Denmark (45% women), Germany (49%) and the Netherlands (55%). The design and delivery of safe/segregated cycling facilities has the potential to offer an alternative for people who are currently undertaking short trips (<10km) by car and help to address the current gender imbalance. While off-road facilities such as greenways are particularly attractive to cyclists, the reality is that the majority of cycling facilities are delivered on or adjacent to roads. TII recognises that the design of these facilities should ensure that the highest possible degree of segregation and safety is provided, and this is reflected in TII's national road design standards .

Similarly, access to bus stops at the roadside outside urban areas should be made attractive, safe and convenient, particularly for elderly people and people with mobility issues.

## Interchange Facilities

Based on the experience gained from operating the Luas P&R facilities, TII emphasises the central importance of providing adequate and sufficient infrastructure around transport hubs (e.g. car and cycle parks around Luas stations) to cater for the current demand and encourage more multi-modal trips. Enhancing the user experience with improvements in comfort and convenience, e.g. provision of secure and safe transport hubs, refreshments/toilet facilities, live information about connections, delays and crowding etc., will encourage increased multi-modal use.



<sup>4</sup> <https://www.housing.gov.ie/planning/guidelines/urban-roads-and-streets/design-manual-urban-roads-and-streets-low-res>

## Accessibility

It is important to have early engagement with disability groups and a commitment to design in accordance with the principles of Universal Design. Furthermore, all those involved in the design and management of public transport should receive Disability Awareness Training, particularly those at decision-making level.

TII supports the concept of ‘Transport Access for All’ that is embodied in the Department of Transport’s (DoT) high level policy goal for accessible public transport. It is also crucial to address other accessibility constraints such as severance, geographic distance, safety, gender issues and affordability, if universal access to public transport is a goal to be achieved. Therefore, TII emphasises the importance of broadening the discussion around accessibility issues and limitations.

Based on TII’s experience in the appraisal of transport projects, and drawing on other relevant international references, it is suggested that the specific needs of different population groups are considered in broader accessibility appraisals, including, for example, disaggregated assessments of accessibility for different:

- **Locations (e.g. rural, suburban, urban):** In rural areas, the lack of safe access to bus facilities and connectivity with other modes is a major barrier to public transport accessibility; and
- **Socio-economic features (e.g. gender, age, ability, and affluence level):** Evidence from the International Transport Forum<sup>5</sup> shows that failure to take account of women’s safety may prompt them to prefer private car use to public transport.

## Improved Facilities in Rural Locations

TII supports active travel in rural areas by including dedicated rural cycle facilities in new National Road projects.

TII initiated a pilot programme of low traffic volume projects for National Roads in rural areas in February 2012. An advice note on the subject of ‘Provisions for Cyclists and Pedestrians on Type 2 and Type 3 Single Carriageway’ was published. TII Standards were developed in April 2014 to make the provision of dedicated cycle facilities mandatory in the verge of Type 2 and Type 3 single carriageways (road types below 8,000 AADT which do not include hard shoulders).

The integration of non-motorised users in the project appraisal for new and improved roads was made mandatory in May 2019 and now requires that the Designer must determine and make adequate provision for any Non-Motorised User requirements at an early stage in all projects.

Some sections of the following routes have segregated cycle facilities, i.e. N59 Westport to Mulraney, N59 Clifden to Oughterard, N86 Tralee to An Daingean. The N56 Dungloe to the Glenties project in Co. Donegal is currently being delivered and has a dedicated cycleway over its entire 27km length. It is anticipated that this project will be completed by 2023. The delivery of these and future projects can play an important role in facilitating and encouraging safe walking and cycling in rural locations.



<sup>5</sup> <https://www.itf-oecd.org/sites/default/files/docs/dp201111.pdf>

**Figure 3** Segregated cycling/walking facility on N86 near Annascaul, Co. Kerry



**Figure 4** N56 Donegal with cycleways



In terms of public transport, TII considers the provision of safe and improved facilities such as shelters, crossings, bus stops, and interchange facilities (cycle and car parks and drop-off/pick up areas) are essential to encourage people to access buses on rural roads. TII, working with the NTA, is currently pursuing the opportunity to standardise bus design at high speed locations.

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### 4.3 Demand Management

TII is tasked with creation of a safe and efficient road network. Demand management is a potential option in the pursuit of this goal. TII considers demand management measures/options to be an important element of a sustainable transport system.

In order to change behaviour and reduce reliance on the car, alternatives must be competitive, convenient, affordable, safe and available. However, demand management measures such as pricing, (i.e. congestion charging, road user charging, tolling or any other pricing), when integrated into a suite of sustainable mobility interventions, can be an effective measure.

TII has a large role to play on road user charging since the M50 and other key radial roads run through major population centres. As technology develops there is an opportunity for demand management in the form of more equitable distance-based road user charging to be developed.

The success of pricing will be limited if there is not a viable, convenient, affordable alternative to car use available in parallel. In the scenario where there are no alternatives to car use, pricing will fail to meet the objective of reducing congestion and car users will simply have no choice but to absorb the extra cost. This would not be an equitable or sustainable model.

It is important, therefore, that a sustainable transport system is pursued that provides alternatives to single-occupancy cars, such as public transport, car-sharing, walking & cycling, rather than simply focusing on deterrents to car usage. A 'carrot and stick' approach is required.



TII's position is that a suite of demand management measures should be investigated for deployment in the short to medium term. Factors which should be considered when determining which potential demand management measures may be effective and relevant include:

- Parking policy and associated charging strategies in towns and cities - in urban areas, the supply of available parking is the greatest contributing factor of car demand;
- Reviewing policy on high-occupancy vehicles (HOV) through Park & Pool areas on main roads, and by creating special lanes for HOVs; and
- In Ireland, it is possible that pricing will be a more acceptable intervention than traffic bans, although, many cities are now seeking to put in place partial or full bans on certain vehicles (e.g. Oslo).

### 4.4 Expanding Data Collection

To enable planners, designers and policy makers to make better evidence-based investment decisions and interventions, comprehensive, accurate data is required. TII has identified a number of important limitations and data gaps in the current transport-related statistics and data collection practices, as outlined below.

- **Transport data:** Travel surveys could be further expanded to get a clearer picture of all the transport modes that individuals use. These transport indicators could, for example, account for multi-modal trips, non-active trips undertaken by persons under 18 years of age and their guardians, non-commuting trips, and congestion-related data. Likewise, more updated indicators and spatial datasets are required for the provision of transport (e.g. spatial location and overall length of cycle routes nationally). TII would also emphasise the need to track disruptive changes to transport via statistics related to car ownership caused by recent/future introduction of shared cars, electric vehicles, electric bicycles etc.
- **Non-commuting trips:** Two-thirds of trips undertaken are not work-related and yet a large proportion of transport data collected focuses on work trips and the peak periods. It is possible that the scope for modal shift for non-commuting trips is not being recognised due to a lack of data about these off-peak periods.
- **Greater investment in data collection:** Greater investment in data collection and data sharing is needed to achieve a better and more holistic understanding of travel patterns. For example, the expansion of the scope of census transport questions (POWSCAR) could enable a better understanding of the complexity and inter-modality of travel patterns. This would mean going beyond simply asking for respondents' 'main' mode of transport. A better understanding of travel behaviour would help policy makers, infrastructure providers and service providers develop solutions that would enhance sustainable mobility and reduce reliance on the private car.

## 4.5 Collaboration

As a public service agency, TII recognises the challenges facing the Irish transport system are vast, complex and intricate. There are many stakeholders involved in the delivery of sustainable mobility and while each has their own important role to play, collaboration between them is essential.

Communication is the foundation of collaboration and therefore, TII is focussed on developing a collaborative approach involving government, academic and industry partners in pursuit of common goals.

TII would welcome the opportunity to work in partnership with the Department of Transport, the National Transport Authority and the relevant local authorities to develop a comprehensive, collaborative, integrated set of phased responses to the provision of a sustainable transport system in Ireland.

In practice, in the current Irish context, TII believes that sustainable mobility will be facilitated through increased levels of provision of P&R, park and share, public transport, cycling and walking infrastructure. Overall this would result in a better balance of usage between car and non-car modes. To this end, TII recommends development of a comprehensive, collaborative, integrated set of phased actions for different state agencies to ensure that the vision of a sustainable transport system can become a reality.



## 5 | Summary

TII plays a key role in the provision of infrastructure that supports sustainable mobility in Ireland.

This position paper outlines the issues and opportunities relating to sustainable mobility where the experience gained by TII in fulfilling its primary functions can provide a valuable contribution to the discussion on how sustainable mobility can be achieved, in an Irish context.

**TII's position in relation to these issues and opportunities is summarised below**

TII considers that the most effective means for the provision of sustainable mobility is through an integrated Sustainable Transport System, where each mode of transport has its own role to play, but also complements the other modes within that integrated system;

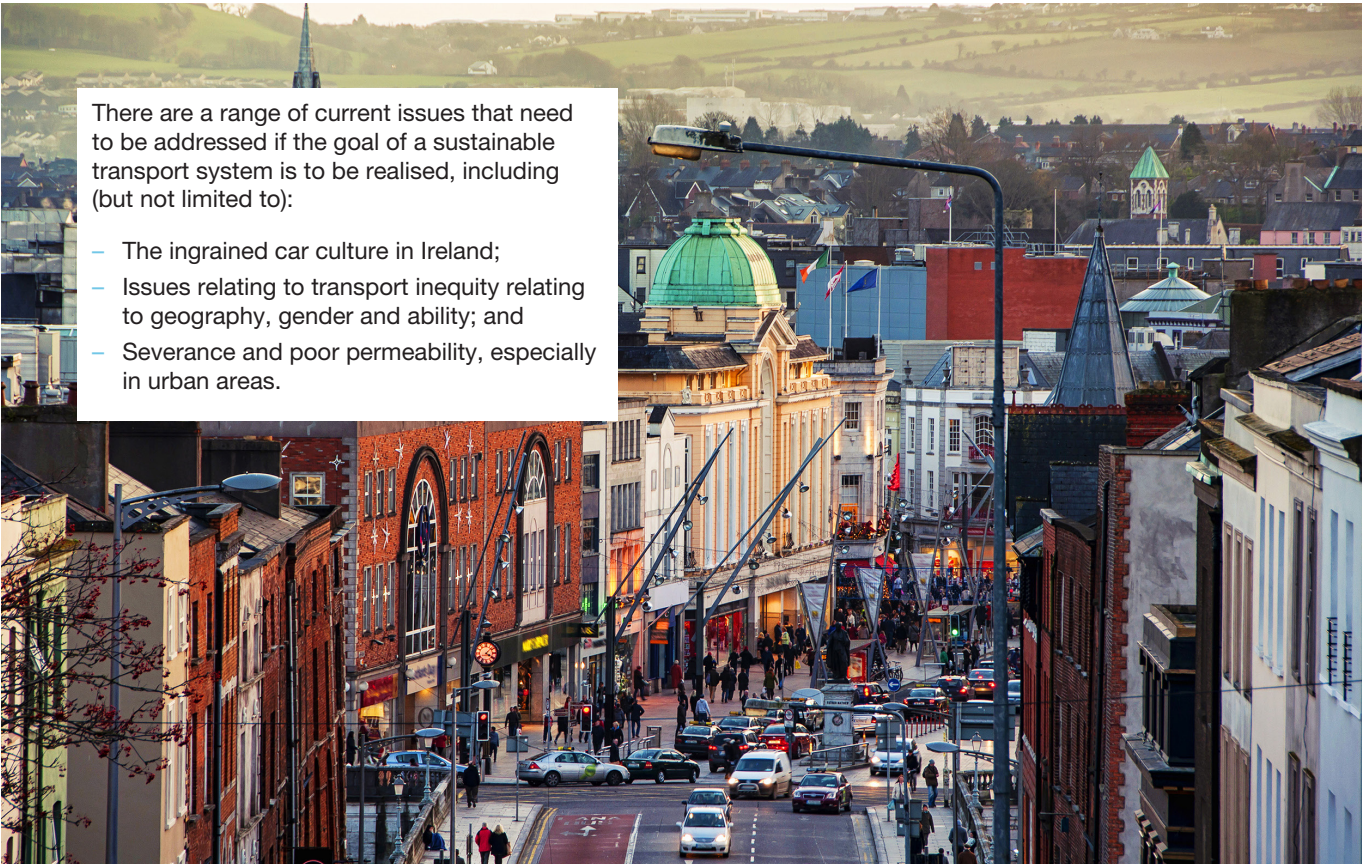
TII notes the important role that roads play in rural and urban areas facilitating sustainable mobility by catering for trips by public transport, walking and cycling. TII also emphasises the key and expanding role of light rail (Luas and future Metro) in urban areas.

TII's vision for sustainable mobility entails a sustainable transport system, that:

Provides a truly multi-modal transport network that enables trip-makers to choose the combination of modes that serves them best

Improves mobility and accessibility for all citizens, in a way which is much more sustainable, equitable and environmentally friendly

Reduces car dependency but retains an acceptable level of personal mobility

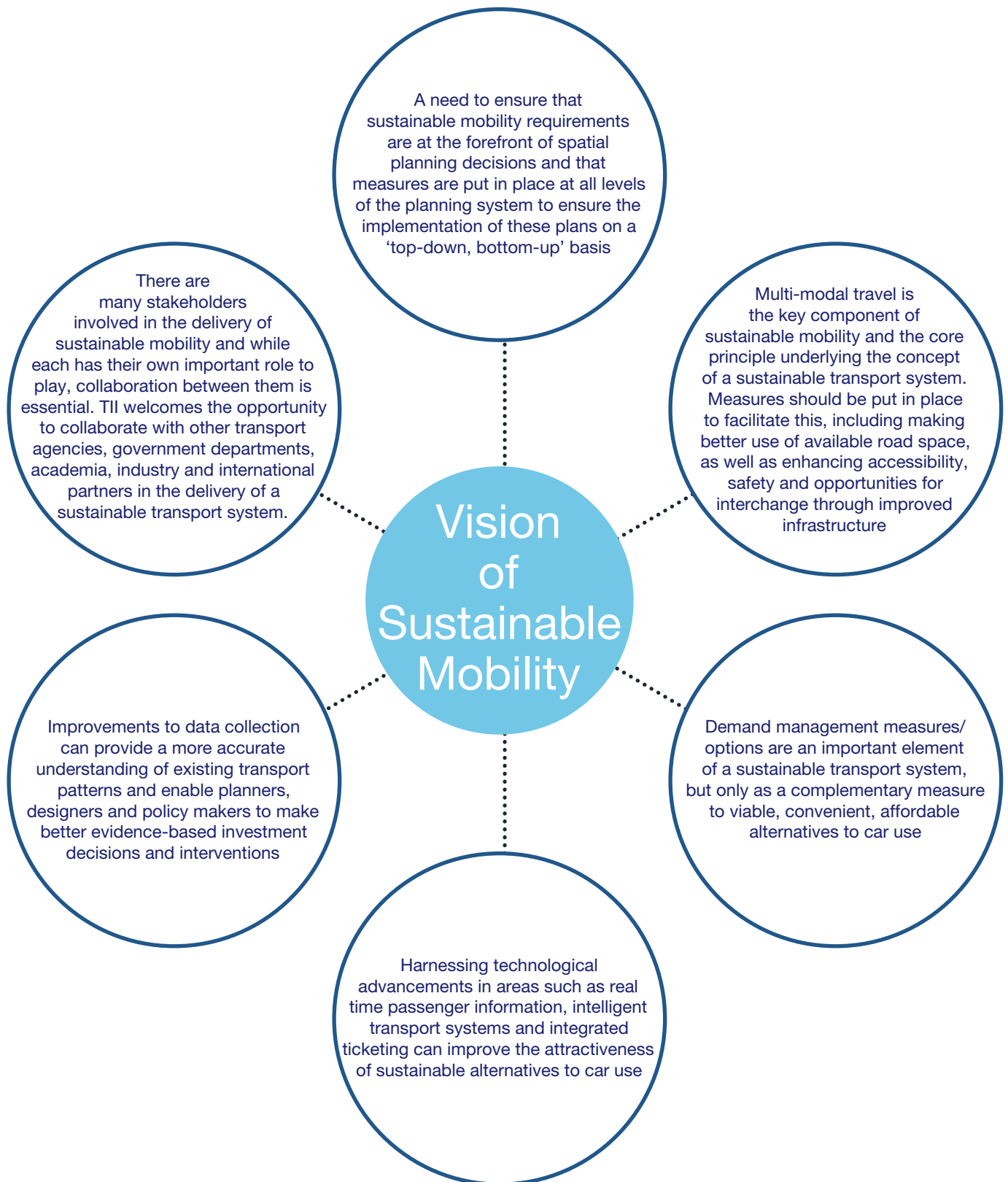


There are a range of current issues that need to be addressed if the goal of a sustainable transport system is to be realised, including (but not limited to):

- The ingrained car culture in Ireland;
- Issues relating to transport inequity relating to geography, gender and ability; and
- Severance and poor permeability, especially in urban areas.



TII considers that a range of key themes are important to delivering the vision of sustainable mobility:





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