

CHAPTER 6: SURFACE TRANSPORT INFRASTRUCTURE

6.1 Introduction

6.1.1 The crucial nature of surface access

In South Fingal, the presence of the Airport renders even more crucial the role of the surface transport infrastructure – which is in itself of vital importance to the nation. Key national transport corridors – the M1/N1 and M50 – pass through the study area; their performance matters critically to the efficiency of the economy as well as directly to that of Ireland’s predominant air gateway. Policies for both transport investment and development control have to be framed in recognition of that fact.

6.1.2 This Chapter

This Chapter reviews policies and priorities for transport, the surface networks as they exist at present and as they are proposed to be developed, future demands and the system’s ability to cope, and possible scenarios.

6.2 Policy background

6.2.1 National Development Plan

The National Development Plan (NDP), published in November 1999, sets out the agenda for Ireland’s economic and social development for the years 2000-2006 and beyond. It sets out proposals for the investment of some IR£47 billion (59.7 billion Euros) of government, private, and European Union funds of which IR£17.6 billion (23 billion Euros) is allocated for “Economic and Social Infrastructure”, which includes roads and public transport.

The NDP makes provision for significant investment in economic and social infrastructure, including new roads. This includes construction and/or improvement (to motorway or near – motorway standard) by 2006 of the following routes in or near the study area:

- M1 Dublin to Northern Ireland Border
- N2 Dublin/Monaghan/Omagh/Derry/Letterkenny
- N3 Dublin/Belturbet/Enniskillen/Derry
- M50
- Dublin Port Access Tunnel

Public transport improvements feature strongly in the NDP. These include implementation of the light rail network (LUAS), investment in suburban rail, and enhancement of bus services.

The principal agency for the implementation of the roads elements of the NDP is the National Roads Authority. The National Roads Authority was formally established as an independent statutory body under the Roads Act 1993. The NRA’s primary function under the Act is “to secure the provision of a safe and efficient network of national roads”. For this purpose it has overall responsibility for planning and supervision of construction and maintenance works on these roads.

6.2.2 The DTO strategy

The Dublin Transportation Office (DTO) was set up in 1995 to co-ordinate the implementation by relevant agencies of an agreed integrated transportation strategy for the Greater Dublin area.

The DTO Strategy is set out in “A Platform for Change – Strategy 2000 – 2016”, published in September 2000 (see Appendix 2). Their report establishes an integrated transportation strategy for the Greater Dublin Area for the period 2000 to 2016. The report is an update of the strategy produced in 1995, developed by the Dublin Transportation Initiative.

The DTO Strategy has two interdependent elements:

- Demand management – this aims to reduce growth in travel while maintaining economic progress, and simultaneously achieving a modal shift towards public transport.
- Infrastructure and service improvements, including significant investment in public transport.

Table 6.1: Mode split in the AM peak hour (person trips)

	1997 (observed)		2016 (forecast)	
Bus	47,000	19%	69,000	14%
Rail	21,000	8%	239,000	49%
Car	181,000	73%	180,000	37%

Source: A Platform for Change, DTO

Table 6.2: Forecast average AM peak journey times 2016 (in minutes)

	Without strategy	With strategy
Bus	47	29
Car	38	18
Rail	94	57
Weighted average	76	34

Source: A Platform for Change, DTO

When distilled, the DTO Strategy has three main objectives:

- to facilitate the provisions of the Strategic Planning Guidelines for the Greater Dublin Area;
- to impose no restraint on journeys to work or place of education in the morning peak – so all projected growth in travel demand is to be accommodated;
- to reduce road congestion to 1991 levels.

The first of these dictates the planned location of development. The attainment of the other two is predicated on a very high growth in public transport usage. This last point is thrown into stark relief by the projected mode share. Table 6.1 compares the morning

peak hour mode split for bus, rail and car for the years 1997 and 2016. This shows that the DTO projects public transport to gain a vastly increased share of person trips. The actual number of car trips is projected to remain constant: all growth in travel demand will effectively be absorbed by public transport. The stated aim is that implementation of the strategy will reduce congestion, and so the DTO forecasts that journey times will be significantly less than they would be without the strategy (see Table 6.2).

In order to achieve this ambitious target, the strategy sets out a comprehensive, integrated programme of investment which covers:

- public transport (LUAS, Metro, heavy rail and bus)
- roads
- traffic management
- integrated land use policies

If implemented to the extent proposed by the DTO these projects will have a significant impact on the north Dublin Fringe and on the South Fingal Study Area.

6.3 Existing networks

6.3.1 Roads

Dublin, like most major cities, displays a radial pattern of main roads emanating from the city centre and connecting to smaller cities and towns throughout the country. In addition, an orbital route has been constructed to the north and west of the city. The principal roads within, or close to, the study area are described below and shown on Figure 6.1.

The M50 motorway provides a major orbital route to the north and west of Dublin, with further construction underway to the south. The road is constructed to dual two-lane standard and, in the study area, provides links between the M1, N2, N3 and local roads.

The M1 motorway extends northwards and southwards from the M50 Junction 3 at Turnapin. To the south it extends some 2.5 kilometres to Whitehall before becoming the N1. To the north it extends towards the Airport. On 28 June 2003 a northward extension of the Motorway from a point about 1km east of the Airport to Balbriggan was opened. The Airport is now served by a spur from the M1 which terminates at a roundabout at the Airport's entrance, the spur being the former alignment of the M1 prior to the construction of its extension.

Parallel to the Motorway is the R132 (formerly the N1), which before the construction of the Motorway extension was the principal route linking Dublin to the north of Ireland. The N1 also extends southwards from the Airport spur roundabout, passing under the M50 motorway and leading into central Dublin.

The N2 is the main road linking Dublin to Derry via Monaghan and Omagh. It is currently constructed to single carriageway standard in the vicinity of the study area and connects to the M50 at Junction 5 at Finglas. It passes to the west of Dublin Airport, but no direct access is available to the airport.

The N3, which is also part of the National Primary route network, heads north-east from Dublin towards Donegal and passes to the south-west of the study area. It crosses and connects with the M50 at Blanchardstown and is of dual carriageway standard from the M50 Interchange to Clonee. North of Clonee it reverts to single carriageway standard.

6.3.2 Public transport – bus services

Buses, coaches and taxis are the only public transport serving the study area at present. Bus services serving the study area and airport have been developed in recent years with the improvement of Bus Atha Cliath's services, coach links to the city centre, and links to other Dublin destinations.

The airport is served by a mixture of Bus Atha Cliath local routes, dedicated express bus services and longer distance coach services to destinations beyond the Dublin conurbation. While there has been a significant increase in recent years in the number of destinations served by bus from the airport and an improvement in the frequency of the services – for example by creation of Quality Bus Corridors on routes into the city centre - there remains scope for improvement. Journey times, reliability and punctuality are all affected by congestion. Terminus facilities at the airport are an obvious target for enhancement.

6.4 Current transport infrastructure proposals

6.4.1 Roads

The National Roads Authority (NRA) published its "Review 2003 and Programme for 2004" in February 2004. This document reports on the work of the NRA for the previous year and sets the agenda for the coming year and beyond. Figure 6.1 shows the existing road network and the important improvement schemes listed below.

M1 Upgrade

Two significant sections of the M1 were completed and opened to traffic in June 2003, Cloghran to Balbriggan and the Drogheda By-pass, providing 72km of continuous motorway between Dublin and Dundalk. The section beyond Dundalk could be completed by late 2006 subject to statutory procedures in Northern Ireland.

(a) The Dublin Port Tunnel

This will provide an important link between the Port and the Airport and is scheduled for completion in 2005.

(b) N2 - Finglas to Ashbourne Improvement Scheme

This scheme entails the construction of a new section of dual carriageway between the Finglas M50 junction and a location on the existing N2 north of Ashbourne, with interchanges at Cherryhound and Ashbourne. The existing road which forms the N2 will be retained as a Regional Distributor Route.

(c) M50 Upgrade

Proposals for the upgrading of the M50 and an Environmental Impact Statement will be published in 2004. These proposals will principally entail the upgrading of the key junctions on the M50 including the M50/N7 interchange, M50/N4 Interchange, M50/N3 Interchange, M50/N2 Interchange and M50/M1 Interchange to free flow junctions together with introduction of a third lane in either direction for traffic flow on the motorway. The project will be constructed in phases with the M1/M50 Interchange being a priority phase of construction.

(d) M1 Auxiliary Lanes and new Drinan Interchange

Construction work will commence in 2004 on the provision of the new half diamond Interchange on the M1 at Drinan. This Interchange will facilitate access and egress to Swords from the south of the M1 to the benefit of the M1 Airport Interchange. Traffic volumes on the M1 however are reaching a stage where the construction of a third lane in each direction on the M1 north and south of the Airport Interchange will have to be seriously considered.

(e) N3

The proposed upgrading of the N3 between Clonee and Kells will comprise some 45km of motorway standard route and will be progressed as a Public Private Partnership. The existing dual carriageway section of the N3 between Clonee and the M50 is being considered for upgrading to include a third lane in each direction.

(f) Outer Ring Road

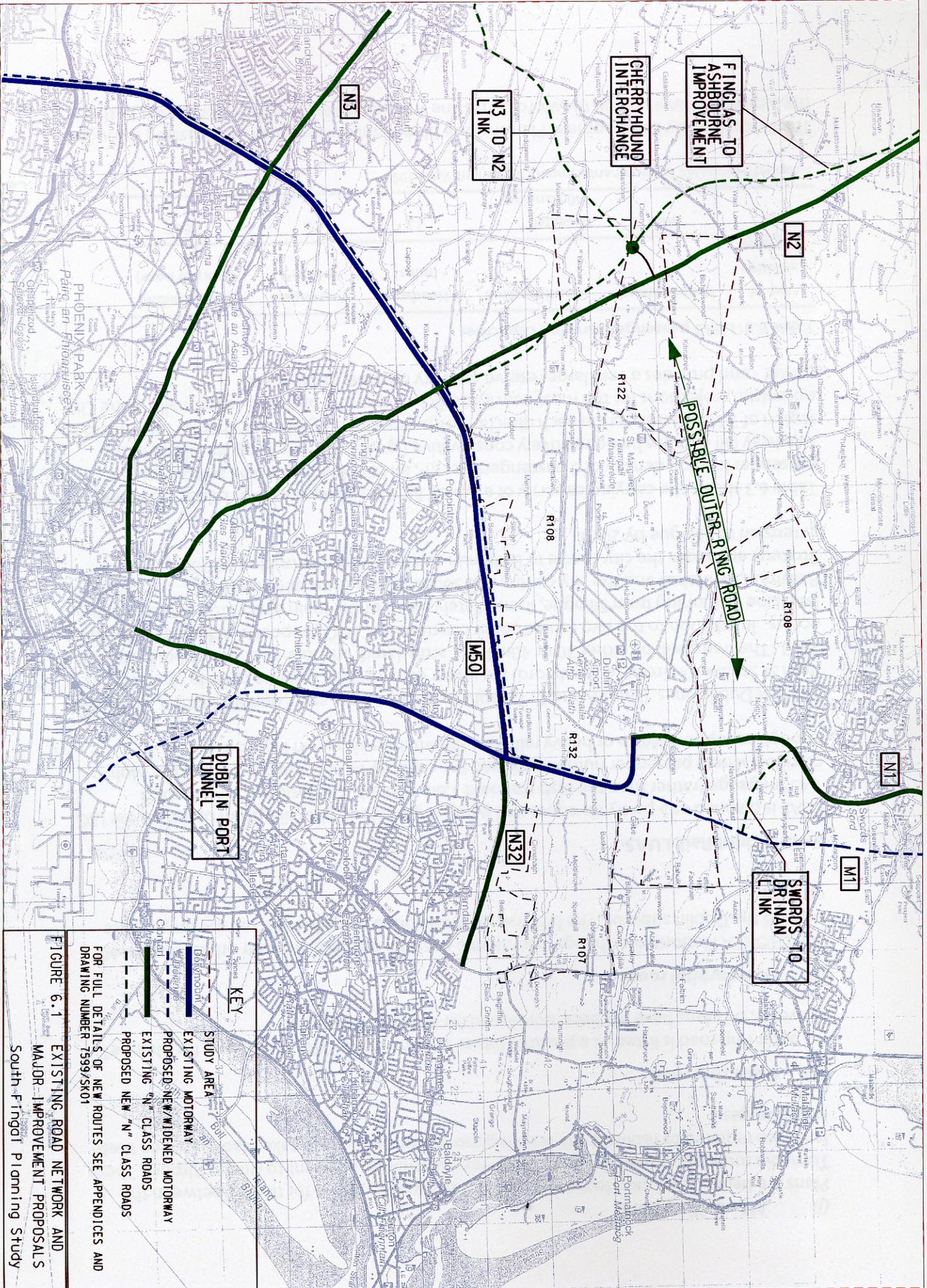
An objective to provide an Outer Ring Road linking the N7 in the South Dublin County Council administrative area and the M1 in the Fingal area is the subject of a strategic re-appraisal. The original purpose of the Outer Ring Road was to provide a western boundary to the development of the Dublin area. The route options identified have been overtaken by development with the result that the road will now serve a function as a strategic distributor link incorporating priority measures for public transport. Elements of the Outer Ring Road in the Fingal area proposed include the N4 Leixlip Interchange to N3 Littlepace Interchange to N2 Cherryhound Interchange and a new western access to Dublin Airport.

(g) Dublin Eastern By-pass

This would form the completion of an eastern by-pass incorporating the Port access route. This is a longer term project and construction is unlikely for the foreseeable future.

(h) Outer Orbital Route

A strategic National Primary Route linking the M1 with the M7 is under consideration by the National Roads Authority. No fixed alignment has been identified for this strategic route.



DUBL IN PORT TUNNEL

CHERRYHOUND INTERCHANGE

FINGLAS TO ASHBORNE IMPROVEMENT

SWORDS TO DRINAN LINK

POSSIBLE OUTER RING ROAD

N3 TO N2 LINK

KEY

- STUDY AREA
- EXISTING MOTORWAY
- PROPOSED NEW/WIDENED MOTORWAY
- EXISTING "N" CLASS ROADS
- PROPOSED NEW "N" CLASS ROADS

FOR FULL DETAILS OF NEW ROUTES SEE APPENDICES AND DRAWING NUMBER 7599/SK01

FIGURE 6.1 EXISTING ROAD NETWORK AND MAJOR IMPROVEMENT PROPOSALS
South Fingal Planning Study

6.4.2 Metro

The “Platform for Change” strategy (2000) includes both Metro and light rail (Luas) routes in the proposals for the South Fingal area (see Figure 6.2). Although the underlying strategy for modal shift, and considerable rail investment, has not altered since then, the balance of the proposals has. In particular, the emphasis is now on the primacy of a Metro solution as the core element in linking South Fingal and the Airport to the City. Metro would provide the high-capacity public transport links which would enable the surface access system to cope with significant growth and development at and around the Airport. Without its completion, the capacity of the local transport network is likely to offer a major constraint on the scale and density of development around the Airport.

The Railway Procurement Agency (RPA) has identified a preferred alignment for the first phase of a wider network for a Dublin Metro. This would link the Airport to the City Centre (St Stephen’s Green) via Ballymun (see Figure 6.3). A link to Swords does not form part of this first phase. An Outline Business Case, which includes the economic and financial case for the preferred first phase has been submitted by the RPA to the Government for its consideration. A decision on the way forward is awaited from Government.

In common with DTO thinking on the subject, it is thought desirable and likely that the vehicles which will operate on the Metro would be similar to those ordered for the light rail system now operating in Dublin. This means that they would have light rail vehicle performance characteristics and would operate on a UIC standard track gauge system. However, as they will run entirely on segregated track (with no on-street sections, unlike Luas), the Metro could support longer trains, travelling at higher speeds and at greater frequency. Collectively these could ultimately provide much higher passenger line capacity than offered by Luas: some two to three times greater than the 4000-5000 passengers per hour for a tram-based system like LUAS (peak hour/1-way/capacity).

The DTO Strategy indicated the line being constructed in the period 2006-10. Achieving this timescale is not now realistic. The RPA is of the view that the best timescale possible would be for construction to start 2.5 to 3 years after a decision to proceed with the project by the Government. However, to achieve such a timescale would require a significant advance on the experience of planning and then implementing the Luas project. Construction will then take several years. Even if a Government decision to proceed is taken soon, the earliest possible opening date for Metro will be 2010, towards the end of the period envisaged in the DTO strategy.

If Metro does proceed it is envisaged that it will be the first phase of a wider network serving the City. An extension beyond the Airport to Swords has already been considered in some depth, being one of the potential elements of a first phase option that was considered by the RPA, but subsequently not included within the first phase. A spur from north of Ballymun to Blanchardstown is a further option: as would be some form of link to any Luas alignment eventually built (e.g. Line B in “Platform for Change”).

A 20-30ha site for a depot serving the whole Metro system, with capacity for 200+ cars, forms part of the first phase option and would be located to the south of the Airport – it could either be in (or partly in) the Safety Zone area, or further west beyond Sillogue.

The 1999-2004 County Development Plan map does not show any Metro alignment (the green “rail proposal” line corresponds more precisely to the CIE/Aer Rianta study heavy rail alignment, identified prior to the development of the “Platform for Change” strategy). “Your Fingal” (the Draft Development Plan for 2005-2011) however contains an explicit policy in support of Metro, and shows a direct north-south alignment consistent with RPA studies.

The RPA’s preferred alignment would serve the existing airport terminal area as well as land between the existing main runway and the M50. The proposal to build the new parallel runway, and the concept of a new terminal on a site west of the existing control tower raises the possibility, which the study team considered carefully, of routing the Metro between the two runways to serve both terminals directly, before (potentially) continuing to Swords. However, this would be more expensive and less certain than the preferred option, which is to follow the RPA route to the airport (existing terminal), with the potential for a Swords extension and some sort of fixed link (e.g. people mover) between the existing and the new terminals.

The RPA route would use and potentially serve land between the main runway and the M50. This could have potential for high-density development clustered around stations. A Metro service would facilitate public transport movements to/from such an area, and development demand could support the financial and economic case for the Metro. However, high-density developments could have undesirable traffic impacts on the wider road network which could outweigh the benefits that development may bring. This is an issue for the long term; for any period up to the opening of a Metro / public transport node in this area, this study recommends that the area remains largely open in character, with approval of uses that do not prejudice long-term development potential of this kind.

6.4.3 Light Rail: Luas

Luas is a partly on-street and partly segregated light rail system based on the UIC 1.435m gauge (rather than the Irish standard 1.6m gauge). It is designed for transport corridors where passenger numbers exceed the capacity of bus services, but are not high enough to support Metro or heavy rail. The “Strategy for Change” alignments are shown in Figure 6.2.

The first Dublin lines (Lines A and C, Tallaght to Abbey Street and Connolly Station, and Line B from St Stephen’s Green to Sandyford) are now complete – Line B opened in July 2004. The trams are 40m long, articulated, and low-floor throughout for easy access. In addition to the two routes under construction, DTO proposals include a north-south line (Line D) running from Sillogue, immediately south of the main airport runway, through Ballymun, Whitehall and the city centre, and south to Dundrum (see Figure 6.2). The DTO Strategy envisaged the city centre to Ballymun section to be constructed by 2006; the extension to Sillogue by 2010. However, given the limited progress to date on the development of the Ballymun and Sillogue extensions that the DTO’s timetable is not now achievable – even leaving aside the interaction with Metro route choice

The Fingal 1999-2004 County Development Plan shows a blue “light rail proposal” line passing through the airport terminal and on to Swords. This line was based on the

original proposals in the 1994 DTI Strategy which have since been developed and amended by the Government and the DTO. It does not correspond with the DTO proposal for Line D, and is now superseded.

The route alignments, and terminus/station locations for Line D shown in “A Platform for Change” are indicative. The RPA (formerly LRPO) has indicated that it will be receptive to recommendations on alignment and station location emerging from the South Fingal Study. The study team takes the view (a) that the Metro alignment reserved could and should also be used for Luas if that were to be the eventual decision on technology, and (b) that Luas could provide valuable linkage especially to the employment catchment. However, Metro is regarded as the priority.

6.4.4 Heavy rail

The idea of constructing a heavy rail line to the airport has been mooted for a long time. The DTO Strategy makes no provision for this. There are two main reasons for this: the potentially high cost of construction; and the severe capacity bottleneck on the network approaching Connolly Station from the north. Two possible routes were examined as part of a CIE/Aer Rianta joint study (undertaken prior to the development of the “Platform for Change” strategy): they were, respectively, from the Dublin-Belfast line, east of the airport; and from the Maynooth/Kildare line via the Tolka Valley, in the west. Neither of these routes is very direct, and there would be little difference in running time. Both routes share the problem of a congested approach to Connolly Station, linking with other lines and penetrating the city centre; but the Tolka Valley route avoids the Howth Junction pinch point. Iarnród Eireann (Irish Rail) are currently studying the options once again.

The potential benefit of a heavy rail link comes from extending the potential markets that can be served directly by public transport, and in particular provides a link to the 1.6m gauge Irish rail network. In theory, markets could include long distance rail services from the North, and/or west, offering the opportunity for Dublin Airport to become the international gateway for all Ireland; commuter-type services linked to the existing DART and Arrow networks (e.g. Dun Laoghaire / Airport without interchange); and an “Airport City Express” service, non-stop to the city centre.

But given that it is proposed to develop a Metro link to the airport, the first of these markets would then provide the principal justification for a heavy rail link, and may not be sufficient to justify the considerable capital cost involved. In addition, a rail spur from the coast line would risk yet further fragmentation of the Green Belt. Protecting the possibility of a link to the Maynooth line would seem to be prudent, and has been included in the 2005-11 Draft Development Plan.

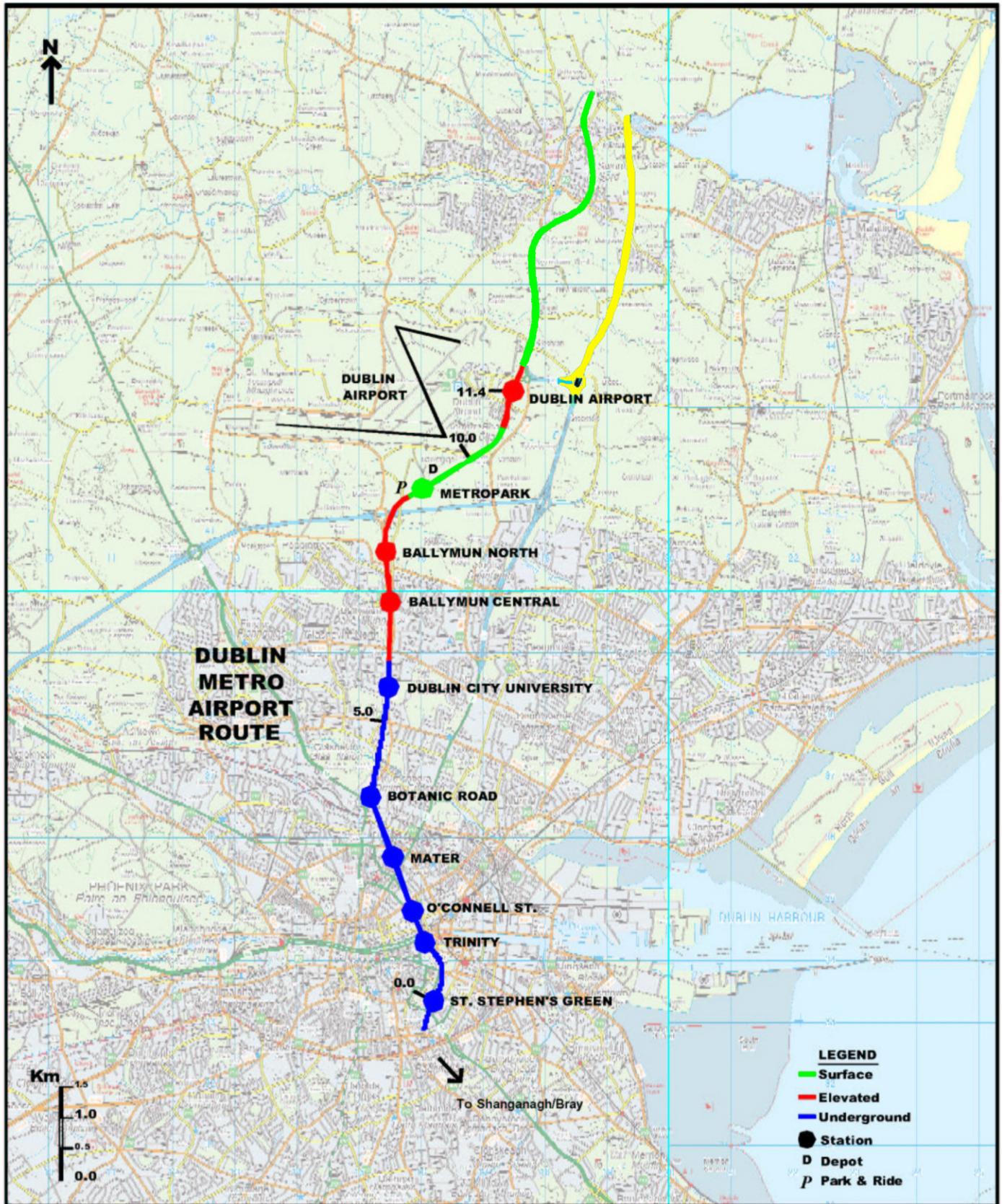


Figure 6.3
Preferred Metro Alignment
Source: RPA

6.4.5 Bus services

Metro, or indeed any of the potential rail solutions, will take at least 6 - 7 years to deliver. In the short to medium-term, therefore, growth in public transport mode share at the airport will inevitably be dependent on increasing patronage for bus services. These have been developed in recent years with the improvement of Bus Atha Cliath's services, the new coach link to the city centre, and links to other Dublin destinations. The introduction of a Quality Bus Corridor (QBC) along the Drumcondra Road promises further improvement.

The development of Metro (or Luas) should not be seen as replacement for bus services, but rather as complementary to them. The different modes will serve different markets and will not necessarily be competing for mode share. Bus links will continue to be important in two respects:

- for local employee and passenger trips from the North Dublin area
- for longer trips not served by Metro, e.g. from villages in Co. Kildare and Co. Meath

Bus services do not require significant additional infrastructure, but a dedicated terminus facility and priority over general traffic wherever significant delays may occur will be required at the airport in due course, to increase public transport mode share. The latter could involve additional QBCs, bus-only lanes on motorways (as on the M4 and M4 spur to London Heathrow) or bus-only links. It would seem sensible that any new road alignment (such as a new airport access) in the South Fingal area should reserve space for bus priority.

It is also important to recognise that, in addition to serving airport trips directly, airports are increasingly becoming important public transport interchange hubs in their own right (e.g. between bus, Luas and Metro). The development of public transport services associated with the airport can bring wider benefits to the community, and bus services will be integral to the delivery of such benefits.

6.5 Demand, capacity and future mode share

6.5.1 Predicting future demand

The most significant source of increased travel demand in South Fingal will be the proposed expansion of the airport. Construction of an additional runway together with associated terminal facilities will increase trip generation to significantly above current levels. The absence of any rail link (whether Metro, Luas or IE) between the airport and the capital puts a greater burden on the highway infrastructure than otherwise would be the case, and this burden is expected to grow steadily over the coming years.

The DTO has developed a traffic model for Dublin and the surrounding area using the SATURN computer program. This model predicts future traffic flows on the main roads, based on the existing flows, any changes in the traffic flows and highway network and any other relevant factors. The latter includes public transport improvements and land-use developments. The model reflects the higher than forecast economic growth rates which have occurred in Dublin in recent years. This has led to higher forecast future traffic flows from the SATURN model than previously obtained.

This model is based on the land use zonings in the County Development Plan. Variations to proposed land use zonings resulting from this study could have some minor impact on transport demand, but are unlikely to be of sufficient magnitude to alter the general SATURN model conclusions (See Appendix 2 for assumptions made in the SATURN model). Note that this is not the case with variations which would result from the proposed Action Plan for the Designated Airport Area (see previous chapter), which would be likely to be of much greater significance for the modelling of future demand.

The DTO traffic model supersedes the 1998 McCarthy and Partners report which reviewed the airport access and local road capacity, and formed part of the technical background work used for the Scott Wilson Airport Masterplan Study.

Appendix 2 summarises the main transport schemes and development proposals, the effects of which have been incorporated into the model. These include all significant highway and public transport schemes expected to be in place by the modelled date (2006/2016) together with all other significant development proposals expected to have been implemented by that time.

6.5.2 Highway network capacity

The process of estimating both the theoretical and practical capacity of an existing or proposed highway link is an inexact science. For the purpose of this study no detailed assessment of the capacity of individual links has been undertaken; but a broad assessment has been made of capacity, to allow identification of the possible need for upgrades to principal links on the road network.

The NRA *National Roads Needs Study* provides details of assumed capacities and levels of service (LOS) for certain categories of road. Estimation of traffic capacity is based on the US Highway Capacity Manual (HCM), which outlines the methodology for estimating the limiting capacity for a particular road type in terms of level of service. Level of service is often expressed in terms of operating speed, but also considers freedom to manoeuvre in traffic, the response to traffic interruptions, safety, comfort and convenience of the driver and passengers.

The HCM defines six levels of service ranging from 'Level of Service A' (representing free flow conditions) to 'Level of Service F' (representing breakdown of flow). Table 6.4 overleaf shows the implications of levels of service C, D and E.

The overall objective in the *National Roads Needs Study* is to maintain the level of development of the National Primary Route Network to ensure that all sections of the network will provide an inter-urban travel speed of 80 kph on single carriageway roads. This would equate to Level of Service D and is regarded as the minimum acceptable standard.

The NRA has calculated the limiting traffic capacities for given road types at different levels of service based on Irish conditions. These capacities are summarised in Table 6.4.

Table 6.4: Traffic capacity for levels of service

Road Type	Classification	Maximum AADT for given LOS (12% HGV)		
		C	D	E
Standard Two-lane 7.5m	Rural	6,500	7,600	20,600
	Commuter	8,400	15,000	26,800
Dual Carriageway 2 x 7.5m	Rural	34,600	44,100	53,500
	Commuter	45,000	57,400	69,600
Motorway 2 x 7.5m	Rural	43,500	55,500	62,500
	Commuter	56,500	72,200	81,200
Motorway 2 x 11m	Rural	65,000	84,000	93,750
	Commuter	84,750	108,300	121,800

In 1995 the NRA undertook an overview of the national primary and secondary road networks. The survey found that 91% of the national primary network and 94% of the national secondary network was providing Level of Service D or better; but significant deterioration could be expected under 2019 design year conditions. The study team regard this as broadly valid as regards the capacities of, and conclusions for, the key roads in the study area.

The DTO has run their SATURN model for the years 2006 and 2016. In both years the model assessed a “Do Minimum” and a “Do Something” strategy. The “Do Minimum” scenarios assume the minimum of improvements to the network, and the “Do Something” scenarios assume that the various highway and public transport improvement proposals are in place.

The current DTO forecasts, which incorporate public transport proposals, including Metro, predict that the existing road network will reach capacity by 2006. Although the model predicts some reduction in traffic levels after 2006 as key elements of the public transport programme enter service, traffic levels are forecast to continue growing after this period such that by 2016 significant congestion will occur on all key links in the study area, and the M50 in particular.

The DTO sees little advantage for running their SATURN model for any of the years between 2006 and 2016 because there are so many proposed changes to the road network and public transport, and new land developments, due in these years. The dates of those network changes are likely to alter significantly in the future, so modelled results for the years between 2006 and 2016 are also likely to be subject to large changes.

This does however make it difficult for us to be precise about when traffic levels on the road network would reach unacceptable levels.

6.5.3 Public transport mode share

Table 6.5 shows Aer Rianta’s forecasts for modal split for the period 2000-2010. This incorporated the following assumptions:

- Swords QBC from city centre to airport completed in 2001
- Orbital QBC completed in 2002
- M1 extension to Lissenhall completed in 2003

- Luas open in 2008
- Metro open in 2008

Note that the dates for Luas and Metro, included in the Aer Rianta figures, are two years earlier than the dates given in the DTO Strategy, which themselves are optimistic.

Figures 6.4 and 6.5 present these data in graphical form: 6.4 shows the data as a percentage of total trips; 6.5 shows the actual numbers in million passengers per annum (mppa).

The figures show the increasing share of travel demand which Aer Rianta planning assumes will be provided by public transport. The private car share is forecast to reduce progressively from 55% of all passenger trips in 2000 to 45% in 2010. The most significant impact is felt with the arrival of Metro/Luas in 2008, which together account for 23% of all trips in 2010 (a share which may be expected to increase in subsequent years). Prior to Metro, the major increase is expected to be taken up by bus/coach, with the private car and taxi shares showing a modest reduction.

Table 6.5: Mode share of Dublin Airport passengers 2000-2010

	2000	2002	2004	2006	2008	2010
Passenger numbers (million per annum)	13.8	16.07	17.86	19.72	21.31	22.91
Private car	7.73	8.84	9.64	10.25	10.44	10.31
	55%	55%	54%	52%	49%	45%
Taxi	3.31	3.70	3.57	3.55	3.20	3.44
	24%	23%	20%	18%	15%	15%
Bus/coach	2.35	3.05	3.93	4.93	2.56	2.75
	17%	19%	22%	25%	12%	12%
Luas					1.07	0.69
					5%	3%
Metro					2.98	4.58
					14%	20%
Other	0.45	0.48	0.71	0.99	1.07	1.15
	3%	3%	4%	5%	5%	5%
Total	100%	100%	100%	100%	100%	100%

Source: Aer Rianta: Centreline 2002 Forecast & Car Parking Strategy Document section 8 & Appendix D; mode share assumption is "high public transport usage – see Chapter 5, section 5.4.5 above

Figure 6.5 and Table 6.5 highlight the important fact that although the private car share decreases significantly, the actual numbers increase (by more than 2.5 million or 33%) until the end of the decade, when some fall off is observed: even with a significant increase in public transport mode share, car trips to the airport are forecast by Aer Rianta to increase. This has direct implications for the level and quality of road access and, more importantly, car parking: until a credible, high capacity public transport alternative is in operation, Aer Rianta is obliged to continue providing kerb-side drop-off space, and car parking (short and long-term) to meet this level of demand. In the event that new public transport provision does not deliver the anticipated modal shift, or that

Metro becomes operational later than assumed in the Aer Rianta modelling (as is likely), then the increase in car trips will be even greater than shown.

6.5.4 Parking

An integral part of managing the network is parking. Because parking is dependent upon the airport, this is predominantly discussed in Chapter 5 (5.4.5).

Figure 6.4: Forecast mode share (%)
 Source: Aer Rianta : See Table 6.5 above

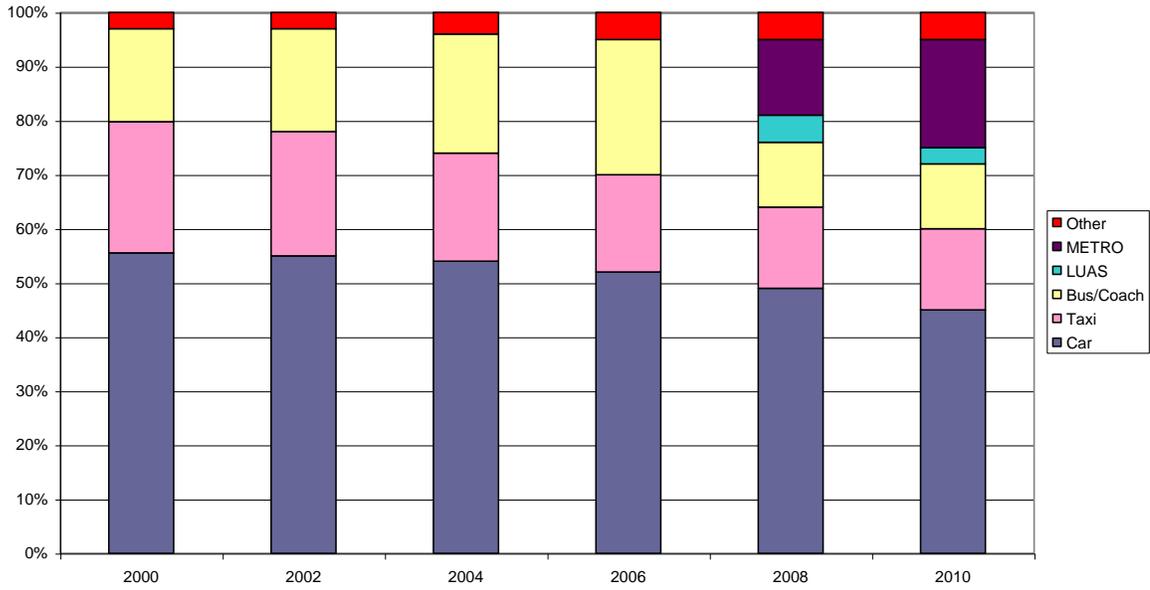
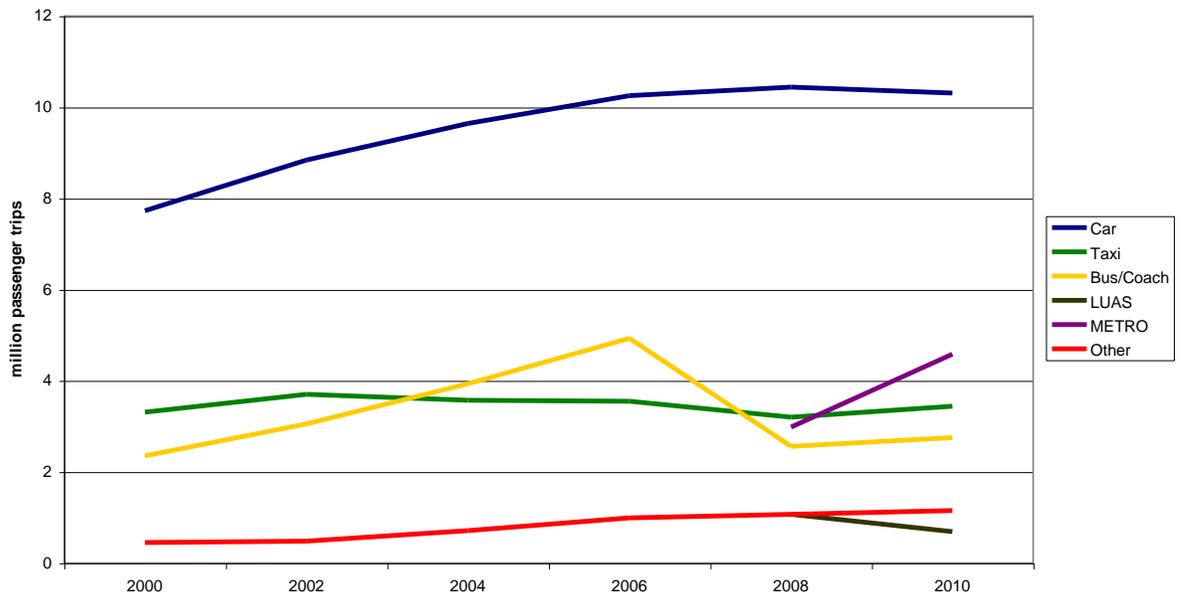


Figure 6.5: Forecast mode share (actual numbers) 2000-2010
 Source: Aer Rianta: See Table 6.5j above



6.6 Summary on transport priorities

The modal split figures show how reliant the airport (and thus the South Fingal area as a whole) will need to be on public transport. Public transport improvements are at the core of the strategy for access to the airport, and for a workable transport system all around the airport area – which after all includes two of the State’s most crucial links, the M1/N1 Corridor, and the M50 C-Ring.

Without major new public transport supply - essentially rail, either Metro or Luas - there will be two principal undesirable effects:

- Unconstrained (except by congestion) growth of car movements to and from the airport, resulting in worsening congestion on these two key arteries, worse and longer intrusion on local residents as they go about their daily lives, and increasingly delay and unpredictability for airport users and staff;
- Pro-rata increases in airport parking, in step with passenger numbers, with significant implications in terms of using up the green buffer land supply and/or expensive recourse to parking structures.

The implications for new development potential in the study area are similarly significant: until the new public transport (rail) capacity is available, it is impossible to envisage extensive new trip-generating development, unless unacceptable risks are to be taken with the capacity and congestion of the whole surrounding network.

6.7 Possible Transport Scenarios

Choices are thus about route reservations, about the need for a proactive policy on rail investment, and about desirable transitional measures prior to major new routes opening.

6.7.1 Public transport north of M50

While the RPA has a preferred first phase option for Metro, there are no fixed proposals for Luas north of the M50.

The most important consideration at this stage is to safeguard the preferred Metro alignment, and to support its procurement as strongly as possible.

The recommended development pattern around the airport (see Chapter 7) is to reserve land for airport-related uses (i.e. activities which have an operational need to be close to the airport), in preference to uses such as offices, business parks etc which would like - but have no pressing need - to be there. This view is supported by the short to medium-term traffic implications of airport growth (i.e. before Metro comes on line); and pressure on the South Fingal road network will be the main argument for resisting development that generates significant peak hour traffic movements.

Station location giving access to the airport terminals will be a major determinant of alignment, since these will be the principal passenger and employee destinations.

6.7.2 Luas alignment

Whatever role light rail (Luas) plays in the eventual package, it seems pointless to have a proposal which terminates Line D at Sillogue (as shown in “A Platform for Change”)

short of the airport terminal. But the choices very much depend on how Metro and Luas are seen as complementing each other.

An extension to Swords is a possibility, and will depend on assessment of travel demand. One option would be shared Luas/Metro operation on the same alignment.

6.7.3 Heavy rail

The case for heavy rail will be demand-driven. It does not feature in the DTO Strategy, for reasons outlined in 6.4.4 above. With Metro planned, the potential benefit of the heavy rail link comes from extending potential markets, whilst augmenting the services run by Metro and Luas.

Heavy rail proposals are being considered again, but no planning choice at this stage can be made, other than general (though conditional) support for the concept.

6.7.4 Programming

A delay in providing adequate rail capacity forces Aer Rianta into the default position of having to provide larger areas of car parking to ensure that the airport can function efficiently (Aer Rianta estimates the need for an additional 2,000 spaces each year). So there is a need for highest priority to be given to the development of Metro routes to the airport, and to explore the possibility of advancing the implementation programme.

Car parking is relatively cheap to provide, can be done in an environmentally sustainable way (to minimise surface water run-off), and can be a temporary use which does not compromise long-term productive development.

In the short-term, there is a need to build on the recent improvements in bus/coach services, with designation of further QBCs on routes into the city centre.

6.8 Preferred transport scenario

The following recommendations consider how transport provision in the study area should be addressed in the County Development Plan. These recommendations are informed by the foregoing discussion and consideration of other topics covered in this report, as well as good planning practice.

6.8.1 The DTO strategy, Metro and Luas

The DTO's "A Platform for Change" establishes the long-term transport strategy for the Dublin City-Region and so, by definition, for the South Fingal area. The County Development Plan must support and facilitate the overall DTO strategy concept. It is important to note that the DTO has developed a strategy; it has not developed a blueprint: it is the responsibility of the RPA to develop Metro and Luas routes. This work will refine the operational specifications, alignments, and station locations. It is possible that any PPP arrangements for procuring Metro or further Luas lines will transfer a significant degree of the alignment and system design to the private sector.

This study recommends that a protected Metro alignment should be shown as a 'reservation' in the new Development Plan, because:

- it will give a clear indication of the Council's support for the DTO strategy and the RPA's approach to its implementation;
- it will help cement the inter-dependence of transport and land-use planning in the conurbation; and

- it will give a clear signal to landowners and developers that the DTO proposals need to be incorporated in their considerations.

For non-Metro proposals, the 1999-2004 Development Plan showed alignments for heavy rail (green) and light rail (blue). Neither of these two lines matches the current proposals and should therefore be deleted. This is the approach adopted in the Draft 2005-2011 Plan, which conforms with the RPA alignment.

In the specific case of Luas, terminating Line D at Sillogue south of the airport and precluding its northward extension would be a missed opportunity. In the past, the LRPO (now RPA) and Aer Rianta have expressed support for the principle of extending Luas into the airport. Protecting a north-south Luas alignment should be based on the RPA alignment, and would cover the possibility that Metro did not proceed.

6.8.2 Alternative Metro alignments

Earlier sections of this report discuss alternative Metro alignments in the area of the Airport, including routes between the parallel runways to serve the existing and new western terminals; as against the RPA's more direct route from the City to the airport.

The 'between the runways' alignment is not recommended for inclusion in this study or in the Development Plan, due to the uncertainty of a new terminal option, the additional construction cost, the practical alternatives (e.g. PeopleMover) for linking the new terminal to a Metro station at the existing terminal, and the risk that pursuit of this option would delay further the Metro project. As noted, a preferred alignment now exists for the Metro and it is recommended that this alignment be identified on the development plan.

6.8.3 Heavy rail

The DTO Strategy does not make any recommendations for heavy rail lines in the South Fingal area and the discussion above (6.4.4, 6.7.5) established no overwhelming case for this provision. Accordingly, no heavy rail alignments are shown on Figure 4.1. However, the Draft 2005-2011 Development Plan does express support for the link to the Maynooth line.

6.8.4 Bus

Whilst this study recognises that the bus will be the principal non-car access mode for several years to come, there are no specific recommendations relating to bus services for inclusion. Major new road schemes (notably the M1 Motorway and the Dublin Port Access Tunnel) provide an opportunity to reallocate road space to buses on relieved routes, through extension and expansion of the Quality Bus Corridors, with potential in the longer term along the Western Access. Areas where further bus priority measures would have the maximum benefit for airport-bound buses lie outside the study area, on the main arterial routes in the City itself. There is scope, however, for enhanced bus priority on the airport approaches, such as the Old Swords Road, and in and around the airport itself.

New development in South Fingal should be served by bus, with the provision of accessible bus stops, bus shelters and bays presented as an integral element of planning applications.

6.8.5 Roads – General

Table 1 in Appendix 2 shows our estimates of the capacity and RFCs (ratio of flow to capacity) for the roads in and around the study area based on the DTO's SATURN model. This indicates that many of the major roads, most notably the M1 and M50 corridor, will have traffic flows well in excess of their capacity by 2016 (based on level of service D), even allowing for the extensive programme of new road construction and improvements.

Additional lanes on the M1 and M50 may increase capacity and provide short-term relief to congestion. But with traffic demand in the peak hours likely to approach twice current capacity by 2016, there is a need to identify solutions that:

- (a) seek to separate north-south through traffic on the M1 from traffic wishing to gain access to the airport, by encouraging traffic associated with future development to access the airport complex via an alternative western access route that would reduce dependency on the M1 and M50 corridors; and
- (b) provide a form of separate local road network which allows the South Fingal area to function without being entirely at the mercy of congestion on the national network – whilst at the same time minimising the use of such a local network by diverted through traffic.

In order to achieve these objectives, and to accommodate the land use proposals recommended in this study as well as any future expansion of the airport, there will be a need for further improvements to the road network. In particular, we would recommend five schemes for further detailed study; these are set out in the table below and their locations indicated on Figure 6.6.

Table 6.6: Proposed Local Road Schemes

Scheme	Details
Western Access from the Cherryhound interchange to the airport	East-west connection to north of the airport to facilitate western access to the existing and proposed terminal buildings and relieve sections of the M50/M1 to the south and east, plus possible realignment of local roads to connect to R132 and airport
New East-West link road east of Turnapin	New local connection from R132 Old Swords Road via Belcamp to meet R107 Malahide Road south of Balgriffin.
N32 east of Turnapin Interchange to R107 Balgriffin junction	Upgrading of single carriageway depending upon level of development.
R122 Clonshaugh Road	Realignment and upgrading from N32 to Cloghran R132
R108 north of Ballymun Interchange branching east and west along the southern boundary of the DAA	Upgrading of single carriageway and possible minor realignment south.

6.8.6 Western Access to Dublin Airport

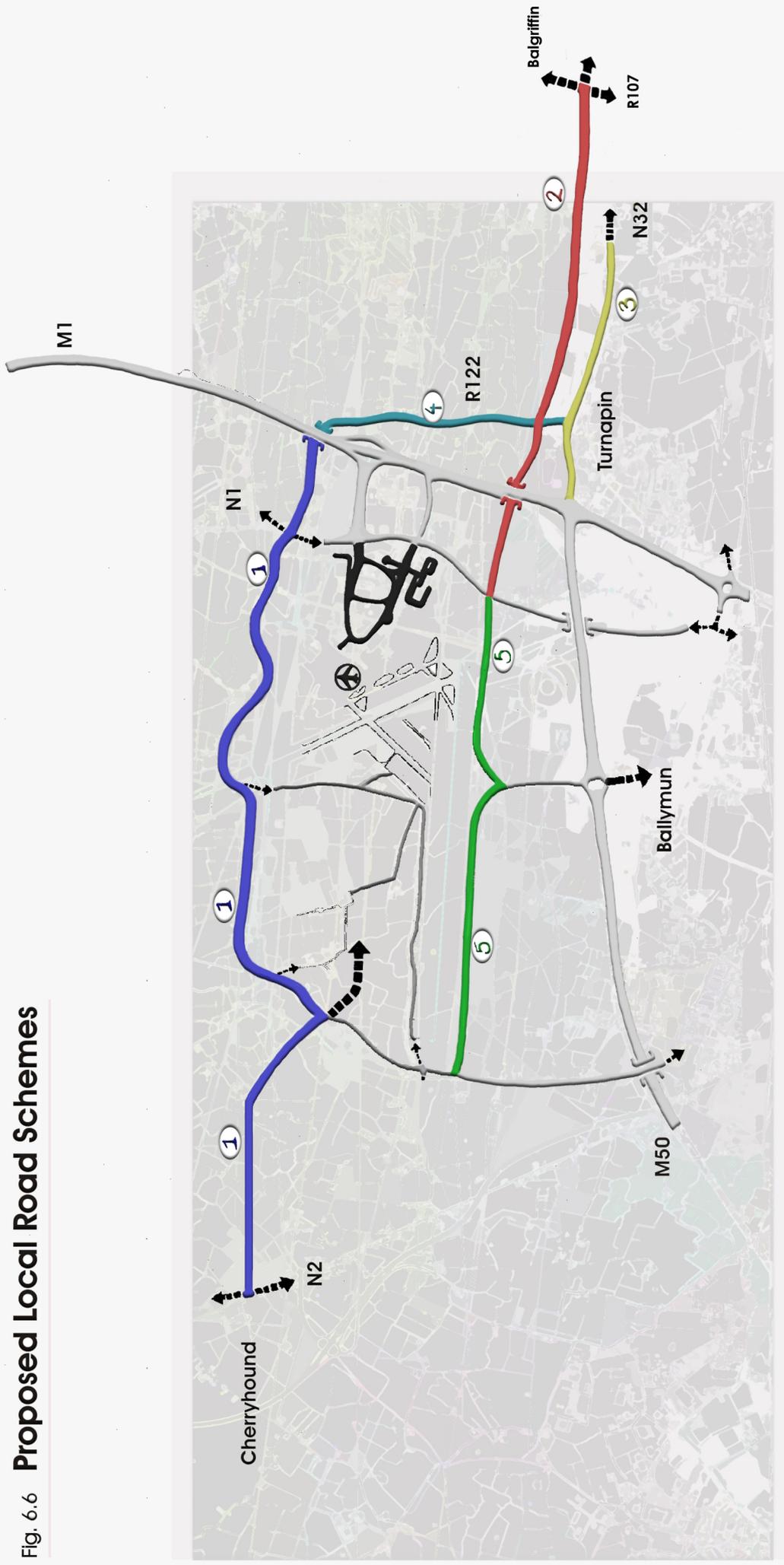
Objective (a) at paragraph 6.8.5 above focuses on the need for additional access to the Airport. The SATURN model indicates that that this access will be required by 2006 in order to dissipate airport traffic and relieve traffic congestion on the wider road network and the M50 between Junctions 4 and 3. With delays looking likely to the construction of the Metro line to the airport, SATURN modelling suggests the provision of this access is crucial to the future expansion of the airport.

It is most unusual for an airport of the size to which Dublin airport is expected to grow to be limited to one main point of access. In the medium to long term, in order to properly facilitate a western access, early consideration should be given to the construction of improved links between the N3, N2 and N1/M1. This essentially means an east-west connection to the north of the airport. Such a connection also has the potential to relieve key sections of the M50 and M1 to the east and south of the airport. In particular, it would enable vehicles from most destinations to access the airport via the western access without the need to utilise the critical Finglas to Turnapin section of the M50.

In the short term, it may however be possible to facilitate a western access by utilising the existing local roads (R108) and construction of a new link from the Cherryhound interchange. Figure 6.6 shows how such an arrangement might be achieved. The precise alignment of any new route would need to satisfy the safety zone/clearance requirements for the proposed second runway.

The new link could extend eastwards from Cherryhound Interchange to a new roundabout on the Forrest Road to the north of St Margaret's village. The roundabout would connect southwards via the R122 and R108 to the M50 at Ballymun. Access to the airport could be achieved via a second roundabout on the R122 at St Margaret's. In addition, the alignment of the Forrest Road could be improved as shown indicatively on Figure 6.6.

Fig. 6.6 Proposed Local Road Schemes



- 1** East-West connection to North of the airport to facilitate western access to the existing and proposed terminal buildings and relieve sections of the M50/M1 to the south and east, plus possible realignment of the local roads to connect to N1 and airport.
- 2** New local connection from R132 Old Swords Road via Belcamp to meet R107 Malahide Road south of Balgriffin.
- 3** Upgrading of single carriageway depending upon level of development
- 4** Realignment and upgrading from N32 to Cloghan N1
- 5** Upgrading and possible minor realignment south.

Such an arrangement would effectively provide three routes to the airport from the major road network to the new western access: from the M50 Ballymun interchange, from Cherryhound interchange and from the Cloghran roundabout.

However, in the long term, the local road network is not best suited to the levels of traffic likely to be attracted to the western access. Furthermore, traffic emanating from the Cloghran roundabout will need to pass either through the airport roundabout or the town of Swords. The capacity for such an arrangement would be limited, and a high standard connection between the N1/M1 should remain a key longer-term requirement. Such a route could connect to the M1 Drinan interchange. The design would have to be modified in order to provide north-facing sliproads.

6.8.7 Separate local road network: new east/west link

Objective (b), at 6.8.5 above, stresses the need to provide a functioning local distributor system which does not rely, in particular, on critical junctions dominated by strategic through movement. The concept is of a linked series of upgraded local roads, crossing the M1 (north of Turnapin) without a junction, and only linking to the M50 at the existing Ballymun interchange, other crossings being without connection. A key element in this would be a new 'East-West Distributor Road', roughly parallel to the existing N32, from Malahide Road (R107) south of Balgriffin, through Belcamp and Clonshaugh to join the Old Swords Road (R132) at or near the Collinstown Lane junction. It would divert traffic away from the N32 and the critical M1/M50 Turnapin interchange, provide capacity for new development on zoned land along the alignment, and enable a continuous bus corridor to be provided between Baldoyle and the airport. A consultants' study for the County Council has examined possible alignments and assessed traffic impacts, including those associated with release of the zoned lands for development. This present study does not show (Fig 6.6) a specific alignment, but recommends that the route should be kept as far south as practicable in order to minimise impact on Green Belt, and should be integrated into the development of the zoned lands it helps release.

The development of these industrial zones north of the N32 has the potential to contribute significantly to traffic flows on the N32, M1 and M50. In addition, development outlined in the Dublin North Fringe Transportation Framework Study (NFTFS), which addresses the area to the north of Baldoyle, will also generate significant extra traffic flows. The NFTFS relies heavily on improvements to public transport including the Quality Bus Corridors and improvements to the rolling stock on the Drogheda rail line south of Malahide. Should development progress in advance of these public transport improvements, there is a risk that the highway network will become seriously congested. Furthermore, should highway improvements be implemented in advance of public transport improvements, road travel is likely to become the established travel pattern in the area and encouraging subsequent modal shift could prove difficult.

6.8.8 Local road network: N32 East of Turnapin interchange

The Transportation Framework Plan prepared by the Atkins consultancy for the County Council also includes a proposal to upgrade the N32 to dual 2-lane east of the Turnapin interchange. Traffic on the N32 increased by 40% in just 5 years to 2003, and although constructed only recently the N32 is a single carriageway road that acts principally as a distributor road to the residential areas of north east Dublin. The addition of further employment related traffic, subject to further traffic assessment work, would be likely to

justify such an improvement. Planning permission for the development of the zoned lands and their access arrangements should be withheld until traffic implications have been assessed by in relation to the potential capacity and delivery dates for improvements to the N32 and the East – West link.

6.8.9 Local Road Network: R122 Clonshaugh Road

To facilitate local access it is recommended that consideration be given to upgrading Clonshaugh Road linking the N32 with the N1 at Cloghran junction. This would help facilitate local access to the industrial areas without the need to use the N32 and Turnapin junction, and forms part of the package of local network creation.

6.8.10 Local Road Network: R108 North of Ballymun Interchange/Collinstown Lane

The fourth element in the concept of the separate local network carries it to the west of Old Swords Road and south of the airport. The existing R108 connects north from Ballymun through the M50 junction and then serves the mixture of low-density uses south of the airport and linking west towards St. Margaret's and (eventually) Cherryhound. This is potentially an important series of connections; it also serves the potential development area between the M50 and the Designated Airport Area. This is proposed to be handled very restrictively unless and until the additional capacity expected by the provision of the Metro is available, and indeed some of it may retain its greenbelt / rural status indefinitely. However, it also includes a number of zonings that are likely to be net generators of traffic. These include areas for general industrial development and potential enhancement of existing industrial areas. In the longer term, with the introduction of Metro, the area immediately to the north of the Ballymun interchange could become a potential public transport and development node.

Depending on the level of development proposed, it is likely that the existing single carriageway route - linking northwards from Ballymun interchange and then forking east towards St Margaret's and west towards Collinstown Lane along the southern boundary of the DAA - may need to be upgraded locally to dual carriageway standard. Part of this route is owned by Aer Rianta, and could be affected by cargo terminal proposals and realignment of aircraft taxiways along the southern boundary of the airport. It would be appropriate that any highway improvements are co-ordinated with such works if they proceed. As a minimum, any realignment of the R108 and Collinstown Lane should make provision for future dualling.

Further traffic assessments will be required in order to determine whether dual carriageway provision is justified at this location. Development should be restricted until transport improvements capable of accommodating the new development have been implemented.

6.8.11 Development and the Road Capacity

It is clear from the data obtained from the DTO's SATURN model that much of the local and regional highway network is operating at or beyond capacity and that significant improvements, both to the highway infrastructure and public transport network will be required to address forecast increases in traffic up to 2016. To minimise capacity problems in the interim, it is essential that development of zoned sites progresses in

parallel with improvements to infrastructure rather than in advance. For this reason development of zoned lands should not progress until it can be demonstrated by developers that sufficient transport infrastructure is in place to accommodate the development without introducing unacceptable travel impacts.

Furthermore, given the importance of Dublin Airport to the local economy, it is essential that such capacity that exists in the transport and road infrastructure should be allocated first and foremost to future development of the airport. This will mean that development should be prioritised, in order to minimise any detrimental impacts from non-airport related projects.