

14 EWAY - Qualitative Option Appraisal

14.1 Overview

- The EWAY rapid transit scheme options have been assessed against central government's transport criteria – environment, safety, accessibility, economic and integration. Each of the EWAY route and technology options have been assessed against a do-minimum scenario which would include the continuation of the existing Metro bus service along Upper Newtownards Road. The results are presented in an Appraisal Summary Table.
- The Guidance on the Methodology for Multi-Modal Studies (GOMMMS) also specifies three important Supporting Analyses to supplement the Appraisal Summary Table. As a result, a high level assessment of the distribution and equity impacts; affordability and the financial sustainability of the scheme; and practicality and public acceptability issues for the scheme options have also been carried out.

14.2 Introduction

It is often difficult to apply a monetary value to some of the costs and benefits associated with each of the options. These non-monetary costs and benefits should not be discounted as being any less important than the monetary values, indeed in many cases they are crucial in the decision making process. Therefore a suitable method of evaluating these non-monetary factors must be applied.

Throughout the New Approach to Appraisal (NATA) process the Government's five objectives for transport as outlined in the White Paper are central to the rapid transit proposals for BMA. These include:

- Environment.
- Safety;
- Accessibility;
- Integration; and
- Economy.

Each of the central government objectives are looked at in turn in relation to the proposed EWAY rapid transit options. The appraisal process is also in line with the approach used in the appraisal of transport schemes in detailed in the DfT Transport Analysis Guidance Website – WebTAG Unit 3.5.4 – February 2006.

14.3 Environment Objective

The Environment objective considers the general environmental impacts of the scheme proposals under a total of 10 headings. These are outlined in detail below. At this stage in the assessment only published information relating to the scheme proposals has been examined. The following sources of information have been used:

- Draft Belfast Metropolitan Area Plan (BMAP);
- Environment and Heritage Service (EHS) Designations; and
- EHS Monuments and Buildings Record Search.

14.3.1 Noise

The EWAY proposals on the on-street sections within Belfast city centre and other roads are assumed to make no significant difference to the noise climate in neighbouring areas. The existing roads are all heavily trafficked and include a significant proportion of buses. In the longer term, the successful implementation of the EWAY proposals will result in an increase in buses (or LRT vehicles, depending on the option chosen) and a reduction in private cars. The overall scale of change is likely to be much less than the 30% change in traffic flows generally regarded as necessary to give rise to a perceptible change in noise levels. In the longer term a benefit in terms of reduced noise can be anticipated. However, even if this is perceptible, it is unlikely to be of more than slight positive significance. However, LRT vehicles, which are electrically propelled, are likely to have a slight beneficial impact on noise levels compared to a bus-based solution. Other environmentally friendly solutions may include the use of hybrid BRT vehicles or use of overhead power lines. (See Chapter 4 for further details on BRT vehicles).

For the off-street segregated alignment along the disused railway corridor, the number of dwellings within 50 metres of the route has been counted between Dee Street and the Comber Road. The anticipated noise effects for each part of this section are summarised in Table 14.1 overleaf. The assumption is that, even where EWAY runs on embankment, it is not likely to result in any significance effects beyond 50 metres from the EWAY centre line. In aggregate, the noise effects of this section are considered to be from slight to moderate adverse significance.

For EWAY route options 1 and 3, between Comber Road and Upper Newtownards Road, EWAY will run through open countryside. Existing noise levels will be low, except near Comber Road and Upper Newtownards Road which are both heavily trafficked roads. The change in noise levels will be moderate given that at this point EWAY will be open to all traffic.

Table 14.1 Houses within 50 metres of the EWAY segregated route

Section	No. of houses within 50m of EWAY alignment	Description of impacts	Significance of effects
Dee Street to Hollywood Arches	75	At grade giving some increase in noise levels away from Hollywood Arches and Beersbridge Road where there is existing traffic.	Moderate adverse
Hollywood Arches to Beersbridge Road	164	At grade giving some increase in noise levels away from Hollywood Arches and Beersbridge Road where there is existing traffic.	Moderate adverse
Beersbridge Road to North Road	65	Mainly in cutting with minimal noise impacts except for the dwellings closest to Beersbridge Road where EWAY would be at grade.	Slight adverse
North Road to Sandown Road	151	Mainly in cutting with minimal noise impacts except for the dwellings closest to Sandown Road where EWAY would be at grade.	Moderate adverse
Sandown Road to Knock Road	25	Mainly on embankment with moderate to high noise impacts except for the dwellings close to Knock Road where noise from existing traffic will be high.	Slight adverse
Knock Road to Kings Road	19	Partly on slight embankment with moderate noise impacts except for the dwellings closest to Knock Road where noise from existing traffic will be high.	Slight adverse
Kings Road to East Link Road	279	Where in cutting noise likely to be low beyond edge of cutting. On embankment across Knock River valley and west of cemetery with moderate noise impacts.	Moderate adverse
East Link Road to Comber Road	86	Partly on slight embankment with moderate noise impacts except for the dwellings closest to East Link Road and Comber Road where there will be noise from existing roads.	Slight adverse

14.3.2 Local Air Quality

The EWAY proposals on the on-street sections within Belfast city centre and other roads are assumed to make no significant difference to air quality in the neighbouring areas. The existing roads are all heavily trafficked and include a significant proportion of buses. In the longer term, the successful implementation of the EWAY proposals will result in an increase in buses (or LRT vehicles, depending on the option chosen) and a reduction in private cars. The overall scale of change is likely to be small, but it is likely to be of slight positive significance for local air quality.

For the off-street segregated alignment along the disused railway corridor, the EWAY proposals are again anticipated to make no significant difference to air quality in the neighbouring areas. The Upper Newtownards Road is heavily trafficked and there may be some reduction in both buses and other traffic. Any benefit to air quality will be partly offset by traffic on EWAY. In the longer term, the successful implementation of the EWAY proposal should result in an overall benefit to air quality if any increase in public transport is more than offset by a reduction in private car traffic. The overall change is likely to be small but it is likely to be of slight positive significance for local air quality.

It should be noted that it is difficult at this stage to assess whether the introduction of cleaner technology will produce a significant difference in air quality with the introduction of the EWAY rapid transit options compared to a do-minimum scenario which includes a Metro service.

Translink is currently specifying Euro 4 exhaust emissions requirements for all vehicle deliveries in 2007 and 2008. They will be required to specify Euro 5 emissions requirements for all vehicle deliveries after 2009 which could include any vehicles used for the do-minimum EWAY service. The use of Euro 5 vehicles is likely to significantly reduce exhaust emissions. Translink have also completed a trial for the use of bio diesel fuel and have introduced a number of more environmentally friendly vehicles into the Metro service for use in Belfast city centre. Without having any detailed information on the type of fuel / technology to be used as part of a BRT system, it is not possible to identify any additional benefits other than those outlined above.

With regard to LRT vehicles, which are electrically propelled, these are likely to have a slight beneficial impact on air quality levels compared to a bus-based solution but only if the electricity source is from renewable energy sources.

However, diesel-electric hybrid or gas-powered vehicles also reduce emissions at the point of delivery and reduce noise levels, while trials of hydrogen-powered fuel-cell electric buses are showing promising results without the need for expensive infrastructure. All are more expensive technologies and while gas-powered and hybrid buses are working in Continental Europe and America, there have been technology problems with them in the UK. However, with announcements of new hybrid designs at Eurobus Expo in November 2006 the hybrid era may just be beginning in the UK. Wrightbus hybrid vehicles are currently being trailed in London.

14.3.3 Greenhouse Gases

Encouraging more people to use public transport, rather than private cars, is expected to help reduce greenhouse gases. The provision of park-and-ride proposals should encourage commuters to use the rapid transit service over the private car. It is therefore expected that this

will help to reduce congestion on roads elsewhere and hence reduce the level of greenhouse gases produced.

14.3.4 Landscape

Within Belfast city centre streets and other streets, the proposed EWAY rapid transit route is within an urban context and no changes to the landscape would result. However, where the route of the rapid transit leaves the Upper Newtownards Road and passes onto the route of the former railway, the open space area behind Ravenscroft Avenue would require removal of much of the new and naturalised planting that now constitutes the Beersbridge Nature Walk. Through Bloomfield and Knock the route is generally in cutting and removal of some of the trees and scrub planting will be required for trackside safety and for the creation of pedestrian access points. The removal of trees and scrub and the loss of the nature walkway will have a negative impact on the landscape resource and character of the area.

Along the nature walk the introduction of the rapid transit route, the removal of many trees and the introduction of night time lighting at stops and pedestrian access points will alter the visual amenity of the area. This may cause a degree of visual impact for properties currently screened by the planting which will now have a view down into the route and will experience glare from the new lighting source.

For EWAY route options 1 and 3, as the route passes into the rural areas prior to re-emerging with the Upper Newtownards Road, areas of undisturbed agricultural land will be affected. The landscape of this eastern part of the route is generally rolling, with fields bounded by mature hedgerow. The cut and fill process for the construction of the route may result in the lowering of the landscape in this rural setting. However, this land is currently zoned for housing development which will also affect the landscape of this area.

Taking into account the landscape designations outlined in the draft BMAP, the EWAY proposals will impinge on the Dundonald Leisure Park, the Dundonald Urban Landscape Wedge and the Newtownards Rural Landscape Wedge. The proposals will also impinge on the Moat / Enler and Cherryvalley Local Landscape Policy Areas.

Overall, EWAY route options 1 and 3 are expected to have a large adverse effect on landscape. EWAY route options 2 and 4 are expected to have a moderate adverse effect on landscape.

14.3.5 Townscape

Through the city centre, the EWAY proposals will pass through a range of landscape character zones including areas of architectural and historical character, conservation zones and the waterfront / riverside amenity area. The existing streetscape in these designated areas reflect the themes for which they are important i.e. the conservation areas have period style street furniture and small scale stone sets whilst the water edge areas include artefacts from the former industrial / quay side uses. The existing planting is limited to on-street tree planting. It is assumed that the rapid transit route will run on-street within the existing highway boundaries and therefore no widening of the carriageway will be required except possibly at localised sites to accommodate turning radii. Therefore the impact on existing street trees is expected to be minimal. Within the urban area of the city centre, the introduction of the rapid transit scheme will bring a new modern and dynamic visual element into the area. New shelters, signage and street furniture designed to be in character with Belfast city centre will enhance the visual quality of the town centre.

Outside of the city centre, along Albertbridge Road (Routes 1 and 2) as well as along Sydenham Road (Routes 3 and 4), the wide road corridors dominate the character of the routes. The existing routes are of low townscape quality – there are limited areas of open space, no mature streets and few buildings of architectural merit. The rapid transit scheme will introduce a new range of street furniture which may enhance the streetscape.

Taking into account the townscape designations outlined in the draft BMAP, the EWAY proposals will impinge on the Kings Road, Cyprus Avenue, Belfast City Centre and Line Conservation Areas. The proposals will also impinge on the Ravenscroft Avenue, Templemore Avenue, Victoria Street / Oxford Street, Holland Park, Sandford Avenue / Sunbury Avenue and Hollywood Arches Areas of Townscape Character.

Overall the rapid transit proposals are expected to have a slight beneficial effect on townscape.

14.3.6 Heritage of historic resources

For the purposes of this assessment, a high level review was undertaken on cultural heritage within the study area which includes known / unknown archaeology, buildings of historic and archaeological interest and industrial archaeology. A search of the Environment and Heritage Service (EHS) Monuments and Buildings Record (MBR) was conducted as part of this investigation.

There are a number of sites of historical significance close to the scheme including industrial and archaeological sites and listed buildings but it is not expected that these would be directly impinged upon by the scheme. However, their presence does suggest that where land affected by the scheme has not previously been disturbed, the potential for finding remains is high. An exception to this would be the Albert Bridge (Routes 1 and 2) which is identified on the listed buildings register. Along the old railway line there are a significant number of sites of industrial significance in relation to the railway which may however be directly impacted upon.

14.3.7 Biodiversity

A high level review was undertaken to identify features of biodiversity in close proximity to the scheme. A review was undertaken of the biodiversity features identified in the draft BMAP as well as EHS's designations for Areas of Special Scientific Interest, Special Protection Areas, Special Areas of Conservation, National Nature Reserves and Ramsar Sites.

In terms of the natural environment, the middle and outer sections of the route will have greater implications in terms of negative effects due to the current undeveloped nature of the area. This relates to the potential loss of hedgerows and mature trees. In addition, the disused railway line has now evolved into a useful habitat and wildlife corridor.

An examination of the EHS records determined that there are no designations in close proximity to the EWAY proposals. However there are a number of designations outlined in the draft BMAP relating to biodiversity which includes the Dundonald old railway line Site of Local Nature Conservation Importance (SLNCI). This is a species rich waste land beside the old railway line with scattered willow and scrub and marshy grassland. The old railway has a hedgerow dominated by hawthorn and ash and continues over East Link Road towards an old quarry area. The woodland in this area has more scrub and is beside a stand of mature broadleaf trees with occasional patches of good ground flora. The site also has ornithological interest. An area with recently planted broadleaf trees is included in the site.

14.3.8 Water Environment

Where the proposed EWAY rapid transit scheme runs through the city centre, it is not anticipated that there would be a risk to the water environment. Outside of the city centre, the potential exists for the increased risk of pollution to water courses in the area as a result of construction and operational activities. The watercourse that would be at most risk is the Enler River. Bridge works would be required which would further heighten the risk during the construction phase especially, due to potential increased siltation or spillages of cement that can result in fish mortalities. Bridges can also affect stream hydrology and geomorphology.

The watercourses that would be affected by the EWAY proposals include Ballyoran Stream, Millmount Stream, Ferndene / Newline Stream, Enler River, Quarry Stream, Ardarra Avenue Stream, Dundonald River Extension, Knock River, River Lagan and Conns Water.

14.3.9 Physical Fitness

The key objective of this sub-objective is the contribution of the proposed scheme to overall health by increasing levels of physical activity. People switching from car to public transport would achieve the recommended minimum distance/time to obtain significant fitness benefits. In this regard, the proposed rapid transit scheme is likely to lead to a positive impact on physical fitness.

The EWAY proposals will directly impact on the Comber Greenway, which is a 7 mile traffic free section of the National Cycle Network being developed by Sustrans along the old Belfast to Comber railway line. The scheme is due for completion in September 2008 but is has already included resurfacing of the pedestrian/cycle walkway as well as the installation of toucan crossings at major road intersections. In order to maintain access to the pedestrian / cycle way and to continue to improve physical fitness, the EWAY scheme will need to maintain these facilities.

14.3.10 Journey Ambience

A prime objective of EWAY is to improve the quality of the travellers' experience. For users of EWAY, this will clearly improve substantially. Modern vehicle designs with good heating, ventilation, seating, luggage space and ride quality would improve traveller care and the provision of better travel information, including real time public transport information, would reduce stress for travellers. Passengers would also benefit from new and better designed waiting and boarding facilities and from vehicles giving a less stressful, smoother journey.

However, for existing users of the Bloomfield Walkway, Beersbridge Nature Walk, Knock Nature Walk and the Belfast to Comber Greenway, slight adverse effects can be anticipated.

14.4 Safety objective

Within GOMMMS there are two sub-objectives under the safety heading: Accidents and Security. These are dealt with separately below.

14.4.1 Accidents

In calculating the present value of benefits relating to accidents, the key quantitative indicators for the assessment of proposals are the number of accidents and the number of casualties.

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Combining these numbers with values for the prevention of accidents provides a monetary estimate of the overall accident benefit of a scheme.

Three main groups of transport user will benefit from changing transport mode to rapid transit services:

- Those car users who transfer from cars who benefit from switching to a safer mode than previously used;
- Those car users who continue to use the car but whose accident risk is reduced as a result of reduced road traffic levels; and
- Pedestrians and cyclists who will benefit due to reduced car traffic.

The assessment considers rapid transit user accidents only and is based on the change in vehicle kilometres between the do-minimum and do-something scenarios.

The transportation modelling undertaken calculates the vehicle kilometres saved across the network between the do-minimum and do-something scenarios. The rapid transit options were seen to have little impact on the overall vehicle kilometres travelled (less than 2% change) therefore the impact on safety is seen as neutral.

The provision of dedicated lanes that allow the segregation of rapid transit vehicles from other traffic and from pedestrians increases the level of safety and decreases the probability and severity of collisions by rapid transit vehicles. In addition, guidance technologies for buses which are incorporated into the running ways allow vehicles to follow a specified path along the running way and in approaches to stations thereby avoiding collisions while maintaining close tolerances.

14.4.2 Security

Passenger's perceptions of their personal security can be a key influence on whether people choose to use public transport. Perceptions of insecurity can impact disproportionately on particular users at particular times of day. For example, vulnerable users (such as unaccompanied females or the elderly) may be more concerned about personal security during hours of darkness.

For public transport passengers, the DTLR (formerly the DETR) Mobility Unit has produced best practice guidelines for railway stations and public transport operators. This raises a number of key security issues and gives guidance on design and management practices and this document will be referred to in detailed design. Although security issues have not been considered in detail at this stage in the assessment process, it is recommended that the following items are considered:

- Effective CCTV system in place designed to encourage staff surveillance and group passengers;
- Passenger information and good lighting at stops and accesses to stops;
- The provision of facilities to ensure that the driver can see the inside of the vehicle;
- Two-way communications between the vehicle driver and the control centre; and
- Good provision of emergency phones, help points, public telephones and information on emergency help procedure.

14.5 Accessibility Objective

The total accessibility benefits are captured effectively by the user benefits included in the economic appraisal. The accessibility objective is therefore limited to the following three sub-objectives:

- Option Values;
- Severance; and
- Access to the Transport System.

Each of these is outlined in more detail in the following sections.

14.5.1 Option Values

Option Values are associated with the unexpected use of a transport facility which is not built into the forecasts produced by the modelling stage, and which would otherwise not appear in the appraisal as a benefit. Hence, option values are, to some degree, a measure of the individual's attitude to uncertainty, in that it represents the amount that a person is willing to pay to have the option of using the rapid transit facility at some unknown point in the future.

Option values are related to the size of the community that is likely to be affected by the introduction (or removal) of a service. Since the introduction of a rapid transit network between Belfast city centre and Dundonald is likely to affect a large community greater than 2,000 people, then it is possible that the magnitude of the impact of the introduction of this proposal could be deemed to be 'strongly beneficial', according to the definitions set out in GOMMMS (WebTAG Unit 3.6.1).

14.5.2 Severance

The severance sub-objective is used to measure the extent to which the rapid transit scheme reduces the level of hindrance experience by pedestrians.

The infrastructure associated with different types of rapid transit technology can result in varying degrees of severance depending on the location. For example, a guideway with high kerbs could have a significant adverse effect on pedestrian movements in a busy shopping district.

The introduction of a rapid transit service in Belfast city centre could result in an increase in severance due to the introduction of additional public transport vehicles but this is likely to be offset by the implementation of traffic management measures and pedestrian priority measures through the BMTP City Centre Traffic Management and Public Realm proposals. The EWAY rapid transit route will run alongside a number of Quality Walking Network including Belfast city centre streets. For EWAY route options 1 and 2, this also includes East Bridge Street and Albertbridge Road. For EWAY route options 3 and 4, this also includes Queen Elizabeth and Queens Bridges; Queens Quay and Sydenham Road. For the inner and middle section along the disused railway line, this also runs along the Beersbridge, Bloomfield and Knock Nature Walks as well as the Belfast – Comber Greenway and National Cycle Route as well as the proposed Connswater Community Greenway project. It will therefore be important to consider improved facilities for pedestrians, including crossing facilities, as part of the detailed design process. The ability to integrate the design of the alignment within the EWAY detailed design proposals will reduce the likely level of severance.

14.5.3 Access to the Transport System

Access to the transport system is influenced by a number of factors, including the availability of a car. However, aspects of the proposed public transport service should also be considered. With respect to the service frequency, the development of a new public transport corridor would enlarge the catchment area of public transport and the travel speeds for public transport users will improve significantly as the segregated sections will reduce public transport journey times. The general quality of the service is also expected to increase, with new halts and vehicles providing greater levels of comfort and convenience. In addition, the introduction of new, modern low floor vehicles (which comply with current government guidelines) may also help to improve access to the transport system for disabled users.

For route options 3 and 4, the introduction of a new and direct public transport service between East Belfast and Titanic Quarter would facilitate access to the public transport system for car users and non-car users in an area which currently has only a limited bus service and therefore it would have a beneficial impact.

14.6 Integration objective

14.6.1 Policy

The policy context for the development of rapid transit in Belfast is well defined. The Regional Development Strategy (RDS) outlines a transportation vision for Northern Ireland to “*have a modern, sustainable, safe transportation vision which benefits society, the economy and the environment and which actively contributes to social inclusion and everyone’s quality of life*”. The RDS identified that if this vision was to be achieved it would be important to improve public transport services in the Belfast Metropolitan Area and it made such improvements a Strategic Planning Guideline. RDS stated that if public transport was to become a real alternative to using the car then these improvements needed to be substantial and it recognised the high quality, high capacity, accessible services that could be provided by the development of a rapid transit network for Belfast.

The Regional Transportation Strategy (RTS) developed the transportation policy of RDS at a strategic level. It identified that the future development and prosperity of Northern Ireland depended on a step increase in the level of provision of transport infrastructure and services. The RTS did not include commitments on individual schemes; this was to be done through three Transport Plans. However, it did include an indicative future integrated public transport network for Belfast, incorporating a rapid transit system.

The Belfast Metropolitan Transport Plan (BMTP) is the Transport Plan for the delivery of the RTS in the Belfast Metropolitan Area (BMA). It went through a systematic process of problem identification, consultation, plan development and appraisal which included consideration of a wide range of public transport solutions in each of the BMA’s main transport corridors. The BMTP process identified that there were significant opportunities to substantially improve the quality and scope of public transport provision across the BMA.

The BMTP process included investigation of the role of different forms of public transport in each of the main transport corridors – termed Metropolitan Transport Corridors (MTCs) as per the RDS. It concluded that, longer term, there would be the demand for and opportunities to introduce rapid transit in most of the MTCs radiating out from Belfast city centre – complementing rather than replacing existing rail and bus services.

Analysis of value for money, needs and feasibility indicated that four main corridors should be considered first including EWAY, WWAY, CITI and SuperRoute. Of these options, the BMTP proposed that EWAY be considered as the priority – confirming the view set out in the Regional Transportation Strategy. This corridor offers very real opportunities in the form of a disused railway. It is also one of the Metropolitan Transport Corridors that is most constrained in terms of highway capacity and public transport options since it has no rail service.

The development of the EWAY rapid transit scheme also supports other Government policies such as:

- The Department of Culture, Arts and Leisure objective to foster a creative, informed and active lifestyle would be supported by measures to improve the accessibility of Belfast city centre and measures to improve accessibility by all modes of transport;
- The Department of Enterprise, Trade and Investment objective to encourage growth of the economy is supported by measures to improve accessibility to a Strategic Employment Location;
- The Department of the Environment objectives for the environment would be supported;
- The Department of Health, Social Services and Public Safety objectives to develop policies that will lead to good health and well-being would be supported by measures to improve public transport;
- The Department for Employment and Learning objectives promoting living standards and accessible employment would be supported by improvements to public transport;
- The Department for Social Development objectives to tackle disadvantage would be supported by measures to improve public transport.

14.6.2 Transport Interchange

The implementation of the EWAY rapid transit scheme would have a beneficial impact on transport interchange since it would facilitate improved interchange by the provision of quality waiting facilities and greatly improved public transport timetable and route information.

Operation and ease of use of the transport system will be improved both by creating new direct journey opportunities and by improving interchange between modes, facilitating a greater range of other movements. The rapid transit service will also provide new and improved interchange opportunities along the whole of the route.

With regard to specific routes, EWAY route options 1 and 2 which would utilise Albertbridge Road and East Bridge Street would have the added benefit of being able to interchange with the railway network at Central Station, which is not possible with EWAY route options 3 and 4. However, EWAY route options 3 and 4 are able to interchange with the proposed CITI rapid transit scheme at Titanic Quarter (providing a new and direct public transport link between East Belfast and Titanic Quarter) as well as the Laganside bus centre at the junction of Queens Square / Donegall Quay and Bridge End Station at Sydenham (using the railway bridge).

EWAY route options 1 and 3 will also interchange with the proposed park-and-ride site at Millmount. Should the preferred route for the outer section be along East Link Road / Upper Newtownards Road (EWAY route options 2 and 4) then it is recommended that a park-and-ride site is provided at the terminus in the vicinity of Quarry Corner.

In the case of bus-based rapid transit, existing bus services meeting the quality threshold may be able to utilise the rapid transit infrastructure along the length of the route which will minimise

the requirement for interchange and allow users of existing buses to derive benefit from the rapid transit network.

14.6.3 Land-use policy

The implementation of the EWAY rapid transit scheme supports the RDS's concept of urban hubs with public transport infrastructure, and a modern integrated transport system for the BMA. It also supports the draft BMAP land use strategy of:

- Improving accessibility to the major development locations and strategic employment locations identified in the RDS;
- Improving public transport accessibility within the Metropolitan Transport Corridors to support the focus of higher density development within these corridors;
- Facilitating the regeneration and environmental enhancement of specific sites and areas within the BMA; and
- Providing the level of accessibility required to support the expected future population and demographic characteristics of the BMA.

With regard to specific routes, the section of route which would utilise the disused railway line between Hollywood Arches and East Link Road is protected in the Belfast Urban Area Plan and proposed for continued protection under the draft BMAP. The majority of this route is also under the ownership of the Department. A protection line is also proposed for the new link road between East Link Road and Upper Newtownards Road at Quarry Corner and is incorporated into the masterplan for the Millmount development site.

However, the section of the route which would utilise the disused railway line between Hollywood Arches and Dee Street (EWAY route options 3 and 4) is not proposed for protection in the draft BMAP and an amendment may be required if this is deemed to be the preferred route. This land is currently under the ownership of a number of different landowners including the Department, Belfast City Council, The Education Board, the Health Board and Connswater Housing Association. A compulsory land purchase order may be needed to acquire this land.

14.7 Economic objective

14.7.1 Economic efficiency

The economic effects of the rapid transit network are largely quantifiable have been examined as part of the quantitative analysis completed in section 13. Transport Economic Efficiency has been estimated in terms of:

- User benefits related to travel time;
- Private sector provider impacts on the operating environment; and
- Public sector provider impacts on the public sector revenue (along side capital and operating costs).

Other government impacts have also been taken into consideration such as VAT and present value calculations have been estimated for both cost and benefit.

14.7.2 Reliability

This sub-objective summarises the rapid transit proposals' impact on the objective to improve journey time reliability for transport users, including both passengers and freight.

The rapid transit service should provide public transport users with an improved level of reliability due to the implementation of extensive public priority measures along the route and the provision of a regular 5 minute frequency.

14.7.3 Wider Economic Impacts

The appraisal shows that the EWAY rapid transit scheme will deliver good economic benefits. Key benefits include the facilitation of future development in and around East Belfast, by addressing the existing transport problems, which restrict the operation and growth of economically important areas. Links to key facilities and centres of employment such as Belfast city centre, Titanic Quarter (Routes 3 and 4 only), new BIFHE College (Routes 3 and 4 only), Dundonald Leisure Park & Eastpoint Development site, Millmount (Routes 1 and 3 only) and Ulster Hospital (Routes 2 and 4 only) and interchanges with existing public transport services will improve accessibility for existing residents as well as serving future development. Stops serving Holywood Arches and Dundonald will help to bring vitality to these areas, bringing indirect business benefits through improved access for customers, clients and employees.

Opportunities for employment will arise as a result of the proposals, particularly during construction of the rapid transit scheme. Although direct employment generation will be relatively low, staff and managers will be required at the park and ride sites. New driver jobs will be created, although a proportion of these may be diverted from existing bus services.

If the services are operated by a private operation, then increased competition and choice of services will improve overall standards of public transport in the area.

14.8 Supporting Analysis

The Guidance on the Methodology for Multi-Modal Studies (GOMMMS) specifies three important Supporting Analyses to supplement the Appraisal Summary Table. These require assessments to be made of the distribution and equity impacts; affordability and the financial sustainability of the scheme; and practicality and public acceptability issues.

14.8.1 Distribution & Equity

The Department for Regional Development is committed to the promotion of equality of opportunity, to tackling factors leading to social need and social exclusion and to promoting good relations between the communities in Northern Ireland. This Distribution and Equity supporting analysis considers the distribution of the overall impacts of the rapid transit scheme, thereby enabling a judgement to be made about the fairness of the impacts on those affected. This supporting analysis has been prepared in accordance with the principles underpinning Section 75 of the Northern Ireland Act 1998¹⁷ and the Department's commitments under the New Targeting Social Need policy.

¹⁷ Northern Ireland Act (1998), HMSO

14.8.1.1 Anti-Poverty and Social Inclusion

In line with the findings from the Regional Transportation Strategy, initiatives resulting in new or improved public transport services will contribute to the Government’s objective of working towards the elimination of poverty and social exclusion by 2020.

Analysis presented in the 2006 Translink Passenger Profile illustrates that public transport users are predominantly drawn from socio-economic groups that represent those in greatest need (see Table 13.2 below).

Table 13.2 – Public Transport Passengers by Socio-Economic Group

Socio-Economic Group	NIR	Metro	Ulsterbus
AB	29.5%	13.4%	16.9%
C1	28.9%	32%	30.4%
C2	21.4%	20.8%	20.8%
DE	20.2%	33.8%	31.9%
Customer Satisfaction Survey, PriceWaterhouseCoopers carried out on behalf of Translink, Spring & Autumn 2006.			

A total of 58.4% of rail passengers fall into the ABC1 Socio-economic Group compared to 45.2% of Ulsterbus passengers and 45.4% of Metro passengers. The socio-economic profile of public transport users clearly demonstrates that investment in these services targets resources at those in greatest social need. The lowest rate of public transport use (buses) is among the most affluent (AB) groups while the largest rate of bus users is among the poorest socio-economic (DE). The DE group also forms the largest single user group of Metro and Ulsterbus services with around a third of users coming from this group. When taken together with the C2 group, this accounts for over half the passengers of these services. Therefore, the proposed investment in public transport schemes, such as rapid transit, is particularly supportive of the objectives of New Targeting Social Need.

However, abstraction from existing bus services onto rapid transit services may be a cause for concern, as reduced bus passengers may require increased bus subsidy to maintain adequate existing services or a reduction in the services.

14.8.1.2 Contribution to Increasing Social Inclusion

The scheme proposals have a beneficial impact in promoting social inclusion. The provision of high standard low floor vehicles (BRT only) will enable improved accessibility to vehicles for those with disabilities, whilst older people on low incomes, who travel without charge, benefit from the introduction of a new public transport system.

Improvements in access to employment, leisure, education and shopping to groups who are currently poorly provided with public transport and have no access to a car will be provided. Public transport accessibility will be greatly improved for the communities along the route. The proposals will increase the range of transport choices, reduce journey times and improve journey time reliability.

14.8.1.3 Access to Employment

Some areas of higher than average unemployment (inner East Belfast) for Belfast will be connected with a major employment centre (Belfast City Centre), reducing the difficulties of

unemployed people gaining access to the workplace and overcoming social exclusion. The system will provide a sustainable mode of transport to a major new residential area within East Belfast (Millmount Village) which may include a proportion of affordable housing. The rapid transit scheme will provide a public transport link to employment opportunities for residents of this lower cost housing.

EWAY Route options 3 and 4 will also provide connection between East Belfast and the Titanic Quarter which will be a major new employment location in Belfast.

14.8.1.4 Access to Education

Access to educational institutions is an important service for public transport. In every one of the 17 electoral wards in East Belfast the percentage of the population that are full time students is less than the average for the Belfast Metropolitan Area (BMA). In over one third of the wards, the percentage is about half of the BMA average.

These are important figures in overcoming social exclusion. A good level of education is increasingly a key requirement in the workplace; particularly for better paid jobs. Access to educational institutions is an important service provided by public transport because many students, or potential students, rely upon it.

The development of a rapid transit route would therefore provide an important public transport link between East Belfast and colleges and universities.

Northern Ireland's third largest tertiary education institution, Belfast Metropolitan College, has announced plans to locate a new campus at Titanic Quarter. Good public transport links would encourage people from East Belfast to attend it; experience has shown that people from the lower socio-economic groups tend to prefer to study close to their home environment.

14.8.1.5 Access to Recreation and Tourism

Recreation and sports are increasingly important parts of people's lives and of the economy. The Dundonald Leisure Park is beside the old Comber Railway; the site includes an Olympic sized ice-rink and indoor bowling and there are proposals to extend the facilities. The new Eastpoint Entertainment Village (due to be completed in Autumn 2008) is also located beside the old Comber Railway beside the Dundonald Leisure Park.

Two of Northern Ireland's leading concert venues - the Odyssey and the Waterfront Hall are on potential routes for EWAY Options 3 and 4; the Odyssey is also home to the Belfast Giants Ice Hockey Team which attracts crowds of up to 7,500. The Oval football stadium which has a capacity of 15,000 is also close to potential EWAY routes although it should be noted that there is doubt about the long term future of the stadium at its present location.

The development of Titanic Quarter will include an international tourist attraction in the form of the Titanic Signature Project and the restoration of the Titanic and Olympic slipways, the Thompson Dock, and Harland and Wolff's former headquarters building.

14.8.2 Affordability and Financial Sustainability

Consideration must be given to the funding required to deliver the EWAY rapid transit proposals and the extent to which the proposals are sustainable in the longer term. Affordability is a measure of the likelihood that funds will be available to deliver the EWAY rapid transit

scheme. Financial sustainability is a measure of the extent to which the scheme can be financially supported. Issues of Affordability and Financial Sustainability are considered in more detail later in this report.

14.8.3 Practicality and Acceptability

Two important and interlinked considerations in developing the rapid transit proposals have been that:

- They must be practical i.e. the scheme must be capable of being implemented within the required timescales; and
- The scheme must have a high degree of acceptability among both the general public and the key stakeholder groups, including those who will be involved in the implementation of the scheme.

Each of these topics is discussed in more detail below.

14.8.3.1 Practicality

In assessing practicality, it has been necessary to consider the following issues that could hinder or block the implementation of the rapid transit scheme:

- Technical issues;
 - Legal issues;
 - Availability of funding and resources;
 - The need for enforcement of priority measures; and
 - Complementarity and conflicts.
- A comprehensive assessment of each of these issues is provided below.

Technical issues

Implementation of the rapid transit scheme is expected to involve the use of new and developing technology and could, therefore, present technical issues that would need to be resolved at the detailed design stage to allow full implementation of the scheme. Examples include:

- Using Information technology to detect rapid transit vehicles and give them priority at junctions;
- Using Information technology for enforcement;
- Using SMART cards (Self Monitoring Analysis and Reporting Technology) to implement fares;
- Using an Automatic Vehicle Location system (AVL) to provide real-time information to passengers on rapid transit vehicles and at stops and waiting areas;
- Using new methods of rapid transit route and timetable information for the management of the system and to provide information to customers e.g. internet; and
- Use of bus rapid transit guidance technology on segregated sections of the route.

The adoption of best practice within the industry should allow these and any additional technical issues to be resolved at the detailed design stage. It is considered that no elements of the rapid transit scheme should require technology which has not been used before and it should therefore not present insurmountable difficulties in this regard.

Legal issues

The implementation of elements of the rapid transit scheme will be subject to legislative constraints and regulation. While the requirements do not rule out the scheme, they could, in practice, delay implementation on the ground. These include the following:

- Changes to the Transport Act (NI) 1967 for new public transport services may be necessary;
- New rapid transit vehicles will have to satisfy accessibility regulations under the Disability Discrimination Act 1995;
- New legislation to enable the enforcement of shared bus/rapid transit lanes in non-segregated sections using camera technology;
- New legislation to enable rapid transit services to be delivered and/or operated by the private sector;
- Development of a rapid transit scheme that would require significant land-take would require Planning Approval or an Amendment to the Belfast Metropolitan Transport Plan;
- The implementation of the rapid transit may require an Environmental Impact Assessment under the Roads (NI) Order 1993;
- If third party land is required, the scheme may require a Vesting Order / Direction Order.

Availability of Funding and Resources

The Regional Transportation Strategy identifies rapid transit as one of the areas that has the greatest potential for private sector funding. The section on 'Affordability and Financial Sustainability' discusses the availability of funding in more detail.

There will be a need to provide professional resources in undertaking and developing the detailed design, procurement and implementation of the scheme proposals. In addition, the successful delivery of the rapid transit services will be dependent on the recruitment of additional operating staff. Recent experience has shown that such resources are not readily available.

Enforcement

Extensive use of shared bus/rapid transit priority measures and running on segregated sections will require rigid enforcement if rapid transit services are to operate effectively. This is expected to entail use of fixed and vehicle-mounted enforcement cameras on all rapid transit routes and an appropriately administered fine system to penalise offenders. Enforcement of shared bus / rapid transit priority measures would need to be tied in with parking controls and enforcement as necessary.

Complementarity and conflicts

The rapid transit scheme will need to be implemented in conjunction with traffic management measures, improved public transport interchange, park-and-ride, demand management and travel awareness campaigns.

14.8.3.2 Acceptability

Public acceptability for the rapid transit proposals can be demonstrated through:

- The Regional Transportation Strategy (RTS) and its comprehensive consultation process. Public acceptability was the primary reason for supplementing the RTS with additional initiatives including an additional £76million to provide £100million for rapid transit in Belfast;
- The Belfast Metropolitan Transport Plan (BMTP) Working Conference and the BMTP itself – a draft Preferred 2025 Strategy and an Emerging 2015 Plan were presented at the BMTP Working Conference on 10th February 2003. The conference was attended by over 200 delegates presenting a wide range of stakeholders. An independent report of the conference, produced by Community Technical Aid presented the views and comments expressed by the delegates regarding the Draft Preferred Strategy and Emerging Plan. Rapid transit was seen by delegates as a positive step forward to enhance public transport; and
- Political support – the rapid transit proposals are likely to receive broad political support from Belfast City Council and Castlereagh Borough Council as well as political parties and a number of Members of the Assembly.

14.9 Conclusion

The Appraisal Summary Table (AST) is a record of the degree to which the five Central Government objectives for transport (environment, safety, economy, accessibility and integration) would be achieved and provides a summary of the impact of the route options. Tabulated overleaf is a summary of the AST assessment scores for each sub-objective for the four options. A more detailed AST is included in Appendix J.

Table 14.2: Summary of AST Assessment Scores

	Sub-Objective	Route 1	Route 2	Route 3	Route 4
		BMTP	BMTP + East Link Road / Upper N'ards Road	BMTP + CITI	CITI + railway line + East Link Road / Upper N'ards Road
Environment	Noise	Slightly adverse	Slightly adverse	Slightly adverse	Slightly adverse
	Air Quality	Slightly beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial
	Greenhouse gases	Slightly beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial
	Landscape	Strong adverse	Moderate adverse	Strong adverse	Moderate adverse
	Townscape	Slightly beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial
	Heritage of historic resources	Neutral	Neutral	Neutral	Neutral
	Biodiversity	Strong adverse	Strong adverse	Strong adverse	Strong adverse
	Water environment	Slight adverse	Slight adverse	Slight adverse	Slight adverse
	Physical fitness	Slightly beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial
	Journey ambience	Slightly beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial
Safety	Accidents	Neutral	Neutral	Neutral	Neutral
	Security	Slightly beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial
Economy	Transport economic efficiency	LRT BCR = 0.5 (NPV = -£116.9m) BRT BCR = 1.2 (NPV = £19.9m)	LRT BCR = 0.3 (NPV = -£179.2m) BRT BCR = 1.6 (NPV = £32.27m)	LRT BCR = 0.4 (NPV = -£146.3m) BRT BCR = 2.1 (NPV = £95.3m)	LRT BCR = 0.5 (NPV = -£152.5m) BRT BCR = 2.5 (NPV = £79.8m)
	Reliability	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial
	Wider economic impacts	Moderately beneficial	Moderately beneficial	Strongly beneficial	Strongly beneficial
Accessibility	Option values	Strongly beneficial	Strongly beneficial	Strongly beneficial	Strongly beneficial
	Severance	Slightly adverse	Slightly adverse	Slightly adverse	Slightly adverse
	Access to the transport system	Moderately beneficial	Moderately beneficial	Strongly beneficial	Strongly beneficial
Integration	Transport interchange	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial
	Land use policy	Moderately beneficial	Moderately beneficial	Moderately beneficial	Moderately beneficial
	Other Government policies	Slightly beneficial	Slightly beneficial	Slightly beneficial	Slightly beneficial