



Department of Transport
An Roinn Iompair



2020 Vision - Sustainable Travel and Transport:
Public Consultation Document



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Ministerial Foreword



When I was first elected to Dáil Éireann in 1987, Ireland had huge problems – economic stagnation, mass unemployment, rampant emigration and inflation. These were the problems of failure.

Thankfully, those times are long passed. Ireland has experienced a remarkable transformation in the last fifteen years. We now have a vibrant economy, virtually full employment, inward migration and wealth unimaginable a decade ago.

That success has brought its own set of challenges. Increased economic and population growth and changing spatial patterns have resulted in the rapid provision of new housing and increased demand for travel and transport. The Government is investing €34 billion in its *Transport 21* programme to provide the physical infrastructure to meet those challenges.

Despite this massive investment, if we continue our present travel patterns, traffic congestion will increase, there will be a resulting loss in economic competitiveness, our quality of life and the quality of the natural environment will decline. We will not be able to meet our international obligations to reduce greenhouse gas emissions.

In short, our travel trends are not sustainable.

There is an alternative to this scenario. This discussion document sets out a vision for a sustainable transport future in 2020 and invites you to outline your views on that future. I strongly believe that by 2020:

- Ireland can have one of the best transportation systems in the world.
- Individual travel behaviour will have changed.
- There will be more appropriate use of the car and 'smarter travel'

Achieving this vision will require changes in personal behaviour. Settlement patterns along with support for alternative ways of travelling, including walking, cycling and public transport will be essential for the necessary change.

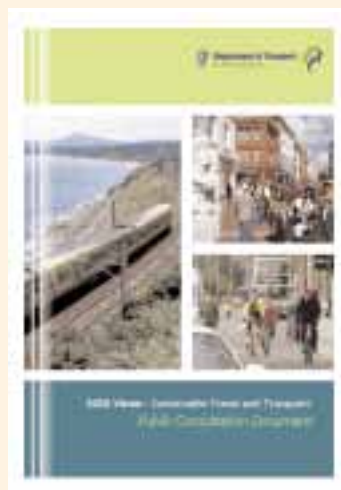
The issues are complex and all options will have to be explored to meet the challenge. I want to ensure that there is a full discussion of the issues before decisions are made and I would very much welcome participation in this public consultation. Your views will help shape the measures to emerge in what will be a *Sustainable Travel and Transport Action Plan* to 2020.

A handwritten signature in black ink that reads "Noel Dempsey".

Noel Dempsey T.D.
Minister for Transport

February 2008

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Executive Summary

This document describes the issues relating to sustainable travel and transport in Ireland with the aim of engaging participation in a public consultation process, which will lead to a Sustainable Travel and Transport Action Plan in 2008.

Chapter 1 sets out the key trends for both freight and personal transport across a number of indicators, including modal split, congestion and emissions. It demonstrates that the current trends for travel and transport in Ireland are not sustainable. Urban congestion will be worse, greenhouse gas emissions from the transport sector will continue to grow and there will be negative impacts on our quality of life and economy unless steps are taken to address this.

Chapter 2 proposes a vision of a sustainable transport system by 2020, which aims for a significant shift towards the use of public transport, car sharing, cycling, walking and trip reduction as well as improved access to transport services.

Chapter 3 addresses the issue of spatial planning and its impact on travel patterns. It discusses the integration of spatial planning and transport infrastructure and proposes that these should be more closely aligned.

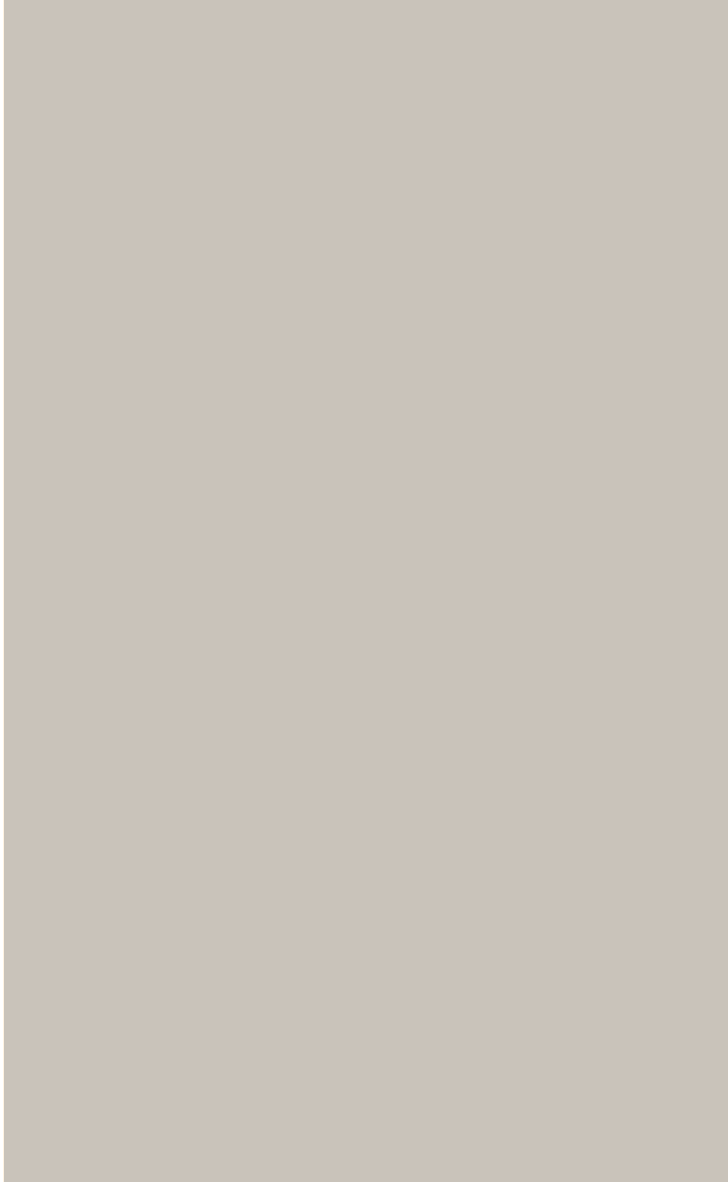
Chapter 4 focuses on the movement of people and the promotion of alternatives to the private car such as public transport, walking and cycling. It outlines details of the current capital investment programme in transport infrastructure and how the public transport system in Ireland could be improved. It also discusses the potential of cycling and walking and suggests ways in which these could be promoted as alternative modes of healthy travel.

Chapter 5 focuses on the movement of goods and freight and includes air and sea transportation.

Chapter 6 provides an outline of how the transport system could be complemented by travel demand measures including soft measures or information on travel choices, fiscal measures and regulatory instruments. It also covers other potential policies and measures, including promoting fuel economy and the use of alternative fuels and technologies.

Chapter 7 deals with institutional issues and explores how actions might best be delivered. It also asks what the appropriate timelines might be.

To support engagement in the public consultation process, questions are posed at the end of each chapter.



Chapter 1

What Are The Trends?

Chapter 1

What Are The Trends?

This chapter introduces why there is a need for a more sustainable travel and transport system and outlines a number of trends and key indicators.

The subsequent chapters set out a range of policies and measures, which are either currently being considered as part of the *Programme for Government*¹ and *National Climate Change Strategy 2007-2012*² or are potential policy options. The document provides a brief description of such potential measures and invites discussion around a number of key questions.

The key trends are outlined below. Between 1996 and 2006 there was:

- ④ Unprecedented economic growth which saw Ireland's Gross Domestic Product (GDP) double;
- ④ An increase in population of 17% from 3,630,000 to 4,240,000;
- ④ An even more dramatic increase, of 40%, in the

numbers at work (there are now 2,100,000 people in employment);

- ④ A doubling of the volume of roll-on/roll-off port traffic from 6 million tonnes to 12 million tonnes;
- ④ An increase of 115% in total road freight vehicle-kilometres and 250% in total tonnes carried;
- ④ An increase of 38% in the number of private cars per 1,000 adults from 382 to 528, which is still below the EU average of 558 for 2003³;
- ④ An increase of 72% in the total number of vehicles licensed from 1,338,616 in 1996 to 2,296,393 in 2006⁴;
- ④ An increase of 93% in Total Final Consumption (TFC) of energy from the transport sector from 2.7 megatonnes oil equivalent (MTOE) in 1996 to 5.4MTOE in 2006.

1 http://www.taoiseach.gov.ie/attached_files/Pdf%20files/NewProgrammeForGovernmentJune2007.pdf

2 <http://www.environ.ie/en/PublicationsDocuments/FileDownload,1861,en.pdf>

3 Howley, M., O'Leary, F., O'Gallachoir, B., 2007. *Energy in Transport – 2007 Report*, Sustainable Energy Ireland

4 Central Statistics Office (CSO), 2007. *Transport 2006*, CSO

Summary of the Trends to 2020

Current trends for travel and transport are unsustainable:

- » Population could exceed 5 million
- » Car ownership could increase to beyond EU average levels
- » The total number of private cars licensed may increase from 1,800,000 to 2,600,000
- » Car use will continue to increase and commuter walking and cycling will continue to decline

Quality of Life

- » Average speed in urban areas in morning peak hour in Dublin will have dropped from 13kph in 2006 to 8kph in 2016
- » Increased dependence on car travel will contribute to obesity

- » Traffic pollution will cause increasing damage to health and contribute to acute and chronic diseases

Economic Competitiveness

- » There will be increased traffic congestion, which could lead to a decline in competitiveness
- » Energy security of supply could be fragile as a result of continued dependence on imported fossil fuels in the transport sector

Environmental Impacts

- » Greenhouse gas emissions from transport could increase to 19 million tonnes CO₂-equivalents, which is a 265% increase over the 1990 levels
- » There will be negative impacts on the urban environment

These projections are outlined in more detail in the Appendix. The Appendix also shows how economic and population growth has been accompanied by increasing congestion, longer journey times, greater distances travelled and a decline in modal share for cycling and walking (modal share refers to the percentage of total travel by different methods – for example car, public transport, cycling and walking).

One indicator from the Appendix illustrates the scale of the challenge to year 2020. Figure 1 shows that, if we continue as we are, there will be increasing car use, despite the investment in public transport infrastructure through *Transport 21*. However, it should be noted that travel demand is dynamic and is dependent on a range of factors, including the availability, cost and convenience of travel modes.

Figure 1:

Travel to Work Trips by Car based on Business as Usual (BAU) and Transport 21 Scenarios

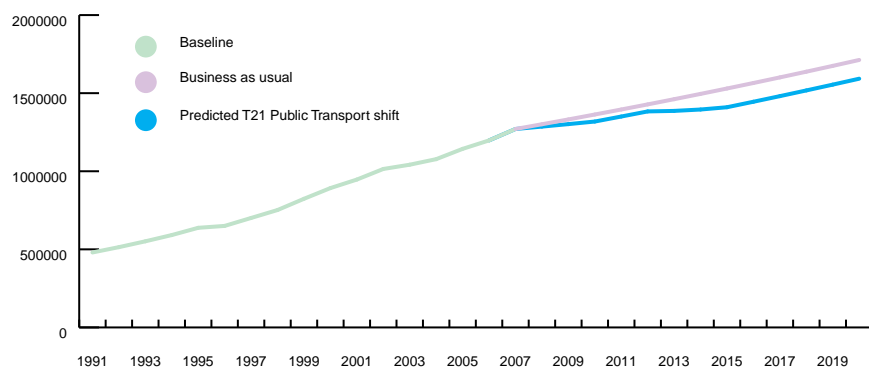


Figure 2:

Travel to Work
Trips by Car Based
on Modal Share
Scenarios

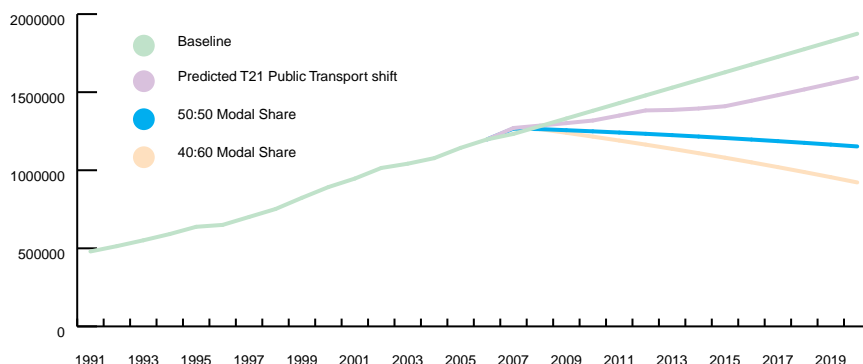


Figure 2 shows some potential targets for modal share of travel to work, which would attempt to move away from the scenario of increasing car use for travel to work. Currently modal share of car/van driver stands at 65%. If a challenging target of reducing this share to 50% is set and achieved, the level of car usage would merely stabilise at 2006 levels, with no significant improvements in congestion. A more ambitious goal would be to reduce car/van driver modal share to 40%. If this were to be achieved, car use would be at year 2000 levels in 2020.

Ireland must plan for continued economic and population growth to 2020. Indeed, it is predicted that Gross National Product (GNP) growth will remain strong⁵ and that by 2020 the population will exceed 5m⁶. This represents an 18% growth in population from 2006 and clearly indicates an increased demand for transportation. A continuation of the trends in travel and transport outlined above, set against a backdrop of economic and population growth, will result in further increases in congestion, fuel consumption and greenhouse gas (GHG) emissions.

It would also have serious implications for quality of life and the environment in general. The challenge is to ensure that our transport system becomes sustainable while allowing for continued economic success and facilitating more efficient travel and transportation of people and goods. The national transport system should meet the needs of all citizens, regardless of location, while policies should consider the different impacts on rural and urban dwellers. The next chapter sets out the vision to meet the challenge.

5 http://www.esri.ie/UserFiles/publications/20060831092754/MTR10_%202005-2012_ES.pdf

6 http://www.cso.ie/releasespublications/reg_pop_projections.htm

Chapter 2

The Vision for Sustainable Travel and Transport

Chapter 2

The Vision for Sustainable Travel and Transport

Summary of the Vision

By 2020 there will be:

- » A considerable shift to public transport, cycling and walking
- » Significant reduction in congestion
- » Reduction in transport emissions
- » Enhancement of Ireland's competitiveness
- » A completely changed public attitude, which ensures that, where feasible, the car becomes the travel mode of last resort

Sustainable travel is about encouraging people to make informed choices about the way they travel and the consequences of those choices on their health and the environment. Transport is central to our economic wellbeing and competitiveness and will remain so for the foreseeable future. Sustainable transport is concerned with the movement of people and goods in a manner, which improves quality of life and ease of access for all. It also aims to protect the environment for future generations and enhance economic competitiveness.

The Government is already committed to delivering a more sustainable transport system through *Transport 21*, which is a capital investment framework for the transport system for 2006 to 2015⁷. This programme involves unprecedented investment in transport infrastructure, which will remove major bottlenecks and improve the public transport system. There will also be a significant rebalancing of capital expenditure towards public transport.

These measures will offer an attractive and efficient alternative to private transport. However, capital investment is only one element of a more sustainable transport system and, on its own, will not reverse the trends outlined in Chapter 2. More needs to be done. Central to that is a clear vision, backed by strong policy, which includes significant changes in personal travel patterns, preferences and habits.



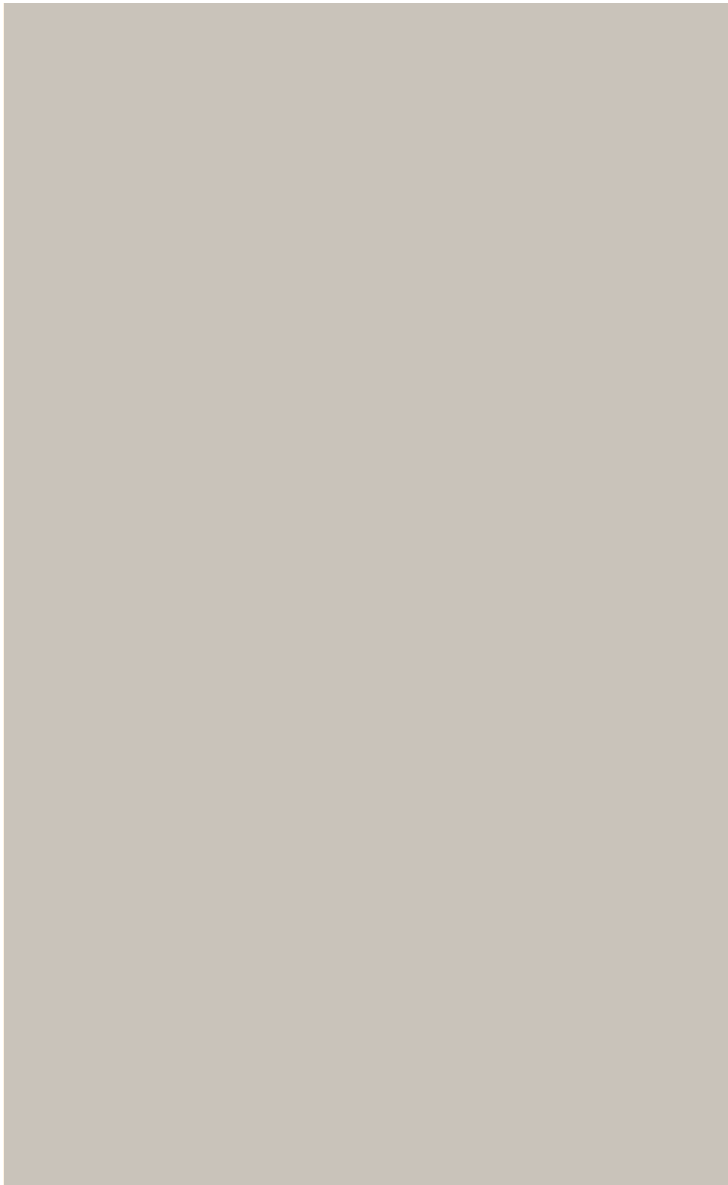
The 2020 vision means:

- ④ There will be a considerable shift to public transport and other sustainable forms of travel;
- ④ The present levels of traffic congestion and travel times will be significantly reduced;
- ④ Ease of access to public transport and other sustainable forms of travel will be improved for all citizens, irrespective of location and mobility needs;
- ④ The transport system will enhance Ireland's economic competitiveness;
- ④ Reduction in greenhouse gas emissions and increased efficiency in the transport sector will contribute to Ireland's international commitments regarding climate change;
- ④ Emissions of other atmospheric pollutants from transport will continue to be reduced;
- ④ Land use planning and the provision of infrastructure will be better integrated;
- ④ Enhanced individual and collective quality of life;
- ④ Reduced health risks and incidence of accidents and fatalities;
- ④ Individual awareness will be heightened to understand and accept the changes in behaviour necessary and level of responsibility required to achieve the vision.

The vision aims to deliver a sustainable transport system by 2020. This will be done through a series of policy actions, which will facilitate changes in personal behaviour and improve the efficiency of the physical transport system. These will complement the current and planned investment over the lifetime of the *Transport 21* programme. The vision also has a critical role to play in national competitiveness as employment, economic growth and transport policies are interlinked.

The following chapters discuss potential policy options to deliver this vision, including, for example:

- ④ The need to integrate transport infrastructure and spatial planning;
- ④ Improved public transport services;
- ④ New policies to promote cycling and walking;
- ④ New initiatives to change travel behaviour;
- ④ Steps to address fuel efficiency;
- ④ Institutional arrangements.



Chapter 3

Integrating Spatial Planning and Transport

Chapter 3

Integrating Spatial Planning and Transport

Some Key Points

- » The National Spatial Strategy (NSS) offers a policy framework for development planning
- » Transport investment is aligned to the NSS
- » Dispersed spatial patterns up to now have contributed to unsustainable travel
- » There are new policies for sustainable neighbourhoods, which are necessary to halt and reverse years of poor planning
- » The proposed Dublin Transport Authority (DTA) needs to achieve better alignment between spatial planning and transport
- » Other initiatives may be necessary

The remarkable transformation of the Irish economy continues to create demand for new housing and other developments. The challenge for the planning system is to channel that growth into a pattern that is compatible with the provision of transport and travel systems that are sustainable in the long term.

The integration of land use planning and investment in transport is necessary to ensure that the need to travel is minimised through consolidated urban form and mixed-use development. The current framework for land use and spatial planning in Ireland places the concepts of sustainable development and balanced regional development at the heart of the planning system and is guided by the *National Spatial Strategy (NSS)*, regional planning guidelines (RPGs), and local area plans (LAPs).

In respect of transport, capital investment provided for under the new National Development Plan (NDP) and *Transport 21* is intended to complement the NSS and RPGs. This is done by providing certainty around key public transport initiatives in the GDA and regional gateways and by encouraging the concentration of intensive development close to public transport corridors. All of this will facilitate better integration of land use planning, spatial development, and transport investment.

The NSS aims to achieve a better balance of social, economic, and physical development across Ireland. It is designed to redistribute economic activity from congested areas to areas experiencing economic and social stagnation. Its objectives are to maintain economic growth and competitiveness by increasing the capacity of the national economic infrastructure, to enhance economic activity, to increase the capacity to protect and improve the environment, and to improve the quality of life.

Nevertheless, much of Ireland's recent growth has been along rail corridors and motorways radiating from the principal



centres of population. International experience shows that, in the long term, land use patterns change and new development occurs along major new transport corridors. This results in an increased demand for travel. This increased demand for travel can, in turn, create demand for further development which, if not located or managed carefully, may generate a need for even more new transport infrastructure construction.

Our economic success in recent years has been accompanied by unbalanced spatial development, which has resulted in unsustainable travel patterns. Such patterns have been formed by the economic strength of some areas and the comparative weakness of others, leading to long distance commuting. Furthermore, the environs of urban areas are growing rapidly due to a number of factors, including the housing market and perceptions regarding quality of life in large urban areas.

To achieve sustainable urban development, a high density, mixed use urban form or 'compact city' has been recommended. A 'compact city' integrates employment, community services, retail facilities, and public transport. It reduces dependence on private car travel, limits extensive residential zoning, and facilitates social cohesion through local facilities and services. For example, the 2004 *NESC Strategy* identified the sustainable, integrated neighbourhood as one which is focused on common activities such as commerce, culture, and public governance; the five-minute walk to key facilities; the street network or pattern, which ideally takes the form of a continuous web or grid; high amenity green spaces; mixed use, including residential, commercial and other activities; and narrow versatile streets. The concept of sustainable integrated neighbourhoods is supported also by national housing policy⁸.

Cork Area Strategic Plan (CASP)

One example of aligning spatial planning with transport investment is the Cork Area Strategic Plan (CASP) model, which sets out a framework to enable the Cork city-region attain critical mass, integrate land use and transport, make efficient use of investment in infrastructure, provide a high quality environment, and improve the competitiveness and attractiveness of the region.

The *Programme for Government* undertakes that all future local authority development plans must be 'sustainability-proofed' and that appropriate criteria, perhaps based on Sustainability Impact Assessment (SIA), should be developed, particularly for transport and land use planning. A multi-criteria approach, based on qualitative and quantitative assessment of both direct and indirect impacts, which have regard for stakeholder and public participation, could be adopted.

The *Programme for Government* has also committed to a Dublin Transport Authority (DTA), which will have powers to better integrate planning, and transportation. The proposed legislation to establish the authority will set out specific

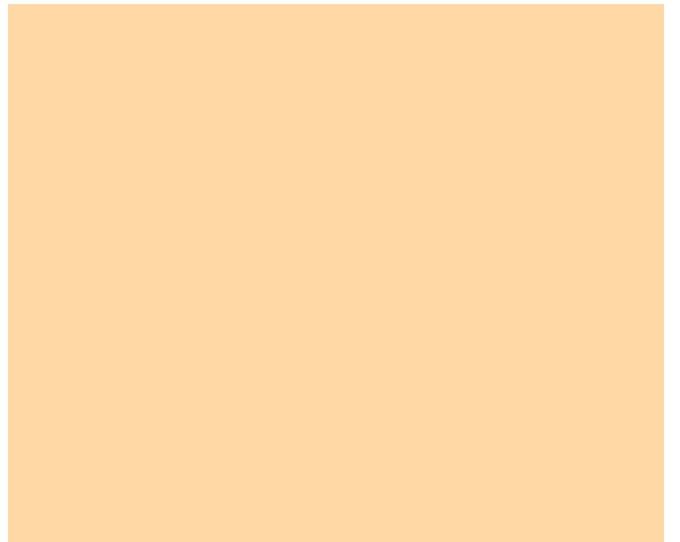
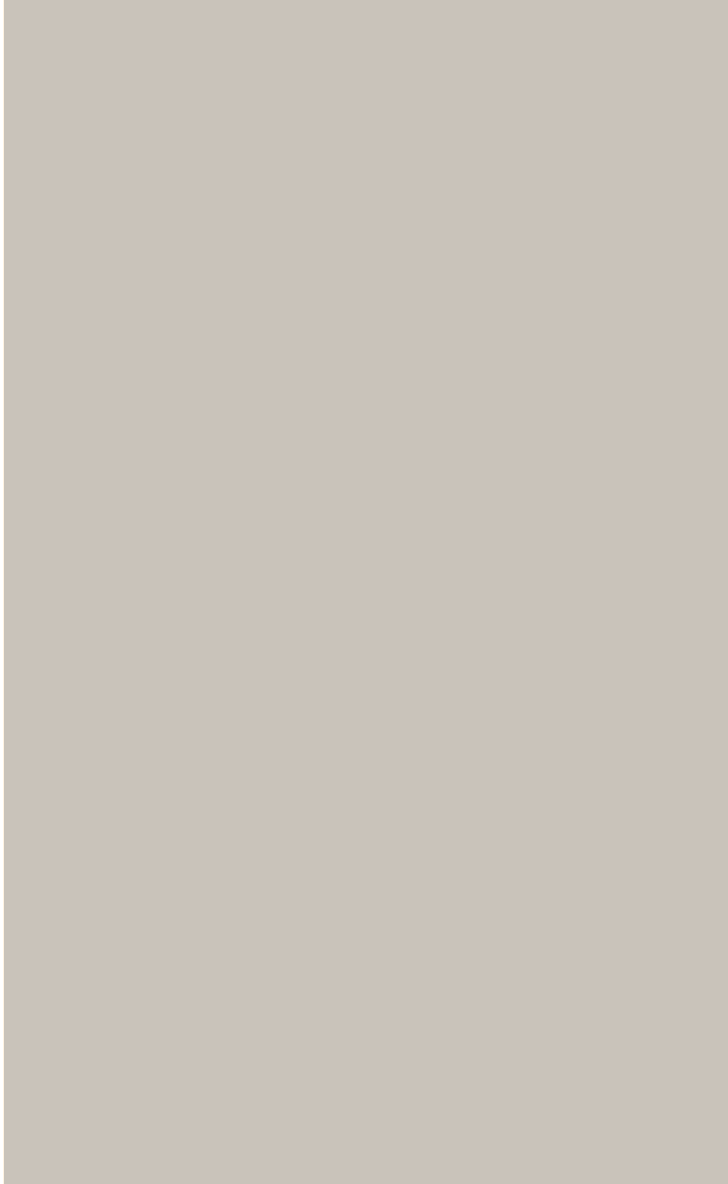


measures to ensure the close involvement of the DTA with the relevant regional authorities in the development of the regional planning guidelines for the GDA. In addition, before the DTA could adopt a transport strategy for the GDA the relevant regional authorities will have to certify that it is compatible with the regional planning guidelines. Similar requirements will apply in relation to development and local area plans to ensure that they are compatible with sustainable transport plans for the area. Furthermore, the Minister for the Environment, Heritage and Local Government would be empowered to ensure that regional planning guidelines are in compliance with any transport strategy developed by the DTA.

The *Programme for Government* is also committed to completing local transportation strategies for all gateways and hubs identified in the NSS. In border counties, it will be essential to align local strategies with those employed by relevant Departments and Local Authorities (LSs) in Northern Ireland, and to ensure data related to the impact of new measures is compatible on a cross-border basis.

3.1 Questions

1. What measures are required to better integrate land use and transport?
2. How can the existing commuting patterns be tackled through spatial, regional and land use planning?
3. Does this issues document generally identify the key measures to be considered to better integrate spatial planning and transportation?



Chapter 4

Moving People

Chapter 4

Moving People

Key Issues to be Considered

- » The role of improved public transport which will materialise through the Transport 21 investment programme
- » The particular importance of improved and reformed bus services, both rural and urban to meet immediate needs
- » The importance of supporting healthy travel options through national cycling and walking policies

4.1 Public Transport

4.1.1. Transport 21

Chapter 2 referred to the *Transport 21* programme, which is a €34 billion capital investment framework for the transport system for 2006 to 2015. Of the total expenditure, €18 billion will be invested in the national roads programme, which will include a nationwide extension of the motorway network and an upgrading of national roads. Public transport projects totalling €16 billion will be provided for in a significant rebalancing of expenditure, which will facilitate commuters in the switch to public transport.

It is vital to ensure that *Transport 21* is delivered so that deficiencies and bottlenecks in infrastructure and services are addressed. Given the long lead-in time to plan major projects, and the time-lag between investment decisions in transport and the resulting response in the form of energy or emission savings, the Programme for Government proposes that work should commence on planning for a successor to *Transport 21* by 2011. This would ensure continuity and maintain the momentum of the investment programme.

What Will Transport 21 Deliver?

- » Completion of the inter-urban motorway network by 2010
- » Improvements in the national road network, focussing particularly on the balanced regional development objectives of the *National Spatial Strategy (NSS)*
- » Radical improvement in the level and quality of rail services
- » Transformation of the public transport system in the Greater Dublin Area (GDA)
- » Almost a doubling to 375 million of public transport journeys in the GDA by 2016
- » Significant improvement in regional and rural public transport services
- » Completion of the safety programme on the national rail network
- » Funding of essential capital works at existing regional airports

For further details, see www.transport21.ie



4.1.2. Bus Transport

4.1.2.1. National Bus Transport

Bus Éireann carried 92 million passengers in 2006, including primary and post-primary students. Customers travelling on scheduled services increased to 50 million, representing an average increase of 1% on 2005. Over the period 2002 to 2006, customer journeys on Expressway and commuter routes increased by 11%⁹.

The Department of Education and Science procures subsidised transport for primary and post-primary schoolchildren as well as those with special educational needs through the deployment of a fleet of 650 Bus Éireann buses and 3,000 buses provided by private operators. In the region of 135,000 students are carried each day on school transport to primary and post-primary schools.

The development of rural transport is outlined in *the National Development Plan (NDP) 2007-2013* and is guided by the *Strategy for Rural Development in Ireland – A White Paper on Rural Development* and the *National Spatial Strategy (NSS)*. These policies all have the objective of 'rural-proofing' to ensure that viable communities are maintained and that there is balanced regional development. The *Rural Transport Programme* is a scheme, which provides funding for community organisations and community partnerships to address the particular transport needs of their rural area through the provision of local transport services.

The Department of Transport provided €3m for the pilot phase between 2002-2004, while €9m was provided for 2006 and 2007. The *Rural Transport Programme* was made permanent

9 http://www.buseireann.ie/site/about_us/pdf/BE_06_no_pics.pdf

10 <http://www.ndp.ie/documents/ndp2007-2013/NDP-2007-2013-English.pdf>

11 http://www.dublinbus.ie/about_us/pdf/BAC_06_no_pics.pdf

12 <http://www.dublinbus.ie/images/upload/news/DublinBusNetworkReview.pdf>

in 2007 and an overall budget of €90m has been allocated for the programme under the National Development Plan (NDP) 2007-2013¹⁰. Improved rural bus services are important if there is to be a reduction in car use in rural areas.

4.1.2.2. Urban Bus Transport

In 2006, Dublin Bus operated a fleet of almost 1,100 buses carrying 146 million passengers, which is an increase of 1 million over 2005¹¹. Private bus companies also operate some routes in the GDA. Bus Éireann also operates bus services in other major urban areas. Average peak-hour bus speeds in Dublin are comparatively low at 15kph, compared with, for example, Stuttgart (25kph) or Prague (26kph), despite the implementation of bus priority measures such as Quality Bus Corridors (QBCs).

A recent review of bus services concluded that, in the GDA¹²:

- ⊙ There is significant congestion and delay to buses away from the QBCs, which has a number of direct consequences for the quality of service and the efficiency of the bus network;
- ⊙ There is insufficient capacity on the public transport network as a whole and peak period demand is increasing, which requires an increase in the capacity of the bus network;
- ⊙ A combination of congestion and increasing distance is extending journey times to unacceptable levels;

Transport for London

All 8,000 buses in London are instantly recognizable by a single brand but are owned by different operators, who comply with route service levels set by Transport for London (TfL) and tender for a London Service Permit issued by TfL. The operators must not only comply with the service requirements set by TfL but they must also provide vehicles, which meet strict environmental standards. TfL aim to purchase up to 60 hybrid double deck buses, which will be made available to operators so they can operate the vehicles on a trial basis and price realistically in tender applications. Six single-decker diesel-electric hybrid buses have been operating on a particular route since March 2006.

- ④ The presentation and marketing of public transport is seen as fragmented (little multi-modal information) and limited (not produced with the infrequent user in mind);
- ④ More bus routes need to be developed to meet demand.

Bus services could be improved by:

- ④ Developing additional park and ride facilities at carefully chosen locations;
- ④ Introducing integrated ticketing and real-time passenger information;
- ④ Introducing more flexibility in work practices to allow more responsive network planning;
- ④ Continuing to develop and improve QBCs in the GDA and priority Green Routes in other urban areas;
- ④ Doubling the length of bus priority schemes to improve the quality, reliability, and efficiency of the bus fleet serving the GDA;
- ④ Investment in new fleet and maintenance of existing fleet.

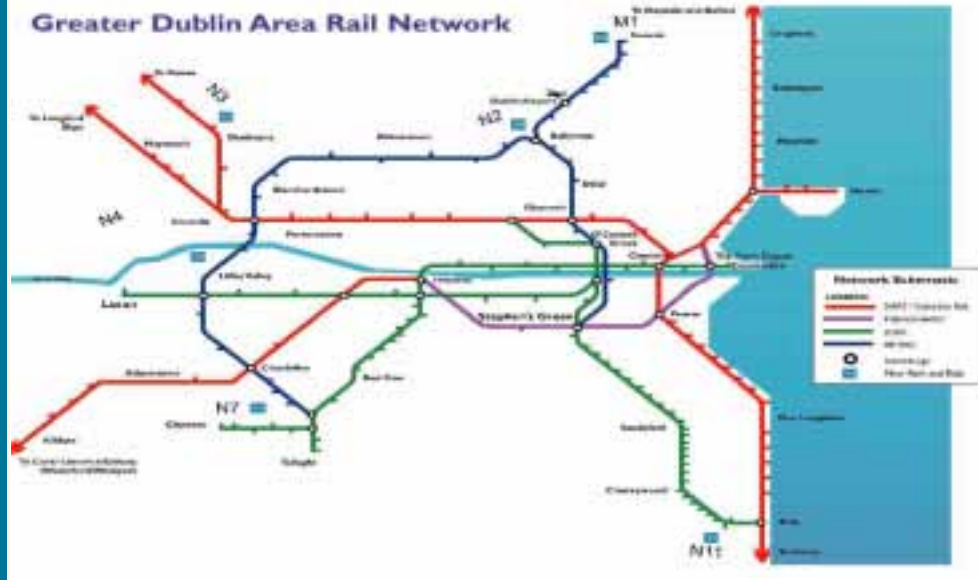
4.1.2.3. Licensing Reform

There is huge potential for a significant increase in bus services in the short and medium term. However, getting the public out of their cars requires a more responsive bus system. This will require expanded services and enhanced quality of services such as integrated timetabling, integrated tickets and real-time passenger information. In this regard, the Government is committed to reforming the bus licensing regime, which is currently regulated by the *Road Transport Act 1932* and the *Transport Act 1958*.

The recently adopted *EU Regulation 1307/2007* on public transport services by rail and road, which has direct application in Ireland provides the basis for a new framework for the regulation of the bus market in Ireland. The objective of any new framework should be to develop and support the bus network so as to create a national public transport service, which serves all citizens, both rural and urban, and encourages integration between public and private operators. In particular, it should provide good value for money to the taxpayer.

Figure 3:

Planned Greater Dublin Area (GDA) Rail Network



4.1.3. Rail Public Transport

A total of 43.3 million passenger journeys were made across Irish Rail's InterCity, DART and Commuter Services in 2006, which is a 14% increase on 2005¹³. The *Transport 21* programme provides funding for a number of heavy rail projects and places a major emphasis on the provision of enhanced intercity and suburban rail services. These projects would include more regular services on the principal intercity routes serviced by modern rolling stock, the electrification of sections of the Dublin suburban rail network, including the Northern, Kildare, and Maynooth lines, and doubling of track on the Kildare line.

The *Transport 21* programme also commits to developing 2 Metro lines in the Greater Dublin Area (GDA), i.e. Metro North, from St. Stephen's Green to Swords, via Dublin Airport, and Metro West, connecting to the Tallaght LUAS line in the Southwest and the Metro North at Ballymun to the north of the city. Outside the GDA, funding will be provided for the phased reopening of the Western Rail Corridor with the initial reopening of the Ennis to Claremorris line by 2014. It will also provide for the preservation of the remaining alignment between Claremorris and Collooney, the rollout of the Navan rail line, and new commuter rail services in Cork and Galway.

The LUAS light rail transit system, which operates in Dublin, carried 26 million passengers in 2006¹⁴. The *Transport 21* programme commits to improving and extending the LUAS services in Dublin by extending the LUAS to the Docklands, Citywest, Cherrywood, Bray and Liffey Junction and by building a new line to Lucan. In line with the commitment in the *Programme for Government*, studies will be undertaken on light rail/bus rapid transit systems for Cork, Galway, Limerick and Waterford as part of the review of existing land

use transportation strategies. Figure 3 above shows the planned rail network, which will be in place at the end of *Transport 21*.

4.1.4. Integrated Transport and Intelligent Transport Systems

4.1.4.1. Public Transport Integration

An integrated approach to the delivery of public transport services should make it as easy and convenient as possible for people to use the public transport system. This has many dimensions, including ease of access, ease of transfer and interchange, integrated ticketing, real-time passenger information, and interchange with other transport modes.

An integrated ticketing scheme is currently being developed for the GDA, which will involve an 'electronic purse' for payment on all participating public transport services. The rollout of the proposed smartcard integrated ticketing system will commence by September 2009 so that a complete system will be available across all participating public transport operators in the GDA within four years. Thereafter, the intention is that the integrated ticketing system will be extended to accommodate public transport operators outside Dublin. *Transport 21* provides funding for park and ride facilities, with a particular focus on rail-based public transport, and good quality interchange facilities, to allow for more flexible travel.

Rail park and ride services on the suburban rail, Metro and LUAS networks may be either strategic, that is providing for the integration of national road and rail networks, or local,

13 http://www.iarnrodeireann.ie/about_us/pdf/IE_06_no_pics.pdf

14 <http://www.luas.ie/faqs.php>



that is providing for car parking at rail stations to cater for the demand for parking from the surrounding area. The key success factors for both strategic and local park and ride sites include size, location, local impacts and control and pricing. The ideal design of the site would include facilities for cycle parking, pedestrian access to public transport services, operational requirements for public transport vehicles and ticketing systems, and car passenger drop-off and pick-up facilities. Park and ride facilities could also be provided for bus services.

Another option is bike and ride. As a feeder mode, the bicycle is substantially faster than walking and more flexible than public transport, thus eliminating waiting and scheduling costs. This option could potentially be supported through the provision of bicycle facilities at public transport nodes, 'bike for hire', and facility to carry bikes on public transport services.

4.1.4.2. Intelligent Transport Systems (ITS)

An ITS Strategy integrates the application of telematics or information and communications technologies (ICTs) for use in transport management strategies to provide for optimum integration of transport systems and to enable increased transparency of freight transport operations through asset tracking. It also allows for improvement of efficiency and capacity in existing physical infrastructure and the delivery of a more reliable public transport system through the provision of route guidance and real-time passenger information. In Brussels, use of public transport increased by 6% on services where real-time information was introduced. The system resulted in 90% user satisfaction and the payback period was 4 years.

15 http://www.ecf.com/1681_1

16 <http://www.dto.ie/web2006/cyclepol.htm>

4.2 Cycling and Walking

Cycling and walking are integral to any policy on sustainable transport as they are health enhancing physical activities and serve to counteract sedentary lifestyles, which can lead to obesity and chronic diseases such as cardiovascular disease, strokes, cancers and diabetes. It is estimated that, on average, the benefit-to-cost ratio of local walking and cycling routes is 20:1, in contrast to the typical ratio of 3:1 for other transport schemes such as rail and roads¹⁵. In other European countries, cycling and walking are seen as key methods of commuting and the development of these modes is closely related to national recreational and tourism policies.

4.2.1. Urban Cycling

Despite investment of almost €30m in cycling in the GDA over the period 1994-2005, which provided for 220km of cycle lanes, the number of people travelling by bicycle continues to decline. The number of persons in the GDA cycling to work and school in 2002 was approximately 36,000 per day or 3.3% of overall travel, with cycling at 3.8% in the Dublin region compared with 1.5% in the Mid-East region. Between 1996 and 2002, the decline in numbers cycling to school and work in the GDA (17%) was less severe than other cities, including Galway (27%) and Limerick (57%).

The Dublin Transportation Office (DTO) estimates that 21% of car commuters would consider cycling to work¹⁶. The main reasons for car commuters not cycling to work include a preference to drive (24%), too dangerous because of traffic (21%), too lazy/strenuous (20%), poor weather conditions (19%), and distance to travel (16%). The main initiatives that



would encourage car commuters to cycle to work are more dedicated cycle lanes (41%), reduced traffic (39%), improved road surface (39%), reduced heavy vehicle volumes (38%), and reduced traffic speed (33%).

The DTO has set an overall objective to increase the proportion of short trips (up to 6km) made by bicycle from 4% to 30% by 2016 with trips to places of education and commuting trips of up to 10km particularly targeted as suitable for cycling. Promotion of cycling as a mode of travel in urban areas and identification of barriers to cycling as a means to commuting is essential to ensuring an increased modal share of cycling. Safety for cyclists is perceived to be a major barrier. Indeed, pedal cyclists accounted for 3% of all road fatalities in 2005, of which 60% occurred in rural areas.

Other barriers to cycling include lack of separate cycle lanes, the computerised traffic management system in Dublin City Centre, which does not give sufficient priority to cyclists or pedestrians, and the restriction on on-board carriage of bicycles by public transport, particularly on commuter rail services.

The Department of Transport, under the auspices of the DTO, is engaged at present in a review of the current manual on provision of cycling facilities titled the *“Provision of Cycle Facilities – National Manual for Urban Areas”*. This sets out comprehensive guidance on the design and provision of cycle facilities. In addition, the provisions in the road traffic regulations with regard to the use of cycle tracks and cycle track signage are being looked at in conjunction with this design and standards review. Furthermore, in November 2007, the Department commissioned research on best practice in the preparation of a national cycling policy. There are also proposals for facilities such as the Sutton to Sandycove coastal cycle path or the Galway promenade, which are vital to promote cycling and walking in an urban environment.

Urban Cycling – Copenhagen

“We have the goal of being the number-one bicycle city in the world...” Klaus Bondam, Vice-mayor of Copenhagen

The Copenhagen Cycle Policy 2002-2012 aims to capitalise on Copenhagen’s reputation as the “City of Cyclists” and proposes that, by 2012:

- » The proportion of people cycling to workplaces in Copenhagen shall increase from 34% to 40%
- » Cyclist risk of serious injury or death shall decrease by 50%
- » The proportion of Copenhagen cyclists who feel safe cycling in town shall increase from 57% to 80%
- » Cyclist travelling speed on trips of over 5 km shall increase by 10%
- » Cyclist comfort shall be improved so that cycle track surfaces deemed unsatisfactory shall not exceed 5%
- » This will be supported by a cycle track network, consisting of separate cycle tracks of 2m width, while bicycle traffic is considered a distinct traffic category.



4.2.2. National Cycle Network

Commuting cycling is linked to recreational cycling, which, in turn, is connected to tourism activity. Indeed, these links are important in generating a cycling culture. Unlike other European countries, Ireland has no national cycle network. There are benefits for tourism, recreation and commuting associated with developing and maintaining a well-signed cycle network with good connections between urban areas on traffic-free paths, quiet lanes, and traffic-calmed roads.

Cycle tourism is in decline in Ireland. The number of tourists cycling fell from 130,000 in 2000 to 60,000 in 2005, although there was a slight increase in 2006. Furthermore, satisfaction with the quality of the product is decreasing with the percentage of satisfied holidaymakers falling from 76% in 2000 to 50% in 2005 and unsatisfied customers rising from 2% to 9% over the same period. Overseas visitors, who cycled while in Ireland, contributed an estimated €34.5m to the economy in 2005. The benefits of cycling tourism include economic revitalisation of rural areas and the utilisation of under-used rural roads and derelict railway lines. It can also help to extend the length of stay and encourage repeat visits.

Policies to help encourage cycling tourism have been set out in the Fáilte Ireland *Strategy for the Development of Irish Cycle Tourism*. This strategy identifies a tourism cycle network, which is estimated at a total of €45m, while a budget of €780,000 would allow 8 towns to be developed as cycling hubs. This would still fall short, however, of a cycle network, where the links between recreational cycling routes, cycle paths to schools, and commuter routes would combine to give a national network, which could support local leisure activity, tourism, and commuting for all age groups.

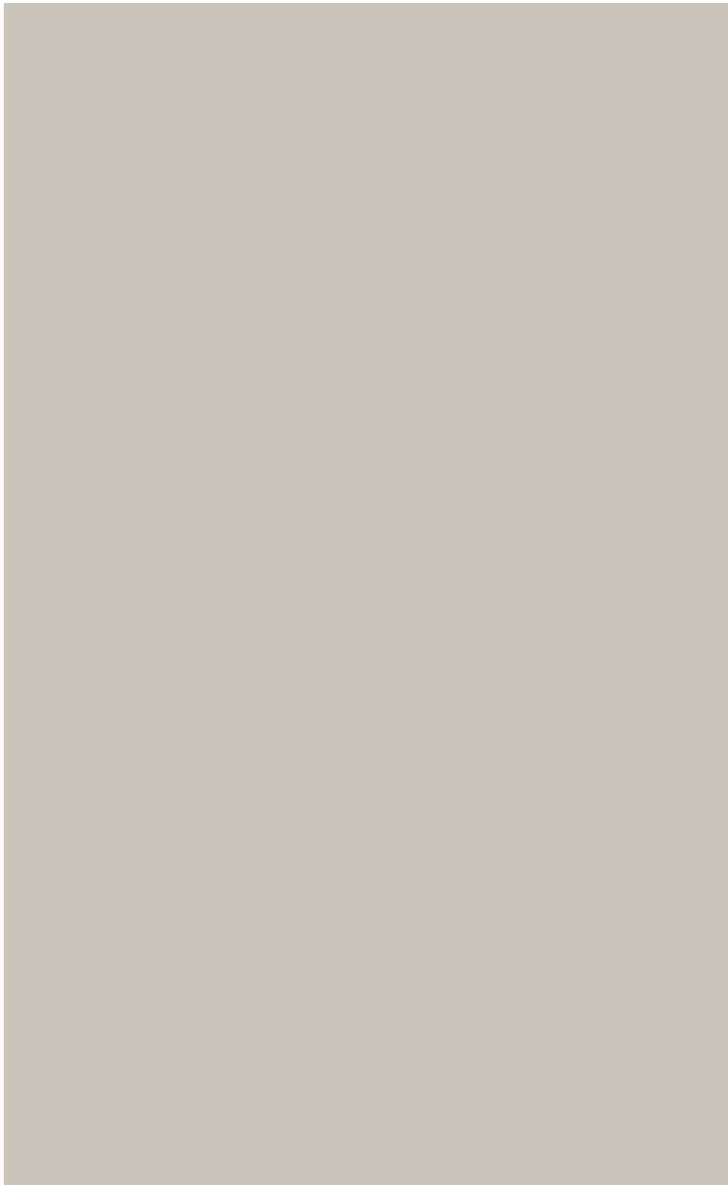
4.2.3. Footpath Network and Walking Policy

The proportion of commuters who walked to work, school or college has fallen from 11.1% in 1991 to 10.9% in 2006. The proportion of primary schoolchildren who walked to school has also declined from 39.4% in 1991 to 24.3% in 2006. The urban walking environment requires pedestrian-friendly design, which could include larger and well-maintained footpaths, particularly on access routes to residential neighbourhoods and schools; proper drainage; traffic calming; reduction of speed limits in urban areas to 30kph; and prioritising of pedestrians at traffic lights. The provision and maintenance of long distance and looped footpaths support a culture of walking and are integral to the promotion of walking and hiking as recreational activities.



4.3. Questions

4. How can existing bus and rail services be improved for customers?
5. In addition to the investment in Transport 21, what other measures are needed to improve and expand services?
6. How should these improved and expanded services be funded?
7. What further measures are needed to improve transport integration?
8. Does this issues document generally identify the key measures to be considered in promoting public transport?
9. What course of action should be taken to encourage more people to walk and cycle?
10. Does this issues document generally identify the key measures to be considered to encourage healthy travel options?



Chapter 5

Moving Goods

Chapter 5

Moving Goods

The previous chapter dealt with the movement of people whereas this chapter focuses on the movement of goods. It also deals with the aviation sector. Although this sector is primarily concerned with the movement of people, it is an important element of the tourism industry and of critical importance to the economy.

Key Issues to be Considered

- » The importance of the movement of goods to our economy
- » The reliance on exports and the key role of our ports in moving goods
- » Recognition that movement of goods by road will remain the principal mode
- » The need to reduce the environmental impacts of heavy goods vehicles and light duty vans
- » The need to maximise use of the rail network
- » Emissions trading for the aviation industry
- » Better management and organisation of airspace

5.1 Freight Transport

5.1.1. Road Freight

Fuel consumption by the road freight sector increased by 264% over the period 1990 to 2005, while energy intensity increased by 44% over the same period. Energy intensity may be defined as energy consumption as a function of GDP. In addition, the ratio of fuel usage to road freight increased by only 3% in the same period, indicating that technical efficiency has remained relatively constant. The increased volumes of heavy goods vehicle (HGV) and light duty vehicle (LDV) traffic, coupled with the declining share of rail freight, have placed increasing pressure on the existing road network. HGVs can cause significant environmental and social impacts and steps have been taken to address this, such as the restriction on HGVs in urban areas.

Efficiency in road freight transportation can potentially be improved and negative impacts reduced through:

- ④ Logistic efficiency through increasing load factors, choosing the optimum type of vehicle, optimising the entire transportation chain from origin to final delivery, 'just in time' delivery, use of telematics and intelligent transport systems (ITS), and tackling under-utilisation and empty running. Typically around a third of vehicle-kilometres are sub-optimal depending on length of haul, type of vehicle, industrial sector and the nature of the delivery operation;
- ④ Engine design and fuel economy;
- ④ Driver efficiency through training or assistance from on-board units used for measuring components of driving behaviour;
- ④ Route efficiency, including information on itinerary, road conditions or traffic; and
- ④ Further regulation of the impact of HGVs in urban areas.



5.1.2. Rail Freight

The Irish rail freight market is in continued decline due to the comparative advantage of road transportation. For example, the share of rail in total inland freight transport in Ireland accounted for less than 2% in 2005, compared with 23.5% in the EU-27. However, there is still potential for rail freight in the movement of bulk volumes and the rail freight market could recover further market share if there was increased competitive advantage. This could be achieved through either further subsidies to rail or internalisation of environmental and social costs in road freight transport.

5.2 Aviation and Maritime

There has been rapid passenger growth in air travel in recent years, with increased leisure time travel and the advent of low cost airlines acting as additional drivers to economic growth. The Government's current aviation policy is to encourage as wide a range as possible of reliable, regular and competitive air services to and from Ireland, although regard should be had towards the sustainability of regional and international air services.

The objective is to have an efficient airport sector operating on a sustainable commercial basis, which takes account of the needs of both low cost and full service airlines. Under the *NDP 2007-2013*, it is planned to invest €1.8 billion in facilities at Dublin Airport and €96 million in the six regional airports and City of Derry Airport. The investment at Dublin Airport is earmarked to provide for significant increases in capacity and, in particular, a second terminal.

The three State airports of Dublin, Cork, and Shannon and the associated air services are a key element of the overall transport system, providing internal transport services and vital international access to and from the island of Ireland. They currently account for 96% of all air traffic in Ireland and have the scope and capacity to expand to cater for future growth in

national and international air traffic for the foreseeable future. The key role of regional airports is to complement State airports and to help promote regional development. The Department provides subvention to contracted regional air carriers for the operation of essential air services under the Public Service Obligation (PSO) regime and these PSO services connect Dublin Airport with the regional airports. Following a review, new contracts for the PSO scheme were put in place in July 2005 and run until July 2008.

One element in dealing with the impact of aviation emissions is the European Emissions Trading Scheme discussed below. A more immediate saving could be achieved through better management of air space and coordination of routes. Improvements to the management and organisation of airspace are necessary to ensure that aircraft avail of the most efficient routings and are not subject to in-flight delays or diversions.

Initiatives are already underway at European level to promote a more coherent approach to expanding the capacity of the pan-European air traffic control system with a view to accommodating anticipated growth in air services while achieving better routings and reduced delays due to air traffic control. The achievement of these objectives will lead to a reduction in relative terms in emissions from the air transport sector in Europe.

Ireland is dependent on seaborne trade and the economic importance of our ports to the prosperity of the country is self-evident. The provision of adequate and efficient port capacity into the future is a strategic objective of the Government. Planned investment by the commercial ports will support the strategic policy objectives in the Government's *Ports Policy Statement*, published in 2005, which sets out a framework to ensure that capacity needs are identified, planned and progressed in a coordinated manner. This policy aims to better equip the port sector and its stakeholders to meet national and regional capacity and service needs including the provision of adequate port capacity.



Under the *National Development Plan (NDP) 2007-2013*, it is planned to invest €480 million in upgrading strategic ports facilities and regional harbours. Ireland's commercial seaports are vital transport arteries, carrying 99% by volume of the island's external trade. Their critical importance to economic prosperity is demonstrated by the fact that the value of this trade was approximately €130 billion for 2005, compared to a figure of €14 billion through our airports. By contrast, passenger movements represent a small and fairly static segment of maritime traffic. Both air and sea transport are essential for an island nation, such as Ireland, to ensure that it retains its share of international tourism.

5.3 Emissions Trading Scheme (ETS)

The EU Emissions Trading Scheme (ETS) was established under *EU Directive 2003/87/EC* as a framework for emissions trading for installations in a number of sectors, including power and heat generation, mineral oil refineries and coke ovens, production and processing of ferrous metals, production of cement clinker, glass, tiles, bricks and porcelain, and production of pulp and paper.

A review of the ETS is currently underway with a view to making the scheme more efficient and to include new sectors and gases from 2013. It is expected that aluminium, chemicals, and aviation will be included in the second phase from 2008-2012, while maritime and surface transport as well as other gases such as nitrous oxide (N₂O) may be included post-2012.

Owing to the growth in the aviation sector and the enhanced global warming effect of emissions at altitude, a proposal was made in 2006 by the Commission to amend the ETS Directive to include aviation activities from 2011¹⁷. This proposal is

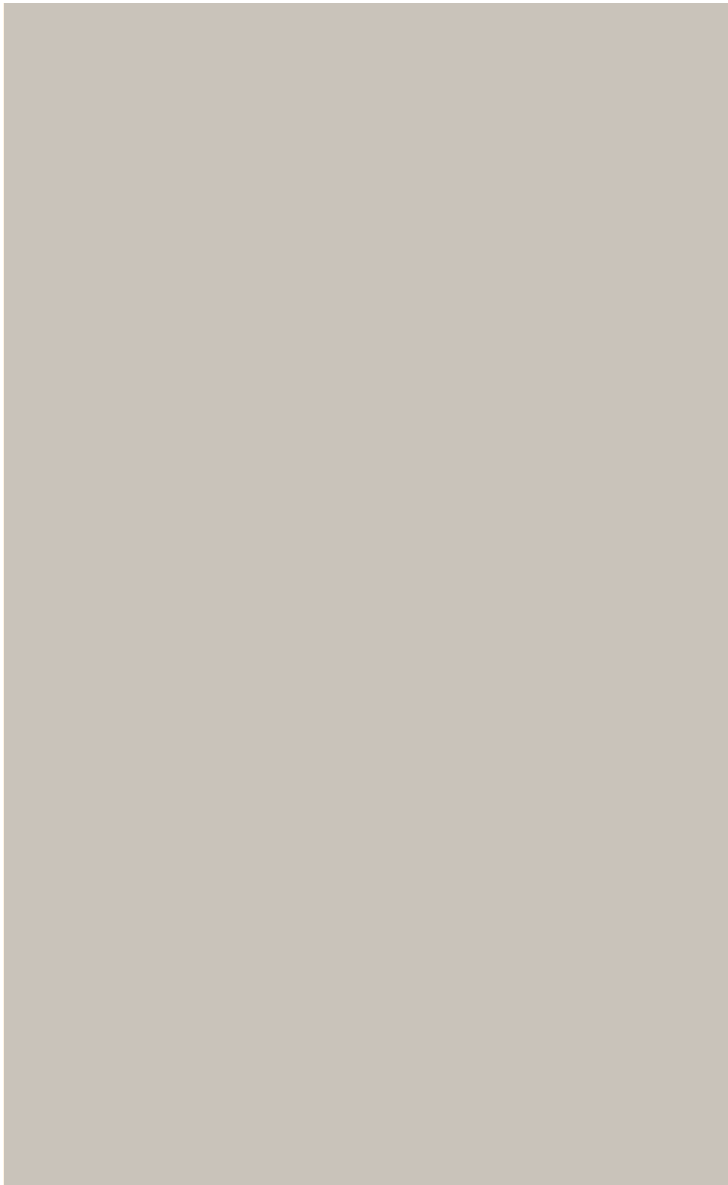
intended to complement the Open Skies and Single European Sky air traffic research system (SESAR) agreements, which allow for optimisation of air routes and air traffic management and, thus, more efficient energy consumption.

The Government's view is that the inclusion of aviation in the ETS should recognise the geographical diversity and peripherality of EU Member States such as Ireland and, in the absence of any international agreement on the taxation of aviation fuel, recognises their inclusion as the most economically efficient approach to controlling aviation emissions. In addition, the proposal should not endanger the diversity of air services, which are now available in a liberalised commercial aviation market, or reduce access to air services.

5.4 Questions:

11. What are the steps needed to reduce the environmental impact of road freight?
12. What is the future for rail freight and how should it be supported?
13. Apart from action at international level, are there changes in current policy or additional national measures that can be taken to reduce the environmental impact of aviation and maritime transport?

17 http://eur-lex.europa.eu/LexUriServ/site/en/com/2006/com2006_0818en01.pdf



Chapter 6 Additional Measures to Achieve the Vision

Chapter 6

Additional Measures to Achieve the Vision

Chapter 3 to 5 dealt with spatial planning and measures related to public transport, healthy travelling and the movement of goods. There are other measures worth examining. For example, policies to influence and change personal travel behaviour include mobility management, information awareness, fiscal measures, and regulatory instruments. These are considered in this chapter.

Key Issues to be Considered

- » The need to change personal behaviour
- » Mobility management schemes
- » The possible need for disincentives such as fiscal and regulatory measures to also influence behaviour
- » Other innovative approaches such as car sharing and significant park and ride measures
- » Alternative fuels such as biofuels
- » Alternative technology such as hybrid vehicles
- » Better fuel efficiency
- » Vehicle standards

6.1 Mobility Management

Mobility management has been widely used to improve the transport options available to users, provide incentives to choose more efficient travel patterns, and/or reduce the need for physical travel. It includes soft support measures such as flexible working and workplace travel plans, car sharing and car clubs, travel vouchers, personalised travel planning and travel blending, and school travel plans.

6.1.1. Flexible Working and Workplace Travel Plans

Flexible working reduces the need to travel to a physical workplace at an appointed time by staggering work over different time periods and physical locations. It may include part-time, flexi-time, annualised hours, compressed hours, staggered hours, worksharing, and homeworking. Home working may be facilitated through use of information technology, thereby reducing the need to travel.

Potential advantages for employers include the ability to match work allocation more closely with customer/product demand; reduced fixed costs; less demand for parking spaces; recruitment and retention of employees; increased productivity and efficiency; improved staff morale; and reduced absenteeism. Advantages for employees include increased motivation, job satisfaction and a better work-life balance. Other benefits include reduced traffic congestion, particularly at peak hour. Possible barriers include building confidence or trust and limited broadband and telecommunications in some rural areas.



Flexible Working - The British Telecom Experience

British Telecom (BT) have developed very ambitious targets to save carbon emissions and have committed to reduce their 1996 emissions by 80% by 2016. Many of its employees have flexible working arrangements and 13,000 employees are home workers. BT estimates that this has saved 100,000 tonnes of CO₂ emissions and has resulted in reduced sick leave and increased quality of life.

A Workplace Travel Plan (WTP) may be described as a package of measures implemented by an employer to encourage more sustainable travel and, in particular, less single-occupancy car use. WTPs primarily aim to address the commuting habits of employees, although many also incorporate measures aimed at travel during the course of work, including business and delivery travel.

Potential components of WTPs include:

- ④ Working with employees to address perceptions and practical difficulties in overcoming car dependency;
- ④ Establishing databases to assist in car sharing;

- ④ Providing shuttle services to nearby rail or bus services;
- ④ Putting in place onsite measures to make cycling and walking safer and more attractive, for example footpaths, cycle lanes, secure cycle parking, and shower facilities;
- ④ Providing incentives to use non-car modes;
- ④ Promoting flexible working.

Travel plans typically have been shown to reduce car use by 15-20%, with higher reductions of 20-25% from plans incorporating measures such as parking management and public transport subsidies. The median annual running cost is £47 in the UK (\$30 in the US) per full-time equivalent employee, which is considerably less than £300-500, which is the annual cost of maintaining a parking space in the UK¹⁸.

A number of pilot initiatives are already in operation in Ireland to trial WTPs but consideration could be given to a national initiative so that all employers have WTPs in place for their employees. Businesses and industries could be encouraged to produce a baseline WTP, followed by annual updates, to ensure that its recommendations are implemented. One existing aid to delivering WTPs is the exemption from benefit-in-kind taxation, which was introduced in 1999 for employees whose employers provide them with annual travel passes. The *TaxSaver Commuter Ticket Scheme* allows for tax relief on the cost of annual public transport tickets. In 2004, over 1,300 private and public companies availed of the scheme.

18 Cairns, S., Sloman, L., Newson, C., Anable, J., Kirkbride, A., Goodwin, P., 2004. *Smarter Choices – Changing the Way We Travel*, Department for Transport



6.1.2. Car Sharing and Car Clubs

Car-sharing schemes aim to encourage individuals to share private vehicles for particular journeys and include a range of different initiatives. These include informal encouragement of arrangements for sharing trips, formal schemes with elaborate arrangements for trip matching, often focused on commuting journeys, and sharing for long-distance leisure journeys. Car sharing can reduce private car use on average by 3%. Corporate costs of car sharing schemes for companies in the UK have been estimated at between £100-1,000 per car sharer.

Car clubs involve payment for access to a vehicle, with the payment charged to the consumer or employer (if offered as a benefit-in-kind) on the basis of use or per journey. Benefits include cost savings, convenience (no responsibility for insurance, tax, fuel, maintenance or parking), fewer kilometres driven (people who join car clubs typically reduce their vehicle kilometres travelled by 45%), reduction in emissions (carsharing reduces average user's CO₂ emissions by 39-54%), less traffic congestion, less parking pressure, local economic benefits, and social inclusion.

Requirements for car clubs include:

- ④ A critical mass of 40-50 vehicles and 1,000 users in a neighbouring area in order to be financially self-sufficient in the medium to long term;
- ④ Areas of medium to high population density;
- ④ Good public transport links and low parking space availability.

Potential issues include the need for on street parking in accessible areas and appropriate signage, which is currently not regulated. In addition, an all-island car club scheme could

be introduced and supported, which would support cross-border commuting.

6.1.3. Personalised Travel Planning

Personalised Travel Planning (PTP) involves making direct contact with individual commuters to encourage them to change their travel behaviour and includes the provision of incentives such as free public transport tickets and travel information. It can also involve travel blending, which seeks to reduce the overall need for travel, through combining activities or destinations in a single trip rather than making repeated trips.

On average, PTP can lead to reductions in car use of 7-15% amongst targeted populations in urban areas and lower reductions of 2-6% in rural trials. It is estimated that the cost of PTP, in the UK, is £44 per household or £15 per person, including project start-up, recruitment, running costs, marketing, and reporting. The benefit-to-cost ratio can be as high as 77:1.

6.1.4. School Travel Plans

Measures to encourage more sustainable travel to school are important and may include physical improvements in the vicinity of schools such as traffic calming, low speed zones, cycle lanes, and safe crossings. Other measures include consultation between schools and communities, education and information measures, road safety training, and initiatives such as 'walking buses' and 'cycle trains'.

School travel plans set out to improve both safety and the environment for walkers and cyclists and help to encourage

children and parents/guardians to walk, cycle, use a bus or car share. Particular benefits include health benefits associated with physical activity, reduced traffic congestion at peak time, improvements in road safety and pedestrian skills, mental development and independent mobility, increased independence for children, greater knowledge of environmental and citizenship issues, community benefits, increased social inclusion, and development of social networks. Possible barriers include perceptions of safety, possible insurance liability, and the need for high quality footpaths and cycle ways.

Research on school travel patterns show that reductions in car use are typically in the range of 6-16%, although some initiatives have resulted in reductions between 40-50%. Costs of school travel plans in the UK range from £3.50-4.00 per pupil, while capital costs per pupil place are £95 on average, ranging from £32-243¹⁹.

Initiatives in Ireland include the DTO *Safer Routes to School* project (2005-2007), which aimed to increase the number of children who walk and cycle and increase the number of families who 'park and stride' or 'carpool'. This is implemented through the An Taisce *Green Schools Travel Programme*. Results from this initiative show that, of journeys to school, walking increased by 7% to 40%, and car use decreased by 8% to 46%, while, on the journey from school, walking increased by 4% and car use fell by 9%.

6.2 Fiscal Measures

Fiscal measures may be used to ensure the efficient pricing or use of the transport system and to reward efficient behaviour. Ecological tax reform (ETR) is used to describe tax changes, where the burden shifts from economic goods such as labour

Walking Buses

A walking bus consists of a group of children, who are escorted by adults to and from school. The walking bus includes a 'driver' at the front and a 'conductor' at the back. As an incentive, the bus may be rewarded for walking. Examples of walking buses include Rathmichael and Donabate, operated under the An Taisce Green Schools Initiative; Christchurch and Auckland in New Zealand; and Macclesfield and Chester.

Benefits include:

- » Modal shift from private car travel
- » Reduced congestion on school routes
- » Increased physical health for both adults and children through regular exercise
- » Community activity and creation of friendships
- » Increased awareness of road safety
- » Mental development and independent mobility

For example, in Christchurch, the main benefits cited were social (25%), increased health of children (17%) and time saved (15%).

(personal income tax), capital (corporate income tax), and consumption (VAT and other indirect taxes) to activities that place pressure on the environment and natural resources. Fiscal changes could be revenue-neutral and could balance increased costs for private car use with reduced taxation in other areas or increased provision of sustainable alternatives.

They could also ensure that the full range of transport costs is captured in the cost of motoring. Fiscal measures to reduce demand for discretionary travel, i.e. travel that could be avoided or for which an alternative exists, could encourage people to use alternatives. These measures should be sufficient to reduce discretionary demand, while not placing a disproportionate burden on marginal or peripheral groups in society.

19 Cairns, S., Sloman, L., Newson, C., Anable, J., Kirkbride, A., Goodwin, P., 2004. *Smarter Choices – Changing the Way We Travel*, Department for Transport



In particular, fiscal measures need to consider the impact on those living in rural areas who do not have viable alternatives and where long commuting distances can be involved. One option could be to ring fence the revenue gained from fiscal measures to support rural public transport. In addition, any changes in fiscal measures should consider potential impacts on economic competitiveness, particularly in export markets and price-sensitive industries such as the food and beverages industry or biopharmaceuticals. The competitiveness of freight transport activities and exports is important in an open, globalised economy such as Ireland's.

The 2006 review of the National Climate Change Strategy *Ireland's Pathway to Kyoto Compliance* recognised the need to make "transport users fully aware of the external costs of their chosen mode of transport... in order to bring about more sustainable travel patterns towards shorter, less frequent trips and modal shift to more sustainable forms of transport". In a recent EU survey²⁰, 52% of Irish people said they would pay up to 10% more for a less polluting mode of transport, i.e. energy efficient vehicles or clean fuels, etc., compared with the EU-27 average of 45%. This indicates a 'willingness to pay' by the Irish consumer. The following sub-sections describe potential measures.

Key Points Relating to Fiscal Measures

- » There are international examples to show that promoting changes in travel behaviour need to be accompanied by disincentives and fiscal measures
- » 7 different types of schemes are discussed below, which range from fuel tax to road pricing
- » There are advantages and disadvantages to each approach, which must be considered in the Irish context

6.2.1. Rebalancing of Vehicle Registration Tax (VRT) and Motor Tax

The *National Climate Change Strategy 2007-2012* committed to changing the basis for assessing Vehicle Registration Tax (VRT) and Motor Tax from 2008 so that they would be more closely aligned with CO₂ emissions. Tax incentives to encourage the purchase of cleaner and more energy efficient vehicles have the potential to increase the fuel efficiency of the vehicle fleet and reward good purchasing behaviour.

There is currently provision for a 50% reduction in VRT for hybrid-electric vehicles, which aims to stimulate the market for these vehicles. Following its announcement in the 2006



Budget, this VRT relief was extended to flexi-fuelled vehicles, i.e. vehicles capable of operating on an E85 bioethanol mix, for a trial period of two years.

Existing incentives for hybrid-electric and flexi-fuelled vehicles will be extended to 30 June 2008. From 1 July 2008, on the introduction of the CO₂ emissions-related VRT system, a relief of up to €2,500 on the VRT payable will replace the existing relief for hybrid electric and flexi-fuelled vehicles, while electric cars and mopeds were deemed exempt from VRT.

In the 2008 Budget, it was announced that, from July 2008, the VRT rate applicable to cars registered will be determined by the CO₂ emission rating of the car. A transparent CO₂ emissions-band system will be applied to the open market selling price (OMSP) of the vehicle, ranging from 14% to 36% of the OMSP, a measure which is intended to be broadly revenue-neutral. It was also announced that motor tax for cars registered before July 2008 would increase by 9.5% for vehicles below 2.5 litres and by 11% for cars above. The motor tax system for such vehicles will continue to be levied on cubic capacity engine size.

In the 2008 Carbon Budget, it was announced that, from July 2008, motor tax for all new and imported cars would also be levied on the basis of CO₂ emissions and will be differentiated also by a similar rating system as VRT, which is comparable to the energy labelling system for electrical goods. Both the motor tax and VRT initiatives will also be supported by a new mandatory labelling system, supported by a public information campaign, which will promote the purchase of fuel-efficient vehicles, in accordance with *Directive 99/94/EC*²¹.

6.2.2. Infrastructure Charging

The *EU Directive 1999/62/EC* on the Charging of Heavy Goods Vehicles for the Use of Certain Infrastructure or *Eurovignette Directive* was amended by *Directive 2006/38/EC* in order to eliminate distortions of competition between transport operators in the internal market. This Directive aims to ensure the proper functioning of the internal market and lays down rules for the application by Member States of tolls or user charges on roads, including the trans-European road network and mountainous areas.

Member States are able to charge different toll rates according to the vehicle's emission category or EURO classification and the amount of congestion it causes, in accordance with the 'polluter pays' principle. In addition, it is proposed that economic and social costs of road transport should be internalised, or accounted for in the total cost, and this could have potential impacts on road freight. However, it will also take account of the full external costs of road freight and will increase the comparative viability of other modes of freight transport, particularly rail.

6.2.3. Road Pricing

Road pricing involves the levying of fees, which may be used to either finance road infrastructure or as a means to reduce travel demand. It incentivises road users to make more efficient use of road capacity. Modelling of a national road-pricing scheme in the UK suggests that simple charging by road type would reduce car traffic by 5% and congestion by 3%.

Road Pricing – The Netherlands

In 2005, a road-pricing scheme was proposed in the Netherlands, based on the price per kilometre for all roads, which would be in place by 2012-2014. The charge that would be levied depends on time, location and environmental aspects and is estimated to equate to an average rate of €0.034 per kilometre and a congestion rate of €0.11 per kilometre. It was estimated also that a nationwide scheme would reduce travel time during the congestion period by 60% and improve road safety by 10%.

The primary objective of the proposal is to ensure pay-for-use or fairness. Secondary objectives are the reduction of congestion and negative environmental impacts. The road-pricing proposal has the potential to differentiate pricing by time of day and location and by the environmental characteristics of the vehicle and could be complemented by adjusting the current taxation system, based on car ownership, to a new system, based on vehicle use.

With technological advances, it should be possible to differentiate pricing by distance travelled, time of day or week, vehicle emissions category, road type, urban/rural location, and level of real-time congestion on the road network. The *National Climate Change Strategy 2007-2012* states that consideration will be given to the potential introduction of fiscal measures, including road pricing or congestion charging, to reduce transport demand, once adequate supply-side infrastructure is in place. This could include the introduction of electronic variable tolls on the approach roads to the M50 or the adaptation of the existing tolling system to deliver traffic management returns.

6.2.4. Congestion Charges and Workplace Parking Levies

Congestion charges can also incentivise the shift from personal car transport and have been successfully adopted in, for example, London and Stockholm. On its introduction, the London congestion charge reduced congestion by 30% and traffic levels by 18% with a positive net annual revenue. Similarly, the Stockholm congestion charge resulted in weekday traffic falling by 22% and a reduction of 12% in emissions. This was introduced initially on a trial basis and was later adopted following a public referendum.

However, it should be noted that the success of these schemes is partly due to the availability of public transport alternatives and democratic consensus, following public awareness campaigns. Various types of charge are feasible, including cordon charges and area licences. Technological development provides the means for more sophisticated and targeted pricing schemes.



Congestion Charge – Stockholm

A congestion charge was introduced in Stockholm in August 2007, following a trial period and subsequent referendum in 2006, in order to reduce traffic congestion and quality of the urban environment. The congestion charge area encompasses Stockholm City Centre and is operated by unmanned electronic control points at all entry points to the city. Vehicles passing the control points are identified by automatic number plate recognition and payment depends on the time of day. Certain exemptions were granted, including for cars operating on biofuels.

Other fiscal measures that could potentially be considered include a charge on free workplace parking in congested urban areas in the form of a workplace parking levy or 'benefit in kind' taxation. Workplace parking levies are not regarded as costly to introduce or administer but difficulties exist such as setting an effective but acceptable level of charge, ensuring all the required spaces are registered, compiling an inventory of spaces, and ensuring local on-street parking controls were in place to prevent transfer from car parks.

In a 2004 study for the DTO²², it was estimated that the introduction of fiscal measures, including a €10 charge in the city centre and workplace parking levies, in the GDA would reduce congestion by 12% in the morning peak hour; reduce car travel by 5% in the morning peak hour; increase public transport usage by 19%; increase average morning peak hour bus speeds by 15%; and increase average morning peak hour car speeds by 8%. In addition, it would reduce road traffic accidents and CO₂ emissions, giving a total benefit-to-cost ratio of 2.84:1.

Complementary measures that may be required to increase the effectiveness of such fiscal measures include on-street parking controls in all areas where workplace levies are applied, traffic management measures in residential areas to deter through-traffic diversion as a result of congestion charging, parking measures in areas on the congestion charging zone boundary to deter 'informal park and ride' or park and walk, and rewards for employers in the hinterland/growth centres. The introduction of workplace parking levies could be considered where there are reliable and frequent public transport alternatives in the vicinity of the workplace. Levies in rural areas would need to consider the lack of public transport and offer an alternative option, supported by the employer.



6.2.5. Fuel and Carbon Taxes

Ireland currently has the fifth lowest petrol excise rate in the EU-15, i.e. 64%, compared with 72% in France and 74% in the UK. Thus, it may be argued that national differences in tax rates induce cross-border fuel tourism. Furthermore, the excise rate in Ireland fell from 66% in 1994 to 64% in 2004 for unleaded petrol and from 60% in 1994 to 59% in 2004 for diesel. Indeed, most EU countries reduced the percentage excise rate between 1994 and 2004, except for the UK for petrol and diesel, Denmark for petrol, and Sweden for diesel. The excise duty rate in Ireland was €368 per 1,000 litres in 2005, compared with EU-15 average of €374 per 1,000 litres and the UK at €693 per 1,000 litres.

The *Programme for Government* contains a commitment to introduce a carbon levy on a revenue-neutral basis over the lifetime of the current Government, although this is subject to a review by the proposed Commission on Taxation. This proposal recognises the growing economic consensus that the introduction of a price signal for greenhouse gas emissions, for example through emissions trading or taxation, or interventions with similar effect, represents the most efficient way of reducing greenhouse gas emissions. However, any proposal to raise fuel prices or impose a carbon levy, the primary objective of which is to reduce demand, should consider responsiveness to price change, particularly with regards to discretionary travel.

6.2.6. Subsidies

Transport subsidies may be either direct or indirect. For example, direct subsidies include subsidies to regional airports and domestic airlines as well as public transport companies in respect of public service obligations. Indirect or 'hidden' subsidies occur when a publicly owned asset is used at below

its true cost. For example, free parking and public funding for a road, which results in the true cost of road transport not being charged to road users, would be classified as hidden subsidies.

Fuel costs are also subject to subsidies in the form of excise relief, including kerosene or jet fuel for airlines, which is exempt from taxation under international agreement, and biofuels. Subsidies will continue to have a role to play in supporting State policy objectives such as balanced regional development and assisting the provision of necessary transport services, which are not commercially feasible. A question to be considered is how such subsidies can be used to promote and support sustainability.

Potential carbon levies could be ring fenced to provide public travel discounts or subsidised travel for marginalised social groups, particularly in rural areas. For example, the Free Travel Scheme, which currently administers 600,000 passes annually, will continue to play an important part in subsidising travel and complements the *Rural Transport Programme*.

6.2.7. Carbon Trading

Carbon trading²³, through for example personal carbon allowances (PCAs), tradable energy quotas (TEQs), domestic tradable quotas (DTQs), or a 'cap and share' scheme, essentially involves an equitable allocation on a per capita basis of emission rights or 'carbon units' to all end-purchasers of fuel and electricity. It also involves trading of surplus units within a market structure. Potential practical issues include the requirement for market policing and financial infrastructure, impacts on inflation and fuel tourism, public acceptability, all-Island implementation, and implementation and operating costs.

23 <http://www.defra.gov.uk/environment/climatechange/uk/individual/pca/pdf/pca-scopingstudy.pdf>



In a Cap and Share scheme²⁴, the annual emissions allowance is allocated equitably among the adult population, each of whom receives a certificate for their individual entitlement. Recipients can then sell these certificates through the banking system to fossil fuel importers. It could be introduced for the transport sector initially with allocated emissions being reduced on an annual basis, thus ensuring a progressive reduction in emissions. Advocates of the Cap and Share scheme²⁵ argue that it is economically efficient and egalitarian. However, potential issues that may arise with such a scheme include administration costs and the need to ensure equity and fairness, particularly for those who are dependent on private car travel.

6.3 Information and Awareness Raising

Sustainable travel can be promoted through targeted information awareness campaigns and dissemination of information in order to complement fiscal and regulatory measures.

6.3.1. Eco-driving

Eco-driving²⁶ is a way of reducing fuel consumption and maximising fuel economy through increasing driver awareness and changing personal driving behaviour. It is estimated that

this can reduce greenhouse gas emissions by 12-15% along an urban test cycle²⁷. Methods for improving eco-driving include vehicle maintenance, minimising car luggage, optimising acceleration and speed, combining trips, avoiding congested routes, sudden braking, and avoidable engine idling.

It is possible to promote the concept of eco-driving at the learner driver stage, by introducing it into the driver education curriculum. It could also involve eco-auditing of haulage and public transport fleets, supported by the development of *Driver Skills Support Programmes*. These programmes could focus on the need for ongoing training to reinforce positive behaviour. Haulage companies and transport operators could also look at possible financial incentives for 'best practice' drivers.

6.3.2. Awareness Campaigns

In addition to specific campaigns, the success of any mobility management programmes would be dependent on an awareness strategy designed to operate over a number of years. The need to reduce energy consumption and emissions are objectives of the *Power of One*²⁸ and the recently launched *National Climate Change Awareness campaigns*. It is expected that promotion of fuel economy and eco-driving will be an element of the *Climate Change Campaign*, in addition to promoting modal shift and reduced use of the private car.

24 <http://www.capandshare.org/>

25 Comhar Sustainable Development Council (SDC) have recently commissioned research on the potential emissions reduction and macroeconomic impacts of a Cap and Share scheme

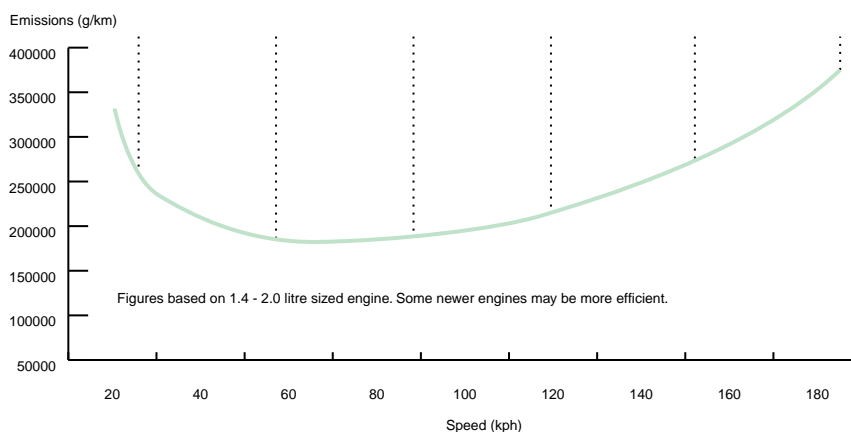
26 <http://www.ecodrive.org/>

27 <http://www.ecodrive.org/Links.202.0.html>

28 <http://www.powerofone.ie/>

Figure 4:

Speed Limits and GHG emissions



Furthermore, there are a number of initiatives, including the DTO *One Small Step* and *Did You Need Your Car Today?* campaigns. These serve to promote sustainable travel and transport, with the latter particularly focussing on commuting in the GDA and on the arterial routes. There is an international brand known as *Travelwise*, which underpins the successful delivery of a wide range of sustainable travel initiatives.

There is potential to launch, possibly on an all-island basis, a Sustainable Travel Demonstration Towns Campaign²⁹ or 'Proud Cities and Town Programme', as referred to in the *Agreed Programme for Government*, which would look at 'best practice' and 'most improved' sustainable urban travel towns in Ireland and promote traffic-free areas and sustainable communities. This could offer a competitive incentive, similar to Tidy Towns, and be supported by capital grants for infrastructure improvements.

Sustainable Travel Demonstration Towns

This is a five-year project, which aims to demonstrate the effect of smarter choices measures, when coupled with infrastructure improvements. The 'showcase' demonstration towns administering the project in the UK include Darlington, Peterborough and Worcester and have shown reductions in car trips of between 11-13% after a two-year period. For example, cycling trips increased by 79% in Darlington, 25% in Peterborough and 36% in Worcester. Walking trips increased by 29%, 21% and 17%, respectively.

In Darlington, for example, information on smarter choices was disseminated using individualised travel marketing, offering personalised travel information. In the non-targeted population area, which was exposed to general marketing, car driver trips decreased by 6.6%, while walking and cycling trips increased by 8.3% and 54%.

29 <http://www.dft.gov.uk/pgr/sustainable/demonstrationtowns/>



6.4. Regulatory Measures

These could include mandatory measures to promote sustainable travel, such as speed limits and the regulation of vehicle or fuel standards. The *Road Traffic Acts* regulate speed limits by setting different limits for built-up areas (50kph), non-urban regional roads (80kph), national roads (100kph), and motorways (120kph). In addition, they permit special speed limit byelaws, which take into account certain circumstances. In many countries, a speed limit of 30kph in urban residential areas is seen as best practice to give priority to pedestrians and cyclists. Carbon emissions vary considerably with speed limits, particularly above 80kph, as can be seen in Figure 4. For example, travelling at 80 kph would produce approximately 25% less emissions than travelling at 120kph.

6.5 Technology Solutions

6.5.1. Biofuels

The policy on biofuels in Ireland is largely directed by *Directive 2003/30/EC*, which stipulates that Member States set indicative targets for a minimum proportion of biofuels to be placed on the market, including 2% of all petrol and diesel by 2005 and 5.75% by 2010. The EU also proposes an indicative target of 10% biofuel in overall consumption of petrol and diesel by 2020, which is also a target in the 2007 Energy White Paper³⁰. The 2006 *Bioenergy Action Plan for Ireland* sets out how biofuels and biomass policy is to be promoted in Ireland³¹.

The Irish Government aims to achieve 5% obligatory fuel blending by 2009 with the additional 0.75% of the target to be achieved through higher blends and the use of 100% pure plant oil (PPO) in fleets maintained by local authorities, public

and semi-state organisations and haulage companies. This will be supported by an international sustainability-certification scheme, which will provide information regarding the type of biofuel, freight transport, fossil energy and agrochemical inputs and the impact on biodiversity.

In 2005 the Mineral Oil Tax Relief (MOTR) scheme was launched, which provides for excise relief on biofuels of 44.3 cent per litre for petrol and 36.8 cent per litre for diesel, over a two-year period. This initial scheme was extended following an announcement in the 2006 Budget of a five-year (2006-2010) biofuels excise relief package, i.e. Biofuels MOTR Scheme II. It is expected that, at full capacity in 2008, this will allow for 2.2% of biofuels or 163m litres per annum at a cost of €200m.

To complement this scheme, *Transport 21* provides funding for pilot projects to support biofuels uptake by public transport, the haulage industry and the taxi fleet. CIÉ have been instructed to move to a 5% biodiesel blend in the current bus fleet as soon as possible and to ensure that all new buses, as part of future fleet replacement, can operate on a 30% blend, subject to technical and logistical constraints. A number of public bodies, including Bus Éireann, Dublin Bus, the National Parks and Wildlife Service (NPWS), and Cork and Galway City Councils, have already tested the use of biofuels. In addition, South Tipperary County Council have converted a number of their vehicles to run on PPO as part of a pilot scheme, funded by the Department of Transport, and operated under the auspices of the German-Irish Chamber of Industry and Commerce.

The benefits of biofuels include lower greenhouse gas emissions (typically CO₂ equivalent savings from biodiesel range between 52-74% compared with conventional diesel), less toxicity, job creation, community development, particularly in peripheral rural areas, and waste reduction and recycling.

30 <http://www.dcmnr.gov.ie/NR/rdonlyres/54C78A1E-4E96-4E28-A77A-3226220DF2FC/27356/EnergyWhitePaper12March2007.pdf>

31 <http://www.dcmnr.gov.ie/NR/rdonlyres/4FFF6234-26CA-46B5-878A-AA04A7288DA4/0/FinalBioenergyReport.pdf>



The development of indigenous biofuels is particularly important in the context of national security of supply and in mitigating against impacts of peak oil and rising fuel prices.

Furthermore, there is added benefit from the recovery of waste and second-generation biofuels. At present, waste oils, greases and fats are low-cost biodiesel feedstock, whose availability is not affected by land use policies. The recovery of such waste materials could be maximised as they deliver multiple benefits. Dublin City Council is currently setting up a licensing system for cooking oil from hotels and restaurants. Ireland could also increase research in the development of second-generation biofuels or ligno-cellulosic crops, such as wood, straw, or *miscanthus giganteus* (Elephant Grass). The use of biogas, derived from municipal waste combustion or landfill, could be considered.

However, although biofuels are regarded as 'zero-carbon' or 'carbon-neutral', they do produce significant emissions in harvesting, production, and transportation, through the use of chemical fertilizers and fossil energy, particularly in the production of 'first generation' biofuels. In addition, due to competing pressures for arable land, large-scale biofuel or dedicated energy crop production may result in higher food prices and ecological impacts, such as loss of biodiversity due to agricultural intensification. Biofuels are also more expensive to produce, compared to mineral diesel, and there are associated blending, conversion and maintenance costs, which may necessitate subsidies and operating grants.

6.5.2. Alternative Technology

Alternative technologies that could be promoted include hybrid electric vehicles (HEVs), which recapture energy through regenerative braking and reduce inefficiencies from under-utilisation; plug-in HEVs; electric vehicles; hydrogen and fuel

cells; and liquefied petroleum gas (LPG) and compressed natural gas (CNG), although some of these technologies are not at full commercial development.

The European vision for the hydrogen economy recognises that moving away from dependency on fossil fuels to an economy powered by complementary energy carriers, such as electricity and hydrogen, will require careful strategic planning and investment in appropriate infrastructure such as transmission and fuelling stations. In addition, it is unlikely that hydrogen technology will be developed sufficiently by 2020 to be a viable alternative fuel by then.

The Department of Transport has sanctioned funding for Dublin Bus for the leasing of a prototype double-decker hybrid electric bus for Dublin. This is expected to be delivered in late 2008 and is estimated to be 34% more fuel-efficient. Future licensing of public transport operators and State operators could require the use of alternative technology, as part of fleet replacement.

6.5.3. Fuel Economy and Vehicle Standards

As stated previously, the Government's energy policy framework sets ambitious targets for energy efficiency. Improving the average fuel economy of the vehicle fleet is a key part of reducing fuel use and emissions from the transport sector. Technological advances within the motor industry will be critically important in bringing more fuel efficient technologies to the market although, in the absence of an indigenous motor industry, Ireland is a technology taker in relation to the development of more efficient vehicle technology on its own. Nevertheless Ireland is working closely with its EU partners to encourage more stringent standards in vehicle manufacturing.



The objective of the *EU Voluntary Agreement* between the European (ACEA), Japanese (JAMA) and Korean (KAMA) motor industries was to achieve a reduction in emissions for new passenger cars of 25% from 186g CO₂/km to 140g CO₂/km between 1995 and 2008 (ACEA) or 2009 (JAMA and KAMA). Between 1995 and 2004, average emissions from new cars sold in the EU-15 only fell by 12.4% from 186g CO₂/km to 163g CO₂/km. As a result of the failure of the *EU Voluntary Agreement* to significantly reduce EU transport emissions, it is expected that a regulatory measure will be introduced. The Government is supportive of the new EU proposal to limit average emissions from private cars.

Improvements in engine technology are being complemented by the National Car Test (NCT), which helps ensure that cars are maintained and operated as efficiently as possible. The Department of Transport is also working with CIÉ to improve its fuel efficiency by developing an environmental impacts framework. *EU Directive 2006/32/EC on Energy End-Use Efficiency and Energy Services*³² states that Member States should achieve a 1% per annum increase in energy efficiency or 9% cumulative savings by 2016, which complements the target of a 20% increase in energy efficiency by 2020. This Directive stipulates that the public sector should play an exemplar role in energy efficiency.

Automotive fuel quality is regulated by *Directive 2003/17/EC*, amending *Directive 98/70/EC* on the quality of petrol and diesel fuels, which outlines the environmental fuel quality specifications for petrol and diesel fuels with the main focus on sulphur, lead and aromatics. Since 1 January 2005 the limit on the sulphur content of petrol and diesel is 50 parts per million (ppm) and Member States are required to start phasing

in ultra-low sulphur fuel with a maximum 10 ppm sulphur content. Since 1 January 2002 all petrol sold in the EU is unleaded.

This Directive is currently being amended to include greenhouse gas emissions from the use of road transport fuels³³ and aims to allow the introduction of cleaner vehicles and machinery that pollute less and encourage the development of lower-carbon fuels and biofuels. In addition, a new petrol blend will be established allowing higher content of the biofuel ethanol, and sulphur levels in diesel and gasoil will be cut to reduce emissions of dangerous dust particles.

Vehicle approval or entry into service regulations are necessary to ensure that vehicles placed on the market meet the minimum technical standards required under various EU Directives. The pollutant emissions from road vehicles are regulated separately for light-duty vehicles (cars and light vans) and for heavy-duty vehicles (trucks and buses). For light-duty vehicles, the emission standard currently in force is Euro IV, as defined by *Directive 98/70/EC*³⁴, amending *Directive 70/220/EEC*. Following the Clean Air for Europe (CAFE) Strategy³⁵ and the resulting Thematic Strategy on Air Pollution, new Euro V and Euro VI standards have already been proposed.

It is expected that Euro V will come into force in September 2009 and will reduce the emission of particulate matter from diesel cars from 25mg/km to 5mg/km. Euro VI is scheduled to enter into force in January 2014 and will reduce the emissions of nitrogen oxides (NO_x) from diesel cars further from 180mg/km to 80mg/km. The legislation currently in force for heavy-duty vehicles includes *Directive 2005/55/EC* and

32 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:114:0064:0085:EN:PDF>

33 http://ec.europa.eu/environment/air/pdf/fuel/com_2007_18_en.pdf

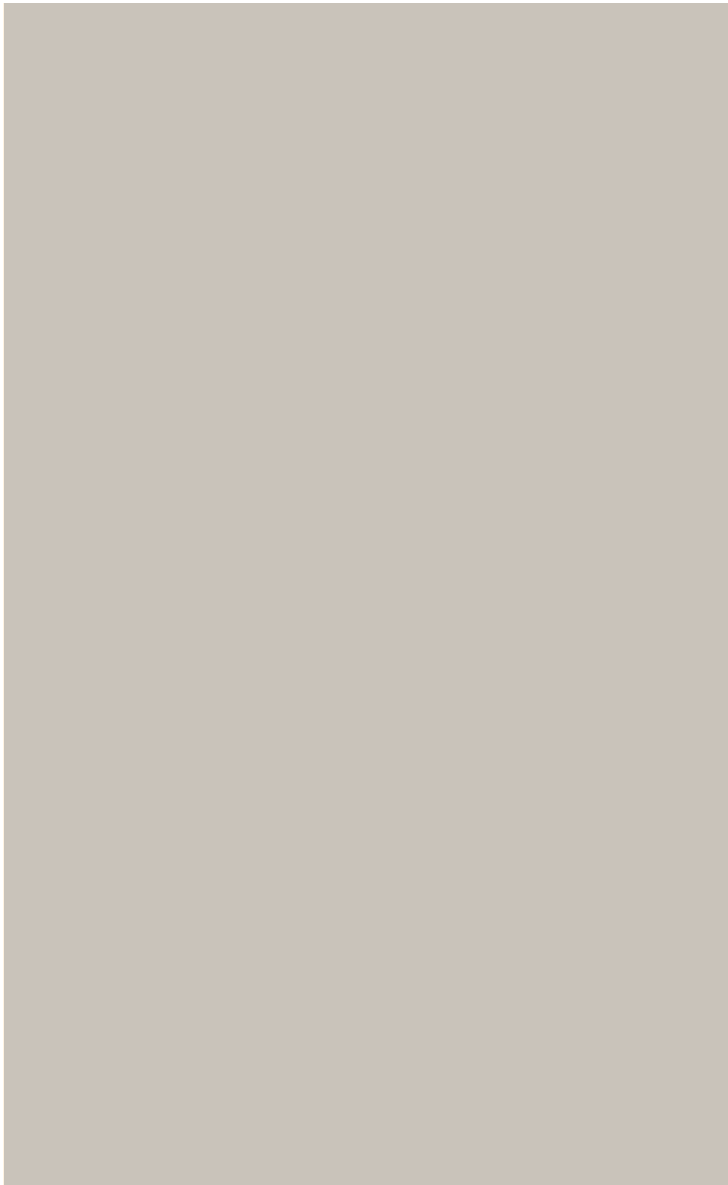
34 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31998L0069:EN:NOT>

35 <http://ec.europa.eu/environment/air/cape/index.htm>

Directive 2005/78/EC, which define the emission standards for heavy goods vehicles (HGVs). The issues raised in this and previous chapters point to the need to consider what institutional arrangements are needed to deliver new policies. This is discussed in the final chapter.

6.6 Questions:

14. What should be done to encourage more flexible working arrangements to reduce commuting travel?
15. Should measures which influence behavioural change be made mandatory and, if so, which measures and in what circumstances?
16. Will new fiscal measures be necessary to move to more sustainable trends?
17. If so, what are the optimum measures?
18. What regulatory measures might be necessary?
19. Does the issues document generally identify the key measures to be considered in changing personal travel behaviour?
20. What additional measures can be taken to promote fuel efficiency and alternative technologies?
21. Does the issues document generally identify the key measures to be considered to promote fuel economy and alternative technologies?



Chapter 7

How Will A New Approach Be Delivered Effectively and to What Timelines?

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How Will A New Approach Be Delivered Effectively and to What Timelines?

The final Chapter summarizes the existing or planned institutional arrangements to address transport issues in Ireland and refers to the need to set timelines to deliver new policies and initiatives.

Sustainable travel and transport policy impinges on a number of other policy areas such as security of supply, climate change, healthy living, rural development, and spatial planning. Crosscutting issues are being addressed at interdepartmental level and in cabinet subcommittees. The proposed *Sustainable Travel and Transport Action Plan* aims to capture synergies between various policies and strengthen existing cooperation between Departments and Agencies.

Key Issues on Delivery

- » The different roles at national level in delivering transport policy and services
- » The need to achieve greater co-ordination across Government departments given the broad reach of transport issues
- » The delivery of better integration at regional level and how the proposed Dublin Transportation Authority will transform the situation in the Greater Dublin Area
- » The role of local authorities in delivering sustainable travel and transport at local level
- » What the priorities and targets should be to move to sustainability between now and 2020

7.1 National Transport Policy

The Department of Transport is the main government department dealing with all aspects of transport policy in Ireland, including roads, public transport, air and sea transport. In 2007, responsibility for regional and local roads and the national vehicle and driver file was assigned to the Department. The Department of Transport operates through a significant number of agencies to deliver projects and implement policy, for example CIÉ, including Dublin Bus, Bus Éireann and Iarnród Éireann. The Department also collaborates with the National Roads Authority (NRA), Railway Procurement Agency (RPA), Road Safety Authority (RSA), Commission for Taxi Regulation, Railway Safety Commission, Irish Aviation Authority (IAA), Commission for Aviation Regulation, and the Irish Coast Guard, etc.

7.2 Dublin Transport Authority (DTA)

The *Programme for Government* commits to establishing the DTA, which will have overall responsibility for transport in the Greater Dublin Area (GDA). When established, its proposed functions will include coordination of transport and land use planning; strategic transport planning; procurement of public transport infrastructure and services; regulation of public transport fares; routes and service levels; delivery of integration measures such as integrated ticketing and information on public transport; and ensuring effective traffic management.

In addition, the DTA will have the authority to deliver transport projects if it considers it appropriate to do so and will also have the power to issue directions to implementing agencies in relation to issues such as integrated ticketing, passenger information, and fares. The legislation will also include provisions to strengthen the interaction between land use and transport. The *Programme for Government* also

points to the need for a National Transport Regulator, who could regulate transport provision outside the GDA.

7.3 Regional and Local Authorities

The Regional Authorities were established by the *Local Government Act 1991* and have specific responsibility for:

- ④ Reviewing the Development Plans of local authorities in their region and in adjoining regions
- ④ Preparing Regional Planning Guidelines (RPG) and Regional Economic and Social Strategies
- ④ Promoting cooperation, joint actions, arrangements and consultation among local authorities and other public bodies

Many aspects of transport policy are implemented at local level, with local government being administered by 34 county and city councils. Local authorities play an important role in implementing and adopting development plans and local area plans as well as delivering traffic management and services at local level and deciding on individual planning applications. They are responsible for the maintenance and improvement of public roads and have important road traffic and safety functions. As land use planning authorities, they have a very important link with transport.

The key issue to be addressed in delivering a *Sustainable Travel and Transport Action Plan* will be to decide on the right institutional arrangements so that national targets are delivered at local level. Given that sustainable travel and transport affects a range of national policies, another key issue to be considered is the integration of these policies at national level. Indeed, recognising the all-island dimension to travel, the need to deepen cross-border co-operation to address sustainability needs to be considered further.



7.4 Proposed Timeline

The vision in this document aims to deliver a sustainable transport system by 2020. To do so will require decisions on a series of priority actions, some short-term but others delivered over the long-term. Some policies and measures could be effectively introduced in the short-term, whereas other measures will be more complex and take longer to implement.

7.5 Concluding Comments

This document is a concise summary of issues influencing travel and transport in Ireland. There is no one simple measure or panacea that can deliver a sustainable transport system. Solutions have to have regard for different geographical locations, both rural and urban. What is clear, however, is that business as usual is not a viable option and the present trends will have to be reversed. Public participation in shaping a response to the challenge will be very important and this document aims to engage such involvement.

7.6 Questions

22. What changes are required to institutional structures at national, regional or local level to meet the sustainable travel challenge?
23. How can sustainable travel be best delivered at an all-island level?
24. Given the target date of 2020 in this document, what do you consider to be the short, medium and long-term priorities?
25. How ambitious should the targets be to achieve the vision set out in Chapter 2?
26. Does the issues document generally identify the key measures to be considered for the effective delivery of sustainable travel and transport?

Glossary & Appendix

Glossary

CO₂-Equivalents:	Greenhouse gas emissions, including CO ₂ , nitrous oxide (N ₂ O) and methane (CH ₄), adjusted for global warming potential
Emissions Intensity:	Greenhouse gas emissions as a function of GDP
Fuel Tourism:	Sale of fuel in Ireland by private motorists and hauliers but consumed outside the State
GDP:	Gross Domestic Product
GDA:	Greater Dublin Area, including Dublin City Council, South Dublin, Fingal, Dun Laoghaire-Rathdown, Kildare, Meath and Wicklow
GWP:	Global Warming Potential. Greenhouse gas emissions may be expressed in terms of their Global Warming Potential (GWP) over a normalised 100-year time horizon, giving a measure of their relative heating effect in the atmosphere. CO ₂ is given a baseline value of 1. Other values include 21 for methane (CH ₄), 310 for nitrous oxide (N ₂ O), 140-11,700 for hydrofluorocarbons (HFCs), 6,500-9,200 for perfluorocarbons (PFCs) and 23,900 for sulphur hexafluoride (SF ₆)
Modal Split:	Ratio of travel by a particular mode to overall travel
Mt:	Megatonnes/million tonnes
TFC:	Total Final Consumption
TPER:	Total Primary Energy Requirement
VRT:	Vehicle Registration Tax

Appendix

Trends in Travel and Transport

Since the mid-1990s Ireland has enjoyed extraordinary economic success. From 1996 to 2006, GDP at constant market value has doubled from €85bn to €171bn.

Not surprisingly, other related indicators have also shown similar strong growth, with the value of imports doubling, and the value of exports increasing by 125% in the same period. This economic growth has been coupled with strong growth in population and the number of people employed. Between 1996 and 2006, the population in Ireland increased by 17% from 3,630,000 to 4,240,000. Within the same period, the number of people at work also increased by over 40% and is now almost 2,100,000³⁶.

This unprecedented growth in the economy, population and workforce has, in turn, led to dramatically increased demand

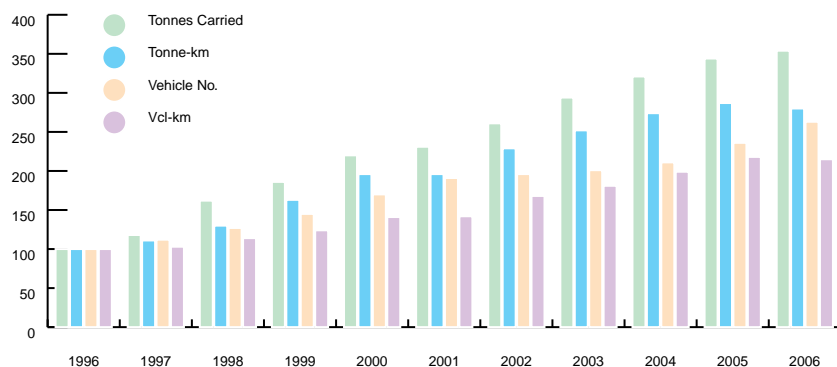
for transport services and travel. For example, the volume of roll-on/roll-off (ro/ro) traffic through Ireland's ports has doubled from 6m tonnes in 1996 to 12m tonnes in 2006³⁷. This increased volume of economic activity within the country has had a large impact on the volume of freight that is transported, as indicated in Figure 5.

The number of freight vehicles, in the taxation class greater than 2 tonnes, increased by 160% from 40,255 to 105,855 between 1996 and 2006. In this period, the total distance travelled by these vehicles more than doubled and the number of tonne-kilometres increased by almost 200%. This indicates the extent to which growth in both trade and consumer demand has impacted on the volume of goods and materials transported throughout the Irish economy.

Alongside this growth in freight and commercial transport there has also been a dramatic increase in the volume of

Figure 5:

Indicators of Growth in Demand for Road Freight, 1996-2006³⁸



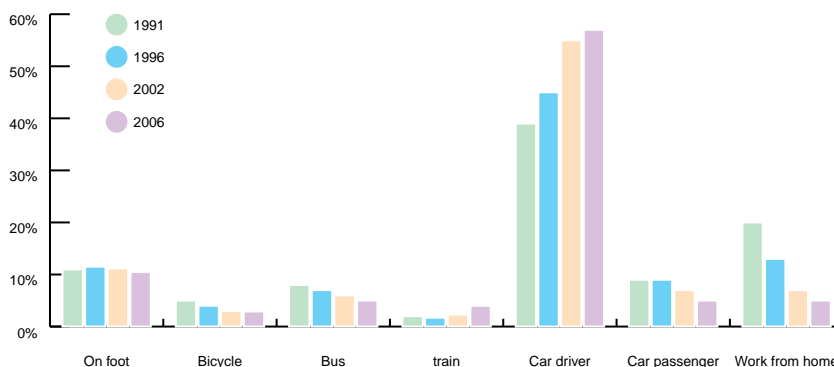
36 <http://www.cso.ie>

37 CSO, 2007. *Statistics of Port Traffic 2006*, Central Statistics Office

38 CSO, 2007. *Road Freight Transport Survey*, Central Statistics Office

Figure 6:

Modal Split of Travel to Work, School and College, 1991-2006⁴⁰



personal travel, an increase in car ownership and a modal shift towards private car use. The number of vehicles on Irish roads increased by 118% between 1996 and 2006³⁹.

Modal split is the breakdown of the different ways of travelling (by car, public transport or other forms such as cycling and walking). Figure 6 shows the modal split of travel to work, school or college and it can be seen that modal share of private car, including both driver and passenger, increased from 47% in 1991 to 63% in 2006. With the exception of rail, which has seen an increase from 1.7% to 2.9%, all other modes have shown a decline.

From 1991 to 2006, bicycle mode share fell from 4.4% to 1.9%, there has been a slight decline in walking from 11.1% to 10.9%, bus fell from 7.7% to 6.1% and car passengers from 8% to 5.5%, which could be explained by more dispersed working and settlement patterns. Furthermore, due mainly to the decline in farming as a full-time profession,

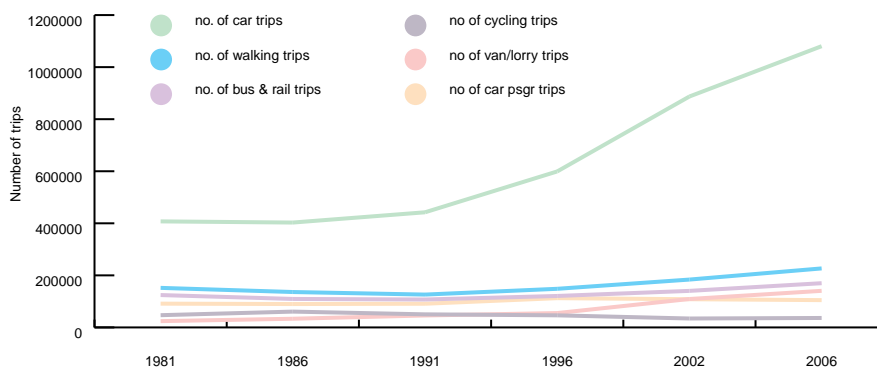
there has been a dramatic drop in the share of people working from home, down from 19.8% in 1991 to 5.6% in 2006.

Figure 7 shows the actual number of trips by selected modes from 1981 to 2006. The phenomenal growth in the actual number of trips by car is clear to see. So also is the fact that, despite this huge increase in the total number of trips, the other modes have not increased to any great extent or, as with cycling, have shown actual declines. The importance of walking as a commute is underlined by the fact that the number of trips consistently exceeds that of public transport. The sharp increase of car trips from 1992 can also be seen and could be explained by the fact that car use is more responsive to economic growth than public transport.

It is also important to note that alongside the growth in demand for the number of trips, there has also been an increase in the distance travelled by commuters. Whereas in

Figure 7:

Number of Trips to Work by Selected Modes, 1981-2006⁴¹

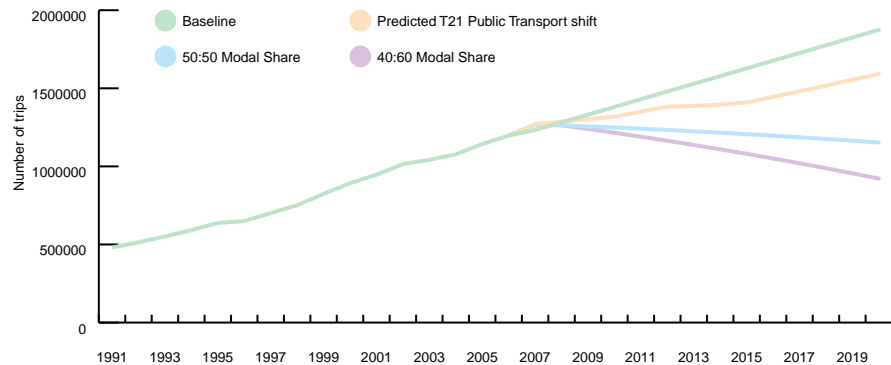


39 Howley, M., O’Leary, F., O’Gallachoir, B., 2007. *Energy in Transport: Trends and Influencing Factors*, Sustainable Energy Ireland (SEI)

40 CSO Census of Population: Volume 12 – Travel to Work, School and College, Central Statistics Office

41 CSO Census of Population: Volume 12 – Travel to Work, School and College, Central Statistics Office

Figure 8:
Travel to Work Projections



1991 the average distance travelled to work was around 7.7km, by 2006 this stood at 15.8km. Therefore, not only has the number of journeys by car more than doubled since 1991, so has the average distance that people are travelling to get to work. This is largely attributable to the rapid increase in the commuter belts around cities especially in the GDA and emphasises the link between land use and transport policies. Furthermore, there is evidence from more recent censuses that the traditional “rush hour” is widening. In 2002, around 10.5% of people left for work before 7am. By 2006, this had increased to 15%.

Figure 8 is a projection of the number of people driving to work over the period 2006 to 2020. In 2006 there were 1.2 million people driving to work. The assumptions for this projection are based on a continuation of trends, but at a moderated level, including average employment growth rate of 1.3% per annum between 2006 and 2020. This compares to employment growth rates of 3.8% per annum over the last ten years. The more moderate growth rate has been chosen to account for the more modest economic growth that is now expected.

There will be continued modal shift to the car/van driver mode, at a rate of 0.7% per annum from 2006 to 2020. This compares to a modal shift to car/van driver at a rate of 1.3% per annum over the previous ten years. The result of this baseline projection is shown in Figure 8 above. It is estimated that there will be over 1.7 million people driving to work in 2020. Should this scenario occur, it would mean that by 2020 the number of people driving to work will have doubled since 2000. Clearly, this will result in increased congestion, travel times, energy use and emissions, all of which will have extremely negative impacts.

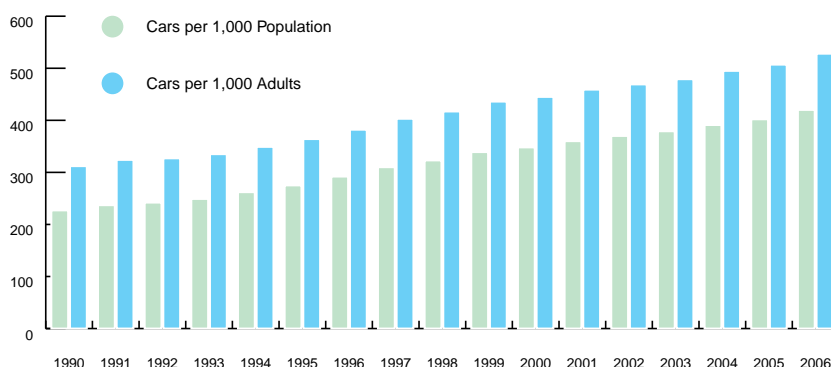
Figure 8 also shows the impact of public transport investment through *Transport 21* in the baseline scenario. This will allow for a significant number of commuters (around 130,000) to use public transport for their commuting needs and will have positive impacts at a local level in terms of congestion and transport-related emissions. However, it is clear that the impact of this investment will be superseded by the overall demand growth unless there is a significant change in behaviour.

Figure 8 shows the trend that is needed if we wish to achieve a 50:50 modal share of vehicle driver versus other modes by 2020. The gap between the baseline scenario in 2020 and the yellow line in 2020 is around 540,000 people. In other words, to achieve a 50:50 mode share for travel to work in 2020 we will need to facilitate over half a million people to use alternative modes. Following *Transport 21* investment in public transport, there will be an additional 400,000 transport users. It is also apparent that the projection will essentially only return us to the 2006 level of driver trips to work.

Figure 8 also shows what would be necessary under the stated assumption to achieve a 40:60 mode share of car/van driver versus all other modes. Such a scenario would return us to the same number of driver trips to work as occurred in 2000. Accounting for a *Transport 21* public transport shift of 130,000 commuters would leave almost 600,000 people to be facilitated to use alternative modes if we are to achieve a 40:60 mode share for travel to work trips. These projections, based on the assumptions stated above, show the scale of the challenge facing the transport sector. Furthermore, it must be borne in mind that this projection refers only to travel to work and does not include discretionary trips for leisure or other forms of commute.

Figure 9:

Private Car Ownership, 1990-2006



Figures for travel to school and college essentially show the same trend to private car that is evident for travel to work. Whereas 39.4% of primary school children walked to school in 1991, by 2006 this had fallen to 24.3%. Perhaps not surprisingly those travelling as a passenger in a car increased from 28% to 55%. Trends for secondary school students are similar. Whereas 14% were driven to school as a passenger in 1991, by 2006 this had increased to 31%. The number of college students commuting by car increased from 5% in 1991 to 22% in 2006. From these figures it is clear that demand for travel for education is becoming more and more centred on the private car.

It is also important to note that while the commute to work, school and college is a major factor in transport demand, it is not the only one. Analysis of the Census data, along with NCT data and a recent household survey by the DTO⁴², shows that commuting accounts for roughly 35% of the total distance travelled per annum. A combination of other journeys, such as shopping, leisure and visiting friends, account for the majority of both the trips we make and the kilometres we travel.

The impacts of the dramatic growth of road transportation outlined are clear. Of particular concern is increased congestion. It is estimated that the average speed on radial roads into Dublin in the morning peak hour fell from 22 kilometres per hour (kph) in 1991 to 16kph in 2001 and that

it could fall further to 8kph by 2016⁴³, even with investment in public transport projects, due to increase in overall trip demand⁴⁴. In a recent study on urban transport in certain EU cities, Dublin was ranked the lowest with average car speeds of 13kph on the main arterial routes⁴⁵.

As a result of increased disposable income and economic activity, the total number of private cars licensed between 1990 and 2006 increased by 109%, while the number of goods vehicles increased by 100%⁴⁶. Figure 9 shows that, between 1990 and 2006, there was an 85% increase in private car ownership in Ireland with car density in 2006 at 528 cars per 1,000 adults, compared with an EU-25 average of 558 and a UK average of 555, based on 2003 figures⁴⁷. It is expected that this trend will continue until ownership reaches average EU levels.

Purchasing patterns have also shifted with the number of cars with an engine size of 1.2 litres or less remaining static or declining whereas the number of cars with engine size of larger than 1.2 litres is increasing. Over the period 1990-2006, the average engine size of the private car stock increased by 14%. Although technology improvements have resulted in increased efficiency, increased fuel efficiency of new cars has been largely offset by the purchasing trend towards larger engine sizes.

42 <http://www.dto.ie/web2006/householdsurveyreport.pdf>

43 Dublin Transportation Office (DTO), 2001. Platform for Change

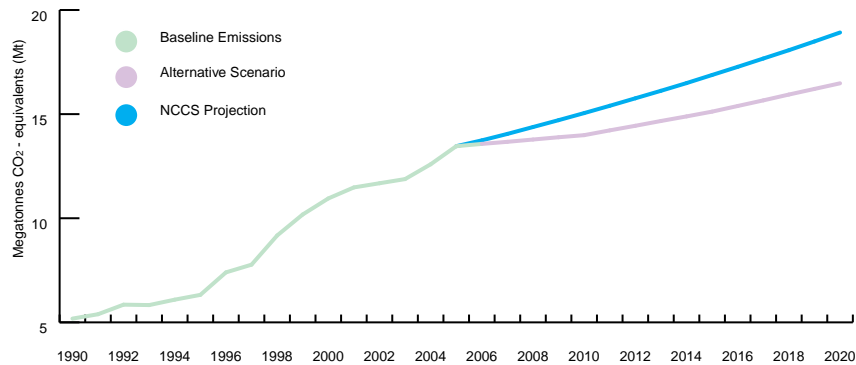
44 Based on a 'Do Minimum' scenario, which provides for the provision of the LUAS, M50 upgrade and the Dublin Port Tunnel to accommodate for anticipated future travel growth

45 Urban Transport Benchmarking Initiative

46 DoEHLG, 2006. Irish Bulletin of Vehicle and Driver Statistics 2005

47 Howley, M., O'Leary, M., O'Gallachoir, B., 2007. *Energy in Transport: Trends and Influencing Factors*, Sustainable Energy Ireland (SEI)

Figure 10:
Greenhouse Gas Emissions from Transport⁵²



Although average mileage for all passenger cars in Ireland fell by 5.5% between 2000 and 2006, total passenger-kilometres increased due to increasing ownership rates, thereby eroding efficiency gains, and this is expected to continue as a result of the trend in purchasing larger cars, due to rising disposable incomes. Indeed, total final energy consumption (TFC) within the transport sector increased by 166% between 1990 and 2006 and accounted for 41% of final energy demand in 2006. Of this, private cars accounted for 46% of road transport energy and 38% of all transport energy use in 2006⁴⁸.

Furthermore, it is estimated that fuel tourism, which is the purchase of automotive fuel by private motorists and hauliers not normally resident in the State, accounted for an estimated 10% of petrol consumption and 25% of diesel consumption in 2005. This is largely due to the price differential between fuel prices in Ireland and other EU Member States and, in particular, due to cross-Border sales.

Emissions from the transport sector closely correlate with the energy consumption trends. As shown in Figure 10, GHG emissions resulting from energy consumption in the transport sector increased by 160% from 5.18Mt CO₂-equivalent in 1990 to 13.46Mt CO₂-equivalent in 2005 and its sectoral share increased from 9.34% in 1990 to 19.4% in 2005⁴⁹. This

compares with total economy-wide CO₂ equivalent emissions growth of 25.4% and a EU-15 average increase of 26% for the same period⁵⁰. Emissions from the transport sector increased by 5.2% in 2006 and its sectoral share increased to 19.7%⁵¹.

Transport emissions in 2020 are predicted to be 16.48Mt CO₂-equivalents or 218% above the 1990 baseline estimate, inclusive of existing mitigation measures, as outlined in the 2007 *National Climate Change Strategy (NCCS) 2007-2012*⁵³. This projection does not include estimated reductions by 2010 as a result of additional policies, such as modal shift through *Transport 21* (0.51 Mt CO₂-equivalents), alignment of transport investment with spatial planning (0.083Mt CO₂-equivalents), 5.75% substitution of biofuels in transport fuels (0.5Mt CO₂-equivalents), and eco-driving (0.13Mt CO₂-equivalents).

In addition, it is estimated that by 2020, further emissions reductions will be achieved through demand side management (0.74Mt CO₂-equivalents) and 10% substitution of biofuels (0.878Mt CO₂-equivalents), which will give an additional reduction of 1.62Mt CO₂-equivalents. Thus, transport emissions could be 13.64Mt CO₂-equivalents in 2020 or 163% above the baseline estimate.

48 Howley, M., O'Leary, F., O'Gallachoir, B., 2007. *Energy in Transport: Trends and Influencing Factors*, Sustainable Energy Ireland (SEI)

49 <http://www.epa.ie/whatwedo/monitoring/climate/ghg/>

50 http://reports.eea.europa.eu/technical_report_2007_7/en

51 http://www.epa.ie/downloads/pubs/air/airemissions/ghg_provisional_20061.pdf

52 <http://www.epa.ie/whatwedo/monitoring/climate/ghg/>

53 <http://www.environ.ie/en/PublicationsDocuments/FileDownload,1861,en.pdf>



However, it is possible that this estimate will be exceeded if current trends in energy consumption and population growth continue. This is indicated in Figure 10 in the 'Alternative Scenario', which is based on a population growth estimate of 1.3% per annum, resulting in a forecast population of 5m by 2020. Projected increase in per capita emissions is 1% per annum, which is a conservative estimate compared with the per annum increase of 2.5% over the period 2000 to 2005. Under this scenario, it is estimated that emissions from the transport sector in 2020 will actually be 19Mt, which is a 265% increase on 1990 emissions.

Transport emissions increased by 107% from 1.45 tonnes CO₂-equivalent per capita in 1990 to 3 tonnes CO₂-equivalent per capita in 2005, compared with 150% increase in GDP. In 2003, Ireland had the second highest emissions per capita in the EU-25. Per capita emissions showed the greatest increase over the period 1990-2005.

The 1997 *Kyoto Protocol* set a target for reduction in GHG emissions below 1990 levels by the end of the commitment period 2008-2012⁵⁴. Ireland is required to limit growth in annual emissions to 13% above 1990 levels by the end of this commitment period, as part of the EU Burden Sharing Agreement⁵⁵. The EU has also committed to achieve at least a 20% reduction of GHG emissions by 2020 compared to 1990 levels, with the possibility of a 30% reduction, provided that

other developed countries commit themselves to comparable emission reductions and economically advanced developing countries contribute according to their responsibilities and respective capabilities.

Furthermore, energy demand in the Irish transport sector, which is heavily dependent on imported fossil fuels, is increasingly vulnerable to security of supply and global oil price increases⁵⁶. Import dependency in Ireland in 2004 was 86.5%, the second highest in the EU-25, compared with 50.5% on average in the EU-25. Ireland's dependency on oil in 2004 was 93%, compared with 80% in the EU-25. This is particularly relevant to the transport sector, which is 99% dependant on fossil fuels⁵⁷. The 2006 International Energy Agency (IEA) *World Energy Outlook Report*⁵⁸ has stated that continuation of business as usual in energy use would be "alarming".

A recent report to the US Department of Energy advised that Governments need to amend investment policies in transport and other areas at least two decades in advance of a peak in global oil production. Thus, it is imperative that peak oil and global fossil fuel prices do not adversely impact on economic competitiveness in Ireland, particularly given the increasing likelihood that global oil supplies will not be able to meet rapidly increasing demand⁵⁹.

54 Including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), and sulphur hexafluoride (SF₆)

55 Decision 2002/358/EC

56 http://ec.europa.eu/energy/green-paper-energy/doc/2006_03_08_gp_document_en.pdf

57 Directorate-General for Energy and Transport, 2006. *Energy and Transport in Figures 2006*, EUROSTAT

58 <http://www.worldenergyoutlook.org/2006.asp>

59 <http://www.worldenergyoutlook.org/2006.asp>



The 2007 Energy White Paper *Delivering a Sustainable Energy Future for Ireland* sets a number of national targets, including the objective to achieve 20% energy efficiency in the total economy and 33% in the public sector, in particular by 2020⁶⁰. The overall EU energy policy aims to reduce GHG emissions from energy consumption by 20% and achieve energy efficiency of 20% by 2020 through cumulative actions, as set out in the 2006 *Energy Efficiency Action Plan*⁶¹ as well as *Directive 2006/32/EC on Energy End-use Efficiency and Energy Services*, which aims for a cumulative energy savings of 9% by 2016 or 1% per annum⁶².

There are also localised environmental impacts from transport, caused by for example emissions of sulphur dioxide (SO₂), oxides of nitrogen (NO_x), particulate matter, polyaromatic hydrocarbons (PAH), and carcinogenic non-methane volatile organic compounds (NMVOC). While air quality in Ireland is generally good and complies with EU air quality standards, increased transport congestion does lead to localised pollution.

Ireland faces a significant challenge to meet our obligations, under the 'National Emissions Ceiling Directive' 2001/81/EC⁶³, to reduce levels of NO_x by 2010, with the transport sector projected to account for over 40% of NO_x emissions by 2010. However, some progress has been made in reducing emissions of NO_x and SO₂ through more stringent EURO vehicle engine standards for passenger and heavy goods vehicles and higher fuel quality standards.

Transport has significant health impacts due to the sedentary lifestyle that a car-oriented society promotes and the noxious effects of localised pollutants. Indeed, it has been shown that each additional hour per day spent in a car results in a 6% increase in the probability of obesity, while each additional kilometre walked per day results in a 4.8% reduction in the probability of obesity⁶⁴. In Ireland, 13% of people are reported as being obese and 34% as overweight with a 30% increase in the prevalence of reported obesity levels between 2000 and 2004.

60 <http://www.dcmnr.gov.ie/NR/rdonlyres/54C78A1E-4E96-4E28-A77A-3226220DF2FC/27356/EnergyWhitePaper12March2007.pdf>

61 http://ec.europa.eu/energy/action_plan_energy_efficiency/doc/com_2006_0545_en.pdf

62 http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_114/l_11420060427en00640085.pdf

63 http://eur-lex.europa.eu/LexUriServ/site/en/oj/2001/l_309/l_30920011127en00220030.pdf

64 Douthwaite, R., Healy, D., Leyden, K., 2006. *Towards a Sustainable Transport System*. Comhar SDC Conference, Dublin, 4th-6th October

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