Department for Infrastructure
An Roinn Bonneagair
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THE BELFAST METROPOLITAN TRANSPORT PLAN

TRANSPORT STUDY

OCTOBER 2020

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Abbreviations

ANBC	Antrim and Newtownabbey Borough Council
ANDBC	Ards and North Down Borough Council
BCC	Belfast City Council
BMA	Belfast Metropolitan Area
BMUA	Belfast Metropolitan Urban Area
BMTP	Belfast Metropolitan Transport Plan
DfI	Department for Infrastructure
HGI	Housing Growth Indicator
LCCC	Lisburn and Castlereagh City Council
LDP	Local Development Plan
LPP	Local Policies Plan
LTP	Local Transport Plan
LTS	Local Transport Study
MEABC	Mid and East Antrim Borough Council
New Approach	Ensuring a Sustainable Transport Future: A New Approach to Regional Transportation
NI	Northern Ireland
NISRA	NI Statistical Research Agency
PAC	Planning Appeals Commission
PDS	Planning Development Scenario
PfG	Draft Programme for Government of the former NI Executive
PNR	Parking Non Residential
POP	Preferred Options Paper
PPS	Planning Policy Statement
PS	Plan Strategy
RDS 2035	Regional Development Strategy 2035– Building a better Future
RSTN	Regional Strategic Transport Network
RSTNTP	Regional Strategic Transport Network Transport Plan
SDL	Settlement Development Limit
SPPS	Strategic Planning Policy Statement for NI – Planning for Sustainable Development
The Act	The Planning Act (Northern Ireland) 2011
The Bicycle Strategy	Northern Ireland Changing Gears – A Bicycle Strategy for Northern Ireland
TEB	Transport Evidence Base
TPMU	Transport Planning and Modelling Unit

Executive Summary

Introduction

1. The Department for Infrastructure (DfI) has undertaken a Transport Study of the 5 Councils that make up the Belfast Metropolitan Transport Plan Area. A particular focus of the study has been the Belfast Metropolitan Urban Area (BMUA). The BMUA is defined by the Regional Development Strategy (RDS) 2035 as the continuous built up area centred on Belfast with an arc from Jordanstown to Knocknagoney and includes the city of Lisburn and towns of Bangor, Carrickfergus and Holywood.

2. The purpose of the Transport Study is to set out an objective evidence-based assessment of current and future transport issues in the context of the Councils' growth ambitions. The transport measures identified are in line with the Draft Programme for Government of the former NI Executive, current government policies and with the direction of the Councils' Community Plans and Preferred Option Papers. A computerised transport model used growth forecasts for population and employment available at March 2018 to predict the impact of a range of illustrative transport measures. The Councils will be expected to demonstrate how they have taken account of the Transport Study in developing their Plan Strategy.

3. The Transport Study has undertaken the following processes in turn:
    - Review of Policy Context and development of transport objectives
    - Transport Context incorporating a review of current transport networks
    - Planned Councils Growth and Development
    - Appraisal of transport options
    - Conclusions – future transport measures.

Review of Policy Context

4. The review of government policy including the Draft Programme for Government of the former NI Executive, the Regional Development Strategy 2035 and Ensuring a Sustainable Transport Future has identified that transport has a key role in meeting economic, environmental and social objectives. It is no longer adequate to plan for transport on a 'predict and provide' basis but that the balance of transport measures should be selected following assessment against multiple objectives informed by a clear statement of the desired outcomes.

5. The review of the constituent Councils' Community Plans has identified that each have economic, environmental and social priorities. In terms of transport, the economic priorities relate to having a thriving local economy and hence a transport infrastructure which makes getting to work and doing business easy and efficient. Environmental priorities relating to transport include the creation of blue / green infrastructure and measures to encourage modal shift from private cars to public transport, walk and cycle to reduce emissions and congestion and to improve air quality. Social priorities for transport include provision of essential public transport for people without a car including vulnerable people and the provision of walking and cycling infrastructure to encourage active travel and hence improve health. Some of the Community Plans also contain specific proposals for growth and infrastructure.

Transport Objectives

6. The review of the policy context has enabled the following objectives to be set for the assessment of transport options in the Study Area:

- **Objective 1 - Improving external linkages:** Enhance accessibility by road and public transport from the City and Town centres to Londonderry, gateways and hubs to support greater levels of inward investment.

- **Objective 2 - Improving public transport accessibility:** Ensure an affordable and sustainable public transport accessibility to essential services for people living in BMTP area.

- **Objective 3 - Improving active travel accessibility:** Ensure there are attractive and safe active travel networks (walking and cycling) linking all residential, retail, leisure, culture, office and commercial uses within the urban areas of the BMTP area.

- **Objective 4 - Providing high quality public realm:** Deliver high quality public realm in town, city and district centres with reduced vehicle dominance, to make them attractive, shared spaces to live and work and improve safety for active modes.

- **Objective 5 - Improving City/Town centre accessibility:** Enhance transport accessibility and manage traffic congestion to town, city and district centres to strengthen Belfast's role as the regional economic driver.

- **Objective 6 - Improving public safety including air quality:** Enhance safety for all modes of travel, reduce the number and severity of casualties and improve air quality.

- **Objective 7 - Promoting sustainability and resilience:** Ensure our transport systems are resilient to climate change and are well maintained.

Current Transport Issues

7. A review of the current transport networks in the study area has concluded in general terms:

- **Regional accessibility** is generally good as the strategic road and public transport networks are focussed on Belfast. However peak hour traffic congestion in and around A12 Westlink and the need for public transport interchange in Belfast termini provide negative impacts. These impacts are expected to be reduced by the York Street Interchange and Belfast Transport Hub projects.

- **Pedestrian infrastructure** in urban areas is generally adequate but standards are not consistent. Pedestrian infrastructure in town and city centres often lacks priority over traffic making it unattractive to users.

- **Cycling infrastructure** provision in urban areas outside Belfast is quite limited in extent and of mixed quality. Whilst there is significant provision in Belfast where there is substantial latent demand this is of mixed quality. The Belfast Cycling Network Plan seeks to address this issue.

- **The Glider** Bus Rapid Transit system operates with substantial priority over general traffic on a substantial cross-city east-west route in Belfast and a shorter route to the Titanic Quarter. The Glider has had significant success in producing a modal shift from private car.

- **Metro bus services** provide a relatively high frequency network across the BMUA throughout the day. However the hub and spoke configuration requires travel into the congested city centre and interchange in order to complete journeys other than those to the city centre or within a single corridor. Whilst there is substantial bus priority in Belfast City Centre, the Metro services have mixed levels of bus priority on their outer radials.

- **Ulsterbus Town services** elsewhere are generally configured to provide accessibility to essential town centre facilities. Their limited frequencies and often non-direct routes make them an unattractive alternative for people with cars.

- **NI Railways** serve many of the towns within the BMUA and all services run through Belfast city centre stations. The services generally operate at capacity at peak periods. There are existing plans to increase the size of trains and increase platform capacity in the Belfast Transport Hub project.

- **Sustainable Transport accessibility** within the BMUA is good with key services often within convenient walk or cycle range and local bus services provide substantial additional catchment. However for rural residents key services focused in urban centres are generally inaccessible by public transport especially outside peak hours.

- **Urban Traffic Congestion** generally operates efficiently without substantial congestion outside peak (AM and PM) periods. However in the AM peak period congestion is marked on routes approaching town centres and throughout Belfast.

- **Parking provision.** It has been confirmed that there is an over-supply of parking spaces in Belfast. However, the geographic distribution of spaces, relative attractiveness of sites and lack of real-time occupancy information leads to localised overloading/congestion as drivers search for spaces during the peak period. In line with Belfast City Council's Draft Car Parking Strategy and Action Plan, the current Controlled Parking Zone could be extended resulting in the reduction of commuter parking capacity within the City Centre.
  In urban centres outside of Belfast, both on and off-street parking assessed. It has been identified that there is generally a substantial supply of spaces but that management regimes on and off-street are often not aligned. Off-street car parks have also been assessed by the Councils. It is understood that in general these have identified that there are adequate numbers of spaces but that their distribution and management regimes (ie charged / free or restricted stay) are often not in line with revenue generation, space turnover or promotion of modal shift.

- **Legacy Road Alignments** exist in the extant Local Development Plans within the study area. In some cases these alignment may first appear out of line with current policy. However, they could have potential as active travel routes. Therefore, these alignments will be retained until the Local Policies Plan when they will be reviewed in conjunction with individual zoning considerations and consequently dropped or retained.

Growth

8. The transport model was run using forecasts of population and employment available at March 2018. Whilst the Belfast City Council LDP is being prepared for 2035, the other councils in the metropolitan area have earlier forecast years. Therefore, with the intention of under-estimating rather than over-estimating transport demand, 2030 was chosen as the modelling forecast year.

9. The Housing Growth Indicator (HGI) calculations use trend population forecasts to estimate additional housing requirements on a Council by Council basis. HGI estimate an average growth of 7.6% in NI and 5.1% across BMTP area Councils between 2015 and 2030. Within BMTP area only Lisburn City & Castlereagh at 13.2% is significantly above this average.

10. As stated in their Preferred Option Papers, within BMTP area, only Belfast City at 19.5% is proposing population and housing growth significantly above the calculated HGI trends.

11. 68,250 new jobs are proposed across the 5 Councils of with a clear focus in Belfast City 46,000 (67%). NISRA estimates there are a total of 396,000 jobs in the BMTP area Councils in 2013 with 210,000 in Belfast City. Therefore proposed employment growth averages approximately 17% across the BMTP area in total and 22% in Belfast City.

12. The transport model was used to estimate changes in transport demand arising from HGI and Council proposed growth. Across NI demand was forecast to grow 7% under the HGI (Business as Usual) scenario but 11% under the Councils' combined proposals. The Councils' proposals were adopted as the reference case for 2030 forecasts as a likely maximum within the BMUA. The model also used a 'best practice' assumption that development growth was focused in locations served by public transport.

Appraisal of Transport Options

13. Transport options within the BMUA were tested quantitatively using the transport model whilst options in the towns outside where assessed qualitatively. Both sets of options were assessed against a common appraisal framework with objectives devised from regional and local policy priorities as detailed earlier and summarised briefly again below. The objectives were:

- Objective 1 - Improving external linkages
- Objective 2 - Improving public transport accessibility
- Objective 3 - Improving active travel accessibility
- Objective 4 - Providing high quality public realm
- Objective 5 - Improving City/Town centre accessibility
- Objective 6 - Improving public safety including air quality
- Objective 7 - Promoting sustainability and resilience

14. The model has been used to test the performance of the BMUA transport network under estimated future transport demand. Initially the model tested the impact of measures bundled by mode. The measures tested were illustrative only and did not represent a commitment to any particular scheme by the Department. The model confirmed that, in general terms each of these measures result in positive operational impacts and that measures which result in a modal switch from private car score more highly across the range of objectives in the appraisal framework.

15. The modelling has also concluded that by 2030 there is estimated to be a 19% increase in transport demand in the BMA. This will result in increased congestion and reduced air quality compared to current conditions. The model was therefore used to test the effect of combining all of the illustrative measures. This substantially improved network returned a positive overall appraisal result, however, even with a focus on sustainable modes this still results in a 19% increase in car trips.

16. Finally a separate test modelled, the addition of demand management. The results showed that demand management reduces the modal share of car trips in the BMA, and returns a more positive appraisal result.

Future Transport Measures

17. Following the assessment of options against the appraisal framework, it was concluded that the following measures were required in the towns and centres throughout the BMTP area.

- **1: Improved Park and Ride and Park and Share on Key Transport Corridors (KTCs) and radial routes**
  New locations for park and ride and park and share facilities identified and prioritised on the KTCs and radial routes to Belfast City Centre. These facilities should be strategically placed, considering the travel patterns of commuters and the areas which would benefit from improvements in public transport use. These facilities would also benefit commuters and increase accessibility and connectivity to the wider Northern Ireland area.

- **2: Consider new road infrastructure within town centres which facilitate public realm**
  enhancements or improvements to active travel modes
  While there may be no current requirements to implement new road infrastructure within the town centres, this option should be retained for potential consideration in the future. Should a need arise for this type of infrastructure, this measure will be reviewed. A number of potential developer-led schemes will be considered and their benefits to the town centres reviewed.

- **3: Improved "limited-stop" bus services to key hubs**
  New "limited-stop" bus services are expected to be identified and prioritised on the KTCs to and from towns. These services will build upon the existing network of bus services. The bus services will capitalise on continued road improvements and seek to identify where the greatest benefits can be derived.

- **4: Improved integration between public transport modes to simplify travel for passengers**
  To promote and encourage the use of public transport, it will be important to consider the linkages between modes and the ease with which this can occur. This could include local bus services connecting to train stations or limited stop bus services.

- **5: Provision of a network of attractive walking and cycling routes in towns and greenways between towns**
  The provision of improved walking facilities in towns. The current pedestrian networks are below standard in some areas. Levels of walking and cycling are low, particularly as a method of travel to work. Improvements to walking facilities and the addition of cycling infrastructure would help to encourage the use of active travel modes. It is also important the active travel modes link to and from public transport services.

- **6: For new developments, walk and cycle infrastructure both within the development and linking to existing or planned networks are provided by the developer**
  When planning for new developments, it is essential that walking and cycling infrastructure is considered as part of the development proposals. Walking and cycling linkages from the development should be linked to existing infrastructure, ensuring a continuous provision is made. It is also necessary to consider how active travel infrastructure is incorporated into the development itself.

- **7: Increases in peak period rail capacity to Belfast City Centre and generators of additional demand.**
  Rail services have proven to be attractive alternatives to private car for journeys to Belfast City Centre. The benefit of the existing rail infrastructure should be maximised with attention paid to access including parking and encouragement of interpeak, offpeak and reverse commuting passengers.

- **8: Town Centre Parking Strategies that manage demand for long and short-stay spaces at locations which reduce town centre congestion and traffic circulating for parking spaces**
  Town Centre Parking Strategies will be required in towns. The location of public parking and its designation as long or short stay will be considered within the Parking Strategies. The strategies should remove extraneous traffic which dominates the town centres and improves the turnover of parking spaces. Special consideration will be needed for parking at bus and rail stations for travel to Belfast.

- **9: Traffic management schemes which enhance safety and give priority to pedestrian, cycling and public transport movements to the town centre**
  It is necessary that road space is used by a range of modes. Consideration should be given to re-balancing priority to pedestrians, cyclists and public transport within the town centre. This is particularly important in shopping streets, however locations where parking is designated should not be unduly inconvenienced.

- **10: Ensure new transport infrastructure is designed and provided to current 'best practice' standards**
  When designing transport infrastructure, this should be completed to 'best practice'. This will strive towards maximising performance and ensuring resilience. Resilience to system failures, such as traffic signal failures or flooding, can be increased by providing 'back-up' systems. Overall urban travel resilience can be increased by ensuring that realistic active travel options are provided.

18. Within the BMUA, the model has confirmed that all of the following measures in combination could contribute to facilitating planned growth and return a positive appraisal result compared to the DoMinimum scenario:
    - improvements in walking infrastructure
    - improvements in cycling infrastructure
    - interurban bus (Goldline)
    - urban bus (Metro)
    - BRT Phase 2
    - suburban rail capacities
    - public transport fares reductions
    - Intelligent Transport Systems
    - selective road improvements.

19. However, the modelling has concluded that by 2030 there is estimated to be a 19% increase in transport demand in the BMA and no change in car modal share from current even with the adoption of the above measures in combination. This will result in increased congestion and reduced air quality compared to current conditions.

20. The modelling has also concluded that demand management is an effective means of reducing car travel and car dominance within the city. As modelled, the addition of demand management reduces the modal share of car trips in the BMTP area, and returns a more positive appraisal result.

21. It was noted that subsequent to the completion of the modelling runs, Councils revised their planning assumptions. An investigation of these revisions and their impact on the modelling results has therefore been undertaken. That investigation has concluded that the modelling results remain robust.

22. Further work will be required to determine the most appropriate demand management approach for the BMUA to maximise the modal shift to sustainable modes of travel while supporting local growth and trade. However it is expected that city centre commuter parking restraint measures will be a key component.

1.0 Introduction

1.1. Purpose of Transport Study

1.1.1. The Department for Infrastructure (the Department) is working co-operatively with councils across Northern Ireland to produce a new family of Local Transport Plans (LTP) to integrate with their Local Development Plans (LDP). These plans move through different stages, and increase in detail from an overall strategic direction, through to specific local policies and schemes.

1.1.2. This initial Belfast Metropolitan Transport Plan (BMTP) – Belfast Metropolitan Transport Study (BMTS) has been prepared by the Department in collaboration with the councils that fall, at least in part within the Belfast Metropolitan Urban Area (BMUA).

1.1.3. Throughout the development of the study, the Department has shared the evidence and drafts of the study (including drafts of the 4 outer Transport Studies) at the earliest possible opportunity so that consideration of the emerging study could to inform the councils' LDPs – Draft Plan Strategy stage.

1.1.4. The purpose of this transport study is to undertake transport modelling to understand the potential effects of different types of transport measures and to help understand the type of measures that might be considered to support the future development for the LDP period to 2035 in the BMTP area. The transport model used growth forecasts for population and employment available at March 2018 to predict the impact of a range of illustrative transport measures. Use of the model will also ensure that the transport network and transport needs of the area are taken into account when planning for its future development. Whilst the transport elements are quite distinct in terms of the services they offer and benefits they bring, the key linkages with land-use planning will collectively help deliver on shared regional and local ambitions and outcomes.

1.1.5. These transport measures are developed in the LTS in line with the draft PfG, current government policies and with the direction of the council's Community Plans and Preferred Options Papers (POP).

1.1.6. This LTS presents the range of measures for active travel, public transport and roads for the period up to 2035.

1.1.7. At this point, in line with the LDP POP and Plan Strategy stage, the location of the transport measures are not confirmed. Specific schemes will be considered and confirmed at a later date within the Belfast Metropolitan Transport Plan (BMTP) and in conjunction with the council's LDP Local Policies Plan stage, when land use zonings are identified. In this LTS, it should be noted that whilst specific schemes have been listed and tested, they are **illustrative only**. They have been selected in order to ascertain the illustrative strengths and weaknesses of a particular mode of transport or to demonstrate the illustrative impact of particular type of scheme. The results and recommendations therefore do not represent a commitment to any particular scheme by the Department. However, the results provide an indication of the modes of transport and types of scheme that may be considered within the BMTP.

1.2. Study Approach and Document Structure

Approach

1.2.1. The approach adopted by the Study is summarised in Figure 1.1 as a sequence of tasks. These tasks are documented in turn in this Study report.

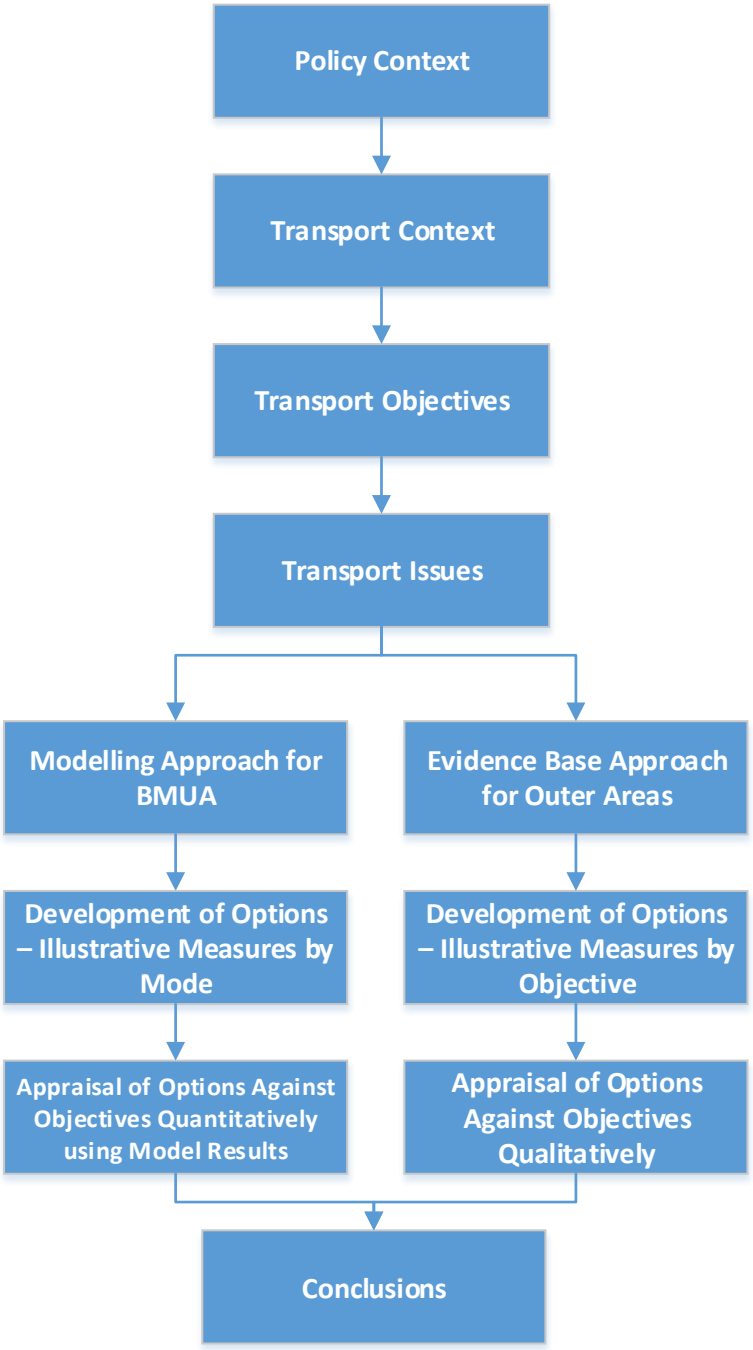

Figure 1.1 - Study Approach

1.2.2. The BMTP study area encompasses five councils that fall, at least in part within the BMUA. The councils that make up the BMTP area are:

- Antrim and Newtownabbey Borough Council (ANBC);
- Ards and North Down Borough Council (ANDBC);
- Belfast City Council (BCC);
- Lisburn and Castlereagh City Council (LCCC); and,
- Mid and East Antrim Borough Council (MEABC).

1.2.3. Two separate approaches have been used in the BMTS depending on where the transport measures occur. For the BMUA, where modal choice and traffic routeing is a primary concern, a computerised transport model has been used to simulate potential future growth scenarios and estimate the quantitative impact of introducing a range of illustrative transport measures. The transport model was run using forecasts of population and employment available at March 2018. Whilst the Belfast City Council LDP is being prepared for 2035, the other councils in the metropolitan area have earlier forecast years. Therefore, with the intention of under-estimating rather than over-estimating transport demand, 2030 was chosen as the modelling forecast year.

1.2.4. Outside the BMUA, a transport evidence base has been produced with a focus on free standing towns and the rural area of the councils. An objective review of the evidence provides a qualitative narrative on the potential transport options.

Supporting Technical Documents

1.2.5. While the main body of this document focuses on the BMUA, both the BMUA and the outer areas are supported by independent Technical Documents which are provided as annexes.

1.2.6. For the BMUA, a Modelling Report has been provided in Annex D. The modelling work was undertaken by Atkins LTD on behalf of the Department. Atkins have produced the report detailing the modelling methodology and results used to inform the BMUA Modelled Area section of this study.

1.2.7. For the remainder of the outer council areas, including detail relating to the freestanding towns within the BMTP area, Transport Studies are provided in Annex E-H.

1.2.8. The remained of this chapter considers the individual characteristics of the 5 council areas.

1.3. Study Area

1.3.1. Figure 1.2 presents a map of the Study Area.

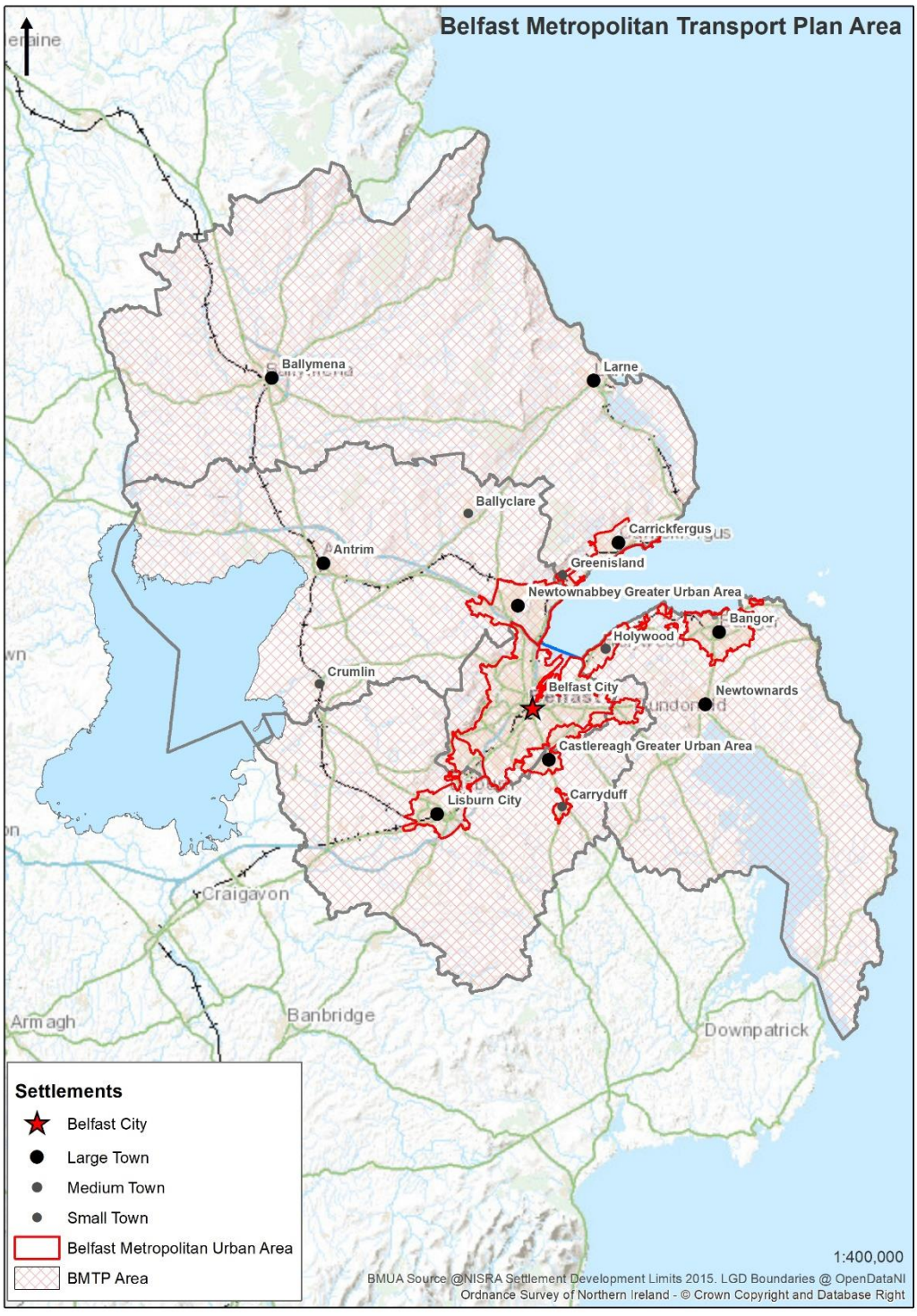

Figure 1.2- Belfast Metropolitan Transport Plan - Local Transport Study - Study Area

1.3.2. The Belfast Metropolitan Transport Plan 2015 (BMTP 2015) was produced prior to the number of Northern Ireland Councils reducing to 11. The BMTP 2015 covered the Belfast Metropolitan Area (BMA) which consisted of a group of 6 council areas. The reform of local government in Northern Ireland has merged the BMA councils with other council areas that fall outside of the BMA to form much larger council areas. As a result the forthcoming BMTP covers a much larger proportion of

Northern Ireland and consists of both urban and rural areas. It is worth noting that while there are pockets of low car ownership within the area, car ownership is high across the entire BMTP area and is reflected in the high percentage of travel undertaken by private vehicle.

1.3.3. The BMA is not to be confused with the Belfast Metropolitan Urban Area (BMUA) which is described in the Regional Development Strategy 2035 as "*the continuous built up area centred on Belfast with an arc from Jordanstown to Knocknagoney and includes the city of Lisburn and towns of Bangor, Carrickfergus and Holywood*" as shown in Figure 1.2.

Belfast

1.3.4. Figures 1.3-1.7 summarise the key demographic and transport-related characteristics of each of the Council areas. These are expressed in terms of their percentage variation from the Northern Ireland (NI) average. The full details are provided in **Error! Reference source not found.** to **Error! Reference source not found.**.

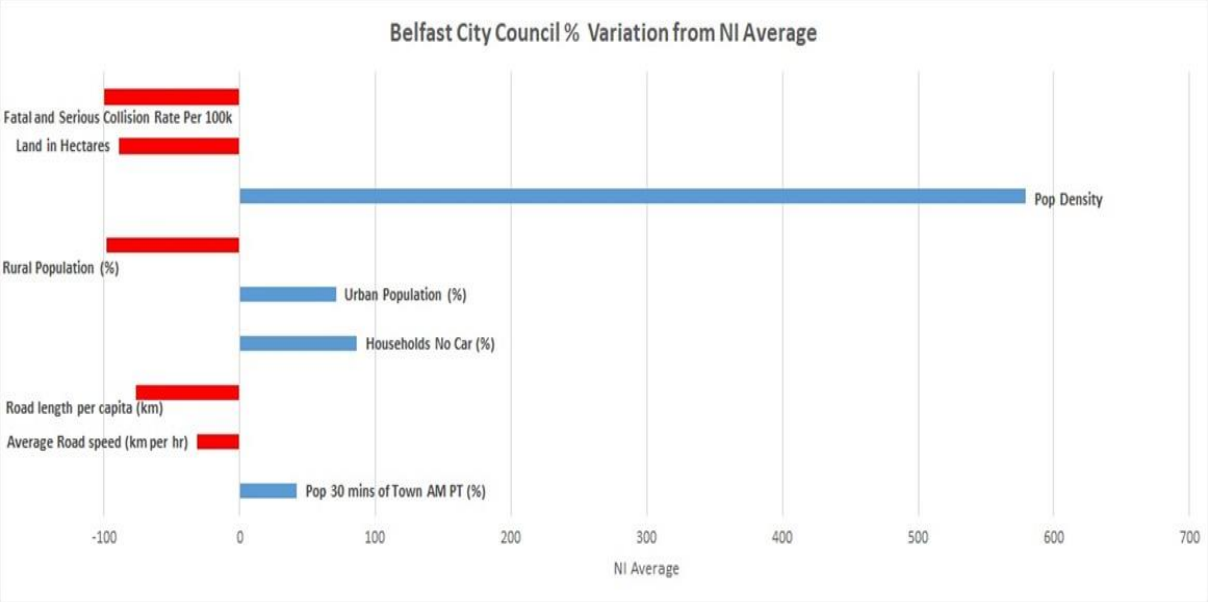

Figure 1.3 – Belfast City Council Key Characteristics Compared to NI Average

Table 1.1 - Belfast City Council Key Characteristics Compared to NI Average

Belfast City Council			
	Council	**NI Average**	**% Variation from Average**
Pop 30 mins of Town AM PT (%)	97%	**68%**	42
Average Road speed (km per hr)	42.29	61.79	-32
Road length per capita (km)	0.0041	0.02	-76
Households No Car (%)	38.20	20.51	86
Urban Population (%)	99.14	58.01	71
Rural Population (%)	0.86	41.99	-98
Pop Density	24.88	3.66	579
Land in Hectares	13,417	123,294	-89
Fatal and Serious Collision Rate Per 100k	38.5	44.8	-14

1.3.5. BCC is almost entirely urban and is not typical for Northern Ireland. Its population density of 24.88 usual residents per hectare is significantly higher than any other council in NI. For comparison ANDBC, the second most densely populated council, has 3.34 usual residents per ha. 38.2% of households do not have a car or van and most residents (97%) are able to access a main town within 30 minutes using public transport. As expected for a city council area, the road length per capita is comparatively small (76% below the NI average) as is the average road speed of 42.29kmph (26.28mph) which reflected the lower urban speed limited and levels of congestion experience by a city of this magnitude.

Antrim and Newtownabbey Borough Council

1.3.6. ANBC has several large settlements. When Metropolitan Newtownabbey is excluded, Antrim, Ballyclare, Crumlin and Randalstown are the largest towns. The next largest settlements of Templepatrick, Doagh and Corgy/Kilbride are much smaller as summarised in **Error! Reference source not found.**.

Table 1.2 - Antrim and Newtownabbey Borough Council Settlements and 2011 Population

SETTLEMENT	USUAL RESIDENTS 2011
Metropolitan Newtownabbey	65,646
Antrim	23375
Ballyclare	9953
Crumlin	5140
Randalstown	5126
Templepatrick	1452
Doagh	1388
Cogry / Kilbride	1259
Ballynure	968
Toome	781
Parkgate	676
Ballyrobert	659
Antrim and Newtownabbey Borough Council Total	**138,651**

1.3.7. ANBC has a mixture of urban and rural land use and contains a number of main transport routes, such as M2, A6 and A8. Belfast International Airport, a key regional gateway as defined in the RDS, is also situated within the Council area. Figure 1.4 summarises the key demographic and transport-related characteristics of the ANBC area. These are expressed in terms of their percentage variation from the Northern Ireland (NI) average. The full details are provided in **Error! Reference source not found.**.

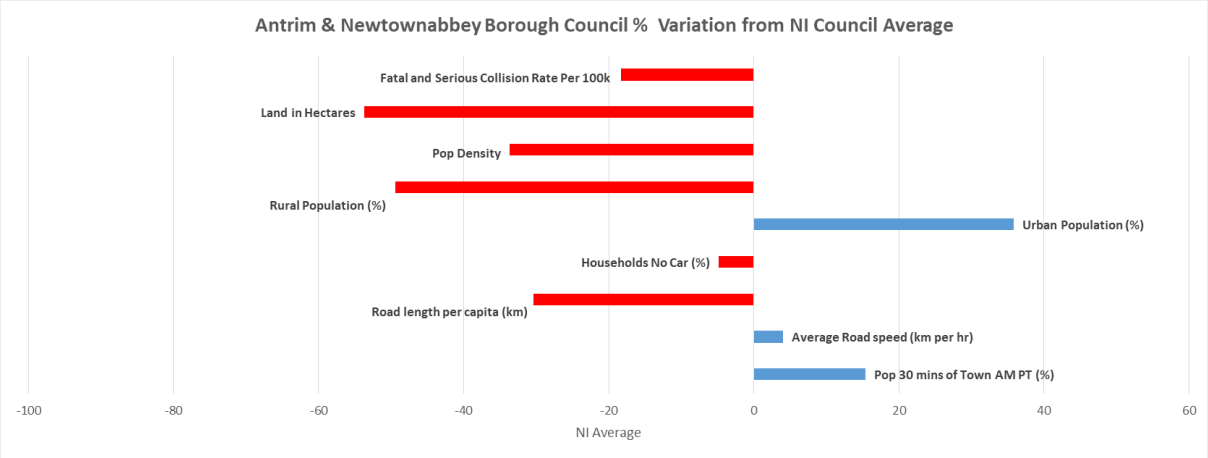

Figure 1.4 – Antrim and Newtownabbey Borough Council Key Characteristics Compared to NI Average

Table 1.3 - Antrim and Newtownabbey Borough Council Key Characteristics Compared to NI Average

Key Characteristic	Antrim & Newtownabbey	NI Average (Council Area)	% Variation from Average
Pop 30 mins of Town AM Peak Public Transport	79%	68%	15
Average Road Speed (kmph)	64.25	61.79	4
Road Length per Capita (km)	0.01	0.02	-30
Households with no car (%)	19.5%	20.5%	-5
Urban Population (%)	78.8%	62%	36
Rural Population (%)	21.2%	38%	-49
Population Density	2.43	3.66	-34
Land in Hectares	57071	123294	-54
Fatal and Serious Collision Rate Per 100k	36.6	44.8	-18

1.3.8. In comparison with the rest of NI, ANBC is a relatively small council in spatial terms. The Council area makes up only 4% of NI and is below the NI average council area size. Its population density is 2.43 usual residents per hectare compared with the average council value of 3.66. The percentage of the population who live in towns with a population of 5000 or more (79%) is much higher than the NI average of 58%. In addition, there is a relatively low road length per capita, which is also under the NI average. The average road speeds which are marginally higher than the NI average (64.25kmph compared to 61.79kmph). While the majority of the population live in urban areas, there is a high car dependency with only 19% of households not owning cars. However, 79% of the population are able to access a main town within 30 minutes using public transport which is higher than the NI-wide value.

Ards & North Down Borough Council

1.3.9. ANDBC has several settlements of which Bangor and Newtownards are the main towns with Holywood as the next largest settlement. Further settlements are summarised in **Error! Reference source not found.**.

Table 1.4 - Ards & North Down Borough Council Settlements and 2011 Population

SETTLEMENT	USUAL RESIDENTS 2011
Bangor	61,011
Newtownards	28,050
Holywood	11,257
Comber	9,071
Donaghadee	6,869
Ballygowan	2,942
Portaferry	2,511
Millisle	2,319
Portavogie	2,131
Ballywalter	2,027
Helen's Bay	1,385
Groomsport	1,214
Kircubbin	1,163
Cloughey	1,092
Ballyhalbert	1,040
Seahill	1,014
Carrowdore	960
Greyabbey	939
Crawfordsburn	581
Killinchy	539
Ards and North Down Borough Council Total	**156,672**

1.3.10. The Council area is a mix of urban and rural areas with the north predominantly urban and the south markedly rural in nature. Figure 1.5 summarises a number of the area's key demographic and transport- related characteristics and expresses these in terms of their percentage variation from Northern Ireland (NI) average. The full details are provided in **Error! Reference source not found.**.

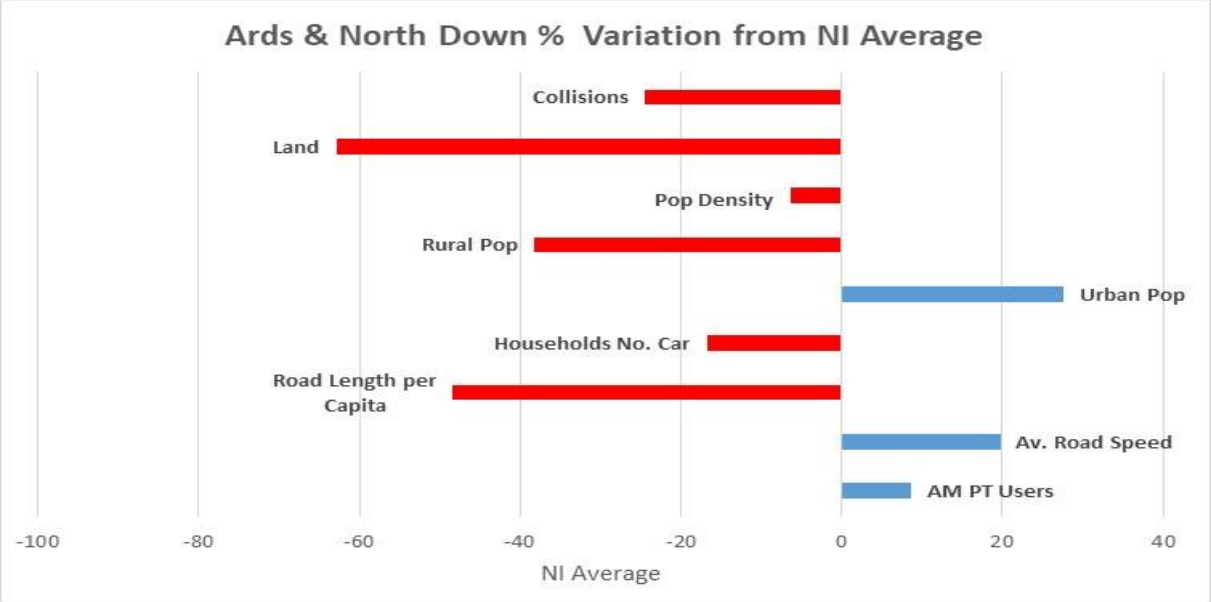

Figure 1.5– Ards and North Down Borough Council Key Characteristics Compared to NI Average

Table 1.5 - Ards and North Down Borough Council Key Characteristics Compared to NI Average

	Council	NI Average	% Variation from Average
Pop 30 mins of Town AM PT (%)	74%	68%	9
Average Road speed (kmph)	74.01	61.79	20
Road length per capita (km)	0.01	0.02	-48
Households No Car (%)	17.08	20.51	-17
Urban Population (%)	74.08	58.01	28
Rural Population (%)	25.92	41.99	-38
Pop Density	3.43	3.66	-6
Land in Hectares	45,731	123,294	-63
Fatal and Serious Collision Rate Per 100k	33.8	44.8	-25

1.3.11. ANDBC is a small council as measured by area at 45,731 ha compared to the NI Average of 123,294 ha. Its population density is approximately 3.43 compared to the average for a council of 3.66, and 74% of the population live in towns of 5,000 or more compared to the NI average of 58%. By comparison, 26% of the population live in rural areas which is significantly lower than the NI average of 42%. The population size combined with the small area translates to a low road length per capita which is 0.01km compared to the NI average of 0.02km. Average road speeds are 74kmph compared to the NI average of 62kmph. There is higher than average car dependency, with 83% of households owning a car. With the population focus in the north of the Council area, there is a high proportion of residents (74%) living within a 30 minute journey by rail or bus from a town centre, compared to the NI average of 68%. The number of collisions in the Council area per 1,000 people is 33.8, compared to the NI average of 44.8.

Lisburn & Castlereagh City Council

1.3.12. LCCC has several settlements with Castlereagh Greater Urban Area, Lisburn City and Lisburn Greater Urban Area comfortably the largest among them. The next largest settlements of Carryduff, Moira and Hillsborough and Culcavy are much smaller. Table as summarised in **Error! Reference source not found.**Figure 1.6.

Table 1.6 - Lisburn & Castlereagh City Council Settlements and 2011

SETTLEMENT	USUAL RESIDENTS 2011
Castlereagh Greater Urban Area	55,857
Lisburn City	45,370
Lisburn Greater Urban Area	31,186
Carryduff	6,961
Moira	4,591
Hillsborough and Culcavy	3,952
Maghaberry	2,450
Glenavy	1,784
Milltown	1,499
Moneyreagh	1,384
Annahilt	1,051
Dromara	1,006
Lower Ballinderry	917
Aghalee	873
Drumbeg	817
Stoneyford	605
Ravernet	554
Lisburn and Castlereagh City Council Total	**134,841**

1.3.13. The Council area is approximately one third urban in nature. Figure 1.6 summarises a number of the area's key demographic and transport- related characteristics and expresses these in terms of their percentage variation from Northern Ireland (NI) average. The full details are provided in **Error! Reference source not found.**.

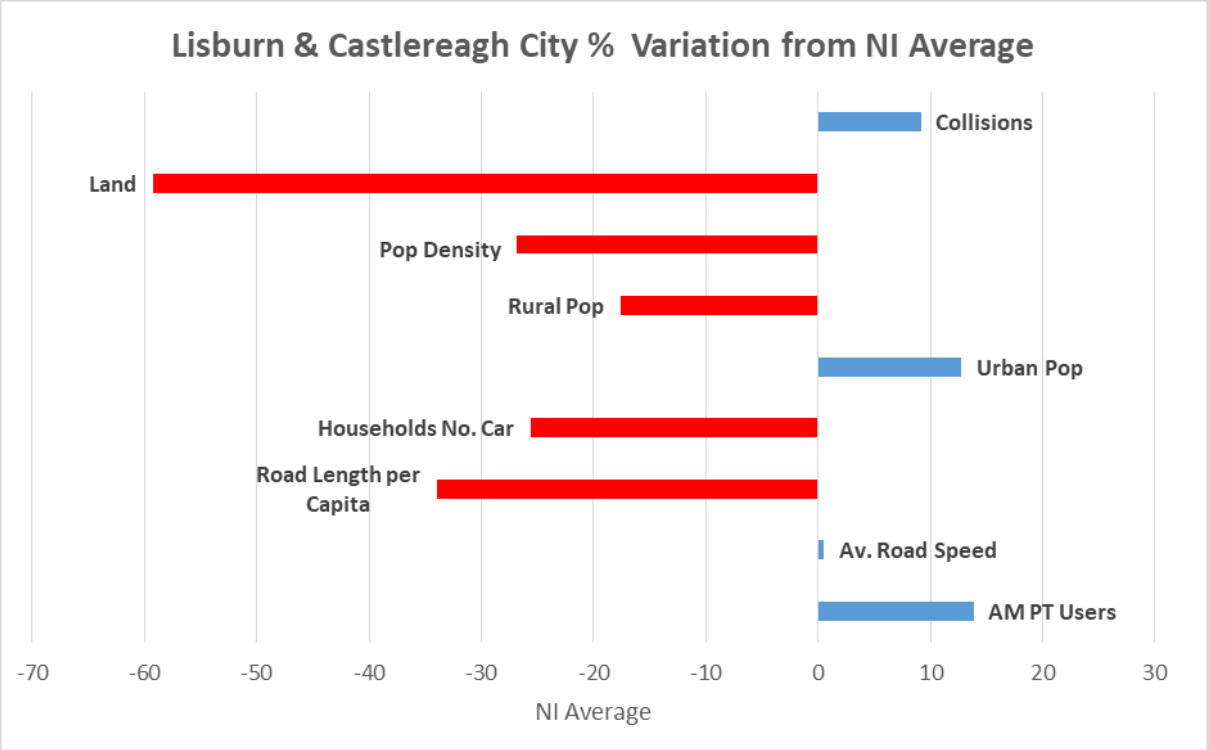

Figure 1.6 – Lisburn and Castlereagh City Council Key Characteristics Compared to NI Average

Table 1.7 - Lisburn and Castlereagh City Council Key Characteristics Compared to NI Average

	Council	NI Average	% Variation from Average
Pop 30 mins of Town AM PT (%)	78	68	14
Average Road speed (km per hr)	62.09	61.79	0
Road length per capita (km)	0.01	0.02	-34
Households No Car (%)	15.26	20.51	-26
Urban Population (%)	65.41	58.01	13
Rural Population (%)	34.59	41.99	-18
Pop Density	2.68	3.66	-27
Land in Hectares	50279	123,294	-59
Fatal and Serious Collision Rate Per 100k	48.9	44.8	9

1.3.14. LCCC is a geographically small council as measured by area at 50,279 ha compared to the NI average of 123,294 ha. Its population density is approximately 2.7 persons per hectare compared to the NI average of 3.7 and 65% of the population live in towns of 5,000 or more compared to the NI average of 58%. The Council area has therefore a predominately urban population with only 35% of the population live in rural areas. Road length per capita which is 0.01km compared the NI average of 0.02km. Road speeds are in line with the NI average. Settlements within the Council area are highly accessible by public transport, with 78% of the population within a 30 minute bus/rail journey,

compared to the NI average of 68%. Only 15% of households in the Council area do not own a car compared to the NI average of 21%.

Mid and East Antrim Borough Council

1.3.15. MEABC has three main towns, Ballymena, Carrickfergus and Larne, with Greenisland having the next largest population. Further detail on the settlements within the council area are summarised in **Error! Reference source not found.**.

Table 1.8 - Mid and East Antrim Borough Council Settlements and 2011 Population

SETTLEMENT	USUAL RESIDENTS 2011
Ballymena	29551
Carrickfergus	27998
Larne	18755
Greenisland	5486
Whitehead	3802
Ahoghill	3417
Broughshane	2879
Cullybackey	2593
Kells / Connor	2073
Carnlough	1512
Ballycarry	1375
Portglenone	1177
Ballystrudder	990
Ballygalley	821
Glynn	628
Cargan	588
Glenarm	568
Mid and East Antrim Borough Council Total	**135338**

1.3.16. The Council area has a large rural area which is interspersed with smaller settlements and is ultimately supported by 3 main towns. Figure 1.7 summarises a number of the area's key demographic and transport- related characteristics and expresses these in terms of their percentage variation from a Northern Ireland (NI) average council area. The full details are provided in **Error! Reference source not found.**.

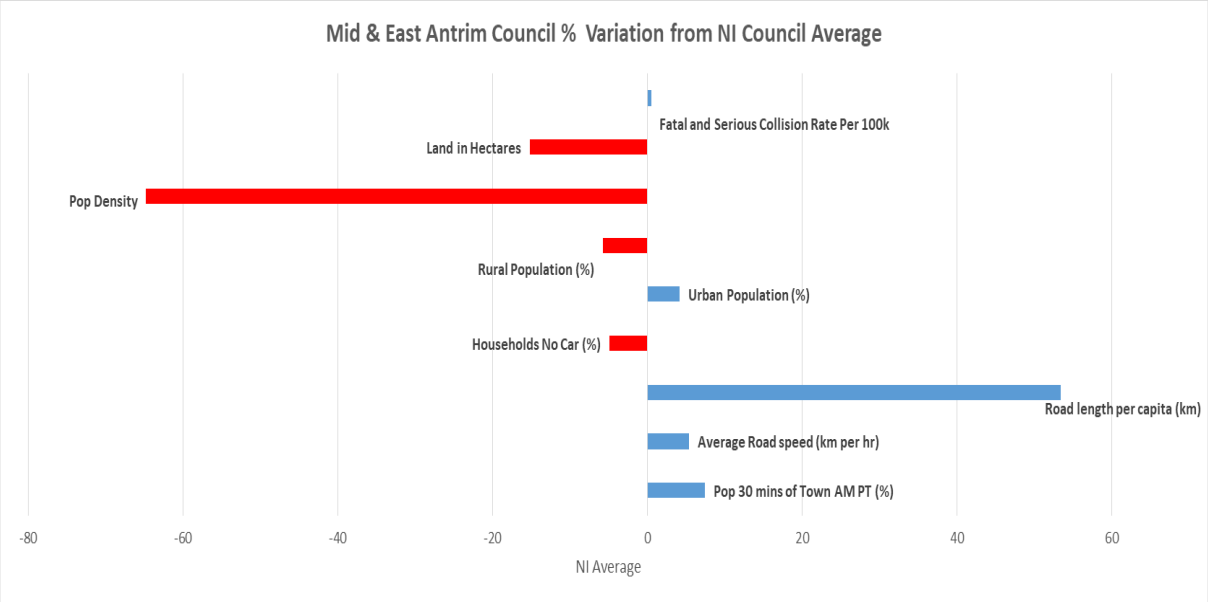

Figure 1.7 – Mid and East Antrim Borough Council Key Characteristics Compared to NI Average

Table 1.9 - Mid and East Antrim Borough Council Key Characteristics Compared to NI Average

Key Characteristic	Mid & East Antrim	NI Average (Council Area)	% Variation from NI Average
Pop 30 mins of a Town AM Peak PT	73%	68%	7
Average Road Speed (kmph)	65.13	61.79	5
Road Length per Capita (km)	0.02	0.02	53
Households with no car (%)	19.50	20.51	-5
Urban Population (%)	60.42	58.01	4
Rural Population (%)	39.58	41.99	-6
Pop Density	1.29	3.66	-65
Land in Hectares	104,570	123,294	-15
Fatal and Serious Collision Rate Per 100k	45	44.8	0

1.3.17. MEABC is a moderately sized council as measured by area and makes up 8% of the NI area, although the council area is under the NI average. Its population density is 1.29 compared to the NI council average of 3.66. 60% of the population live in towns of 5000 or more which is consistent when compared to the NI average of 58%. It has a road length per capita which is consistent with the NI average and road speeds which are slightly above the NI average. 19.5% of households do not own a car or van. 73% of the population are able to access a main town within 30 minutes using public transport which is above the NI-wide value of 68%.

2.0 Policy Context

2.1. Introduction

2.1.1. This Transport Study has been developed within the policy contexts of the councils, the Department and the Northern Ireland Executive.

2.1.2. The BMTP councils' community plans set out Councils ambitions and the LDP process aims to map out the delivery of these ambitions. Each of the BMTP councils have published a POP. That POP is designed to stimulate debate and encourage feedback on key issues of strategic significance which are likely to influence the direction of the LDP.

2.1.3. The LDP Plan Strategies (LDP PS) will set out a vision and strategic objectives of the councils with the expectation of being achieved by 2030-2035, for the benefit of the entire community. The LDP dPS will go through Independent Examination by the Planning Appeals Commission (PAC).

2.1.4. Similarly, the PfG sets out the former Northern Ireland Executive's wider ambitions to address the major social, economic and environmental issues affecting all sections of society.

2.1.5. In addition to the PfG, there are a number of strategic planning and transport policies developed by the Department which set the context for this LTS, namely:

- The Regional Development Strategy 2035 – Building a Better Future (RDS);
- Ensuring a Sustainable Transport Future: A New Approach to Regional Transportation (the New Approach);
- Northern Ireland Changing Gear – A Bicycle Strategy for Northern Ireland; and
- Exercise Explore Enjoy: A Strategic Plan for Greenways.

2.1.6. These strategic documents are NI-wide and all Council areas are required to take account of their content and to plan accordingly.

2.1.7. This BMTS supports the achievement of both the objectives set out in the above documents, and also the objectives of the BMTP councils' Community Plans and POPs. The relevant elements of all of these documents are summarised below.

2.2. Planning Policy Context

Reform of local government & development planning

2.2.1. Reform of the Northern Ireland planning system came into operation on 1st April 2015. The unitary system where all planning powers rested with the Department of the Environment[1] was replaced by a new two-tier model of delivery, with Local Government District Councils being made responsible for

[1] The Department of the Environment no longer exists. Functions and services delivered by the Department of the Environment have been transferred to new departments, including the Department for Infrastructure.

a number of planning functions including local plan-making, development management and planning enforcement.

2.2.2. Within this system central government (the Department) has responsibility for regional planning policy, the determination of regionally significant planning applications, called-in applications and planning legislation. It also provides oversight, guidance for councils, audit, governance and performance management functions. In addition to this DfI continues to be the competent authority for transport.

Strategic Planning Policy Statement for Northern Ireland – Planning for Sustainable Development (SPPS)

2.2.3. The SPPS was published in September 2015 and is a statement of the government's policy on important planning matters that should be addressed across Northern Ireland. It reflects expectations for delivery of the planning system.

2.2.4. The document consolidates the 20 separate Planning Policy Statements into one document, and sets out strategic subject planning policy for a wide range of planning matters. It sets out the core planning principles to underpin delivery of the two-tier planning system with the aim of furthering sustainable development.

2.2.5. The SPPS identifies a number of regional strategic objectives for transportation and land-use planning as follows:

- promote sustainable patterns of development which reduce the need for motorised transport, encourages active travel, and facilitate travel by public transport in preference to the private car;
- ensure accessibility for all, with the needs of people with disabilities and others whose mobility is impaired given particular consideration;
- promote the provision of adequate facilities for cyclists in new development;
- promote parking policies that will assist in reducing reliance on the private car and help tackle growing congestion;
- protect routes required for new transport schemes including disused transport routes with potential for future reuse;
- restrict the number of new accesses and control the level of use of existing accesses onto Protected Routes; and,
- promote road safety, in particular for pedestrians, cyclists and other vulnerable road users.

2.2.6. Accessibility is considered to be a key strand throughout the SPPS. The SPPS must be taken into account in the preparation of LDPs and in the determination of planning applications. The SPPS also recommends that councils undertake local transport studies to identify transportation and land use planning issues to be addressed through the delivery of LDPs. This is to have consideration of transport infrastructure (as related to development proposals / land use zoning) such as new transport schemes, active travel and car parking.

2.2.7. This approach is in accordance with the stated aim of the SPPS contained within the Regional Development Strategy 2035 (RDS 2035) with regard to transportation "to secure improved integration with land-use planning". In addition, Section 3 of Part 2 of the Planning Act (Northern Ireland) 2011 (the Act) refers to the "survey of the district" and the requirement from councils to keep under review matters which may be expected to affect the development of its district or the planning of that development, including "the communications, transport system and traffic of the district" (Section 3 (2) (d)).

Local Development Plans

2.2.8. Part 2 of the Act places a statutory requirement on each council to prepare an LDP for its district. An LDP consists of two separate development plan documents, covering the council district:

- a Plan Strategy which will set out the council's vision, objectives and growth strategy for the area along with strategic policies; and
- a LPP which will set out the council's detailed policies in relation to the development and use of land in its district.

2.2.9. The Plan Strategy is produced first, with scrutiny at the independent examination stage. The LPP is prepared subsequently to be consistent with the Plan Strategy.

2.2.10. As an initial task, each council is also required to prepare and publish a POP which sets out for consultation purposes:

- a series of options for dealing with the key issues in the plan;
- evidence to appraise the different issues and options; and
- the council's preferred options and its justification for selecting/recommending its preferred approach.

2.2.11. The BMTP councils have all completed this initial task by publishing their POPs. Each of the POPs include direct references to transport in the documents' objectives. The objective can be categorised as economic, social or environmental.

2.2.12. Common transport themes run through the five POPs including the promotion of sustainable transport including public transport and active travel as well as forms of management the city/town centre demand for private vehicles such as parking restraints. In addition, there is an acceptance within the documents that growth should be focused within the existing cities/towns where levels of sustainable transport provision and infrastructure are generally higher.

2.2.13. In terms of sustainability, the growth aspirations across the BMTP area have the potential to produce a greater number of trips and careful mitigation will be needed to reduce the number undertaken by private car. The complementary investment in green transport and Active Travel would be critical in ensuring sustainable long-term development.

2.3. Draft Programme for Government

2.3.1. The PfG2 framework focuses on improving wellbeing for all through tackling disadvantage and driving economic growth. The PfG is outcomes-based and is focused on impact at a whole population level, rather than a list of activities or inputs. The ambitions contained in the PfG will only be realised through sustained collaboration, across organisational and sectoral boundaries.

2.3.2. The PfG identifies key strategic outcomes, supported by a number of indicators. Draft Delivery Plans have been developed for each of these, setting out the key actions to support delivery of PfG outcomes.

2.3.3. The Department's main contribution to the PfG is through:

- Outcome 2: We live and work sustainably – protecting the environment; and
- Outcome 11: We connect people and opportunities through our infrastructure.

2.3.4. Outcome 2 has a focus on protecting the environment while supporting wider economic growth and social cohesion objectives. The key focus of Outcome 11 is the importance of physical connectivity as a key enabler of economic growth and social cohesion. Under this framework the Department is directly responsible for delivery of two transport related PfG indicators:

- Indicator 23: Average journey time on key economic corridors; and
- Indicator 25: % of all journeys made by walking, cycling and public transport.

2.3.5. The focus within the Delivery Plan for Indicators 23 and 25 is to ensure that investment in transport infrastructure supports economic and social progress while seeking to minimise the harmful effects generated by road traffic through congestion and pollution on the environment and on health. Indicators 23 and 25 are strongly inter-dependent, for example, progress in increasing the uptake of active travel and public transport will help reduce pressure on the strategic road network, mitigate congestion and improve journey times on key corridors.

2.3.6. It is understood that variations in the rural / urban settlement balance across NI will provide different challenges and opportunities for councils in delivering PfG outcomes and indicators. The Departments contribution to the successful delivery of PfG outcomes will also be highly reliant on the concerted and collaborative efforts of delivery partners working in partnership with the Department.

2.4. The Regional Development Strategy 2035 – Building a better Future (RDS 2035)

2.4.1. The RDS 2035, published March 2012, is a long-term plan to deliver the spatial aspects of the NI Executive. The RDS 2035 describes Belfast as a principal city and acknowledges its importance as the major driver for regional growth. However, it also recognises the need for balanced sub-regional growth and importance of key settlements as centres for growth and investment.

[2] Outgoing Ministers have given cover to proceed with the policy direction set by the last Executive in the draft PfG, consequently, Departments are continuing to deliver public services in line with the policy direction in the draft PfG.

2.4.2. The RDS 2035 includes Regional Guidance to "deliver a balanced approach to transport infrastructure" and Regional Guidance 2 (RG2) which will allow the region to remain competitive in the global market in a sustainable manner. The focus of this guidance is on managing the use of road and rail space and how we can use our network in a better, smarter way.

2.4.3. In particular, the RDS 2035 recognises the need to maximise the potential of the Regional Strategic Transport Network (RSTN) to enhance accessibility to towns; to help build an integrated regional economy; facilitate tourist travel including improving connections to key tourism sites; and reduces where possible, unsuitable traffic into towns.

2.4.4. The RDS 2035 contains a Spatial Framework and Strategic Planning Guidelines based on focusing development in principal cities, main hubs, local hubs and clusters. It also and prioritises the improvement of the main transport corridors that form the regional transportation network. The RDS identifies Belfast as a principal city and therefore one of the main economic centres for the region.

2.5. Ensuring a Sustainable Transport Future: A New Approach to Regional Transportation (New Approach)

2.5.1. The New Approach, published April 2012, sets out proposals for regional transportation beyond 2015. It was developed to complement the RDS 2035.

2.5.2. The New Approach sets out three High Level Aims for transportation, each of which is supported by a number of Strategic Objectives – these are outlined below:

A. Support the Growth of the Economy
1: Improve connectivity within the region
2: Use road space and railways more efficiently
3: Better maintain transport infrastructure
4: Improve access in our towns and cities
5: Improve access in rural areas
6: Improve connections to key tourism sites

B. Enhance the quality of life for all
7: Improve Safety
8: Enhance Social Inclusion
9: Develop transport programmes focused on the user

C. Reduce the Environmental Impact of Transport
10: Reduce Greenhouse gas emissions from transport
11: Protect biodiversity
12: Reduce water, noise and air pollution

2.5.3. The New Approach sets out the Policy Prioritisation Framework which is an objective-led decision-making tool which allows for transport schemes / programmes to be assessed by taking a broad view

on how they contribute to specific policy objectives. The aim is to link strategic transportation interventions to the PfG, based on qualitative and quantitative evidence.

2.6. Northern Ireland Changing Gear – A Bicycle Strategy for Northern Ireland

2.6.1. Northern Ireland Changing Gear - A Bicycle Strategy for Northern Ireland, published August 2015, outlines the ambition to transform cycling in Northern Ireland over a 25 year period. The strategy's vision for cycling in Northern Ireland is for;

"A community where people have the freedom and confidence to travel by bicycle for every day journeys"

2.6.2. The document identifies a number of objectives which have been set to guide the delivery of the bicycle strategy. These are:

- *Making urban areas in Northern Ireland more accessible for people using the bicycle – improvements to cycling infrastructure will enable more people to access facilities in our urban centres by bicycle or by multi modal journeys.*

- *Improve opportunities for social interaction – 22% of households in Northern Ireland do not have access to a car/van. Improved cycling infrastructure enhances the travel opportunities for those who don't have access to a car/van. Perhaps more importantly, cycling is a social form of transport. It allows people to interact and engage with their surroundings, their community and their neighbours. This can help build a sense of community and contribute to personal well-being and social inclusion.*

- *Improvements in public health – increased levels of bicycle use have both direct (personal fitness) and indirect (improvements to air quality) benefits for public health.*

- *Increase safety for people using the bicycle – this includes reducing the proportion involved in collisions and increasing the 'feel safe' factor for people riding a bicycle.*

2.6.3. The bicycle strategy outlines how a comprehensive network of bicycle facilities should be developed, including a focus on urban networks where detailed proposals for infrastructure should be outlined and delivered alongside specific behaviour change initiatives and campaigns. In the urban areas, radial routes (primary routes) and quiet routes should be developed to form a comprehensive hierarchical network. The bicycle strategy also highlights the role that greenways can play in a comprehensive network and this is developed in the greenway network that was published in 'Exercise – Explore – Enjoy: a Strategic Plan for Greenways' in November 2016.

2.6.4. The Bicycle Strategy outlines a 3 Pillar Approach, based around Build (infrastructure, design, cycle parking and safety), Support (education and training, safety and security, legibility and mapping), and Promote (respect and understanding, marketing and flagship events and schemes).

2.7. Exercise Explore Enjoy: A Strategic Plan for Greenways

2.7.1. In November 2016 the Department published it greenways strategy entitled "Exercise Explore Enjoy: A Strategic Plan for Greenways". The documents provides a vison for "A region where people have ready access to a safe traffic free environment for health, active travel and leisure".

2.7.2. The strategy sets out the plans for a network of greenways, connecting towns and cities to the villages and countryside from east to west and north to south across all eleven councils.

2.7.3. The document identifies 3 classifications of greenway routes that should be explored;

- Primary Greenway Network – to provide long distance connectivity;
- Secondary Greenway Network – to provide wider access to greenways; and,
- Community Paths – to provide doorstep opportunities to connect local communities to their local green space and neighbouring communities.

2.8. Draft Belfast Metropolitan Area Plan 2015

2.8.1. The Belfast Metropolitan Area Plan 2015 (BMAP) is unadopted, however draft BMAP along with representations received to the draft plan and the Planning Appeals Commission inquiry reports remain as material considerations to be weighed by the decision maker. Draft BMAP was prepared in parallel with the (non-statutory) Belfast Metropolitan Transport Plan (BMTP) to ensure that as far as possible the plans are mutually supportive. In this respect the land use locations in the Plan were closely linked with the priorities and proposed transport investment in BMTP, outlined separately below.

2.8.2. In developing BMTP attention was paid to improving accessibility to key strategic sites and regeneration areas identified by the RDS and progressed by the draft Plan. In addition the Plan took into account the land use requirements of transportation infrastructure by identifying protection lines for planned transport schemes and abandoning protection for schemes which were no longer to be implemented

2.8.3. The Draft Plan includes two Transport Policies:

- TRAN 1 – Parking Standards within Areas of Parking Restraint. These standards were expected to be varied only in appropriate circumstances and on the basis of empirical evidence.
- TRAN 2 – Publicly Owned Off-street Surface Car Parks within City and Town Centres. This effectively required parking supply levels to be maintained following the re-use of existing central car parks.

2.9. Belfast Metropolitan Transport Plan 2015

2.9.1. The BMTP is non statutory and was prepared by the then Department for Regional Development[3] as a technical supplement for the Draft BMAP and unadopted BMAP 2015. The BMTP includes a phased and costed implementation programme of transport schemes to 2015. The implementation of these proposals was subject to separate detailed economic appraisal, funding availability and statutory processes.

2.9.2. BMTP included schemes arranged along four modal themes:

- Walking and Cycling – such as walking corridors and cycle routes;
- Public Transport – such as bus and rail schemes;
- Highway – such as road schemes; and
- Management measures – such as parking controls or traffic management used to control traffic and influence travel demands and patterns.

2.9.3. Whilst many of the core objectives of the BMTP 2015 remain relevant, the wider strategic framework has changed with the publication of the RDS 2035 and the New Approach , in addition, many of the proposed schemes/measures have been completed. Therefore BMTP 2015 may be considered outdated. As a result any remaining schemes and transportation initiatives included in the BMTP 2015 will require further consideration as part of the development of the new Belfast Metropolitan Transport Plan to determine whether are not they are relevant in today's context.

2.10. Belfast City Centre Transport Framework

2.10.1. The Belfast City Centre Transport Framework set out a short term framework for the planning and delivery of transport infrastructure in and providing access to Belfast City Centre covering the period from 2017 to 2020. The Framework was prepared by the Department in consultation with BCC with the aim of ensuring an integrated approach in the development of transport infrastructure and services supporting the regeneration of Belfast City Centre in line with wider strategic objectives as set out in the draft PfG and supported by the Belfast Agenda. In this context, the Framework presented a 'refresh' of the policies and schemes set out in the BMTP 2015.

2.10.2. The Framework aimed to ensure a joined-up approach between the Department as the transport authority and BCC as the planning authority in the development of Belfast City Centre. In particular it sought to ensure clarity as to both the major transport priorities and the strategic focus of transport policy and investment.

2.10.3. While the Framework was concerned with developments and transport infrastructure within Belfast City Centre, in order to influence travel choices to the city centre, the Framework also commented on the balance of commuter priorities on the major radial corridors which deliver commuters to and from the City Centre.

[3] The Department for Regional Development no longer exists. Functions and services delivered by the Department for Regional Development have been transferred to new departments, including the Department for Infrastructure.

2.11. Belfast City Council Context

Preferred Options Paper

2.11.1. BCC's POP was published in January 2017. The POP contained the following Vision statement which contains strong messages relating to economic, environmental and social advancements.

> *"Belfast will be a globally successful, dynamic, smart 21st century regional city that is environmentally resilient with a vibrant economic heart, bustling with sustainable mixed use businesses that attracts investment, talent and visitors; and is surrounded by thriving well-connected neighbourhoods where people love to live. A strong local economy will support progressive, healthy, safe and vibrant communities and provides a gateway to opportunities locally, nationally and worldwide."*

2.11.2. The POP prioritises the growth of Belfast to compete with similar sized UK cities. It will be strengthened by increasing the population by 66,000 and creating 46,000 new jobs.

2.11.3. The POP outlines the strategic approach to developing Belfast to 2035 will be guided by four strategic aims:

- **Shaping a liveable place** - Promoting development that enhances the health and wellbeing of communities, neighbourhoods and places;
- **Creating a vibrant economy** – A strengthened Belfast as the regional economic driver;
- **A smart connected and resilient place** - Improving connectivity and supporting the efficient movement of people, goods, energy and information to create a dynamic, innovative 21st century city, with the capacity for adaption to environmental challenges; and,
- **A green and active place** - A protected, enhanced and attractive natural setting, reinforcing uniqueness and accessibility to all who live, work and enjoy the city.

2.11.4. Many of the key issues for transport infrastructure fall within the Smart connected and resilient place aim including:

- Support walking and cycling alongside sustainable transport;
- Support improvements to public transport and facilities;
- Review parking to encourage more sustainable travel and accessibility for all; and,
- Aim to ensure there is appropriate infrastructure to meet our needs whilst protecting our environment.

2.11.5. Other issues that impact upon transport fall within the **Green and active place** aim including:

- ensure developers help provide 'green and blue' networks close to residential developments – to include cycleways and pedestrian routes; and,
- protect and improve natural heritage – which in general would mitigate against new physical infrastructure.

2.11.6. In addition the strategic aim **Shaping a liveable place** gives a commitment to:

- Allocate land for new homes prioritising 'brownfield' land – leading to greater use of existing transport infrastructure;
- Sustainable neighbourhoods promoting health and wellbeing – presumably, at least in part, through greater walking and cycling; and,

- Ensure new development promotes greater connectivity – this is likely to involve consideration and allowance for walking and cycling and public transport access.

2.11.7. Finally the strategic aim Creating a vibrant economy gives a commitment to two development options which would reduce journey lengths and promote the use of active modes of transport, namely:

- promote vibrant local neighbourhood shopping centres; and,
- support city centre living.

Community Plan

2.11.8. The BCC Community Plan was entitled The Belfast Agenda and was published in 2018. The Belfast Agenda contained the following Vision for Belfast in 2035 which contains strong messages relating to substantially improved economic, environmental and social conditions.

"Belfast will be a city re-imagined and resurgent. A great place to live and work for everyone. Beautiful, well connected and culturally vibrant, it will be a sustainable city shared and loved by all its citizens, free from the legacy of conflict. A compassionate city offering opportunities for everyone. A confident and successful city energising a dynamic and prosperous city region. A magnet for talent and business and admired around the world. A city people dream to visit."

2.11.9. The Belfast Agenda sets out five strategic outcomes for 2035:

1. Everyone in Belfast benefits from a thriving and prosperous economy;
2. Belfast is a welcoming, safe, fair and inclusive city for all;
3. Everyone in Belfast fulfils their potential;
4. Everyone in Belfast experiences good health and wellbeing; and,
5. Belfast is a vibrant, attractive, connected and environmentally sustainable city.

2.11.10. The fifth outcome includes reference to the use of sustainable modes of transport and includes transport indicators:

- Percentage of all journeys which are made by walking, cycling or public transport; and,
- Number of miles of cycle lanes, footways and footpaths.

2.11.11. The fifth outcome also includes reference to the built and natural environment being well protected and air quality is listed as an indicator. It is considered that the outcomes reinforce the need for a balanced set of improvements meeting economic, environmental and social objectives.

2.11.12. A core ambition of the Belfast Agenda is growth in the city including by 2035:

- 46,000 additional jobs; and,
- 66,000 additional people.

2.11.13. In the medium term this provides a framework for a number of key priorities for the period 2017 – 2021. Of particular relevance for transport is City Development which includes delivery of the following transport schemes:

- Belfast Rapid Transit;
- Belfast Transport Hub; and
- York Street Interchange.

2.11.14. As part of the City Development Work-streams to 2021 the Council had committed to developing an integrated and sustainable city transport plan. The purpose is to maximise the opportunities of the Transport Hub and Rapid Transport System (Phase II) and attract additional use of sustainable transport modes including public transport. The Council stated it will work in partnership to progress key transport infrastructure, including the York Street Interchange and walk and cycle networks and develop a comprehensive solution to city centre parking.

2.12. Antrim and Newtownabbey Borough Council Context

Preferred Options Paper

2.12.1. ANBC published their POP in January 2017. The vision of this document is "In 2030, Antrim and Newtownabbey Borough will have a reputation as an excellent, attractive and diverse place in which to live and work. It will be a place in which to live and work. It will be a place that all citizens can take pride in and that is appealing to new residents, investors and visitors alike, with improved job opportunities, housing availability and connectivity that meets the needs of our community. Development will be sustainable and of high quality and will address the ongoing challenges of climate change. Our built and natural environment will continue to be high quality and well looked after and will support prosperity and economic development and provide for a wide range of recreational and leisure activities."

2.12.2. The objectives set in the POP are as follows (note: objectives in the POP are listed as bullet points. For ease of reference throughout this LTS, numerical values have been assigned to represent each bullet point):

1. To provide an adequate range and quality of land and premises for business and industry;
2. To protect strategically important business and employment opportunities;
3. To promote the development and regeneration of our towns and commercial centres;
4. To promote high quality environmentally sustainable design;
5. To provide a sufficient supply of land for mainstream and affordable housing and ensure a diverse choice of housing;
6. To ensure that necessary new infrastructure accompanies new development;
7. To accommodate necessary community facilities;
8. To encourage better connectivity by transport and digital networks;
9. To protect and enhance the natural and built environment;
10. To protect open spaces of public value and promote green network linkages around our larger settlements;
11. To promote sustainable tourism and economic diversification;
12. To integrate climate change adaptation requirements such as flood prevention and sustainable renewable energy production; and
13. To make adequate provision for waste management.

2.12.3. The above POP objectives will be used, along with other relevant considerations, to help inform transport related objectives for the ANBC area.

2.12.4. The POP also set out a number of overarching principles as follows:

- Sustainable economic growth;

- Climate Change;
- Quality of Life;
- Quality of Place;
- Environment;
- Energy and Resources; and
- Community Benefits.

Community Plan

2.12.5. The ANBC 2030 Community Plan sets out the vision for "a resilient, socially responsible community where citizens enjoy a high quality of life".

2.12.6. To support this vision, themes and priorities have been set. These are presented in Figure 2.8. Each of the key themes and priorities within them relevant to this LTS are summarised as follows (note: priorities in the Community Plan are listed as bullet points. For ease of reference throughout this LTS, numerical values have been assigned to each of the bullet points):

1. Our Citizens enjoy good health and wellbeing;
    a) Exercise and physical activity are acknowledged as important ways to stay well both physically and mentally;
    b) There is provision of accessible recreational and leisure opportunities for all our citizens;
    c) The particular needs of an ageing population are met so that our citizens can live long, healthy and independent lives in their own homes if that is their wish; and
    d) The particular needs of the most vulnerable in our community are met so that they can live active and healthy lives. These needs may include access to leisure or play facilities, access to appropriate advice and support or access to services.
2. Our Citizens live in connected, safe, clean and vibrant places;
    a) Getting around our Borough is easier for those who don't have access to a car and for those who would prefer a more active mode of transport;
    b) Our town and village centres are vibrant places where people live and where they spend their leisure time;
    c) Our natural environment is valued; and
    d) Local people get involved in decisions on the future development of their areas through the Place Shaping Forum
3. Our Citizens benefit from economic prosperity;
    a) Our local economy thrives, with local businesses starting up, growing, expanding and generating employment;
    b) Our area has a skilled population and infrastructure which is attractive to investors and employers; and
    c) Barriers to accessing employment are reduced or removed enabling all of our citizens to have equitable access to the opportunities available in the Borough.
4. Our Citizens achieve their full potential; and
5. Our vulnerable people are supported.
    a) Our aging population is supported to live active lives as part of their community;

b) Our aging population is supported to live as contentedly and independently as possible for as long as possible; and
c) Our young people are supported to access opportunities which enable them to fulfil their potential.

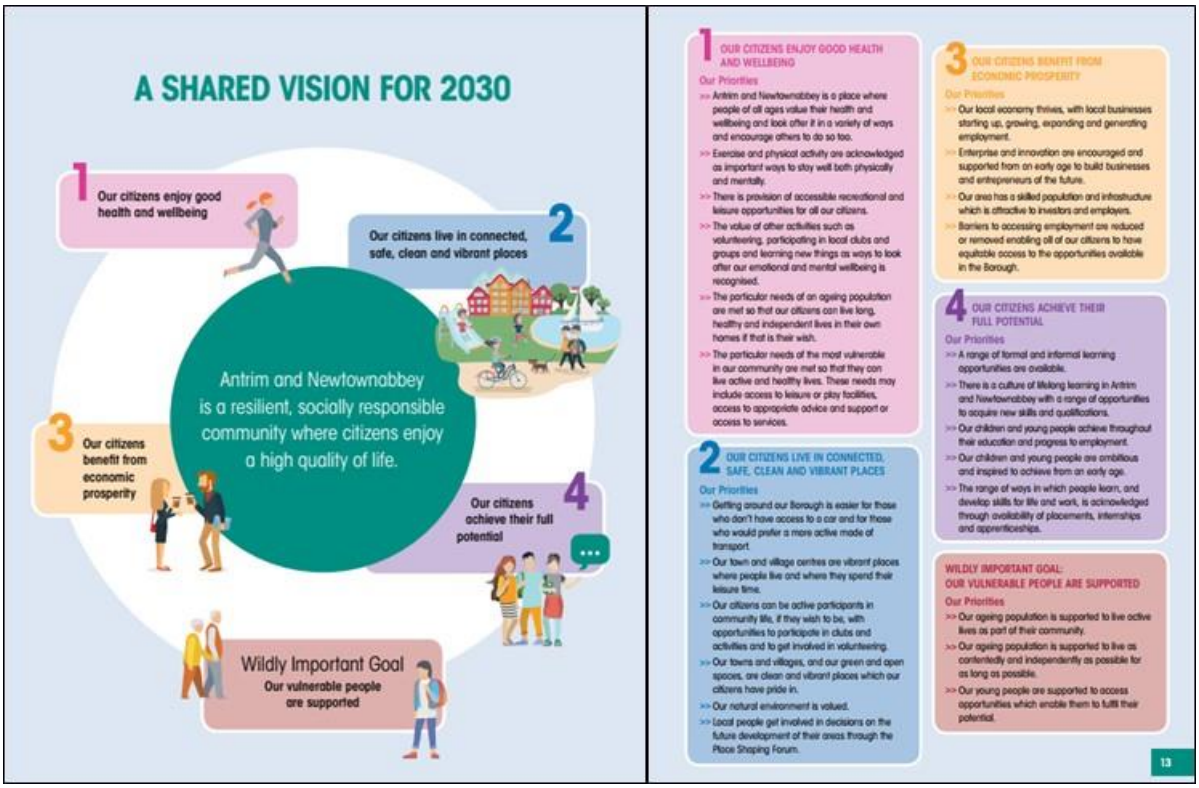

Figure 2.8 - Community Planning Vision, Themes and Priorities (Source: Antrim and Newtownabbey Borough Council – Community Plan)

2.12.7. The shared principles which underpin this vision are:

- Equality;
- Sustainability;
- Connectivity;
- Opportunity;
- Inclusivity;
- Vitality;
- Capability; and
- Compassion

2.12.8. These themes are fundamental in guiding the emerging vision and strategic objectives of the LDP – Plan Strategy and the LTS.

2.13. Ards and North Down Borough Council Context

Preferred Options Paper

2.13.1. ANDBC published their POP in March 2019. The Council proposed a concise vision, shared with the Community Plan known as 'The Big Plan':
"Ards and North Down is a vibrant, connected, healthy, safe and prosperous place to live."

2.13.2. The POP confirms that the LDP will seek to deliver the above shared vision guided by three **Strategic Objectives** referring directly to the economy, society and the environment, namely:

- Promoting economic vitality;
- Ensuring cohesive and safe communities; and supporting healthy lifestyles; and
- Protecting and enhancing the environment.

2.13.3. The POP identifies five **Overarching Principles** that all development proposals must have regard to:

- Improving Health and Well-being;
- Creating and Enhancing Shared Space;
- Supporting Sustainable Economic Growth;
- Supporting Good Design and Positive Place Making; and,
- Preserving and Improving the Built and Natural Environment.

2.13.4. The POP sets out strategic direction in terms of its **Spatial Growth Strategy** which seeks to guide the majority of development to locations within large towns and which serve as accessible centres within the larger rural hinterland. This Growth Strategy is supported by a **Settlement Hierarchy** with a **Housing Allocation** of 8190 new dwellings and the provision of **Economic Development** land to support 7,500 new jobs. The Settlement Hierarchy includes the preferred option of re-evaluating existing housing zonings using the sequential approach in the SPPS.

2.13.5. Additionally the first key issue identified is "To facilitate development through developer contributions" with the Preferred Option "Provide strategic policy on developer contributions through the LDP and identify sites where developer contributions would be appropriate in the LPP." This is likely to be very relevant to the provision of transport infrastructure and services.

2.13.6. The POP continues under the headings of **People, Place** and **Prosperity** to identify the Key Issues and the **Preferred Options**. The majority directly related to transport are outlined under **Prosperity** and include:

- Introduce a policy requiring the consideration of sustainable transport and active travel in all new development proposals;
- Introduce areas of parking restraint in our Town Centres and other areas, where appropriate
- Identify sites suitable for Park and Ride / Park and Share facilities; and,
- Continue to protect proposed transport routes in extant plans and disused former transport routes.

2.13.7. A number of key issues appearing under other headings are also related to transport and include the following preferred options:

- People Heading
    - Identify and facilitate the development of Community Greenways – this has obvious linkages to the development of sustainable travel networks.

- Place Heading

- designate urban waterfronts to promote their regeneration and enhancement – this links to the consideration of vehicle dominance and the prioritisation of pedestrians in urban areas.

- Prosperity Heading
  - identify new sites to meet local employment and economic development needs – this relates to the accessibility of the site by sustainable modes;
  - define a hierarchy of town centre and retail centres based on the preferred settlement hierarchy – this can relate to the accessibility of the centres; and
  - promote appropriate sustainable tourism developments - this can relate to the accessibility of the site by sustainable modes.

Community Plan

2.13.8. The ANDBC 2032 Community Plan is called 'The Big Plan for Ards & North Down and sets out the vision for the Council area to be "a vibrant, connected, healthy, safe and prosperous place to live".

2.13.9. This overarching vision of the Big Plan outlines the Council's ambition to deliver five main outcomes and is shown in Figure 2.9. They include, to enable residents to fulfil their potential, enjoy good health and wellbeing, be respected and feel safe and secure, benefit from a prosperous economy and to have access to a sustainable environment. These themes are fundamental in guiding the emerging vision and strategic objectives of the LDP– PS and the LTS.

Figure 2.9 - Community Planning Vision, Themes and aims (Source: Ards and North Down Borough Council – Community Plan)

2.14. Lisburn and Castlereagh City Council Context

Preferred Options Paper

2.14.1. LCCC published their POP in March 2017. The Council proposed a concise vision, shared with the Community Plan:

"An empowered, prosperous, healthy and inclusive community."

2.14.2. The POP identifies six Strategic Objectives that clearly encompass the areas of economy, environment and social advancements:

- Enabling Sustainable Communities & Delivery of New Homes;
- Driving Sustainable Economic Growth;
- Growing our City, Town Centres, Retailing & Offices;
- Promoting Sustainable Tourism, Open Space & Recreation;
- Supporting Sustainable Transport and Other Infrastructure; and,
- Protecting and Enhancing Built and Natural Environment.

2.14.3. The objective, **Supporting Sustainable Transport and Other Infrastructure** includes direct support for specific road schemes such as the Knockmore to M1 link and the M1 to A1 link. It also states that the LDP should provide the means to promote, influence and deliver a shift to more sustainable travel modes. The objective gives rise to a number of specific Preferred Options:

- Retain a number of key transportation infrastructure schemes;
- Retain a number of Key Park & Ride and identify new Park & Ride / Park & Share sites;
- Promote Active Travel in new development; and
- Protect and develop safe, shared and accessible Greenways.

2.14.4. Other transport-related options are found within the other Strategic objectives:

- **Enabling Sustainable Communities & Delivery of New Homes**
  - Focus future housing growth in Lisburn City and retain the existing settlement hierarchy – hence maximising the use of existing transport infrastructure
- **Driving Sustainable Economic Growth**
  - Redesignate the Blaris Major Employment Zoning as a Mixed Use site – potentially providing short distance journeys but also creating significant additional commuting traffic on the M1 to Belfast; and,
  - Retain designation of the Maze Lands as a Strategic Land Reserve of Regional Importance – providing the potential for significant additional commuting and goods vehicle flows on the M1.
- **Growing our City, Town Centres, Retailing and Offices**
  - Extend the existing City Centre Boundary of Lisburn City Centre – providing additional potential for growth in the most accessible locations; and,
  - Extend District and Local Centre Boundaries of Forestside and Dundonald - providing additional potential for growth in currently accessible locations.
- **Enhancing the Built & Natural Environment**
  - Retain the existing policy-led approach with regards to the protection and enhancement of Built Heritage Assets and Natural Assets and identify new Assets and designations – possibly impacting on the assessment of new physical infrastructure.

Community Plan

2.14.5. The LCCC 2017/2032 Community Plan sets out the vision for:

"an empowered, prosperous, healthy, safe and inclusive community."

2.14.6. The shared values and principles which underpin this vision are sustainable development, equality and participation. These themes are fundamental in guiding the emerging vision and strategic objectives of the LDP PS and the LTS.

2.15. Mid and East Antrim Borough Council Context

Preferred Options Paper

2.15.1. MEABC published their POP in June 2017. The vision of this document is

"Mid and East Antrim will be shaped by high quality, sustainable and connected places for people to live, work, enjoy, invest and visit, so as to improve the quality of life for all".

2.15.2. Going forward MEABC are committed to delivering the core planning principles as set out in SPPS, which are:

- Improving Health and Well-being;
- Creating and Enhancing Shared Space;
- Supporting Sustainable Economic Growth;
- Supporting Good Design and Positive Place Making; and
- Preserving and Improving the Built and Natural Environment.

Community Plan

2.15.3. The MEABC 2032 Community Plan sets out the vision for:

"a strong, vibrant, safe and inclusive community, where people work together to improve the quality of life for all".

2.15.4. The shared values and principles which underpin this vision are presented in Figure 2.10 and summarised as follows:

- Sustainable Jobs and Tourism;
- Progress in Education;
- Good Health and Wellbeing;
- Community Safety and Cohesion; and
- Our Environment.

2.15.5. These themes are fundamental in guiding the emerging vision and strategic objectives of the LDP– Plan Strategy and the LTS.

Figure 2.10 - Community Planning Themes and Outcomes (Source: Mid and East Antrim Borough Council – Community Plan)

3.0 Transport Context

3.1. Integrated Land Use and Transport Planning

3.1.1. The integration of land-use and transport planning processes provides a unique opportunity to combine the shared regional and local sustainable development ambitions which are set out in the PfG, RDS, Community Plan and LDP.

3.1.2. The integration of land use and transport planning has the potential to reduce the need for travel, make better use of existing transport infrastructure and ensure that new transport infrastructure and services are effective, efficient and minimise impacts on the environment.

3.1.3. Integration is especially important in urban areas where there are practical choices to be made in terms of the location and type of development that may have substantial knock-on impacts on local environments and travel behaviour. In general terms, stronger city centres and greater development densities along public transport corridors can increase the use of sustainable and active travel modes. Conversely, dispersed development and low densities, whilst generally not adding to city centre traffic congestion, tend to further increase car dependency.

3.2. Belfast Transport Network

Belfast

3.2.1. With Belfast being the regional capital city many of the strategic roads are designed to deliver traffic to the city. The M1 connects the west and south, the M3 connects the east, while the M2/M5 connects the North. The A12 Westlink links these main routes and provides access to several parts of the city.

3.2.2. Outside to the strategic network there are many radial routes into the city and A55 provides an orbital route around the city.

3.2.3. The River Lagan provides a natural barrier to the east of the city and while there are several road crossing points, the river has the effect of reducing accessibility to the east.

3.2.4. The city centre is, for the most part is open to motorists and there is an extensive number of car parks throughout the area.

3.2.5. There is a Belfast Cycling Network and the Belfast Bike scheme provides a network of shared bikes. However the cycle network is patchy in places and work is being done to enhance the current infrastructure.

3.2.6. Pedestrian access is provided across the city through the city's footways, crossings and a pedestrian bridge provides a link from the City Centre across the Lagan Weir to the Titanic Quarter.

3.2.7. The city supports an urban bus network, comprising 18 Metro routes and 2 Belfast Rapid Transit Glider routes. In addition, many of the Translink Goldline services provide interurban links into Belfast and several Ulsterbus services make use of the Metro stops.

3.2.8. Park and Ride facilitates across the province provide easier access to many of the Belfast bound bus services but there are also several dedicated Park and Ride services into the city such as Black's Road, Cairnshill, Dundonald, Eastside, Northside and Sprucefield.

3.2.9. Like the Goldline services, many of the rail services deliver passengers into Belfast. The main stations are at Lanyon Place and Great Victoria Street. These stations provide for the Lisburn, Bangor, Larne, and Derry~Londonderry railway lines.

3.3. Wider BMUA Transport Networks

3.3.1. Within the wider BMUA there are further settlements considered in this study as shown in Figure 3.1. Several of the main settlements are discussed further below.

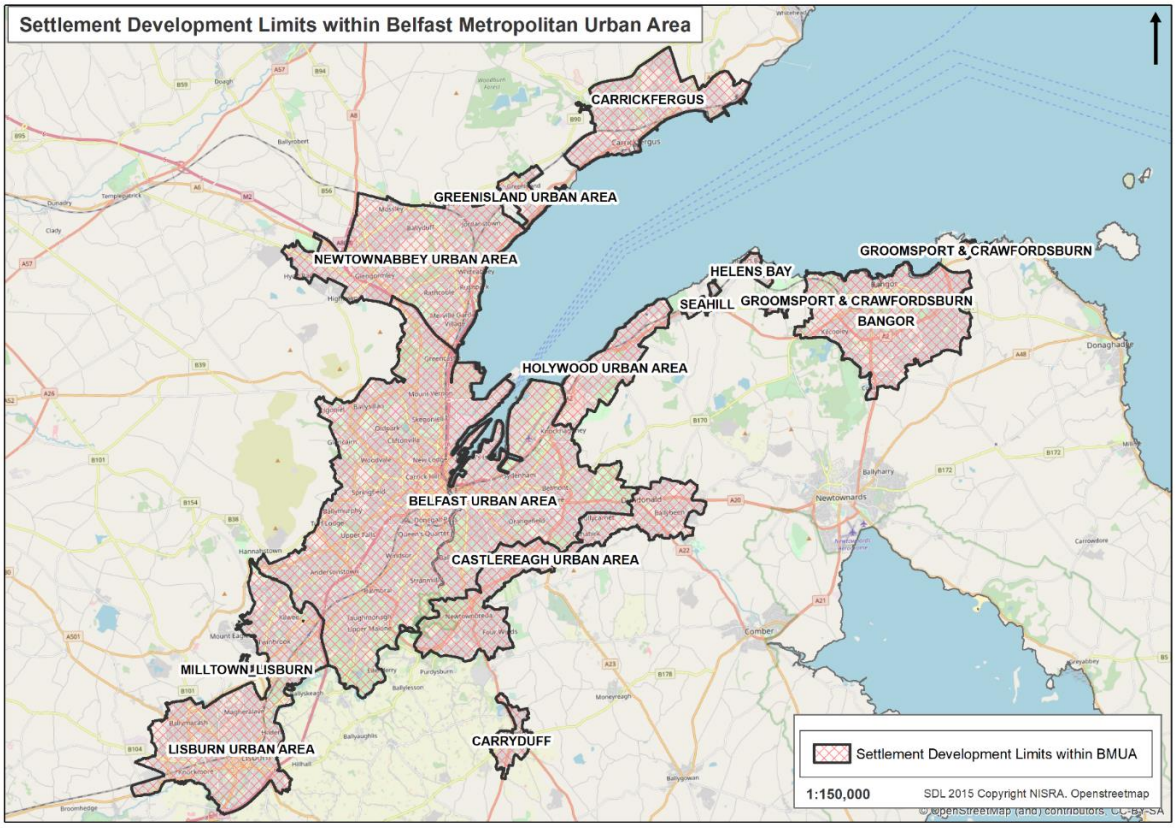

Figure 3.11 – BMUA Settlement Development Limits

Newtownabbey

3.3.2. Newtownabbey, in ANBC, is a settlement that shares is southern border with BCC. It has a mix of residential, commercial and industrial development and falls mostly between the M5 to the east and the M2 and A8 to the west.

3.3.3. Newtownabbey is served by Translink Metro corridors 1 and 2 as well as having three train stations at Whiteabbey, Mossley West and Jordanstown.

3.3.4. Newtownabbey is connected from Whiteabbey to Belfast through walking and cycling via a path that makes up part of the National Cycle network route 93. The route follows the coast, cuts through Duncrue Industrial Estate and connects with the Lagan towpath. In addition this path connects to the Newtownabbey Way walking and cycling route which goes as far as Corr's Corner.

Bangor

3.3.5. Bangor, in ANDBC, is a free standing settlement to the east of Belfast that links to Belfast through a few smaller settlements along the A2 Belfast road. In addition to the Belfast connection, Bangor links to Newtownards to the south along the A21 Bangor Road and to the Ards Peninsula via the A2 to the east. The town is primarily of residential in character with a commercial town centre and retail areas mostly to its south.

3.3.6. The two railway stations, Bangor (just on the edge of the town centre) and Bangor West connect the town not only to Belfast but also to the other stops along the Portadown line.

3.3.7. Bangor is on the National Cycling Route 99/93 which links it via Newtownards to Belfast.

Newtownards

3.3.8. Newtownards, in ANDBC, is situated to the south of Bangor and to the East of Belfast.It is mostly of residential in character but does have a strong local retail function and industrial areas. It links to Bangor along the A21 Bangor Road to the north and to Belfast via the A20 Kempe Stones Road/Newtownards Road. It also connects to Donaghadee to the east along the A28, Comber to the south west along the A21 and to the Ards Peninsula via the A20 and A2 to the south east. These routes are served by Ulsterbus services.

3.3.9. The Newtownards town centre is approximately 5 miles from the Dundonald Park and Ride facility that is served by the Translink G1 Glider service. This service crosses the City Centre in finishes at the McKinstry Road to the west of the Belfast City Council area.

3.3.10. Newtownards links to Bangor along the National Cycling Route 93 and to Belfast by the National Cycling Route 99.

Holywood Urban Area

3.3.11. Holywood, in ANDBC, lies along the A2 between Belfast and Bangor and is residential in character.

3.3.12. The Holywood Train station connects the area to not only to Belfast and Bangor but also to the other stops along the Portadown line.

3.3.13. There are active travel connections between Holywood and Belfast via shared use footways and on road lined cycle lanes which make up part of the Belfast Cycle Network.

Lisburn Urban Area

3.3.14. Lisburn Urban Area, in LCCC, includes Lisburn City and the surrounding urban development. It has a town centre retail core along with a few other retail areas and industrial developments to the south

and west. It is well connected to other settlement through several main highway connections, most notably to Belfast along M1 and the A1, Moira via the A3 Moira Road and Newry along the A1.

3.3.15. It has good public transport links with both an Ulsterbus Station and a Train Station within the City Centre and the Translink G1 Glider Service to the west of the area which serves not only Belfast City Centre but also the east of the city as far as the Dundonald Park and Ride.

3.3.16. The lagan towpath makes up part of the National Cycle Network Route 9 and links Lisburn to Belfast City Centre.

Castlereagh Urban Area

3.3.17. The Castlereagh Urban Area, in LCCC, covers both Castlereagh and Dundonald and makes up part of the continuous Belfast urban area. As such there are many connections to Belfast City Centre. Notably additional connections include to Newtownards and Comber from Dundonald via the A20 and the A22 respectively, and Carryduff and Lisburn along the Saintfield Road and B23 respectively.

3.3.18. The Metro corridors 5 and 6 serve Castlereagh while Dundonald benefits from the Translink G1 Glider service which crosses the City Centre in finishes at the McKinstry Road to the west of the Belfast City Council area.

3.3.19. The National Cycle Network Route 99 links Dundonald with both Belfast and Newtownards while there are several parts of the Belfast Cycle Network that run through the area, most of which have a focus on Belfast City Centre.

Carryduff

3.3.20. Carryduff, LCCC, is one of the smaller settlements in the BUMA and sits south of Castlereagh. It is a residential settlement with some limited retail developments. The main highway connection from Carryduff are to Belfast, Saintfield and Ballynahinch via the A24 Sainfield Road, A7 Saintfield Road and A24 Ballynahinch Road respectively.

3.3.21. Carryduff has public transport links to Belfast, Newcastle and Downpatrick via the Translink Ulsterbus Network and has a further links to Belfast through the Cairnshill Park and Ride service which runs between Belfast and Carryduff via the Park and Ride Location.

Carrickfergus

3.3.22. Carrickfergus, in MEABC, is to the northeast of Newtownabbey and consists mainly of residential development with industrial zones to both the westerly and easterly points. It has retail uses focused in the town centre. The main highway connection from Carrickfergus is the A2 which heads towards Belfast to the west and Larne to the east.

3.3.23. The town is situated along the Larne Railway line and benefits from having 4 train stations, Trooperslane, Clipperstown, Downshire Halt and Carrickfergus. In addition, there are Ulsterbus services to Belfast and Antrim Area Hospital as well as a town service bus route.

4.0 Transport Objectives

4.1. Introduction and Transport Objectives Outline

4.1.1. This transport study has been developed to support the achievement of objectives developed by the councils, the Department and the Northern Ireland Executive. The objectives presented in this transport study therefore have had regard to the existing strategic policy context and the draft local policies derived through the Community Plans and the Planning Options Papers. It is important to note that the subsequent development of the BMTP will be subject to the relevant assessments and public consultation and the objectives in this BMTS are without prejudice to that process.

4.1.2. To inform the analysis of issues and indicative measures, a set of Objectives have been developed that take account of the objectives of the key strategic documents detailed in Chapter 2. As noted in Figure 1.1, the BMTS uses a single generic set of objectives for both the BMUA and the Outer Areas. However these objectives have been refined by the councils to include explicit reference to the appropriate urban centres and any distinguishing local variations in policy. It should also be noted that for the modelling-based approach adopted in the BMUA, where the focus of the analysis is on Belfast City Centre, the objectives for Belfast City Council have been adopted.

4.1.3. Further details on the objectives and how they link to the key strategic documents and the councils' LDP POP objectives can be found in Annex A – Development of Transport Objectives.

4.1.4. The generic objectives are as follows:

Objective 1 - Improving external transport linkages: Enhance accessibility by road and public transport from the city and town centres to Derry, gateways and hubs to support greater levels of inward investment.

Objective 2 - Improving public transport accessibility: Ensure viable public transport accessibility to essential services for people living in the BMTP area.

Objective 3 - Improving active travel accessibility: Ensure there are attractive and safe active travel networks (walking and cycling) linking all residential, retail, leisure, culture, office and commercial uses within the urban areas of the BMTP area.

Objective 4 - Providing high quality public realm: Deliver high quality public realm in town, city and district centres with reduced vehicle dominance, to make them attractive, shared spaces to live and work and improve safety for active travel modes.

Objective 5 - Improving City/Town centre accessibility: Enhance transport accessibility and manage traffic congestion in town, city and district centres to strengthen the Belfast's role as the regional economic driver and maintain the economic importance of other centres.

Objective 6 - Improving public safety including air quality: Enhance safety for all modes of travel, reduce the number and severity of casualties and improve air quality.

Objective 7 - Promoting sustainability and resilience: Ensure our transport systems are resilient to climate change and are well maintained.

5.0 Current Transport Issues

5.1. Introduction

The Transport Evidence Base

5.1.1. Many of the following sections make use of a Belfast Metropolitan Transport Evidence Base (TEB). While the modelling approach has been used to test illustrative measure within the BMUA, the TEB provided a wider understanding of the current transport issues.

5.1.2. The TEB has been gathered from a range of standard published sources including the 2011 Census, Translink public transport timetables, and Police Service NI statistics, in addition to analytical analyses and fieldwork surveys undertaken by the Department's Transport Planning and Modelling Unit (TPMU).

5.1.3. The following are dealt with in turn:

- Regional Accessibility;
- Active Travel Infrastructure;
- Public Transport Services;
- Sustainable Transport Accessibility;
- Urban Traffic Congestion;
- Road Collision History;
- Modal Choice for Journeys to Work and Education;
- Parking Provision: and
- Legacy Road Alignments.

5.1.4. Similar TEBs have been produced for the freestanding towns in the outer BMTP areas and further details can be found in Annexes E – H.

5.2. Regional Accessibility

Belfast - Car

5.2.1. The BMUA is currently well connected by road to many parts of Northern Ireland. Figure 5.12 shows drive time accessibility isochrones from Belfast City Hall in 10 minute time bands using AM peak speeds. The AM peak represents the period with the highest travel demands and the period most directly influenced by changes in population and employment numbers.

5.2.2. Belfast benefits from the regional road network that is primarily a mix of strategic roads that make up part of the Regional Strategic Transport Network (RSTN) and is designed to deliver people and goods into the city centre, and a network of single carriageway standard local roads allowing movement around the city and to/from neighbouring settlements. The 60 minute travel time isochrones to Belfast City Centre in the morning peak illustrates the substantial 60 minute catchment area that radiates out

of the city, stretching 75km almost to Augher to the west, 77km to Ballymoney to the north and 78km to the south reaching beyond Newry.

5.2.3. Notable travel times include;

- Belfast City Airport – less than 30 minutes;
- Belfast International Airport – Approximately 30 minutes;
- Port of Larne – 30 – 60 minutes;
- A1/N1 Border Crossing – Approximately 60 minutes; and,
- Derry City – 90 – 120 minutes.

5.2.4. Travel times across Northern Ireland are relatively good on account of access to the strategic road network. In particular, the benefits of the motorways and dual carriageways can be seen to stretch accessibility out along their routes.

5.2.5. Travel time to all settlements within the BMUA can be reached within 30 minutes.

Figure 5.12 – Regional Accessibility from Belfast City by Car

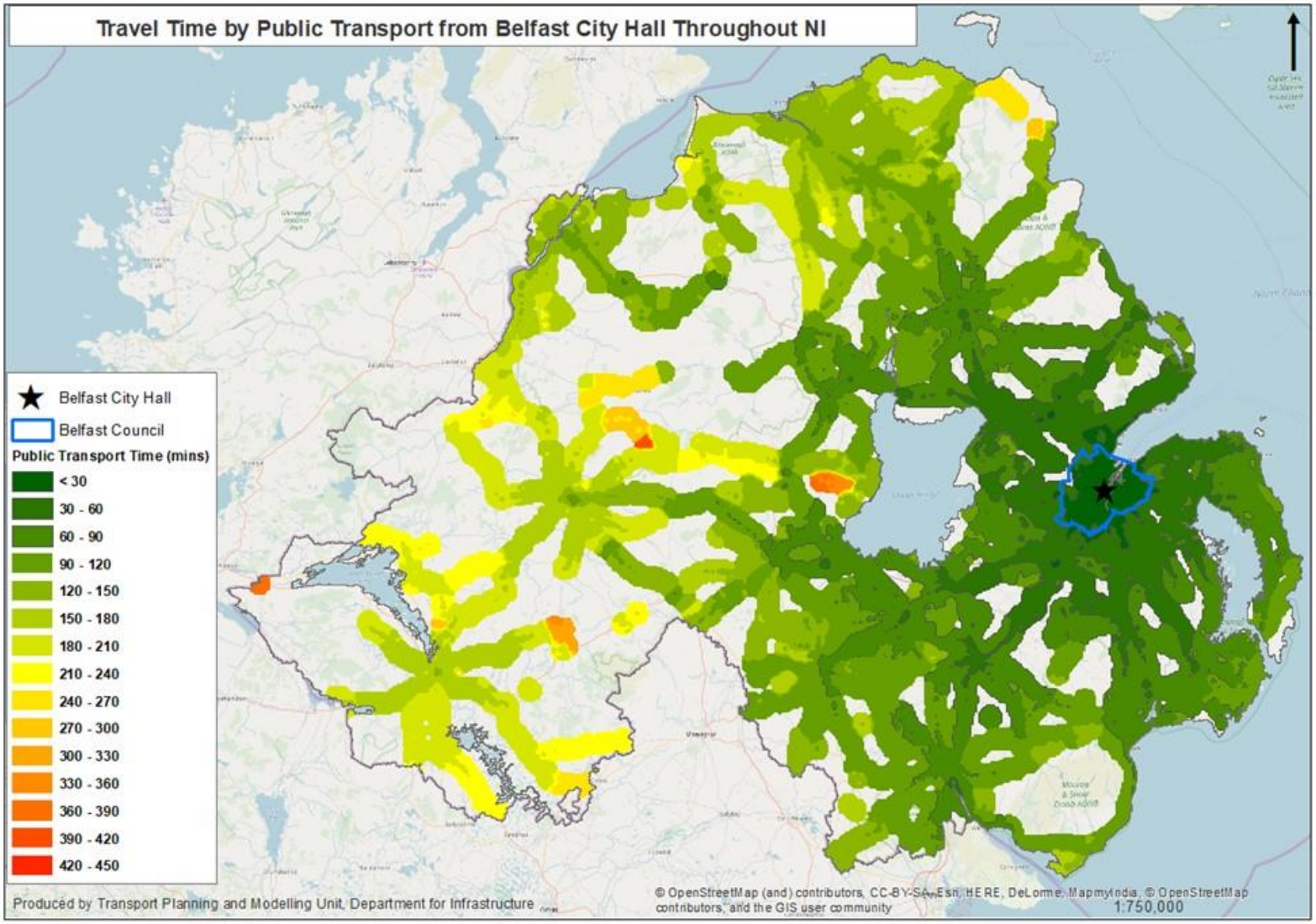

Figure 5.13 – Regional Accessibility from Belfast City by Public Transport

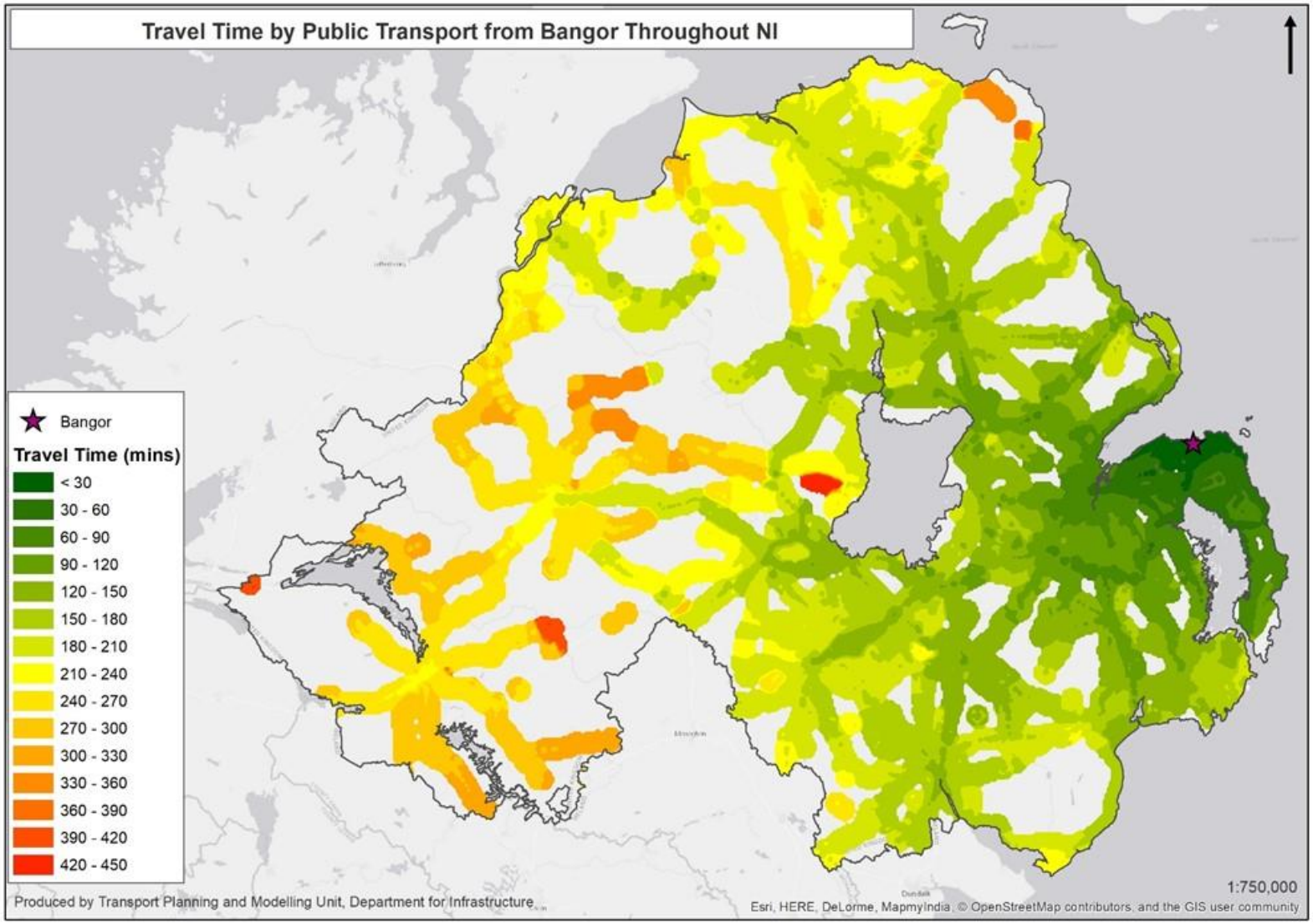

Figure 5.14 – Bangor Regional Accessibility by Public Transport

Other BMUA Towns – Car

5.2.6. While, as can be seen in Figure 5.12, there are slight variations in accessibility by road across the BMUA settlements, the results are broadly similar. However it is notable that in many cases there is a need for journeys to traverse Belfast City Centre which has a negative impact on the accessibility of the outer towns. This negative impact is expected to be reduced by the York Street Interchange and Belfast Transport Hub projects. Further maps showing the results from several BMUA settlements can be found in the relevant data annexes of Annex E – H.

Belfast – Public Transport

5.2.7. Belfast City public transport accessibility is presented in

5.2.8. Figure 5.13, and shows the reach of the bus and train services in the morning peak providing travel times of under one hour from Ballymena, Larne, Bangor, Crossgar, Banbridge and Portadown. While the accessibility is good, it is limited to main routes and towns. Rural areas have limited accessibility by public transport.

5.2.9. Public transport travel times are dependent on the bus network coverage and timetable integration. As a consequence, unlike car travel times, the pattern of public transport travel times are very unevenly distributed as can be seen in Figure 5.2. This is in part due to the required interchanges needed to reach some destinations.

5.2.10. It can also be seen that there are many rural areas that are not accessible from Belfast by public transport. This is likely to be because these areas do not have a public transport access within the allotted 800m (10 minute walk) allowed for in the analysis or there are no appropriate interchanges to make journey. The location of these areas are mostly sparsely populated spaces such as mountainous regions. However for rural residents key services focused in urban centres are generally inaccessible by public transport especially outside peak hours.

5.2.11. As you would expect compared to the drive times, Belfast City Centre public transport journey times are slower. For instance;

- Belfast International Airport – takes 30-60 minutes rather than approximately 30 minutes by car;
- Port of Larne – takes 60-90 minutes rather than 30 – 60 minutes by car;
- A1/N1 Border Crossing – takes 60-90 minutes rather than 30 – 60 minutes by car; and,
- Derry City – takes 120-150 minutes rather than 90 – 120 minutes by car.

Other BMA Towns – Public Transport

5.2.12. From the other BMUA settlements the public transport accessibility maps reflect the need for longer journeys due to the need for public transport interchange in Belfast City Centre. This increases the journey time to destinations other than those served directly. The accessibility maps therefore have a ‘skewed’ appearance compared to the Belfast map.

5.2.13. Figure 5.3 presents the Accessibility from Bangor as an example. The shorter travel times are ‘skewed’ to the east including the Ards peninsula. Further maps can be found in the relevant data annexes of Annex E – H.

5.3. Active Travel Infrastructure

Pedestrian Infrastructure

5.3.1. Pedestrian infrastructure in urban areas is generally adequate but standards are not consistent. Pedestrian infrastructure in town and city centres often lacks priority over traffic making it unattractive to users.

5.3.2. The pedestrian infrastructure for freestanding towns within the BMTP area is considered in more detail in the TSs included in Annexes E-H.

Cycling Infrastructure

5.3.3. Figure 5.15 shows details of the Belfast Cycling Infrastructure in BCC.

5.3.4. It can be seen that the city centre has significant cycle provision and a substantial amount of cycle parking.

5.3.5. There is reasonable provision of active travel infrastructure along some of the main radial routes to the city centre however it is worth noting that this is of mixed quality and there are many gaps in the provision, particularly where bus lanes or on road lined cycle lanes are used. This can be unattractive for some potential cyclists and lead to safety issues for existing cyclists as they have to frequently merge with other traffic.

5.3.6. Provision in urban areas outside Belfast is quite limited in extent and of mixed quality and is considered in more detail in the LTSs included in Annexes F-I.

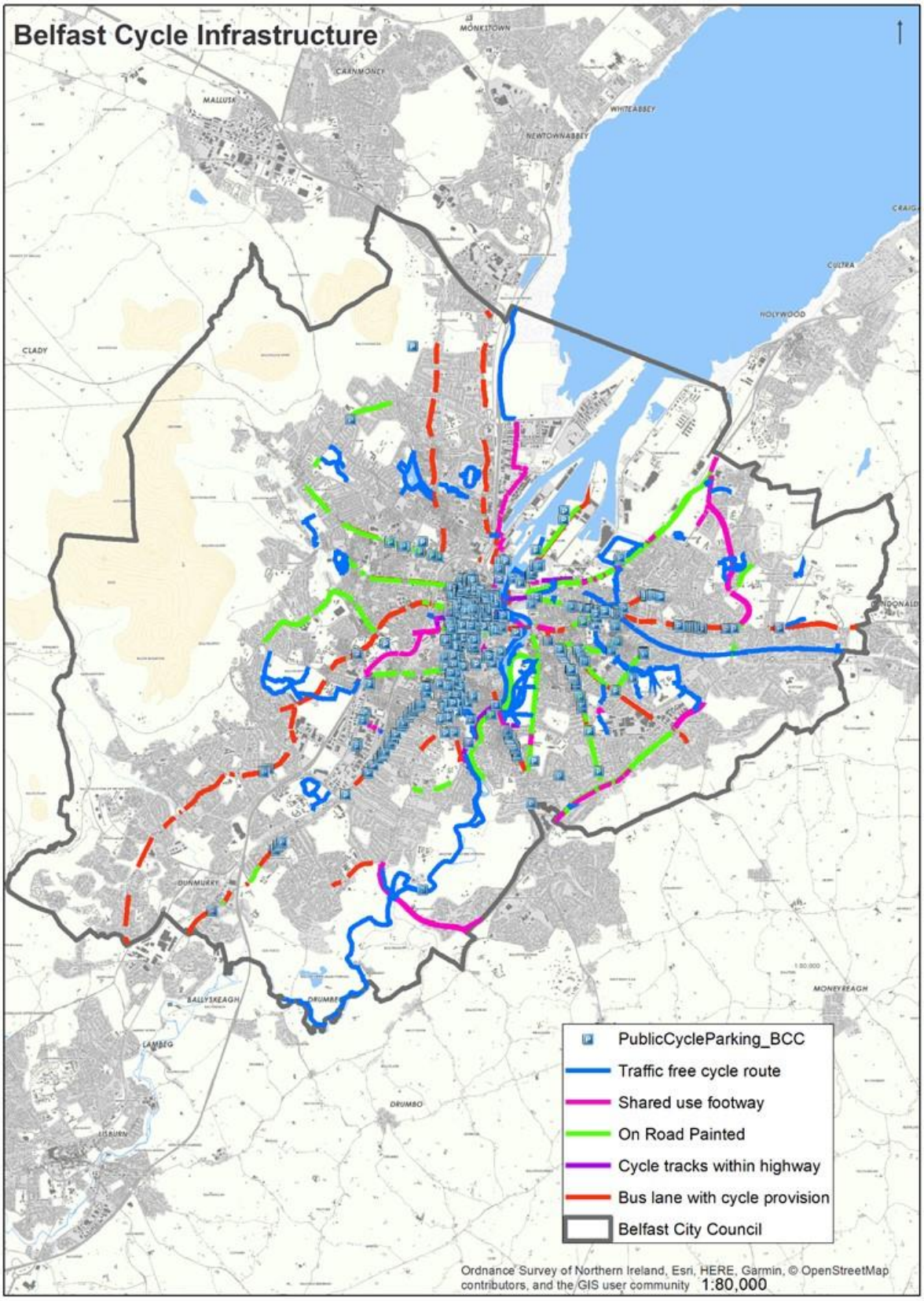

Figure 5.15 – Belfast Cycling Infrastructure

5.4. Public Transport Services

5.4.1. There are several modes of transport that operate within the BMTP area. This section provides a brief description of the following modes;

- Metro
- Glider
- Ulsterbus
- NI Railways
- Strangford Ferry

Metro

5.4.2. Translink operate an urban bus operation within the BMUA, branded as Metro. The core Metro network consists of 12 high-frequency service corridors along the main arterial roads into the city. Additionally there are a number 'in fill' services - generally non-profitable 'socially necessary' services which operate less frequently. Figure 5.16 below shows the core concept.

Figure 5.16 – Belfast Bus Services

5.4.3. Monday to Saturday a Metro service frequency of not less than 10 minutes is offered over the core portion of corridors is operated during the daytime hours. The buses are fully accessible with a low floor and take advantage of bus priority. However it is accepted that extensive bus priority has not

been implemented on all routes and buses can be delayed by general traffic congestion leading to problems with journey time reliability.

5.4.4. The hub and spoke configuration requires travel into the congested city centre and interchange in order to complete journeys other than those to the city centre or within a single corridor. There is a longer term aspiration to also operate orbital and cross city services. A number of orbital routes were implemented on a trial basis but subsequently withdrawn due to low passenger demand. Similarly whilst some cross city services operate, they are the exception due to journey time reliability concerns.

5.4.5. Whilst there is substantial bus priority in Belfast City Centre, the Metro services have mixed levels of bus priority on their outer radials.

5.4.6. The Metro network also includes the City Express 13 and 14 routes to link Newtownabbey and Belfast City Centre using the motorway network which includes a section of hard shoulder bus facility.

5.4.7. Most recently Translink have introduced 'Urby' buses to provide commuter services from towns at the edge of the BMUA to the city centre. The buses have a distinctive livery and have high quality interiors including leather seats, free wifi access and USB charging. They operate limited-stop on corridors with extensive bus priority. To date services have been introduced from Ballyclare and Newtownards.

Glider

5.4.8. The Glider is a Bus Rapid Transit (BRT) service which operates the G1 East – West route with extensive 12 hour bus priority through the city centre to outer suburban locations including the park and ride at Dundonald. There is also a shorter service (G2) linking the city centre and Titanic Quarter. The vehicles are single-deck articulated hybrid-powered with multiple doors and there is compulsory off-vehicle ticketing to reduce journey times by lowering loading times.

5.4.9. Glider has proved extremely successful with patronage figures on the BRT corridors showing an increase of some 70% when compared to the 2013 baseline figure (prior to the commencement of the BRT implementation works). Whilst figures haven't been produced to determine the number of users who have switched to Glider from private vehicles, given the magnitude of the increase in patronage it is believed that the Glider service has had significant success in producing a modal shift from private car.

Ulsterbus

5.4.10. Ulsterbus Town services elsewhere are generally configured to provide accessibility to essential town centre facilities. Their limited frequencies and often non-direct routes can make them an unattractive alternative for people with cars.

NI Railways

5.4.11. NI Railways serve many of the towns within the BMUA and all services run through Belfast city centre stations. The services generally operate at capacity at peak periods. There are existing plans to increase the length of trains and increase platform capacity in the Belfast Transport Hub project.

Strangford Ferry

5.4.12. The Strangford Ferry, operated by the Department, sails across Strangford lough linking Portaferry in Ards and North Down Borough Council and Strangford in Newry, Mourne and Down District Council. Without the connection a road journey of almost 50 miles would have to be made to link the two towns that are just over a mile apart.

5.5. Sustainable Transport Accessibility

5.5.1. The extent of the BMUA is quite large and distances from Belfast City Centre to the edge of the area vary considerably. Access to essential services such as health, banking, retail and leisure facilities are vital to any residential area. The BMUA has several locations such as town centres that provide key services to residents. The following analysis on sustainable transport accessibility uses these locations as a proxy for access to vital services such as shopping, banking and leisure activities. The key locations used are listed in **Error! Reference source not found.**.

Table 5.1 – List of key locations within the BMUA

Town/City	**Location**
Bangor	Post Office
Belfast	City Hall
	Cityside
	Connswater
	Kennedy Centre
	Westwood
	Hillview
Carrickfergus	Town Hall
Carryduff	Former Carryduff Shopping Centre Site
Castlereagh Metropolitan Area	Forestside District Centre
Greenisland	Community Centre
Holywood	Post Office
Lisburn City	Ulsterbus Depot
Newtownabbey Metropolitan Area	Abbeycentre
	Glengormley
	Mallusk Central Park
	Mossley Mill
	Tesco Northcott

Walking Accessibility

5.5.2. The accessibility analyses presented in Figures 5.6 shows that a 30 minute walk to the nearest key location encompasses most of the BMUA with a few notable gaps such as Dundonald, parts of the Newtownabbey Urban Area along with West and South Belfast. That is not to say that residents of these areas can't access vital services on foot but rather they cannot access these larger key centres within 30 minutes on foot.

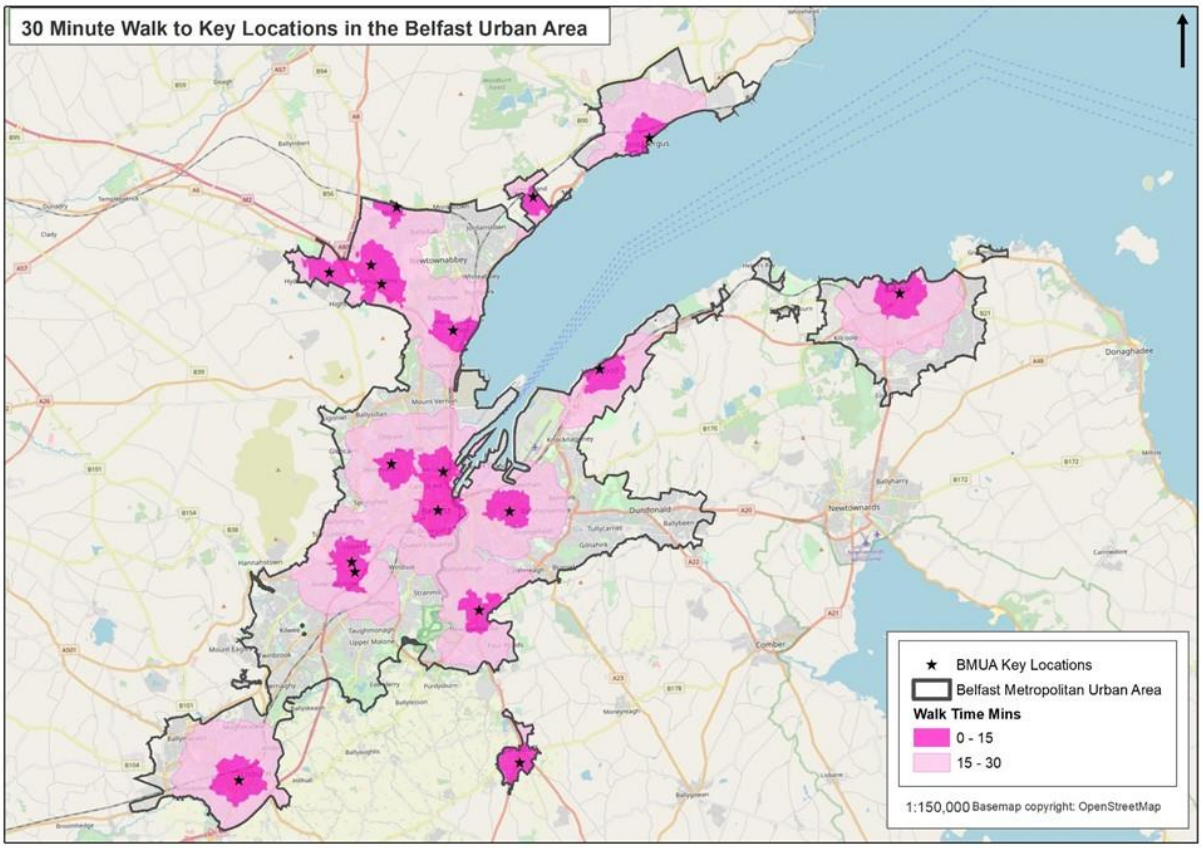

Figure 5.17 - BMUA 30 Minute Walk to Key Locations

Cycling Accessibility

5.5.3. Given the speed advantage it has, cycling fairs better than walking. As shown is Figure 5.18, cycling accessibility to the key locations covers the entire BMUA area, with the 15 minute isochrones similar to that of the 30 walking isochrones.

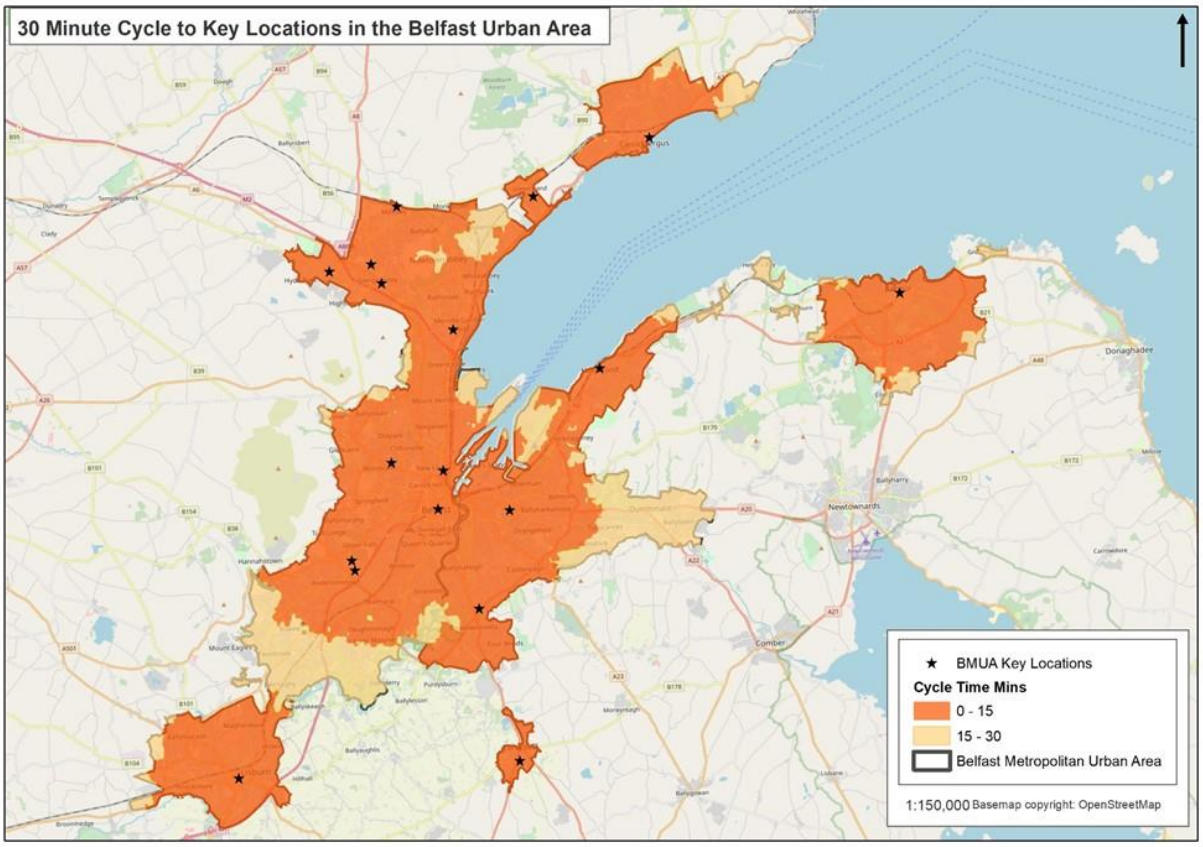

Figure 5.18 – BMUA 30 Minute Cycle to Key Locations

Public Transport Accessibility

5.5.4. Figure 5.8 provides the equivalent public transport analysis. It should be noted that unlike active travel modes, when using public transport users are bound by timetables. The public transport accessibility analyses does not reflect the frequency of the bus service and the potential waiting time associated with making a journey with a fixed start/finished time such as an appointment or to fit with working hours. Thus, if it takes 5 minutes to walk to a stop bus, the bus service required to reach the location is 15 minutes in duration and the onward travel to the final destination takes 5 minutes then the analysis will show a 25 minute journey time and will not reflect the likely requirement to leave earlier or wait longer to fit with the public transport timetabling.

5.5.5. The analyses show that almost the full BMUA is accessible within 30 minutes by public transport at AM peak. The analysis allows for an 800m (10 minute) walk to a bus stop from the origin and it is likely that the few small areas that appear to be inaccessible are more than 800m from a bus stop. Therefore they should not be consider as inaccessible but rather that their accessibility falls outside the parameters of the analysis. The high proportion of areas that can reach a key location by public transport within 15 minutes would indicate that the BMUA is well served by public transport.

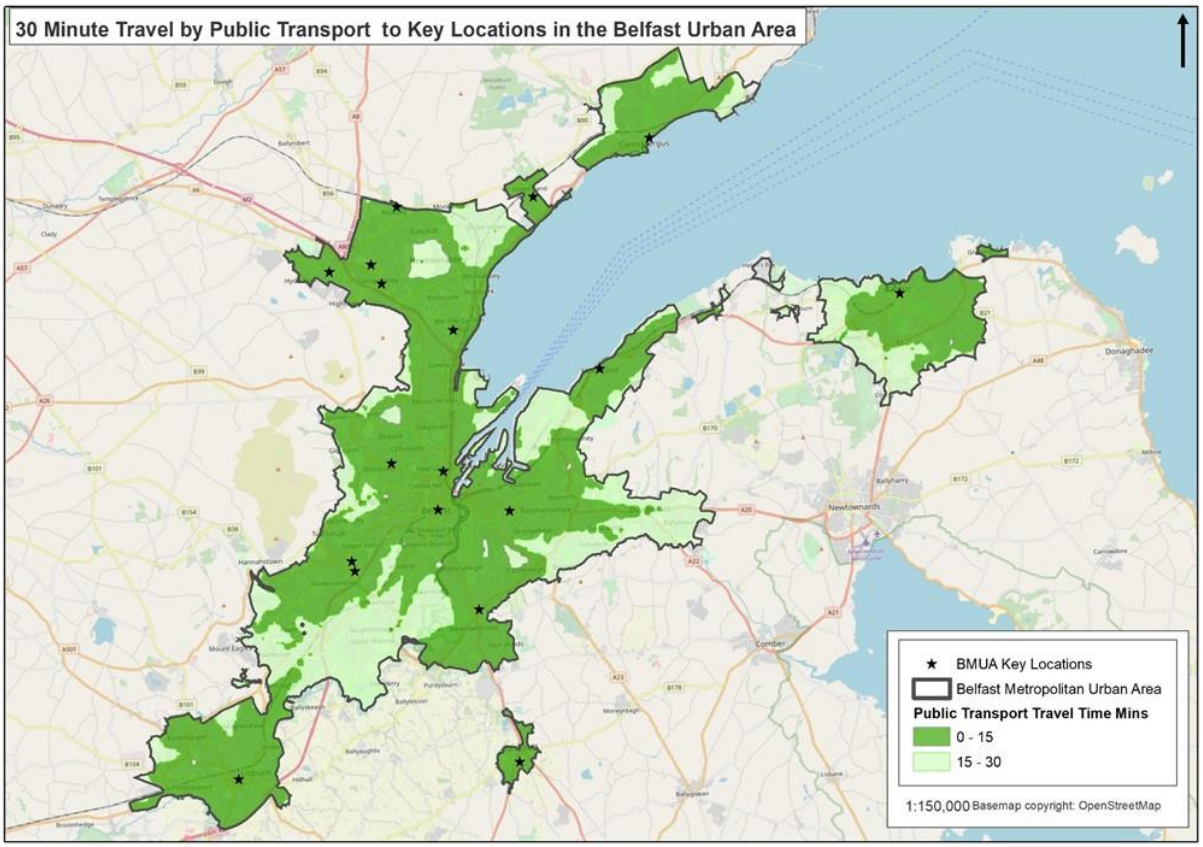

Figure 5.19 - BMUA Public Transport AM Peak Travel Time to Key Locations

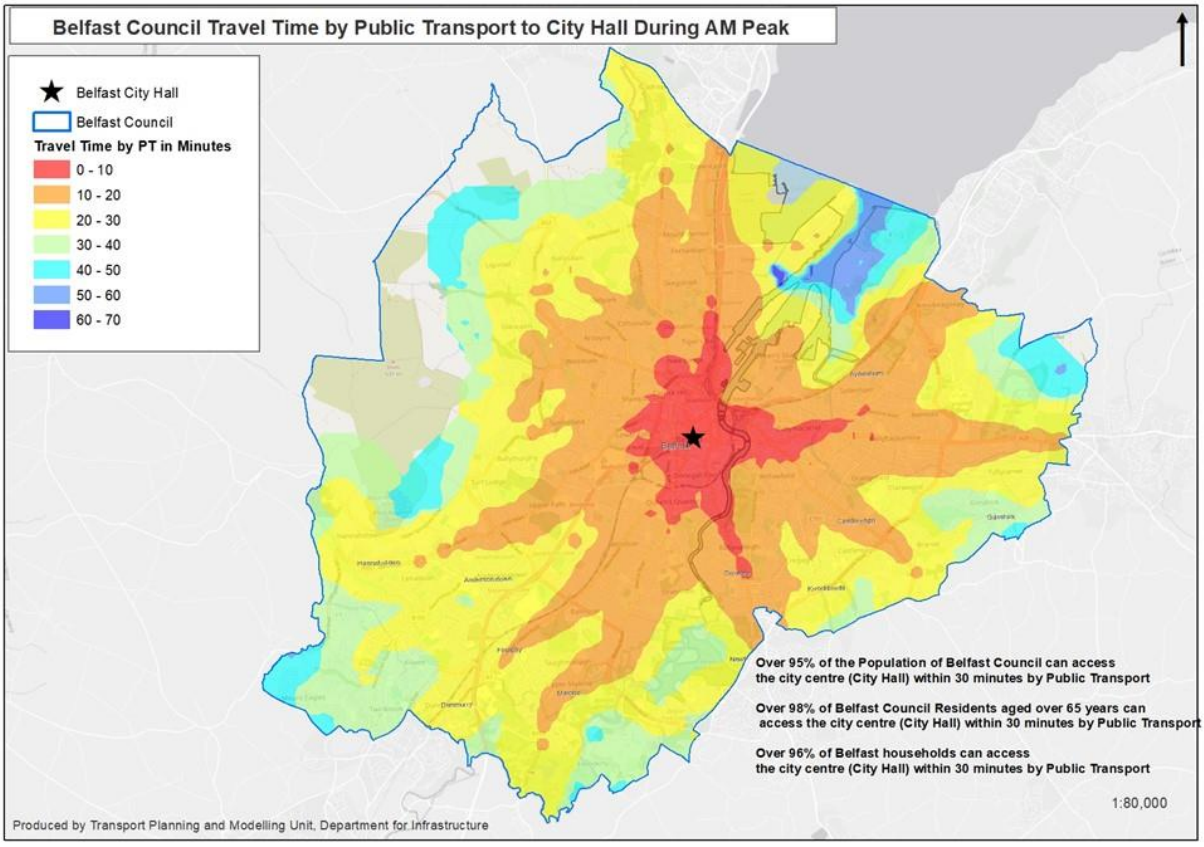

Figure 5.20 – Belfast City Council Public Transport AM Peak Accessibility

5.5.6. Looking closer at the BCC area as shown in Figure 5.20, the effect of the Translink Metro services can be seen as the isochrones stretch along their routes. Over 95% of the population of BCC can access the city centre within 30 minutes by public transport at AM peak. Unlike private vehicle accessibility which usually reduces in the AM peak due to congestion, public transport accessibility during the AM peak is usually at its best due the higher frequency of services and peak hour bus priority.

5.6. Urban Traffic Congestion

AM Peak

5.6.1. An investigation of road network efficiency has been undertaken by inspection of estimates of actual vehicular speeds calculated from global positioning system data sourced by commercial telematics sources (INRIX). The Department used this 3rd party datasets in order to obtain a comprehensive view of traffic speeds throughout NI and the study area.

5.6.2. The data providers do not provide statistical detail regarding the size of the data sample and the vehicles from which the data is supplied. Neither is it currently possible to inspect speeds by link direction on single carriageway road, rather speeds are the average speed for both directions. It is considered that the dataset likely underestimates congestion as the lower congested direction speeds are offset by the higher speeds in the opposite direction. In summary, it is not currently possible to independently review the accuracy of the datasets. However, whilst speeds do seem to be consistently faster than would be expected on congested links, it is considered that the data does produce a useful representation.

5.6.3. The peak period map, provided in Figure 5.21 shows that speeds drop into the 10 - 20 mph range on the inner sections of radial roads and there are frequent occurrences of speeds less than 10 mph in the city centre. In conclusion the maps show a network which is particularly congested in the city centre; fed by three high capacity principal roads.

Off-peak

5.6.4. The off-peak map provides a very similar representation. As detailed above, it is considered that the dataset likely underestimates congestion. This means that in reality there are more notable changes in speeds between peak and off-peak periods than those indicated within the dataset.

5.6.5. In general the highway network operates efficiently without substantial congestion outside peak (AM and PM) periods. However in the AM peak period congestion is marked on routes approaching town centres and throughout Belfast.

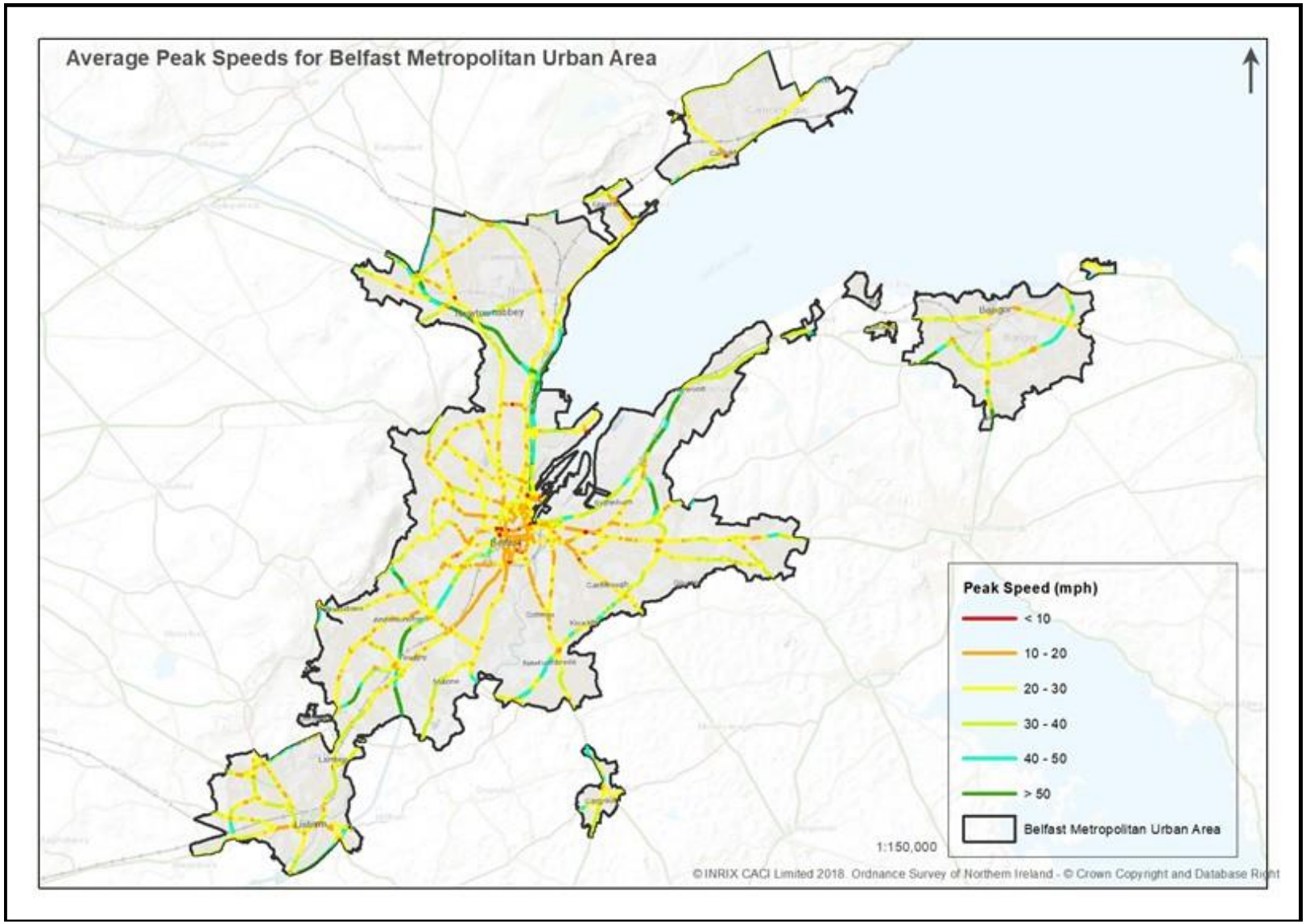

Figure 5.21 – BMA AM Peak Road Speed Data for the Council Area

5.7. Road Collision History

5.7.1. An investigation of road collision history has been undertaken for the BMUA using PSNI records dated between 2007 and 2016. Consideration has been given to the type of road user, the severity of the casualties and the location of the collision in seeking to draw general conclusions. **Error! Reference source not found.** provides the overall NI wide road traffic casualties while **Error! Reference source not found.** shows results for NI urban road traffic casualties. **Error! Reference source not found.** shows results for the settlements in the BMUA area.

Table 5.2 - All NI Road Traffic Casualties 2007 -2016

All Northern Ireland Casualties 2007 -2016	Severity	All casualties	Fatalities	Serious injuries	Slight injuries
	All Road Users	93,384	775	8603	84,006

Table 5.3 - NI Urban Road Traffic Casualties 2007 -2016

2007-2016 NI Urban Road Traffic Casualties				
Road User Type	All casualties	Fatalities	Serious injuries	Slight injuries
All Road Users	**48,894**	**167**	**3,134**	**45,593**
Pedestrians	6,128	73	1,274	4,781
Motor Vehicle Users (inc passengers)	38,740	57	1,085	37,598
Motorcyclists (inc pillion passengers)	2,061	24	493	1,544
Pedal Cyclists	1,794	10	262	1,522
Other Road Users	171	3	20	148

Table 5.4 - BMUA Road Traffic Casualties 2007 -2016

		2007-2016			
		All casualties	Fatalities	Serious injuries	Slight injuries
BMUA	All Road Users	**32,533**	**86**	**1,965**	**30,482**
	Pedestrians	3,715	36	761	2,918
	Motor Vehicle Users (inc passengers)	26,004	25	674	25,305
	Motorcyclists (inc pillion passengers)	1,466	17	346	1,103
	Pedal Cyclists	1,228	6	172	1,050
	Other Road Users	120	2	12	106

5.7.2. The BMUA accounts for 35% of all NI casualties and 11% of fatalities. The BMUA makes up 67% of the NI urban casualties but only 51% of fatalities. This is consistent with generally lower speeds across the continuous built up area in BMUA but contains relatively high fatalities for motorcyclists and pedal cyclists.

5.7.3. In the BMUA between 2007 and 2016, there were a total of 1965 people seriously injured of which 761 were pedestrians and 172 were cyclists. In the same period there were 86 fatalities, 36 of which were pedestrians and 6 of which were cyclists. The collision records show that pedestrians and cyclists are over-represented considering the proportion of trips made on foot and by bicycle, particularly in the seriously injured casualties and fatalities in the urban areas.

5.7.4. Whilst there are relatively small numbers of journeys made by walking and cycling in the urban areas compare to the number of trips by motorised vehicles, pedestrians and cyclists are often seriously injured in road collisions. By contrast, collisions in the urban areas involving vehicles tend to result in larger numbers of slight casualties to driver or passengers. The application of engineering, enforcement and education methods all have a role in minimising urban road casualties. In particular the message that there needs to be mutual respect between all road users is particularly important for the safety of pedestrians and cyclists.

5.7.5. While **Error! Reference source not found.** show the BMUA totals, **Error! Reference source not found.** provides the results broken down by settlement area. The percentage of road traffic collisions (RTCs) involving pedestrians in the Belfast City area is 12%. Only the settlements of Carrickfergus and Larne have higher percentages with 15% and 13% respectively.

5.7.6. The percentage of RTCs involving cyclists is a much lower 3.9% in the Belfast City area which reflects the lower number of trips made by bicycle. Bangor, Holywood and Castlereagh are the three settlements with higher percentages of RTCs involving cyclists with 4.4%, 5.3% and 4.0% respectively.

Table 5.5 - BMUA Road Traffic Casualties by Settlement 2007 -2016

Settlement		2007-2016			
		All casualties	Fatalities	Serious injuries	Slight injuries
BELFAST CITY	All Road Users	**20470**	**44**	**1183**	**19243**
	Pedestrians	2544	21	488	2035
	Motor Vehicle Users (inc passengers)	16188	12	384	15792
	Motorcyclists (inc pillion passengers)	844	6	186	652
	Pedal Cyclists	806	3	116	687
	Other Road Users	88	2	9	77
BANGOR	All Road Users	**1894**	**2**	**117**	**1775**
	Pedestrians	206	2	54	150
	Motor Vehicle Users (inc passengers)	1503	0	41	1462
	Motorcyclists (inc pillion passengers)	97	0	14	83
	Pedal Cyclists	84	0	8	76
	Other Road Users	4	0	0	4
CARRICKFERGUS	All Road Users	**732**	**4**	**71**	**657**
	Pedestrians	105	2	23	80
	Motor Vehicle Users (inc passengers)	553	1	21	531
	Motorcyclists (inc pillion passengers)	46	1	20	25
	Pedal Cyclists	25	0	6	19
	Other Road Users	3	0	1	2
CARRYDUFF	All Road Users	**298**	**1**	**21**	**276**
	Pedestrians	13	0	3	10
	Motor Vehicle Users (inc passengers)	267	1	15	251
	Motorcyclists (inc pillion passengers)	10	0	2	8
	Pedal Cyclists	8	0	1	7
	Other Road Users	0	0	0	0
HOLYWOOD	All Road Users	**337**	**0**	**27**	**310**
	Pedestrians	26	0	7	19
	Motor Vehicle Users (inc passengers)	280	0	14	266
	Motorcyclists (inc pillion passengers)	13	0	2	11
	Pedal Cyclists	18	0	4	14
	Other Road Users	0	0	0	0
LARNE	All Road Users	**526**	**3**	**48**	**475**
	Pedestrians	66	2	18	46
	Motor Vehicle Users (inc passengers)	419	1	21	397
	Motorcyclists (inc pillion passengers)	27	0	8	19
	Pedal Cyclists	14	0	1	13
	Other Road Users	0	0	0	0
LISBURN CITY	All Road Users	**1996**	**10**	**142**	**1844**
	Pedestrians	219	2	48	169
	Motor Vehicle Users (inc passengers)	1612	4	55	1553
	Motorcyclists (inc pillion passengers)	90	3	30	57
	Pedal Cyclists	66	1	8	57
	Other Road Users	9	0	1	8
CASTLEREAGH GREATER URBAN AREA	All Road Users	**1989**	**6**	**111**	**1872**
	Pedestrians	139	1	28	110
	Motor Vehicle Users (inc passengers)	1652	2	40	1610
	Motorcyclists (inc pillion passengers)	111	3	32	76
	Pedal Cyclists	80	0	11	69
	Other Road Users	7	0	0	7
NEWTOWNABBEY GREATER URBAN AREA	All Road Users	**3037**	**12**	**179**	**2846**
	Pedestrians	264	3	71	190
	Motor Vehicle Users (inc passengers)	2511	4	57	2450
	Motorcyclists (inc pillion passengers)	167	3	38	126
	Pedal Cyclists	86	2	12	72
	Other Road Users	9	0	1	8
NEWTOWNARDS	All Road Users	**1254**	**4**	**66**	**1184**
	Pedestrians	133	3	21	109
	Motor Vehicle Users (inc passengers)	1019	0	26	993
	Motorcyclists (inc pillion passengers)	61	1	14	46
	Pedal Cyclists	41	0	5	36
	Other Road Users	0	0	0	0

5.8. Travel to Work Destinations

5.8.1. The 2011 census results for journey to work present a summary of movements between council areas. As reported at 2011, it is possible to inspect the results for the legacy Belfast City Council area as shown in Figure 5.23 This shows that a high proportion of employed residents in Belfast (78%) work within Belfast. Given the high percentage of residents who work within the Belfast council area (78%), flows to other councils are minimal with the geographically closer councils, Castlereagh (6%), Newtonabbey (5%), and Lisburn (4%) largely accounting for the remaining outward journeys from Belfast council.

5.8.2. Figure 5.23 shows the inward percentage of flows from the other legacy councils in 2011 to Belfast. From this it is clear the greatest percentage of council flows into Belfast are from Castlereagh (59%), Newtownabbey (45%), Lisburn (41%), and Carrickfergus (36%).

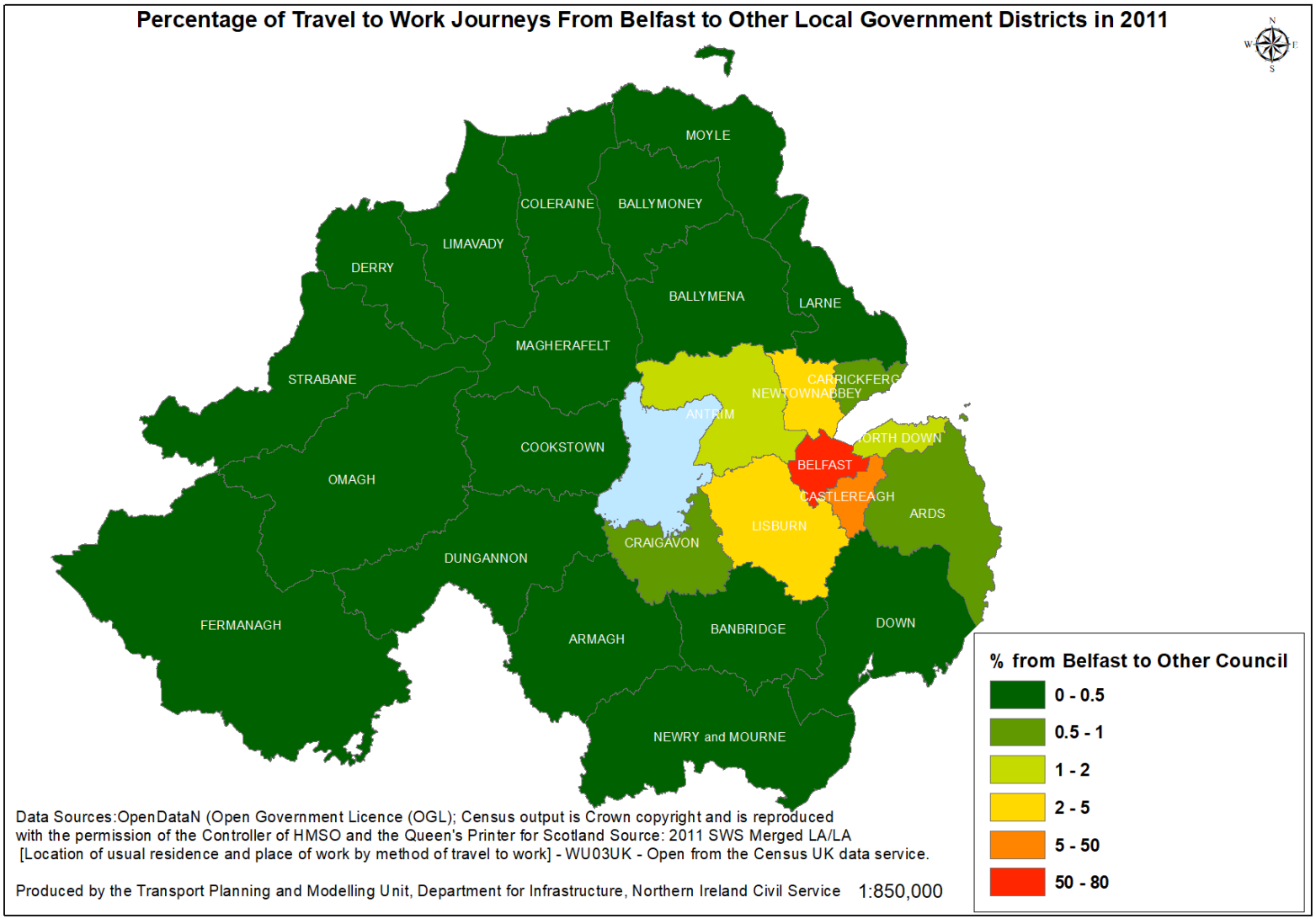

Figure 5.22 Travel to Work Out of Belfast

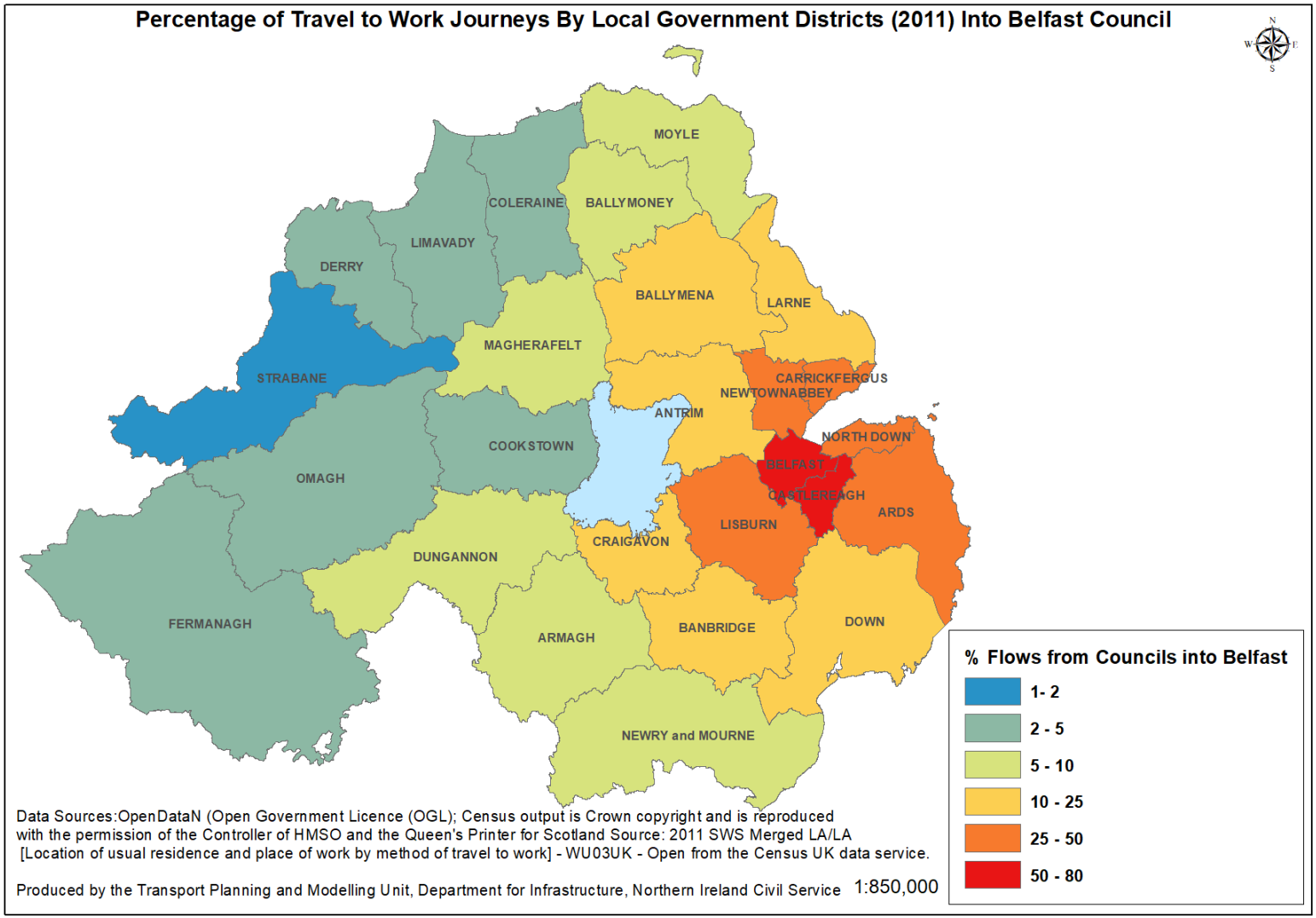

Figure 5.23 Travel to Work Journey into Belfast

5.9. Modal Choice for Journeys to Work and Education

Travel to Work

5.9.1. The 2011 Census provides detailed statistics of the mode of transport used by NI residents in travelling to work. Figure 5.24 shows the travel to work modal split for each of the councils making up the BMTP area.

5.9.2. The 4 outer councils' modal spits are remarkably similar with only one or two percentage points difference across each mode. For these areas approximately 60% of travel to work journey are made by driving a car, while 7-8% are made by walking or cycling and 5-8% using public transport. Belfast compares favourably with a much lower 44% of commuters travelling to work by driving a car while a much higher 17% use active travel and 15% use public transport. Whilst better public transport provision and active travel infrastructure contribute to the difference, other factors such as urban density, landuse patterns (which provides more opportunities for shorter journeys) and access to private vehicles will have an influence.

5.9.3. It is worth noting that only 4-6% of travel to work journeys in each council are made as a passenger in a car. Comparing this figure to the 60% driving a car, it is likely that the majority of journey to work car trips within the BMTP are in single occupancy vehicles. It should be noted however that it is possible that "trip-chaining" may be occurring with part of the journey to work involving leaving a children to school.

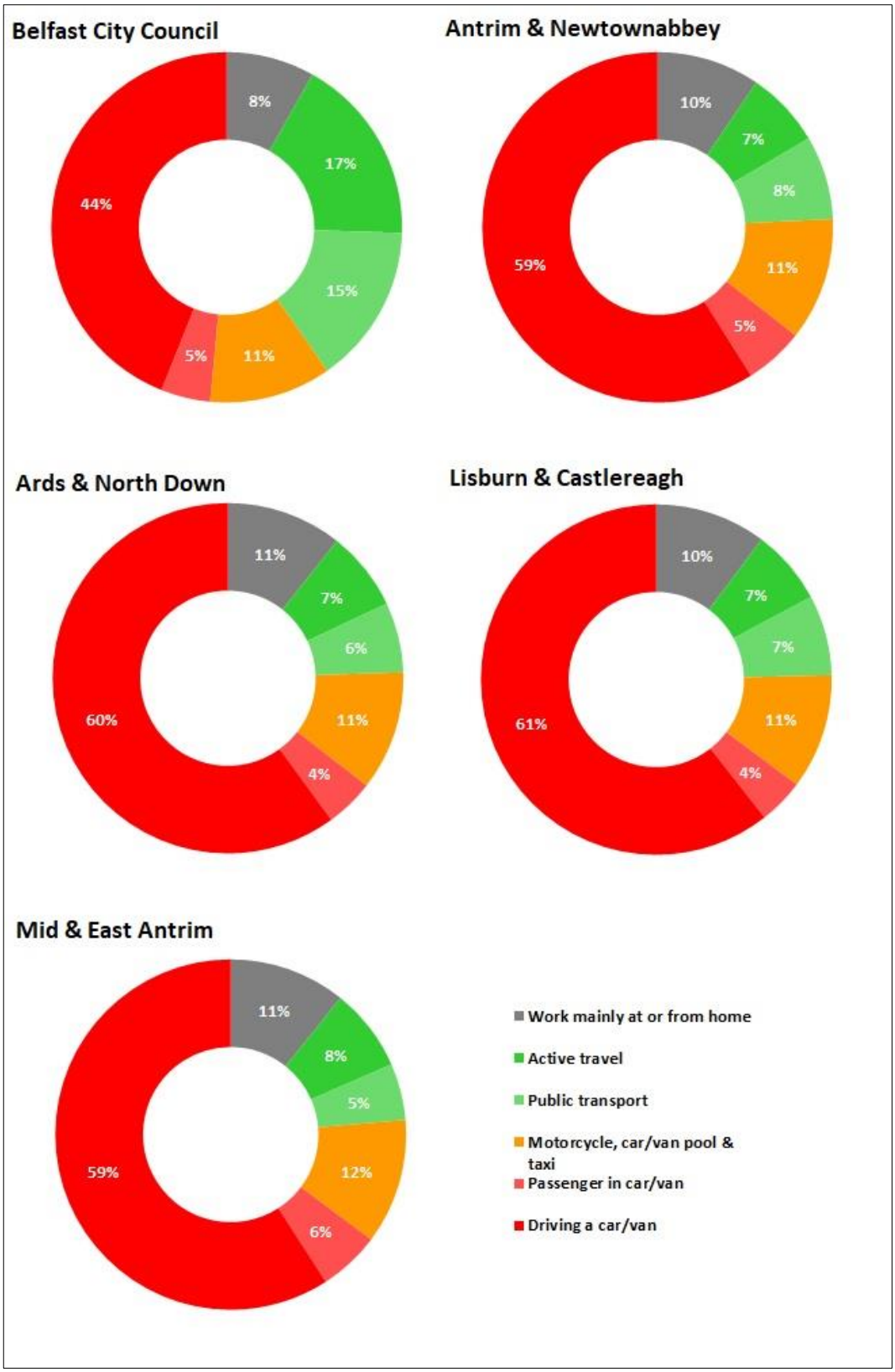

Figure 5.24 – BMTP Method of Travel to Work

Travel to Education

5.9.4. As with the journey to work, the 2011 Census provides detailed statistics of the mode of transport used by NI residents in travelling to education. Figure 5.25 shows the travel to education modal split for each of the Councils making up the BMTP area.

5.9.5. As with the journey to work the 4 outer councils modal spit are quite similar across each mode. However, comparing journeys to education and work presents a contrast in terms of use of car and sustainable modes. As the majority of students do not drive the combined 'driving a car' and 'passenger in a car' modes must be compared. Cars usage for journeys to education ranges between 40 and 45% for these Council areas. This is up to 24 percentage points lower than for journeys to work. Belfast City Council also has a smaller number of journeys to education using a car/van as either the driver or passenger than the other council areas. As is the case for journeys to work, better public transport provision and active travel infrastructure contribute to this difference along with other influencing factors such as urban density, land-use patterns (which provides more opportunities for shorter journeys) and access to private vehicles.

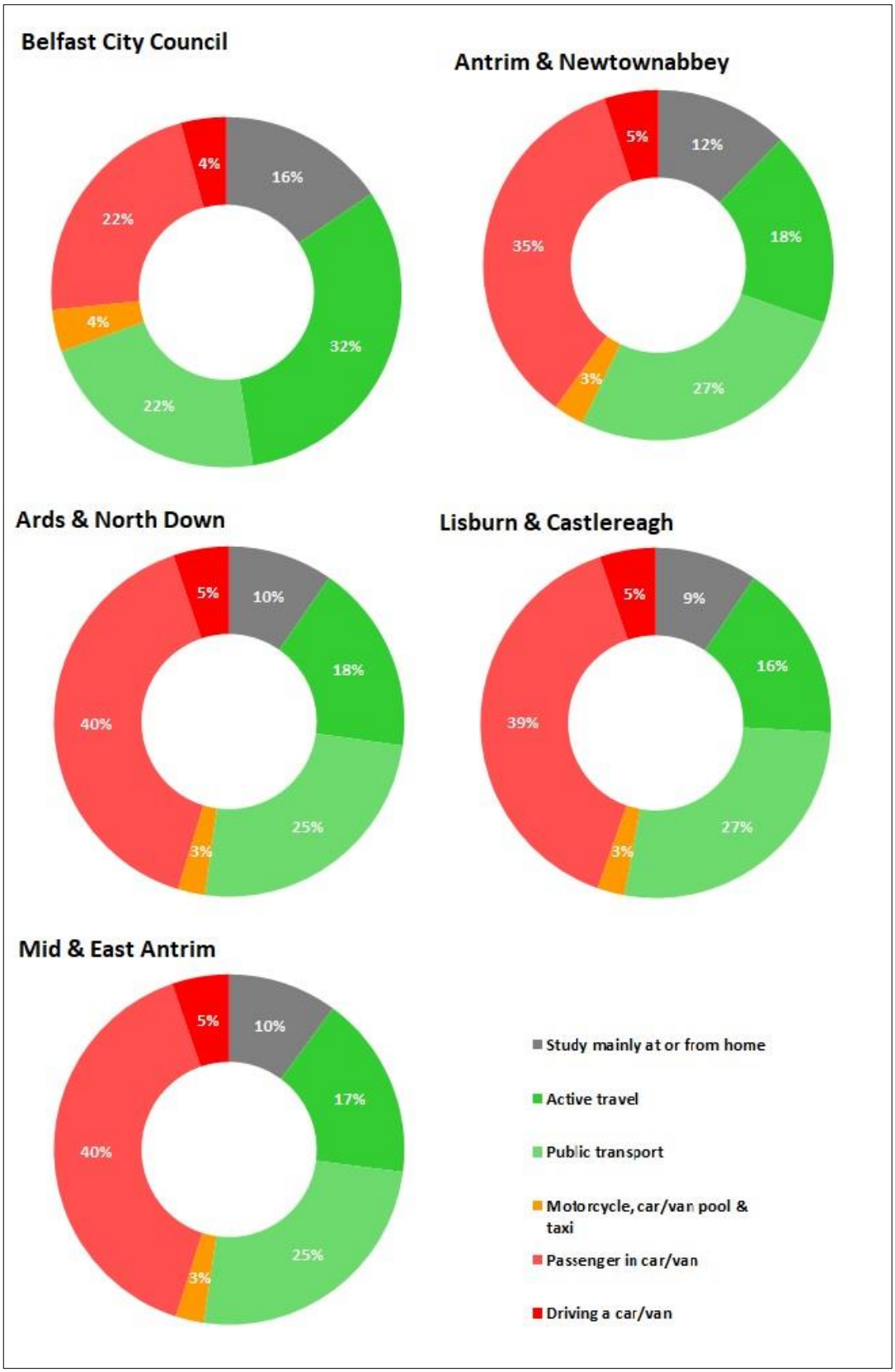

Figure 5.25 – BMTP Method of Travel to Place of Study

5.10. Parking Provision in Belfast City Centre

5.10.1. An analysis of existing BCC owned public car parking provision has been undertaken using the BCC dataset published by the Council on the OpenDataNI website.

5.10.2. The results are presented in Figures 5.15. The map shows a ring of carparks surround the City Centre offering between 30 to 200 car parking spaces each. Given the distances to the City Centre, it is not unreasonable to expect that drivers would walk from the car parks to their destination for purposes such as work, shopping and leisure.

5.10.3. In addition to the off street car park there is time restricted paid on-street parking in many locations across the City Centre operated by the Department. The on-street spaces are generally the most conveniently located for shopping and personal business purposes in the principal business streets.

5.10.4. As well as Council managed car parks there are also several privately run car parks that the public can access and a number of car park sites that are not generally publicly available but privately owned or contract operated. Often these are associated with businesses and offices and are termed as 'Private Non Residential' (PNR) spaces, meaning they are privately owned commercial and business car parks. The majority of these either cater for commuters or retail customers.

5.10.5. Figure 5.16 and Figure 5.17 are taken from the BCC Parking Strategy and Action plan. Figure 5.27 shows the approximate number of parking spaces in the city centre broken down by classification and geographic zone. Figure 5.28 shows the working definition of the geographic zones.

5.10.6. On the edge of the city centre there are a number of residential areas that are frequently used by commuters to park without payment. This can reduce the availability of parking to residents during the day and may cause contention between commuters and residents.

5.10.7. It has been confirmed that there is an over-supply of parking spaces in Belfast. However, the geographic distribution of spaces, relative attractiveness of sites and lack of real-time occupancy information leads to localised overloading/congestion as drivers search for spaces during the peak period. In line with BCC's Draft Car Parking Strategy and Action Plan, the current Controlled Parking Zone could be extended resulting in the reduction of free on-street commuter parking capacity within the City Centre.

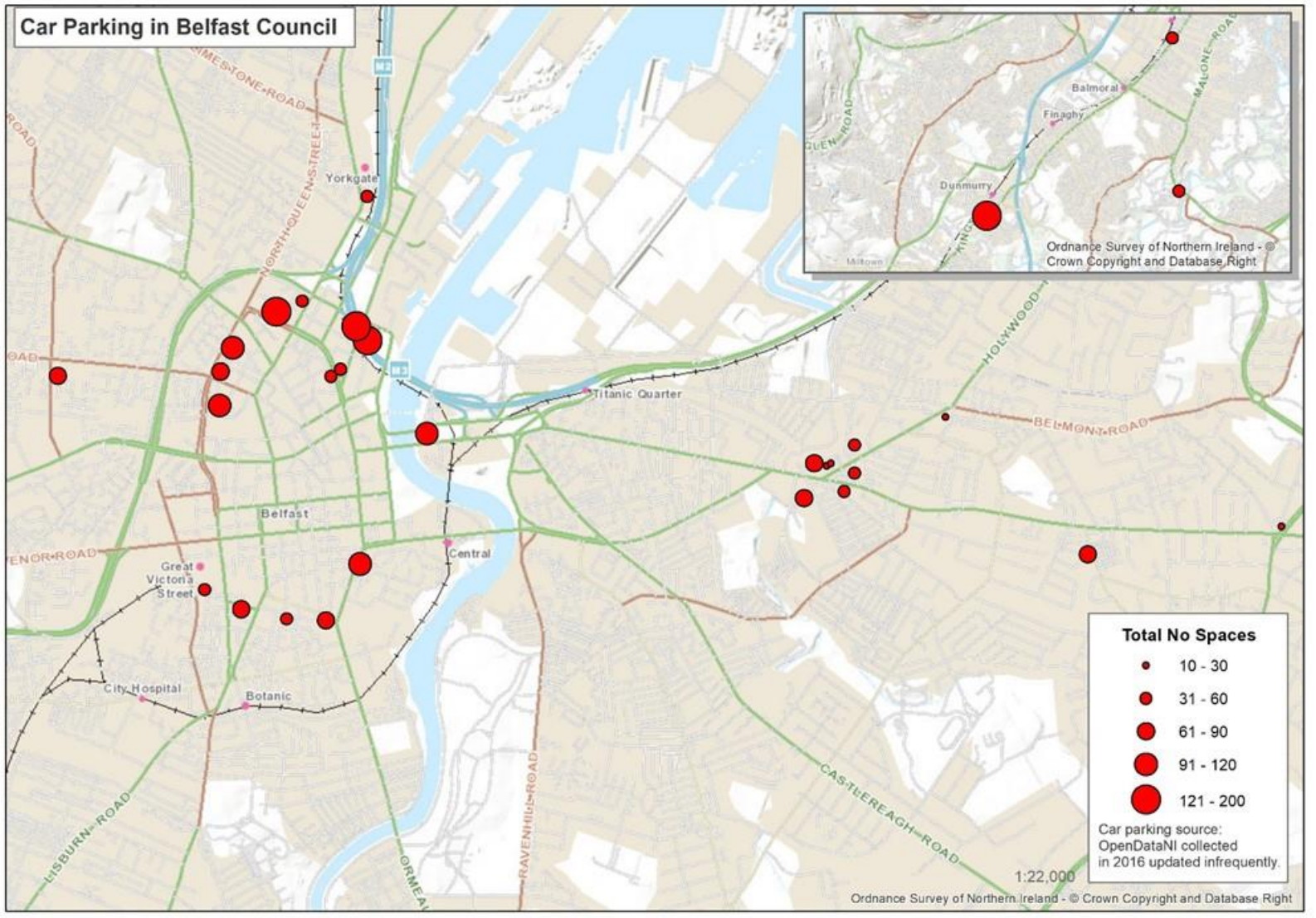

Figure 5.26 – Belfast City Council Public Parking Provision

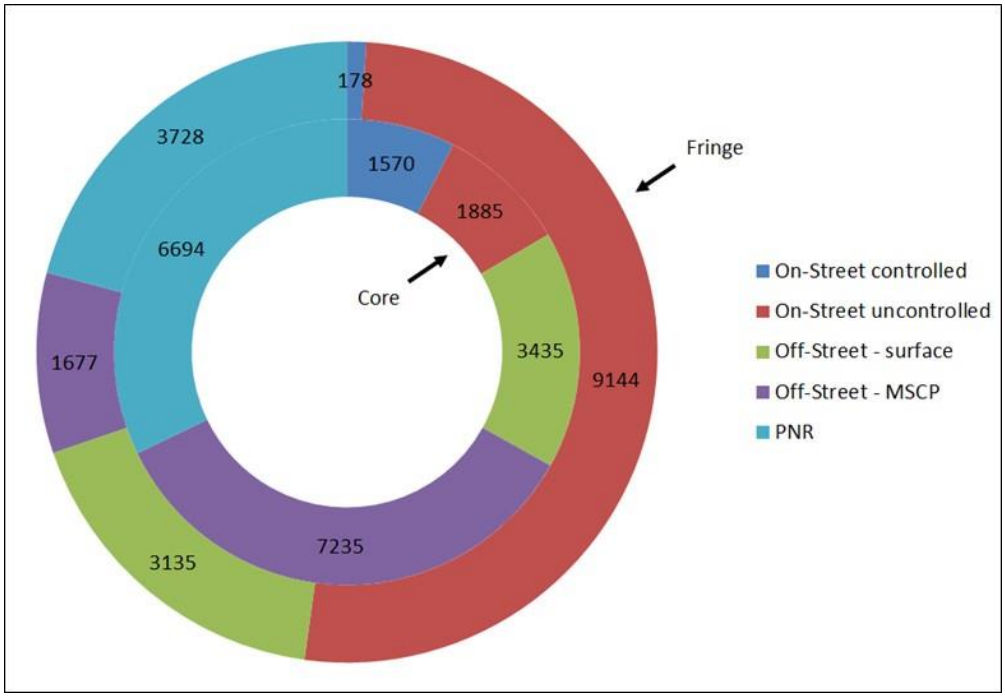

Figure 5.27 – Approximate Number of Spaces in Core and Fringe Areas of Belfast City Centre

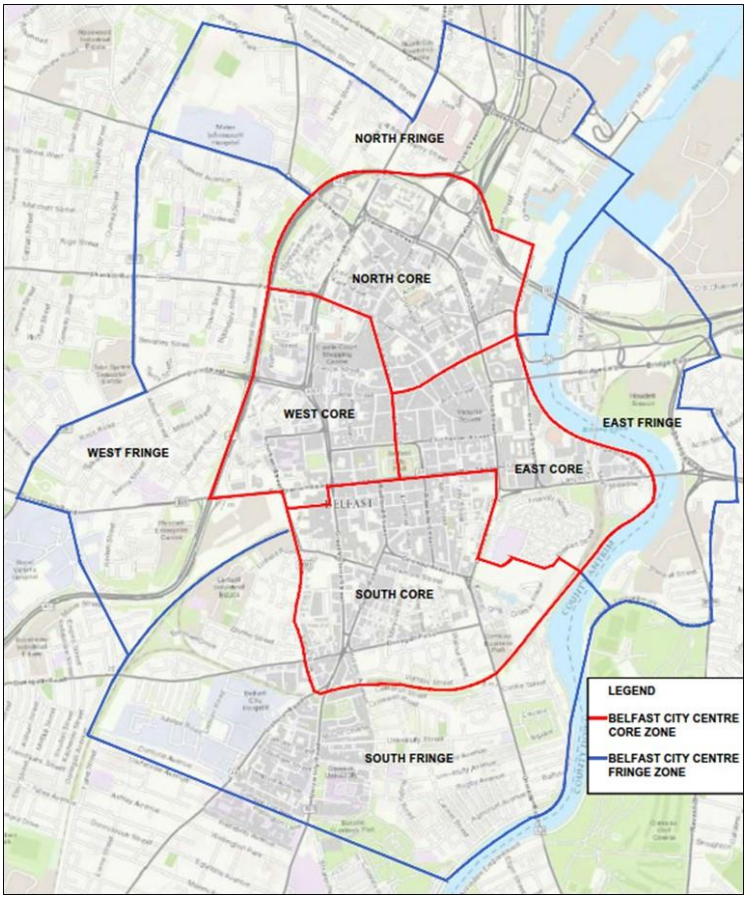

Figure 5.28 – Working Definition of Parking Zones

5.11. Legacy Road Alignments and Other Protected Land

5.11.1. Legacy Road Alignments and other transport related protected schemes exist in the extant LDPs within the study area. They are regarded as undeveloped alignments/areas identified in previous LDPs that have been protected from development. While some alignments may not be retained in the future, in general they should remain protected until more detailed consideration is given to each alignment/scheme at the LDP Policy Plan/ Local Transport Plan stage when zoning and scheme level detail will be provided.

5.11.2. In some cases these alignments may first appear out of line with current policy and some schemes may not progress in the form previously planned or not at all. However, these alignments will be retained until the LPP when they will be reviewed in conjunction with individual zoning considerations. At that stage they will be dropped or retained if they have potential alternative uses such as for active travel or pubic transport routes. Details of the existing legacy road alignments and other transport related schemes with associated protected lands in the BMTP area can be found in Annex C – Legacy Road Alignments.

6.0 Growth

6.1. Belfast City Council Growth in Population and Employment

6.1.1. A computerised transport model requiring growth forecasts for population and employment was used to estimate future travel demand by mode of transport and hence the impact of a range of illustrative transport measures. The model used growth forecasts for population and employment available at March 2018.

6.1.2. Whilst the Belfast City Council LDP is being prepared for 2035, the other councils in the metropolitan area have earlier forecast years. Therefore, with the intention of under-estimating rather than over-estimating transport demand, 2030 was chosen as the modelling forecast year.

6.1.3. The Housing Growth Indicator (HG14) calculations use NISRA trend population forecasts to estimate additional housing requirements on a council by council basis. Table 6.1 presents the NISRA population estimates calculated pro-rata to 2030 for use in the transport model. The 2030 pro-rata HGI figures estimate an average population growth of 7% in NI and 5.1% across BMTP Councils between 2015 and 2030. Within the BMTP, only Lisburn & Castlereagh at 13.2%, is significantly above this average.

6.1.4. Table 6.2 presents the councils growth proposals as outlined in their POPs and agreed as part of the BMTS for input to the transport model. These figures were adjusted to 2030 growth for use within the model. Within BMA, only Belfast City at 19.5% is proposing population and housing growth significantly above the calculated HGI trends.

6.1.5. 68,250 new jobs are proposed across the 5 Councils of with a clear focus in Belfast City 46,000 (67%). NISRA estimates there are a total of 396,000 jobs in the BMA Councils in 2013 with 210,000 in Belfast City. Therefore proposed employment growth averages approximately 17% across BMA in total and 22% in Belfast City.

6.1.6. Since, March 2018, Councils have revised their planning assumptions. An investigation of these revisions has therefore been included at Annex I.

Table 6.1 - NISRA Population Forecasts

Council	[2] NISRA Projected Pop 2015	[2] NISRA Projected Pop 2030	[2] HGI Plan Period 2015 - 2030	% Growth	Avg % Growth
Belfast City	338,250	351,396	15,810	3.9	
Lisburn & Castlereagh City	140,160	158,618	11,080	13.2	
Antrim & Newtownabbey	140,410	145,401	8,310	3.6	**5.1**
Mid & East Antrim	137,223	142,164	6,230	3.6	
Ards & North Down	158,325	163,100	8,190	3.0	
Armagh City, Banbridge & Craigavon	208,070	238,414	16,620	14.6	
Causeway Coast & Glens	143,016	146,898	7,730	2.7	
Fermanagh & Omagh	115,468	122,800	5,190	6.3	
Mid Ulster	144,342	165,063	10,960	14.4	
Newry, Mourne & Down	176,548	194,994	12,580	10.4	
Derry City & Strabane	149,416	151,169	5,770	1.2	
Total NI	**1,851,228**	**1,980,017**	**108,470**		**7.0**

Table 6.2 - Council Proposals for Growth

Council	Council Proposals		
	Population (increase)	Housing (new homes)	Employment (new jobs)
Belfast City	66,000	26,430	46,000
Lisburn & Castlereagh City	18,413	13,300	6,500
Antrim & Newtownabbey		13,000	
Mid & East Antrim		6,230	8,250
Ards & North Down			7,500
Armagh City, Banbridge & Craigavon	30,600		
Causeway Coast & Glens	3,543		6,826
Fermanagh & Omagh	7,332	5,190	4,875
Mid Ulster	21,000	11,000	8,500
Newry, Mourne & Down	22,433	18,353	9,213
Derry City & Strabane	10,584	12,000	15,000

7.0 The BMA Modelled Area

7.1. Introduction

7.1.1. A computer-based strategic transport model has been used to investigate to what degree the levels of growth proposed by the councils can be accommodated by the current transport networks and what blend of measures may be needed to deliver on the outcomes set by councils and the Department. The model enabled a quantified assessment of the comparative performance of alternative transport measures.

7.1.2. Whilst the model includes an assessment of travel demand across all of Northern Ireland based upon census-derived travel patterns the network detail has a focus in the metropolitan area where the transport network is under greatest stress and where there is greatest opportunity for multi-modal transport solutions.

7.1.3. A strength of the model is its ability to forecast total travel demand by all modes of travel at different times of the day using changes in population and employment by location. The model was therefore used to test alternative growth scenarios proposed by councils.

7.1.4. The model was not used simply to forecast operational performance of the transport networks but rather model outputs were used to populate an appraisal framework which captured a range of indicators across economic, environmental and social objectives.

7.1.5. The model was used to assess the relative performance of a range of illustrative transport measures, in isolation and in combination under a 'reference' growth scenario at 2030. Whilst the Belfast City Council LDP is being prepared for 2035, the other councils in the metropolitan area have earlier forecast years. Therefore, with the intention of under-estimating rather than over-estimating transport demand, 2030 was chosen as the modelling forecast year.

7.1.6. Technical details of the model and the testing are provided in the BMTS Modelling Report prepared by Atkins. This chapter combines a summary of that Modelling Report including the strengths and weaknesses of the modelling and appraisal approach and an interpretation of the results including conclusions in terms of transport measures required. It was noted that subsequent to the completion of the modelling runs, Councils revised their planning assumptions. An investigation of the impact of these revisions to the robustness of the modelling results has therefore been included at Annex I.

Structure

7.1.7. This chapter describes the development and application of the transport model including the appraisal framework. The sections deal in turn with:

- modelling Approach including its base year verification – details of the model and how it was confirmed 'fit for purpose';
- forecasts of Demand base on Growth Ambitions – constructing alternative Planning Development Scenarios proposed by the Council and the Department's HGI;

- illustrative measures - comparing the impacts of highway, public transport, active travel and demand management measures;
- alternative networks - consideration of the impacts of the best performing measures when applied in combination; and
- Conclusions of the model testing.

7.2. Technical Modelling Approach

7.2.1. In view of the current traffic congestion across the road network in BMA, the important role of the public transport networks in meeting travel demand and the potential for major changes in the future it was considered imperative that a quantitative assessment was undertaken. The natural choice was the Belfast Strategic Transport Model developed by the Department. Whilst the model includes an assessment of travel demand across all of Northern Ireland based upon census-derived travel patterns the network detail has a focus in the metropolitan area where the transport network is under greatest stress and where there is greatest opportunity for multi-modal transport solutions. The modelling report for the work undertaken in relation to the BMTS can be found in Annex D - Belfast Metropolitan Transport Study Modelling Report.

7.2.2. The model was able to test alternative growth scenarios proposed by the Department's HGI and the Councils' LDP POP.

7.2.3. In this section the structure of the model and its verification are explained. It is important that the model is capable of providing robust quantitative results.

Model Structure

7.2.4. In summary, the BSTM model comprises:

- a trip end model for estimating base year and forecast year travel demand from demographic data;
- a travel demand model to forecast changes in mode and destination (distribution);
- a highway assignment model to assign trips to the highway network and determine routes used and to output journey costs and times for each zone pair; and
- a public transport assignment model to assign trips to the public transport network, determine routes used and output journey times for each zone pair.

7.2.5. The detail of the model is focussed on the urban extent of BCC and the neighbouring councils where the principal transport issues arise and where there are opportunities for multi-modal solutions. Figure 7.1 presents the extent of the detailed model area. The model is composed of three distinct areas as follows:

- Core Area – That includes the new BCC area and extending to cover Newtownabbey to the north, Lisburn to the south and Dundonald to the east (consistent with the settlement limits identified in BMAP). Within this area the model includes detailed coding of road junctions and public transport services including bus priority measures.

- Collar Buffer – The remaining extent of the previous Belfast Metropolitan Area. This includes the inter-urban links around Belfast and public transport services but without detailed coding of junctions. Traffic routes and delays are modelled using link capacities and speed flow curves.
- External Buffer –Buffer with Fixed Speeds. Whilst demand and the inter-urban road network and bus and rail network is fully represented across all of Northern Ireland, this area includes movements to / from the Republic of Ireland.

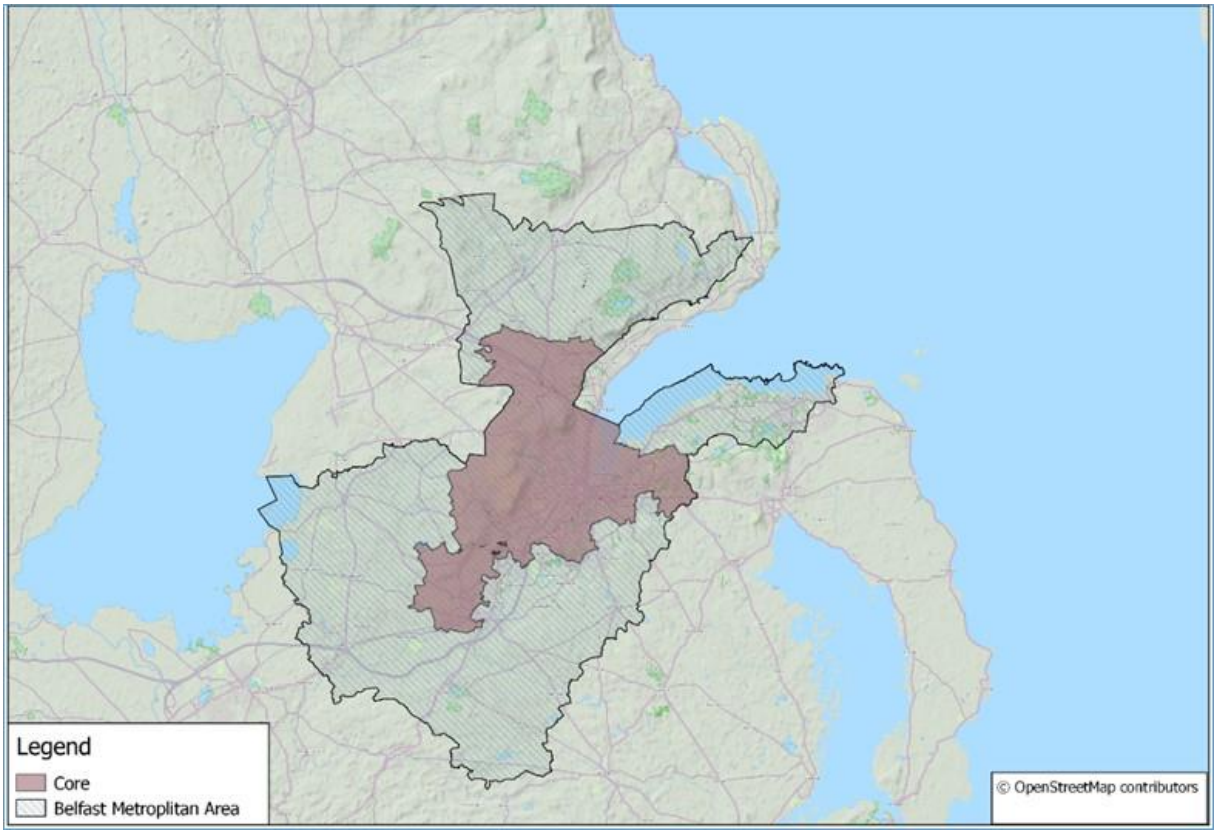

Figure 7.1 – Belfast Strategic Transport Model Coverage

7.2.6. While the model does have networks and matrices of the morning (AM) peak, inter-peak and evening (PM) peak time periods, the focus on the model performance throughout the BMTS has been for the AM peak only which represents the period with the highest travel demands and the period most directly influenced by changes in population and employment numbers.

7.2.7. As the model is strategic the results are indicative rather than definitive. For example, it is not possible to conclude with confidence that traffic levels will fall by a precise number of vehicles on a particular road link. At its current stage of development, the model was used to estimate whether the vehicle flows, travel times and modal split on a road corridor or within an area would likely increase, decrease or effectively remain unchanged, and to what degree any changes would make in terms of congestion.

Model Verification

7.2.8. The verification of the model in the base year has been undertaken by considering its representation of a number of key characteristics presented below:

- Traffic flows on a corridor basis
  Traffic Volume over Capacity (VoC) ratios which provide an indication of the percentage of the available operating capacity of a road ay or intersection where the number of vehicles passing through is divided by the number of vehicles that could theoretically pass through when at capacity. If vehicles (v) divided by capacity (c) is less than one the facility has additional capacity. If (v)/(c) is greater than one it is likely that the peak hour will elongate into a peak period. VoC have been used to identify links and corridors approaching capacity and Traffic delays at junctions
- Trips by mode - mode choice to, from and within the Belfast City Council (BCC) area in the AM peak hour
- Cordon Flows – The cordon flows provide detail on the number of trips (by highway, bus and rail) crossing both the inner and outer cordons (inbound and outbound) in the AM peak hour. The location of the cordons are shown in Figure 7.2 - Belfast Metropolitan Area Cordon Location.

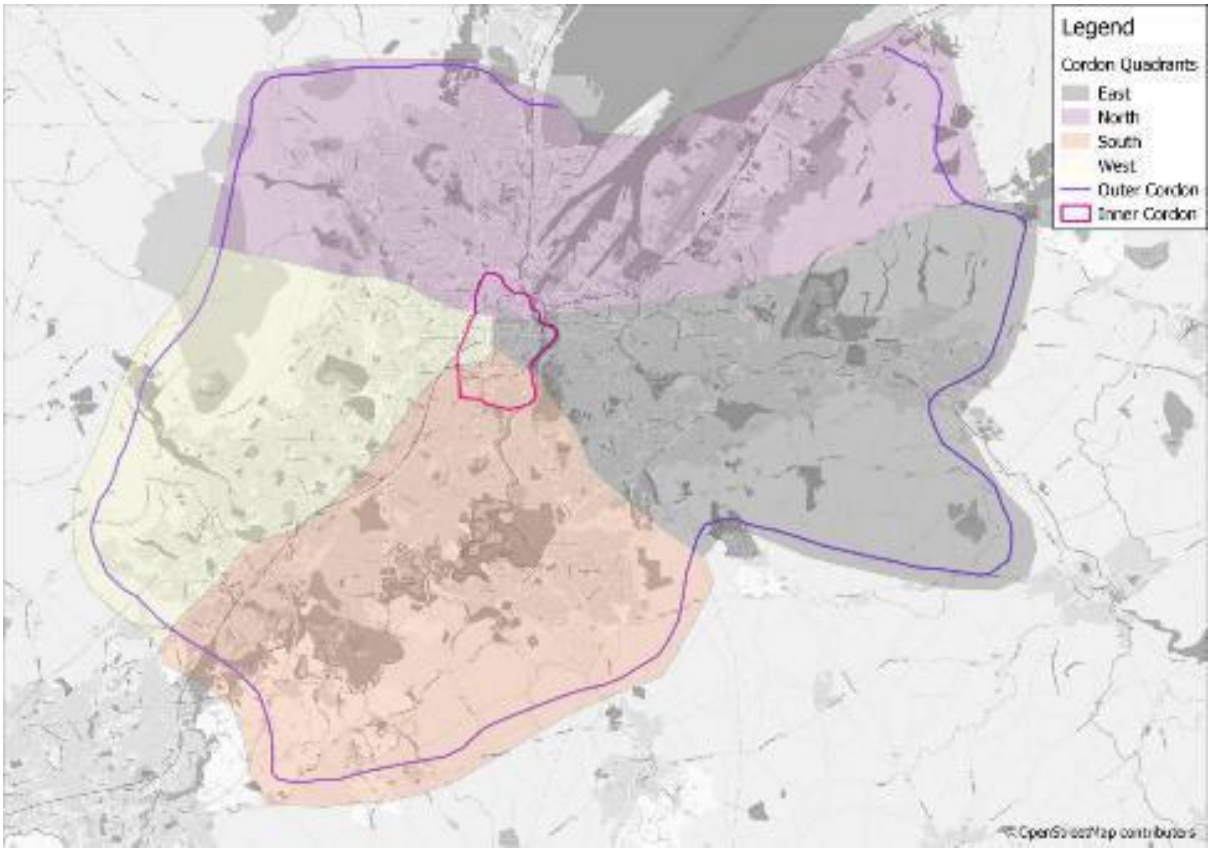

Figure 7.2 – Belfast Metropolitan Area Cordon Location

7.2.9. Changes in these key characteristics were also used to assess the technical credibility and robustness of the model when forecasting future travel demand and network performance later in the testing processes.

7.2.10. Figure 7.3 shows Volume over Capacity (V/C) ratios and accords with operational knowledge of the network. Across the council area the traffic V/C can exceed 100%. This is noted on sections of the key strategic road corridors:

- A12 Westlink; and,
- Sydenham Bypass.

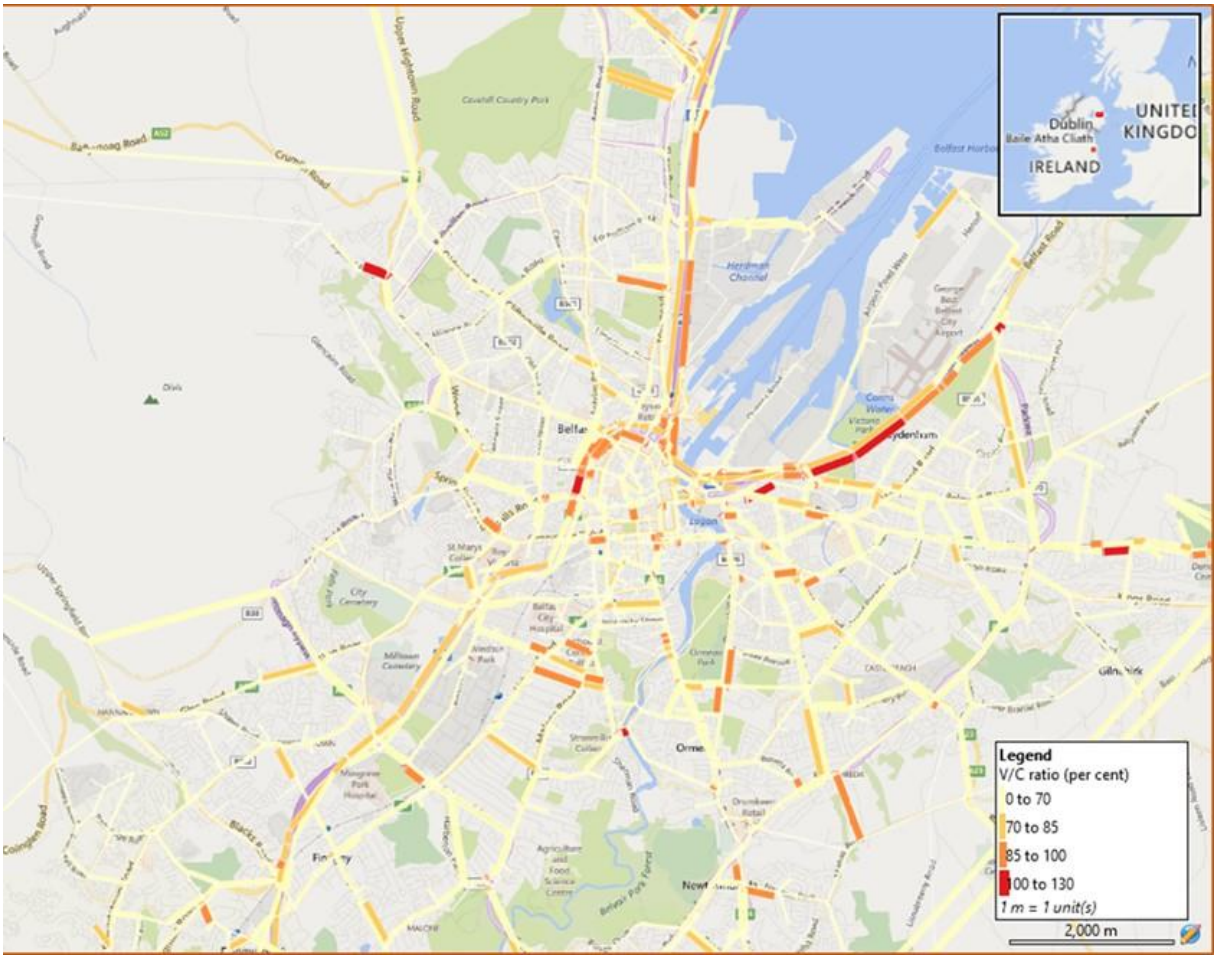

Figure 7.3 – Belfast Strategic Transport Model – Base Year Traffic Volume / Capacity

7.2.11. In addition there are large sections of the following roads which are approaching capacity (85% - 100%):

- M1 from Lisburn;
- A12 Westlink; and,
- M2 from Newtownabbey.

7.2.12. Figure 7.4 shows base year junction delays and also accords with technical knowledge of the network. In general, throughout the AM peak hour junction delays of at least 20 seconds exists across the majority of the network, with the greatest delays (100-200s) observed at:

- York Street Interchange;
- Along the A12; and,
- On the Sydenham Bypass at Dee Street.

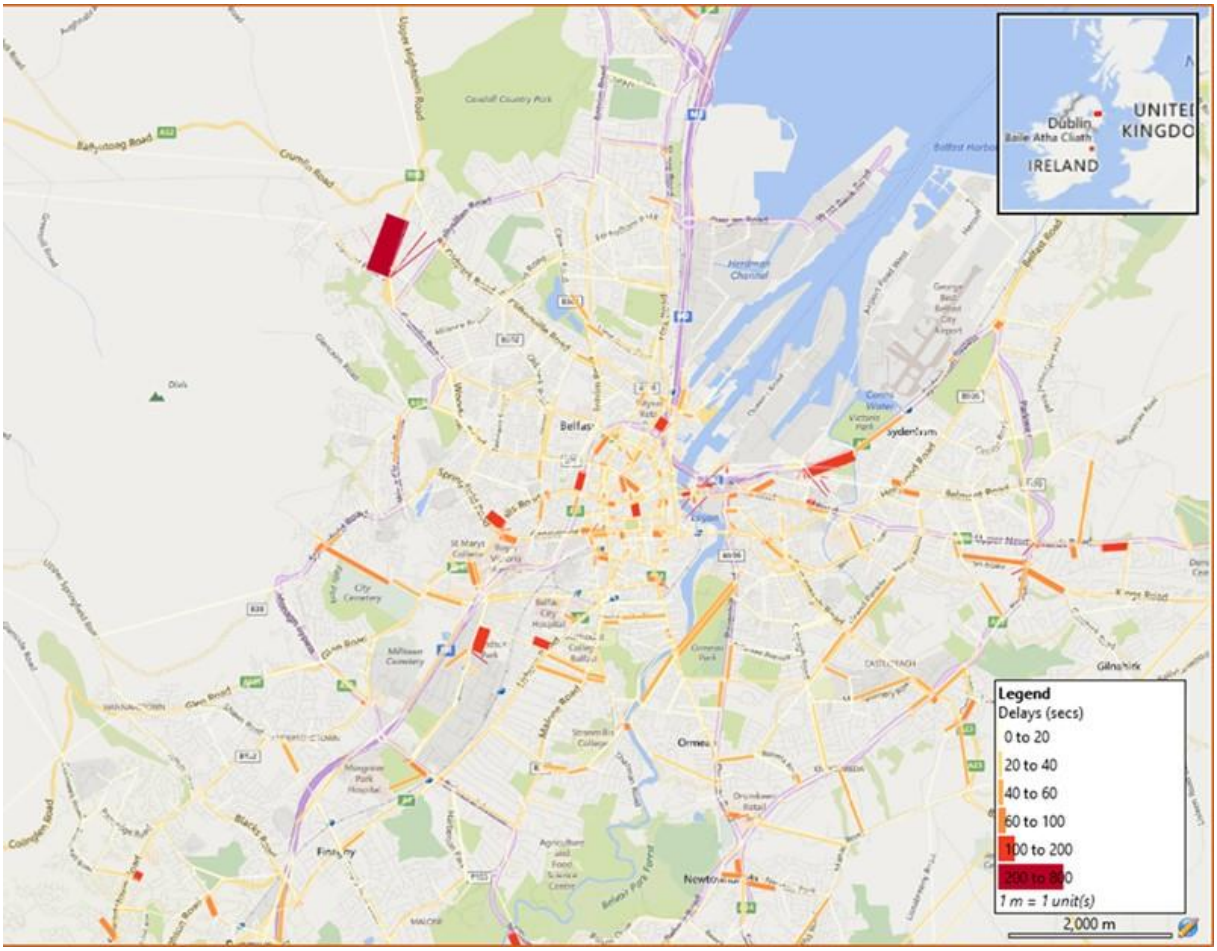

Figure 7.4 – Belfast Strategic Transport Model – Base Year Junction Delays

7.2.13. The model output was also inspected for modal choice in the AM peak hour. The AM peak hour flows are presented for highway, bus and rail. These flows are displayed for three separate movements in Figure 7.5:

- Trips from the rest of NI and RoI to the BCC area (i.e. journeys start outside BCC);
- Trips from BCC to the rest of NI and RoI (i.e. journeys finish outside BCC); and,
- Total trips made wholly within the BCC area (i.e. journeys both start and finish in BCC).

7.2.14. In line with operational knowledge Figure 7.5 shows:

- The majority of trips for all 3 movements are made by highway (even for shorter trips made wholly within BCC);
- The fewest trips are by rail – with the greatest rail movement to BCC; and,
- The largest volume of bus trips is experienced in the within BCC (this shows the importance of the Metro services).

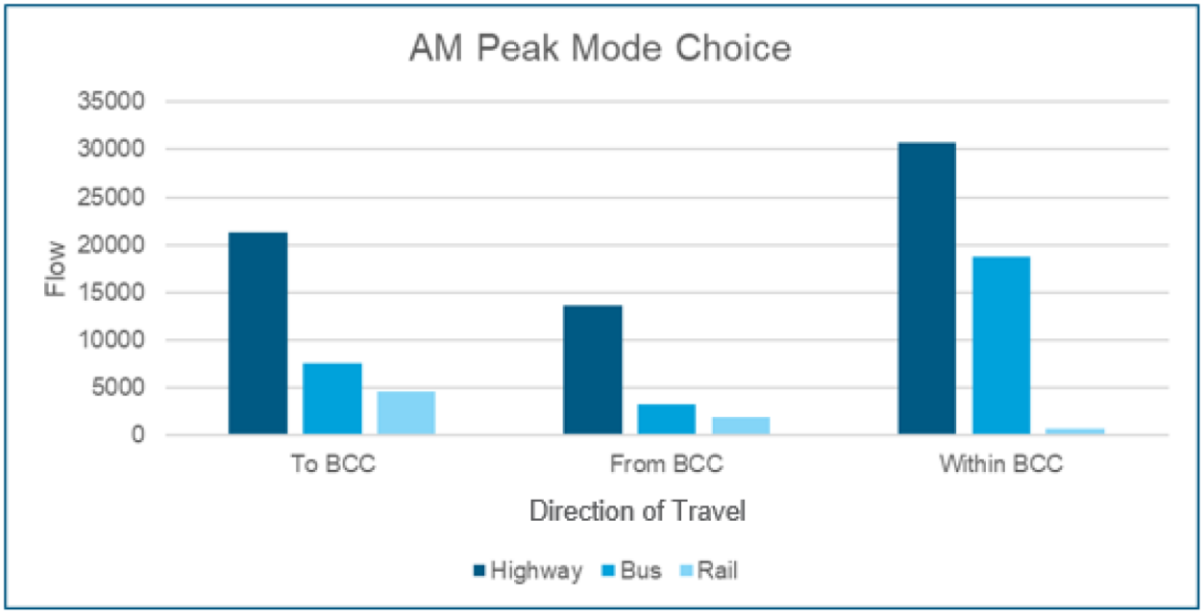

Figure 7.5 – Belfast Strategic Transport Model – Base Year AM Mode Choice

7.2.15. In order to further investigate the AM peak travel patterns in the vicinity of Belfast City Centre, the model output was also inspected for inbound and outbound flows across an inner and outer cordon. Figure 7.6 shows the inner and outer cordon flows in the AM peak hour.

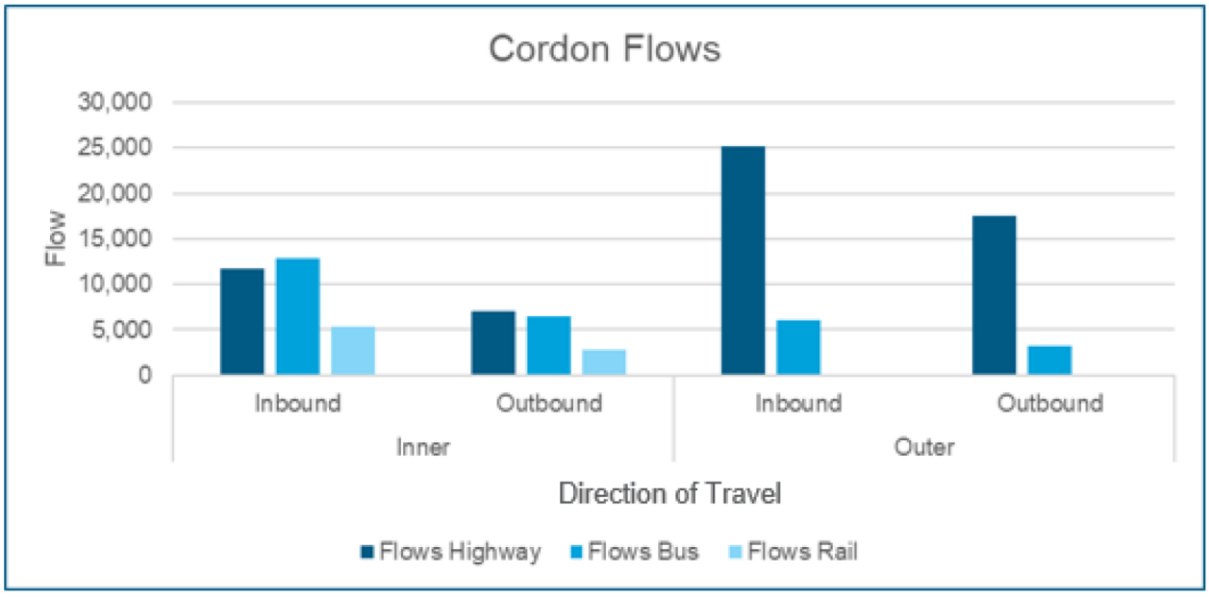

Figure 7.6 – Belfast Strategic Transport Model – Base Year AM Cordon Flows

7.2.16. Figure 7.6 is in line with technical knowledge and shows:

- total flows are higher across the outer cordon (the wider the area the greater the travel demand);
- across both cordons the inbound flow is greater than the outbound flow (travel demand is tidal towards the city centre in the AM peak);

- across the outer cordon, the clear majority of trips are highway in each direction (at the outer cordon a high proportion of trips are not travelling on routes served by public transport);
- bus trips are the most popular mode inbound across the inner cordon (High occupancy of buses in comparison to private cars); and
- the fewest trips are made by rail (Capacity of the bus network with a large number of services exceeds the capacity of the rail network on 4 principal lines).

Conclusions

7.2.17. The model structure and verification has been inspected and explained. It has been noted that, as the model is strategic in nature and not detailed, the results are considered indicative rather than definitive. It has been concluded that whilst the strategic model had not been validated to link level detail, the modelling approach is appropriate and fit for purpose in terms of differentiating between the relative performance of strategic options in terms of modal choice, traffic congestion and public transport patronage.

Forecasts of Demand, Modal Split and Network Loads

Introduction

7.2.18. A key feature of the model and the modelling approach is to forecast future travel demand arising from changes in population and employment. In strategic terms the demand for travel, or number of trips, is directly proportional to the number of people and the number of jobs. The scale and location of population and employment changes can have substantial effects on the performance of the transport networks and hence differential impacts on the objectives and appraisal framework.

7.2.19. For example, if a council population is forecast to remain static there may be no increase in travel demand and in traffic levels originating in the council. However if a council is forecast to increase its employment base it may generate new travel to the council area (a complication is the possibility that the new jobs may reduce travel levels by creating shorter journeys for its own residents who switch from travelling to jobs in another Council). People travelling to new jobs will choose their mode of travel based upon the transport network opportunities including walk/cycle for the shortest trips and public transport if available. Depending on the new choices, the level of road congestion will change as will the viability of existing and new public transport services. Figure 7.7 illustrates the knock-on impacts of population and/or employment growth assessed in the transport model.

Figure 7.7 – Effect of Forecast Growth

7.2.20. This section explains how the model has been used to generate a range of planning development scenarios representing a future horizon of 2030 and to select and verify a single 'reference forecast' with which to assess alternative transport measures and networks.

Planning Development Scenarios

7.2.21. The Department has prepared a forecast of housing growth need, the Housing Growth Index, (HGI) which is based upon NI Statistics and Research Agency (NISRA) observed trends in births, death and net migration for each of the 11 Council areas. In addition, the Department was able to source forecasts of employment numbers produced by Oxford Economics for the transport model used recently in the A5 WTC road scheme inquiry.

7.2.22. The transport model has been used to investigate a range of planning development scenarios (PDS) prepared by varying the growth in population levels and the distribution of population and employment. **Error! Reference source not found.** outlines the options under consideration:

- Two overall levels of growth in population – sourced from HGI or Council's POP figures
- Two alternative distributions of growth – as per current or with a focus on location served by public transport

Table 7.1 - Planning Development Scenario Overview

Source of Population and Employment Growth	Distribution of Development Growth	
	As per Existing	Public Transport Orientated
NISRA and Oxford Economics	PDS1 – 'Business as Usual'	
Council and Oxford Economics	PDS2 – 'Council Plans'	PDS3 – 'Public Transport Focus'

7.2.23. This logically gives rise to three alternative planning development scenarios:

- PDS 1 – HGI growth distributed as per current – 'Business as Usual'
- PDS 2 – council growth distributed as per current - 'Council Plans'
- PDS 3 – council growth distributed to locations served by public transport – 'PT Focus'.

7.2.24. The following should be noted;

- The total growth predicted from legacy zonings, extant planning permissions and expected windfall development is significant for some areas which weakens the ability to focus development in the preferred locations as modelled in PDS 3 during this LDP period;
- DfI publish revised HGI figures in September 2019. The modelling work undertaken as part of this study was completed prior to their release and therefore used the previous figures. The time and resource implications required to update this work are prohibitive and are unlikely to have a significant impact on the strategic direction of the illustrative transport measures tested. As a result this study refers to the HGI figures published in May 2016; and,
- The figures used for the 'Council Plans' have been taken from the councils' POPs. Since the completion of the modelling work, some councils have published their draft Plan Strategies with updated growth strategies. In particular ANBC and MEABC have made a signification reduction in their growth ambitions. While the results of these changes are likely to mean that this study has overestimated growth, the update growth ambitions would not change the results significantly enough to effect the direction or magnitude of the impacts of the tested illustrative transport measures. A further examination of the impact of the changes in growth aspirations can be found in Annex I – Addendum to Growth.

7.2.25. Manipulation of the model inputs can generate these scenarios efficiently. Whilst growth levels are specified as aggregate Council totals, the model's inbuilt Geographic Information System and zone system allows this growth to be distributed precisely. It should be noted that for all PDS, the model transport network assumed the currently committed transport network (effectively the 2019 network including BRT Phase 1); consequently the model manipulated trip origins and destinations, and travel modes to optimise conditions.

7.2.26. The use of scenarios is considered appropriate at this Plan Strategy stage of LDP plan to test the impacts off:

- Alternative overall levels of growth by comparisons of PDS1 and PDS2.
- Strategic decisions regarding the location of growth by comparisons of PDS2 and PDS3.

Details of the Planning Development Scenarios Inputs

7.2.27. This future growth is added to the model via the 24hr productions and attractions, i.e. the total number of trips either produced by a model zone (Productions) or attracted to a model zone (Attractions). **Error! Reference source not found.** details the 2013 base year productions and attractions. The entries highlight:

- the generally balanced nature of trips starting (origins) and finishing (destinations) in the majority of the Councils – this is consistent with a high proportion (78%) of Belfast City Council residents who work within the same Council[4]
- Belfast has a unique profile with a substantially larger number of attractions than productions – this is consistent with its role as a regional centre of employment;
- Within the BMA, ANBC and LCCC have very balanced entries consistent with their roles for employment and for commuting locations to Belfast;
- Elsewhere within BMA and more distant from Belfast, in MEABC and ANDBC, the significantly larger number of productions is consistent with an established commuting role (to Belfast); and,
- A similar Belfast commuting role is suggested in all the other Councils except Fermanagh and Omagh.

Table 7.2 - 2013 Productions and Attractions

Council Area	2013 Productions (1000's)	2013 Attractions (1000's)
Antrim and Newtownabbey	225	228
Ards and North Down	242	209
Armagh and Banbridge	315	296
Belfast	536	684
Causeway Coast and Glens	219	202
Derry and Strabane	219	211
Fermanagh and Omagh	191	186
Lisburn and Castlereagh	226	222
Mid and East Antrim	213	197
Mid Ulster	216	195
Newry Mourne and Down	265	239
NI Total	**2,868**	**2,868**

[4] Based on the 2011 Journey to Work Census Data for the 2011 Belfast City Council Area

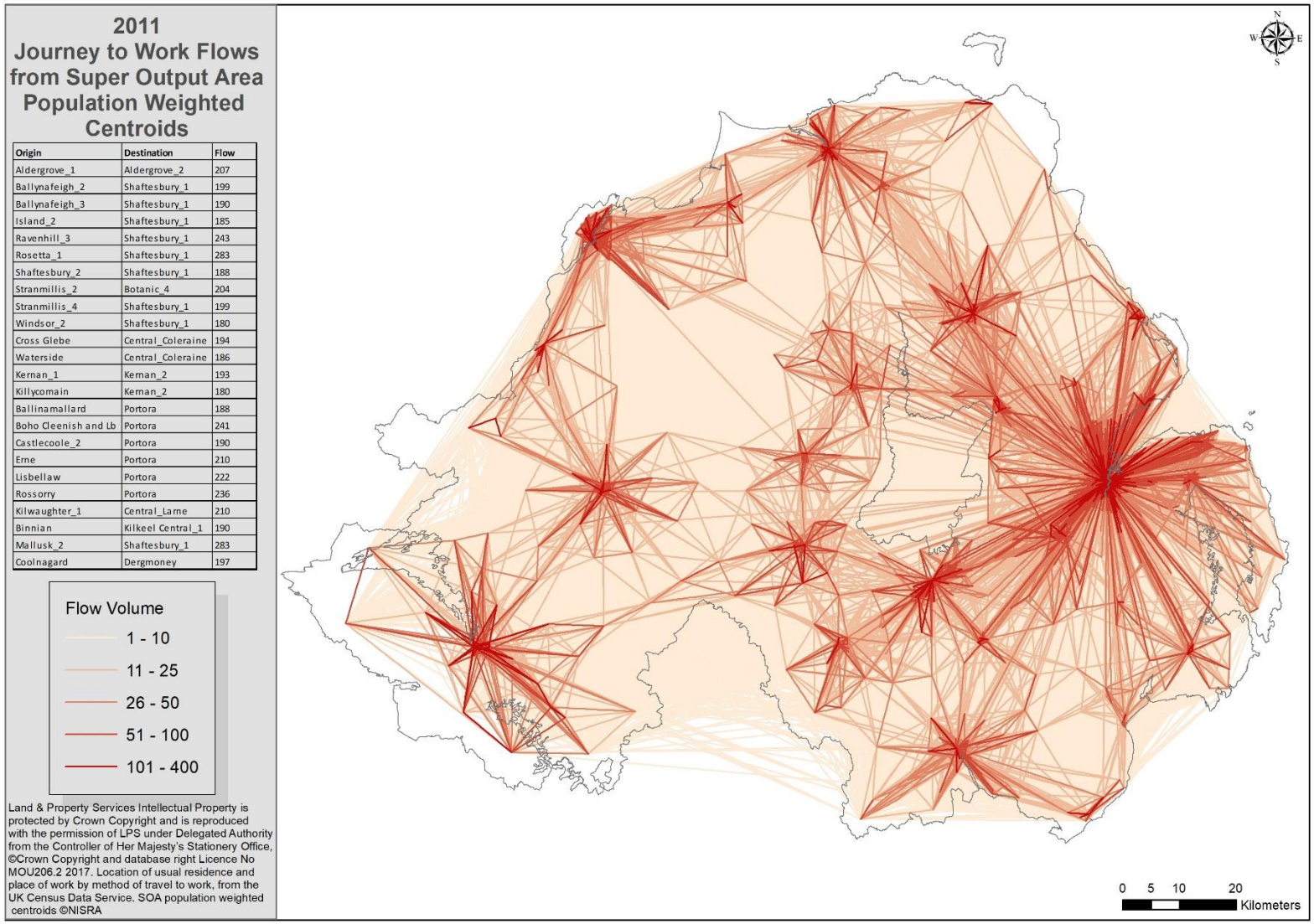

Figure 7.8 - Journey to Work Flows from 2011 Census- Produced by Lorraine Barry as part of a PhD in the Geographical Data Science of Population Flows completed in 2020 with Queen's University Belfast. ©Lorraine Barry

7.2.28. The pattern of trips suggested in **Error! Reference source not found.** is also consistent with Figure 7.8 prepared independently from the 2011 Census Journey to Work statistics. Figure 7.8 confirms the regional reach of Belfast as an employment centre which contrasts with the local reach of the other towns. It is also notable that Enniskillen and to a lesser extent Omagh are relatively self-contained with very limited commuting towards Belfast.

7.2.29. **Error! Reference source not found.** presents details of the modelled changes in trip productions and attractions for PDS1 – Business as Usual. The figures represent changes from the corresponding 2013 level. The figures highlight:

- Overall there is a growth of 7% in trips made, derived from the population growth
- The highest growth in trip productions (origins) are in Armagh City, Banbridge and Craigavon Borough Council, Mid Ulster District Council, Lisburn & Castlereagh City Council, and Newry, Mourne and Down District Council which each exceed 10%.
- In terms of attractions (destinations) the percentages represent the relative distribution of the trip total in line with new employment. There is a marked increase in Belfast but decreases in Causeway Coast & Glens Borough Council, Fermanagh and Omagh District Council and MEABC.

Table 7.3 - Changes in Productions and Attractions from 2013 Base

Council Area	PSD1	
	Productions % Growth	Attractions % Growth
Antrim and Newtownabbey	3.8	2.5
Ards and North Down	2.9	0.2
Armagh City, Banbridge and Craigavon	14.6	5.4
Belfast	5.7	8.2
Causeway Coast and Glens	2.2	-3.6
Derry and Strabane	1.9	3.4
Fermanagh and Omagh	5.4	-0.7
Lisburn and Castlereagh	13.1	4.9
Mid and East Antrim	3.5	0.1
Mid Ulster	13.5	1.8
Newry, Mourne and Down	10.3	4.0
NI Total	**7.10**	

7.2.30. **Error! Reference source not found.** presents details of the modelled changes in trip productions and attractions for PDS2 – Council Planned and PDS3 – Public Transport Focus. The figures represent changes from the corresponding 2030 PDS1 Business as Usual value. Only one set of figures is

presented as the PDS2 and PDS3 figures are essentially identical when viewed at Council level and the effect of the distribution to Public Transport served location will be evident only at a local scale. The figures as presented therefore highlight the Councils' growth ambitions compared to the Department's HGI scenario and employment growth:

- Overall generations (origins) are substantially increased
  - The greatest and most striking increases are in Belfast (13.3%) and Derry & Strabane (8.9%) otherwise increases are generally of the order of 2-3%
  - Armagh City,Banbridge and Craigavon Borough Council and LCCC have decreases whilst Mid Ulster District Council has an increase less than 1% but importantly these Councils had the greatest increases in the HGI scenario.
- The attractions (destinations) show marked changes reflecting planned aspirations in generating additional jobs
  - Derry City and Strabane City Council and Causeway Coast and Glens Borough Council are the biggest but 7 of the 11 Councils return changes greater than 10%

Table 7.4 - PDS2 and PDS3 - Changes in Productions and Attractions from 2030 PDS 1

	PDS2 & PDS3	
	Productions % Growth	Attractions % Growth
Antrim and Newtownabbey	1.7	0.0
Ards and North Down	2.9	15.2
Armagh and Banbridge	-1.5	0.0
Belfast	13.3	11.0
Causeway Coast and Glens	2.6	17.7
Derry and Strabane	8.9	21.4
Fermanagh and Omagh	1.0	10.3
Lisburn and Castlereagh	-0.4	5.3
Mid and East Antrim	3.3	16.1
Mid Ulster	0.8	11.3
Newry Mourne and Down	5.2	9.2
NI Total	**4.3**	**10.2**

Planning Development Scenarios Outputs

7.2.31. The previous section has highlighted the difference in the PDS transport demand inputs arising from the changes in population and employment; in this section the changes in transport network performance are documented.

7.2.32. Figure 7.9 presents the 24 hour person trip totals. As noted above the PDS1 total is 7% greater than 2013 and PDS2 and PDS3 produce similar larger increases of 11%.

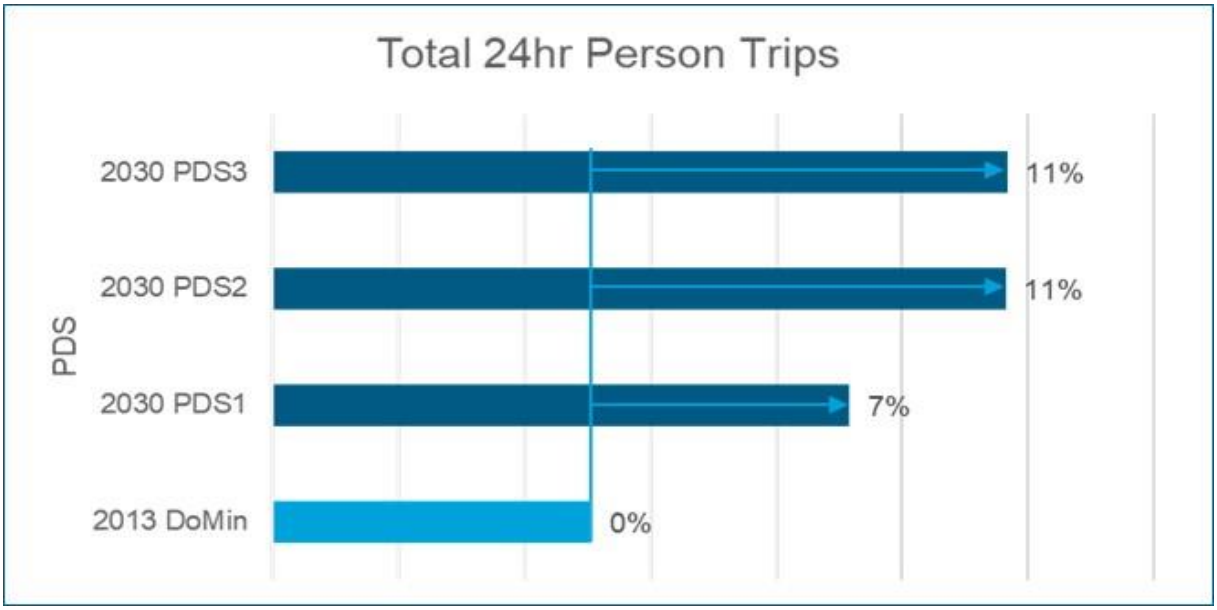

Figure 7.9 – Total 24 Hour Model Trips

Reference Demand

7.2.33. Based on the modelling outputs, PDS3 was selected as the reference demand for 2030 with which to test the impact of alternative transport measures and networks.

7.2.34. PDS3 represents a realistic scenario in terms of the development aspirations of the Councils as expressed in their LDP POPs.

7.2.35. PDS2 also represents a 'worst case' scenario in terms of transport demand in the BMUA arising from:

- total growth in population some 66% above the total NI HGI levels;
- population growth in BCC and LCCC together totalling some 78% of the total NI HGI level; and,
- Employment growth in Belfast of some 22% to 2030.

7.2.36. PDS3 also represents best practice in sustainable planning principles in locating growth close to public transport services. It is unclear, in view of the zone sizes in the model, to what extent the distributions can be manipulated differently between PDS3 and PDS2. However within the capability of the Belfast Strategic Transport Model PDS3 represents a realistic scenario at locating development where it will be most attractive for public transport.

7.2.37. The remainder of this section sets out a series of network plots showing the performance of the transport networks when loaded with the transport demand from 2030 PDS3. The same key network performance characteristics used for the verification are presented:

- Link VoC Percentage; and,
- Junction Delay

7.2.38. Figure 7.10 shows the change in 2030 PDS3 Do Minimum Volume over Capacity as a percentage across Belfast in the AM peak hour compared to 2013. Figure 7.14 shows there are increased VoC percentages identified across the council area, in particular on:

- Orbital and cross-linking routes and
- the local road network.

7.2.39. These increases are consistent with a highway network operating close to capacity when traffic switches between corridor and 'rat-runs' on residential streets to exploit spare capacity and to minimise delays.

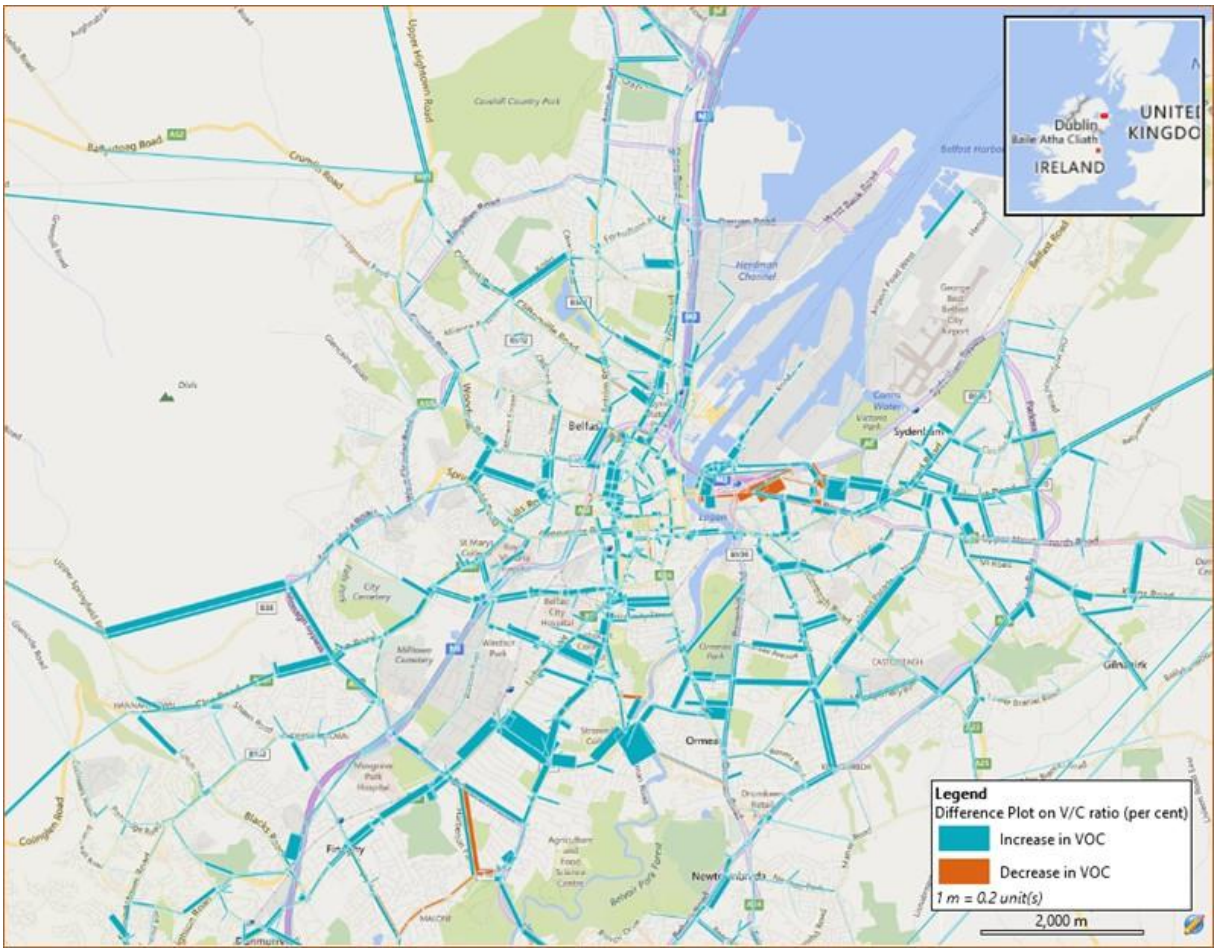

Figure 7.10 – 2030 PDS3 – 2013 Do Minimum Delay Difference Plot

7.2.40. Figure 7.11 shows the change in 2030 PDS3 Do Minimum Junction Delays in seconds across Belfast in the AM peak hour compared to 2013. Figure 7.16 shows there are increases identified across the council area, in particular on:

- A12 Westlink;
- M3/Sydenham Bypass;
- Malone Road; and,
- Ravenhill Road.

7.2.41. These increases are consistent with a highway network operating close to capacity with large increases at key junctions on the strategic network and other important radial corridors.

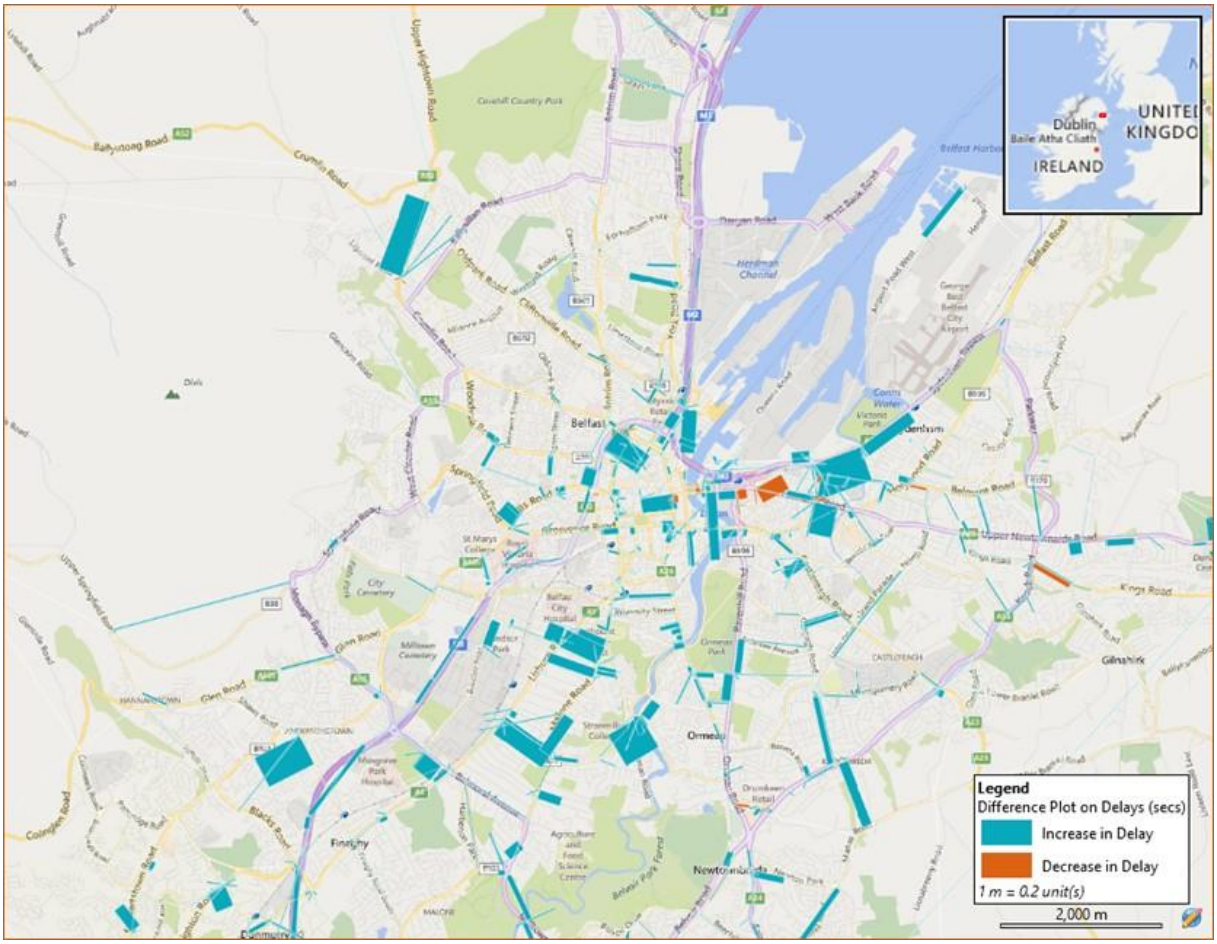

Figure 7.11 – 2030 PDS3 – 2013 Do Minimum Delay Difference Plot

Conclusions

7.2.42. The model has been used to generate a range of planning development scenarios with alternative levels of growth and distribution. It was concluded that the PDS3 scenario represented a reasonable 2030 reference scenario with which to assess the impact of alternative transport measures. The scenario incorporated Councils' ambitions for levels of growth and as such represented the likely maximum for transport demand in the BMUA. However the scenario also included a 'best practice' assumption in that the growth in development was focused in locations served by public transport. The scenario showed that at 2030 transport demand would increase by 11% and AM traffic conditions would deteriorate substantially from the current level with additional congestion and associated problems.

7.3. Alternative Illustrative Transport Measures

Introduction

7.3.1. This section describes how the model has been used to test the performance of a range of alternative transport measures arranged by mode of transport. All the transport measure are illustrative only. They have been selected in order to ascertain the illustrative strengths and weaknesses of a particular mode of transport or to demonstrate the illustrative impact of particular type of scheme. The results and recommendations therefore do not represent a commitment to any particular scheme by the

Department. However, the results provide an indication of the modes of transport and types of scheme that should be considered within the BMTP.

7.3.2. This section sets out in turn:

- Definition of the illustrative transport measures in terms of the schemes coded into the model; and,
- Confirmation of robustness of the model results and the principal differences in performance in terms of modal Choice within Belfast City Council.

Definition of alternative illustrative transport measures

7.3.3. Each of the illustrative transport measures are defined below in terms of the schemes assumed and particular coding details where appropriate. The illustrative measures are as follows:

7.3.4. **IM01 – Highway**

Schemes Included

- York Street Interchange – fully grade separated junction between the A12 Westlink/ M2 and M3 (also included in the Do Minimum modelling);
- Inner Ring Road – new highway link between Bruce Street and A24 Ormeau Road;
- Dualling of A26; and
- Radial Capacity Enhancements:
    - A55 Knock Road (2 lanes in each direction);
    - A2 Sydenham Bypass (3 lanes in each direction and closure of side roads);
    - M1/A1 Sprucefield Bypass (2 lanes in each direction); and
    - M1 Widening (3 lanes in each direction).

7.3.5. **IM02 – Intelligent Transport Systems (ITS)**

Schemes Included

- Upgraded Urban Traffic Control for the Belfast Central Zone, as shown in Figure 7.12 below, increasing the efficiency of the traffic throughput and reducing delay through the Belfast Central Zone signalised junctions.

Coding Detail

- The traffic modelling software (SATURN) has been used to optimise the traffic signals in the Belfast Central Zone to ensure that the signal timings at each signalised junction are optimal for the volume of traffic.

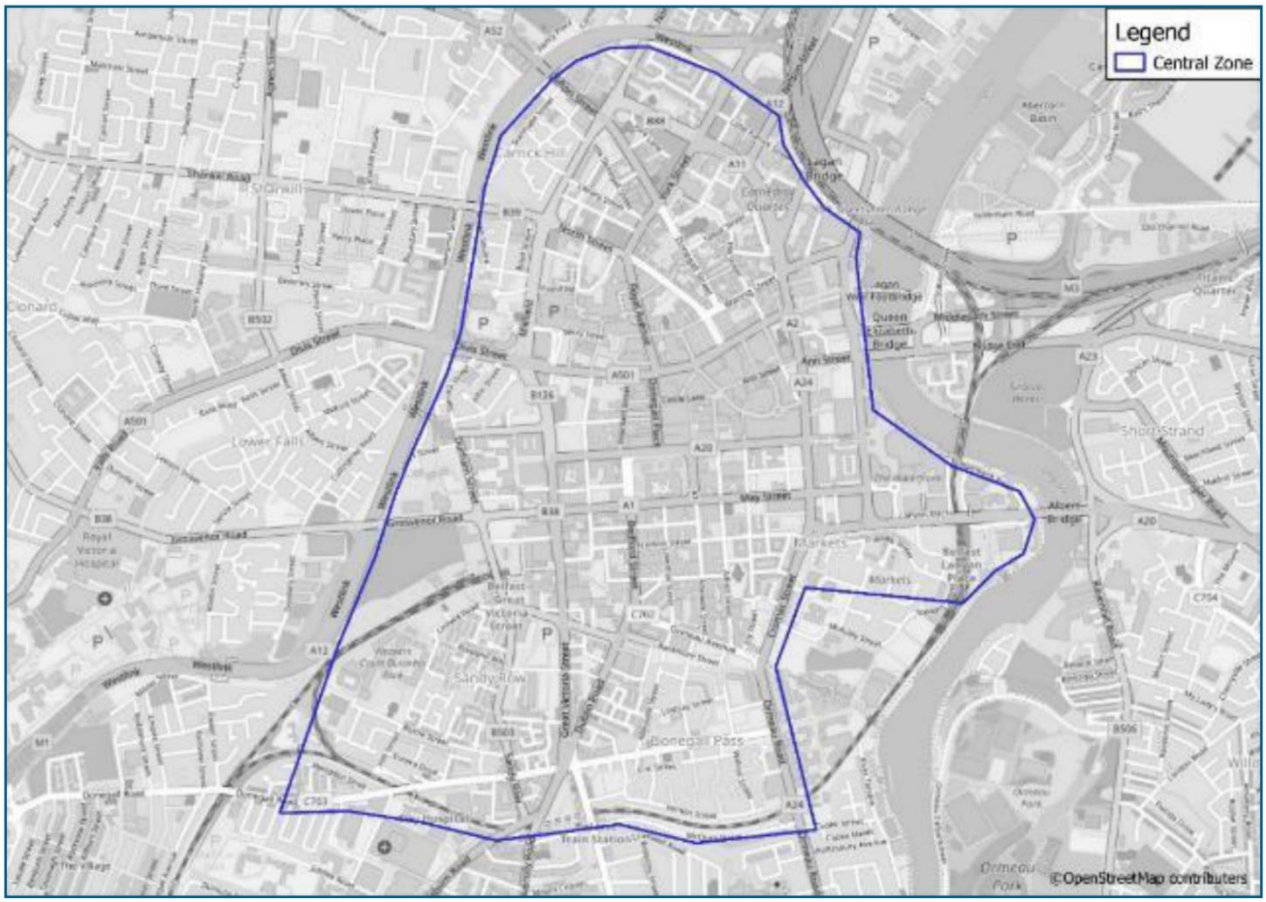

Figure 7.12 – Belfast Central Zone

7.3.6. IM03 – Rail A

Schemes Included

- All trains 6 cars in length;
- Multi-Modal Transport Hub at Great Victoria Street;
- Ballymartin Rail Station;
- Hourly Enterprise Services;
- New BUMA stations/halts (Gamble Street, Merville, Monkstown); and
- Increased Frequency on Larne Line.

7.3.7. IM04 – Goldline

Schemes Included

- Doubling Current Goldline Frequencies;
- M2 Hard Shoulder Running; and
- Local Park and Ride.

7.3.8. IM05 – Bus Rapid Transit Phase 2

Schemes Included

- North Route; and
- South Route.

Coding Detail

- BRT services have been coded with an 8 minute frequency; and
- The BRT Phase 2 routes have been coded into the highway network, adding bus lanes and reducing traffic junction and link capacity where appropriate.

7.3.9. IM06 – Metro bus improvements

Schemes Included:

- Double Current Frequencies;
- Cross City Services; and
- Uniform Speed increase to 20kph.
- The following routes have been merged for cross city services:
  - 9 and 11;
  - 12 and 6;
  - 4 and 10; and
  - 2 and 7.

7.3.10. IM07 – Cycling

Scheme

- Assumed network-wide adoption of a Cycling Masterplan.

Coding Detail

- All cycling costs were reduced by 25%. This was considered the most appropriate way of modelling an improvement in cycling designed to reflect a range of improvements such as improved cycle priority, cycle route signage.

7.3.11. IM08 – Walking

Schemes

- Assumed adoption of a Walking Masterplan in Belfast City Centre.

Coding Detail

- All walking costs were reduced by 25% in the Belfast Central Zone. This was the most appropriate method of reflecting proposed improvements to walking such as improved pedestrian priority at junctions and crossings, route signage improvements.

7.3.12. IM09 – Demand Management A

Schemes Included

- Introduction of Toll Roads;
- Motorway Slip Road Closures; and
- City centre controlled parking zone.

Coding Detail

- Tolls have been added to the strategic road network (including M1, M2, A2 Sydenham Bypass, M5). These have been coded as a time penalty;
- Slip roads at Broadway, Divis Street, Crumlin Road and M3 Lagan Bridge have been closed on the strategic road network close to Belfast city centre by banning in the slip road links to highway traffic in the SATURN highway model; and
- A 25% increase has been added to the city centre parking charge.

7.3.13. **IM10 – Public Transport Fares**

Scheme

- Reduction in Public Transport (PT) Fares.

Coding Detail

- All public transport fares (bus and rail) have been reduced by 15% across the NI network.

7.3.14. **IM11 – Rail B**

Scheme

As an alternative to Rail A in view of concerns about the deliverability of new stations in view of costs

- All trains 6 cars in length;
- Multi-Modal Transport Hub at Great Victoria Street;
- Ballymartin Rail Station;
- Hourly Enterprise Services; and
- Increased Frequency on Larne and Lisburn Lines.

Coding Detail

- As for IM03 Rail A, but new stations removed on Larne line and increased frequency applied on Lisburn line.

7.3.15. **IM12 – Demand Management B**

Scheme

As an alternative to Demand Management A in view of concerns about the deliverability of tolling and its apparent negative knock-on impacts. Scheme is;

- City centre controlled parking zone.

Coding Detail

- A £20 increase has been added to the city centre parking charge.

Verification of Model Results

7.3.16. It is important that the model outputs are inspected to ensure that the model is producing intuitively correct results before passing these to the appraisal framework. It has been identified also that the modal choice results have a substantial impact on the appraisal framework results.

7.3.17. The results for the Illustrative Measures, run with 2030 PDS3 demand, have been compared against a Do Minimum network alternative. Figure 7.13 shows the total change in trips within the BCC area in the AM peak hour. The highway demand is shown in passenger car units (PCU) whereas the bus and rail demand are shown in person trips.

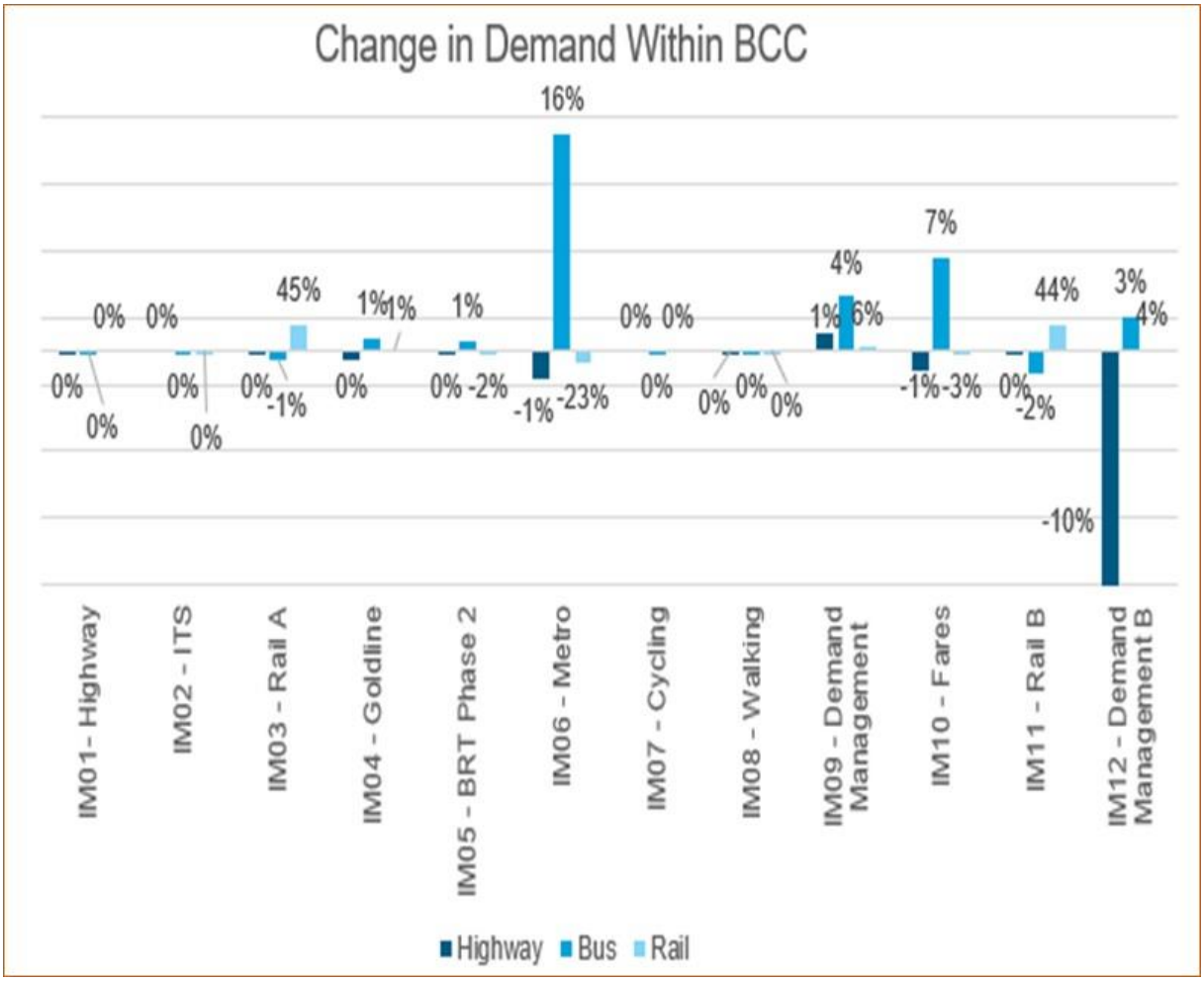

Figure 7.13 – Total Change in Demand within BCC (AM Peak) by Mode

7.3.18. Figure 7.13 shows:

- IM03 (Rail A) and IM11 (Rail B) show a significant increase in rail trips (45% increase in rail) within BCC;
- IM06 (Metro) shows a significant increase in bus person trips (16%), which includes some transfer from rail (a 23% decrease in rail trips);
- IM10 (Fares) shows a 7% increase in bus person trips within the BCC area with a reduction in both highway and rail trips within BCC; and,
- IM12 (Demand Management B) shows a decrease in highway trips (10%) within BCC.

7.3.19. The modelling outputs in this section have demonstrated that in general:

- Highway related IMs improve the travel time and attractiveness of highway;
- Bus based IMs result in a mode shift towards bus; and
- Rail based IMs result in a mode shift towards rail;
- The Demand Management Illustrative Measures result in an overall reduction in highway trips and in turn total highway travel time across the network.

7.4. Appraisal of Options

Introduction

7.4.1. An Appraisal Framework has been produced in order to assess the impact of the Illustrative Measures in line with the potential objectives of the BMTP.

7.4.2. The purpose of the appraisal framework is to allow an assessment of the performance of the transport network against a range of objectives identified in relevant policy documents. This should ensure that any conclusions regarding the best performing transport measures accords with current policy and not simply with operational issues.

7.4.3. The appraisal framework was prepared early in the Transport Study process. This ensures that the formulation of the conclusions are fair and transparent, as the results of the tests were not known when the framework was prepared. It should also be noted that a degree of judgement is needed in concluding the best performing measures as scores cannot simply be totalled across all objectives.

7.4.4. The Appraisal Framework uses outputs form the transport model as indicators of the change from the do minimum option. The model output indicators matched to the objectives are presented below in Figure 7.14. A short explanation is provided for each:

- Objective 1 – regional accessibility relates to ease of regional connectivity and therefore travel times to the respective centres is an appropriate indicator produced directly by the model
- Objective 2 – local accessibility relates to financial viability and is therefore dependent on patronage and journey lengths which are estimated by the model
- Objective 3 – active travel networks, where improved, would be expected to produce an increase in walking and cycling use as predicted by the model
- Objective 4 – public realm would be expected to be supported by a reduction in traffic flows in the city centre
- Objective 5 – accessibility of the city centre can be quantified by using the TRACC software to prepare travel time catchment statistics
- Objective 6 – safety and air quality relate statistically to the scale of vehicle kms travelled (assuming fixed accident rates)
- Objective 7 – sustainable public transport and active travel networks require additional users whilst climate change adaptation requires reduced Green House Gas emissions and hence reduced private car use. Air Quality Management Areas require reduced vehicular flows in the local areas.

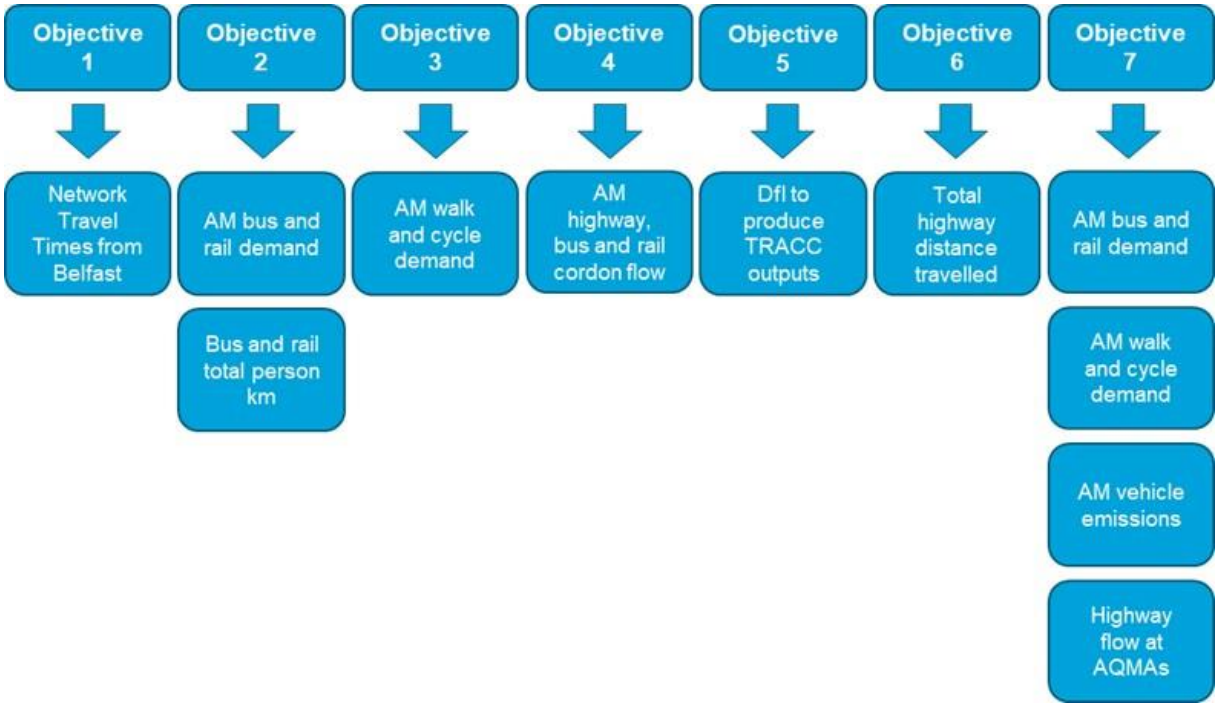

Figure 7.14 – Appraisal Framework Indicators

7.4.5. In selecting the indicators it was noted that compromises were needed in a number of instances based upon the strategic nature of the model. For instances, ideally model estimates would be extracted and totalled across the most sensitive city centre links. However, as the model has not been validated at link level, a more strategic cordon total is adopted. This was considered unavoidable and preferable to a wholly qualitative assessment. In addition, the impact of any modal switch from private car was likely to produce positive impacts across a number of objectives, for example Objectives 2, 4, 6 and 7. Finally it was noted that care would be needed in drawing conclusions from the appraisal results as the model results may not be sufficiently sensitive to identify significant impacts and the objectives are not weighted.

Appraisal Framework Results

7.4.6. The remainder of this section sets out the Appraisal Framework for the 2030 PDS3 Illustrative Measure model runs. While an overview of the result is found in Figure 7.15, the key results by Objective are:

- Objective 1 reflecting regional accessibility is positive for the Highway and Rail measures. The local bus and active travel measures have no significant impact whilst the demand management measure IM09, with tolls has a negative impact

- Objective 2 relating to improved public transport is positive for the public transport measures and neutral for all others

- Objective 3 relating to active travel is negative for the Public Transport infrastructure measures because the number of people forecast to walk and cycle is used to determine its performance. Therefore as public transport, especially Metro bus is improved, with shorter

waiting and journey times, in addition to people switching from car, a number of people switch from walk and cycle.

- Objective 4 relates to public realm. As modelled, most of the measures with the exception of ITS, cycle and demand management are forecast to have a positive impact primarily by reducing car modal share or traffic flows in the central area. Cycle has a neutral impact due to its small impact in terms of numbers, whilst demand management causes traffic diversion from strategic roads to local roads. ITS as modelled simply makes traffic flow more efficiently and has a negative impact.

- Objective 5 results are awaiting TPMU technical input.

- Objective 6 relates primarily to the level of travel by private car. Therefore the highway measures increase car mode share and hence have a negative impact whilst demand management reduces car mode share and traffic and hence has a positive impact. It is noted that this is a coarse measure and would benefit from additional detailed consideration.

- Objective 7 relates to traffic levels and impacts on air quality. Whilst in general public transport and cycling score positively the neutral impacts for other measures reflect the mixed impacts on air quality management areas.

Conclusions

7.4.7. It can be concluded from the model results that improvements to particular modes of transport provide direct impacts on that mode but rather limited impacts across the range of objectives in the appraisal framework. It was also concluded that modal shift from private car commuting is very important in achieving positive impacts across the range of objectives.

Illustrative Measure	Objective 1 - Enhance accessibility by road and public transport from the centre of Belfast to Londonderry, gateways and hubs to support greater levels of inward investment	Objective 2 - Ensure financially viable and sustainable public transport accessibility to essential services for people living in Belfast City Council Area	Objective 3 - Ensure there are attractive and safe active travel networks (walking and cycling) linking all residential, retail, leisure, culture, office and commercial uses within the urban areas of the Belfast City Council area	Objective 4 - Deliver high quality public realm in Belfast City Centre and in district centres with reduced vehicle dominance, to make them attractive, shared spaces to live and work and improve safety for active modes.	Objective 5 - Enhance transport accessibility and manage traffic congestion to Belfast City Centre and to district centres to strengthen Belfast's role as the regional economic driver	Objective 6 - Enhance safety for all modes of travel and reduce the number and severity of casualties.	Objective 7 - Ensure our transport systems are resilient to climate change and are well maintained.
IM01 – Highway	✓			✓	DfI to Produce TRACC Outputs	×	
IM02 – ITS				×			
IM03 – Rail A	✓	✓	×	✓			✓
IM04 – Goldline		✓	×	✓			✓
IM05 – BRT Phase 2		✓	×	✓			
IM06 – Metro		✓	×	✓			✓
IM07 – Cycle			✓				✓
IM08 – Walk			✓	✓			
IM09 – Demand Management	×	✓	×			✓	
IM10 – Fares		✓	×	✓			✓
IM11 – Rail B	✓	✓	×	✓			✓
IM12 – Demand Management B		✓	✓	✓		×	

Summary Table Colour	Outcome Type
✓	Positive Contribution
	Neutral Contribution
×	Negative Contribution

Figure 7.15 – Illustrative Measure Appraisal Framework Overview

7.5. Alternative Illustrative Networks

7.5.1. The final element of model testing involved combining a series of the illustrative transport measures into alternative illustrative networks. The appraisal framework was then used to assess their respective performance under 2030 PDS3 conditions. These alternative networks were developed based on the modelling results of the illustrative measures and PDS model runs.

7.5.2. The earlier modelling had shown that improvements to particular modes of transport tended to have direct impacts on that mode but rather limited impacts across the range of objectives in the appraisal framework. It was also noted that modal shift from private car commuting was quite pivotal in achieving substantial impacts across the range of objectives. Finally it was clear that in practice a mix of infrastructure improvements across the range of transport modes would be needed and that both 'stick' (prohibitive) and 'carrot' (enabling) measures should be assessed.

7.5.3. This section describes the derivation of the Alternative Networks and the model Results.

Derivation and Coding of Alternative Networks

7.5.4. The two Alternative Networks (ANs) tested were:

- AN01 focused on combining the previously tested Illustrative Measures into a single network with the exclusion of IM09 - demand management. It was considered important to understand how effective enabling measures, in combination, might be in achieving modal shift and wider objectives. Due to the overlap of indicative schemes included within the two rail illustrative measures it was decided that only one needed to be included in the alternative networks and Rail B was selected.

- AN02 was identical to AN01 but with the inclusion of a substantial Belfast city centre parking charge to represent city centre based parking restraints. Consideration of the results for IM09 suggested that the cordon of tolls would have substantial traffic diversion impacts and that, at this stage, city centre parking represented a more practical form of demand management to test. The difference in model results would be attributed directly to the parking restraint.

7.5.5. Table 7.5 confirms the relevant illustrative measures included in the alternative networks under test

Table 7.5 - Alternative Network Coding Overview

Alternative Networks (AN)	Illustrative Measures (IM) Included
AN01	IM01 – Highway; IM02 – ITS; IM04 – Goldline; IM05 – BRT Phase 2; IM06 – Metro; IM07 – Cycling; IM08 – Walking; IM10 – Fares; IM11 – Rail B
AN02	As AN01 but with IM12 Demand Management B

7.5.6. The same Planning Development Scenario (PDS3 – Public Transport orientated growth) was used as the Reference Demand forecast for the do minimum and to test both networks. In addition, in order to test the effectiveness of the two networks they were compared with the Reference Demand applied to a Do Minimum network.

Model Results

7.5.7. Figure 7.16 presents the results of the alternative networks and show the varying growth across the modes from 2013 levels.

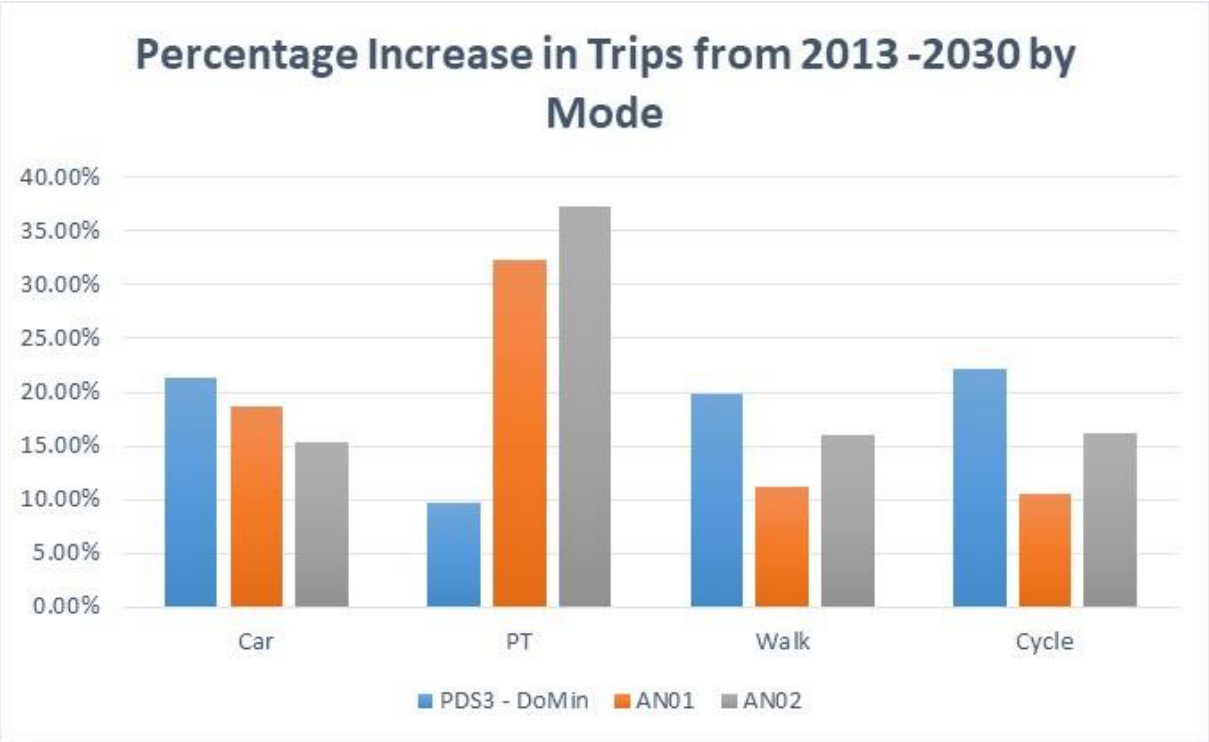

Figure 7.16 - Percentage Increase in Trips from 2013 -2030 by Mode

7.5.8. Without any transport intervention (PDS3 DoMin) there are increases of approximately 21% in car trips, 10% in public transport trips, 20% in walking trips and 22% in cycling trips. The significant increase in car trips would be expected to add to congestion and result in travel time increases. Note that the car increase is above the 19% total trip growth and therefore extends the modal dominance of private vehicles. This effect was confirmed by considering the 24 hour modal split in Figure 7.17. In the 2030 PDS3 Do Minimum test Highway use has increased from 59% to 60% in 2013 model base year.

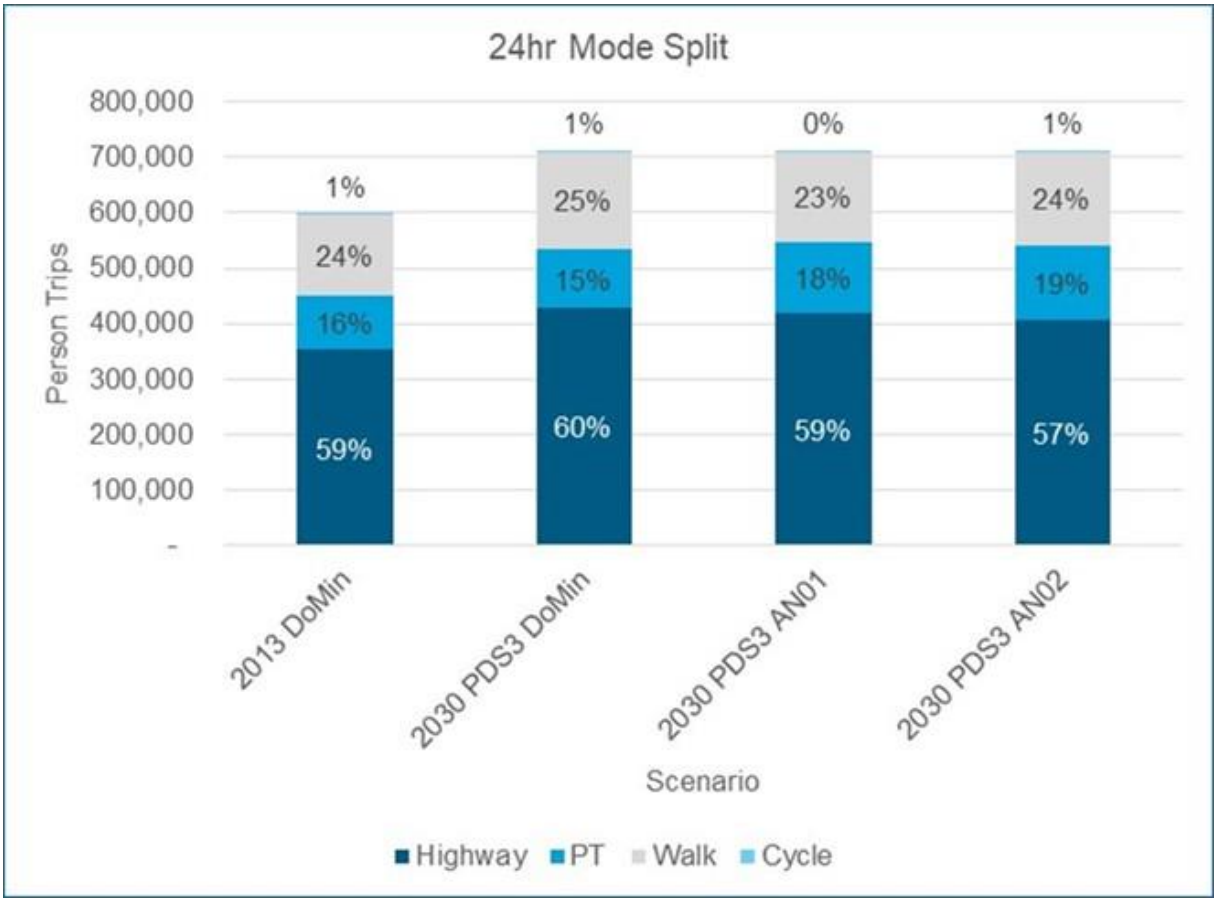

Figure 7.17 – 24 hour Trips by mode of travel

Alternative Network 01

7.5.9. AN01 combines the previously tested Illustrative Measures into a single network with the exclusion of IM09 - demand management. Figure 7.16 confirms that introducing the combined transport measures in AN01 favours public transport with an increase of 32% from the base year, 22 percentage points higher than the 2030 Do Minimum. In doing so, AN01 reduces the growth of car trips to 19% bringing it in line with the total increase in trips.

7.5.10. One notable negative impact of AN01, as estimated by the model, is that it reduces the growth in active travel modes to around 11% (9 percentage points lower for walking and 11 percentage points lower for cycling than the 2030 Do Minimum). This is a result of the improved attractiveness of public transport, with some people switching from walking or cycling when the bus is reliable, fast and cheap. However, it should be noted that the model is concerned with the main mode of travel only. Undoubtedly people switching to public transport will still use walk or cycle as part of their journey. This 'real-life' effect is not recorded in the model results.

Alternative Network 02

7.5.11. AN02 is identical to AN01 but with the inclusion of a substantial Belfast city centre parking charge to represent city centre based parking restraints. Figure 7.16 confirms that AN02 favours public transport even further with an increase of 37% from the base year, 27 percentage points more than the 2030

Do Minimum and 5 percentage points higher than AN01. As with AN01, it has a negative impact on active travel but to a lesser extent.

7.5.12. AN02 shifts more users away from private vehicles than AN01 with an increase of only 15% in car trips, a reduction of 6 percentage points over the 2030 Do Minimum. Importantly this means that the increase in car trips falls below the total increase in trip. As can be seen in Figure 7.17 this reduces the mode share for private vehicles by 2 percentage points from the 2013 base year. Figure 7.17 also highlights car modal share; AN01 maintains 2013 levels whilst AN02 reduces it.

7.5.13. Before considering the Appraisal Framework results, it is useful to confirm the effects of the Alternative Networks on the performance of the highway network. Inspection of the VOC results by link and Delays at junctions have not identified major differences between AN01 and AN02. The Figures below present difference plots between the 2030 PDS3 Do Minimum and 2030 AN02 networks. Figure 7.18 shows VoC whilst Figure 7.19 shows delays.

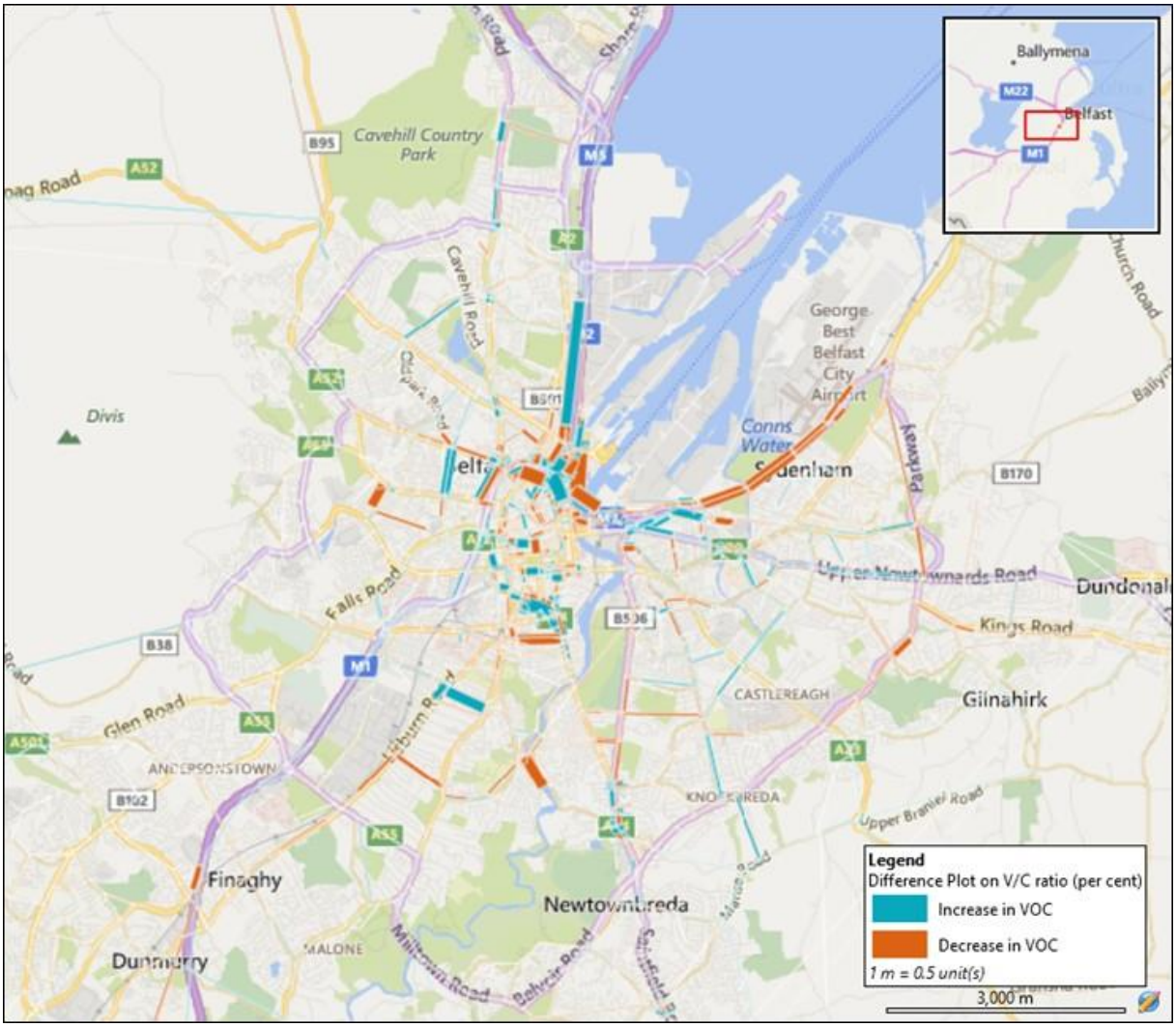

Figure 7.18 – 2030 AN02 - 2030 PDS3 Do Minimum VOC Difference Plot

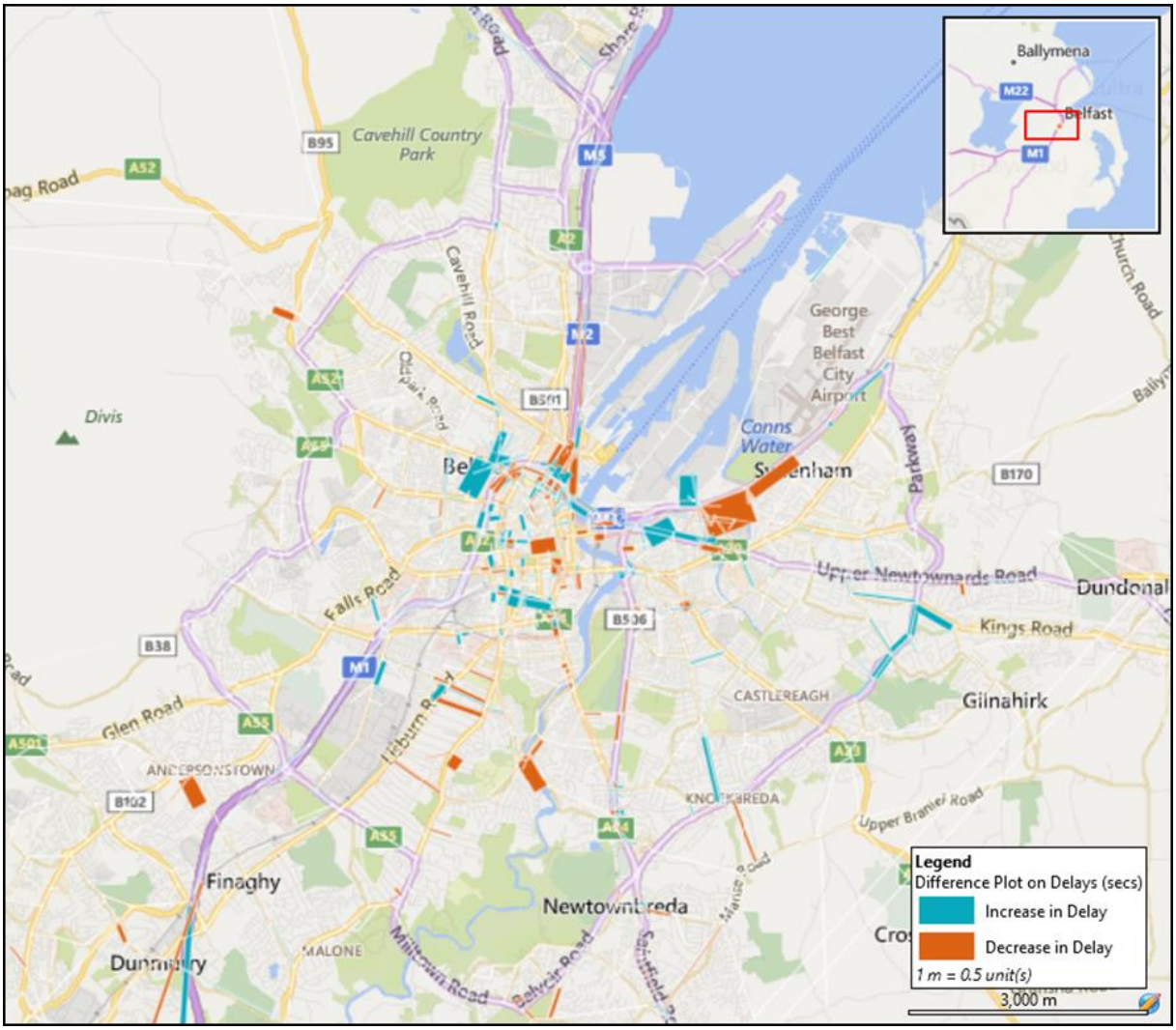

Figure 7719 – 2030 AN02 - 2030 PDS3 Do Minimum Delay Difference Plot

7.5.14. Both Figure 7.18 and 7.19 show increases and decreases in the mapped performance indicator. However it is perhaps notable that decreases in VoC and junction delay are both observed close to the highway schemes included in the Alternative Network:

- M1;
- York Street Interchange.

7.5.15. This suggests that highway schemes can have a positive local impact on operational performance.

7.6. Appraisal of Networks

Appraisal Framework Results

7.6.1. As for the Illustrative Measures, the effectiveness and appropriateness of future Alternative Illustrative Networks are assessed against the study objectives by using the Appraisal Framework. The results of the Appraisal Framework for the Alternative Networks are summarised in Figure 7.20.

Illustrative Measure	Objective 1 - Enhance accessibility by road and public transport from the centre of Belfast to Londonderry, gateways and hubs to support greater levels of inward investment	Objective 2 - Ensure financially viable and sustainable public transport accessibility to essential services for people living in Belfast City Council Area	Objective 3 - Ensure there are attractive and safe active travel networks (walking and cycling) linking all residential, retail, leisure, culture, office and commercial uses within the urban areas of the Belfast City Council area	Objective 4 - Deliver high quality public realm in Belfast City Centre and in district centres with reduced vehicle dominance, to make them attractive, shared spaces to live and work and improve safety for active modes.	Objective 5 - Enhance transport accessibility and manage traffic congestion to Belfast City Centre and to district centres to strengthen Belfast's role as the regional economic driver	Objective 6 - Enhance safety for all modes of travel and reduce the number and severity of casualties.	Objective 7 - Ensure our transport systems are resilient to climate change and are well maintained.
AN01: • IM01 – Highway; • IM02 – ITS; • IM04 – Goldline; • IM05 – BRT Phase 2; • IM06 – Metro; • IM07 – Cycling; • IM08 – Walking; • IM10 – Fares; • IM11 – Rail B		✓	×	✓	DfI to Produce TRACC Outputs		✓
AN02: • AN01 • IM12 - £20 Parking Charge		✓	×	✓		×	✓

Summary Table Colour	Outcome Type
✓	Positive Contribution
	Neutral Contribution
×	Negative Contribution

Figure 7.20 – AN Appraisal Framework Overview

7.6.2. The results show the strengths and weaknesses of the networks. In general terms, and as would be expected, the results largely mirror the results of the illustrative measures which have been combined in the Alternative Network, as follows:

- Objective 1 regional accessibility is neutral in both as the predominant impact arises from the focus of local public transport measures.

- Objective 2 public transport accessibility is positive in both due to the local public transport measures.

- Objective 3 walking and cycling is recorded as negative in both due to the modal switching impact of the public transport measures. However it should be noted that this modelling result overlooks the 'real-life' effect of greater use of active modes to access public transport.

- Objective 4 public realm is positive in both - the predominant impact arises from the public transport measures whilst the demand management measures no longer include tolls which had previously had an impact in diverting traffic onto local roads

- Objective 5 transport accessibility results are awaiting TPMU technical input. There may be differences between AN01 and AN02. Whilst both would include the impact of improved public transport times, the level of traffic congestion may differ. It is expected that traffic congestion would be moderated by the demand management measures

- Objective 6 relating to safety is neutral in AN01 but recorded as a negative in AN02. Whilst this appears counter-intuitive, it is considered to be due to an increase in vehicle travel distance arising from the re-routing of private cars and a change in destinations to avoid the demand management area. This modelling result ignores that, in practice, supporting local measures would undoubtedly be introduced to minimise these effects and maximise the positive impacts of a decrease in trips by private car.

- Objective 7 relating to environment are positive for both networks reflecting the balance of impacts arising from public transport and active travel measures.

7.6.3. The appraisal framework results suggest that, as would be expected, both the Alternative networks perform better than the Do Minimum network. AN01 would appear to perform slightly better as AN02 scores negatively against Objective 6 safety. However inspection of the detailed results confirm that the summary results are slightly misleading for the following general reasons:

- In many instances minor changes in impacts have been scored as positive or negative when it might be argued that the impacts are insignificant and hence neutral;
- In several instances the positive impact of the AN02 objective is larger than the AN01 objective and yet both are scored equally, for example:
    - Objectives 2, 4 and 7 where AN02 has additional public transport usage; and,
    - Objective 7 where AN02 has a greater positive impact on Air Quality Management Areas.

- In addition it is noted that in Objective 3, AN02 has a smaller negative impact than AN01.

7.6.4. In summary, detailed inspection of the Appraisal Framework results for AN01 and AN02 suggest that AN02 performs slightly better across the range of objectives.

Conclusions

7.6.5. By 2030 there is estimated to be a 19% increase in the number of trips predicted in the BMUA. The results of AN01 testing indicates that even with the improved infrastructure that has a focus on sustainable travel modes this growth still results in a 19% increase in car trips. This will result in increased congestion, road traffic collisions and reduced air quality compared to current conditions. However when compared to a Do Minimum network, AN01 returns a positive impact across a range of objectives with the only concern being the potential for improved public transport to reduce the use of active modes, especially for shorter journeys.

7.6.6. The results of AN02 demonstrates that demand management is an effective means of reducing car travel and car dominance within the city. While it reduces the modal share the increase in car trips is still 15% and this will further worsen air quality, road traffic collisions and congestion compare to current conditions. Compared to AN01, the addition of demand management measures returns a more positive impact compared to Do Minimum conditions across a range of objectives when detailed appraisal framework results are inspected.

7.6.7. Further work is still required to determine the most appropriate demand management approach for the BMTP area to maximise the modal shift to sustainable modes of travel while supporting local growth and trade. Careful use will need to be made to the appraisal framework to ensure it represents impacts in a real-life manner.

7.7. Overall Modelling Conclusions

7.7.1. The model structure and verification has been inspected and explained. As the model is strategic the results are considered indicative rather than definitive. It has been concluded that the modelling approach is appropriate and fit for purpose in terms of differentiating between the relative performance of strategic options in terms of modal choice, traffic congestion and public transport patronage.

7.7.2. It was concluded that the Appraisal Framework as formulated using model outputs would provide a transparent and equitable basis on which to assess the relative performance of alternative measures in line with the current shared policy objectives of the Department and the Councils. The use of the appraisal framework has identified issues regarding the recording of small changes in model outputs and hence impacts and the representation of impacts in a real-life manner.

7.7.3. The transport model was run using forecasts of population and employment available at March 2018. Whilst the Belfast City Council LDP is being prepared for 2035, the other councils in the metropolitan area have earlier forecast years. Therefore, with the intention of under-estimating rather than over-estimating transport demand should the LDPs' growth be delivered, 2030 was chosen as the modelling forecast year.

7.7.4. The model has been used to generate a range of planning development scenarios with alternative levels of growth and distribution. It was concluded that the PDS3 scenario represented a reasonable 2030 reference scenario with which to assess the impact of alternative transport measures. The scenario incorporated Councils' ambitions for levels of growth and as such represented a 'worst case' or likely maximum for transport demand in the BMUA. However the scenario also included a 'best practice' assumption in that the growth in development was focused in locations served by public transport. The scenario showed that by 2030 overall 24 hour transport demand across NI would increase by 11% and, under a Do Minimum network assumption, AM traffic conditions in the BMUA area would deteriorate substantially from 2013 with additional congestion and associated problems.

7.7.5. The testing of Illustrative Transport Measures has shown that improvements to particular modes of transport tend to have direct impacts on that mode but rather limited impacts across the range of objectives in the appraisal framework. It was also noted that modal shift from private car commuting was quite pivotal in achieving substantial impacts across the range of objectives. Finally it was clear that in practice a mix of infrastructure improvements across the range of transport modes would be needed and that both 'stick' (prohibitive to the use of private vehicles) and 'carrot' (enabling use of sustainable modes) measures should be assessed.

7.7.6. By 2030 there is estimated to be a 19% increase in the number of trips predicted in the BMUA. Model testing indicates that even with the improved infrastructure that has a focus on sustainable travel modes (AN01) this growth still results in a 19% increase in car trips. This will result in increased congestion and reduced air quality.

7.7.7. The final testing demonstrates that demand management is an effective means of reducing car travel and car dominance within the city. Detailed inspection of the appraisal framework results has identified that, on balance, the inclusion of demand management measures returns a positive impact across a range of objectives. While demand management reduces the car modal share below 2013 percentages the absolute increase in car trips is still 15% which will have a detrimental impact on air quality and congestion. Further work will be required to determine the most appropriate demand management approach for the BMTP area to maximise the modal shift to sustainable modes of travel while supporting local growth and trade.

7.7.8. It was noted that subsequent to the completion of the modelling runs, Councils revised their planning assumptions. An investigation of the impact of these revisions to the robustness of the modelling results has therefore been included at Annex I. That investigation has concluded that the modelling results remain a robust under-estimate of the likely travel demands in the congested study area focused on Belfast City Council. Importantly, the testing had identified that future traffic levels would be unacceptably high and therefore demand management measures would be required to reduce them and force a modal shift. That conclusion therefore remains valid even under revised planning assumptions.

8.0 Indicative Transport Measures

8.1. Introduction

8.1.1. This section presents the range of proposed indicative Transport Measures recommended to be considered within the BMTP for delivery up to 2035 to guide the development the BMTP area councils. The measures have been identified using a standard objectives-based approach and have been assessed against the objectives identified earlier in order to identify the most appropriate set of Transport Measures. More detail on the process used to determine the measures can be found in Annex B – Illustrative Transport Measures.

8.2. BMUA Illustrative Transport Measures

8.2.1. The illustrative measures to be considered further in the BMTP for the BMUA are as follows;

8.2.2. **Walking**

Walking schemes such as a Walking Masterplan in Belfast City Centre.

8.2.3. **Cycling**

Cycling schemes such as a network-wide adoption of a Cycling Masterplan

8.2.4. **Metro Bus Improvements**

Improvement to the Metro Bus services such as;

- Increase Current Frequencies;
- Cross City Services; and
- Increase bus priority infrastructure.

8.2.5. **Bus Rapid Transit (BRT)**

New BRT routes. For instance the introduction of a North/South route.

8.2.6. **Inter-urban Bus Services**

Improved Inter-urban schemes. For example;

- Increased Goldline Frequencies;
- Extension of the M2 Hard Shoulder Running; and
- Additional Local Park and Ride.

8.2.7. **Rail**

Improved rail services through schemes like;

- All Trains 6 car;
- Multi-Modal Transport Hub at the Great Victoria Street;
- Ballymartin Rail Station;
- Hourly Enterprise Services;

- New Belfast Metropolitan Area (BMA) stations (such as Gamble Street, Merville, Monkstown); and
- Increased Frequency on Larne and Lisburn Lines.

8.2.8. **Public Transport Fares**

Consideration of options for reducing Public Transport Fares

8.2.9. **Highway**

Improved highway schemes. For Example;

- York Street Interchange – fully grade separated junction between the A12 Westlink/ M2 and M3;
- Inner Ring Road – new highway link between Bruce Street and A24 Ormeau Road;
- Dualling of A26; and
- Radial Capacity Enhancements
  - A55 Knock Road (2 lanes in each direction);
  - A2 Sydenham Bypass (3 lanes in each direction and closure of side roads);
  - M1/A1 Sprucefield Bypass (2 lanes in each direction);
  - M1 Widening (3 lanes in each direction).

8.2.10. **Intelligent Transport Systems**

Updated Intelligent Transport Systems such as;

- Upgraded Urban Traffic Control for the Belfast Central Zone increasing the efficiency of the traffic throughput and reducing delay through the Belfast Central Zone signalised junctions.

8.2.11. **Demand Management**

Schemes to reduce the demand for private vehicle transport to Belfast City Centre. For example;

- City centre controlled parking zone;
- Residential Parking Schemes;
- Work Place Parking Levy;
- Restrictions on single occupancy cars.

8.3. Outer Area Transport Measures

8.3.1. In line with the Transport Studies presented in Annexes E-H and following the assessment of options against the appraisal framework, it was concluded that the following measures were required in the towns and centres throughout the BMTP area.

8.3.2. **1: Improved Park and Ride and Park and Share on Key Transport Corridors (KTCs) and radial routes**

New locations for park and ride and park and share facilities identified and prioritised on the KTCs and radial routes to Belfast City Centre. These facilities should be strategically placed, considering the travel patterns of commuters and the areas which would benefit from improvements in public transport use. These facilities would also benefit commuters and increase accessibility and connectivity to the wider Northern Ireland area.

8.3.3. **2: Consider new road infrastructure within town centres which facilitate public realm enhancements or improvements to active travel modes**

While there may be no current requirements to implement new road infrastructure within the town centres, this option should be retained for potential consideration in the future. Should a need arise for this type of infrastructure, this measure will be reviewed. A number of potential developer-led schemes will be considered and their benefits to the town centres reviewed.

8.3.4. **3: Improved "limited-stop" bus services to key hubs**

New "limited-stop" bus services are expected to be identified and prioritised on the KTCs to and from towns. These services will build upon the existing network of bus services. The bus services will capitalise on continued road improvements and seek to identify where the greatest benefits can be derived.

8.3.5. **4: Improved integration between public transport modes to simplify travel for passengers**

To promote and encourage the use of public transport, it will be important to consider the linkages between modes and the ease with which this can occur. This could include local bus services connecting to train stations or limited stop bus services.

8.3.6. **5: Provision of a network of attractive walking and cycling routes in towns and greenways between towns**

The provision of improved walking facilities in towns. The current pedestrian networks are below standard in some areas. Levels of walking and cycling are low, particularly as a method of travel to work. Improvements to walking facilities and the addition of cycling infrastructure would help to encourage the use of active travel modes. It is also important the active travel modes link to and from public transport services.

8.3.7. **6: For new developments, walk and cycle infrastructure both within the development and linking to existing or planned networks are provided by the developer**

When planning for new developments, it is essential that walking and cycling infrastructure is considered as part of the development proposals. Walking and cycling linkages from the development should be linked to existing infrastructure, ensuring a continuous provision is made. It is also necessary to consider how active travel infrastructure is incorporated into the development itself.

8.3.8. **7: Increases in peak period rail capacity to Belfast City Centre and generators of additional demand.**

Rail services have proven to be attractive alternatives to private car for journeys to Belfast City Centre. The benefit of the existing rail infrastructure should be maximised with attention paid to access including parking and encouragement of interpeak, offpeak and reverse commuting passengers.

8.3.9. **8: Town Centre Parking Strategies that manage demand for long and short-stay spaces at locations which reduce town centre congestion and traffic circulating for parking spaces**

Town Centre Parking Strategies will be required in towns. The location of public parking and its designation as long or short stay will be considered within the Parking Strategies. The strategies should remove extraneous traffic which dominates the town centres and improves the turnover of parking spaces. Special consideration will be needed for parking at bus and rail stations for travel to Belfast.

8.3.10. **9: Traffic management schemes which enhance safety and give priority to pedestrian, cycling and public transport movements to the town centre**

It is necessary that road space is used by a range of modes. Consideration should be given to re-balancing priority to pedestrians, cyclists and public transport within the town centre. This is particularly important in shopping streets, however locations where parking is designated should not be unduly inconvenienced.

8.3.11. **10: Ensure new transport infrastructure is designed and provided to current 'best practice' standards**

When designing transport infrastructure, this should be completed to 'best practice'. This will strive towards maximising performance and ensuring resilience. Resilience to system failures, such as traffic signal failures or flooding, can be increased by providing 'back-up' systems. Overall urban travel resilience can be increased by ensuring that realistic active travel options are provided.

8.4. Land-Use

8.4.1. The BMTS concludes that land-use policy can make a contribution to modifying the demand for transport and the move to more sustainable modes of transport.

At a strategic level, residential development and key services should be focused in city and town centres which are the natural focus of sustainable networks. Additionally in rural areas, alternative models of delivery of services are essential.

8.4.2. In the BMUA, drawing on the results of the strategic transport model, greater density of new development close to public transport hubs and along any public transport routes should also be encouraged.

Annex A Development of Transport Objectives

1. Approach

1.1 The BMTP is being developed to support the achievement of the objectives set out in Draft Programme for Government (PfG)/ Outcomes Delivery Plan, the Regional Development Strategy 2035 – Building a Better Future, Ensuring a Sustainable Transport Future: A New Approach to Regional Transportation and Northern Ireland Changing Gear – A Bicycle Strategy for Northern Ireland.

1.2 In addition, the objectives have been developed following careful consideration of the existing strategic policy context and the draft local policies contained in the LDP Preferred Options Papers and Community Plans produced by each of the BMTP Councils.

1.3 The BMTS uses the same set of objectives to appraise the Illustrative Measures considered as part of the study.

1.4 The following approach has been adopted:

- Develop a number of transport objectives and check their alignment against the Region-wide policies and strategies. The result are displayed in Table A.1;
- Confirm alignment of the transport objectives against the objectives in the councils' LDP Plan Preferred Options Papers – Table A.2;
- Confirm Objectives for each council area – Table A.3;
- Confirm BMTP Objectives.

Table A.1 - BMTP Objectives alignment with Region-wide Policies and Strategies

LTS Objective	PfG	ODP	RDS	New Approach	NI Changing Gear
Objective 1 - Improving external linkages	Outcome 1 (economic focus) Outcome 2 Outcome 13	Outcome 1 Outcome 2 Outcome 11	Aim 1 Aim 2 Aim 5 Aim 8	Objective 1 Objective 2 Objective 4 Objective 8	n/a
Objective 2 - Improving public transport accessibility	Outcome 2 Outcome 13	Outcome 2 Outcome 11	Aim 2 Aim 4 Aim 5 Aim 7	Objective 2 Objective 4 Objective 5 Objective 8 Objective 10	n/a
Objective 3 - Improving active travel accessibility	Outcome 2 Outcome 13	Outcome 2 Outcome 11	Aim 1 Aim 2 Aim 4 Aim 5 Aim 6 Aim 7	Objective 2 Objective 4 Objective 7 Objective 8 Objective 9 Objective 10 Objective 12	Objective 1 Objective 2 Objective 3 Objective 4
Objective 4 - Providing high quality public realm	Outcome 2 Outcome 13	Outcome 2 Outcome 11	Aim 1 Aim 2 Aim 4 Aim 6 Aim 7	Objective 4 Objective 7 Objective 8 Objective 9 Objective 10 Objective 12	Objective 1 Objective 2 Objective 3 Objective 4
Objective 5 - Improving City/Town centre accessibility	Outcome 2 Outcome 13	Outcome 2 Outcome 11	Aim 1 Aim 2 Aim 4 Aim 5	Objective 4 Objective 9	Objective 1 Objective 2 Objective 3 Objective 4
Objective 6 - Improving public safety including air quality	Outcome 4	Outcome 4	Aim 4	Objective 7	Objective 4
Objective 7 - Promoting sustainability and resilience	Outcome 2	Outcome 2	Aim 6 Aim 7	Objective 3 Objective 11 Objective 12	Objective 1 Objective 2 Objective 3 Objective 4

Table A.2 - BMTP Objectives alignment with Councils' LDP Plan POP Objectives

LTS Objective	BCC POP	LCCC POP	MEA LDP POP	AND POP
Objective 1 - Improving external linkages	Objective 1 Objective 9 Objective 11	Objective 1 Objective 2 Objective 3 Objective 4 Objective 5	Social (a & g) Economic (f) Environmental (h, i & j)	People/Social Place/Environmental
Objective 2 - Improving public transport accessibility	Objective 3 Objective 5 Objective 9 Objective 10 Objective 11 Objective 12 Objective 13 Objective 14	Objective 1 Objective 2 Objective 3 Objective 5	Social (g) Economic (f) Environmental (i & j)	Place/Environmental
Objective 3 - Improving active travel accessibility	Objective 3 Objective 5 Objective 7 Objective 10 Objective 11 Objective 12 Objective 13 Objective 14 Objective 17 Objective 18	Objective 1 Objective 2 Objective 3 Objective 4 Objective 5 Objective 6	Social (g & j) Environmental (h, i & j)	People/Social Place/Environmental
Objective 4 - Providing high quality public realm	Objective 3 Objective 4 Objective 5 Objective 6 Objective 7 Objective 9 Objective 10 Objective 14 Objective 18	Objective 1 Objective 2 Objective 3 Objective 4 Objective 5 Objective 6	Social (a, b, g & k) Economic (e) Environmental (h, i & j)	People/Social Place/Environmental
Objective 5 - Improving City/Town centre accessibility	Objective 1 Objective 5 Objective 9 Objective 10 Objective 11 Objective 12 Objective 13	Objective 1 Objective 2 Objective 3 Objective 4 Objective 5	Social (a, g & j) Economic (e & f) Environmental (h, i & j)	Prosperity/Economic
Objective 6 - Improving public safety including air quality	Objective 1 Objective 4 Objective 5 Objective 11 Objective 12 Objective 13 Objective 14	Objective 1 Objective 5	Social (f) Economic (f & g) Environmental (j)	Place/Environmental
Objective 7 - Promoting sustainability and resilience	Objective 3 Objective 6 Objective 13 Objective 14 Objective 18 Objective 19	Objective 1 Objective 3 Objective 5 Objective 6	Social (j) Economic (f) Environmental (g, h, i & j)	Place/Environmental Prosperity/Economic

Table A.3 - BMTP Objectives Tailored for each Council Area

	Antrim & Newtownabbey	Ards & North Down	Belfast City Council	Lisburn & Castlereagh	Mid & East Antrim
Objective 1 - Improving external linkages	Enhance accessibility and connectivity by road and public transport from the centre of Antrim, Ballyclare, Crumlin and Randalstown to strategically important areas including Belfast, Derry, gateways and hubs to support sustainable economic growth of our town and commercial centres	Enhance accessibility by road and public transport from the centres of Bangor, Newtownards and Holywood to Belfast, Derry, gateways and hubs.	Enhance accessibility by road and public transport from the centre of Belfast to Derry, gateways and hubs to support greater levels of inward investment	Enhance accessibility by road and public transport from the centres of Lisburn City, Metropolitan Castlereagh, Moira and Carryduff to Belfast, Derry, gateways and hubs	Enhance accessibility and connectivity by road and public transport from the centre of Ballymena, Carrickfergus, Greenisland and Larne to Belfast, Derry as well as gateways and hubs
Objective 2 - Improving public transport accessibility	Ensure viable public transport accessibility for all citizens, especially vulnerable people, living, working, studying and visiting in the Antrim and Newtownabbey Borough Council area	Ensure viable public transport accessibility to essential services for people living in Ards & North Down Borough Council Area.	Ensure financially viable and sustainable public transport accessibility to essential services for people living in Belfast City Council Area	Ensure viable public transport accessibility to essential services for people living in the L&CCC area	Ensure viable public transport accessibility to essential services for people living and working in MEABC area to promote inclusive communities

Objective 3 - Improving active travel accessibility	Promote community health and well being through the delivery of high quality, safe active travel networks (walking and cycling) linking all necessary community facilities in the urban areas of Antrim, Ballyclare, Crumlin and Randalstown to existing and new developments	Ensure there are attractive and safe active travel networks (walking and cycling) linking all existing and new residential, employment, retail and leisure developments in the urban areas of Bangor, Newtownards and Holywood.	Ensure there are attractive and safe active travel networks (walking and cycling) linking all residential, retail, leisure, culture, office and commercial uses within the urban areas of the Belfast City Council area	Ensure there are attractive and safe active travel networks (walking and cycling) linking all residential, employment, retail and leisure uses in the urban areas of Lisburn City, Metropolitan Castlereagh, Moira and Carryduff	Promote community health and wellbeing through the delivery of high quality, safe active travel networks (walking and cycling) linking all residential, employment, retail and leisure uses in the urban areas of Ballymena, Carrickfergus, Greenisland and Larne
Objective 4 - Providing high quality public realm	Ensure quality of place through the delivery of an enhanced public realm environment in the centres of Antrim, Ballyclare, Crumlin and Randalstown	Deliver high quality public realm in the centres of Bangor, Newtownards and Holywood, with reduced vehicle dominance, to make the towns attractive places to live and work and to improve safety for active travel modes.	Deliver high quality public realm in Belfast City Centre and in district centres with reduced vehicle dominance, to make them attractive, shared spaces to live and work and improve safety for active modes.	Deliver high quality public realm in the centres of Lisburn City, Metropolitan Castlereagh, Moira and Carryduff, with reduced vehicle dominance, to make the towns attractive places to live and work and to improve safety for active travel modes	Ensure legibility and quality public realm, with reduced vehicle dominance, in the centres of Ballymena, Carrickfergus, Greenisland and Larne

Objective 5 - Improving City/Town centre accessibility	Enhance accessibility by sustainable modes of trasport to the centres of Antrim, Ballyclare, Crumlin and Randalstown to promote the development of town centres, protect business and employment opportunities and thus supporting sustainable economic growth	Enhance accessibility by sustainable modes of transport to the centres of Bangor, Newtownards and Holywood to safeguard their viability.	Enhance transport accessibility and manage traffic congestion to Belfast City Centre and to district centres to strengthen Belfast's role as the regional economic driver	Enhance accessibility by all modes of transport to the centres of Lisburn City, Metropolitan Castlereagh, Moira and Carryduff to safeguard their viability	Enhance accessibility by all modes of transport to the centres of Ballymena, Carrickfergus, Greenisland and Larne to connect people and opportunities and to safeguard town centre viability.
Objective 6 - Improving public safety including air quality	Enhance safety for all modes of transport and reduce the number and severity of casualties	Enhance safety for all modes of transport and reduce the number and severity of casualties.	Enhance safety for all modes of travel, reduce the number and severity of casualties and improve air quality.	Enhance safety for all modes of transport and reduce the number and severity of casualties.	Enhance safety for all modes of travel and reduce the number and severity of casualties
Objective 7 - Promoting sustainability and resilience	Ensure our transport systems are resilient to climate change and are well maintained.	Ensure our transport systems are resilient to climate change and are well maintained.	Protect and enhance the built and natural environment by ensuring our transport systems operate sustainably and can integrate climate change adaptation requirements	Ensure our transport systems are resilient to climate change and are well maintained	Protect and enhance the built environment by ensuring our transport systems are resilient to climate change and are well maintained

2. Confirmed Transport Objectives

2.1 The Transport Objectives are confirmed as:

Objective 1 - Improving external linkages: Enhance accessibility by road and public transport from the City and Town centres to Londonderry, gateways and hubs to support greater levels of inward investment.

Objective 2 - Improving public transport accessibility: Ensure an affordable and sustainable public transport accessibility to essential services for people living in the BMTP area.

Objective 3 - Improving active travel accessibility: Ensure there are attractive and safe active travel networks (walking and cycling) linking all residential, retail, leisure, culture, office and commercial uses within the urban areas of the BMTP area.

Objective 4 - Providing high quality public realm: Deliver high quality public realm in town, city and district centres with reduced vehicle dominance, to make them attractive, shared spaces to live and work and improve safety for active modes.

Objective 5 - Improving City/Town centre accessibility: Enhance transport accessibility and manage traffic congestion to town, city and district centres to strengthen the BMTP's role as the regional economic driver.

Objective 6 - Improving public safety including air quality: Enhance safety for all modes of travel, reduce the number and severity of casualties and improve air quality.

Objective 7 - Promoting sustainability and resilience: Ensure our transport systems are resilient to climate change and are well maintained.

Annex B Illustrative Transport Measures

1. General approach to assessment

1.1. Annex A has provided a set of objectives for local transport development in BMTP area consistent with the Community Planning and LDP processes. These objectives are now used to assess alternative options and ultimately recommend a set of Transport Measures to be developed for the BMTP area.

1.2. This objectives-based approach is considered consistent with the "New Approach to Regional Transportation" and suited to the outcome-based approach being applied across policy making in NI, particularly as the objectives have been formulated to take account of the draft PfG Outcomes The approach is also preferred to a "problems- based" approach that might tend to simply replicate past strategies and measures and make the achievement of new objectives and outcomes particularly difficult.

1.3. The options for the BMA modelled area and the Outer BMTP areas were developed separately due to the difference in approach to assessing options.

2. Development of Options for the BMA Modelled Area

2.1. Introduction

2.1.1. For options in the BMUA, where modal choice and traffic routeing is a primary concern, the Belfast Strategic Transport Model has been used to estimate the impact quantitatively.

2.1.2. The model has therefore been used to test a number of options in turn:

- Alternative growth scenarios including development close to public transport hubs.
- Illustrative transport measures, including:
  - Metro Bus Improvements
  - Bus Rapid Transit (BRT)
  - Inter-urban Bus Services
  - Rail
  - Public Transport Fares
  - Highway
  - Intelligent Transport Systems
  - Demand Management

2.1.3. Further details on each of the illustrative transport measures are provide below.

Metro Bus Improvements

Improvement to the Metro Bus services;

- Increase Current Frequencies;
- Cross City Services; and
- Increase bus priority infrastructure.

Bus Rapid Transit (BRT)

New BRT routes – the introduction of a North/South route.

Inter-urban Bus Services

Improved Inter-urban schemes;

- Increased Goldline Frequencies;
- Extension of the M2 Hard Shoulder Running; and
- Additional Local Park and Ride.

Rail Improvements

Improved rail services through schemes like;

- All Trains 6 car;
- Multi-Modal Transport Hub at the Great Victoria Street;
- Ballymartin Rail Station;
- Hourly Enterprise Services;
- New Belfast Metropolitan Area (BMA) stations (such as Gamble Street, Merville, Monkstown); and
- Increased Frequency on Larne and Lisburn Lines.

Public Transport Fares

Consideration of options for reducing Public Transport Fares

Highway

Improved highway schemes;

- York Street Interchange – fully grade separated junction between the A12 Westlink/ M2 and M3;
- Inner Ring Road – new highway link between Bruce Street and A24 Ormeau Road;
- Dualling of A26; and
- Radial Capacity Enhancements
    - A55 Knock Road (2 lanes in each direction);
    - A2 Sydenham Bypass (3 lanes in each direction and closure of side roads);
    - M1/A1 Sprucefield Bypass (2 lanes in each direction); and
    - M1 Widening (3 lanes in each direction).

Intelligent Transport Systems

Updated Intelligent Transport Systems;

- Upgraded Urban Traffic Control for the Belfast Central Zone increasing the efficiency of the traffic throughput and reducing delay through the Belfast Central Zone signalised junctions.

Demand Management

Schemes to reduce the demand for private vehicle transport to Belfast City Centre;

- City centre controlled parking zone;
- Residential Parking Schemes;
- Work Place Parking Levy; and
- Restrictions on single occupancy cars.

2.2. Development of the Appraisal Framework for the Modelled Area

2.2.1. The purpose of the appraisal framework is to allow an assessment of the performance of the transport network against a range of objectives identified in relevant policy documents. This should ensure that any conclusions regarding the best performing transport measures accords with current policy and not simply with operational issues.

2.2.2. The appraisal framework was prepared early in the Transport Study process. This should ensure in addition that the formulation of the conclusions are fair and transparent as the results of the tests were not known when the framework was prepared. It should also be noted that a degree of judgement is needed in concluding the best performing measures as scores cannot simply be totalled across all objectives.

2.2.3. This section outlines the development of the appraisal framework and considers how it meets the needs of the study in terms of objectivity and transparency.

2.2.4. The appraisal framework for the Belfast Metropolitan Transport Study has been developed in two stages:

- Develop Objectives: - By considering key regional and local policy documents which include economic, environmental and social objectives;
- Identify Suitable Indicators – For each of the Objectives, indicators from model outputs were identified which would help to demonstrate if an Objective is either being met successfully or adversely impacted.

2.2.5. There are seven transport Objectives for the Belfast Metropolitan Transport Study. These span economic, environmental and social considerations and no one objective is considered more important than another. The Objectives are:

Objective 1: Enhance **accessibility** by road and public transport from the centre of Belfast to Londonderry, gateways and hubs to support greater levels of inward investment

Objective 2: Ensure viable **public transport accessibility** to essential services for people living in BMTP Area

Objective 3: Ensure there are attractive and safe **active travel networks** (walking and cycling) linking all residential, retail, leisure, culture, office and commercial uses within the urban areas of the BMTP area

Objective 4: Deliver high quality **public realm** in town, city and district centres with reduced vehicle dominance, to make them attractive, shared spaces to live and work and improve safety for active modes

Objective 5: Enhance **transport accessibility** and manage traffic congestion to town, city and district centres to strengthen Belfast's role as the regional economic driver

Objective 6: Enhance **safety** for all modes of travel, reduce the number and severity of casualties and improve air quality.

Objective 7: Ensure our transport systems are resilient to climate change and are well maintained.

2.2.6. The model output indicators matched to the objectives are presented below in Figure B.1. A short explanation is provided for each:

- Objective 1 – accessibility relates to ease of regional connectivity and therefore travel times to the respective centres is an appropriate indicator produced directly by the model
- Objective 2 – accessibility relates to viability and is therefore dependent on patronage and journey lengths which are estimated by the model
- Objective 3 – active travel networks, where improved, would be expected to produce an increase in walking and cycling use as predicted by the model
- Objective 4 – public realm would be expected to be supported by a reduction in traffic flows in the city centre
- Objective 5 – accessibility of the city centre can be quantified by preparing travel time catchment statistics
- Objective 6 – safety relates statistically to the scale of vehicle kms travelled (assuming fixed accident rates)
- Objective 7 – sustainable public transport and active travel networks require additional users whilst climate change adaptation requires reduced Green House Gas emissions and hence reduced private car use. Air Quality Management Areas require reduced vehicular flows in the local areas.

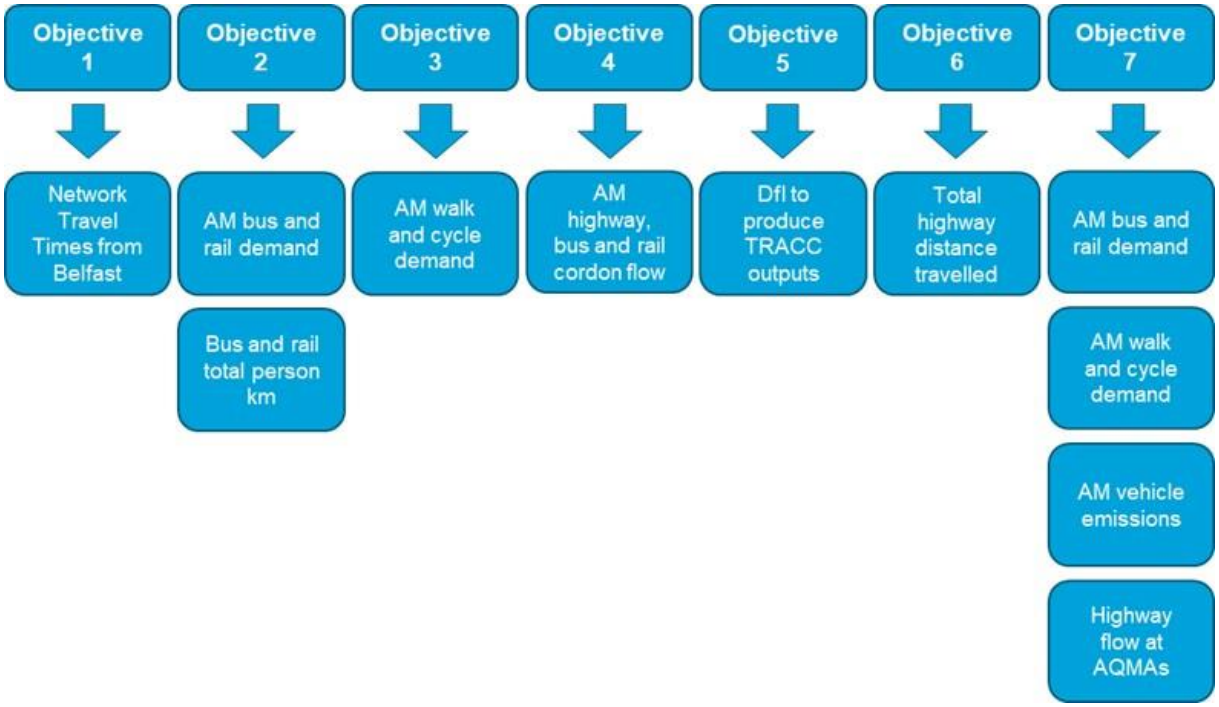

Figure B.1 - Appraisal Framework Indicators

2.2.7. In selecting the indicators it was noted that compromises were needed in a number of instances based upon the strategic nature of the model; this was considered unavoidable and preferable to a wholly qualitative assessment. In addition, it was noted that the impact of any modal switch from private car was likely to produce positive impacts across a number of objectives, for example Objectives 2, 4, 6 and 7. This was considered to be realistic and defendable. Finally it was noted that care would be needed in drawing conclusions from the appraisal results as the model results may not be sufficiently sensitive to identify significant impacts and the objectives are not weighted.

2.3. Conclusions

2.3.1. It was concluded that the Appraisal Framework as formulated using model outputs would provide a transparent and equitable basis on which to assess the relative performance of alternative measures in line with the current shared policy objectives of the Department and the Councils.

3. Development of Options for the Outer BMTP Areas

3.1. For the outer BMTP areas, the development of options is initiated by the consideration of the objectives as follows:

Objective 1 - Improving external linkages: Enhance accessibility by road and public transport from the City and Town centres to Londonderry, gateways and hubs to support greater levels of inward investment.

Objective 2 - Improving public transport accessibility: Ensure an affordable and sustainable public transport accessibility to essential services for people living in the BMTP area.

Objective 3 - Improving active travel accessibility: Ensure there are attractive and safe active travel networks (walking and cycling) linking all residential, retail, leisure, culture, office and commercial uses within the urban areas of the BMTP area.

Objective 4 - Providing high quality public realm: Deliver high quality public realm in town, city and district centres with reduced vehicle dominance, to make them attractive, shared spaces to live and work and improve safety for active modes.

Objective 5 - Improving City/Town centre accessibility: Enhance transport accessibility and manage traffic congestion to town, city and district centres to strengthen the BMTP's role as the regional economic driver.

Objective 6 - Improving public safety including air quality: Enhance safety for all modes of travel, reduce the number and severity of casualties and improve air quality.

Objective 7 - Promoting sustainability and resilience: Ensure our transport systems are resilient to climate change and are well maintained.

3.2. **Objective 1 summarised as External Accessibility**, is specific in requiring improvements in both road and public transport and in identifying the precise locations which focus improvements on Key Transport Corridors (KTC), the Link Corridors and Trunk Roads. The potential options appear to be:

- Improved inter-urban roads on KTC, Link Corridors and Trunk Roads
- Improved 'limited-stop' bus services to key hubs
- Park and Ride and Park and Share also have complementary roles in improving local access or increasing vehicle occupancy respectively
- Improving and maintaining rail provision, particularly to key hubs and gateways

3.3. **Objective 2 summarised as Public Transport Accessibility**, essentially focuses on rural bus services and connections to essential services such as, for example, health, food shops and banks. The potential options appear to be:

- Maintained or improved town services
- Maintained or improved Ulsterbus rural services
- Alternative Ulsterbus rural operations including integration with 'limited-stop' services
- Integrated public transport service delivery including Ulsterbus, Education, Health and Community Transport services
- Land-use policy changes which focus residential development in towns
- New or improved public transport serving new developments funded by the developer
- Alternative models of delivery of essential services including, mobile services and use of the internet
- Application of modern technology to provide passengers with increased service standards; real time information, integrated ticketing systems, integrated timetable information

- Improving peak hour rail service frequency and/or capacities
- Improving walk access routes to the rail station from residential areas and the town centre

3.4. **Objective 3 summarised as Active Travel Accessibility**, essentially focuses on the provision of connections to essential services such as, for example, health, food shops and banks. The potential options appear to be:

- Provision of improved walking facilities in towns
- Provision of a network of attractive cycling routes in towns
    - Focus on radial routes
    - Local improvements which together provide longer routes

3.5. There are other options which relate to how this infrastructure is provided and at additional locations such as:

- For new developments, walk and cycle infrastructure both within the development and linking to existing or planned networks are provided by the developer
- The provision of greenways between towns

3.6. **Objective 4 summarised as High Quality Public Realm in town centres**, generates a number of largely complementary transport options:

- Town Centre Parking Strategies that reduce circulating traffic searching for parking spaces
- Traffic management schemes that remove traffic routes through the town centre which may include reallocation of existing road space to facilitate active modes of travel
- Priority to be given to pedestrians in moving to and around town centre streets
- Pedestrianisation of town centres

3.7. **Objective 5 summarised as Accessibility to Town Centres**, generates a number of quite different transport options:

- New urban roads and traffic management to reduce travel times to town centres by all road-based modes
- Public Transport improvements options as identified against Objective 2
- Improved walking and cycling options identified against Objective 3
- Town Centre Parking Strategies that provide for demand for long and short-stay spaces at locations which reduce town centre congestion
- Traffic management schemes that give priority to movements to the town centre

3.8. **Objective 6 summarised as Safety, is quite specific**. The only potential options appear to be:

- Continue to implement Collision Remedial Schemes
- Ensure new transport infrastructure is designed and provided to current 'best practice' standards
- In urban areas, review the potential to introduce traffic calming measures

3.9. **Objective 7 summarised as Resilience, is quite specific**. The only potential options appear to be:

- Ensure transport infrastructure is designed and provided to current 'best practice' standards regarding extreme weather events
- Ensure transport infrastructure is maintained to 'best practice' standards to maximise performance at all times and that whole life costs are minimised.

Assessment of options and selection of recommended Transport Measures

Objective 1: External Accessibility

3.10. The following options are progressed as feasible within the BMTS time frame of 2035 and consistent with the objectives.

- Improved 'limited-stop' bus services to key hubs
- Park and Ride and Park and Share also have complementary roles in improving local access or increasing vehicle occupancy respectively
- Improving and maintaining rail provision, particularly to key hubs and gateways

3.11. The reasons for not progressing the other options are outlined below:

- Improved inter-urban roads on KTC, Link Corridors and Trunk Roads - it is considered that further improvements beyond those recently constructed or currently under construction will not facilitate limited-stop public transport services. Any improvements to KTC will be considered as part of the RSTN TP. Further improvements within these areas will not produce additional benefits to public transport and access to key hubs.

Objective 2: Public Transport Accessibility

3.12. These transport options are considered in the context of the NI-wide policy issues for the Department and the other statutory transport providers and are subject of separate work. The findings and recommendations from this work will be fed back to the Local Transport Plan and LDP processes as and when the next steps for the wider public transport network are identified and agreed. In outline, the proposal is to develop innovative integrated public transport services, using for example transport models such as 'ride-share'.

3.13. It is recommended that land-use policy should focus residential development in towns. In addition consideration should be given to alternative delivery models of essential services including mobile and remote services and use of the internet.

Objective 3: Urban Active Travel Networks.

1.4. It is proposed that in general all of the options **are progressed** as feasible within the BMTS time frame of 2035 as follows:

- Provision of improved walking facilities in towns
- Provision of a network of attractive radial cycling routes in towns and greenways between towns
- For new developments, walk and cycle infrastructure both within the development and linking to existing or planned networks are provided by the developer
- The provision of greenways between towns

1.5. It is recommended that there is a focus on radial routes in towns in order that it is clear that the expectation is for direct high quality cycle routes which can provide a realistic option for journeys to and through the town centre. The designation of routes also facilitates the proposal to seek developer contributions for infrastructure over and beyond the development site.

Objective 4 High Quality Public Realm in town centres

1.6. It is proposed that, with two exceptions, all of the options **are progressed** as feasible within the BMTS time frame of 2035 as follows:

- Town Centre Parking Strategies that reduce circulating traffic searching for parking spaces
- Traffic management schemes that remove traffic routes through the town centre which may include reallocation of existing road space to facilitate active modes of travel
- Priority to be given to pedestrians in moving to and around town centre streets

1.7. The exception which is **not progressed** is outlined below with reasons:

- Pedestrianisation of town centres – this measure is considered out-moded and likely to fail by removing key servicing access and after hours operation. The other options seek to deliver the positive points of pedestrianisation relating to reducing vehicle dominance.

Objective 5 Accessibility to Town Centres

1.8. It is proposed that, with two exceptions, all of the options **are progressed** as feasible within the BMTS time frame of 2035 as follows:

- Public Transport improvements options and identified against Objective 2
- Improved walking and cycling options identified against Objective 3
- Town Centre Parking Strategies that provide for demand for long and short-stay spaces at locations which reduce town centre congestion
- Traffic management measures to reduce travel times to town centres by all sustainable modes.

1.9. The exception which is **not progressed** is outlined below with reasons:

- New urban roads and traffic management to reduce travel times to town centres by all road-based modes – this would act directly against the Objective 4 High Quality

Public Realm in town centres by promoting car use in town centres and against the schemes to give priority to pedestrian and cycling movements to the town centre.

1.10. However, it is noted that there are likely to be instances when key development will require essential new urban road infrastructure simply to access and service the development and to facilitate active travel modes. In such instances the urban road infrastructure will be provided by the developer. Therefore, the following option is progressed:

- New urban road links (and supporting sustainable transport infrastructure) to facilitate key development funded and by developer.

Objective 6 Safety

1.11. It is proposed that in general all of the options **are progressed** as feasible within the LTS time frame of 2035 as follows:

- Continue to implement Collision Remedial Schemes
- Ensure new transport infrastructure is designed and provided to current 'best practice' standards
- In urban areas, review the potential to introduce traffic calming measures

Objective 7 Resilience.

1.12. Both options **are progressed** as feasible within the LTS time frame of 2030 and consistent with the objectives. It is proposed that the options can be combined as follows:

- Ensure transport infrastructure is designed and provided to current 'best practice' standards regarding extreme weather events
- Ensure transport infrastructure is maintained to 'best practice' standards to maximise performance at all times and that whole life costs are minimised.

Confirmation of indicative Transport Measures Assessment against the Objectives

1.13. The BMTS is primarily focused on the principal urban centres where there are opportunities to deliver the most significant impact on the greatest number of residents and employees in conjunction with the LDP. The Transport Study is purposely composed of indicative measures rather than schemes as this provides flexibility in the definition and design of schemes in order to integrate with land-use opportunities that arise in the plan policies stage of the Local Development Plan. Schemes will be identified in the BMTP.

1.14. The BMTS is proposed as comprising the following 10 indicative measures:

1. Improved Park and Ride and Park and Share on KTCs and radial routes
2. Consider new road infrastructure within town centres which facilitate public realm enhancements or improvements to active travel modes
3. Improved 'limited-stop' bus services to key hubs
4. Improved integration between public transport modes to simplify travel for passengers
5. Provision of a network of attractive walking and cycling routes in towns and greenways between towns

6. For new developments, walk and cycle infrastructure both within the development and linking to existing or planned networks are provided by the developer
7. Increases in peak period rail capacity to Belfast City Centre and generators of additional demand.
8. Town Centre Parking Strategies that provide for demand for long and short-stay spaces at locations which reduce town centre congestion and circulating for parking spaces
9. Traffic management schemes which enhance safety and give priority to pedestrian, cycling and public transport movements to the town centre
10. Ensure new transport infrastructure is designed and provided to current 'best practice' standards

1.15. Each of the indicative measures are confirmed against the transport objectives below. Table B.1 summarises how each of the 10 indicative measures support the Transport Objectives. A double tick (√√) designates strong or direct support for the objective whilst a single tick (√) designates lesser or indirect support. Each measure is subsequently described separately below.

Measure	Objectives						
	1: External Accessibility	2: Public Transport Accessibility	3: Urban Active Travel Networks	4: High Quality Public Realm in town centres	5: Accessibility to Town Centres	6. Safety	7: Resilience
1. Improved Park and Ride and Park and Share on KTCs	√	√√	√		√√	√	
2. Consider new road infrastructure within town centres which facilitate public realm enhancements or improvements to active travel modes	√√	√	√√	√	√√	√	
3. Improved 'limited-stop' bus services to key hubs	√√	√√			√		
4. Improved integration between public transport modes to simplify travel for passengers		√√	√		√√		
5. Provision of a network of attractive walking and cycling routes in towns and greenways between towns		√	√√	√	√√		
6. For new developments, walk and cycle infrastructure both within the development and linking to existing or planned networks are provided by the developer			√√	√	√√		
7. Increases in peak period rail capacity to Belfast City Centre and generators of additional demand.	√√	√√			√		
8. Town Centre Parking Strategies that provide for demand for long and short-stay spaces at locations which reduce town centre congestion				√	√√		
9. Traffic management schemes which enhance safety and give priority to pedestrian, cycling and public transport movements to the town centre		√√	√√	√	√√	√√	√
10. Ensure new transport infrastructure is designed and provided to current 'best practice' standards		√				√√	√√

Table B.1 - 10 indicative measures which support the Transport Objectives

Measure	Objectives						
	1: External Accessibility	2: Public Transport Accessibility	3: Urban Active Travel Networks	4: High Quality Public Realm in	5: Accessibility to Town Centres	6. Safety	7: Resilience
1. Improved Park and Ride and Park and Share on KTCs	√	√√			√√		

1. Improved Park and Ride and Park and Share on KTCs

1.16. Improved and additional Park and Ride and Park and Shares sites will be considered, with those in close proximity to KTCs offering the greatest ability to influence a mode shift to this form of travel.

1.17. The provision of improved Park & Ride and Park & Share sites has the potential to provide environmental benefits by further reducing the proportion of single occupancy journeys utilising private car.

Measure	Objectives						
	1: External Accessibility	2: Public Transport	3: Urban Active Travel Networks	4: High Quality Public Realm in	5: Accessibility to Town Centres	6. Safety	7: Resilience
2. Consider new road infrastructure within town centres which facilitate public realm enhancements or improvements to active travel modes	√√	√		√	√√		

2. Consider new road infrastructure within town centres which facilitate public realm enhancements or improvements to active travel modes

1.18. Should a need arise for a throughpass or bypass within any of the main towns in the BMTP area through the development of the BMTP, the precise route and its design will be confirmed as part of the Transport Plan and the Plan Policies stage of the LDP.

1.19. Such schemes may provide benefits to a town centres, including facilitating access to development lands and removal of traffic from town centres, so providing high quality public realm.

1.20. However, these routes are considered to be most applicable as developer led schemes to support potential land zonings.

Measure	Objectives						
	1: External Accessibility	2: Public Transport Accessibility	3: Urban Active Travel Networks	4: High Quality Public Realm in town centres	5: Accessibility to Town Centres	6. Safety	7: Resilience
3. Improved 'limited-stop' bus services to key hubs	√√	√√			√		

3. Improved 'limited-stop' bus services to key hubs

1.21. New 'limited-stop' bus services are expected to be identified and prioritised on the Key Transport Corridors to improve external accessibility to key hubs. These services will build upon the existing Goldline route network to be listed in the Regional Strategic Transport Plan to be prepared. The bus services will capitalise on continued road improvements.

1.22. These 'limited-stop' bus services will improve external accessibility by reducing journey times by public transport and increasing service frequency between the key hubs.

1.23. These services will indirectly improve public transport accessibility from the wider rural area as this objective is primarily met by local Ulsterbus services.

1.24. These services will also directly improve accessibility to the town centres by reducing journey times from the catchment areas, potentially in combination with park and ride sites.

Measure		Objectives					
	1: External Accessibility	2: Public Transport	3: Urban Active Travel Networks	4: High Quality Public Realm in	5: Accessibility to Town Centres	6. Safety	7: Resilience
4. Improved integration between public transport modes		√√	√		√√		

4. Improved integration between public transport modes

1.25. Integration between transport modes is an efficient way to connect people with places through a network of transport systems as well as providing a realistic travel choice alternative to the private car.

1.26. Providing well connected, accessible interchange points increases the attractiveness and provides the ability to easily interchange between modes.

1.27. Improving the ability to interchange both in terms of location and payment methods (potentially through linked ticketing) will encourage the use of more sustainable travel options for all or part of a journey.

1.28. For example, this may include utilising a local town service where it would be possible to connect onto a train to access a wider range of key locations. In some locations, it may be possible to introduce public transport access or improve existing services which pass through each town.

Measure	Objectives						
	1: External Accessibility	2: Public Transport	3: Urban Active Travel Networks	4: High Quality Public Realm in	5: Accessibility to Town Centres	6. Safety	7: Resilience
5. Provision of a network of attractive walking and cycling routes in towns and greenways between towns		√	√√	√	√√		

5. Provision of a network of attractive walking and cycling routes in towns and greenways between towns

1.29. The provision of improved walking facilities in town centres is a central measure of this Transport Study. Whilst improvements to the walking facilities may require retro-fitting work and may impact on traffic capacity it is clear that the measure has a role in delivering greater walking activity and hence a number of objectives. In addition, attractive local and town-centre routes must be an integral part of any PS or subsequent LPP.

1.30. Improved walking facilities will have a direct impact on urban active travel networks. In particular in designing off-road walking routes consideration will be given to their potential as shared cycle facilities.

1.31. Improved walking facilities will have a direct impact on accessibility to the town centres. By making it easier to cross roads and making walking routes to the town centre more attractive, it will be more convenient for people without cars to travel to the town centre. Walking routes can provide convenient access to the town centre from residential areas within a range of up to 1 mile (assuming a travel time of 20 minutes); this represents all residential areas within the development area of both towns with few exceptions. In addition, should parking strategies displace long stay parking to the edge of town, the accessibility of the town centre for car users would be largely unaffected as the consequent longer walk access would be improved in quality.

1.32. Improved walking facilities will have an indirect impact on public transport accessibility as local town centre walk access is often the final component of a public transport journey.

1.33. Improved walking facilities will have an indirect impact on high quality public realm as they are often designed together in an integrated fashion.

1.34. The measure has a role in delivering sustainable accessibility across the urban areas and the designation and identification of a network of routes must be an integral part of any PS and subsequent LPP so that the network can be delivered in co-ordination with development proposals.

1.35. Attractive cycle routes will have a direct impact on urban (and inter-urban) active travel networks. In designing off-road cycle routes consideration will be given to their potential as shared walking facilities. Cycle routes can provide convenient access to places of employment and education within a range of up to 3 miles (assuming a travel time of 20 minutes) which would encompass the entire development area of the towns.

1.36. Improved cycle routes will have a direct impact on accessibility to the town centres. By making these attractive, it will be more convenient for people without cars (including children), to travel (independently) to the town centre.

1.37. Improved cycle routes will have an indirect impact on high quality public realm as they are often designed together in an integrated fashion as part of local routes or longer greenways. Care will be needed to ensure that the cycle routes function and use do not discourage use by pedestrians, elderly people or other people with particular impairments.

Measure	Objectives						
	1: External Accessibility	2: Public Transport Accessibility	3: Urban Active Travel Networks	4: High Quality Public Realm in town centres	5: Accessibility to Town Centres	6. Safety	7: Resilience
6. For new developments, walk and cycle infrastructure both within the development and linking to existing or planned networks are provided by the developer			√√	√	√√		

6. For new developments, walk and cycle infrastructure both within the development and linking to existing or planned networks are provided by the developer

1.38. The provision of active travel options for all new development proposals shall be considered with an onus on the provision of such facilities. Developers will be required to ensure that both the internal layout and connections to the external active transport network are provided to promote and encourage active travel.

1.39. New developments should be sustainably focused and identified in locations that are well served by public transport, accessible by walking and cycling, have adequate infrastructure and where development can be properly integrated, in terms of land use and design, with the wider Council area.

Measure	Objectives						
	1: External Accessibility	2: Public Transport Accessibility	3: Urban Active Travel Networks	4: High Quality Public Realm in town centres	5: Accessibility to Town Centres	6. Safety	7: Resilience
7. Increases in peak period rail capacity to Belfast City Centre and generators of additional demand.	√√	√√			√		

7. Increases in peak period rail capacity to Belfast City Centre and generators of additional demand.

1.40. It is recommended that service enhancements to the railway lines serving Belfast and other cities/towns that are large generators of demand should be prioritised in order to enhance their current attractiveness.

1.41. Where there is deemed to be potential additional demand, the transport capacity of the line should be reviewed to determine if additional capacity can be created. However, the rail network has a number of capacity 'bottlenecks' which arise from a combination of infrastructure and operational issues.

Measure	Objectives						
	1: External Accessibility	2: Public Transport	3: Urban Active Travel Networks	4: High Quality Public Realm in	5: Accessibility to Town Centres	6. Safety	7: Resilience
8. Town Centre Parking Strategies that provide for demand for long and short-stay spaces at locations which reduce town centre congestion				√	√√		

8. Town Centre Parking Strategies that provide for demand for long and short-stay spaces at locations which reduce town centre congestion

1.42. Town Centre Parking Strategies will be required in Town and City Centres, as stipulated in the SPPS. Parking strategies have a key role to play in improving how the urban transport networks operate as public parking locations represent the ultimate destination for many car journeys. The location of public parking and its designation as long or short-stay using payment controls will be identified in the parking strategy at the LPP stage.

1.43. Parking strategies will have a direct impact on the potential to provide high quality public realm. By removing extraneous traffic which often dominates the town centres it will be possible to design and deliver high quality public realm.

1.44. The parking strategies will have a direct impact on accessibility to the town centres. It will be important that the strategies improve turnover of parking spaces. This will reducing traffic searching for spaces and will improve travel times and safety by public transport and walking and cycling.

1.45. The parking strategies will have an indirect impact on public transport accessibility as it is envisaged that the charges needed to increase the turnover of spaces may lead to public transport becoming a more attractive and financially viable option.

Measure	Objectives						
	1: External Accessibility	2: Public Transport Accessibility	3: Urban Active Travel Networks	4: High Quality Public Realm in	5: Accessibility to Town Centres	6. Safety	7: Resilience
9. Traffic management schemes which enhance safety and give priority to pedestrian, cycling and public transport movements to the town centre		√√	√√	√	√√		

9. Traffic management schemes which enhance safety and give priority to pedestrian, cycling and public transport movements to the town centre

1.46. The imposition of sustainable transport measures, as proposed in this Transport Study, will involve an impact on traffic capacity and on traffic flows. Consequently, there will be a requirement for the Department and stakeholders to consider how road-space is designated and used by a range of modes (pedestrian, cyclist, bus, goods service vehicles and general traffic) and exactly what priority is given to each. Traffic management schemes can complement physical infrastructure schemes by amending regulations, signing and lining to achieve that priority and provide safer and more coherent networks.

1.47. Traffic management schemes will impact directly on the objective to improve and create continuous high quality urban active travel networks where traffic capacity has to be re-assigned using amended road markings, junction layouts or phasing of signal settings.

1.48. Traffic management schemes will be required to ensure that accessibility to the town centre is improved. Consideration will be given to re-balancing priority to pedestrians and public transport in town centre shopping streets whilst private car routes to designated parking locations as identified in the parking strategy should not be unduly inconvenienced.

1.49. Traffic management will also indirectly impact on public transport accessibility from the wider catchment as town centre bus priority could make a significant difference in the viability of routes at off-peak periods.

1.50. Traffic management will also indirectly impact on public realm as traffic engineers will likely need to engage in the co-design of schemes that require changes in local traffic designations or regulations to ensure their success.

Measure	Objectives						
	1: External Accessibility	2: Public Transport Accessibility	3: Urban Active Travel Networks	4: High Quality Public Realm in	5: Accessibility to Town Centres	6. Safety	7: Resilience
10. Ensure new transport infrastructure is designed and provided to current 'best practice' standards		√				√√	√√

10. Ensure new transport infrastructure is designed and provided to current 'best practice' standards

1.51. The provision of transport infrastructure designed, provided and maintained to 'best practice' standards to maximise performance at all times relates directly to the objective to be resilient to climate change and be well maintained.

1.52. This measure is effectively cross-cutting and has no direct bearing impact on any of the other objectives.

1.53. Best practice design does not remove all risk in extreme conditions such as road collisions, traffic signals failures or flooding and road infrastructure, especially urban, can reach capacity leading to grid-lock. Similar grid-lock would never occur on active travel networks. Resilience to system failures, such as traffic signal failures, can be increased by providing 'back-up' systems whilst overall urban travel resilience can be increased by ensuring that realistic active travel options are provided.

Conclusion

1.54. This Transport Study recommends the following 10 indicative measures for the Outer BTMP areas:

- **1: Improved Park and Ride and Park and Share on KTCs**
  New locations for park and ride and park and share facilities identified and prioritised on the Key Transport Corridors. These facilities should be strategically placed, considering the travel patterns of usual residents and the areas which would benefit from improvements in public transport use. These facilities would also benefit more rural residents and increase accessibility and connectivity to the wider Northern Ireland area.

- **2: Consider new throughpasses/bypasses within town centres which facilitate public realm enhancements or improvements to active travel modes**
  This option should be retained for potential consideration in the future. Should a need arise for this type of infrastructure, this measure will be reviewed. A number of potential developer-led schemes will be considered and their benefits to the town centres reviewed.

- **3: Improved "limited-stop" bus services to key hubs**
  New "limited-stop" bus services are expected to be identified and prioritised on the Key Transport Corridors. These services will build upon the existing network of bus services. The bus services will capitalise on continued road improvements and seek to identify where the greatest benefits can be derived.

- **4: Improved integration between public transport modes to simplify travel for passengers**
  To promote and encourage the use of public transport, it will be important to consider the linkages between modes and the ease with which this can occur.

- **5: Provision of a network of attractive walking and cycling routes in towns and greenways between towns**
  The provision of improved walking facilities in town and city centres is a central measure of this Transport Study. The current pedestrian networks are below standard in some areas. Levels of walking and cycling could be improved, particularly as a method of travel to work. Improvements to the walking facilities and the addition of cycling infrastructure may help to encourage the use of active travel modes.

- **6: For new developments, walk and cycle infrastructure both within the development and linking to existing or planned networks are provided by the developer**
  When planning for new developments, it is essential that walking and cycling infrastructure is considered as part of the development proposals. Walking and cycling linkages from the development should be linked to existing infrastructure, ensuring a continuous provision is made. It is also necessary to consider how active travel infrastructure is incorporated into the development itself.

- **7. Increases in peak period rail capacity to Belfast City Centre and generators of additional demand.**

It is recommended that service enhancements, including additional capacity, to the railway lines should be considered to enhance their current attractiveness and capture any potential additional demand.

- **8: Town Centre Parking Strategies that provide for demand for long and short-stay spaces at locations which reduce town centre congestion and circulating for parking spaces**
  Town Centre Parking Strategies will be required in town and city centres. The location of public parking and it's designation as long or short stay will be considered within the Parking Strategies. The strategies should remove extraneous traffic which dominates the town centres and improves the turnover of parking spaces.

- **9: Traffic management schemes which enhance safety and give priority to pedestrian, cycling and public transport movements to the town centre**
  It is necessary that road space is used by a range of modes. Consideration should be given to re-balancing priority to pedestrians, cyclists and public transport within the town centres. This is particularly important in shopping streets, however locations where parking is designated should not be unduly inconvenienced.

- **10: Ensure new transport infrastructure is designed and provided to current 'best practice' standards**
  When designing transport infrastructure, this should be completed to 'best practice'. This will strive towards maximising performance and ensuring resilience. Resilience to system failures, such as traffic signal failures or flooding, can be increased by providing 'back-up' systems. Overall urban travel resilience can be increased by ensuring that realistic active travel options are provided.

Annex C Legacy Road Alignments

Table C.1 - Legacy Road Alignments

Location	Scheme
Antrim & Newtownabbey	
Antrim	
Kirby Lane Link	Dublin Road to Abbey Cross
Lignite Road	Route near Crumlin to provide access to the lignite field.
Newtownabbey	
Ballyclare Relief Road	Templepatrick Road to Rashee Road
Hightown Link Road	Mayfield Link to Hightown Road
M2 Motorway Interchange	New junction on the M2 to the north of Sandyknowes with links to Mallusk and Corrs Corner.
Park and Ride Access Road	Jordanstown Road
Ards and North Down	
Newtownards	
Talbot Street	Talbot Street to North Road Upgrade
Portaferry Road Link	Bowtown Road to Portaferry Road Link
Belfast City	
Belfast City	
City Centre Ring Road	Southern Section including Bankmore link
A2 Sydenham By-pass	Between Tillysburn and M3 Lagan crossing and new Junction on M2 Belfast Habour Estate
CITI	Just north from Victoria Park, Belfast
A55 Outer Ring Road	A55 Outer Ring Road (Knock Road)
Connsbank Link	Connsbank Link and Holywood Arches By-Pass
WWAY	Durham Street to Mulhouse Road, Belfast
Blacks Road Link	Blacks Road Link
Lisburn and Castlereagh	
Lisburn	
Knockmore Link	Knockmore Link
North Lisburn Feeder Road	North Lisburn Feeder Road
A1 Link	A1 Link
Castlereagh	
A24 Saintfield Relief Road	Between Cairnshill and the A55 Outer Ring Road
Quarry Corner	East Link Road
Mid & East Antrim	
Ballymena	
West Link	Ballymoney Road to Galgorm Road & Old Park Road Ballymena)
South West Relief Road	Galgorm Road to Ballee Roundabout
Woodtown Road	Old Cullybackey Road to Carniney Road
Cullybackey Throughpass	Ballymena Road to Main Street
Larne	
West Distributor Road	Old Belfast Road to Killyglen Link
Glynn Bypass	Redlands Roundabout to Shore Road
Carrickfergus	
Spine Road	Upper Road to North Road
Sloefield Road	Sloefield Road to Spine Road
Victoria Road	Prince Andrew Way to Marshallstown Road

Annex D Belfast Metropolitan Transport Study Modelling Report

Provided as a separate document.

Annex E ANBC LTS

Provided as a separate document.

Annex F AND LTS

Provided as a separate document.

Annex G LCC LTS

Provided as a separate document.

Annex H MEA LTS

Provided as a separate document.

Annex I Addendum to Growth

Introduction

1. The transport scenario modelling undertaken for the BMTS used a 2030 forecast horizon and the most up to date information regarding population and employment forecasts and Councils' growth aspirations at that time.

2. However, since the transport modelling has been undertaken, a number of the forecasts have been updated. The purpose of this Annex is to explore to what extent the transport model results would likely change if the model used the updated forecasts. Belfast City Council was also concerned that the model was run for 2030 rather than 2035, the year of their Plan. This Annex therefore also explores the use of 2035 forecasts. The background data utilised in the adjusted 2030 and 2035 projections are presented in Table I.7 at the end of the Annex.

3. The largest part of this annex is structured as follows:

    i. The growth forecasts used in the model run at 2030
    ii. The updated growth forecasts now available for 2030
    iii. The updated growth forecasts now available for 2035
    iv. Comparison of i and ii
    v. Comparison of i and iii

4. The annex also contains a discussion of both residential growth and commuting, and employment growth and commuting before presenting summary conclusions.

5. It should be noted that whilst the transport modelling developed separate 2030 "Business as Usual" and "Council Growth" planning development scenarios, the "Council Growth" scenario was used as the reference case for the appraisal of transport measures and so is the focus of the exploration.

Growth Forecasts

6. Table I.1 presents the forecast inputs used in the 2030 Council Growth scenario as used in the model. The growth figures available were those provided in Council's Local Development Plan (LDP) Preferred Options Papers (POP). However not all Councils had prepared a POP at this time and so where a POP wasn't yet available the Housing Growth Index (HGI) figures were used. As the figures spanned from 2025 (for HGIs) to 2035, 2030 was selected as the forecast year and all figures were adjusted to that year. The inputs highlight the strong aspirational growth for a number of councils.

Table I.1 - Modelled Growth Figures

Council	Council Proposals (POP Stage)	
	Housing (new homes)	Employment (new jobs)
Belfast City	26,430	46,000
Lisburn & Castlereagh City	13,300	6,500
Antrim & Newtownabbey	13,000	10106**
Mid & East Antrim	6,230	8,250
Ards & North Down	8190*	7,500
Armagh City, Banbridge & Craigavon	16620*	12,233
Causeway Coast & Glens	7730*	6,826
Fermanagh & Omagh	5,190	4,875
Mid Ulster	11,000	8,500
Newry, Mourne & Down	18,353	9,213
Derry City & Strabane	12,000	15,000
Total	138,043	135,003

*HGI have been used in the absence of a POP. 2030 HGI have been calculated by dividing the 2025 figure by 13 to give a yearly growth rate and then multiplied by 15 to cover 2015 to 2030. Cells are rounded to the nearest 10.

** HGI 2013 employment figures subtracted from Oxford Economics 2031 predicted employment figures.

7. Table I.2 presents the forecast inputs now available for 2030 drawing from the Councils' Draft Plan Strategy documents which have been adjusted for the 15 year model period from 2015 – 2030. In addition, the Department provided updated HGI figures in 2019 for the time period 2016-2030. The inputs highlight that in the BMTP area the housing and employment projections adjusted for the 15 year period from 2015 - 2030 have dropped by 292 and 18,023 respectively. Across all of NI the housing projection has decreased by 4,842 and the employment projection has decreased by 18,023 (no additional decrease beyond the BMTP area).

Table I.2 - Update Growth Figures

Council	15 Yr draft Plan Strategy Growth	
	dPS Adjusted for 2015 - 2030 Housing	dPS Adjusted for 2015 - 2030 Employment
Belfast City	31,600	46,000
Lisburn & Castlereagh City	11,550	4,608
Antrim & Newtownabbey[2]	9,750	4,100
Mid & East Antrim	5,768	0
Ards & North Down[1]	8,190	5,625
BMTP Area Total	**66,858**	**60,333**
Armagh City, Banbridge & Craigavon[1,3,4]	17,200	12,233
Causeway Coast & Glens[3,4]	5,600	6,826
Fermanagh & Omagh	5,190	4,875
Mid Ulster	11,000	8,500
Newry, Mourne & Down[3]	18,353	9,213
Derry City & Strabane	9,000	15,000
Total	**133,201**	**116,980**

[1] HGI have been used in the absence of POP - Housing (AND, ABCBC, CCGBC).

[2] HGI 2013 employment figures subtracted from Oxford Economics 2031 predicted employment figures (ANBC)

[3] POP has been used in the absence of a dPS - Employment (ABCBC, CCGBC, NMDDC) - Housing (NMDDC)

[4] HGI have been used in the absence of a POP - Housing (ABCBC, CCGBC)

8. Table I.3 presents the forecast inputs now available for 2035 drawing from the Councils' Draft Plan Strategy documents and extrapolating where necessary. It should be noted that for the BMTP area the housing projections show a 21,993 increase and a 2,088 employment increase from the modelled

2030 council growth scenario inputs. For all of NI there is a 39,558 housing increase and a 20,970 employment increase from the modelled inputs to the 2035 projections.

Table I.3 - 2035 Growth Forecasts

Council	2035 Growth	
	dPS Adjusted for 2015 - 2035 Housing	dPS Adjusted for 2015 - 2035 Employment
Belfast City	42,133	61,333
Lisburn & Castlereagh City	15,400	6,144
Antrim & Newtownabbey[2]	13,000	5,467
Mid & East Antrim	7,690	0
Ards & North Down[1]	10,920	7,500
BMTP Area Total	**89,143**	**80,444**
Armagh City, Banbridge & Craigavon[1,3,4]	22,933	16,311
Causeway Coast & Glens[3,4]	7,467	9,101
Fermanagh & Omagh	6,920	6,500
Mid Ulster	14,667	11,333
Newry, Mourne & Down[3]	24,471	12,284
Derry City & Strabane	12,000	20,000
Total	**177,601**	**155,973**

[1] HGI have been used in the absence of POP - Housing (AND, ABCBC, CCGBC).

[2] HGI 2013 employment figures subtracted from Oxford Economics 2031 predicted employment figures (ANBC)

[3] POP has been used in the absence of a dPS - Employment (ABCBC, CCGBC, NMDDC) - Housing (NMDDC)

[4] HGI have been used in the absence of a POP - Housing (ABCBC, CCGBC)

Comparison of Forecasts

9. Table I.4 compares the updated forecasts available at 2030 with the forecasts used in the model. The comparison shows that:

- At a total NI level there is a 4% decrease in the housing projection and 13% decrease in the employment projection in comparison with the modelled 2030 council growth scenario inputs.
- At a BMTP-wide level there is no change for the housing projection and a 23% decrease in the employment projection when comparing the 2030 forecasts with the 2030 modelled inputs.
- For Belfast City Council there is a 20% increase in the housing forecast and no change in the employment projection from the 2030 modelled inputs to the 2030 forecast projections. These forecasted increases are offset by the forecasted reduction in the other councils with the BMTP area.

Table I.4 - Comparison of Modelled Growth with 2030 Growth Forecast

Council	**Modelled Growth Scenario - POP stage (adj 2015 - 2030)**		**15 Yr draft Plan Strategy Growth to 2030**		**% Change from POP to 15 Yr dPS**	
	New Housing	New Employment	dPS Adj 2030 Housing	dPS Adj 2030 Employment	**Housing**	**Employment**
Belfast City	**26,430**	**46,000**	31,600	46,000	20%	0%
Lisburn & Castlereagh City	**13,300**	**6,500**	11,550	4,608	-13%	-29%
Antrim & Newtownabbey[2]	**13,000**	**10,106**	9,750	4,100	-25%	-59%
Mid & East Antrim	**6,230**	**8,250**	5,768	0	-7%	-100%
Ards & North Down[1]	**8,190**	**7,500**	8,190	5,625	0%	-25%
BMTP Area Total	**67,150**	**78,356**	**66,858**	**60,333**	**0%**	**-23%**
Armagh City, Banbridge & Craigavon[1,3,4]	**16,620**	**12,233**	17,200	12,233	**3%**	**0%**
Causeway Coast & Glens[3,4]	**7,730**	**6,826**	5,600	6,826	**-28%**	**0%**
Fermanagh & Omagh	**5,190**	**4,875**	5,190	4,875	**0%**	**0%**
Mid Ulster	**11,000**	**8,500**	11,000	8,500	**0%**	**0%**
Newry, Mourne & Down[3]	**18,353**	**9,213**	18,353	9,213	**0%**	**0%**
Derry City & Strabane	**12,000**	**15,000**	9,000	15,000	**-25%**	**0%**
Total	**138,043**	**135,003**	**133,201**	**116,980**	**-4%**	**-13%**

10. Table I.5 compares the updated forecasts available at 2035 with the forecasts used in the model. The comparison shows that:
    - At a total NI level there is a 29% increase in the housing projection and 16% increase in the employment projection in comparison with the modelled 2030 council growth scenario inputs.
    - At a BMTP-wide level there is a 33% increase for the housing projection and a 3% increase in the employment projection when comparing the 2035 forecasts with the 2030 modelled inputs.
    - For Belfast City Council there is a 59% increase in the housing forecast and a 33% increase in the employment projection from the 2030 modelled inputs to the 2035 forecast projections. These forecast increases are offset slightly by the forecasted employment reduction in most other councils within the BMTP area.

11. Considering the comparisons illustrated in Tables I.4 and I.5 together it appears reasonable to conclude regarding the 2030 modelled runs:

    - The model runs may marginally over-estimate peak hour motorised travel demand in Belfast City Council area at 2030 using the updated Council inputs. This is because, although employment levels are unchanged, there has been an increase in housing in Belfast and a decrease in the surrounding Councils, hence reducing commuting flows from the surrounding councils and potentially increasing use of walk and cycle by Belfast City residents.

    - The model runs will continue to estimate travel demand of all modes lower than those likely to occur in 2035 using the updated Council inputs. This is because 2035 estimates of housing and employment are significantly increased from the 2030 modelled levels across BMTP and NI. It is notable that Belfast City employment increases by 33% and whilst Belfast City housing also increases substantially (59%), so does housing in 3 of the 4 surrounding councils.

12. Overall it can be concluded that the 2030 inputs utilised for the modelled growth scenarios at BMTP area level and for all NI will likely underestimate travel demand at 2035 the year of the BCC plan.

Table I.5 - Comparison of Modelled Growth with 2035 Growth Forecast

Council	Modelled Growth Scenario - POP stage (adjusted 2015 - 2030)		2035 Growth		% Change from POP to 2035	
	New Housing	New Employment	dPS Adjusted for 2015 - 2035 Housing	dPS Adjusted for 2015 - 2035 Employment	**Housing**	**Employment**
Belfast City	**26,430**	**46,000**	42,133	61,333	59%	33%
Lisburn & Castlereagh City	**13,300**	**6,500**	15,400	6,144	16%	-5%
Antrim & Newtownabbey[2]	**13,000**	**10,106**	13,000	5,467	0%	-46%
Mid & East Antrim	**6,230**	**8,250**	7,690	0	23%	-100%
Ards & North Down[1]	**8,190**	**7,500**	10,920	7,500	33%	0%
BMTP Area Total	**67,150**	**78,356**	**89,143**	**80,444**	**33%**	**3%**
Armagh City, Banbridge & Craigavon[1,3,4]	**16,620**	**12,233**	22,933	16,311	**38%**	**33%**
Causeway Coast & Glens[3,4]	**7,730**	**6,826**	7,467	9,101	**-3%**	**33%**
Fermanagh & Omagh	**5,190**	**4,875**	6,920	6,500	**33%**	**33%**
Mid Ulster	**11,000**	**8,500**	14,667	11,333	**33%**	**33%**
Newry, Mourne & Down[3]	**18,353**	**9,213**	24,471	12,284	**33%**	**33%**
Derry City & Strabane	**12,000**	**15,000**	12,000	20,000	**0%**	**33%**
Total	**138,043**	**135,003**	**177,601**	**155,973**	**29%**	**16%**

[1] HGI have been used in the absence of POP - Housing (AND, ABCBC, CCGBC).

[2] HGI 2013 employment figures subtracted from Oxford Economics 2031 predicted employment figures (ANBC)

[3] POP has been used in the absence of a dPS - Employment (ABCBC, CCGBC, NMDDC) - Housing (NMDDC)

[4] HGI have been used in the absence of a POP - Housing (ABCBC, CCGBC)

Residential Growth and Commuting

While the reduction in housing growth may seem significant it is only 4% of the total growth aspirations to 2030 for all NI. Considering the 5 Council BMTP area only, there is a no change in relation to forecasted housing growth when compared with the 2030 draft Plan Strategy forecasts. A 20% increase in Belfast City Council's projected housing growth is offset by reductions in 3 of the other BMTP council areas. MEABC and ANBC have made significant reductions in their housing growth projections. Both of these council areas feed commuters into Belfast from the north and so the impact on the modelling results has been considered further.

Error! Reference source not found. shows the percentage of commuters that travel from each of the old 1992 Local Council areas that make up MEABC and ANBC into BCC. The table uses the 2015 NIRSA Household estimates, the councils' POP housing growth projections and the percentage of Belfast commuters provided by the Census Journeys to Work data to estimate the 2030 percentage increase in the number of commuters to Belfast that was modelled. The table also uses the same method with the revised draft Plan Strategy growth forecasts to estimate the 2030 percentage increase in the number of Belfast commuters that would be modelled today. The table shows the small changes in Demand into Belfast that have resulted from the updated growth forecasts.

Table I.6 - Estimated difference in modelled commuter flows from MEABC and ANBC to BCC

1992 LGD Area	Percentage of Journey to Work to Belfast*	Estimated Percentage Increase in Journey to Work to Belfast Modelled to 2030**	Estimated Percentage Increase in Journey to Work to Belfast in 2030 using updated forecast***
Ballymena	10.6%	1.2%	0.9%
Larne	19.8%	2.2%	1.6%
Carrickfergus	36.3%	4.1%	3.0%
Newtownabbey	44.5%	10.5%	7.9%
Antrim	23.2%	5.5%	4.1%

Employment Growth and Commuting

The bulk of the reduction in projected employment growth falls within the Mid and East Antrim and Antrim and Newtownabbey Council areas, where employment growth aspirations have dropped by a combined figure of over 14,000. While this is a significant reduction it can be seen in **Error! Reference source not found.** that the vast major of Belfast residents work within the BCC area and few commute to MEABC and ANBC. In addition, the flows from Belfast to other councils tend to travel against the direction of the peak flows and therefore don't make up a significant part of the network congestion. Note that the modelling was undertaken to determine the impact of potential transport interventions on the Greater Belfast area while the outer BMTP areas were considered separately through an objective review of evidence to provide a qualitative narrative on the potential transport options.

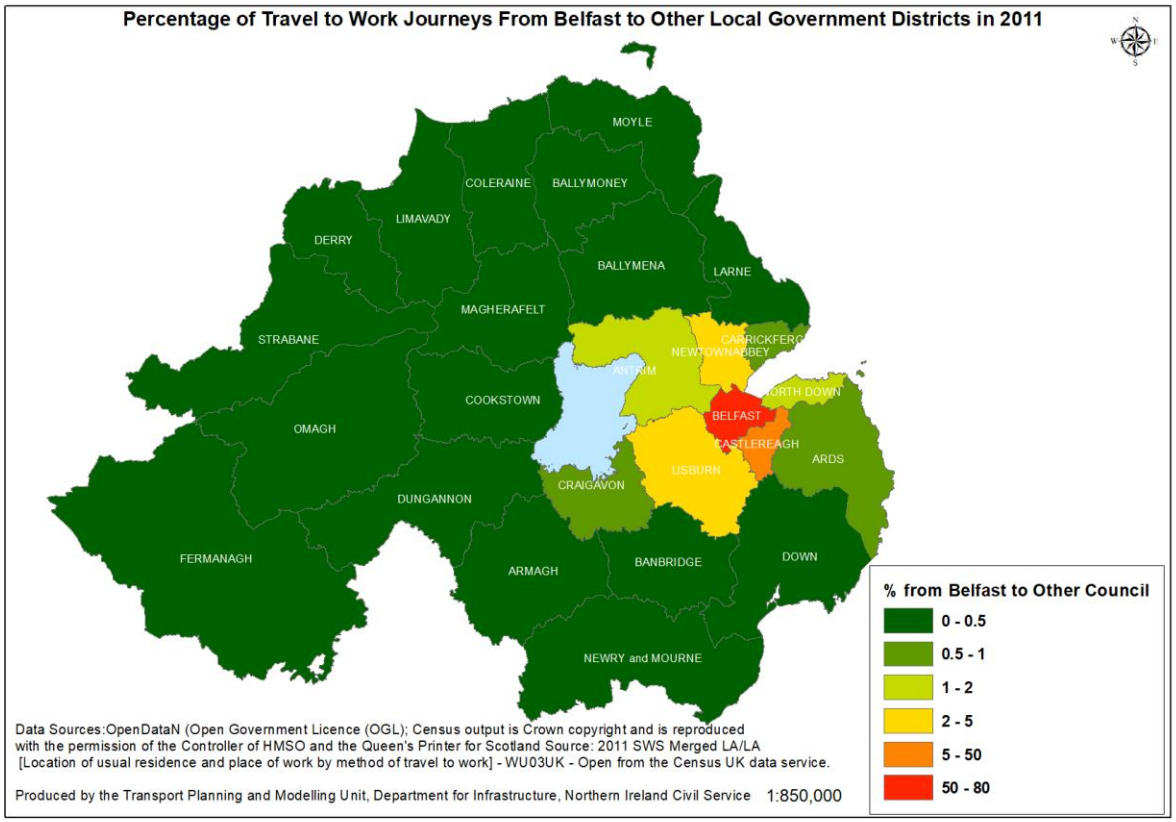

Figure I.1 - Travel to Work Out of Belfast

Conclusion

While it is acknowledged that there have been, in some cases significant changes to Councils' growth projections from the time that the modelling work was undertaken for the BMTS, it has been concluded that the modelling results remain a robust under-estimate of the likely travel demands in the congested study area focused on Belfast City Council.

The modelling in the BMTS was used to understand the potential effects of different types of transport measures and to help understand the types of measures that might be considered to support the future development for the LDP period to 2035 in the BMTP area. The aim of the work was to identify the strengths and weaknesses of particular illustrative measures and to provide an indication of the direction and magnitude of the impacts of introducing such illustrative measures in the Great Belfast Area. The current investigations have concluded that the model results will likely under-estimate travel demand at the BCC Plan year of 2035. Importantly, the BMTS testing of measures identified that even with the underestimate of demand, future traffic levels will be unacceptably high and therefore demand management measures will be required to reduce them and force a modal shift. This conclusion therefore remains valid even if the model was re-run with revised demand forecasts.

Table I.7 – Adjusted Growth Figures

Council	POP stage (adjusted 2015 - 2030)		Council Proposals (Draft Plan Strategy Stage)		Plan Period (Yrs)	POP Growth Per Annum		dPS Growth Per Annum		2030 Growth		2035 Growth	
	New Housing	**New Emp**	**New Housing**	**New Emp**	**Plan Period (Yrs)**	**PA Rate Housing**	**PA Rate Emp**	**PA Rate Housing**	**PA Rate Emp**	**dPS Adjusted for 2015 - 2030 Housing**	**dPS Adjusted for 2015 - 2030 Emp**	**dPS Adjusted for 2015 - 2035 Housing**	**dPS Adjusted for 2015 - 2035 Emp**
Belfast City	**26,430**	**46,000**	31,600	46,000	15	1,762	3,067	2,107	3,067	**31,600**	**46,000**	42,133	61,333
Lisburn & Castlereagh City	**13,300**	**6,500**	11,550	4,608	15	887	433	770	307	**11,550**	**4,608**	15,400	6,144
Antrim & Newtownabbey[2]	**13,000**	**10,106**	9,750	4,100	15	867	674	650	273	**9,750**	**4,100**	13,000	5,467
Mid & East Antrim	**6,230**	**8,250**	4,614	0	12	415	550	385	0	**5,768**	**0**	7,690	0
Ards & North Down[1]	**8,190**	**7,500**	8,190	4,500	15 (Employment 12)	546	500	546	375	**8,190**	**5,625**	10,920	7,500
BMTP Area Total	**67,150**	**78,356**	**65,704**	**59,208**						**66,858**	**60,333**	**89,143**	**80,444**
Armagh City, Banbridge & Craigavon[1,3,4]	**16,620**	**12,233**	17,200	12,233	15	1,108	816	1,147	816	**17,200**	**12,233**	22,933	16,311
Causeway Coast & Glens[3,4]	**7,730**	**6,826**	5,600	6,826	15	515	455	373	455	**5,600**	**6,826**	7,467	9,101
Fermanagh & Omagh	**5,190**	**4,875**	5,190	4,875	15	346	325	346	325	**5,190**	**4,875**	6,920	6,500
Mid Ulster	**11,000**	**8,500**	11,000	8,500	15	733	567	733	567	**11,000**	**8,500**	14,667	11,333
Newry, Mourne & Down[3]	**18,353**	**9,213**	18,353	9,213	15	1,224	614	1,224	614	**18,353**	**9,213**	24,471	12,284
Derry City & Strabane	**12,000**	**15,000**	9,000	15,000	15	800	1,000	600	1000	**9,000**	**15,000**	12,000	20,000
Total	**138,043**	**135,003**	**132,047**	**115,855**						**133,201**	**116,980**	**177,601**	**155,973**

[1] HGI have been used in the absence of POP - Housing (AND, ABCBC, CCGBC).

[2] HGI 2013 employment figures subtracted from Oxford Economics 2031 predicted employment figures (ANBC)

[3] POP has been used in the absence of a dPS - Employment (ABCBC, CCGBC, NMDDC) - Housing (NMDDC)

[4] HGI have been used in the absence of a POP - Housing (ABCBC, CCGBC)