Mid-West Area Strategic Plan

Public Transport Feasibility Study

June 2012
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Executive Summary

The Public Transport Feasibility Study (PTFS) forms an important part of the emerging Mid-West Area Strategic Plan and aims to achieve a mode shift from car to more sustainable modes, primarily public transport in its various forms. This is dependent on demand being generated for improved rail and bus services so that they can be viable operationally – a balance needs to be struck between the number of services available and the number of people using them.

The region is characterised by an extensive rural area with small settlements apart from the main urban areas of Limerick city, Shannon and Ennis. The PTFS aims to reconcile the different transport needs of the metropolitan population by improving accessibility and hence expanding opportunities for social inclusion and connectivity within the city and suburbs and improving links beyond.

The existing transport options have been reviewed and it is clear that bus, coach and rail currently form a very small proportion of total journeys, car being by far the most popular means of travel around the region. This suggests that major efforts will be required to create a transfer from car use to public transport. A number of possible improvements have been considered including the upgrading of rail services, the introduction of more and better buses and exploring the role of bus rapid transit (BRT) or quality bus corridors (QBCs) to provide high quality, frequent services between key locations but particularly for journeys to access employment opportunities.

The provision of a ‘big-ticket’ public transport facilities, like light rail, new heavy rail or high speed rail, are unlikely to be needed in the foreseeable long term (30 years) due to their high cost and the low number of users currently. However, the region still needs significant investment to deliver major public transport interchanges (urban bus/inter-urban coach and rail/inter-urban coach), three QBC/BRT lines and an extensive cycle network.

For the rural area, public transport is difficult to provide due to the low demand base and is inevitably costly given the dispersed population. One option is to further develop and pilot the role of rural taxi-bus services, linked with the main inter-urban bus corridors. Park and Ride could also have a role, primarily for Limerick metropolitan areas, by intercepting car journeys from the rural hinterland. In addition, smarter choice initiatives will contribute to a reduction in car use and supporting healthier communities through targeted investment.

Three different transportation scenarios have been considered based on a similar population growth to that outlined in the 2010-2022 Mid-West Regional Planning Guidelines. This includes focusing strong population and employment growth in Limerick.
City and the remaining dispersed across the region. In summary, the scenarios tested are as follows:

1. **Scenario 1 (Do Minimum)** – with no changes to the current transport provision;

2. **Scenario 2 (Do Something Low Cost)** – includes a wide range of transport improvements; and

3. **Scenario 3 (Do Something High Cost)** – includes a wide range of public transport and other initiatives in addition to those in Scenario 2.

In Scenario 2, improvements to the local bus network in Limerick city and demand responsive services in the rural area are suggested. To achieve the more significant mode shift outlined in Scenario 3, an extensive range of measures is proposed including major upgrading of public transport (both infrastructure and services), smarter choices initiatives and land use policies to avoid dispersed development plus investment in rural public transport. This can only be achieved with considerable investment over a longer term period. Modelling of a deliverable strategy combining Scenario 2 with the elements of Scenario 3 has been undertaken to assess the possible impacts. It is clear that with the proportion of public transport journeys being very low currently, creating a more sustainable balance between public and private transport will be very costly and will need to develop behavioural change over a considerable period.

The development of the strategy has been informed by the Strategic Environmental Assessment process. The parallel SEA process has been undertaken to ensure that the proposed MWASP strategies that are implemented will not have a significant negative effect on the receiving environment over the lifetime of the plan.
1. **Introduction**

1.1 **Background**

Mott MacDonald Ireland in association with sub-consultants McGill Planning and PriceWaterhouseCoopers were commissioned by Limerick City Council to develop a strategic Planning, Land Use and Transportation Strategy for the Mid-West of Ireland.

The lead authority for the study is Limerick City Council on behalf of the other three local authorities in the Region, namely Clare County Council, Limerick County Council and North Tipperary County Council along with their respective statutory councils contained therein.

This report can be read as a standalone report but also forms an appendix to the Mid-West Area Strategic Plan (MWASP). This report summarises the work undertaken for the Public Transport Feasibility Study (PTFS). A review of national, regional and local planning policy and existing transport conditions in the Mid-West region has been undertaken. Based on this review, the report sets out a framework for the development of public transport services and infrastructure, considered in tandem with smarter choices initiatives.

The overarching objective is to deliver modal shift from the car to more sustainable modes (public transport, walking and cycling) for journeys of all lengths throughout the region, with a target objective of 55% for the metropolitan area of Limerick and a marked change in the modal split for the other large towns in the region, including Shannon, Ennis, Nenagh, Roscrea, Newcastle West and Thurles.

1.2 **Study Approach**

Three scenarios have been assumed for the purposes of strategy development and the modelling of identified public transport, walking and cycling infrastructure and service measures. These scenarios are broadly as follows:

1. **Scenario 1 (Do Minimum)** – Forecast growth with no changes to the current transport provision.

2. **Do Something (Low Cost)** – this scenario uses the same population projections as scenario 1 above, but includes improvements to the public transport network as well as all road infrastructure that had sufficient detail to be modelled from County Development Plans and new roads proposed by the National Roads Authority.

3. **Do Something (High Cost)** – Scenario 3 is a list of additional measures added to Scenario 2. This scenario uses the same population projections as scenarios 1 and 2 above, but has been developed to achieve a significant growth in the use of more sustainable modes of transport and lessen car dependency. A range of public transport, smarter choices, land use and transport planning measures have been identified with the objective of taking a large step towards achieving the governments modal split target.

The following sections identify the approach to conducting the PTFS based on the three scenarios outlined above.
1.3 Consultation

A preliminary public consultation exercise was undertaken in October 2009, with the purpose of exploring local people’s perceptions and attitudes to current transport issues in the Mid-West region and to help develop a vision for the future. Four focus groups were conducted, in Limerick city, Ennis, Newcastle West and Nenagh.

The general consensus from the group discussions was that public transport is either unreliable or, in the case of rural areas, non-existent. However, participants discussed the impracticality of developing a regular and reliable public transport system – given the high cost, low demand, and wide area to be covered – but suggested that a demand responsive transport-type service could work.

The points made in relation to developing a 2030 vision for the Mid-West region included:

- Concentrating growth in Shannon and Limerick would put other towns at an economic disadvantage, although it was agreed that development should be focused on Shannon to safeguard the airport and bring about better job opportunities;

- A more integrated transport system is needed. Buses should be frequent, reliable, cheaper and reach a wide range of people. Rail services should support local areas better, have a link to Shannon airport and be cheaper;

- Integrated ticketing was also felt to be important. Park and Ride facilities would work as part of an effective traffic management programme; and

- Overall, all participants wanted growth to happen in the towns across the region as well as in Limerick, citing concerns about reduced quality of life from longer commuting distances as well as increased congestion in Limerick.

The development of the public transport strategy for the Mid-West has been shaped by the opinions expressed in the focus groups.
2. Setting the Scene

2.1 Urban and Regional Bus Services within Mid-West Region

2.1.1 Existing Bus Network

The majority of services in the region are operated by Bus Éireann, the state-controlled operator of buses across the country. Whilst a regular service operates in the main urban areas, the rural and commuter services are erratic with complex timetables that do not fully address main journey to work needs and, in the Limerick to Nenagh corridor, compete with rail services. Figure 2.1 shows the Limerick city network. There currently is no composite map of existing bus services in Limerick.

Figure 2.1: Limerick City Bus Services

Source: Derived from bus information at www.limerick.ie
While some of the built-up area around Limerick City is relatively well provided for by bus, others have less choice. The areas to the north and south of Ennis Road and to the south west of the city, for example, fall into this category. Only two urban bus services operate across the city centre, routes 302 and 305, both originating in the north-west. Other opportunities may exist to link routes and should be considered provided that reliability can be maintained through the central area. This can be assured by using priority measures which would create some efficiency savings.

2.2 Existing Bus Infrastructure

Bus passenger facilities in the main urban areas vary in quality. The key observations can be summarised as follows:

- the arrangements in Limerick city (and other boarding points) are somewhat confusing. Numerous layover and pick-up points exist with no apparent grouping of stops or services;
- in the central area of Limerick, the presence of buses and coaches which lay over presents an untidy appearance;
- the facility at Colbert Station for rail/bus or coach/bus interchange requires upgrading;
- in strong contrast to Limerick, the facilities in Ennis are good. The bus/coach station is again adjacent to the rail station but has a manned information point and space to support effective rail/bus, coach/bus and coach/taxi interchange;
- the disadvantage for passengers in Ennis is that the bus/coach station is a few minutes’ walk from the town centre and is not signed clearly;
- in Nenagh, bus stop facilities are basic and are absorbed into the town centre activities; and,
- as with Nenagh, the two bus stops in Roscrea do not stand out as a focus for local or inter-urban travel. This trend is mirrored across the region.

Information on services, timetables and fares is difficult to obtain. Limited website information is evident and for Limerick city, no single map shows all the routes. This makes it difficult for intending users to identify the services that could meet their needs (with the result that they do not use them). Although a journey planner is available that includes fares, a real time bus information system on the website does not include Limerick. At Shannon Airport, a number of coach services depart from stops close to the terminal building but facilities are basic. JJ Kavanagh operates regular coach services between Shannon Airport, Limerick city, Nenagh, Roscrea and Dublin Airport and real time updates are available via its website.

The only bus priority measures currently in situ in Limerick County Council are on the R526 St Nessans Road between Raheen Roundabout and Crescent Shopping Centre Roundabout and in Limerick City Council on, Ennis Road, Condell Road, Mulgrave Street, William Street. There is significant potential for reallocation of road space and enhanced urban design in Limerick city centre, to complement the Limerick Orbital Route one-way traffic management arrangements implemented during 2010. A more radical approach to bus priority could be pursued by excluding general traffic from some streets and dedicating them to buses, cyclists and pedestrians; other traffic would be re-routed to parallel streets. In Ennis, the narrow streets in the town centre preclude their use by buses but good walk links and signing to public transport stops would help to overcome this.

Shannon Airport is removed from the centre urban conurbation and coach services provide access beyond the region in the absence of a rail link. The distance to the main road network – around 5 km using

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1 www.buseireann.ie
2 www.jjkavanagh.ie
the N19 to the main M18 road – means that the market is confined to airport staff and passengers. The residential and employment areas of Shannon cannot be served easily by airport coaches and the markets are distinct. Air passenger growth has been in decline however freight by air is a growing market. The new terminal facility has a capacity for 4.5 million annual users, extensive car parking is available but site layout adds to journey time. Around 2,500 jobs are located at the airport while Shannon Free Zone employs around 9,000 (of which only 4% use buses); the residential area of Shannon Town has a population of around 9,000. The challenge is to make coach and bus services as attractive as car use but completion of new highway links will further encourage car use to access Shannon.

2.3 Rural Bus Services in Mid-West Region

In deeply rural areas the cost of providing conventional bus services can be prohibitively expensive due to low population densities and limited patronage. Rural communities are more reliant on private transport, with high levels of car ownership. However, for elderly or mobility impaired people and those on low incomes, access to private transport remains difficult.

The Government’s 1999 White Paper on Rural Development acknowledged the economic and social impacts of inadequate rural transport. It articulated a vision for rural society with an overall long-term objective of maintaining vibrant communities in rural areas; the availability of transport is a critical element in achieving this objective. The White Paper recommended the development of innovative approaches to rural transport provision and the Rural Transport Programme (RTP) commenced in 2006. Funded by the Department of Transport under the National Development Plan 2007-2013, the RTP has delivered rural public transport through 36 community based groups, including three in the Mid-West, each operating as ‘not-for-profit’ companies:

- **Clare Accessible Transport (CAT)** operates with Ennis as the principal hub with services to other service centres (e.g. Scarriff, Ennistymon, Kilrush, Gort) using six low floor fully accessible minibuses owned by CAT, as well as by a local private operator under contract. CAT is operated using an integrated model, with services providing access to a variety of purposes.

- **North Tipperary Rural Transport Programme** The North Tipperary LEADER Partnership (NTLP) operates 31 routes in four main areas (Borrisokane, Thurles, Boherlahan and Kilcommon-Uppercurch) on a flexible basis. Although services are open to all, there is a strong community element with 75% of journeys delivered on a door to door basis to assist elderly and mobility impaired users on a pre-booked basis.

- **Rural Bus (County Limerick and North Cork Transport Group Ltd)** operates in six distinct areas of County Limerick and North Cork, i.e. Newcastle West, Rathkeale, Bruff, Castleconnell, Kilmallock and North Cork. Rural Bus provides weekly services on various semi-fixed routes, collecting members from their homes.

The North Tipperary and Rural Bus community transport services operate on a ‘shared taxi’ basis, providing a service from door to door. These are fully demand-responsive services with prior booking essential. The CAT services operate on a semi-scheduled (i.e. partially demand responsive) basis, with published routes, stops and timetables but some diversions permitted. Tickets must be bought beforehand by registered CAT users, but prior booking is not essential.

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3 www.ruralbus.com
2.4 Current Bus Usage

2006 Census data indicates that the proportion of the number of journeys to work made by bus is relatively small, reflecting the largely rural travel patterns (see Table 2.1).

Table 2.1: Journeys to Work by Bus (means of travel by usual residence for persons aged 15 years and over)

<table>
<thead>
<tr>
<th>Bus Users</th>
<th>County Clare</th>
<th>Limerick City and County</th>
<th>County Tipperary</th>
<th>Mid-West Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of users</td>
<td>843</td>
<td>3222</td>
<td>766</td>
<td>4831</td>
</tr>
<tr>
<td>Per cent</td>
<td>1.7</td>
<td>4.1</td>
<td>1.2</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Source: CSO 2006.

Table 2.2 shows that the proportion of journeys to school made by bus is much higher than that for journeys to work. For students aged between 13 and 18, between 33% and 28% of journeys in the region are made by bus/minibus/coach. It is evident that although children are used to travelling by bus, they do not become regular bus users subsequently. This is through a combination of home and work location, changing circumstances and personal preferences.

Table 2.2: Journeys to School/College by Bus (means of travel by usual residence for persons aged 15 years and over)

<table>
<thead>
<tr>
<th>Bus Users</th>
<th>County Clare</th>
<th>Limerick City and County</th>
<th>County Tipperary</th>
<th>Mid-West Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of users</td>
<td>1335</td>
<td>2080</td>
<td>3073</td>
<td>6488</td>
</tr>
<tr>
<td>Per cent</td>
<td>10.6</td>
<td>11.1</td>
<td>18.2</td>
<td>13.4</td>
</tr>
</tbody>
</table>

Source: CSO 2006.

Car ownership is a key influence on the propensity to use buses. Table 2.3 shows car ownership rates which reflect the dispersed residential locations in the region and the complex travel patterns that result. No bus network can address all travel needs and hence consolidating services is the best means of attracting users, particularly if interchange opportunities are established.

Table 2.3: Car Ownership per Household (%)

<table>
<thead>
<tr>
<th>Area</th>
<th>No Car</th>
<th>1 Car</th>
<th>2 Cars</th>
<th>3+ Cars</th>
</tr>
</thead>
<tbody>
<tr>
<td>County Clare</td>
<td>15</td>
<td>38</td>
<td>37</td>
<td>9</td>
</tr>
<tr>
<td>Limerick City</td>
<td>38</td>
<td>41</td>
<td>18</td>
<td>4</td>
</tr>
<tr>
<td>Limerick County</td>
<td>14</td>
<td>36</td>
<td>39</td>
<td>12</td>
</tr>
<tr>
<td>North Tipperary</td>
<td>16</td>
<td>38</td>
<td>36</td>
<td>10</td>
</tr>
<tr>
<td>Mid-West</td>
<td>18</td>
<td>38</td>
<td>34</td>
<td>9</td>
</tr>
<tr>
<td>National</td>
<td>20</td>
<td>39</td>
<td>33</td>
<td>9</td>
</tr>
</tbody>
</table>

Source: CSO 2006.

2.5 Existing Rail Network

The rail network in the region is of varying quality with some regular services operated by diesel units providing inter-urban links and commuter trains and less frequent local services. A major change in rail travel opportunities was recently achieved with the reintroduction of Limerick to Galway services as part of the Western Corridor scheme, with new stations at Sixmilebridge (between Ennis and Limerick), Gort, Ardrahan and Craughwell (to the north of Ennis). The services are limited by capacity which, with the
exception of services operating via the Dublin to Cork line between Ballybrophy and Limerick Junction, depend on passing loops along single track routes. However, there are no regular freight movements. Iarnród Éireann operates all the rail services in the region.

The pattern of through services to destinations outside the region is variable with timing differences between Sunday trains and Monday to Saturday trains. From Nenagh, no early weekday train is available for commuters and similarly evening timings do not encourage use. These do not compare favourably with the equivalent road journey, particularly on the Nenagh line with the completion of the M7 motorway from Limerick in September 2010. Also, where inter-urban coach services operate, journey times can be competitive with rail.

### 2.6 Rail Infrastructure

The condition of the infrastructure is variable, with a number of speed restrictions on the Limerick to Ballybrophy route in particular. The alignment of other former routes has been retained including Limerick to the Dublin main line at Charleville (Rath Luirc) with branches to Newcastle West and Foynes.

Limerick Colbert Rail Station, the main bus and rail interchange hub in the region, is located within easy walking distance of the city centre with the regional bus station adjacent. The condition of the Nenagh line means that the route is low speed. Nenagh station is staffed despite low levels of use, particularly for commuter journeys to Limerick city. The station at Birdhill is well tended with a few cars parked, suggesting that the station is useful for people travelling from more remote origins. Ennis station has benefited from works to improve the passenger experience including weather protection, a waiting room and information systems; facilitating a regular service to Limerick Monday to Saturday. The co-location of the bus station, taxi rank and car park provide a range of onward journey opportunities.

### 2.7 Rail Usage

As a proportion of total journeys to work, rail is very poorly used; the number of users is very small, especially in comparison with car use (62% of the total are car driver and a further 6.4% are car passenger). Even taking into account the longer distance journeys made by rail for other purposes (leisure etc), the number of rail users is low. This implies that any investment would be difficult to justify unless substantial mode shift can be achieved. 2006 Census data indicates the number of rail users as shown in Table 2.4.

<table>
<thead>
<tr>
<th>Rail Users</th>
<th>County Clare</th>
<th>Limerick City and County</th>
<th>County Tipperary</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>93</td>
<td>88</td>
<td>219</td>
<td>400</td>
</tr>
<tr>
<td>Per cent</td>
<td>0.2</td>
<td>0.1</td>
<td>0.3</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Source: CSO 2006

Given the number of local commuter users, rail services are caught in a situation in which further investment which may attract more users is unlikely to be forthcoming but the current level of service is costly to operate. Without major changes, decline could be inevitable and the local rail network could remain primarily to provide inter-urban links, which appear to operate a far superior capacity and offer a robust regular service between the region and Dublin/Cork.
3. Developing and Improving Public Transport Services

3.1 Policy Objectives

From the assessment of the current transport situation, a framework was developed for strategies intended to reduce car dependency and improve the quality of public transport services with policy objectives informed by the 2010-2022 RPGs:

- **Economic growth**
  - Retain a robust and well balanced economy;
  - International links and competitive location;
  - Providing social, economic and physical infrastructure required to support industry.

- **Balanced spatial development**
  - Develop Limerick/Ennis/Shannon as a co-ordinated urban agglomeration as the core driver for the region;
  - Develop key service centres for each peripheral part of the region, linking to Limerick/Ennis/Shannon;
  - Avoid car commuting where possible; and
  - Maximize the use of existing infrastructure.

- **Urban renewal**
  - Develop Limerick city centre as a multi-purpose zone supporting social and commercial activity;
  - Promote regeneration of run-down areas; and
  - Provide good public transport to reinforce the role of the city.

- **Social inclusion**
  - Improve accessibility to employment, education, health and community facilities.

- **Environment**
  - Minimize, or where necessary avoid, impact on sensitive areas;
  - Minimize impact on rural landscape; and
  - Promote sustainable access to countryside.

- **Transport**
  - Link Limerick city centre through an integrated public transport system and traffic management system;
  - Ensure a high quality public transport system;
  - Provide transport for the area hinterland to access the core area and economic nodes;
  - Link the region with Galway, Waterford and Cork creating a critical mass to attract investment;
  - Supporting the travel corridor to/from West Limerick and Kerry;
  - Investment in infrastructure; and
  - Reduce car dependency.

3.2 Light Rail

Light rail offers a modern, fast and high profile solution to transport problems in key corridors. In comparison with heavy rail systems, light rail is more adaptable to established urban areas and is able to operate on segregated alignments or on-street (or a combination of both). In Europe and elsewhere, light
rail is well established with many systems being extended to form the main public transport network but linked with heavy rail and bus services throughout.

Ireland has two light rail routes in Dublin:
- LUAS Red Line – Point Depot (O2), via Connelly Station and central bus station to Heuston Station, Tallaght or City West; and
- LUAS Green Line – Blackglen via Cherrywood, Sandyford and St Stephen’s Green.

Both access the central area and provide a core corridor for access from the suburbs with both on-street and segregated running. However, the two routes have yet to be linked so that a network offering wider journey opportunities is not yet in place without interchange. The routes were delivered at high cost with on-street remodelling works, land acquisition, new structures and stops and the necessary track and equipment.

Two key issues arise when light rail is being considered in the Mid-West context:
- Capital costs are very high; and
- A high level of forecast demand is essential.

It must be demonstrated that any scheme can cover its operating costs without long term subsidy, unless there is a government policy to subvent, and that capital costs are not excessive. In the UK, the National Audit Office (NAO) investigated the relative costs and experiences of light rail schemes and drew comparisons with schemes introduced in Europe\(^4\). Seven systems had been completed in England\(^5\) at a combined cost of over €2.6 billion of which €1.4 billion was contributed by Government. A particular concern was that patronage had not been realized due to over-optimistic forecasts, operational problems, land use changes and other factors. It was also noted that integration with other forms of transport was important, especially with through ticketing, although connections with buses were generally poor and even competitive. All the schemes address transport needs in major urban areas; the population of the smallest, Nottingham, is 288,700 (650,000 for Greater Nottingham and 779,500 for the travel to work area\(^6\)). This is substantially more than Limerick city 2030 – c.150,000 and; the Mid-West as a whole with a population of c.500,000 much of which is in the rural area.

Taking the mean cost of proposed schemes in the UK – around €15 million per kilometre – and a theoretical route from Raheen via the Docklands development area and Limerick city centre to the edge of the urban area at Annacotty (addressing new retail sites, employment areas and the university) – around 15-20 kilometres – a minimum construction cost would be around €300 million, excluding any local circumstances that would incur additional cost. This cost estimate could potentially be doubled if the proposed route alignment was exclusively on-street.

### 3.3 Potential Heavy Rail Improvements

A number of smaller stations on various lines have been closed and it is unlikely that the small communities could support their reopening. However, locations such as Boher (between Colbert and Limerick Junction) could possibly provide a Park and Ride function at some point in the future. Crusheen on the Galway line

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5 Tyne and Wear Metro, Docklands Light Railway, Manchester Metrolink, Sheffield Supertram, Midland Metro, Croydon Tramlink, Nottingham Express Transit.

6 Nottingham City Council estimates for 2007.
north of Ennis could be a future addition to the revitalized route. A new station at Crusheen would benefit the local community, but lengthen journey times for through rail passengers by approximately four minutes. However, the typical line speed on the Limerick to Galway route is 100km/h, with the overall journey time between the two cities being almost two hours. In this context, the additional journey time incurred would have a minor impact on the overall attractiveness of the rail service. However current anecdotal evidence suggests that the current western rail corridor is struggling to find adequate volumes of regular patronage. This means that providing more services between Limerick and Ennis (possibly extended beyond) would be unviable given the current levels of demand and the modelled patronage figures.

There may also be longer-term opportunities to develop new local rail stations, of a simplified form, at Moyross (Regeneration) and Parkway/Lynwood. The City Council should undertake a study to further determine the potential patronage that could use these stations and how more concentrated developments within close proximity to the stations could be further developed.

The rail services are costly to operate in their current form although the use of diesel units reduces operating costs compared with other possible arrangements. It may be possible to introduce lighter units of the tram-train type, reducing track maintenance costs and signalling while maintaining or improving journey times and levels of service. While this would incur some costs initially, operating costs would be reduced but tram-train type vehicles would need to operate separately from heavy rail trains and combining the two could present some technical difficulties, particularly if the routes are to be retained for possible heavy rail use in the future. However, track sharing has been achieved in Germany and tram-train could be a means of securing better services in the long term.

If required, additional passing loops could be provided at much lower cost than providing additional heavy rail capacity. Driving tram-trains on line-of-sight removes the need for complex signalling.

Construction of a rail link to service the Shannon employment area could help facilitate its development as an export distribution centre and passenger terminal. However, a review of previous feasibility studies has indicated that such a scheme would incur high capital costs with an uncertain level of demand. The viability of such a link is constrained by the high quality road network in the local area, and low levels of congestion. With regard to freight exports, this could make rail an unrealistic alternative for products other than bulk or high volume goods. The level of rail passenger demand from site employees is also uncertain, as existing car-based travel patterns are well established in Shannon and unlikely to change without the implementation of unpopular demand management measures. Those passengers who could be attracted to the new rail service are likely to be existing bus users, with local bus services potentially losing a significant proportion of passengers. The high quality local road network provides an opportunity to improve bus and coach services more cheaply and quickly than the rail alternative.

### 3.4 Urban and Regional Bus Services

Bus services offer considerable potential to meet the travel needs of many users in the region. A network of core local services could cover the main residential and employment areas in central and suburban locations. Secondary services may or may not coincide with these core corridors and can extend into the rural hinterland. Beyond these, the inter-urban services provide access to the smaller communities and use the core routes to access the urban centre. The main interchange is in the urban centre but other local interchange opportunities exist where users can change between local, secondary or inter-urban services. In this way, journey opportunities are maximized and inter-urban services can focus on limited stop timetables. However, such local interchanges must be at appropriate locations where they are highly visible and secure such as outside a retail facility or similar. Timetables must also be adapted to connect
i.e. all services at that location must meet at the same time to allow transfer in both directions. The main interchange is the urban centre and should focus on one particular location such as a bus station or main thoroughfare where transfer between services can be made as easy as possible.

The main employment areas shown in Table 3.1 should be a focus for a revised network. These include Limerick central area (the City Council offices, retailing, etc), the Raheen corridor to the south west of Limerick city (Midwestern Regional Hospital, Crescent Shopping Centre, Raheen, etc), Shannon (Airport and Freezone Industrial Estate) and in the Dublin Road corridor (UL, Annacotty and National Technology Park) to the east of the city centre, with local activity focusing on Ennis, Nenagh and other main towns.

Table 3.1: Major Employment Areas

<table>
<thead>
<tr>
<th>Location</th>
<th>Administrative Area</th>
<th>Number of Employees</th>
<th>% of Mid-West Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limerick City</td>
<td>Limerick City</td>
<td>19,751</td>
<td>12</td>
</tr>
<tr>
<td>Ballycummin (Raheen/Dooradoyle Road)</td>
<td>Limerick County</td>
<td>12,757</td>
<td>8</td>
</tr>
<tr>
<td>Clenagh (Shannon)</td>
<td>County Clare</td>
<td>11,401</td>
<td>7</td>
</tr>
<tr>
<td>Ennis</td>
<td>County Clare</td>
<td>8,797</td>
<td>5</td>
</tr>
<tr>
<td>Nenagh</td>
<td>North Tipperary</td>
<td>4,266</td>
<td>3</td>
</tr>
<tr>
<td>Ballysimon</td>
<td>Limerick County</td>
<td>3,394</td>
<td>2</td>
</tr>
<tr>
<td>Ballyvara</td>
<td>Limerick County</td>
<td>2,884</td>
<td>2</td>
</tr>
<tr>
<td>Thurles</td>
<td>North Tipperary</td>
<td>2,864</td>
<td>2</td>
</tr>
<tr>
<td>Newcastle Urban</td>
<td>Limerick County</td>
<td>2,137</td>
<td>1</td>
</tr>
<tr>
<td>Roscrea</td>
<td>North Tipperary</td>
<td>1,679</td>
<td>1</td>
</tr>
<tr>
<td>Rest of Mid-West</td>
<td></td>
<td>90,557</td>
<td>56</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>160,487</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: CSO 2006.

Other journey purposes will also be important so a revised network needs to address the demand from employment and school/college as well as retail, health and leisure activities. Given school trip mode share consideration should be given to increasing this market further.

3.5 Bus Rapid Transit

Bus Rapid Transit (BRT) takes a number of forms ranging from extensive on-street sections of reallocated road space dedicated for buses, roads exclusively for bus use and guided systems using methods such as magnetic, optics, wire or kerb guidance. The purpose of the various systems is to provide high capacity networks emulating the advantages of light rail systems but at lower cost. BRT systems have a number of advantages and disadvantages when compared with light rail and conventional bus systems:

**Advantages**
- Lower capital cost than light rail;
- Flexibility in operation with possible services beyond the core infrastructure on the road network;
- New image of reliable and modern service;
- Operable by existing bus operators; and
- High capacity depending on frequency.

**Disadvantages**
- Image not always sufficiently different from conventional buses;
Mainly suited to high concentrations of demand where light rail cannot be achieved; and
Can be costly if extensive infrastructure is required.

BRT has been used overseas for many years. The original 12km system in Essen, Germany was opened in 1986. This deployed kerb guidance with conventional designs of vehicles, adapted with small guide wheels for use on the infrastructure. This type of technology was subsequently adopted elsewhere, notably in Adelaide, Australia with a 12km system being constructed. Bus provides the basis for urban transit in other Australian cities, notably Brisbane which has an expanding BRT network.

In Europe, a number of systems have been established featuring guided trolleybuses (Nancy, France), rail guidance (Caen, France) and tram-style Civis guided buses (Rouen, France) (see Table 3.2).

Table 3.2: European BRT Systems

<table>
<thead>
<tr>
<th>System</th>
<th>Year Opened</th>
<th>Route Length (km)</th>
<th>Length of Guided/Segregated Sections (km)</th>
<th>Infrastructure Costs (at time of completion) (GBP million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nancy, France</td>
<td>2000</td>
<td>n/a-</td>
<td>60% / 70%</td>
<td>81</td>
</tr>
<tr>
<td>Essen, Germany</td>
<td>1979</td>
<td>12</td>
<td>3.5</td>
<td>n/a</td>
</tr>
<tr>
<td>Caen, France</td>
<td>2002</td>
<td>15.7</td>
<td>n/a</td>
<td>130</td>
</tr>
<tr>
<td>Rouen, France</td>
<td>2001</td>
<td>25.8</td>
<td>n/a</td>
<td>85</td>
</tr>
<tr>
<td>Athens, Greece</td>
<td>1980s</td>
<td>148</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Bradford, UK</td>
<td>2002</td>
<td>3.7</td>
<td>2.3</td>
<td>7</td>
</tr>
<tr>
<td>Crawley Fastway, UK</td>
<td>2003/05</td>
<td>24</td>
<td>2.4</td>
<td>26</td>
</tr>
<tr>
<td>Kent Fastrack, UK</td>
<td>2006</td>
<td>23</td>
<td>3</td>
<td>80</td>
</tr>
<tr>
<td>Ipswich Superoute 66, UK</td>
<td>2005</td>
<td>n/a</td>
<td>0.2</td>
<td>2</td>
</tr>
<tr>
<td>Leeds Scott Hall Road, UK</td>
<td>2001</td>
<td>5</td>
<td>1.5</td>
<td>4.5</td>
</tr>
<tr>
<td>Leeds York Road, UK</td>
<td>2001</td>
<td>4.7</td>
<td>2.1</td>
<td>10</td>
</tr>
<tr>
<td>Tyne and Wear Centrelink, UK</td>
<td>2005</td>
<td>5</td>
<td>Part</td>
<td>26.4</td>
</tr>
<tr>
<td>Tyne and Wear Stephenson Link</td>
<td>2005</td>
<td>0.25</td>
<td>0.25</td>
<td>14.4</td>
</tr>
</tbody>
</table>


Various schemes have emerged in the UK following an initial scheme in Leeds based on the kerb guidance system and a number of smaller trial schemes. Fastway links residential areas, Crawley and other local centres in Sussex with London Gatwick Airport. Road space has been reallocated to form the guided sections and new connections have been engineered. In North Kent, the Fastrack network has been created to serve existing demands and planned development areas offering high quality services with on-street priority measures and segregated routes.

The longest guided busway in the World has recently been constructed in Cambridgeshire, a 40 km route of which 25 km is kerb guided. It links Huntingdon and St Ives with Cambridge including two major hospitals and main rail stations, two Park and Ride sites and a planned community of 6,000 homes at Northstowe. The alignment is that of a former railway and it was concluded that BRT offered the most advantageous approach as services could operate beyond the dedicated infrastructure. Cost was around €132 million, equivalent to around €5 million per kilometre of which 80% was provided by Government. Similarly, the 12 km Luton Dunstable busway will use a former railway and construction is expected to commence shortly after a long gestation period at a cost of around €95 million, equivalent to around €8 million per kilometre with a 94% Government contribution. The service will link two town centres with
London Luton Airport, two rail stations and a number of employment locations and is expected to have a positive regeneration role in the context of a growth area.

**Belfast** is promoting three BRT routes into the city centre with a combination of on-street and segregated alignments. Another further example is Swansea Metro in Wales which features extensive priority measures through the city centre and a segregated section of route. Dun Laoghaire Rathdown also launched the Blue Line ([www.blueline.ie](http://www.blueline.ie)) proposal.

Outside Europe, BRT is being applied on an increasing scale including examples in:

- **Ottawa**, Canada (60 km system including 26 km of bus-only roadway);
- **Pittsburgh**, USA (18.5 miles of dedicated bus lanes on three routes, one of which uses an former heavy rail alignment);
- **Boston**, USA (featuring bus-only tunnels);
- **Curitiba**, Brazil - an extensive BRT system provides a high frequency, high capacity network with a strong emphasis on infrastructure design and uses 1100 vehicles carrying 1.3 million users per day;
- **Brisbane**, Australia which uses state-of-the-art technologies and emphasizes passenger amenity at stations; and
- A recent scheme in **Lagos**, Nigeria covers a corridor of 22km and has been a spectacular success, now carrying over 200,000 people per day with a fleet of 280 vehicles. This follows the success of a scheme in **Accra**, Ghana.

The most suitable form of BRT in the Mid-West would be through a combination of on-highway priority measures (bus lanes, junction priorities, etc) and segregated sections of route (achieved through the reallocation of road space and/or carriageway widening) with bus-only access to key streets. This would offer high frequency, high quality services with a strong level of reliability and a high profile to support patronage growth. Reliability and punctuality are key features of BRT systems and hence as much segregation from other vehicles should be achieved wherever possible. Where space is limited, conventional measures such as extensive bus lanes can be applied and is likely to require priority at traffic signal junctions. A non-guided system would be advantageous and could be developed incrementally first starting with quality bus corridors and then progressing to a more comprehensive BRT system, if necessary. The number of locations where BRT interfaces with other traffic should be minimised so that BRT speeds and reliability can be maintained. This is a step change from linked bus priority measures in favour of extensive segregation.

### 3.6 Improving Interchange

Limerick city lacks a focus for bus and coach services, despite the location of the bus station at Colbert Station which is not in the commercial core of the city centre. Many buses layover on-street in the William Street/O’Connell Street/Henry Street/Arthurs Quay area and interchange between services is difficult for unfamiliar users. Layover also uses valuable road space. It has been suggested that a new facility be provided in the core of the city centre in conjunction with redevelopment or as a new facility. Any new facility requires a number of issues to be addressed:

- The facility should be high quality;
- Interchange opportunities should be evident;
- Appropriate travel information should be readily available;
- Imaginative, safe and practical designs are achievable; and
- The facility should be visually linked with its surroundings and have good walk access to them.
3.7 Conversion of Rail Alignments for Bus Use

Rail alignments offer the potential for conversion to bus-only roads where their use for trains has diminished or where lines are mothballed. However, the strategy is cognisant of the fact that the removal of rail corridors has cost the state dearly and in future all existing corridors should continue to be protected from development. In developing rail corridors there are a number of practical considerations:

- The railway should be unused or very lightly used with little or no contribution to the wider network;
- Structures will often need to be altered, notably bridges, to allow the passage of buses;
- Access points will need to be included to allow buses to enter and leave the route at appropriate places, often to access demand nodes which may be some distance from the alignment;
- Prevention measures are desirable to prevent unauthorized use; and
- The width of the alignment is crucial and single track railways do not provide for buses in two directions without substantial reconstruction and possible land acquisition.

The Limerick Colbert-Nenagh-Ballybrophy railway is lightly used due to the relatively small settlements in the area, the limited train service available, the condition of the track and its line speeds and an apparent lack of promotion of the route. There are many options that can be considered for this and similar rail corridors and to investigate these a specific options study should be undertaken. Potential options for the corridor include:

- Improving the service provision by diverting some of the mainline services via the Ballybrophy spur.
- Increase usage as a tourism asset, offering rail tours through unspoilt landscape and assisting in opening up Lough Derg’s tourism potential. The opportunities for regular steam train based tours should also be examined as this would have the potential to attract significant numbers of tourists from abroad.
- The rail line has the potential to build upon the Cloughjordan Eco-Village concept, with the villages and towns along the Limerick to Ballybrophy rail line driving further innovation in this area, focused around the rail line and the linkages which it provides.

Mungret Line for re-use to BRT Line – With the correct placement and intensity of future development there may be future opportunity to convert or develop dual-running along the Mungret line corridor for BRT and rail. This corridor shall remain protected and further consideration should be given to the potential in Development and Local Area Plans.

3.8 Rural Public Transport Services

The rural services meet particular needs and represent a residual service, perpetuating long-established routes. Several options are available:

- Continuing them in their present form;
- Withdrawing them to save costs;
- Introducing a more coherent network although this is very unlikely to cover its costs; and
- Linking services with services along inter-urban corridors so that interchange is facilitated (rather than running all rural services into urban centres).

In the Mid-West context, there may be a role for taxi-based public transport schemes in providing a cost-effective solution to meeting the transport needs of local communities. Some community-based services have been successful in addressing many of the issues of marginalisation in Irish rural communities. However, they have not been developed to a stage where they are seen to offer an appropriate alternative.
to the car. A review of taxi-based public transport schemes in the UK and mainland Europe\(^7\) indicates a similar situation, in the context of rising operating costs, changes in the availability of funding and the perception of operating services in rural areas for the private sector.

Ten case studies in mainland Europe and the UK were investigated\(^8\), particularly the success factors where there was evidence of the following:

- Strong leadership and political backing;
- A significant improvement to people’s lives;
- Good local partnerships involving the local community, transport operators (taxis in particular), local councils and call centre;
- Long term sustainable finance;
- Ease of operation, comprehension and use;
- Effective planning, information and marketing;
- An image which is positive, reliable, non-institutional, friendly and value for money;
- Effective targeting in terms of potential market;
- Genuine ‘flexibility’; and
- Ability to deliver the same quality of service as that offered by the current service.

The UK and mainland Europe taxi-based schemes fall into a number of categories:

- Door-to-door bookable shared taxis;
- Taxis running on bus routes as a supplement to bus services;
- The taxi element of ‘train-taxi’ services; and
- Taxis which are booked to meet passengers at bus stops.

Many of the journeys that are made by dedicated rural transport services are local in nature, often restricted to shopping, healthcare or similar purposes. However, in a wider hierarchy of services, rural transport could be co-ordinated with bus services where they exist, inter-urban coach stops and rail stations. This would facilitate longer distance journeys and widen the market for area-based services to some extent, particularly if timings can be co-ordinated, supported by accessible vehicles and rolling stock.

Hence research indicates that there is no single taxi-based service type which will guarantee success. However, there are a number of critical factors which influence the development of successful taxi-based public transport services:

- **Fares** must be within the budgets of the individuals whose accessibility is to be enhanced. If this is not the case, there will be no reduction in their level of social exclusion;

- **Adequate financial provision** needs to be available for low demand transport. Whilst the relative cost per passenger journey for an equivalent passenger journey may be less than that for conventional modes, particularly in deep rural areas, the requirement for financial support for flexible solutions in areas of low density is still likely to remain at a significant level;

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\(^7\) The Role of Taxis in Rural Public Transport – Final Report (Mott MacDonald, June 2008).

\(^8\) Rural Wheels (Cumbria, UK), Devon Fare Car (Devon, UK), Connect2 Wiltshire (Wiltshire, UK), Billilinks (West Sussex, UK), North Sutherland Subsidised Taxi (Scotland, UK), PubliCar (Switzerland), TaxiTUB (France), TreinTaxi (Netherlands), RegioTaxi (Netherlands), Anruf Sammel Taxi (AST) (Germany), Teletaxa (Denmark).
It is critical to recognise that there is **not necessarily a single ‘best solution’** to the transport needs of rural communities due to the wide variation in the nature of settlements, their facilities, location and populations;

- There is a need to **integrate** present and future taxi schemes with other forms of public transport; and
- **Multi-modal ticketing** is fundamental to developing a coordinated regional public transport offer.

The scale of a scheme is vital to its long term future. The research has identified that developing schemes in rural areas at a scale large enough to offer a level of service which offers an alternative to the car in time means that the scheme draws a level of subsidy which is proportionately lower as a percentage of the scheme’s overall operating costs compared to much smaller schemes.

The research has highlighted the need to examine:

- **Administrative structures** used to manage the involvement of the community sector’s involvement in scheme operation; and
- The role of **funding** and financial support for scheme development. There is a fine balance to be achieved between giving the community and voluntary sectors confidence in the developing scheme and the provision of financial support to sustain their involvement and giving the public sector confidence that they will be able to achieve value for money without committing themselves to funding an under-performing service.

In terms of modal shift from the car it is difficult to determine the impact of the case study schemes, which may only become apparent in the longer term although the potential social and community benefits are significant. It is unlikely that taxi-based services could ever become commercially viable, but the costs of operation could be counterbalanced by these wider benefits, as is suggested by experience of RTP schemes in Ireland.

**Existing RTP scheme provision should be reviewed, via a series of pilots, to understand current needs, integration with other public/community transport services, vehicle utilisation and gaps in service coverage and to demonstrate whether a wider investment in taxi-based solutions for the Mid-West region is justified or otherwise.** The existing CAT network in County Clare provides a good starting point with a mixture of scheduled and fully demand-responsive services. A variety of booking/ticketing options are also available to CAT users, and timetable/route information is provided on the operator website. This is the quality of information which should be achieved as a minimum for public transport across the Mid-West region (and could be incorporated within a new ‘Transport for Mid-West Area’ website, to include journey planning/fares information).

The scope of a pilot should be informed by the Local Integrated Transport Services Pilot Project. Initiated in May 2009, the aim of this initiative is to assess how Bus Eireann, the Health Services Executive, the IWA and the RTP/Pobal can work together in partnership to achieve greater synergies, meet identified transport needs and deliver increased value for money for the Exchequer by making better use of existing networks and services. Two pilot areas have been selected for this exercise: North East (including Counties Meath and Louth) and the North West (including Counties Sligo and Leitrim).

A number of joint proposals have been developed and are being implemented in these pilot areas, including:
A series of ‘Collect and Connect’ feeder services linking rural dwellers to mainstream public services, public hospitals and other facilities;
Commuter feeder services;
Travel Voucher Schemes with the HSE to encourage wider use of public transport;
Integrated data management, service planning and service mapping;
Combined ticketing solutions;
Joint marketing strategy; and
Synchronisation of training policies and training provision.

In the Mid-West region, it is recommended that two or three areas should be selected to pilot a regular ‘Collect and Connect’ taxi-based feeder service, building on the demand responsive services already available in across the region, including Clare Accessible Transport (CAT), North Tipperary Rural Transport Programme and Rural Bus (County Limerick and North Cork Transport Group Ltd). This would extend the function of these demand responsive services beyond a predominantly community transport function into services which can also act as feeders into public transport interchanges in the main service towns, from which high frequency services could be provided to connect with the gateway/hub of Limerick/Shannon/Ennis. In so doing, public transport could be made a more realistic proposition for residents of deep rural areas.

Selection of a single area would enable demonstration projects to be introduced of perhaps five years’ duration which would enable independent evaluation. This should encompass a significant settlement and a large proportion of its surrounding rural hinterland in order to demonstrate deeply rural transport needs as well as the requirements of market towns. Potential sites for a pilot taxi-based service which meet these criteria include:

- **Thurles area** - This could provide access from rural communities to education, employment and shopping opportunities in Thurles and Templemore. Thurles Community Hospital is an important local facility. Both Thurles and Templemore have rail stations and taxis could provide interchange with services to Dublin, Cork and Limerick. Taxis could also serve scheduled bus stops, e.g. for Expressway service 71 to Roscrea and Cahir. Population (Thurles, Templemore, Borrisleigh, Upperchurch, Ballycahill, Holycross, Moycarkey, Littleton and Twomileborris) is 19,697;

- **Kilrush area** - This could provide access to opportunities in Kilrush, and to the coastal resort of Kilkee. Taxis could also provide interchange with provincial/Expressway services to Ennis. Population (Kilrush, including Kilkee, Cooraclare, Killimer, Kilmihil and Querrin) is 8,844;

- **Ennistymon area** - This could provide access opportunities in Ennistymon and access from inland areas to the coastal settlements of Liscannor, Lahinch and Doolin, as well as to the Cliffs of Moher, an international tourist attraction. Further patronage opportunities could be developed in association with the waymarked Burren Way walking trail. Taxis could also provide interchange with provincial/Expressway services to Ennis and Galway. Population (Ennistymon, including Lisdoonvarna, Liscannor, Killilagh, Kilfenora, Magherareagh and Moy) is 8,064;

- **Newcastle West area** - This could provide access to St Ita’s Hospital in Newcastle West, as well as education, employment and shopping opportunities in both Newcastle West and Abbeyfeale. Taxis could also provide interchange with provincial/Expressway services to Limerick, Killarney and Listowel.

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9 CSO, 2006.
Population (Newcastle West, Abbeyfeale, Ardagh, Glenagower, Monagay, Rathronan and Templeglentan) is 15,524;

- **Kilmallock area** - Taxis could provide access to Kilmallock from the surrounding rural communities of Bruff, Bruree, Hospital and Kilfinnane. 5km north of Bruff, Lough Gur is one of Ireland’s most important archaeological sites, and one of the main tourist attractions in County Limerick. There may be opportunities to stimulate car-free tourism, for example by providing interchange with scheduled provincial bus services from Limerick and by providing access to Lough Gur for visitors staying locally. Taxis could also provide interchange with rail services at Charleville, just over the border in County Cork, which is served by regular trains to Cork and Dublin. Population (Kilmallock, Ardpatrick, Bruff, Bruree, Hospital, Kilfinnane, Knocklong and Tobernea) is 14,987;

- **Kilkishen area** - This deeply rural area could benefit from a taxi-based service to provide access to essential facilities and the wider public transport network. For example, interchange with rail services at Sixmilebridge station would facilitate public transport access to Ennis, Limerick and Galway. Taxis could also provide access to SkyCourt Shopping Centre in Shannon, as well as employment on Shannon and Smithstown Industrial Estates. Taxis could also serve scheduled bus stops, e.g. to provide access from Kilkishen and Quin to provincial bus services to Ennis and Limerick. There may be tourism opportunities to be developed in association with the waymarked Clare Way walking trail. Population (Kilkishen, Killuran, Kilseily, Quin, Rossroe, Spancelhill, Tomfinlough and Tulla) is 7,746; and

- **Scarriff area** - A taxi-based service could provide access to education, employment and shopping in Scarriff and Tuamgraney. The Finsa Forest Products factory and pleasure craft marina are significant local employers. Lough Derg and the waymarked Clare Way walking trail represent opportunities to stimulate car-free tourism between Killaloe, Scarriff, Mountshannon and Whitegate. Taxis could provide interchange with scheduled bus services to Ennis, Limerick and Nenagh. Population (Scarriff, Ayle, Drummaan, Killaloe and Ogonnell) is 7,239.

Development of any of the above areas as a pilot, or possibly the Burren Region as a similar TransTourism pilot, for a taxi-based service should take place alongside the rationalisation of the existing demand responsive services operated by CAT, Rural Bus and the North Tipperary Rural Transport Programme, and the scheduled provincial bus network. With regard to the latter, irregular services should be discontinued and resources reallocated to improve frequencies on core corridors linking the Gateway, Hub and Service Towns as specified in the Regional Planning Guidelines (2010-2022).

It is unlikely that any pilot scheme could ever become financially free-standing, but with a more coherent allocation of existing resources it is considered that an increased level of social value could be released. Pre-requisites for a successful pilot scheme include the following:
- Long term funding (i.e. a five year programme rather than the two or three years which has been typical of UK taxi-based schemes);
- Substantial investment;
- Political engagement throughout; and
- An independent team providing management support, evaluation and dissemination and commissioning additional research, as required.
3.9 Taxis

The potential contribution of taxis to providing a cost-effective public transport solution in rural areas has been outlined above. However, taxis also have an important role to play in the urban public transport offer. Reasons include the following:

- they act as an infill to bus services, covering areas and time periods where it is not cost-effective for scheduled services to operate;
- they can fulfil an important community transport function, particularly for those with mobility difficulties who may encounter barriers when attempting to access conventional public transport services; and
- they support the night time economy and provide a safe means of travel home.

A step change in the provision of taxi rank facilities in Limerick city centre was achieved as part of the Limerick Orbital Route one-way traffic management arrangements implemented during 2010. As part of these new arrangements formal taxi ranks have been provided on various key streets including Parnell Street (for Colbert Station), O’Connell Street, Bedford Row, William Street, Arthurs Quay, Cecil Street and Michael Street.

At present it would appear that supply of service is greater than demand for most time periods. Given, what appears to be a significant supply of taxi ranks, consideration must be further given to the utilisation of the supply in other ways to support the necessary growth in public transport provision.

3.10 Park and Ride

Park and Ride can play a role in providing car parking capacity at the periphery of urban centres, facilitating possible changes in central areas regarding parking, traffic flows and pedestrian movement. Successful Park and Ride schemes should be located close to the strategic network and have high quality facilities and frequent bus/rail services offering competitive journey times at affordable price. Park and Ride effects a mode shift from car to bus for part of the journey which improves the efficient use of road space but recognizes that the initial part of the journey may have to be undertaken by car due to the lack of other options. In planning for a site, location is critical – the site must be located where large numbers of motorists pass regularly and in corridors where congestion regularly occurs and an appropriate site must be available. Bus priority measures should be in place to ensure that there is a journey time advantage compared with a congested car journey (ideally with a ride time of no more than 20 minutes).

Park and Ride can take a number of forms:

- **Rail-based schemes** - suitable for locations where there is an intensive train service (at least half-hourly) to a major destination. Where rail services are less frequent, the appeal of Park and Ride can be lost as there is little incentive to change from car to train due to the extra time and cost involved. Rail-based schemes work most effectively where there are constraints on traffic movement at the destination.

- **Bus-based schemes** – the most common form of facility. This provides high frequency, dedicated services and can serve several destinations, for example in and around a city centre. Other destinations can also be served such as major employment sites or health sites, the latter meeting the needs of both staff and visitors. Bus-based schemes tend to involve large sites and a general view is that they have a tendency of providing some 700 spaces with variations from lower figures of 500 are needed for a facility to be viable. There are however many variables and this is not to be taken as an
absolute figure and there is also evidence to suggest smaller scale facilities of a few hundred can be established and then further developed, such as Black Ash in Cork.

- **Smaller sites/Interchanges** - Park and Ride can also occur on a smaller scale. This generally requires a small parking area – perhaps less than 30 spaces – next to an interchange point. These locations need to be secure and offer basic amenities if possible, particularly if a wait for the connecting service is likely to be required.

A typical bus- or rail-based site can be costly and requires parking area, access, landscaping and often an amenities building. With land acquisition and associated costs, a typical site can cost in the range €2 million to €6 million depending on the circumstances. Where a rail-based scheme is planned, a new station may be necessary which will add considerably to the cost.

The first permanent Park and Ride site in Ireland is **Black Ash, Cork**. Services operate 0730 to 1930 Monday to Saturday between the site and Lapp’s Quay in the city centre with buses operating at a 10 minute frequency in peak times and every 15 minutes off-peak. 940 spaces are available and costs users €5.00 per day to park and use the bus service. The site is regarded as a success and around 6% of motorists are intercepted. This compares with UK Park and Ride intercept rates of between 0.7% and 12.4%.

Traffic levels can be expected to increase in future years but are currently low, suggesting that delays encountered on inbound car journeys are not excessive. Collected traffic data indicates that the busiest routes include the;

- M7/R445 Dublin Road,
- N18/R445 Ennis Road,
- N69/R512 Dock Road,
- R526 Ballinacurra Road,
- R509 Childers Road,
- N24/R527 Ballysimon Road and
- R511 Roxborough Road.

The largest inbound flows – over 10,000 vehicles per day – are potential locations for Park and Ride facilities with the greatest opportunities to intercept motorists. If 5% intercept can be achieved then Park and Ride would need to accommodate the following:

- 1015 cars in the Dublin Road corridor to the east of the city;
- 1640 cars in the Ennis Road corridor to the northwest of the city;
- 1150 cars in the Dock Road corridor to the west of the city;
- 840 cars in the Ballinacurra Road/St Nessans Road corridor to the southwest of the city with potential intercept of M20;
- 510 cars in the Ballysimon Road corridor to the southeast of the city;
- 450 cars in the Childers Road corridor to the south of the city; and
- 430 cars in the Roxborough Road corridor to the south of the city.

A number of Park and Ride sites on the periphery of Limerick city have been considered and have been identified by Limerick City Council and Limerick County Council as potentially being available for development.

- **R445 Dublin Road between M7 and Castletroy** - The weekday average inbound traffic flow on the R445 between its junctions with the M7/M20 and Plassey Park Road is **40,598 vehicles** two-
way. However, the count location incorporates traffic flows to Limerick from Castletroy and the University of Limerick; actual flows in the vicinity of the proposed Park and Ride site are likely to be lower.

The R445 is one of the main arteries into the city from the east (Dublin, Nenagh and Roscrea). A Park and Ride facility at this location can intercept the Limerick bound traffic from the east and north east. Limerick County Council has already constructed a bus lane from the Kilmurray Roundabout to the Groody Roundabout and it is the intention of Limerick City Council to continue this facility to the city centre thus giving certainty of journey time to the city centre which is necessary for a successful Park and Ride.

- **R445 Clondrinagh/Coonagh Roundabout** - Two routes are possible via Ennis Road and Sarsfield Bridge (approximately 3.7 km) or R527 Condell Road and Lower Mallow Street (approximately 4.7 km), the latter being faster. Potential development sites may become available with the construction of Phase 1 of the Northern Distributor Road, which could also serve Limerick Institute of Technology and events at Thomond Park and the Gaelic Grounds.

- **N18/N69/R510 Interchange** – The N69/R510 is a main artery to the city bringing traffic in from the N18, N69 and the Mungret area of the city. A rail line extends from the nearby Irish Cement factory to Colbert Station via the Crescent Shopping Centre and this could provide direct access to the city centre, if used by either bus or rail along the corridor. The area is zoned light industrial in the local area plan and is easily accessed by the adjacent residential areas. There may be future potential for a park and ride facility at this location if the land-use generates the volumes of trip makers. There are also other potential for park and ride sites along the N69 corridor that should be investigated if this corridor is been considered as an option.

- **M20/R256 Loughmore Roundabout (vicinity of)** - A proposed site located in a greenfield location was investigated previously as part of work undertaken by MRG-ROD Consulting Engineers, which estimated demand at 422 vehicles (based on a 6% intercept rate) requiring approximately 500 spaces. This does not include for latent demand from the local residential areas. The viability of the scheme with the proposed continuous bus priority makes this a strong contender.

Limerick County Council has constructed a bus lane from Raheen to the city boundary and it is the intention of Limerick City Council to continue this bus lane to the city centre via Ballincurra and O’Connell Avenue. Limerick County Council also intends to extend the existing bus lane to the Loughmore Roundabout and have identified a number of potential sites for a Park and Ride location.

Although the bus lane only extends over 1.7km it has been shown by Bus Éireann that the improvements have been substantially successful in terms of journey time savings and increases in patronage.

The proposed location for the Park and Ride facility is close to the M20 which can intercept the M20 and M21 traffic from Cork, Tralee, Killarney and the county town of Newcastle West. This is one of the main arteries into the city. It is also located within close proximity of the major employment centre of Raheen Industrial Estate and can easily be accessed via zoned lands as per the local area plan. Given the associated development and prioritisation this may possibly be the best location to pilot the first bus based park and ride facility in Limerick.
• Land to northeast of **N24 Ballysimon Road** – This location could be made highly visible to potential users. There is the opportunity for a rail-based Park and Ride service to Limerick city centre although the current service is considered inadequate to perform a meaningful Park and Ride function. With an adjusted service or alternate mode use on the corridor, this may be a potential Park and Ride site.

The sites which have been identified as available for development as Park and Ride schemes are located in close proximity to the main road corridors into Limerick, on highly visible greenfield sites with the opportunity for future expansion. However, the level of demand for Park and Ride is uncertain in the context of variable levels of traffic congestion on the main corridors, dispersed journey destinations owing to the number of out-of-town retail/employment centres and the current absence of car parking restraint measures in the central area. Comprehensive bus priority measures and regular bus services are required so that using the Park and Ride facilities would provide a journey time advantage, outweighing the time taken to transfer between car and bus.

A private coach company- Coaches- operates Park and Ride services on a commercial basis for events in Limerick. Two of these are in the type of locations that could be appropriate for a permanent Park and Ride facility, being relatively close to the urban periphery. However, the hotel car parks have limited capacity. For events at Thomond Park, parking locations include:

- Kilmurray Lodge Hotel, Castletroy, R445 Dublin Road;
- South Court Hotel, Raheen; and
- Radisson Blu Hotel, CratloeMoyle, N18 Ennis Road (outside the city);

The level to which interception can be achieved depends on a number of factors including:
- The extent to which car users are willing to be flexible in their travel arrangements;
- The quality of the Park and Ride facility;
- Relative journey times (taking into account bus priority measures);
- Destinations;
- The extent of restraint measures in the central area e.g. parking charges and availability;
- Relative costs; and
- Levels of congestion.

For **Limerick city**, the N18 and R462 routes converge to the south of Cratloe, a former station on the Limerick-Ennis-Galway route. Providing a rail-based Park and Ride site would require a new station near the N18 which could be served by Western Corridor trains. The current train service between Colbert and Ennis would need to be improved to attract users of a Park and Ride facility but is constrained by the capacity of the single track sections. The location could attract users from Shannon and Ennis working in Limerick, avoiding the need to drive through the city to reach central destinations.

However, consideration must be given to a more effective strategy which is likely to involve the provision of a series of smaller Park and Ride sites along the Annacotty/Dublin Road, Roxburgh Road/Raheen, Ennis Road, Dock Road and Ballysimon Road corridors, which could intercept traffic from the adjoining areas. This should take advantage of potential bus service upgrades which could include BRT or QBCs.

**Shannon** is developed on a low density basis and the employment area is separate and unsuitable for Park and Ride in that accommodating the needs of a high number of users would be difficult and motorists would not be attracted to a facility as parking is available on the site.
Traffic relief for Ennis would be desirable but routing a Park and Ride service would be difficult given the very limited capacity of the streets in the town centre. The diverse origins of journeys into the town suggest that Park and Ride would not address major levels of demand.

Figure 4.3 outlines the approximate locations of the proposed park-and-ride sites.

### 3.11 Smarter Choices

‘Smarter choices’ is the collective term for a range of initiatives that support sustainable travel and provide realistic options instead of sole-occupancy car use. These can include measures to encourage more efficient use of vehicles and also some discouragements; also, healthy options of walking and cycling can have great potential for shorter journeys. Policy is moving away from predicting demand and providing capacity to meet that demand towards a new approach in which demand constraints remain and travel needs are dealt with in different ways. This is in response to a variety of issues including personal and community health, environmental changes, safety and social inclusion.

As a relatively new concept, data over a period of more than a few years is scant. However, initiatives in North America and Australasia have been followed by a number of initiatives in Europe including the UK\textsuperscript{10}. However, it is clear that smarter choices can contribute positively to wider strategy objectives, often providing a credible way forward when infrastructure improvements are not feasible or fundable.

UK research considered that a reduction in peak traffic flow of 21% could be achieved in urban areas and 14% in other areas with intensive smarter choice measures; at off-peak times, the reductions could be 13% and 7% respectively. Three demonstration projects were funded to test how shifts from car use could be achieved, known as Sustainable Travel Towns. They are relevant to the Mid-West Strategy in that some or all of the principles could be applied. The three locations were:
- Peterborough, a free-standing urban centre in Cambridgeshire with an extensive hinterland of small communities;
- Darlington, an urban area in north east England with a declining industrial base; and
- Worcester, one of a number of towns within commuting distance of a major urban area but also fulfilling a role as a centre for smaller communities.

Data has been made available for Peterborough and Worcester for the 2004 to 2008 period. This showed that car driver trips reduced by 9% and 7% respectively. In Peterborough, car driver trips reduced by 5% in the AM peak and 6% during the PM peak. Larger reductions occurred off-peak with an 11% reduction between 0900 and 1500. However, the main impacts were on leisure journeys with a more limited impact in peak times. While Peterborough demonstrated that change is achievable, it reflects the city’s position as a largely self-contained community – some 82% of economically active residents working within the city – with limited out-commuting.

Further UK Government research\textsuperscript{11} suggested that wider smarter choice applications could reduce car trips by 7% compared with the 11% assumed in the 2004 report. Significantly, it was indicated that reductions would be constrained to urban areas with a negligible effect on rural traffic flows. However, this has generated considerable debate and it has been suggested that there are a number of options for rural

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\textsuperscript{10} UK Department for Transport (2004) Smarter choices – changing the way we travel.

\textsuperscript{11} UK Department for Transport (July 2009) Low carbon transport: a greener future.
areas such as car sharing, home working and shopping deliveries. A further initiative\textsuperscript{12} suggested that after two years has indicated that cycle use has risen by 50\% and bus use increased by 12.9\%, both notably different to the control areas. However, there is less evidence that the project has reduced traffic flows and there is no specific data for weekday peak periods for which the potential impacts could be greatest.

A longer term view was taken by the ‘Changing Travel Behaviour’ research project\textsuperscript{13} which tried to understand the dynamics of travel behavioural change over a ten year period. This drew the following conclusions:

- **Overall changes in travel and transport behaviour** can mask the dynamics involved e.g. car ownership data;
- **Policy can have a significant impact** on travel behaviour but the full impacts are longer term, can have unintended consequences and involve complex decision-making processes; and
- **Increases in road capacity** may induce traffic which undermines efforts to relieve congestion and increases environmental impacts.

### 3.11.1 Potential Smarter Choice Initiatives

The simplest and cheapest form of transport is **walking**. It is also healthy and does not contribute to congestion. However, remarkably little provision is made for walking and barriers to movement are common, such as poor road crossing arrangements, inadequate lighting, poor direction signing and incomplete networks. A high proportion of car trips are relatively short and many could be made on foot. Encouraging walking at an early age establishes healthy lifestyles and with more people on the streets, many personal security fears can be overcome. Limerick City already has a strong walking culture and carries a 17\% mode share for trips to work.

**Cycling** is also under-provided for, although there is considerable potential to promote cycling for journeys that are too long to walk but would otherwise be made by car. Apart from the health benefits, cycling trips are often quicker than the car driver’s perception. Infrastructure inadequacies are common within the region with poorly linked routes, limited or inappropriate priority measures and insecure or no parking. Many of these difficulties can be overcome, often at little cost but cycling needs to be considered more fully in the planning process to ensure that it becomes an attractive option.

Currently there is little or no opportunity to take cycles on public transport. However, interest in this is growing, particularly through the Department of Transport’s Smarter Travel Funding Competition. In a joint submission for the Smarter Travel Funding Competition both Limerick City and Limerick County Councils’ developed a substantial proposal to influence travel behaviour. Unfortunately funding for this competition has not been announced. Given the depth of detail and support generated for this bid proposal it could be used as the starting point for investment into Smarter Travel in the Limerick metropolitan area. Limerick City Council, in association with Limerick County Council, has also developed a Walking and Cycling Strategy for the Metropolitan City region of Limerick.

\textsuperscript{12} Smarter Travel Sutton (London Borough of Sutton).

\textsuperscript{13} UK Economic and Social Research Council (ESRC) Transport Studies Unit (September 2004).
The main option for medium and longer distance journeys is public transport in its various forms. Often this requires a significant change in perception among groups who have little or no experience of making journeys other than by car. Inter-urban coaches and local bus services offer the framework for an improved network of services provided that quality can be improved, journey times enhanced and the image changed considerably. New forms of integration can be encouraged such as Park and Ride and better interchange between rail, bus, taxi, cycling and walking. Improved ticketing and payment systems are important here with the evolution of smart card applications to provide multi-modal ticketing to overcome the penalties of interchange.

Initiatives can include the following:

- **Smarter living lifestyle changes**
  - Working at home; and
  - Home deliveries.

- **Travel planning**
  - Workplace travel plans;
  - School travel plans;
  - Area travel plans;
  - Personalized travel planning;
  - Financial incentives;
  - Improved walking and cycling facilities;
  - Car sharing;
  - Car clubs;
  - Better public transport information;
  - Advice on travel options e.g. through a travel plan adviser;
  - Smarter working practices e.g. teleconferencing; and
  - Disincentives for car use e.g. restricted parking.

- **Parking**
  - Public off-street parking: restricting availability, increasing charges, etc;
  - Public on-street parking: increase charges relative to off-street spaces, introduce restrictions, etc; and
  - Private off-street parking: more rigorous parking standards, workplace parking charges.

- **Fiscal measures**
  - Road user charging: congestion charging, toll roads;
  - Workplace parking levy; and
  - Mileage-based insurance.

### 3.11.2 Cost of Smarter Choice Initiatives

Although a limited number of initiatives have been introduced in the UK, this provides some comparative figures as shown in Table 3.3 although there are some inconsistencies about the published costs.

<table>
<thead>
<tr>
<th>Location</th>
<th>Total Budget (GBP million)</th>
<th>Project Duration</th>
<th>Annual Budget (GBP million)</th>
<th>Population</th>
<th>Cost per Head (GBP)/Yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>London Borough of Sutton</td>
<td>5.00</td>
<td>3 years</td>
<td>1.67</td>
<td>185,000</td>
<td>9.04</td>
</tr>
<tr>
<td>Worcester</td>
<td>3.52</td>
<td>5 years</td>
<td>0.74</td>
<td>94,000</td>
<td>7.51</td>
</tr>
</tbody>
</table>
The figures suggest that an intensive programme could be achieved for around €8.60 per head – around £7.50 – suggesting that intensive smarter choice programmes for the Mid-West region could be achieved for the figures shown in Table 3.4.

Table 3.4: Indicative Cost of Intensive Smarter Choices Initiatives

<table>
<thead>
<tr>
<th>Area</th>
<th>Population 2006</th>
<th>Indicative Cost (€)/Yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clare</td>
<td>110,950</td>
<td>832,000</td>
</tr>
<tr>
<td>Limerick City</td>
<td>52,539</td>
<td>394,000</td>
</tr>
<tr>
<td>Limerick County</td>
<td>131,516</td>
<td>986,000</td>
</tr>
<tr>
<td>North Tipperary</td>
<td>66,023</td>
<td>495,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>361,028</strong></td>
<td><strong>2,207,000</strong></td>
</tr>
</tbody>
</table>

Source: Population data from CSO 2006.

With a projected population of 500,000 this financial figure escalates to c.€3.1M/year.

A targeted programme could offer better value for money over a period of around ten years, for example focusing on the main urban areas and selected smaller settlements where more travel options are available. This could focus on the following:

- Limerick city;
- Ennis;
- Shannon;
- Thurles;
- Nenagh;
- Roscrea;
- Kilrush;
- Ennistymon;
- Newcastle West;
- Kilmallock;
- Kilkishen;
- Lisdoonvarna;
- Scarriff.
- Kilkee;
- Rathkeale.

The development and piloting of local transport hubs in some of the more rural locations and smaller settlement towns should be investigated further to try and encourage smarter travel. Small investments, in strategically prominent locations will also add to the profile of the smarter travel initiative.

These initial pilot transportation hubs may include such measures as bus stop upgrades to shelters and seating, cycle parking, adjacent small volume of dedicated car parking to facilitate car-sharing or park and ride. In Ennis, a pilot freight transhipment hub should be established to lessen the burden of commercial vehicles in the town centre. The idea of developing and managing a scheme for urban freight logistics should be brought forward in an independent pilot study that could be used to inform other such changes to urban freight logistics management in the region. This approach will make the implementation of smarter travel choices more implementable due to the safer traffic environment.

Any spend on smarter choices would also require spend on infrastructure to create the options to which people would be expected to change.
Monitoring is essential to evaluate the effectiveness of smarter choices initiatives. The Census provides valuable information on travel trends on a five-yearly basis; however there is a need for monitoring to be ongoing between these years. Possible indicators could include:

- the proportion of companies/schools with live travel plans (i.e. with travel patterns surveyed and travel plan targets/objectives regularly updated);
- air quality;
- counts of the number of pedestrians/cyclists on strategic routes;
- bus service punctuality; and
- bus/rail patronage (analysis of Electronic Ticket Machine (ETM) data from operators could enable cost-effective monitoring).

While congestion relief may not yield good rates of return given that Limerick city’s congestion is relatively light, benefits for air quality, safety and environment would be expected to be worthwhile. There would also be added benefits with reallocation of road space if bus reliability and punctuality are improved. Quantification of the benefits of walking and cycling has been debated with strong and clear direction emerging that significant benefits can accrue from smaller targeted investments. However, an aspirational target of 50% mode share or more for smarter choices is extremely unlikely to be achieved and would not be financially feasible given the high costs involved, even after a programme of measures is established.

However, the city and vulnerable road users could additionally benefit from the implementation of heavy commercial vehicle restrictions in the core of the city at certain times and this should be considered jointly by the council and stakeholders, given the available routing options now available for through traffic.

### 3.12 Land Use Planning and Transport

Planning decisions affect how public transport services are provided and the extent to which they are effective. At the same time, designing with public transport services as a central feature of development areas can help inform land use decisions and promote sustainable travel. However, there are many examples where this integration between land use planning and public transport is not achieved – the result is further car dependency.

In this respect, it is instructive to consider the region in its current built form. One major example is the employment area at Shannon. This offers extensive employment premises but is severed from the residential community by a major road link to the airport and is poorly linked to the public transport network, no rail link being available and many of the bus and coach services heading towards the airport bypassing the employment area. The consequence is that the overwhelming majority of workers on the site travel by car and this pattern is likely to be perpetuated, it being difficult to ‘retro-fit’ other travel options for this type of area.

The edge of Limerick city is characterized by some relatively isolated developments, notably retail, with poor public transport connectivity and difficult access by walking and cycling. In addition to the location of sites, their design is aimed at accommodating parking and accessibility by other modes is not provided for to any extent that would encourage their use.

At a smaller scale, settlements such as Nenagh are dominated by traffic and on-street parking which undermines their role as centres of economic activity and social interaction. Similarly, in Ennis movement of commercial vehicles making deliveries through small streets could be addressed through piloting a local freight transhipment hub to improve the streetscape, safety and environment.
For new development sites, the principles of sustainable access can be applied. Designs which allow the site to be accessed predominantly by car often provide poor access for buses and service vehicles. Inevitably, bus users are marginalized as there is little advantage to travelling by bus and only a ‘residual’ market develops. Instead, the layout can be redefined with priority being given to sustainable modes. This design philosophy should be noted in particular for the design of the proposed Orbital route around the Limerick City. Many business premises are laid out around the vehicle entrance and parking space with the result that people who drive have an advantage in such aspects as convenience, safety and cost.

This approach presents an entirely different perception of access in which the balance between car access and sustainable modes is much more evident and the frontage is more active. People will be more inclined to use new facilities if they are comfortable with the access arrangements and are not excluded simply because they have chosen (or are unable) to travel by car. This re-establishes the principles of streets and their focus on people rather than vehicle movements.
4. Scenario Development

4.1 Growth Scenarios

Initially three growth scenarios were assumed for the purposes of strategy development and the modelling of identified public transport infrastructure and service measures. These scenarios had been developed by McGill Planning as follows:

1. Scenario 1 (Do Minimum) – Forecast growth with no changes to the current transport provision.
2. Do Something (Low Cost) – this scenario uses the same population projections as scenario 1 above, but includes improvements to the public transport network as well as all road infrastructure that had sufficient detail to be modelled from County Development Plans and new roads proposed by the National Roads Authority.
3. Do Something (High Cost) – Scenario 3 is a list of additional measures added to Scenario 2. This scenario uses the same population projections as scenarios 1 and 2 above, but has been developed to achieve a significant growth in the use of more sustainable modes of transport and lessen car dependency. A range of public transport, smarter choices, land use and transport planning measures have been identified with the objective of taking a large step towards achieving the governments modal split target.

Following discussions with the Steering Group, and on the basis that the Regional Planning Guidelines had been adopted, it was decided to use the same population targets and dispersal of settlement but utilise the developed public transport options by harmonising them into Do Nothing, Do Something (Low Cost) and Do Something (High Cost).

A fourth scenario was also undertaken. This scenario set-out to achieve the Smarter Travel policy target objective of having 55% of people travelling to work by more sustainable means. It included many hard, soft and demand management measures, some publicly contentious. The scenario was undertaken to see if the current low base of public transport in the region could be substantially raised.

With an exceptionally strong portfolio of measures the mode-share rate between car and other alternate modes failed to raise anywhere near the policy target of 55% by smarter travel modes at a cost of c.€2bn.

The focus then moved to try and achieve the 55% target in the urban area of Limerick with effective change in the other main urban towns.

The following sections outline the initial public transport assessment based on the first population settlement work presented and the target objective.

4.2 Potential Limerick City Bus Service Improvements

In developing a framework for the improvement of bus services in Limerick city and environs, we have considered three network enhancement options based on a single population and employment growth scenario specified in section 1. There is potential for many of these enhancements to be implemented incrementally, starting with the best performing existing routes and phasing improvements to match the progress of new development. The solution may incorporate elements of all three enhancement options.
4.2.1 Scenario 1

Scenario 1 represents the continuation of existing dispersed development patterns which are difficult to serve by public transport modes. For this scenario it is therefore proposed that the existing Bus Éireann network and frequencies within Limerick city be retained but with the simplification of routes. The following elements could help to facilitate this:

- The grouping of city centre stops and services to create mini interchange hubs, as well as the use of Colbert interchange as a layover area;
- Renumbering of routes with potential colour coding on printed and electronic service information and external vehicle branding to include major destinations, daytime frequencies and fares information;
- Interior vehicle branding, with the potential use of Dublin Luas style network maps and promotion of interchange opportunities with regional bus/coach and rail services; and
- Upgraded bus stop infrastructure, to reflect the rebranded routes, and which are fully accessible with raised kerbs to facilitate access to low floor buses and tactile paving.

Journey time information has been supplied by Bus Éireann for routes 301 to 312. Using this data, together with current service frequencies within published timetables, the peak vehicle requirement for this scenario is estimated at 24 buses. This is consistent with the current vehicle requirement reported by Bus Éireann. It has also identified the main congestion points\textsuperscript{14}.

\textsuperscript{14} Athlunkard Street, Ballinacurra, Brookville Avenue, Clancy Strand, Corbally Road, Crescent Roundabout, Ennis Road/Sarsfield Bridge, Hyde Road/Lower Hyde Road, Mallow Street/Henry Street, Mulgrave Street/Ballysimon Road, Punches Cross, Roxborough Road, Scoil Ide, St Munchins, Thomondgate, Approach to Parkway, UL access/egress, Plassey Park Road, Childers Road (sections)
Figure 4.1: Limerick City Bus Services – Scenario 1
4.2.2 Scenario 2

This scenario presents an opportunity to deliver a public transport-oriented development pattern within Limerick. Accordingly, a clean sheet approach to the development of a public transport network has been adopted, using the analysis of CSO travel to work data and then tested using the model to identify the areas of the city with the greatest market potential and so provide a higher level of service for these areas.

The five largest employment areas in the Mid-West region comprise the Limerick central area (the City Council offices, retailing, etc), Ballycummin (Midwestern Regional Hospital, Crescent Shopping Centre, Raheen Industrial Estate etc), Shannon (Airport, Freezone Industrial Estate etc), Ennis and Nenagh. Within each of the five employment areas the main residential origins of employees have been identified, i.e. residential Enumeration Districts (EDs) with flows of 100 commuters or more. New and improved bus routes have been identified to connect the majority of these residential EDs to the five employment areas.

The proposed network modifications are summarised in Table 4.1.

<table>
<thead>
<tr>
<th>Route</th>
<th>Mon-Sat Daytime Frequency (mins)</th>
<th>Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>QBC/BRT 1</td>
<td>15</td>
<td>New route from Raheen to Annacotty via Ballinacurra Road, (for Colbert Station), City Centre, Pennywell Road and Dublin Road. Replaces route 304. – Potential to connect with Park and Ride –</td>
</tr>
<tr>
<td>QBC/BRT 2</td>
<td>15</td>
<td>New route from Raheen to National Technology Park via St Nessans Road, City Centre, Pennywell road, Dublin Road and Plassey Park Road.</td>
</tr>
<tr>
<td>QBC/BRT 3</td>
<td>15</td>
<td>New route from Coonagh Roundabout to Ballysimon Road via Ennis Road, City Centre, Carey’s Road, Roxborough Road and Childers Road – Possibility to connect to Moyross via Phase 1 of Northern Distributor Road – Possibility to connect through South Hill regeneration Area</td>
</tr>
<tr>
<td>4</td>
<td>60</td>
<td>Extension of route 305 to serve Ennis Road and Coonagh Roundabout to west and new residential development at Garryglass and University to east. Frequency unchanged.</td>
</tr>
<tr>
<td>5</td>
<td>30</td>
<td>Revised route 302. Frequency reduced but service extended to Crescent Shopping Centre and Mid-West Hospital via Roxborough Road.</td>
</tr>
<tr>
<td>6</td>
<td>30</td>
<td>Revised route 306. Route amended at Craveel Park and diverted via Mulgrave Street to O’Malley Park, onwards to Crescent Shopping Centre and Mid-West Hospital. Frequency unchanged.</td>
</tr>
<tr>
<td>7</td>
<td>60</td>
<td>Revised route 309. Retains Pineview section of route but instead of serving St Mary’s Park, routed to Mid-West Hospital via Crescent Shopping Centre. Frequency unchanged.</td>
</tr>
<tr>
<td>8</td>
<td>60</td>
<td>Revised route 309. Retains St Mary’s Park section of route but extended to Dock Road and Courtbrack Road areas. Frequency unchanged.</td>
</tr>
<tr>
<td>9</td>
<td>60</td>
<td>Combines routes 301 and 312 to operate cross-city. Route 304A discontinued. Frequency unchanged.</td>
</tr>
<tr>
<td>10</td>
<td>20</td>
<td>Revised route 308. Removal of hourly route 308A via Clare Street. Extension of route 308 to Mid-West Hospital via Crescent Shopping Centre. Frequency unchanged.</td>
</tr>
</tbody>
</table>

Source: Mott MacDonald

In addition to the elements identified for Scenario 1, for the BRT and QBC routes it would be highly desirable to provide Real Time Passenger Information (RTPI), building upon Bus Éireann’s ongoing
development of an Automatic Vehicle Location (AVL) system. As well as fixed display screens at bus stops, this would also provide the opportunity to access real time information from the Internet or from mobile phones, further increasing the attractiveness of the bus service.

A two-tier network is envisaged, with core routes operated by high frequency limited stop BRT services or QBC corridors connecting the main destinations, and secondary routes operated by cross-city conventional bus services providing links from the main destinations to most other areas of Limerick. The intention has been to create new intra-urban interchange hubs, both within the city centre retail area (as well as with regional bus/coach and rail services at Colbert Station) and at Crescent Shopping Centre, Mid-West Regional Hospital and the University of Limerick. The introduction of QBC/BRT services via the Ennis Road, Roxborough Road and Ballysimon Road also promote their use for Park and Ride, and purpose built Park and Ride facilities, such as at Ballysimon Road, on the N24 adjacent to the M7 motorway, may be feasible in the future.

The peak vehicle requirement for this scenario is estimated at 36 buses, compared with the 24 buses used on the existing network. A QBC/BRT operating speed of 30 km/h is a target objective; this is relatively rapid and depends on a high level of segregated alignment being achieved, without which BRT will not be sufficiently attractive to potential users when compared with car journeys. Should this not be achievable, then more BRT vehicles will be required to operate services at the same frequency and incur additional operating costs. QBC/BRT routes 1 and 2 combine to provide eight buses per hour between Raheen and Annacotty via Limerick city centre. This service frequency will help to facilitate the provision of small-scale Park and Ride sites along the Dublin Road/Annacotty and Raheen corridors. The network modifications proposed as part of Scenario 2 are shown in Figure 4.2.
Figure 4.2: Limerick City Bus Services – Scenario 2
4.2.3 Bus Priority Measures

Over the 20 year period between 2010 and 2030, the National Roads Authority predicts a 26% increase in car and light goods vehicle kilometres travelled. Although these forecasts were produced prior to the current economic difficulties in Ireland, it is clear that car ownership will continue to grow in the longer term, with traffic congestion worsening as a consequence. Bus Éireann report average bus speeds in Limerick city of 13 km/h during weekday peak periods and speeds are also sub-optimal at off-peak times, with 21 km/h reported. The proposed reconfiguration of city and provincial bus services should form part of an integrated package of transport interventions to stimulate use of sustainable travel modes and a shift away from car use. However, if such services are ever to be viable in the longer term, introducing further bus priority measures will be crucial to achieve attractive journey times and acceptable reliability, particularly within the Limerick city boundary and are a critical element of any BRT or QBC scheme.

The Limerick City Green Route Project forms the beginning of the establishment of a Bus Rapid Transit system. It has identified routes where road capacity should be reallocated from car to other more sustainable modes. One of the key project objectives is to increase average bus speeds within Limerick to 20km/h, including dwell time at stops. Segregated bus lanes would be provided wherever the carriageway width allows, together with bus gates, Selective Vehicle Detection (SVD), traffic metering and bus gates. These measures would be complemented by improved bus stop infrastructure, new and improved pedestrian crossings and better facilities for cyclists, with the aim of promoting modal shift from car.

For the southern corridor (Ballinacurra Road), the following measures could be considered subject to detailed feasibility:

- Inbound bus lane on Ballinacurra Road, on approach to McDonald’s Cross signals;
- Inbound bus lane on O’Connell Avenue, on approach to St Gerard Street signals and on approach to Mallow Street signals; and
- Outbound bus lane (200m approx) on O’Connell Avenue, on approach to the Punch’s Cross signals.

However, to facilitate interchange with coach and rail services at Colbert Station, the routeing of some services via the R858 Rosbrien Road/Lord Edward Street should be investigated (as per Scenario 3) and the feasibility inbound bus priority measures (e.g. bus gate) considered on this route.

For the western corridor (Ennis Road/ Cratloe Road) the following bus priority measures may be feasible:

- Inbound bus lane on Ennis Road from Coonagh Roundabout to pre signals Clonmacken Road/ Appleton Court junction (Caherdavin Lawn);
- Inbound bus lane on R857 Ennis Road east of Lansdowne Park junction to pre-signals at R464 Shelbourne Road junction;
- Continuation of inbound bus lane on Ennis Road to Mid-West Regional Maternity Hospital junction;
- Inbound bus lane and SVD on Cratloe Road on approach to Hassetts Cross signals; and
- Inbound bus lane Sexton Street (North) and pre signals at Cross Road junction.
For the eastern/south eastern corridors (Dublin Road/Childers Road/Musgrave Street) the following bus priority measures may be feasible:

- Outbound bus lane on R509 Childers Road, on approach to Parkway Roundabout;
- Inbound bus lane on R509 Childers Road, on approach to Tipperary Roundabout;
- Inbound bus lane on R509 Childers Road, on approach to Kilmallock Roundabout;
- SVD at the Dublin Road/Milford Road signal junction (south of University);
- SVD at the Dublin Road/St Patricks Road (west of Parkway Shopping Centre);
- Inbound bus lane and pre signals at the Dublin Road/Park Road signal junction;
- Outbound bus lane on the N7 Dublin Road on approach to Parkway roundabout (requires road widening east of Ennis rail line overbridge); and
- Inbound bus lane Mulgrave Street on approach to Cathedral Place junction (proposed for signalisation under Green Route scheme). This would require the removal of on-street parking.

To support the above, the further development and expansion of a more comprehensive Urban Traffic Management and Control (UTMC) system would be desirable, to achieve synchronisation between traffic signals around the Limerick urban area, as recommended in the Limerick Traffic Management Study. However this is a high cost option, both in terms of initial capital costs (over €1 million) and ongoing staffing and maintenance.

4.3 Potential Rural Public Transport Improvements

The challenges facing the public transport system are particularly acute in rural areas with a key issue of low density and consequently low demand in rural communities. This makes the majority of rural public transport routes commercially unviable. A limited number of passengers and the necessity to keep fares affordable precludes bus operators from operating without subsidy. Rural communities are more reliant on private transport and have high levels of car ownership.

Elsewhere in Europe, the framework within which rural transport services are delivered is leading to consideration of new or alternative approaches. However, no scheme has yet been developed to a stage where they are seen to offer an appropriate alternative to the private car. Integration with core bus services is key in linking rural areas with larger settlements. The identification of options for the provincial bus network within the three scenarios has been informed by these emerging rural transport options.

The provincial bus network comprises services currently operated by Bus Éireann and smaller operators providing scheduled local/inter-urban services. These operators include JJ Kavanagh and Sons, Kenneally’s Bus Service, Martin Walsh, Dick Martin and Sons, John Flynn and Curtin Executive Travel. Changes to the current regulatory regime could see such operators and local authorities having a greater role in the provision of bus services in the future.
4.3.1 Scenario 1

Under Scenario 1 it is assumed that the existing network of provincial Bus Éireann services in the Mid-West region remains unchanged. However, improved electronic and printed information, together with a targeted marketing campaign to include new fares initiatives, should be taken forward if new patronage is to be stimulated. Bus Éireann has indicated that the current peak vehicle requirement for provincial services (excluding the Expressway network) is 40 vehicles.

4.3.2 Scenario 2

Under Scenario 2, a clean sheet approach has been adopted. It is proposed that the provincial bus network be refocussed on the core corridors between Gateway, Hub and Service Towns as similarly outlined in the Regional Planning Guidelines (2010-2022). It is recommended that irregular services, such as Wednesday or Friday only routes, be discontinued and vehicles/staff reallocated to improve frequencies on the core corridors. This would enable a more coherent offer to be presented, appealing to potential users and generating operating cost savings.

The overarching objective in reshaping the network has been to ensure a minimum combined frequency of one provincial bus every hour connecting the service towns of Kilrush, Ennistymon, Newcastle West, Thurles, Roscrea, Scarriff and Kilmallock with Ennis and Limerick. In addition, based on modelling and analysis of CSO travel to work data, it is proposed that services be improved between Limerick City, Ennis and Shannon, with services commencing from Limerick suburban areas such as Raheen and Singland, which have proven commuter flows to/from Shannon, although mainly car-based currently. These improvements should focus on Shannon and Smithstown Industrial Estates and the Shannon residential area, rather than routing additional services into Shannon Airport, which is already served by a large number of Expressway coach services.

Also, the renumbering of services may be worthwhile in creating the perception of an integrated bus network. It is likely that service renumbering would help improve existing/potential users’ understanding of the travel opportunities available over the wider region, with route timetable guides produced for individual services or groups of services within a defined area.

In West Clare, due to the remoteness of the coastal settlements from the Ennis/Shannon/Limerick axis, and the generally low population density in the area, commuter flows to Ennis/Limerick are limited and unlikely to justify the provision of regular bus services. However, public transport accessibility between West Clare and Ennis could be improved through the introduction of a new two-hourly coastal bus service connecting the resorts of Kilkee, Miltown Malbay, Lahinch, Cliffs of Moher, Doolin (for the Aran Islands), Lisdoonvarna and Ballyvaughan. Onward journeys to Ennis could be facilitated by timetabled connections at Kilrush and Ennistymon. The new coastal bus service could be branded as a ‘Clare Coast Explorer’ or similar to improve tourism opportunities for those without access to a car and benefiting local residents at the same time, particularly if timetable co-ordination and through bus/rail ticketing to Ennis, Shannon and Limerick can be achieved.

East Clare is also remote from the Ennis/Shannon/Limerick axis, although to a lesser extent than West Clare. A new direct two-hourly bus service between Scarriff and Ennis via Tulla could improve public transport connectivity to the wider Mid West region. Following the R352 corridor, from Ennis the bus service could facilitate access to high frequency bus services to Limerick and Shannon, and rail services to Limerick and Galway. However, providing a local service within Ennis would be difficult due to the constrained road space in the centre, the need to focus on the bus/rail interchange and the levels of use
that could be expected; a suitable route for service 310 within Ennis would need to be devised. From Scarriff, the bus service could provide connections with a combined hourly bus service to Limerick via Broadford or Killaloe.

It is acknowledged that network rationalisation could disadvantage those living within isolated rural communities, who may lose their bus service as a result. For those areas, it may be feasible to introduce demand responsive transport (DRT) services, which can feed passengers into scheduled provincial bus services at designated interchanges on the core inter-urban corridor, or within the nearest service town. It may be feasible to pilot some schemes and possibly include a scheme in Thurles, so that passengers can interchange with Iarnrod Éireann services to Limerick for example. From Thurles, substandard road links with Limerick and the rest of the Mid-West region mean that bus services are unlikely to provide attractive through journey times (although intermediate settlements such as Dundrum and Cappamore may allow a new bus service to develop a sustainable patronage base). Strong branding, such as ‘Collect and Connect’, will be important to raise awareness of the DRT service and the interchange opportunities presented. Should a sufficient level of demand be generated by the Thurles pilot scheme, “Collect and Connect” type schemes could also be rolled out to other towns and their hinterland. These include:

- Kilrush;
- Ennistymon;
- Newcastle West;
- Kilmallock;
- Burren (TransTourism)
- Kilkishen; and
- Scarriff.

From Roscrea, the existing Expressway route 12 (Dublin-Limerick), together with rail services on the Nenagh/Ballybrophy line, is considered to provide a good standard of connectivity with Limerick. CSO travel to work data (for all modes) indicates a total of 49 daily commuters from Roscrea to Nenagh, two daily commuters to Ballycummin and one daily commuter to Shannon. This level of demand would not justify the introduction of a new provincial bus service.

However, as new employment opportunities emerge in Limerick, early morning coach services may be justified to provide public transport access from Roscrea. The first coach currently departs from Roscrea at 09:50, arriving in Colbert Bus Station at 11:10, which is impractical for commuting purposes. Generally however, it is considered that the Expressway network functions well and requires little modification.

The possible introduction of a ‘Rail Air Shuttle’ between Sixmilebridge rail station and Shannon Airport has also been considered.

Potential modifications to the provincial bus network are presented in Table 4.2, and illustrated diagrammatically in Figure 4.3.
Figure 4.3: Provincial Bus Services – Scenario 2

Source: Mott MacDonald
The peak vehicle requirement for this scenario is estimated at 51 buses, with 17 required to operate services from Ennis and Limerick to Shannon (assuming a single vehicle is utilised for each of the “Collect and Connect” schemes). However, the number of vehicles may vary according to the scheme developed. For example, a dedicated vehicle may be purchased for Bus Éireann or a private operator, which could provide a semi-scheduled service diverting according to demand, serving different areas from day to day. Alternatively, local taxi operators could be contracted to provide a fully demand responsive service, which would not operate at all if no bookings are received.
**4.3.3 Scenario 3**

Under Scenario 3, it is considered that the rationalised network identified for Scenario 2 should be taken forward but with the aim of achieving a half-hourly frequency between the service towns and Ennis/Limerick. Additional ‘Collect and Connect’ services are also proposed to act as feeder services into the core interurban services and thereby increase the likelihood of achieving a sustainable patronage base for these core routes. However, it is unlikely that such routes would ever fully cover their operating costs through fare revenue. Similarly, longer distance coach services such as Limerick-Tralee-Killarney are unlikely to attract sufficient users to cover costs despite its parallel with the Great Southern Trail, particularly as rail services are available to Tralee from Limerick via Limerick Junction. Other services between smaller settlements would need to be promoted on a commercial basis and therefore attract sufficient demand to operate them without subsidy.

Potential modifications to the provincial bus network under Scenario 3 are presented in Table 4.3. It is assumed that the provision of a new rail station, bus interchange and Park and Ride at Cratloe (for Shannon Airport) would obviate the provision of a ‘Rail Air Shuttle’ from Sixmilebridge rail station.

<table>
<thead>
<tr>
<th>Route</th>
<th>Mon-Sat Daytime Frequency (mins)</th>
<th>Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>301</td>
<td>60</td>
<td>Scarriff-Broadford-Ardnacrusha-Limerick</td>
</tr>
<tr>
<td>302</td>
<td>60</td>
<td>Scarriff-Killaloe-O’Briensbridge-Ardnacrusha-Limerick</td>
</tr>
<tr>
<td>303</td>
<td>60</td>
<td>Scarriff-Tulla-Ennis</td>
</tr>
<tr>
<td>304</td>
<td>60</td>
<td>Borrisokane-Nenagh-Silvermines-Newport-Limerick</td>
</tr>
<tr>
<td>305</td>
<td>60</td>
<td>Borrisokane-Nenagh-Killaloe-Castleconnell-Limerick</td>
</tr>
<tr>
<td>306</td>
<td>30</td>
<td>Thurles-Dundrum-Cappamore-Limerick</td>
</tr>
<tr>
<td>307</td>
<td>30</td>
<td>Charleville-Kilmallock-Bruff-Croom-Patrickswell-Limerick</td>
</tr>
<tr>
<td>308</td>
<td>30</td>
<td>Newcastle West-Rathkeale-Limerick</td>
</tr>
<tr>
<td>309</td>
<td>60</td>
<td>Tarbert Island-Foynes-Pallaskenry-Limerick</td>
</tr>
<tr>
<td>310</td>
<td>10</td>
<td>Ennis-Newmarket-Smithstown Ind Est-Shannon-Shannon Ind Est</td>
</tr>
<tr>
<td>311A</td>
<td>20</td>
<td>Shannon Ind Est-Shannon-Bunratty-Limerick-Singland</td>
</tr>
<tr>
<td>311B</td>
<td>20</td>
<td>Shannon Ind Est-Shannon-Bunratty-Limerick-Raheen</td>
</tr>
<tr>
<td>312</td>
<td>60</td>
<td>Kilrush-Killimer-Labasheeda-Ennis</td>
</tr>
<tr>
<td>313</td>
<td>60</td>
<td>Ennis-Ennistymon-Lisdoonvarna</td>
</tr>
<tr>
<td>314</td>
<td>60</td>
<td>Ennis-Corrofin-Kilfenora-Ennistymon-Lisdoonvarna</td>
</tr>
<tr>
<td>315 ‘Clare Coast Explorer’</td>
<td>60</td>
<td>Kilrush-Kilkee-Miltown Mallbay-Lehinch-Ennistymon-Cliffs of Moher-Doolin-Lisdoonvarna</td>
</tr>
</tbody>
</table>

Thurles ‘Collect and Connect’ | Demand responsive | Thurles and surrounding area |
Kilrush ‘Collect and Connect’ | Demand responsive | Kilrush and surrounding area |
Ennistymon ‘Collect and Connect’ | Demand responsive | Ennistymon and surrounding area |
Newcastle West ‘Collect and Connect’ | Demand responsive | Newcastle West and surrounding area |
Kilmallock ‘Collect and Connect’ | Demand responsive | Kilmallock and surrounding area |
Kilkishen ‘Collect and Connect’ | Demand responsive | Kilkishen and surrounding area |
The peak vehicle requirement for this scenario is estimated at 77 buses, with 40 of these required to operate services from Ennis and Limerick to Shannon and an assumed six vehicles to operate each of the proposed ‘Collect and Connect’ schemes. This vehicle requirement compares with the current requirement for 40 provincial vehicles reported by Bus Éireann.

4.4 Strategic Implementation Plan

A strategic implementation plan for improvements to public transport in the region has been developed and fully outlined in Appendix A, based on an incremental approach which builds on investments already made and committed. The plan begins by identifying a number of relatively low cost measures with potential for early implementation (‘quick wins’). These measures seek to raise awareness of the existing public transport network and sustainable travel measures generally. A programme is envisaged to highlight to the public the benefits of using sustainable travel modes, e.g. potential cost savings, improved health and fitness, car free days out to local attractions. Work on these measures could potentially begin immediately and be fully implemented within 12 months.

4.4.1 Short Term (Stage 1)

- Mid-West Area/Limerick City Public Transport Map and Guide to promote an integrated public transport network in printed and electronic form;
- Provide printed information displays at all city bus stops, showing network map, departure times, journey times to key destinations, time of last return bus, fares information;
- Improved signing to interchanges (bus/rail stations) e.g. Ennis;
- Undertake accessibility audits of pedestrian routes serving bus stops and railway stations (including crossings) to improve access;
- Review of all waiting and loading restrictions in the region, with potential amendments to include rationalisation of on-street parking and implementation of bus stop clearways;
- Fares initiatives – promote existing day tickets, timed transfer ticket, weekly ticket, ten trip carnet ticket, better value longer duration season tickets. Integrated ticketing products e.g. bus/rail/Shannon ferry (latter to provide through ticket from Kilrush to Limerick via Foynes);
- Review of bus stop ownership and approval process for new stops;
- Assign Travel Plan Co-ordinators (one for Limerick City and environs, second for Shannon employment area, third for Ennis and some for rural hinterland to include the relevant parts of Clare, Limerick and North Tipperary) to liaise with existing local employers to establish travel plan forums and develop
sustainable travel initiatives, promoting the financial as well as the environmental benefits to businesses and employees;

- Launch Transport for Mid-West Region website, championed by the Travel Plan Co-ordinators, visiting local businesses and schools as part of a programme to promote sustainable transport;

- Require travel plans as a planning condition for new developments, to include details of monitoring strategy and framework under which corrective measures will be taken if specified targets are not met. Planning conditions could also be used to secure funding contributions towards the appointment of Travel Plan Co-ordinators; and

- Marketing campaign for Nenagh-Ballybrophy railway including door to door distribution of marketing/information material.

### 4.4.2 Short Term (Stage 2)

- Launch Limerick City Car Club. This is likely to be similar to schemes already launched in Cloughjordan and Cork (www.gocar.ie);

- Implement simplified city Bus Eireann network, maximising opportunities for interchange with rail/Expressway coach services at Colbert station. Renumbered routes, new information and scrolling electronic displays on buses;

- Introduce showcase cross-city bus route (assumed to be Raheen-City Centre-Annacotty = QBC/BRT1) with new shelters, raised kerbs/boarders, route information at bus stops, etc. This upgrade to BRT could be done incrementally by implementing QBC measures in the first instance and later progressing to BRT;

- Route launch to be associated with marketing campaign (potential use of external agency to develop route branding). Advertisements on buses and at bus shelters – most cost effective;

- Implement additional bus priority measures (road space reallocation/SVD) on showcase route;

- Provide cycle parking at key destinations, e.g. major public transport interchanges, shopping centres and tourist attractions. These should be secure ‘Sheffield’ type stands, or ideally cycle lockers;

- Maximum, not minimum, car parking standards for new developments in Zone 1 (RPG 2009); and

- Produce Sustainable Design Guide for residential/commercial developments as supplementary planning guidance with higher density development and new layouts to support sustainable modes.

### 4.4.3 Short Term Measures (Stage 3)

- Improve bus stop infrastructure on second showcase route (assumed to be Raheen-Docklands-City Centre-National Technological Park = QBC/BRT 2) with appropriate infrastructure (segregated QBC/BRT alignment and priority junction arrangements plus bus lanes where full segregation is not achievable) and strong marketing. Development of QBC/BRT2 could be done incrementally by implementing QBC measures in the first instance and later progressing to BRT;
Implement additional bus priority measures (road space reallocation/SVD) on second showcase route;

Enhanced Urban Traffic Management and Control (UTMC) for Limerick City and environs of Raheen/Doonadysk and Ballysimon/Annacotty/Castletroy;

Amend traffic management arrangements in Limerick city centre to improve efficiency of bus operations and simplify stopping arrangements;

Reconfigure regional Bus Eireann network, with two-hourly or hourly services from service centres into Limerick/Ennis/Shannon. Introduce ‘Collect and Connect’ demand responsive services from key rural interchange hubs. Enhance Expressway service 12 (Dublin-Roscrea-Limerick) with additional early morning/late evening services;

Review potential for new city bus services, e.g. orbital routes to connect new residential/employment/retail areas;

All local/regional/expressway buses to be real time information compatible;

Selective Vehicle Detection at all signal controlled junctions;

Southern Park and Ride site in vicinity of Loughmore Roundabout (integrated with QBC/BRT1 extension). Other existing car parks to be designated for Park and Ride/Park and Share (e.g. Crescent Shopping Centre, Childers Road). Sites to east of city centre (Dublin Road corridor) could include Travelodge Castletroy, existing retail at Kilmurry Roundabout, new build at Dublin Road/Plassey Park Road junction (Annacotty Roundabout);

Refurbishment of Limerick Colbert rail station, to complement bus station redevelopment; and

Develop Limerick city cycle network with quiet routes/opportunities for cycle lanes (in accordance with National Cycle Manual) supported by printed and electronic network map.

### 4.4.4 Medium Term Measures

Western Park and Ride site in vicinity of Coonagh Roundabout (integrated with QBC/BRT3 introduction). Other existing car parks to be designated (e.g. Kilmurry Lodge Hotel, Maldron Hotel);

South Eastern Park and Ride site in vicinity of N24 Ballysimon Road/M7 Limerick Bypass intersection (initially small scale site integrated with QBC/BRT3 introduction);

Combine existing city bus services to provide cross-city routes;

Enhance existing Shannon-Limerick bus service and extend routes to Raheen and Singland to provide direct services with improved infrastructure and information;

Rail/air shuttle bus from Sixmilebridge rail station to Shannon Airport;

### 4.4.5 Long Term Measures

New rail stations (Boher, Crusheen);
- Moyross and Paway/Lynwood rail stations-2;
- Provide walk/cycle greenways using disused railway alignments e.g. Limerick to Kilmallock and Limerick to Foynes;
- Review possibility of converting Nenagh-Ballybrophy rail route to tram/train operation; and
- Improved rail frequencies Galway – Ennis – Limerick.
5. Delivery

5.1 Towards a Deliverable Strategy

The scenarios discussed above represent a spectrum ranging from minimal intervention to a very high level approach designed to create a high proportion of journeys by sustainable means. The reality can be expected to be somewhere in between with a selection of measures on a scale that can be funded over the period envisaged and that will help reduce car dependency in favour of other means of travel. Therefore the recommended strategy includes some of the initiatives considered in the scenarios described having considered the relative merits of each contender.

The list includes all the measures included in Scenario 2 and some of those from Scenario 3. The interventions that have not been included, in trying to achieve the Smarter Travel targets for the region, are very high cost relative to the expected benefits with little evidence that they would generate a shift from car use on a large scale. For example, extensive highway widening to accommodate buses requires high expenditure for a relatively low number of journeys. Heavy rail schemes are excluded on the grounds that they are very high cost but the base number of users is relatively small. The very high costs of light rail are unjustifiable given the very low levels of demand even with the most optimistic patronage forecasts and sympathetic land use changes. Other initiatives such as widespread parking restraint or road user charging would be unpopular and hence could undermine economic competitiveness while being politically undeliverable. Such schemes would be better suited to application on a national scale rather than at a regional or local scale.

5.2 Indicative Appraisal

Each of the potential measures has been scored against the following policy objectives:

- **Economic growth**
  - Retain a robust and well balanced economy;
  - International links and competitive location;
  - High added value and high wage economy; and
  - Providing social, economic and physical infrastructure required to support industry.

- **Balanced spatial development**
  - Develop Limerick/Ennis/Shannon as a co-ordinated urban agglomeration as the core driver for the region;
  - Area-wide benefits;
  - Develop key service centres for each peripheral part of the region, linking to Limerick/Ennis/Shannon;
  - Avoid car commuting where possible; and
  - Maximize the use of existing infrastructure.

- **Urban renewal**
  - Develop Limerick city centre as a multi-purpose zone supporting social and commercial activity;
  - Promote comparison shopping in Limerick City;
  - Promote regeneration of run-down areas; and
  - Provide good public transport to reinforce the role of the city.

- **Social inclusion**
Accessibility to employment; and
Accessibility to education, healthcare, etc.

- **Environment**
  - Minimize, or where necessary avoid impact on sensitive areas;
  - Promote sustainable use of resources;
  - Minimize impact on rural landscape; and
  - Promote sustainable access to countryside.

- **Transport**
  - Link Limerick city centre through an integrated public transport system and traffic management system;
  - Ensure a high quality public transport system;
  - Provide transport for the area immediately adjacent to Limerick/Ennis/Shannon to access the core area;
  - Link the region with Galway and Cork creating a critical mass to attract investment;
  - Investment in infrastructure; and
  - Reduce car dependency.

The scoring process and subsequent ranking identified those schemes that offered the best response to the objectives. In addition, deliverability issues are key in that any intervention needs to be feasible, affordable and acceptable. Hence a number of factors were considered with weightings applied in order to produce a combined policy objective and deliverability score. The deliverability factors included the following:

- Acceptability to the public;
- Acceptability to other stakeholders;
- Technical and operational feasibility;
- Likely funding availability; and
- Risks (e.g. land purchase, ability to attract patronage in the medium to long term, impact on other travel modes).

Ranking the interventions indicated that the most beneficial included improving the frequency of all bus services, related bus service improvements, station travel plans for Colbert and Ennis, facilities for cyclists and similar.

Appendix A and Appendix B show the elements of the modelled package which combines initiatives for rural areas and urban centres. The indicative cost of the package is around €322.6 million over the period to 2030 although the most costly measures involve significant bus service improvements which would generate some additional revenue; the scale of some of the proposed public transport infrastructure measures could be reduced to contain expenditure but this would be expected to reduce the associated benefits.
6. Scenario Modelling

6.1 The approach

We have developed a transport model to estimate the effectiveness of the 3 scenarios developed and presented earlier in this report. However, original proposed varied population settlement scenarios have been changed to a single population scenario, that of the Regional Planning Guidelines.

The model is based on the VISUM and DIADEM software platforms and is described in detail in a separate Local Model Validation Report. However, the principles of the modelling approach are:

- the Mid-West study area has been split up into 322 zones. Of these zones, 148 are in Limerick, 12 are in Shannon, 38 are in Ennis and 20 are in Nenagh.
- the road network is fully represented. Junction details have been used to calculate capacities and delays in Limerick.
- all public transport services in Chapter 2 are represented.
- base year travel demand has been estimated from surveys with car and public transport users.
- a 2009 base year model has been calibrated using UK Department for Transport standards, aiming at a good fit between real-life observations and the model representation.
- regional development figures have been obtained for Growth Scenario 1 to produce a forecast of the demand for travel generated by population and economic activity in future years 2015, 2020 and 2030 respectively.
- the three investment scenarios have been captured; we have assumed that scenarios 2 and 3 will only be feasible in 2020 and 2030.
- Appendix B sets out the way in which each of these scenarios has been interpreted in the model.
- A demand response model has been developed in DIADEM which allows travellers to respond to push and pull measures regarding destination choice, mode choice and route choice.

The total number of scenario runs is considerable, as indicated in the table below: a base year, 3 do-minimum scenarios (for 2015, 2020 and 2030) and 6 do-something scenarios, for 3 time periods (AM, interpeak and PM) each. In this report we concentrate only on 12-hour results in the numerical analyses, whilst all plots are only for the AM peak. We only analyse scenario 1 for 2015, scenario 2 for 2020, and scenario 3 for 2030 – in other words, we do not compare the lower cost alternatives in later years. This will make the interpretation of results easier for the reader. A full description of results is given in the Forecasting Report.

<table>
<thead>
<tr>
<th>Scenario Runs</th>
<th>2009</th>
<th>2015</th>
<th>2020</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do-minimum</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Scenario 1</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Scenario 2</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Scenario 3</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>
6.2 The problem

As already described in sections 2.4 and 2.7, public transport usage is currently very low in the Mid-West area (less than 3% for commute trips), and even in the urban areas. Achieving a substantial increase in public transport usage may well be possible; however, this is unlikely to translate to a substantial reduction in car dominance.

This is reflected in the demand matrices developed in the study (for car and public transport only):

- for commute trips, the public transport modal share is less than 4%; however for trips wholly within Limerick this value increases to almost 11%
- trips with other purposes have in the AM peak a public transport share of over 8% in the whole study area; although for trips wholly in Limerick this value doubles.

On the basis of Census data we assume that the current mode share for walking is 10%, and for cycling 1%. These values are used in some of the calculations, and help reduce the overall car modal share to around 80-85%.

A second problem is that the effects of a number of the components of the public transport strategy developed in the study cannot easily be quantified in a transport model. This includes:

- Renumbering of routes
- Branding
- Bus stop and vehicle improvements
- Information provision
- Travel Plan Coordinators
- Car Club and Car Share initiatives
- Cycling and walking initiatives (as these modes are not explicitly modelled)
- Routeing and signing strategies

These initiatives have been reflected by external adjustments to the demand patterns, based on experience elsewhere. However, this implies that we assume that a) these initiatives are effective at the investment levels suggested and b) their effectiveness is similar to what has been observed in other urban areas. This may require further investigation and adjustments to the model.

Finally, a number of elements in the public transport strategy have not been modelled, either because the impact on demand is expected to be negligible, or because the model is not able to reflect the intervention in a meaningful way. More information on these are contained in the Appendices.

6.3 The current situation

The validated base year model for 2009 provides the following vital statistics.

The daily (12 hour) number of trips in the study area equals around 217,000, of which 94.5% are made by car; the calculated modal share for public transport is just under 6%, about double what Census statistics suggest for the AM peak commute, which is as expected (for the home-based work purpose, the matrix PT share is 4%). The majority of trips are made with the purpose of home to work (HBW) or home-based other purposes, although for public transport trips from home with other purposes (HBO) dominate strongly.
Fourteen to fifteen percent of car trips do not have a home origin; this proportion is lower for public transport at around 6%. The number of trips for business purposes is low. This is in line with expectations.

<table>
<thead>
<tr>
<th>2009</th>
<th>Highway</th>
<th>PT</th>
</tr>
</thead>
<tbody>
<tr>
<td>HBEB: Home Based Employer Business</td>
<td>1760</td>
<td>89</td>
</tr>
<tr>
<td>HBO: Home Based Other</td>
<td>101082</td>
<td>8598</td>
</tr>
<tr>
<td>HBW: Home Based Work</td>
<td>82214</td>
<td>3344</td>
</tr>
<tr>
<td>NHBE: Non Home Based Employer Business</td>
<td>1587</td>
<td>63</td>
</tr>
<tr>
<td>NHBO: Non Home Based Other</td>
<td>30355</td>
<td>750</td>
</tr>
<tr>
<td>Total</td>
<td>216,998</td>
<td>12,845</td>
</tr>
<tr>
<td>Share</td>
<td>94%</td>
<td>6%</td>
</tr>
</tbody>
</table>

The daily number of kilometres and hours travelled by car is more than 10 times as high as those as PT passenger, at an average speed of 66 km/h. Average speed by public transport is slightly lower, reflecting the mainly rural and regional character of the study area and (train) services provided.

<table>
<thead>
<tr>
<th>Highway</th>
<th>2009BASE</th>
<th>PT</th>
<th>2009BASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>VehKm</td>
<td>543,659</td>
<td>PassKm</td>
<td>44,268</td>
</tr>
<tr>
<td>VehHr</td>
<td>8234</td>
<td>PassHr</td>
<td>740</td>
</tr>
<tr>
<td>Average Speed-kph</td>
<td>66.02</td>
<td>Average Speed-kph</td>
<td>59.82</td>
</tr>
</tbody>
</table>

Base year (2009 AM) highway flows are illustrated in figures 5.1 to 5.3, for the whole study area, Limerick and Shannon/Ennis separately. The highest flows are experienced around Limerick. There are significant interurban flows. The other three towns have relatively low flows. The remainder of the plots will focus mainly on Limerick.
Figure 5.1 Highway flows 2009 (study area)

Figure 5.2 Highway flows 2009 (Limerick)
6.4 Doing Nothing (2015, 2020 and 2030)

A Do-Minimum scenario has been defined, which includes committed highway investments for each of the three forecast years for which sufficiently detailed coding information was received. Details are provided in Appendix C. No public transport investments are defined for the Do-Minimum.

Traffic growth takes place due to population increases and specific development zones as defined in Growth Scenario 1. The total number of trips in the study area increases from 230,000 to 261,000 in 2015, to 282,000 in 2020 and 324,500 in 2030, increases of 13%, 23% and 41% respectively. Despite the highway improvements, the public transport share increases marginally.

<table>
<thead>
<tr>
<th>2009 Base</th>
<th>HWY</th>
<th>PT</th>
<th>2015 DM</th>
<th>HWY</th>
<th>PT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trips</td>
<td>216,998</td>
<td>12,845</td>
<td>Trips</td>
<td>246,962</td>
<td>13,978</td>
</tr>
<tr>
<td>Share</td>
<td>94.4%</td>
<td>5.6%</td>
<td>Share</td>
<td>94.6%</td>
<td>5.4%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2020 DM</th>
<th>HWY</th>
<th>PT</th>
<th>2030 DM</th>
<th>HWY</th>
<th>PT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trips</td>
<td>267,189</td>
<td>15,217</td>
<td>Trips</td>
<td>306,927</td>
<td>17,573</td>
</tr>
<tr>
<td>Share</td>
<td>94.6%</td>
<td>5.4%</td>
<td>Share</td>
<td>94.6%</td>
<td>5.4%</td>
</tr>
</tbody>
</table>

Figure 5.4 illustrates the impact on the road network for 2030, and particularly the effect of the Limerick Tunnel. The tunnel has attracted a large amount of traffic and growth in highway flows in Limerick Centre.
is as a result very limited. This is illustrated in Figure 5.5 as a difference plot with the 2009 base situation. Figure 5 also shows the impact of the M7, where this new link (in red) attracts all flow from the N7 (in green). Substantial increases in trips occur on the interurban network, particularly to Shannon, whereas changes in Ennis, Nenagh and Shannon themselves are limited. Some re-routing takes place in Limerick City Centre.

Figure 5.4 Highway flows 2030 Do Minimum (study area)
Figure 5.5 Flow difference plot 2030 Do-Min vs 2009 base (red = increase)

Figure 5.6 Public transport flows 2030 Do-Min (study area)
In comparison, figure 5.6 shows public transport usage for the 2030 do-minimum situation. The importance of regional flows can clearly be seen.

### 6.5 Doing Nothing 2015 (Scenario 1)

Scenario 1 includes a very modest number of ‘soft’ interventions related to branding and vehicle / bus stop improvements. These interventions have been reflected through an assumed 5% increase in public transport usage, and an equivalent reduction in car usage. Given the dominance of car use in the Mid-West area, the impact on car demand is very small – around 0.3%. The public transport share increases to just under 6%. The details of the exact representation of each of the interventions are given in Appendix B.

<table>
<thead>
<tr>
<th>2015 DM</th>
<th>HWY</th>
<th>PT</th>
<th>2015 DS1</th>
<th>HWY</th>
<th>PT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trips</td>
<td>246,962</td>
<td>13,978</td>
<td>Trips</td>
<td>246,254</td>
<td>14,946</td>
</tr>
<tr>
<td>Share</td>
<td>94.6%</td>
<td>5.4%</td>
<td>Share</td>
<td>94.3%</td>
<td>5.7%</td>
</tr>
</tbody>
</table>

The corresponding impacts on the highway and public transport flows are limited, illustrated in figures 5.7 to 5.9 below.

**Figure 5.7 Highway flows 2015 Scenario 1 (study area)**
Figure 5.8 Flow difference plot 2015 Scenario 1 vs 2015 Do-Min (green = decrease)

Figure 5.9 Public transport flows 2015 Scenario 1
Figure 5.8 indicates a small decrease of traffic (in green) in most of the study area, most visible on the Limerick Bypass. Public transport flows in figure 5.9 are very similar to the Do-Minimum situation.

### 6.6 Doing Something 2020 (Scenario 2) Low Cost

In this scenario bus routes are changed and frequencies enhanced, whilst also three QBC/BRT routes are introduced. Park and Ride capacities are increased. These are all explicitly modelled. Again, a number of Smarter Choices are included, and reflected through an additional increase of 20% in overall PT patronage, counterbalanced by an equivalent reduction in car trips. Some planned public transport interventions cannot be modelled, such as station refurbishment, SVD, RTPI and some of the proposed Park and Ride sites.

The model predicts that the public transport mode share increases to nearly 8%. Compared to the Do-Minimum case, this is an increase in PT patronage by 43%.

<table>
<thead>
<tr>
<th>2020 DM</th>
<th>HWY</th>
<th>PT</th>
<th>2020 DS2</th>
<th>HWY</th>
<th>PT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trips</td>
<td>267,189</td>
<td>15,217</td>
<td>Trips</td>
<td>261,742</td>
<td>21,827</td>
</tr>
<tr>
<td>Share</td>
<td>94.6%</td>
<td>5.4%</td>
<td>Share</td>
<td>92.3%</td>
<td>7.7%</td>
</tr>
</tbody>
</table>

The impact on highway and PT passenger kilometres travelled and associated travel time is more visible. Highway kilometrage and vehicle hours fall (compared with the Do-Minimum) by 3.5%. PT passenger kilometres more than double, and nearly triple compared to the 2009 base. Travel time rises slightly less, indicating a slight speeding up of PT trips.

<table>
<thead>
<tr>
<th>Highway</th>
<th>2009BASE</th>
<th>2020DM</th>
<th>2020DS2</th>
</tr>
</thead>
<tbody>
<tr>
<td>VehKm</td>
<td>543,659</td>
<td>731,106</td>
<td>707,288</td>
</tr>
<tr>
<td>VehHr</td>
<td>8234</td>
<td>10370</td>
<td>10029</td>
</tr>
<tr>
<td>PassKm</td>
<td>44,268</td>
<td>56,742</td>
<td>124,106</td>
</tr>
<tr>
<td>PassHr</td>
<td>740</td>
<td>887</td>
<td>1858</td>
</tr>
</tbody>
</table>

The impact of Scenario 2 on highway flows is most clearly seen on Limerick Bypass, in figure 5.10, and particularly Limerick Tunnel. Figure 5.11 shows the difference plot between the 2020 Do-Minimum and Scenario 2 flows. The differences are small, and mainly focused on the interurban network.
Figure 5.10 Highway flows 2020 Scenario 2

Figure 5.11 Flow difference plot 2020 Scenario 2 vs Do-Min (green = decrease)
In the public transport flow plot in figure 5.12 the impact of service improvements on the Ennis-Shannon-Limerick corridor and the QBC/BRT routes can be clearly seen. The effects of the Park and Ride sites are limited; this can be partly explained by the model approach to these new alternatives.

Figure 5.12 Public transport flows 2020 Scenario 2 (study area)

6.7 Do Something 2030 (Scenario 3) High Cost

This high cost scenario includes further improvements to bus services, frequencies and priority. Some bus gates are introduced. These are all explicitly modelled. Further Smarter Choices and Walking/Cycling initiatives are reflected through an additional 5% demand matrix manipulation, as in previous scenarios.

As a result, the public transport share increases to nearly 9%, through an increase in PT trips compared to the Do-Minimum situation of 65%.

<table>
<thead>
<tr>
<th></th>
<th>2030 DM</th>
<th>HWY</th>
<th>PT</th>
<th>2030 DS3</th>
<th>HWY</th>
<th>PT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trips</td>
<td>306,927</td>
<td>17,573</td>
<td>Trips</td>
<td>297,099</td>
<td>29,052</td>
<td></td>
</tr>
<tr>
<td>Share</td>
<td>94.6%</td>
<td>5.4%</td>
<td>Share</td>
<td>91.1%</td>
<td>8.9%</td>
<td></td>
</tr>
</tbody>
</table>

Despite the quite modest increase in the number of PT trips, the number of passenger kilometres increases substantially compared with the Do-Minimum: an increase by 237%. Car kms reduce by only 2.5%, again reflecting the continued dominance of the car mode in the study area.

<table>
<thead>
<tr>
<th>Highway</th>
<th>2009BASE</th>
<th>2030DM</th>
<th>2030DS3</th>
</tr>
</thead>
<tbody>
<tr>
<td>VehKm</td>
<td>543,659</td>
<td>856,526</td>
<td>837,055</td>
</tr>
<tr>
<td>VehHr</td>
<td>8234</td>
<td>12684</td>
<td>11989</td>
</tr>
<tr>
<td>PT</td>
<td>2009BASE</td>
<td>2030DM</td>
<td>2030DS3</td>
</tr>
<tr>
<td>PassKm</td>
<td>44,268</td>
<td>69,701</td>
<td>163,975</td>
</tr>
<tr>
<td>PassHr</td>
<td>740</td>
<td>1055</td>
<td>2432</td>
</tr>
</tbody>
</table>
The impacts on traffic flows are illustrated in figures 5.13 and 5.14. The plots look very similar to those for Scenario 2, although figure 5.14 shows the effectiveness of bus gates in Limerick (substantial re-routing), indicated by parallel green and red links.

Figure 5.13 Highway flows 2030 Scenario 3 (study area)
Figure 5.14 Flow difference plot 2030 Scenario 3 vs Do-Min (green = decrease)

Figure 5.15 Public transport flows 2030 Scenario 3 (study area)
6.8 Final Discussion

In this final section we describe our current interpretation of the model’s performance reflecting the future development of travel patterns in the Mid-West, and its success in reflecting the impacts of the public transport strategy.

The modelled effectiveness of the proposed investments is limited. An investment of €100M increases the PT market share from 5.6% in 2009 to 7.7% in 2020, reflecting a trebling of passenger kilometres compared to the 2009 base year. An investment of €252M in 2030 increases the PT share to 8.9%, and quadruples the passenger kilometres. This is not surprising as the base year modal share of cars is so high (94%). The public transport share in Limerick is greater (13% in the base year and 16% in the 2030 Do-Something scenario 3) but the effectiveness of the policies no greater. Some of the investments have only been modelled approximately as they are difficult to reflect directly.

Rail and regional bus services tend to be very infrequent (less than one per hour) which affects our ability to model them as viable alternatives to car in the base year. The modelled responses to substantial public transport investments seem reasonable, but given the low initial mode share, their impact on car demand is small. A strong impact of smarter choices is estimated, but it should be noted that these are reflected through matrix manipulations; and it is estimated that more than a third of the increased PT share in 2030 Scenario 3 is due to these.

In these analyses future growth has been driven only by the volume and distribution of population and employment; we have excluded the effects of increased car ownership that would result from GDP growth. People / households with more cars make more trips, and more trips by car.

An analysis of demand forecasts by NRA (Future Traffic Forecasts 2002-2040, August 2003) determines:

- overall traffic growth for cars (all roads) between 2011 and 2031 of 33.3%
- population growth in the same period of 8.7%

According to these figures, population growth (and ignoring trip lengthening) only accounts for a quarter of the forecast traffic growth at the national level; car ownership increases and other effects are more important. For example, the forecast growth in number of cars in the same period is 24.4%, and hence there is a forecast growth in average car ownership per person of 14.5%. Ignoring car ownership impacts is in this case acceptable, given the uncertain economic situation (car ownership is closely linked to GDP growth), but this possibly underestimates future car-based demand, affecting congestion and modal share. If DOT-compliant economic analyses are required, a realistic and acceptable approach must be agreed.

Current modelled transfers are between cars (or actually car drivers) and public transport passengers. Car occupancy has not been incorporated in the matrix manipulations but is included in the DIADEM calculations. Our assessment is that the impacts of allowing for occupancy in our calculations will potentially reduce the effectiveness of the policies.

Summarising, the model is generally WebTAG compliant – this is described in detail in the Local Model Validation Report. The representation of a number of elements of the public transport strategy has been difficult, as many of its components are not driven by the model’s main variables: time, distance and cost. However, we have reflected those elements that can be directly modelled and have approximated the effects of most of the other measures by up-front matrix adjustments. This is common practice.
Conservative assumptions about growth have been considered which is reasonable in the current situation; however, these can be adjusted if required.
The current public transport services have a number of weaknesses in addressing transport needs, particularly in the rural parts of the region due to the dispersed nature of settlements and employment locations. Bus and coach services are established but have limited appeal for a variety of reasons while the uptake of rail is very poor as a proportion of total journeys. To address policy objectives, public transport needs to play a much more prominent role. New forms of providing services have been considered including light rail (prohibitively costly) and Bus Rapid Transit for core corridors into Limerick city and linked with Park and Ride facilities for motorists from the surrounding rural catchments. Some improvements to rail such as Park and Ride and new stations are possible although capacity is limited and the level of service is relatively low. Interchange arrangements could be improved throughout with the development of new taxi-based services linking with core bus/coach corridors. However, providing such taxi-based services is unlikely to be on a commercial basis due to the dispersed demand.

Smarter choice initiatives can also play a role in supporting sustainable transport options while decisions regarding land uses can have a critical impact on travel patterns. Concentrating growth has considerable advantages to the viability of public transport services, particularly if demand management measures such as strong parking controls are introduced. Links within the Limerick city/Shannon/Ennis area are crucial in this respect if car dependency is to be reduced. It is proposed that the bus network within Limerick city be re-cast to simplify services, improve efficiency and reliability and address emerging demand more effectively although highway priority measures would help considerably in this respect. Bus Rapid Transit could be introduced as the basis of a revised network of services offering a high quality alternative to car use. Across the region, services could be consolidated in core corridors with local public transport connections to meet the needs of the rural communities.

A range of potential improvements are proposed. Given the settlement and land use patterns envisaged by the three scenarios considered, it is clear that interventions on a very large scale will be necessary if the aspiration for a low level of car use is to be achieved. More modest investment in improvements will address the travel needs of a minority of people in the region, even with concentrated land uses. The role of bus-based public transit is particularly important for all scenarios and if people are to transfer from car to bus in significant numbers then there must be adequate incentives to do so. Supported by other measures such as smarter choices, walking, cycling – all supported by new infrastructure and demand management initiatives – high quality bus and coach services offer a way forward. However, dispersed development will counteract efforts to introduce efficient sustainable transport. Hence Scenario 1 achieves minor change compared with current travel, Scenario 2 achieves the start of progress at a cost of around €169.1 million (see Appendix A) while Scenario 3 could effect lasting change at an additional cost of €153.5M, giving a total cost of €322.6M.
Appendices

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## Scenario 2 (Do Something Low Cost) – Recommended Transport Implementation Plan

<table>
<thead>
<tr>
<th>Ref No.</th>
<th>Measure</th>
<th>2010 Capital Cost (€m)</th>
<th>Short-Term</th>
<th>Medium-Term</th>
<th>Long-Term</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bus Services</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2BS1</td>
<td>Limerick city Bus Éireann service simplification</td>
<td>€0.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2BS2</td>
<td>Enhance existing Shannon-Limerick services</td>
<td>€1.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2BS3</td>
<td>Rail/Air Shuttle Sixmilebridge-Shannon</td>
<td>€0.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2BS4</td>
<td>Cross-city bus services (to complement QBC/BRT routes)</td>
<td>€1.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2BS5</td>
<td>Reconfigure regional Bus Éireann network</td>
<td>€0.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2BS6</td>
<td>Enhance Expressway route 12 (Dublin - Roscrea - Nenagh - Limerick)</td>
<td>€0.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2BS7</td>
<td>“Collect and Connect” taxi feeder services to public transport interchanges</td>
<td>€1.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bus Infrastructure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2BI1</td>
<td>First showcase cross-city bus corridor (QBC/BRT)</td>
<td>€9.4</td>
<td></td>
<td></td>
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<tr>
<td>S2BI2</td>
<td>Second showcase cross-city bus corridor (QBC/BRT)</td>
<td>€23.5</td>
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<td>S2BI3</td>
<td>Third showcase cross-city bus corridor (QBC/BRT)</td>
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<td>S2BI4</td>
<td>UTMC system for Limerick city and environs</td>
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<tr>
<td>S2BI5</td>
<td>Ensure RTPI compatibility for all buses</td>
<td>€0.3</td>
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<tr>
<td>S2BI6</td>
<td>SVD at all signal controlled junctions in Limerick, Ennis and Shannon (AVL)</td>
<td>€0.4</td>
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<td>S2BI7</td>
<td>City Centre, Limerick public transport interchange improvements</td>
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<td>S2HR1</td>
<td>Refurbishment of Limerick Colbert station</td>
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<td>S2HR2</td>
<td>Promotion of rail services on the Limerick-Nenagh-Ballybrophy line to increase public transport usage for work, education and other trip purposes between settlements</td>
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<td>S2CP1</td>
<td>Bus-based Park &amp; Ride N of R510/R526 Loughmore Rbt, Ballycummin</td>
<td>€9.4</td>
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<td>Bus-based Park &amp; Ride at Milltown (M7 Limerick Bypass, N24 Ballysimon Rd)</td>
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<td>Bus-based Park &amp; Ride site N of M18 Clondrinagh Rbt</td>
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<td>S2CPX4</td>
<td>Small scale Park &amp; Ride/Park &amp; Share sites (10 locations)</td>
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<td>S2PTI1</td>
<td>Mid West Region/Limerick City Public Transport Map and Guide</td>
<td>€0.2</td>
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<td>S2PTI2</td>
<td>Printed information displays (branded) at all Limerick city bus stops</td>
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<td>Improved signing to major public transport interchanges</td>
<td>€0.1</td>
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<td>S2PTI4</td>
<td>Promote new ticketing products</td>
<td>€0.1</td>
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<td>S2SMC1</td>
<td>Assign Travel Plan Co-ordinators (five years) for each local authority area</td>
<td>€0.9</td>
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<td>S2SMC3</td>
<td>Launch Limerick City Car Club</td>
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<td>Cycle parking facilities</td>
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<td>S2SMC5</td>
<td>Develop Limerick Cycle Network</td>
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<td>S2SMC6</td>
<td>Implement Smarter Travel Pilot Projects in 10 rural towns of various scales</td>
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<td>S2SMC7</td>
<td>Develop Region Wide Cycle Network including signage, mapping and connectivity to Rural Network Trails</td>
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<td>AS01</td>
<td>RTPI for Limerick</td>
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<td>AS02</td>
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<td><strong>Total Costs</strong></td>
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Source: Mott MacDonald Ireland
## Scenario 3 (Do Something High Cost) – Recommended Transport Implementation Plan

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<td>S3BS1</td>
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<td>Increase scheduled bus frequencies from Scenario 2</td>
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<td>Limerick Orbital service</td>
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<td>S3BI5</td>
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<td>Upgraded bus stops Coonagh Rbt - Shannon – Ennis</td>
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<td>S3BI7</td>
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<td>Public realm and bus facility improvement</td>
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<td>S3BI8</td>
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<td>Bus gate Lord Edward St, Limerick</td>
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<td>S3BI11</td>
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<td>Shannon Airport public transport interchange improvements</td>
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<td>S3BI13</td>
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<td>Public transport interchange improvements (bus, rail or both) in Nenagh, Thrurles, Newcastle West, Roscrea to include seating real time timetables, electronic ticket purchasing, designated parking for buses, bicycles and cars, and associated upgrading of the hard and soft landscaping around the stations.</td>
<td>€10.0</td>
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<td>S3CP1</td>
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<td>Limerick Parking Management Strategy</td>
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<td>S3CP2</td>
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<td>Limerick routeing/signing strategy</td>
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<td>S3SMC1</td>
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<td>Workplace Travel Plans (appoint additional Travel Plan Co-ordinators (five years))</td>
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<td>S3SMC2</td>
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<td>Establish Area Travel Plan Networks (five years)</td>
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<td>S3SMC3</td>
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<td>School Travel Plans (five years)</td>
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<td>S3SMC4</td>
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<td>Individualised Travel Marketing</td>
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<td>S3SMC5</td>
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<td>Travel Plans for Limerick Colbert Station and Ennis Bus/Rail Station</td>
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<td><strong>Walking and Cycling</strong></td>
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<td>S3WC1</td>
<td></td>
<td>Shared use cycleways/footways beside strategic roads</td>
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<td>S3WC2</td>
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<td>Cycle lanes on residential roads</td>
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<tr>
<td>S3WC3</td>
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<td>Advanced stop lines at signal junctions where appropriate</td>
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<td>S3WC4</td>
<td></td>
<td>Raised pedestrian priority crossovers on minor road arms at appropriate locations.</td>
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<td>S3WC5</td>
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<td>Conversion of signal controlled pedestrian crossings to raised zebra crossings at appropriate locations.</td>
<td>€5.0</td>
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<td>S3WC6</td>
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<td>Provision of raised zebra crossings on roundabout arms where appropriate</td>
<td>€5.0</td>
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<tr>
<td>S3WC7</td>
<td></td>
<td>Cycle racks on Limerick city/regional buses</td>
<td>€0.1</td>
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<td>S3WC8</td>
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<td>Limerick Public Use Bicycle Scheme</td>
<td>€0.5</td>
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### Timescale

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<tr>
<td>S3WC9</td>
<td>Off-street cycle/pedestrian Greenways linking employment, residential and commercial areas</td>
<td>€31.3</td>
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<td><strong>Freight</strong></td>
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<td>S3FR1</td>
<td>Pilot Freight Transhipment Centre for Ennis Town centre</td>
<td>€2.0</td>
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<td>S3FR2</td>
<td>Limerick Freight Quality Partnership (five years) + Freight Management Strategy for Limerick City Centre</td>
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<td></td>
<td><strong>Demand Management</strong></td>
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<td>S3DM4</td>
<td>Mid West speed limit review</td>
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<td><strong>Total Costs</strong></td>
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Source: Mott MacDonald Ireland
Appendix B. Modelled Approach to Interventions

B.1. Scenario 1

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<tr>
<th>Ref. No.</th>
<th>Measure</th>
<th>Impacts</th>
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<tbody>
<tr>
<td>S1BS1</td>
<td>The grouping of city centre stops and services to create mini interchange hubs, as well as the use if Colbert bus station as a layover area.</td>
<td>5% Increase in Public Transport, compensated by equal reduction in Car use</td>
</tr>
<tr>
<td>S1BS2</td>
<td>Re-branding of services including electronic service information (the rebranding of Belfast’s Citybus network as Metro is one example), and external vehicle branding to include major destinations.</td>
<td>5% Increase in Public Transport, compensated by equal reduction in Car use</td>
</tr>
<tr>
<td>S1BS3</td>
<td>Interior vehicle branding, with the potential use of Dublin Luas style network maps and promotion of interchange opportunities with regional bus/coach and rail services.</td>
<td>5% Increase in Public Transport, compensated by equal reduction in Car use</td>
</tr>
<tr>
<td>S1BS4</td>
<td>Highly visible flags, poles and timetable cases, and an agreement in place for their maintenance. Bus stops should be full accessible in accordance with the Disability Discrimination Act.</td>
<td>5% Increase in Public Transport, compensated by equal reduction in Car use</td>
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### B.2. Scenario 2

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<th>Measure</th>
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<td><strong>Bus Services</strong></td>
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<tr>
<td>S2BS1</td>
<td>Limerick city Bus Éireann service simplification</td>
<td>0.4</td>
<td>6% increase in public transport, compensated by equal reduction in car.</td>
</tr>
<tr>
<td>S2BS2</td>
<td>Enhance existing Shannon-Limerick services</td>
<td>1.1</td>
<td>60% increase in supply of services along the Ennis-Shannon-Limerick corridor.</td>
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<tr>
<td>S2BS3</td>
<td>Rail/Air Shuttle Sixmilebridge-Shannon</td>
<td>0.2</td>
<td>In the interim to provide access to train services so that passengers to/from Shannon airport can have available to them a faster public transport alternative.</td>
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<tr>
<td>S2BS4</td>
<td>Cross-city bus services (to complement QBC/BRT routes)</td>
<td>1.2</td>
<td>Reduce interchange for passengers crossing Limerick City Centre.</td>
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<tr>
<td>S2BS5</td>
<td>Reconfigure regional Bus Éireann network</td>
<td>0.5</td>
<td>Improve the frequencies for regional buses.</td>
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<tr>
<td>S2BS6</td>
<td>Enhance Expressway route 12 (Dublin - Roscrea - Nenagh - Limerick)</td>
<td>0.4</td>
<td>Virtually no services are available in the AM peak period from Dublin into Limerick city and therefore not attractive to commuters in the AM peak. This enhancement is to provide hourly services in the AM peak period.</td>
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<tr>
<td>S2BS7</td>
<td>“Collect and Connect” taxi feeder services to public transport interchanges</td>
<td>1.5</td>
<td>Will not be modelled.</td>
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<tr>
<td><strong>Bus Infrastructure</strong></td>
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<tr>
<td>S2BI1</td>
<td>First showcase cross-city bus corridor (QBC/BRT)</td>
<td>9.4</td>
<td>Provide a quicker travel alternative into Limerick City Centre thereby reducing peoples overall cost of travel into the City.</td>
</tr>
<tr>
<td>S2BI2</td>
<td>Second showcase cross-city bus corridor (QBC/BRT)</td>
<td>23.5</td>
<td>Provide a quicker travel alternative into Limerick City Centre thereby reducing peoples overall cost of travel into the City.</td>
</tr>
<tr>
<td>S2BI3</td>
<td>Third showcase cross-city bus corridor (QBC/BRT)</td>
<td>9.8</td>
<td>Provide a quicker travel alternative into Limerick City Centre thereby reducing peoples overall cost of travel into the City.</td>
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<tr>
<td>S2BI4</td>
<td>UTMC system for Limerick city and environs</td>
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<td>Will not be modelled</td>
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<tr>
<td>S2BI5</td>
<td>Ensure RTPI compatibility for all buses</td>
<td>0.3</td>
<td>Will not be modelled</td>
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<tr>
<td>S2BI6</td>
<td>SVD at all signal controlled junctions in Limerick, Ennis and Shannon (AVL)</td>
<td>0.4</td>
<td>Will not be modelled</td>
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<tr>
<td>S2BI7</td>
<td>City Centre, Limerick public transport interchange improvements</td>
<td>10.0</td>
<td>Passengers experience a 4 min interchange penalty in the City Centre instead of 7.5 min which is used globally in the Public Transport model</td>
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<tr>
<td><strong>Heavy Rail</strong></td>
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<tr>
<td>S2HR1</td>
<td>Refurbishment of Limerick Colbert station</td>
<td>15.0</td>
<td>Will not be modelled</td>
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<tr>
<td>S2HR2</td>
<td>Promotion of rail services on the Limerick-Nenagh-Ballybrophy line to increase public transport usage for work, education and other trip purposes between</td>
<td>3.1</td>
<td>Can be modelled</td>
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## Mid-West Area Strategic Plan

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<td>S2CP1</td>
<td>Bus-based Park &amp; Ride N of R510/R526 Loughmore Rbt, Ballycummin</td>
<td>9.4</td>
<td>Provide a quicker travel alternative into Limerick City Centre thereby reducing peoples overall cost of travel into the City.</td>
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<tr>
<td>S2CP2</td>
<td>Bus-based Park &amp; Ride at Milltown (M7 Limerick Bypass, N24 Ballysimon Rd)</td>
<td>12.0</td>
<td>Provide a quicker travel alternative into Limerick City Centre thereby reducing peoples overall cost of travel into the City.</td>
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<tr>
<td>S2CP3</td>
<td>Bus-based Park &amp; Ride site N of M18 Clondrinagh Rbt</td>
<td>14.3</td>
<td>Provide a quicker travel alternative into Limerick City Centre thereby reducing peoples overall cost of travel into the City.</td>
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<tr>
<td>S2CPX4</td>
<td>Small scale Park &amp; Ride/Park &amp; Share sites (10 locations)</td>
<td>2.0</td>
<td>These park and ride sites are existing car parks along the newly created P and R lines which are to be converted to additional park and ride sites.</td>
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### Public Transport Information

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<td>0.2</td>
<td>6% increase in public transport, compensated by equal reduction in car.</td>
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<td>S2PTI2</td>
<td>Printed information displays (branded) at all Limerick city bus stops</td>
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<tr>
<td>S2PTI3</td>
<td>Improved signing to major public transport interchanges</td>
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<tr>
<td>S2PTI4</td>
<td>Promote new ticketing products</td>
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### Smarter Choices

<table>
<thead>
<tr>
<th>Ref No.</th>
<th>Measure</th>
<th>Capital (€m)</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>S2SMC1</td>
<td>Assign Travel Plan Co-ordinators (five years) for each local authority area</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>S2SMC3</td>
<td>Launch Limerick City Car Club</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>S2SMC4</td>
<td>Cycle parking facilities</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>S2SMC5</td>
<td>Develop Limerick Cycle Network</td>
<td>20.0</td>
<td>10% increase in public transport, compensated by equal reduction in car.</td>
</tr>
<tr>
<td>S2SMC6</td>
<td>Implement Smarter Travel Pilot Projects in 10 rural towns of various scales</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>S2SMC7</td>
<td>Develop Region Wide Cycle Network including signage, mapping and connectivity to Rural Network Trails</td>
<td>5.0</td>
<td></td>
</tr>
</tbody>
</table>

### Additional Schemes

<table>
<thead>
<tr>
<th>Ref No.</th>
<th>Measure</th>
<th>Capital (€m)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS01</td>
<td>RTPI for Limerick</td>
<td>2.0</td>
<td>Will not be modelled</td>
</tr>
<tr>
<td>AS02</td>
<td>Limerick Green Routes and bus priority measures</td>
<td>20</td>
<td>Increase in speeds of service</td>
</tr>
</tbody>
</table>

**Scenario 2 Total**: 169.1
<table>
<thead>
<tr>
<th>Ref No.</th>
<th>Measure</th>
<th>Capital Cost (€m)</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bus Services</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S3BS1</td>
<td>Increase bus frequencies from Scenario 2</td>
<td>10.2</td>
<td>Frequency of all services in Scenario 2 to be doubled</td>
</tr>
<tr>
<td>S3BS3</td>
<td>Limerick Orbital service</td>
<td>1.5</td>
<td>The Limerick Orbital service to provide shorter connection between attractions (particularly retail centres) on the periphery of Limerick City Centre. Passengers from surrounding areas can access these attractions without going all the way into the City Centre.</td>
</tr>
<tr>
<td><strong>Bus Infrastructure</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S3BI5</td>
<td>Upgraded bus stops Coonagh Rbt - Shannon - Ennis</td>
<td>0.9</td>
<td>Will not be modelled</td>
</tr>
<tr>
<td>S3BI7</td>
<td>Public realm and bus facility improvement William St/Roches St/Henry St/Parnell St/O'Connell St, Limerick</td>
<td>25.0</td>
<td>Bus priority coded on associated streets</td>
</tr>
<tr>
<td>S3BI8</td>
<td>Bus gate Lord Edward St, Limerick</td>
<td>0.1</td>
<td>Buses only allowed on Lord Edward Street - both directions</td>
</tr>
<tr>
<td>S3BI11</td>
<td>Shannon Airport public transport interchange improvements</td>
<td>5.0</td>
<td>Passengers experience a 4 min interchange penalty at Shannon Airport instead of 7.5 min which is used globally in the Public Transport model</td>
</tr>
<tr>
<td>S3BI12</td>
<td>Public transport interchange improvements (bus, rail or both) in Nenagh, Thurles, Newcastle West, Roscrea to include seating real time timetables, electronic ticket purchasing, designated parking for buses, bicycles and cars, and associated upgrading of the hard and soft landscaping around the stations.</td>
<td>10.0</td>
<td>Passengers experience a 4 min interchange penalty at associated stops instead of 7.5 min which is used globally in the Public Transport model</td>
</tr>
<tr>
<td><strong>Car Parking</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S3CP1</td>
<td>Limerick Parking Management Strategy</td>
<td>1.0</td>
<td>Will not be modelled</td>
</tr>
<tr>
<td>S3CP2</td>
<td>Limerick routeing/signing strategy</td>
<td>2.4</td>
<td>Will not be modelled</td>
</tr>
<tr>
<td><strong>Smarter Choices</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S3SMC1</td>
<td>Workplace Travel Plans (appoint additional Travel Plan Co-ordinators (five years))</td>
<td>1.5</td>
<td>5% increase in Public Transport compensated by equal reduction in car</td>
</tr>
<tr>
<td>S3SMC2</td>
<td>Establish Area Travel Plan Networks (five years)</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>S3SMC3</td>
<td>School Travel Plans (five years)</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>S3SMC4</td>
<td>Individualised Travel Marketing</td>
<td>10.0</td>
<td></td>
</tr>
<tr>
<td>S3SMC5</td>
<td>Travel Plans for Limerick Colbert Station and Ennis Bus/Rail Station</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td><strong>Walking and Cycling</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Mid-West Area Strategic Plan

### Public Transport Feasibility Study

<table>
<thead>
<tr>
<th>Ref No.</th>
<th>Measure</th>
<th>Capital</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>S3WC1</td>
<td>Shared use cycleways/footways beside strategic roads</td>
<td>20.0</td>
<td>20% increase in cycling demand. This impact is expected in conjunction with the provision of proposed GREENWAYS i.e. cycle and pedestrian routes.</td>
</tr>
<tr>
<td>S3WC2</td>
<td>Cycle lanes on residential roads</td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>S3WC3</td>
<td>Advanced stop lines at signal junctions where appropriate</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>S3WC4</td>
<td>Raised pedestrian priority crossovers on minor road arms at appropriate locations</td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>S3WC5</td>
<td>Conversion of signal controlled pedestrian crossings to raised zebra crossings at appropriate locations</td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>S3WC6</td>
<td>Provision of raised zebra crossings on roundabout arms where appropriate</td>
<td>5.0</td>
<td></td>
</tr>
<tr>
<td>S3WC7</td>
<td>Cycle racks on Limerick city/regional buses</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>S3WC8</td>
<td>Limerick Public Use Bicycle Scheme</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>S3WC9</td>
<td>Off-street cycle/pedestrian Greenways linking employment, residential and commercial areas</td>
<td>31.3</td>
<td></td>
</tr>
<tr>
<td><strong>Freight</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S3FR1</td>
<td>Pilot Freight Transhipment Centre for Ennis Town centre</td>
<td>2.0</td>
<td>Will not be modelled</td>
</tr>
<tr>
<td>S3FR2</td>
<td>Limerick Freight Quality Partnership (five years) + Freight Management Strategy for Limerick City Centre</td>
<td>2.2</td>
<td>Will not be modelled</td>
</tr>
<tr>
<td><strong>Demand Management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S3DM4</td>
<td>Mid West speed limit review</td>
<td>5.0</td>
<td>Will not be modelled</td>
</tr>
<tr>
<td><strong>Scenario 3 Total</strong></td>
<td></td>
<td><strong>163.5</strong></td>
<td></td>
</tr>
</tbody>
</table>
Appendix C. Modelled Do Minimum Highway Schemes

Infrastructure improvements modelled in the DM scenario were provided to Mott MacDonald by Limerick City Council. The proposed infrastructure improvements in the DM scenario cover North Tipperary County (North Tipp), Limerick City, and Limerick County. Schemes in Clare County could not be modelled due to a lack of relevant information received. Some of the schemes in other areas were not modelled, if insufficient data was received for modelling, or if they were in areas where model detail was not sufficient to represent the changes. The tables below show the modelled improvements in each of the sub-areas.

North Tipp Infrastructure Improvements

<table>
<thead>
<tr>
<th>Locality</th>
<th>Type</th>
<th>Description</th>
<th>Complete / Under Construction</th>
<th>2010-2015</th>
<th>2015-2020</th>
<th>2020-2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Tipp</td>
<td>N-road</td>
<td>N7 Nenagh to Limerick</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Tipp</td>
<td>N-road</td>
<td>N8 Cashel Cullahill (Kilkenny Coco leading authority)</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Tipp</td>
<td>N-road</td>
<td>N7 Castletown to Nenagh (Laois coco leading Authority)</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Tipp</td>
<td>N-road</td>
<td>Bypass for Thurles, providing linkroad for N62(south), N75 and N62 (north)</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Tipp</td>
<td>N-road</td>
<td>Linkroad between N62 and R498 (Nenagh/Thurles Roar)</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Tipp</td>
<td>N-road</td>
<td>N62 bypass of Roscrea</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Tipp</td>
<td>Bridge</td>
<td>Bridge over Shannon between Ballina and O'Briansbridge incl linking</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Tipp</td>
<td>N-road</td>
<td>Link between new bridge over Shannon and N7 dual carriageway</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Holycross</td>
<td>Road closure</td>
<td>Access to R661 at western end of the green to be closed and traffic to be redirected to improved junction</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Roscrea Traffic Alteration

<table>
<thead>
<tr>
<th>Location</th>
<th>Type</th>
<th>Description</th>
<th>Complete/Under Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roscrea</td>
<td>Traffic alteration</td>
<td>Conversion of the southern section of Green Street to a one-way northbound operation</td>
<td>✓</td>
</tr>
<tr>
<td>Roscrea</td>
<td>L-Road</td>
<td>Link road between Chapel lane and Green Street</td>
<td>✓</td>
</tr>
<tr>
<td>Roscrea</td>
<td>Traffic alteration</td>
<td>Conversion of the Cronan's Terrace to a one-way southbound operation</td>
<td>✓</td>
</tr>
<tr>
<td>Roscrea</td>
<td>Traffic alteration</td>
<td>Remove Hives from Roscrea</td>
<td>✓</td>
</tr>
</tbody>
</table>

### Limerick City Infrastructure Improvements

<table>
<thead>
<tr>
<th>Locality</th>
<th>Type</th>
<th>Description</th>
<th>Complete/Under Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limerick City</td>
<td>Road</td>
<td>Provide a northern distribution road for Limerick city. Phase 1 Coonagh to Knockalisheen at EIS/CPO</td>
<td>✓</td>
</tr>
<tr>
<td>Limerick City</td>
<td>M-Road</td>
<td>Full construction of Atlantic Way Motorway. Includes linkage from M20/Southern Ring Road to Southill</td>
<td>✓</td>
</tr>
</tbody>
</table>

### Limerick County Infrastructure Improvements

<table>
<thead>
<tr>
<th>Locality</th>
<th>Type</th>
<th>Description</th>
<th>Complete/Under Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limerick Co</td>
<td>N-road</td>
<td>N7 Dublin road</td>
<td>✓</td>
</tr>
<tr>
<td>Limerick Co</td>
<td>Buslane</td>
<td>Raheen roundabout to Ballinacurra road</td>
<td>✓</td>
</tr>
<tr>
<td>Adare</td>
<td>R-road</td>
<td>Adare Bypass</td>
<td>✓</td>
</tr>
<tr>
<td>Castleroy</td>
<td>R-road</td>
<td>Distributor road linking Groody road to Schoolhouse road</td>
<td>✓</td>
</tr>
<tr>
<td>Locality</td>
<td>Type</td>
<td>Description</td>
<td>Complete/Under Construction</td>
</tr>
<tr>
<td>------------------</td>
<td>--------</td>
<td>-----------------------------------------------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>Fedamore</td>
<td>Junction</td>
<td>Junction at Fedamore cross</td>
<td>✓</td>
</tr>
<tr>
<td>Kilfinane</td>
<td>R-road</td>
<td>Distributor road on the southern part of town</td>
<td>✓</td>
</tr>
<tr>
<td>Newcastlewest</td>
<td>R-road</td>
<td>Southern distributor road</td>
<td>✓</td>
</tr>
<tr>
<td>Southern environs</td>
<td>N-road</td>
<td>Link between N7 and N18 on south side of Limerick City, refer to Southern Environs Map 1</td>
<td>✓</td>
</tr>
<tr>
<td>Southern environs</td>
<td>R-road</td>
<td>Distributor road according to Land use zoning map no 1</td>
<td>✓</td>
</tr>
</tbody>
</table>