



Executive Summary

# Greater Dublin Area Travel Demand Management Study

Dublin, October 2004

Submitted to

**DUBLIN TRANSPORTATION OFFICE**

**OIFIG IOMPAIR ÁTHA CLIATH**

by

**Booz | Allen | Hamilton**  
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In association with:



## **Status of this Report**

***The Greater Dublin Area Travel Demand Management Study Final Report was presented to the DTO Steering Committee in November 2004. The report was considered at a number of meetings and the following decisions were made:***

### **1. Proposed Travel Demand Management Promotion Measures**

*In May 2005, the DTO Steering Committee accepted the recommendations of the Travel Demand Management (TDM) Study Report in relation to the promotion of Travel Demand Management.*

*In December 2005, the DTO executive proposed the establishment of a Regional TDM Promotion Unit to develop and oversee the development of the TDM study recommendations in this area. The DTO Steering Committee noted that the proposal for the Regional Unit raised issues regarding staffing (within the constraints of government numbers), and funding. For these reasons, it decided not to proceed with the establishment of a Regional TDM Promotion Unit at this time*

*In the interim, the Steering Committee suggested that the DTO Executive should look at ways to move the proposals forward.*

### **2. Proposal on Managing Travel Demand through the Land Use Planning System**

*In September 2006, Section 6 of the TDM Study Report – “Managing Travel Demand Through the Planning System” - was agreed by the DTO Steering Committee, with some amendments. The agreed version is contained in the Final Study Report.*

### **3. Proposed Travel Demand Management Fiscal Measures**

*In May 2005, the DTO Steering Committee decided not to proceed with further work on charging for free workplace parking.*

*In May 2005, the DTO Steering Committee also agreed in principle to procure additional investigative work in relation to a congestion charging scheme*

*This work was to include a stated preference survey, to better determine the expected driver reaction to congestion charging. In November 2005, the Steering Committee decided to proceed with this work in 2007.*

*In the meantime, the Steering Committee suggested that the DTO look into a variety of different technology options for road user charging– aiming to build on technologies that have been tested elsewhere.*

*In this regard, the DTO Executive is continuing to keep technology options tested or in use elsewhere under regular review.*

## Executive Summary

### Background

Booz Allen Hamilton, in association with ERM, HOP and Halcrow, was engaged by the Dublin Transportation Office (DTO) in November 2002 to undertake a Demand Management Study for the Greater Dublin Area (GDA). Travel Demand Management is part of the Dublin Transportation Office's *A Platform for Change – Transport Strategy 2000-2016* which describes Demand Management as the second, interdependent element of the Strategy:

*“which seeks to reduce the growth in the demand for travel while maintaining economic progress, and which is designed to encourage a transfer of trips to sustainable modes”*

The first element of the strategy is the supply of infrastructure projects and service improvements.

### What is Travel Demand Management?

Travel Demand Management (TDM) is the implementation of programmes of measures which seek to change travel demand patterns by:

- **Trip reduction** – to reduce the need to travel and thereby reduce overall travel demand
- **Reduction in vehicle use** – in particular, to reduce the amount of car travel
- **Increase in vehicle occupancy** – to reduce the amount of single occupancy car trips and increase car occupancy
- **Increased travel by alternative modes** – this includes measures to encourage public transport use, walking and cycling in preference to car
- **Trip retiming** – to encourage travel at less congested times
- **Offering alternative destinations** – to encourage travel to destinations that are closer, and that lead to less overall congestion
- **Reduction in trip length** – by planning for the provision of employment, retail and other services closer to where people live.

TDM programmes are thus primarily demand oriented rather than supply oriented i.e. they attempt to manage people's travel rather than seeking to provide more physical capacity for travel (such as more roads, bus and train services etc).

### Study Objectives

The main objectives for this TDM study can be summarised as:

- To reduce the need to travel, particularly by private car; and

- To yield a greater modal share for public transport over and above that achievable through the transport supply measures/infrastructure proposals described in '*A Platform for Change 2000 – 2016*'.

## Study Process

The study process was set out in the DTO's Terms of Reference as follows:

- Initial consultation;
- Research and development of potential measures based on international experience, previous experience in the GDA and current travel demand trends in the GDA;
- Initial assessment of potential measures;
- Consultation on feasible measures;
- Assessment of the transport impact of feasible measures and packages of measures; and
- Evaluation of preferred package(s) of measures.

## Why is Travel Demand Management required in the Greater Dublin Area?

Demand for travel in the GDA has increased rapidly as a result of increased economic activity and prosperity, reflected in a growing population and workforce.

- The Irish GDP grew from €36,300 million in 1990 to €129,300 million in 2002;
- The population of the GDA grew from 1,405,000 in 1996 to 1,535,000 in 2002; and
- The number of residents of the GDA in employment grew from 511,000 in 1996 to 680,000 in 2002.

Transport demands generated by a growing population and workforce are challenging to meet. The task is made more difficult as increasing numbers of people are housed in outer parts of the GDA where public transport supply is limited and where local services may only be accessible by car.

Average speeds on roads into the city in the morning peak hour (8am-9am) in 2001 were 16kph (10mph)<sup>1</sup>. By 2008, without travel demand management, it is forecast that slow speeds will be more widespread and average speeds on the routes into the city will be 11kph (7 mph).

Such congested road conditions are inefficient and detrimental to the economy of the GDA and the well being of its inhabitants. For sustained economic development, travel demand needs to be better managed, employing two tactics:

- Reducing demand by locating activities so that travel distances are shorter – or using information and communications technology (ICT) to substitute physical trips with virtual trips; and

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<sup>1</sup> DTO Transport Model

- Encouraging a shift from private car trips to more sustainable modes including public transport, walking and cycling.

There are two aspects to the second tactic. The first aspect takes the form of major public transport improvements such as the Luas and the upgrading of the DART and suburban rail network. In the longer term, very substantial public transport infrastructure is proposed in the *Platform for Change*. Along with initiatives to promote cycling and walking, these amount to a large incentive to change travel behaviour. Nevertheless, a second aspect, that of car restraint, will still be needed to persuade people not to continue to use their cars. This is evidenced by the forecast that, without demand management, average morning peak hour speeds on the radial routes into the city would fall to 9 kph (5.5 mph) in the year 2016, even with the proposed *Platform for Change* infrastructure completely in place.

## The Problems to be Tackled

The problems to be tackled by TDM can be summarised as follows:

- The population has become more dispersed resulting in less sustainable settlement patterns which are reflected in a high mode share for car use – over 80% of trips made outside the M50 between 8am and 9am are by car;
- The share of trips to school and work made by car is increasing;
- The absolute number of trips to work by car is increasing;
- In 2002, 50% of all those travelling to work (150,000 people) in the Dublin City Council area did so by car;
- In the future, average car speeds are forecast to decline throughout the GDA; and
- Speeds are currently slower in the central areas than elsewhere, and this trend will continue into the future.

## The Preferred Package of Travel Demand Management Measures

To address the problems, a package of TDM measures is required that:

- Influences land use planning policy and practice leading to more sustainable, less car dependent, settlement patterns in the GDA
- Facilitates drivers who would like to reduce their car use, particularly for trips to work and to school; and
- Strongly discourages unnecessary car use in certain areas where alternatives are available.

The package of measures also needs to be capable of implementation throughout the GDA in the short to medium term (to 2008). To achieve this, a package of measures is being considered which is best described in three groupings:

- **Measures that can be implemented through the planning system** – this includes measures through from long term spatial planning to development control for individual developments to regional parking restraint measures;

- **Measures to promote travel demand management** - incentive measures including car sharing, flexible working, individual marketing and all measures to encourage people to change their travel behaviour in favour of less driving. Typically, these measures would be packaged into a Travel Plan for an individual site or group of sites; and
- **Fiscal measures** – measures that introduce financial penalties to discourage car use.

#### **The Preferred Package**

- Land use planning measures
- Measures to promote travel demand management
- Fiscal Measures:
  - A City Centre Congestion Charge of €10 applicable between the hours of 7am and 10am to drive in the area within the canals
  - A workplace parking levy in the rest of the Dublin Counties and the Development Centres in the Hinterland Counties. This would be set in line with the market price for parking in each local area which is within the following ranges €1,000 - €4,500 in the City Council area (outside congestion charging area), €600 - €3,600 in the other Dublin Local Authorities and €350 - €900 in the Hinterland Growth Towns.

## **Managing Travel Demand Through the Planning System**

The measures proposed for implementation through the planning system are diverse and wide ranging. They aim to achieve promote land use and transport integration at the strategic level and local level by:

- Consolidation as far as practicable of population growth in existing built up areas in the GDA region, where accessibility to work, leisure and other destinations by foot, cycle and public transport is generally better;
- Location of major trip-intensive land uses in areas well served by public transport or in areas that will be well served by public transport in future<sup>2</sup>;
- Relating the scale of urban centres to public transport accessibility<sup>3</sup>;
- Location of major trip-intensive land-uses as far as practicable in defined higher-order centres (e.g. city, town or district centre);
- Regional maximum parking standards, and the relation of maximum permitted parking provision to the scale and density of new developments to current and future<sup>4</sup> public transport accessibility, and to the scale and proximity of the nearest centre;
- Providing a mix of local services within walking distance of their surrounding neighbourhood;
- Designing all new developments with walking, cycling and public transport in mind;

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<sup>2</sup> As set out in the DTO's strategy *A Platform for Change*.

<sup>3</sup> Accessibility measure based on existing and future population within a maximum public transport journey time, taking account of walk, wait and transfer time, and access delays that may occur due to lack of provision of sufficient public transport capacity.

<sup>4</sup> As set out in the DTO's strategy *A Platform for Change*.

- Relating maximum permitted parking provision for new developments to existing and future public transport accessibility, and proximity to the nearest centre.

Some of the above recommendations were proposed for inclusion in the Regional Planning Guidelines for the Greater Dublin Area, during their preparation in 2004. Guidance at a regional level is required so that all local authorities act in a consistent manner, providing a “level playing field” in terms of TDM policy.

In summary, new development should be oriented towards non car use and should underpin existing centres of activity. In addition, new development that is likely to attract a large number of people should be highly accessible by public transport, cycle and on foot.

## Measures to Promote Travel Demand Management

The application of incentives, marketing initiatives or other practical measures to promote travel demand management has been considered in terms of their potential to reduce car use for journeys to work and education. The measures focus on the workplace, schools, information and communications technology (ICT) applications and the possible role of marketing. Going forward, the larger employers, including local authorities and Government Departments, are considered to be key to a wider take up of workplace travel plans by implementing plans and advertising the positive results. It is therefore important that they put in place work place travel plans within the next few years. Guidance on implementing plans has already been prepared by the DTO<sup>5</sup>.

Potential components of **workplace travel plans**, or *Mobility Management Plans*, may include:

- Working with employees to address perceptions, fears and practical difficulties in overcoming car dependency;
- Establishing databases to assist ridesharing;
- Developing car pooling schemes;
- Providing shuttle services to nearby rail or bus services;
- Putting in place on-site measures to make cycling and walking safer and more attractive, e.g. footpaths, cycle lanes, crossings, secure cycle parking, shower facilities for cyclists;
- Providing incentives to use non-car modes;
- Introducing staggered or flexible working hours so that employees can avoid travel in the peak hour;
- Allowing compressed working weeks so that employees work a four day week, or nine day fortnight, but a longer day;
- Promotion of working at home, teleworking or working at another site to employers and assistance or technical support with implementation;
- Reducing the amount of car travel undertaken for work purposes by increasing the use of telecommunications;

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<sup>5</sup> “The Route to Sustainable Commuting”: An Employers Guide to Mobility Management Plans, DTO, 2001



- Introducing travel allowances and reimbursements that encourage non-car travel as a replacement for the current arrangements in some organisations which act as a financial incentive to unnecessary use of cars for commuting and business trips; and
- Restricting parking, e.g. giving priority for parking to ride sharers or individuals with certain needs - many successful travel plans are driven by a shortage of on-site parking.

In the longer term, employers' recruitment policies can also be included in the workplace travel plan. For example, employers can target employment in local areas, particularly those served by public transport. Employees can also be recruited with the understanding that free parking is not provided. Additionally, a long term workplace travel plan can ensure that any future relocation of the workplace is to a site that is accessible by non-car modes.

A workplace travel plan is, in effect, a site-specific (or multi-site in the case of some employers) demand management plan. Workplace travel plans can also cover more than one employer, for example, at the East Point Business Park, one plan serves all the employers located within the park

**School travel plans** are designed to overcome the barriers for pupils to walk, cycle or take public transport to school. The basic aim of school travel plans is to arrest the rapid growth in travel to school by car. School travel plans may include some or all of the following measures:

- Working with teachers, pupils and families to address perceptions, fears and practical difficulties in overcoming reliance on the car and agreeing a school policy to actively promote sustainable school travel;
- A toolkit of practical measures including walking, cycling, training, encouraging bus use, car lift sharing, incentive schemes, curriculum based promotion and managing parking and drop off; and
- Putting in place infrastructure to support the school travel plan and make the route to school safer to walk or cycle and creating a pupil centred front of school environment.

**Individual marketing** provides transport advice and information to people, based on an understanding of their personal trip patterns. This involves one-to-one interviews. Travel information is then offered which has been individually tailored and which encourages modal shift away from the car. The individual marketing approach is effective because many people make journeys by car for which a reasonable alternative (public transport, walking or cycling) already exists, of which they are unaware.

An individual marketing programme in the GDA may be worthwhile, particularly as public transport, pedestrian facilities and the cycle network have improved markedly in recent years and will continue to do so with the introduction of Luas, the DART upgrade, the Quality Bus Network and the expansion of the regional cycle network. It would be advisable to start with a pilot project in one area before embarking on a large-scale programme.

Rather than changing the mode by which people travel, **information and communications technology** can be used to alter the ways in which people fulfil their aspirations for mobility and access to work, services and shopping. This is referred to as "virtual mobility", a term that focuses on how activities can be undertaken without being dependent on physical mobility. The following possible measures are recommended to promote virtual mobility as



an alternative to physical mobility. They require working in partnership with other agencies and would not be promoted purely as travel demand management measures.

- Awareness campaigns both for organisations and for the wider public about the possibilities for reducing travel through virtual mobility;
- E-work pilots and programmes, promoting e-work amongst local organisations, including public sector organisations, with the development of flagship pilots and programmes;
- Telework centres - developing “telework centres” as have been developed in and around some US cities;
- E-commerce - promoting online shopping/home delivery amongst local firms and consumers;
- E-services - continuing to promote the use of online services - government and local authority services, online learning, telemedicine, etc and/or
- Development of “wired-up communities” - in collaboration with other stakeholders (public agencies, telecommunications companies, etc.) promoting “wired up communities” projects, to help overcome the digital divide, promote local work opportunities in less favoured areas away from the urban centre, and encourage use of online services.

## **Fiscal Measures**

The two fiscal measures that are under consideration are a charge on free workplace parking and city centre congestion charging.

### **Congestion Charging**

The preferred congestion charging area would be the area “within the canals”. The area has the advantages of a well defined boundary and the highest level of public transport provision in the GDA. Dublin City Council’s Outer Orbital Route would be outside the zone, providing diversion routes. The proposed Macken Street Bridge, which has been assumed to be in place by 2008, would also be outside the zone.

All vehicles moving in the charging zone during the hours of operation would need to purchase a licence, which would allow unlimited trips during that period. The charge would not apply at weekends and on bank holidays. Stakeholder consultation indicated a strong preference for morning peak only operation (7am to 10am), so that shoppers and other visitors arriving late morning onwards would not have to pay the charge.

The most appropriate technology to administer and enforce the congestion charge is currently considered to be that used in the London congestion charging scheme. Other feasible alternatives may emerge in future when the London scheme matures and planned schemes are introduced in Stockholm (2005) and Edinburgh (2006). The preferred system would work as follows:

- Drivers purchase a licence to drive in advance or on the day of travel by various media e.g. retail outlets, online, telephone, text message, etc;

- The driver's registration number is then entered in a database of vehicles licensed to drive in the charging area on that day;
- Cameras monitor and record the registration numbers of cars entering and driving within the charging zone during the charging hours; and
- The registration numbers are compared with the database and penalty notices are issued to registered owners of any vehicles without a valid licence.

### **Charges on Free Workplace Parking**

A charge on free workplace parking is considered to be a measure that would be effective across the entire GDA, addressing the rapid growth in demand even in non-central areas. The charge could be implemented either by a workplace parking levy or "benefit in kind" taxation policy. With a levy, the employer would pay in the first place and then choose whether or not to pass onto the employee. With a taxation policy, the parking space would be declared by the employer and/or employee as a benefit in kind and would be paid for by the employee. Of these two options, the workplace parking levy was preferred, however, benefit in kind taxation would also be a possible option, and much better than doing nothing. For these reasons, a charge on free workplace parking is included in the preferred package of measures, as follows:

- It would apply in the Metropolitan Area and Development Centres (Large Growth Towns and possibly other Growth Towns) in the Hinterland Area of the GDA;
- It would not apply in the same area as the Congestion Charge; and
- The cost of the levy would vary locally depending on the local market price for parking.

By comparison with the congestion charge, a workplace parking levy (or taxation) would not be costly to introduce and administer. However, many practical difficulties have been recognised such as setting an acceptable yet effective level of charge, ensuring all the required spaces were registered, compiling an inventory of spaces, ensuring local on-street parking controls were in place to prevent transfer from car parks etc. As a result, there is less confidence that such a charge would be acceptable throughout the GDA, or even within designated centres in the GDA, or that it would be implemented in an effective manner. There is no comparable example of a regional workplace parking levy elsewhere that could be used as a model.

### **Other Fiscal Measures Considered and Rejected**

Other fiscal measures considered and rejected during the study include an increase in fuel duty, tolls on the M50, regional road user charging and a road user charge for inbound traffic on radial roads crossing the M50. When assessed, these options were seen to be either less effective or likely to be less acceptable, at least in the short term than the preferred options of central area road user charging and workplace parking charges. Some also had less scope for implementation in the short to medium term. However, we consider all of these options should remain under consideration for the longer term when congestion is likely to be more widespread, or public transport is improved, or additional technological options become available.

## Complementary Measures

Complementary measures may be required to make the TDM measures **effective**, for example:

- City Centre congestion charging would be more effective if traffic signals on the junctions on the Outer Orbital Route were adjusted;
- For the workplace parking levy to be effective, on-street parking controls would be required in all areas where the levy is applied; and
- For school travel plans or workplace travel plans to be effective, investment in, for example, footpaths on the approaches to the site may be required if footpaths are not already provided or are of a poor standard.

Other complementary measures may be required to make the TDM measures **acceptable**, for example:

- Traffic management measures in residential areas (or other sensitive 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 Development Centres/Growth Towns e.g. financial support for a travel plan which would off-set the workplace parking levy and provide a more level playing field with employers outside the workplace levy area.

The above examples are all directly related to the proposed TDM measures, and would not take place otherwise. Equally, the TDM measures are less likely to be adopted without the complementary measures. Therefore a budget has been allowed for their provision, although individual measures have not been specified.

There are two further categories of complementary measures which it may be appropriate to finance from the TDM budget:

- Non-transport measures, for example, marketing initiatives to ensure the City Centre remains a vital and vibrant centre for shopping and cultural activities; and
- Additional buses.

The TDM measures are themselves complementary to long term transport strategy, for example, *A Platform for Change*.

## The Benefits

The benefits of the preferred package would be primarily to reduce the number of car trips on the road network in the GDA. The resultant impacts were calculated using the DTO Transportation Model, for the morning peak hour (8am to 9am):

- Congestion would be reduced substantially – some 30,000 vehicle-hours (over 12% of total) would be removed from the road network in the morning peak hour alone;
- The amount of travel undertaken by car would be reduced substantially – total travel in the peak hour would be reduced by some 340,000 vehicle-kilometres (5% of total);

- Some 25,000 people would transfer from car to public transport in the peak hour, representing a 19% increase in public transport patronage;
- Average morning peak hour bus speeds would increase by 15%; and
- Average morning peak hour car speeds would increase by 8%.

These changes would result in other benefits:

- An estimated saving of 70 road traffic accidents per year, 15 of which would be fatal or serious; and
- An estimated 33,000 tonne reduction in CO<sub>2</sub> emissions per year, as well as substantial reductions in local air pollution.

The monetary value of the benefits arising from the preferred package is substantial, and has been calculated to be over €400 million per annum.

## **The Estimated Costs**

The estimates of costs associated with the Preferred Package for the first full year of implementation (2008) are set out below. Establishment costs over the first three years are expected to reach €154 million, this will include traffic management measures which will be spread out as they are implemented over time. It is expected that a number of one off launch costs, estimated at €8 million will also be incurred. The annual operating costs of the congestion charge far outweigh those associated with the other measures combined and are likely to account for over 95% of the annual operating costs of the Preferred Package.

The cost estimate assumes that the economic-life for the congestion charging equipment is 12 years. Thereafter renewal is required. Given the total recurrent cost range of €67 - 127 million per annum, we assumed a mid range estimate of €97million per annum for the purpose of the appraisal.

The annual operating cost (recurrent cost) of the scheme has been based on the scheme currently operating in London. It is possible that the costs of congestion charging will fall in future as more experience is gained in London and other cities such as Stockholm (congestion charging planned for 2005) and Edinburgh (congestion charging planned for 2006).

### Costs Associated with Preferred Package

Item	€ million
<b>Capital Costs</b>	
<i>Congestion Charge</i>	
System set-up – over 3 years	50
Complementary traffic management measures – over 2 years	44
Education / awareness programme – one-off	5
<i>Work Place Parking Levy</i>	
Inventory & database development – one-off	1
Complementary traffic management measures – over 3 years	25
Education / awareness programme – one-off	1
<i>TDM Support Measures</i>	
Establishment costs – one-off	2
Complementary traffic management measures – over 3 years	25
Launch costs - one-off	1.5
<b>Total Capital Costs (over 3 years)</b>	<b>154.5</b>
<b>Recurrent Costs</b>	
<i>Congestion Charge</i>	
Scheme administration – recurrent	5 pa
Scheme operations – recurrent	60-120 pa
<i>Work Place Parking Levy</i>	
Scheme administration – recurrent	1.3 pa
<i>TDM Support Measures</i>	
Scheme administration – recurrent	1.0 pa
<b>Total recurrent costs</b>	<b>67-127 pa</b>

## The Economic Case

The economic case examines the balance between the costs of introducing and operating the package, and the benefits to the community such as travel time savings, reduced road traffic accidents, reduced vehicle operating costs and environmental improvements. The costs and benefits associated with the preferred package over a 25-year period were calculated, indicating:

- Present Value Costs: €1.62 billion
- Present Value Economic Benefits: €4.59 billion
- Benefit/Cost Ratio: 2.84.

This represents a very strong economic case for the Preferred Package. Sensitivity analyses indicated that the economic case is also very robust – there would be a strong case even if the capital and operating costs were 50% higher than forecast, or if there was less reduction in traffic than forecast. In summary, the Preferred Package would deliver overwhelming net economic benefits to the community.

If the Preferred Package was implemented without the workplace parking levy, (referred to as Reduced Package 1) the resultant reduction in economic benefits would be significant, but there would still be a strong economic case for the reduced package, even if the capital and operating costs were higher than forecast.

The economic case for a package with a €5 congestion charge and measures to promote TDM and without the parking levy (Reduced Package 2), indicated a reasonable economic case, unless outturn capital and operational costs were significantly greater than expected.

## The Financial Case

The financial case examines the balance between the revenue raised by the Preferred Package and the capital and operating costs. As indicated in the table below, the annual revenues are substantial.

**Annual Revenues Associated with Preferred Package**

Item	€ million
Revenues (annual)	
Congestion Charge fees paid by those crossings the canals	144
Congestion Charge fees paid by residents within the canals	94
Work Place Parking levies paid for spaces within the GDA	81
Total	319

These estimates assume a congestion charge of €10 (payable for travel in the congestion charging zone between 7am and 10am, Monday to Friday) and average annual workplace parking levies of €2,000 in Dublin City Council area, €1,000 in Fingal, Dun Laoghaire-Rathdown and South Dublin and €500 in the Development Centres/Growth Towns in the Hinterland counties. In practice, the levy may vary across each local authority area in line with the local market price for parking.

Over a 25-year period, the Present Value of Revenues would total some €3.58 billion. Given a Present Value of Costs over the same period of €1.62 billion, this represents a 2.21 ratio of revenues to costs. A strong financial case for the Preferred Package is therefore indicated. Sensitivity analyses show that the financial case is robust, that it would be an attractive commercial proposition even if revenues were 30% lower than forecast and capital and operating costs were 30% higher than forecast.

If, as is the case in London, various categories of drivers were to be exempted from paying the congestion charge or heavily discounted (e.g. residents of the zone, taxis, emergency services, disabled badge holders and several other candidates), this could reduce the revenue by some €1.21 billion over the 25-year evaluation period. However, the financial case would still be reasonably strong.

The preference for morning only operation of the congestion charging scheme has significant financial implications. An all-day scheme, operating from 7am to 7pm (or 6:30pm as in London), would raise some €4.7 billion additional revenue over the 25-year evaluation period. It would therefore be stronger financially and give greater scope to offer discounts and exemptions and fund complementary measures.

Conversely, if congestion charging was to operate in the morning only (7am – 10am), as proposed, the need to offer extensive exemptions and discounts is questionable as drivers would have the choice to drive without paying after 10am. As far as potential exemptions for residents of the charging zone are concerned, it is noteworthy that they form the group

that will benefit most from reduced traffic flows and the resulting environmental benefits, and from faster bus and tram services.

If the Preferred Package were amended so that the congestion charge was set at €5 per day, and the workplace parking levy were not included (referred to as Reduced Package 2), significantly less revenue would be generated. The financial case would be substantially weakened and commercial success would only be achieved if the operating costs associated with the congestion charge were at the lower end of the expected range and/or the congestion charging scheme operated all day.

## Conclusions

A viable travel demand management package and programme, capable of implementation in the short to medium term, has been prepared for the Greater Dublin Area. It is the result of extensive research of best practice internationally and locally, consultation and the assessment of the performance of a wide range of options in the GDA for the forecast year of 2008.

### The Preferred Package

- Land use planning measures
- Measures to promote travel demand management
- Fiscal Measures:
  - A City Centre Congestion Charge of €10 between the hours of 7am and 10am to drive in the area within the canals
  - A workplace parking levy in the rest of the Dublin City Council area, the other Dublin local authorities and the Development Centres/Growth Towns in the Hinterland Area set in line with the market price for parking in each local area

The introduction of this package of measures would have very substantial benefits for the GDA, even in the short to medium term, which would greatly outweigh the costs of introducing the scheme. These include a reduction in congestion, a reduction in overall car use, an increase in public transport patronage, increased speeds for buses and other vehicles, accident savings and reductions in emissions. The extent of the benefits means that the economic case for the Preferred Package of measures is overwhelmingly strong. There is also a robust financial case for the introduction of the measures i.e. the revenues raised would amply cover the capital and operating costs, and provide funds for complementary measures such as public transport improvements.

If the workplace parking levy were not introduced, the resulting “reduced package” would also have a strong economic case, as it too would deliver substantial benefits to the GDA. Excluding the workplace parking levy would reduce the revenue generated, but there would still be a robust financial case for such a package.