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An Comhchoiste um Chomhshaol agus Gníomhú ar son na hAeráide

Tuarascáil maidir le hastaíochtaí san earnáil iompair a laghdú de 51% faoi 2030

Meitheamh 2021

Joint Committee on Environment and Climate Action

Report on reducing emissions in the transport sector by 51% by 2030

June 2021

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Chairman's Foreword



Following the Joint Committee's recommendation in its pre-legislative report on the draft of the Climate Action and Low-Carbon Development (Amendment) Bill 2020, that a target of 51% reduction of greenhouse gas emissions by 2030 over 2018 levels be set in legislation, the Committee agreed to undertake a sector-by-sector analysis to investigate how this reduction can be achieved. Depending on sectoral allocations, certain sectors may be required to achieve a greater than 51% reduction. The Committee was interested in identifying the challenges facing the State and the policy solutions

to address them, and agreed to commence this analysis of the Transport Sector which accounts for 20% of Ireland's total emissions.

This report points the way towards how we achieve the necessary reduction in transport emissions through a fundamental change in how we plan and manage a quality and sustainable transport system in Ireland.

It seeks to embed the 'avoid-shift-improve' approach into our transport and mobility infrastructure planning. Reducing transport demand must be the first and key priority, followed by shifting carbon-intensive journeys to zero carbon modes such as walking and cycling, and by providing sustainable public transport in both rural and urban areas.

Electrification of our public transport and freight fleet is the necessary third step, and finally, the electrification of private vehicles.

This report challenges the conventional 'predict and provide' approach and legacy of poor planning that has induced traffic and car dependency, driven road construction and high greenhouse gas emissions, with their resulting adverse consequences for our economy, our health, our society and our environment.

I would like to express my appreciation to all the witnesses for their valuable contributions and to the members of the Committee for their dedicated work in this collaborative process.

A handwritten signature in black ink that reads "Brian Leddin".

Brian Leddin T.D.

Chairman

Joint Committee on Environment and Climate Action

June 2021

Introduction

In February 2021, as part of its Work Programme, the Joint Committee on Climate Action agreed to conduct a sector-by-sector analysis of how Ireland will meet its target of a 51% reduction in emissions by 2030 and net zero emissions by 2050. Currently, Ireland has the fourth highest level of transport emissions *per capita* in Europe.

Taking into account projected population growth and, in turn, economic growth in the coming decades, Ireland will face a significant challenge in decarbonisation of the transport sector. It is estimated that population and employment growth in the Greater Dublin Area alone could result in a 28.5% increase in the number of journeys by 2035. Economic growth has a significant impact on the transport sector in terms of emissions: during the last recession, the transport sector experienced the largest reduction in energy emissions; in the years post-recession, the sector has experienced the largest growth in emissions.

Ireland's transport emissions increased by 136% between 1990 and 2019 compared to the EU average of 20%. While it is broadly agreed that this is largely due to national policy decisions, the EU also played a role by lending heavily to carbon intensive projects in the past, especially airports and roads which were regarded as necessary infrastructural projects to support economic growth. There has been a change of direction, however, as the EU and individual Member States work towards reducing emissions and decarbonising the transport sector.

In 2017, Ireland had the third highest level of emissions of greenhouse gases *per capita* in the EU with Ireland's emissions being 51% higher than the EU average.¹ The transport sector is responsible for around 20% of Ireland's overall CO₂ emissions with private cars being the largest contributors to transport emissions. The National Transport Survey 2019 showed that, in Ireland, around 74% of all journeys were made by car. This rose to over 80% in thinly populated areas and decreased to around 60% in densely populated areas. In addition, around 67% of all one-person journeys in 2019 were by private car.²

The Department of the Environment, Climate and Communications published Ireland's Climate Action Plan in 2019. The Plan outlines Ireland's roadmap to becoming a climate neutral economy by 2050 and sets out 183 actions to tackle the climate crisis across all sectors, 28 of which target the transport sector. The primary actions set out for the transport sector include the following:

- Increase the number of electric vehicles (EVs) on the road by 2030 to circa 1 million;

¹ [CSO - Greenhouse gases and climate change – Environmental Indicators 2019](#)

² [CSO – National Travel Survey 2019](#)

- Build EV charging network to stay ahead of demand;
- Expand our network of cycle paths and “Park and Ride” facilities helping ease congestion;
- No diesel-only purchases for public buses in our cities from 1 July 2019.³

The new Programme for Government published in June 2020 committed to the ambitious target of an average 7% reduction in emissions per year to 2030. The Climate Action and Low Carbon Development (Amendment) Bill 2021, which was published in March 2021, sets Ireland on the road to net zero emissions by 2050 and makes the Government legally accountable for this target.

Planning and analysis are currently underway to ascertain how these targets will be met and will be published in the Climate Action Plan 2021. The Plan is expected to be launched in tandem with the renewed National Development Plan (NDP) and includes a public consultation process to engage with citizens and stakeholders.

Relevant Legislation

The Government’s Climate Action and Low Carbon Development (Amendment) Bill 2021 - which amends the Climate Action and Low Carbon Development Act 2015 - was published on 23 March 2021 and is key to supporting Ireland’s transition to a climate neutral economy by 2050. Key provisions of the Bill are -

- An objective of climate neutrality by 2050;
- An interim target of a 51% reduction in CO2 emissions by 2030 relative to a baseline of 2018;
- A framework for the development of enabling plans and strategies to reach the 2030 and 2050 targets as follows:
 - annual climate action plans,
 - five-yearly long-term climate action strategies,
 - five-yearly carbon budgets,
 - sectoral emission ceilings, and
 - national adaptation framework.
- changes to the Climate Change Advisory Council including to its functions and membership;
- The requirement that all local authorities must make individual local climate action plans; and
- Climate Reporting by the Minister to a parliamentary Committee.

In addition, the Bill also amends the Planning and Development Act 2000 and the National Oil Reserves Agency (NORA) Act 2007 by expanding the types of projects eligible for support under the Climate Action Fund (established on a statutory basis

³ [Climate Action Plan 2019, Infographic](#)

in 2020 and to be part-funded by the Nora levy) and providing for local authorities to take account of their climate action plans when creating Development Plans.

The Climate Action and Low-Carbon Development (Amendment) Bill 2021 is currently at second stage in the Dáil.

Prior to the amendments provided for in the Climate Bill, the National Oil Reserves Agency (Amendment) and Provision of Central Treasury Services Bill 2020 (NORA) was signed into law in July 2020 and amended the National Oil Reserves Act 2007. The main purpose of this Bill was to provide for the establishment of the existing Climate Action Fund on a statutory basis. In addition, the bill provides for the future surpluses generated by the NORA levy to be used to fund climate action initiatives and projects through the Climate Action Fund.

The Land Development Agency Bill 2021 was published in February 2021 and is currently before the Dáil for debate. The Bill provides for the establishment of the Land Development Agency on a statutory basis, setting out core goals to undertake strategic land assembly and fully utilise State-owned/public lands to build affordable homes and sustainable communities.

Stakeholder engagements

The Committee held a series of engagements with stakeholders which provided evidence from a national and international perspective. These engagements took place as follows:

<u>Date of hearing</u>	<u>Witnesses</u>
<u>23 February 2021</u>	Dr Tadhg O'Mahony, Finland Futures Research Centre, University of Turku, Finland Mr Niall Cussen, Office of the Planning Regulator Mr Andrew Murphy, Transport and Environment
<u>09 March 2021</u>	Ms Anne Graham, CEO, National Transport Authority Mr Hugh Creegan, National Transport Authority Dr Brian Caulfield, Trinity College Dublin Dr Diarmuid Torney, Dublin City University
<u>23 March 2021</u>	Dr Lynn Sloam, Transport for Quality of Life Dr Elisabeth Windisch, International Transport Forum at the OECD Professor Alan McKinnon, Kühne Logistics University, Hamburg, Germany

The Committee also received a number of written submissions. These submissions along with other supplementary evidence from witnesses are available in Appendix 3.

Key Themes

Key themes emerged from the Committee meetings and written submissions. It was made abundantly clear that the “**avoid-shift-improve**” approach to reducing emissions is the internationally recognised standard that should be implemented in order to achieve our targets by 2050. This approach sets the emphasis on more radical and long-term policy changes:

- **Avoid** – Reduce the need for travel
- **Shift** – Move travel to more environmentally-friendly/sustainable modes
- **Improve** – Improve efficiency of transport modes to reduce emissions

Such an approach, if implemented effectively, would allow for the development of sustainable transport systems with limited environmental impacts and make a significant contribution to meeting the targets within the Climate Action Plan.

1. Planning

Many stakeholders highlighted that decades of poor planning have resulted in significant numbers of low-density communities, most of which have had little, if any, integration of public transport and land use planning. In addition, heavy development of motorway and road networks has imposed car dependency on a significant proportion of the population, with no sustainable alternatives. Dr. Tadhg O’Mahony outlined that:

“through urban sprawl, our settlement pattern has increased travel distances. At the same time, transport policy directed major investment towards roads and motorways and allowed walking, cycling and public transport to stagnate or decline in comparison.”

In turn, economic growth, particularly following the recent recession, led to an increase in demand for transport and exacerbated the unsustainable use of private cars over public transport.

It has been widely stated that the construction of roads and motorways is inconsistent with the aim to reduce carbon emissions in the transport sector. Aside from the emissions as a result of the construction process, generally, road schemes result in increased traffic due to the increased road capacity which encourages car dependency and increased driving speeds. Dr. Lynn Sloman outlined that in an assessment undertaken of the English Department of Transport’s road investment strategy RIS2:

"we found that RIS2 was likely to increase cumulative CO₂ emissions by about 20 megatonnes between now and 2032. That is about 5% of emissions from the strategic road network over the relevant time period. About one-third of the additional emissions are from construction, one-third from increases from high speeds and one-third from induced traffic."

In exploring this finding, the Committee suggested the need for some road construction in some instances, such as, to redirect heavy volumes of traffic congestion out of towns and villages. While stakeholders agreed that some targeted road construction may be necessary where there is a particular problem, it was re-emphasised that road construction – even in tandem with the electrification of vehicles – is not the best strategy to reduce congestion and will not provide the significant reductions in emissions that is urgently needed. This was highlighted by Mr. Andrew Murphy in relation to the Galway relief road project. The impact assessment for that project showed that:

"the evidence was pretty clear that building the road would cause more cars to be used in Galway and would make the city more car dependent. Is our vision to have electric buses stuck in traffic behind electric cars? That is what we will get if we pursue both the electrification of vehicles and the construction of more roads."

Additionally, stakeholders emphasised that the building of new roads is expensive and these budgets could be reallocated and utilised for more sustainable projects.

The Committee agreed that, in order to move away from the current system, planning policy has to be significantly transformed to repair urban sprawl, prevent low-density development and avoid the generation of longer journeys by car. This will be of significance for local and regional areas where strategic planning can work to revitalise towns and villages.

Mr. Niall Cussen of the Office of the Planning Regulator (OPR) outlined that in 2010, legislative reforms introduced controls on how much land could be zoned for development. The Government's National Planning Framework (NPF):

"commits to securing an average of 40% of the delivery of all new homes on brownfield and infill development land, rising to 50% in cities (Dublin, Cork, Limerick, Waterford and Galway) and 30% in towns and villages through good local authority planning."

The targets as set out in the NPF were considered by the Committee. Indications are that 50% of new housing will be developed around cities and 70% around towns and villages, which seems contrary to the objective of compact growth. Moreover, it seems such development will drive urban sprawl and dependency on private cars which is at its highest in towns and villages where there are limited public transport options.

Mr. Cussen pointed out that the OPR enforces the NPF and the targets within it but has no role in policymaking. While the OPR will enforce implementation of Section 10(2) of the Planning and Development Act 2000 to ensure that *"local authorities address the issue of climate change in their development plans with regard to patterns of development"*, evidence also pointed to the challenges that exist within the implementation of this type of development at a local level. The Committee considered the inconsistency across local authorities where some are very proactive and work hard to have climate action-centred planning policy while others would rather build on a greenfield site on the edge of a town than build on derelict/infill sites or vacant properties. In order to facilitate a transition to compact growth, Mr. Cussen pointed to the need to progress the Land Development Agency Bill which would empower local authorities to implement the vacant and derelict sites legislation (which aims to make better use of underutilised urban land). Mr. Cussen also emphasised that the OPR does not currently have adequate tools to monitor and assess the progress of developments on brownfield and infill sites and urged the Committee to recommend the establishment of a Brownfield Register in order to address this issue.

The Committee supports better use of existing urban land and building upwards on vacant and derelict sites. However, the Committee also heard that well-thought out plans for such developments are regularly refused at the application stage. Stakeholders expressed a need for greater public awareness of the intersection between climate action targets and planning and development. The OPR highlighted that it provides various resources including-

- toolkits for the public regarding planning processes and
- regular training programmes for elected members in relation to climate action and securing compact development.

Mr Cussen also advised that a review or reorganisation of resources could allow for a more co-ordinated delivery of further services around public awareness and the training staff of local authorities. There are indications of this training through the climate action regional offices there is scope for improvement

Dr. Diarmuid Torney noted that local authorities and local representatives have a connection to local communities that Government does not and that:

"structures like the public participation networks, PPNs, provide pathways for tapping into local community groups. It is welcome, as far as I understand it, that one of the strands of the forthcoming consultation on the revision of the Climate Action Plan is tapping into that network of PPNs. Using such an approach in the context of climate action is to be welcomed."

In addition, the Committee agreed that in order to strengthen local authorities, elected mayors could lead and drive the planning strategies in line with climate action and bring stakeholders into the decision-making process. While stakeholders agreed that a directly elected mayor could provide this leadership

role at local government level, Dr. Torney strongly emphasised that any leader would require the:

"appropriate powers and resources. Otherwise, we just repeat some of the existing difficulties with local councillors, which is that they are elected, but they do not have the power to deliver the things that their constituents want."

There was discussion on the question of the NPF being fit-for-purpose and whether it is presently aligned with achieving current targets on transport emissions and the principle of avoid-shift-improve. Dr. O'Mahony advised that:

"the commitments in the NPF and the NDP must be seen as a floor of ambition rather than a ceiling. They are not consistent with the scale of the challenge we now face."

The Committee agreed that a more transformative, long-term approach to transport emissions was needed rather than the more modest, short-term changes as set out in the NPF and NDP. Mr. Cussen stated however, that the NPF:

"is a cyclical plan that will have to be reviewed or revisited by the Government in conjunction with all stakeholders on a regular basis. The Planning and Development (Amendment) Act 2018 established the legislative basis for the NPF and its renewal out into the future. That will ultimately be a matter for the Government and the processes are laid out in the legislation, including Oireachtas scrutiny of the preparation of revisions to the NPF."

While planning around the repair of urban sprawl and the regeneration of towns and villages has a significant immediate and long-term cost attached, stakeholders highlighted that one of the most low-cost initiatives to reduce emissions in the transport sector is a working from home strategy. In 2020, the EPA estimated a 17% drop in transport emissions due to lockdowns and working from home brought on by the Covid-19 pandemic.

The Government launched the ["Making Remote Work: National Remote Work Strategy"](#) in January 2021 which will study the potential benefits of remote working and how to make it a permanent option post-pandemic. Elsewhere, the Welsh Government has committed to the target of 30% of the workforce working from home on a regular basis. In light of this, Dr Lynn Sloman stated that:

"the Welsh Government is looking at the idea of super-fast broadband-enabled remote-working hubs. We all know from the last year, it is fine working from home if one has a spare office or a spare bedroom to work in but many people, particularly young people, may not have a good space to work in. There may be noise from children, and it may be difficult to work from home. One of the things the Welsh Government is looking at is repurposing either public buildings or supporting the private sector to develop remote

working hubs so a person can cycle a couple of miles to his or her local remote hub and work from there rather than having to drive 15 miles to his or her office. It is an idea that seems very worthwhile."

Such measures would greatly reduce the need to travel and in turn, reduce the emissions of commuter journeys as well as revitalising smaller villages and towns. The Committee agreed that there is strong potential for remote working to play a significant role in the reduction of transport emissions.

2. Public transport and active modes

Integration between transport and land use planning is vital if Ireland is to achieve a significant level of decarbonisation in the transport sector. In order to meet these targets, stakeholders emphasised that substantial investment will be required to shift travel to more sustainable modes – i.e. moving people away from private cars and onto public transport and active travel modes. It was acknowledged that there are many alternatives - particularly in higher-density, urban areas - that would encourage the shift to more sustainable modes of transport. Stakeholders advised that the reallocation of road space is the best way to achieve modal shift.

There was some support for the view that the building of roads is inconsistent with reducing emissions in the transport sector (as stated in section 1) However, there is also some support for targeted road building to reduce congestion. Stakeholders emphasised that while a road could limit existing congestion upon its initial opening, the increased road capacity will result in more vehicles, longer journeys and higher transport emissions. In addition, the significant cost of road building should be an incentive for exploring alternative, sustainable transport modes. Dr. Sloman highlighted that:

"building roads is expensive. If we need to find more money to invest in world-class public transport network and cycle facilities, it makes sense to reduce the road budget to free up money for that. One of my colleagues has done a piece of work looking at the potential for investment in rural bus services in England. It is very clear that reallocation of the funding that is currently being spent on road building would enable something akin to Swiss-style public transport service frequency standards, with every village having a service every hour throughout the day. It feels as if these are the sorts of ambitions we need and they are really only possible if we stop spending so much money on road building."

Many stakeholders emphasised that, in order to meet the emissions targets for the transport sector, there is a need to take this more radical and ambitious approach following on experience of other countries such as Switzerland and

Norway. In order to achieve the level of modal shift required, stakeholders emphasised the need for guaranteed levels of public transport, in both rural and urban areas, which is also integrated and linked with active modes.

In terms of reallocating road space, it was agreed that a shift away from private cars will be necessary though this could be challenging in less densely populated areas. In general, cars are stationary for around 95% of time. Stakeholders pointed to a need to close off streets to cars entirely, removing on-street parking and reallocating road space to public transport and cycleways. There was some support for measures which could facilitate a reduction in traffic congestion while improvements to other sustainable modes are also being affected. Stakeholders agreed that, while it may not be met with initial support from the public, road user charging must be looked at as part of the package of measures to “shift travel behaviours”. Dr. Sloman highlighted that:

“the evidence from Stockholm, Milan, London and elsewhere is that [road use charging] creates more winners than losers and particularly benefits older people, young people, those on a low income and women. Places that have implemented a road user charge find that once people see how it improves their town or city, there is net support. Money from an eco-levy could be used to fund free local transport. A number of towns in France have made local buses free with positive results.”

There was some discussion on whether to introduce measures such as road pricing and congestion charges before or after improving alternatives. The Committee noted the advantages and disadvantages to each approach and noted also that public buy-in is very important. Stakeholders emphasised that there had to be “upfront improvements” and decent alternatives at the same times as introducing road charging with Dr. Brian Caulfield stating that:

“when that investment has been put in place and there is the capacity in the public transport network then we will have to look at demand management measures and road pricing. We will also have to look at the level of parking we provide in cities.”

Highlighting the Central London experience, Dr. Loman pointed to congestion charges being introduced following a two-year period where bus networks were improved:

“The narrative that the congestion charge or eco levy, which might be more of a pay-per-mile scheme, provides the revenue that enables us to carry on improving public transport and creates the political and public narrative in support of it. It is about upfront investment in improving the alternatives, but also accepting that if we waited for the perfect public transport system and cycle infrastructure, we would never do road-user charging. We have to

do enough to ensure people have an alternative and to then continue to improve those alternatives."

There was general agreement that an examination into the implementation of road user charges – including potential targets for car mileage reductions - is needed. Dr. Sloman highlighted that Scotland has set a target of 20% reductions in car mileage *per capita* and encouraged the Committee to consider such strategies. The reallocation of revenue from such charges to improvements in more sustainable alternatives should form part of that examination.

Dr. Elisabeth Windisch also highlighted the necessity of road charging on the basis of large-scale uptake of EVs stating that:

"economies will fall significantly short in terms of tax revenue from fossil fuels following a large-scale shift to the use of electric vehicles. This is how Ireland wants to go forward. Many countries rely on electric vehicle uptake. They would, therefore, be well advised to introduce road user charging rather earlier than later in order to avoid a complete backlash from the population. These pricing systems are not only a necessity for some countries; they can be reinforced if they are implemented properly in line with the polluter and user pays principle in line with what the European Commission suggests. That can drive the uptake of electric vehicles even further. It is a win-win situation. It is a necessity while at the same time helping with the push towards electric vehicles."

There is evidence that the best solution to reducing transport emissions is through the provision of comprehensive integrated transport networks, cycleways and bus priority measures. Highlighting that the London cycleway over Blackfriars Bridge is 5 times more efficient at moving people than the general traffic lane beneath it, Dr. Lynn Sloman stated that *"reallocating road space to more efficient modes, whether to buses or bikes, makes the city function more efficiently. It is a very sensible thing to do."* Dr. Windisch highlighted that:

"the International Transport Forum (ITF) research for the greater Dublin area has shown that if 20% of private car trips were replaced with shared mobility on-demand modes, emissions would fall by more than 20%. These reductions do not assume that shared vehicles may be electric, which by now would be a feasible option as well. A transport system based on such shared mobility can decarbonise transport while promoting a truly sustainable transport system, including the use of existing bus and rail networks. Another ITF study shows that if 20% of car users were to shift to shared services, mobility demand would require 40% less street space. This space could be used for active modes or green spaces, greatly enhancing the liveability of the city."

Ms. Anne Graham outlined the BusConnects programme as an example of how the NTA is currently reallocating road space to public transport but cautioned that, in prioritising sustainable modes, it must be recognised that *“there needs to be space for the car mode for business and social activity.”* While the NTA is presently allocating priority for such networks at locations where larger numbers would use the transport services there is a recognition that:

“we have to spread the services throughout rural Ireland in particular, where we may not get the best return but where a social benefit will accrue associated with the delivery of services.”

The Committee heard that, while there is a plan in place to reduce emissions, there has been no research as to whether investments are being made in the right measures and no modelling of emission reduction as a result of those investments. While the NTA stated that no modelling has been carried out on what reductions could be achieved through strategies such as an electric bus fleet, work is ongoing in this area. Highlighting the challenge of reducing emissions in the transport sector and that such modelling was essential in order to meet that challenge, the NTA was urged to complete progress on this and make it available to the Committee as soon as possible.

The Committee agreed that good connections from active modes to rail or bus services will be essential in reducing emissions. A multimodal approach as seen in the Netherlands could be vital in addressing those in more rural communities who live farther from a public transport hub. Ms. Graham stated that such an approach was part of the ambition for the NTA and that investment is being provided for such measures including an integrated system with secure bike parking and rail and bus hubs across the country.

There is substantial investment in cycling infrastructures in Ireland and while the Committee noted the implementation of cycle superhighways in large capital cities like London, the feasibility of such an option in Ireland’s larger provincial towns or more rural areas needs to be considered. Dr. Sloman provided examples of:

“countries like the Netherlands, Germany and Denmark [who] are building cycle superhighways that extend for up to 40km from their main cities. The Capital region of Denmark – Copenhagen and its surrounding municipalities – have a fantastic network. Denmark is planning to build 760km of high-quality cycleway radiating out great distances from the centre of Copenhagen. People are making journeys of 12 or 13km on average on some of Copenhagen’s routes and many are using e-bicycles. In continental Europe, e-bicycles are becoming a mainstream mode of mobility. The Netherlands is set to reach the point where more than half of new bicycle sales are e-bicycles. The kind of cycleway that the Senator experienced in London is applicable to areas outside large metropolitan centres and when combined with e-bicycles, they make perfect sense.”

While the Committee is supportive of such an infrastructure, the Committee is also cognisant of the need to incentivise the uptake of bikes and e-bikes in Ireland; the Netherlands is cited again as an exemplar in relation to cycling culture. Stakeholders agreed that while a change in behaviour would also be required, measures such as grants schemes, as seen in Europe, to incentivise the purchase of electric bikes could be considered. Such a scheme is being considered in the UK as they have been very effective in growing the electric bike market in continental Europe. In addition, Dr. Windisch explored the idea of *“employer benefits that encourage the use and uptake of private cars”* whereby employers would cover the cost of a bike. The benefit of incentivising e-bikes is that they can go farther with less effort making them particularly appealing for more rural areas where people may need to travel further to link up with public transport hubs.

While the Committee agreed with the overarching need to provide greater connectivity to public transport links in all areas, both urban and rural, it was highlighted that the rollout of such projects will be met with difficulty in more rural, dispersed communities. The Committee commended the NTA’s ongoing work to improve the Local Link rural bus services and noted that Connecting Ireland is the programme to address the gaps in connections to local and regional centres in rural areas and to allow for the possibility of access to local services without the need for a car.

A public consultation is to commence this year in relation to this network of services.

However, the Committee noted that the increase in journey times for those living in rural areas as a result of bus services travelling to each village along the route was a disincentive to public transport and only pushed people into private cars. Ms. Graham highlighted that the NTA are cognisant of journey times in their review of transport services and that the ambition within Connecting Ireland is that journey times to large metropolitan centres from villages and towns are around 30 minutes with regional centres being 90 minutes from there. Such a structure would allow more regular services on key routes and then:

“feeding in demand-responsive services, whether it is every day or a number of days a week”.

On the challenge of dispersed communities, stakeholders suggested the Committee explore the experiences of countries such as Switzerland, Austria and Germany which have some of the best rural public transport networks in Europe which:

“tend to favour fixed public transport networks over demand responsive transport because people trust and believe it will always be there for them”.

Dr. Sloman referred to the German “*Every Village, Every Hour*” scheme which looks at providing dispersed rural communities with a guaranteed level of service dependent on the population in each village. Dr O’Mahony stated that:

“The new [‘Every Village, Every Hour’ report](#) gives an idea of how plausible it is to provide a comprehensive bus service in rural areas of England, for reasonable cost. This is the kind of transformative thinking we need in Ireland, to deliver the immense social benefits of mobility access for all, sustainably, and re-vitalise the towns and villages of Ireland, as vibrant communities that meet our aspirations for a better life. It would be desirable to produce such a transformation study for Ireland, and similar for cycling, rail and spatial planning/housing. If we are to develop a sustainable low-carbon transport system, and a better Ireland, we need big vision. We also need to greatly improve the analysis and evidence available to support decision-making. We need to go beyond a risky and costly reliance on electric vehicles and biofuels alone, that continually dominates the discussion here, and consequently pushes out of discussion the measures for ‘avoid’ and ‘shift’ of transport, that can deliver far better outcomes.”

By contrast, Dr. Windisch emphasised that certain rural communities should be:

“one of the focal areas for the deployment of electric vehicles. If it is really a non-dense, very partially populated area, on-demand transport services would not be economically viable. There should be innovative new solutions. I encourage these as the priority target areas for the uptake of electric vehicles.”

The Committee raised the question of whether a free public transport service may encourage non-public transport users into the system, keep cars off the roads and allow for a more convenient multimode system. While stakeholders agreed, they cautioned that a high-quality bus network would be essential to ensure that once people use the service, they continue to do so. Mr. Murphy highlighted that:

“making public transport either free or lower cost needs to sit alongside making it more efficient and making sure people are not sitting in buses that may be free but are stuck in traffic along with other cars. We need a holistic approach to free public transport with price being just one aspect of it.”

The Committee was encouraged to examine the many examples of such networks in Europe such as Dunkirk which introduced free bus services – which had also been improved upon - in September 2018. Bus use increased by about 85% in the space of one year. Dr Windisch also pointed to Vienna as a best practice example internationally where cheap public transport was introduced. Public transport there costs around €365 per year and public transport use is well above average. The Committee noted that the provision of free public transport is generally

cheaper than expected since public transport is already heavily subsidised while stakeholders highlighted that the benefits of reallocating road space to a free transport network would greatly impact the liveability of cities which should be another driving force alongside carbon objectives. In response to a parliamentary question⁴ on 21 April 2021 the Minister for Transport stated that

"The provision of public transport services is heavily dependent on passenger fare revenue as it normally contributes about 65% of the operational cost. The remaining 35% of cost is covered by the PSO grant and the Department of Social Protection grant under the Free Travel Scheme. In Budget 2020, and prior to the Covid-19 pandemic, €288.667 million was provided for PSO, including approximately €8 million for Local Link rural regular services, which is in addition to €14.896 million provided for Local Link under the Rural Transport Programme (RTP)."

Utilising these figures, it could be estimated that the 65% revenue amounts to circa €550.95 million excluding the provisions under the RTP. The Minister also pointed out that:

"Any assessment of a proposed change to public transport fare structures would be a matter for the NTA to consider in the first instance."

3. Electrification

Ireland's approach to reducing carbon emissions for 2030 is heavily reliant on the electrification of vehicles. The Committee found that stakeholders, in the main, agree that EVs will play a vital role in the strategy for reducing emissions in the transport sector though it was emphasised that the shift from private car ownership - albeit electric private cars - to public transport must not be undermined by this. The Committee was cognisant of the overarching view that EVs will not be the "silver-bullet" solution to Ireland's transport emissions problem, particularly in relation to our 2030 targets, though stakeholders highlighted that, regarding the SDG goal of making cities more liveable, a rapid shift to zero-emission vehicles - as opposed to low-emission vehicles - would certainly help to achieve this.

The current target for 2030 is that Ireland will increase electric cars on the roads by around one million. Stakeholders cautioned that relying on EVs to meet our emissions target was "a gamble" and that while greater numbers of EVs will have an impact on reducing emissions, replacing standard vehicles with EVs will not solve congestion issues or car dependency nor will it have a positive impact on road traffic accidents and public health. This is again linked to the need to move away from road construction and improve public transport and active modes. The

⁴ [Link to PQ number 429](#), 21 April 2021

Committee noted that the focus should remain on the electrification of vehicles and not on road capacity and agreed that the provision of a significant level of charging points must be implemented to facilitate the transition to electric vehicles.

The Committee questioned the feasibility of achieving the target of nearly a million EVs by 2030 and pointed to difficulties in rolling out EVs in Ireland. In 2020 only 7.4% of new passenger sales were EVs compared with 74.8% in Norway and 18.1% in Finland. Acknowledging the extent of the challenge facing Ireland in decarbonising the transport sector, Dr. Sloman outlined that:

"with a ban on the sale of new petrol and diesel cars from 2030, the majority of cars on the road will probably still be powered by fossil fuels into the early 2030s. That is because the average car is used for 14 years before it is scrapped."

In her opening statement to the Committee, Dr. Windisch emphasised that reliance on EVs will be unavoidable if Ireland is to meet 2030 targets although she advised that the uptake of full EV's should be encouraged to avoid long transition periods via hybrid alternatives. Mr. Murphy agreed and, in his follow up to the Committee, highlighted that:

"low-emission vehicles such as plug-in hybrids aren't delivering the promised reduction in fuel consumption; our research has found that in fact they produce 30-90% more emissions than advertised. This has important implications for air quality in cities."

In consideration of this, the Committee highlighted that the incentive for low-emission, plug-in hybrids has already been reduced and it was agreed that low-emission vehicles bring real gains and help to overcome range anxiety. Members noted that there have been several barriers to the uptake of EV's, such as the lack of diversity in the consumer market, cost of EVs, and the range of EVs though stakeholders firmly stated that these barriers would be resolved in a short number of years. However, Members noted that the supply of minerals for battery manufacturing was not guaranteed which could impact the number of EVs available in the future. Mr. Murphy outlined that:

"the EU has proposed legislation to regulate the mineral content of batteries, including enforcing social conditions for extraction and recycling targets for some of those minerals. Obviously, the more vehicles we have to produce the more challenging it is to ensure that production is done sustainably. We should electrify as much as we can but we must focus on electrification and not road building."

The disparity in cost between EVs and standard internal combustion engine vehicles has proved to be the greatest barrier thus far and although stakeholders were generally optimistic that price parity would be reached in the next few years some cautioned the Committee to examine the area of just transition in relation

to EVs. The current evidence shows that it is in more affluent, urban areas that the uptake of EVs is currently taking place and price parity timelines are not definite.

There was some disagreement around the cost concerns however, with Mr. Murphy arguing that:

"the next ten years will be extremely different from the past ten years where the deployment of EVs is concerned. The primary reason is that the range of cars available in a showroom and their prices are largely decided by EU legislation. This legislation forces manufacturers to lower the CO2 produced by those vehicles and therefore puts more electric vehicles on the road. In the last quarter of 2019 and 2020 there was an uptick in sales of EVs in Ireland. They were offered at lower rates to encourage uptake. On the issue of cost, those who have bet against the cost of EVs declining have lost every time. Batteries have reduced in price by 85% in the past decade and have decreased by 17% in the last year alone. Batteries are one third of the cost of electric vehicles. Bloomberg New Energy Finance, which is among the most optimistic about the cost of EVs, upgraded its forecast for price parity between EVs and internal combustion vehicles to between 2023 and 2025. EVs are cheaper to produce, maintain and power."

Stakeholders highlighted that the provision of infrastructure would be necessary and the roll out of adequate electric charging points would need to be a priority in order to encourage the shift from standard vehicles to EVs. Such infrastructure would prove to reassure consumers shifting to EVs that range will not be an issue though attitudes in this regard will likely change with the greater uptake of EVs as people realise range is not as great an issue as expected.

Dr. Windisch stated that individual behaviour will be key to a successful reduction in emissions and that communicating the urgency and relevance of individual choices in achieving these targets will be necessary. She highlighted a need to move away from private car ownership entirely where possible and to encourage people to use the right size vehicles, or shared use vehicles:

"People tend to buy one, two or maybe three personal mobility means. One of these is often a private car, which serves all needs. To think about holiday trips in summer, people may want to take a lot of baggage and their children. Families therefore need to buy big cars, but they also use the same car to go to work and for all kinds of other trips where more efficient mobility means would be better. Encourage people to use the right size of vehicles rather than the one-size-fits-all option."

The Committee agreed that all vehicles, including electric, are more efficient when they are smaller and lighter and noted that significant changes in relation to

vehicle size is something that must be dealt with at EU level. National policy would need to encourage shifting vehicle use to shared vehicles and encouraging the public to use the right size vehicles for their needs. In consideration of this, the Committee were advised to examine incentives for EV uptake particularly for those living in more dispersed, rural areas where the necessity of EV uptake will be greater than for those living in urban areas that have access to high quality public transport networks.

As the Committee are focusing on how to achieve modal shift away from private car ownership, there was heavy interest in the strategy for electrification of public transport fleets. In their opening statement the NTA outlined the ambition of transitioning urban bus fleets to low and zero emission vehicles and highlighted the purchase of 280 diesel electric hybrid double deck buses and the current procurement process for fully electric vehicles. In addition, the NTA are trialling hydrogen-fuelled electric buses with Bus Éireann. An area that will prove to be quite challenging in this transition will be long-distance coaches. Ms. Graham outlined that:

“while the battery technology has advanced significantly in recent years to enable longer bus trips in an urban context without requiring a recharge in service, the future fuelling of long-distance coach travel in an environmentally sustainable way is challenging because of the distances involved.”

The Committee queried if, given the concerns surrounding electrification of long-distance bus transport, additional new rail infrastructure could be provided that would be balanced with integrated electric feeder buses to rail networks. However, Ms. Graham highlighted that in respect of the provision of infrastructure local authorities have the role in delivering such projects and that the NTA only have the power to fund the infrastructure associated with the greater Dublin area only. They do, however, work closely with local authority partners and *“do transport strategies, statutorily for the Dublin region but on a non-statutory basis with local authorities for regional cities.”*

In terms of the rail fleet, the NTA stated that significant investment was provided in the NDP for the greater Dublin area on the DART+ programme and that the purchasing of fleet, including battery electric hybrid train carriages, will add capacity to commuter rail services. Hybrid carriages can operate without electrification of the lines and switch over to fully electric when line electrification has been delivered. Ms. Graham acknowledged however that rail infrastructure projects such as metro and light rail expansion in Dublin may not reduce our emissions profile before 2030.

Notwithstanding the lack of modelling available regarding emission reductions, Members questioned if the public transport fleet was capable of meeting the 51% reductions in nine years. Mr. Hugh Creegan highlighted that aside from the challenge of long distance regional routes where the technology simply isn't available for electrification, the NTA are confident that such a target can be

achieved and are already working on expanding the electrification of rail in Dublin and Cork as well as on urban bus routes as mentioned above. However, the Committee agreed that the electrification of rail transport is too slow-paced and that consideration is not being given to the long-term picture with regard to the electrification of lines in commuter towns that will no doubt be moved to an electric rail service in the coming years.

4. Freight Transport

The Committee heard evidence pertaining to a need for greater ambition in the area of freight decarbonisation, with the 2019 Climate Action Plan and the Programme for Government being “quite weak” on this particular area. The freight sector is generally seen as a challenge for decarbonisation due to its heavy dependence on fossil fuels and because of predicted growth rates for freight traffic although Professor Alan McKinnon noted that freight activity has not returned to 2007 levels and seems to have decoupled from economic growth, an aspiration many countries are trying to achieve.

Ireland has the most road dependent economy in Europe for freight. Mr. Murphy outlined that across Europe, 18% of freight is transferred by rail, in some cases up to 23%. Ireland, however, has one of the lowest levels of rail freight with only 0.5% of freight transferred by rail. This is largely due to the decommissioning of rail lines over the past century. Ireland’s freight, therefore, is primarily on vans, trucks and lorries. Stakeholders acknowledged that transferring freight to rail will be a challenge as 0.5% is a very low base to start from. However, stakeholders highlighted that there are many areas of the sector that can provide greater and more easily accessible scope for decarbonisation.

It was highlighted that the Irish rail system is currently underutilised and that reopening existing lines is an option though such a project would likely have limited positive effects on 2030 targets at this stage. While there is a move in the EU to get more freight onto rail, the Committee queried the reality of rebuilding rail lines, though it was agreed such plans would go a long way towards relieving congestion on roads and reducing emissions in terms of freight. Dr. O’ Mahony pointed to a need for further examination of the options around rail and freight to ensure a transformation opportunity is not being overlooked:

“I would suggest that in the climate action plan we need to see a commitment to a study on transformation of spatial planning and of mobility to see what is plausible and to see all the implications and costs.”

Stakeholders also pointed to an absence of evidence around the best measures to implement in order to reduce emissions in the freight sector and the Committee was urged to examine this. Dr. O’ Mahony emphasised that:

“Looking out to 2050, we need to be considering the implications of moving the bulk of freight over to rail. What would that mean? How much expansion would it mean? How many new rail heads or hubs would it mean? What would it mean in terms of technological approaches to logistics and bundling goods together from different companies, whether they are intermediate products for industry or final products for consumers? We need to look at all of this. We do not necessarily switch everything over but at the moment we are working in a vacuum, on both the passenger and freight sides, because we do not have the evidence to allow us to look at the transformative approaches”.

The Committee questioned the viability of investing in the rebuilding rail lines throughout Ireland, noting that in doing so, there would be very limited impact for 2030 targets. In addition, stakeholders emphasised that the average length of haul in Ireland is quite short, around 60-70km, and it is therefore difficult for rail to compete with road vehicles. Professor McKinnon stated that while there are some countries where rail freight is used for distances of 40-50 miles, these are exceptional cases where there is a proportion of factories and warehouses along the rail line. Without a rail connection between warehouses, he advised that:

“one is dependent on an intermodal operation which includes a road feeder movement at one or both ends of the transit. Where the length of the trail haul is very short, long road feeder movements make it very difficult to provide the service competitively.”

With regard to the decarbonisation of road vehicles that transport freight, stakeholders agreed that electrification would play the most significant role. Urban areas should prove to be easy to decarbonise with local delivery services using smaller vehicles such as vans and cars that will be transitioning to battery electrification. However, long-haul road freight, i.e. trucks and lorries will be the challenge. Stakeholders highlighted that there is significant debate regarding the best way to achieve decarbonisation of long-haul freight vehicles particularly around the use of hydrogen. Other options to consider are battery, e-highways or potentially biomethane. Mr. Murphy outlined that technology in this area is moving fast but that currently, hydrogen would not make sense for vehicles as it is too expensive by comparison to batteries. Highlighting that the standards for regulating emissions from HGVs are due for revision in 2022, he urged the Committee to recommend following the example of California and introduce mandates for zero emission trucks. In consideration of the general move to EVs, he further advised the Committee to invest European funds in the necessary charging infrastructure to facilitate a transition to zero emission trucks.

The Committee noted that Scania (a global Swedish company with sales of trucks, buses & services in 100 countries) recently abandoned plans for hydrogen-powered trucks for battery electric vehicle and Professor McKinnon outlined that

in Germany and Sweden the electrification of highways is currently being trialled and that:

"analysis has shown that if there is a sufficient volume of truck traffic, that can be a cost-effective way of decarbonising long-distance road freight."

In addition, Professor McKinnon emphasised that, due to short haul distances and Ireland being a small country, truck batteries would be the most efficient measure though cost and availability will be the immediate issue. The Committee noted, as with private cars, it takes on average 14 years for Ireland to replace its truck fleet and thus the electrification of the fleet will likely have little effect on 2030 targets.

Stakeholders emphasised that the freight sector is also a highly competitive, fragmented industry with over 500,000 small carriers across Europe. Despite this, there has been a corporate move to commit to cutting emissions in the sector in recent years. Professor McKinnon outlined that:

"a lot of logistics is outsourced to big logistics companies like DHL or, in many cases, by small companies. The big manufacturers and retailers, are, therefore, hoping their logistics providers will decarbonise on their behalf. They are putting increased pressure on those companies to do so."

Professor McKinnon also highlighted that a lot of emissions arise from empty trucks driving back and forth and that:

"Ireland's percentage of trucks running empty is significantly above the EU average and that there is potential for filling vehicles more effectively".

This could be related to the average length of haul being so short in Ireland as there is little incentive to put time and effort into finding return loads for trips of 50 or 60km. However, Professor McKinnon highlighted that:

"Current developments in digitalisation in this regard will help, including the use of online platforms to help companies to find backloads for their vehicles. It would also help if we could encourage companies to share their logistics assets through the process of supply-chain collaboration. Maybe even more radical measures, such as relaxing the just-in-time principle, could be considered. This principle gets blamed for much of the under-loading of vehicles."

Digitalisation of freight logistics is to be transformed across Europe in the coming years and this will be reflected in a reduction of empty trucks everywhere including Ireland. In addition to positive impacts on backloading and empty loads, stakeholders also highlighted that technology could assist in managing freight traffic whereby freight vehicles can be re-routed or even rescheduled to evening or night-time journey to avoid congestion.

The Committee noted potential measures around “last mile delivery” and what could be done to reduce emissions in that particular area. Again, stakeholders pointed to a need to ensure that vans delivering goods are well-loaded though this has become less of an issue as online retail has expanded. The use of delivery locker banks could also be looked as a measure to reduce the number of deliveries to individual homes. The increase in same or next-day delivery will inevitably have the opposite effect on carbon emissions where vehicles will be less well-loaded and more trips made. An option to counter this could be through the use of cargo bikes, e-bikes/trikes and of course transitioning to electric vehicles, particularly in more urban areas.

5. Future challenges

Stakeholders pointed to a number of future challenges for meeting climate action targets. Mr. Murphy highlighted that European legislation and how it is amended in the coming years will play a significant role in achieving a substantial reduction in emissions in the transport sector. The EU also plays an important role in financing transport infrastructure. While much of EU legislation is now under review under Europe’s Green Deal, Mr. Murphy cautioned that aviation and shipping have received little examination from European regulators to date.

Aviation will prove to be a major challenge for decarbonisation. Prior to the Covid-19 pandemic, aviation was the fastest growing source of emissions in Europe – an issue that will return post-pandemic - and a failure to regulate aviation emissions continues at European level. Mr. Murphy highlighted that:

“this lack of regulation has consequences. Measures put in place to decarbonise other sectors, including measures relating to cars, buildings and electricity, are starting to pay dividends. Aviation is increasingly isolated as a high emitter of carbon. This lack of regulation does the sector no favours and Ireland’s role in resisting such regulation at European level is short-sighted in the extreme. I am acutely aware of the role aviation plays in connecting Ireland. Those who talk up the strategic importance of aviation to Ireland should be equally vocal in ensuring the sector cuts its emissions.”

In terms of solutions to decarbonise aviation, a debate around hydrogen is ongoing in Europe. The Committee noted that there is employment potential around hydrogen that could be produced from excess renewables in Ireland but where to store it once produced needs to be explored. While hydrogen is too expensive for small vehicles Mr. Murphy emphasised that:

“it makes a lot of sense in shipping and aviation because those modes of transport do not have low-carbon alternatives. One cannot put a battery in a plane because it would be too heavy. Likewise,

they are too heavy for ships. We are an island and rely on shipping and aviation to remain connected."

In addition, the Committee noted that Germany and the Netherlands are moving ahead with a hydrogen strategy that is producing fuels for their shipping and aviation sectors. Mr. Murphy urged the Committee to recommend the setting up of a hydrogen strategy in Ireland, as per the Programme for Government, without delay.

Throughout proceedings, stakeholders stressed the importance of ensuring that 2030 targets are built upon for 2050 goals through transformative approaches that are fully researched. The Committee noted the significant gaps in evidence and research for reducing emissions in the transport sector. Some stakeholders cautioned that much of the work in the area is being conducted around methodologies and frameworks that were in place long before the current urgency for reducing emissions and that many of the measures were aimed towards 2030 targets only without looking further into the future. Stakeholders emphasised that, in order to mitigate risks and limit uncertainty around more long-term planning, there is a need to conduct robust examination of scenarios, best practice examples and quantitative evidence that looks beyond 2030 and even 2050. Such evaluations would ensure that decisions taken are the best option for emission reduction outcomes and witnesses urged the Committee to recommend a commitment to this in the Climate Action Plan which would help more transformative projects to gain public and political support.

In addition, stakeholders criticised current project appraisal methods stating that they are inconsistent with supporting current climate targets. Dr. Brian Caulfield stressed that the cost-benefit analysis tools currently used do not take in to account the climate "cost" of not doing the project. Dr. Caulfield pointed to the Metro project and the level of carbon emissions as a result of delaying the implementation of the project since 2007. Noting that current assessments do not fully estimate the true value of projects, the Committee agreed that further factors should be considered in relation to transport projects for meeting climate targets to ensure a balance is met between cost, social benefits and emissions benefits.

Dr. O'Mahony advised the Committee that the current system works against climate action targets and moves decisions towards emissions intensive and low-sustainability projects and urged Members to consider a review of this. In a follow-up to the Committee he highlighted that:

"Cost-Benefit Analysis is the tool used to consider whether public investments contribute to economic welfare. If they are not implemented correctly, they will bias towards emissions intensive projects, and away from emissions reducing projects. The approach in Ireland, mandated by the Public Spending Code of DPER, is not fit-for-purpose, to appropriately analyse public investment projects such as roads and rail. A paper published in the international peer-reviewed scientific journal, Environmental Impact Assessment

Review, shows us that the time horizons applied to analysis, the length of years for which the analysis is done, at about 30 years in Ireland, are too short, and are not in line with practices internationally. In addition, the 'discount rate', used to value future costs and benefits in the present, mandated at 4%, is too high, and cannot credibly be defended. Both of these factors will bias analysis towards more carbon-intensive and environmentally damaging projects such as roads, and away from projects that can reduce emissions, such as investing in rail."

In respect of rail, it was agreed that, as one of the most sustainable modes of transport, it could play a major role in reducing emissions though it is likely to be quite limited in terms of the 2030 targets. However, the Committee agreed that current cost-benefit analysis tools do not favour such projects and agreed that significant changes to factor in all benefits was needed.

Several stakeholders pointed to a need to examine the governance structures around the transport sector for ways to encourage a more cohesive approach to delivering the transformative changes needed for meeting climate action targets. Highlighting that governance institutions are key to decarbonisation, Dr. Diarmuid Torney stated that they can also be barriers to progression and that how the transport system currently operates is a challenge for pursuing a path to a zero-carbon future:

"The transport system is inherently complex, characterised by tensions between public and private, rural and urban, and the role of special interests. There are also complex external interactions with broader policy objectives and systems including planning, health and education. To overcome these, we need to adopt collaborative, adaptive and reflexive approaches to policymaking that enable input from a diverse range of public private and civil society actors whose voices are not sufficiently heard at present. We should support bottom-up approaches to decarbonising transport that take into account geographical and technical variations, including different requirements in rural and urban settings. Furthermore, transport should be understood as a social practice. This means going beyond a technical view of transport as an infrastructural problem to be solved and taking account of social, cultural and governance forces that shape our mobility choices."

The Committee agreed that the urgency of climate action is not clearly set out in the transport policy of governance institutions which were generally established in a period before climate change was a priority. In light of this, stakeholders suggested that consideration be given to revising the mandates of these bodies in order to provide for statutory commitments to decarbonisation goals.

In addition to this, stakeholders highlight the fragmented approach to transport decision-making with authority spread among multiple institutions. The

Committee noted that the NTA's remit is limited to a statutory transport strategy that is solely applicable to the greater Dublin area, and only work with local authorities on transport strategies on a non-statutory basis for regional cities. The Committee agreed that a strategy for long-term planning on a national level was urgently needed in this regard. Highlighting that local government bodies in Ireland are weak on powers and funding by international standards, Dr. Torney urged the Committee to consider solutions to achieve a more cohesive approach to the transport sector amongst the various institutions and that focused task forces and forums could provide the combined insights needed to address the challenges facing the sector.

Conclusions and recommendations

Planning

1. The Committee notes the ongoing review of the National Development Plan, in particular the adequacy of how climate is addressed. However, in light of significant emissions resulting from road construction, and in consideration of the evidence heard throughout engagements, the Committee is of the opinion that a review of future road construction projects should be conducted. This review should include an analysis of whether such substantial investment would be better allocated to more sustainable projects such as remote-working hubs and sustainable transport modes.
2. The Committee heard extensive evidence that the mandates of local authorities should be strengthened to ensure that planning policy is aligned with climate action targets and the repair and prevention of urban sprawl. Accordingly, the Committee recommends that relevant local authority mandates be reviewed and strengthened, and that legislation, particularly around vacant and derelict sites, be examined. In addition, funding and access to resources for local authorities should be increased and that proposals to address climate action be centrally reflected in all new local development plans.
3. The Committee notes that new local development plans should provide for clear engagement with the EPA and other statutory bodies on an ongoing basis, by clear tracking of carbon emissions, including measurement and assessment of embodied energy, natural sinks and transport emissions, in anticipation of the Climate Action Bill. The Committee further notes the importance of active engagement with the UN Sustainable Development Goals as part of the development plan process, particularly SDG11 on sustainable cities and communities.
4. The Committee supports the establishment of a Brownfield and Infill Site Register to support the work of the Office of the Planning Regulator. Each

Local Authority should engage with such a register following the publication of the next local development plans and proposals they have for such sites.

5. A public awareness campaign to inform the public on climate action and planning processes is recommended to address public concerns and support constructive engagement with regard to planning.
6. Local authority resources should also be reviewed and strengthened to support them in taking a more active role in public development particularly in terms of social housing, active travel, public transport and public amenity and use of public land or green spaces. This might include EU funding and loans to local authorities.
7. Planning policies should encourage planning applicants to engage more actively and effectively with environmental considerations, including relevant assessment tools, at an earlier stage in the application process.
8. The Committee is of the view that there is a role for a directly elected mayor to lead local authorities in aligning planning development with climate action through a cohesive, coordinated approach with stakeholders. Such a role if given adequate powers and resources would significantly strengthen local governance.
9. The Committee urges the Government to consider and reflect the Climate Action Plan in its review of the National Planning Framework and to ensure that the revised National Planning Framework is strengthened to reflect the avoid-shift-improve framework examined by the Committee and a stricter requirement for compact growth.
10. The Committee suggests that strategies be put in place to strengthen the potential for green spaces, hedgerows and trees alongside transport infrastructure to support emission reduction and deliver co-benefits, in terms of biodiversity, pollinator pathways and wildlife corridors.
11. The Committee commends the current Remote Working Strategy and recommends further exploration be given to the establishment of remote working hubs in towns and villages. Consideration should also be given to sustainable transport links to these hubs, particularly in less densely populated areas. The Committee also recommends that a national target for remote working should be introduced, as is the case in Wales.

Public Transport and Active Modes

12. There is substantial scope for sharing of transport fleet (cars, e-scooters, e-bikes etc.) to reduce transport emissions by making lower impact travel more accessible, and indirectly by improving efficiency of fleet use and reducing the need for car ownership, with beneficial impacts on reduced resource use lower need for car parking space which both reduce emissions. Measures should be taken to remove barriers to sharing and enable its adoption, particularly examining the role of local authorities.
13. The Committee recommends that a policy of road space reallocation away from the private car and towards sustainable transport modes be introduced for cities, towns and villages, in order to induce demand for sustainable transport modes and to reduce capacity for private cars in compliance with road traffic legislation.
14. The Committee notes that early and effective delivery of the programme for government commitment to allocate 10% of transport capital funding for cycling infrastructure, 10% of the transport capital funding for pedestrian infrastructure and two thirds of remaining capital funding for public transport could contribute significantly to reduction of emissions. The achievement of these targets will require ambitious and effective action, including a strategy to support the rapid and widespread rollout informed by successful local initiatives.
15. The Committee recommends that current planned road projects should be reviewed in order to assess where funding could be reallocated towards more sustainable modes of travel. Such a review needs to include a cost-benefit analysis that would examine the long-term carbon impact of the planned road projects versus the potential sustainable alternatives.
16. The Committee strongly recommends that modelling of emission reductions by the NTA for transport strategies be progressed and issued without delay to ensure investment is optimal.
17. In light of the evidence from rural public transport projects such as the "Every Village, Every Hour" project in Germany, the Committee recommends a significant increase in targeted investment in an immediate expansion of public transport measures for rural and dispersed communities in Ireland, to provide a level of service throughout the day that can provide a realistic alternative to travelling by car.
18. The Committee recommends that a car mileage reduction target be introduced to reduce transport emissions, as in Scotland, having due regard to the difficulty in implementing measures where strong alternatives are not yet provided.

19. The Committee recommends that road user charges – including potential targets for car mileage reductions – be examined. The reallocation of revenue from such charges to more sustainable alternatives should form part of this examination.
20. The Committee recommends that to achieve a major modal shift Ireland learns from successful initiatives in other countries. For example. The introduction of cycling superhighways such as those in Denmark and London should be developed as an alternative travel option for those living outside larger cities. Family friendly cycling infrastructure to achieve wider and more diverse uptake of cycling, as used in other countries, should be introduced.
21. Following on from this, the Committee recommends that incentives for the uptake of e-bikes and bicycles be reviewed beyond the Bike-to-Work scheme. European examples to increase the uptake of e-bikes and encourage trust in and use of cycling infrastructure including the use of cycle superhighways should be delivered.
22. The Committee recommends that a free public transport system be costed as an option for encouraging the uptake of public transport in Ireland. This should be completed in line with transport improvements as per the transport strategies. The Committee recommends that the Minister considers the benefits and feasibility of the provision of free public transport, based on the experiences of such policies in other cities and towns in Europe and elsewhere and roll out initiatives in this respect as soon as possible.
23. The Committee notes that while cycling and pedestrian routeways should be part of all road planning, they should not be limited to the roadside. The Committee recommends the development of a 'green network' of cycling and/or pedestrian routes providing safe alternative access to towns or villages and key amenities from homes in surrounding area. Traditional or historic rights of way could provide a useful basis for such a network. Similar enhanced networks of pedestrian or cycle laneways and passages in urban areas could increase permeability and support goals such as 'the 10 minute town' or '15 minute city'.
24. The Committee notes school transport as one important area for modal shift and recommends actions to support safe routes and drop off zones for active travel as well as a review of how public school transport might be strengthened.
25. Safety and comfort will be key factors in achieving modal shift. The Committee recommends a major upgrade in the planning for and

provision of bike-parking infrastructure. Access to secure overnight parking is particularly important for those living in apartments and in urban centres. Moreover, given the increased use of child carriers and e-bikes, access to sheltered storage is also important. One flagship initiative in this regard could be the provision of high capacity, secure, well located bicycle parking at every bus or train station across the country.

26. The Committee also recommends that other actions be taken to support greater integration between active travel modes and public transport, this might include planning to ensure easy pedestrian and cycle access to bus and railway stations and an increased capacity for the carrying of bicycles of both local and national public transport.

27. The committee recognises that successful modal shift and particularly the increased uptake of cycling has the potential to create new economic and procurement opportunities and recommend that a just transition approach be taken to ensure that such opportunities are open to SMEs or Social Enterprises with a local focus and build on successful pilot projects.

28. Investment in new public transport fleets and infrastructure will need to be accompanied by a commensurate increase in recruitment and staffing levels, something which also creates positive opportunities for employment.

29. The Committee notes that the achievement of increased emission reduction targets will require supply first rather than solely demand dependent initiatives in rail and public transport as a whole. This may include expansion of rail and bus networks as well as greater frequency and regularity of services. Subsidised or free access to public transport could be another effective 'pull factor'.

Electrification

30. In light of evidence surrounding the emissions impact of "low-emission" or "hybrid" vehicles, the Committee is of the view that work should be more focussed on transitioning to fully electric, zero-emission EVs. To achieve this, efforts should be made to fully and quickly equalise the purchase cost of new zero emission EVs with fossil fuel vehicles. The Committee also recommends that a policy of modal shift to sustainable modes be treated with at least equal importance to electric vehicles in decarbonising the Irish transport system.

31. To encourage emission reduction through use of EVs, the Committee recommends that a public awareness campaign highlighting the urgency of climate action and the individual and collective behavioural changes

required - including the necessity to reduce car usage and/or move car ownership to EVs, which may include e-bikes.

32. Incentives and supports for EV take-up should be reviewed and targeted with a particular focus on areas of high forced car usage and EVs as primary vehicles.
33. The Committee recommends the immediate expedition of the roll out of Ireland's electric charging infrastructure to encourage uptake of EVs in line with 2030 targets.
34. The Committee is of the view that consideration be given to the further electrification of all public transport including commuter rail lines as part of the DART+ programme.
35. The Committee is of the view that the review of previous proposals and development of new projects to support increased use of rail for both passengers and freight should be undertaken without delay. The Committee recommends that both "reopening" and "rebuilding" rail be examined and note that the creation of new routes should not be ruled out. While cognisant that some longer term strategic actions in terms of rail may have limited impact on achievement of 2030 targets, the Committee believes they have the potential to contribute significantly in the longer term. Moreover, this can be accompanied by actions with a more immediate impact such as the reopening of stations, an increase in frequency and regularity of services, the provision of connecting bus links, and measures to support affordability.

Freight Transport

36. The Committee recommends consideration be given to introducing mandates for zero emission trucks (as seen in California). The Committee also recommends measures to encourage and accelerate removal of current tax reliefs on diesel for freight.
37. The Committee urges a move to zero emission vehicles for all home delivery services and increased use in non-motorised cargo bikes/trikes in urban areas. In addition, the Committee recommends the increased use of delivery lockers/banks be explored.
38. In order to address emissions in relation to road freight, the Committee recommends that a central digitalised system for freight logistics in Ireland be developed. Such a system should allow all carriers to work towards ensuring fully loaded journeys, backloading, as well as re-routing and rescheduling to avoid congestion. Measures to encourage more strategic use of national and toll roads by freight rather than smaller roads

should be considered, which may include flat annual fees in respect of toll roads.

Future Challenges

39. The Committee recommends an examination of the area of just transition in relation to mobility and associated policies.
40. In light of the significant challenge regarding the decarbonisation of the aviation sector and in consideration of the importance of aviation and shipping to Ireland's connectivity as an island nation, the Committee recommends Ireland actively engage with EU and international public research initiatives to track emissions and drive new solutions and best practice in this area and recommends that a green hydrogen strategy be developed without delay.
41. The Committee recognises aviation and shipping as areas that will need further consideration from a transport emissions and climate policy perspective and will engage further with this area in the course of its future work programme, including with respect to international connectivity, emission reduction, alternative fuels and just transition.
42. The Committee recommends that an examination of innovative and transformative approaches to reducing emissions be conducted in order to bridge gaps in evidence around potential projects for reducing emissions. Such an examination should provide evidence enabling optimal decision-making i.e. the right projects are being implemented with the best outcomes for decarbonisation.
43. Cost-Benefit analysis and methodologies need to be reviewed and that review should reflect:
 - The potentially excessive weight given to time savings;
 - The undervaluing of innovative investments and co-benefits including those which cannot be as easily identified;
 - The time horizon of project appraisals to reflect the true long-term value;
 - The importance of low discount rates for long-life infrastructure;
 - The short and long term climate costs and benefits;
 - Measures to allow for cost-benefit analysis of economically smaller scale projects which may have significant impact.
44. The Committee suggests that an appropriately revised cost-benefit methodology should be applied to a review of current plans for the expansion of rail lines in Ireland. Several potential rail lines including commuter lines have been excluded from this expansion due to current cost-benefit analysis tools. The Committee agrees that these lines are

likely to be included in future expansions regardless of the current cost-benefit analysis and suggests a re-examination which might move this forward.

45. The Committee notes that emission reductions due to modal shift must be tracked and planned for in terms of actual reduction of emission journey kilometres and not only vehicle ownership.
46. The Committee is of the view that consideration be given to revising the mandates of Governance institutions for the transport sector to provide statutory commitments to decarbonisation goals.
47. Solutions to allow a more cohesive approach amongst Governance bodies should be considered such as focussed task forces and forums to combine insights to address decarbonisation.

**Joint Committee on Climate Action
Deputies**



Richard Bruton
Fine Gael



Réada Cronin
Sinn Féin



Cormac Devlin
Fianna Fáil



Alan Farrell
Fine Gael



Brian Leddin (Chair)
Green Party



Darren O'Rourke
Sinn Féin



Christopher O'Sullivan (Vice-Chair)
Fianna Fáil



Bríd Smith
Solidarity – People Before Profit



Jennifer Whitmore
Social Democrats

Joint Committee on Climate Action Senators



Lynn Boylan
Sinn Féin



Timmy Dooley
Fianna Fáil



Alice-Mary Higgins
Independent



John McGahon
Fine Gael



Pauline O'Reilly
Green Party

Appendix 2: Terms of Reference

Functions of the Committee – derived from Standing Orders [DSO 95; SSO 71]

- (1) The Select Committee shall consider and, unless otherwise provided for in these Standing Orders or by order, to report to the Dáil on any matter relating to—
 - (a) legislation, policy, governance, expenditure and administration of—
 - (i) a Government Department, and
 - (ii) State bodies within the responsibility of such Department, and
 - (b) the performance of a non-State body in relation to an agreement for the provision of services that it has entered into with any such Government Department or State body.
- (2) The Select Committee appointed pursuant to this Standing Order shall also consider such other matters which—
 - (a) stand referred to the Committee by virtue of these Standing Orders or statute law, or
 - (b) shall be referred to the Committee by order of the Dáil.
- (3) The principal purpose of Committee consideration of matters of policy, governance, expenditure and administration under paragraph (1) shall be—
 - (a) for the accountability of the relevant Minister or Minister of State, and
 - (b) to assess the performance of the relevant Government Department or of a State body within the responsibility of the relevant Department, in delivering public services while achieving intended outcomes, including value for money.
- (4) The Select Committee appointed pursuant to this Standing Order shall not consider any matter relating to accounts audited by, or reports of, the Comptroller and Auditor General unless the Committee of Public Accounts—
 - (a) consents to such consideration, or
 - (b) has reported on such accounts or reports.
- (5) The Select Committee appointed pursuant to this Standing Order may be joined with a Select Committee appointed by Seanad Éireann to be and act as a Joint Committee for the purposes of paragraph (1) and such other purposes as may be specified in these Standing Orders or by order of the Dáil: provided that the Joint Committee shall not consider—
 - (a) the Committee Stage of a Bill,
 - (b) Estimates for Public Services, or

- (c) a proposal contained in a motion for the approval of an international agreement involving a charge upon public funds referred to the Committee by order of the Dáil.
- (6) Any report that the Joint Committee proposes to make shall, on adoption by the Joint Committee, be made to both Houses of the Oireachtas.
- (7) The Chairman of the Select Committee appointed pursuant to this Standing Order shall also be Chairman of the Joint Committee.
- (8) Where the Select Committee proposes to consider—
- (a) EU draft legislative acts standing referred to the Select Committee under Standing Order 133, including the compliance of such acts with the principle of subsidiarity,
 - (b) other proposals for EU legislation and related policy issues, including programmes and guidelines prepared by the European Commission as a basis of possible legislative action,
 - (c) non-legislative documents published by any EU institution in relation to EU policy matters, or
 - (d) matters listed for consideration on the agenda for meetings of the relevant Council (of Ministers) of the European Union and the outcome of such meetings,

the following may be notified accordingly and shall have the right to attend and take part in such consideration without having a right to move motions or amendments or the right to vote:

- (i) members of the European Parliament elected from constituencies in Ireland,
 - (ii) members of the Irish delegation to the Parliamentary Assembly of the Council of Europe, and
 - (iii) at the invitation of the Committee, other members of the European Parliament.
- (9) The Select Committee appointed pursuant to this Standing Order may, in respect of any Ombudsman charged with oversight of public services within the policy remit of the relevant Department consider—
- (a) such motions relating to the appointment of an Ombudsman as may be referred to the Committee, and
 - (b) such Ombudsman reports laid before either or both Houses of the Oireachtas as the Committee may select: Provided that the provisions of Standing Order 130 apply where the Select Committee has not considered the Ombudsman report, or a portion or portions thereof, within two months (excluding Christmas, Easter or summer recess periods) of the report being laid before either or both Houses of the Oireachtas.

b. Scope and Context of Activities of Committees (as derived from Standing Orders) [DSO 94; SSO 70]

- (1) It shall be an instruction to each Select Committee that—
- (a) it may only consider such matters, engage in such activities, exercise such powers and discharge such functions as are specifically authorised under its orders of reference and under Standing Orders;
 - (b) such matters, activities, powers and functions shall be relevant to, and shall arise only in the context of, the preparation of a report to the Dáil;
 - (c) it shall not consider any matter which is being considered, or of which notice has been given of a proposal to consider, by the Joint Committee on Public Petitions in the exercise of its functions under Standing Order 125(1)¹; and
 - (d) it shall refrain from inquiring into in public session or publishing confidential information regarding any matter if so requested, for stated reasons given in writing, by—
 - (i) a member of the Government or a Minister of State, or
 - (ii) the principal office-holder of a State body within the responsibility of a Government Department or
 - (iii) the principal office-holder of a non-State body which is partly funded by the State,

Provided that the Committee may appeal any such request made to the Ceann Comhairle, whose decision shall be final.

- (2) It shall be an instruction to all Select Committees to which Bills are referred that they shall ensure that not more than two Select Committees shall meet to consider a Bill on any given day, unless the Dáil, after due notice to the Business Committee by a Chairman of one of the Select Committees concerned, waives this instruction.

Appendix 3: Submissions received

The Committee received a number of follow-up submissions from witnesses on issues which arose during hearings.

CCA-R21-129

Dr. Tadhg O'Mahony 26 February 2021

Reponses to questions and comments at JOCCA from Senator Alice Mary Higgins and Deputy Bruton, and checklist of actions for inclusion in new Climate Action Plan for all members

A) Questions and comments from Senator Alice Mary Higgins

- 1. The question of compact growth, does that need to be reimagined so it's not just technical density of office spaces empty or not, but a liveable space in our cities, that idea of the fifteen minute city, if there are comments on that. Specifically permeability in terms of better use public rights of way, can public rights of way, the network of laneways we have in our towns, the networks of connections that we have in estates that were built before intensive car usage be reimagined so that we are not just talking about cycling and walking on the sides of roads but around other networks for walkability and cyclability of the city. So if you could comment around better use of that public right of way infrastructure that is there and maybe formalisation of that.*

There are already very strong conclusions in the international literature, that urban form drivers of energy and GHG emissions, are density, land use mix, connectivity, and accessibility (Seto et al., 2014)⁵. These are interrelated and interdependent, pursuing one of them in isolation is insufficient for lower emissions. Connectivity and accessibility are tightly related: highly connected places are accessible. It is necessary to take a systemic view of sustainability to reduce emissions, looking at spatial pattern, urban design and transport planning together. The IPCC note that while individual measures of urban form have relatively small effects on vehicle kilometres travelled, they become more effective when combined. The template for this is found in co-location of higher residential densities, employment densities, and land-use mix with significant improvement to active and public transport. This process requires a holistic view, at the granular community level, noting Moreno's fifteen minute city, and closer to home, the 'ten minute town' concept of the Southern Assembly (2020)⁶.

Accessibility is useful concept which can link the permeability of urban design with the macro spatial and transport planning for access to services and sustainable transport links. In the three Irish towns studied, the Southern Assembly (2020) noted common problems in all three categories, permeability, access to services and sustainable transport. Specifically on permeability, the report recommended increases in walk-cycle bridges and removing physical barriers -effectively to ensure public right-of-way.

⁵ https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter12.pdf

⁶ <https://www.southernassembly.ie/regional-planning/rses-implementation/10-minute-towns>

There is a clear connection between the overall national system, and its carbon emissions, and the settlement pattern and transport structure at the local level. In Ireland, we have not yet had the kind of vertical integration that is necessary for a transformative spatial and transport planning. By definition, transformation is a national objective, which then needs to be adequately envisioned for implementation, where it actually needs to occur, at the local level. This disconnect, between national emissions policy, and local spatial and transport policy, is one of the key reasons for the dominance of the conversation by EV -it is all that is left to reduce emissions. Mr. Niall Cussen's recommendation, for a national audit of brownfield sites, is one of the sensible measures which can complete this jigsaw. This would help to illuminate the opportunities for increased density, on the ground, in each local authority. However, there will also be further work to be done. We also have an urgent need to do both survey and strategic long-term planning on:

- a) potential sites for sprawl repair, by increased density in urban areas, and/or retrofit of active and public transport in all areas,
- b) potential sites for change of use, from low-density industrial to new urban villages, as has been alluded to by planner Ciarán Cuffe, and,
- c) potential for national programme of transformative rail, to 2050, to consider local, commuter, high-speed and also freight.

We need to move away from the over-reliance on the 'end of pipe,' on EV, which is a marginal solution to a systemic problem. It is only by understanding these systemic spatial planning and mode shift options, and their implications, can we begin to make the informed decisions on a transformation, that can deliver on the objective of a 'sustainable and low-carbon future', and lead to win-win outcomes.

2. *In terms of planning, should there be better use of environmental impact assessments and social impact assessment at a much earlier stage in the planning process so that these issues are getting caught and so we don't have a backlog later at the judicial review level so that we're having a better quality of decisions made at an earlier point.*

It is not clear that either EIA or SIA are an efficient approach for improving design and/or screening of projects, or that they are an adequate failsafe to prevent failures. These assessments can be resource-intensive, and are designed for a different purpose. If the goal is better proactive, transformative and sustainable planning, then it will be necessary to continually improve resources, for better local authority decision-making: staffing levels, work-load and expertise are all relevant. It is also important to reflect on whether providing best practice guidance is enough, or if established procedures are now needed. If an incorrect interpretation of the Senator's question has been taken here, I am happy to revert once more.

3. *If the witnesses did want to comment on the SDG's which are now a mandate in terms of local development specifically SDG 11 around sustainable cities and communities and how that might be one of the imperatives or mandates for change in how we approach liveable and walkable cities.*

SDG 11 has elements of concept and framework, unifying political objective and values-based commitment. It has detail of key elements relevant to Ireland, to embark on a 'sustainable mobility transformation,' these include:

1. integrated settlement and transport planning,

2. priority on sustainable transport, notably expansion of public transport,
3. sustainability through positive links across scales/ reduction of impacts,
4. participatory policy, and,
5. equity, needs and inclusion.

While noting the importance of the procedural and ethical considerations, in 4 and 5 above, I will highlight the first three categories. It is demonstrable, in a reasonable interpretation, that integrated planning, priority of sustainable transport and sustainability of outcome, have not been adequately achieved in Ireland in recent decades. There are some signs of change, but little evidence we are yet evolving on sustainable path, or have acknowledged the need for long-term systemic transformation. There is much progress to be made to align analysis, practice and policy with the challenge of transformation. SDG 11 offers a further impetus to compel a leap forward in Ireland's approach. It must be noted that the SDG's are designed to be universal, so they indicate universal aims such as in SDG 11 "By 2030, reduce the adverse per capita environmental impact of cities...". An appropriate interpretation for Ireland, as a wealthy nation, must be stronger. It would necessitate deep reduction in absolute impacts, not merely one which might be minor. The SDG framework provides a useful impetus, and requires robust implementation. However, recognising the challenges in Ireland, across spatial planning, housing, transport and climate action, it will not provide for a comprehensive response on its own.

B) Questions and comments from Deputy Bruton

Deputy Bruton noted that he was happy with written responses if the time was not available. I will now come back to key points and questions.

The Deputy raised the point of a potential false dichotomy between electrification verses compact development, and considering the limits or otherwise of measures for compact development (avoid) and active and public transport (shift). It is indeed correct that there should not be a false dichotomy, between avoid-shift-improve, they are all necessary measures in transformation to a sustainable low-carbon future. For this purpose, 'improve' by electric vehicles is a useful, but not a sufficient approach. Avoid-shift-improve measures are not created equally. Consistent with this now standard approach, is to also recognise that it is a hierarchy of options: avoid is always considered first, followed by shift, and then improve last. This is recognised in accepted global conclusions, including in the report of the Intergovernmental Panel on Climate Change (Sims et al., 2014⁷, Seto et al., 2014⁸; Rogelj et al. 2018)⁹.

There has been a persistent myth in Irish policy discussion of emissions reduction from transport, that compact development (avoid) and active and public transport (shift) can only deliver emissions reductions for new settlement, in the long-term future, in urban areas -for the 1% growth in housing noted in the session. However, to take this approach would greatly undermine the ability to transform and reduce emissions. As noted above, in response to the question from Senator Higgins, it is possible to implement long-term transformation by 'sprawl repair' of existing urban areas (through increasing density, including redeveloping brownfield and considering change-of-use), and also retrofit of active and public transport measures in all areas, including rural, as per the Western Development Commission (2020)¹⁰. This approach

⁷ https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter8.pdf

⁸ https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter12.pdf

⁹ https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15_Chapter2_Low_Res.pdf

¹⁰ https://www.wdc.ie/wp-content/uploads/2020/08/Transition-to-a-Low-Carbon-Region-WDC-Main-Report_FINAL-August-2020.pdf

needs to embrace both currently existing development, as well as all future development. If the approach is taken that we will only consider future development, it will be virtually impossible to deliver a sustainable system. Indeed it is documented in the synthesis literature that shift measures for cycling can deliver rapid short-term emissions reductions (Sims et al., 2014), necessitating a scale up of the recent Irish cycling measures nationally to multiply the effects.

In Ireland, there has yet to be a focus on transformative change in spatial planning, transport planning or climate action. Spatial and transport planning have existed separately and have operated on short-term and medium-term timescales that only consider small changes. Climate action has been dominated by the limited ‘improve’ approach, for EV and biofuels, again on short-term timescales. This separation of policy, reliance on marginal measures and only considering the shorter-term, leave our national spatial and transport policy wholly un-prepared for the challenge we now face. We need to integrate these policy areas, move to long-term strategic planning -based on an understanding of alternative pathways- and explicitly platform transformative system-based approaches for consideration by the policy process. This approach is consistent with what is known about climate action policy globally, supported by strong conclusions of the intergovernmental Panel on Climate Change reports (Sims et al., 2014; Seto et al., 2014; Rogelj et al, 2018). The IPCC reports are the gold standard of knowledge, that synthesise the frontier of literature globally, into conclusions that can be strongly supported. These reports offer a major resource to support the discussion of climate action policy in Ireland, a resource that often remains largely untapped, particularly in spatial and transport policy. While noting that there are specificities in each context, hence the need for study of related topics nationally, I would like to stress once more the utility of bringing the IPCC reports to bear in Irish climate action policy discussions. They can help us greatly to address the gaps we have in our approaches. The EPA State of the Environment Report 2020, in its environment and transport chapter, has drawn on this knowledge to clarify what is required to address the considerable gaps in knowledge and policy that exist in Ireland (EPA, 2020)¹¹.

The roll-out of EV will likely continue to form an important part of Irish climate action policy on transport. However, following the state-of-the-art in the literature, it is not the first port of call, it is always the last measure, when avoid and shift have been exhausted by the policy process. EV will drive emissions from Irish power generation, until power has been completely decarbonised, which may be decades away. It will continue to drive emissions in producer countries, due to the energy intensive processes involved in car production. It will continue to drive a whole host of sustainability impacts, from our growing traffic congestion to road traffic accidents, and air pollution by particulates. EV also includes a number of hidden system costs, in requiring increased electricity generation and distribution infrastructure, vehicle charging infrastructure, and most importantly of all, inducing and demanding increased investment in road transport infrastructure, ironically to alleviate car-generated traffic congestion.

The recent evaluation of the Climate Change Advisory Council (Tallon et al., 2020)¹², pointed to a crucial conclusion for Irish climate action in general, and spatial and transport policy in particular. It noted that the first decades of policy were about marginal change, to meet short-term targets, by changing technology and using economic instruments. It noted this must now move to a ‘theory of change,’ for long-term systemic and transformative change. This conclusion is consistent with accepted conclusions at global levels in IPCC reports. That our

¹¹ <https://www.epa.ie/media/EPA-Ireland's-Environment-2020-Chapter11.pdf>

¹²

<https://www.climatecouncil.ie/media/climatechangeadvisorycouncil/contentassets/documents/news/Independent%20Evaluation%20of%20the%20Climate%20Change%20Advisory%20Council%20.pdf>

spatial planning continues to allow for more dispersed settlement, and for limited active and public transport, leaves us continually falling behind our European peers. Every year that passes we are more deeply locked-in to our carbon intensive transport system. Addressing the gaps in our policies, and in our knowledge, will require thought leadership from our policy and research communities, and also from our politicians. The kind of leadership Deputy Bruton pursued in the policy and administrative innovations of the first Climate Action Plan of 2019. The deputy is correct to point out that there are difference between short-term and long-term measures. However, we currently only have shorter-term measures. It is necessary that short-term measures are introduced to serve the long-term needs of transformation, on all of avoid-shift-improve. If we continue to focus only on 2030 and EV, we will sacrifice our ability to reach 2050 sustainability goals, while imperilling our 2030 emissions goals -through an over-reliance on a single end-of-pipe measure.

To conclude, once avoid and shift measures have been exhausted, EV and other alternative drive trains are useful and desirable solutions to decarbonise transport demand, and meet our 2030 targets. While necessary, they are however not a sufficient approach for climate action and sustainability. That requires transformative system-based approaches, to prioritise avoid and shift measures, as part of strategic long-term planning to 2050, in which 2030 is a stage on that journey. Adopting the avoid-shift-improve approach, beyond the marginal medium-term tweaks currently committed to, requires change to the policy process, to the analysis used to support it, and the thought leadership that drives it. The Committee have made a good start by constructively engaging in these discussions. I look forward to seeing more progress being made.

What is the role of pricing approaches?

Pricing approaches, including carbon pricing, road pricing and congestion charges, are acknowledged as useful to assist the process of transformation. They can generate funds that can be used to improve equity of outcomes, or to develop more sustainable infrastructure. However, it is accepted in the literature that they are not a substitute for policies that lead to actual systems changes (O'Mahony, 2020)¹³, their use in the transport sector is chiefly to prevent a 'rebound' of demand for fuels when the price drops.

How to value short-term costs verses long-term benefits?

The Deputy pointed to a crucial issue with investing in public projects for sustainability and transformation, the issue of high up-front capital costs and long-term flow of benefits. If the long-term flow of benefits are not fully captured in a Cost-Benefit Analysis, the arbiter of public investment, then they will not be valued for their full contribution, This leads to over-valuing the benefits of emissions intensive infrastructure, such as new roads, and undervaluing the benefits of emissions reducing infrastructure, such as rail. It has been demonstrated that Cost-Benefit Analysis in Ireland uses excessively high discount rates (for a wealthy country), and excessively short-time horizons of analysis (O'Mahony, 2018)¹⁴. This approach will systematically favour more emissions intensive public infrastructure, and deflect projects that can deliver sustainability and transformation. It has also been noted that it has been standard practice in Ireland, to not publish the full results of Cost-Benefit Analysis. This renders it impossible to fully consider if the analysis can indeed be fully supported. The approach to Cost-

¹³ <https://www.aimspress.com/article/doi/10.3934/GF.2020022>

¹⁴

https://www.researchgate.net/publication/328383318_Appraisal_in_transition_21st_century_challenges_and_updating_Cost-Benefit_Analysis_in_Ireland

Benefit Analysis of public investment in Ireland, is not consistent with supporting climate action and sustainability.

What needs to be in the new plan to 2030 for deeper emissions reductions?

The 2030 approach needs to be built on meeting the 2050 goal. The 2050 objective has no policy in Ireland, and the 2030 policy is not consistent with a sustainable low-carbon future. As settlement and transport planning are long-term phenomena, it is critical that the approach use 2030 as a waymark on this journey to 2050 (Sims et al., 2014), rather than the shorter-term approach used to date. There are short-term policies that can deliver significant emissions reductions, as previously noted for cycling. Consistent with recognising the need for long-term policy, and short-term policy which supports this, an action checklist is included below in C). This addresses both short-term policy actions, and also the urgent need to address gaps in knowledge, for a transformative approach to 2050, in ‘study actions’. These study actions need concrete commitment for implementation as soon as possible, to avoid a succession of years being lost to improving knowledge. They also do not constitute an excuse for failure to implement avoid-shift-improve actions in the new Climate Action Plan. To assist this, it is possible to build on current knowledge in the interim, including using international expertise, and drawing on knowledge from sources such as the IPCC reports

C) Checklist of actions required in new climate action plan, to support 2030 targets, and address gaps in knowledge and policy for transformative approach from 2021 to 2050

Avoid

Policy: Reinforce the National Planning Framework, while clearly noting its limitations, that is it short-term and marginal, and requires an urgent review to bring it in to line with climate action and sustainability

Policy: Deepen demand management measures through home-working provisions

Study: National survey of brownfield sites

Study: National survey of potential zones for sprawl repair and increased density

Study: National survey of potential sites for change of use, to increase density and develop new urban blocks and villages

Study: National study of scenarios of alternative spatial planning pathways, different densities and patterns that can meet increased housing demand, illuminate their transport demand, costs and other implications, and the policy needs for implementation

Shift

Policy: Immediate cessation of road-building programme as costly investment in deepening lock-in to carbon intensive transport system

Policy: Re-doubling of efforts for walking and cycling, including the commitment to €1 million a day investment

Policy: Improving efforts for e-mobility

Policy: Specific measures to enhance delivery of public transport projects

Policy: Specific measures to reverse decline in public transport due to Covid-pandemic

Study: National study of transformative long-term shift to walking and cycling, integrated with the study of alternative spatial planning pathways, to illuminate implications and policy needs for implementation

Study: National Study of transformative pathways for passenger rail, and of freight, for local, commuter, and also high-speed

Study: National study of transformative pathways for passenger bus, including both urban and rural services

Improve

Policy: for increase in EV and zero-carbon alternatives, including both passengers and freight, recognising that decarbonisation is the option of last resort

Policy: for electrification of rail

Policy: absolute reduction in emissions from aviation and shipping, not defined by offsets

Study: pathways for sustainable zero-carbon fuels for aviation and shipping in Ireland

Study: policy options to support more serious engagement in international reduction of carbon emissions from aviation and shipping

Further follow up from Dr O'Mahony received 01/04/2021

Dear Chair, Committee Members and Secretariat,

Further to your recent incisive deliberations on transport and climate action, I would like to draw your attention to three topics:

1. A recent paper published on Cost-Benefit Analysis (attached)
2. The new 'Every Village, Every Hour' report for rural bus in England
3. The discussions at Committee on the 9th of March on the carbon emissions reductions from the NTA 2016 Strategy

1. Cost-Benefit Analysis is the tool used to consider whether public investments contribute to economic welfare. If they are not implemented correctly they will bias towards emissions intensive projects, and away from emissions reducing projects. The approach in Ireland, mandated by the Public Spending Code of DPER, is not fit-for-purpose, to appropriately analyse public investment projects such as roads and rail. A paper published in the international peer-reviewed scientific journal, Environmental Impact Assessment Review last weekend, shows us that the time horizons applied to analysis, the length of years for which the analysis is done, at about 30 years in Ireland, are too short, and are not in line with practices internationally. In addition, the 'discount rate', used to value future costs and benefits in the present, mandated at 4%, is too high, and cannot credibly be defended. Both of these factors will bias analysis towards more carbon-intensive and environmentally damaging projects such as roads, and away from projects that can reduce emissions, such as investing in rail.

As the author of this paper I attach it for your information.

2. The new 'Every Village, Every Hour' report gives an idea of how plausible it is to provide a comprehensive bus service in rural areas of England, for reasonable cost <<https://www.cpre.org.uk/resources/every-village-every-hour-2021-buses-report-full-report/>>. This is the kind of transformative thinking we need in Ireland, to deliver the immense social benefits of mobility access for all, sustainably, and re-vitalise the towns and villages of Ireland, as vibrant communities that meet our aspirations for a better life. It would be desirable to produce such a transformation study for Ireland, and similar for cycling, rail and spatial planning/ housing. If we are to develop a sustainable low-carbon transport system, and a better Ireland, we need big vision. We also need to greatly improve the analysis and evidence available to support decision-making. We need to go beyond a risky and costly reliance on electric vehicles and biofuels alone, that continually dominates the discussion here, and consequently pushes out of discussion the measures for 'avoid' and 'shift' of transport, that can deliver far better outcomes.

3. I would like to refer back to the discussion of the 9th of March on the carbon emissions reductions from the NTA Greater Dublin Area Strategy of 2016. The discussion noted that this Strategy achieves a 3% reduction of emissions in 2035. This may appear to be a reduction of emissions on 2016, however, the modelling actually estimated a growth of emissions of 33% if we do nothing, and 30% if we successfully implemented the NTA

strategy. While neither a 3% reduction, nor a 3% reduction on a 33% growth, are indeed consistent with the emissions challenge we now have, it is important to note that emissions in the Greater Dublin Area are forecast to increase significantly. The need for transformative change of systems is therefore even more pressing.

Kind regards,

Dr Tadhg O'Mahony PhD BSc Dip

Sustainability Transformations consultant
Marie Sklodowska Curie Fellow/ external advisor at FFRC

Finland Futures Research Centre
University of Turku
Finland

Transport for Quality of Life provided the following presentation which can be accessed via this link: [The Carbon Impact of the National Roads Programme.](#)

Follow up received from Dr Lynn Sloman 24/03/2021

I promised at the session of the Committee yesterday to send links to relevant documents, picking up on some of the questions asked by members of the Committee. Please find relevant links below.

- Senator John McGahon asked whether **cycle superhighways** were appropriate outside urban areas. [This](#) document and [this](#) one may be helpful, describing the cycle superhighways that radiate up to 40km out from Copenhagen into surrounding municipalities.
- Senator McGahon also asked who gets to keep the revenue from a **road user charge**. [This](#) briefing and [this](#) one explain how a pay-per-mile Eco Levy might work, and how it might be framed to get public support.
- Deputy Whitmore asked about the role of **free local public transport** in attracting a wider range of people to use buses, and Deputy Smith asked what was the reason for introducing free buses in Dunkirk. [This](#) briefing may be useful, although it was written before the Dunkirk free bus scheme was implemented. There are links to a summary and full evaluation of the effect of the Dunkirk scheme [here](#); if the Committee would like to look at this further I have an electronic file of press articles about free local public transport in France.
- Senator Higgins was interested in the “**Every Village, Every Hour**” aspiration of Nord Hesse, Germany, and Deputy O’Rourke was interested in how **public transport could be provided in dispersed rural communities**. [This](#) report (pp12-19) describes the public transport services in Nord Hesse, and also the rural areas of Zurich and Bern cantons in Switzerland, and explains how they have been achieved.
- Deputy O’Rourke asked for more information about the decision in South East Wales to **cancel the motorway scheme** that was designed to relieve congestion on the M4 around Newport, and instead to provide a package of public transport and active travel alternatives. The recommendations of the South East Wales Transport Commission on this are [here](#).
- Deputy Cronin suggested the idea that grants might be provided to offer free bicycles to children. I haven’t come across any places that have done this (though it’s a great idea). However, [this](#) briefing describes the grants schemes in a number of European countries that have been used to encourage wider uptake of e-bikes.

Many thanks to the Committee for inviting me to contribute, and for asking such wide-ranging and thoughtful questions. If there is any way I can be of any further assistance in providing information as you write your report, please do let me know.

Kind regards,

Lynn

Lynn Sloman
Transport for Quality of Life



Outline reply to Supplementary JOC (Climate) Questions Senator Mary Alice Higgins

1. Compact growth, does that need to be reimagined so it's not just technical density of office spaces empty or not, but a liveable space in our cities, that idea of the fifteen minute city, if there are comments on that. Specifically permeability in terms of better use public rights of way, can public rights of way, the network of laneways we have in our towns, the networks of connections that we have in estates that were built before intensive car usage be reimagined so that we are not just talking about cycling and walking on the sides of roads but around other networks for walkability and cycle-ability of the city. So if you could comment around better use of that public right of way infrastructure that is there and maybe formalisation of that.

Response:

Guidelines for Planning Authorities on Sustainable Urban Development published by the Minister for Housing, Local Government and Planning published in May 2009 address this.

<https://www.gov.ie/en/publication/a8c85-sustainable-residential-developments-in-urbanareas-guidelines-for-planning-authorities-may-09/>

The guidelines outline various methodologies that can be employed in achieving more sustainable patterns of urban development, not just in terms of achieving numerical dwellings or jobs per hectare but the delivery of sustainable communities as well in terms of the quality and liveability of urban places.

The concept of the 15 minute city or town is highly compatible with the messages and methodologies of the above guidelines and its associated and highly regarded urban design manual that are well worth further study.

Similarly, the National Transport Authority has published excellent guides on urban permeability and area based transport assessment that touch on the points raised in the question. Please see:

<https://www.nationaltransport.ie/planning-and-investment/strategicplanning/guidance-documents/>

These guidance documents make the very point in the question about the value of urban ways, side streets, linkages between residential areas, linkages between parks and other public or publicly-owned areas in providing a

foundation architecture for new active travel networks such as safe, direct, legible and well-constructed pedestrian and cycle networks that offer attractive travel options for citizens especially over shorter trips, than the traditional reliance on the car for many of such trips.

Funding of local authority activities in these areas, to work with local communities in a programme of co-design, would be one way to progress this area, one which the NTA is committed to and which the OPR will also support.

2. In terms of planning, should there be better use of environmental impact assessments and social impact assessment at a much earlier stage in the planning process so that these issues are getting caught and so we don't have a backlog later at the judicial review level so that we're having a better quality of decisions made at an earlier point.

Response

The Strategic Environmental Assessment (SEA) process is an excellent platform for consideration of the high-level environmental aspects of plans and programmes like development plans and local area plans and setting an effective framework for project level consideration including EIA.

SEA processes could be used much more effectively for the type of issues raised by the question as evidenced by updated guidance on SEA due imminently from the EPA and DHLGH.

Except for Planning Schemes in Strategic Development Zones, development plan and local area plan detail and objectives do not tend to go in to much detail apart from setting broad use mixes and densities. This has often led to the detail being worked out at planning application stage where broad policies can be the subject of differing interpretation depending on whether participants in the planning process are on the project proposal or other sides.

A way to counter this is through more effective and detailed area based planning, commensurate with the provision of appropriate resources and means for public engagement and general awareness building and engagement generally for the public. The OPR has a statutory role in relation to promoting greater public awareness around the issues and choices involved in planning and the benefits of proper planning which are accessible at www.opr.ie

There is no statutory basis for social impact assessment but humans along with all other natural and ecosystem elements of our surroundings are part and parcel of the terms for SEA and EIA.

That said, no matter how effective SEA etc processes might be made into the future, there has been a notable trend in recent years in Ireland and other EU countries for increased litigation in the planning space with rapidly increasing

levels of applications made and leave granted for judicial review of planning policy and case level decisions.

Continued growth of this trend is resulting in the effectiveness, timeliness and coherence of the process coming in to question as well as the balance of risk for the various participants in the planning process. These are matters for Government and the Oireachtas to address in relation to setting the regulatory and policy framework for planning.

3. If the witnesses did want to comment on the SDG's which are now a mandate in terms of local development specifically SDG 11 around sustainable cities and communities and how that might be one of the imperatives or mandates for change in how we approach liveable and walkable cities.

Response

The Strategic Development Goals are specifically called up in the Government's National Planning Framework, which acts as a capstone to wider planning at regional and local levels, which also are increasingly articulated around the achievement of the goals.

CCA-R21-130

Written responses to: Oireachtas Joint Committee on Climate Change *How Ireland can reduce its Carbon Emissions by 51 per cent by 2030* February 23rd 2021

Andrew Murphy, Aviation Director, Transport & Environment
February 28th 2021

Senator Higgins' question regarding cities

I'll limit my response to the Senator's third question, relating to the SDG goal of making cities more livable. Looking at the current Climate Action Plan (CAP), there are some changes we can make to that which will improve the livability of cities. The first is to ensure a rapid shift to zero emission vehicles, as opposed to either low-emission vehicles or the use of CNG in freight. Lowemission vehicles such as plug-in hybrids aren't delivering the promised reduction in fuel consumption; our research has found that in fact they produce [30-90% more emissions](#) than advertised. This has important implications for air quality in cities. Likewise, supporting CNG for freight, as the CAP proposes, will not solve air quality issues as [our report](#) has found. Instead freight should be fully electrified, which is possible given recent industry announcements for fully electric Heavy Goods Vehicles (HGVs).

Noise pollution from aircraft take-offs and landings is also a concern. The proposed extension of night flights from Dublin Airport should be delayed, in particular until we ascertain whether employers will return to the same level of business-travel post-pandemic. There are some suggestions that employers, particularly large multinational companies, will not resume the same level of business-travel post-pandemic, and this will have implications for the case for aviation expansion in Ireland.

Electrification is only part of the solution, and in particular for mitigating the negative effects of the existing fleet of internal combustion engines (ICE) much more ambition is required. Numerous European cities are moving towards city-wide 30km/h speed limits (Brussels, Oslo, Helsinki) and this has been found to improve air quality, reduce noise pollution and increase the rate of cycling and walking. An ambitious working from home (WFH) strategy must also be pursued.

Deputy O'Rourke's question regarding freight

As I indicated at the Committee hearing, and in my written answer to Senator Higgins above, I believe much more ambition is possible in the area of freight decarbonisation. We should avoid supporting increased biofuel use and CNG deployment, the first of which has worrying implications for global biodiversity and food prices and both of which will fail to improve air quality.

Direct electrification of freight is possible. European legislation can help, and the standards regulating emissions from HGVs are due for revision in 2022. We should follow [the example of](#)

[California](#) and introduce mandates for zero emission trucks. We should also ensure that we use [European funds to invest](#) in the necessary charging infrastructure. And here the issue with CNG is acute - we can't afford to split infrastructure investment between CNG and electric charging, and should therefore prioritise the latter.

As with passenger vehicles, the potential for future electrification should not distract us from the need to reduce emissions from the existing ICE freight fleet. The UK's Committee on Climate

Change have [made a number of recommendations](#) to improve operational efficiency of freight (changes to delivery times, better driving, incentivising more efficient distribution). Each of these should be examined for their suitability in Ireland.

Clarification regarding Deputy Bruton's carbon pricing question

Deputy Bruton suggested he would accept written responses, so I will take this opportunity to make a clarification regarding carbon pricing. At European-level, there is currently a debate regarding the extension of the EU's Emissions Trading Scheme (EU ETS) to the road transport sector, potentially at the expense of that sector's inclusion in the Effort Sharing Regulation (ESR). Our view is that such a reform would [not reduce emissions](#) from the road transport sector, as both the ESR and car standards are more effective. Consumer organisations have also [opposed this idea](#) on similar grounds.

This is different from carbon pricing at national level, in particular an agreed increase in carbon pricing over a period of time, which sends an important signal to the public. At national level, governments have a much greater ability to ensure social consequences of such an increase are mitigated through fiscal transfers and investments, options which are less available at European level due to the EU's limited role in social policies.

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Emissions Reduction in Transport: Submission to Oireachtas Committee on Climate Action

April 6th 2021

Brian Ó Gallachóir, Paul Deane, Tomás MacUidhir, Vera O'Riordan, Shane McDonagh, Vahid Aryanpur and Fionn Rogan

HOST INSTITUTION



PARTNER INSTITUTIONS



MaREI note on greenhouse gas emissions reduction in Transport

This note responds to the Oireachtas Joint Committee on Climate Action request (CCA-I-2021-045) for a written submission from MaREI on reducing greenhouse gas (GHG) emissions in Transport. It summarises the emissions savings associated with measures identified in the Climate Action Plan 2019 and quantifies the savings from additional measures that may be considered for inclusion in Climate Action Plan 2021.

Figure 1 shows the CO₂ emissions in 2018, the projected increase by 2030 due to changes in population and economic growth, projected emissions reductions due to measures in the Climate Action Plan 2019 and the remaining gap to achieving a 51% reduction in transport emissions by 2030 relative to 2018.

- It is worth noting that the projected growth in emissions by 2030 (reported in the Climate Action Plan 2019) due to transport activity growth are estimated to be offset by calculated emissions savings associated with the increased electric vehicles (940,000) and biofuels blending (10% ethanol and 12% biodiesel).
- The Climate Action Plan 2019 projects total transport emissions by 2030 as 7-8 Mega (or million) tonnes by 2030, and contains other measures, including carbon tax and improved engine efficiency. The associated 4.7 Mt emissions savings are more difficult to replicate (than for EVs and biofuels) and these are calculated here as a residual and captured in Figure 1 as ‘other CAP 2019 measures.’

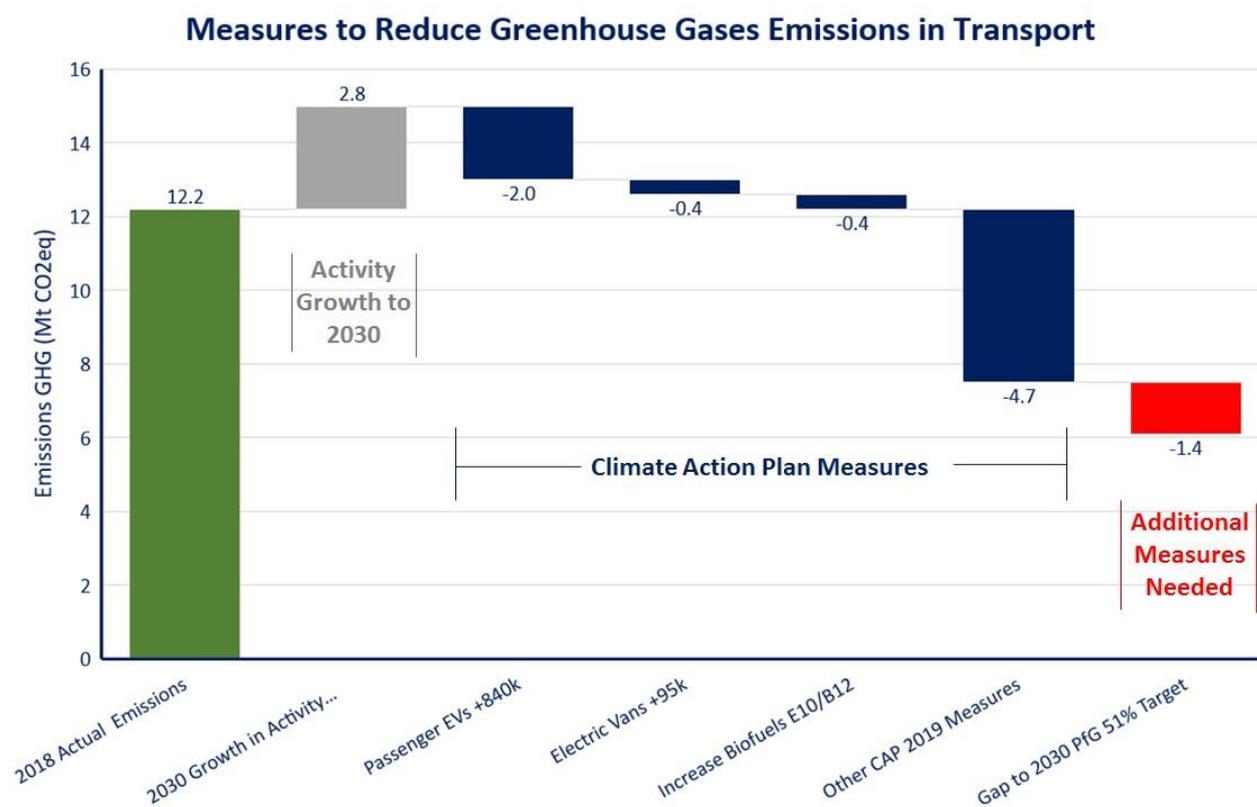


Figure 1 Reducing GHG Emissions from Transport in Ireland

There are many additional measures that can also contribute to emissions reductions, including

- HVO (hydrotreated vegetable oil), active modes (i.e. walking and cycling), remote working, and speed limit reductions,
- increasing public transport (e.g. Dublin Bus connects and extending the LUAS to Finglas), changes to public transport (electrification of rail, hybrid rail), and
- specific measures for heavy goods vehicles (reform of diesel rebate scheme, incentivised driver training, changing the allowable weight / length limits).

Measure	Description	Emissions Avoided in 2030 (Mt)
Hydrotreated Vegetable Oil (HVO)	Blend HVO with diesel displacing 20% of diesel in road transport by 2030	1.3
Increase active modes of transport	Cycling and walking increase by 2030 to replace car journeys for up to 10% of short trips	0.2-0.6
Targeted measures for trucks	Incentivised driver training for heavy goods vehicles, reform of diesel rebate scheme and changing allowable max weights and truck lengths	0.2-0.5
Changes to public transport	Electric or hybrid trains, Dublin Bus Connects and extension of LUAS to Finglas by 2030	0.2-0.3
Working from home	Up to half of workers living more than 25 km work from home by 2030	0.1-0.3
Reduce speed limits	Reduce speed limit on motorway from 120 to 100 km/h	0.1-0.2

Table 1 Estimated GHG Savings from Additional Possible Measures

Table 1 summarises a number of possible measures and associated emissions savings estimates. Please note that due to interaction effects, the emissions avoided cannot be added to estimate the combined impacts.

- **Hydrotreated Vegetable Oil (HVO)**, also known as Renewable Diesel can provide an option for rapid emissions reduction in road transport. If HVO achieves a 20% of diesel for road transport in 2030 (i.e. 5.4 TWh in transport energy), this would avoid 1.3 Mt CO₂. Note: Sweden increased blending of HVO with diesel from 0 TWh in 2011 to 14 TWh in 2018
- Increasing **active transport modes** (i.e. walking and cycling) have multiple benefits, including improved health and wellbeing, reduced traffic congestion and reduced air pollution. The CO₂ emissions avoided by up to 10% of short car trips being shifted to walking and cycling are in the range 0.2 – 0.6 Mt. This does not include the additional savings that may be achieved if electric bikes are used, which can also replace longer car trips.

- A number of targeted measures for **heavy goods vehicles** are project to avoid 0.2 – 0.5 Mt emissions per annum, based on a 9.5% fuel savings achievable from driver training, over 25% CO₂ savings per movement by changes in truck weight and length in line with other EU Member States, and encouraging fleet turnover through changes in diesel rebate scheme. reduce tonne kilometres
- Specific changes in **public transport**, including moving rail transport to using electric or hybrid trains, implementing Dublin Bus Connects and extending the LUAS can yield 0.2 – 0.3 Mt emissions savings.
- **Working from home** has many potential benefits for employees (e.g. avoiding commuting time) - if half of employees living more than 25 km from home work at home, this can avoid up to 0.3 Mt.
- Reducing the **motorway speed limit** from 120 km/h to 100 km/h could yield 0.1 – 0.2 Mt CO₂ emissions, mostly from reduced private car emissions.

More information can be provided on these measures or associated calculations on request.



FUNDED BY:



By email only to climateaction@oireachtas.ie

Gina Long
Clerk to the Joint Committee on Climate Action
Leinster House
Dublin 2

25th March 2021

Dear Ms Long

I refer to the recent attendance of the National Transport Authority (NTA) at the Committee meeting on 9th March (Your Ref: CCA-I-2021-030).

At the meeting the NTA undertook to provide additional information on how health benefits are assessed within our transport modelling system.

I attach a document titled “Health Module – Development Report”, which documents the approach to the appraisal of health benefits in transport projects and details the methodology used as part of the NTA’s overall transport modelling system.

Yours sincerely

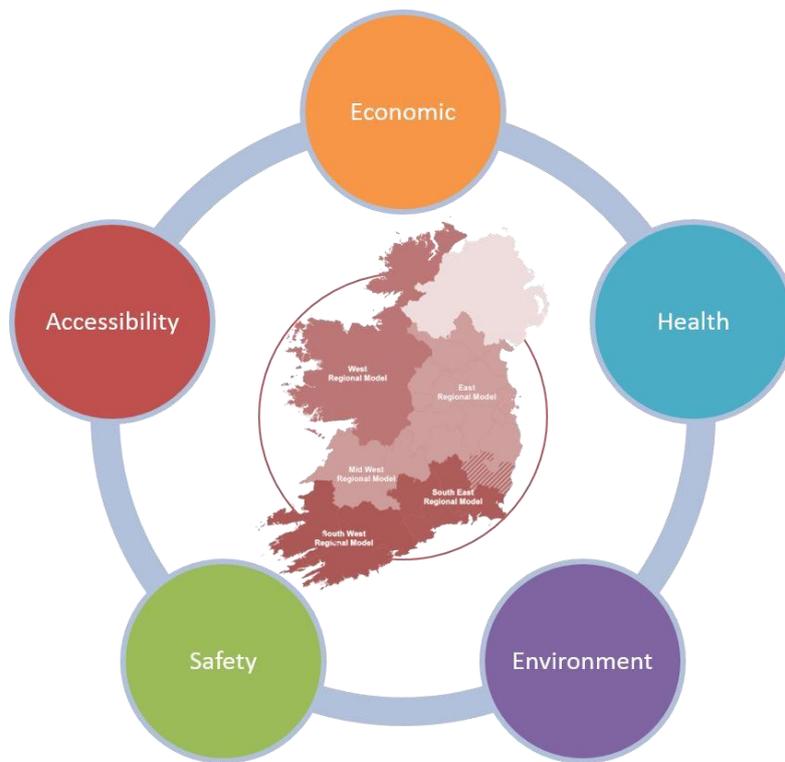


Anne Graham
Chief Executive



NTA

Údarás Náisiúnta Iompair
National Transport Authority



Health Module

Development report – DRAFT

March 2021 (v3.1.2)

National Transport Authority,
Dun Scéine,
Harcourt Lane,
Dublin

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Introduction

Background

As part of the Modelling Services Framework, Systra/Jacobs were commissioned by the National Transport Authority (NTA) to develop a system of multi-modal transport models for each regional city in Ireland. As part of this commission, a scoping process was initiated in September 2014 to define the most appropriate suite of appraisal tools to complement the regional models.

A number of separate appraisal processes are being developed:

- Safety
- Economy
- Reliability
- Environment
- Health
- Accessibility

This note documents the approach to the appraisal of Health Benefits and the development of the tool itself. It includes a discussion of the health benefit appraisal process, outlines the required datasets and then details the implementation of the approach and tools.

Overview of Health Appraisal

Active travel modes, i.e. walking and cycling, can bring about significant benefits for our health and environment. Most transport investment is assessed for its value for money using methods which compare costs against benefits over the lifetime of a project. Benefits are now increasingly being assessed in a wider sense – economic, environmental, social, and health. As a result, the consideration of health benefits arising from transport is becoming an integral part of the appraisal process adopted to inform transport policy and investment decisions.

Transport related changes to the following factors can have health impacts:

- **Physical activity** – increased levels of activity can positively impact on reducing the risk of death and occurrence diseases such as heart, diabetes and cancer related illnesses;
- **Absenteeism** – this is expected to decrease when more people walk or cycle. Moderate physical activity can lead to a reduction in the number of sick days and a healthier workforce can, in turn, provide benefit to employers and overall economy;
- **Journey quality** – refers to the quality impacts of schemes on journey experience which is calculated on the basis of ‘safety-insecurity’ and assigning a ‘quality value’ to each trip made by existing and new users;
- **Safety** – a ‘safety in numbers’ effect can result from increasing levels of active travel or conversely a decline in safety where change occurs towards these modes and/or routes with higher accident rates. This is addressed in the Safety note; and

- **Environment** – air quality, greenhouse gas and noise impacts resulting from a decline in road traffic and associated congestion. These factors are considered through damage costs which are discussed further in the Environment note.

Health Benefit Appraisal Tool Overview

The scope of this Health Appraisal Tool is to provide the basis to calculate benefits associated with changes in levels of physical activity and absenteeism as a result of more walking and cycling taking place. This section provides an introduction to both aspects of the tool.

Physical Activity

The WHO¹⁵ developed the Health and Economic Appraisal Tool (HEAT) to calculate the health benefits associated with changes in physical activity resulting from differences in walking and cycling. The tool is available as an online platform.

Adopting the principles of HEAT, the DfT published *Cycling and Walking: The Economic Case for Action*¹⁶ in March 2015. The ‘toolkit’ comprises a technical note including an overview of how to demonstrate the economic case for a new cycling and walking proposal accompanied by a spreadsheet based model which provides a basis to replicate calculations for different schemes.

In regard to physical activity, the basis of the DfT tool is to calculate *‘If x people cycle or walk y distance on z days, what is the economic value of the mortality rate improvements?’*

The DfT tool can be applied in many situations, for example:

- To plan a new piece of cycling or walking infrastructure: it models the impact of different levels of cycling or walking and attaches a value to the estimated level when the new infrastructure is in place;
- To value the mortality benefits from current levels of cycling or walking, such as benefits from cycling or walking to a specific workplace, across a city or in a country; and
- To provide input into more comprehensive cost–benefit analyses, or prospective health impact assessments: for instance, to estimate the mortality benefits from achieving national targets to increase cycling or walking, or to illustrate potential cost consequences of a decline in current levels of cycling or walking.

¹⁵ Health Impact Assessment Tool (HEAT) <http://heatwalkingcycling.org/index.php?pg=cycling&cs=q6.1&m=pre>

¹⁶ Cycling and Walking: The Economic Case for Action <https://www.gov.uk/government/publications/cycling-and-walking-the-economiccase-for-action>

Absenteeism

Benefits associated with a reduction in absenteeism primarily arise through increases in physical activity levels leading to increased productivity as a result of reduction in short-term sick leave. Research undertaken by the WHO in 2003 noted a cycling or walking intervention of 30 minutes per day reduces absenteeism through a reduction in short-term sick leave by between 6% and 32% per annum.

The aforementioned DfT Walking and Cycling Toolkit also includes functionality to calculate health benefits in relation to absenteeism. The monetary value of the total absenteeism benefit is calculated by the total hours per year saved and value of work time per hour.

In summary, the DfT tool:

- Is intended to be part of comprehensive cost–benefit analyses of transport interventions or infrastructure projects;

- Complements existing tools for economic valuations of transport interventions, for example on emissions or congestion;
- Can also be used to assess the current situation or past investment; and
- Is based on best available evidence, with parameters that can be adapted to fit specific situations. Default parameters are valid for the European context.

The DfT spreadsheet tool includes four modules, the first two use inputs from modal shift which monetise the health benefits of the number of trips being diverted to cycling and walking separately. The third and fourth modules allow for the assessment of health impacts from cycling and walking in separate sheets and independently from the modal shift impact.

NTA Health Appraisal Tool

Following discussion, it was agreed with the NTA to use the DfT tool as the basis for calculating the health benefits related to changes in physical activity and absenteeism.

Web-TAG recommends that the impact of a proposed scheme on journey distances and also on cycling speeds should be assessed if it is considered that this will be affected significantly. From this, an average journey time may be estimated for new users. Section 11.3.8 of the Design Manual for Roads and Bridges (DMRB) contains further detail on the inference of changes to trip length resulting from a scheme.

Figure 1 summarises the functionality of the Health Appraisal Tool. The inputs and parameters are outlined further in Section 2.2. A more detailed flow of the model can be found in Appendix A.

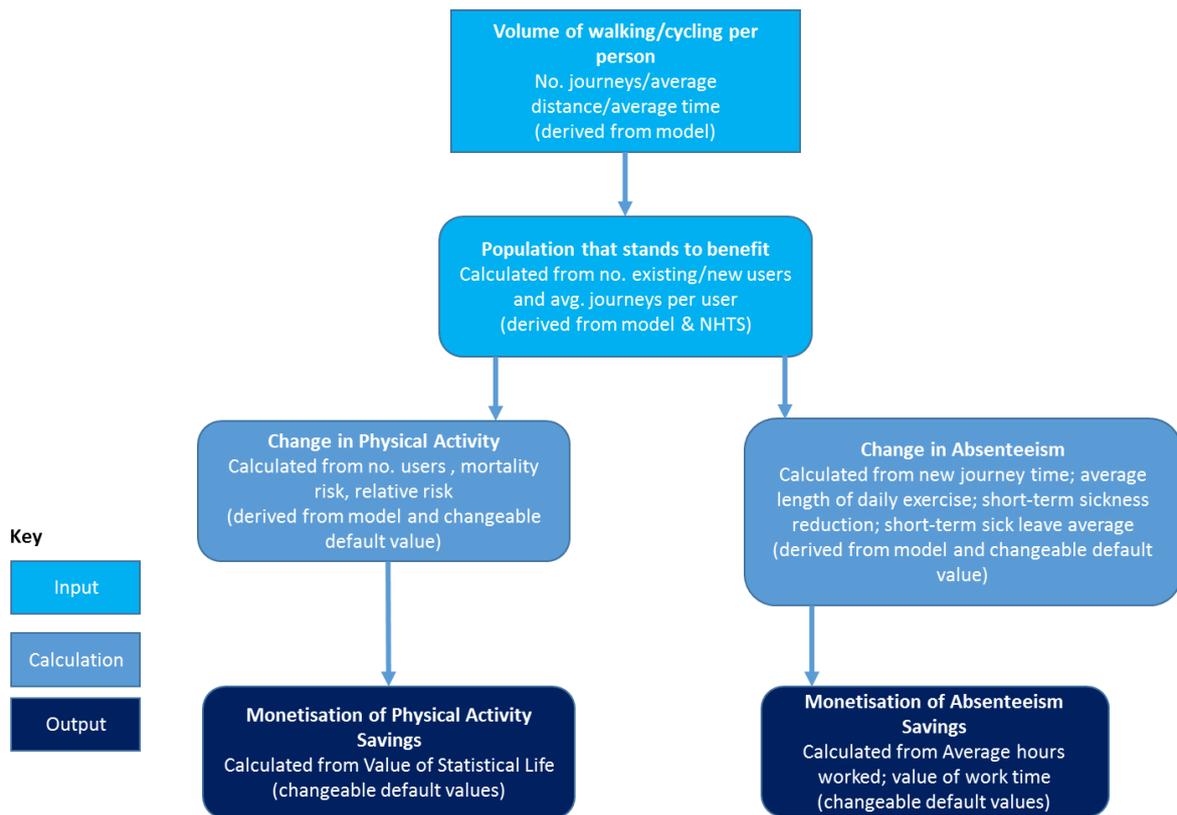


Figure 1 Health Appraisal Tool Overview

Implementation of the Health Appraisal Process

Implementation of the Health Appraisal Process

Overview

This section considers the approach to calculating the health benefits associated with physical activity (specifically the reduced risk of mortality based on the time spent walking and cycling) and absenteeism.

Physical fitness benefits are derived through the application of the DfT tool. This was supported by inputs from the emerging DTTAS appraisal guidance, specifically details relating to the calculation of the Relative Risk for cyclists and walkers in Ireland.

Benefits associated with a reduction in absenteeism primarily arise through increases in physical activity levels leading to increased productivity as a result of reduction in short-term sick leave. Research undertaken by the WHO in 2003 noted a cycling or walking intervention of 30 minutes per day reduces absenteeism through a reduction in short-term sick leave by between 6% and 32% per annum.

Inputs and Parameters

The DTTAS Common Appraisal Framework Guidance and NTA regional model are the primary data source for the different parameters to input to the health benefit appraisal. However, until the DTTAS appraisal guidance is published and formally adopted, it is proposed to work with the following assumptions as defined in HEAT for the calculation of health benefits related to physical activity:

- The build-up of benefits will be accrued over a five year period;
- There is a linear relationship between risk of death and cycling/walking duration (assuming a constant average speed), i.e. each dose of cycling/walking leads to the same absolute risk reduction;
- No thresholds have to be reached to achieve health benefits; and
- Men and women have approximately the same level of relative risk reduction.

Data inputs can take the form of:

- Data from a single point in time – used when assessing the status quo, such as valuing current levels of walking and cycling in a city or if data on the results of an intervention are only available; and
- Before and after data – used when assessing the impact of an actual intervention or hypothetical scenarios. Pre and post measures will be used to calculate health benefits and associated financial savings.

As the appraisal tool is related to the NTA’s multi-modal regional model it has been assumed that data input requirements will primarily draw on outputs from scenario testing. As such, the primary sources are before and after data to assess the impact of changes in the levels of walking and cycling resulting from interventions tested.

Demand Model Inputs

Time and distance skims are processed as part of the secondary analysis CUBE Catalog for input to the health appraisal tool. The skims are firstly aggregated to the 24hr level before the calculation of the time and distance weighted averages. This applies to both of the active modes, walking and cycling. For the V3 tool, this has also incorporated the walk component of PT trips.

Implementation of the Health Appraisal Process

The factors used for this aggregation are consistent with the factors used in the demand models. The demand is taken as the weighting factor in order to calculate the daily distance travelled and journey duration for each mode.

There are several output print files that display displays the average daily journey duration in minutes and distance in kilometres. These files are named:

- ‘Weighted_Ave_Data_PT.PRN’ displays the average daily journey duration in minutes and distance in kilometres for PT trips.

- 'Weighted_Ave_Data.PRN' displays the average daily journey duration in minutes and distance in kilometres for walk/cycle trips
- 'Weighted_Ave_Data_Comb.PRN' displays the average daily journey duration in minutes and distance in kilometres for all trips.

Inputs drawn from the tool and used by the tool to calculate the health impact of cycling and walking are summarised in Table 1. .

Table 1 Summary of Inputs – Physical Activity and Absenteeism

Input	Units	Comment	Source	Values
PHYSICAL ACTIVITY				
Number of cycling/walking journeys per day as a result of the policy/measure.	Number of journeys	These are the journeys resulting from the policy or measure derived from the demand model. Walking and cycling parameters input separately.	Demand Model	Input sourced from demand model
Length of cycling/walking journeys.	Km	Cycle and walking distances derived from the demand model. Walking and cycling parameters input separately.	Demand Model	Input sourced from demand model
Duration of cycling/walking journeys.	Mins	Average cycle and walking times derived from the demand model. Walking and cycling parameters input separately.	Demand Model	Input sourced from demand model
PT Trips				
Number of PT trips per day as a result of the policy/measure.	Number of journeys	These are the journeys resulting from the policy or measure derived from the demand model.	Demand Model	Input sourced from demand model
Length of Walk Leg of PT trips.	Km	Walking distances for the PT trips derived from the demand model.	Demand Model	Input sourced from demand model
Duration Length of Walk Leg of PT trips.	Mins	Walking Times for the PT trips derived from the demand model.	Demand Model	Input sourced from demand model

Tool Parameters

A set of parameters are also built in to the tool as shown in Table 2. Where the source for an input is defined as 'User / Default' this means that default values are already pre-populated in the tool

Implementation of the Health Appraisal Process

but can be modified with study specific values where appropriate and information is available. The Ireland specific default values for the different parameters are reflected in the tool and also shown in Table 2. These can be amended in the tool by the User where it may be desired, for example, to undertake sensitivity testing around a particular parameter.

Table 2 Summary of Parameters – Physical Activity and Absenteeism

Parameter	Units	Comment	Source ¹⁷	Values
PHYSICAL ACTIVITY				
Percentage of weekday cycled in a year.	Percent	Proportion suggesting the number of days per year cycle trips are made on average.	User / Default	100%
Percentage of weekday walked in a year.	Percent	Proportion suggesting the number of days per year walking trips are made on average.	User / Default	100%
Number of trips per cyclist.		The average number of trips made by a cyclist with data obtained from the National Household Travel Survey (NHTS) Travel Diary .	NHTS Travel Diary	2.79
Number of trips per walker.		Obtained from the NHTS Travel Diary these are the average number of trips made by a walker.	NHTS Travel Diary	3.05
Proportion of 7 days average journey time to 5 days (weekdays) average journey time cycled.		Proportion to convert the weekday average into a 7 day weekly average.	NHTS Travel Diary	1.046
Proportion of 7 days average journey time to 5 days (weekdays) average journey time walked.		Proportion to convert the weekday average into a 7 day weekly average.	NHTS Travel Diary	1.019

¹⁷ Spreadsheet: Annualisation_GDA_v4_20150205; DTTAS Common Appraisal Framework Peer Review RFP (2015)

Value of life saved.	€ in 2011 prices	The economic value of a life saved based on the willingness to pay of a middle-aged person to avoid a sudden death.	User / Default	€2,310,500
Reference journey time per weekday.	Minutes per week	The average length of active modes journeys in order to achieve a relative risk of death.	User / Default	100 mins (Cycling) 168 mins (Walking)

Parameter	Units	Comment	Source ³	Values
Reduced relative risk index for cycling and walking.	Index	The relative risk of premature death. The relative risk of death as suggested by the HEAT tool. The DTTAS Peer review forecasting advice report notes that for Ireland relative risks are calculated by interpolating between 0 and the maximum reductions of 0.28 and 0.22 for cyclists and walkers respectively on the basis of the average active time per week ..	User / Default	0.90 (Cycling) 0.89 (Walking)
Mortality risk.	Percentage	Mean proportion of population aged 15-64 who die each year from all causes (deaths per 100,000 people per year in the respective age group).	User / Default	0.0019
ABSENTEEISM				
Short-term sickness reduction.	Percentage	The value that is attributed to a decrease in absenteeism due to an increase in the adopting of walking and cycling by an individual.	User / Default	6%
Average length of daily exercise.	Minutes	On a daily basics the average length an individual would typically cycle.	User / Default	30mins
Average hours worked in a weekday.	Hours	The time spend in a workplace by an individual on a daily basics.	User / Default	7.5hrs
Ireland's short-term sick leave average.	Days	This is the annual average sick leave taken by an individual in Ireland.	User / Default	4.9 days per annum

Value of work time per hour.	Euros	The monetarisation of the value each individual would bring spent working. The data is taken from the DTTAS Peer Review report for the base year. To take into account the value in the forecasted year, the forecasted growth in GNP should be used. Table 3 shows the annual percentage factor used in order to grow these statistical values. The growth factor for any year beyond 2025 should adopt the 2025 factor.	User / Default	€34.33
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Implementation of the Health Appraisal Process

Calculating Physical Activity Benefits

The health benefits associated with physical activity are derived from a reduction in the relative risk of premature death - the 'Relative Risk of Mortality' is directly linked to the time spent walking and cycling based on the average length, speed and frequency of new trips encouraged by active travel modes. This indicator provides a calculation of the lives saved due to the health benefits of cycling and walking.

The physical activity benefit calculation can be summarised as:

$$\text{Net Impact} = \text{Impact on New users} + \text{Impact on Existing Users}$$

Where:

- $\text{Impact on New Users} = \text{Expected Death among New Users} \times \text{Reduction in relative Risk}$
- $\text{Impact on Existing Users} = \text{Expected deaths among existing users} \times \text{Reduction in relative Risk}$

The calculated reductions in relative risk of death and the number of new walkers and cyclists are used to calculate a figure for the potential number of lives saved based on average mortality rates.

An average mortality rate of 0.0019¹⁸ is used, the mean proportion of the population aged 15 – 64 who die each year. The number of potentially prevented deaths is then multiplied by the value of a prevented fatality used in accident analysis (see Safety note) to provide a monetary value.

For Ireland the relative risks are calculated by interpolating between 0 and the maximum reductions of 0.28 and 0.22 for cyclists and walkers respectively. This is on the basis of the average active time

¹⁸ DTTAS Common Appraisal Framework Peer Review RfP (2015) – Appendix 5 (In 2011 5,895 deaths occurred in the 15 – 64 year old population and there was 3.73m people in the 15 – 64 year old population).

per week (CSO Census POWSCAR, 2011); for example, for cyclists: 41.8mins [(average active time per day)*5/ 100mins * 0.1 = 0.21]. This is higher than the reference population, but lower than the maximum cap.

Table 3 Relative Risk for Cyclists and Walkers in Ireland¹⁹²⁰

Mode	Cyclists		Walkers	
	Return	Single	Return	Single
Average Active time per workday (mins) ⁶	44	22	36	18
Proportion of individuals	0.9	0.1	0.9	0.1
Average Active time per workday (mins)	41.8		38	
Reduction in relative risk	0.21		0.11	

In summary, the physical activity monetary benefits are calculated as follows:

- The change in all-cause mortality rates as a result in the change in activity;
- The calculated reduction in relative risk of death and the number of new walkers and cyclists are used to calculate the potential number of lives saved based on average mortality rates (evidence suggests this proportion is 0.0019 of people aged 15 – 64 years in Ireland);
- The number of prevented deaths is multiplied by the value of a prevented fatality (€2,258,250 in 2011 prices)²¹ to give a monetary benefit for each year. A peer review of the DTTAS CAF noted that the value stated appears to relate to the cost of a fatal motor accident which includes a range of non-casualty costs as well as casualty costs in respect of more than one casualty. It was suggested the Irish Value of Statistical Life in respect of one individual should be used in preference (or alternatively Web-TAG presents the equivalent value for the UK in 2010 prices);
- Calculations are repeated for both cyclists and walkers for each year of the appraisal period, including real growth in value; and
- Each annual value is summed to and discounted to give a total net present benefit.

Future benefits include real growth in the value of a prevented fatality in line with forecast GDP/capita. GNP per person is used to adjust the cost of pedestrian and cycling accidents from one year to another (nominal GNP for years prior to the baseline year and real GNP thereafter).

¹⁹ DTTAS Common Appraisal Framework Peer Review RfP (2015) – Appendix 5

²⁰ DTTAS Common Appraisal Framework Peer Review RfP (2015) – Appendix 5 (Data from POWSCAR 2011 (CSO) commute times for walkers and cyclists main mode up to maximum of 45 mins cycle and 1 hour walk (new users assumed unlikely to make long commuting journeys by active modes).

²¹ DTTAS Common Appraisal Framework Peer Review RfP (2015) – Appendix 5 & Peer Review & Forecasting Services Report to DTTAS (SYTSRA & DKM, April 2015)

The Department for Transport's (DfT's) Web-TAG guidance notes that the HEAT methodology estimates the benefit to the population using active modes for any level of activity, not just those achieving a specific threshold. There are these considerations for new and existing users:

- For any new walk and cycle trips (shifting from mechanised modes) there will be some health benefits to each individual; and
- For existing walk and cycle trips, health benefits may change where the duration of travel may change (e.g. removal of severance on a specific route to decrease journey times).

The physical activity calculation process is presented diagrammatically below in Figure 2.

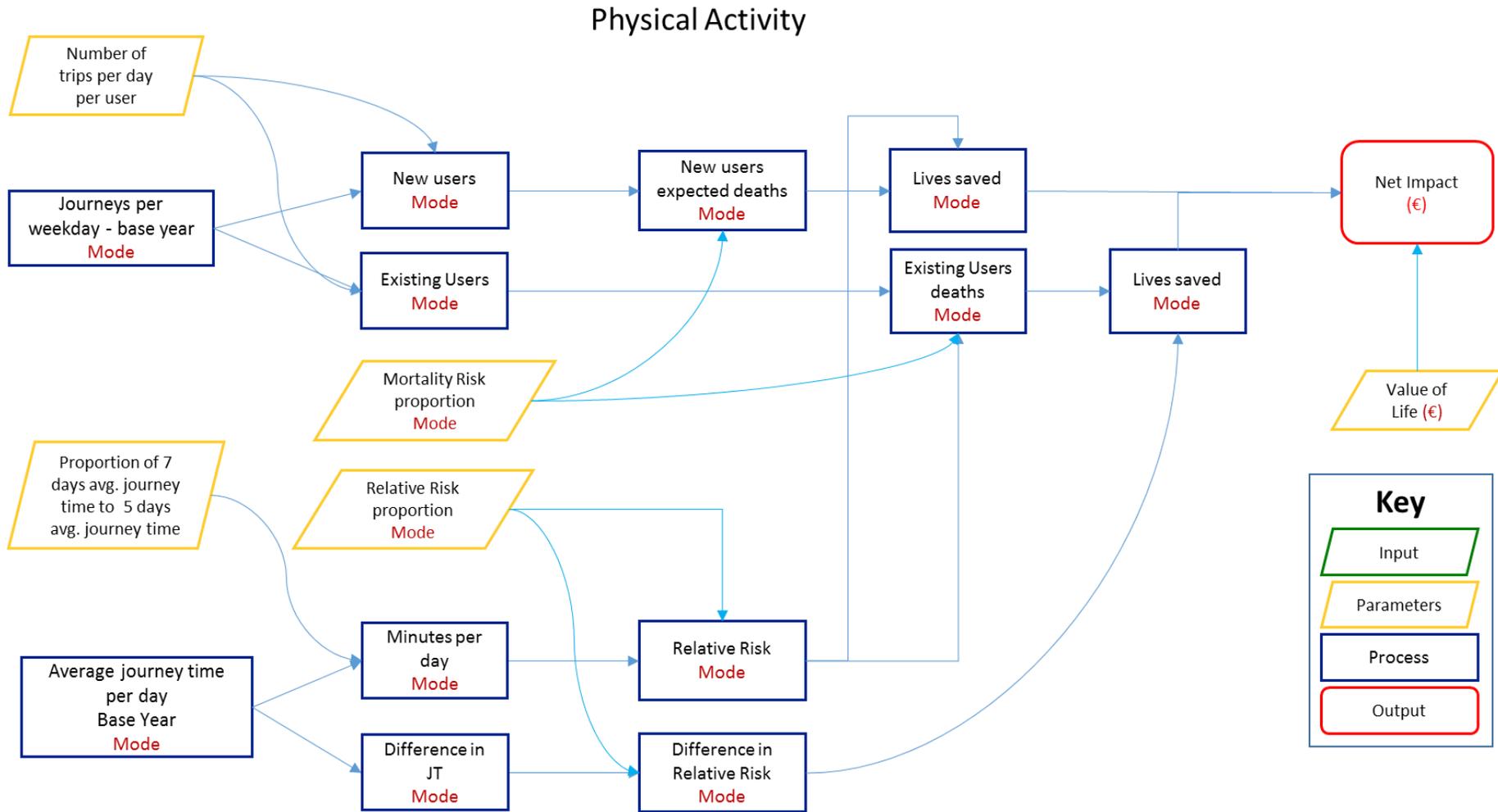


Figure 2 Physical Activity Process Overview

Calculating Absenteeism Benefits

In order to quantify the impact of a change in walking and cycling on workplace absenteeism, the impact on the reduction of sick days due to an increase in physical activity can be evaluated alongside the value of work time per hour. The absenteeism calculation can be summarised as:

Net Impact = Total reduction in Absenteesim

Where:

- *Total Reduction in Absenteeism = New Demand × Average Reduction*
- *Average Reduction = Average Sick leave in Ireland × Reduction in Sickness from new journey time*

The monetary value of the total absenteeism benefit is calculated by the total hours per year saved and value of work time per hour.

The Peer Review undertaken of the draft Department for Transport, Tourism and Sport (DTTAS) appraisal guidance noted that the value of time in calculating absenteeism benefits excluded the uplift to reflect higher wages among travellers. This was not considered appropriate and that value of time should be uplifted in line with standard methodology.

Again, the approach described in this note is as consistent as possible with forthcoming appraisal guidance to be released by the DTTAS.

The absenteeism calculation process is presented diagrammatically below in Figure 3. [11](#)

Absenteeism

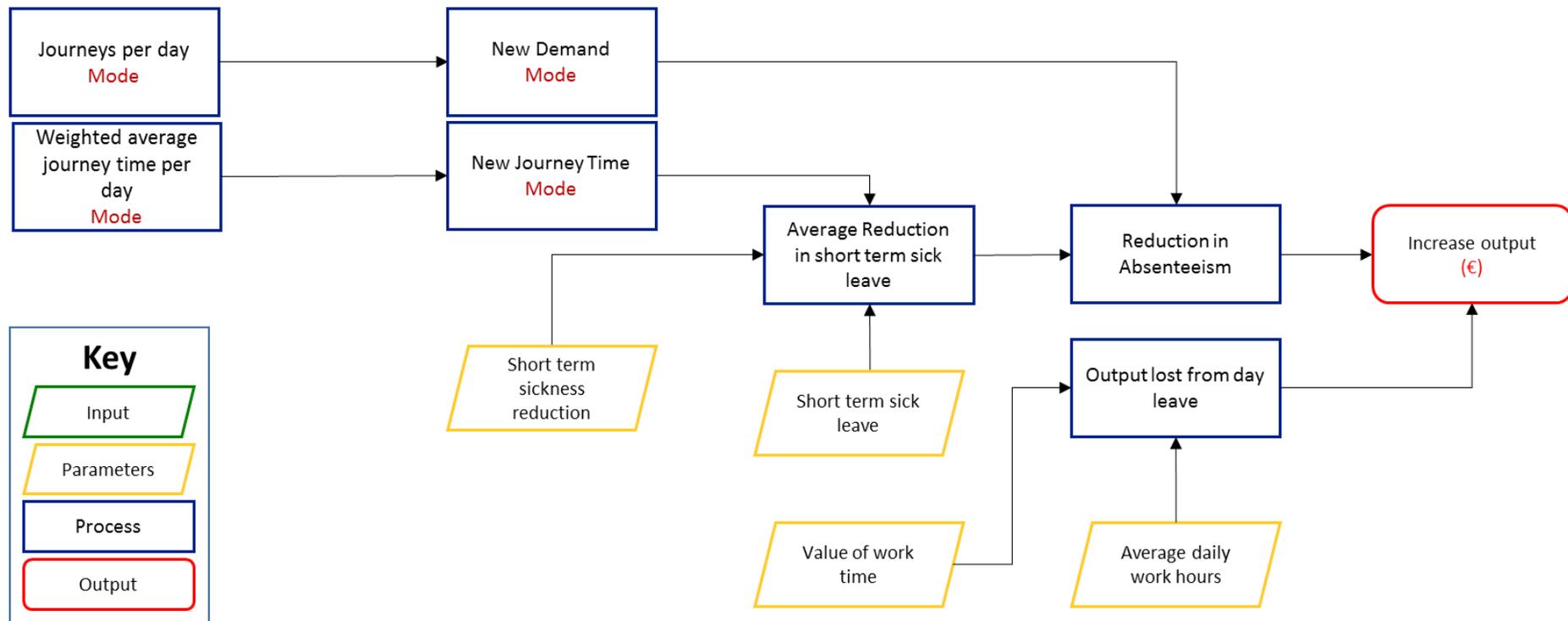


Figure 3 Absenteeism Process Overview

Testing

The Health Module has been tested using an ERM sample scenario. The purpose of these tests is to assess the functionality and compatibility of the Health Module for the ERM and therefore the overall functionality of the tool. Tests were undertaken successfully on NTA machines as well as consultant computers.

ERM

Cube Extraction Process

The Cube process successfully extracted walk and cycle demand, outputting the results to a text file in the correct output folder.

Health Spreadsheet Operation

The health spreadsheet successfully launched upon completion of the Cube process, importing the walk and cycle totals into the calculations.

Test Results

The ERM Health Run yielded major benefits for walking, with some slight dis-benefits for cycling. These dis-benefits were incurred in all three areas covered by the health module; cyclists, walkers and absenteeism. These levels of dis-benefits in cyclists were incurred as a result of the improved public transport network available in the strategy which caused a large shift from active mode to public transport. This reasoning is also why there was a large benefit attributed to walkers, as the walking part of the PT trip was included.

Parameter updates

Using the same run as mentioned above, updates were made to two parameters between the V2 and the V3 models. The value of life was updated from € 2,258,250 to € 2,310,500. The V2 model came from the DTTAS common appraisal framework peer review RfP 2015, and the V3 model came from the DTTAS common appraisal framework peer review RfP 2020. The other variable that was updated was the value of work time per hour, from € 25.83 to € 34.33. The source for the V2 value was not listed, but then updated V3 value came from the "Project Appraisal Guidelines for National Roads Unit 13.0 - Pedestrian and Cyclist Facilities (October 2016)". The table below shows the comparison of the PA Calculations and Absenteeism results using the same input data for the V2 and V3 models.

Table 5 Comparison of the PA Calculations results for the V2 and V3 model parameters

V2 Model result		V3 Model results	
Net Impact per annum		Net Impact per annum	
Cyclists	-€ 373,265.77	Cyclists	-€ 381,902.17
Walkers	€ 2,579,803.83	Walkers	€ 2,639,493.75
Parameters	Cyclists	Walkers	
BY distance	3.97	1.56	
FY distance	3.94	1.59	
BY minutes per day	14.51	18.54	
FY minutes per day	14	19	
FY minutes per weekday	6.65	7.48	
New Users	-1946	7195	
Existing Users	81,716	1,168,420	
% of weekdays cycled	84%		
% of 7 days walked	72%		
Impact on New users	Cyclists	Walkers	
Expected deaths among new users	-3.6973	13.6712	
Relative Risk FY	0.0334	0.0216	
Lives saved FY	-0.1235	0.2959	
Value (€ per year)	-€ 278,871.54	€ 668,166.43	
Impact on existing users (if route Journey Time changes)	Cyclists	Walkers	
difference in minutes	-0.055	0.135	
difference relative risk	0.000	0.000	
Deaths amongst existing users	150.075	2,171.952	
Lives saved FY	-0.042	0.847	
Value (€ per year)	-€ 94,394.23	€ 1,911,637.40	
Impact on existing users (if route Journey Time changes)	Cyclists	Walkers	
difference in minutes	-0.055	0.135	
difference relative risk	0.000	0.000	
Deaths amongst existing users	150.075	2,171.952	
Lives saved FY	-0.042	0.847	
Value (€ per year)	-€ 96,578.27	€ 1,955,867.69	

Table 6 Comparison of the Absenteeism results for the V2 and V3 model parameters

V2 Model result		V3 Model results	
Absenteeism		Absenteeism	
Change in Demand		Change in Demand	
Cyclist	-1946 person	Cyclist	-1946 person
Walkers	7195 person	Walkers	7195 person
Change in Journey Time		Change in Journey Time	
Cyclist	14.39 minutes per weekday	Cyclist	14.39 minutes per weekday
Walkers	18.88 minutes per weekday	Walkers	18.88 minutes per weekday
Average reduction in short-term sick leave per cyclist	0.141022	Average reduction in short-term sick leave per cyclist	0.141022
Average reduction in short-term sick leave per walker	0.185024	Average reduction in short-term sick leave per walker	0.185024
Change in absenteeism (days)	1056.892563	Change in absenteeism (days)	1056.892563
Output lost from day leave	€ 193.73	Output lost from day leave	€ 257.48
Increased output from reduction in absenteeism per year	€ 204,746.51	Increased output from reduction in absenteeism per year	€ 272,123.41

Conclusion and Recommendations

Conclusion

This report has presented the development of the initial health appraisal module for the NTA. The tool was developed based on pre-existing tools developed by the UK DfT, which were in turn based

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on HEAT. The tool developed is fully consistent in approach as the HEAT and DfT tools, but it is implemented in a spreadsheet for transparency and ease of adaptation.

In applying the tool within the NTA regional model context, the following factors have been identified for further consideration by the NTA and discussion:

- Treatment of weekend walking and cycling trips which are not included in the regional model;
- Values for parameters specific to Ireland, in particular the basis of the value of statistical life;
- Elasticity of cycling and walking demand, particularly where a scheme may shorten journeys and in turn the time spent undertaking physical activity;
- Position on the treatment of other health benefits, such as those relating to accidents, in other appraisal notes; and
- Limitations of the HEAT based approach and potential/desire for any refinements prior to application of the DfT tool.

Recommendations

Appraisal of transport related health benefits and their monetisation is an evolving area. HEAT provides a means to assess benefits referencing to impacts on all-mortality (reflecting the number of preventable deaths because of increased physical activity). Areas of potential development and refinement the NTA may wish to consider and incorporate into their own bespoke tool surround the current scope and parameter definitions applied by HEAT, including:

- It applies only to working age adults carrying out exercise at average intensity and therefore not applicable to the population with high physical activity levels. It does not take into consideration differences in the intensity of cycling/walking or the possibility that less welltrained individuals may benefit more from the same amount of activity and therefore potentially underestimate the effect in very sedentary population groups;
- It assumes direct linear relationship between cycling and risk of all-cause mortality (but a more complex non-linear relationship can be applied);
- It does not take account of men and women separately (but it could if different relative risks were introduced);
- It does not take account of the different relative risks for different age groups (but uses a relative risk which is adjusted for age). The age group usually evaluated are adults;
- It does not take account of morbidity and is therefore likely to produce more conservative estimates as it does not account for disease-related benefits;
- It assumes a standard cycling speed (but can be adjusted to allow for different speeds); and

- It assumes that the relative risks found in one study population can be applied to different populations and settings.