

# Strategy Appraisal Report

## **Greater Dublin Area** **Draft Transport Strategy** **2011-2030**

**2030 vision**





## Assembling and Appraising Strategy Packages

Greater Dublin Area Transport Strategy 2010-2030

Draft Report for consultation

JMP Consultants Limited  
Blackfriars House  
Parsonage  
Manchester  
M3 2JA

T 0161 831 5600  
F 0161 831 5601  
E manchester@jmp.co.uk

[www.jmp.co.uk](http://www.jmp.co.uk)

Job No. COR1001

Report No. 1

Prepared by BA

Verified LB

Approved by BA

Status Draft

Issue No. 1

Date 28 February 2011



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### Contents Amendments Record

This document has been issued and amended as follows:

Status/Revision	Revision description	Issue Number	Approved By	Date
Draft		1	BA	20/01/2010
Draft for issue		1	BA	28/02/2011

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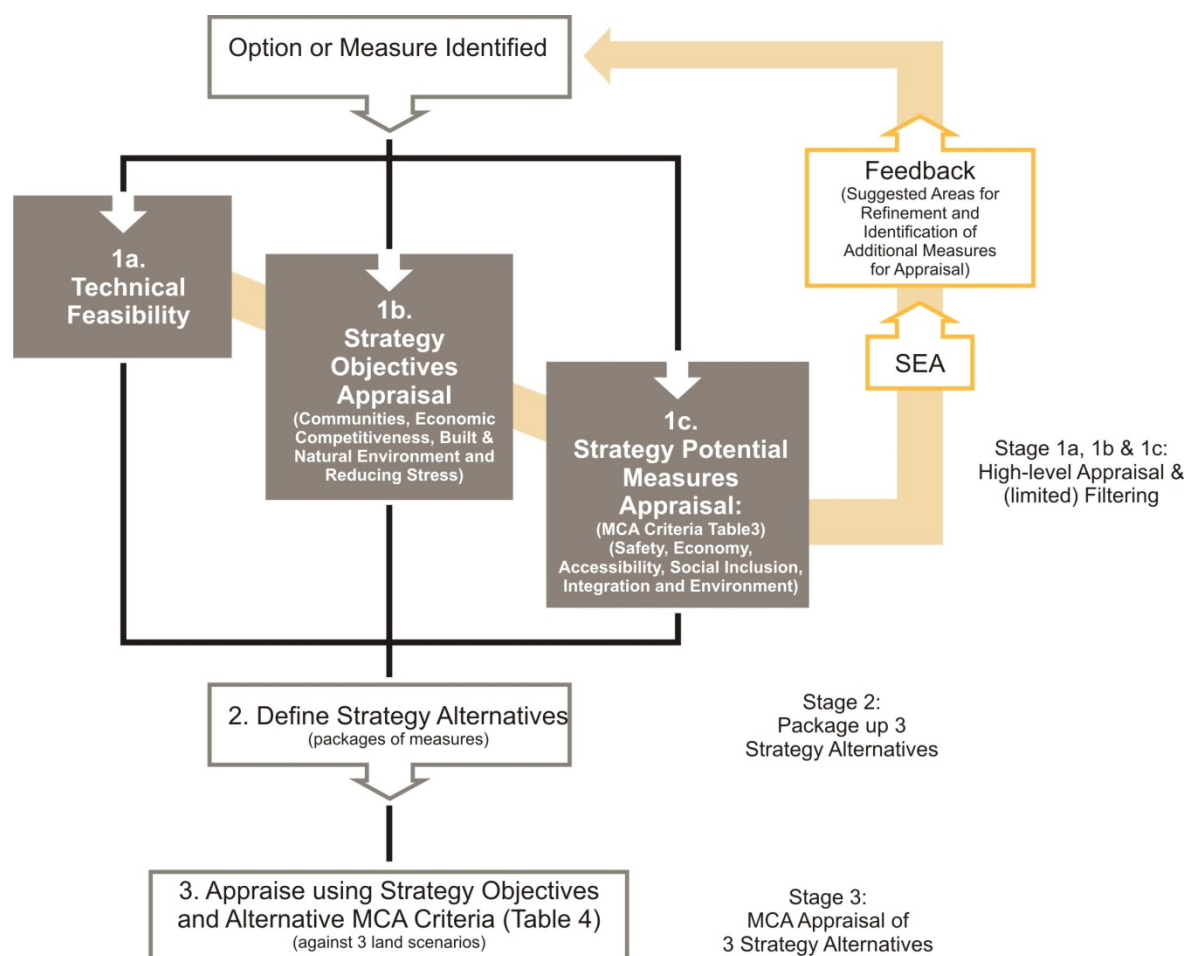
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# 1. Introduction

## Background

- 1.2 JMP Consultants Ltd. (JMP) and partners, MRC McLean Hazel (MRCMH), were appointed by the former Dublin Transportation Office (DTO) in July 2008 to provide assistance in developing the '2030 vision' transport strategy for the Greater Dublin Area. This responsibility was taken over by the newly-formed National Transport Authority on its inception on 1 December 2009. This report covers work undertaken under the auspices of both bodies.
- 1.3 JMP, in close consultation with the DTO and its partners, developed an objective-led approach to appraising measures and packages for the strategy. Following completion of Stage 1 of the process – a high-level appraisal of a number of potential strategy measures, as outlined in **Figure 1.1** – it was necessary to construct “strategy packages” (of short-listed measures) to take forward to more detailed appraisal. This report will provide details of that process and the results obtained.

**Figure 1.1 GDA Transport Strategy Process**



## Stage 1 Feasible measures identification

- 1.4 Stage 1 involved the identification and appraisal of the long list of high-level measures. This provided a list of appraised generic measures to be taken forward to Stage 2, which focuses on the packaging of these measures and the definition of implementable alternative strategy proposals. The process and results were summarised in JMP's report "Greater Dublin Area Transport Strategy 2010-2030 – Feasibility Assessment of potential strategy measures" published in February 2009.

## Stage 2 Strategy Alternative development

- 1.5 This report begins by detailing the Stage 2 process that JMP used to package the appraised high-level measures and how specific proposals within these packages were generated through an extensive engagement process with the key local authority and transportation agency stakeholders.
- 1.6 This sections sets out how individual strategy alternatives have been developed and how component measures were defined in detail to allow the initial package appraisal to be undertaken.
- 1.7 The stages undertaken in Stage 2 were therefore those shown under 'Packaging' in **Figure 1.2** i.e.:
- The identification of three thematic objectives-led strategy package alternatives – Economic, Environmental and Social – using outputs from Stage 1, high-level feasible measures appraisal
  - The allocation and categorisation of measures within each package – managing potential negative impacts of certain measures and establishing the likely benefits of certain interactions
  - Generating location and mode-specific proposals and developing them into feasible options
  - How these proposals were then allocated into one or more packages for the appraisal stage

## Stage 3a/b Strategy Alternatives Appraisal

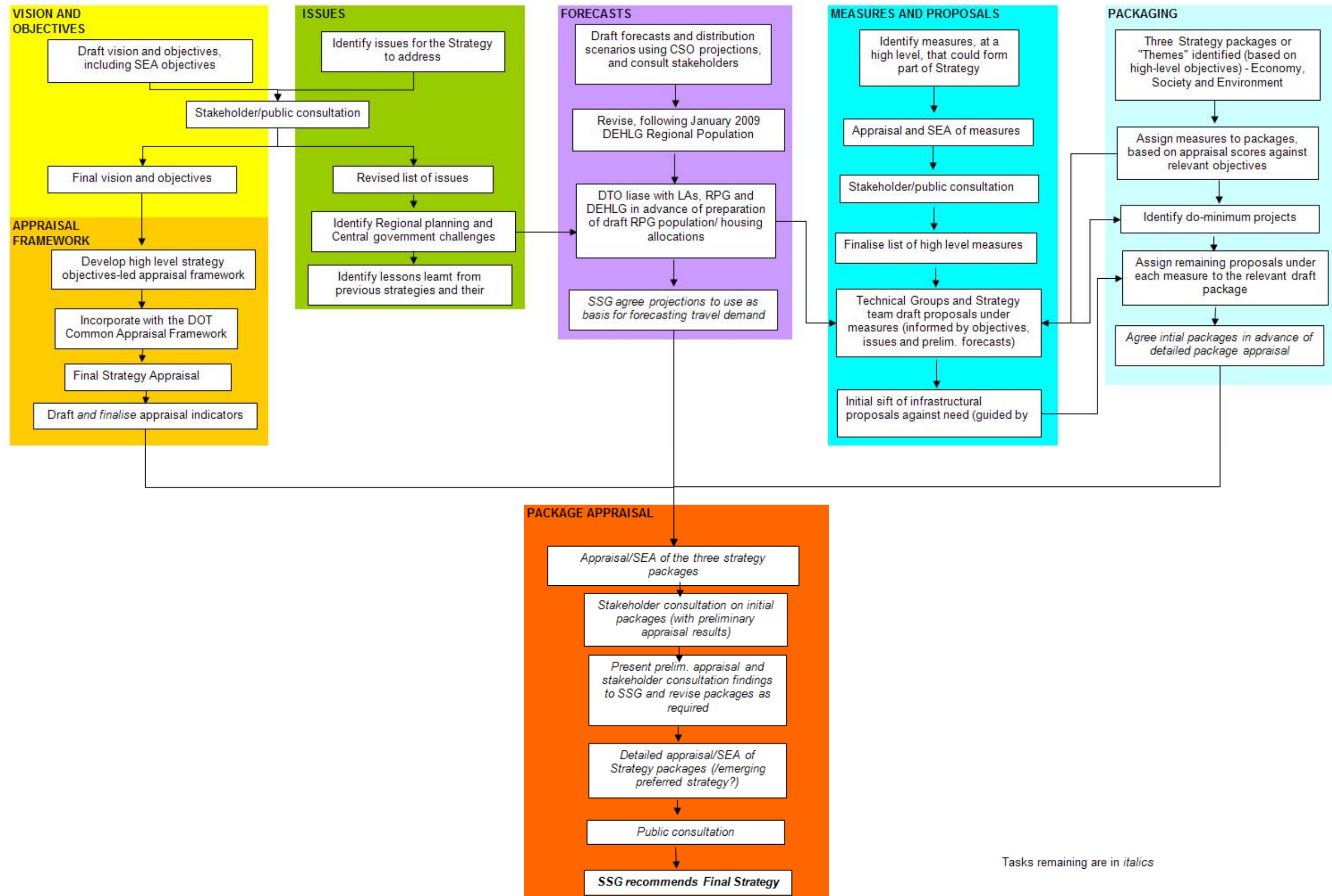
- 1.8 Following a stakeholder consultation phase and further testing at option, corridor and scheme levels, finalised Strategy Alternative Packages were agreed and taken forward for formal appraisal. The final Strategy Alternatives contained a mix of road and public transport infrastructure schemes and high-impact policy measures (such as road user charging), targeted at the relevant objectives.
- 1.9 Packages were compared both to a future year Do-Minimum scenario and to each other. This was undertaken using the revised Strategy Appraisal Framework, with a two-stage process of assessment against the strategy-specific sub-objectives followed by formal Multi Criteria Appraisal.
- 1.10 The best performance overall related to the contribution of new public transport (especially rail) infrastructure, which was strongest in the Economic package, and the impact of per-kilometre road user charging, implemented in the Environmental package. These and complementary measures (both physical, for walking and cycling, and policies including parking restraint) were taken forward.

## Stage 3c/d Final Strategy Assembly and Appraisal

- 1.11 Based on the conclusions from the Strategy package appraisals, guidelines for assembling a draft final strategy were agreed, resulting in the prioritisation of appropriate public transport capacity in each corridor (rail, Luas or bus priority/rapid transit) relative to anticipated demand, backed up by GDA-wide road user charges and parking restraint at major centres of employment/development.
- 1.12 As well as these measures, which were capable of being modelled and quantitatively appraised, a wide range of policy measures and more local interventions were developed for strategy chapters – these include hinterland town bus networks, pedestrianisation of district centres and cycling routes.
- 1.13 Appraisal of the resulting Draft Strategy was once more undertaken in two stages, with an additional final stage of transport economic analysis to consider the level of benefits achieved (for users and the public purse) in relation to the costs of delivering the strategy – the benefit:cost ratio.
- 1.14 This analysis shows that, overall, the resulting Draft Strategy is feasible, delivers high levels of benefits against the required investment, and maximises outcomes against most of the objectives. Along with the specified range of complementary polices and measures to support shorter trips by sustainable modes, the strategy would provide an improved transport system in 2030's conditions.



Figure 1.2 Detailed Stages of the Strategy Process (as at 1 December 2009)





## 2. Assembling Strategy Packages

- 2.1 Having completed the Stage 1a, b and c scoring of Feasible Measures, JMP identified a number of possible ways that the appraised measures could be allocated into three strategy packages. Internal workshops were held with the DTO to discuss possible packaging approaches.

### The Objectives-led Approach

- 2.2 It was agreed, following some discussion, that an objectives-led approach had merit, for the following reasons:
- It is in keeping with the overall desire for an objectives-led strategy;
  - The five high level objectives lend themselves to grouping into 3 higher order themes, (economy, environment and social) and strategy packages could be built on this basis;
  - The strengths of proposals (i.e. schemes/programmes with defined locations, scale etc., under each measure) in delivering each of those themes could be assessed using the appraisal framework; and
  - The relative importance placed on each of the three themes in a final strategy could, potentially, be informed by the relative importance attached to objectives by the stakeholders and the public, producing a 'balanced' approach.
- 2.3 The parallel SEA process expects that the strategy packages that are tested should be 'valid' – i.e. that any one of those considered could be implemented, if required. Therefore each of the packages has to be realistic and feasible, in case they are selected as the preferred strategy.
- 2.4 Hence, the approach that was agreed with the Strategy Steering Group (SSG) was to use an objectives-led approach to developing the three strategy alternatives: one for "economy", one for "environment", and one for "social".

### Constructing the Strategy Packages

- 2.5 Having agreed in principle to this objectives-led approach to packaging, JMP developed a methodology for using the Stage 1 scoring to help construct the three thematic packages.
- 2.6 It was decided to use the scoring from specific objectives to develop each strategy package as defined below:
- Economic package: build the package around measures that achieved a high positive score against the "improve economic competitiveness" and/or the "reduce personal stress" strategy objectives.
  - Environment package: build the package around measures that achieved a high positive score against the "improve the built environment" and/or "respect and sustain the natural environment" objectives.
  - Social package: build the package around measures that achieved a high positive score against the "build and strengthen communities" and/or the "reduce personal stress" objectives.
- 2.7 As the "reducing personal stress" objective covers all personal journeys, including commuting, it is included in both the economic and social packages. If this objective was not included in the economic package then a bias towards business journeys would result, with no economic value given to commuting. Similarly, if personal stress was not included in the social package then this package would not reflect the social benefits of enhanced personal travel. However, a high score

against 'stress' alone – with no corresponding positive score for 'economy' or 'communities' - should not guarantee inclusion in the economy or social packages respectively.

- 2.8 The high-level objectives and transport specific sub-objectives associated with the three strategy alternative package themes are set out in **Table 2.1** below.

**Table 2.1 Strategy Packages and Associated Objectives**

Strategy alternative	Final high-level objective	No.	Final related sub-objectives
Economic	Objective 2 – Improve economic competitiveness	2.1	Improve journey time reliability for business travel and movement of goods
		2.2	Reduce overall journey times for business travel and movement of goods
		2.3	Ensure value for money of transport expenditure
		2.4	Support business agglomeration and competition
		2.5	Improve access to GDA ports and Dublin airport
		2.6	Provide for efficient goods distribution, servicing and access to materials
	Objective 5 - Reduce personal stress	5.1	Improve journey time reliability for personal travel
		5.2	Reduce overall journey times for personal travel
		5.3	Improve travel information
		5.4	Improve ease of use of public transport system
Social/Community		5.5	Promote healthier forms of travel and use of public space
		5.6	Improve travel safety
		5.7	Improve travel comfort and the sense of personal security
	Objective 1 – Build and strengthen communities	1.1	Improve accessibility to work, education, retail, leisure and other activities
		1.2	Improve access for disadvantaged people (including physical access for mobility impaired people)
		1.3	Improve links between communities within the region
		1.4	Improve links to the rest of the island of Ireland
Environmental	Objective 3 – Improve the built environment	3.1	Improve and maintain the environment for people movement (e.g. better quality design of streets and open spaces)
		3.2	Improve the quality of design and maintenance of transport infrastructure and vehicles
		3.3	Minimise physical intrusion of motor traffic
	Objective 4 – Respect and sustain the natural environment	4.1	Minimise the impact of transport on air quality
		4.2	Minimise the impact of transport on water quality
		4.3	Reduce greenhouse gases associated with transport
		4.4	Improve efficiency in the use of natural resources, especially non-renewable ones (e.g. land, materials, fuels)
		4.5	Minimise the impact of noise and vibration
		4.6	Minimise adverse impact of transport on biodiversity and natural amenities

2.9 The Stage 1 scores were also used to build the packages as described below:

- For each strategy package, “core” (i.e. high scoring/high impact) and “complementary” (lower impacts, but also likely to be lower cost and/or less controversial) measures were identified.
- ‘Core’ measures are those which scored +2 or +3 in the Stage 1b appraisal against one or both of the relevant objectives, and did not score negatively against a package objective.
- ‘Complementary’ measures are those that scored +1 in the Stage 1b appraisal against a relevant objective.
- Negatively scoring measures are not included in the relevant package.
- Some measures will appear in more than one package but may be delivered differently according to the overall objectives of each package (in terms of scope, scale, location, and/or phasing).

2.10 The final allocation of measures into the three packages, shown in Table 2.2, illustrates this process and also highlights that many measures appear in more than one package.

**Table 2.2 Measures Allocated to Packages**

Measure		Measure appraisal scores			Include measure in package?		
Code (yellow=high scoring)	Measure Name	Econ. score	Env't. score	Social score	Economy	Env'nment	Social
BS1	Enhance bus priority and segregation	0 & 2	0 & 2	2 & 2	Core	Core	Core
BS2	Optimise 'strategic bus network' performance	1 & 2	1 & 2	3 & 2	Core	Core	Core
BS3	Improve carrying capacity of fleet	0 & 1	0 & 1	1 & 1	Cmplmtry	Cmplmtry	Cmplmtry
BS4	Reducing bus delays from boarding and ticketing issues	1 & 2	0 & 1	2 & 2	Core	Cmplmtry	Core
BS5	Enhancement of off-peak networks	0 & 1	0 & -1	2 & 1	Cmplmtry	No	Core
BS6	Expansion of network (spatially)	1 & 1	0 & 1	2 & 1	Cmplmtry	Cmplmtry	Core
CY8	Improve cycle network	0 & 1	1 & 1	1 & 1	Cmplmtry	Cmplmtry	Cmplmtry
CY9	Cycle parking facilities	0 & 1	1 & 1	1 & 1	Cmplmtry	Cmplmtry	Cmplmtry
CY10	Cycle rental schemes	0 & 1	1 & 0	1 & 1	Cmplmtry	Cmplmtry	Cmplmtry
DC1	Region-wide road pricing ('pay-per-km')	1 & 2	1 & 3	-2 & 2	Core	Core	No
DC2	Cordon (or area) based 12 hour congestion charge	0 & 2	1 & 3	-2 & 2	Core	Core	No
DC3	Cordon (or area) based peak only congestion charge	1 & 1	0 & 2	-1 & 1	Cmplmtry	Core	No
DC4	Provide new tolled roads or toll lanes	1 & 1	0 & -2	1 & 1	Cmplmtry	No	Cmplmtry
DC5	Tolling of existing strategic roads (or toll on existing lane on strategic roads)	1 & 2	-1 & 0	-1 & 2	Core	No	No
DC6	Freight charging	-2 & 1	1 & 2	0 & 1	No	Core	Cmplmtry
FM1	Land Value Taxes	1 & 1	1 & 1	3 & 1	Cmplmtry	Cmplmtry	Core
FM3	Car taxes	0 & 0	1 & 2	-2 & 0	No	Core	No
FM4	Fuel taxes	0 & 1	2 & 3	-2 & 1	Cmplmtry	Core	No
FS4	Transfer of freight to rail (incl. narrow gauge), waterways, pipelines and coastal shipping	1 & 1	1 & 1	0 & 1	Cmplmtry	Cmplmtry	Cmplmtry
FS5	Reallocate or provide new HOV or freight lanes; Improve strategic network access to ports and airports; Freight quality partnership measures.	2 & 1	1 & 0	0 & 1	Core	Cmplmtry	Cmplmtry
FS6	Freight quality partnership working including permit systems, distribution transshipment plus local marshalling facilities	-1 & 1	2 & 1	0 & 1	No	Core	Cmplmtry
IG1	Location and design of Health Facilities, Education Facilities and Industrial/Employment Facilities (especially those promoted by Development Agency IDA)	1 & 2	1 & 2	2 & 2	Core	Core	Core
MC1	Support use of motorcycles and mopeds	0 & 0	0 & 1	1 & 0	No	Cmplmtry	Cmplmtry
MM3	Real Time Passenger Information (RTPI - at bus stops, rail stations, by internet/mobile, on board)	1 & 2	0 & 0	1 & 2	Core	No	Core
MM5	Better public transport information plus internet journey planner	0 & 2	1 & 1	1 & 2	Core	Cmplmtry	Core
MM6	Co-ordinated and simplified advanced direction signing on national, strategic and local roads, including freight routes and local cycling/walking signage.	0 & 1	1 & 0	1 & 1	Cmplmtry	Cmplmtry	Cmplmtry
MM7	Live traffic condition information; Live parking Information	1 & 1	-1 & 0	1 & 1	Cmplmtry	No	Cmplmtry
NI1	Improved interchange between modes	0 & 1	1 & 0	1 & 1	Cmplmtry	Cmplmtry	Cmplmtry

Measure		Measure appraisal scores			Include measure in package?		
Code (yellow=high scoring)	Measure Name	Econ. score	Env't. score	Social score	Economy	Env'nment	Social
NI2	Demand responsive services, taxi bus and community transport	0 & 1	0 & 0	1 & 1	Cmplmtry	No	Cmplmtry
NI3	Permit cycles on bus or rail	0 & 1	0 & 1	1 & 1	Cmplmtry	Cmplmtry	Cmplmtry
NI4	Integrated Ticketing	0 & 2	0 & 0	2 & 2	Core	No	Core
NI5	Integrated Fares	0 & 2	0 & 0	2 & 2	Core	No	Core
NI6	Public Transport fares reductions (off -peak 'yield management')	1 & 1	1 & 0	1 & 1	Cmplmtry	Cmplmtry	Cmplmtry
NI7	Lower public transport fares overall	0 & 1	1 & 1	0 & 1	Cmplmtry	Cmplmtry	Cmplmtry
PE1	Enhance quality of public transport vehicles	0 & 2	1 & 0	1 & 2	Core	Cmplmtry	Core
PE2	High quality interchanges	0 & 1	3 & 0	1 & 1	Cmplmtry	Core	Cmplmtry
PE4	Bus stop improvements	0 & 1	1 & 0	1 & 1	Cmplmtry	Cmplmtry	Cmplmtry
PM2	Mixed use development	1 & 2	2 & 2	2 & 2	Core	Core	Core
PM3	Increase availability of wider variation in housing type (reducing need to relocate elsewhere if household size goes up or down)	0 & 1	1 & 1	1 & 1	Cmplmtry	Cmplmtry	Cmplmtry
PM4	Improve permeability and connectivity	0 & 2	2 & 1	1 & 2	Core	Core	Core
PM6	Measures to mitigate adverse transport impacts of new development	0 & 1	2 & 1	1 & 1	Cmplmtry	Core	Cmplmtry
PM9	Measures that encourage or direct high density person trip intensive development in locations accessible by public transport	2 & 2	2 & 2	3 & 2	Core	Core	Core
PM10	Measures that encourage or direct high density residential development in locations accessible by public transport	1 & 1	1 & 1	2 & 1	Cmplmtry	Cmplmtry	Core
PS1	Commuter focused provision	1 & -1	1 & 1	0 & -1	No	Cmplmtry	No
PS3	Control parking for retail, other short stay uses	0 & 1	1 & 2	0 & 1	Cmplmtry	Core	Cmplmtry
PS4	Park and ride (bus based)	0 & 1	1 & 1	0 & 1	Cmplmtry	Cmplmtry	Cmplmtry
PS7	Maximum parking standards applied to developments	0 & 1	1 & 1	-1 & 1	Cmplmtry	Cmplmtry	No
PS9	Control of commuter parking	0 & 0	1 & 2	0 & 0	No	Core	No
RC1	Local road and junction improvements	1 & 1	-1 & -1	1 & 1	Cmplmtry	No	Cmplmtry
RC2	New local road links	2 & 0	-1 & -2	1 & 0	Core	No	Cmplmtry
RC4	Widening of strategic roads	2 & 1	0 & -2	2 & 1	Core	No	Core
RC5	New strategic links/bypasses	3 & 2	0 & -3	2 & 2	Core	No	Core
RC6	New River/Canal Crossings	2 & 2	0 & -2	1 & 2	Core	No	Core
RL3	Improve off-peak service levels	0 & 1	0 & 1	1 & 1	Cmplmtry	Cmplmtry	Cmplmtry
RL5	New rail and tram corridors	2 & 1	0 & 2	2 & 1	Core	Core	Core
RL6	Additional rail and Metro stops/stations	1 & 0	1 & 1	1 & 0	Cmplmtry	Cmplmtry	Cmplmtry
RL8	Station parking expansion	1 & 1	0 & 1	1 & 1	Cmplmtry	Cmplmtry	Cmplmtry
RL9	Improve rail services and capacity	2 & 2	0 & 2	2 & 2	Core	Core	Core

Measure		Measure appraisal scores			Include measure in package?		
Code (yellow= high scoring)	Measure Name	Econ. score	Env't. score	Social score	Economy	Env'nment	Social
RL10	Improve light rail services and capacity	2 & 2	-1 & 2	2 & 2	Core	No	Core
SC10	Reduce the need to travel through technology	2 & 1	1 & 2	1 & 1	Core	Core	Cmplmtry
SC11	Destination based Travel Plans and national car share database	2 & 3	1 & 2	3 & 3	Core	Core	Core
SC12	Travel awareness, driver education, walking and cycling information and promotion	0 & 1	1 & 1	1 & 1	Cmplmtry	Cmplmtry	Cmplmtry
SC6	Individualised travel planning/marketing measures	0 & 1	0 & 1	1 & 1	Cmplmtry	Cmplmtry	Cmplmtry
SC8	Car clubs	1 & 1	1 & 1	1 & 1	Cmplmtry	Cmplmtry	Cmplmtry
SI3	Targeted measures for mobility impaired people to access the transport system	0 & 1	1 & 0	2 & 1	Cmplmtry	Cmplmtry	Core
SI4	Better access to key facilities	1 & 2	1 & 2	3 & 2	Core	Core	Core
SS3	Home Zones	0 & 2	3 & 1	0 & 2	Core	Core	Core
SS6	Priority for pedestrians & vulnerable users in key centres	-1 & 1	2 & 1	1 & 1	No	Core	Cmplmtry
SS7	Improve & maintain Streetscape	0 & 1	2 & 0	1 & 1	Cmplmtry	Core	Cmplmtry
TE1	Eco-vehicle measures	0 & 0	0 & 2	0 & 0	No	Core	No
TE2	Low emissions zone	-1 & 1	1 & 3	0 & 1	No	Core	Cmplmtry
TM1	Traffic management plans and road user hierarchy	-1 & 1	2 & 1	1 & 1	No	Core	Cmplmtry
TM2	Traffic signal control and co-ordination	1 & 1	2 & 0	1 & 1	Cmplmtry	Core	Cmplmtry
TM3	Capacity enhancements on strategic and local road networks using 'active traffic management' measures and ramp metering.	2 & 0	-2 & -1	1 & 0	Core	No	Cmplmtry
WN4	Water taxis and new river ferries	0 & 1	0 & 0	1 & 1	Cmplmtry	No	Cmplmtry
WS5	Improve walking network	0 & 2	2 & 1	2 & 2	Core	Core	Core

## Generating Scheme Options for Strategy Packages

### Agency Meetings

- 2.11 In order to develop location/agency specific proposals that could be included in the packages, the Strategy Team (DTO and JMP consultants) met with all local authority and transport agency members of the Technical Groups, to start an iterative process of generating scheme proposals.
- 2.12 Meetings were held with: Dublin City Council, Fingal County Council, Meath County Council, South Dublin County Council, Dun Laoghaire-Rathdown County Council, Kildare County Council, Wicklow County Council, Bus Eireann, Dublin Bus, Irish Rail, National Roads Authority and Railway Procurement Agency.
- 2.13 At the meetings the Strategy Team requested submissions containing potential proposals of interest to the local authority or agency, together with a rationale for the schemes. Meetings were recorded and all ideas generated were added to the emerging list of proposals.
- 2.14 Where no specific implementation agency was responsible for developing scheme proposals within a measure category, internal DTO teams developed suitable proposals. These related primarily to:

- 'Smarter travel' proposals (travel planning, car clubs etc.);
- Information and marketing;
- Traffic management and demand restraint; and
- Freight and distribution measures.

2.15 In addition, a freight workshop was held on 16th April 2009, where various business, professional and industry representatives with an interest in freight helped to identify potential proposals for inclusion in the Strategy.

#### **Pro-forma and guidance**

- 2.16 In order to identify more specific schemes within the packages, we required detailed input on potential schemes, services, policies and operational changes for the period 2010 to 2030 (and potentially beyond, to 2050) from local authorities, transport operators and other key stakeholders.
- 2.17 To assist with this scheme definition, a pro-forma was developed to generate consistent and comprehensive information on each scheme or group of schemes. A copy of the pro-forma can be found in Appendix A. These were populated from both Agency responses and strategy team input.
- 2.18 This process drew on local knowledge and helped to identify where evidence of problems or constraints existed. For example, capacity or overcrowding problems; a lack of mode choice; poor accessibility; negative 'quality of life' impacts (e.g. noise, air pollution, accidents); barriers to economic development and other local issues. This in turn helped to ascertain where these constraints might be alleviated or supported by adding measures into a certain Strategy Alternative.

### **Allocating Proposals into Packages**

- 2.19 Following extensive consultation with local authorities and transport agencies, over 200 proposals were put forward for possible inclusion in the Strategy packages under the various measure headings. These were tabulated, mapped, and re-circulated to technical group members for final review.
- 2.20 As expected, the large majority of proposals were infrastructural, particularly roads. Local authorities in particular considered that the economy was the key objective that the vast majority of these proposals should meet, often linked to specific locations for development. There were few local authority proposals specifically identified to meet social or environmental objectives, other than advice to public transport operators.

#### **Gap Analysis**

- 2.21 Gaps therefore remained, either where specific proposals were not identified under certain measures, or where the proposals put forward appeared unlikely to fully meet objectives or address identified transport issues in an area.
- 2.22 The Strategy team therefore identified additional proposals for various measures, focussing initially on non-infrastructure measures, as this is where the largest gaps existed, but also addressing some modal and geographic gaps.

#### **Refinement / Sifting (Infrastructure Schemes)**

- 2.23 Due to the large number of infrastructure proposals these required an initial sift against objectives to determine the likely need and fit of proposal with strategy objectives.. This was carried out using the criteria described below.



- 2.24 The first two criteria relate to the need for the infrastructure:
- Does the proposal duplicate another piece of infrastructure?
  - Is there likely to be significant demand for the infrastructure?
- 2.25 The demand estimates were extracted from the GDA transport model, and were broad estimates only, based on sector-to-sector journey to work trips, using preliminary 2030 RPG compatible forecasts (as of August 2009) and preliminary Trip Attraction and Generation (TAGM) modelling. These were subject to revision once forecasting work was finalised and cannot be directly compared with the model outputs used in the evaluation of the Strategy Alternative packages.
- 2.26 The other criteria used relate to the strategy objectives:
- Are there likely to be significant timesaving's associated with the infrastructure (is it likely to *reduce personal stress, build and strengthen communities or improve economic competitiveness*)?
  - Does the infrastructure support or undermine sustainable modes of travel in its corridor (does it *respect and sustain the natural environment*)?
  - Does the infrastructure provide other benefits such as safety improvements or promote healthier forms of travel or enable improvements to streetscapes and open spaces (does it *reduce personal stress or improve the built environment*)?
- 2.27 Although infrastructure cost was not used as a sifting criterion at this stage, it becomes a key aspect to be considered at the detailed package appraisal stage (Stage 3), and when a preferred package is being developed. At these stages, broad bandings of scheme costs were used.

## Finalisation of Strategy Packages

- 2.28 Generally, proposals were included in a package if the associated high-level measure was included in that package. **Appendix B** shows a worked example of the packaging process, from identification of measures through to package allocation.

### Do minimum

- 2.29 The do minimum assumptions against which all Strategy packages will be appraised were agreed by the Steering Group. The do minimum can be defined as including all existing schemes and interventions that are at implementation stage or committed (see **Appendix C** for details of these).
- 2.30 It was also agreed that the DART Underground and Metro North schemes should be included in all of the packages of proposals, but not in the do minimum. Of the other Transport 21 schemes in the GDA, each will be included in at least one Strategy package alternative.

### Proposals Common to All Packages

- 2.31 Many proposals are common to all packages. As might be expected, this particularly applies to policy and best practice proposals.

### Public transport infrastructure

- 2.32 The Strategy Steering Group previously agreed that Metro North (Swords to Stephens Green) and the DART Underground project (and associated electrification) should be included in all packages.
- 2.33 In addition the following are included in all packages:

- Key bus priority proposals. (Some bus priority proposals overlap with proposed rail corridors and model testing will be required before deciding on inclusion.)
- New rail and light rail stations/stops (some outer stations require model testing to better assess forecast passenger demand and whether it has impact on train loadings/overcrowding).
- Bus and rail based park and ride proposals.

#### ***Public transport integration and service improvements***

- Restructure routes and frequencies across bus network, with better separation of direct and indirect QBC services.
- Expansion of bus network and additional bus carrying capacity.
- Improve rail and light rail services and capacity, including off peak rail services.
- Reduce bus boarding delays - greater discounts for pre paid tickets, on street ticket machines, multiple door bus boarding, relocation of bus stops.
- Integrated fares – multi mode zonal fares structure with simplified range of zone-to zone fares regardless of mode used.
- Reductions in fares (either off peak (with corresponding peak increases) or at all times).
- Improved public transport interchange.
- Improved public transport vehicle quality.
- Carriage of cycles on public transport at certain times.
- Bus stop improvements.
- Better public transport information and internet journey planner.
- Improve access to public transport for mobility impaired people.

#### ***Travel planning and sustainable travel promotion***

- Travel planning proposals (workplace, school, individualised).
- Teleworking, teleshopping, and other teleservices that reduce the need to travel.
- Lift sharing.
- Car clubs.
- Sustainable travel awareness and promotion – public transport, cycle and walking marketing campaigns, travel choice awareness raising, cycle and driver training.
- Grants for provision of sustainable travel infrastructure at existing workplaces, schools and other destinations.

#### ***Cycling***

- Improved cycle parking facilities.
- Expansion of public cycle rental facilities.
- Improved cycle network (focussing on town and city centres and approaches).

#### ***Walking***

- Improve walking network.

- Reduce wait times for pedestrians crossing streets.
- Widen footpaths and improve quality.

#### ***Traffic management***

- Shared street space in residential areas – “Home zones”.
- Improve and maintain streetscape – particularly footpaths and cycle lanes.
- Improved road direction signing.
- Traffic signal control and coordination, particularly to improve priority for pedestrians and public transport.

#### ***Freight***

- Measures to encourage transfer from road to rail.
- Designate a strategic freight road network.
- Allocate freight/HOV lanes where congestion is an issue.
- Improve access for freight to Ports and Airport where necessary.

#### ***Planning measures to support sustainable travel***

- Define a single hierarchy of urban centres for the region (avoiding separate hierarchies for employment, retail centres).
- Locate key trip attracting facilities (large scale employment, hospital and education facilities) in urban centres and in areas with good public transport access, with scale of facility related to scale of centre.
- Locate social infrastructure serving more local needs (e.g. primary schools, local health centres) within walking or cycling distance of its catchment.
- More mixed use development, and greater variety of residential units in any area, to reduce need to travel or to move out of an area as household sizes change.
- Place higher density residential and commercial developments in locations with good access by public transport.
- Control development away from public transport and larger urban areas.
- Improve permeability and connectivity for pedestrians and cyclists within and between developments.
- Land value taxes – annual site taxes based on value of land to encourage better land utilisation in high value areas (e.g. town centres and near public transport), and discourage land-banking and pressure for inappropriate zoning.
- Measures to mitigate adverse transport impacts of new development.
- Control parking for retail and other short stay uses.

#### ***Social inclusion***

- Better access to key facilities by non-car modes.

#### **Excluded Proposals**

- 2.34 The high-level assessment led to the exclusion of several major road proposals from all packages, these include:

- N2 dualling North of Ashbourne (MCC).
- New dual carriageway parallel to N32/M50 between Baldoyle and N2 (FCC).
- Western Distributor Road, linking N4 to N7 west of Outer Ring Road (SDCC).

2.35 These roads either appear to duplicate existing or proposed road infrastructure, or to open up substantial tracts land for development away from existing or planned public transport.

## Summary of Packages

2.36 Table 2.3 summarises the types of proposals included within each package.

**Table 2.3 Summary of Packages**

Proposals	Include in Economic Package?	Include in Environment Package?	Include in Social Package?
New road infrastructure and upgrades to existing roads	Yes	No	Yes
Capacity enhancement measures on strategic roads	Yes	No	Yes
New rail infrastructure	Yes	No (only T21 rail)	No (only T21 rail)
Additional bus priority proposals	Yes	Yes	Yes
Improvements to light rail services and off peak bus services	No	No	Yes
Integrated fares and expansion of integrated ticketing	Yes	No	Yes
Real time passenger information and live traffic condition and parking information	Yes	No	Yes
Demand responsive public transport services	Yes	No	Yes
Traffic management plans favouring vulnerable road users, with priority for pedestrians in town centres	No	Yes	Yes
Road pricing proposals targeting distance travelled	No	Yes	No
Road pricing proposals targeting congestion, and tolling of strategic roads	Yes	No	No
Restrictions to freight access in town centres (transhipment depots etc.)	No	Yes	Yes
Freight charges	No	Yes	Yes
Car and fuel tax increases	No	Yes	No
Eco- vehicle measures	No	Yes	No
Low emission zones	No	Yes	Yes
Restrictions in parking provision at workplaces and elsewhere	Yes	Yes	No

### 3. Finalising Strategy Alternative Packages

- 3.1 Following the formation of the NTA, stakeholder consultation on the contents of packages took place in January 2010. Refinements to proposals and packages arising from this were fed back into future meetings of the Strategy Steering Group (SSG) and final approval for packages sought.
- 3.2 The following Strategy Alternatives, arising from the above work, were presented to stakeholders.

#### The Economic Package

- 3.3 This package included:
- New roads and upgrades to existing roads.
  - Capacity enhancement measures on strategic roads.
  - Additional bus priority.
  - New rail infrastructure.
  - Road pricing measures targeting congestion including cordon tolling around the city centre.
  - Integrated fares and expansion of integrated ticketing.
  - Real time passenger information and live traffic condition and parking information.
  - Restrictions in parking provision at workplaces and elsewhere.
  - Demand responsive public transport (taxi-bus and community transport).
- 3.4 This package excluded:
- Traffic management plans and road user hierarchy favouring vulnerable road users.
  - Car and fuel tax increases.
  - Freight charging.
  - Town centre freight access restrictions (transhipment depots etc.).
  - Priority for pedestrians and vulnerable users in town centres.
  - Eco-vehicle initiatives, or low emission zones.
- 3.5 Several major road infrastructure proposals were under consideration which would require further demand assessment work before deciding on whether they should be included in the final Economic Package. These include proposals such as the Eastern Bypass, the Leinster Outer Orbital Route, motorway widening south of Sandyford, upgrades of junctions on the N3 in the Blanchardstown area and links between the N2, N3 and N4 in the Fingal County Council area.

#### The Environment Package

- 3.6 This package included:
- Additional bus priority.
  - Traffic management plans and road user hierarchy favouring vulnerable road users.
  - Priority for pedestrians and vulnerable road users in town centres.

- Road user charging targeting distance travelled.
- Car and fuel tax increases.
- Freight charges.
- Town centre freight access restrictions (transhipment depots etc.).
- Restrictions in parking provision at workplaces and elsewhere.
- Eco-vehicle proposals and low-emission zones.

### 3.7 This package excluded:

- Many rail infrastructure proposals (bus substitutes are generally included instead)
- New road infrastructure and upgrades to existing roads.
- Capacity enhancement measures on strategic roads.
- Tolling of strategic roads (as diverted traffic may impact on built environment and local air quality).
- Integrated fares and expansion of integrated ticketing.
- Real time passenger information and live traffic condition and parking information.
- Demand responsive public transport (taxi-bus and community transport).

## The Social Package:

### 3.8 This package included:

- New road infrastructure and upgrades to existing roads.
- Capacity enhancement measures on strategic roads.
- Additional bus priority.
- Traffic management plans and road user hierarchy favouring vulnerable road users.
- Priority for pedestrians and vulnerable road users in town centres.
- Improvements to light rail services and off peak bus services.
- Demand responsive public transport (taxi-bus and community transport).
- Freight charges and restrictions in freight access to town centres (through provision of transhipment depots etc.).
- Integrated fares and expansion of integrated ticketing.
- Real time passenger information and live traffic condition and parking information.
- Eco vehicle proposals.

### 3.9 This package excluded:

- Many rail infrastructure proposals (bus substitutes are included instead)
- Road user charging or congestion (cordon) charging, and tolling of strategic roads.
- Car or fuel tax increases.

- Low emission zones.
  - Restrictions in parking provision at workplaces and elsewhere.
- 3.10 As with the Economic package, several major road infrastructure proposals required further demand modelling work before deciding on whether they should be included in the Social Package. These include the Eastern Bypass, the Leinster Outer Orbital Route, motorway widening south of Sandyford, upgrades of junctions on the N3 in the Blanchardstown area and links between the N2, N3 and N4 in the Fingal County Council area. Tests of the package with and without these proposals were undertaken and reported to Technical Groups and the Strategy Steering Group.

## Specification of the Final Strategy Alternative Options

### Do-Minimum

- 3.11 The year 2030 Do-minimum assumptions included only the existing and committed interventions. These are provided in detail in Appendix C; however, the main schemes included are as follows:
- M3 Toll Clonee to Kells; N11 dualling; M1, M50, N4 and N7 Newlands Cross upgrades
  - Clonsilla-Pace railway; Luas lines A1, B1 & C1
  - Strategic Pace (M3) park and Ride and major additional DART/Luas station-based parking
  - New Dublin Bus and Bus Eireann networks in place and significantly increased QBCs
  - Integrated ticketing and AVL in place across all public transport modes
  - Dublin City Council parking restrictions/levy and all existing tolls in place at 2008 rates.
- 3.12 Model results for the Do-Minimum were analysed and the following characteristics were evident:
- Very large increases in traffic and congestion – 40% rise in vehicle-kilometres from 2010
  - Lower public transport mode share overall and more trips pushed out of the 8-9 AM peak
  - Very little demand deterred by existing road and bridge tolls (East Link, West Link, M1, M4)
  - The overall mode split across the GDA is: car 53%, public transport 23%, walk/cycle 24%
  - Public transport availability and reliability will be affected by lack of capacity and congestion
  - Freight (HGV) trips will take significantly longer in terms of both time and distance

### Strategy Alternatives

- 3.13 The three Strategy options identified for appraisal were grouped around the following objectives:
- Environment theme – with an emphasis on proposals that support the natural environment and improve the built environment, by minimising car travel and providing sustainable alternatives
  - Economy theme – with an emphasis on proposals that support economic objectives through reducing journey times (by all modes) and accommodating growth in peak travel demand
  - Society theme – with an emphasis on those proposals that build and strengthen communities
- 3.14 In advance of confirmation of the three Strategy Alternatives for detailed appraisal, model runs were undertaken of variants of each package, with and without certain major infrastructure schemes and key policies that would support the Strategy Alternative's theme. These tests helped to inform as to which variant is most likely to meet the objectives related to the Alternative's theme, and assisted the decision on which option variant should be brought forward to formal appraisal.



- 3.15 Along with the input from stakeholder consultation – where strong support was expressed for a wide range of Transport 21 infrastructure schemes, regardless of cost – this process allowed for a broader range of measures to be taken into account, especially in the Environment and Social packages, along with testing of the effect of high-level charging and demand management policies.
- 3.16 Due to the high levels of demand in the do-minimum, the ‘plus with policies’ variants – as outlined in Table 3.1 below – were taken forward for appraisal in each case, since these produced the largest benefits (and costs). A full list of the contents of each option will be found in **Appendix D**.

**Table 3.1 Contents of ‘Plus with Policies’ Strategy Options**

Variant	Key infrastructure	Policies
4d “Environment plus with policies”	Most major rail schemes (including Metro North, Metro West, DART Underground, Luas Line BXD). Additional public transport schemes (Lucan Luas, Luas Line B2, Upgrade of Green Luas Line to Metro, Rathfarnham Luas, Tallaght via Kimmage Luas, Finglas Luas, Navan Rail line, BRT Sandyford to Vincents via UCD, etc.). No major road schemes.	Parking – additional restrictions in key employment areas in DCC, DLRCC, SDCC areas, including at out-of-town retail centres. A region-wide distance based road user charge applied at peak times*. All bridge and Port Tunnel tolls retained for car and HGVs. Fare policies to encourage shift to travel outside peak (+10% in peak; -20% off peak).
3d “Economy plus with policies”	All additional major rail schemes (Navan rail line, Metro North Extensions, Finglas Luas, Lucan Luas, Tallaght via Kimmage Metro, upgrade of Green Luas line to Metro, Luas Line B2, BRT Sandyford to Vincents via UCD etc.). Additional major road schemes (Eastern Bypass, Leinster Outer Orbital, M1 widening Swords to Airport, M50 widening south of Sandyford etc.)	Parking – additional restrictions in key employment areas in DCC, DLRCC, SDCC Road charges/tolls – congestion charge cordon; the inbound tolls at M50 (€3) and canal (€6) are applied to all cars. No additional specific toll is applied to Eastern Bypass / Dublin Port Tunnel users. HGVs do not have any of the tolls applied. Fare policies to encourage shift to travel outside peak (+10% in peak; -20% off peak).
5d “Society plus with policies”	Major rail schemes (including Metro North, Metro West, DART Underground and Luas Line BXD), some (typically local) road schemes. Additional major rail schemes (Navan rail line, Finglas Luas, Lucan Luas, Tallaght via Kimmage Luas, upgrade of Green Luas line to Metro, Luas Line B2, BRT Sandyford to Vincents via UCD etc.). Additional major road schemes (Eastern Bypass, Leinster Outer Orbital, M1 widening Swords to Airport, M50 widening south of Sandyford etc.)	Parking – additional restrictions in key employment areas in DCC, DLRCC, SDCC Eastern Bypass/Port Tunnel free for HGVs. Cars pay €6 to use the Eastern Bypass / Dublin Port Tunnel route and an additional €3 if they access the city at the North or South Port junctions. 20% public transport fare reductions at all times, to encourage greater use of these modes.

- Due to the nature of the modelling undertaken, it is not possible or robust to express the charge in cash terms, as it is added to the generalised cost element of journey times for road vehicles.

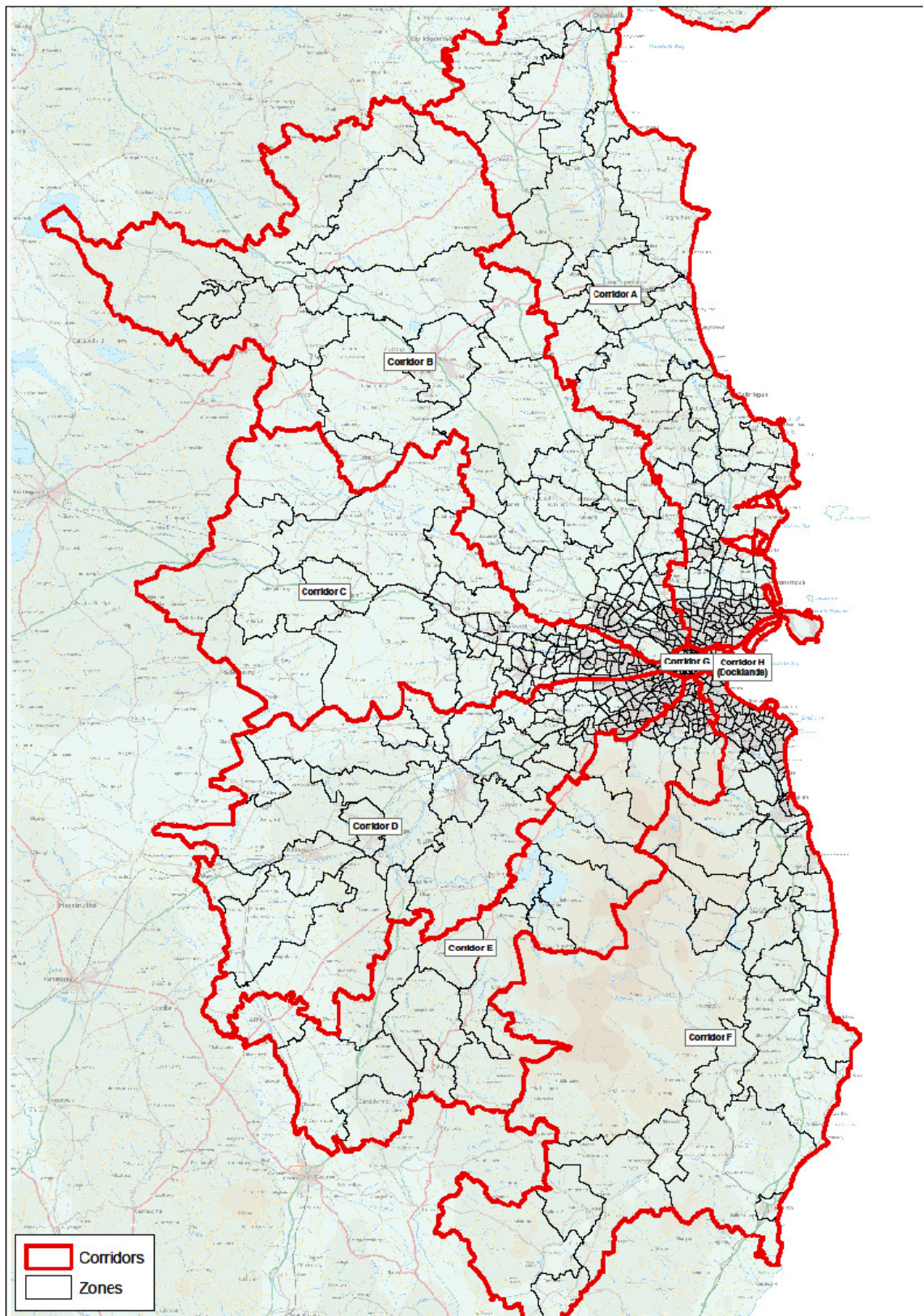
- 3.17 These tests also provided additional information on the likely benefits of particular schemes and policies at the next stage of strategy development – assembly of a Draft Final Strategy – where key decisions on the inclusion or exclusion of specific local schemes and policies will need to be taken.
- 3.18 Two scenarios were run to determine an acceptable level of per-kilometre road user charge in the Environment package, which was finally set at the level required to achieve the Smarter Travel target of a 45% car mode share in the morning peak. It is assumed to be a peak time-only charge.
- 3.19 Because the ‘charge’ was represented by additional generalised costs being added to car journeys, and due to other aspects of the modelling used, it is not robust to show this charge in cash terms. Significant further modelling – including analysing trip-making behaviour, elasticity of demand and ability to shift journeys outside of the peaks – would be needed to provide a realistic charging level.
- 3.20 Testing was undertaken through demand analysis at the level of six radial corridors and two zones (City Centre and Docklands), to account for travel to the city and district centres along corridors; as well as a complementary analysis by three orbital area bands – Canals, M50 and Metropolitan Area – to account for orbital movement and the catchment area around the five hinterland growth towns.
- 3.21 These boundaries can be seen on the maps in Figure 3.1 and Figure 3.2 overleaf. This also shows zone boundaries from the transport model, illustrating clearly the level of detail at which it is possible to accurately assess trips. Hence, trips along the corridors to the City Centre can easily be assessed by any mode; however local trips within and into e.g. Navan, would not show up at all.
- 3.22 However, for consultation and objectives appraisal purposes, measures which could not be modelled were still included in each of the Strategy Alternative packages, and taken into account in qualitative appraisal. The lists of measures in **Appendix D** specify which fall into these categories.

#### **Additional measures common to all options**

- 3.23 When assembling options, proposals likely to support the relevant objectives were included. Many proposals met all the objectives and were therefore included in all options. Indeed, over 50% of the measures proposed are common to all three of the packages – especially ‘policy and best practice’ measures in Categories B, C and D; while another 45% of measures are included in at least two of the three packages. Many of the common Category A infrastructure measures are ‘in development’ Transport 21 schemes awaiting funding approval, and include the following schemes and projects:
- DART Underground (“Interconnector”) and linked Maynooth/Kildare rail line electrification
  - Metro North, Metro West and Luas Green Line upgrade to Metro
  - New Luas Lines BX/D, E and F and Luas extensions B2 and D1
  - Eleven new rail or Luas stations and stops on existing lines
  - Bus Rapid Transit – City-Docklands and DART-Dundrum
  - All remaining planned QBN office schemes not already in the Do-Minimum
  - New Hawkins Street Liffey bridge and Dodder Bridge across Grand Canal Dock
  - Park & Ride (rail / bus) at 22 locations on rail, Luas and bus with 13,570 total spaces
- 3.24 Together, these measures were also tested as a ‘reference case’ option – designed to ensure that the incremental impact of schemes which are only included in one option can show up better. This applies especially to major road infrastructure proposals, travel demand management measures (charging for road use or restricting parking supply), and the additional public transport schemes.

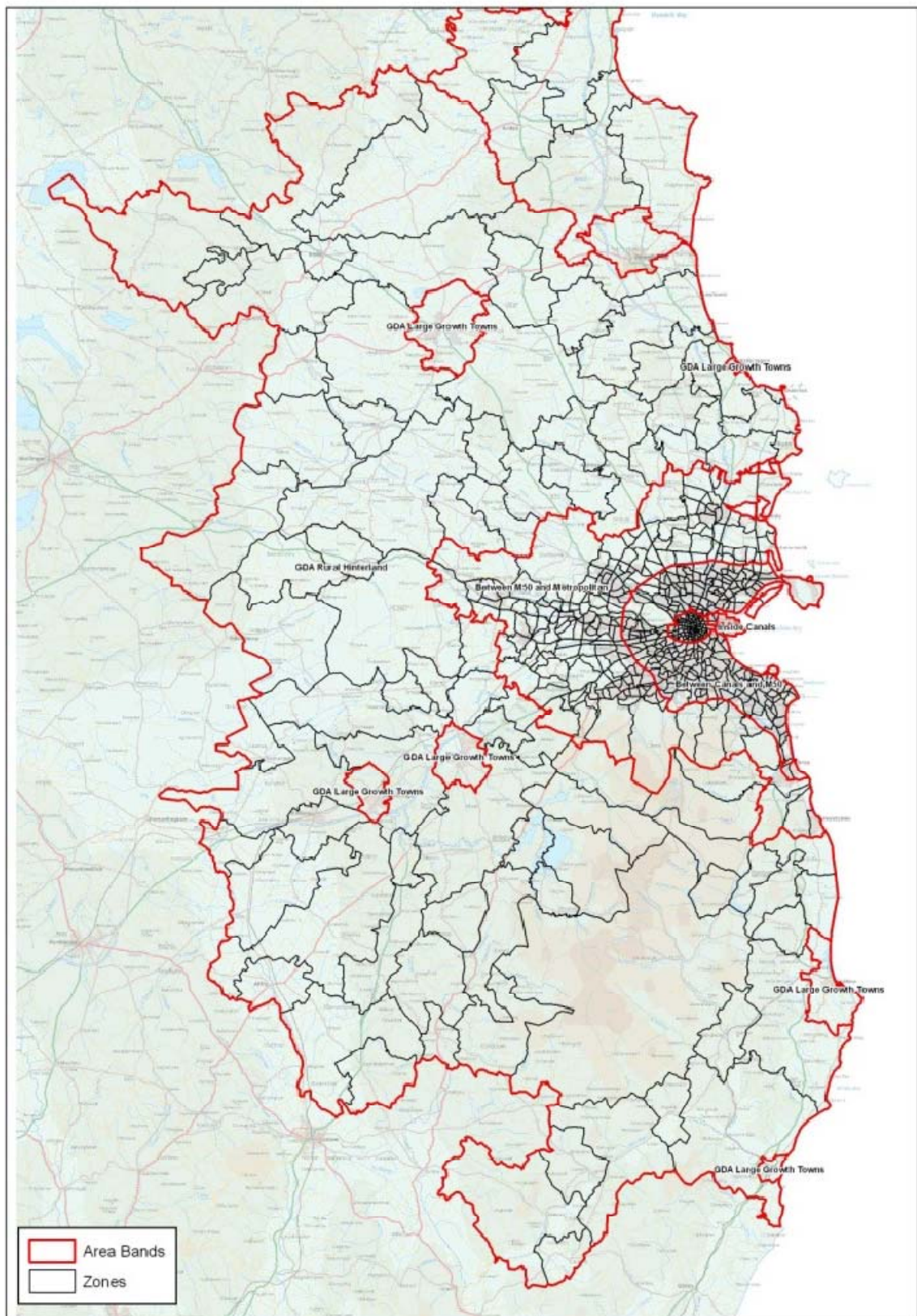


**Figure 3.1 Corridors and model zones**





**Figure 3.2 Area Bands, Hinterland Towns and model zones**



## 4. Stage 3 Strategy Alternative Appraisal

- 4.1 This chapter details the Stage 3 process that JMP used in order to appraise Strategy Alternatives, outlines the initial results of this process, and suggests how measures and specific proposals within these packages might be taken forward for full appraisal, within the next draft Final Strategy stage.
- 4.2 The next stage of the process was the detailed appraisal of the three packages of Strategy Alternative proposals, in line with the Revised Framework for GDA Strategy Appraisal, adopted in June 2010 (though it was subsequently revised to account for later changes in technical values).
- 4.3 This required, wherever possible, the proposals to be coded into models and spreadsheets in order to test their impacts and enable an informed appraisal to be undertaken.

### Categorisation of Measures

- 4.4 To ensure that all types of measures could have their potential role estimated within the appraisal process, they were categorised into four broad groupings based on the level of specification needed to enable appraisal. This builds on the distinction between operation, infrastructure, policy and best practice measures used in scheme generation, taking into account how they were to be appraised.
- 4.5 Table 4.1 shows the four categories and also indicates the appraisal tool that will provide the information required within the appraisal process. This indicates that, for the bulk of the appraisal, the impact of new and enhanced infrastructure proposals will be based on modelled assessments.

**Table 4.1 Measure Categories**

Category	Type	Level of specification required	Appraisal tool
A - 1	Infrastructure	Location and scale specific	Greater Dublin Area Transport model
A - 2	Service operation	Location and scale specific	Greater Dublin Area Transport model
B	Policy and best practice	Location and scale specific	GDA model or spreadsheet analysis
C	Policy and best practice	Detail implementation assumptions not required – examples may be given	Generally using qualitative appraisal
D	Policy and best practice – land use planning	Detailed implementation assumptions generally not required, but may be made for certain proposals to demonstrate potential impact	Generally qualitative appraisal – however travel demand matrix may be adjusted for test purposes to assess potential impact of certain policies in a more quantitative manner.

- 4.6 Proposals under public transport service proposals (A - 2) were developed in detail at this stage. Initial proposals had been prepared for these measures, however they went through significant change (both in terms of routes and frequencies) as modelling work demonstrated more precisely the nature and scale of demand on particular corridors, in relation to new infrastructure provision.
- 4.7 The baseline bus network was also affected by the announcement in April 2009 of a major network review within Dublin Bus, to take place over an 18-month period. The final bus networks modelled in both Do-Minimum and Strategy Alternative scenarios were informed by the emerging changes.

- 4.8 Walking and cycling measures also require additional specific proposals, and these were developed within the DTO. However, most trips by these modes are short and would not therefore cross the boundary of a zone in the transport model (except in the city centre). Hence, they tend to be obscured in the model outputs in relation to longer trips by public transport and road vehicles.

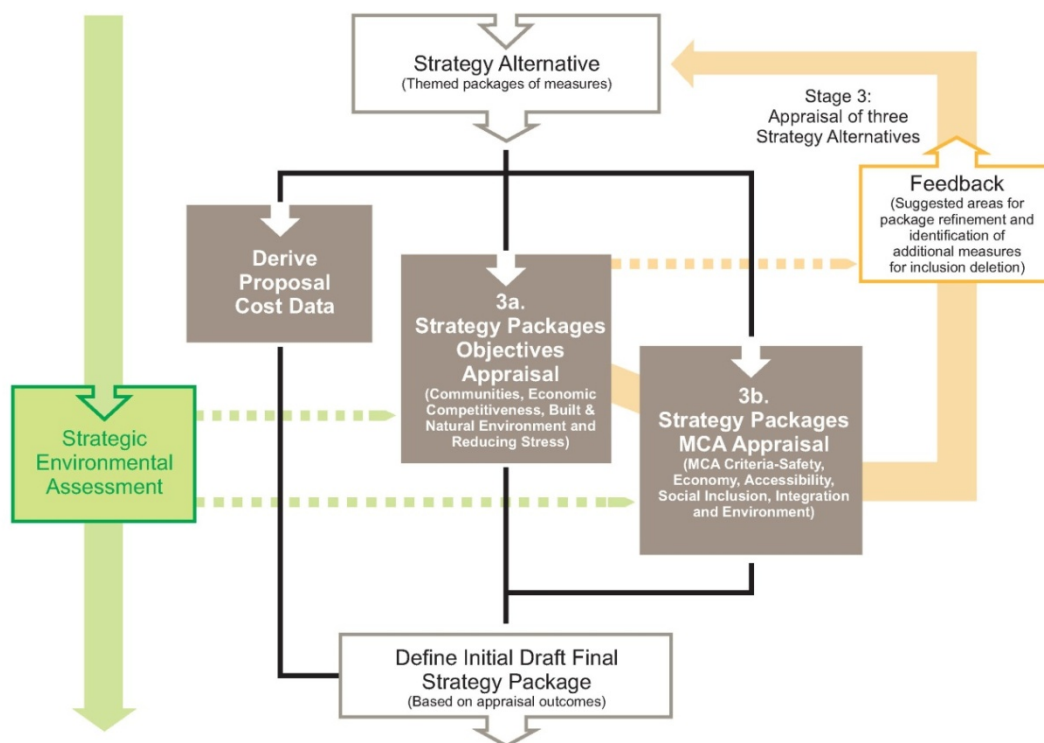
## Process of Appraising Options

- 4.9 JMP had proposed to undertake a two-stage appraisal of the each of the three Strategy Options, in line with the approach taken for Stage 1 potential measures appraisal, but with additional evidence:

- A Strategy Options Objectives Appraisal, which would measure the performance of each option against sub-objectives reflecting policy goals and contribution to strategy vision; and
- A Strategy Options 'Multi-Criteria Appraisal', which would measures each option package's performance against key transport outcomes (e.g. safety, accessibility, economic efficiency etc.), in line with the Department of Transport's Common Appraisal Framework approach.

- 4.10 Figure 4.1 below illustrates the steps in the Stage 3a/3b process and link through to the next stage.

**Figure 4.1 Stage 3a/b Strategy Packages Appraisal Process**



- 4.11 The NTA's 'Greater Dublin Transport Strategy Option Appraisal Framework' outlines in some detail the indicators taken into account in evaluation of each of the criteria in both stages, and Tables 4.3 and 4.4 (found later in this Chapter) show detailed results for each option against all these criteria.
- 4.12 In line with best practice, the appraisal of each option was initially made relative to the Do-Minimum for the future year (2030); however, some relative comparison between options was undertaken, to ascertain which of the measures that were in some options but not others were affecting the result. This element is useful as a guide to which measures should be taken forward to meet objectives in the draft final strategy, alongside more detailed infrastructure analysis by corridor and area bands.



- 4.13 The evidence for this appraisal of the options is derived primarily from the Greater Dublin transport models – although qualitative measures and judgement are used for those measures for which the model would not capture the impacts effectively. At this stage, data from the three AM peak hours in the model was used alone, since the greatest benefits could be expected to accrue at this time.
- 4.14 In parallel, a Strategic Environmental Assessment (SEA) analysis for each option was undertaken by ERM consultants, and scores from 29 sub-objectives were aggregated and fed in, to produce a set of unified environmental scores for both stages of the appraisal agreed between the two teams.

## General character of the options

- 4.15 By examining the measures that are within only a single Strategy option package, the following primary characteristics of each package – which affect appraisal performance – become evident.
- 4.16 The **Environment** option is concentrated on per-kilometre road charging and limited investment, primarily in additional Quality Bus; few roads and no additional rail-based public transport. A high impact measure is the application of region-wide pay-per-kilometre road pricing for cars across the entire GDA road network, at a level which depresses car demand to that which would be in line with Smarter Travel targets (a 45% peak mode share). It also includes measures to increase car taxation. In addition, it includes eco-vehicle measures, CO<sub>2</sub>-based taxation rates for commercial vehicles, and schemes to relocate commuter parking out to the peripheries around town centres.
- 4.17 Relative to the other options, the package excludes 67 road-based infrastructure measures and capacity enhancement schemes on the strategic road network. Additionally, it omits integrated public transport fares and Smartcards, real-time passenger information and live traffic information.
- 4.18 The **Economy** theme focuses on road and public transport capacity enhancements, building 95% of all proposed schemes – Luas and Metro lines, new rail capacity and roads; plus all passenger improvements. The package has a strong rail infrastructure focus, with the additional rail provision leading both into the city centre and to and between main hinterland towns. This is combined with the introduction of additional cordon charges (€3 at M50 and €6 at Canals) for car trips to the city.
- 4.19 The **Social** theme also includes most road schemes, but has bus or BRT options instead of eight new rail/Luas lines (though the largest rail infrastructure is already included in common measures). The package has a single focused policy of reducing all public transport fares by 20% in the peak period – as compared with a peak period increase of 10% in the other packages – and includes a number of bus-based measures, some of which are designed to replicate the rail schemes that are otherwise only included in the Economy option. In addition, twelve traffic management and road hierarchy measures are excluded, along with freight charging measures and a low emissions zone.
- 4.20 Details of all the measures assumed within each package for appraisal are shown in **Appendix D**.

## Performance of the Strategy Options

### Environment option

- 4.21 Compared against the Do-Minimum, this option provides for very large changes in car trip volumes, distances and mode split. It reduces the need to travel and minimises trips overall for all purposes – in response to greater motoring costs, these trips tend to seek a destination closer to their origin. This is a function of how the trip generation model treats cost rises – assuming that, over 20 years, people respond to the higher travel cost by relocating home or trip destination to something closer.



- 4.22 This generates mode shift away from cars, but also greatly decreases on-road congestion – hence, there are large ‘free flow’ benefits in reduced journey times for car users who remain on the roads. However, toll revenues from bridges and tunnels fall in this option, due to the reduced trip lengths.
- 4.23 HGV tolls remain marginally below the level of the Do-Minimum since – although they do not pay per kilometre – they benefit marginally from reduced congestion. However, there are no large-scale benefits for Port-related trips as with the (HGV toll-free) Eastern By-Pass in the other two options.
- 4.24 Notably, most of this option’s benefits come from user charging – a ‘no charging’ variant produced mode split, toll and distance results slightly better than the Do-Minimum. However, with charging in place, public transport use – especially bus – rises, despite the 10% peak period increases in fares.
- 4.25 All bus usage broadly doubles, and fare income rises by 105% as more and longer public transport trips are made. However, capacity becomes an issue, with a 46% rise in overcrowding across the entire network (bus/rail/Luas); while a lack of choice causes issues for people in deprived areas – as they are either charged to drive, or must pay the higher peak-hour fares to use public transport.
- 4.26 The reduced road trip numbers and distances and limited building of new infrastructure mean that this option scores positively or minimally badly against most of the Environmental appraisal criteria.

#### **Economy option**

- 4.27 This option accommodates extra growth in total demand for road and public transport (PT) relative to the Do-Minimum, though managing to achieve a greater mode share for PT (27% as opposed to 23%) at the expense of road (-3%), but also a small shift away from the walking and cycling modes.
- 4.28 This small level of change may be the result of public transport fare increases (+10%) offsetting the cordon charges imposed on road users, though an 8% fall in vehicle kilometres also suggests that some journeys may be truncated in response to charging. This is slightly complicated by the total cordon charge to access the City Centre (€9) being lower than the Do-Minimum tunnel tolls (€12).
- 4.29 The high level of infrastructure and service provision improves accessibility and choice overall and is beneficial to travel from many deprived communities, even though 10% fare rises are imposed.
- 4.30 Cordon charging for trips within the M50 (€3) and within the Canals (€6) has relatively little effect on either overall road trip length or the public transport mode split, indicating that other factors are coming into play. In fact, overall toll revenue falls 19%, as lower-cost alternatives are provided to the existing Port Tunnel tolls, Eastlink and Westlink bridges, as well as better local road options.
- 4.31 Freight benefits from both more efficient movement on the new infrastructure – though not as good as the decongested network in the Environment option for this – and from the absence of tolls. In fact, total HGV tolls fall by 78%, largely due to the Eastern Bypass’ free access to the city and Port.
- 4.32 Unsurprisingly, the high level of investment in both rail and strategic road improves links to the rest of Ireland for PT, freight and car users – with road becoming notably faster relative to other options. This option also has a larger fall in PT journey time between communities than in the other options.
- 4.33 The Economy option would support the anticipated RPGs’ use of land, being able to service higher levels of City Centre employment growth and commuting, as well as hinterland growth town access – this would also be supported by other local measures, such as local bus networks in such towns, which were not modelled (as the impact would have all been within one of the larger model zones).

- 4.34 However, the SEA impacts are largely negative, being compromised by large scale infrastructure construction and the high levels of overall travel. Only the safety element of ‘human health’ sees a positive score, from reduced accidents associated with higher standard roads and more PT trips.

### **Social option**

- 4.35 This option accommodates the highest levels of growth in road traffic compared to the Do-Minimum and the highest level of overall demand when road and public transport demand is taken together. However, there is less mode shift from car to public transport and hence more car/kilometres than any other option – 93% of the Do-Minimum level. Public transport demand is lowest of all options.
- 4.36 This is in spite of public transport fare reductions of 20% at all times. However, there are also no additional tolls or road user charges created in this option, while most road schemes are included. This leads to SEA impacts similar to Economy, since both are compromised by building schemes.
- 4.37 Overall, this creates similar patterns to the Economy option package. There are similar levels of public transport usage and overcrowding – although significantly lower fares revenues (only 18.5% above the Do-Minimum levels, compared to 54% in Economy, and 105% in Environment options).
- 4.38 Rail, bus and Luas proportions are similar between these two options – although fewer Luas lines and extensions are built. Toll revenues are also similar, suggesting that existing tolls have a similar scale of effects to a cordon charge, once some compensatory reallocation of trip-ends in the model has taken place. The option is good for freight as all road schemes are built but no tolls are added.
- 4.39 This option also contains the widest range of measures which do not show up in the model results, such as: Public realm and pedestrianisation schemes (especially where road improvements lead to a reduced flow on another route, for example bypasses and town centre roads); bus user real-time information and smartcard ticketing; and measures that promote and enhance walking and cycling.
- 4.40 This option is noticeably better for deprived communities and vulnerable people. Despite average journey times from such areas to key centres being slightly higher than the Economy option, peak hour public transport fares are a net 30% lower here (-20% in Social, compared to +10% in both of the other options). Moreover, neither cordon nor per-kilometre additional road charges are applied in this option. Hence, travel by deprived communities gains the widest choices in the Social option.

## **Initial comparative assessment of Strategy Options**

- 4.41 Although all three options largely greatly improve on the Do-minimum and Do-reference situations, further close analysis of the differences between them will help to establish which of the measures contained in some, but not all, packages have a distinctive impact, and on which criteria or values.
- 4.42 The model output summary statistics in Table 4.2 below provide an overview of certain impacts of the different options on data relating to overall trip patterns and mode choice at a whole-GDA level. Other, more specific, quantitative estimates of benefits were undertaken for the appraisal process, and these are discussed in the Sub-Objectives and Appraisal Summary tables later in this Chapter.

**Table 4.2 Comparative package outputs**

Indicator	Do Minimum	Economy	Social	Environment
Car: Demand	694,800	655,200	662,100	553,600
Car: Vehicle-hours	681,500	514,900	535,900	354,100
Car: Vehicle-kms	17,247,000	15,917,000	16,044,000	10,363,000
Car: Total Toll – Euros	€392,000	€318,000	€317,000	€220,000
Toll per car vehicle-km	€0.023	€0.020	€0.0198	€0.21
HGV: Demand	101,200	101,200	101,200	101,200
HGV: Vehicle-hours	108,800	90,700	90,000	87,200
HGV: Vehicle-kms	3,586,000	3,599,000	3,630,000	3,469,000
HGV: Total Toll – Euros	€48,000	€10,000	€5,000	€46,000
Toll per HGV vehicle-km	€0.0133	€0.0029	€0.0015	€0.0130
PT: Demand	379,500	452,100	449,700	528,000
PT: Boardings	437,000	570,000	583,000	706,000
PT: Transfers	1,578,000	1,666,000	1,750,000	2,250,000
PT: Walk time	253,600	250,600	248,300	313,600
PT: In-vehicle time (IVT)	187,000	208,900	216,500	279,400
PT: Wait time	75,600	67,600	68,300	90,400
PT: Total Travel Time	516,200	527,100	533,100	683,400
PT: Pass-kms	5,403,562	7,150,250	7,331,063	9,977,098
PT: Fares	€994,000	€1,531,000	€1,173,000	€2,043,000
PT: Crowding Penalty	3,661,000	2,301,000	2,178,000	5,342,000
PT: Pass-kms / IVT	28.9	34.2	33.9	35.70
PT: Pass-kms/Demand	14.24	15.82	16.30	18.89
PT: Fare / Demand	2.50	3.38	2.60	3.87
PT: Fare / Pass-kms	0.18	0.21	0.16	0.20
PT: Transfers* / Demand	4.16	3.69	3.89	4.26
PT: Boardings / Demand	1.15	1.26	1.30	1.34
Total demand (Car + PT)	1,074,300	1,107,300	1,111,800	1,081,600

\* This includes transfers from PT to walk, both from journey origins to PT and from PT to destination

4.43 The following observations can be drawn from the summary statistics provided in Table 4.2 above:

#### **Car**

- Car demand decreases in all three packages, but most notably in the Environment option it falls by 20%, compared to around 5% in both of the Social and Economy option packages.
- Likewise, car vehicle-kilometres also decrease in all packages, most notably by 40% in the Environment option, where car vehicle/hours also drop 48%, double that in other options.
- These results indicate that the whilst demand for road travel is reduced in the Environment option, the length (and hence time) of trips is decreased at a substantially higher rate, i.e. trip lengths are becoming much shorter, in addition to the significant reduction in overall trips being undertaken. Vehicle/hours fall in other options due to additional road building.
- While the most notable impact on Car Tolls would be from the (unquantified) per/kilometre charges in Environment, residual bridge and tunnel tolls fall overall and per vehicle-

kilometre in all options. Toll results for Economy and Social options are similar since, while the former substitutes cordon charges at the M50 and the Canals for existing Port Tunnel and future Eastern Bypass tolls, in the Social option cars pay less than the do-minimum rate (€9 as against €12) to use the Eastern Bypass / Port Tunnel to access the city centre.

- The small drop in cordon and link tolls under the Environment option package, which does not include the Eastern ByPass scheme, probably relates to the increased ability to divert around remaining tolled routes, due to lower congestion levels across the network overall.

### **HGV**

- HGV demand is fixed; however, vehicle hours decrease for all packages, but most notably by 28% for the Environment option. This is a function of more free-flowing roads as no new routes are provided here. The fall in the other packages comes from building new routes, with HGV vehicle-kilometres increasing marginally for the Economy and Social options (indicating longer but faster routes) while the Environment option allows more direct routes.
- HGV Toll levels fall dramatically in both the Social and Economy option packages, and this appears to be due to the new Eastern Bypass route into North and South Ports – which is toll-free for HGVs in these options. However, it is not immediately clear why the Economy option results in toll levels double those of the Social option, as their networks are similar?

### **Public Transport**

- Public Transport (PT) demand increases in all packages, but in most notably in the Environment option package by almost 40%, or more than twice that of the other options.
- The number of boardings divided by demand increases for all three options – but most notably for the Environment option (+0.19), and even more for the bus-based Social option (+0.15) than rail-based Economy option (+0.11). Transfers relative to demand fall in both the Economy (-0.5) and Social (-0.3) options – but rise (+0.1) in the Environment option; while transfers per boarding fall far less in Environment (-0.42) than in other options (-0.6).
- These results suggest that, as well as demand for PT increasing in the Environment option, the amount of interchanging increases significantly – suggesting travellers are substituting indirect PT trips for direct road trips, as a result of road pricing, despite PT fares increases.
- Total PT travel time increases in all packages, but only marginally for the Economy and Social options. For the Environment option it increases by almost 33%. This is as a result of increases in all three elements – walk (+23%), in-vehicle (+49%), and wait time (+20%). In the Environment option, as well as demand increasing, the PT trip length also increases, with sharp rises in passenger-kms against demand (+4.65) and in in-vehicle time (+6.8).
- PT passenger-kms increase notably for all packages but most notably for Environment by 84.5%, with Social (36%) and Economy options (32%) producing similar results despite differences in PT modes and fares – suggesting that availability of free highway capacity is a greater determining factor in mode shift than are any characteristics of PT provision itself.
- The ratio of passenger-kms over in-vehicle time suggests that PT journey speeds improve for all packages, the Environment option having the greatest increase in this proxy for PT speed (+23.5%) with Social (17%) and Economy (18%) options again performing similarly.
- PT fares are higher in all packages, but most notably for the Environment option where total fare revenues increase by 105%, relative to 54% in the Economy option (with greater use of rail and peak hour fare rise) against only 18% in the Social option (where fares are

reduced by 20%). Fare per passenger-km reflect overall fare levels, with the Social option being significantly lower than in the Do Minimum (at -€0.02/km) with the others at +€0.02.

- The PT Crowding penalty increases notably in the Environment option package (by 46%) , – due to the limited additional PT capacity provided – whereas new capacity created (but not used due to other schemes which increase the available roadspace) mean that levels of PT overcrowding would fall by 40% in the Social package and 37% in Economy option.
- This indicates that provision of new PT services and routes will not on its own generate much mode shift, if road capacity and measures to reduce congestion are also put in place.

## Strategy Options Appraisal Results and Conclusions

- 4.44 The formal appraisal results are contained in Tables 4.3 and 4.4 below, containing Sub Objective Scores and Multi Criteria Appraisal Summary Tables (AST) respectively. These give scores initially based on the performance of each package individually compared to the Do-Minimum, although all the scores have also been moderated to take account of the relative levels of impact which each of the packages have compared to each other. These issues are discussed in the table commentary.
- 4.45 The performance of the three options in the final, moderated, two-stage Appraisal scoring may be summarised as follows, though it is important to note that each sub-objective and AST criterion is a distinct measure, and should not be summed to give a single ‘overall’ score to any of the options:
- Environment option impacts driven by road user charging are clear throughout the results. Car demand has been decreased significantly, and correspondingly PT demand has increased. The road pricing measure has also resulted in a significant reduction in car trip lengths, with the model adjusting for the increase in generalised cost by producing shorter journey distances and times. Despite some additional bus and rail infrastructure provision, ‘pull’ measures do not seem to themselves generate mode shift to public transport – albeit fare increases do not deter it either, in the presence of large-scale increases in charges for car use. The scale of additional demand results in increased crowding on the PT network.
  - For the Economy option, a combination of cordon charges, additional rail infrastructure, and PT services results in a slight decrease in car trip demand and distance travelled and a correspondingly small increase in PT demand. This mode shift between road and PT is probably constrained by many other infrastructure measures that improve road availability. The results suggest that average walk, wait and in-vehicle times for PT will all decrease as new services are provided, but the likelihood is that they would struggle to be economic.
  - The Social option is most notable for the surprisingly similar set of results to the Economy package. Whilst many measures were included in both, this seems to suggest that at GDA level, cordon charges and additional rail infrastructure do not significantly impact upon the results, relative to PT fares reduction and bus-based measures, when road capacity is maintained or enhanced. However, this is not to say that bus/rail/road differences will not occur on an individual corridor basis, and this analysis will be done for groups of schemes.
- 4.46 Clearly, there are variations in how far the three packages perform against the key objectives which they were designed to support – with the Social package especially not yet providing a clear picture of how a distinctive package of transport interventions might link communities, and reduce stress – though the Economy and Environment options differences do reflect the competing policy priorities.
- 4.47 Overall the Sub-Objective and Multi Criteria Appraisal results heavily favour the Environment option – but this is very much due to the effects of the per-kilometre road charging. Since this measure is

not currently capable of implementation across the GDA, basing a strategy on this form of demand management would need further work. However, it is worth assessing what alternatives exist, as this is the only option giving a mode split in line with the Government Smarter Travel policy targets.

4.48 On the other hand, some of the Economy option's investments in public transport may well perform better than others, especially in generating mode shift where road congestion is not relieved. It will be important to assess which do this best at the corridor-specific level and at affordable cost – as it is clear that this option would be far more expensive to implement than would the Environment one.

4.49 In assessing the results below, some important caveats need to be taken into account, especially:

- AM Peak model runs only were undertaken for this appraisal; this may disadvantage some of the Social package measures (more local bus provision etc.) which benefit shorter trips;
- Similarly, if the Environment tolls were only applied in the peak (as a congestion charge), the off-peak performance of this option would be far poorer than these model results show;
- Although the model compensates for cost increases by altering trip destinations over time, it does not show the additional ('generated') trips people will tend to make when costs fall – this could result in the re-emergence of congestion in the Social and Economy options; and
- The development patterns which are generating the trips in the model are derived from RPGs. There is still potential for unforeseen or uncommitted local development pressures to create demand and congestion impacts that might potentially require different measures.
- Lastly, none of the results give a clear picture of the outcomes for walking and cycling – though it can be assumed that Environment option especially would be highly beneficial. Similarly, the extent to which any of the options' positive impacts might be supported, and negative ones mitigated, by use of measures supporting travel behaviour change cannot be clearly seen in the results, since the modelling does not account for these measures.



# Strategy Option Appraisal Results

Table 4.3 Comparative Strategy Option Sub-objective scores

Objective	No.	Sub-objective	Definition	Economy option	Social option	Environment option	Description
Objective 1 - Build and Strengthen Communities	1.1	Improve accessibility to work, education, retail, leisure and other activities	Report changes in catchment of major towns in the GDA by car and public transport modes by catchment time band. Score aggregate impacts across all transport modes using seven-point scale.	+1	+1	+1	The Environment option package performs best in terms of increasing the car catchment areas within the time bands to major centres; however, it does so at a financial cost to all car and Public Transport (PT) users (e.g. per/km charges and 10% peak period PT fares increase). The Economy option is marginally the strongest for PT accessibility but also includes road cordon charging and peak period PT fares increases. The Social option has the lowest car accessibility, and medium PT accessibility but no road user charges and a 20% peak period fare reduction so it could promote access to work through reducing the cost of travel to employment areas.
	1.2	Improve access for disadvantaged groups	Report improvements in average journey times (by car and public transport) from origin zones with evidence of deprivation to nearest large town and Dublin City Centre. Qualitatively assess physical improvement measure benefits for people with mobility impairments.	0	+1	+1	The Environment option is the best performing package for car access; however, it does so at a financial cost to all car and PT users (e.g. per/km charges and 10% peak period PT fares increase), which is considered to be a critical issue for access for the disadvantaged. Economy is better than the Social option but, again, the Economy package includes cordon charging, which will affect car trips into Dublin, as well as PT peak period fares increases.
	1.3	Improve access between communities within the region	Quantitative improvement in access (journey times) by car and public transport to main GDA towns. Score on a seven-point scale.	+1	+1	+1	Weighting the results by mode share indicates that the Environment option package generally has a lower proportion of car trips between communities in comparison to the Economy option and Social option. Therefore, whilst the Environment option package provides the greatest benefits in terms of car access, these are attributed to a smaller proportion of car travellers. Again, the issue of road user costs and PT fares increase in the Environment option and Economy option has to be considered.
	1.4	Improve access to other regions and the rest of the island of Ireland	Improvement in journey times on select links in GDA to 'Rest of Ireland' by car and PT. Data then used to inform a qualitative assessment scored on seven-point scale.	+1	+1	+1	Weighting the results by mode share indicates that the Environment option package generally has a lower proportion of car trips between communities in comparison to Economy and Social options. Therefore, whilst the Environment option provides the greatest benefits in terms of car access, these are attributed to a smaller proportion of car travellers. Again, the issue of road user costs and PT fares increase in the Environment option and Economy options has to be considered. The Environment option package has the greater proportion of rail and bus users so the marginally higher benefits offered to these modes within the Environment option are also attributed to larger numbers of travellers.
Objective 2 - Improve Economic Competitiveness	2.1	Improve journey time reliability for business travel	Quantitative assessment of change in links 'over capacity' (demand in excess of 85% capacity). Report numbers of trips affected by mode. Aggregate score against seven-point scale.	+2	+2	+2	The Environment option offers business travellers, who are more likely to be willing to pay the road pricing charges, a much more reliable highway network. Conversely, more of the rail and Luas network is likely to operate at close to capacity and therefore may be susceptible to delays and overcrowding. The Economy and Social options are considered to offer similar benefits, with Economy option better for public transport and Social option for highway.
	2.2	Reduce overall journey times for business travel	Improvement in average journey time for car, HGV and public transport for journeys between identified business clusters. Report time savings by mode and also weighted by percentage mode split.	+1	+1	+2	The Environment option package offers the greatest reduction in journey times by Car and HGV between business clusters, with very similar public transport journey time savings.
	2.3	Ensure value for money of transport expenditure	Aggregate BCR for the modelled and costed schemes in packages. Indicative BCRs for schemes not directly appraised by modelling. Report relative level of the aggregated net benefit (low to high on seven-point scale).	+1	+1	+2	It is difficult to draw strong conclusions at this stage without clear information about the treatment of road pricing and cordon charges and without cost information; however, it is considered likely that the additional capital costs associated with the Economy option are likely to produce a lower Benefit to Cost Ratio than for the Environment option.
	2.4	Support agglomeration and competition	Qualitative assessments of overall changes in journey times to identified business clusters by car and PT. Report time savings by mode (car and PT) and weight by mode split for these trips.	+1	+1	+2	The Environment option package provides the best performance for Car and HGV travel to and from business clusters; however Economy option and Social option provide enhanced PT business connectivity.



Objective	No.	Sub-objective	Definition	Economy option	Social option	Environment option	Description
Objective 2 - Improve Economic Competitiveness	2.5	Improve access to ports and airports	Improvement in average journey time for all trips to Dublin Port, Dublin Airport and Belfast by car, HGV and PT. Report average times and splits by mode. Aggregate score on seven-point scale.	+2	+2	+3	The results suggest that the Environment option provides the most benefits in terms of access to and from the airport and port, with Social option next followed by the Economy option.
	2.6	Provide for efficient goods distribution, servicing and access to resources	Qualitative assessment of the impact on goods distribution of schemes within the packages. Score on seven-point scale.	+2	+3	+2	Environment option includes road pricing that would increase the cost of LGV road freight but improve journey times and reliability. Economy option includes a cordon charge but this is not applied to HGV but should improve efficiency of deliveries into Dublin. Environment option and Social option include transshipment centres and marshalling facilities. All packages have a commitment to increase facilities for rail and water freight. In addition a strategic freight network is proposed with consolidation centres and potential dedicated freight lanes.
Objective 3 - Improve the Built Environment	3.1	Improve and maintain the environment for people movement (e.g. better quality design of streets and spaces)	Qualitative assessments of impacts on the built environment. Score on a seven-point scale.	+1	+2	+2	There are a number of measures that seek to generally enhance the urban environment, including improving and maintaining the streetscape and homezones, but neither are detailed at this time and are included in all packages. Providing priority for pedestrians and vulnerable users in town centres is not included within the Economy option package.
	3.2	Improve the quality of design and maintenance of public spaces and transport fleets, infrastructure	Qualitative assessments to be provided for the in-vehicle and other quality impacts described right. Separate results would be assessed for vehicles and infrastructure. Score on a seven-point scale.	+2	+2	+3	The Environment option package benefits most from the measures directed at public transport overall, as well as those specifically targeted at bus.
	3.3	Minimise physical intrusion of all forms of transport	Quantitative assessment of the volume of trips through major areas of public realm (defined as key links in main towns). Qualitative assessment of overall changes in the level of intrusion of vehicles/HGVs. Score on a seven- point scale.	+1	+1	+2	Whilst the available data does not allow for a detailed assessment of the vehicle flows along corridors, the aggregate evidence indicates that the Environment option will have the greatest positive impact on reducing the physical intrusion of traffic. The Economy option and Social option packages should have minor positive benefits, albeit with significant negative impacts for areas where new road infrastructure will be built.
Objective 4 - Respect and Sustain the Natural Environment	4.1	Minimise the impact of transport on air quality	Results expressed as change in air quality index.	-1	-1	+1	The Environment option package has a positive impact on the level of roadside air pollutants due to the reduction in road vehicle-kilometres. The Economy option and Social option packages are considered to have marginal negative impacts upon roadside pollutant levels.
	4.2	Minimise the impact of transport on water quality	Qualitative scores on seven- point scale.	-2	-2	-1	The Economy option and Social option packages have a negative impact against River Management Plans and the aims of the Water Framework Directive, and surface-water, ground-water, and coastal systems. The Environment option package has only marginal negative impacts against these criteria due to the lower number of infrastructure schemes.
	4.3	Reduce the rate of growth of greenhouse gases associated with transport	Change in CO2 emissions.	-1	-1	+2	The Environment option package has strong positive impacts upon the level of CO <sub>2</sub> emissions, resulting from reduced road vehicle- kilometres. The Economy option and Social option packages have marginal negative impacts.
	4.4	Improve efficiency in the use of non-renewable natural resources (e.g. land, materials, fuels)	Qualitative scores on seven- point scale.	-1	-1	+1	The Economy option and Social option packages have negative impacts upon important and vulnerable resources used for agriculture, the consumption of construction materials, as well as the consumption of fossil fuels as a result of the infrastructure measures and greater road vehicle- kilometres. The Environment option has marginal negative impacts upon soil and construction materials but scores highly positively in reducing the consumption of fossil fuels due to the large reduction in road vehicle- kilometres. All packages score positively in promoting the re-use and regeneration of brownfield sites.

Objective	No.	Sub-objective	Definition	Economy option	Social option	Environment option	Description
Objective 4 - Respect and Sustain the Natural Environment	4.5	Minimise the impact of noise and vibration	Change in population affected by noise.	0	0	+1	The Environment option package has a positive impact upon noise levels in urban areas resulting from the reduction in road vehicle- kilometres. The Economy option and Social option packages are considered to have a neutral impact.
	4.6	Minimise adverse impact of transport on biodiversity and natural amenities	Qualitative scores on seven- point scale.	-2	-2	-1	The Economy option and Social option packages generally have a negative impact upon biodiversity and landscape as a result of the level of road and rail infrastructure, in particular river crossings. The Environment option package has only marginal negative impacts against these criteria due to the lower number of infrastructure schemes.
On some car journeys	5.1	Improve journey time reliability for personal travel	Quantitative assessment of highway links 'over capacity' (with traffic flows in excess of 85% capacity). Quantitative assessment of public transport passenger kilometres on services over 85% capacity. Aggregate score against seven point scale.	+2	+2	+2	It is considered that the Environment option package offers personal travellers a much more reliable highway network; however they may be less willing to pay the road pricing costs than business travellers. Conversely, more of the rail and Luas network is likely to operate at closer to capacity and therefore may be susceptible to more delays. The Economy option and Social option packages are considered to offer similar benefits, with the Economy option better for public transport and Social option for highway.
	5.2	Reduce overall journey times for personal travel	Overall journey time changes report separately by car and PT modes.	+2	+1	+2	The Environment option package provides the most benefit in personal journey time but at a cost – due to per/km charges and 10% peak period PT fares increases. In addition the mode share for car is lower in the Environment option package. The Economy option package provides the most PT journey time benefits but has a lower proportion of passengers, but has the detriment of a 10% peak time fare increase, as well as cordon tolls on some car journeys.
	5.3	Improve travel information	Qualitative scores for the impact against each of elements listed, separately by vehicles and interchanges/stops as appropriate. Score on a seven- point scale.	+1	+1	+2	The greatest benefits would be derived though the Environment option package which encourages the highest combined bus, Luas and rail mode share. There are few measures that are specifically attributable to PT mode; however, a number of measures relate to travel information for walking and cycling. The Environment option package again has the highest walking and cycling mode share so will benefit most from these elements).
	5.5	Improve ease of use of public transport system (ticketing, fares)	Qualitative scores for access and ticketing impacts for both interchanges/stops and vehicles. Score on a seven- point scale.	+2	+2	+3	The greatest benefits would be derived though the Environment option package which encourages the highest combined bus, Luas and rail patronage.
	5.5	Promote healthier forms of travel and use of public space	Qualitatively assess changes in: Number of walk/cycle trips; Total length of walk/cycle trips; and Health impacts of walk/cycle trips. Aggregate effects scored against a seven point scale.	-1	-1	+2	The Environment option package does the most to encourage walking and cycling modes of walking and cycling with mode share increasing on all corridors and bands. In addition PT mode share also increases. Whilst Economy option and Social option increase PT mode share it does this to the detriment of Smarter Travel modes, as well as highway. These packages, therefore, are not deemed to promote healthier travel.
	5.6	Improve travel safety and the sense of personal security	Numbers and monetised impacts of types of accident forecast against highway trips. Aggregate effects scored against a seven point scale.	+1	+1	+2	All the packages result in a lowering of accident levels; however, the Environment option package offer higher levels of accident reduction.
	5.7	Improve travel comfort	Qualitative assessment of surveillance and design impacts for both PT and walk/cycle modes. Also assessment of crowding and assistance impacts for PT modes. Aggregate effects scored against a seven point scale.	+1	+1	+2	The greatest benefits would be derived though the Environment option package which encourages the highest combined bus, Luas and rail patronage.

Table 4.4 Multi-Criteria Appraisal (MCA) Summary Table scores

MCA Objective		Economy option	Social option	Environment option	Description
Safety	Accidents	+1	+1	+2	All the packages result in a lowering of accident levels; however, the Environment option offers considerably higher levels of accident reduction.
	Security	+1	+1	+2	There are a few measures that are proposed in ALL three packages to improve security on public transport. These include i) Good lighting and CCTV in vehicles, and ii) Lighting, help points and CCTV at particular bus waiting facilities. The greatest benefits would be derived though the Environment option which encourages the highest combined bus, Luas and rail patronage.
Economy	Transport Economic Efficiency	+1	+1	+2	As stated in the appraisal framework documentation, a full transport economic (TEE) assessment has not been undertaken for the individual packages and will only be completed for the final draft strategy. The available summary statistics indicate that user benefits will be greatest for the Environment option package.
	Reliability and quality	+2	+2	+3	There are a wide-ranging number of measures applied across all packages that will enhance reliability and improve quality. The Environment option package is considered likely to embody the greatest benefits by providing a more reliably highway network and, although potentially having a more crowded PT network, the improvements to quality will benefit a greater number of travellers.
	Wider Economic Impacts	+1	+1	+2	The Environment option package offer the most benefits in reducing business travel between, as well as to and from business clusters; however there is an associated (unquantified) road pricing cost to offset benefits for highway trips.
Accessibility	Option values	+3	+2	+1	It is likely that the Economy option will provide the most opportunity for benefits in this area due to the increased numbers of infrastructure schemes; however, it will be important to assess the routes to clarify the number of communities that are affected.
	Severance	-2	-1	0	It is likely that Economy option will induce the highest levels of severance as it is the most infrastructure intensive; however it will be important to assess where the infrastructure is spatially.
	Access to transport	+2	+2	+1	The Environment option package is considered to be the worst performing package under this criterion; however the additional public transport provision provided means it still scores positively. The Economy option and Social option packages offer benefits in different areas, with Economy option offering lower journey times and more direct routes, whilst Social option has lower fares and less crowding.
Social Inclusion	Deprived geographic areas	+2	+1	+2	The Environment option is the best performing package, particularly for car access; however, it does so at a financial cost to all car users of per-km charges, which are considered to be a critical issue for access for the disadvantaged. The Economy option is better than Social – but it should also be noted that the Economy package includes cordon charging which will affect car trips to Dublin.
	Vulnerable groups	0	+2	0	The issue with the tolls is considered to have a notable negative impact upon this criterion for the Environment option and Economy option; however, there are positive impacts from improvements to public transport infrastructure and vehicles, although not many of these are specifically targeted towards vulnerable users. The Social option package benefits from no road charges, lower fares and specific measures to improve access for the vulnerable.
Integration	Transport Interchange	+2	+1	+1	The Economy option package has the most new infrastructure, followed by Social option, so it is anticipated that there will be more public transport interchange opportunities. All packages include park and ride sites.
	Geographic Integration	+2	+2	+3	The results suggest that the Environment option package provides the most benefits in terms of access to and from the airport, port and Belfast, with Economy option and Social option similar.
	Land Use Policy	+2	+1	+2	Weighting the results by mode share indicates that the Environment option package generally has a lower proportion of car trips between communities in comparison to the Economy option and Social option. Therefore, whilst the Environment option package provides the greatest benefits in terms of car access, these are attributed to a smaller proportion of car travellers. Again the issue of road pricing also has to be considered. The Environment option package has the greater proportion of rail and bus users so the greater benefits offered to these modes within the Environment option package are also attributed to larger numbers of travellers.

MCA Objective		Economy option	Social option	Environment option	Description
Integration	Other Government Policies	+1	+2	+1	There are some individual benefits from measures in all packages, however the road charging schemes in the Environment option, and to a lesser degree the Economy option, will impact upon equity and social inclusion, whilst the Social option provides additional benefits to low income and non-car owners.
Environment	Air quality	-1	-1	+1	The Environment option package has strong positive impacts upon the level of roadside air pollutants; however, a wider assessment of air quality standards indicated that, whilst overall emissions fall across the region, there are a very small number of road links where pollutant levels approach (but do not exceed) the air quality standards. The Economy option and Social option packages have marginal negative impacts upon roadside pollutant levels.
	Human Health (incl. noise)	+2	+1	+3	The Environment option package contributes significantly to the transport related aspects of quality of life for residents, it has positive impacts upon noise levels in urban areas, it minimises safety risks and supports health improvements. The Economy option and Social option packages still contribute to quality of life and safety; however they have a neutral impact on noise and a negative impact on health.
	Landscape	-2	-2	-1	The Economy option and Social option packages have negative impacts upon protected landscapes and conservation areas, as well as undesignated landscape resources, as a result of the level of road and rail infrastructure being provided. The Environment option package has a smaller negative impacts against these criteria due to the lower number of infrastructure schemes.
	Biodiversity	-3	-3	-1	The Economy option and Social option packages have very negative impact upon integrity of European Conservation Sites, as well as acting against the National Biodiversity Plan and locally important biodiversity in the GDA as a result of the level of road and rail infrastructure. The Environment option package has a lower level of negative impacts against these criteria due to the lower number of infrastructure schemes.
	Cultural Heritage	-1	-1	0	The Economy option and Social option packages are considered to have a marginally negative impact upon designated cultural, architectural and archaeological resources, due to quantum of road and rail infrastructure measures. The Environment option package is expected to have a broadly neutral impact.
	Water	-2	-2	-1	The Economy option and Social option packages have negative impacts against River Management Plans and the aims of the Water Framework Directive. In addition they have negative impact upon surface water, groundwater, coastal systems, transitional systems and the risk of flooding as a result of the level of road and rail infrastructure. The Environment option package has only marginal negative impacts against these criteria due to the lower number of infrastructure schemes.
	Climate Change (CO <sub>2</sub> )	-1	-1	+2	The Environment option package has strong positive impacts upon the level of CO <sub>2</sub> emissions, resulting from reduced road vehicle- kilometres. The Economy option and Social option packages have marginal negative impacts.
	Soil and geology	-2	-2	-1	The Economy option and Social option packages have negative impacts upon important and vulnerable resources used for agriculture, the consumption of construction materials, and on protected and designated geological and geomorphologic sites, resulting from the level of road and rail infrastructure. The Environment option package has only marginal negative impacts against these criteria due to the lower number of infrastructure schemes.
	Material assets	+1	+1	+2	All packages are rated as marginally positive for protecting public assets and infrastructure, as well as notably positive at assisting with the re-use and regeneration of Brownfield sites. The Environment option package is also considered to contribute extremely positively to the reduction in fossil fuel demand, resulting from the decrease in road vehicle- kilometres. In comparison, the Economy option and Social option packages are anticipated to have a marginally negative impact on this criterion.



## 5. Preparation of Draft Strategy

- 5.1 The results of the appraisal of Strategy Alternative options were presented to the SSG and Technical Groups in July and August 2010, along with proposals to undertake further analysis of infrastructure schemes at a corridor level, to ascertain which would best support the Draft Strategy.
- 5.2 The conclusion that the Draft Strategy should be based upon the combined effect of road user charging – from the Environment package – and significant public transport investment – from the Economic package – was broadly accepted, as the combined measures strongly meet objectives.

### Contents of the Draft Final Strategy

- 5.3 Working from the results of the Strategy Alternatives appraisal, key messages were identified and used to inform the draft Strategy's contents. The key points taken into account were as follows:
- Additional rail, bus priority and road infrastructure all contribute to meeting the objectives;
  - However rail and bus infrastructure meet all social, economic and environmental objectives (subject to scheme-specific mitigation in the case of new alignments), whereas major road infrastructure generally does not meet environmental objectives, even with local mitigation;
  - If both rail and road improvements are provided in the same corridor they tend to vie for demand with no major change in mode share, and therefore neither meets their objectives;
  - There can be some flexibility about what public transport is implemented (e.g. BRT or Luas), however the highest capacity mode will be specified for the purposes of appraisal;
  - For all modes, high impact schemes are also by and large the highest cost schemes; and
  - Policy tools – especially travel demand management – have a crucial role in improving public transport's mode share BUT they require capacity improvements to public transport.
- 5.4 Strategic infrastructure and services to meet forecast travel demand (with the major policies in place) was subjected to further analysis on a corridor by corridor basis. This was similar to work undertaken to allocate relevant infrastructure into Strategy Alternative packages (see 3.18 above).
- 5.5 Alongside the selection of the additional infrastructure to be included, it was also necessary to fine-tune the policy measures – especially those relating to demand management – in two key areas:
- **Parking:** working with local authorities, the NTA calculated how restrictions on parking provision in new developments at key locations would affect car demand. This included a policy of no new workplace parking in the City Centre; a cap at 15% of assumed additional 2030 demand in Docklands and Ballsbridge; 20% of demand at Clonburris and Parkwest; 30% of demand at Cherrywood and Sandyford; and 50% of the future demand at Tallaght.
  - **Road user charging:** in line with the results achieved with the Environment package's per/km road user charge, tests were carried out to see what level of additional generalised cost resulted in a mode split in line with the Government's 'Smarter Travel' policy target, of 45% of trips being undertaken by car given assumed levels of investment in other modes.
- 5.6 Some preliminary model runs were undertaken which established that, for AM peak traffic, the additional generalised cost applied to all trips across the GDA would be marginally higher than the Environment package. This is needed to compensate for the TAGM model's effect of reallocating trips to closer destinations in response to increased charges (referred to in para. 4.44 above), as this was switched off for the evaluation of the Draft Strategy. This produces more conservative demand assumptions, but also illustrates the artificial nature of applying "charges" with this method.

- 5.7 The details of the main infrastructure measures in the Draft Strategy by corridor are outlined in **Table 5.1 below**. In addition, some changes were made to public transport service patterns – for example, with Metro North services running through to Cherrywood on the upgraded Green Line, and through running between the new Tallaght via Kimmage Luas and Line BX/D to Broombridge.

**Table 5.1 Infrastructure schemes in the Draft Strategy**

Corridor/Band		Scheme Reference	Proposal
Corridor A	Northern coastal	RL5-IE5,DTOR1, IE11d	DART Balbriggan-Hazelhatch via DART Underground, facilitated by 3/4 tracking of Northern Rail corridor north of Connolly to point south of Balbriggan
		RL5-RPA1	Metro North Swords to Stephens Green, via Airport, Ballymun, DCU, Mater etc.
		BS1-FCC24-FCC105	Malahide to Swords QBC
		BS1-QBN3b	Swords QBC - extend along bypass (northern section)
		BS1-DCC1b-DTOB21	Malahide Road north of N32 online QBC Kinsealy to N32 including QBC upgrade at N32 junction
		RC2-DTOH1	Swords Western Bypass alternative proposal linking to Fosterstown
Corridor B	Navan / Blanchards town	RL5- IE3	Navan line (Navan to Pace only)
		RL9-IE1	Maynooth line upgrade/ electrification Maynooth to Connolly
		RL5-RPA2	Metro West Tallaght via Clonburris, Blanchardstown, then Metro North alignment to Swords and city centre
		RL5-RPA6	Luas BXD Stephens Green to Broombridge
		BS1-DCC4k	Cappagh Road QBC
		BS1-FCC27-FCC107	Tyrellstown to Ballycoolin QBC
		BS1-QBN3q	New Cabra Rd QBC
Corridor C	Maynooth/ Lucan	RL5-RPA5	Lucan Luas Line F to city centre and south Docklands
		BS1-QBN3ab	Link Quarryvale/Clondalkin to Parkwest/Cherry Orchard
		BS1-DTOB20	Bus priority Lucan to Adamstown as alternative to Line F extn (RL5-RPA13)
		BS1-BAC5c	Bus bridge over M4 west of Lucan
		BS1-BE1	M4 QBC
Corridor D	Kildare/ Tallaght	RL5-IE5	Kildare suburban upgrade/electrification => DART Hazelhatch to city centre via DART Underground
		BS1-KCC6a	Bus corridor from Naas to Sallins (instead of RL5-KCC6b)
		RL6-RPA16	New Red Line station at Longmile Road/Naas Road
		RL5-RPA8	Tallaght via Kimmage Luas
		BS1-QBN3ac	Naas Road QBC extend Kingswood to Rathcoole
		BS1-QBN3ad-QBN3af	Tallaght QBC extension to Outer Ring Road and enhance Old Bawn Rd- Glenview section
Corridor F	Southern Coastal Corridor	RL5-IE5	DART/southern rail corridor reconfiguration post DART Underground (Maynooth to Bray/Greystones services)
		RL9-RPA15	Upgrade Luas Green line to Cherrywood to Metro
		RL5-RPA4	Green Line Luas extension to Bray/Fassaroe, built to Metro infrastructural requirements
		BS1-QBN3ap	Dun Laoghaire-Cherrywood QBC

Corridor/Band		Scheme Reference	Proposal
	Southern Coastal	BS1-QBN3ag	Sandyford to N11 via Leopardstown Road/Brewery Road
Corridor G/H	City Centre/ Docklands	RL5-IE5	DART Underground
		RL5-RPA6	Luas (BXD) Stephens Grn to Broombridge
		BS1-QBN3s	Fariview-Ballybough Rd-Summerhill Rd QBC
		BS1-QBN3av	Manor St to O'Connell St QBC - NB Luas BXD is now present in all options therefore QBC probably no longer needed.
		RC5-NRA4	Port Bridge (as substitute to Eastern Bypass for south port access)
		BS1-BAC5g-DDDA3b_QBN3t	Annesley Bridge- Point-Bus only Link over Grand Canal/Dodder at Quays with Docklands BRT
		BS1-DDDA3a	Extend QBC from Point to Poolbeg
		BS1-QBN3ae-DLR18-DLR30	Bus priority Green Route Tallaght to Ballinteer Rd - Drumartin (substitute for RL5-RPA12 Metro West extn to Balally)
		BS1-QBN3i-QBN3j-QBN3c	QBC Northside Centre-Beaumont-Collins Ave-Glasnevin Ave-N2
		BS1-QBN3d	QBC Howth Junction - Kilmore via Oscar Traynor Rd
		RC5-FCC15	N2-N3 Link (NB largely already through planning process)
Area Band 4	Rural Hinterland	RC5-NRA2	Leinster Outer Orbital Route wide single carriageway, primarily on-line
		RC4-WCC1	Extension of Outer Orbital Route to Arklow (widening/ local improvements)

- 5.8 This is a list of schemes assumed for Draft Strategy modelling and appraisal purposes only. Specifications of some schemes may vary following further evaluation/assessment (e.g. Kimmage Luas, Lucan Luas etc.); these may also be implemented initially at a lower level of provision (e.g. as BRT rather than Luas) – though others may in practise require upgrading. Other schemes not listed may be implemented over the lifetime of the strategy e.g. level crossing closures, additional rail tracks south of Bray, additional rail stations, local roads etc. See the Strategy Report for details.

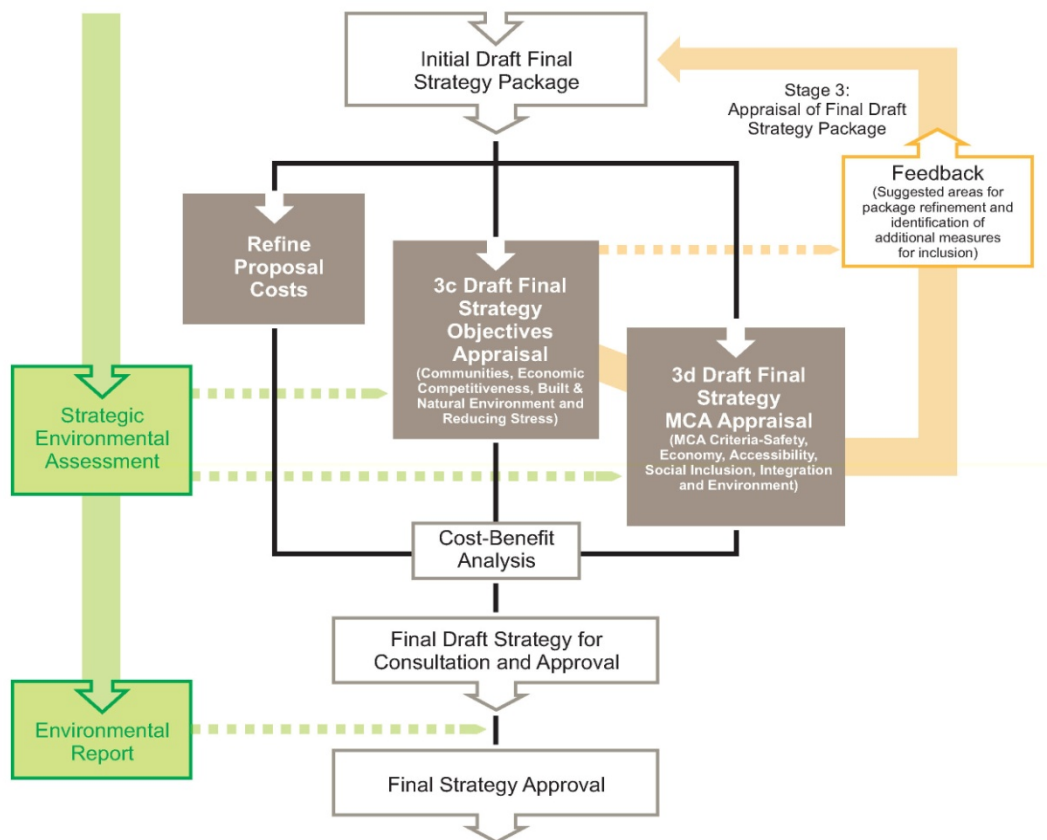
#### Other measures and policies

- 5.9 Other than the infrastructure measures modelled, the Draft Strategy assumes that local bus services will be provided serving major town centres. Bus interchange with rail services will also be provided at key locations, including major town centres in the Metropolitan Area and in the city centre. It is assumed that buses would not run parallel to the main rail corridors into the city centre.
- 5.10 A strategic cycling network will be developed, building on existing facilities but focusing in particular on the city centres, town centres and their approaches where trips tend to be shorter and potential for cycling use is at its highest. For appraisal purposes no highway capacity is assumed to be lost.
- 5.11 Other than the on-line improvements on the Leinster Outer Orbital corridor, roads are provided only to support development in appropriate locations where it can be expected to occur by 2030. Road proposals put forward for other development sites (either not yet zoned or not expected to come forward) have not been included and would be dealt with in the process of planning a development.
- 5.12 Park and ride schemes will be addressed on a case-by-case basis, however a number of schemes (primarily involving parking at rail stations, but some bus-based on the N2, N3, N4 N7 and N11) have been included for the Draft Strategy assessment – some 13,500 spaces at 23 sites in total.

## Development and Appraisal of the Draft Final Strategy

5.13 The process used for development and appraisal of the draft final strategy is shown in **Figure 5.1**.

**Figure 5.1 Stage 3c/d Strategy Packages Appraisal Process**



- 5.14 As can be seen, the initial Draft Strategy will be appraised in the same way as the Strategy options. However, much more detailed costs were developed and used in the initial appraisal this time, with the full cost data feeding through to the final economic Cost-Benefit Analysis step of the process.
- 5.15 Once the outcome of initial appraisal had been reported, there was scope for the SSG to change the contents of the Strategy – either responding to need to improve some area of performance, or to accommodate constraints on certain measures which may have become apparent (e.g. land use, financial or environmental issues). In practise, limited further changes were made at this point, and the Draft Strategy for consultation alongside this report is largely as described in this Chapter.
- 5.16 As with the earlier Strategy Alternatives stage, the appraisal process was run alongside and in consultation with, the Strategic Environmental Assessment (SEA). Scores from both processes were shared and (largely) aligned, as can be seen in the narrative accompanying environmental objectives in the tables in Chapter 6. The SEA work will now inform a final Environmental Report.



## 6. Results of the Appraisal of the Draft Strategy

- 6.1 Once again, both an Objectives and Multi-Criteria Appraisal were undertaken. These were based solely on the data provided from AM peak runs of the model. This was in order that the scale of change being seen could be validated against the performance of the previous packages – so that a +2 or a -1 score, for example, would signify a change of a similar order of magnitude as before.
- 6.2 This does mean that some of the other assessments undertaken – which took account also of results from the Inter-Peak model – show a slightly different picture. This is especially true in relation to the modelling undertaken by ERM for the Strategic Environmental Assessment, where all-day levels of noise and air quality impacts were found to be marginally worse than the patterns found in the AM peak only; and also with the economic modelling (using TUBA software), to generate a benefit-cost ratio for the strategy, where aggregated results were substantially better.

### Initial assessment of Draft Strategy

- 6.3 The Draft Strategy option generally includes rail and bus corridor schemes, although there are some road schemes. It has per/km peak-only road user charges, also applied to HGVs, with no net increase in workplace parking in the city and some controls in new developments. Public transport fares increase by 10% in the AM peak but are reduced at off-peak times, similarly to the packages.
- 6.4 The Draft Strategy AM peak summary statistics show the following changes from the Do Minimum:
- 15% reduction in car demand
  - 39% reduction in car hours
  - 38% reduction in car kilometres
  - Static HGV demand
  - 15% reduction in HGV hours
  - 3% reduction in HGV kilometres
  - 32% increase in Public Transport demand
  - 56% increase in Public Transport boardings
  - 47% increase in Public Transport transfers
  - 102% increase in Public Transport fares revenue
  - 52% increase in 'total crowding penalty'
  - 23% increase in walk time
  - 22% increase in wait time
  - 52% increase in In Vehicle Time (IVT)
- 6.5 Generally, the option indicates that car and HGV demand would be much lower than earlier Economy or Social packages but marginally higher than the earlier Environmental option – though overall vehicle kilometres are less than in that variant, probably due to a slightly higher charge and a greater availability of alternatives. Likewise, Public Transport demand is higher than all except Environment, but crowding is much higher. **Table 6.1** below shows variations across all packages.

**Table 6.1 Headline Indicators from Draft Strategy Appraisal**

Indicator	Do Minimum (original)	Economy	Social	Environ't	Do-Minimum (updated)	Draft Strategy
Car: Demand	694,800	655,200	662,100	553,600	<b>677,700</b>	<b>574,000</b>
Car: Vehicle-hours	681,500	514,900	535,900	354,100	<b>481,100</b>	<b>292,900</b>
Car: Vehicle-kms	17,247,000	15,917,000	16,044,000	10,363,000	<b>13,746,000</b>	<b>8,509,000</b>
Car: Total Toll – €	€392,621	€318,535	€317,030	€2,810,373	<del>€254,000</del>	<b>€128,000</b>
<i>Toll per car veh-km</i>	<i>€0.022</i>	<i>€0.020</i>	<i>€0.0197</i>	<i>€0.2711</i>	<i>€0.0185</i>	<i>€0.015</i>
HGV: Demand	101,200	101,200	101,200	101,200	<b>101,200</b>	<b>101,200</b>
HGV: Vehicle-hours	108,800	90,700	90,000	87,200	<b>93,700</b>	<b>79,300</b>
HGV: Vehicle-kms	3,586,000	3,599,000	3,630,000	3,469,000	<b>3,562,000</b>	<b>3,448,000</b>
HGV: Total Toll – €	€47,903	€10,447	€5,479	€45,385	<del>€42,000</del>	<b>€38,000</b>
<i>Toll per HGV veh-km</i>	<i>€0.0133</i>	<i>€0.0029</i>	<i>€0.0015</i>	<i>€0.0130</i>	<i>€0.0118</i>	<i>€0.011</i>
PT: Demand	379,500	452,100	449,700	528,000	<b>374,500</b>	<b>493,200</b>
PT: Boardings	437,000	570,000	583,000	706,000	<b>403,000</b>	<b>628,000</b>
PT: Transfers	1,578,000	1,666,000	1,750,000	2,250,000	<b>1,450,000</b>	<b>2,130,000</b>
PT: Walk time	253,600	250,600	248,300	313,600	244,000	302,100
PT: In-vehicle time (IVT)	187,000	208,900	216,500	279,400	172,500	261,400
PT: Wait time	75,600	67,600	68,300	90,400	70,100	85,800
PT: Total Travel Time	516,200	527,100	533,100	683,400	486,600	649,300
PT: Pass-kms	5,403,562	7,150,250	7,331,063	9,977,098	<b>5,210,676</b>	<b>9,671,569</b>
PT: Fares	€994,000	€1,531,000	€1,173,000	€2,043,000	<del>€961,000</del>	<b>€1,946,000</b>
PT: Crowding Penalty	3,661,000	2,301,000	2,178,000	5,342,000	<b>4,655,000</b>	<b>7,096,000</b>
<i>PT: Pass-kms / IVT</i>	<i>28.9</i>	<i>34.2</i>	<i>33.9</i>	<i>35.70</i>	<i>30.21</i>	<i>36.99</i>
<i>PT: Pass-km/Demand</i>	<i>14.24</i>	<i>15.82</i>	<i>16.30</i>	<i>18.89</i>	<i>13.91</i>	<i>19.61</i>
<i>PT: Fare / Demand</i>	<i>2.50</i>	<i>3.38</i>	<i>2.60</i>	<i>3.87</i>	<i>2.57</i>	<i>3.95</i>
<i>PT: Fare / Pass-kms</i>	<i>0.18</i>	<i>0.21</i>	<i>0.16</i>	<i>0.20</i>	<i>0.18</i>	<i>0.20</i>
<i>PT: Transfer/Demand</i>	<i>4.16</i>	<i>3.69</i>	<i>3.89</i>	<i>4.26</i>	<i>3.87</i>	<i>4.32</i>
<i>PT Boarding /Demand</i>	<i>1.15</i>	<i>1.26</i>	<i>1.30</i>	<i>1.34</i>	<i>1.08</i>	<i>1.27</i>
<b>Total demand (Car/PT)</b>	<b>1,074,300</b>	<b>1,107,300</b>	<b>1,111,800</b>	<b>1,081,600</b>	<b>1,052,200</b>	<b>1,067,200</b>

## Sub-Objectives Appraisal results

### Objective 1 – Build and strengthen communities

- 6.6 Generally the preferred package option reduces car access times, as well as PT access time, and therefore performs well against all these sub-objectives, with the caveat that the per-km road user charge will impact upon general motoring access. In detail the indicator results seen are as follows:
- 6.7 **Sub-Objective 1.1 Access to work and other facilities** (population within acceptable journey times to City Centre, seven District Centres and five Hinterland Towns by public transport and car):
- Increase of 61% in population within 30 minutes travel to work in a key centre by public transport
  - Increase of 70% in population within 60 minutes travel to work in a key centre by public transport
  - Increase of 52% in population within 30 minutes travel to work in a key centre by Car
  - Increase of 37% in population within 60 minutes travel to work in a key centre by Car
- 6.8 Clearly, there is a significant improvement in access by all modes and potential large benefits. However for travel to work in the morning peak, these will be reduced for car users through the imposition of the per/km road user charge; and for public transport users by the 10% fare increase.
- 6.9 Travel at other times (while not directly assessed) can be expected to benefit from the same public transport service improvements, together with off-peak fare reductions. However, the fact that road user charges are not imposed suggests that road users may experience slower off peak journeys.
- 6.10 **Sub-Objective 1.2 Access for the disadvantaged** (average journey times from deprived areas to the City Centre, and nearest District Centres and/or Hinterland Town by public transport and car):
- Average reduction of 14% in journey times from deprived wards to nearest major town by public transport
  - Average reduction of 13% in journey times from deprived wards to Dublin City Centre by public transport
  - Average reduction of 20% in journey times from deprived wards to nearest major town by Car
  - Average reduction of 26% in journey times from deprived wards to Dublin City Centre by Car
- 6.11 Although the largest journey time reductions are on the less-congested roads, these will be subject to the per/km peak time charge. Public transport trips too will face fare rises of 10%. However, as many trips made by disadvantaged people will be outside the peaks, neither of these charges will apply, while public transport service improvements will be available at reduced fares. Car users outside of the peak times, when charges do not apply, may suffer additional congestion in practise.
- 6.12 **Sub-Objective 1.3 Links between communities** (change in average journey times between the City Centre, the seven District Centres and the five Hinterland Towns by public transport and car):
- An average reduction in journey time between key communities by public transport of 12%
  - An average reduction in journey time between key communities by Car of 28%
- 6.13 Once more, the largest journey time reductions are on less-congested roads, subject to the per/km peak time charges. However, many trips of this type will be made outside the peaks, when the charge does not apply, and public transport service improvements are available at reduced fares – though off-peak car users, when charges do not apply, may in practise suffer additional congestion.

- 6.14 **Sub-Objective 1.4 Links to the rest of Ireland** (Change in journey time along main corridors from Dublin City Centre to edge of model in directions of main cities by rail, bus and all road vehicles):
- No change in the average journey time along the main corridors to the rest of Ireland by rail
  - An average reduction in journey time along the main corridors to the rest of Ireland by bus of 8%
  - An average reduction in journey time along the main corridors to the rest of Ireland by road of 10%
- 6.15 The rail situation is driven by assumptions that Inter City timetables will remain the same; whereas in practise some capacity might be reallocated to them after the proposed main line improvements. Inter-urban bus and car journeys to the boundaries of the GDA benefit from the reduced congestion that arises from charging. By their nature, trips of this kind in the peak will often be business trips.
- Objective 2 – Improve economic competitiveness**
- 6.16 The preferred package significantly reduces highway delay and congestion on Luas and rail, and to a lesser degree Dublin Bus and Bus Éireann. It doesn't significantly improve journey times between business locations and the overall benefits through journey time savings do not look as substantial as any of the previous package options. Access to the airport and port is significantly enhanced.
- 6.17 **Sub-Objective 2.1 Improve journey time reliability for business travel** (change in links with demand in excess of 85% of capacity for rail, bus and car; percentage of trips affected by mode):
- An average reduction of 20% in passenger trips on links above 85% of capacity by Luas
  - An average reduction of 13% in passenger trips on links above 85% of capacity by rail
  - An average reduction of 6% in passenger trips on links above 85% of capacity by all bus
  - An average reduction of 12.5% in passenger trips on links above 85% of capacity by car
- 6.18 Additional capacity on public transport together with reduced road congestion due to the charge will greatly enhance reliability. Here, travel on the busiest routes and services is used as an effective proxy as these are the most likely to be subject to delay and variability. Other measures which are not able to be modelled (e.g. better traffic signals with bus priorities) would also improve reliability.
- 6.19 **Sub-Objective 2.2 Reduce overall travel time for Business Travel** (Improvement in average journey time for car, HGV and public transport for journeys between identified business clusters):
- A 6% increase in average peak travel time between designated business clusters by car
  - A 21% increase in peak average travel time between designated business clusters by HGV
  - A 7% decrease in peak average travel time between designated business clusters by Public Transport
- 6.20 This is a mixed picture, with direct routes to these busy destinations appearing still to suffer road congestion at peak times. This partly reflects conservative assumptions about demand, where the trips to areas of high demand in 2010 were forecast to still have such demand in 2020, whereas in practise over time some trips would migrate to new destinations where easier journeys are available. However, the public transport improvements centring on bus towns improve the situation.
- 6.21 **Sub-Objective 2.3 Value for Money for transport expenditure** (this is only assessed qualitatively at this stage; more detail can be found in the Section on Transport Economic Efficiency Analysis).
- 6.22 **Sub-Objective 2.4 Support business agglomeration and competition** (report time savings by car and public transport for all trips to and from designated business clusters):

- A 19% reduction in peak average travel time to or from designated business clusters by car
  - A 1% increase in peak average travel time to or from designated business clusters by HGV
  - A 6% reduction in peak average travel time to or from a designated business cluster by Public Transport
- 6.23 Unlike the trips between busy towns, the situation to and from all destinations is greatly improved. The HGV statistic is within margins of error and also does not reflect the ability to re-time journeys.
- 6.24 **Sub-Objective 2.5 Access to Port and Airport** (improvement in average journey time for all trips to and from Dublin Port and Dublin Airport by car, HGV and Public Transport):
- A 27% reduction in peak period average travel time to or from Dublin Airport by Car
  - A 25% reduction in peak period average travel time to or from Dublin Port by Car
  - A 27% reduction in peak period average travel time to or from Dublin Airport by HGV
  - A 12% reduction in peak period average travel time to or from Dublin Port by HGV
  - A 42% reduction in peak period average travel to or from Dublin Airport by Public Transport
  - A 4% increase in peak period average travel to or from Dublin Port by Public Transport
- 6.25 At their prime origin and destination points, HGVs do achieve large benefits. As would be expected from current demand patterns, little of the new public transport benefits access to the Port itself, but in practise services would be provided to meet passenger sailings which may be outside the peaks.
- 6.26 **Sub-Objective 2.6 Provide for efficient goods distribution and servicing** (Qualitative assessment of the impact on goods distribution of schemes within the package only at this stage).

### Objective 3 – Improve the built environment

- 6.27 The Draft Strategy option is considered to perform well and at a similar level to the previous Environment package. All three sub-objectives in this area are assessed by qualitative judgement.

### Objective 4 – Respect and sustain the natural environment

- 6.28 The Draft Strategy option is considered to perform well and at a similar level to the previous Environment package. All bar two of the six sub-objectives in this area are assessed qualitatively.
- 6.29 **Sub-Objective 4.1 Minimise the impact of transport on air quality** (calculated by ERM for SEA as the change in air quality index for population living within 20 m of roads where pollution levels for NO<sub>2</sub> and PM<sub>10</sub> exceed the appropriate threshold levels, as specified in the results given below):
- For PM<sub>10</sub>, there is a net benefit for approximately 6,319 people (i.e. approximately 14,614 people will have exposure reductions of >0.5µg/m<sup>3</sup> against 8,295 people who will have exposure increases of >0.5µg/m<sup>3</sup> PM<sub>10</sub>). Thus, a small positive impact across the region.
  - For NO<sub>2</sub>, there is a net negative impact for approximately 22,921 people (i.e. approximately 19,002 people will have exposure to reductions of 1µg/m<sup>3</sup> against approximately 41,923 people who will have exposure increases of 1µg/m<sup>3</sup>). Thus a small negative impact overall.
- 6.30 **Sub-Objective 4.3 Reduce the rate of greenhouse gases associated with transport** (calculated by ERM for the SEA as the total annual CO<sub>2</sub> emissions on the assessed road network):
- The Draft Strategy demonstrated a total decrease of 7.1% compared to the Do-Minimum.

### Objective 5 – Reduce personal stress

- 6.31 The preferred package reduces highway delay and congestion on Luas, and to a lesser degree Rail and Dublin Bus, but the per/km road user charge will impact upon the highway benefits gained.

Overall journey time benefits differ by corridor. The increase in public transport patronage means that the introduction of service and other enhancements will benefit a wider range of individuals.

6.32 **Sub-Objective 5.1 Improve journey time reliability for personal travel** (change in links with demand in excess of 85% of capacity for rail, bus and car; percentage of trips affected by mode):

- An average reduction of 20% in passenger trips on links above 85% of capacity by Luas
- An average reduction of 13% in passenger trips on links above 85% of capacity by rail
- An average reduction of 6% in passenger trips on links above 85% of capacity by all bus
- An average reduction of 12.5% in passenger trips on links above 85% of capacity by car

6.33 Note that the above calculations are the same as for Sub-Objective 2.1, as the model is not able to distinguish between trip purposes once journeys are assigned to the network. A different set of assumptions is made about the balance between different types of trip in the Transport Economic Efficiency calculations below. However, it is clear that the benefits are very high for both trip types.

6.34 **Sub-Objective 5.2 Reduce overall travel time for Personal Travel** (percentage change in average journey time in minutes for all journeys on identified corridors and all journeys in GDA):

Area	Car	PT
Entire GDA	-27%	-2%
Corridor A (Northern Coastal)	-39%	9%
Corridor B (Navan/Blanchardstown)	-38%	-8%
Corridor C (Maynooth/Lucan)	-35%	-12%
Corridor D (Kildare/Tallaght)	-22%	20%
Corridor E (Rathfarnham)	-23%	17%
Corridor F (Southern Coastal)	-26%	14%
Corridor G (Dublin City Centre)	43%	-6%
Corridor H (Docklands)	-17%	-8%

6.35 In general these results are positive. The reduction in car travel times to Dublin City Centre is not a major issue since so many alternatives exist – some of these may in practice transfer to cycling or walking, for example – and the remaining trips are likely to be driven more by the availability of parking spaces than other transport considerations. Some of the public transport journey time increases appear to result from conservative assumptions on improved coastal rail services, as well as complex routing decisions from Tallaght given an option of the new Luas line via Kimmage.

6.36 The Rathfarnham corridor receives no major improvements in the Draft Strategy, while demand still rises on all these corridors as the road user charges impact on car use – hence journey times slow.

6.37 Sub-Objectives 5.3 (Improve Travel Information); 5.4 (Improve ease of use of public transport system); 5.5 (Promote healthier forms of travel); and 5.7 (Improve travel comfort) are all assessed qualitatively. However overall, benefits accrue to a larger number of people using public transport in the Draft Strategy scenario, as well as from the actual improvements provided by the measures.

6.38 **Sub-Objective 5.6 Improve travel safety and personal security** (number of road traffic accidents in Do-Something scenario, calculated using COBA from vehicle kilometres run by type of road link):

- An average annual reduction of 32% in fatal traffic accidents in the morning peak period
- An average annual reduction of 27% in serious traffic accidents in the morning peak period

6.39 Results of Sub-Objectives and MCA Appraisals of the Draft Strategy are shown in the tables below.



**Table 6.2 Draft Strategy Option Sub-objective scores**

Objective	No.	Sub-objective	Definition	Strategy Score	Description of Draft Strategy Scoring/Comments
<b>Objective 1 - Build and Strengthen Communities</b>	1.1	Improve accessibility to work, education, retail, leisure and other activities	Report changes in catchment of major towns in the GDA by car and public transport modes by catchment time band. Score aggregate impacts across all transport modes using seven-point scale.	+2	The draft strategy results in a significant increase in car accessibility, albeit with a per/km road user charge. It also increases PT demand; however by a much less significant margin, plus PT peak period fares increase by 10%; although, off-peak PT fares will reduce and so would help those travelling in these periods.
	1.2	Improve access for disadvantaged groups	Report improvements in average journey times (by car and public transport) from origin zones with evidence of deprivation to nearest large town and Dublin City Centre. Qualitatively assess physical improvement measure benefits for people with mobility impairments.	+1	The draft strategy reduces both PT and Car journey times to local towns and into Dublin; however, it does so at a financial cost to road users (the per/km charge) plus PT peak period fares (+10%); although off-peak PT travel fares will reduce and so would help members of disadvantaged groups travelling in these periods.
	1.3	Improve access between communities within the region	Quantitative improvement in access (journey times) by car and public transport to main GDA towns. Score on a seven-point scale.	0	The draft strategy reduces both public transport and car journey times between communities; however, it does so at a financial cost to road users (the per/km charge) plus PT peak period fares (+10%); although off-peak PT travel fares will reduce and so would help those travelling in these periods.
	1.4	Improve access to other regions and the rest of the island of Ireland	Improvement in journey times on select links in GDA to 'Rest of Ireland' by car and PT. Data then used to inform a qualitative assessment scored on seven-point scale.	+1	The draft strategy reduces both bus and car journey times to other regions and the rest of Ireland; however, it does so at a financial cost to road users (the per/km charge) plus PT peak period fares (+10%); although off-peak PT travel fares will reduce and so would help those travelling in these periods. The impact on rail journey times is relatively neutral.
<b>Objective 2 - Improve Economic Competitiveness</b>	2.1	Improve journey time reliability for business travel	Quantitative assessment of change in links 'over capacity' (demand in excess of 85% capacity). Report numbers of trips affected by mode. Aggregate score against seven-point scale.	+2	The draft strategy option reduces highway congestion. It also significantly reduces crowding on the Luas and, to a lesser degree, rail. It also provides crowding reduction benefits on other bus, but only marginal benefits on Dublin Bus. The impact of the per/km road user charge, and peak PT fares increase (+10%) is discounted as it is considered businesses will be more willing to pay this charge (as they can recoup it or pass it on to customers) than would individual travellers.

Objective	No.	Sub-objective	Definition	Strategy Score	Description of Draft Strategy Scoring/Comments
Objective 2 - Improve Economic Competitiveness	2.2	Reduce overall journey times for business travel	Improvement in average journey time for car, HGV and public transport for journeys between identified business clusters. Report time savings by mode and also weighted by percentage mode split.	0	The draft strategy option indicates an increase in journey times by road between business clusters, but a reduction by public transport.
	2.3	Ensure value for money of transport expenditure	Aggregate BCR for the modelled and costed schemes in packages. Indicative BCRs for schemes not directly appraised by modelling. Report relative level of the aggregated net benefit (low to high on seven-point scale).	+1	The draft strategy indicates that there will be significant reduction in car and HGV journey times, but that this will be nearly off-set by increases in public transport In-Vehicle Time, walk and wait times. Alongside the substantial capital costs associated with the additional infrastructure it is not clear at this stage whether the strategy option will offer significantly positive value for money. This will need to be assessed further as part of the TUBA assessment.
	2.4	Support agglomeration and competition	Qualitative assessments of overall changes in journey times to identified business clusters by car and Public Transport. Report time savings by mode (car and PT) and weight by mode split for these trips.	+1	The strategy package option provides the largest benefits for car users travelling between business clusters; however there are also benefits for public transport users. There are slight negative impacts for HGVs.
	2.5	Improve access to ports and airports	Improvement in average journey time for all trips to Dublin Port, Dublin Airport and Belfast by car, HGV and PT. Report average times and splits by mode. Aggregate score on seven-point scale.	+3	The strategy package option provides significant benefits for car and HGV travellers to and from the Airport and Port. There are also benefits for public transport users travelling to the Airport, but not to the Port.
	2.6	Provide for efficient goods distribution, servicing and access to resources	Qualitative assessment of the impact on goods distribution of schemes within the packages. Score on seven-point scale.	+2	The strategy package option includes road user charges that would increase the cost of road freight but improve journey times and reliability. The package includes a commitment to increase facilities for rail and water freight. In addition a strategic freight network is proposed with consolidation centres and potential dedicated freight lanes. The package would include consolidation / transshipment centres and marshalling facilities.
Objective 3 - Improve the Built Environment	3.1	Improve and maintain the environment for people movement – better quality design of streets & spaces	Qualitative assessments of impacts on the built environment. Score on a seven-point scale.	+2	The strategy package option includes a number of measures that seek to generally enhance the urban environment, including improving and maintaining the streetscape and homezones, but neither are detailed at this time. Providing priority for pedestrians and vulnerable users in town centres will also generate benefits.



Objective	No.	Sub-objective	Definition	Strategy Score	Description of Draft Strategy Scoring/Comments
Objective 3 - Improve the Built Environment	3.2	Improve the quality of design and maintenance of public spaces and transport fleets, infrastructure	Qualitative assessments to be provided for the in-vehicle and other quality impacts described right. Separate results would be assessed for vehicles and infrastructure. Score on a seven-point scale. Score on a seven-point scale.	+2	The strategy package option includes a significant number of public transport enhancements and so measures to improve the quality of public transport vehicles and infrastructure, particularly on rail, will have a significant positive impact
	3.3	Minimise physical intrusion of all forms of transport	Quantitative assessment of the volume of trips through major areas of public realm (defined as key links in main towns). Qualitative assessment of overall changes in the level of intrusion of vehicles/HGVs. Score on a seven-point scale.	+2	Whilst the available data does not allow for a detailed assessment of the vehicle flows along corridors, the aggregate evidence indicates that the strategy package option will have a significant positive impact on reducing the physical intrusion of traffic.
Objective 4 - Respect and Sustain the Natural Environment	4.1	Minimise the impact of transport on air quality	Results expressed as change in air quality index.	-1	Based on ERM's local air quality assessment of transport impacts, emissions of PM <sub>10</sub> will be reduced by the strategy, hence standards will be met. For the strategy package, the assessment of NO <sub>2</sub> indicates there will be higher numbers of roads where people will be exposed to concentrations either close to or above the standards, hence a small disbenefit.
	4.2	Minimise the impact of transport on water quality	Qualitative scores on seven-point scale.	-1	The relatively low number of infrastructure schemes within the strategy package means there are only minor negative impacts against surface-water, coastal, and transitional systems. The package of measures is considered to have neutral impacts against River Management Plans, the aims of the Water Framework Directive and groundwater systems.
	4.3	Reduce the rate of growth of greenhouse gases associated with transport	Change in CO <sub>2</sub> emissions.	+1	The strategy package has a positive impact upon the levels of CO <sub>2</sub> emissions with a 7% reduction resulting from reduced road vehicle-kilometres.

Objective	No.	Sub-objective	Definition	Strategy Score	Description of Draft Strategy Scoring/Comments
Objective 4 - Respect and Sustain the Natural Environment	4.4	Improve efficiency in the use of non-renewable natural resources (e.g. land, materials, fuels)	Qualitative scores on seven- point scale.	+1	The strategy package has marginal negative impacts upon construction materials, neutral impacts upon agricultural soil resources, and scores positively in reducing the consumption of fossil fuels due to the large reduction in road vehicle-kilometres. Overall, the package is considered to give a marginal positive benefit under this criterion.
	4.5	Minimise the impact of noise and vibration	Change in population affected by noise.	+1	With the large percentage reduction in road vehicle- kilometres, the noise impact of traffic is reduced, hence the positive score.
	4.6	Minimise adverse impact of transport on biodiversity and natural amenities	Qualitative scores on seven- point scale.	-1	The strategy package has a small negative impact upon biodiversity and landscape as a result of the level of the rail infrastructure, in particular river crossings; however, the limited number road infrastructure projects in the package means that, overall, the impacts are low.
Objective 5 - Reduce Personal Stress	5.1	Improve journey time reliability for personal travel	Quantitative assessment of highway links 'over capacity' (with traffic flows in excess of 85% capacity). Quantitative assessment of public transport passenger kilometres on services over 85% capacity. Aggregate score against seven point scale.	+1	The strategy package option reduces highway congestion. It also significantly reduces crowding on the Luas and, to a lesser degree, rail. It also provides crowding reduction benefits on other bus, but only marginal benefits on Dublin Bus. The per/km road user charge is likely to have a negative impact for road users, as well the PT peak period fares increase, although there is also a corresponding off-peak PT fares reduction.
	5.2	Reduce overall journey times for personal travel	Overall journey time changes report separately by car and PT modes.	+1	The strategy package option indicates a significant reduction in average journey times by road across all arise, but an increase by public transport on Corridors A, D, E, and F. The car user benefits will also be eroded by the per/km road user charge, as will peak period PT travel as a result of the 10% fare increase, although the corresponding off-peak fare reductions will provide benefits to those travelling in that period.

Objective	No.	Sub-objective	Definition	Strategy Score	Description of Draft Strategy Scoring/Comments
Objective 5 - Reduce Personal Stress	5.3	Improve travel information	Qualitative scores for the impact against each of elements listed, separately by vehicles and interchanges/stops as appropriate. Score on a seven- point scale.	+2	The strategy package option significantly increases public transport usage so the benefits derived from improved travel information will be extended to a wider range of travellers. There are few measures that are specifically attributable to PT mode; however, a number of measures relate to travel information for walking and cycling.
	5.4	Improve ease of use of public transport system (ticketing, fares)	Qualitative scores for access and ticketing impacts for both interchanges/stops and vehicles. Score on a seven- point scale.	+2	The strategy package option significantly increases public transport usage so the benefits derived from improved ease of use from the transport system will be extended to a wider range of travellers.
	5.5	Promote healthier forms of travel and use of public space	Qualitatively assess changes in: Number of walk/cycle trips; Total length of walk/cycle trips; and Health impacts of walk/cycle trips. Aggregate effects scored against a seven point scale.	+1	The strategy package option has an overall neutral impact upon Smarter Choice mode share, but does increase public transport mode share.
	5.6	Improve travel safety and the sense of personal security	Numbers and monetised impacts of types of accident forecast against highway trips. Aggregate effects scored against a seven point scale.	+2	The reduction in vehicle kilometres translates to significant reductions in forecast accidents across the network.
	5.7	Improve travel comfort	Qualitative assessment of surveillance and design impacts for both PT and walk/cycle modes. Also assessment of crowding and assistance impacts for PT modes. Aggregate effects scored against a seven point scale.	+2	The strategy package option encourages combined bus, Luas and rail patronage so the enhancements in public transport comfort will be enjoyed by a wider range of travellers

Table 6.3 Draft Strategy Option Multi-Criteria Appraisal scores

MCA Objective criteria		Draft Strategy Score	Description of Draft Strategy Option Scoring
Safety	Accidents	+2	The reduction in vehicle-kilometres forecast as a result of the strategy package measures translates to significant reductions in forecast accidents across the network. A 32% reduction in fatal accidents and a 27% reduction in serious accidents, is estimated during the AM peak period.
	Security	+2	The strategy package option includes a few measures proposed to improve security on public transport. These include: i) Good lighting and CCTV in vehicles, and ii) Lighting, help points and CCTV at particular bus waiting facilities. Since the package also encourages higher public transport patronage, these benefits will be delivered for a wide range of travellers.
Economy	Transport Economic Efficiency	+1	The results of a standard TEE assessment indicates that the strategy package will deliver strong benefits to individual and business travellers, in terms of reduced journey times; however, this is off-set by increase user charges resulting from the road user charge and peak period public transport fare increases. Overall the NPV of benefits to the individuals and the private sector is estimated to be in the region of €26 billion over 30 years. Whilst the NPV of Scheme Costs is estimated at €7 billion, this value will also be significantly reduced by the revenue generated from the road user charges.
	Reliability and quality	+3	There are a wide-ranging number of measures applied within the strategy package that will enhance reliability and improve quality. The preferred package option will embody significant benefits by providing a more reliable highway network and a less crowded public transport network, and so the improvements to quality will benefit a large number of travellers. The number of peak period public transport services operating over capacity is estimated to fall by 15%, despite rising patronage levels. Road congestion also falls by 7%, with HGV traffic forecast to benefit from a 15% reduction in journey times as a result of less congested networks.
	Wider Economic Impacts	+1	The strategy package option indicates an increase in journey times by road between business clusters (+6%), however, there is a significant reduction in average journey times to and from business clusters by road (-19%), although HGV journey times remain broadly similar. There is a reduction both between and to/from business clusters by public transport (around -7% in both cases). The benefits that are derived for car and HGV users are off-set by the road user charges that will apply to all road-based trips.
Accessibility	Option values	+2	The strategy package option provides significant additional public transport infrastructure schemes that will provide new options for travel. There are large average increases in the proportion of the population that are within 30 minutes of a key centre for works when travelling by both public transport and car, 61% and 52%, respectively, demonstrating the increased availability of travel options.
	Severance	0	The strategy package option includes some additional public transport infrastructure schemes that could impact upon community severance; however, most of these are routed away from major conurbations and would include mitigation measures that minimise any negative impacts. The proposed walking and cycling priority in town centres will also help reduce severance.
	Access to transport	+2	The strategy package option enhances access to the public transport network with new public transport provision and improvements to public transport access times and reduced crowding. The package of measures is considered to provide significant increased accessibility to both economic and employment opportunities, as well as public, cultural and community services, specifically for those who are physically, economically or socially disadvantaged. On average, there is forecast to be a 61% increase in the population that is within 30 minutes of a key centre for work when travelling by public transport.
Social Inclusion	Deprived geographic areas	+1	The strategy package reduces both public transport and car journey times to local towns and into Dublin, by between 13% and 26%; however, it does so at a financial cost to road users across the GDA (the per/km charge). This is considered to be a critical issue for access for the disadvantaged and those in rural areas. In addition, public transport peak period fares increase by 10%; although, off-peak PT travel fares will be reduced, and so would benefit members of disadvantaged groups travelling in these periods.
	Vulnerable groups	0	The road user charge is considered to have a notable negative impact upon this criterion for the strategy package option, as will peak period public transport fares increases; however, there are positive impacts from reduced off-peak put fares, improvements to public transport infrastructure and vehicles, although not many of these are specifically targeted towards vulnerable users.



MCA Objective criteria		Draft Strategy Score	Description of Draft Strategy Option Scoring
Integration	Transport Interchange	+2	The strategy package option includes new infrastructure that is anticipated to allow more public transport interchange opportunities. It also includes park and ride sites.
	Geographic Integration	+3	The strategy package option provides significant benefits for car and HGV travellers to and from the Airport, Port and Belfast, between a 10% and 27% reduction in average journey times. There are also benefits for public transport users travelling to the Airport and Belfast (42% and 20% reductions in average journey times, respectively), but not to the Port, which has a small increase in journey times.
	Land Use Policy	+2	The strategy package has relatively high proportions of rail travel along certain corridors where there are new or existing schemes; however, the greatest journey time savings tend to be related to travel by road. Along certain corridors there will be large highway benefits attributed to a significant majority of people travelling by that mode.
	Other Government Policies	+1	The strategy package option includes some specific benefits from measures that support other government policies; however, the road user charging will impact upon equity and social inclusion. Likewise, the public transport peak period fare increase will also affect low-paid workers having to travel during these periods, although off-peak fares reductions will provide benefits to others.
Environment	Air quality	-1	Based on ERM's local air quality assessment of transport impacts, emissions of PM <sub>10</sub> will be reduced by the strategy, hence standards will be met. For the strategy package, the assessment of NO <sub>2</sub> indicates there will be higher numbers of roads where people will be exposed to concentrations either close to or above the standards, hence a small disbenefit.
	Human Health (incl. noise)	+2	With the 38% reduction in average road vehicle-kilometres, the impact on noise levels will be positive. Accident analysis data shows that again, the reduction in road vehicle-kilometres creates a positive benefit. Generally, the strategy package supports improved quality of life with improved public transport connectivity, frequency and reliability. Levels of walking and cycling across the GDA are anticipated to rise slightly contributing to public health benefits for the local population.
	Landscape	-1	Rural road and minor negative may impact on designated and protected landscapes, as well as wider greenfield sites. With appropriate mitigation measures these impacts will be relatively low. The strategy package is forecast to provide positive impacts upon townscape and urban realm with, in particular, high quality walking and cycling schemes. Furthermore, the policy framework to promote land-use densification will minimise general landscape impacts from construction.
	Biodiversity	-1	The strategy package has a minor negative impact upon integrity of European Conservation Sites and locally important biodiversity in the GDA, as a result of the rail infrastructure schemes. It is considered to have a neutral impact on the National Biodiversity Plan, although aspects of the policy of densification actually support the plan. Overall it is considered to have a minor negative impact against this criterion.
	Cultural Heritage	-1	The strategy package is considered to have a marginally negative impact upon designated cultural, architectural and archaeological resources, due to the rail infrastructure measures.
	Water	-1	The relatively low number of infrastructure schemes within the strategy package means there is only a minor negative impact against surface-water, coastal, and transitional systems. The package of measures is considered to have neutral impacts against River Management Plans, the aims of the Water Framework Directive and groundwater systems.
	Climate Change (CO <sub>2</sub> )	+1	The strategy package has a positive impact upon the level of CO <sub>2</sub> emissions with a 7% reduction resulting from the reduction in road vehicle-kilometres.
	Soil and geology	-1	The strategy package has marginal negative impacts upon construction materials and on protected and designated geological and geomorphological sites, resulting from the rail infrastructure schemes. It is considered to have a neutral impacts upon vulnerable agricultural soil resources. Overall, the package is considered to give a marginal negative impact against this criterion.
	Material assets	+2	The strategy package is rated as marginally positive for protecting public assets and infrastructure, as well a significantly positive in assisting with the re-use and regeneration of brownfield sites and reducing fossil fuel demand.

- 6.40 The above table provides sufficient basis for suggesting that the draft Strategy would deliver positive results against Department of Transport objectives for investment proposals. If the revenue from road user charging were retained within the transport system (e.g. to support public transport subvention) then the level of benefits to the public purse could be even greater – albeit that some of these benefits would transfer from the road users paying the charges.
- 6.41 Low scores for severance and vulnerable groups could be overcome by additional local measures and targeting of benefits to particular groups (e.g. through specific fare concession or road use charge exemptions). Similarly, some local environmental impacts (e.g. air quality) could be ‘designed out’ at scheme development stage, suggesting that overall, packages of schemes within the Draft Strategy should themselves be capable of successful appraisal. However, it should be noted that no level of cost-benefit or MCA score for any scheme or schemes should be imputed from the overall draft Strategy score.

## Transport Economic Efficiency Analysis

- 6.42 The strategy package has been subject to a detailed assessment of economic benefit and costs analysis in order to help assess the overall impact upon the economy. An economic modelling package (TUBA) has been utilised to assess the benefits and costs of the strategy for users, private sector service providers and the public accounts over a 30 year period.
- 6.43 Unlike most of the appraisal assessments, the TUBA modelling utilises both the AM Peak and Inter-Peak transport model outputs but, as such, only those schemes that are incorporated within the transport model are assessed as part of the TUBA outputs.

### Road User Charge

- 6.44 Due to the approach taken to the transport modelling work, the impact of the road user charge is not included within the TUBA input matrices (although its influence on mode and route choice is still definitively within the results). The standard results produced by TUBA do not, therefore, include any direct financial impact of the road user charge on users or the public accounts. A separate assessment of the impact of road user charging is included within the section summarising overall social cost benefit analysis.

### TUBA Model outputs

- 6.45 The analysis below presents an assessment of the three areas where economic benefits and costs can accrue: transport users; private sector service providers; and the public accounts.

### Transport Users

- 6.46 The proposed measures within the strategy package will result in changes in User Benefits for both personal travellers (consumers), as well as business travellers. Benefits (or disbenefits) are derived from changes in:
- Journey times
  - Vehicle operating costs
  - User charges (including fares and tolls); and
  - Reliability and Quality benefits
- 6.47 The first three elements can be quantified and monetised within TUBA. Table 6.4 presents the present values of the benefits for consumers and businesses.

**Table 6.4 Summary of User Benefits (Present Values, €M, 2002 prices, discounted to 2002)**

User Benefits	Road Benefits	PT Benefits	Total
Consumer Journey Time Impacts	4,025	20,605	24,630
Consumer Vehicle Operating Cost Impacts	1,336	0	1,336
Consumer User Charge Impacts	-1	-177	-178
<b>Net Consumer Benefits</b>	<b>5,360</b>	<b>20,428</b>	<b>25,788</b>
Business Journey Time Impacts	3,737	4,954	8,691
Business Vehicle Operating Cost Impacts	355	0	355
Business User Charge Impacts	32	-34	-2
<b>Net Business Benefits</b>	<b>4,124</b>	<b>4,920</b>	<b>9,044</b>



- 6.48 The majority of the Consumer Benefits are derived through public transport journey time savings that result from the large-scale investment in new public transport schemes. There are also benefits associated with road journey times that result from reduced levels of congestion as individuals switch from road to public transport.
- 6.49 Similarly, the largest proportion of Business Benefits is derived for journey time savings for business trips by public transport. Road freight journey time savings also account for a considerable proportion of net business benefits (32%) demonstrating the impact of reduced road congestion and measures to support access along key routes, e.g. to ports.

#### Private Sector Service Providers

- 6.50 Private Sector Service Providers, operating either road tolling schemes or public transport services, will also be affected by the scheme. In this instance, there are no assumed changes to operating costs; however, the revenues derived from tolls and public transport fares do change, as indicated in Table 6.5.

**Table 6.5 Summary of Private Sector Benefits (Present Values, €M, 2002 prices, discounted to 2002)**

Private Sector Benefits	Road Benefits (Present Value, €M, 2002)	PT Benefits (Present Value, €M, 2002)	Total (Present Value, €M, 2002)
Revenue Impacts	-128	1,131	1,003

- 6.51 The TUBA results indicate that there is a loss in public sector toll revenue – excluding per-kilometre charges which were not assessed in the TUBA model – resulting from lower numbers of vehicle trips across the GDA. This is more than off-set; however, by increases in public transport revenue resulting from both the increase in peak period fares, as well as much higher levels of public transport trips, even without income from per-kilometre road user charges being taken into account.

#### Net User and Private Sector Benefits

- 6.52 Table 6.6 below provides a summary of the combined user and private sector benefits that are estimated to be derived from the scheme.

**Table 6.6 Net User and Private Sector Benefits (Present Values, €M, 2002 prices, discounted to 2002)**

Net Benefits	Net Present Value (€M, 2002)
Net Consumer Benefits	25,788
Net Business Benefits	9,044
Net Private Sector Service Provider Benefits	1,003
<b>Net Present Value of User and Private Benefits</b>	<b>35,835</b>

- 6.53 This summary demonstrates that, over the 30 year appraisal period, the strategy package is forecast to generate considerable benefits for private users and service providers.

## Public Accounts

- 6.54 The strategy package will have a direct impact upon the public accounts through both the direct costs associated with building and operating schemes, as well as changes to public sector revenue streams and taxes.

## Capital and Operating & Maintenance Costs

- 6.55 Table 6.7 presents a summary of the capital and operating and maintenance costs by mode.

**Table 6.7 Capital and Operating & Maintenance Costs (€M, 2010 prices)**

2010 Prices	Infrastructure	Rolling Stock / Depots	Renewal (pa)	Operating & Maintenance (pa)
Suburban Rail	4,037	1,080	15	110
Metro	6,737	1,360	32	60
Luas			37	97
Bus	98	-	1	-
Highway	372	-	4	-
Road User Charge	600	-	6	70
<b>Total</b>	<b>11,844</b>	<b>2,440</b>	<b>95</b>	<b>337</b>

- 6.56 All scheme costs have been profiled for delivery across the period 2015 to 2025 and incorporated within the TUBA modelling process.

## Net Present Impact upon Public Accounts

- 6.57 The associated net present (discounted) scheme capital and operating and maintenance cost values are presented in Table 6.8 below, along with the forecast impact of the strategy upon government transport and tax revenue.

**Table 6.8 Discounted Public Sector Costs (Present Values, €M, 2002 prices, discounted to 2002)**

Public Sector Costs	Net Present Value (€M, 2002)
Net Government Transport Revenue Costs	-2,822*
Net Capital Costs	6,464
Net Operating Costs	2,029
Net Indirect Tax Revenue Costs	1,471
<b>Net Present Value of Costs to Public Sector</b>	<b>7,082*</b>

\* excludes the impact of road user charge revenues

- 6.58 The assessment of government transport revenue includes the impact of both reduced road tolls, as well as increased peak public transport fares and decreased off-peak fares. The impact of the fares increases outweighs the reduced road tolls giving a negative cost (i.e. increased revenue) to the public accounts. This value does not include any allowance for road user charge revenues, which was not included directly within the TUBA modelling and is discussed further below.

- 6.59 The net capital costs include all up-front infrastructure and rolling stock costs, as well as on-going renewal costs over the 30 year appraisal period.
- 6.60 Operating costs include public transport operating and maintenance costs, as well as highway maintenance costs over the 30 year appraisal period.
- 6.61 The indirect tax revenue costs are the result of a reduction in road tax revenue.

## Social Cost Benefit Analysis

- 6.62 The strategy package has been subject to a detailed social costs benefit analysis in order to assess the overall costs and benefits to society. This analysis draws upon much of the Transport Economic Efficiency analysis within the economy section of the multi-criteria assessment. This provided an assessment of both the Net Private (User and Service Provider) Benefits from the strategy, as well as Public Sector Investment Costs..
- 6.63 In addition, the social costs benefit analysis also gives consideration to any changes in the cost of externalities, specifically carbon and accidents.

### Carbon

- 6.64 An assessment of the impact of carbon savings is incorporated within the TUBA modelling results. The results indicate a present value monetary benefit of £40 million over the 30 year appraisal period.

### Accidents

- 6.65 An assessment of the impact of accident savings is also included and indicates a present value monetary benefit of £111 million over the 30 year appraisal period.

### Benefit Cost Ratio of the Strategy Package

- 6.66 Table 6.9 below summaries the benefits and costs associated with the strategy package and produces an overall ratio of the benefits to costs.

**Table 6.9 Benefit Cost Ratio (Present Values, €M, 2002 prices, discounted to 2002)**

Element	Net Present Value (€M, 2002)
Net Present Value of User and Private Benefits	35,835
Net Present Value of Costs to Public Sector	7,082
Net Present Value of Carbon Benefits	40
Net Present Value of Accident Benefits	111
<b>Benefit to Cost Ratio</b>	<b>5.1 to 1</b>

- 6.67 The result indicates that the package of measures is forecast to deliver substantial private benefits in relation to the public sector costs associated with construction and operating the schemes. Whilst there must be caveats in relation to the actual scale of the benefits and costs, the result clearly demonstrates that the strategy package will deliver substantial benefits to society that outweigh an costs of implementation and operation.
- 6.68 As highlighted with the analysis of Transport Economic Efficiency benefits, the TUBA output does not directly include an allowance for the user charges and revenues associated with the Road User

Charging scheme. A separate analysis has therefore been conducted below to assess the impact of included these within the results.

### Impact of Road User Charging

- 6.69 A key element of the strategy package is the inclusion of a road user charging scheme. This would apply to all road trips across the GDA during the AM and PM peak periods (7am to 10am and 4pm to 7pm). An uplift is applied to generalised cost for highway trips and TUBA is able to monetise this.
- 6.70 The road user charge is considered to have a strong influence on mode choice and is a key driver of the forecast mode shift from road to public transport. In addition, however, it will impact upon consumer and business user charges and public sector revenues. As such, it has a direct impact upon the net present value of benefits and costs. Table 6.10 below provides a summary of the impacts.

**Table 6.10 Impact of Road User Charging (Present Values, €M, 2002 prices, discounted to 2002)**

Benefit and Costs	Net Present Value (€M, 2002)
Net Consumer Benefits	17,914*
Net Business Benefits	7,076*
Net Private Sector Service Provider Benefits	1,003
<b>Net Present Value of User and Private Benefits</b>	<b>25,993*</b>
Net Government Transport Revenue Costs	-12,724*
Net Capital Costs	6,464
Net Operating Costs	2,029
Net Indirect Tax Revenue Costs	1,471
<b>Net Present Value of Costs to Public Sector</b>	<b>-2,760*</b>
Net Present Value of Carbon Benefits	40
Net Present Value of Accident Benefits	111

\* adjusted for road user charge impact

- 6.71 The results demonstrate that by including an allowance for road user charging this reduces the net present value of benefits but also the net present value of costs to the public sector. The result, effectively, indicates that the strategy package is forecast to provide net benefits to both the private and public sectors and so will offer strong overall social benefits.

## Conclusions

- 6.72 The above analysis shows that the Draft Strategy performs well against both the strategy-specific Objectives and Sub-Objectives, in line with the earlier package alternatives from which it was selected. Hence it would be expected to deliver a transport system that improved accessibility, aided business travel, improved the built environment and minimised adverse effects on the natural environment, while overall making the business of travelling within the GDA a deal less stressful.
- 6.73 In addition, multi-criteria appraisal and economic analysis show that this would be done while also improving safety, delivering better integration, supporting wider policies and economic benefits. Overall the package would be good value for the investment funding and could cover its running costs. On the basis of this, JMP has no hesitation in recommending the Draft Strategy for adoption.

## Appendix A

### Technical Groups pro-forma and guidance

Job No	Report No	Issue no	Report Name	Page
COR1001	1	1	Assembling and Appraising Strategy Packages	A1

## Section A: Planned and proposed interventions

Proforma heading	Notes	Schemes 1
<b>1. Scheme/policy overview and description</b>		
1a. Scheme or policy name and reference		
1b. Scheme or policy description (what and where).		
1c. Context of proposal and problems and opportunities.		
1d. What are the likely consequences of non-delivery?		
<b>2. Measure type and links to other schemes</b>		
2a Is it related to a type of strategy "feasible measure" already identified?	See Appendix A of Guidance Notes	
2b. Are there other related measures that would help deliver this intervention?	e.g. complementary feasible measures (see Appendix A), or other measures that would need to be delivered in advance	
2c. Are other schemes proposed here that may address the same problems?	Please give column number/name of these	
<b>3. Likely contribution to objectives</b>		
3a. Is the rationale for the scheme primarily:	Tick one or rank 1-3 in order of importance (1 = most important)	
Economic?		
Environmental?		
Social/community?		
3b. Which strategy sub-objectives will it help to address?	See Figure 1.2 in Guidance Notes. Please identify up to three	
3c What local policies or objectives does it meet?		
<b>4. Evidence and Outcomes</b>		
4a. What data or evidence supports the rationale for this intervention?		
4b. How could a successful outcome be measured?	Estimated scale of benefits and level of capital/operating cost	
<b>5. Delivery Issues</b>		
5a. What is the state of readiness of the proposal?	How long to deliver and earliest possible start date?	
5b. Are there any barriers to delivery of the proposal?		
<b>6. Other information</b>		
Supplementary information - included or sent separately?		



## Section B: Outstanding constraints and anticipated future issues & challenges

Proforma heading	Notes
<b>1. Constraint/issue overview and description</b>	
1a. Type of issue or constraint and timing	Issue 'name' and whether current or future problem
1b. Issue or challenge description	How, where and when likely to emerge and type of issue or problem
1c. Context of constraint and problems and opportunities.	
1d. Scale of the problem and likely outcome if nothing is done	Indication of the number of people affected, and by how much
<b>2. Links to identified measures</b>	
2a Could the issue be addressed by a type of strategy 'feasible measure' already identified?	See Appendix A of Guidance Notes
2b. Are there other complementary 'feasible measures' that would help to address this issue?	See Appendix A of Guidance Notes
<b>3. Impact of constraint or issue on policy objectives</b>	
3a. Is the impact of the problem or issue primarily:	Tick one or rank 1-3 in order of importance (1 = most important)
Economic?	
Environmental?	
Social/community?	
3b. Which strategy sub-objectives is the problem affecting delivery of?	See Figure 1.2 in Guidance Notes. Please identify up to three
3c What local policies or objectives are affected by this problem or issue?	
<b>4. Evidence and resolution</b>	
4a. What data or evidence is showing this as a problem?	
4b. How could a successful resolution of the issue be measured?	
<b>5. Governance issues</b>	
5a. What level of priority is or would be given to this issue?	
5b. Are there barriers to identifying/delivering solutions?	
<b>6. Other information</b>	
Supplementary information - included here or sent separately?	

# Guidance for completing pro-forma

## Introduction

The pro-forma should be used to detail all planned and proposed interventions and/or to identify anticipated transport constraints or likely future issues and challenges. It is designed to capture as much relevant knowledge as possible to be used in developing strategy alternatives. Therefore, all stakeholders are asked not to restrict themselves to interventions only they can deliver, but to suggest how other agencies etc. may be able to help resolve issues and problems that you identify.

The pro-forma is split into two sections:

1. **Section A:** is designed to be used to identify schemes or interventions which the local authority or Agency concerned has a reasonably clear idea about. These may already be quite well-developed ideas or could be highly conceptual aspirations for the future.
2. **Section B:** can be used to identify other potential constraints, issues and challenges where a solution has not been identified or considered. This will help us to scope out other potential schemes that may need to be included into the packages to address specific problems. Such constraints or issues may or may not be directly transport-related. They could, for example, be related to particular environmental, social or economic issues which transport may play some role in helping to address.

It is not a problem if stakeholders are not clear which section to use for different schemes/problems/issues, as long as they are flagged up somewhere in the pro-forma. For example, if it is anticipated that a particular problem may arise in the future, this could **EITHER** be described in Section A in terms of a potential future scheme that is likely to address the problem **OR** in Section B, by outlining the issue and identifying which of the generic list of measures identified to-date may provide the appropriate solution.

It is not necessary to repeat or summarise scheme evaluations and justifications where original documentation already exists and can be provided. In such instances '*see attached*' is a valid response.

Some guidance notes for completion are included in the pro-forma. The following paragraphs provide further detail and reference the appendices and additional information as applicable. All the rows and columns within the pro-forma can be expanded to accommodate the information provided. More than 10 schemes or policies can be included by adding further numbered columns.

## Section A: Planned and proposed interventions

### 1. Scheme / policy overview and description

#### Question 1a Scheme or policy name and reference

This section should be used to provide the scheme or proposal name (where known) or a brief description that can serve as a name if not. If the scheme or proposal is also a development plan policy, please provide the policy number reference here. Proposed interventions may be fairly well-developed ideas or highly conceptual in nature. However, they should be of a scale that would make a significant impact on travel patterns or behaviour at a county/GDA level. Smaller measures with very local impact (e.g. individual cycle routes or footways, Home Zone treatments or re-timing of traffic signals at junctions) should be combined into wider area- or network-wide programmes.

**Question 1b** Scheme or policy description (what and where)

This section should detail the **type** of scheme or proposal implementation types, namely **Policy measures, Best practice measures, Operational or Infrastructure measures**. In addition, the mode (e.g. road, rail, etc.), description and location or area covered should be included where relevant. A location map should be attached or referred to where appropriate and if possible. If the scheme or proposal refers to a new service pattern or changed operational policy, the nature of the change and the likely extent of its effects need to be described in brief here.

**Question 1c** Context of proposal and problems and opportunities

This section should highlight the rationale for the scheme. This should include any problems that the proposal would overcome / address (for example, capacity or overcrowding problems; a lack of mode choice; poor accessibility; negative 'quality of life' impacts; barriers to economic development and other local issues) and outline the consequences of not undertaking the action.

Finally, this section should be used to highlight (briefly) any opportunities that the proposal would take advantage of (e.g. links to development, specific funding opportunities etc.).

**Question 1d** What are the likely consequences of non-delivery?

To clarify the need for the scheme, please describe what, if any, changes would occur in the scale and nature of the identified problems over time, should no action be taken to address these issues.

If you are able to specify the scale of the disbenefits expected (e.g. likely % growth in congestion on unrelieved route; loss of x minutes on bus journey times) please provide or reference the data.

**2. Measure types / links**

**Question 2a** Is it related to a type of strategy '*feasible measure*' already identified?

The generic measures identified for each of the three strategy alternatives (i.e. Economic, Environmental and Social) are illustrated in **Appendix A**. Each measure has a code to help with referencing. If the proposed scheme or policy links to one of these measures, please identify this in the proforma, using the appropriate reference code (e.g. Travel Plans are coded SC11).

If there is no obvious link to the measure categories as listed, this question should be left blank.

**Question 2b** Are there other related measures that would help deliver this intervention?

This section of the pro-forma needs to record whether there are any other measures that may complement the delivery of this scheme or would help to address the same problem. Using the travel plan example again, delivery of the travel plan measure may be complemented by measures like SC8 (car clubs), SC7 (car sharing) and SC10 (reduce the need to travel through technology). Such measures need not be included in a separate detailed pro-forma entry if their impact is small.

**Question 2c** Are there other schemes proposed here that may address the same problems?

This is to provide cross-reference to any other scheme or policy included on the pro-forma that might have some overlap in impact on the area, problem or issue planned to be dealt with. For example, an area with poor access might be proposed to be served by diversion of an existing QBC route bus service, or by a 'feeder bus' to a new Luas or rail line proposed for other reasons.

It should suffice to give the scheme column number (A7 or B11 etc.), unless a brief explanation of the relationship between the two proposals is necessary (e.g. one proposal might need adaptation in order to also resolve the additional problems or issues).

### 3. Scheme / Policy contribution to Objectives

**Question 3a** Is the rationale for the scheme primarily economic, environmental or social / community?

This section will help us to identify which strategy alternative(s) the intervention may best support. Here, we simply require a tick ✓ in the appropriate column if the rationale for a scheme or policy is strongly related to one type of outcome. Alternatively, if there is a significant subsidiary rationale in another policy area, feel free to rank outcome 1 to 3, or to allocate percentages to each alternative.

To assist with this process, we have further defined each of the three themes, to identify potential spatial features of the strategy alternatives. These definitions relate back to the high-level strategy objectives and their component sub-objectives:

- **Economy** theme concentrates on measures which: reduce journey times and make them more reliable (especially for business travel and movement of goods); make access to dense locations of employment and national/international gateways more efficient; and deliver value for money.
- **Environment** theme concentrates on measures which: reduce need to travel and minimise trips overall (all purposes); modal shift from car (or, if not possible, reduction in single-user car journeys); make best use of land; and/or improvements to the built environment which benefit non-car users.
- **Social/Community** theme concentrates on measures which: enhance accessibility to jobs and services, link up communities and regions; increase use of healthier modes; and improve the journey experience.

**Question 3b** Which strategy sub-objectives will the scheme help to address?

The strategy objectives and their relevant sub-objectives are illustrated in **Figure 1.2** above. In order to show how well the proposal helps to deliver the overarching aims of the strategy, we would like stakeholders to identify up to a **maximum of three** sub-objectives that would be affected by the delivery of the transport intervention. Reference codes shown in Figure 1.2 should be quoted.

For example, a new road link to Dublin airport might help to deliver the following strategy sub-objectives.

- 2.1 - Improve journey time reliability for business travel and movement of goods.
- 2.5 – Improve access to GDA ports and Dublin airport.
- 5.1 – Improve journey time reliability for personal travel.

**Question 3c** What local policies or objectives does the scheme/policy meet?

This section should be used to refer to any local, regional or national plans or strategies which the scheme or proposal would help to support (including specific policy numbers/references where appropriate). Please include any of your organisation's own internal aims, objectives and business planning ambitions that are affected (even if they are not written down in a formal policy document).

#### 4. Evidence and Outcomes

**Question 4a** What data or evidence supports the rationale for this intervention?

As part of this process it will be crucial to use analysis of the available evidence base and obtain input from stakeholders on specific delivery issues. This section of the proforma should be used to detail any data or evidence (including anecdotal) that supports the need for the scheme, policy or proposal or shows that it is necessary.

**Question 4b** How could a successful outcome be measured?

This section needs to consider which data or indicator sets would be expected to change as a result of the scheme or proposal. If no such data or indicator sets are currently available, please provide suggestions of what might need to be collected in the future to facilitate this evaluation. The strategy alternatives identified in **Appendix A** include some initial thoughts about how a successful outcome might be measured. Stakeholders may wish to consider these in terms of potential indicators of success, also proposing others if they feel they are more appropriate or manageable.

For those proposals that may appear in more than one strategy alternative, the issues being addressed at different locations may vary between packages. It may therefore be necessary to define key indicators / outcomes differently in each context (social/economic/environmental etc.), as the packages are differentiated by their focus on the different types of outcomes they support.

If there is quantitative data of the costs and benefits of the scheme, please provide an outline or reference to it. Even if not, an idea of the scale relative to the other measures being proposed (e.g. of the form “medium travel time benefits to small number of people”; “good value for money”; “high operating costs” etc.) would be extremely useful.

#### 5. Delivery Issues

**Question 5a** What is the state of readiness of the proposal?

This section should be used to briefly describe the status and level of development of infrastructure schemes, service changes and or policy proposals. The following categories may be helpful to use:

- **CO** – Conceptual only – no feasibility work undertaken nor fixed option identified
- **PI** – Under preliminary investigation but no preferred solution identified
- **FW** – Scheme feasibility work being undertaken (state what work has been undertaken)
- **BC** – Fully costed and appraised business case developed (attach any relevant information)
- **FP** – Included in Transport 21 or other funded programme (please state which)
- **PA** – Planning approval received
- **Other** – please describe if not included in the categories above (or combinations thereof)

Please also state how long the scheme would be likely to take to deliver and the earlier possible start date.

**Question 5b** Are there any barriers to the delivery of the proposal?

Any potential barriers that may affect the development, implementation or delivery of the scheme or proposal should be detailed here. Issues to be noted here could include, for example:

- **Governance Issues:** e.g. lack of political support, need for inter-agency/cross-boundary working, not priority of other agency; no obvious responsible agency exists.
- **Financing:** e.g. funding is not forthcoming or no source can be identified.
- **Legal:** e.g. change in existing legislation or guidance is required by a higher body.
- **Other:** (please specify) – e.g. community/stakeholder opposition, lack of internal resources (staff/skills), unmet technical or technological requirements, land ownership issues.

## 6. Other Information

Lastly, there is space to include any other supplementary information or to make reference to any accompanying documentation.

# Section B: Outstanding constraints and expected future issues and challenges

## 1. Constraint / Issue overview and description

### Question 1a Type of issue or constraint and timing

This section should be used to provide a brief description to serve as a 'name' for the issue or constraint, which may or may not be directly transport-related. The location of the issue/constraint should be identified too – for example, “capacity problems at X location”; “no mode choice from Y to city centre”; “congestion at Z” – as well as wider local and area wide issues affected by transport.

It should also state if the problem currently exists or is likely to develop in the future. If a future issue or problem, please suggest whether it is likely to arise in the short (up to 2015), medium (up to 2020) or longer (up to 2030) term. Lastly, if the issue or constraint is referred to in a plan or policy, then please provide the appropriate reference here.

### Question 1b Issue or challenge description

This section should provide detail on how, where and when the issue is likely to emerge as a significant problem. It should provide more detail on the **type** of issue or challenge, such as overcrowding, poor accessibility or missing link, operational safety, etc. In addition, the mode (e.g. road, rail, etc.) and location or area affected and the extent of its effects on specific groups / communities should be detailed. Details of the location and/or area affected should to be shown on a map. If a future constraint has been identified, please suggest what the circumstances leading to it are likely to be.

### Question 1c Context of constraint and problems and opportunities

This needs to consider what overall wider problem(s) the issue or constraint causes (e.g. social exclusion, local environmental detriment, reduced economic competitiveness), what would be the consequences if nothing were done, and what wider opportunities may exist to overcome the problem(s), such as links to development/regeneration or changes in government policy.

### Question 1d Scale of the problem and likely outcome if nothing is done

This allows for a broad estimate of the extent and relative impact of the issue identified in relation to others mentioned. For example, stating whether there are “medium accessibility issues for small numbers of people”; ‘small congestion impacts for large numbers etc., would be extremely useful.



To clarify the urgency of the issue, please describe what, if any, changes would occur in the scale and nature of the identified problems over time, should no action be taken to address these issues.

## 2. Links to identified measures

**Question 2a** Could the issue be addressed by a type of strategy '*feasible measure*' already identified?

There may be obvious links between the constraints identified and potential strategy measures identified in Appendix A. Where this is the case, the relevant measure code and description should be provided in the proforma. This information will help determine whether the issue or constraint could be addressed by a type of measure already identified.

For example, if the issue or constraint was overcrowding on local bus services then this could be overcome by adopting one or more of the measures detailed as follows:

- RL2 - upgrade public transport corridors to meet demand
- BS2 - optimise strategic bus network performance
- PE1 - enhance quality of public transport vehicles
- BS3 - improve carrying capacity of fleet

If there is no obvious link to the measure categories as listed, this column should be left blank.

**Question 2b** Are there other complementary '*feasible measures*' that would help to address this issue?

As with the guidance detailed under **Section A: Question 2b**, this section needs to record whether there are any other categories of measure that are likely to help with addressing the issue/problem. As before. If the scale of contribution is likely to be limited they will not require a separate entry.

## 3. Impact of constraint or issue on policy objectives

**Question 3a** Is the impact of the problem or issue primarily economic, environmental or social / community?

Refer to the guidance for **Section A: Question 3a** for this question.

**Question 3b** Which strategy objectives and sub-objectives is the problem affecting delivery of?

Refer to the guidance for **Section A: Question 3b** for this question.

**Question 3c** What local policies or objectives are affected by this problem or issue?

This section should be used to refer to any local, regional or national plans or strategies which the issue or constraint is undermining, including your organisations own internal aims, objectives and business planning ambitions (even if they are not written down in a formal policy document).

## 4. Evidence and resolution

**Question 4a** What data or evidence is showing this as a problem?

This section of the proforma should be used to detail any data or evidence (including anecdotal) of the issue or constraint which shows current and future impacts. If no such data or indicator sets

are currently available, please provide suggestions of what might need to be collected in the future to facilitate the identification of the problem.

**Question 4b** How could a successful resolution of the issue be measured?

This needs to identify which data or indicator sets would be expected to change if a successful solution could be implemented. If there are no such data or indicator sets currently available, please provide suggestions of what might need to be collected to facilitate this.

Where a solution appears in more than one Strategy Alternative, the issues being addressed at different locations may vary between packages. It may therefore be necessary to define key indicators / outcomes differently in each context.

## 5. Governance issues

**Question 5a** What level of priority is or would be given to this issue?

This section should be used to briefly describe the level of priority being given to developing and implementing solutions to the issue or constraint – either current or anticipated. This should identify why this is a lesser priority than, for example, the proposals included in Section A of the pro-forma, as well as whether there are reasonable prospects of this priority level changing in the future – and if so, what the reasons for a change in the issues priority might be (e.g. worsening of a situation).

The kinds of descriptions that may be applicable could be as follows:

- Currently of limited or local concern or nuisance
- A current or emerging local issue or growing challenge to the business
- An identified issue but not yet a priority
- Likely to be a high priority issue in the future (if so, when – 2010-2015; after 2015 etc.?)
- Likely to be a lower priority issue in the future (if so, when – 2010-2015; after 2015 etc.?)

**Question 5b** Are there barriers to identifying and/or delivering solutions?

This section should detail any issues of governance, financing or legal powers that affect the problem. Refer to the guidance for **Section A: Question 5b** for further detail on this question.

## 6. Other Information

Lastly, there is space to include any other information or reference accompanying documentation.

### Worked Example of Measure Allocation to Packages (13/11/09)

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COR1001	1	1	Assembling and Appraising Strategy Packages	B1

# A worked example – from identification of measures to package allocation

The following is a worked example of the Strategy packaging process used, from identification of a high level measure through to identification of a specific proposal under that measures to allocation of the proposal to a Strategy package.

## Step 1: Identification of high level measure

High level measures were identified at an early stage in the project. 74 generic measures were identified. Full details of measures proposed are contained in Final Stage 1 Appraisal Report (SSG18/08).

An example of a high level measure is “New Road Links” (measure RC2)

## Step 2: Appraisal of high level measure

The “New Road Links” measure was appraised by JMP against

- a) Feasibility – Political, technical and legal
- b) The five Strategy Objectives
- c) Transport Common Appraisal Framework criteria

In the appraisal against Strategy objectives , the measure was awarded scores within a seven point range (+3 to -3) as follows:

### ***Strategy Objective 1: Build and Strengthen Communities***

JMP Observation: Measure will result in improved accessibility across all modes to work, education, retail, leisure and other activities and improved links at a local level. However only affects new development [areas]

JMP Score: 1

### ***Strategy Objective 2: Improve Economic Competitiveness***

JMP Observation: Measure is likely to benefit businesses and improve access to markets at a local level

JMP Score: 2

### ***Strategy Objective 3: Improve the Built Environment***

JMP Observation: Measure will be designed to take into consideration all road users, though is likely to be visually intrusive (e.g. introducing motor traffic into new areas, signing, traffic lights etc.) and will result in loss of land through construction

JMP Score: -1

#### **Strategy Objective 4: Respect and Sustain the Natural Environment**

JMP Observation: Loss of land through construction could have an adverse impact on biodiversity depending on scale. Induced traffic will increase CO2 emissions, and will affect air quality in urban areas.

JMP Score: -2

#### **Strategy Objective 5: Reduce Personal Stress**

JMP Observation: Improves journey times for new development trips. However induced traffic may adversely affect other trips on the networks.

JMP Score: 0

### **Step 3: Allocation of Measure to Strategy Packages**

The allocation of the “New Road Links” measure to Strategy Packages is based on the scores it received under the relevant objectives

- Society/Community Package Objectives
- Build and strengthen communities: Score +1
- Reduce personal stress: Score 0

A low positive score and no negative score means that this is included in the Society/Community Package as a “complementary” measure

- Economy Package Objectives
- Improve economic competitiveness: Score +2
- Reduce personal stress: Score 0

A high positive score and no negative score means that the measure is included in the Economy Package as a “core” measure

- Environment Package Objectives
- Improve the built environment: Score -1
- Respect and sustain the natural environment: Score -2

The negative scores mean that the “new road links” measure is not included in the Environment Package

### **Step 4: Identification of specific proposals under measures**

A large number of infrastructural proposals (over 250) were received from Strategy Technical Group agencies. The volume of infrastructural proposals received from agencies, meant that some sifting of proposals down to a more manageable number was deemed essential before allocation of proposals to packages commences.

In addition it was recognised that whereas a measure may score well against objectives at the generic level, a proposal under that measure may have specific characteristics that mean it does not merit inclusion in a package. For example a proposal may not meet a transport need because there is insufficient demand for the proposal, or it duplicates other infrastructure. Alternatively it

may fail to meet Strategy objectives because it is unlikely to yield significant travel time savings, safety or environmental benefits, or it may seriously undermine sustainable transport alternatives.

The Strategy Technical Groups submitted many specific proposals under the “new road links” measure (RC2). An example of one such proposal is the Maynooth Relief Road (KCC 4h).<sup>1</sup>

This proposal is likely to attract significant travel demand, and is also likely to provide significant travel time savings, relieve the centre of Maynooth from through traffic and facilitate town centre development. As such the proposal qualifies for inclusion in the packages that include its parent measures.

On this basis, the proposal is included in the Social package (as a complementary proposal) and the Economic package (as a core proposal). In common with all other new road proposals, it is not included in the Environment package.

Another new road link (KCC 4a Newbridge Ring Road (south)) is proposed to route some distance from Newbridge town centre. It appears unlikely that this road will offer significant traffic relief to the town centre and it also appears likely to prematurely open up development land some distance from the town centre, well away from public transport. As such it does not perform well against Strategy objectives, and performs particularly poorly against environmental objectives. On this basis it is not included in any Strategy package.

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<sup>1</sup> See SSG19/04 Appendix A: CATEGORY A1



## Appendix C

### Do minimum definition

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## Detailed do-minimum specification

The detailed do-minimum is set out in Tables A1 to A3 and following text below. Note significant network changes over the pre-existing 2006 base model year were also included within this.

**Table A1: Do-minimum public transport measures**

Group	Status (October 2009)
<b>All Public Transport</b>	
Integrated ticketing – smartcard rollout	At implementation
<b>Bus</b>	
Dublin Bus service/route modifications within currently available fleet (based on 1st April 2009 Dublin Bus announcement)	At implementation
Bus Eireann confirmed service changes (as per BE proforma Appendix A)	At implementation
Supplementary bus service modifications to reflect changing demand patterns and provide better integration with other do-minimum schemes (see Appendix B)	Constrained by assumption of no additional bus fleet capacity on April 2009 levels.
Dublin Bus AVL integration with SCATS (Dublin City only) and real time passenger information	At implementation
QBN infrastructure as per QBN Office Programme 2008-2011 prioritised schemes (see Appendix C)	At implementation
<b>Luas</b>	
Line C1 Connolly to Point Depot	At implementation
Line A1 Cookstown to Saggart	At implementation
Line B1 Sandyford to Bride's Glen	At implementation
Park and Ride associated with above schemes (Carrickmines, Cherrywood, Cheeverstown)	At implementation
<b>Suburban Rail</b>	
Dunboyne Spur (Clonsilla to Pace)	At implementation
New Docklands station	Completed 2007
Kildare line 4 tracking (Inchicore to Hazelhatch)	At implementation
Resignalling of Northern Corridor (Howth Junction to Sandymount)	At implementation
Park and Ride associated with above schemes (Pace, Dunboyne, Fonthill Road, Adamstown, Kishogue)	At implementation
Clongriffin station	At implementation
Pelletstown station	At planning – funding likely

**Table A2: Do-minimum Road Measures**

Group	Status (October 2009)
<b>Road</b>	
Completion of M50 Upgrade M1 to Sandyford	At implementation
N4 Leixlip to M50 upgrade	At implementation
M3 Clonee to Kells motorway	At implementation
N7 Newlands Cross grade separation	Out to tender

Monkstown Ring Road	Implementation
M1 widening Airport to M50, M50 to Port Tunnel	Implementation, open
Outer Ring Road N4 to N81	Open
R132 Swords Road Upgrade Airport Roundabout to Collinstown Cross -Online upgrade of Regional Road	Funding provided as part of Airport T2 permission
Ballymun - St Margaret's Road/Jamestown Road-northern section. On-line improvement/widening.	At implementation
East Wall Road/Sheriff Street to North Quays. Dualling.	Completed
Dualling of the N11 between Wicklow and Arklow	Out to tender
Dublin Port Tunnel	Completed (2007)
Ashtown Road improvements	Completed
North Road to Jamestown Road (Seamus Ennis Road)	Completed

**Table A3: Do-minimum Demand Management, Cycling and P&R measures**

<b>Demand Management</b>	
No net increase in workplace parking in city centre over 2006 levels (through combination of implementation of DCC and DDDA parking standards and extension of on-street parking controls)	Parking policy measures in development plans are in place
Some restrictions in parking supply at new workplaces in areas identified in Development Plans (e.g. rest of City Council area, DLRCC), or where planning restrictions have been imposed to cap workplace parking (Airport) Assume only 40% of employees to new workplaces in DCC and DLRCC area use car (as driver or passenger) to get to work.	Parking policy measures in development plans are in place
Workplace Parking Levy inside Canals (€200/year)	Decision to implement announced in Dec 08 budget – precise levy boundaries remain to be confirmed
City Centre bus gate at College Green (no through traffic Dame Street<> O Connell Street or O Connell Street <> Nassau Street) (7am-10am and 4pm-7pm)	Open
Some allowance for reductions in car usage in areas covered by school travel plans up to 2012 (assumes roll out to 279 of 1022 schools in GDA by 2012)	Funding approved through Green Schools programme
<b>Cycling</b>	
SDCC Grand Canal scheme	At implementation
DCC Grand Canal Premium Route (Rathmines Road to Macken Street Bridge) and S2S Docklands (Macken Street Bridge to Fairview Park)	Funding approved by DoT
Park and Ride (rail based)	
Newbridge 205 spaces (planning approved out to tender), Portmarnock 150 spaces extension completed, Gorey 168 spaces extension completed. Pace Strategic Park and Ride.	Out to tender, or completed.

**Table A3: Transport 21 schemes in Strategy alternative packages**

<b>Group</b>	<b>Comment</b>
DART Underground (Interconnector) (Docklands to Inchicore)	Will be included in all Strategy packages
Suburban rail electrification associated with DART Underground Northern line to Balbriggan Kildare line to Hazelhatch Maynooth line Maynooth to city centre including resignalling and level crossing closures	Will be included in all Strategy packages
Metro North (as per current railway order application)	Will be included in all Strategy packages
Other Transport 21 schemes	Each scheme will be included in at least one Strategy alternative

#### **Bus Eireann confirmed service changes**

The following service changes were notified in an email to DTO dated 22nd June 2009:

- All major commuter towns will have a direct service to the airport by the end of 2009.
- New fleet of high capacity vehicles for Navan. 15 min all day service from 05.00 inbound to 23.00 outbound, using high spec double deck coaches. Core service will continue to run on the old N3 once motorway opens.

### **DTO bus network principles for do-minimum service specification**

#### **Buses on Rail/Light Rail Corridors**

In areas where rail or light rail services operate, the catchment area of these services will be widened to maximise the investment in rail. In such areas bus will provide feeder services to appropriate rail stations and also provide local services.

Where interchange is involved, the benefit of faster journey times by rail/light rail should outweigh the penalties of interchange. As such, feeder and local bus services should be scheduled to meet trains. Where appropriate due to anticipated demand, feeder services may be operated by smaller vehicles.

Bus will provide through services where rail/light rail does not provide the most suitable service.

#### **Radial services along Quality Bus Corridors**

High frequency conventional bus services are assumed, operating on even headways. Where appropriate radial Quality Bus Corridors will have a fast, direct core route supplemented by additional conventional services feeding into the corridor.

Additional peak hour services will operate on a limited stop basis to and from key places of employment, education and retail.

#### **Orbital Services**

Enhanced frequency conventional bus services operating on even headways along orbital Quality Bus Corridors providing additional interchange opportunities with radial bus services at specific locations in addition to interchange with rail and light rail services. Interchange locations would include Metropolitan town centres defined in the Regional Planning Guidelines (Swords,

Blanchardstown, Liffey Valley, Tallaght, Dundrum, Dun Loaghaire and Bray) as well as in the larger Hinterland growth towns.

### **Inter urban services**

Conventional bus services on even headways wherever possible, operated by coach or semi-coach vehicles for added comfort. Services will or may operate via rail stations, Luas stops and town centres. Where appropriate services will operate as feeders to rail stations.

### **Local Bus Services**

Local bus services will graduate to town centres in the Metropolitan area and to development centres in the hinterland. Where appropriate due to road configuration or anticipated demand, services may be operated by smaller vehicles.

### **Cross City Services**

Radial services operating southbound and terminating in the North City Centre to be extended to and beyond the City Centre.

Radial services operating northbound and terminating in the South City Centre to be extended to and beyond the City Centre.

Radial services on Quality Bus Corridors to be joined cross-city where there are high degrees of infrastructure providing reliable journey times

### **Airport Services**

Additional direct services and services from additional areas to provide greater journey opportunities to the airport by public transport.

### **Additional Network Principles**

Specific application of the following recommendations of the Deloitte Cost & Efficiency Review:

- Simplified network with a reduction in the number of variations of bus routes
- This has been extended to include a reduction in the overall number of services.
- Additionally, wherever possible, services will operate on more direct alignments and maximise the provision of Quality Bus Corridor infrastructure.
- Elimination of unnecessary duplication of services
- Creation of even headways between departures
- This includes the provision of clock face timetables and the interworking of services on Corridors
- Elimination of routes operating to garages with no customer demand

## **QBN Office programme – short term priorities**

The following QBN schemes were identified by the QBN Office as short term priorities in an email to DTO dated 10 June 2009. Some schemes are omitted as they are not considered strategically significant. Additional scheme information was taken from QBN Office 2009 programme.

The following schemes are included in the do-minimum model specification:

- St Margarets Road QBC – Ballymun Road to Jamestown Road/North Road Finglas
- Malahide Road QBC (Kilmore Road to Collins Avenue widening in both direction and banned right turn Malahide Road to Kilmore Road)

- Merrion Road QBC (Trimbelstown Avenue to Merrion Gates)
- Howth Junction to Ballymun Orbital QBC (Coolock Lane to Oscar Traynor Road)
- Swords Road QBC (Iveagh Road to Collins Avenue and Granby Row approach to Dorset Street)
- East Wall Road to Memorial Road
- Mount Merrion Avenue (Rock Road to N11)
- Sandyford Road (M50 to Wyckham Way)
- N3 inbound Clonee to M50
- Blanchardstown Road North
- Belgard Road to Newlands Cross
- Scholarstown Road (pinch point)
- Greenhills Road to Tallaght Village
- Merrion Square (point point)
- Chapelizod
- Berkeley Rd Outbound
- North of Swords
- Huntstown Way
- Clanbrassil Street/ Patrick Street
- Walkinstown Road
- College Green Public Transport Gate
- Main road at Luas terminus (Tallaght town to N81)
- Santry Village Improvement Scheme
- Santry Avenue QBC - Phase 2
- Main St., Vevay Road, Killarney Road, Castle Street, Quinsborough Road & Florence Road.
- Red Cow to Longmile (Phase IV)
- Howth Road - Sybill Hill Brookwood Avenue
- Sandyford & Stillorgan Business Park
- Kill Avenue – N11 to Dun Laoghaire
- Churchtown Road/Nutgrove Avenue (approaches to Nutgrove Ave junction only assumed)
- Rathfarnham QBC Enhancements
- James Street / Thomas Street
- Greenhills Road Realignment (Greenhills/Calmount/Parkview)
- N81 – Hard Shoulders
- Blakestown Way QBC
- Old Bawn Road
- Taney Road
- Fosters' Avenue/ Mount Annville Road
- Lower Kilmacud Road
- Ballycullen Road / Firhouse Road / Old Bridge Road
- Laurel Lodge / Castleknock Road / Auburn Avenue
- St Augustine TMP
- Outer Ring Road to Nangor Road Realignment Scheme
- Naas Town R445 Newbridge Road (N7 Interchange to Blessington Road)
- Abbey Road & Rochestown Avenue
- Belgard Road to Outer Ring Road
- Monkstown Ring Road/Stillorgan Park



## Appendix D

### Final Strategy Alternative Packages

Job No	Report No	Issue no	Report Name	Page
COR1001	1	1	Assembling and Appraising Strategy Packages	D1

**CATEGORY A: INFRASTRUCTURE SCHEMES - HIGH LEVEL ASSESSMENT FOR INCLUSION IN STRATEGY PACKAGES**

Measure	Description	Scheme Proposer	Code	Description	Capital cost estimate (L=<€5m, M=€5m-€50m, H=>€50m)	Assessment (include in initial package for appraisal?)	Assessment (include in initial package for appraisal?)	Assessment (include in initial package for appraisal?)
						Social Plus 5d	Economic Plus 3d	Environment Plus 4d
BS1	Enhance bus priority and segregation	BAC	5b	Bus bridge over Swords bypass at Pavilions centre	Medium	Y	Y	Y
BS1	Enhance bus priority and segregation	BAC	5c	Bus only bridge Celbridge Road over N4 west of Lucan	Medium	Y	Y	Y
BS1	Enhance bus priority and segregation	BAC	5d	Bus only bridge Long Mile Road/Nangor Road over Naas Road	Medium	Y	Y	Y
BS1	Enhance bus priority and segregation	BAC	5f	Marlborough Street-Hawkins Street bridge (see also DCC 6 below)	Medium	Y - not modelled for bus routes as OCS is not congested in future run	Y - not modelled for bus routes as OCS is not congested in future run	Y - not modelled for bus routes as OCS is not congested in future run
BS1	Enhance bus priority and segregation	BAC	5g	Bus only bridge over Grand Canal/Dodder at Quays (see also DDDA 1a)	Medium	Y	Y	Y
BS1	Enhance bus priority and segregation	BAC	4	Traffic Light Priority	TBC	Y - NOT MODELLED - we said we would come back to this at Draft Strategy stage	Y - NOT MODELLED - we said we would come back to this at Draft Strategy stage	Y - NOT MODELLED - we said we would come back to this at Draft Strategy stage
BS1	Enhance bus priority and segregation	BE	9	BRT on M3 Navan - Dublin	Low	Y - modelled BRT speeds (40KPH) on the M3 from Navan area to Clonee area. Bus gets this speed if ambient speed is lower NOTE- NO BUS SERVICES MODELLED YET ON M3 - ALL on N3	N	Y - modelled BRT speeds (40KPH) on the M3 from Navan area to Clonee area. Bus gets this speed if ambient speed is lower NOTE- NO BUS SERVICES MODELLED YET ON M3 - ALL on N3
BS1	Enhance bus priority and segregation	DCC	4k	Cappagh Road	Low-medium	Y	Y	Y
BS1	Enhance bus priority and segregation	DDDA	3b	Bus corridor 2 - Docklands Rapid Transit core route - Poolbeg to Tara Street via Quays (BRT) (Figure 6.1 DDDA Transport Strategy Dec 08)	Low (if BAC 5g in place)	Y	Y	Y
BS1	Enhance bus priority and segregation	DDDA	3a	Bus Corridor 1 - Pearse/Stephens Green to Poolbeg (conventional bus) (Figure 5.2 - DDDA Transport Strategy Dec 08) USES DODDER BRIDGE	Low	Y	N	Y
BS1	Enhance bus priority and segregation	DDDA	5	Bus Corridor 4 - East Wall to Poolbeg via Point (conventional bus) (Figure 5.2 - DDDA Transport Strategy Dec 08).	Low	Y	Y	Y
BS1	Enhance bus priority and segregation	DLR	1	Bus Rapid Transit (BRT) Dart (to Dundrum Centre / Sandford via UCD and RTE/Vincents using the Eastern Bypass reservation (Draft CDP Policy T9).	Medium	Y	Y	Y - YES, THIS WAS MODELLED, also put 8 services per hour per direction in college green-sandford-college green along the brr route
RC1	Local road and junction improvements	DCC	3c	Rathoath Road and Rileys bridge. Incorporates a new road bridge over Maynooth line	Low-medium	Y - complementary	Y - complementary	N
CY8	Improve cycle network	DCC	102	Grand Canal cycle route Inchicore to Rathmines (see also SDB 14 and do minimum link Rathmines to Fairview)	Medium	Y-Complementary -not coded as it is ped/cycle	Y-Complementary -not coded as it is ped/cycle	Y-Complementary -not coded as it is ped/cycle
CY8	Improve cycle network	DCC	105	Develop cycle link from Sandymount to Clontarf using Dodder Bridge (DDDA 1b) and Macken Street bridge	Medium	Y-Complementary -not coded as it is ped/cycle	Y-Complementary -not coded as it is ped/cycle	Y-Complementary -not coded as it is ped/cycle
RC1	Local road and junction improvements	DCC	4a	Belcamp Lane. Single carriageway on-line improvement with local realignments.	Low	Y - complementary	Y - complementary	N
RC1	Local road and junction improvements	DCC	4b	Ballymun(improved town centre linkage)	Low	Y - complementary - Ballymun link not changed in coding as it is already coded as a 'good' road	Y - complementary - Ballymun link not changed in coding as it is already coded as a 'good' road	N
RC1	Local road and junction improvements	DCC	4f	Kilmainham South Circular Road. Single carriageway on-line improvement with local realignments assumed.	Low	Y - complementary	Y - complementary	N
RC1	Local road and junction improvements	DTO	H2	R128 Lusk-Rush Road Upgrade - Single carriageway online upgrade of regional road (see also FCC5)	Low-medium	Y - complementary	Y - complementary	Y - complementary (as safety upgrade for pedestrians and cyclists)
RC1	Local road and junction improvements	DLR	3	Upgrade of Blackglenn Road/ Harold's Grange Road - a strategic route which will improve East to West connectivity within the County. The proposed route will be from Marley Park to Sandford Road. Draft CDP Policy T18. This is assumed to be an on-line improvement with local realignment where appropriate.	Low	Y - complementary	Y - complementary	N
RC1	Local road and junction improvements	DLR	9	Loughinstown Roundabout (Grade Separation) - Draft CDP Policy T18	N/A	Y	Y	N

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						Social Plus 5d	Economic Plus 3d	Environment Plus 4d
RC1	Local road and junction improvements	SDB	20	Greenhills Road to Ballymount Road Lower - To Longmile Road (part Of). Single carriageway on-line improvement with local realignments.	Low	Y - complementary - assumed to be in DOMIN in model coding as it is part of greenhills rd QBC scheme	Y - complementary - assumed to be in DOMIN in model coding as it is part of greenhills rd QBC scheme	N
RC1	Local road and junction improvements	DLR	32	Ballinteer Road dual carriageway (M50 to Ballinteer Avenue) (DLR 6 year road objective)		Y	Y	N
RC1	Local road and junction improvements	FCC	2	R122 Naul Road, Harry Reynolds Road to M1 - Access to Balbriggan from Motorway .Dual carriageway from Balbriggan Ring Road to M1	Medium	Y	Y	N
RC1	Local road and junction improvements	FCC	7	R106 Swords-Malahide Road Upgrade. Online upgrade of Regional Road . Single carriageway on-line improvement with local realignments.	Low	Y - complementary	Y - complementary	N
WS5	Improve walking network	DCC	104	Continue boardwalk from Capel Street to Heuston and new river side walk in Heuston vicinity to improve access to Heuston Station.	Low-medium	Y - NOT CODED as it is ped/cycle	Y - NOT CODED as it is ped/cycle	Y - NOT CODED as it is ped/cycle
WS5/CY8	Improve cycle/walk network	DCC	3b	Link from Military Road to Conyngham Road Links Parkgate Street/Phoenix Park area with Heuston office quarter/Kilmainham/Royal Hospital area.	Low-medium	Y - NOT CODED as it is ped/cycle	Y - NOT CODED as it is ped/cycle	Y - NOT CODED as it is ped/cycle
WS5/CY8	Improve cycle/walk network	DCC	4g	River Road. Single carriageway on-line improvement assumed to substandard road	Low-medium	Y - NOT CODED as it is ped/cycle	Y - NOT CODED as it is ped/cycle	Y - NOT CODED as it is ped/cycle
WS5/CY8	Improve cycle/walk network	DCC	4h	Richmond Road. Single carriageway on-line improvement assumed.	Low-medium	Y - NOT CODED as it is ped/cycle	Y - NOT CODED as it is ped/cycle	Y - NOT CODED as it is ped/cycle
BS1	Enhance bus priority and segregation	DLR	30	Bus priority on parallel Roads between M50 junctions 13 and 14. (Ballinteer Road to Drumartin Link Road)	low-medium	Y - CODED BRT Speeds (40KPH) on these links. Bus will take this speed or ambient speed, whichever is higher. NOTE - no extra bus services coded. Tallaght - Blackrock-Tallaght bus service coded (using this alignment 6 per hour per direction)	N	Y - CODED BRT Speeds (40KPH) on these links. Bus will take this speed or ambient speed, whichever is higher. NOTE - no extra bus services coded. Tallaght - Blackrock-Tallaght bus service coded (using this alignment 6 per hour per direction)
BS1	Enhance bus priority and segregation	DLR	31	Old Connaught Avenue to Old Dublin Road, Bray	low	Y	Y	Y
BS1	Enhance bus priority and segregation	DLR	33	Old Dublin Road between Wilford slip roads and Old Connaught Avenue	low-medium (widening assumed to facilitate bus lane in both directions)	Y	Y	Y
RC1	Local road and junction improvements	SDB	21	Knocklyon Road to Firhouse Road. Single carriageway on-line improvement with local realignments.	Low	Y - complementary - did not change model coding, as road is coded as a 'good' road already	Y - complementary - did not change model coding, as road is coded as a 'good' road already	N
RC1	Local road and junction improvements	SDB	23	Walkinstown road To Calmount Road. Single carriageway on-line improvement with local realignments.	Low	Y - complementary - assumed to be in DOMIN in model coding as it is part of greenhills rd QBC scheme	Y - complementary - assumed to be in DOMIN in model coding as it is part of greenhills rd QBC scheme	N
RL5	New rail and tram corridors	DTO	R2	Metro Tallaght to City centre via Kimmage (see also RPA 8 above)	High	N	Y	N - LUAS CODED IN ALL SCENARIOS EXCEPT DO ECON PLUS and DO ECON PLUS WITH MEASURES
RL9	Improve rail [services and] capacity	DTO	R1	3-4 tracking of Northern rail corridor between East Wall junction and Howth Junction (see also IE11d above)	High	Y? (TBC) Assumed to be covered by Irish Rail's 'unconstrained' Do Something document	Y? (TBC) Assumed to be covered by Irish Rail's 'unconstrained' Do Something document	Y? (TBC) Assumed to be covered by Irish Rail's 'unconstrained' Do Something document
WS5/CY8	Improve cycle/walk network	DTO	H2	R128 Lusk-Rush Road Upgrade - Single carriageway upgrade to sub-standard regional road (see also FCC5)	Low-medium	Y - NOT CODED as it is cycle/ped, but the road improvements part was coded	Y - NOT CODED as it is cycle/ped, but the road improvements part was coded	Y - NOT CODED as it is cycle/ped, but the road improvements part was coded
BS1	Enhance bus priority and segregation	DLR	18a	BRT Sandyford to Tallaght	Medium	Y - Coded BRT speeds from Tallaght to Dundrum (NOTE - no extra bus services added/main bus line is Tallaght - Blackrock - tallaght 6 per hr per direction. Various other services also use small sections.	N	Y - Coded BRT speeds from Tallaght to Dundrum (NOTE - no extra bus services added/main bus line is Tallaght - Blackrock - tallaght 6 per hr per direction. Various other services also use small sections.
BS1	Enhance bus priority and segregation	DTO	B21	Malahide Road bus priority at N32	Low	Y - not coded as the offline proposal for Malahide Road is coded (as per JR/JKS discussion). Note, did not divert any bus services to the new road	Y	Y
BS1	Enhance bus priority and segregation	DTO	B3	Bus priority on approach to N3 at Damastown		Y	Y	Y

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						Social Plus 5d	Economic Plus 3d	Environment Plus 4d
BS1	Enhance bus priority and segregation	DTO	B20	Bus priority to Adamstown from Luas Line F terminus (alternative to RPA 13)		Y	N	Y
BS1	Enhance bus priority and segregation	FCC	24, 105	Extend QBC's - Malahide. Malahide (DART) to Swords QBC (see BAC5b and QBN3a)	Low	Y	Y	Y
BS1	Enhance bus priority and segregation	FCC	27, 107	Extend QBC's - Tyrellstown/Ballycoolin. Priority on Church Road and Cruisera Road, linking to Blanchardstown Road north.	Low	Y	Y	Y - YES, THIS WAS CODED
BS1	Enhance bus priority and segregation	KCC	6a	Naas Smarter Travel Town - Bus corridor proposed from Sallins station to Naas town centre on new alignment (potentially via Millenium Business Park lands/set back boundary of De Burgh Estate)	Medium	Y - NOT CODED - the congestion in Naas does not show up in the model	N	Y
BS1	Enhance bus priority and segregation	KCC	6c	Bus priority link from centre of Naas to centre of Newbridge (using main streets of both towns)	Low-medium	Y - NOT CODED - the congestion in Naas/Newbridge does not show up in the model	Y - NOT CODED - the congestion in Naas/Newbridge does not show up in the model	Y
BS1	Enhance bus priority and segregation	MCC	13	Construction of quality bus corridors around Navan town.	?	Y - NOT CODED - the congestion in Navan does not show up in the model	Y - NOT CODED - the congestion in Navan does not show up in the model	Y - NOT CODED - the congestion in Navan does not show up in the model
BS1	Enhance bus priority and segregation	QBN	3ab	Cloverhill Road/Cedarbrook Avenue/Park West Avenue. (bus priority from Quarryvale, Clondalkin across M50 to Park West and Cherry Orchard area)	Low?	Y	Y	Y
BS1	Enhance bus priority and segregation	QBN	3ac	Naas Road priority - Rathcoole to Kingswood	Low?	Y	Y	Y
BS1	Enhance bus priority and segregation	QBN	3ad	N81 Blessington Road (Outer Ring Road to N82)	Low/Medium (depends on need for hard shoulder widening)	Y	Y	Y
BS1	Enhance bus priority and segregation	QBN	3af	N81 Old Bawn Road to Glenview Area	low	Y	Y	Y
BS1	Enhance bus priority and segregation	QBN	3ag	Leopardstown Road/Brewery Road (M11 to N11 link via Sandford)	low	Y	Y	Y
CY8	Improve cycle network	SDB	14	Liffey to Locks cycle scheme - infrastructure from Inchicore to Lucan via Clondalkin	Low-medium	Complementary - NOT CODED as it is ped/cycle	Complementary - NOT CODED as it is ped/cycle	Complementary - NOT CODED as it is ped/cycle
BS1	Enhance bus priority and segregation	QBN	3ah	Ballyboden Road (Rathfarnham Road QBC extension)	low	Y	Y	Y
CY8	Improve cycle network	SDB	15	Green route Dodder valley cycle track. Rathfarnham to Tallaght via Templogue	Low-medium	Complementary - NOT CODED as it is ped/cycle	Complementary - NOT CODED as it is ped/cycle	Complementary - NOT CODED as it is ped/cycle
BS1	Enhance bus priority and segregation	QBN	3aj	Firhouse - Ballycullen QBC (Ballycullen Road/Firhouse Rd junction to Butterfield Avenue/Rathfarnham Road junction)	low?	Y - most of this already coded - no new links coded	Y - most of this already coded - no new links coded	Y
BS1	Enhance bus priority and segregation	QBN	3al	Clonskeagh Road bus priority	low?	Y (no road widening)	Y (no road widening)	Y (no road widening)
BS1	Enhance bus priority and segregation	QBN	3am	Naas Road (Longmile Road to Walkinstown Road)	low?	Y - THIS IS ALREADY BUILT	Y - THIS IS ALREADY BUILT	Y - THIS IS ALREADY BUILT
RL8	[Rail] station parking expansion	WCC	7	Park and Ride facilities at Fassaroe Luas terminus (700 spaces)	Low?	Y	Y	Y
PS4	Park and Ride (bus-based)	BE	6b	Satellite Park and Ride facilities - in rest of GDA M1 in vicinity of Drogheda, Balbriggan N2 in vicinity of Rathoath, Ashbourne M3 in vicinity of Kells, Trim, Navan M4 in vicinity of Kilcock M7 in vicinity of Newbridge and Naas M11 in vicinity of Rathnew (see also WCC 9b)	Medium	Y	Y	Y
RC1	Local road and junction improvements	DLR	8a	Sandford Urban Framework Proposals - Draft CDP Policy T18 1) Leopardstown Roundabout Reconfiguration, (Assume new grade separated roundabout over M50 at Leopardstown Road, with full access to M50).	?	Y	Y	N
RC1	Local road and junction improvements	DLR	8b	(2) Drummartin Grade Separation (M50 to Dundrum). New grade separated junction at Blackthorn Road/Drummartin Link Road.	N/A	Y	Y	N
RC1	Local road and junction improvements	SDB	27	Nangor Road Improvement. Single carriageway on-line improvement with local realignments.	Low	Y - complementary	Y - complementary	N
RC1	Local road and junction improvements	SDB	36	Ballymount Road Lower. Single carriageway on-line improvement with local realignments.	Low	Y - complementary	Y - complementary	N
RC1	Local road and junction improvements	SDB	37	Robinhood Road. Single carriageway on-line improvement with local realignments.	Low	Y - complementary - NOT CODED as Robinhood Road is not included in the model	Y - complementary - NOT CODED as Robinhood Road is not included in the model	N

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						Social Plus 5d	Economic Plus 3d	Environment Plus 4d
BS1	Enhance bus priority and segregation	OBN	3an	Naas Road (Tyrconnell Road)	low?	Y	Y	Y
BS1	Enhance bus priority and segregation	OBN	3ap	Dun Laoghaire to Cherrywood QBC	Low - assumes no significant road widening would be required to facilitate (see DLR 5)	Y (primarily (- or perhaps exclusively?) without widening)	Y (primarily (- or perhaps exclusively?) without widening)	Y (primarily (- or perhaps exclusively?) without widening)
BS1	Enhance bus priority and segregation	OBN	3ar	Fortfield Road/Kimmage Road Lower QBC	TBC	Y (online without widening)	Y (online without widening)	Y (online without widening)
BS1	Enhance bus priority and segregation	OBN	3b	Bus priority on Swords Bypass (northern section) and Swords main street on north and south approaches to town centre.	Low	Y	Y	Y
BS1	Enhance bus priority and segregation	OBN	3c	Bus priority Collins Avenue extension approaching Ballymun Road from west.	Low	Y	Y	Y
BS1	Enhance bus priority and segregation	OBN	3d	Bus priority Howth Junction DART to Kilmore via Tonleeg Road/Oscar Traynor Road	Low	Y	Y	Y
BS1	Enhance bus priority and segregation	OBN	3f	Airport southern perimeter road (R108-R132)	Low (assuming road widening already in place, funded as part of Terminal 2 permission)	Y	Y	Y
BS1	Enhance bus priority and segregation	OBN	3i	Beaumont Road - Collins Avenue West Collins Ave extension - Glasnevin Avenue to N2	Low	Y	Y	Y
RC2	New local road links	MCC	4	Ashbourne-Hungry Hall N2 Road Scheme - dual carriageway road between Ashbourne and Ardee. The section in Meath terminations at Hungry Hall.	High	Y	Y	N
RC2	New local road links	MCC	5	Slane Bypass - N2 bypass of Slane including a new crossing over the River Boyne.	Low	Y - Complementary - NOT CODED as it is in buffer area	Y	N
RC2	New local road links	DLR	11	M50 Western Parallel Road from Fassaroe/ Old Conna to Rathmichael, Cherrywood/ Carrickmines with a northbound link to the N11 - Draft CDP Policy T18. New single carriageway assumed	Moderate	Y - NOT CODED as more detail would be needed in the model to get benefits	Y - NOT CODED as more detail would be needed in the model to get benefits	N
RC2	New local road links	DLR	26	Parallel Road - Leopardstown Racecourse - extend the M50 parallel road from Carrickmines to Sandymount via Leopardstown. New single carriageway.	Moderate	Y - NOT CODED as more detail would be needed in the model to get benefits	Y - NOT CODED as more detail would be needed in the model to get benefits	N
RC2	New local road links	FCC	12a	East-West Distributor Road - Airport to Cherryhound Interchange -Dual two lane.	High	Y	Y	N
RC2	New local road links	FCC	12b	East-west Distributor Road - Airport to North Fringe/Fingal south Fringe -Dual two lane.	High	Y	Y	N
BS1	Enhance bus priority and segregation	OBN	3j	Bus priority from Beaumont Road through Hospital to Northside Shopping Centre Kilmore Road	Low	Y	Y	Y
RC2	New local road links	FCC	13	Sillogue Road Link - new link over M50 between St Margaret's Road and the East-West Distributor Road	Medium	Y	Y	N
BS1	Enhance bus priority and segregation	OBN	3k	Littlepace Road and Huntstown Road priority including bus gate to Huntstown Way	Low	Y - NOT CODED as Littlepace Road is not in model	Y - NOT CODED as Littlepace Road is not in model	Y
RC2	New local road links	FCC	8	R107 Malahide Road Upgrade - Offline upgrade of Regional Road. Dual assumed from Darndale to East West Distributor Road (DCC 1a). Single carriageway assumed north of this point (to Kinsealy Church)	Medium	Y	Y	N
RC2	New local road links	FCC	9	R123 Moynoe Road Upgrade - Offline upgrade of Regional Road	Low	Y	Y	N
RC2	New local road links	KCC	4c	Ring road for Athy - southern distributor	Medium	Y - Complementary - NOT CODED as it is in the buffer	Y NOT CODED as it is in buffer area	N
RC2	New local road links	KCC	4d	Kildare outer relief road (north)	Medium	N	N	N
RC2	New local road links	KCC	4f	Sallins By-pass	Medium	Y - NOT CODED as it is in buffer area	Y - NOT CODED as it is in buffer area	N
RC2	New local road links	KCC	4g	Naas south east Inner Relief Road	Medium	Y - NOT CODED as it is in buffer area	Y - NOT CODED as it is in buffer area	N
RC2	New local road links	KCC	4h	Maynooth relief road (Leixlip Rd to Celbridge Road)	Low?	Y	Y	N

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						Social Plus 5d	Economic Plus 3d	Environment Plus 4d
RC2	New local road links	MCC	8	N51 Realignment. Realignment of the N51 national secondary route between Navan and Drogheda. Single carriageway online upgrade assumed	Low	Y	Y	N
RC2	New local road links	SDB	40	Font-Hill-Cloverhill Distributor Road	N/A	Y	Y	N
RC2	New local road links	SDB	38	Alymer Road	High	Y	Y	N
RC2	New local road links	FCC	21, 102	Remediation for closures of level crossings on Maynooth Line (associated with DART underground project IE 5 - which is common to all packages) Assume new road bridges, with associated road realignments where needed at Barberstown, Coolmine, Ashtown, Rathoath Road. Road closure assumed at Blakestown, Clonsilla (following completion of new link road to west), Porterstown	Medium	Y - NOT CODED , as these crossings are not included in current model	Y - NOT CODED , as these crossings are not included in current model	N (road closure assumed to remain)
RC2	New local road links	KCC	4i	R402 Edenderry to Enfield. Single carriageway on-line improvement with local realignments.	Low?	Y	Y	N
RC4	Widening of strategic roads	SDB	19	N81 Blessington Road (Tallaght Bypass Extension) - dual carriageway	High?	Y - CODED IN MODEL JUST AS FAR AS BOHERBOY ROAD (near the embankment)	Y - CODED IN MODEL JUST AS FAR AS BOHERBOY ROAD (near the embankment)	N
RC4	Widening of strategic roads	DLR	7	M11 Upgrade to Fassaroe - Draft CDP Policy T18 (assume additional lane each direction)	Medium?	Y	Y	N
RC4	Widening of strategic roads	DLR	10	M50 Widening (Sandyford Interchange to M11) and junction upgrades an additional lane plus auxiliary lanes to deal with future growth and zoned development - Draft CDP Policy T18	High	Y - mainline upgraded to 3 lanes plus auxiliary. No junction upgrades as no details available	Y - mainline upgraded to 3 lanes plus auxiliary. No junction upgrades as no details available	N
RC4	Widening of strategic roads	MCC	12	Dunboyne-Maynooth Regional Road - Improvements to and realignment of the Dunboyne-Maynooth regional road R157.	Low	Y	Y	N
RC4	Widening of strategic roads	NRA	3	M1 widening using central reservation - Swords to Airport	High?	Y	Y	N
BS1	Enhance bus priority and segregation	QBN	3l	Hartstown Road Blanchardstown	Low	Y	Y	Y
BS1	Enhance bus priority and segregation	QBN	3m	Connolly Memorial Hospital. Bus gate	Low	Y - NOT CODED - not enough network detail to model	Y - NOT CODED - not enough network detail to model	Y
BS1	Enhance bus priority and segregation	QBN	3n	N3 Scotts roundabout to Clonee QBC. Outbound only (inbound complete)	Low (assuming no road widening)	Y	Y	Y
RC4	Widening of strategic roads	WCC	1	Leinster Outer Orbital Road EXTENSION to Arklow. Assumed to be generally online improvements with local realignments, and remaining single carriageway.	Depends on specification	Y	Y	N
RC4	Widening of strategic roads	MCC	19	Upgrade of N3 Clonee to M50 to 3 lanes each direction+ bus lane	High?	Y	Y	N
BS1	Enhance bus priority and segregation	QBN	3o	Ballyboggan Road approach to Finglas Road	Low	Y	Y	Y
BS1	Enhance bus priority and segregation	QBN	3p	Glasnevin Hill bus priority	Low	Y (no road widening)	Y (no road widening)	Y (no road widening)
BS1	Enhance bus priority and segregation	QBN	3q	New Cabra Road bus priority	Low	Y	Y	Y
RC5	New strategic links/bypasses	FCC	15	N2-N3 Links - Tyrellstown to Cherryhoun and Castaheany to Damastown - New links to provide access to National Roads for development lands	High	Y	Y	N
RC5	New strategic links/bypasses	FCC	17	N3-N4 Links - Ongar to Barnhill and Barnhill to Leixlip - New links to provide access to National Roads for development lands. Dual carriageway assumed	High	Y	Y	N
RC5	New strategic links/bypasses	NRA	1	Dublin Eastern Bypass - Refer to Feasibility Report (published on NRA website 16/03/09 for public information and issued to DTO on 20/03/09)	High	Y	Y	N



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						Social Plus 5d	Economic Plus 3d	Environment Plus 4d
RC6	New river/canal crossings	DCC	6	Public Transport Bridges/Pedestrian Bridges: Marlborough Street Public Transport Priority Bridge: Policy T8 The bridge will provide a link between Eden Quay and Burgh Quay at the locations of Marlborough Street.. It is intended for buses and the LUAS, will have cycleways and generous footpaths. (See also BAC 5f above)	Medium	Y - NOT CODED -see earlier explanation - all buses down uncongested oconnell street however assume present as Luas BXD is included in this package)	Y - NOT CODED -see earlier explanation - all buses down uncongested oconnell street however assume present as Luas BXD is included in this package)	Y - NOT CODED -see earlier explanation - all buses down uncongested oconnell street however assume present as Luas BXD is included in this package)
BS1	Enhance bus priority and segregation	OBN	3s	Fairview Road/Ballybough Road/Summerhill Road	Low?	Y	Y	Y
RL5	New rail and tram corridors	IE	3	Navan Rail Line. Rail spur from Pace to Navan: 2nd phase of Navan rail line (same as RL5- MCC 3)	High	Y - Assumed to be covered by Irish Rail's 'unconstrained' Do Something document	Y - Assumed to be covered by Irish Rail's 'unconstrained' Do Something document	Y - Assumed to be covered by Irish Rail's 'unconstrained' Do Something document
RL5	New rail and tram corridors	IE	5	DART Underground- tunnel Docklands- Heuston/Inchicore. Includes electrification Inchicore to Hazelhatch.	High	Y - Assumed to be covered by Irish Rail's 'unconstrained' Do Something document	Y - Assumed to be covered by Irish Rail's 'unconstrained' Do Something document	Y - Assumed to be covered by Irish Rail's 'unconstrained' Do Something document
RL9	Improve rail [services and] capacity	IE	11a	Selective double tracking west of Maynooth	Medium/high	Y (IF NEEDED)	Y (IF NEEDED)	Y (IF NEEDED)
RL9	Improve rail [services and] capacity	IE	12	Flyover junction north of Connolly	Medium/high?	Y (IF NEEDED)	Y (IF NEEDED)	Y (IF NEEDED)
RL9	Improve rail [services and] capacity	IE	13	Eliminate Level Crossing constraint on S.E. Line. Closure of the level crossings at Sandymount, Sydney Parade, Merrion Gates (tunnel replacement), Quinsborough Road	Medium	Y (IF NEEDED)	Y (IF NEEDED)	Y (IF NEEDED)
RL5	New rail and tram corridors	KCC	6b	Naas Smarter Travel Town. Light rail linking Naas with Sallins rail station (or Osbertstown)	High	N (KCC6a acts as substitute)	Y	N (KCC6a acts as substitute)
RL5	New rail and tram corridors	RPA	1	Metro North - Bealinstown (North Swords) to St. Stephen's Green via airport and Ballymun	High	Y	Y	Y
RL5	New rail and tram corridors	RPA	10	Metro North - north extension Bealinstown - Irish Rail (Assume extension to Donabate station.)	High	N (bus alternative not modelled yet)	Y	N (bus alternative not modelled yet)
RL5	New rail and tram corridors	RPA	12	Metro West - south extension - Tallaght- Luas Green line	High	N (DLR18 acts as substitute)	Y	N (DLR18 acts as substitute)
RL5	New rail and tram corridors	RPA	13	Luas Line F extension - Adamstown, or Lucan Village or further westwards (Assume extension to Adamstown station). (See DTO B20 QBC alternative)	High	N (see DTO B2 -QBC alternative)	Y	N (see DTO B2 -QBC alternative)
RL5	New rail and tram corridors	RPA	14	Luas Line A1 Extension- Further north or westwards from Garter Lane (Assume extension to Baldonnel area)	High	N (Maynooth-Tallaght- Maynooth bus service coded on this route (via Baldonnel/Luas A1) - 3 per hr per direction)	Y	N (review prelim model results for need for bus priority on corridor as a substitute)
RL5	New rail and tram corridors	RPA	2	Metro West - Orbital - Tallaght to junction with Metro North south of airport (Dardistown)	High	Y	Y	Y
RL5	New rail and tram corridors	RPA	3	Luas BX/D - Broombridge-St. Stephen's Green	High	Y	Y	Y
RL5	New rail and tram corridors	RPA	4	Luas Line B2 (Cherrywood to Bray) - (also identified by DLRC - DLR 13)	High	Y	Y	Y

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						Social Plus 5d	Economic Plus 3d	Environment Plus 4d
RL5	New rail and tram corridors	RPA	5	Luas F Lucan-City Centre	High	Y	Y	Y
RL5	New rail and tram corridors	RPA	6	Luas D1 Broombridge-M50 via Finglas	High	Y	Y	Y
RL5	New rail and tram corridors	RPA	7	Luas E Rathfarnham - City Centre	High	Y	Y	Y
RL5	New rail and tram corridors	RPA	8	Luas Tallaght area to City centre via Kimmage Luas option (see also DTO R2 below)	High	Y	N	Y
BS1	Enhance bus priority and segregation	QBN	3t	East Wall QBC	Low	Y	Y	Y
RL6	Additional rail/light rail stations/stops	IE	7a	New rail stations at Drumcondra East (Croke Park), Pelletstown,	Low/medium also additional operating costs due to additional stopping trains	Y	Y	Y
RL6	Additional rail/light rail stations/stops	MCC	26	New stations (and associated park and ride) at Hill of Down (between Enfield and Mullingar) and Bettystown (south of Drogheda)		Y	Y	Y
RL8	[Rail] station parking expansion	IE	10	Rail Park and Ride expansion Rush-Lusk - increase from 160 to 359 spaces Donabate - increase from 200 to 345 spaces Other sites at planning: Drogheda Pitch and Putt/Marsh Road (160 spaces), Laytown (300), Wicklow (80), Athy (250 spaces), Kildare (150 spaces)	Low-medium	Y	Y	Y
BS1	Enhance bus priority and segregation	QBN	3u	Manor Street to O'Connell Street QBC (via Parnell Street W)	Low?	Y	N	Y
RL9	Improve rail [services and] capacity	IE	11b	Selective four tracking south of Hazelhatch	Medium/high	Y - IF NEEDED	Y - IF NEEDED	Y - IF NEEDED
RL9	Improve rail [services and] capacity	IE	11c	Passing loops on single track railway line south of Bray	Medium	N (M11 bus priority (WCC 3) assumed as alternative)	Y - propose extent, discuss with IE after prelim modelling	N (M11 bus priority (WCC 3) assumed as alternative)
RL9	Improve rail [services and] capacity	IE	11d	Selective four tracking north of Howth Junction (see also DTOR1 below)	Medium/high	Y - IF NEEDED	Y - IF NEEDED	Y - IF NEEDED
RL9	Improve rail [services and] capacity	RPA	15	Metro extension Stephens Green to Cherrywood (utilising Luas Green Line alignment south of Beechwood)	High	Assumed same alignment and speed as current Green line, but with higher capacity Metro trains rather than Luas trains. Donabate to Cherrywood services coded. NOTE - LUAS also runs on this line (services from Fassaroe/Bray to BXD and Meakstown as applicable)	Assumed same alignment and speed as current Green line, but with higher capacity Metro trains rather than Luas trains. Donabate to Cherrywood services coded. NOTE - LUAS also runs on this line (services from Fassaroe/Bray to BXD and Meakstown as applicable)	Assumed same alignment and speed as current Green line, but with higher capacity Metro trains rather than Luas trains. Donabate to Cherrywood services coded. NOTE - LUAS also runs on this line (services from Fassaroe/Bray to BXD and Meakstown as applicable)
BS1	Enhance bus priority and segregation	QBN	3v	Chapelizod Road QBC	Low?	Y	Y	Y
BS1	Enhance bus priority and segregation	WCC	3	Extension of QBC along the M11 by making use of hard shoulder south of Loughlinstown to N11 (Fassaroe Lane)	Low?	Y	Y	Y

Notes on changes to Appendix A- CAT A1

19/10/2009 Exclude duplicates

CATEGORY B: SPECIFICATION OF POLICY OR BEST PRACTICE MEASURES FOR APPRAISAL (SCHEME IMPLEMENTATION ASSUMPTIONS WILL GENERALLY BE REQUIRED FOR APPRAISAL PURPOSES)

Model																				
Do not model																				
Include only if initial model output suggests need																				
May test to inform tech note																				
Input matrix manipulation																				
Measure		Policy/best practice			Where applied		Benefits/disbenefits		Cost estimate (L=€5m, M=€5m-€50m, H>€50m)		Scale of application		Observations		Assessment (include in initial package for appraisal?)		Assessment (include in initial package for appraisal?)		Assessment (include in initial package for appraisal?)	
Code	Description	Proposer	Code													Economic	Environment		Social	
BS4	Reduce bus delays from boarding and alighting issues	DTO	B1	Provide greater discounts for pre-paid tickets to make them more attractive to users	GDA wide.	Reduce overall bus dwell times at stops especially on busier routes.	Set up costs only. Proposed to apply in a revenue neutral (ie increase cost of single fare, and reduce cost of discounted tickets)	Progressive increase in differentiation in cost of single fare relative to cost of discounted ticket.	Recommended in Deloitte Report (Cost and Efficiency Review - January 2009) P19. Related to fares regulatory policy (see N15)	Y	Y - complementary	Y								
BS4	Reduce bus delays from boarding and alighting issues	DTO	B2a	Provide on-street bus ticket machines at locations where large numbers of people board buses	City centre bus stops in first instance (O'Connell, Parnell, Stephens Green and Quays areas). Roll out over time to all stops with large numbers of people board services.	Speeds passenger boarding and alighting times and reduces bus dwell time	Low			Y	Y - complementary	Y								
BS4	Reduce bus delays from boarding and alighting issues	DTO	B2b	Introduce wider ticket pre-paid purchase options e.g. through mobile phone purchase/ticketing	Throughout GDA	Speeds passenger boarding and alighting times and reduces bus dwell time	Low	GDA wide.		Y	Y - complementary	Y								
BS4	Reduce bus delays from boarding and alighting issues	DTO	B3	On certain routes, provide open boarding and alighting buses (similar to Luas), where pre-paid tickets only are accepted. Phase in to all bus services over time	Cross city bus services initially. Phase in to all bus services over time	Speeds passenger boarding and alighting times and reduces bus dwell time. Revenue retention measures would be required e.g through use of Luas type roving inspectors.	Low (potential operator savings through shorter operation times may be offset by need for greater enforcement/ticket inspection)	Assume open buses provided as part of bus replacement cycle	Y	Y - complementary	Y									
BS4	Reduce bus delays from boarding and alighting issues	DTO	B4	Provide multiple door buses, to facilitate separate boarding and alighting points	All bus routes that pass through areas where significant numbers of passengers wish to board and alight bus at the same locations.	Speeds passenger boarding and alighting times and reduces bus dwell time. Less confusing to tourists and other visitors, reduces or eliminates need to provide additional "set down only" bus stops	Assume buses provided as part of bus replacement cycle		Y	Y - complementary	Y									
BS4	Reduce bus delays from boarding and alighting issues	DTO	B5	Remove some tourist bus boarding points from busy city centre locations (relocate boarding points and termini where tourist buses currently dwell for long periods to adjacent less busy streets).	O'Connell Street, College Green area (e.g relocate from O'Connell Street north to Cathal Brugha Street, and from College Green area to Pearse Street area)	Many tourist buses dwell at bus stops for long periods of time, and frequently obstruct movement and cause delays to other buses. This proposal should reduce this impact.	Low		Y	Y - complementary	Y									
BS4	Reduce bus delays from boarding and alighting issues	DTO	B6	Relocate stops to points where greatest numbers of passengers wish to access bus service, and consider reducing bus stops where closely spaced.	Selected routes where bus stops are very closely spaced. Consider first a limited stop service running on same route as a local at stops service.	Faster journey times through less frequent stops	Low	Route by route review of bus stop locations required to determine scale of changes, in consultation with stakeholders. As a guide, bus stops should be spaced approximately 400m apart although user requirements may dictate closer spacing.	On certain routes may be more appropriate to introduce limited stop or express services and retain local services serving all stops	Y	Y - complementary	Y								
BS4	Reduce bus delays from boarding and alighting issues	DTO	B7	Ensure bus stop area design permits stopping buses to rejoin traffic without any delays to bus	GDA wide		Low		Y	Y - complementary	Y									
N15	Integrated fares Test 3b, 3d, 5b, 5d	BAC	3	Create a fares system that does not impose an additional charge on passengers if they choose a different public transport mode or undertake a multi-leg PT journey. Implement via all mode zonal fares structure with simplified range of zone to zone fares regardless of mode used.	GDA wide	Easy to understand fare structure. Increases public transport use by encouraging multi-leg journeys, thus increasing number of destinations people are willing to travel to by public transport. Would result in some fare increases where journey crosses zone boundaries.	Assume revenue neutral - no overall impact on cost of public transport travel. This may require significant rises in some single fares, especially if interzonal.	Issues may arise at zone boundaries where fare costs are likely to increase for relatively short distance trips. Requires integrated ticketing as a prerequisite.	Y	N	Y									
N16	Public transport fares reductions (off peak) Test 3b, 3d, 5b, 5d	DTO	N1	Reduce all fares for off peak travel relative to peak, to encourage travel outside of peak times	GDA wide	Potentially move some peak trips into off peak times, reducing operator requirements for peak capacity. Increased use of public transport when capacity is available, and potentially increase revenue in off peak	Structure to ensure revenue neutral or positive.	May not wish to apply this measure to certain services including premium services such as AirLink etc.	Y - complementary	N (although measure scores well, so does measure N17, would not introduce both)	Y - complementary									
N17	Lower public transport fares overall Test 4b, 4d	DTO	N2	Reduce all fares in GDA at all times	GDA wide	Encourage greater use of public transport	High	Test impact of 20% overall reduction in fare levels	Will have ongoing revenue implications, which could impact on quality of public transport services, unless shortfall is made up through additional subsidy or hypothecation from other measures (e.g. congestion charging revenue). May require additional fleet at peak times	N (although measure scores well, so does measure N16, would not introduce both)	Y - complementary	N (although measure scores well, so does measure N16, would not introduce both)								
TM1	Traffic management plans and road user hierarchy	DTO	M1	Establish a road user hierarchy (by road type, user type and time period) and reallocate road space in accordance with new priorities. ; plus physical speed limiting, traffic calming and junction accident remedial measures. All road authorities to establish a priority of users for consideration in traffic and road planning, operational management and design. This will usually place the most vulnerable users (pedestrians and cyclists) first, but must also take account of the need of mass transit modes, and should prioritise freight/distribution/commercial vehicles over those of the private car. More sophisticated hierarchies will also classify types of traffic and trips along different classes of road (strategic down to residential)	Throughout GDA	Provides incentives for modal shift away from car, especially to soft modes, due to reduced dominance of roads and streetscape by motor vehicles. Improved access and reduced delays for cyclists and public transport users at junctions and uncontrolled crossing points, lower levels of accidents affecting vulnerable road users.	Zero - follow up costs implied however, in implementing policy		Part of enabling measures to improve the management of the highway network in line with sustainable principles. Principle may emerge in legislation (see Action 37 in Sustainable Transport Future document). Note that similar but slightly different hierarchies may be used relative to different objectives - e.g. an environmentally-led policy may prefer walking and cycling over the use even of road public transport vehicles; whereas one with social/community access priorities may put demand-responsive transport, motorcycle and bus users' needs more centrally.	N	Y	Y - complementary								
TM1	Traffic management plans and road user hierarchy	BAC	8	Traffic Calming of Suburban Centres	-	-	-	-	-	N	Y	Y - complementary								
TM1	Traffic management plans and road user hierarchy	DTO	M2	Traffic management plans to reduce delays associated with street works and events. Road authorities to have policies and partnership working processes in place which ensure that planned maintenance and construction work and planned events on the road do not give rise to an unacceptable level of journey time unreliability and that the network can remain at a level of working efficiency which will not impose excessive or unnecessary delays on those travelling on it, including non-motorised users. Also incident management plans (including emergency services role) for unplanned incidents and events to minimise the amount and extent of disruption.		Reduces unreliability and delays; better resilience in case of unplanned disruptions that could lead to knock on delays. Better user confidence in network performance; less pressure to delay maintenance beyond sensible time limits in order to maintain short-term operating capacity.	Zero		This relates closely to best practice traffic management processes in 'normal' conditions, aiming to ensure that the specified function of the road and the level of service available to its users (by all modes) can be maintained within reasonable limits when normal service is disrupted. Should include measures to maintain on-road public transport journey times and pedestrian and cycle accessibility as a priority when diversions are in place. Includes widespread provision of advance and real-time information on locations, impact, start and finish times/dates; details of alternative (diversionary routes and alternative modes) and linked travel advice.	N	Y	Y - complementary								
TM1	Traffic management plans and road user hierarchy  CANNOT MODEL AS NOTHING SPECIFIC PROPOSED	DTO	M3	Managed restrictions for car traffic in urban centres (e.g. traffic cells, no through car traffic) Create zones within which traffic can enter and gain local access but not travel through. This is usually achieved by physically blocking the carriageway off at a junction or partway along its length (though it can be designed to allow unimpeded pedestrian/cycle access through the physical feature which impedes motorised traffic). Individual cells are bounded by designated 'distributor routes' which allow provide a less direct but higher capacity route to access neighbouring cells.	Could be implemented in city centre (e.g. Groningen, Netherlands; Gothenburg) or town/district centres or in residential localities (e.g. Mount Merion, DLR; Boodle, Salford UK). Other than residential, the approach could be used within the Outer or Inner Orbital Routes (with physical access to parking retained and time limited-servicing access); and centres of the met. consolidation towns and hinterland growth towns; potentially also in larger district centres.	Continued growth in traffic intrusion in commercial centres and some residential areas. Worsening air and noise pollution; potential loss of commercial viability if centres become too prone to through traffic. In residential areas, potential loss of amenity and traffic safety issues.	Low	Should be adopted on routes in the hierarchy where carrying traffic is a primary or significant function, but conflict with vulnerable road users is experienced regularly or frequently; for example, near to schools; in district centres severed by a main artery; and where residential areas have grown up alongside major traffic routes ('ribbon development'). Localised treatments will be needed in areas with specific patterns of accidents to address their common causes (e.g. poor visibility splay; merging and weaving movements; cyclist collisions at pinch points etc.) Important to avoid any detrimental side-effect on cyclist or bus access by using suitable treatments (allowing width for on-road cycling where narrowings occur; avoiding full width humps and bumps on bus routes).	Measures to reduce traffic levels and discourage unnecessary through-trips are the first stage on a continuum of restrictive measures, through 'shared space' treatments to full-scale closures and pedestrianisations. This approach is most effective where vehicular access to destinations within a 'traffic cell' is required throughout the day - e.g. to residential properties with associated parking; or to public off-street car parks etc. It is not normally required where only servicing vehicles are permitted. Schemes may be linked with urban public realm improvements, where traffic levels (and speeds) drop so as to make 'shared space' treatments viable (to below 100 vph). Otherwise, traffic calming may also be used.	N	Y	Y - complementary								
TM1	Traffic management plans and road user hierarchy	DTO	M4	Traffic calming and physical speed limiting. Measures which fall short of closures of streets to traffic (see DTM3), but which significantly reduce traffic levels and speed through physical restrictions (chicanes, narrowings, built-outs, tables, ramps and humps etc., though cycle lanes should not be introduced just for this purpose). Generally aim to enhance safety of vulnerable road users and reduce impact (but not volume) of traffic.	Can be applied in suburban district centres with high footfall to make them more pedestrian-friendly; also in residential areas with localised speed issues and on regional roads in rural areas, at transition points from open country into settlements and built-up areas to encourage speed to immediately drop to lower limits. Chapter 20 of 'Transport in the Urban Environment' (IHT) details types of treatments commonly used and the issues each would best address.	Lower levels of speed-related accidents. Greater levels of walking and cycling and fewer access problems for vulnerable road users.	Depends on extent of application		Can be applied in suburban district centres with high footfall to make them more pedestrian-friendly; also in residential areas with localised speed issues and on regional roads in rural areas, at transition points from open country into settlements and built-up areas to encourage speed to immediately drop to lower limits. Chapter 20 of 'Transport in the Urban Environment' (IHT) details types of treatments commonly used and the issues each would best address.	N	Y	Y - complementary								
TM1	Traffic management plans and road user hierarchy	DCC	13	Development of orbital routes and integrating Samuel Beckett Bridge into the network and imposition of 30kph speed limit within this area	30km/h where current 5 axle HGV ban is in force					N	Y	Y - complementary								
TM1	Traffic management plans and road user hierarchy	DTO	M5	'Shared space' treatments and reallocation of roadspace. Significant redesign of physical streetscape to reduce or remove much of the differentiation between carriageway and footway. Includes the removal of a majority of signing and traffic control features and little or no segregation between users, whether pedestrian, vehicles or cycles. May include full 'Shared Surface' treatments where no kerb delineates road from footway and pedestrian movement across the entire space is encouraged; while vehicles are barred from 'safe areas' by positioning of street furniture etc. Overrunning can be psychologically discouraged by different surface materials and layouts, or even by allowing parking.	Approach most likely to be used in busy commercial areas (both retail and office) where through-traffic has been re-routed and local parking relocated to the edges of the zone, but some local access still required. Areas covered tend to be smaller than 'traffic cells', and may be core areas within them - 'malls', plazas etc. but with traffic needing to get in. Full 'shared spaces' require low traffic volumes (estimated at >100 vph) and high pedestrian activity levels to discourage inappropriate speed and driver behaviour. Some zones may only function as 'shared space' at busy times, allowing access and even parking at others (potentially introducing more evening activity, for example), though high traffic levels are seldom if ever appropriate within this type of engineering.	Less traffic intrusion in commercial areas. Less air and noise pollution; potential gain in commercial viability if these centres become less dominated by traffic. Higher quality of urban public realm. Benefits relative to traffic calming or traffic cells primarily relate to the quality of the urban environment created, but this also adds to the cost.	Depends on extent of application		The approach will often take the opportunity to reallocate roadspace to non-motorised users, sometimes leaving just a single lane width for traffic in both directions to negotiate. However, the same principles can be applied to relatively busy roads (e.g. Kensington High Street) - see 'Arterial Streets for People', and other EU ARTISTS project material.	N	Y	Y - complementary								

CATEGORY B: SPECIFICATION OF POLICY OR BEST PRACTICE MEASURES FOR APPRAISAL (SCHEME IMPLEMENTATION ASSUMPTIONS WILL GENERALLY BE REQUIRED FOR APPRAISAL PURPOSES)

Model																		
Do not model																		
Include only if initial model output suggests need																		
May test to inform tech note																		
Input matrix manipulation																		
Measure				Policy/best practice		Where applied	Benefits/disbenefits	Cost estimate (L=€5m, M=€5m-€50m, H>=€50m)	Scale of application		Observations		Assessment (include in initial package for appraisal?)	Assessment (include in initial package for appraisal?)	Assessment (include in initial package for appraisal?)			
Code	Description	Proposer	Code													Economic	Environment	Social
TM1	Traffic management plans and road user hierarchy	DTO	M6	A strategy for on street waiting, loading & parking, with full enforcement of moving traffic and parking regulations. Comprehensive review of uses of kerbside space, aimed at maximising the efficiency of allocations of space and time to different users, in line with strategy objectives and hierarchy of provision at specific locations. Primarily in commercial areas (town and district centres) but also along arterial routes and bus corridors, where provision for essential parking and deliveries for retail may have to be made in side streets, balanced with the needs of local residents of these areas for parking, access etc. Also need to determine adequate overall allocations for special uses in town and district centres - additional bus stops and bus layover spaces; coach parking and drop-off/pick up; taxi ranks and feeders; permanent delivery bays; disabled parking. Car Club spaces; Pay and Display etc.		Regulation should be informed by function of route in the hierarchy: is it primarily a 'road' or a 'street'; if the latter what uses does it perform. Parking allocations should also take account of area-wide availability (on- and off-street) and due consideration of short- and long-stay uses. Includes (in commercial areas): control of hours during which servicing is undertaken, usually involving limited times (delivery prior to peak shopping times and post-shopping refuse collections etc.); associated with limiting vehicle access during the main shopping day (e.g. 10-6).	Better availability of space for deliveries at key times reducing delays and disruption. Easier shopper parking in local/district centres. Less on-street traffic impact in commercial areas at busy times and better pedestrian and cyclist accessibility. Less impact on local residents. Better access to bus, coach, taxi etc. and disabled bays.	Depends on extent of application, but could be to be revenue neutral or positive, depending on parking charges imposed.					N	Y	Y - complementary			
TM1	Traffic management plans and road user hierarchy	DTO	M7	Introduce controlled parking zones for residents' on-street parking. Allocate available kerbside parking to residents' permit holders where no off-street options exist. May be best applied in those areas close to and within city and town centres where unlimited waiting spaces could otherwise be occupied by commuters and other non-resident visitors. Can be introduced alongside other permitted uses (e.g. servicing for local business, limited time waiting for shopping in local centres etc.), provided restrictions discourage usage of spaces by inward commuters. Likely to be applied only within Canals and in centres of growth towns (though may be localised issues where large employment site parking spills over on to nearby residential streets, as a form of enforcement).		Aims to encourage continued inner-city and central area living through all stages of family formation, and using a range of housing types. The availability of spaces linked to dwellings would allow for inbound visits and car ownership for off-peak use, e.g. shopping, leisure and visiting. Would both restrict availability of kerbside parking spaces in residential areas for commuters, and encourage residents' cars to be left in their permit spaces during the working day (so that they travel to work by other modes) to avoid accruing charges for parking at work locations. Needs to be balanced with potential parking needs of nearby retailing and reduced ability to control it with Pay and Display parking charges.	Reduction in informal commuter parking in residential areas. Family-forming households will be encouraged to stay in central areas. Legitimate change may be desirable so that residents permit schemes become more viable in non-central areas (currently residents permits schemes cannot be introduced without provision of on-street pay and display machines (which can be expensive to provide with limited parking revenue in non-central areas)	Depends on extent of application, but could be to be revenue neutral or positive, depending on parking permit costs.					N	Y	Y - complementary			
TM1	Traffic management plans and road user hierarchy	DTO	M8	Increased (civil) enforcement of parking and moving traffic offences. Co-ordinated and expanded enforcement over all on-street offences, including: illegal kerbside parking and overstay; waiting and loading offences (including at bus stops); Taxi over-ranking and unauthorised waiting; Bus lane and tramway encroachment; ignoring traffic bans and encroaching on pedestrian areas; traffic light and pedestrian crossing failures to stop; illegal turns; overtaking and speeding on local roads. May involve civil enforcement through local Councils and would apply primarily on regional/focal roads in urban areas. Existing Garda powers on strategic roads would be retained but others could be handed over. Alternatively Garda resources could be increased to undertake this, but it would be less co-ordinated with Councils' other enforcement work.		In Dublin and other towns throughout GDA	Aim is to increase best use of the highway for all users, including those on foot and bicycle, but also to maximise efficiency of motorised traffic and ensure priority in place for buses, taxis, goods vehicle loading etc. is respected. Should enhance safety and may reduce costs relative to Garda activity. Could also provide Councils with income from fines etc.	Low ongoing					N	Y	Y - complementary			
TM1	Traffic management plans and road user hierarchy Test 4b, 4d, 5b, 5d	NRA	6	Closure of access to minor at-grade sideroads on N7 between Red Cow and Naas			Likely to have safety benefits, perhaps at the expense of local access requirements. Further discussions with NRA would be required to confirm possible scope of this proposal	?	?		?		N	Y	Y - complementary			
TM2	Traffic signal control and co-ordination	DTO	M10	Extend dynamic (adaptive) Traffic Signal Control, with a view to (1) relocating queues at peak times to where congestion is likely to impact less on bus, cycles and pedestrians, or vehicle associated air pollution is likely to affect people's health (2) Increasing reliability of journey times Greater use of, e.g. SCATS, SCOOT and MOVA across Metropolitan area. Includes traffic monitoring using cameras, ANPR and GPS technology; control rooms and inter-authority interface using UTMIC open systems (may be organised through linking or single centralised control centre). Choice of technology not specified, though MOVA most suited to more isolated or stand-alone junctions; whereas SCATS works for networks. Overall, majority of installed network is SCATS though implementation of vehicle detection and bus priority has not been achieved to date.		Includes corridor-based controls (SCOOT regions or SCATS sub-systems) along arterial routes within M50, to provide linked signal control plans to improve peak traffic capacity. Local UTC management systems within Metropolitan Centres and Hinterland Growth Towns to manage access to the centres, main car parks and attractors (e.g. large business parks). Could be installed as required in line with road hierarchy (DTM1) and on bus corridors to allow selective vehicle detection and bus priority.  Agency proposals include extend use of MOVA in SDCC and SCOOT in KCC and manage traffic signals in Meath towns via signal control and coordination to enhance pedestrian crossing and public transport movements, while keeping traffic moving.	Reduction in long fixed cycle times that currently add to delays for traffic and pedestrians; fixed-time UTC plans lack flexibility, are expensive and resource intensive to keep up-to-date and do not assist journey time reliability for road users including bus. Dynamic signal control enables improved interface with other control systems, e.g. driver information in regard to delays and car park availability MM7); event and incident management; 'green wave' for emergency services. Delays for drivers, bus passengers and pedestrians would reduce.	Medium-high?	SCOOT/SCATS on arterial routes, bus corridors (with selective vehicle detection), local UTC within Metropolitan Centres and Hinterland Growth Towns		Overarching traffic control policy needs to be agreed at a regional level in advance of implementation. To achieve a uniform response from the network, it is necessary that the control system itself be uniformly managed. Examine protocols or ITS solutions to provide common management instructions to a variety of controllers (ref. Delcan). Note that Selective Vehicle Detection for bus priority is not included directly as part of this scheme, however it would become possible to implement SVD wherever dynamic signal control is installed, by adding infrastructure for GPS-based detection and checking for late running of buses against a central timetable server - scheme is within measure BS1.		Y - complementary	Y	Y - complementary			
		KCC	3															
		SDB	5															
		MCC	22															
TM2	Traffic signal control and co-ordination	DTO	M15a	Provide signalised pedestrian crossings on all arms of traffic signal junctions in built up areas and upgrade existing signalised crossings as required		In built up parts of the GDA.	Improves pedestrians safety at junctions, provides a better sense of security for pedestrians especially for mobility impaired.	Low-medium, depending on scale of application					Y - complementary	Y	Y - complementary			
TM2	Traffic signal control and co-ordination	DTO	M9	Allow traffic to turn left with caution - where green straight on traffic signal is showing (replace red left filter signal with flashing amber). Pedestrians "walk with" traffic with zebra markings and flashing green man (as in many mainland European countries). Allow vehicles to turn left with caution at same time, giving way to any pedestrians crossing - aim is to reduce delay and increase junction capacity.		Allow traffic to turn left with caution against red signal. Could be applied at all signalised junctions (although where a left turn already has a segregated turn lane and staggered phasing there may be confusion unless pedestrian signal were changed to a flashing amber (or flashing green)). (This approach is common in continental Europe, where crossing points at signalised junctions are given zebra markings to emphasise pedestrian priority)	Would benefit all users on roads. Delays to pedestrians will occur (e.g. if they arrive at the kerb while an HGV or bus is already turning, and must wait for the manoeuvre to complete). However, could enable reductions in signal cycle times, reducing pedestrian delays waiting for green man. Fewer delays for drivers, bus passengers and cyclists. Depending on the junction, permitting traffic to turn left with caution could permit a reduction in signal cycle time and reduce the wait time for pedestrians to cross. May deter some mobility impaired users from crossing.	Low	May in practise be limited to junctions and times with lower pedestrian flow, potentially following monitoring counts and a safety assessment		Balance will be between journey time savings and potential adverse safety impact. Although safety impact appears minimal in countries where this has always been allowed, there is no evidence of how its introduction would change driver behaviour and willingness to cede to pedestrians. However, could be complementary with use of a shared space approach, as both require engagement and negotiation between cars and peds. May be introduced with specific signs (as in Germany); a necessity to stop before turning (possibly enforced by cameras); and/or a phase-specific filter signal, or permanent signal (flashing amber as in France		Y - complementary	Y	Y - complementary			
TM2	Traffic signal control and co-ordination	DTO	M15b	Additional zebra crossings or on-demand (instant response) signal crossings. Increased use of zebra crossings in built up areas. In certain areas zebra crossings could be coupled with raised tables as an additional traffic calming measure. Instant response green man button-press signal crossing may be considered as an alternative.		Throughout Metropolitan area and Hinterland towns and villages.	Zebra crossings eliminate waiting delays to pedestrians, and minimise the waiting required by motorists for a pedestrian to cross away from a junction. Good safety record in Europe and elsewhere. Promotes walking as a mode. Can be introduced in many areas where it might be more difficult to justify a traffic signalised pedestrian crossing due to lower pedestrian crossing volumes. Inexpensive to provide, compared to pedestrian signals.  Additional use of zebra crossing markings (coupled with ped. signals) at signalised junction crossing points (as throughout much of continental Europe) would increase visibility of crossing points and reduce overrunning of pedestrian crossing points by motorists. Would require a change in Traffic Signs Manual and road user education in advance of introduction. Ideally introduce with proposal DTO M9.  See also proposals under SS6	Low	Widespread application appropriate throughout built up areas of the GDA, subject to safety and (exceptionally) traffic capacity reasons.		In certain locations zebra crossings may be inappropriate for safety reasons (e.g. bus lanes where queuing traffic in the adjacent lane may obscure crossing pedestrians from the bus driver)		Y - complementary	Y	Y - complementary			
TM2	Traffic signal control and co-ordination	DTO	M12	Upgrade signalised crossings away from junctions (e.g. pelican crossings) to Puffin or Toucan facilities. Replace fixed-time user-activated crossings with user detecting ones (e.g. Pedestrian User Friendly Intelligent PUFFIN). This will ensure maximum efficiency of use of the green time, with only the minimum crossing time required being used and faster return to green for traffic. Also unwanted or discarded pedestrian crossing phases are not called, freeing up the traffic flow; while nearside signals and vibrating/tactile buttons benefit visually impaired users who can cross with confidence. Potentially also introducing raised tables to allow for crossing at grade (this would have additional traffic calming and speed limiting effects). Where signalised junctions have been linked together, e.g. in a SCOOT (SCATS region, it may be advantageous to also link the pedestrian crossing, so that its activity does not disrupt planned and programmed traffic flows along a route, while remaining responsive to pedestrian demand calls.		Signal crossing points between junctions, where zebra crossings are inappropriate for safety or capacity reasons	Reduced delay to pedestrians and traffic, shorter pedestrian wait times reduces jaywalking and pedestrian injuries/collisions as a consequence. Greater motorist confidence in pedestrian signals - less waiting at red lights after pedestrians have crossed.	TBC	Where pedestrian desire lines exist away from junctions in built up areas, and where zebra crossings are inappropriate for safety or (exceptionally) traffic capacity reasons.		Where cyclist desire lines also coincide with the pedestrian routes, it will be more advantageous to introduce Toucan crossing with separate detection for both types of users. This will release even more time to motorists when only the (relatively fast moving) cyclists wish to cross.		Y - complementary	Y	Y - complementary			
TM2	Traffic signal control and co-ordination	DTO	M11	Reduce pedestrian wait time at signalised junctions implement changes to traffic signal controls to reduce the wait for pedestrian crossing stages (either fixed or on-demand) and, where appropriate lengthen the time allocated to pedestrian (and cyclist where provided) stages. In dynamic/adaptive traffic control systems can incorporate facility for on-demand pedestrian phase hurry calls and on-crossing detection and nearside green man indication, to allow faster return to traffic phases. In fixed-time systems, include plans for on-demand pedestrian phases; reduce overall cycle times and extend use of double-cycling for pedestrians crossing (either all-red stage or walk-with-traffic). Include provision for diagonal crossing at junctions with all-red stages.		Should be introduced in locations where traffic levels remain high but pedestrian footfall and desire lines are still significant e.g. in and at the edges of city centre, town centres and on local distributor routes and arterial bus corridors. In urban areas and town/city centres the presumption should be to set traffic signal controls to accommodate demand for pedestrian crossing. This will reduce capacity for vehicles (unless introduction of dynamic signal control is able to compensate) and will need to be supported by other policies aimed at reducing traffic otherwise congestion will grow. Where bus priority also exists, a strong presumption for adaptive signal control will be needed so that benefits to buses are not cancelled out.	Reduced delay to pedestrians, less jaywalking and pedestrian injuries/collisions as a consequence.	Zero?			Measure should be part of a continuum of pedestrian priority measures - from exclusion of vehicles through to segregation of pedestrians - in line with the road user and route hierarchies set out in policy (DTM1). Where bus priority also exists, a strong presumption for adaptive signal control will be needed so that benefits to buses are not cancelled out.		Y - complementary	Y	Y - complementary			
TM3	Capacity enhancement on strategic road networks using "active traffic management" measures and ramp-metering Test 3b, 3d, 5b, 5d	DLR	28	Demand Management on M11 and M50		Assumed to be applied via "ramp metering" to control rate of traffic entry onto these motorways at peak traffic times (see DTO M14)		-					Y	N	Y - complementary			



CATEGORY B: SPECIFICATION OF POLICY OR BEST PRACTICE MEASURES FOR APPRAISAL (SCHEME IMPLEMENTATION ASSUMPTIONS WILL GENERALLY BE REQUIRED FOR APPRAISAL PURPOSES)

Model		CATEGORY D: SPECIFICATION OF POLICY OR BEST PRACTICE MEASURES FOR AT PRASAL (SCHEME IMPLEMENTATION ASSUMPTIONS WILL GENERALLY BE REQUIRED FOR AT PRASAL FOR USES)																	
Do not model																			
Include only if initial model output suggests need																			
May test to inform tech note																			
Input matrix manipulation																			
Measure		Policy/best practice		Where applied		Benefits/disbenefits		Cost estimate (L=€5m, M=€5m-€50m, H=€50m+)		Scale of application		Observations		Assessment (include in initial package for appraisal?) Economic		Assessment (include in initial package for appraisal?) Environment		Assessment (include in initial package for appraisal?) Social	
Code	Description	Proposer	Code																
TM3	Capacity enhancement on strategic road networks using "active traffic management" measures and ramp-metering <b>Test 3b, 3d, 5b, 5d</b>	DTO	M13	Variable speed limits and hard shoulder running on strategic roads "Active Traffic Management" measures which seek to maintain journey time reliability and traffic flow by reducing speed and opening up the hard shoulder to moving traffic, as the road approaches capacity limits. Use of both measures together is becoming known as 4 Lane Variable Mandatory Speed Limits (4L-VMSL), though the principle works with three lanes (i.e. two lanes plus hard shoulder). Requires provision of closely-spaced overhead gantries to display speed limits and status of the hard shoulder, as well as lane designation on junction approaches. Can only be used where full grade separation is in place (and even then current implementation only opens hard shoulder between junctions); hence only relevant sections of M1, M3, M4, M50, N2, N3, N4 and N7. A VMSL scheme includes adaptive speed control through sensors in the carriageway and on slip roads, allowing speed levels to be set such that flow is maintained, avoiding stop-start conditions that arise from driver behaviour when congestion limits speed below the road's usual limit.	Can only be used where full grade separation of junctions is in place - hence only relevant sections of M1, M3, M4, M50, N2, N3, N4, M7/N7, M11/N11	ATM measures generally are a lower-cost alternative to road widening. Since they only add capacity in the peaks, it may be argued that they do not as greatly support traffic generation or increasing car dependency. Although (operator-controlled) variable speed limits may be used just with existing running lanes (and have been for some time, primarily for incident management), use in combination with hard shoulder running brings significantly greater capacity benefits; while compliance with lower limits ensures hard shoulder running (combined with emergency refuge areas) is safe at the speeds allowed, and limits lane changing. Adding ramp metering may bring further supporting benefits, though limiting the amount of merging traffic to what can be accommodated. Reduced peak-hour congestion; less peak spreading and diversion to other routes, as well as demands for expensive additional capacity schemes.	Low-medium	Where congestion arises outside the M50 on the following roads: M1, N2, M3/N3, M4, M7/N7, M11/N11 (i.e. motorways and grade separated dual carriageways outside M50). Also could be applied to M50 itself as peak demand grows.	Technology is emerging and developing (for example, on the M42, a trial is still underway on continuous hard shoulder running through the junctions, which limits weaving and adds more capacity. This requires ramp metering to control the flow of vehicles onto the hard shoulder and may also need dynamic road markings to indicate status changes). Unsure whether VMSLs require amendments to traffic legislation? Not all technologies (e.g. dynamic road markings) are proven in practice. Does require some increase in the road's land-take, both for overhead gantry footings and emergency refuge areas at regular intervals. If full hard shoulder running through junctions is introduced, there will also need to be an additional length of auxiliary lane at the bottom of the slip road, to facilitate merging into a traffic flow on the hard shoulder.	Y	N	Y - complementary							
TM3	Capacity enhancement on strategic road networks using "active traffic management" measures and ramp-metering <b>Test 3b, 3d, 5b, 5d</b>	DTO	M14	Ramp metering on strategic roads Access management using traffic signal control on on-slips at a grade separated junction to control flow of vehicles joining a strategic road. Aim is to prevent the breakdown of flow on the strategic road when operating close to capacity through limiting merging onto the highway. A ramp metering system uses signals on the slip road which come into operation when traffic sensors on the main carriageway indicate heavy traffic. Traffic conditions are monitored and signal timings constantly updated to minimise delays to joining traffic. The system also watches the slip road junction to ensure queues do not back up onto local roads.	Can only be used where full grade separation of junctions is in place - hence only relevant sections of M1, M3, M4, M50, N2, N3, N4 and N7.	Measure should have positive impact on journey time reliability, journey times and goods distribution on the strategic network. Implementation needs to consider queuing space on slip roads and upstream impacts of queues on the roads feeding the junction. Also impacts on diverted traffic to parallel routes to the strategic road. Benefits for flow on the strategic route but can cause traffic to divert on to regional or local roads to avoid queues at strategic road junctions.	Low-medium	I	Relatively low-cost system to add peak capacity, though can also be used to enhance 'VMSL's and hard shoulder running (see DTM13). Technology is emerging and developing. The UK Highways Agency is commencing trials on the motorways around Manchester and another scheme is planned on the A19 Trunk Road in North East England, aimed at managing the traffic from a series of new development sites along it.	Y	N	Y - complementary							
SC8	Car clubs	DLR	23	Giving people and businesses the option of a fleet vehicle which can be hired by the hour in their local neighbourhood. Possible overlap with residential travel	Urban Areas – particularly suited to high density mixed use but may also be appropriate in areas of low car ownership and low car usage (due to	The rationale for the scheme touches the three domains. Economic – they can offer a cost effective alternative to fleet. Environmental -	Low	Potential pilot locations: Connolly/Huston Stations, Docklands, Mater Hospital, South East Quadrant, Temple Bar, Smithfield, Tallaght.	Current legislative vacuum regarding road space parking allocation for car clubs. No legal	Y - complementary	Y - complementary	Y - complementary							
DC1	Region wide road pricing ("pay per km") <b>Test 3b-1, 3d-1, 4b-1, 4d-1</b>	DTO	C1b	Distance based charge on all roads to manage demand. No assumptions made about how revenues would be used. Assume that road based public transport capacity and journey times would improve as a result of the reduced congestion, but measure does not include additional other public transport enhancements. Focus on reducing the number of car journeys made and the distance travelled. Environmental pricing - Uniform distance based charge for private and commercial vehicles, that applies at all times of the day.	All roads throughout GDA.	Would benefit the environment by reducing overall levels of road travel. Likely to reduce congestion, particularly on roads where there is a larger share of long-distance trips (motorways and national roads). Excludes costs or benefits of freight trips as these are covered by Freight charging measure DC6 below. Measure is not revenue neutral as the charge is additional to existing road charges.	High	Assumptions for appraisal purposes: Per km. Engine rating A-B 40c, Engine rating C-E, 70c, Engine rating F-G €1.00. All day charge. Exemptions would apply for certain vehicle classes and disabled. Applied to private vehicles, but exemptions likely to be provided for, e.g. people with disabilities.	Although technology is emerging and developing, not yet implemented elsewhere.	Y (test DC1 - DC3 options further to determine benefits of each, before finalising which is included in package)	Y (test DC1 - DC3 options further to determine benefits of each, before finalising which is included in package)	N							
DC1	Region wide road pricing ("pay per km") <b>Test 3b-2, 3d-2, 4b-2, 4d-2</b>	DTO	C1a	Distance based charge on all roads to manage demand. No assumptions made about how revenues would be used. Assume that road based public transport capacity and journey times would improve as a result of the reduced congestion, but measure does not include additional other public transport enhancements. Focus on reducing the number of car journeys made and the distance travelled. Congestion pricing - based on area and time of day (higher in urban areas and at peak times)	Throughout GDA, with higher charges in congested areas.	Would reduce road congestion, dependent on level of charge and availability of viable alternatives. May benefit the environment, however, may also over time encourage employers and service providers to move out of city centre and other areas where congestion is high on approaches, to places where it is less expensive for employees or customers to access.	High	Assumptions for appraisal purposes: Per km - Peak (7-10am and 4-7pm) between Canals €2, between Canals and M50 €1.00, Outside M50 (Met Area) 60c, Hinterland 30c. Off peak 10am-4pm within Canals €1.00, between Canals and M50 50c, Outside M50 Met Area and Hinterland 20c. Other times free. Exemptions for certain vehicle classes and disabled.	Although technology is emerging and developing, not yet implemented elsewhere.	Y (test DC1 - DC3 options further to determine benefits of each, before finalising which is included in package)	Y (test DC1 - DC3 options further to determine benefits of each, before finalising which is included in package)	N							
DC2	Area based 12 hour congestion charge <b>Test 3b-3, 3d-3, 4b-3, 4d-3</b>	DTO	C2a	Area based charge levied for travel within Dublin city Canal cordon from start of am peak to end of pm peak (notionally 7am to 7pm). Applied to freight and private vehicles, but exemptions provided for, e.g., people with disabilities.	Assumes charging within City Centre cordon only (i.e. Canals/Docklands) initially, potentially expanded later to manage demand within M50	Assume that road based public transport capacity and journey times improve as a result of the reduced congestion, but measure does not include additional other public transport enhancements, dependent on level of charge and availability of viable alternatives. May benefit the environment, however, may also over time encourage car users to shop and do business out of city centre, where it is less expensive to access by car. Measure is not revenue neutral as the charge is additional to existing road charges. No assumptions about how revenue would be used.	High	Assumptions for appraisal purposes: €10 charge for crossing canal cordon or driving within cordon, 7am to 7pm weekdays only. No additional charge for multiple crossings on same day.	Similar to proposal in DTO Travel Demand Management Study 2004, however charge would not be area based (ie. no charge for those driving within the city centre). This should lead to substantially lower operating costs. DCC have expressed serious reservations	Y (test DC1 - DC3 options further to determine benefits of each, before finalising which is included in package)	Y (test DC1 - DC3 options further to determine benefits of each, before finalising which is included in package)	N							
DC2	Cordon based 12 hour congestion charge <b>Test 3b-4, 3d-4, 4b-4, 4d-4</b>	DTO	C2b	Cordon based charge levied for travel across Dublin city Canal cordon from start of am peak to end of pm peak (notionally 7am to 7pm). Applied to freight and private vehicles, but exemptions provided for, e.g., people with disabilities.	Assumes charging for crossing City Centre cordon inbound only.	Assume that road based public transport capacity and journey times improve as a result of the reduced congestion, but measure does not include additional other public transport enhancements, dependent on level of charge and availability of viable alternatives. May benefit the environment, however, may also over time encourage car users to shop and do business out of city centre, where it is less expensive to access by car. Measure is not revenue neutral as the charge is additional to existing road charges. No assumptions about how revenue would be used.	Medium-high?	Assumptions for appraisal purposes: €5charge for crossing canal cordon or driving within cordon, 7am to 7pm weekdays only. Charge applies for each inbound crossing.		Y (test DC1 - DC3 options further to determine benefits of each, before finalising which is included in package)	Y (test DC1 - DC3 options further to determine benefits of each, before finalising which is included in package)	N							
DC3	Cordon (or area) peak only congestion charge <b>Test 3b-5, 3d-5, 4b-5, 4d-5</b>	DTO	C3	Charge for inbound crossings in AM peak and outbound crossings in the PM peak. Applied to freight and private vehicles, but exemptions provided for, e.g., people with disabilities. Limited impact on personal (leisure, shopper etc.) journeys as only applies in the peak. Principal impact is therefore on commuters.	Assumes charging cordon round City Centre (i.e. Canals/Docklands) initially, potentially expanded later to manage demand within M50, to manage demand flows in peak directions only (charges levied for crossing the cordon inbound in the AM peak, outbound in PM peak).	Assume that road based public transport capacity and journey times improve as a result of the reduced congestion, but measure does not include additional other public transport enhancements. Measure is not revenue neutral as the charge is additional to existing road charges. No assumptions about how revenue would be used. - Benefits to local environment also. Since the charge would only apply in morning peak period, it is less likely than an all day charge to discourage car users from shopping and doing business out of city centre. Revenue would be less than a 12 hour charge.	High	Assumptions for appraisal purposes: €5 charge for crossing Canal cordon inbound in AM peak or outbound in PM peak.	Similar to proposal in DTO Travel Demand Management Study 2004, however charge would not be area based (ie. no charge for those driving within the city centre). This should lead to substantially lower operating costs. DCC have expressed serious reservations	Y complementary (test DC1 - DC3 options further to determine benefits of each, before finalising which is included in package)	Y (test DC1 - DC3 options further to determine benefits of each, before finalising which is included in package)	N							
DC5	Tolling of existing strategic roads (or tolls on existing lanes on strategic roads) <b>Test 3b-6, 3d-6</b> JR to specify	DTO	C4	Tolling of strategic roads to manage demand only on existing infrastructure and raise revenue for maintenance and minor upgrading along existing strategic routes. Not assumed to apply to freight vehicles, as covered by DC6. Routes concerned likely to be strategic roads, as they will need to be segregated with a low number of (grade separated) junctions to allow toll collection.	Assume toll applies to national roads outside M50, and the M50	Improves journey times and reliability on strategic roads, which should particularly benefits business and freight traffic. Potentially increases congestion and unreliability on adjacent local roads as drivers use alternative less suitable routes, with adverse impacts on local communities.	Medium	Toll to a level required to maintain uncongested conditions on strategic roads.		Y (specific proposal still needs to be developed)	N	N							
DC6	Freight charging <b>MODEL NOT FIT FOR PURPOSE</b>	DTO	F2	Area-wide charge per kilometre for heavy goods vehicles on GDA-wide (or national) basis to reduce impact on infrastructure and environment. May include differential charges on freight vehicles within urban areas.	75c per kilometre on national roads. €1.50 per kilometre elsewhere.	Would encourage use of non-road means of freight transport, and encourage road freight to use roads where environmental impact will be less. Would have an adverse impact on business costs. Revenues could potentially be used to fund rail freight infrastructure and operating costs.	High	GDA wide, and would probably need to be nationwide. Proposal is not revenue neutral as the charge would be additional to existing road charges. Not assumed to be applied in addition to other road user charges (DC1-DC5)		N	Y	Y - complementary							
DC6	Freight charging <b>MODEL NOT FIT FOR PURPOSE</b>	DTO	F17	Toll rebates on existing tolled roads for freight	M50 Westlink bridge, M3 Motorway	Encourages freight vehicles to use more suitable roads, reducing volumes and associated noise, vibration and air pollution on local roads, close to where people live.	Neutral. Any reductions in freight tolls would need to be offset by increased tolls for other vehicle classes.	Free or reduced tolls for freight vehicles.	Would be applied only where weight limits or other measures to restrict freight vehicles from using local roads cannot feasibly be applied. Could be funded through increased tolls on other road users.	N	Y	Y - complementary							
SC6	Individualised travel planning/marketing measures	DTO	SC9	Individualised or personalised travel plans aim to overcome the habitual use of the car, enabling more journeys to be made on foot, bike, bus, train or in shared cars. This is achieved through the provision of information, incentives and motivation directly to individuals to help them voluntarily make more informed travel choices, often provided on a one-to-one basis	Pilot personalised travel plan in a GDA neighbourhood, and roll out to other neighbourhoods dependent on success. Areas to target include those with a range of facilities reachable by cycling walking and public transport, areas of high-density residential development. Areas with above average car use for the area type. Also Quality public transport corridors and new residential areas (as part of a residential travel plan)	Results so far available from elsewhere suggest that personalised travel planning may lead to reductions in car driver trips of 7-15% amongst targeted populations in urban areas (according to trials in Germany, Australia, USA and the UK), with rather lower reductions in car driver trips (2 – 6%) reported from a smaller number of more rural trials.	Low/medium depending on scale of application	Assume 20% of population are covered by individualised travel plans by 2030 for appraisal purposes		Y - complementary	Y - complementary	Y - complementary							
SC10	Reduce the need to travel through technology <b>Test 3b-7, 3d-7, 4b-7, 4d-7, 5b-7, 5d-7</b>	DTO	17	Teleconferencing, teleworking, teleshopping, accessing services remotely. Assumed most of these initiatives would come from private sector but public sector can help kickstart the initiatives e.g. DTO introduce home working. Planning authorities can specify broadband and wifi be available at new business parks and residential areas. The design of new homes could also incorporate the opportunity for homeworking. New retail developments could also have conditions placed on them about home deliveries (with car park restrictions in association with it). In terms of home shopping should consider in conjunction with locker banks and community delivery points. This assumes an overall net benefit through reducing the number of car trips to stores/retail centres and replacing these with less, more efficient van deliveries. National rollout assumed.	Implement initially with existing partners to Workplace Travel Plan initiative under One Small Step	Reduces the demand for travel, especially at peak times when congestion is likely to be worst	Low/medium depending on scale of application	Implementation assumptions not yet defined		Y	Y	Y - complementary							
SC10	Reduce the need to travel through technology <b>Test 3b-7, 3d-7, 4b-7, 4d-7, 5b-7, 5d-7</b>	DCC	17	Teleworking: prepare and disseminate guides and manuals for employers on how to introduce, equip and manage teleworking arrangements in the workplace, including successful case histories and 'lessons learned' from less successful ones, (2) establish a 'web-based forum' under the auspices of the Dept. of Communications, Energy and Natural Resources to provide trouble-shooting support for teleworking schemes, and (3) establish Grants, where appropriate, towards the equipping of homes for teleworking	Throughout GDA, especially targeted at those who travel long distances by car.	Provides support, knowledge base and incentives for employers wishing to introduce teleworking, potentially reducing travel requirements for business purposes, and thereby reducing congestion and environmental impacts of travel.	Low			Y	Y	Y - complementary							
SC10	Reduce the need to travel through technology <b>Test 3b-7, 3d-7, 4b-7, 4d-7, 5b-7, 5d-7</b>	DTO	18	Remote access to retail, government and other services (teleshopping, teleservices). While traditionally key services have been delivered in fixed locations in urban centres. With improvements in communication and information technology, key services are no longer restricted to these locations and can be delivered to remote and distant locations.	Throughout GDA, especially targeted at those who travel long distances by car.	This has the benefit of reducing the need to travel to access services and reduces the overall cost of the delivery of these services (although using computers could also prove to be a barrier to socially excluded people).	Low	Implementation assumptions not yet defined	This measure is focussed on the improvement of the delivery of services through technology such as video conferencing and the Internet. The expansion of affordable broadband into areas with lower accessibility is key to the implementation of this measure.	Y	Y	Y - complementary							
SC11	Destination based travel plans and national car share database <b>Test 3b-7, 3d-7, 4b-7, 4d-7, 5b-7, 5d-7</b>	DTO	SC1	Would include all site travel plans e.g. workplace, residential, health, leisure etc. Therefore includes employees/pupils/visitors/residents. Employment measures to include incentives from employers to promote sustainable travel such as salary sacrifice, bike	Could be applied at employer level, or by a group of employers located in the same area (e.g. Eastpoint Business Park, Dublin Airport, Sandford etc).	Healthier workforce, potential reductions in employer costs of leasing car parking spaces.	Low/medium depending on scale of application	As of April 2009, 25 GDA employers have a Workplace Travel Plan in operation through DoT "Smarter Travel Workplaces" initiative, representing 25,000 employees. Over the next 3 years, DoT Smarter Travel target is for 100 largest	-	Y	Y	Y							
SC11	Destination based travel plans and national car share database <b>Test 3b-7, 3d-7, 4b-7, 4d-7, 5b-7, 5d-7</b>	DTO	SC2	School Travel Plans - Green Schools Travel. Encompasses car sharing, cycle to school, walk to school initiatives, in some instances cycle parking provision and cycle training.	In schools with an An Taoiseach Green School flag (approx 90% of schools nationwide)	Reduction in car trips of 8% to 15% achieved internationally. Pilot "Green Schools Travel" initiative has reduced the car share of overall travel to school in participating schools by approximately 6% (large majority transferring to walk), in addition to which a further 4% to 8% of students now take the car for only part of the journey (walking the final leg to school). In the relatively small number of pilot schools where cycle parking and training is provided, 5% of total trips switched to cycling.	Low/medium depending on scale of application	Nationwide. The programme is currently funded by the Department of Transport until 2012 and will reach 265,000 school children nationwide (approx 100,000 in GDA) by that date.		Y	Y	Y							

CATEGORY B: SPECIFICATION OF POLICY OR BEST PRACTICE MEASURES FOR APPRAISAL (SCHEME IMPLEMENTATION ASSUMPTIONS WILL GENERALLY BE REQUIRED FOR APPRAISAL PURPOSES)

Model												
Do not model												
Include only if initial model output suggests need												
May test to inform tech note												
Input matrix manipulation												
Measure		Policy/best practice			Where applied	Benefits/disbenefits	Cost estimate (L=<€5m, M=€5m- €50m, H=>€50m)	Scale of application	Observations	Assessment (include in initial package for appraisal?)	Assessment (include in initial package for appraisal?)	Assessment (include in initial package for appraisal?)
Code	Description	Proposer	Code							Economic	Environment	Social
SC11	Destination based travel plans and national car share database Test 3b-7, 3d-7, 4b-7, 4d-7, 5b-7, 5d-7	SDB	10	School bus transport	Pilot in SDCC initially	Assume roll out to other local authorities over time, depending on result of pilot. Could be incorporated into demand responsive transport services (NIZ)	Low/medium depending on scale of application	?	?	Y	Y	Y
SC11	Destination based travel plans and national car share database Test 3b-7, 3d-7, 4b-7, 4d-7, 5b-7, 5d-7	DTO	SC3	Car Sharing- national carsharing website.	All island	Reduction in single occupancy car trips.	Low	All-island	This proposal is likely to be brought forward through the Department of Transport. Marketing is essential for success. Complementary measures may include car share meet points adjacent to national road network for example.	Y	Y	Y
SC12	Travel awareness, driver education, walking and cycling information and promotion	DTO	SC20	A mixture of area wide and targeted campaigns covering: Education: improve the understanding of problems caused by traffic growth and encourage people to think about their travel behaviour (includes Eco-driving, driver awareness campaigns and health campaigns). Identify and overcome psychological barriers to cycling. Training: ensure future generations of car/van/HGV drivers are more capable, drive more safely and are more aware of/friendly towards public transport vehicles and vulnerable road users. Links to reform of driving test system e.g. including refresher courses/units for existing drivers, reeducation of older drivers unfamiliar with modern driving conditions. Cycle training initiatives such as cycle to work training and Dr Bike surgeries. Marketing: promotion of sustainable modes including walking, cycling and public tranport. Also promotion of sustainable methods e.g. Eco driving and accident reduction campaigns (see also MM7)	GDA wide	Greater awareness of sustainable travel options and reason for using them. Reductions in car use, healthier workforce, greater driver awareness of vulnerable road users, greater cyclist awareness of motorists and cycling safely in traffic	Depends on scale of application		Y - complementary	Y - complementary	Y - complementary	
SC12	Travel awareness, driver education, walking and cycling information and promotion	DTO	118	Grants for provision of sustainable travel infrastructure (showers, cycle parking etc) at existing workplaces, schools and other destinations	GDA wide		Low		Y - complementary	Y - complementary	Y - complementary	
SC12	Travel awareness, driver education, walking and cycling information and promotion	DTO	121	Cycle Training for adults and school-children (with on-street element)	GDA wide		Low		Y - complementary	Y - complementary	Y - complementary	
SC12	Travel awareness, driver education, walking and cycling information and promotion	DTO	113	Driver training - greater focus on vulnerable road users (pedestrians and cyclists)	GDA wide		Low		Y - complementary	Y - complementary	Y - complementary	
SC12	Travel awareness, driver education, walking and cycling information and promotion	DTO	SC8	Travel Awareness Campaigns to improve the general public understanding of the problems caused by traffic growth and to encourage people to think about their own behaviour and modify it where appropriate.	GDA wide		Low		Y - complementary	Y - complementary	Y - complementary	
SC12	Travel awareness, driver education, walking and cycling information and promotion	SDB	11b	Promote and encourage role of the bus	Where bus is a viable alternative to car		Low	?	?	Y - complementary	Y - complementary	Y - complementary
SC12	Travel awareness, driver education, walking and cycling information and promotion	DTO	11	Promote cycling - including provision of information (incl.cycle network maps and journey planner - see also MM7)	GDA wide		Low		Y - complementary	Y - complementary	Y - complementary	
PS1	Commuter focussed provision of parking	DTO	P1	Provide car parking at edge of urban centres for commuters, and reduce commuter provision within urban centres by an equivalent amount.	At edge of Metropolitan centres and Hinterland Growth Towns. Inappropriate to provide at edge of city centre as parking restrictions and measures to discourage commuter traffic extend beyond walking distance to CBD workplaces.	Reduces congestion in central areas. Reduces attractiveness to employees of driving to work every day - makes it more likely that alternative travel modes will be considered.Central area parking standards (which are generally more restrictive) would need to be retained if benefits of scheme are to be realised.	Costs likely to be borne by developers. Could have net cost savings for developers if central site is developed to a higher intensity or smaller footprint because parking does not have to be provided with building	Dependent on rate of development/redevelopment in town centres	N	Y - complementary	N	
PS7	Maximum parking standards applied to developments Test 3b-8, 3d-8, 4b-8, 4d-8	DTO	P2a	This demand management measure provides a control mechanism to encourage other (more appropriate) modes of transport to be utilised. It challenges the traditional minimum parking standards for new developments and aims to provide a consistent regional approach across the seven GDA local authorities. The level of maxima is dependent on the availability of alternative modes of transport and in this context the maximum standard ( whilst having a GDA regional threshold) may vary by area (but with a regional threshold maximum). To date the measure has been applied to trip attractors. However the measure could also be applied in certain residential areas, where parking remains a challenge to urban design solutions which aim to provide for streets as liveable spaces rather than car parks		Based on experience in areas such as Dublin city centre where this measure has been applied for many years, a substantial increase in walking cycling and public transport use can be expected over time especially for travel to work and retail by non-car modes. The timescale for benefits would be largely dependent on the rate of development/redevelopment of major trip attractors (such as offices, retail etc)		The GDA Travel Demand Management Study, completed by the DTO in 2004 includes recommended standards for a range of non-residential uses. At the time, these were agreed by the DTO Steering Committee.	Y - complementary	Y - complementary	N	
PS7	Maximum parking standards applied to developments Test 3b-8, 3d-8, 4b-8, 4d-8	DTO	P2b	Non-residential parking standards should be specified as maxima					Y - complementary	Y - complementary	N	
PS7	Maximum parking standards applied to developments Test 3b-8, 3d-8, 4b-8, 4d-8	DTO	P3	More use-specific parking standards and for different user types (e.g. staff, visitors, deliveries, etc.).					Y - complementary	Y - complementary	N	
PS7	Maximum parking standards applied to developments Test 3b-8, 3d-8, 4b-8, 4d-8	DTO	P4	Review existing non-residential standards in light of regional maxima specified in Table 6.2 of the TDM report (should be more restrictive in certain areas - pt accessible areas and Metro area generally).					Y - complementary	Y - complementary	N	
PS7	Maximum parking standards applied to developments Test 3b-8, 3d-8, 4b-8, 4d-8	DTO	P5	Residential and non-residential standards should be brought into line with the standards specified in the Dublin City DP for areas that have equivalent levels of pt accessibility and provision of local services.		Reduced congestion in town centre areas.	Revenues likely to at least cover any parking control/charge set up costs.		Y - complementary	Y - complementary	N	
PS7	Maximum parking standards applied to developments Test 3b-8, 3d-8, 4b-8, 4d-8	DTO	P6	Capping of the level of parking in major town centres outside Dublin City Centre. (Local authorities or site managers could introduce parking charges in town centres/shopping centres to encourage turnover and ensure continuing balance between supply and demand for parking spaces and to reduce local congestion associated with queuing).			zero		Y - complementary	Y - complementary	N	
PS7	Maximum parking standards applied to developments	DTO	P7	Reduced residential parking provision (including car-free developments) should be permitted in certain circumstances, allowing for whether the development proposes a type of housing that is characterised by low car ownership. The level of pt access is high; and The proposed development is in an area with a residents' parking scheme or other on-street parking controls.					Y - complementary	Y - complementary	N	
TE1	Eco-vehicle measures	DTO	E1	Incentives and facilities for electric freight vehicles and quiet delivery technology. ELECTRIC VEHICLES: Support package should include: A. Pilot schemes with public electric vehicle fleets. B. Funding from Sustainable Distribution Innovation Funds.		Reduced carbon emissions, improved local air quality	Depends on extent of application		At current time there is no evidence that any technologies other than ELECTRIC vehicles are being commercialised in the freight market. LPG and CNG have proved too costly in terms of load space lost - and anyway apply only to the van market. Hydrogen is not yet viable. Only ELECTRIC vehicles therefore considered here	N	Y	N
TE1	Eco-vehicle measures	DTO	E2	Public electric charging points on-street. At goods vehicle stopping points: lorry parks, loading bays, rest areas, lay-bys.	Freight vehicle charging points to be decided by Freight Quality Partnership (see FS3)		Depends on extent of application		Precursor measure to encourage switch to electric vehicles. Related to other support measures for electric vehicles. Related to FQPartnerships.	N	Y	N
TE1	Eco-vehicle measures	DTO	E3	Eco-vehicle policy supports Group of measures to encourage behaviour change to use of electric vehicles. Support for electric vehicles could include the following:- 1: Fiscal support in terms of lower vehicle tax rates. 2: exemptions from environmental protection bans (based on daytime emissions, nighttimes noise). 3: innovation fund financial supports to help change vehicle fleets. 4. Scrapage scheme for purchase of electric and other low carbon emission vehicles (as recommended by Commission for Taxation)			Likely to be high - depends on scale of application		Electricity grid is available everywhere and ESB have stated their enthusiasm (at the recent EV conference) not only for electric vehicles (which will charge mainly at night - and thus even up the supply profiles) but also for buying back from these new electricity stores at peak demand times (Called V2G Veh to grid).	N	Y	N
TE1	Eco-vehicle measures	DTO	E4	Conditions on carbon emission levels for e.g. the licensed taxi fleet; education transport vehicles; incentives for low carbon car clubs/vehicles etc. Supplier procurement policies to promote low carbon deliveries and services - the DTO/DoT could develop minimum procurement standards for municipal vehicles and supply companies who provide outsourced goods and services on the behalf of Dublin Local Authorities. This would also support wider sustainable procurement and climate change strategies in the GDA	Most of the experience to date relates to taxis, where licensing conditions are easier to apply within existing legislation. This fits in well with Low Emission Zones, as taxi numbers tend to be highest in the city centre. On other fleets, greener vehicle procurement could be linked to subsidy (e.g. for Dublin Bus and BE); while incentives for new operators (in, e.g. education transport and car club sectors) could ensure they start out with greener fleets.		Low-medium, depending on scale of application but operating savings likely over time.			N	Y	N
TE1	Eco-vehicle measures	DTO	E5	Public sector low carbon vehicle fleets Develop a low carbon fleet programme to support public sector organisations to procure low carbon vehicles. To include range of hybrid, biofuels, LPG, CNG, and electric power vehicles, with a move towards the latter over time (unless hydrogen fuelled vehicles also become viable). All publicly owned fleets in the GDA could pioneer low carbon technologies - Council vehicles (servicing vans; fleet cars; highway etc. support vehicles; waste disposal vehicles etc.); Garda patrol vehicles, ambulances, and education transport vehicles as appropriate.		A growing fleet of low carbon vehicles will be a highly visible demonstration of Dublin public authorities' commitment to reducing carbon emissions and promoting low carbon transport solutions and will help infrastructure develop. Because the environmental output of the current fleet is known, the gains from conversion can be demonstrated, and the relative performance of different vehicle types and fuels assessed.	as above		The actual carbon reductions associated with biofuels have been shown to vary substantially by biofuel source and care needs to be taken that biofuel source actually reduces CO2 emissions before widespread introduction to vehicle fleets	N	Y	N
TE2	Low emissions zone	DTO	E6	Define an area where restrictions are placed on vehicles which do not meet defined emission standards. This can involve either banning vehicles or charging vehicles if their emissions are over a defined level. Restricting access to busy or sensitive areas for older, more polluting vehicles. Low Emission Zones are used to restrict access to vehicles with most polluting engines (usually diesel) over a certain EU engine size (currently >3.5t GVW & EUROIII in London) or in terms of CO2 emissions. Germany has 36 LEZ (older petrol and diesel cars banned). The Netherlands has 18. Italy 6. Zone needs to be easily identified and bounded by roads suitable for freight flows.	Could apply to central Dublin within N and S Circular roads or DCC 5 mile zone. Permits for access are usually set prohibitively - e.g. London £200	Improve people's health. Less pollution of historic and retail core by noxious emissions and dirt. According to the Draft Dublin Regional Air Quality Management Plan, "levels have approached legal limit values for particulate matter and there is a risk that limits could be exceeded in urban areas (p25)" and that "although emissions from vehicles continue to fall as a result of technological advances and cleaner fuel, improvements to date have been largely offset by the significant increase in the number of vehicles on the road (p31)". The objective of this measure is to reduce air pollution caused by, inter alia, particulate matter (PM10) and nitrogen oxide. Air pollution affects people's health, ranging from minor breathing problems to premature death. It particularly affects the most vulnerable people, including older, young and sick people.	Medium- high? The ITS requirement for this system is considerable, requiring communication between the licensing database and ANPR		In UK, Euro engine specifications became mandatory for manufacturers on certain dates. So compliance depends on the year of registration of new vehicles. Thus, HGVs >12t GVW registered as new with DVLA after Oct 2001 are assumed to be compliant. The UK Driver and Vehicle Licensing Centre monitors this. In addition, abatement kits can be fitted, or reduced emissions certified, and owners can apply for Reduced Pollution Certificates (RPCs) to comply. ANPR is used to check compliance.	N	Y	Y - complementary



**CATEGORY C: SPECIFICATION OF POLICY OR BEST PRACTICE MEASURES FOR APPRAISAL PURPOSES (SPECIFIC IMPLEMENTATION ASSUMPTIONS NOT REQUIRED FOR APPRAISAL PURPOSES)**

[illegible]

CATEGORY C: SPECIFICATION OF POLICY OR BEST PRACTICE MEASURES FOR APPRAISAL PURPOSES (SPECIFIC IMPLEMENTATION ASSUMPTIONS NOT REQUIRED FOR APPRAISAL PURPOSES)

Model									
Do not model									
Include only if initial model output suggests need									
May test to inform tech note									
Input matrix manipulation									
Measure		Policy/best practice	Where it could be applied	Relevant proposals identified by agencies		Benefits	Assessment (include in initial package for appraisal?) Economic	Assessment (include in initial package for appraisal?) Environment	Assessment (include in initial package for appraisal?) Social
Code	Description								
SS3	Home zones	Home Zones are defined as “residential streets in which the road space is shared between drivers and other users and where the wider needs of residents (including pedestrians, cyclists and children) are emphasised in the design...very low traffic speeds allow a sense of place to be prioritised over movement” - Sustainable Residential Development in Urban Areas (DOEHLG, 2008, p22) 1. Low speed environment with speed limits enforced by the design of the street. 2. Through vehicular traffic in Homezones should be restricted or banned, resulting in low traffic flows. Design of Home zone should encourage pedestrian and cycling permeability. 3. The innovative use of the space between buildings in Home zones, such as play areas, is encouraged. 4. The design of entry points to shared surfaces, using tight kerb radii, ramps at entry points, and distinctive surface materials, helps to emphasise the difference between shared surfaces and other types of street. 5. The space between the buildings should not be primarily for vehicles. Use of shared spaces emphasises this principle. Consideration should also be given to the needs of blind or partially-sighted people who might normally rely on the presence of a footpath kerb. 6. The use of lateral deflections (strategic placement of trees, street	Home Zones can be used in new developments or can be retrofitted into developed residential areas. When incorporating Home Zones in new developments, the design should be integrated into the wider layout, potentially, as part of a wider network of Homezones with links to the external pedestrian and cycle network. The Homezone concept has been piloted by South Dublin Council Council in Adamstown. Home Zones can be integrated into the statutory and non-statutory planning process, including, for example, County Development Plans, Strategic Development Zones, Local Area Plans and non-statutory masterplans.			Improves the environment for pedestrians and cyclists and those using the street space for purposes other than movement. Reduces the dominance of the motor vehicle. Minimises potential for excessive vehicular speeds. Encourages vitality and community activities in residential streets. Provides a safe and attractive area for all residents. Improves the quality of life for those living in residential streets. Increases security on the street through passive surveillance.	Y	Y	Y
SS6	Priority for pedestrians and vulnerable users in key centres	1. Restrictions in traffic movement in central areas -examples include full pedestrianisation of a street/group of streets, streets where only access is permitted (no through traffic), restriction of a street to certain classes of vehicles only, or vehicle restrictions by time of day.	Dublin city centre, urban villages (Phibsborough Ranelagh, Rathmines, etc) Metropolitan centres, Hinterland town centres Pedestrianisation of the area bounded by South King Street/Stephen Street Lower, Grafton Street, S. Gt. Georges Street Lower and College Green (access excepted). Pedestrianisation of area bounded by Capel Street, Bachelor's Walk, O'Connell Street and Parnell Street (access excepted). Reduction of Westmoreland Street and D'Olier Street to two lanes, with accompanying pedestrian footpath widening and cycle facilities. Extension of boardwalk along River Liffey towards Heuston Station. Reduced lanes on the Quays to facilitate footpath widening and pedestrian facilities. Reduced waiting time for pedestrians within the city centre. Navan: The Pestrrianisation of Trimgate Street from Cannon Row to Kennedy Road. And where appropriate the pedestrianisation of Bakery Lane, Old Commarket and Watergate Street as part of subsequent phases (MCC20)	MCC20		Improves the environment for pedestrians and vulnerable road users, by providing a safe and attractive environment. Improves the quality of life in commercial centres. Improve air quality and reduces noise pollution. Traffic calmed environment. Improves public transport accessibility. Economic benefits accrue for retailers and commercial activities	N	Y	Y - complementary
SS6	Priority for pedestrians and vulnerable users in key centres	2. Additional crossing points for pedestrians	This should be considered in all areas with pedestrian activity. Zebra crossings and uncontrolled crossing points (with pedestrian islands where required to assist pedestrians in crossing at uncontrolled points)				N	Y	Y - complementary
SS6	Priority for pedestrians and vulnerable users in key centres	3. Wider footpaths, especially in central areas and close to major public transport facilities,	Dame Street, Tara Street, Pearse Street/Westland Row, Connolly Station/Busáras				N	Y	Y - complementary
SS6	Priority for pedestrians and vulnerable users in key centres	4. High quality and well maintained footpaths that are clear of unnecessary clutter and obstructions to pedestrian movement.					N	Y	Y - complementary
SS6	Priority for pedestrians and vulnerable users in key centres	5. Shorter wait time for 'green man' at signalled crossing points	Shorter signal cycle times (or double cycling of the pedestrian phase) should apply at all town/city centre junctions. Fast green man response times (10 seconds or less, except if activated recently) should apply at all push-button isolated pedestrian signals (away from junctions)				N	Y	Y - complementary
SS6	Priority for pedestrians and vulnerable users in key centres	6. Level crossing points for pedestrians (dropped kerbs or raised crossing points), with tactile paving (and audible signals if signalled) for visually impaired.					N	Y	Y - complementary
SS6	Priority for pedestrians and vulnerable users in key centres	7. Narrowing of roads and reassignment of redundant roadspace to pedestrians, or to provide seating or planted areas.	E.g. Merrion Street, Fitzwilliam Street, Mountjoy Square				N	Y	Y - complementary
SS6	Priority for pedestrians and vulnerable users in key centres	8. Other traffic calming measures such as lower speed limits, reduced kerb radii at junctions etc.					N	Y	Y - complementary
SS6	Priority for pedestrians and vulnerable users in key centres	9. New more direct pedestrian routes to be provided as opportunities arise.					N	Y	Y - complementary
SS7	Improve and maintain streetscape	This measure refers to the improvement and maintenance of the public realm between buildings in urban areas. This includes all the elements that make up these spaces including footpaths, road space including cycle lanes, bus lanes, general traffic lanes, shared spaces & pedestrian only areas, parking spaces, pay points, bollards, bus stops and shelters, loading bays, street furniture (bins, kiosks etc), lighting, signage, including traffic and direction signs, public squares, trees, green space and other planting, kerbs, medians. 1. A coherent streetscape design to a high quality is important. The use of indigenous materials for infrastructural works in the major centres, historic areas and areas of civic importance should be promoted. 2. Local authorities should develop streetscape design and maintenance guidelines, which may vary by street or area, and should ensure all proposed strteetscape interventions are audited in advance to ensure compliance with the guidelines 3. Ensure sensitive design of necessary street infrastructure such as bins, poles, lighting, signs etc. Consider provision of seating and trees where space permits 4. Ensure that footpaths, cycle lanes and the facilities on the streets are well-maintained to an agreed quality standard. Initiate a programme to upgrade footpath quality especially in areas of high pedestrian footfall. Speedy repair				Improving the functionality of the streetscape will encourage the use of streets as living spaces, as an integral part of the community and the focus of activities. A coherently designed urban street environment is more attractive to all users. Minimising the impact of traffic infrastructure in urban areas, particularly in historically sensitive areas and areas of civic importance also makes the area more attractive to visitors and residents alike . The measure should particularly improve the environment for those on foot in urban areas.	Y - complementary	Y	Y - complementary
MC1	Support use of motorcycles and mopeds	Provide on-street parking for motorcycles in certain areas. Provide motorcycle parking in new developments (as substitute for car parking spaces)				Use less roadspace than cars, and therefore could contribute to reducing road congestion. However motorcycles and mopeds have a poor accident record, and there can be noise and local air pollution issues.	N	Y - complementary	Y - complementary
FM1	Land value taxes	Introduce a location based tax based on the market value of the site. Would apply to all land overshyps. (This proposal will need to be reviewed in light of Commission on Taxation report)	Throughout the GDA (would probably need to be introduced on a nationwide basis)			Taxation of all sites including undeveloped, vacant or underutilised sites would encourage early development, or redevelopment to higher density, of sites with higher market values, and in particular those close to public transport. Would also discourage inappropriate land owner speculation, premature land rezonings and lessen impetus for "landbanking". This would encourage higher density (consolidation) in existing centres and near public transport where land values tend to be higher.	Y - complementary	Y - complementary	Y
FM3	Car taxes	Increase Vehicle Registration Tax and Road tax to encourage lower car ownership. Linking car VRT even more directly to CO2 (ie by reducing or eliminating open market selling price impact on VRT) could be used to reduce ownership of older cars with higher CO2 emissions.	Nationwide. CO2 based system is already in operation for cars. Proposal is to increase VRT rates for cars over current levels, and consider reducing relationship of VRT to Open Market Price (to discourage purchase of older, cheaper but more polluting cars).	DTR5		Discourages car ownership, and for those purchasing cars it encourages choice of models with lower CO2 emissions.	N	Y	N
FM3	Car taxes	Extend CO2 based system to other road vehicle categories, including commercial vehicles.	Nationwide. Commercial road vehicles.			Encourages purchase of commercial vehicles with lower CO2 emissions	N	Y	N
FM4	Fuel taxes Test 4b-9, 4d-9	Increase fuel tax both to dissuade car use and encourage more fuel efficient vehicles and operation. Effectively a tax that reflects the carbon contribution of vehicle fuels but avoids the need to establish new collection methods. (This proposal will need to be reviewed in light of Commission on Taxation report)	Could realistically only be applied nationwide.	DTO	R6	Could help to reduce CO2 emissions from cars. Could help to reduce unnecessary car use, especially for shorter journeys, thus reducing congestion.	Y - complementary	Y	N
FS4	Transfer of freight to rail, waterways, pipelines and coastal shipping	Encourage transfer of movement of goods by road to rail / light rail, coastal shipping and pipeline. Increase facilities for freight trains on main lines including track/bridge strengthening as appropriate, passing places (of adequate length), train paths, rolling stock and subsidised provision of private sidings. Use of freight trains on Luas lines for city centre deliveries. Consider use of freight barges to transport freight. (This proposal will need to be reviewed in light of Commission on Taxation report)	All new Port facilities (or extensions to existing Ports to have rail freight access). Consider locations in GDA (or near GDA such as Portlaoise) where road/rail transhipment facilities can be provided. Initial analysis suggests that in the case of the GDA, transfer of freight from road to rail is likely to be more feasible than transfer to water or pipeline.	DTO	F6	Reduction of road freight movements. Reduce CO2 and local air pollution associated with road freight. Reduce wear and tear on road network, reduce road congestion.	Y - complementary	Y - complementary	Y - complementary
FS5	Reallocate or provide new HOV or freight lanes, improve strategic network access to ports and airports	Designate a strategic freight network linking sources of materials, manufacturing and warehousing locations with ports, airports and interregional/international motorways. Improve lorry access and journey times to and from these routes and at ports/airports. Provide at port consolidation centres and truck stops along routes. Monitor freight journey times in real time, and provide priority on key freight routes where required at certain times. Reserve lane capacity or consider localised widening to provide dedicated freight lanes. Agree best routes, maps etc. to reduce delays to lorry movements around the GDA and provide advance and live journey time information.	Could be provided as an alternative to road widening on national roads. Could allow certain freight vehicle to use hard shoulder bus lanes on national roads or motorways at certain times of day, providing this did not impact on bus journey times. Particular attention to be paid to minimising freight delays and reducing journey time unreliability on approaches to Ports and Airport.	DTO	F3	Reduce freight vehicle journey times and improve reliability. Depends on level of congestion/journey time reliability in absence of such provision (to be determined on review of model output)	Y	Y - complementary	Y - complementary
FS5	Reallocate or provide new HOV or freight lanes, improve strategic network access to ports and airports Test 3b, 3d, 4b, 4d, 5b, 5d	Reallocate or provide High Occupancy Vehicle lanes on strategic roads, where congestion is an issue and where bus frequencies may not merit a dedicated bus lane.	e.g. M50, other national roads on approach to M50.	NRA DTO DTO	7 F7 F3		Y	Y - complementary	Y - complementary
FS6	Permit systems, distribution transhipment plus marshalling facilities, etc, through Freight quality partnership working .	Expand Dublin City Centre HGV ban, by restricting where and when lorries can enter city and town centres by using permits and enforcement of waiting/loading restrictions. Provide facilities to transfer goods from HGVs to smaller environmentallyfriendly vehicles at edge of certain towns for onward transfer (potentially including using light rail). Ensure that larger retail centres have marshalling facilities at edge of centre and internal	Industry survey required as first step in establishing a freight quality partnership and implementation priorities arising from the policy statement	DTF1 DTF4 DTF5 DTF6 DTF10 DTF20		Improves environment for people movement in cities and town centres.	N	Y	Y - complementary
SI3	Targeted measures for mobility impaired people to access the transport system	Ensure good quality footpaths to public transport. Provide level boarding facilities at all stops/stations Design bus stops so that bus can pull in flush to kerb. Provide adequate priority seating for mobility impaired people as well as buggy and wheelchair space, close to doors of vehicle. Provide step free access at all stations and stops. Provide exemptions from fiscal demand management measures for disabled people, where appropriate.				Avoids exclusion from access to transport facilities due to mobility impairments.	Y - complementary	Y - complementary	Y
SI4	Better access to key facilities (particularly targeted at socially excluded)	1. Development and facilitation of rural, community and voluntary transport schemes. There are many areas within the GDA which are not served by scheduled, regular public transport. The widespread implementation of rural, community and voluntary transport could encourage the facilitation of the sustainable local transport patterns in these areas. Demand responsive transport through a centralised booking system could be one way to facilitate this. 2. Provide transport to people with limited means to access employment, training or educational opportunities where regular or affordable public transport, walking and cycling is not an option e.g. moped hire, taxi subsidies, car club access, cycle hire, travel vouchers/ concessionary fares etc.				Improves social inclusion, by targeting transport services in particular at socially disadvantaged groups in areas where transport accessibility is poor.	Y	Y	Y

CATEGORY D: ALL PACKAGES: LAND USE PLANNING POLICY OR BEST PRACTICE PROPOSALS

Model		Do not model		Include only if initial model output suggests need		May test to inform tech note		Input matrix manipulation							
Measure		Policy		Policy summary		Likely benefits (short term and long term)		Where it might be applied		Assessment (include in initial package for appraisal?)		Assessment (include in initial package for appraisal?)		Assessment (include in initial package for appraisal?)	
Code	Description	Code	Description							Economic	Environment	Social			
IG1	Location and design of government sponsored facilities (health, education, industrial/employment)		This measure aims to ensure that the provision of key social infrastructure at local, district and regional level are both designed and located so as to ensure its accessibility to the population within their intended catchment, by the range of transport modes required. Site designs should be reviewed for opportunities to improve access and permeability by sustainable modes if existing facilities are being expanded. (Note that IG1 policies in relation to location and design of government sponsored facilities apply to similar facilities provided by others)	For employment-intensive uses, accessibility by public transport should be a primary consideration in both the location and design of new development. Maximum potential should be drawn from public transport networks by focusing development at points with good public transport accessibility (usually central locations) in the first instance. Manufacturing and logistics-based activities have different accessibility needs to office based employment. As goods based activities with associated freight transport requirements, ease of access to the national road network can be an important consideration in determining their optimal location. However manufacturing and other industries with a higher employment intensity, also require good access to the public transport network. The redevelopment of older industrial areas at higher densities for a mix of uses comprising more employment-intensive uses must be accompanied by an assessment of the adequacy of existing transport networks and the identification of future networks to serve stations/stops, and associated bus stop/waiting infra		More likelihood of choosing to walk, cycle or use public transport instead of driving to work.		Across the GDA at local, district and regional levels.		Y	Y	Y			
				Primary shoos should be located within residential areas, away from main roads, possibly with car drop-off facilities located away from the main school buildings, leaving the immediate environs car-free, thus avoiding local parking and congestion problems and presenting better opportunities for the promotion of walking and cycling to school. In the case of secondary schools, especially larger schools with wider catchments, there may be a stronger case for their location on main streets and roads (with good public transport services, and safe, convenient to use cycling and walking facilities. Ideally, school buildings should not be separated from street entrances by car parks or drop off areas. Third level institutions should be located as close as possible to an Urban Centre, and the scale of an institution should relate to the order of the centre in the Urban Centre hierarchy. Sprawling campus style developments should be avoided, in order to make access by foot, cycle and public transport more viable.		Shorter travel distances, and more likelihood of choosing to walk, cycle or use public transport to education instead of drive		Across the GDA at local, district and regional levels.							
				Greater coordination should take place between local authorities and government agencies/departments to ensure the timely provision of services in the appropriate location. In this regard, cross departmental policy co-ordination (for example housing, education, health, enterprise and employment) is essential.		More likelihood of choosing to walk, cycle or use public transport instead of drive		Across the GDA at local, district and regional levels.							
PM2	Mixed use development		The creation of a single hierarchy of Urban Centres (city centre, town centres, district and local centres) within the GDA, where the scale and mix of development in each Centre is related to public transport accessibility is a key means of reducing the need to travel and of making public transport an attractive option for more people over time.	The position of an Urban Centre in the hierarchy should be based on its public transport accessibility. Mixed-use developments comprising a range of compatible retail, commercial, cultural and residential uses should be provided for within these centres. The mix of uses and scale of each use should correspond to the function of each centre in the hierarchy and should be based on public transport accessibility to the centre.				When such facilities are provided concurrent with the residential element (as is the case in Adamstown), travel habits favouring non-car modes can be affected from the outset		Y	Y	Y			
PM3	Increase availability of wider variation of housing types		This measure aims to encourage people to stay in established residential areas, especially where public transport access is good, to ensure that investment in transport continues to be useful.	Incorporate within dwelling designs, more of the key attributes that will render them suitable for more of the household 'life cycle'. These attributes would include overall floor area, number of bedrooms, private/public open space, practical storage space. Convenient location relative to services over a household's lifecycle is also a key consideration.						Y - complementary	Y - complementary	Y - complementary			
				Encourage additional residential development with a variety of housing types in established areas, to provide greater local housing choice to those who wish to move house but remain in the area.											
				Note: reform of residential stamp duty may encourage greater housing turnover/mobility, and encourage freeing up houses in established areas for families etc.											

CATEGORY D: ALL PACKAGES: LAND USE PLANNING POLICY OR BEST PRACTICE PROPOSALS

		Model							
		Do not model							
		Include only if initial model output suggests need							
		May test to inform tech note							
		Input matrix manipulation							
Measure		Policy		Policy summary	Likely benefits (short term and long term)	Where it might be applied	Assessment (include in initial package for appraisal?)	Assessment (include in initial package for appraisal?)	Assessment (include in initial package for appraisal?)
Code	Description	Code	Description				Economic	Environment	Social
PM4	Improve permeability and connectivity		This measure primarily aims to promote walking and cycling within urban places through urban design principles which not only reduce the distance for trip making but provide for high quality, direct, safe and secure routes that connect with existing movement networks and follow key desire lines. While permeability is generally applied at the local level connectivity on the wider network is also a key element of this measure. "A hierarchical, well connected and permeable street layout is the basis of successful placemaking"(p32, Draft CRS).	Promote smaller block sizes, to maximise route choice with buildings addressing streets with minimum setback, active usage/frontage.  Ensure a network of direct routes for pedesitrians and cyclists o all local services, amenities and public transport stops/stations reflecting desire lines.Safe pedestrian /cyclist crossing oints should be conveniently located on people's desire lines.Addressing road width, volume and speed of traffic is critical, where this may act as a barrier to pedestrian/cyclist movement. Route design should consider safety, lighting, passive surveillance, convenience, route legibility; improving local knowledge of routes, through, for example, signposting and mapping. Related to this is the importance of overcoming perceptions of distance for non-car mode and reduction of visual/ psychological barriers, and creating an attractive route		This measure is most applicable in urban locations. Permeability as a principle should be designed into local authority and developer plans from the outset. It is often problematic to retrofit direct, good quality pedestrian / cycling routes into layouts once an area is constructed and occupied. It should be planned for and applied at a district level, rather than on a piecemeal (site by site) basis.	Y	Y	Y
PM9	Measures that encourage or direct person trip intensive development into locations accessible by public transport		This measure aims to locate new developments that are likely to attract large numbers of people (commercial, retail, health, education, leisure) in areas that are highly accessible by public transport and/or in larger urban centres (where the use of walking and cycling modes for local or linking trips is most viable).	Identify a hierarchy of Urban Centres based on public transport accessibility (see PM2). Mixed use developments are favoured, however in higher-order centres (where public transport accessibility is better), land uses likely to attract larger numbers of people should be preferred. (Note that IG1 policies in relation to location and design of government sponsered facilities apply to similar facilities provided by others)  Development densities in each centre should be directly related to public transport accessibility. The development potential of public transport interchange locations should be realised, interchanges should act as the focus for high density mixed-use development. Commercial activities which complement the interchange function should be provided for in the design of interchange facilities. There should be stronger development restrictions in areas not served by public transport and away from larger urban areas.			Y	Y	Y
PM10	Measures that encourage or direct higher density residential development into locations accessible by public transport		Higher density residential development should be encouraged on public transport corridors especially those which provide good access to a higher-order Urban Centre (see PM2).	Unlike developments that attract large numbers of people (PM9), significant residential development may well take place in areas lower down in the Urban Centre hierarchy, providing that public transport access to a higher-order centre is also available.  Control sporadic development in rural and remote locations and maintain a clear separation between urban and rural areas by use of Green Belt zoning. Restrict additional development in smaller towns and villages where public transport access to higher order Urban Centres is (and is likely to remain) poor.			Y - complementary	Y - complementary	Y