



Cork Metropolitan Area Transport Strategy

Regional Spatial and Economic Strategy (RSES)

Addendum Report

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CONTENTS

CONTENTS	i
1 Introduction	2
1.1 Background	2
1.2 Southern Regional Assembly Overview	2
1.3 Purpose of Report	3
1.4 Report Structure	3
2 RSES Growth Projections	4
2.1 Introduction	4
2.2 RSES Projections	4
2.3 CMATS Growth Projections	5
3 CMA Transport Strategy Modelling Approach	8
3.1 Introduction	8
3.2 Land-Use Assumptions	8
3.3 Scenario Description	9
3.4 Strategy Assessment Methodology	16
4 CMA Transport Strategy Assessment	17
4.1 Introduction	17
4.2 Economy	17
4.3 Demand and Mode Share Analysis	20
4.4 Public Transport Network Analysis	28
4.5 Road Network Operations	28
5 Conclusions	29
Annex 1 Settlement Level Growth Projections	30

1 Introduction

1.1 Background

The National Transport Authority (NTA) is a public body set up under statute and established in December 2009. The role and functions of the NTA are set out in three Acts of the Oireachtas; the Dublin Transport Authority Act 2008, the Public Transport Regulation Act 2009 and the Taxi Regulation Act 2013. In August 2015, the Department of Transport, Tourism and Sport (DTTas) published its policy document *“Investing in our Transport Future - Strategic Investment Framework for Land Transport”*. Action 4 of that framework states that: *“Regional transport strategies will be prepared by the NTA and provide an input to regional spatial and economic strategies”*.

Having regard to its role in relation to transport, and the action placed upon it in the DTTas policy document, the NTA, in collaboration with Cork County and City Councils, is developing a Transport Strategy for the Cork Metropolitan Area (CMA) covering the period 2018 to 2040. The strategy will provide a framework for the planning and delivery of transport infrastructure and services in the CMA over the next two decades. It will also provide a planning policy for which other agencies can align their future policies and infrastructure investment.

1.2 Southern Regional Assembly Overview

The Southern Regional Assembly established on 1st January 2015, is one of three Assemblies in the Republic of Ireland. The former 8 regional authorities and 2 regional assemblies were consolidated under the Government’s regional reform process under the Local Government Reform Act 2014 to form the Southern, the Northern and Western and the Eastern and Midland regions.

The three new Assemblies incorporate the functions of both the former regional authorities and assemblies, with significant enhancement of some powers, particularly in relation to spatial planning and economic development. During 2018 the Assemblies are charged with preparing new Regional Spatial & Economic Strategies for their regions.

The Southern Regional Assembly covers the following geographic areas and counties:

- South-East Region - Carlow, Tipperary, Waterford City and County, Wexford, Kilkenny;
- South-West Region - Cork City, Cork County and Kerry; and
- Mid-West Region - Clare, Limerick City and County, Tipperary

The primary function of the Assemblies is:

- Manage and monitor EU programmes of Assistance;
- To co-ordinate, promote and support strategic planning and sustainable development of the region;
- To promote effective local government and public services in the region, in conjunction with the National Oversight and Audit Commission; and
- **To prepare and oversee the implementation of Regional Spatial & Economic Strategies (RSES).**

Regional Spatial and Economic Strategy (RSES)

The RSES is a link between the National Planning Framework, the City and County Development Plans and the Local Economic and Community Plans. Through this process the Assemblies are centrally involved in the formulation of policies geared towards achieving a greater dispersal of economic growth and development throughout their respective regions.

To ensure that all Local Authority development plans are consistent with the RSES and relevant national policy, draft plans or proposed variations to development plans are referred by the Local Authorities to the Regional Assemblies. Following the preparation of a new draft development plan, or a proposed variation to an existing development plan, the Regional Assembly will consider if the draft is consistent with the RSES and can issue formal recommendations to the relevant local authority where necessary. The Assemblies are prescribed bodies under the Planning Acts, meaning that they must be consulted on certain strategic infrastructural proposals.

1.3 Purpose of Report

The draft RSES forecast growth projections for County Cork were made available by the Southern Regional Assembly to the CMATS project team in November 2018, subsequent to the production of the initial draft CMATS report. It was agreed with the CMATS project stakeholders that the growth assumptions, modelling and analysis underpinning CMATS, should be updated to incorporate the latest draft RSES growth forecasts.

This report summarises the differences in land-use assumptions between the draft RSES growth projections for Cork and the draft CMATS projections (based on NPF). The report also details the outcome of a modelling exercise undertaken within the National Transport Authority's (NTA) South West Regional Model (SWRM) for all modes (public transport, walking, cycling, car and freight) comparing the Do-Minimum scenario to the Do-Strategy (CMATS) scenario to understand if the proposed CMATS network could accommodate the revised growth levels. The modelling process also considered the refinement of the transport options in tandem with the forecast land use scenarios to better support the efficient development of the transport network.

A high-level assessment of the Strategy options, utilising the Regional Modelling System (RMS) appraisal toolkit has been undertaken to understand the performance of the proposed CMATS network in 2040 across all modes.

A more detailed appraisal of the CMATS measures can be found in the supporting “**CMATS Transport Modelling Assessment Report**”.

1.4 Report Structure

The following provides a description of the contents of each section of the report;

- **Section 2** summarises the differences in land-use assumptions between the draft RSES projections and the draft CMATS assumptions.
- **Section 3** summarises the Transport Modelling Assessment approach including the assumed CMATS transport network assumptions.
- **Section 4** outlines the high-level results of the assessment of CMATS for a number of criteria; and
- **Section 5** concludes the report.

2 RSES Growth Projections

2.1 Introduction

As mentioned in Chapter 1, draft RSES forecast growth projections for Cork were made available by the Southern Regional Assembly to the CMATS project team in November 2018, subsequent to the production of the initial draft CMATS report. This chapter outlines the differences in land-use assumptions between the draft RSES projections and the previous draft CMATS assumptions

2.2 RSES Projections

The draft RSES population growth projections for County Cork are shown in Figure 2-1 below. The Cork City and Suburbs settlement is envisaged to increase in population by 125,000 by 2040 (a 60% increase above 2016 levels). Figure 2-2 below shows the extent of the Cork City and Suburbs settlement in relation to the rest of the Cork Metropolitan Area (CMA). The settlement covers the Cork City administrative area as well as the surrounding urban areas of Ballincollig, Little Island, Glanmire, Rochestown etc.

The remainder of the Cork Metropolitan Area (CMA) is estimated to grow by approximately 47,000 to 142,548 in 2040. Outside of the CMA the remainder of Cork County is expected to grow in population by 55,210 to reach 293,909 in 2040. In total the County Cork population is expected to reach over 770,000 by 2040 (a 42% growth above 2016 levels).

Location	2016 Base Year	2026 Growth	2031 Growth	2040 Growth	2040 Total by
Cork City and Suburbs	208,669	50,000	75,000	125,000	333,669
Rest of Cork Met. Area	95,500	20,281	29,657	47,048	142,548
Balance of Cork County	238,699	25,739	36,695	55,210	293,909
Total	542,868	96,020	141,352	227,258	770,126

Figure 2-1: RSES Growth Projections – County Cork

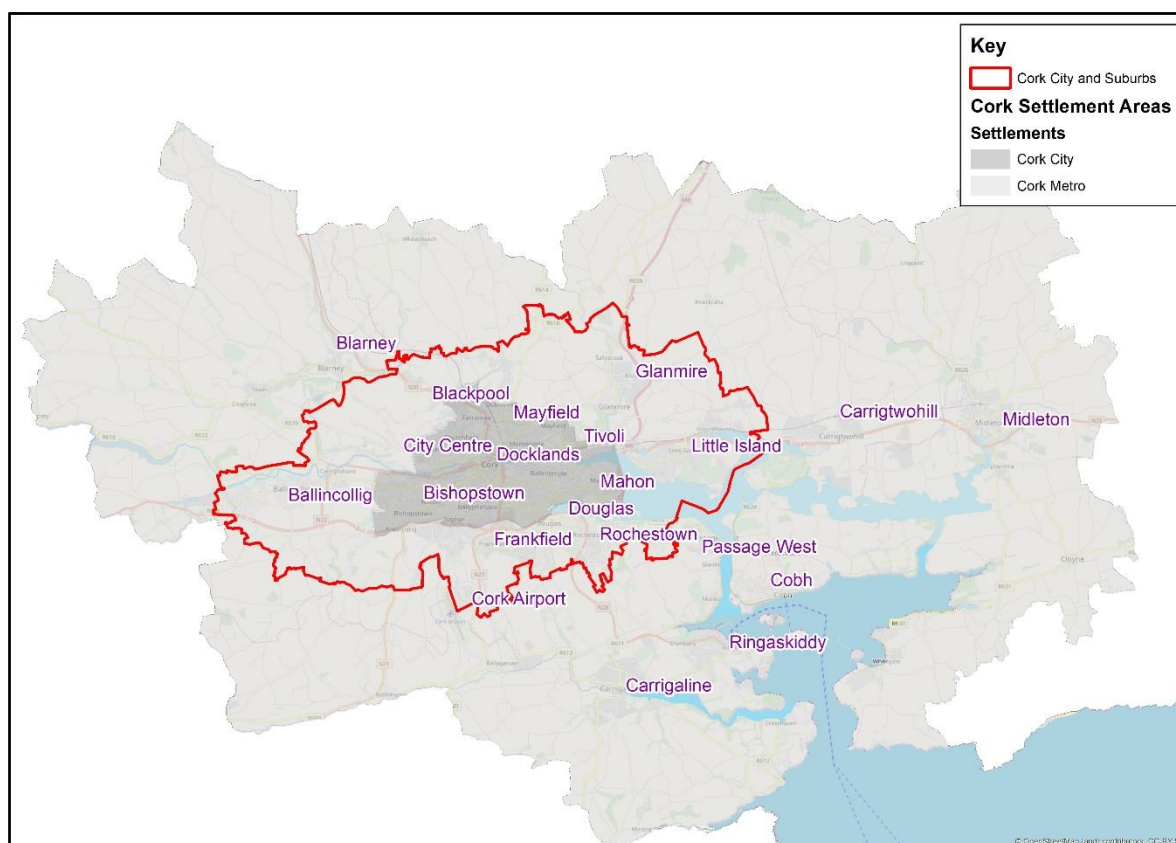


Figure 2-2: CSO - Cork City and Suburbs Settlement Boundary

2.3 CMATS Growth Projections

The RSES growth projections for Cork provide the overall target population levels for the CMA and the defined Cork City and Suburbs settlement. This growth was then distributed into the 29 CMATS sub-metropolitan area settlements and 20 Cork County settlements maintaining the existing proportional distribution of growth as contained in the 2040 CMATS Optimised Planning Sheet (D3)

Further detail on the CMATS settlements and methodology for the distribution of growth to these settlements is contained in the supporting document – “**CMATS Planning Datasheet Development Report**”.

Figure 2-3 below shows the change in growth levels for the Cork City, City and Suburbs, CMA and remainder of County Cork regional areas comparing the previous CMATS planning sheet (D3) and the revised CMATS RSES planning sheet (D4).

In summary, the main changes are the following:

- An approx. 69,000 (9.8%) increase in the County Cork population forecast;
- An approx. 42,500 increase in population in the CMA coupled with a 26,500 in the non-metro County area.
- The CMA population growth is ‘more skewed’ more towards the Cork City and Suburbs.
 - 42,500 increase in population in the CMA is distributed with 29,500 more in the City and 13,000 in the County Metro area

The draft RSES only provides population growth forecasts. For Education, the same ratio of population to education places was maintained at the settlement level as per the current CMATS planning sheets to ensure that growth in population was accompanied by an appropriate allocation of education places.

For employment, the existing CMATS distribution of employment places was maintained with the overall level of employment increasing proportionally in line with population growth.

A full breakdown of the changes in population, employment and education by settlement is provided in Annex 1 of this report.

Settlements	2040_D3	2040_D3	2040_D3	2040_D4	2040_D4	2040_D4	% Diff	% Diff	Diff
	Population	Jobs	Education		Population	Jobs			
TOTAL - CITY	186,860	120,161	58,622	216,426	131,906	67,908	15.8%	9.8%	15.8%
TOTAL - CITY AND SUBURBS	288,080	158,116	80,402	333,669	173,571	93,140	15.8%	9.8%	15.8%
TOTAL - COUNTY METROPOLITAN	246,942	60,567	47,314	259,791	66,490	48,399	5.2%	9.8%	2.3%
TOTAL - CITY & COUNTY METROPOLITAN	433,802	180,728	105,936	476,217	198,396	116,307	9.8%	9.8%	9.8%
TOTAL - COUNTY	267,537	52,707	46,713	293,909	57,904	51,319	9.9%	9.9%	9.9%
TOTAL - CORK CITY & COUNTY	701,339	233,436	152,649	770,126	256,300	167,626	9.8%	9.8%	9.8%

Figure 2-3: Revised CMATS Growth Projections

3 CMA Transport Strategy Modelling Approach

3.1 Introduction

This section details the transport modelling approach used to assess the performance of CMATS, including the modelling inputs and assumptions underpinning the assessment.

The National Transport Authority's (NTAs) South West Regional Transport Model (SWRM) has been used to assess the performance of the CMA Transport Strategy.

3.2 Land-Use Assumptions

As described in Chapter 2 above, the CMATS Land-use forecasts have been revised to align with the draft RSES growth projections for Cork. Table 3-1 below provides a summary of the growth forecasts above 2016 levels to 2040.

Table 3-1: CMATS Land-use Forecasts

County Cork	Population Growth
Total Cork Metropolitan Area	172,048
<i>Cork City and Suburbs</i>	<i>(125,000)</i>
<i>Remaining Metropolitan Area (estimate)</i>	<i>(47,048)</i>
Remainder of Cork County	55,210
Target Cork County Population Growth	227,258

The distribution of the CMA transport demand forecasts for the 2040 "Design Year" scenario was developed by the NTA based on the NPF forecasts and included extensive consultation between the NTA, Cork City and County Councils'.

Following the identification of growth at the CMA level, the following steps were used to allocate growth at the settlement level within the CMA:

1. Distribute internally to CMA based on Core Strategy Distribution for City and County from their respective development plans;
2. Optimise and intensify land-use growth along the two - identified high capacity public transit corridors (identified within the "CMATS Demand Analysis Report";
3. Liaison and feedback from the Cork City and County Councils; and
4. Finalised CMATS 2040 forecasts for assessment.

The CMATS 2040 forecasts were then converted into people trips using the NTA's National Demand Forecasting Model (NDFM), which converts planning data forecasts to trip forecasts for inclusion within the regional model.

3.3 Scenario Description

3.3.1 Do-Minimum

As per the Common Appraisal Framework (CAF) guidance, a current 'business as usual' scenario must be prepared against which the Do-Something (CMATS) option is compared against. This is referred to as the Do-Minimum scenario.

The 'Do-Minimum' network includes forecast transport demand (for the design year of 2040) and additional transport schemes (public transport, cycling and road) that are already built, under construction or are committed in terms of planning approval and allocation of funds. The list of schemes included in the Do-Minimum scenario is as follows:

- M28 Cork to Ringaskiddy: As part of the 2030 Cork TEN-T network this scheme is assumed to be in place by 2040;
- Dunkettle Interchange Upgrade: As included in the Government's 'Building on Recovery: Infrastructure and Capital Investment 2016-2021' - due for delivery in 2022; and
- Cork City Centre Movement Strategy: Phases 1 and 2 of this strategy have been implemented and are included in the Do-Minimum scenario.

This scenario is set as the baseline against which all the public transport proposals are compared against.

3.3.2 Do-Strategy (CMATS)

The Do-Strategy network represents the future year with all CMATS transport schemes included. The schemes are coded on top of the Do-Minimum 2040 scenario, to facilitate the assessment of the Strategy. A summary of the schemes that have been included in the Do-Strategy scenario is provided below with further details on the schemes contained within the Main Report.

Bus Connects

CMATS proposes a comprehensive network of high frequency bus services providing radial services between corridors either side of the city core and orbital services across the network and is shown in Figure 3-1 below. The Core Radial Bus Network connects the external corridors to the City Centre and has been refined to pair Cross-City travel demand to maximise the utilisation of the bus services on these corridors. A significant improvement in the frequency of bus services on these radial routes is also proposed. For the purposes of assessment and to understand the scalability of the proposed bus network - 5-minute frequencies have been assumed on all corridors.

The Core Radial Bus Network is set out below:

1. Dublin-Hill – Togher;
2. Ballyvolane- Donnybrook;
3. Mayfield – Bishopstown;
4. Glanmire – Ballinacollig;
5. Mahon – Apple;
6. Mahon – Blarney / Tower;
7. Rochestown – Apple;
8. Grange – Ballinacollig (via City Centre); and
9. Frankfield – Fairhill.

Four high frequency orbital routes are proposed to serve key destinations including Little Island and the Cork Institute of Technology. The upgraded orbital network will cover proximity 50km of services and enable interchange with the proposed radial bus services. Four orbital routes are as follows:

1. Northern Orbital Inner;
2. Northern Orbital Outer (following NDR alignment)
3. Southern Orbital Inner; and
4. Southern Orbital Outer.

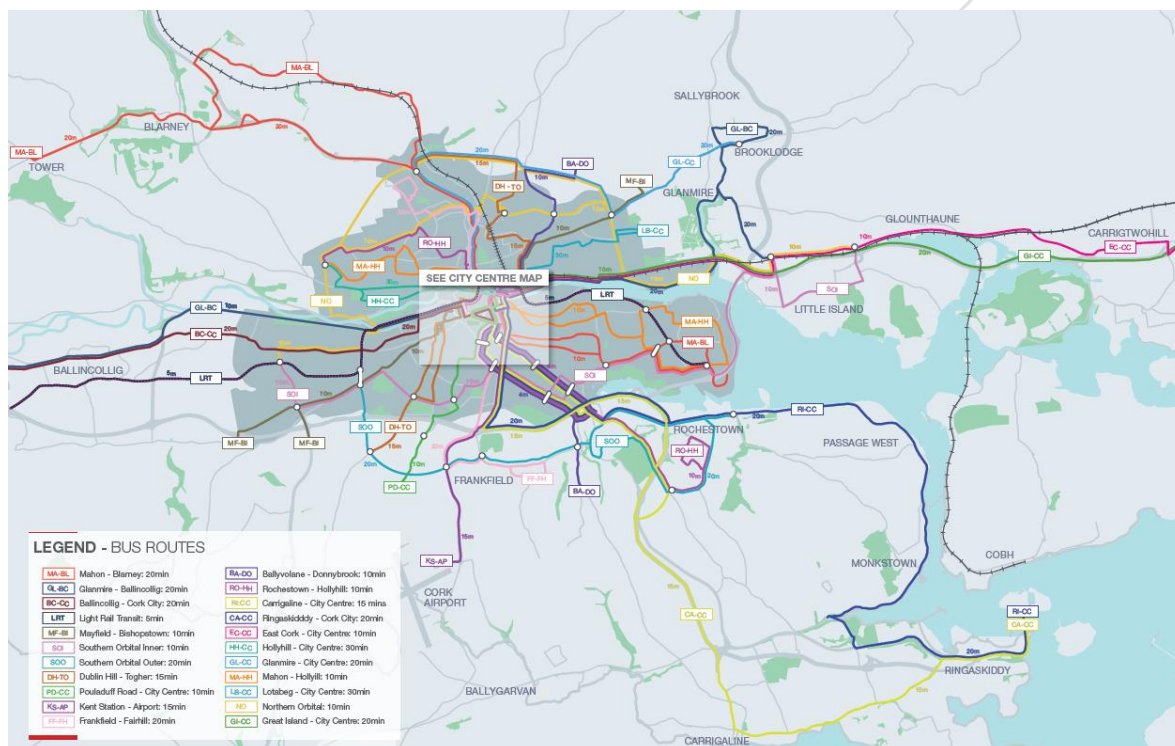


Figure 3-1: CMATS Blue Connects Network

Suburban Rail

To support sustainable growth along an enhanced railway corridor, CMATS proposed new railway stations at the following locations which have been coded into the SWRM in the Do-Strategy scenario. The proposed CMATS suburban rail network is shown in Figure 3-2 below. Improvements at Kent Station allow for through running of services between Mallow, Midleton and Cobh without impacting on Inter-City services. New stations are also proposed on the line suburban rail line.

Midleton / Cobh-Cork Line:

- Tivoli Docks;
- Dunkettle;
- Waterrock;
- Ballynoe; and
- Carrigtwohill West.

Mallow-Cork Line:

- Blackpool / Kilbarry;

- Monard; and
- Blarney / Stoneview.

In order to meet the target demand on the strategic rail corridor it is proposed to increase the service frequency between Kent Station and Midleton, and between Kent Station and Cobh from one train every 30min to one train every 10min. It is also proposed to increase the service frequency between Kent Station and Mallow from one train every 30min to one train every 10min. It is also proposed to provide through running services between Mallow and both Midleton and Cobh to cater for the identified cross city demand. The following lists the proposed Cork Suburban Rail Service Frequencies:

- Midleton – Cork: 20 min;
- Midleton – Mallow: 20 min;
- Cobh – Cork: 20 min;
- Cobh – Mallow: 20 min,
- The combined cross city services equate to:
 - Glounthaune – Cork Kent: 5 min;
 - Cork – Mallow: 10 min; and
 - Cross City Demand: 10 min.



Figure 3-2: CMATS Suburban Rail Network

Light Rail

CMATS proposes a strategic east-west public transport corridor from Mahon to Ballincollig via the City Centre. Approximately 25 stations have been coded in to the SWRM between Ballincollig and Mahon Point, and an estimated total journey time of 47 minutes. This is in line with similar speeds for the Red Luas line in Dublin. These stations will serve a catchment area of all existing and

proposed key adjoining development areas and provide interchange with InterCity and suburban rail services at Kent station plus proposed Bus Connects services.

To serve predicted level of passenger demand based on the revised RSES forecasts to 2040, a headway of every 2 minutes has been coded, which provides an hourly capacity of 11,400pax/hr/dir (4,600pax/hr/dir at 5min frequency). The following locations have been included within the catchment area of the future light-rail system in the CMA:

- Ballincollig;
- The proposed Cork Science and Innovation Park (CSIP);
- Cork Institute of Technology (CIT);
- Cork University Hospital (CUH);
- University College Cork (UCC);
- Cork City Centre;
- Kent Station / Cork North Docklands;
- Cork South Docklands; and
- Mahon.

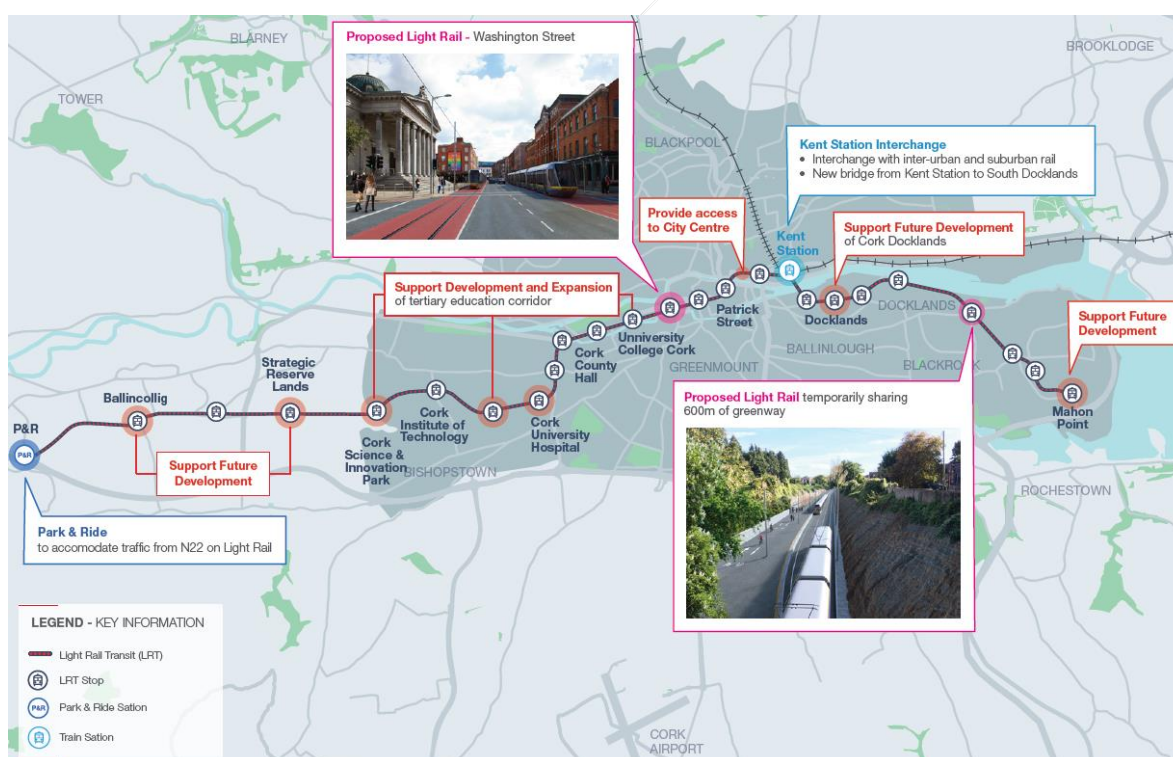


Figure 3-3: CMATS Light Rail Network

Walking

The walking network within CMATS is based on the Cork City Walking Strategy 2013 – 2018. The walking strategy was reviewed to ensure integration and alignment with the proposals for the public transport, cycling and road modes proposed in the strategy. Walking links were coded into the SWRM to coincide with new road links and internal network links within green and brownfield development areas.

Cycling

The cycle network development for CMATS is based on the Cork Cycle Network Plan 2017, which was reviewed to ensure integration and alignment with the transport proposals within this strategy and is shown in Figure 3-4 below. The CMATS cycle network includes for 200km of Primary, 150km of Secondary, 60km of Inter-Urban and 140km of Greenway network. The proposed cycle network was coded into the SWRM in the Do-Strategy scenario to represent the increased cycle speeds associated with the various levels of service provided by the proposed network.

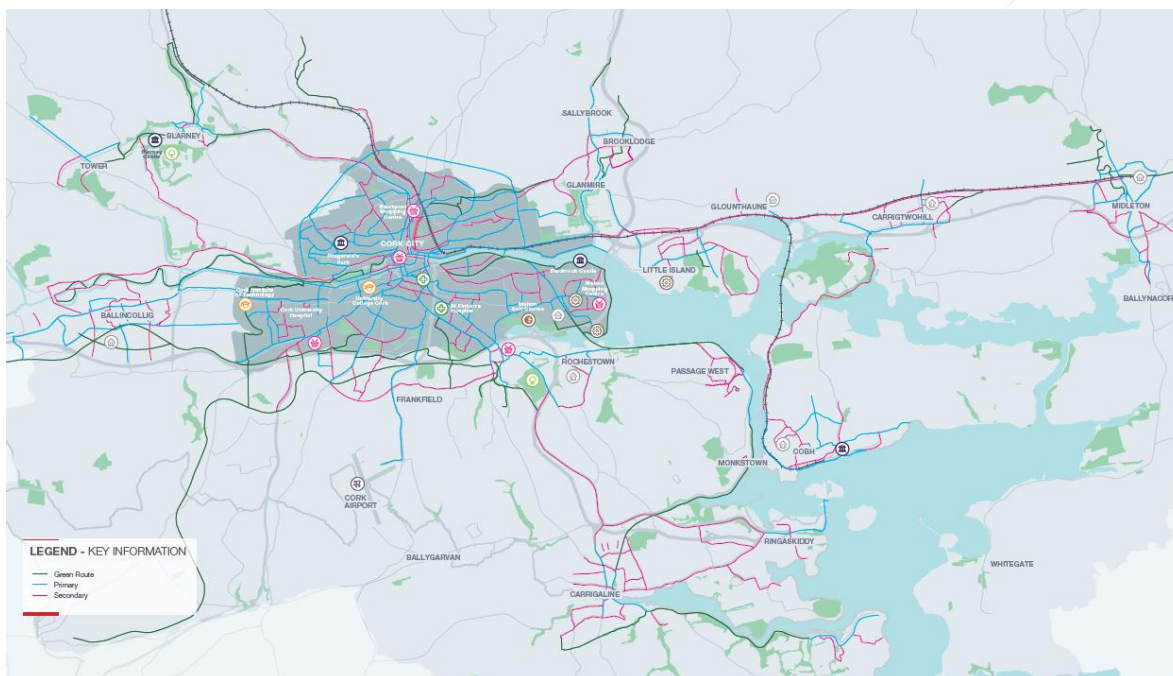


Figure 3-4: CMATS Cycle Network

Road

CMATS proposes significant investment (€1.39bn) in roads schemes up to 2040 which are shown in Figure 3-5 below and summarised below. Further details on the individual schemes is provided in the Main Report and also in the “Transport Options and Network Development Report”.

National Roads

- Cork Northern Ring Road (CNRR);
- N40 South Ring Road;
- Dunkettle Interchange (also included in Do-Min);
- M28 Cork - Ringaskiddy (also included in Do-Min);
- N22, N25, N27 and N71 improvements;

Local Roads

- Cork Northern Distributor Road (CNDR);
- Sothorn Distributor Road;
- Local Road improvements to support the Cork County Urban Expansion Areas;
- City Centre Movement Strategy;
- Docklands internal roads to support development;
- South Docklands Eastern Gateway Bridge;

- Water Street Bridge;
- Mill Road Bridge; and
- Eastern access to Tivoli.

In addition to the new links and national road improvements described above, significant bus priority measures have been included in the SWRM SATURN road model to account for the proposed BusConnects network and are shown in Figure 3-6 below. For the purposes of model coding, it was assumed that this would be achieved through the provision of 2-way bus lanes along the majority of routes. To ensure this could be achieved, reductions in road capacity within the model had to be accounted for in areas where full bus priority could not be feasibly accommodated. The following traffic management measures were coded into the model where applicable:

- Reduction in the number of lanes;
- Right-turn bans; and
- Converting Road to 1-way inbound or outbound (e.g. Douglas);

Bus speeds in the SWRM are taken as 80% of the uncongested speed of the adjacent road network link, where a bus lane is provided. Where there are no bus lanes, the congested road speeds are applied.



Figure 3-5: CMATS Road Network

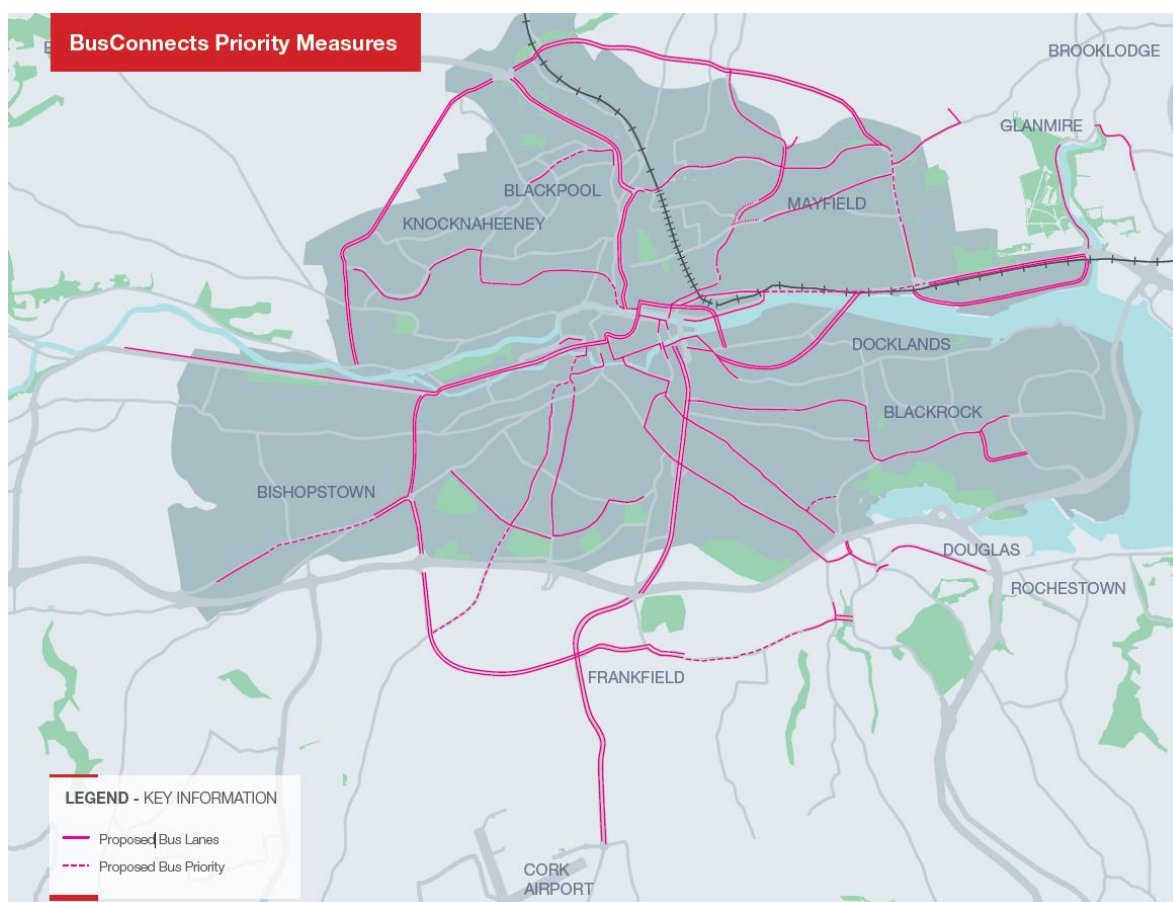


Figure 3-6: CMATS Bus Connects Priority Measures

CMATS Supporting Measures

To include for the impact of the proposed supporting measures contained within CMATS, the following additional measures were included in the Do-Strategy scenario.

- 20% reduction in fares;
 - All public transport services will migrate to a cashless system, to facilitate driver safety and faster passenger boarding times. As a proxy to account for this in the model, a 20% reduction was applied to PT fares, predominantly due to the fact that Leap card fares are on average 20% cheaper than the cash alternative;
- Transfer penalty reduction (5mins);
 - To account for the fact that passenger transfers with Rail services in a more integrated PT system will be more seamless and therefore should not be overly penalised – a consistent 5min transfer penalty has been used in the sensitivity modelling for all PT sub-modes instead of the existing 15min penalty to/from Rail to other modes.
- Parking constraint – removal of available on-street parking to accommodate bus priority measures, cycle schemes etc;
 - 50% reduction in on-street spaces assumed within the model.

The inclusion of these measures provides an indication of the likely improvement in sustainable mode share resulting from the 'softer' (non-infrastructure) CMATS measures.

3.4 Strategy Assessment Methodology

The procedure for the assessment of CMATS is guided by the 'Common Appraisal Framework (CAF) for Transport Projects and Programmes, March 2016' published by the Department of Transport, Tourism and Sport (DTTAS), which requires schemes to be appraised under the objective headings below.

- Safety;
- Physical Activity;
- Environment;
- Integration;
- Accessibility and Social Inclusion; and
- Economy.

The supporting ***"CMATS Transport Modelling Report"*** contains a detailed assessment of the performance of CMATS under each of the above CAF criteria.

For the purpose of this Addendum Report, which assesses the performance of the CMATS scenario following the change in land-use assumptions arising from the draft RSES, the transport modelling results have been analysed on selective model outputs to confirm that the CMATS measures can accommodate the additional growth for Cork envisaged by the draft RSES. The following indicators were assessed using SWRM outputs:

- Economy
 - Transport User Benefits;
 - Cost; and
 - BCR
- Demand Analysis
 - Mode Share
 - Trip Length Distribution
- Public Transport Network Operations; and
- Road Network Operations.

4 CMA Transport Strategy Assessment

4.1 Introduction

As described in Chapter 3, the Do-Minimum and Do-Strategy scenarios have been quantitatively assessed using outputs from the SWRM. This section outlines the results for each scenario using the Key Performance Indicators (KPIs) described above.

4.2 Economy

This chapter sets out an assessment of estimated transport user benefits for the CMA Transport Strategy scenario with the higher levels of population growth envisaged by the RSES. This provides a high-level indication of whether the proposed investment required for the Strategy is worthwhile.

This assessment has taken account of relevant guidance of the Department of Public Expenditure and Reform and the Department for Transport, Tourism and Sport (DTTAS).

The purpose of this assessment is to provide an initial high-level indication of the performance of the package of strategy infrastructure schemes, i.e. do the benefits of implementing the Strategy exceed the costs. It is undertaken at a level of detail that is appropriate for this stage of transport strategy development, i.e.

- Cost estimates for the proposals are developed based on cost outturns for similar projects rather than detailed design; and
- Benefits are forecast based on outputs from the transport modelling assessment of the proposals which use broad assumptions regarding scheme operation and design.

4.2.1 Cost Estimate

An outline cost estimate of the Strategy has been prepared based on estimates of per/km costs used for the NTA Greater Dublin Area Transport Strategy and other studies. The profile of expenditure is based on an estimated programme of works to deliver the Strategy by 2040 and are in line with outline implementation plan provided in the Main Report.

The outline cost estimates are high level estimates based on values from individual scheme development, broad per km rates, and other general assumptions for each strategy option. The estimates are provided for the purposes of this high-level estimate of transport user benefits only and should not be used or relied upon for any other purposes.

More detailed cost estimates will be undertaken at each scheme development stage for each individual scheme included in the Strategy, as appropriate. The estimates of scheme capital costs are presented in Table 4-1, in 2016 prices and exclusive of VAT.

Table 4-1 CMATS Outline Scheme Cost Estimates

Scheme	Capital Expenditure (€m)
Cork Luas (LRT)	1084.8
Rail Upgrade (New Stations, Electrification and Kent Upgrade)	273.3
Cork BusConnects	545.8
Cycle Network	230.9
Walk Network	3.0
National Roads <i>(Note: Includes Cork North Ring Road but not M28 and Dunkettle Interchange which are included in the DoMin so costs not included for appraisal purposes)</i>	144.3
Regional and Local Roads (CNDR, N27, Docklands etc.)	698.25
Park and Ride	15.2
Demand Management	20
Integration & ITS	70
Total	3,343

In addition to the capital costs of the schemes, an allowance was made for appropriate annual operation and maintenance (O&M) costs and an allowance for fleet and infrastructure renewal requirements over the assessment period.

Estimates were developed based on comparative costs of similar schemes and previous experience. The total annual operating cost estimate and fleet renewal cost estimate over the assessment period for the entire CMA Transport Strategy is detailed in Table 4-2 below.

Table 4-2 CMATS Operational and Maintenance Costs

Estimate	Cost (€m)
Average Annual O&M Cost	18.1
Average Annual Fleet and Infrastructure Renewal Cost	7.8

4.2.2 Transport User Benefits Appraisal

The Transport User Benefits Appraisal (TUBA) (v1.9.4) program has been used to estimate transport user benefits arising from the Strategy. The assessment compares the “Do-Minimum” scenario (i.e. not to progress with the proposals) with a “Do-Something” scenario (i.e. the scheme) and estimates the benefits resulting from the scheme in terms of:

- Transport user time impacts;
- Vehicle operating cost impacts;
- Transport provider revenue impacts; and
- Impacts related to emissions (greenhouse gases).

TUBA is the ‘best practice’ software used in transport scheme appraisal across the UK and Ireland and was developed specifically for the purpose of cost benefit analysis and economic appraisal.

Inputs from the Transport Models

In order to calculate the changes in travel costs as a result of the implementation of the Strategy, travel demand and cost skims are extracted from the Do-Minimum and Do-Strategy transport model runs. The demand is split by purpose with common value of time and the travel costs are split into the appropriate sub-components as required in the guidance.

For the purposes of this assessment, it is assumed that all the schemes proposed as part of the Strategy start operating on a phased basis up to 2040. Full details of the phasing of transport schemes is contained in the Main Report.

Standard economic parameters

Standard transport appraisal parameters in Ireland are available from the following documents:

- Department of Public Expenditure and Reform ‘Public Spending Code’, 2013;
- Department of Transport ‘Guidelines on a Common Appraisal Framework for Transport Projects and Programmes’, 2016 - Appendix 1: Application Rules for Cost-Benefit Parameter Values; and
- NRA 2011 ‘Project Appraisal Guidelines’, 2011 - Unit 6.11 National Parameters Values Sheet.

All general transport appraisal parameters are taken from the above documents. Updated vehicle purpose splits and vehicle occupancy rates were derived from the NTA’s National Household Travel Survey (2012).

The other main input assumptions to the assessment are as follows:

- A price base year and present value year of 2016;
- A strategy opening year of 2040;
- A standard appraisal period of 30 years;
- Residual value period of a further 30 years;
 - Growth in transport demand beyond 2040 is assumed to be 15% up to 2070 based on CSO Population projections.
- A discount rate of 5% as per the DPER ‘Public Spending Code’;
- Shadow pricing has been included in line with the DPER ‘Public Spending Code’, i.e. a shadow price of public funds of 130% and a shadow price of labour of 80%;
- All outputs are presented in market prices; and
- Annualisation factors have been developed from a detailed analysis of observed data and transport model outputs.

4.2.3 Cost Benefit Analysis

A simple assessment was undertaken to compare the estimated transport user benefits to the set of outline cost estimates.

Generally, if the forecast benefits for the Strategy exceed the estimated costs, then the investment can be considered worthwhile. The results of the assessment of the Strategy are presented below in Table 4-3.

Table 4-3 Transport Economic Efficiency (TEE) Table

	€ m
Present Value of Transport User Benefits	5,716
Present Value of Strategy Costs	2,305
Net Present Value	3,410
Transport User Benefit to Cost Ratio	2.48:1

4.3 Demand and Mode Share Analysis

4.3.1 Demand Analysis

Figure 4-1 and Figure 4-2 below show the Cork Metropolitan Area (CMA) 24Hr and AM Demand Distribution by mode for the Base Year (2011) and the forecast (2040) Do-Minimum and Do-Strategy scenarios.

The analysis shows an increase in overall trips within the CMA from approximately 830,000 in the base year 2011 to 1.3million trips in 2040 – representing a 57% increase in demand.

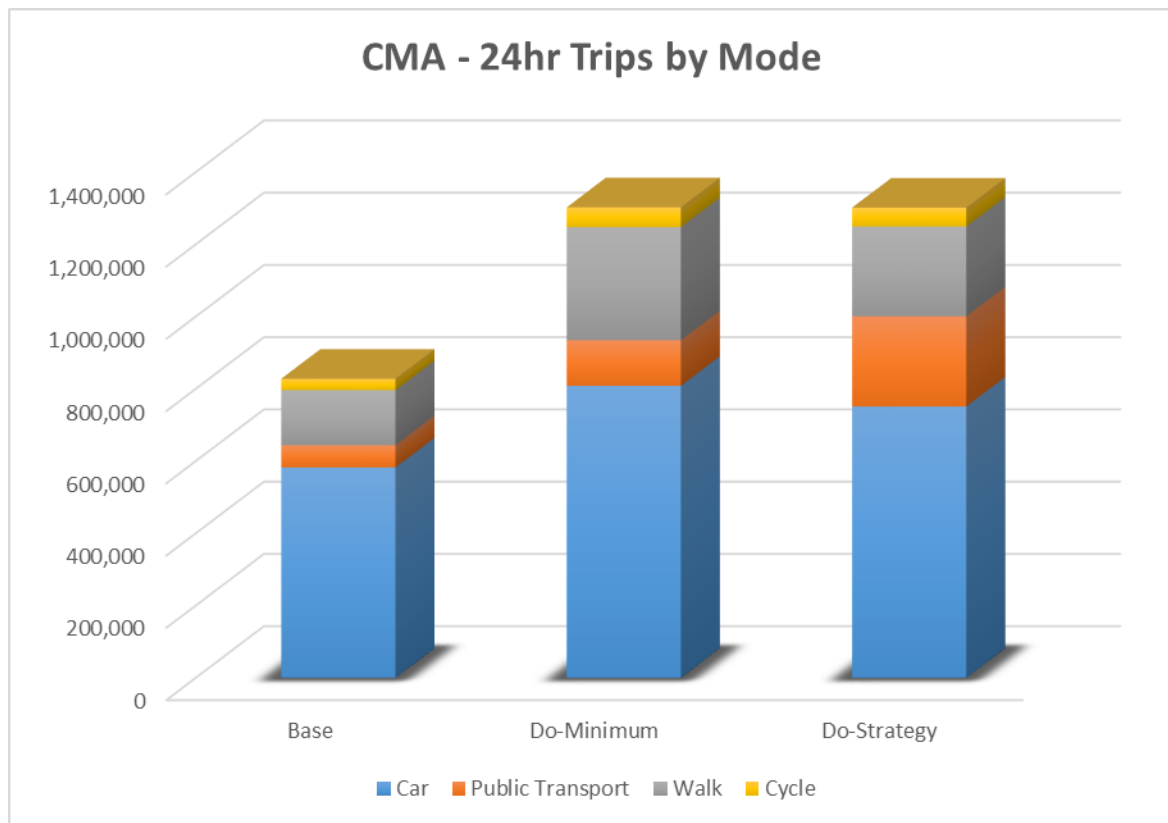


Figure 4-1: CMA 24Hr Demand Distribution

Trips within the AM time period across the CMA increase from approximately 200,000 in the base year 2011 to 330,000 trips in 2040 – representing a 62% increase in demand.

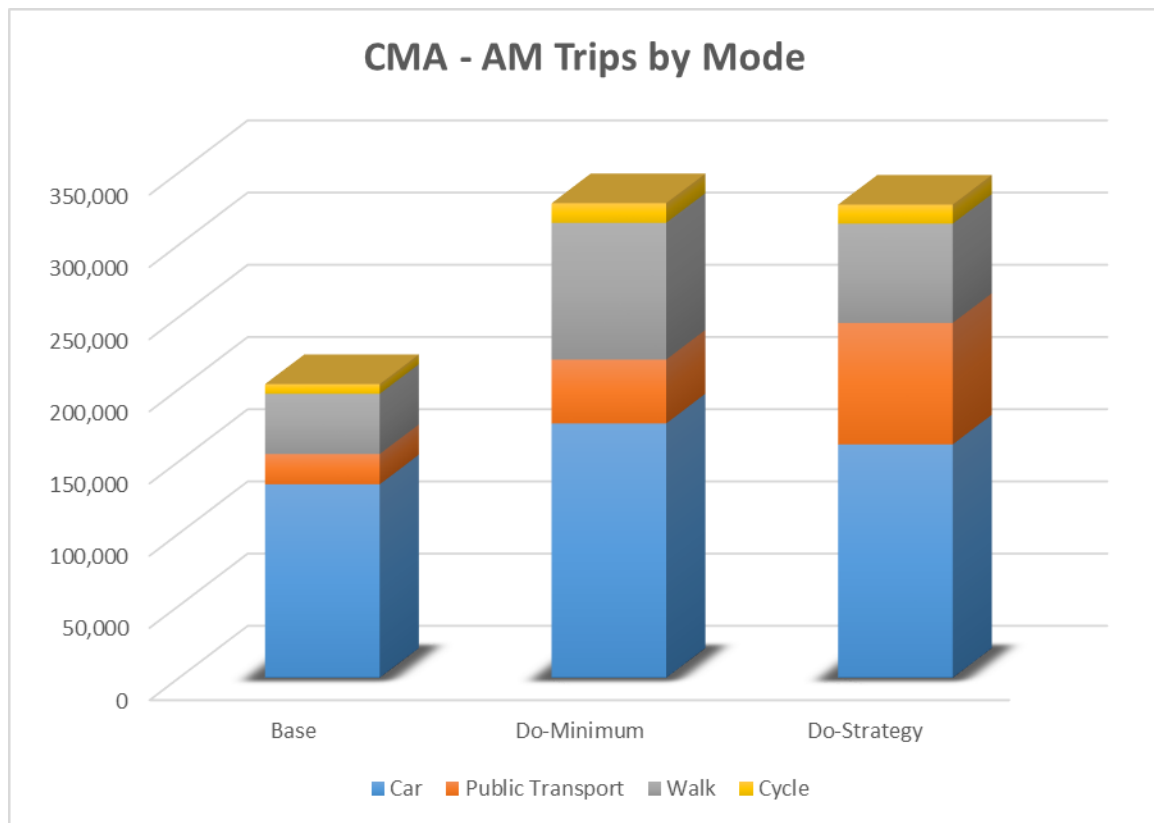


Figure 4-2: CMA - AM Demand Distribution

4.3.2 Mode Share Analysis

This section provides an analysis of mode share for trips within the CMA in 2040. The mode shares for 24-hour, each individual time period and by area for the Do-Minimum and Do-Strategy scenarios are shown in Figure 4-3 to Figure 4-8 below.

The results of the assessment show a substantial increase in sustainable mode share in the Do-Strategy scenario compared to the Do-Minimum. 24-hour PT mode share increases from 9.7% to 19.2%, with corresponding reductions in Car mode share reducing from 62.1% to 57.7%.

For the AM peak period, the PT mode share is 25.7% which represents a substantial improvement on the 13.4% in the Do-Minimum scenario.

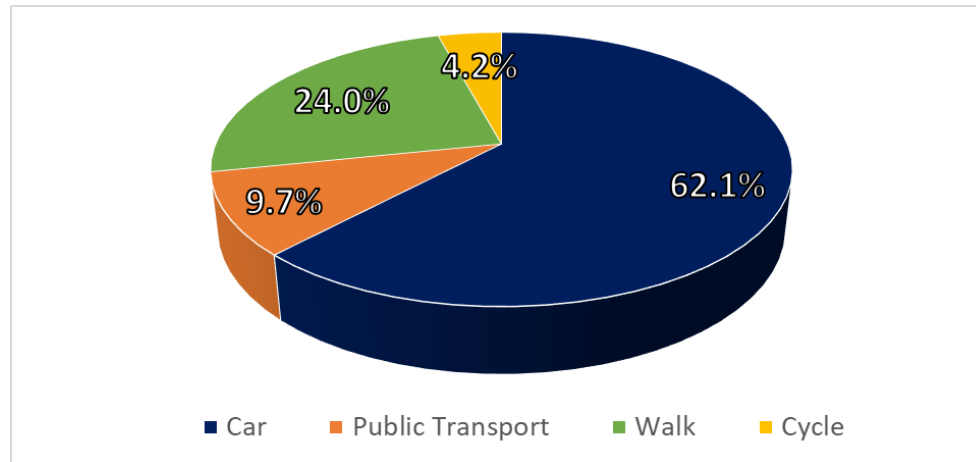


Figure 4-3: Do-Minimum - 24 Hr Metropolitan Area Mode Share

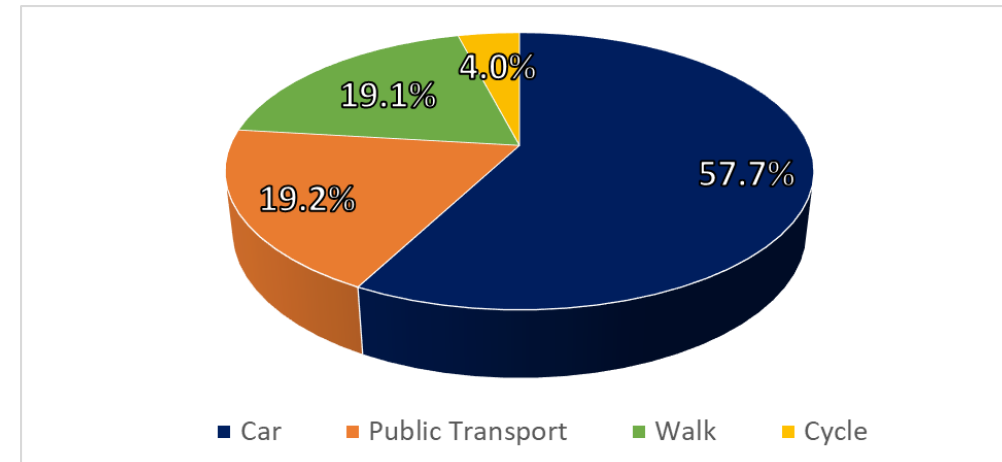


Figure 4-6: Do-Strategy - 24 Hr Metropolitan Area Mode Share

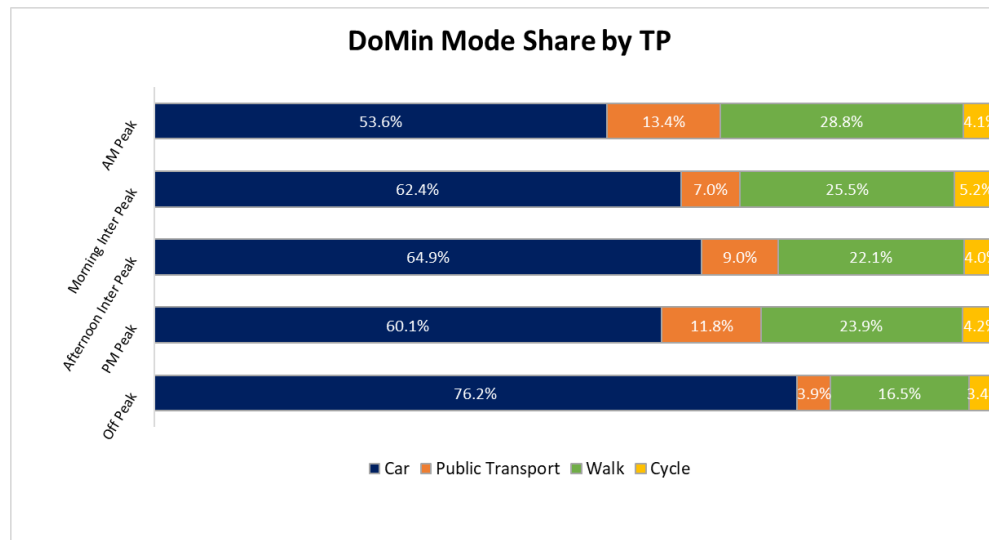


Figure 4-4: Do-Minimum Mode Share by Time Period

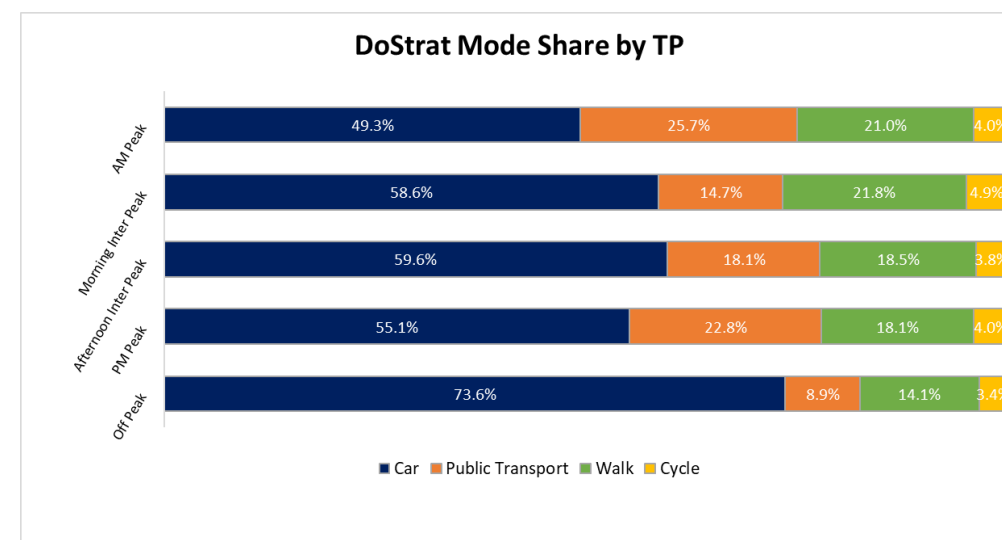


Figure 4-7: Do-Strategy Mode Share by Time Period

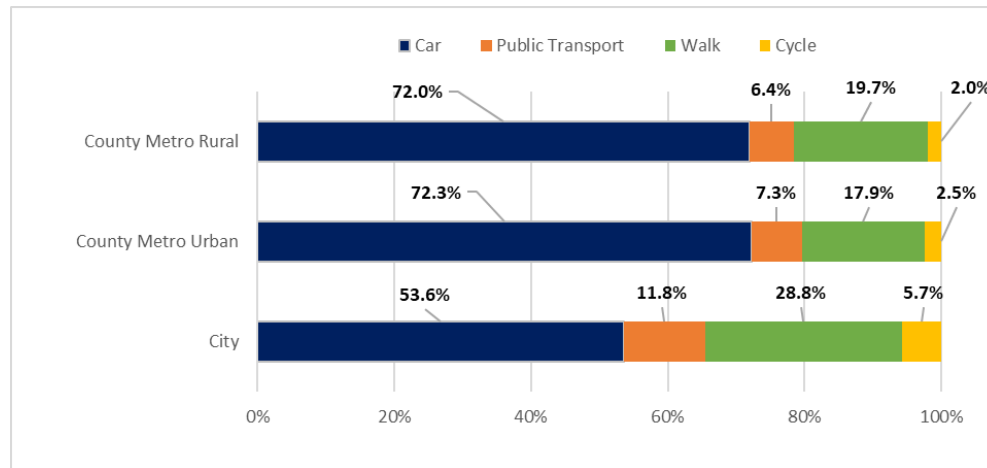


Figure 4-5: 24hr Do-Minimum Mode Share by Settlement

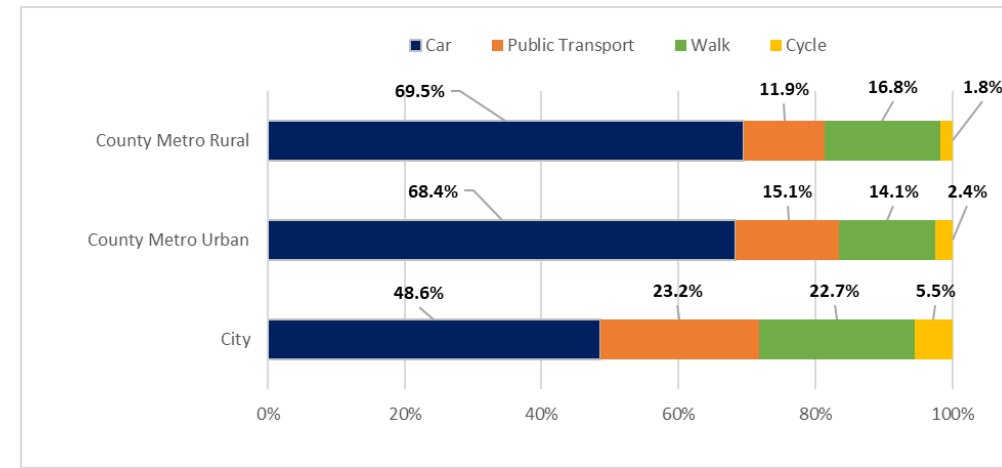


Figure 4-8: 24hr Do-Strategy Mode Share by Settlement

4.3.3 Trip Length Distribution

Another Key Performance Indicator (KPI) used in the assessment is Trip Length Distribution (TLD). TLDs provide detail on the number of trips by journey length for each mode within the CMA. They can be used to compare scenarios and indicate how trip patterns are changing. The Trip Length Distribution for the Do-Minimum and Do-Strategy for all trips is displayed in the Figure 4-9 below.

This shows reduced levels of short trips, with people able to travel longer distances due to the improved transport network and accessibility provided by the CMATS measures.

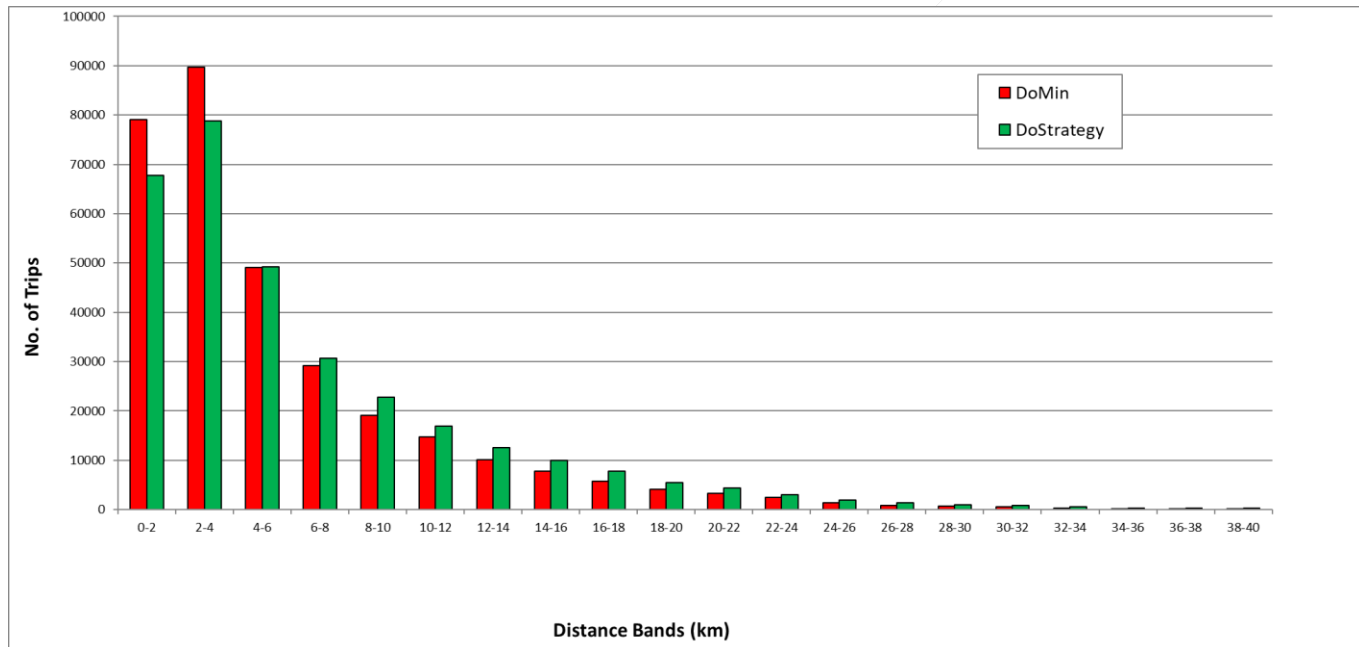


Figure 4-9: Do-Minimum and Do-Strategy Trip Length Distribution

The Trip Length Distribution for each Mode - Car, PT, Walk and Cycle are presented in Figure 4-10, Figure 4-11, Figure 4-12 and Figure 4-13 respectively below.

The results show reduced levels of Car trips across all distance bands, particularly over short to medium distances (<12km). Public Transport trips are shown to increase substantially across all distance bands in the Do-Strategy scenario, as the new CMATS public transport measures provide a viable alternative to travel by car.

Walking trips are shown to reduce compared to the Do-Minimum scenario. This is because within the Do-Minimum scenario the increased level of trips could not be accommodated on the existing public transport and cycle network. The road network is also heavily congested resulting in many people forced to walk to complete their trip.

The introduction of the CMATS cycle network results in large increases in cycling trips compared to the Do-Minimum scenario, particularly over the 4-12km range, due to the provision of high quality cycle routes across the CMA to access the city centre core.

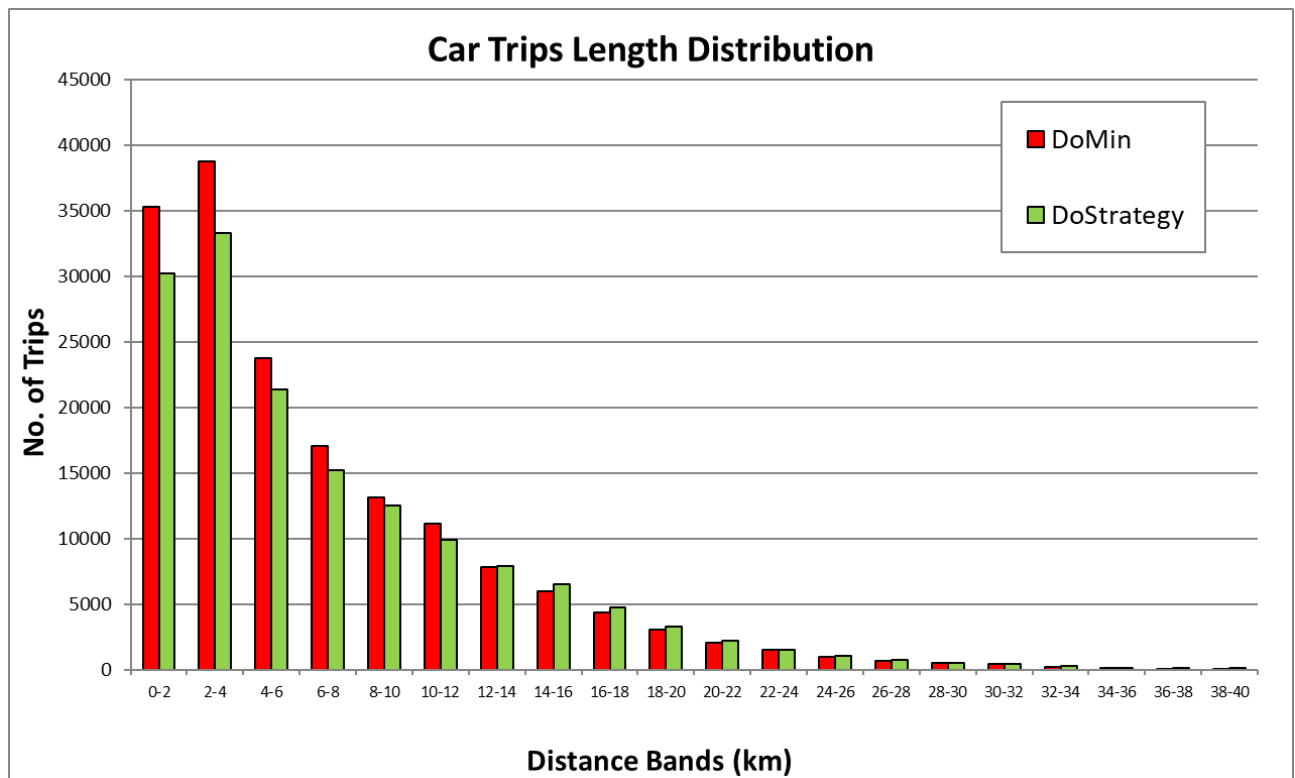


Figure 4-10: Road Trip Length Distribution

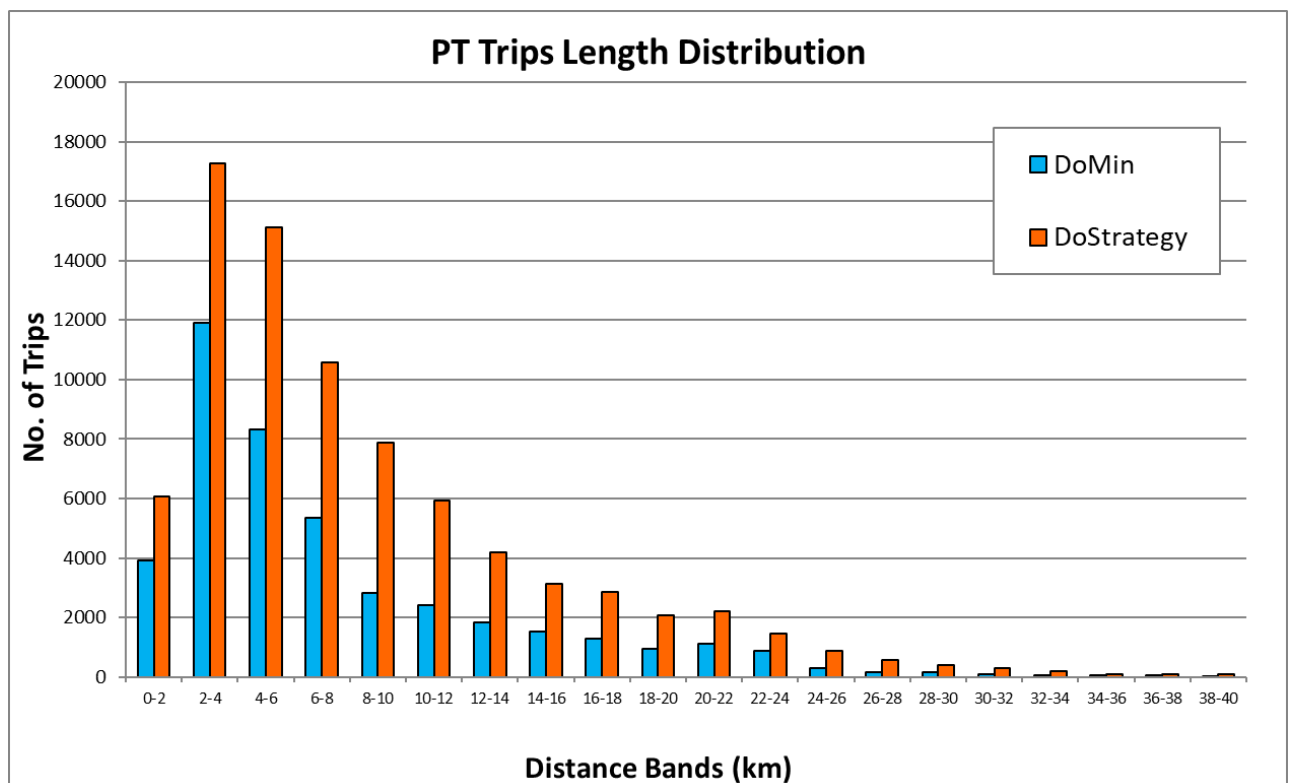


Figure 4-11: PT Trip Length Distribution

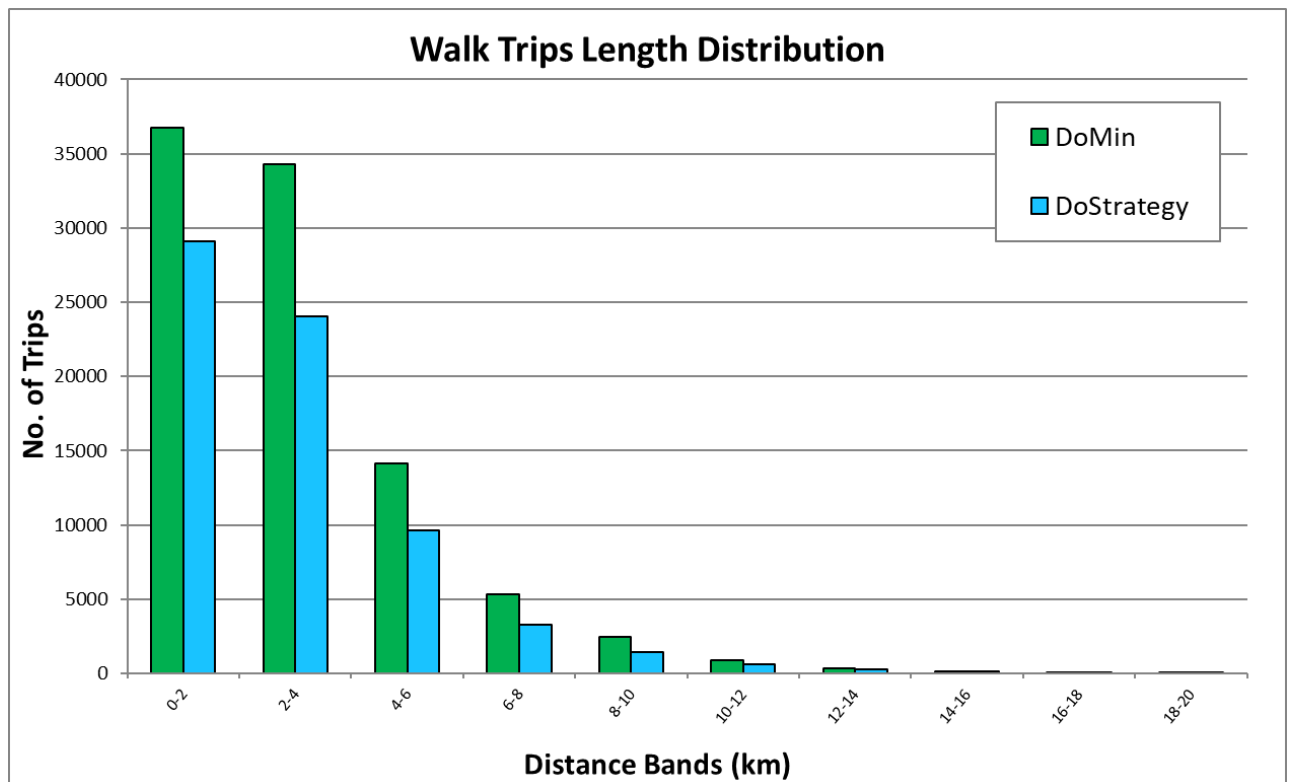


Figure 4-12: Walk Trip Length Distribution

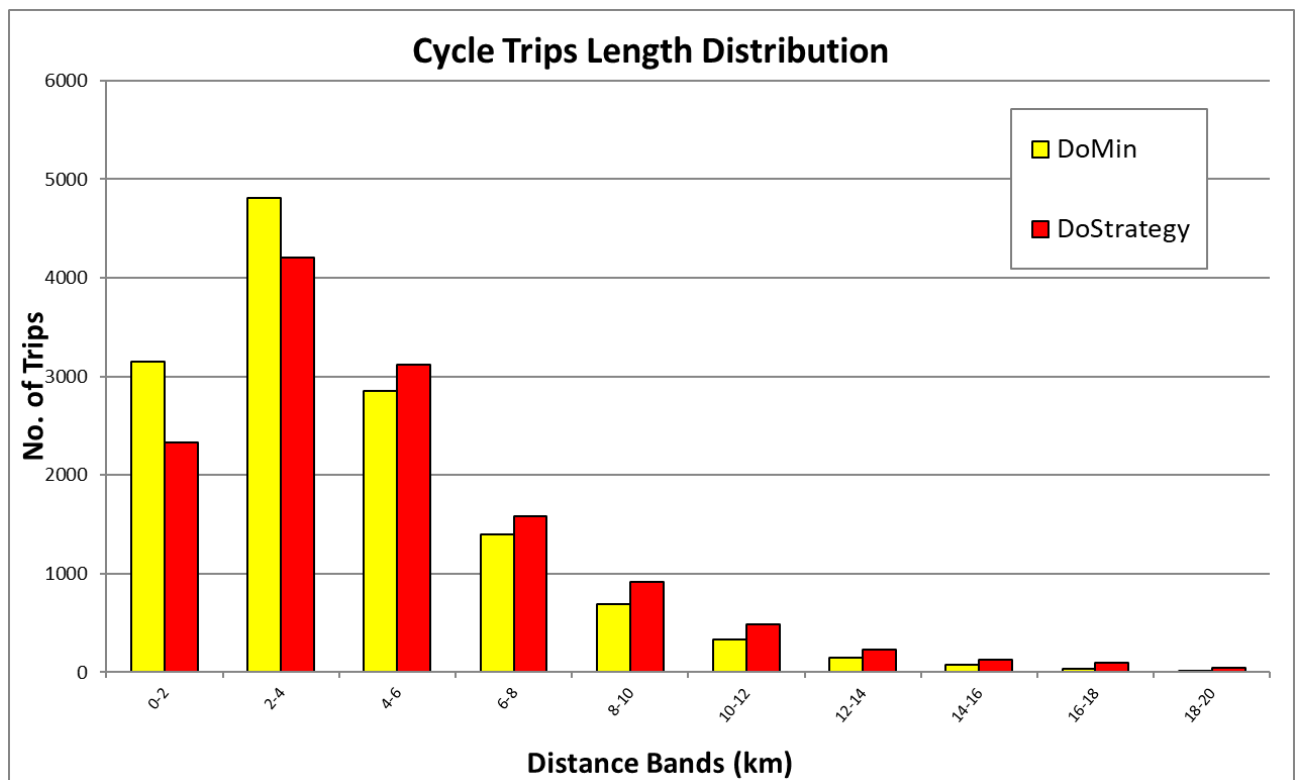


Figure 4-13: Cycle Trip Length Distribution

4.4 Public Transport Network Analysis

This section provides further detail on the performance of the CMATS Do-Strategy public transport network compared to the Do-Minimum scenario.

Table 4-4 below shows the breakdown of AM Trips by PT Sub-Mode for the Do-Minimum and Do-Strategy scenarios.

Table 4-4 AM Peak Hr PT trips by Sub-mode

Sub-mode	Do-Minimum	Do-Strategy
Rail	7,194	10,453
Luas	0	10,226
Bus	31,090	49,421
Total	38,284	70,100

The results show an 83% increase in public transport trips compared to the Do-Minimum scenario with substantial increases across all of the public transport sub-modes. Over 10,000 trips will be made on the new Luas service in the AM peak hour.

4.5 Road Network Operations

This section provides detail on the performance of the road network. Table 4-5 below presents High-Level Road Network statistics for the Do-Minimum and Do-Strategy extracted from the SWRM SATURN road model in the AM peak hour.

Table 4-5 AM Road Network Assignment Statistics

Assignment Stats	Do-Minimum	Do-Strategy	% Difference
Transient Queues (PCU.HRS)	8,284	7,779	-6.1%
Over-Capacity Queues (PCU.HRS)	5,360	3,974	-25.8%
Link Cruise Time (PCU.HRS)	43,618	43,215	-0.9%
Total Travel Time (PCU.HRS)	57,262	54,968	-4.0%
Travel Distance (PCU.KMS)	3,380,080	3,384,639	0.1%
Average Speed (KPH)	59	62	4.4%

The results show substantial improvements in road network performance between the Do-Minimum and Do-Strategy scenarios. Over-capacity queueing – a measure of congestion on the wider road network shows a reduction of 26% between the two scenarios.

5 Conclusions

This Addendum Report summarised the difference in land-use assumptions between the draft RSES growth projections for Cork and the draft CMATS projections (based on NPF). A detailed assessment of the transport proposals outlined as part of the Cork Metropolitan Area Transport Strategy (CMATS) was undertaken using outputs from the South West Regional transport model comparing the Do-Minimum scenario to the Do-Strategy (CMATS) scenario to understand if the proposed CMATS network could accommodate the revised growth levels.

As a result of this assessment, the main impacts of the Strategy can be summarised as follows:

- The majority of projected growth in travel demand in the CMA will be accommodated by sustainable transport modes;
- The Strategy is forecast to provide an increase in mode share for sustainable transport modes and a reduction in the demand to travel by private car;
- The public transport network is forecast to have very high usage with a significant increase in total passenger boardings;
- Travel times on the road network are forecast to reduce as a result of the Strategy – compared to the Do-Minimum;
- The Strategy represents a worthwhile investment with transport user benefits forecast to exceed the outline estimate cost of delivering the Strategy by 2.5:1.

Annex 1 Settlement Level Growth Projections

Settlements	Area	2016	2040_D3	2040_D3	2040_D3	2040_D4	2040_D4	2040_D4
		Population	Population	Jobs	Education	Population	Jobs	Education
City Centre	City	18,331	26,983	36,999	13,777	31,258	40,623	15,962
City NW	City	19,239	19,931	2,360	2,535	23,084	2,591	2,936
City NE	City	16,250	19,001	3,355	1,794	22,007	3,683	2,078
City SE	City	20,476	20,960	2,984	4,796	24,270	3,275	5,554
City SW	City	34,048	45,107	12,491	31,588	52,245	13,713	36,592
Blackpool	City	5,016	8,977	4,998	325	10,399	5,488	376
Tivoli	City	2,726	9,789	5,001	718	11,337	5,489	832
Docklands	City	1,414	23,752	23,351	574	27,509	25,632	665
Mahon	City	6,072	7,829	10,249	1,428	9,068	11,252	1,655
Wilton	City	223	729	3,157	235	845	3,466	272
CUH	City	938	1,353	4,520	101	1,566	4,960	116
Model Farm	City	665	2,182	7,000	724	2,526	7,681	838
Apple	City	258	269	3,695	27	311	4,052	32
TOTAL - CITY		125,657	186,860	120,161	58,622	216,426	131,906	67,908
Ballincollig	Metro	17,775	30,804	5,603	5,722	35,683	6,152	6,628
Blarney	Metro	5,598	13,101	1,005	1,949	12,816	1,103	1,768
Carrigaline	Metro	15,621	17,057	1,634	3,103	16,684	1,793	2,815
Carrigtwohill	Metro	6,049	13,695	3,533	2,817	13,398	3,879	2,556
Cobh	Metro	13,144	14,540	1,472	2,943	14,220	1,615	2,669
Ballyvolane	Metro	7,975	11,968	1,885	1,820	13,860	2,069	2,107
Glanmire	Metro	10,232	16,112	1,353	3,695	18,664	1,486	4,280
Midleton	Metro	14,745	27,944	4,609	5,876	27,334	5,060	5,331
Monard	Metro	528	7,656	254	940	7,489	279	853
South Environs	Metro	34,589	34,861	4,567	2,334	40,377	5,013	2,703
Passage West	Metro	5,907	6,617	214	853	6,474	234	774
CSIP	Metro	1,184	4,213	8,686	8,000	4,880	9,537	9,270
Little Island	Metro	2,026	2,875	10,860	209	3,330	11,923	242
Ringaskiddy	Metro	1,416	1,426	5,000	398	1,396	5,490	361
Airport	Metro	373	387	5,000	1	447	5,485	1
Metro Villages & Rural Areas	Metro	42,588	43,686	4,893	6,657	42,738	5,372	6,041
TOTAL - CITY AND SUBURBS		199,811	288,080	158,116	80,402	333,669	173,571	93,140
TOTAL - COUNTY METROPOLITAN		179,749	246,942	60,567	47,314	259,791	66,490	48,399
TOTAL - CITY & COUNTY METROPOLITAN		305,406	433,802	180,728	105,936	476,217	198,396	116,307
Fermoy	County	7,281	8,720	3,128	2,906	9,582	3,437	3,193
Kinsale	County	6,732	7,902	2,327	1,891	8,682	2,556	2,077
Mallow	County	13,053	16,432	5,499	3,984	18,047	6,039	4,375
Bantry	County	4,598	5,593	2,410	1,416	6,145	2,647	1,556
Youghal	County	8,484	10,193	2,058	1,891	11,201	2,262	2,078
Clonakilty	County	5,999	7,306	3,682	2,159	8,026	4,045	2,371
Bandon	County	7,886	9,390	2,935	3,057	10,316	3,225	3,359
Macroom	County	4,726	5,613	1,978	1,416	6,165	2,173	1,555
Mitchelstown	County	4,316	5,276	1,647	1,443	5,795	1,809	1,585
Watergrasshill	County	1,366	1,499	659	3	1,648	724	4
Millstreet	County	3,007	3,432	1,333	550	3,770	1,464	604
Skibbereen	County	3,956	4,602	2,214	1,537	5,058	2,433	1,689
Kanturk	County	3,640	4,188	1,040	1,199	4,600	1,142	1,317
Dunmanway	County	2,493	2,907	918	963	3,195	1,009	1,058
Rathcormac	County	2,595	2,850	242	366	3,132	266	402
Castlemartyr	County	2,403	2,640	267	312	2,899	293	343
Rathluirc	County	4,147	4,554	2,485	1,385	5,003	2,731	1,522
Kilumney	County	1,628	1,789	131	0	1,964	143	0
Ballinhassig	County	720	790	29	158	868	32	174
Cork Rural	County	148,431	161,860	17,726	20,078	177,811	19,473	22,057
TOTAL - COUNTY		237,462	267,537	52,707	46,713	293,909	57,904	51,319
TOTAL - CORK CITY & COUNTY		542,868	701,339	233,436	152,649	770,126	256,300	167,626