



**Renfrewshire Local Development Plan
Proposed Plan
Transport Appraisal 2019
Background Paper 6**



Part 1

BASELINE REPORT



SYSTRA

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1. INTRODUCTION

1.1 Background

SYSTRA has been commissioned by Renfrewshire Council (RC) to carry out a transport assessment in order to support the Council's transport appraisal of their emerging Local Development Plan (LDP) 2.

LDPs provide the vision for how communities will grow and develop in the future. They set out the spatial strategy for the area and guide the future use of land. They set out where future development should and should not occur, identifying opportunities for change, regeneration and enhancement. They also provide an indication of the level of infrastructure required for growth.

The process of developing a LDP requires evidence on traffic related matters to be presented in the shape of a transport appraisal. The appraisal is aligned with Transport Scotland's Development Planning & Management: Transport Appraisal Guidance (DPMTAG) process, in that it will examine all modes of travel including rail, bus, road, and active travel (walking and cycling) connections and land use solutions.

The appraisal outcomes will in turn support and inform the Council's vision for its spatial strategy and help to determine the impact that the various development would have on local and strategic transport network.

In preparation of this report consultations have been undertaken with key stakeholders including Renfrewshire Council and Transport Scotland.

1.2 Purpose of the report

The purpose of this report is to provide the baseline evidence that will set the context for the transport appraisal. The report provides discussion around:

- The context of how Renfrewshire's LDP sits within the wider planning policy;
- The existing socio – economic baseline for Renfrewshire;
- Development of the spatial strategy behind the LDP;
- Background evidence on travel demand and supply in the area.

The Report concludes by drawing together key challenges, issues and opportunities facing Renfrewshire in the context of the LDP and how, in turn, the strategy is likely to influence both travel demand and supply over the life of the plan.

The evidence base will also help to shape the transport planning objectives (TPOs) that will provide the framework of the transport appraisal.

2. POLICY REVIEW

2.1 Overview

There are a number of wider transport, planning, and economic policies, strategies, and plans, that will inform the development of the emerging LDP and its Supporting Transport Appraisal (STA). These documents include:

2.1.1 National policies and plans

- National Planning Framework 3, 2014
- Scottish Planning Policy, 2014
- Scotland's National Transport Strategy, 2016
- Infrastructure Investment Plan, 2015

2.1.2 Regional policies and plans

- Clydeplan Strategic Development Plan, 2017
- Glasgow City Region City Deal
- Glasgow City Region Economic Action Plan, 2017

Local policies and plans

- Renfrewshire Local Development Plan, 2014 – 2024
- Renfrewshire Monitoring Statement, 2016/17
- Main Issues Report, 2017
- Renfrewshire Local Transport Strategy, 2017
- Renfrewshire Cycling Strategy, 2016-2025
- Renfrewshire Outdoor Access Strategy, 2016-2026
- Renfrewshire Community Plan, 2017-2027
- Renfrewshire Strategic Economic Framework, 2016 - 2018

2.2 National policies and plans

2.2.1 National Planning Framework

Scotland's *National Planning Framework 3* (NPF3) was laid in the Scottish Parliament on 23 June 2014 and spatially sets out the Scottish Government's Economic Strategy. It focuses on four outcomes:

- Creating a successful, sustainable place that supports sustainable economic growth and regeneration including the creation of well-designed places;
- Making Scotland a low carbon place, reducing carbon emissions and adapting to climate change;
- Ensuring that Scotland is a natural and resilient place, helping to protect and enhance its natural and cultural assets, facilitating sustainable use;
Making Scotland a connected place, supporting better transport and digital connectivity.

NPF3 also identifies the Government's development priorities over the next 20 – 30 years including 14 national developments which support the strategy. Two of these developments - Strategic Airport Enhancements at Glasgow Airport and Central Scotland Green Network will continue to be reflected in Renfrewshire LDP.

The policy refers to Renfrewshire under the Glasgow and Clyde Valley area as Scotland's biggest economic region. It notes emerging new opportunities in the area including a Simplified Planning Zone at Hillington and improvements to Paisley to create a 21st-century town centre. It makes references to economic and connectivity benefits of Glasgow Airport and the continuing works to improve its surface access.

2.2.2 Scottish Planning Policy

Scottish Planning Policy (SPP) was also published on 23 June 2014 and sets out national planning policies which reflect Scottish Ministers' priorities for the operation of the planning system and for the development and use of land. The SPP promotes consistency in the application of policy across Scotland while allowing sufficient flexibility to reflect local circumstances. It directly relates to:

- The preparation of development plans;
- The design of developments, from initial concept through to delivery;
- The determination of planning applications and appeals.

2.2.3 Transport Scotland National Transport Strategy, 2016

Scotland's National Transport Strategy was originally published in December 2006 to act as an enabler of economic growth. Its aim is to support businesses in achieving their local, national and international objectives and to improve the lives of individuals and communities by providing connections to future economic development. A refresh to the Strategy was prepared in January 2016.

The Strategy refers to Renfrewshire Council as part of The Glasgow and Clyde Valley City Deal which is backed by £500m of investment from both the UK and Scottish governments. Each of the eight Glasgow and Clyde Valley Councils are contributing a further £130m over 20 years.

The Strategy refers to the importance of economic growth around Scotland's Airports, including Glasgow airport which is located in Renfrewshire.

2.2.4 Infrastructure Investment Plan, 2015

The Infrastructure Plan was published in 2015 and sets out the priorities for investment in public infrastructure in Scotland.

It details that Renfrewshire have benefited from £12 million pound investment in the Paisley Canal line electrification. This has enhanced the capacity and capability of the rail network in Renfrewshire, connecting to central Scotland and beyond. More generally, over £6 billion has been invested in Scotland's railways since 2007, supporting growth through new and better services, new trains, new tracks, new and improved stations, and policies aimed at improving affordability and accessibility.

2.3 Regional policies and plans

2.3.1 Clydeplan Strategic Development Plan, 2017

The Clydeplan Strategic Development Plan has been prepared in partnership between the eight Glasgow and the Clyde Valley local authorities and sets out the long term strategy and vision for the city region. Its policies will provide the strategic context for the emerging Renfrewshire LDP and STA.

The Plan retains the focus and emphasis on the growth of the City Region. The overall vision is:

“By 2036 Glasgow and the Clyde Valley will be a resilient, sustainable compact city region attracting and retaining investment and improving the quality of life for people and reducing inequalities through the creation of a place which maximises its economic, social and environmental assets ensuring it fulfils its potential as Scotland’s foremost city region.”

Placemaking is a principle objective in Clydeplan, supporting a safe, pleasant and sustainable City Region where priority is given to people movement over vehicle movement.

Clydeplan also supports high quality and convenient public transport which is integrated with land use and development. It highlights support for development which is concentrated along transport corridors in close proximity to existing transport connections, optimising the use of existing infrastructure.

2.3.2 Glasgow City Region City Deal, 2017

The Glasgow City Region City Deal is a 20-year investment programme that aims to deliver significant economic growth through funding in infrastructure, places and people across eight neighboring local authorities in the Glasgow and the Clyde Valley Region.

The programme will see £274 million of the overall £1.13 billion City Deal investment being delivered in Renfrewshire. This includes three of the biggest infrastructure investment projects – the Airport Access Project; the Clyde Waterfront and Renfrew Riverside project; and the Glasgow Airport Investment Area (GAIA) project.

2.3.3 Glasgow City Region Economic Action Plan, 2017

The Glasgow City Region Economic Action Plan covers eight local authorities, one of which is Renfrewshire Council. The vision set for the region for 2035 is:

“A strong, inclusive, competitive and outward-looking economy, sustaining growth and prosperity with every person and business reaching their full potential”.

In total eleven objectives are set through the Plan, the ones regarding the provision of accessible, sustainable and reliable transport are outlined below:

- Create a skills and employment system that meets the current and future needs of Glasgow City Region businesses and supports our residents to access jobs and progression opportunities.
- Significantly improve the productivity of Glasgow City Region’s diverse business base through increased investment, innovation and exporting.
- Building on the City Deal bring forward in parallel strategic programmes, projects, and associated investment that maximise the value of the Deal.
- Maximise the potential of the key Glasgow City Region economic assets.
- Increase the number of housing and commercial completions and decrease the amount of derelict and vacant land.

Further, the Economic Plan highlights the importance of Glasgow Airport as “key driver of the City Region economy.” It states further that “we will utilise the Airport Access Project, Airport Investment Area, and Clyde Waterfront & Renfrewshire Riverside projects to maximise the economic impact of the airport across the City Region.”

2.4 Local policies and plans

2.4.1 Renfrewshire Local Development Plan, 2014 – 2024

Renfrewshire LDP was adopted in 2014 and replaces the previous Local Plan from 2006. Through key policies and proposal maps the Plan outlines the spatial strategy for the area. The spatial strategy is developed around the following five strategic elements:

- Economy – with the aim to facilitate economic investment and deliver sustainable economic growth in Renfrewshire;
- Centres – The LDP encourages a town centres economy by creating vibrant, well designed and accessible places which offer a range and choice of uses. The town centres are classified under one of the four categories – strategic centres, core town centres, local service centres and commercial centres, depending on their strategic role for Renfrewshire and the region beyond;
- Infrastructure - The LDP is supporting investments which assist in creating sustainable communities by ensuring people and places are well connected through access to a range of travel and transport networks. The next LDP will focus on supporting Glasgow City Deal Projects to enhance connectivity and economic development opportunities for existing and new businesses across Renfrewshire.
- Places - the LDP is focusing on regeneration and enhancing existing places, particularly focusing on Renfrewshire’s Community Growth Areas.
- Environment - The LDP aims to promote sustainable patterns of development that minimise carbon and greenhouse gas emissions in line with the Climate Change (Scotland) Act 2009.

2.4.2 Renfrewshire Monitoring Statement, 2016/17

The Monitoring Statement reviews the progress in implementing the plans, policies and strategies as set out in the existing Renfrewshire LDP, 2014 – 2024. It sets out the changes in economic, environmental and social characteristics, along with any trends in the area

since the preparation of the first Renfrewshire LDP. It also helps to identify main issues in the context of the emerging LDP.

2.4.3 Renfrewshire Main Issues Report, 2017

The Main Issues Report (MIR) is one of the first stages in the cycle of producing the next LDP. Renfrewshire MIR was published in 2017. The Report builds on the (adopted) LDP and outlines the Council's aspiration for bringing forward additional development to meet Scottish Government land use targets.

The Report discusses the focus of the next LDP in terms of making the most of Renfrewshire's assets, such as the airport, the strategic road and rail network as well as business and employment areas. It also considers the importance of preserving and enhancing the built and natural environments including the allocation of resources to implement new green and blue networks associated with City Deal, the development of Community Growth Areas at Dargavel Village, Bishopton and South West Johnstone, along with the potential development at Ferguslie Park.

The MIR also, revises the objectives set in the adopted LDP for each of the key five strategic elements. In transport context, ensuring that people and places are well connected is key to the delivery of the LDP Spatial Strategy and sustainable communities across Renfrewshire.

The MIR concludes with setting out the key future development priorities for the emerging LDP with the aim to facilitate sustainable development and a low carbon economy.

2.4.4 Renfrewshire Local Transport Strategy, 2017

Renfrewshire's Local Transport Strategy (RLTS) 2007 sets out a vision for region's transport for the next 10 to 20 years. The strategy was refreshed in 2017, the outlined vision is:

"The vision for Renfrewshire is that people can improve their health and travel to where they want to get to within a set timescale using all modes including walking, cycling, public transport or their car for essential trips; business can operate effectively and efficiently creating prosperity and job opportunities; visitors are attracted to enjoy the tourism and leisure facilities; and all of this is accommodated without compromising our future environment and at best value to the Council."

The Strategy's key five objectives are:

- Regenerate the local economy wherever possible;
- Extend opportunities for all by:
 - Encouraging healthier lifestyles;
 - Encouraging a choice of transport options;
 - Improving access for all, including the mobility impaired;
- Ensure a healthy and sustainable environment;

- Improve community safety and security, both real and perceived, and increase connectivity between settlements and services;
- Encourage integration of services and an integrated approach by public bodies whilst achieving best value;

The aims set in RLTS are:

- Resolving traffic congestion on the M8 and A737 and rail capacity at peak periods such that economic growth is supported without constraints imposed by transport;
- Continue to develop strategies for travel planning and parking which reduce the number of car trips and achieve a shift to walking, cycling, public transport and car sharing;
- Continue to promote and encourage increasing in cycling and walking for commuter, leisure and business trips in order to improve local people's health and reduce car usage;
- Aiming to minimise delays for road users, particularly for public transport, subject to constraints imposed by road safety, physical limits on the network and the need for repairs.

2.4.5 Renfrewshire Cycling Strategy, 2016-2025

Renfrewshire Cycling strategy vision for the area is:

“By 2025, there has been genuine ongoing commitment and leadership from Renfrewshire Council in supporting and encouraging cycling. The network is improving and extending steadily, according to best design guidance principles, with clear links to public transport hubs, schools, other key destinations and between communities. Employers and residents alike realise the benefits of cycling; people of all ages and background feel confident cycling on the network; and there is a culture of mutual respect amongst all road users.”

Four objectives have been outlined to guide the delivery of the Cycling Strategy:

- By 2020, 3% of all journeys to work to be made by bike and this figure to raise to 7% by 2025;
- Keep cycling high in the agenda, through sustained and collective action, within Renfrewshire and with its partners;
- Make cycling safe and attractive to people of all ages and backgrounds, and for a wide range of transport and leisure journeys;
- Promote, through a range of media methods, everyday cycling as an attractive and beneficial means of transport. Promotion should be aimed especially at short trips and in particular targeting young people.

2.4.6 Renfrewshire Outdoor Access Strategy, 2016-2026

The vision behind Renfrewshire's Outdoor Access Strategy is to be “easy for people to use Renfrewshire's outdoors for responsible access and active travel”.

For achieving this the Strategy outlines four aims:

- Improve communities' health and well-being;
- Increase economic benefit;
- Improve connectivity between people and places; and,
- Aid responsible access for people and nature.

By 2020 the Strategy is aiming to increase the number of people who:

- Actively travel to work by cycle to 3% (in line with Renfrewshire Cycling Strategy objective);
- Use walking as a means of transport on more than one day per week by 5%;
- Walk just for pleasure or to keep fit on more than one day a week by 5%.

2.4.7 Renfrewshire Community Plan, 2017-2027

The vision set in Renfrewshire Community Plan is: *“Working together to make Renfrewshire a fairer, more inclusive place where all people, communities and businesses thrive”*.

The aims stated in the Plan include:

- Assisting in meeting the Scottish Government's carbon reduction targets;
- Promoting and delivering sustainable growth through sustainable travel and transport options being available across Renfrewshire;
- Coordinating transport activities across Renfrewshire to enable a reduction in fuel use, carbon impacts and improve air quality.

2.4.8 Renfrewshire Strategic Economic Framework, 2016 – 2018

Renfrewshire Strategic Economic Framework is aligned to the Scottish Government's Economic Strategy, aiming to increase competitiveness and tackle inequality. It aims to deliver 10 strategic priorities one of which includes the provision of fully accessible and integrated transport network.

The Framework highlights the importance of behavioural shift from the private car to more sustainable forms of transport, the need for 'Smart' public transport and Quality Bus Corridors, Park and Ride and improved feeder services (including accessible and rural transport services), rail and station upgrades and an improved road network to enable reduced journey times.

2.5 Summary

This section has reviewed some of the wider planning, transport and economic policies and strategies that inform the development of the LDP and STA.

In terms of setting the context for the transport appraisal and the overriding transport planning objectives, it can be seen that the policies seek to deliver ways of:

- Enhancing connectivity between people and places by making the most of Renfrewshire's rich built heritage and a varied natural environment;

- Optimising the use of existing infrastructure by supporting development which is concentrated along transport corridors in close proximity to existing transport connections;
- Supporting Glasgow City Deal Projects to enhance connectivity and economic development across Renfrewshire;
- Regenerating and enhancing existing places with a particular focus on Renfrewshire's Community Growth Areas;
- Ensuring healthy and sustainable environment that minimises carbon and greenhouse gas emissions;
- Improving integration and accessibility of all modes of transport;
- Supporting high quality and convenient public transport which is integrated with land use and development.
- Making cycling safe and attractive to people of all ages and backgrounds, and for a wide range of transport and leisure journeys;
- Reducing traffic congestion and minimising delays to road users.

3. SOCIO-ECONOMIC BASELINE

3.1 Overview

This section provides an overview of the economic characteristics of Renfrewshire Council area in terms of its demographics and economic profile. Transport investment is typically predicted based on the underpinning economic development objectives, so it is important to understand the economic profile of an area, together with its strengths and weaknesses as part of case making investment in the transport system.

The majority of the data used in this chapter are derived from the Office of National Statistics, Scottish Household Survey 2016 and Census data from 2001 and 2011. As with all available data at a national scale there is usually several years' gap between the data capture and present time. It is however considered that the data presented in this report allows key trends in the socio-economic baseline to be identified.

3.2 Economic outline

Renfrewshire is situated in the West of Scotland, and shares borders with five other local authorities; the City of Glasgow, East Renfrewshire, Inverclyde, North Ayrshire, and West Dunbartonshire.

Renfrewshire includes the towns of Paisley, Renfrew and Johnstone, smaller towns such as Erskine and Linwood, and villages such as Bishopton, Bridge of Weir, Elderslie, Houston, Inchinnan, Kilbarchan, Langbank, and Lochwinnoch (see Figure 1).

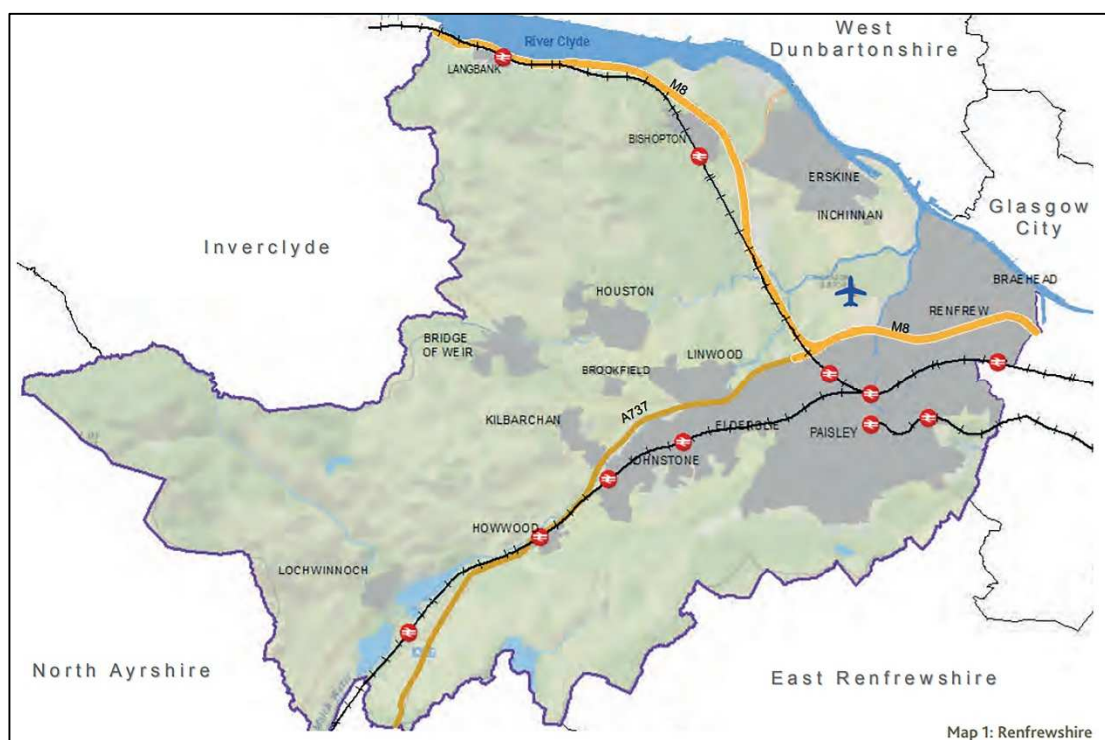


Figure 1. Renfrewshire Council boundary (Renfrewshire LDP 2014)

Renfrewshire benefits from access to a range of transport networks as well as natural and historic environment which provide opportunities for many sustainable and economic ventures.

Some of the area key attractions and destinations include: Glasgow International Airport, the historical town of Paisley, Braehead Shopping Centre on the banks of the River Clyde, St Mirren Park (an 8,000 seated stadium) and the University of the West of Scotland.

According to NOMIS in 2017 there were 4,565 businesses operating in the Renfrewshire area. The largest employers include Renfrewshire Council and the Royal Alexandra Hospital in Paisley. Other key employers include Rolls Royce, Diageo, Chivas, Intu Braehead, Thermo Fisher, Glasgow Airport, HP and Scottish Leather Group.

Based on the information provided by Renfrewshire Chamber of Commerce, Renfrewshire accounts for over one third of Scotland's manufactured exports.

The largest business park in Scotland - Hillington Park is also partially located in the area.

The Renfrewshire economy will benefit from the £274 million Glasgow City Region City Deal which is expected to result in a significant increase in jobs within the Glasgow and the Clyde Valley Area. Three of the City Deal infrastructure projects will be delivered in Renfrewshire which will facilitate the development and expansion of Glasgow Airport, unlock the development potential of key sites and establish programmes to support unemployed people and people on low incomes.¹

3.3 Population

According to 2011 Census data the population of Renfrewshire has grown by 1% since the 2001 Census. In 2017 it was estimated that almost 177,000 people lived in the area.

In comparison for the 2001 - 2011 period, Scotland's population has grown at a rate of 5%. In terms of age groups distribution, the data indicates that the number of people aged 65 and over has had the biggest increase (see Table 1).

¹ Renfrewshire Monitoring Statement 2016-2017, page 9

Table 1. Population change comparison between Renfrewshire and Scotland (2011 Census)

	Renfrewshire	Scotland
Population 2001	172,900	5,062,000
Population 2011	174,900	5,295,400
% change 2001 to 2011	1.2%	4.6%
% change 2001 to 2011 in population		
Aged under 15	-8.6%	-5.8%
Aged 15 to 64	1.5%	6%
Aged 65 and over	11.2%	10.6%

Figure 2 illustrates the change in the demographic profile in Renfrewshire for the last 20 years. The data suggests that the age groups: 25 to 44 years old and 0 to 15 years old have decreased significantly, by -18 % and -15% respectively. The largest increase is observed in the following age groups: 75 years old and over (31%), 45 to 64 years old (22%) and 65 to 74 years old (20%).

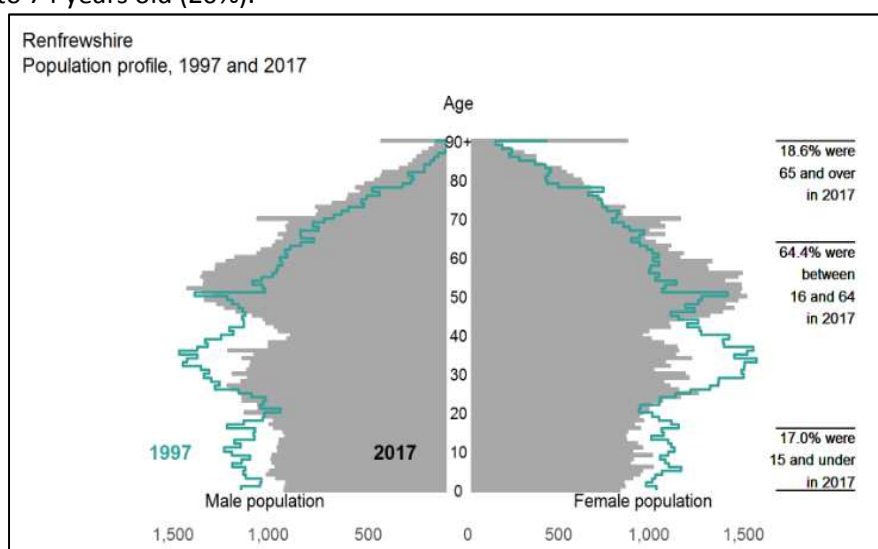


Figure 2. Comparison of population profile between 1997 and 2017 (Population Estimates Time Series, 2017)

In terms of overall population size, in 2017 the 45 to 64 age group was the largest, accounting for approximately a third of the population in Renfrewshire (51,442 people). The data also suggests that more females than males live in the area in four out of the six groups (see Figure 3).

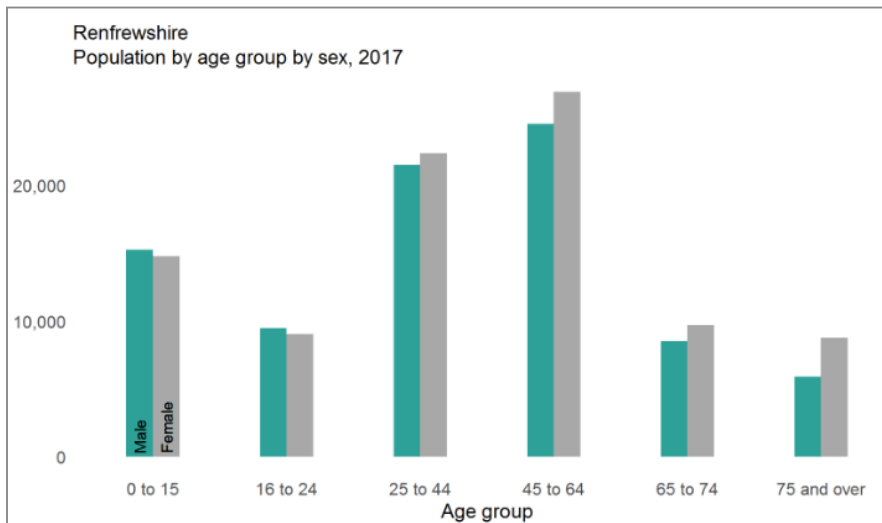


Figure 3. Renfrewshire population by age group and sex (Population Estimates Time Series, 2017)

For the period 2015 and 2016, the level of in-migration in Renfrewshire was 6,162 people, a 13.9% increase from 5,410 in the period 2014 and 2015. In comparison, the level of out-migration in Council’s area was 4,548 people, which is a 5.6% decrease from 4,819 in 2014-15 (see Figure 4).

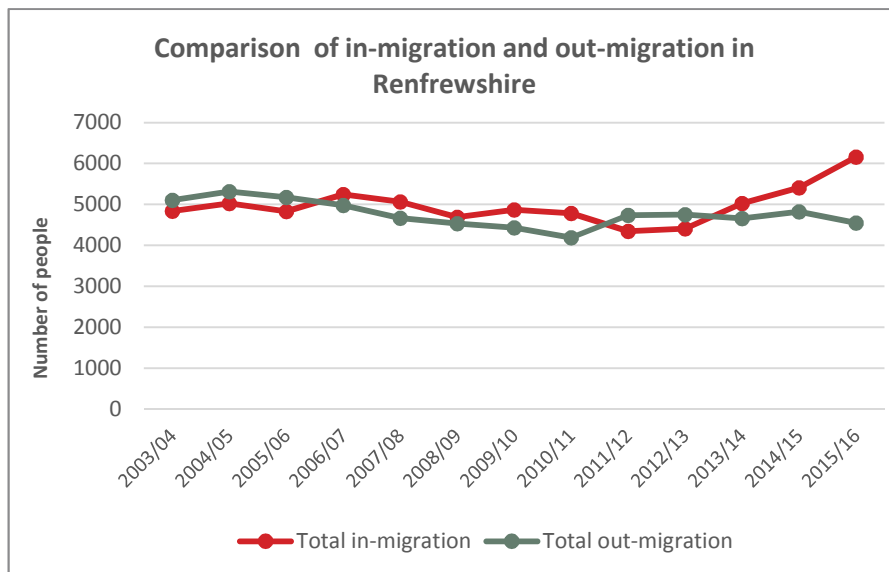


Figure 4. Comparison of in-migration and out-migration in Renfrewshire (National Records of Scotland, 2016)

3.4 Households

In 2017, it was reported that the number of households in Renfrewshire was 84,938. This is a 1.1% increase from 84,025 households in 2016. In comparison, the number of households in Scotland overall increased by 0.7%. The increasing number of households suggests that any new developments will need to be connected with easily accessible and reliable transport networks.

The housing tenure varies from that of the Scottish average as seen in the Table 2. Over two thirds of the properties tend to be owned outright or with a mortgage than social or private rented.

Table 2. Tenure of households in Renfrewshire and Scotland (2011 Census)

	Renfrewshire	Scotland
All People	80,902	2,372,777
Owned outright	25%	28%
Owned with a mortgage or loan	39%	34%
Shared ownership (part owned and part rented)	0%	0%
Rented from council	16%	13%
Other social rented	9%	11%
Private landlord or letting agency	9%	11%
Employer of a household member	0%	0%
Relative or friend of a household member	1%	1%
Other	0%	0%
Living rent free	1%	1%

3.5 Employment

The 2011 Census defines Economic Activity as “whether or not a person aged 16 and over was working or looking for work in the week before Census. Rather than a simple indicator of whether or not someone was currently in employment, it provides a measure of whether or not a person was an active participant in the labour market.”

Across Renfrewshire, 69% of the working age population are economically active with 41% of people aged 16 to 74 in full-time employment. The figures are broadly in line with the national average (see Table 3).

Table 3. Economically active people aged 16 and 74 (2011 Census)

Economically active people aged 16 to 74 in 2011	Renfrewshire %	Scotland %
Employee Part-time	13%	13%
Employee Full-time	41%	40%
Self-employed	5%	8%
Unemployed	5%	5%
Full-time student	4%	4%

Figure 5 presents a breakdown of employment by industry and gender. The figures differ for males and females – nearly half of the males (49%) in Renfrewshire were in full-time employment, compared with one-third of females (34%).

The top industries that employed the most of the working age population were wholesale and retail trade including repair of motor vehicles, human health and social work activities, manufacturing and construction (see Figure 5).

Across the area, 5% of people were unemployed and approximately 16% of the population were retired.

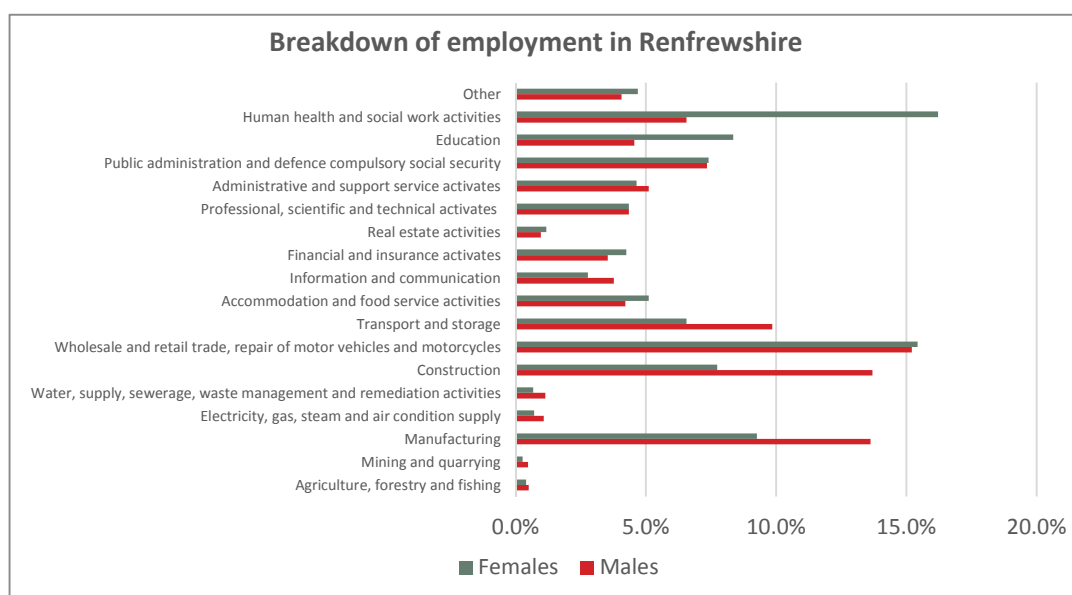


Figure 5. Breakdown of employment in Renfrewshire (Renfrewshire Local Authority Profile, 2015)

When comparing the profile of economically active population between 2001 and 2011 it can be observed that there is a significant increase in the employability of people between 54 to 59 years old (+14%) and 60 to 64 years old (+13%) (see Figure 6).

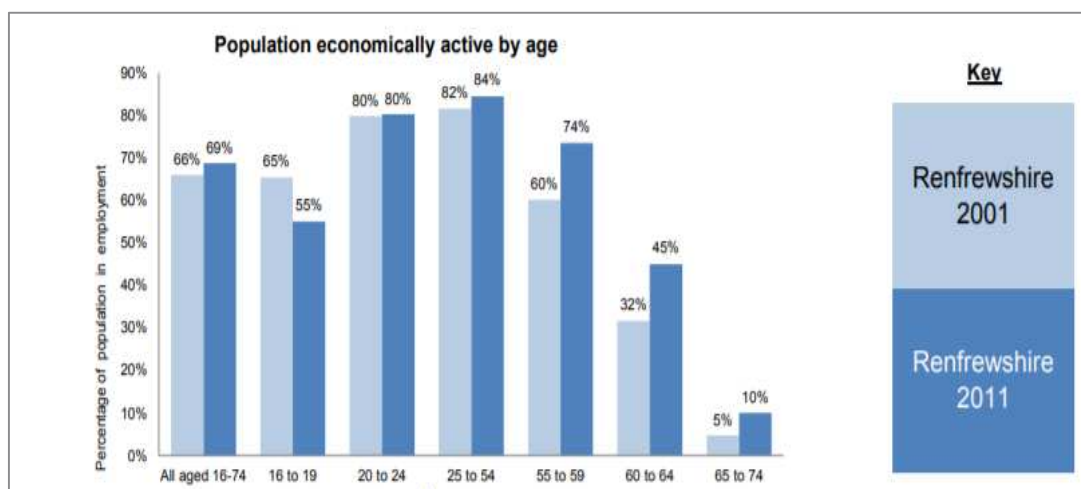


Figure 6. Economically active population in Renfrewshire (2011 Census)

Job density is the measure of an area’s capability to provide local jobs to local people. In a transport context job density rates are directly related with people’s travel behaviour.

Job density is calculated by dividing the number of jobs in an area by the resident working age population, thus a job density of 1.0 would mean there was a job for every resident.

Based on figures from 2016, Renfrewshire has a job density of 0.80, while Edinburgh and Glasgow was more than 1.0, however, Renfrewshire was still at the national average (see Table 4).

Table 4. Job density in Renfrewshire 2016 (NOMIS 2018)

Job density, 2016	Renfrewshire (jobs)	Renfrewshire (Density)	Scotland (Density)
Job density	90,000	0.80	0.80

3.6 Deprivation

The dimensions of deprivation used to classify households are indicators based on four selected household characteristics. A household is classified as being deprived in none, or one to four of the following dimensions in any combination.

- “Employment: where any member of a household, who is not a full-time student, is either unemployed or long-term sick.
- Education: no person in the household has at least level 2 threshold education (five or more A - C grades) and no person aged 16-18 is a full-time student.
- Health and disability: any person in the household has general health that is ‘bad’ or ‘very bad’ or has a long term health problem.
- Housing: the household's accommodation is either overcrowded, with an occupancy rating -1 or less, or is in a shared dwelling, or has no central heating”.

NOMIS data indicates that 62% of the households in Renfrewshire are deprived at least in one dimension as evident from Table 5.

Table 5. Dimensions of deprivation for households in Renfrewshire (2011 Census)

	Household is not deprived in any dimensions	Household is deprived in 1 dimension	Household is deprived in 2 dimensions	Household is deprived in 3 dimensions	Household is deprived in 4 dimensions
Renfrewshire (%)	38%	31%	22%	8%	1%

Scottish Index of Multiple Deprivations (SIMD) combines data from seven different domains of deprivation: income, employment, health, education, access, crime and housing, all derived from 2011 Census Data. According to SMID the number of data zones in Renfrewshire within the top 15% most deprived threshold in 2016 was 47 (for reference Renfrewshire Council area is divided into 225 data zones). Figure 7 shows the SIDM based most deprived areas.

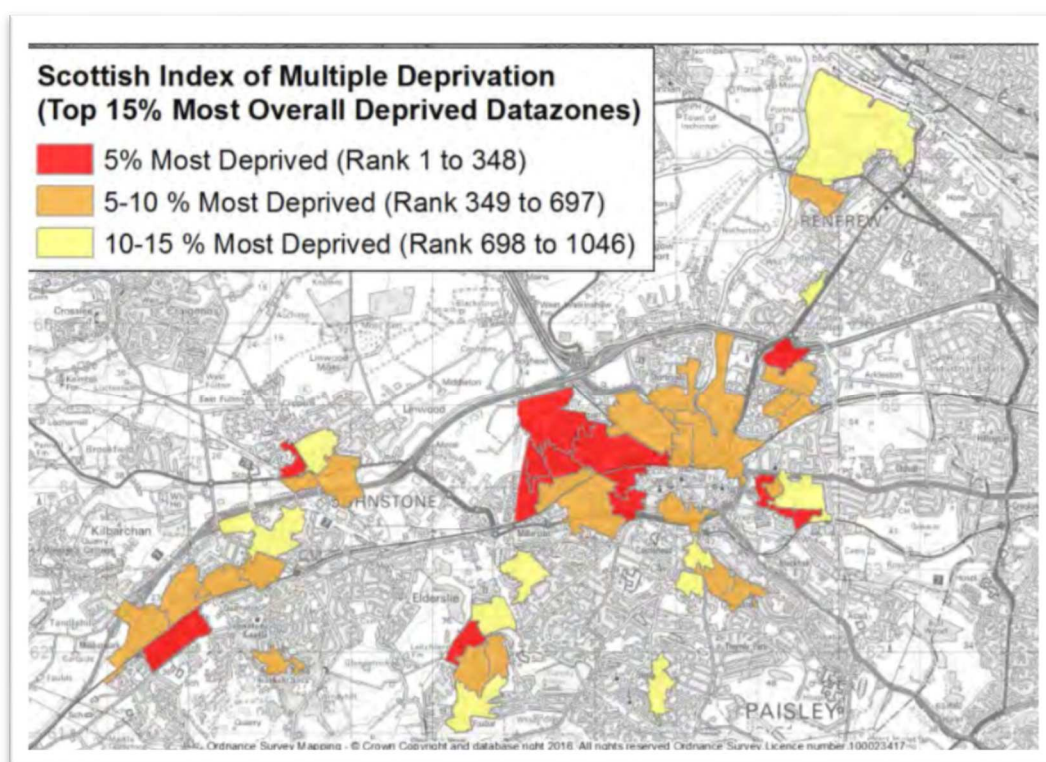


Figure 7. SIMD 2016 for Renfrewshire (Renfrewshire Monitoring Statement)

3.7 Car availability

2011 Census indicates that over a third of the households (35%) in Renfrewshire do not have an access to a car or van, this is higher than the national average (29%). Respectively, approximately 65% of the households have access to at least one car/van as highlighted in Figure 8.

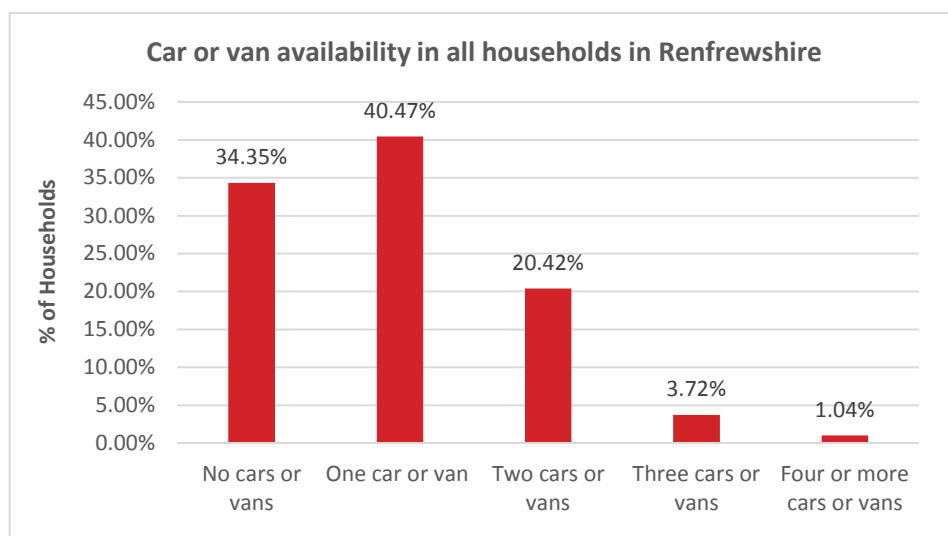


Figure 8. Car/van availability in all households in Renfrewshire (Renfrewshire Local Authority Profile Report 2015)

Table 6 suggests that in the ten years window between the Census data collection for the period 2001 and 2011 there was an increase of 3% in the proportion of people that have an access to one or more cars. However, this is still lower than the average for Scotland (70%).

Table 6. Car ownership per household (2011 Census)

Households with access to one or more cars 2001 and 2011	Renfrewshire	Scotland
2001	63%	66%
2011	66%	70%

3.8 Travel to work

Based on 2011 Census data, over two thirds (65%) of the people travel to work by car/van, this figure is slightly higher than the average for the country (63%). The second most popular transport mode is taking the bus (12%). 7% of the people said that they usually walk to work, 7% car share, 6% travel by train and less than 1% cycle (see Figure 9). Approximately 8% of the people work from home.

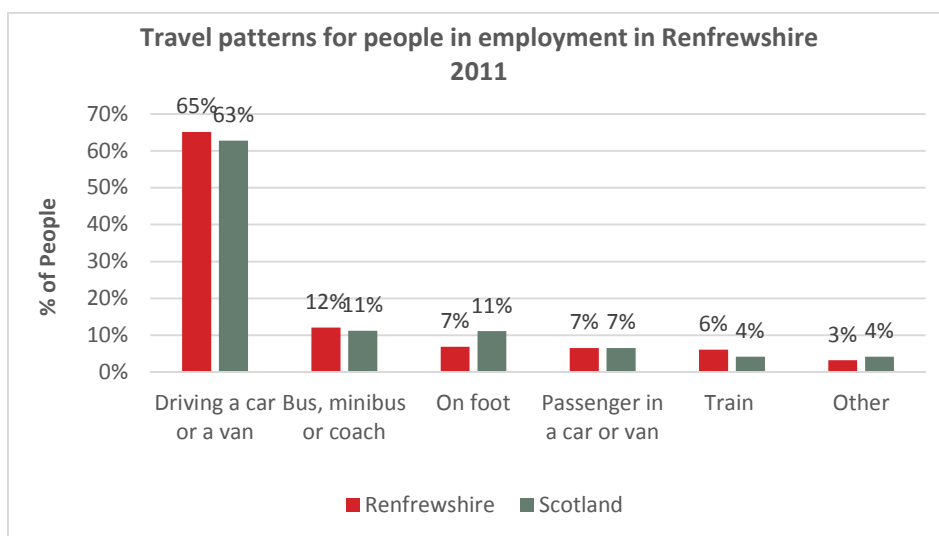


Figure 9. Travel patterns of people in employment in Renfrewshire (2011 Census)

The above travel patterns change when incorporating people that are studying. The majority of them (41%) walk to their place of study, this can be explained with the location of the education establishments (see Figure 10).

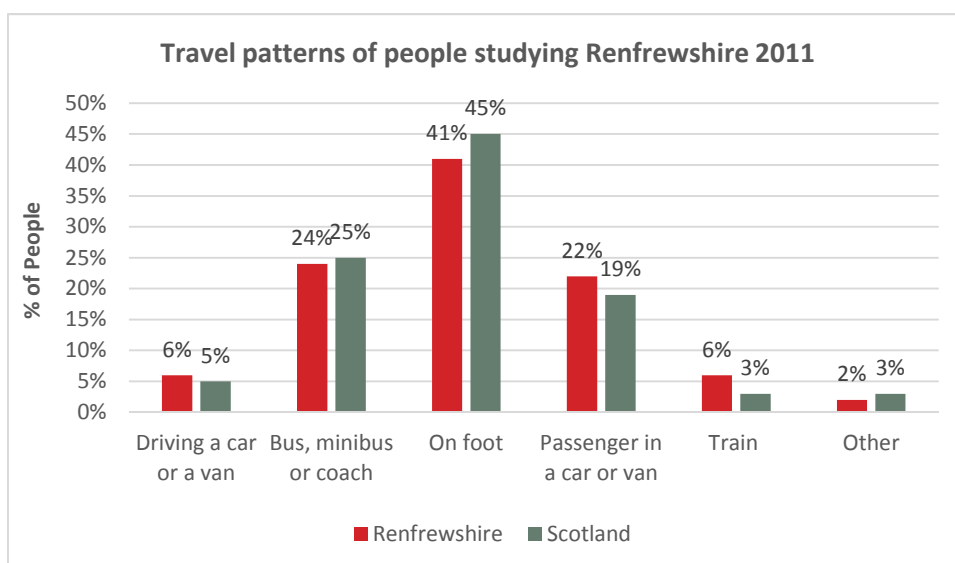


Figure 10. Travel patterns of people studying in Renfrewshire (2011 Census)

SPT’s Transport Outcomes report from 2015/16 indicates that more than 100,000 commuters travel to, from or across Renfrewshire on an average weekday. As it is evident from Figure 11 the top three most popular commuter destinations from Renfrewshire were Glasgow, Inverclyde and West Dunbartonshire. The majority of the people that were commuting to Renfrewshire were from Glasgow, East Renfrewshire and North Ayrshire.

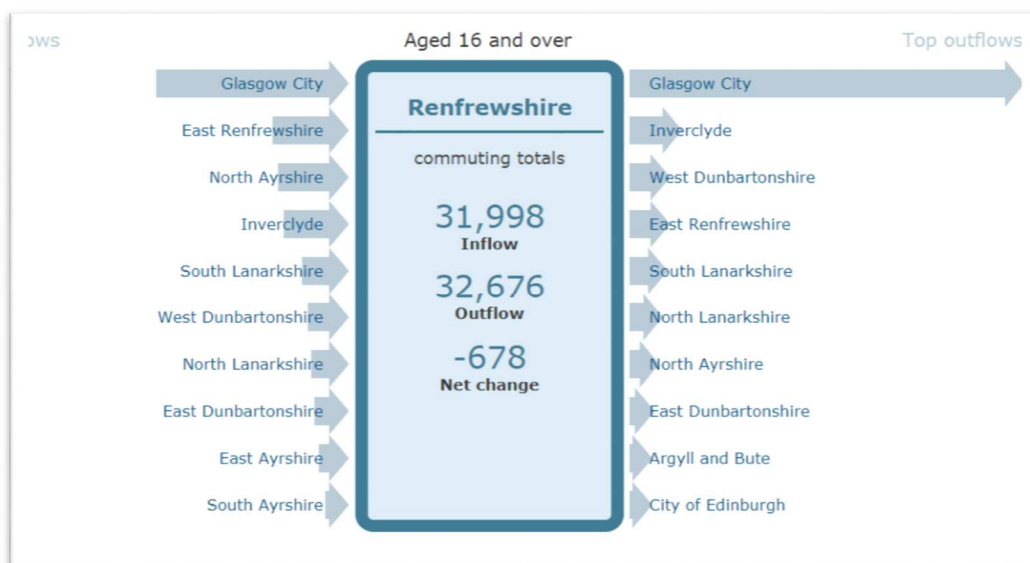


Figure 11. Renfrewshire inflows and outflows (Nomis, 2018)

In terms of distance travelled, 2011 Census data indicates that 33% of people commute to work up to 5km; this figure is slightly lower than the national average of 37%. A quarter (25%) of the people commuted to work between five and ten kilometres, this is higher compared with the average for the country (19%). Figure 12 shows further details.

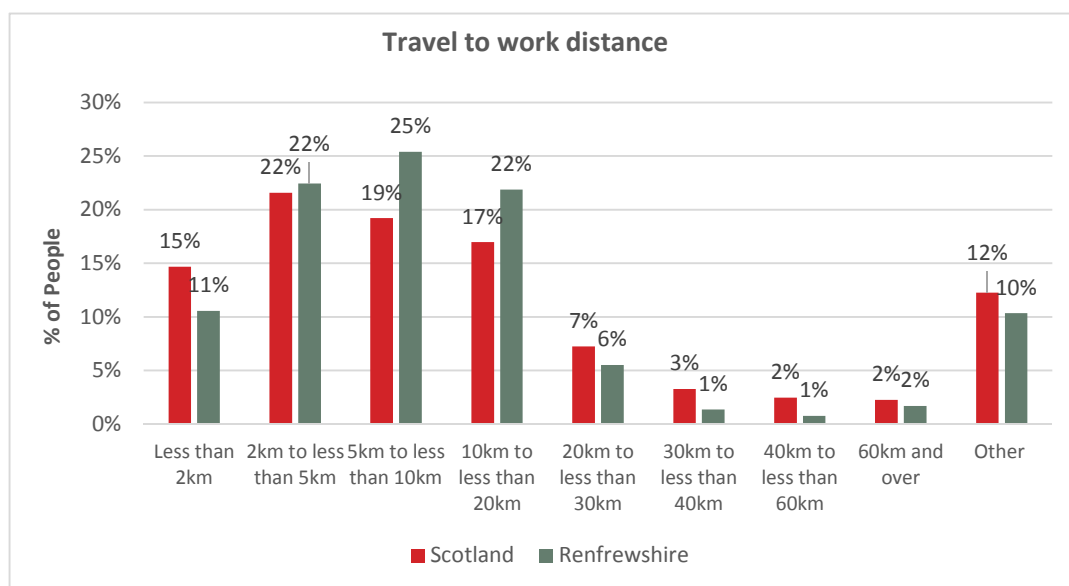


Figure 12. Distance travelled to work in Renfrewshire (2011 Census) * all people aged 16 to 74 in employment the week before the Census, excluding full-time students and people working mainly from home

In terms of distance travelled to education, nearly two thirds of people travel up to 5km (see Figure 13).

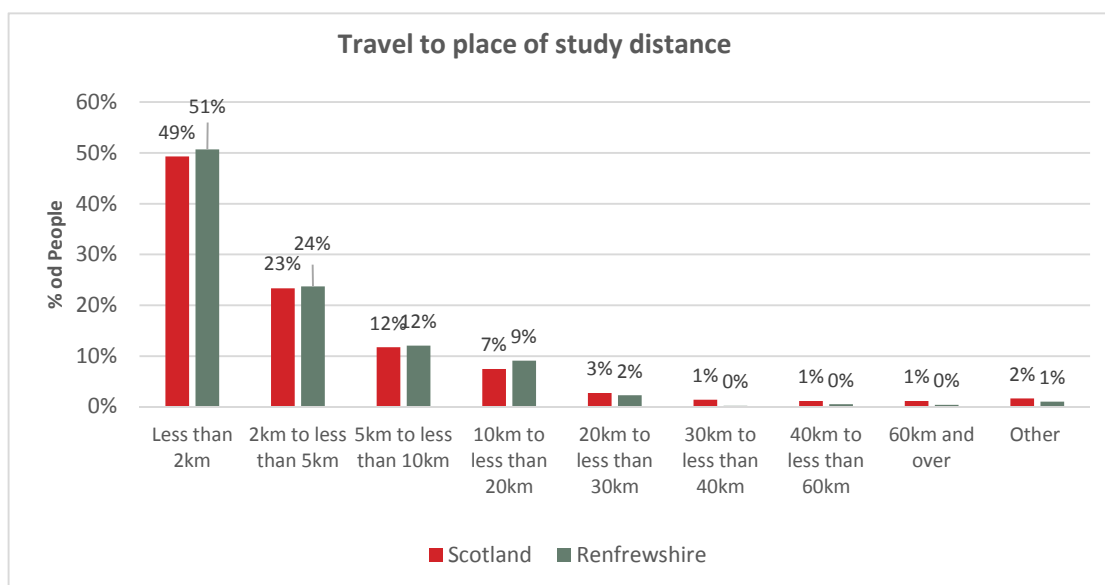


Figure 13. Distance travelled to education in Renfrewshire (2011 Census) * all people aged 4 and over studying the week before the Census, excluding people studying mainly from home.

Figure 14 shows travel to work data split by travel mode and distance. The dataset excludes the proportion of people that work mainly from home. The key messages are:

- 54% of people who commute to work up to 5km drive to work; this figure is higher than the Scottish national figures at 47%;
- The proportion of people who travel to work by public transport for distance up to 5km is in line with the Scottish national figures (15%);
- The proportion of people who travel to work by public transport between 10 and 30km is higher (25%) than the Scottish national average figures (15%).

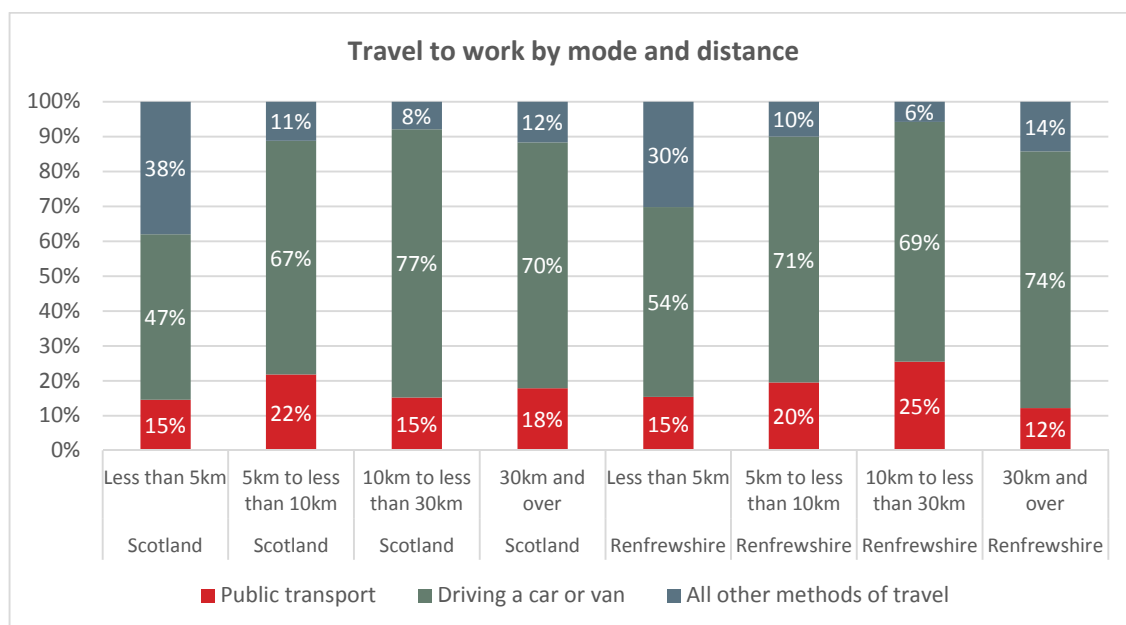


Figure 14. Travel to work split by travel mode (2011 Census) excluding people working mainly from home

3.9 Summary

This section has analysed the socio-economic profile of Renfrewshire's population. The key points/general trends from the above analysis are:

- Renfrewshire's transport networks, natural and historic environments provide sustainable and economic opportunities for businesses and communities;
- Glasgow City Deal projects will enable to unlock the development potential of key sites, increase jobs in the area and help reduce deprivation;
- In terms of population, there has been an increase in elderly population since 2001;
- 45 to 64 years old age group is the largest demographics group in Renfrewshire;
- In 2015 – 2016 more people moved into Renfrewshire than moved out; there has been a slight decrease in out migration for the same period;
- The number of households has slightly increased since 2016;
- Employment activity (i.e. the number of people working full time, part time, unemployed) follows the Scottish average;
- There has been a significant increase in the employability of people aged 54 to 64 between 2001 and 2011;
- Industries that employ the most of the working age population are wholesale and retail trade including repair of motor vehicles, human health and social work activities, manufacturing and construction;
- There are pockets of deprivation across the Council area. According to SIDM 2016, the most deprived area was within Paisley Ferguslie area;
- Over a third of households (35%) do not have access to a car;
- According to Census 2011 figures, 65% of people travel to work by car (which slightly higher than Scottish average of 63%), 12% travel by bus, 7% car share, 7% walk, 6% travel by train and 1% cycle;
- The top commuting destinations are Glasgow, Inverclyde and West Dunbartonshire.

- People that commute to Renfrewshire mostly travel from Glasgow, East Renfrewshire and North Ayrshire;
- 54% of people who commute to work up to 5km drive to work, which is higher than the Scottish national average at 47%;
- The proportion of people who travel to work by public transport for distance up to 5km is in line with the Scottish national figures (15%).

4. LOCAL DEVELOPMENT

4.1 Key developments and priorities

The spatial strategy outlined in the 2014 Renfrewshire LDP is not proposed to significantly change in the preparation of the second LDP. The aim of the emerging LDP will be to strengthen the focus on place making and the delivery of new homes across Renfrewshire. The priority also remains for developments on previously used sites, concentrating first on existing built-up areas and key redevelopment sites and aiming to facilitate sustainable development and a low carbon economy.

Figure 15 illustrates the proposed key development priorities outlined in the MIR. The Report suggests that they should be added to the present spatial strategy, which is shown in Figure 16. As part of the emerging LDP and STA these developments will be considered in the context of transport infrastructure and requirements. Some of the key developments are further described below in this chapter.

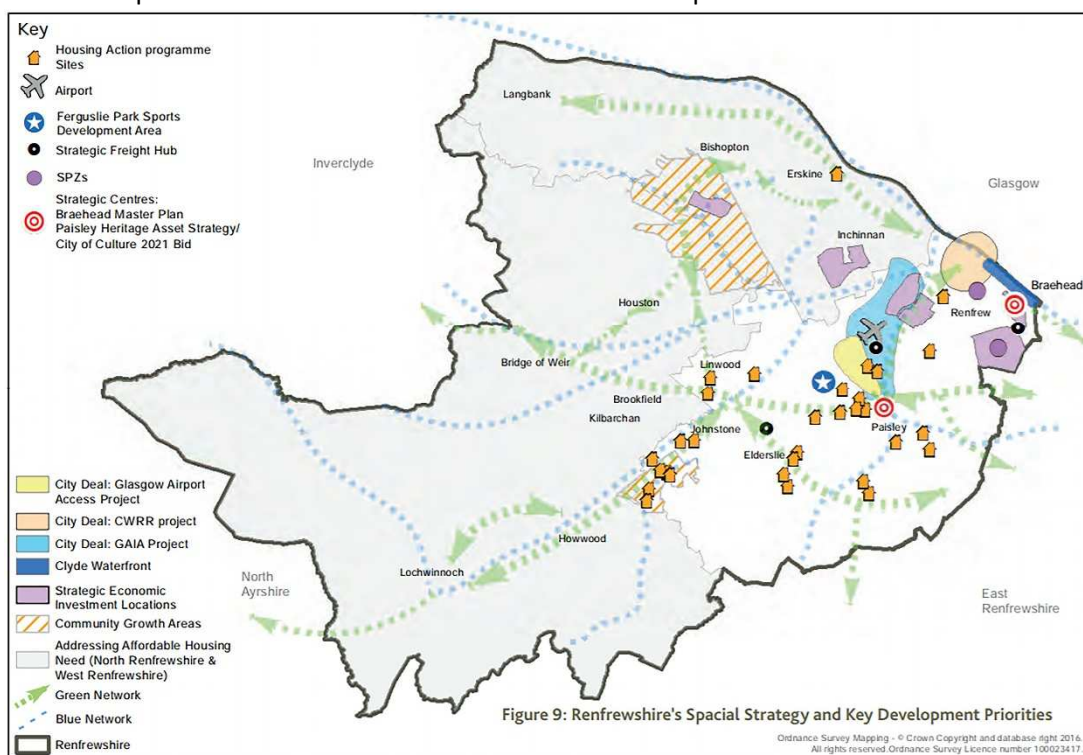


Figure 15. Renfrewshire Spatial Strategy and Key Development Priorities (Renfrewshire MIR 2017)

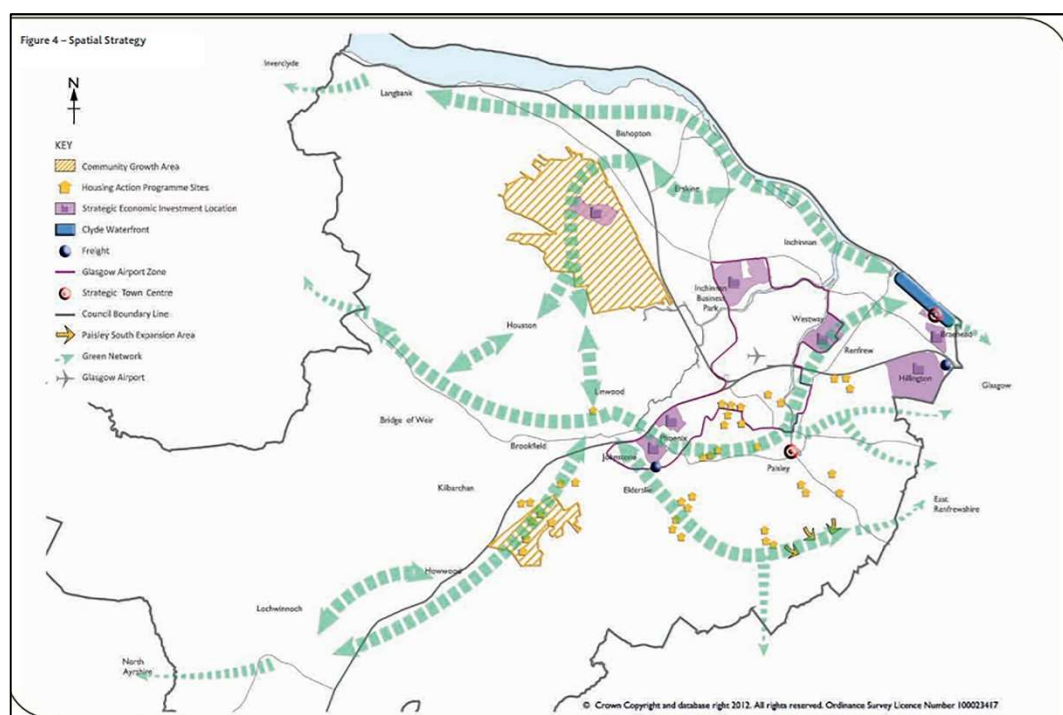


Figure 16. Renfrewshire Spatial Strategy (Renfrewshire LDP 2014)

As noted earlier in this document, Renfrewshire will benefit from three significant projects that are being undertaken as part of Glasgow City Deal. The projects are aimed to increase connectivity to the area and provide opportunities for place making and green networks. The projects include:

4.1.1 The Glasgow Airport Access project

The Glasgow Airport Access project is aiming to provide a direct link between Glasgow Central Station and Glasgow Airport, via Paisley Gilmour Street station. The project will significantly improve access to Glasgow Airport.

4.1.2 The Glasgow Airport Investment Area project

The Glasgow Airport Investment Area project is said to “... facilitate the creation of a world class business and commercial location focussed around the Airport”. The project is expected to deliver infrastructure and environmental improvements, including a new crossing of the White Cart Water and improved links for cyclists and pedestrians. The project will also improve connections between the Westway, Inchinnan and Airport Business Parks and will act as an enabler for the delivery of a recognised district for innovation, research and manufacturing centred around the airport. This development is underway with planning applications for the new cycle bridge and cycleways currently being considered by Renfrewshire Council.

These investments are expected also to be key for the tourism in the area. Within Renfrewshire, Glasgow Airport generates nearly 4500 jobs through 117 companies based around the airport.

Figure 17 shows there has been a steady increase in Glasgow airport’s passenger numbers between 2010 and 2015. Figure 18 indicates the most common transport modes used by passengers in 2013 to access the Airport. The data suggests that the vast majority of the people (80%) were travelling by car including taxi rides, followed by 13% which were taking the bus. This represents an increase of +3% from 2009 for both transport modes.

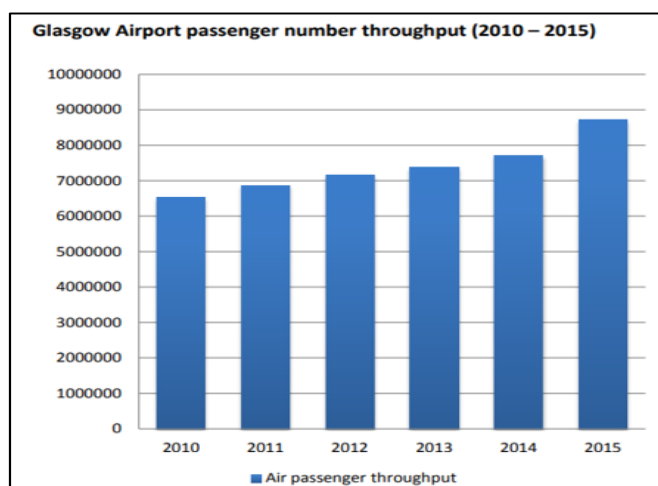


Figure 17. Glasgow air passenger numbers for the period 2010-2015 (Glasgow Airport, 2015)

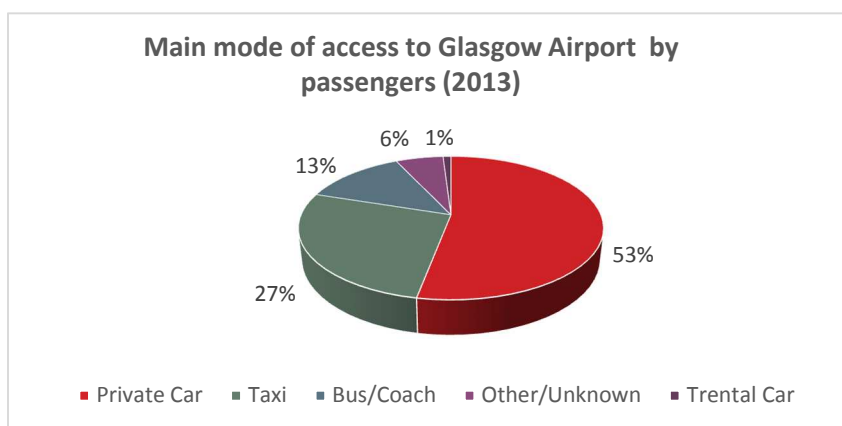


Figure 18. Main mode of access to Glasgow Airport by passengers (Glasgow Airport, 2013)

4.1.3 The Clyde Waterfront and Renfrew Riverside project

The Clyde Waterfront and Renfrew Riverside project involves the construction of a new river crossing between Renfrew and Glasgow/West Dunbartonshire along with the development of the North Renfrew Development Road. This is a key project for the continued re-development of Renfrew Riverside.

The Renfrewshire’s City Deal projects are illustrated in Figure 19.

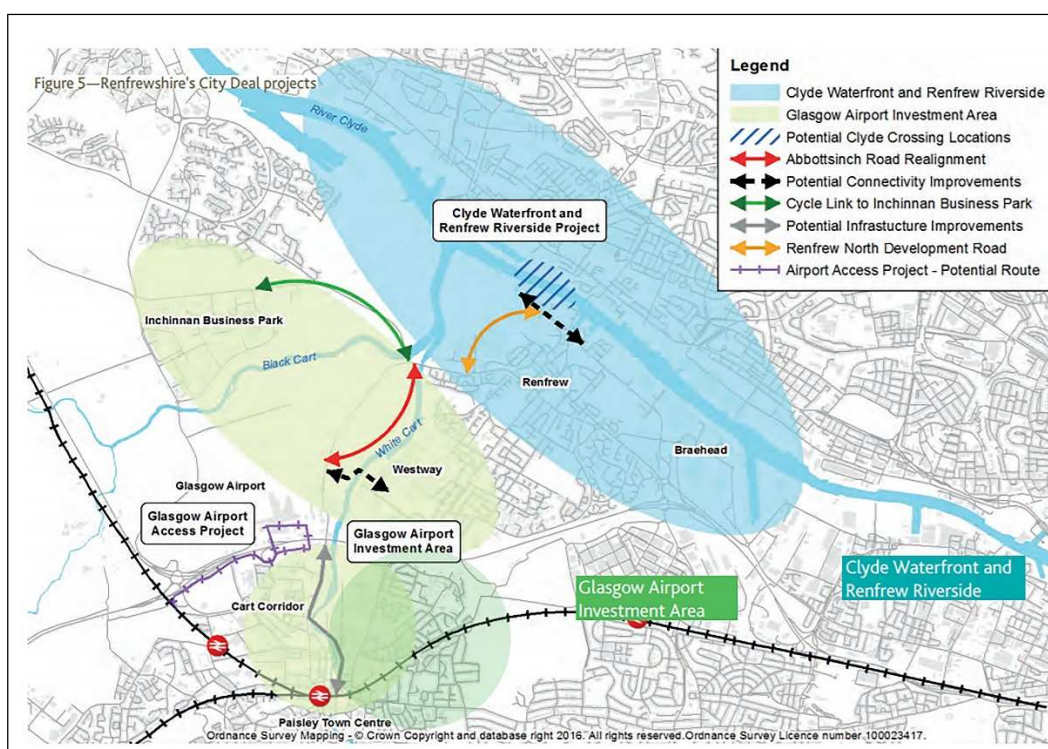


Figure 19. Renfrewshire City Deal projects (Renfrewshire MIR 2017)

4.1.4 Bishopton and South West Johnstone Community Growth Areas

Bishopton and South West Johnstone are two community growth areas that have been progressing over the last few years with a number of new homes, roads and other infrastructure being delivered. The focus of the emerging LDP will be to investigate whether more development land could be identified at these areas.

4.1.5 Paisley South Expansion area

The potential expansion of Paisley South has been considered with a view to providing a strategy to deliver a range and choice of sites to meet the housing needs and demand across Renfrewshire. The current LDP suggests that the site requires further investigation and a masterplanned approach to take forward the development.

4.1.6 Increasing the supply of new homes and affordable housing

The next LDP will look to increase the supply of new homes in sustainable locations across Renfrewshire. The LDP will support Renfrewshire's Strategic Housing Investment Plan to deliver new affordable homes in areas of need.

5. RENFREWSHIRE – TRANSPORT NETWORK

5.1 Current situation

In line with Renfrewshire policies, connection to travel and transport networks is a key factor for increasing access to employment and encouraging people to live, work and spend time in Renfrewshire.

One of Renfrewshire’s key assets is its location which offers sustainable travel opportunities as well as access to air, road, rail and motorway networks.

5.2 Walking and cycling

Renfrewshire has an extensive network of path with 291 core paths and 2 national cycle routes (NCN). Figure 20 illustrates the main local walking and cycling routes in Renfrewshire.

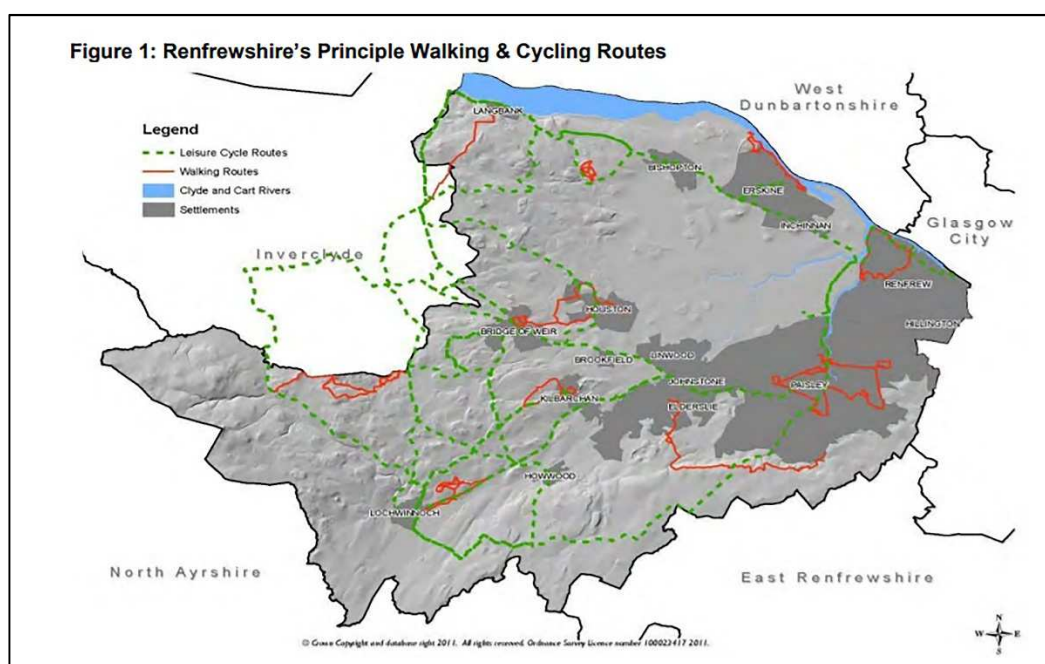


Figure 20. Walking and cycling routes across Renfrewshire (Renfrewshire MIS 2011)

The two NCN run right across Paisley town centre and serve some of the largest settlements in Renfrewshire, with many major destinations within 500m of the routes (e.g. University of West of Scotland, high schools, Royal Alexandra Hospital, railway stations, etc.) Renfrewshire cycling strategy suggests that the routes are used by a wide range of users including sportive and everyday cyclists, walkers, joggers and dog walkers. The NCN routes comprise of:

- NCN 7 - which links up Kilbirnie, Lochwinnoch, Howwood, Johnstone and Paisley. The route then connects with Ayr, Troon, Irvine, Kilwinning, Kilbirnie, the SECC, Partick, Clydebank, Dumbarton, and Balloch;
- NCN 75 - which runs the same route as NCN7 from Glasgow to Johnstone, and then continues westwards towards Port Glasgow, Greenock and Gourock, via Bridge of Weir and Kilmacolm (see Figure 21).

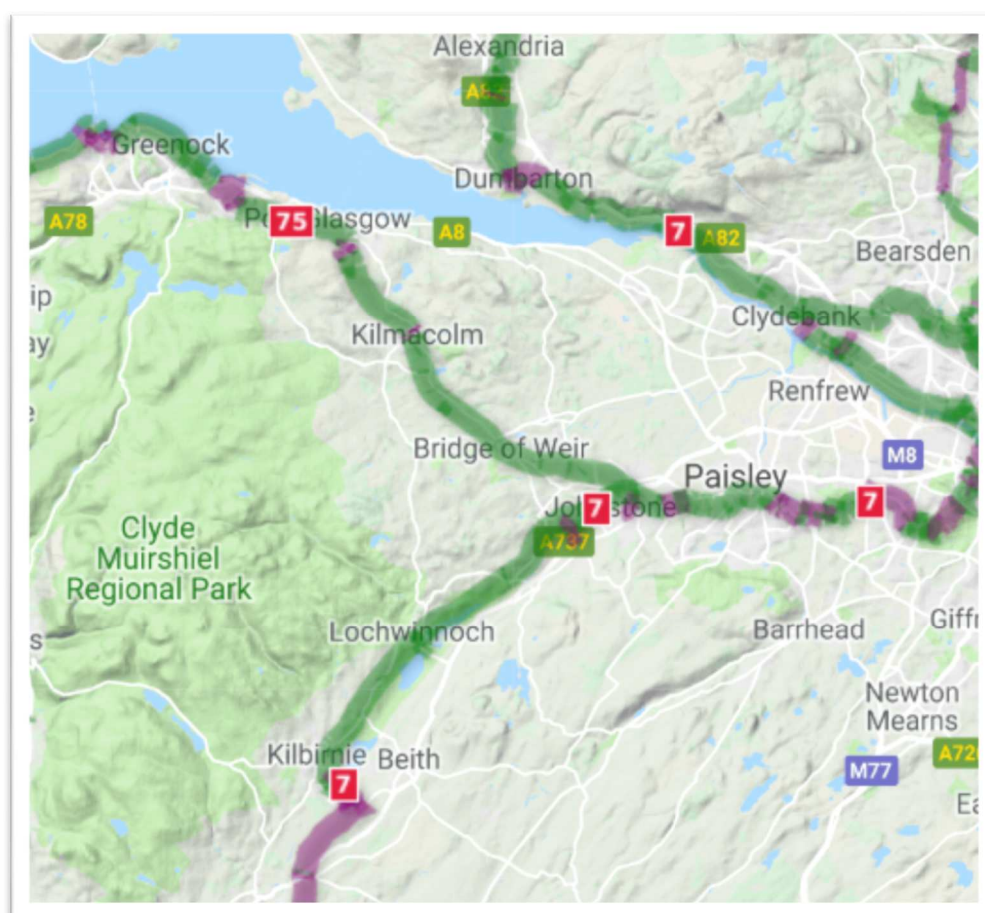


Figure 21. National Cycling Network passing through Renfrewshire (Sustrans, 2018)

The annual Cycling Monitoring Report (2015) indicates that over a quarter of the people (26%) in Renfrewshire have access to a bike (see Figure 22). The report also gives an indication of the proportion of primary school children that cycle to school, in 2015 the figure was 3%.

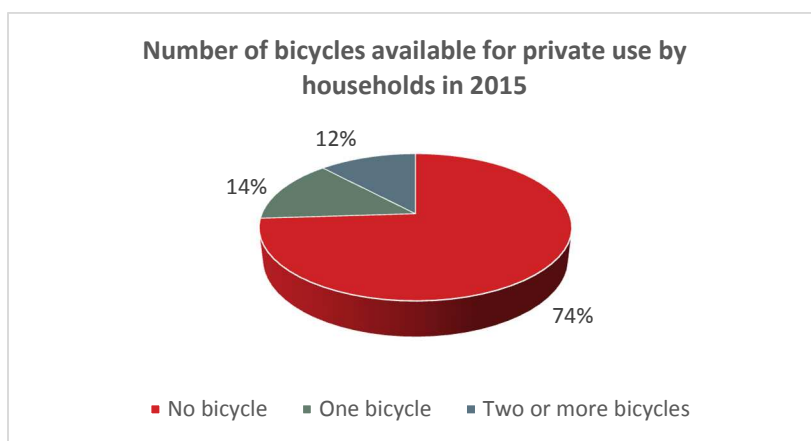


Figure 22. Number of bicycles available for private use by households in Renfrewshire in 2015 (SPT Transport Outcomes Report: Renfrewshire 2017/18)

As highlighted in Renfrewshire Cycling Strategy, both Renfrewshire’s and Scotland’s cycling levels remain low, and short of the vision set by the Scottish Government that 10% of all journeys to be done by bike (see Figure 23).

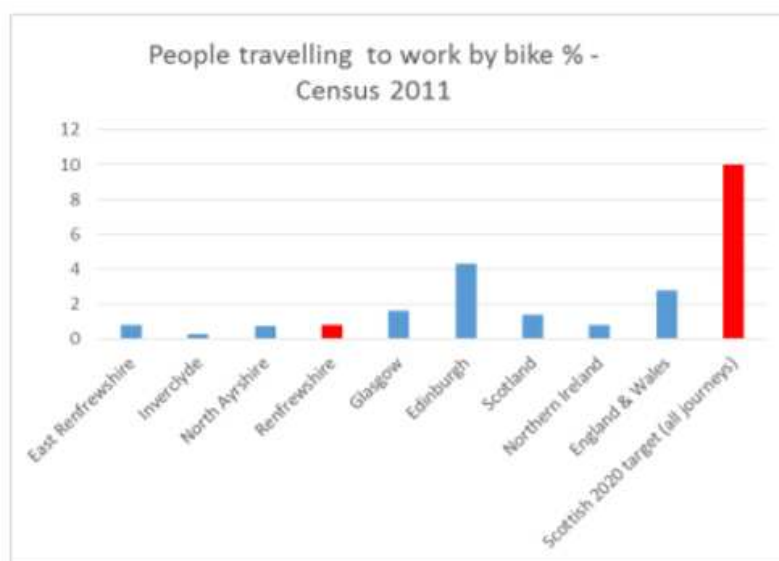


Figure 23. Proportion of the people that travel to work by bike (Renfrewshire Cycling Strategy 2011)

Figure 24 summarises the pedal cycles recorded in Renfrewshire for the period between 2000 and 2017. The data is derived from Department for Transport Areas Traffic Profile. The data suggests a significant growth in the cycle traffic in Renfrewshire between 2007 and 2013. However, since 2014 a steady decrease can be observed.

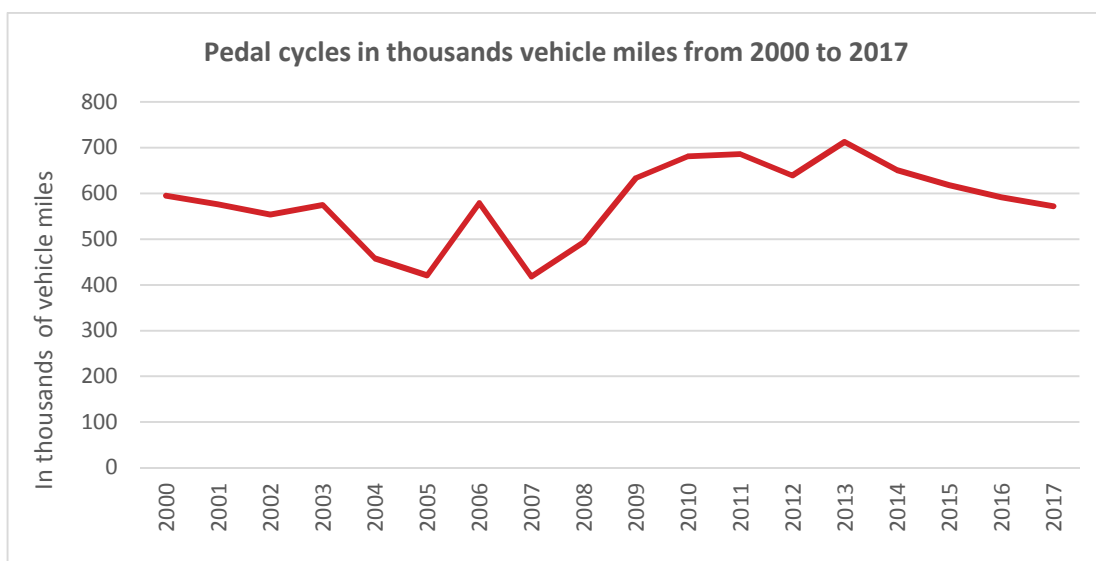


Figure 24. Pedal cycle counts Renfrewshire (Department for Transport Areas Traffic Profile, 2017)

During the preparation of Renfrewshire cycling strategy, a number of issues associated with cycling provision were highlighted by survey respondents (sample of 352). These include:

- Safety concerns (including driver behaviour and lack of safe facilities);
- Condition of roads and cycle routes (including surfaces, lighting and overhanging vegetation);
- Lack of on-road cycle lanes;
- Lack of off-road, traffic-free cycle routes.

Further, as part of the consultation process the public was asked how they rated the existing provision for people who cycle in Renfrewshire. As can be seen from Figure 25 the surface condition of roads and cycle routes were highlighted as a major issue, followed by poor lighting on cycle routes and a lack of secure cycle parking facilities.

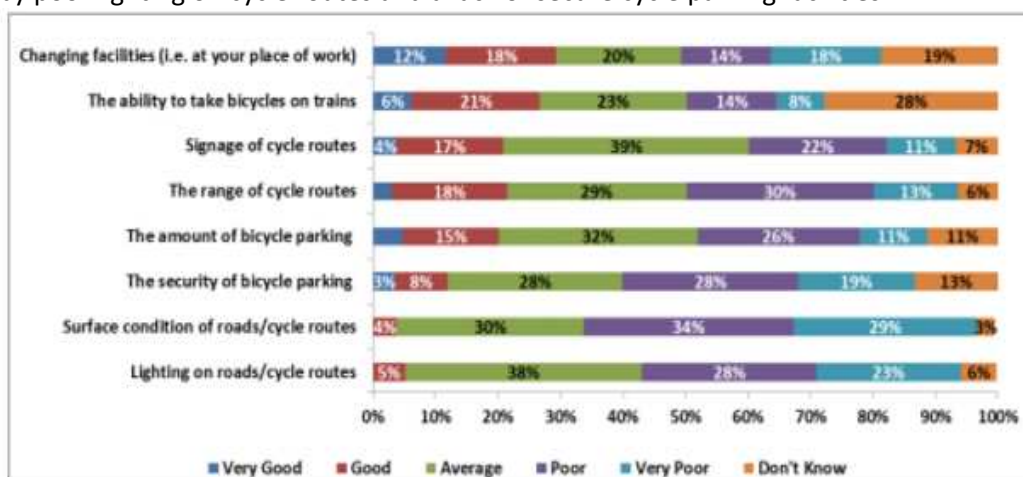


Figure 25. Community satisfaction with existing provision for cyclists - Renfrewshire Cycling Strategy 2015/16

At the same time there are a number of opportunities to increase active travel in the area, including:

- The completion of The Paisley South Side Strategic Walking/ Cycling Route;
- The extension of the Barrhead to Paisley cycle route to Linwood and the On-X Sports Centre and its promotion through personalised travel planning;
- Improvements to pedestrian and cycling infrastructure through Glasgow City Deal projects and new and enhanced developments;
- Further development and promotion of Renfrewshire’s Green Networks.

5.3 Public transport

Renfrewshire has a wide choice of public transport options. Bus services have improved in terms of quality due to the recently completed Statutory Quality Partnership. Figure 26 demonstrates that after a drop of 10% in 2013 in public satisfaction, in 2016 the majority of the people (80%) were satisfied with the provided public transport services.



Figure 26. Public transport services satisfaction (Scottish Household Survey 2016)

Nevertheless, despite the increase in public satisfaction, bus patronage continues to decline in favour of rail travel. Data presented in SPT Transport Outcomes Report (2017/18) indicates that half of the survey respondents stated that they do not use any bus services, followed by 16 % that stated they use them once a fortnight/month (see Figure 27).

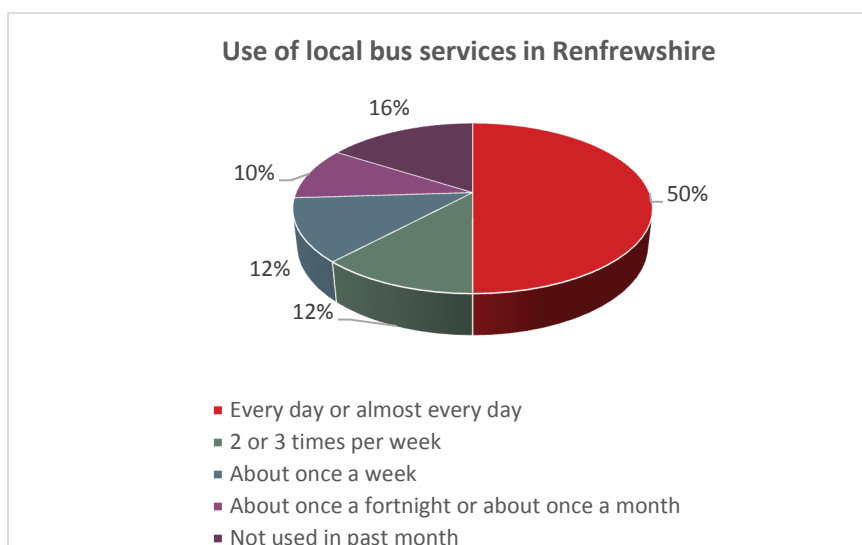


Figure 27. Renfrewshire local bus usage (SPT Transport Outcomes Report (2017/18))

The decreasing number of people using the local bus services is discussed in the refreshed Renfrewshire Local Transport Strategy, in that:

“... there have been the reduction in the number of bus companies active in Renfrewshire and the rise in popularity of park and ride at rail stations, although the Paisley St James Park & Ride car park has been lost. The drop in the number of bus stops is most probably due to the change in demand occasioned by the removal of old housing stock.”

Table 7 derived from Renfrewshire Transport Strategy summarises the changes in the public transport that took place between 2007 and 2017.

Table 7. Renfrewshire public transport changes 2007 -2017 (Renfrewshire Transport Strategy, 2017)

	2007	2017
Bus companies	33	6
Bus stops	951	932
Bus shelters	398	410
Rail Stations	10	10
Rail Park and Ride car parks	7	6
Extra Rail Park & Ride car parking spaces		83 at Johnstone 62 at Bishopton (another 150 planned)

As evident from Table 7 there is a significant change in the number of bus companies serving the area. The drop in the bus companies is explained by the fact:

“The deregulation of the bus industry in 1985 opened up the market to competition and a proliferation of bus companies vying for passengers in central Paisley causing congestion and pollution. In response the Council introduced one of Scotland’s first Statutory Bus Quality Partnerships to guarantee that only companies with modern clean buses and adequate customer service would be allowed to operate in Renfrewshire. The result of this and natural market forces has been a reduction in the number of bus companies operating in Renfrewshire from 33 to 6.”

Renfrewshire Transport Strategy 2017 Refresh

The Council wishes to improve bus patronage and is working to change the trend by improving user convenience by providing real time information at bus stops.

In the context of rail travel, the rail network links Renfrewshire with Inverclyde, Glasgow City and North Ayrshire Councils areas. There are 10 railway stations in Renfrewshire as shown in Figure 28.

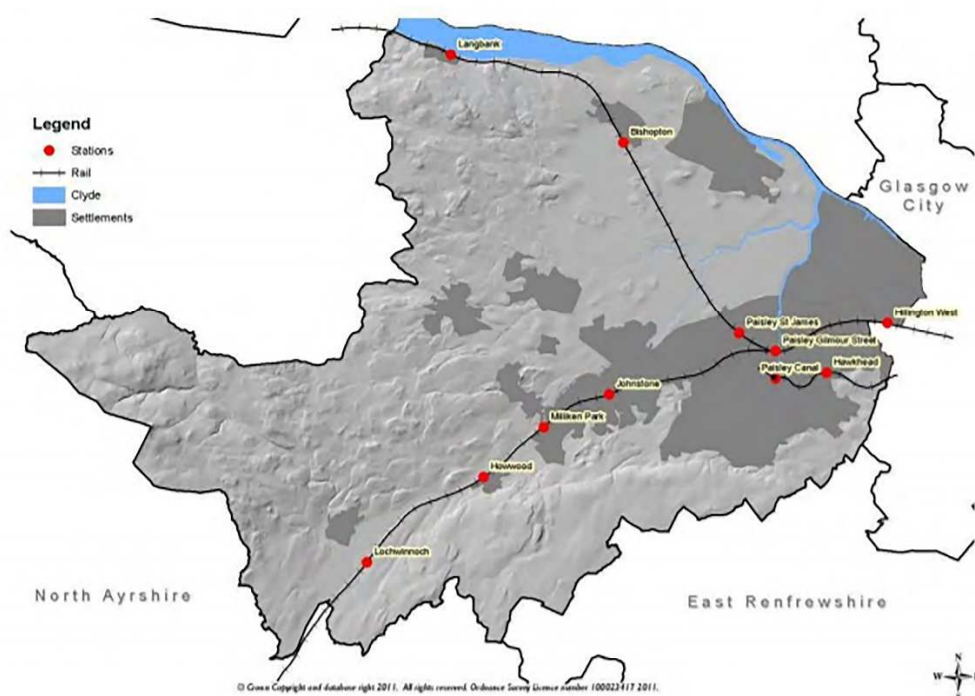


Figure 28. Railways stations across Renfrewshire (Renfrewshire MIS 2011)

The number of people travelling by train has increased between 2013 and 2016. Figure 29 illustrates the usage of Renfrewshire’s train stations. As can be seen, the three most used stations are Paisley Gilmour Street, followed by Johnstone and Bishopton.

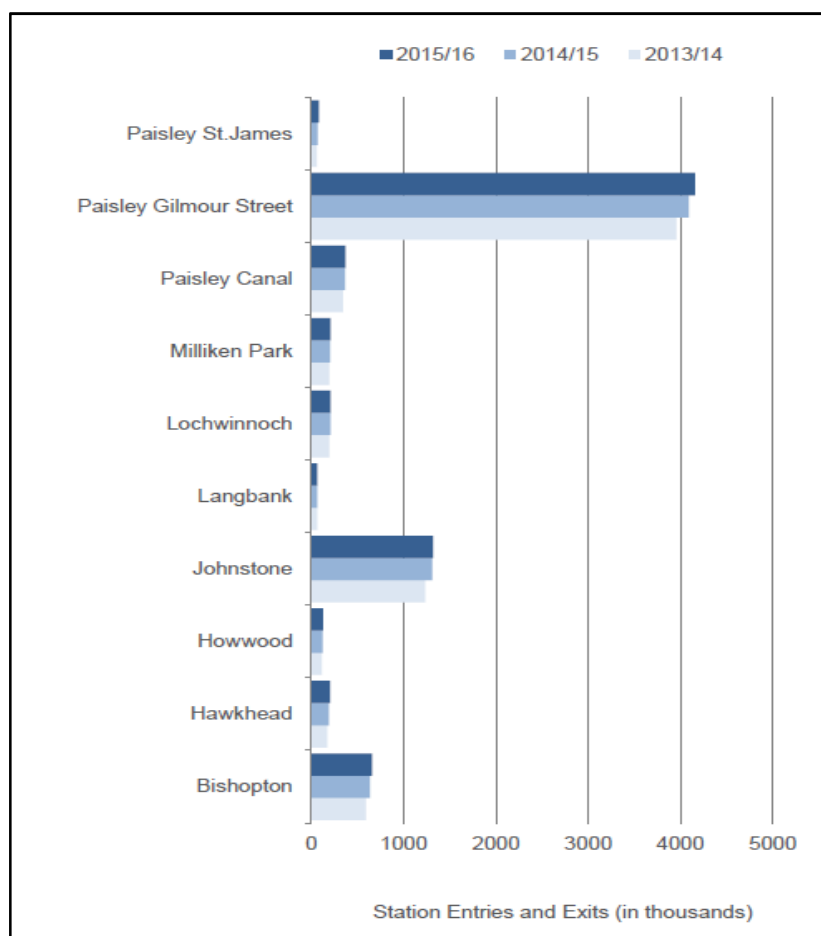


Figure 29. Rail patronage (SPT Transport Outcomes Report: Renfrewshire 2017/18)

It is expected that the Glasgow Airport Rail Link will bring significant benefits through providing direct rail connections to the airport as well as enhancing capacity between Paisley and Glasgow. The airport rail link also improves track capacity which in turn can be used to improve services west of Paisley.

5.4 Park and Ride

There are six Park and Ride (P&R) sites across Renfrewshire. According to the latest SPT figures Johnstone P&R had the largest capacity with over 425 car parking spaces, followed by Bishopton (270 spaces) and Paisley Gilmour Street (75 spaces) (see Figure 30).

Policies encouraging sustainable travel and limitation in the amount of affordable long stay parking provision in Glasgow have resulted in an increased use of rail P&R sites for those commuting from Renfrewshire to Glasgow. In response to the increased demand, an 83 space upper deck of car parking opened at Johnstone Station in 2015 and the car park at Bishopton Station was extended by 62 spaces in 2017, with another 150 planned to coincide with the completion of the residential development there.

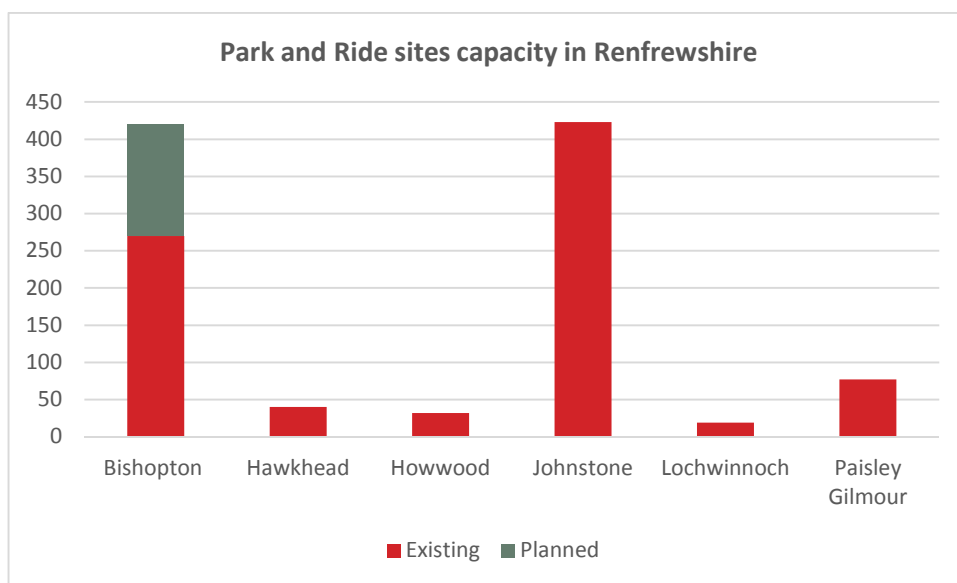


Figure 30. Park and Ride sites capacity across Renfrewshire (SPT 2018)

5.5 Road Network

Renfrewshire has over 860 kilometres of roads. The strategic road network consists of the M8, A8 and the A737 being the main arterial routes through the area connecting to Glasgow, Inverclyde and Ayrshire. Other main routes include the A726, A741, A761 and the A898. These routes are indicated in Figure 31.

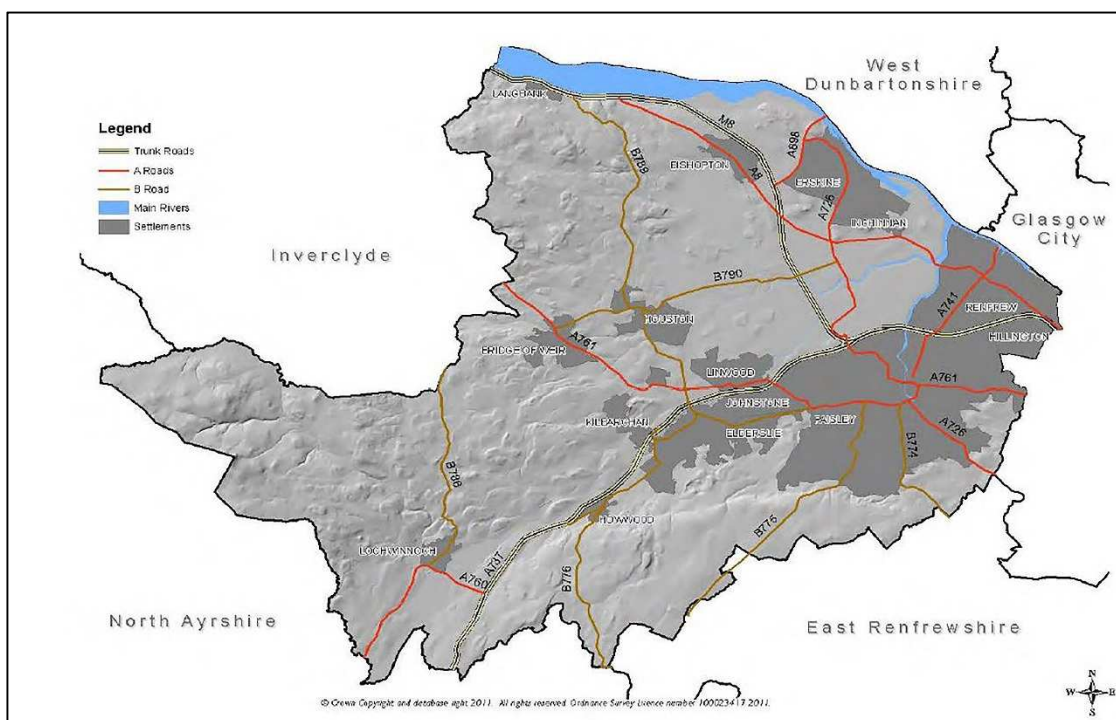


Figure 31. Key road links in Renfrewshire (MIR 2011)

Figure 32 shows peak time congestion hot spots and capacity pinch points on Renfrewshire’s strategic transport network. The information is based on 2011 MIR data,

however it is considered that there are unlikely to have been significant changes to the location of hotspots. These include:

- M8 between junctions 29 and 30, including Junction 29 St James; Junction 29a Bishopton, Junction 30 Erskine);
- M8 / A737 / A726 junction 29;
- A737 south of M8 junction 29;
- M8 between junctions 26 and 29;
- A726 between M8 junction 29 and Paisley Town Centre.

In addition, the following parts of the trunk road network will also require further consideration in the context of the new LDP:

- A737 Linclive Junction;
- A737 Barocha Junction.

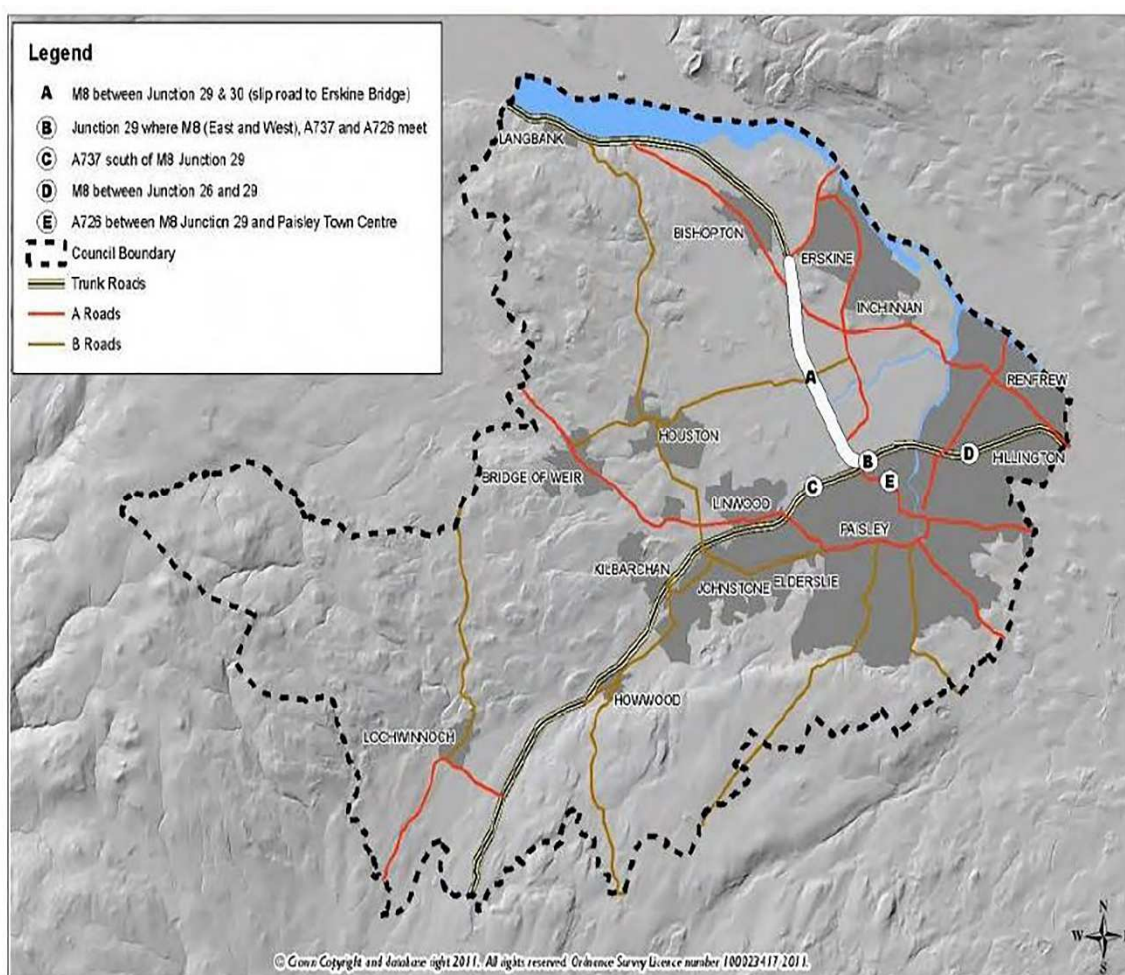


Figure 32. Congestion hot spots and capacity pinch points (MIR, 2011)

The Renfrewshire, MIR 2017 outlines an Infrastructure Considerations Map which identifies parts of Renfrewshire’s local infrastructure requiring to be considered by developers when submitting development proposals. The locations follow the capacity pinch points as noted above (Figure 32).

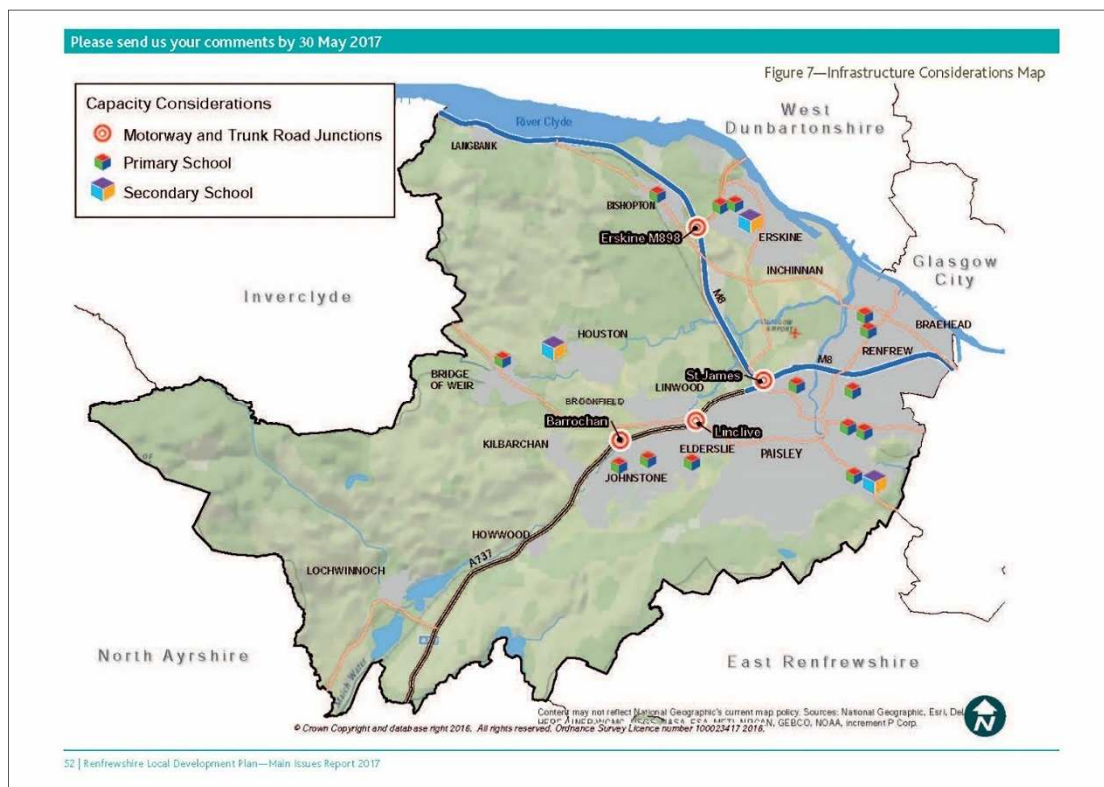


Figure 33. Developer - infrastructure consideration map (MIR, 2017)

Figure 34 shows the amount of congestion delays experienced by drivers across Renfrewshire, SPT and Scotland. The data shows that 18% of drivers in Renfrewshire experience congestion delays which is more than the average figures for the region (11%) and wider Scotland (12%).

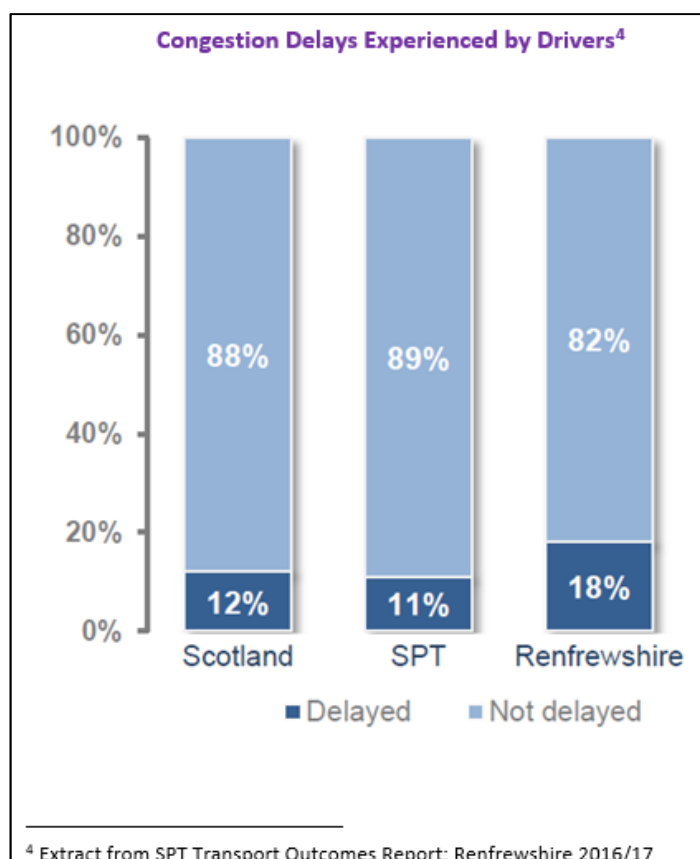


Figure 34. Congestion delays experienced by drivers (Renfrewshire LTS, 2017)

According to Renfrewshire LTS 2017, annual journey time surveys carried out on eight routes between 2007 and 2017 indicate that journey times have decreased by 0.14%. This represents a decrease of 40 seconds from an average of 22min 26 sec in 2008 to 21 min 46 sec in 2016. Three routes showed a slight increase in journey times in both directions and one route (Route 7) showed a decrease in journey time in both directions. The greatest change in journey time is the decrease of 10min 40sec on Route 7 (from Bridge of Weir to Thornliebank) which seems attributable to traffic being attracted off the A726 to the M8/M74 Glasgow southern orbital which opened in 2011. The journey time routes are illustrated in Figure 35.

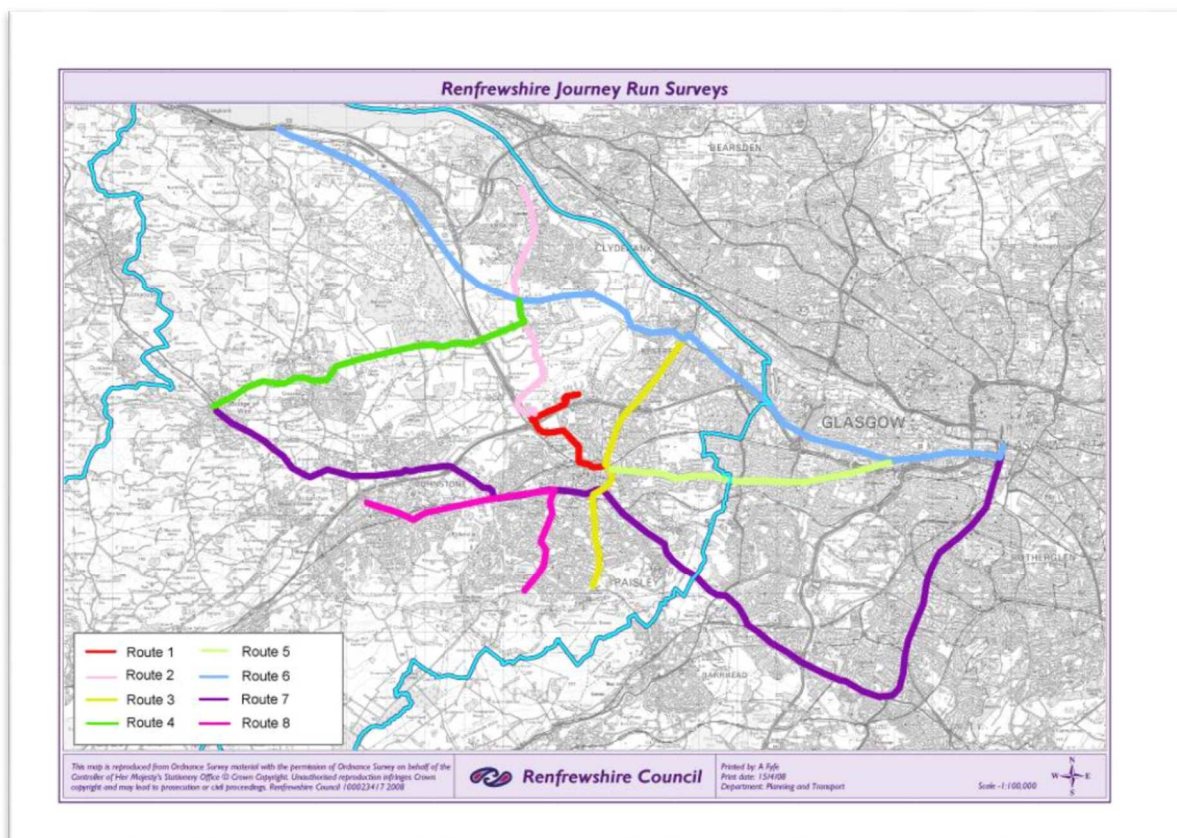


Figure 35. Journey time surveys (Renfrewshire LTS, 2017)

Moreover, based on RC's traffic counts data on three cordons surrounding Paisley, Renfrew and Erskine, there has been a decrease in weekday traffic flows between 2006 and 2016 by around 1.2%.

In terms of road accidents, Figure 36 shows that there has been a significant reduction (-46%) in the road accidents rates across all roads types within Renfrewshire for the period 2006-2015. In 2006 the number of reported road casualties (by any severity) was 584, this figure went down to 322 in 2015.

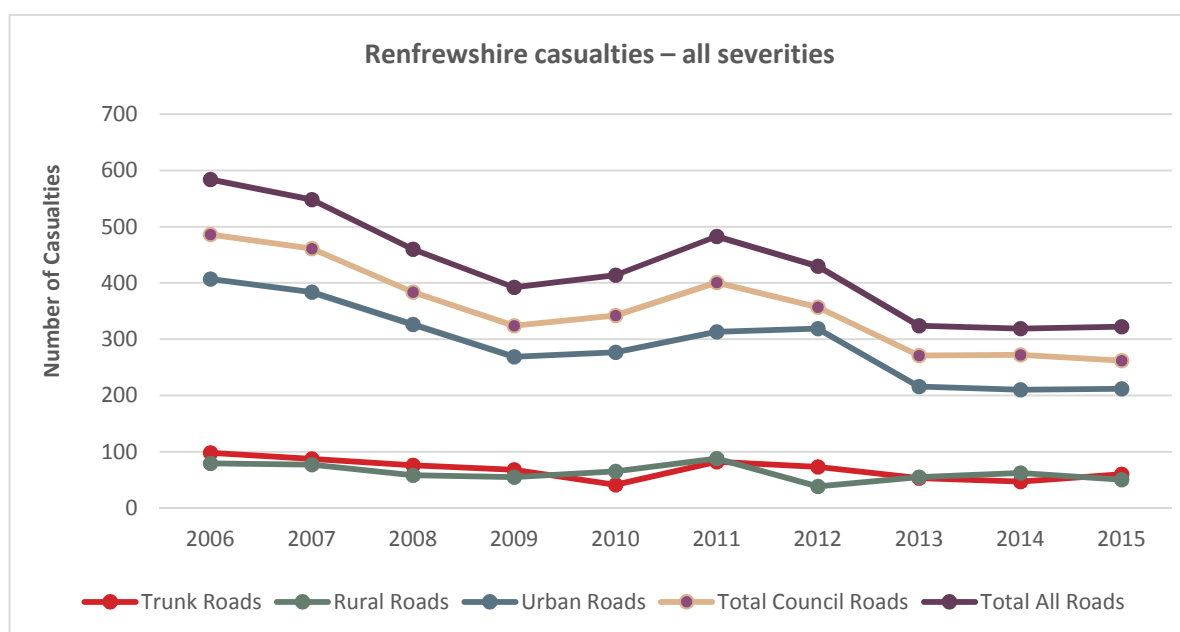


Figure 36. Renfrewshire casualties -all severities (Renfrewshire LTS, 2017)

5.6 Parking

Renfrewshire Council has recently set out to consider new parking changes in the towns of Renfrew and Johnstone. The main conclusions from the Parking Impact Assessment are listed below.

- *“Parking behaviour is significantly different in the towns of Renfrew and Johnstone, with different arrival patterns, stay durations and mix of on and off-street demand.*
- *Key car parks in both towns are very busy throughout the day however there are examples of available capacity such as the privately owned Morrison’s supermarket car park in Johnstone; Final Report Impact Assessment of Parking Charges in Renfrew and Johnstone vii*
- *Both towns show streets with high proportions of parking occupancy (Anderson Drive, Wilson Street and Muir Street in Renfrew and Church Street and Overton Road in Johnstone all operating above 100% capacity). Broadly, those streets closer to the core of each town centre, are operating closer to capacity, particularly at and over lunch time periods.*
- *Johnstone train station also affects available on-street capacity within Johnstone. Surveys show key streets surrounding the station are often operating near, or over capacity. This is due to the nature of the station operating as a park & ride and therefore the average duration of stay on these streets is often quite long.*
- *Streets around Johnstone Town Hall (Church Street and Quarry Street) show high occupancy levels often operating close to capacity.*

- *There is an element of illegal parking occurring in both towns, our surveys show approximately 400 incidents of cars parked in inappropriate locations in Johnstone and 200 in Renfrew, on each survey day. This number is vehicles that are parked on double yellow lines, at potentially dangerous points on junctions, and within other restrictions. Lack of enforcement across Renfrewshire may contribute to this current element of non-compliance.”*

For Paisley, a targeted expansion of the Paisley town centre controlled parking zones is being considered within the Renfrewshire LTS 2017, to help residents alleviate pressures from commuter car parking.

5.7 Summary

This section has outlined the transport baseline for Renfrewshire. The key points from the above analysis include:

- Renfrewshire’s location offers sustainable travel opportunities as well as good access to air, road, rail and motorway networks;
- Renfrewshire has an extensive network of core paths and includes 2 national cycle routes which serve some of the largest settlements in the area;
- 26% of people in Renfrewshire have access to a bike though cycling levels remain low;
- Some of the key barriers to cycling include: poor condition of roads and cycle routes (including surfaces and lighting), lack of secure cycle parking facilities and a lack of traffic-free cycle routes;
- Bus patronage continues to decline in favour of rail travel; the three most used train stations are Paisley Gilmour Street, followed by Johnstone and Bishopton;
- Renfrewshire’s peak time congestion hot spots and capacity pinch points include sections of the M8 (between junctions 26 and 29 as well as Junction 29 St James, Junction 29a Bishopton and Junction 30 Erskine), the A737 (south of M8 junction 29), the A726 between M8 junction 29 and Paisley Town Centre, A737 Linclive and A737 Barochan Junctions;
- 18% of drivers in Renfrewshire experience congestion delays which is more than the average figures for the SPT region (11%) and wider Scotland (12%);
- There has been a decrease in journey times by 0.14% between 2007 and 2017 across Renfrewshire;
- Traffic flows recorded on cordons surrounding Paisley, Renfrew and Erskine between 2006 and 2016 show there has been a decrease in weekday traffic flows by around 1.2%;
- The number of casualties across all roads types within Renfrewshire continues to decline.

6. SUMMARY AND FINDINGS

6.1 Key issues, challenges and opportunities

This report has outlined the available baseline information which will guide the transport appraisal of the emerging LDP.

The analysis of wider planning policy, socio-economic data, local development proposals and transport and travel information identified a number of issues, challenges and opportunities across Renfrewshire. These will provide a basis for defining the Transport Planning Objectives and guide the development of options.

The key issues, challenges and opportunities have been grouped in common themes and are summarised in Table 8.

Table 8. Key issues, challenges and opportunities

ISSUES / CHALLENGES	OPPORTUNITIES
Network performance and safety	
<ul style="list-style-type: none"> ○ Renfrewshire’s road network has peak time congestion hot spots and capacity pinch points, these include sections of the M8, the A737, and the A726 between M8 junction 29 and Paisley Town Centre; ○ 18% of drivers in Renfrewshire experience congestion delays which is more than the average figures for the SPT region (11%) and wider Scotland (12%); ○ More people have moved into Renfrewshire than moved out and the number of households has slightly increased since 2016; 	<ul style="list-style-type: none"> ○ Glasgow City Deal projects will help to improve connectivity and economic activity; ○ There has been a decrease in journey times by 0.14% between 2007 and 2017 across Renfrewshire; ○ The number of casualties across all roads types within Renfrewshire continues to decline;
Accessibility and social inclusion	
<ul style="list-style-type: none"> ○ 35% of households do not have access to a car; Renfrewshire has pockets of deprivation with the most deprived area being within Paisley Ferguslie area; 	<ul style="list-style-type: none"> ○ Renfrewshire’s location offers sustainable travel opportunities as well as good access to air, road, rail and motorway networks; ○ The area has also an extensive network of core paths and includes two national cycle routes which serve some of the largest settlements in the area; ○ Glasgow City Deal projects will help to reduce deprivation;

ISSUES / CHALLENGES

OPPORTUNITIES

Sustainable travel and environment

- In line with the Climate Change Plan there is a need to work towards healthy and sustainable environment that minimises carbon and greenhouse gas emissions; (65% of people travel to work by car which slightly higher than the Scottish average; also, 54% of people who commute to work up to 5km drive to work, which is higher than the Scottish national figures);
- There is a need to make cycling safe and attractive to people of all ages and backgrounds, and for a wide range of transport and leisure journeys; (26% of people in Renfrewshire have access to a bike though cycling levels remain low; less than 1% of the working age population cycle to work. Poor condition of roads and cycle routes (including surfaces and lighting), lack of secure cycle parking facilities and a lack of traffic-free cycle routes contribute to low levels of cycling;
- Bus patronage continues to decline; there is a need to enhance bus service provision and reliability;
- Rail patronage continues to raise as well as the use of the park and ride facilities at the rail stations;
- Renfrewshire Green Networks provide opportunities for active travel;
- Traffic flows recorded on cordons surrounding Paisley, Renfrew and Erskine between 2006 and 2016 show there has been a decrease in weekday traffic flows by around 1.2%;

Integration

- There is a need to optimise the use of existing infrastructure by supporting development which is concentrated along transport corridors in close proximity to existing transport connections (e.g. high quality and convenient public transport);
- Glasgow City Deal projects will help optimise the existing infrastructure by supporting future potential development;

Part 2

RENFREWSHIRE LDP CUMULATIVE ASSESSMENT

Draft Model Development & Results Report



SYSTRA

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1. INTRODUCTION

1.1 Background

- 1.1.1 SYSTRA Limited (SYSTRA) was appointed by Renfrewshire Council to prepare a Transport Assessment to support the Council's second Renfrewshire Local Development Plan (LDP2).
- 1.1.2 LDPs provide the vision for how communities will grow and develop in the future. They set out the spatial strategy for the area and guide the future use of land. They set out where future development should and should not occur, identifying opportunities for change, regeneration and enhancement. They also provide an indication of the level of infrastructure required for growth.
- 1.1.3 Two different documents have been completed as part of the Transport Assessment. One is the Baseline Assessment. This sets out the key challenges, issues and opportunities facing Renfrewshire in the context of the LDP.
- 1.1.4 The second document is this Cumulative Impact Assessment. This report identifies the future trip generation and attraction associated with the LDP strategy, and how it will impact on future travel demand and supply. This assessment is only a road based assessment. Public transport via bus or rail is not analysed.
- 1.1.5 In order to accomplish this, transport modelling was undertaken utilising existing S-Paramics models of the Renfrewshire area as SYSTRA has carried out a large volume of modelling for the Renfrewshire City Deal projects in recent years.
- 1.1.6 This report details the methodology and the results of the Cumulative Impact Assessment.

1.2 Cumulative Assessment Requirements

- 1.2.1 SYSTRA has been involved in the Renfrewshire City Deal modelling and has a good understanding of the Renfrewshire Council area. It therefore has a good understanding of the proposed LDP2 content and potential mitigating infrastructure required to develop the strategy. The process of cumulative impact assessment offers the opportunity to ensure that the proposed infrastructure mitigates the impact of the LDP2.
- 1.2.2 This work utilised the Renfrewshire City Deal traffic models, which were modified to reflect the existing conditions. The models used were:
- **The Base model** – The model has a base year of 2015 and was developed for the previous City Deal work. On request of Renfrewshire Council the model was extended to the south west, as described in SYSTRA report *Base Model Calibration & Validation Report* (Ref: GB01T17N62_26/09/2018)
 - **The Do Minimum model** - This model contains only infrastructure changes that have been implemented since the 2015 Base model was created, and those confirmed to be going ahead. It also contains all committed developments in the

Renfrewshire Council area, and a number of proposed developments in West Dunbartonshire and Glasgow Council areas. These developments are documented in Chapter 5.

- **The Do Something model** - This model contains all of the proposed infrastructure changes as included in the Do Minimum model, plus infrastructure improvements that are proposed to aid the delivery of the LDP and mitigate any potential adverse impact. The most significant improvement included is the Clyde Waterfront and Renfrew Riverside project (CWRR), which comprises a new road bridge over the Clyde between the existing Erskine Bridge and the Clyde Tunnel, and a road connecting Inchinnan Road with the new bridge. As well as all the developments allowed for in the Do Minimum model, there are a number of additional proposed LDP developments. The model also contains and a number of Housing Pipeline sites that are not allocated for development in the LDP but could come forward during the plan period if there is a shortfall in the housing land supply. The LDP and Housing Development Pipeline sites will also be discussed in Chapter 5.

1.2.3 If the Do Something scenario records modelling results that are better or similar to the Do Minimum scenario, the LDP2 would be considered to not have a minimal impact on road traffic.

1.2.4 All models were run for the same time periods as follows: the morning peak, or AM (07:00 – 10:00), the Interpeak, or IP (10:00 – 16:00) and the evening peak, or PM (16:00 – 19:00).

1.2.5 One future year has been be modelled for the Do Minimum and Do Something scenarios, which is 2029. This is the final year of the LDP2.

1.2.6 The following chapters describe the infrastructure and the demands in the Do Minimum and Do Something models, and the results of the cumulative assessment. The major aim is to determine if the additional development contained in the Do Something scenario can be accommodated by the additional infrastructure, identified in this report.

1.3 Executive Summary

1.3.1 Each of the models were tested and results obtained in the form of traffic flows, queues and average journey times.

1.3.2 The traffic flow results demonstrate the following:

- Generally, even without implementing the Renfrewshire Local Development Plan, modelling shows that there is likely to be an increase in flows at peak times across parts of the strategic road network over the next ten years. However, when looking at the potential new development and land allocations within the Local Development Plan Proposed Plan on its own, it will not result in significant increases in flows on the M8 or A737.
- When comparing the Do Something scenario with the Do Minimum, traffic flows on local roads vary. In the vicinity of the new Clyde Crossing, flows, particularly on King’s Inch Road, increase. However, there are reductions around Renfrew town centre, as the new Renfrew Northern Development Road allows for an alternative route around the Renfrew Cross junction.

1.3.3 The queue length results demonstrate the following:

- Queue levels are similar between the Do Something and Do Minimum around the Abbostinch Road/Inchinnan Road/Greenock Road junction in Renfrew. There is also little difference recorded on the A737 and the St James Interchange.
- The Do Something records greater queues around the Glasgow Airport area. This is primarily due to increased development in the vicinity of the airport, especially from the new AMIDS site. Queuing is at its highest levels in this area around 17:30 (without causing queueing onto the M8) before falling away. Queueing also increases around the Braehead area due to the new Clyde Crossing. The queues are operational in nature and do not represent excessive delay.
- The Do Something scenario records lower queueing than the Do Minimum scenario in the area between the Arkleston junction in the south and Renfrew Cross in the north. This is due to new infrastructure providing relief for areas of congestion.
- Overall, queue levels in the area south of the Clyde are slightly greater than in the Do Minimum. However the increase is not considered significant.

1.3.4 The following key results were observed regarding journey times:

- The Do Something has generally faster journey times than the Do Minimum.
- Overall, Do Something journey times are slightly lower in the AM and PM peak periods compared with the Do Minimum, and are slightly higher in the interpeak.

1.3.5 The results demonstrate that the new development proposed within the Local Development Plan Proposed Plan can be accommodated within Renfrewshire without significant additional impacts on the road network.

2. FUTURE YEAR MODELS

2.1 Introduction

2.1.1 This chapter sets out all of the infrastructure tested in each of the future year models, the Do Minimum model and the Do Something model. Additional commentary on the new infrastructure is provided in subsequent sections.

2.2 Do Minimum Model

2.2.1 The 2029 Do Minimum model contains major road network changes that have occurred since 2015 or are planned to be improved by 2029.

2.2.2 The improvements are listed below:

- Glasgow Airport - The Airport road layout has changed as a result of adding in the Pick Up and Drop Off (PUDO) facility. This facility was implemented shortly after the Base Model was completed in 2015.
- The M8 Junction 29A - the junction has been added as this is a committed scheme associated with the Dargavel Village Community Growth Area.
- Braehead – The approved Braehead expansion will deliver improvements to the road network around Braehead.

2.2.3 The network improvements as included in the Do Minimum model are shown in Figure 2.1 below.



Figure 2.1 : Do Minimum Road Improvements

2.2.4 Chapter 3 contains more detail on the proposed improvements and the schemes included in the Do Minimum.

2.3 Do Something Model

2.3.1 The Do Something model contains all of the improvements in the Do Minimum model plus additional improvements as follows:

- Abbotsinch Road Junction - The junction of Abbotsinch Road/Greenock Road/Inchinnan Road has been improved. The scope for improvement was limited due to listed structures.
- Abbotsinch Road has been realigned. This change will not reduce delay or increase capacity, but is rather to allow access for the proposed GAIA development.
- Wright Street Bridge. This is a new bridge over the White Cart Water. It connects Abbotsinch Road on the west and Wright Street to the east. It is only for traffic, particularly heavy vehicles, heading to industrial sites around Wright Street.
- The Clyde Waterfront and Renfrew Riverside (CWRR) project is in place. This comprised of a new road bridge across the Clyde and a new Renfrew North Development Road between Inchinnan Road and the new bridge.
- The Gateway route between the northern side of Paisley Gyratory and Inchinnan Road is a possible improvement for the future. It is mentioned in this report for descriptive purposes and hasn't been modelled. If this project is taken forward, an assessment would be required considering the impact of this infrastructure on the local and trunk road network.

2.3.2 The improvements detailed above are shown below in Figure 2.2.

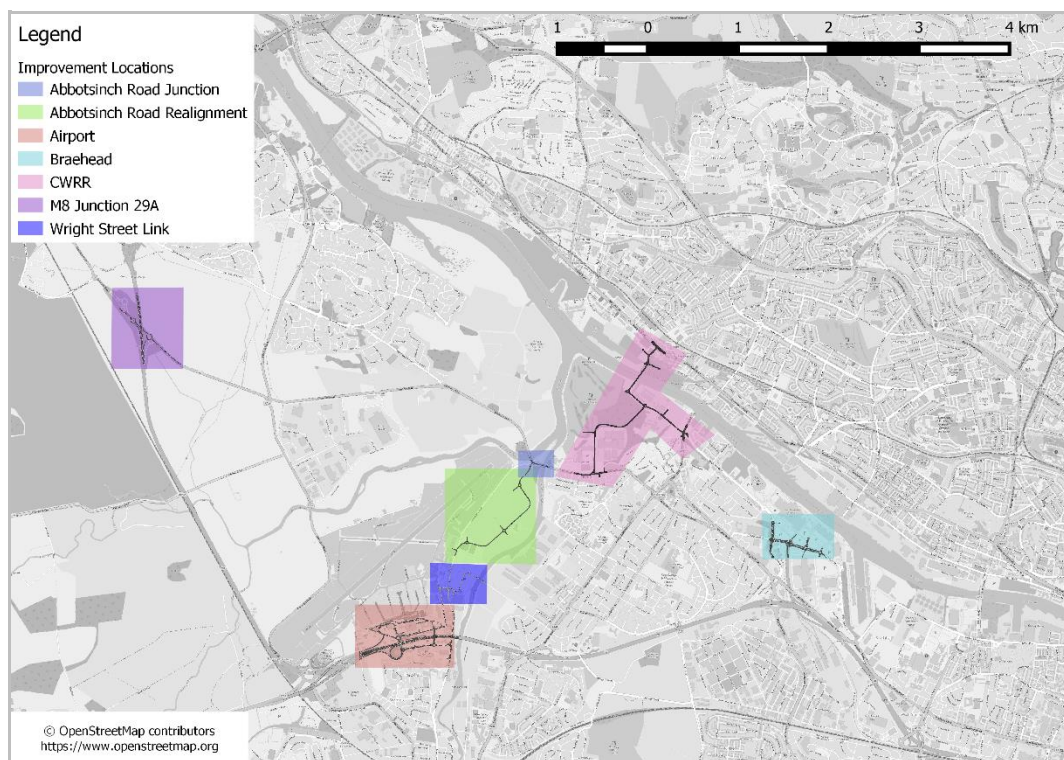


Figure 2.2 : Do Something Road Improvements

- 2.3.3 Existing traffic signals have been optimised in some regions of the model.
- 2.3.4 Chapter 4 contains more detail on the proposed improvements and the schemes included in the Do Something.

3. DO MINIMUM ROAD NETWORK IMPROVEMENTS

3.1 Introduction

3.1.1 This chapter contains more detail on the improvements included in the Do Minimum model.

3.2 Glasgow Airport Pick Up & Drop Off (PUDO)

3.2.1 This improvement was implemented just after the previous Base Model was completed in 2015. The scheme was added in the Do Minimum Model, but not in the Base Model as no information exists on the new turning counts that would ensue from the addition of this infrastructure.

3.2.2 The improvement is shown, as modelled, in Figure 3.1 below.

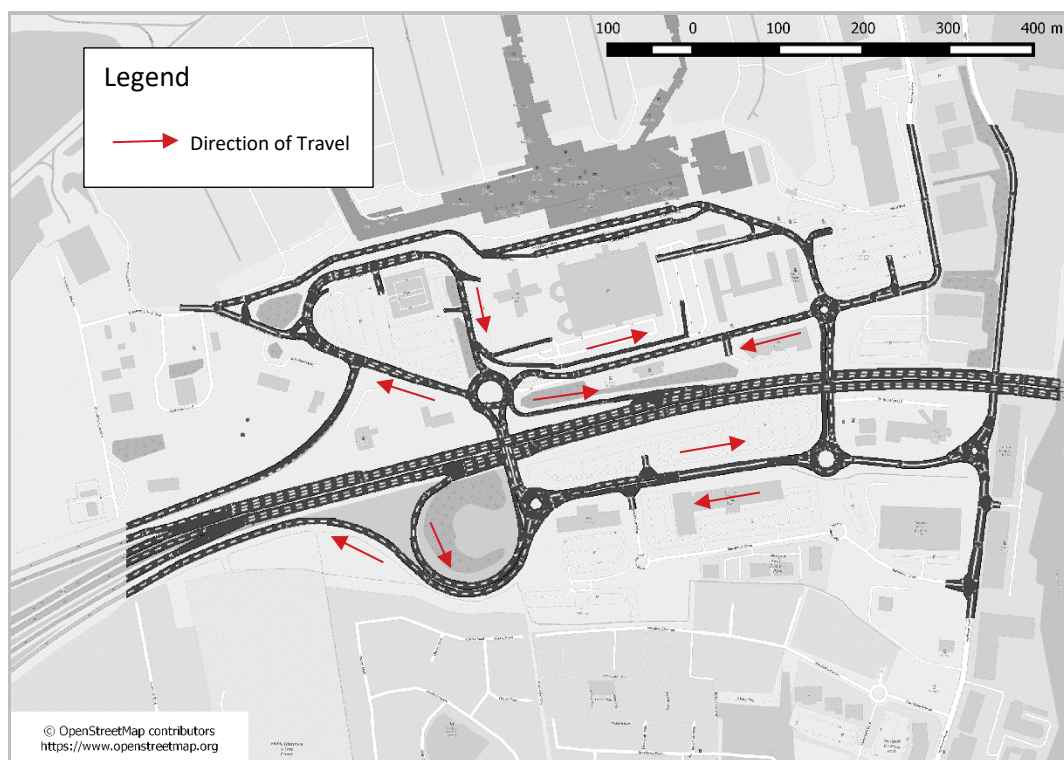


Figure 3.1 : Airport PUDO Layout.

3.2.3 From a modelling perspective the improvement means that traffic can now only travel along St Andrew's Drive in a westbound direction, as shown in the figure.

3.3 M8 Junction 29A

3.3.1 This is a new motorway junction that is currently under construction and is designed to allow traffic to exit the M8 on Greenock Road in a westbound direction, or go from Greenock Road to the M8 in a eastbound direction. Currently, traffic from Bishopton that wishes to travel the M8 southbound must either travel along Greenock Road and Barnsford Road then join via the St James Interchange, or join via the B815 and the M898. The junction is to assist traffic travelling to and from the Dargavel Village Community Growth Area which is to expand with future development.

3.4 Braehead Area Road Improvements

3.4.1 The roads around the Braehead Arena are proposed to be upgraded in the future to account for the proposed development at Braehead.

3.4.2 The plans for these improvements were extracted from the *Braehead, Proposed Mixed Use Development Proposals* transport assessment prepared by Dougall Baillie Associates on behalf of Intu. There are additional lanes of traffic and roundabouts have been replaced with signalised priority junctions.

4. DO SOMETHING ROAD NETWORK IMPROVEMENTS

4.1 Introduction

4.1.1 This chapter details the improvements only present in the Do Something model. The improvements centre on the new Clyde Crossing.

4.2 Abbotsinch Road/Greenock Road/Inchinnan Road Junction Improvement

4.2.1 This junction is the intersection of three important roads on the western end of Renfrew, that will be required to assist with additional vehicle movements anticipated by the development of the new Advanced Manufacturing Innovation District Scotland (AMIDS)¹ development. The junction currently is, and will remain, a signalised junction. There are physical constraints which limit how this junction could be improved due to the presence of Grade-A listed structures.

4.2.2 Currently, there is a short two lane section on the Abbotsinch Road (i.e. the southern arm) of this junction. Both of the other arms only have one lane which is a constraint on capacity.

4.2.3 The general design of this junction came from the previous City Deal modelling, which predicted worsening congestion at this junction without improvement. In the future, Abbotsinch Road will have a much longer two lane section, and Greenock Road will now have a short two lane section to allow right turning vehicles to discharge more easily. There are extensive physical constraints at this location that reduce the extent of the possible improvements. This junction is shown in Figure 4.1.

¹ <http://www.renfrewshire.gov.uk/amids>

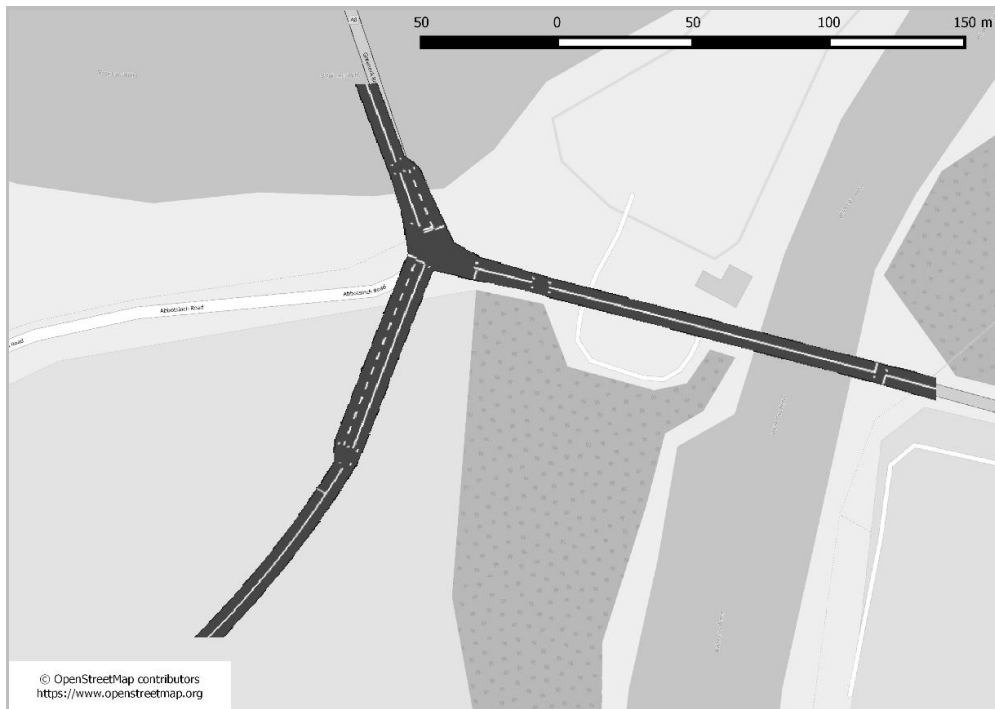


Figure 4.1 : Abbotsinch Road/Greenock Road/Inchinnan Road Junction Improvement

4.3 Abbotsinch Road Realignment

4.3.1 This road needs to be realigned to provide for a new advanced manufacturing development, currently proposed to be at the heart of the new AMIDS development.

4.3.2 Figure 4.2 shows the realignment.

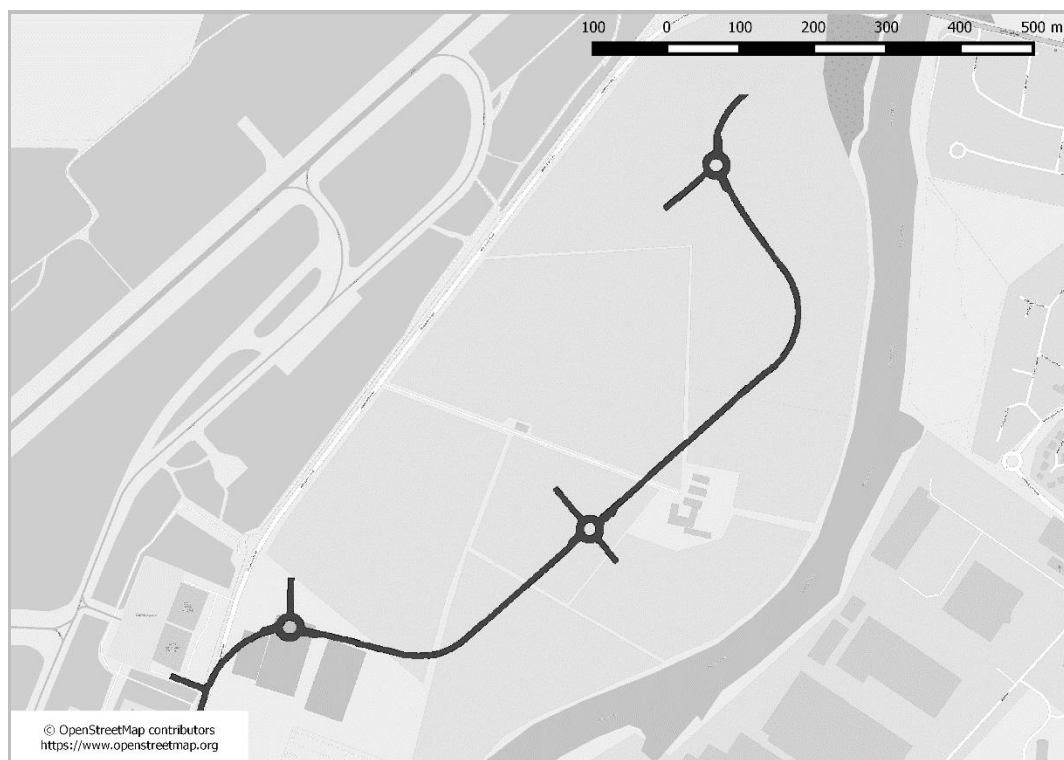


Figure 4.2 :Abbotsinch Road Realignment

4.3.3 As can be seen, the re-aligned road will have three new roundabouts which are the accesses to new development. To the north, the road connects to the proposed junction improvement described in section 4.2.

4.4 Wright Street Link

4.4.1 This new feature is a bridge over the White Cart Water, running between Arran Avenue in the west and Wright Street to the east.

4.4.2 The new bridge, as proposed, would only be used by traffic going to and from business sites on the east bank of White Cart Water. In particular, the bridge would provide access for heavy vehicles. It would therefore reduce the volume of heavy vehicles on a residential section of Wright Street, Porterfield Road and Paisley Road within Renfrew.

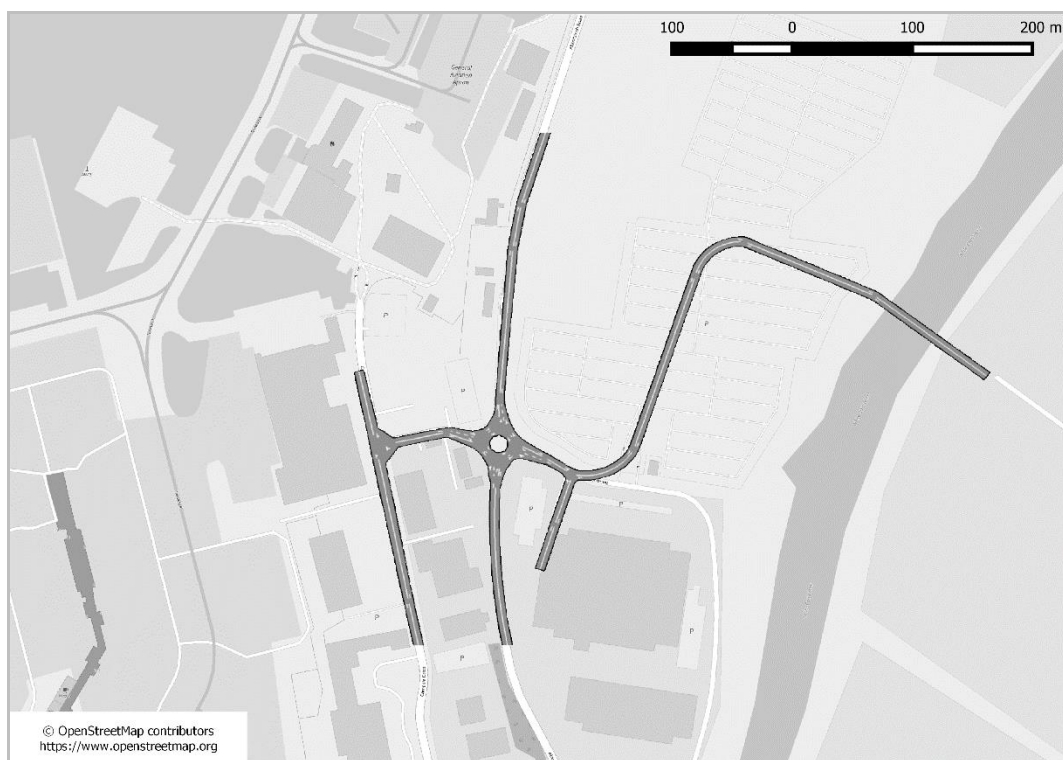


Figure 4.3 :Wright Street Bridge

4.5 The Clyde Waterfront and Renfrew Riverside (CWRR)

- 4.5.1 This is the most substantial proposed improvement in the Renfrewshire area. The most important feature of this improvement is a new opening bridge over the Clyde, roughly equidistant between the Erskine Bridge and the Clyde Tunnel. The main purpose of this bridge is to improve local connections between Renfrew, Yoker and east Clydebank, thereby improving economic conditions in these communities.
- 4.5.2 In addition, the Renfrew Northern Development Road (RNDR) is proposed. This road runs between the new bridge and Inchinnan Road to the south. It provides traffic relief to Renfrew Cross to the east.
- 4.5.3 According to information on Renfrewshire Council’s website² the CWRR will bring a number of benefits to the area, including:
- *Improved access for communities north & south of the Clyde to key residential, employment, healthcare, education, leisure and retail sites for all modes of transport, including improved opportunities for leisure and active travel alongside and across the Clyde*
 - *Enhanced local environment through the use of high quality landscaping to encourage high quality development and regeneration*
 - *Optimised operation of the local road network, resulting in improved journey time reliability and safety*

² <http://www.renfrewshire.gov.uk/cwrr>

- *Improved access to and enhance local greenspace This investment in infrastructure will help to create a more attractive, vibrant and sustainable place to live and work by better connecting communities*

4.5.4 Aside from the economic opportunities created by the CWRR, the new bridge is designed to connect and take existing local traffic travelling between communities on each side of the River Clyde. The RNDR allows traffic travelling east and west across Renfrew to provide an alternative to the route through Renfrew town centre.

4.5.5 The bridge is proposed to be closed to road traffic on occasions to allow ships/vessels through to navigate the River Clyde. The road traffic implications of this factor was tested extensively in the City Deal project. For the purposes of the modelling the impact of the LDP, it was assumed that the bridge will remain open to traffic at all times.

4.5.6 The CWRR is shown in Figure 4.4 below.

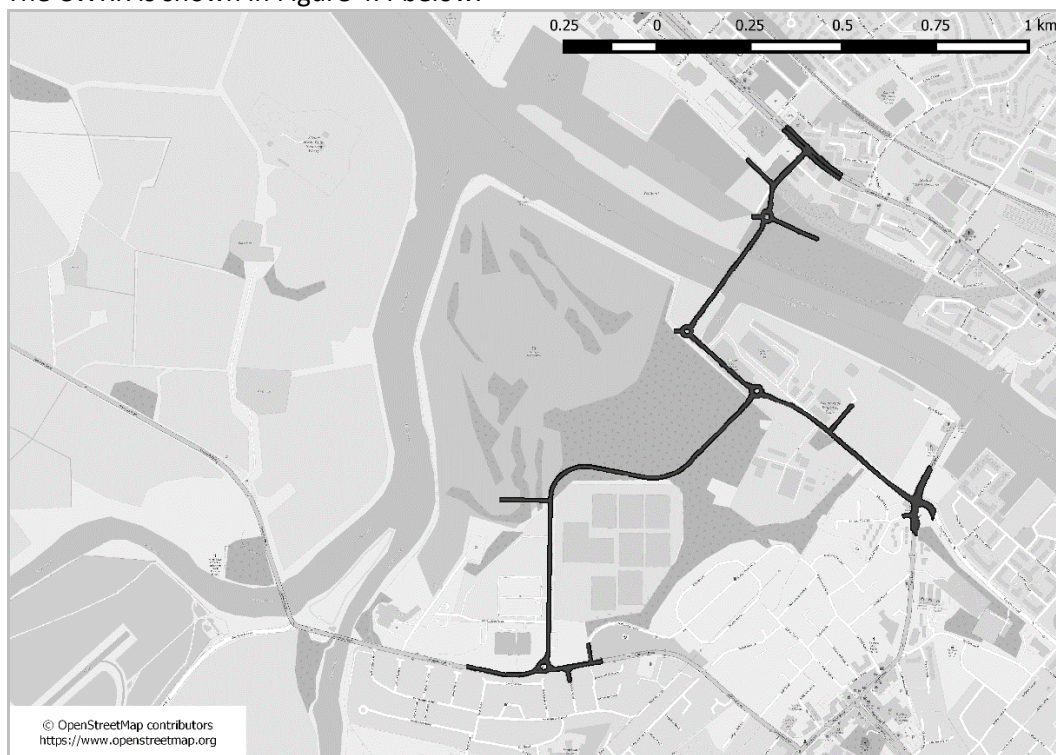


Figure 4.4 : CWRR Improvements

5. FUTURE YEAR DEVELOPMENT TRIP GENERATION

5.1 Introduction

5.1.1 This chapter details the list of future year developments that are included in the Do Minimum and Do Something models. SYSTRA was provided with a list of future developments from Renfrewshire Council which informed this assessment.

5.2 Development Information

5.2.1 The information provided for each development included:

- Type of development (e.g. industrial, residential, shop, etc.)
- Location
- The date the development begins construction, and the build rate
- Final development size upon completion
- Whether the development applies to the Do Minimum or the Do Something scenario

5.2.2 The Do Minimum development sites have already received planning consent while all Do Something sites are currently without planning consent.

5.2.3 In addition to the list of developments from Renfrewshire Council, SYSTRA reused the development information from the City Deal project for West Dunbartonshire Council and Glasgow City Council. Both sets of information had previously been provided by the local authorities. While this information is less relevant than the Renfrewshire Council development data, the future development in these locations may have an impact on the Renfrewshire LDP model and therefore has been included. All of the West Dunbartonshire and Glasgow sites have been included in the Do Minimum scenario, and are therefore also present in the Do Something model.

5.2.4 The TRICS database was used to create the trip rates of each development. The criteria for which reference sites were selected was:

- All sites in Great Britain, except for Greater London, the South East and the South West.
- All sites surveyed from the first of January 2010.

5.2.5 Finally, some developments have been classified as *Inside* or *Outside*. An *Inside* development is one that lies within the confines of the model. An *Outside* development lies outwith the model area. The methodology for assigning the new trips varies depending on this classification.

5.2.6 The positions of all the new development sites, consented and otherwise, are shown in Figure 5.1 below.

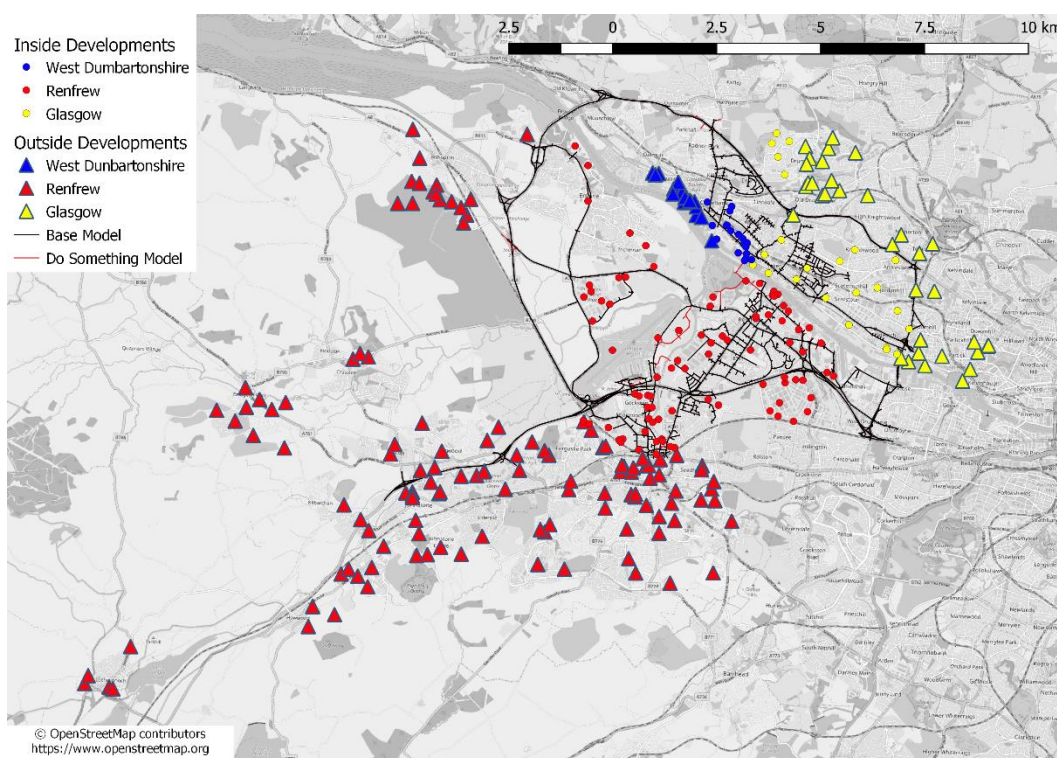


Figure 5.1 : Locations of New Developments

5.3 Airport Growth

5.3.1 In addition to the growth from new developments, traffic to and from Glasgow Airport is assumed to grow in the future as well. The growth methodology is consistent with that used in the City Deal modelling, which was in turn based on information provided by the airport. This resulted in a growth in departures and arrivals of approximately 20% over Base flows for the airport to 2029.

5.4 New Development Trips

5.4.1 Table 5.1 shows the total volume of development considered in the Renfrewshire LDP2 disaggregated by land use.

Table 5.1 : Total Volume of Development in Renfrewshire LDP Model

TRICS Code	Main Land Use	Sub Land Use	Parameter	Unit	Renfrewshire				Glasgow		West Dunbartonshire	
					Do Minimum Inside	Do Minimum Outside	Do Something Inside	Do Something Outside	All Inside	All Outside	All Inside	All Outside
1M	RETAIL	MIXED SHOPPING MALLS	GFA	100 m ²	576	21	5.5	0				
2A	EMPLOYMENT	OFFICE	GFA	100 m ²	31	1.6	442					
2C	EMPLOYMENT	INDUSTRIAL UNIT	GFA	100 m ²		3.7	1,101					
2C	EMPLOYMENT	INDUSTRIAL UNIT	Site Area	1 Ha	39	6.1					12	3.8
2D	EMPLOYMENT	INDUSTRIAL ESTATE	Site Area	1 Ha					1.1			
2F	EMPLOYMENT	WAREHOUSING (COMMERCIAL)	GFA	100 m ²	3.2	0.0						
3A	RESIDENTIAL	HOUSES PRIVATELY OWNED	Dwelling	1 Dwelling	1,553	4,527	969	2,990	1,757	3,395	870	962
3A	RESIDENTIAL	HOUSES PRIVATELY OWNED	Site Area	1 Ha							3.8	29
4D	EDUCATION	NURSERY	GFA	100 m ²			5.5	1.0				
6A	HOTEL, FOOD & DRINK	HOTELS	ROOM	1 Room	294	79						
6A	HOTEL, FOOD & DRINK	HOTELS	GFA	100 m ²								
6C	HOTEL, FOOD & DRINK	PUB/RESTAURANT	GFA	100 m ²		2.0	5.5					
7A	LEISURE	EVENTS ARENA	Seats	1 Seat	5,000							

5.4.2 The trip generation per given unit is shown in Table 5.2 below. All of the values were obtained from the TRICS database as previously given.

Table 5.2 : Trip Generation Per Unit

TRICS Code	Main Land Use	Sub Land Use	Parameter	Unit	AM (07:00 - 10:00)		IP (10:00 - 16:00)		PM (16:00 - 19:00)	
					Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
1M	RETAIL	MIXED SHOPPING MALLS	GFA	100 m ²	0.44	0.08	1.49	1.50	0.39	0.65
2A	EMPLOYMENT	OFFICE	GFA	100 m ²	2.93	0.64	1.79	1.98	0.41	2.39
2C	EMPLOYMENT	INDUSTRIAL UNIT	GFA	100 m ²	0.73	0.16	0.58	0.67	0.14	0.66
2C	EMPLOYMENT	INDUSTRIAL UNIT	Site Area	1 Ha	29.12	7.68	27.72	32.00	7.70	27.61
2D	EMPLOYMENT	INDUSTRIAL ESTATE	Site Area	1 Ha	31.32	18.17	51.46	53.07	11.97	25.69
2F	EMPLOYMENT	WAREHOUSING (COMMERCIAL)	GFA	100 m ²	0.28	0.14	0.38	0.37	0.11	0.24
3A	RESIDENTIAL	HOUSES PRIVATELY OWNED	Dwelling	1 Dwelling	0.31	0.69	0.91	0.91	0.73	0.47
3A	RESIDENTIAL	HOUSES PRIVATELY OWNED	Site Area	1 Ha	8.98	19.93	25.50	25.58	20.85	13.05
4D	EDUCATION	NURSERY	GFA	100 m ²	7.51	5.85	5.59	6.15	4.79	5.94
6A	HOTEL, FOOD & DRINK	HOTELS	ROOM	1 Room	0.31	0.43	0.47	0.53	0.43	0.27
6A	HOTEL, FOOD & DRINK	HOTELS	GFA	100 m ²	0.68	0.82	0.98	1.09	0.83	0.56
6C	HOTEL, FOOD & DRINK	PUB/RESTAURANT	GFA	100 m ²	0.00	0.00	7.50	6.25	5.59	4.15
7A	LEISURE	EVENTS ARENA	Seats	1 Seat	0.00	0.00	0.11	0.08	0.09	0.07

5.4.3 Finally, the total number of trips generated in the whole weekday (arrivals and departures) between 07:00 and 19:00 is shown in Table 5.3.

Table 5.3 : Total Trip Generation (Arrivals and Departures, 07:00 – 19:00)

TRICS Code	Main Land Use	Sub Land Use	Parameter	Unit	Renfrewshire				Glasgow		West Dunbartonshire	
					Do Minimum		Do Something		Inside	Outside	Inside	Outside
1M	RETAIL	MIXED SHOPPING MALLS	GFA	100 m ²	2614	97	25	0				
2A	EMPLOYMENT	OFFICE	GFA	100 m ²	314	16	4483					
2C	EMPLOYMENT	INDUSTRIAL UNIT	GFA	100 m ²		11	3240					
2C	EMPLOYMENT	INDUSTRIAL UNIT	Site Area	1 Ha	5085	808					1532	494
2D	EMPLOYMENT	INDUSTRIAL ESTATE	Site Area	1 Ha					210			
2F	EMPLOYMENT	WAREHOUSING (COMMERCIAL)	GFA	100 m ²	5	0						
3A	RESIDENTIAL	HOUSES PRIVATELY OWNED	Dwelling	1 Dwelling	6240	18189	3893	12014	7060	13641	3496	3865
3A	RESIDENTIAL	HOUSES PRIVATELY OWNED	Site Area	1 Ha							429	3263
4D	EDUCATION	NURSERY	GFA	100 m ²			197	36				
6A	HOTEL, FOOD & DRINK	HOTELS	ROOM	1 Room	716	192						
6A	HOTEL, FOOD & DRINK	HOTELS	GFA	100 m ²								
6C	HOTEL, FOOD & DRINK	PUB/RESTAURANT	GFA	100 m ²		48	129					
7A	LEISURE	EVENTS ARENA	Seats	1 Seat	1745							
-	-	AIRPORT GROWTH	-	-	2793							

6. FUTURE YEAR MATRIX DEVELOPMENT

6.1 Methodology

6.1.1 The matrix development process is designed not only to generate a plausible number of trips to and from each development, but also to distribute it sensibly.

6.1.2 The total number of trips entering and leaving existing developments internal to the model area has been maintained, as there is no reason to assume that this will change in the future. However, some trips from existing developments are assumed to redistribute to new developments.

6.1.3 It must be noted that while this chapter throughout refers only to *departures* for brevity, *arrivals* are equally important to the matrix development process.

6.1.4 A trip released from an *Inside* development is treated as follows:

- It can end its journey in the model area, for which it must travel to an internal zone; or
- It can end its journey in an area outwith the model area (e.g. Glasgow), for which it must travel to an external zone.

6.1.5 A trip released from an *Outside* development is treated as follows:

- It can end its journey in the model area, for which it must travel to an internal zone; or
- It can pass through the model area in order to end its journey in an area outwith the model area (e.g. Glasgow); or
- It does not enter the model area at all. While these trips are departing a new development, they are irrelevant to the model.

6.1.6 Therefore, only a certain proportion of the total trip generation from *Outside* developments, as shown in Table 5.3, is relevant to the model.

6.2 Internal Trips

6.2.1 For *Inside* developments, the proportion of all traffic heading to an internal zone is taken from the 2011 Scottish Census Intermediate Area that the development is within. The remainder of traffic is assumed to travel to External zones.

6.2.2 For *Outside* developments, the proportion of all traffic heading to an internal zone is also taken from the 2011 Scottish Census Intermediate Area that the development is within. Trips from *Outside* developments that pass through the model extents were calculated using a different method from the 'Internal' trips, described in section 6.3.

6.2.3 The trip distribution was then further disaggregated by using the existing trip distribution on the Base model network. It is possible for a new trip to leave a new development and go to a new development.

6.2.4 The total trip generation was separated into light and heavy vehicles, with the TRICS database again providing this information.

6.2.5 Table 6.1 shows the total AM trips departing new developments and arriving at internal zones, or arriving at new developments from internal zones. The IP and PM tables are shown in Table 6.2 and Table 6.3 respectively.

Table 6.1 : AM Internal Trips

Council Area	Scenario	Development Location	Light Vehicles				Heavy Vehicles			
			Departures To		Arrivals From		Departures To		Arrivals From	
			Internal	External	Internal	External	Internal	External	Internal	External
Renfrewshire	Do Minimum	Inside	677	1149	763	1421	27	51	51	95
		Outside	909		430		11		14	
	Do Something	Inside	375	783	687	1905	18	50	30	80
		Outside	718		406		8		9	
West Dunbartonshire	All	Inside	224	517	247	351	11	13	22	22
		Outside	335		185		6		9	
Glasgow	All	Inside	338	862	150	383	3	9	4	10
		Outside	685		318		8		9	
Total	Do Minimum	Inside	1239	2528	1160	2155	42	72	77	128
		Outside	1929		933		25		32	
	Do Something	Inside	1614	3311	1847	4060	61	122	107	208
		Outside	2647		1339		32		40	

Table 6.2 : IP Internal Trips

Council Area	Scenario	Development Location	Light Vehicles				Heavy Vehicles			
			Departures To		Arrivals From		Departures To		Arrivals From	
			Internal	External	Internal	External	Internal	External	Internal	External
Renfrewshire	Do Minimum	Inside	1672	3107	1586	2884	64	119	88	165
		Outside	1228		1219		17		19	
	Do Something	Inside	793	1905	724	1708	42	114	52	141
		Outside	919		907		11		11	
West Dunbartonshire	All	Inside	422	784	383	751	27	27	38	36
		Outside	468		457		11		14	
Glasgow	All	Inside	445	1138	444	1135	5	13	5	13
		Outside	921		918		12		13	
Total	Do Minimum	Inside	2539	5029	2414	4770	96	159	131	214
		Outside	2616		2594		41		45	
	Do Something	Inside	3332	6933	3138	6478	138	274	183	355
		Outside	3535		3501		51		56	

Table 6.3 : PM Internal Trips

Council Area	Scenario	Development Location	Light Vehicles				Heavy Vehicles			
			Departures To		Arrivals From		Departures To		Arrivals From	
			Internal	External	Internal	External	Internal	External	Internal	External
Renfrewshire	Do Minimum	Inside	1075	1988	921	1552	11	21	9	17
		Outside	643		973		5		4	
	Do Something	Inside	689	1820	379	767	7	18	5	14
		Outside	523		741		3		3	
West Dunbartonshire	All	Inside	297	469	243	553	4	5	3	4
		Outside	260		356		2		2	
Glasgow	All	Inside	229	585	360	919	1	4	1	4
		Outside	473		726		4		3	
Total	Do Minimum	Inside	1601	3042	1523	3025	17	29	14	25
		Outside	1376		2055		11		10	
	Do Something	Inside	2290	4862	1902	3791	23	47	19	39
		Outside	1899		2796		13		13	

6.2.6 It is apparent from each table that Renfrewshire Council area developments only account for a proportion of the new total development.

6.2.7 Figure 6.1 shows the total internal trip generation of the two scenarios in diagrammatic form.

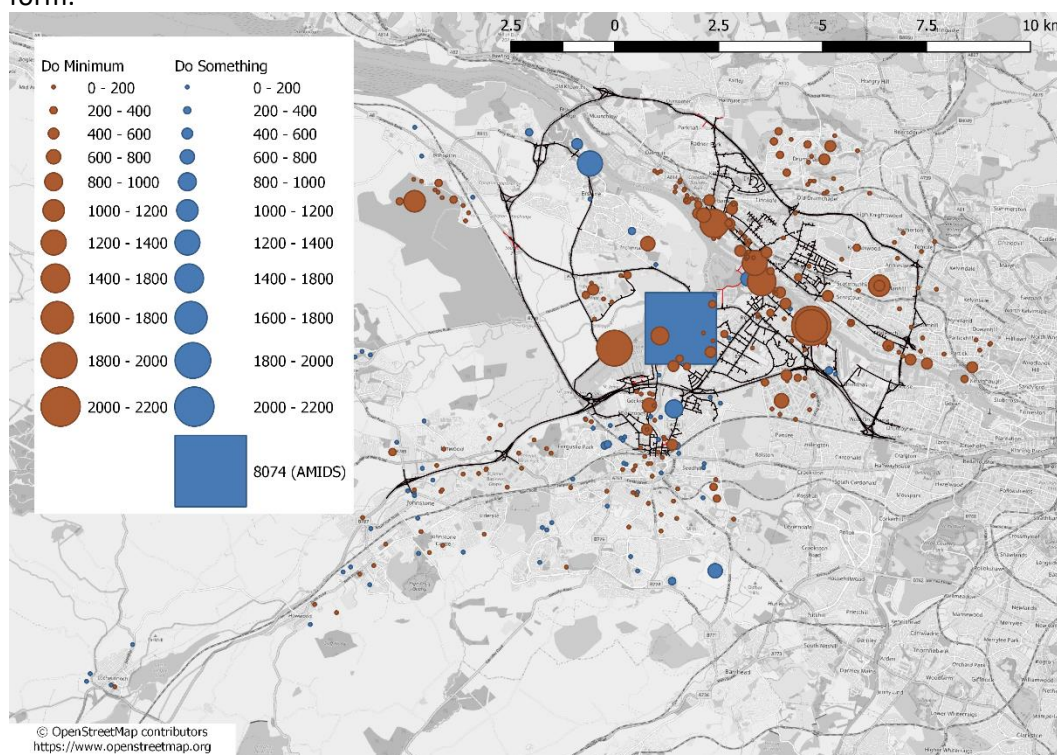


Figure 6.1 : Total Internal Trip Generation (Departures Plus Arrivals, 07:00 – 19:00)

6.3 External to External Trips

- 6.3.1 As noted previously, trips that leave an *Outside* development and pass through the model network are calculated using a different methodology than that used for internal (*Inside*) trips. Transport Model for Scotland (TMfS) sub-area matrices were used to calculate the aggregate growth of all new External to External trips between 2017 and 2029.
- 6.3.2 TMfS takes into account proposed developments and growth all over Scotland and will therefore take into account all the new developments outside the model area. It also takes into account changes in infrastructure which may attract traffic into the Renfrew area; as such, the TMfS growth with the new Clyde Crossing is different to the growth without it.
- 6.3.3 The growth (or occasionally reduction) from each area of the TMfS sub-area to all the other areas was calculated. As TMfS only provides one peak hour, the resulting growth in the cumulative impact assessment was then factored from a one hour peak to the three or six hour period level using surveyed traffic data sets.
- 6.3.4 It must be noted that while the TMfS flows are different between the Do Minimum and Do Something scenarios due to the new Clyde Crossing, they are not substantially different. Both TMfS scenarios assume the same volume of development, which is different to the assumption for internal trips.

6.4 Induced Traffic

- 6.4.1 The new Clyde Crossing has potential to generate traffic movements which do not currently exist. To allow for this, a gravity model was created.
- 6.4.2 As the new bridge will reduce journey times to cross the Clyde for traffic in the vicinity of the new bridge, it is expected that it will induce more trips on the network. The gravity model provides a method of calculating the number of induced trips. Any increase in trips between zones across the Clyde are balanced by an equivalent reduction in trips between zones on the same side of the Clyde. Over the whole network, no additional trips are made.
- 6.4.3 The gravity model works on the basis that if the travel time between two different areas of the model reduces, then the 'gravitational pull' between those two areas increases, effectively increasing the number of trips between those two areas.
- 6.4.4 To implement the gravity model, factors based on existing demand and travel time between all of the zones in the model were derived from the previous City Deal models using standard methods. It is usually the case that the greater the travel time between two zones, the lower the demand between two zones.
- 6.4.5 Because it is now much faster to travel between some zones, the demand between them will increase. The increase is proportional to the reduction in travel demand and the existing demand between zones.

6.5 Final Demands

- 6.5.1 The final demands for the Do Minimum scenario are shown in Appendix A, and the Do Something demands are included in Appendix B. It should be noted that:
- The new departures and arrivals to or from Inside developments equal the new totals shown in Table 6.1 to Table 6.3.
 - The Base arrivals and departures inside the model extents do not meaningfully change.
 - Demand changes from external to external zones are solely as a result of TMfS.
 - The Do Minimum model matrix total is 9% greater than the Base.
 - The Do Something model matrix total is 12% greater than the Base.
 - Not all of the increased demand in both scenarios is from new development within Renfrewshire Council area.

7. RESULTS

7.1 Introduction

7.1.1 This chapter discusses the results for each modelled scenario in the AM, IP and PM periods.

7.1.2 The scenarios have been assessed using the following metrics:

- Traffic flows
- Queues
- Average journey times, counts and average distances from area to area

7.1.3 Each output was extracted from multiple model runs of each scenario and the results were averaged.

7.2 Traffic Flows

7.2.1 Figure 7.1 shows the location of traffic flows that were extracted from the model for each scenario. s in question:

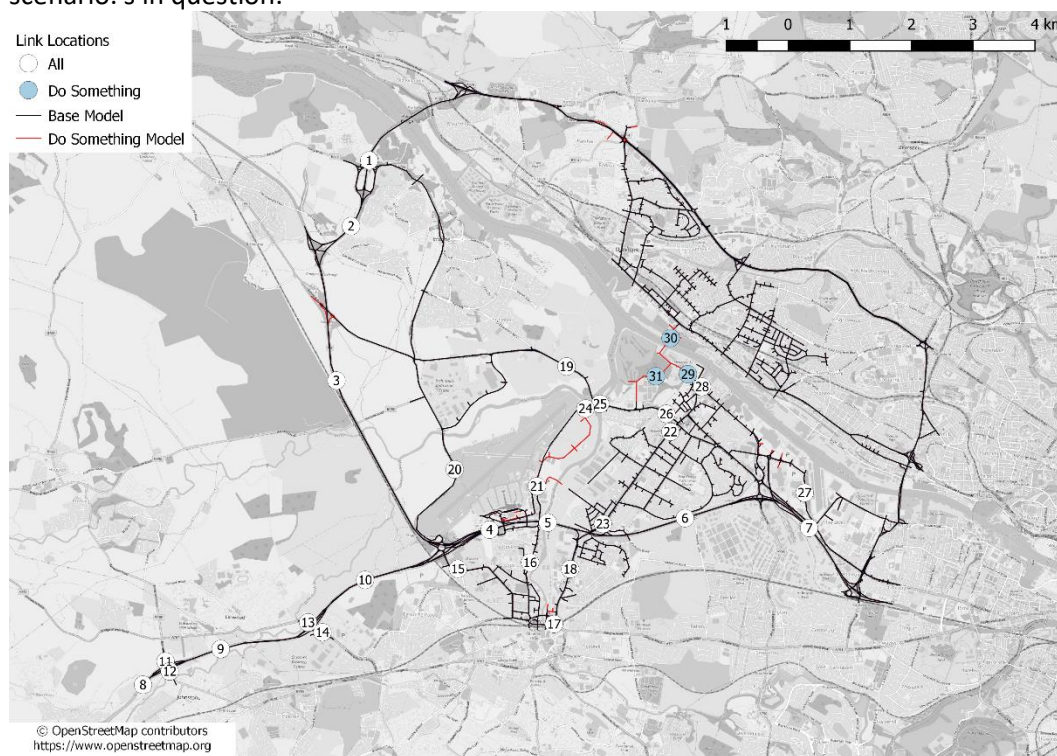


Figure 7.1 : Link Flow Locations

7.2.2 Table 7.1 to Table 7.3 show the flows at strategic road locations in each period, followed by a discussion of the results. The tables present the traffic flow in the Base model, the Do Minimum scenario and the Do Something scenario. The impact of the LDP2 is given by the percentage difference between the Do Something over the Do Minimum.

7.2.3 Table 7.1 shows the AM (07:00 – 10:00) peak period traffic flows.

Table 7.1 : AM (07:00 – 10:00) Peak Period Strategic Flows

Location	Road	Direction	Base	Do Minimum	Do Something	Impact of LDP2
<i>M8 Corridor</i>						
1	A726, South of Erskine Bridge	Northbound	4,224	4,966	4,455	-10%
		Southbound	4,519	5,159	4,927	-4%
2	M898	Northbound	4,778	5,333	5,080	-5%
		Southbound	5,451	5,802	5,736	-1%
3	M8, West of St James Interchange	Northbound	6,488	8,260	8,046	-3%
		Southbound	5,707	6,994	7,045	1%
4	M8, West of Airport	Eastbound	11,004	11,415	11,715	3%
		Westbound	8,980	9,408	9,518	1%
5	M8, East of Airport	Eastbound	13,101	13,848	14,217	3%
		Westbound	11,087	11,703	12,501	7%
6	M8, West of Hillington	Eastbound	14,101	14,545	14,728	1%
		Westbound	11,724	12,342	12,814	4%
7	M8, East of Hillington	Eastbound	15,735	15,989	16,205	1%
		Westbound	14,477	15,308	15,365	0%
<i>A737</i>						
8	A737, West of Barrochan	Eastbound	5,217	5,266	5,407	3%
		Westbound	2,480	2,612	2,653	2%
9	A737, West of Linclive	Eastbound	6,306	6,522	6,786	4%
		Westbound	3,418	3,680	3,785	3%
10	A737, West of St. James	Eastbound	8,199	8,484	8,860	4%
		Westbound	5,143	5,631	5,762	2%

7.2.4 As can be seen in Table 7.1, traffic flows south of the Erskine Bridge are higher in the Do Minimum compared with the Base, but are reduced in the Do Something scenario compared with the Do Minimum. This is due to the presence of the new Clyde Crossing, which attracts local traffic in Renfrew, Yoker and Clydebank away from the Erskine Bridge. Flows on the M898, just to the south of Erskine Bridge show a similar pattern.

7.2.5 Flows on the M8 west of the St. James Interchange are greater in the Do Minimum compared with the Base, and are only slightly lower in the Do Something compared with the Do Minimum. The reason for this increase in flow, which is higher than any other point shown in the table, is because of the new Junction 29A, which is currently under construction to support the delivery of new Dargavel Village development. This allows traffic heading to Bishopton to use the M8 in favour of local roads.

7.2.6 Flows further east on the M8 show that the Do Something has higher flow than the Do Minimum in both directions, or at most 7% greater. The relatively higher flow westbound is largely as a result of new development around Glasgow Airport.

7.2.7 On the A737, the Do Something flows are at most 4% greater than the Do Minimum, which was observed to the west of the St. James Interchange in an eastbound direction.

7.2.8 Table 7.2 shows the traffic flows in the interpeak period (10:00 – 16:00).

Table 7.2 : IP (10:00 – 16:00) Peak Period Strategic Flows

Location	Road	Direction	Base	Do Minimum	Do Minimum	Impact of LDP2
<i>M8 Corridor</i>						
1	A726, South of Erskine Bridge	Northbound	6,954	7,976	7,374	-8%
		Southbound	8,195	9,253	8,780	-5%
2	M898	Northbound	8,199	9,031	8,729	-3%
		Southbound	9,024	9,765	9,527	-2%
3	M8, West of St James Interchange	Northbound	11,633	14,961	14,579	-3%
		Southbound	11,348	14,701	14,427	-2%
4	M8, West of Airport	Eastbound	18,017	20,854	20,980	1%
		Westbound	17,979	20,350	20,036	-2%
5	M8, East of Airport	Eastbound	22,809	26,445	26,838	1%
		Westbound	22,222	25,094	25,333	1%
6	M8, West of Hillington	Eastbound	23,728	26,594	27,027	2%
		Westbound	23,311	26,336	26,537	1%
7	M8, East of Hillington	Eastbound	28,203	31,434	31,262	-1%
		Westbound	27,354	30,076	29,713	-1%
<i>A737</i>						
8	A737, West of Barrochan	Eastbound	6,918	7,417	7,564	2%
		Westbound	6,268	6,725	6,847	2%
9	A737, West of Linclive	Eastbound	8,137	9,004	9,297	3%
		Westbound	8,082	8,957	9,220	3%
10	A737, West of St. James	Eastbound	10,803	12,160	12,557	3%
		Westbound	11,055	12,452	12,788	3%

7.2.9 The flows in the IP show a similar pattern to the AM period.

7.2.10 Table 7.3 shows the traffic flows in the PM period (16:00 – 19:00).

Table 7.3 : PM (16:00 – 19:00) Peak Period Strategic Flows

Location	Road	Direction	Base	Do Minimum	Do Something	Impact of LDP2
<i>M8 Corridor</i>						
1	A726, South of Erskine Bridge	Northbound	4,616	5,911	5,211	-12%
		Southbound	5,503	6,236	6,326	1%
2	M898	Northbound	5,479	6,439	6,020	-7%
		Southbound	5,912	6,372	6,591	3%
3	M8, West of St James Interchange	Northbound	7,103	9,429	9,099	-4%
		Southbound	5,533	7,000	7,028	0%
4	M8, West of Airport	Eastbound	8,326	8,810	9,014	2%
		Westbound	11,844	12,815	12,980	1%
5	M8, East of Airport	Eastbound	10,834	11,655	12,658	9%
		Westbound	13,690	14,757	15,078	2%
6	M8, West of Hillington	Eastbound	10,495	11,406	12,194	7%
		Westbound	13,186	14,536	14,381	-1%
7	M8, East of Hillington	Eastbound	13,972	14,241	14,778	4%
		Westbound	15,016	16,304	15,408	-5%
<i>A737</i>						
8	A737, West of Barrochan	Eastbound	3,435	3,717	3,768	1%
		Westbound	4,675	4,833	5,004	4%
9	A737, West of Linclive	Eastbound	4,083	4,588	4,729	3%
		Westbound	6,325	6,717	7,031	5%
10	A737, West of St. James	Eastbound	5,968	6,888	7,048	2%
		Westbound	8,698	9,320	9,754	5%

7.2.11 The flows in the PM show a similar pattern to the other periods.

7.2.12 Table 7.4 to Table 7.6 shows the traffic flows on the local network within Renfrewshire. As with the strategic flows, the tables present the traffic flow in the Base model, followed by the percentage difference from that in the Do Minimum and Do Something models.

7.2.13 Table 7.4 shows the traffic flows in the AM period (07:00 – 10:00).

Table 7.4 : AM (07:00 – 10:00) Peak Period Local Flows

Location	Road	Direction	Base	Do Minimum	Do Something	Impact of LDP2
<i>A737 Junctions</i>						
11	Barrochan Road North	Northbound	1,337	1,405	1,431	2%
		Southbound	1,644	1,738	1,791	3%
12	Barrochan Road South	Northbound	1,303	1,373	1,442	5%
		Southbound	1,459	1,529	1,558	2%
13	Linwood Road North	Northbound	1,728	1,774	1,778	0%
		Southbound	2,701	2,718	2,744	1%
14	Linwood Road South	Northbound	2,963	3,001	3,078	3%
		Southbound	3,512	3,641	3,673	1%
<i>Paisley</i>						
15	Greenock Road A726	Eastbound	2,481	2,546	2,573	1%
		Westbound	1,935	1,934	1,840	-5%
16	Inchinnan Road, South of Airport	Northbound	1,315	1,503	2,002	33%
		Southbound	1,128	1,262	1,415	12%
17	Incle Street	Northbound	4,116	4,257	4,744	11%
		Southbound	3,725	4,008	4,071	2%
18	Renfrew Road	Northbound	2,894	2,839	3,139	11%
		Southbound	2,718	2,883	3,002	4%
<i>Renfrew</i>						
19	Greenock Road A8 East	Eastbound	1,956	2,056	2,213	8%
		Westbound	1,121	1,006	934	-7%
20	Barnsford Road	Northbound	1,866	681	792	16%
		Southbound	2,176	1,481	1,582	7%
21	Abbotsinch Road South	Northbound	595	569	1,926	238%
		Southbound	1,093	1,286	1,701	32%
22	Paisley Road, North	Northbound	723	722	778	8%
		Southbound	753	753	751	0%
23	Paisley Road, South	Northbound	1,987	2,178	2,257	4%
		Southbound	2,141	2,257	2,163	-4%
24	Abbotsinch Road North	Northbound	594	571	830	45%
		Southbound	1,093	1,290	2,259	75%
25	Inchinnan Road, East of Abbotsinch Road	Eastbound	1,752	1,881	1,880	0%
		Westbound	1,383	1,447	1,889	31%
26	Inchinnan Road, West of Hairst Street	Eastbound	1,656	1,773	961	-46%
		Westbound	1,345	1,384	1,093	-21%
27	King's Inch Drive	Northbound	446	654	579	-11%
		Southbound	557	821	769	-6%
28	King's Inch Road	Eastbound	595	868	1,985	129%
		Westbound	382	449	1,356	202%
29	Meadowside Street	Eastbound	-	-	2,112	-
		Westbound	-	-	1,949	-
30	New Bridge	Northbound	-	-	2,165	-
		Southbound	-	-	2,194	-
31	Northern Development Road	Northbound	-	-	1,006	-
		Southbound	-	-	872	-

- There is a marginal increase in traffic flows on the A737 junctions in the Do Something model compared with the Do Minimum model in the AM period.
- In Paisley, there is a large increase in flow northbound in the Do Something model compared with the Do Minimum model. This is observed in particular on Inchinnan Road and also on Incle Street and Renfrew Road, both due to increased development south of Paisley in the Do Something scenario. There is a lower increase southbound.
- There is a fall in traffic on Barnsford Road in both scenarios relative to the Base as a result of the new Bishopton junction on the M8. Traffic heading to Bishopton now uses the M8 in preference to this road.

- Within Renfrew, the Do Something model shows a number of changes compared to the Do Minimum model:
 - There is a large increase in traffic on Abbotsinch Road caused by the new AMIDS development, in particular those movements heading to the site. However, this is from a low Base level.
 - There is a large reduction in flow on Inchinnan Road to the west of Hairst Street as a result of traffic using the new Northern Development Road.
 - There is an increase in traffic on King's Inch Road. The new Clyde Crossing accounts for this increase in traffic. This increase must be seen in the context of the very low flow in the Base model.
 - There is a marginal percentage increase on the northern end of Paisley Road in a northbound direction. This is from a low flow in the Do Minimum.
 - Outside of the observations above, there is little difference between the Do Something and Do Minimum.

7.2.14 Table 7.5 shows the traffic flows in the interpeak period (10:00 – 16:00).

Table 7.5 : IP (10:00 – 16:00) Peak Period Local Flows

Location	Road	Direction	Base	Do Minimum	Do Something	Impact of LDP2
<i>A737 Junctions</i>						
11	Barrochan Road North	Northbound	2,332	2,549	2,605	2%
		Southbound	1,992	2,184	2,254	3%
12	Barrochan Road South	Northbound	2,133	2,307	2,392	4%
		Southbound	2,374	2,568	2,652	3%
13	Linwood Road North	Northbound	3,254	3,386	3,400	0%
		Southbound	3,559	3,733	3,755	1%
14	Linwood Road South	Northbound	4,839	5,105	5,196	2%
		Southbound	5,322	5,638	5,707	1%
<i>Paisley</i>						
15	Greenock Road A726	Eastbound	3,790	3,403	3,365	1%
		Westbound	3,138	2,561	2,898	-1%
16	Inchinnan Road, South of Airport	Northbound	1,987	2,343	2,802	13%
		Southbound	2,113	7,213	7,678	20%
17	Incle Street	Northbound	6,573	9,168	9,579	6%
		Southbound	8,163	5,235	5,576	4%
18	Renfrew Road	Northbound	5,291	6,577	6,694	7%
		Southbound	5,730	2,215	2,425	2%
<i>Renfrew</i>						
19	Greenock Road A8 East	Eastbound	2,105	2,215	2,425	9%
		Westbound	2,538	2,217	2,295	3%
20	Barnsford Road	Northbound	2,565	1,196	1,363	14%
		Southbound	3,058	1,620	1,717	6%
21	Abbotsinch Road South	Northbound	1,223	1,274	2,638	107%
		Southbound	1,243	1,489	2,979	100%
22	Paisley Road, North	Northbound	1,762	1,706	1,676	-2%
		Southbound	1,688	1,716	1,762	3%
23	Paisley Road, South	Northbound	3,651	3,949	4,238	7%
		Southbound	3,874	4,227	4,336	3%
24	Abbotsinch Road North	Northbound	1,222	1,269	1,987	57%
		Southbound	1,244	1,487	2,163	45%
25	Inchinnan Road, East of Abbotsinch Road	Eastbound	2,425	2,661	3,253	22%
		Westbound	2,925	2,905	3,326	14%
26	Inchinnan Road, West of Hairst Street	Eastbound	2,798	3,012	1,772	-41%
		Westbound	3,526	3,494	1,921	-45%
27	King's Inch Drive	Northbound	2,219	2,510	2,663	6%
		Southbound	2,705	3,051	3,175	4%
28	King's Inch Road	Eastbound	1,494	1,816	3,501	93%
		Westbound	1,316	1,499	3,568	138%
29	Meadowside Street	Eastbound	-	-	3,873	-
		Westbound	-	-	4,341	-
30	New Bridge	Northbound	-	-	3,815	-
		Southbound	-	-	3,155	-
31	Northern Development Road	Northbound	-	-	2,069	-
		Southbound	-	-	2,191	-

7.2.15 The IP period shows a very similar pattern to the AM period, but there is less of a tidal flow. Flows are more similar in each direction compared with the AM.

7.2.16 Table 7.6 shows the traffic flows in the PM period (16:00 – 19:00).

Table 7.6 : PM (16:00 – 19:00) Peak Period Local Flows

Location	Road	Direction	Base	Do Minimum	Do Something	Impact of LDP2
<i>A737 Junctions</i>						
11	Barrochan Road North	Northbound	2,044	2,161	2,232	3%
		Southbound	1,252	1,361	1,400	3%
12	Barrochan Road South	Northbound	1,772	1,884	1,932	3%
		Southbound	1,988	2,101	2,183	4%
13	Linwood Road North	Northbound	3,067	3,122	3,149	1%
		Southbound	2,520	2,650	2,645	0%
14	Linwood Road South	Northbound	4,074	4,318	4,350	1%
		Southbound	4,251	4,392	4,485	2%
<i>Paisley</i>						
15	Greenock Road A726	Eastbound	2,598	2,765	2,846	3%
		Westbound	2,171	1,996	2,038	2%
16	Inchinnan Road, South of Airport	Northbound	1,175	1,653	1,474	-11%
		Southbound	1,643	1,701	2,049	20%
17	Incle Street	Northbound	3,499	3,721	3,974	7%
		Southbound	5,153	5,491	5,849	7%
18	Renfrew Road	Northbound	3,226	3,185	3,652	15%
		Southbound	3,097	3,393	3,472	2%
<i>Renfrew</i>						
19	Greenock Road A8 East	Eastbound	1,623	1,736	1,876	8%
		Westbound	2,401	2,402	2,379	-1%
20	Barnsford Road	Northbound	1,807	1,017	1,127	11%
		Southbound	2,233	1,216	1,329	9%
21	Abbotsinch Road South	Northbound	999	1,018	1,443	42%
		Southbound	915	1,108	2,664	140%
22	Paisley Road, North	Northbound	1,127	1,142	1,110	-3%
		Southbound	780	778	902	16%
23	Paisley Road, South	Northbound	2,515	2,562	2,669	4%
		Southbound	2,496	2,590	2,566	-1%
24	Abbotsinch Road North	Northbound	1,001	1,022	1,524	49%
		Southbound	913	1,107	1,325	20%
25	Inchinnan Road, East of Abbotsinch Road	Eastbound	1,959	2,085	2,501	20%
		Westbound	2,595	2,825	2,820	0%
26	Inchinnan Road, West of Hairst Street	Eastbound	1,903	2,056	1,400	-32%
		Westbound	2,643	2,883	1,662	-42%
27	King's Inch Drive	Northbound	1,457	1,730	2,174	26%
		Southbound	1,415	1,847	1,714	-7%
28	King's Inch Road	Eastbound	814	958	2,047	114%
		Westbound	862	975	2,673	174%
29	Meadowside Street	Eastbound	-	-	2,264	-
		Westbound	-	-	2,895	-
30	New Bridge	Northbound	-	-	2,623	-
		Southbound	-	-	2,057	-
31	Northern Development Road	Northbound	-	-	1,322	-
		Southbound	-	-	1,523	-

7.2.17 The PM results show a similar pattern to the AM period, with a different tidal flow. The flows are, on the whole, greater than in the AM period.

7.2.18 In conclusion, the Do Something scenario shows the following when compared with the Do Minimum scenario:

- There are marginal increases in traffic flow along strategic roads, and sometimes reductions as a result of the new infrastructure in the Do Something scenario.
- The new Clyde Crossing will act as a trip attractor. Flows around Braehead increase as some traffic to and from the M8 now travels via the Clyde Crossing.
- There are increases in flow along Abbotsinch Road and Inchinnan Road as a result of new development, in particular the new AMIDS development. However, these roads did not have a large traffic flow in the Base scenario.

7.3 Queues

7.3.1 The average number of vehicles in a queued state within certain areas was obtained from the model. Eight different areas have been analysed as well as the cumulative modelled area south of the River Clyde. These are shown in Figure 7.2 below.

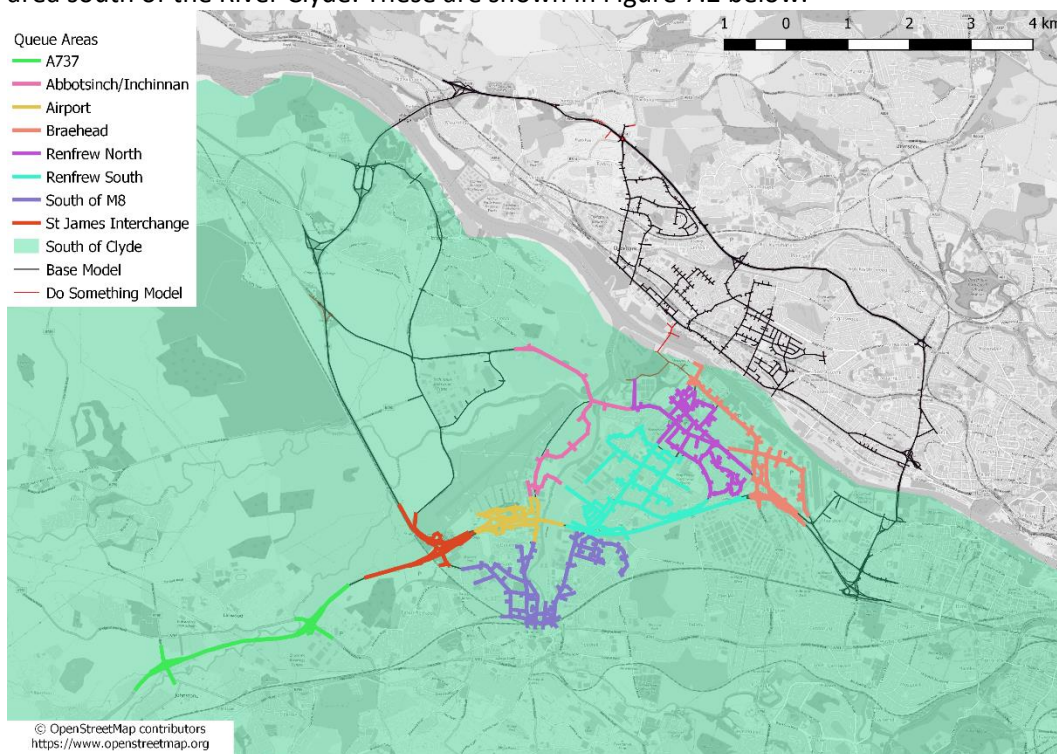


Figure 7.2 : Queue Areas of Interest

7.3.2 The total length of road with a traffic queue on it as a percentage of total road length in each area collected from the model runs, and the results were averaged over a five minute period. The relative difference between the scenarios should be the primary consideration.

7.3.3 Figure 7.3 shows the queuing on the A737:

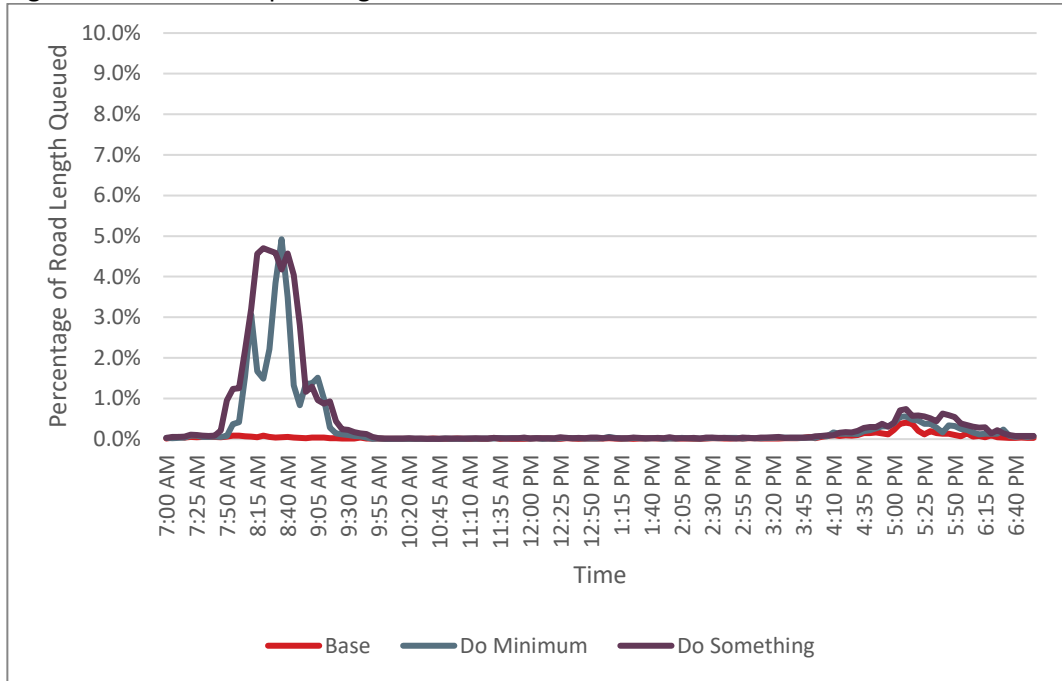


Figure 7.3 : A737 Queuing

7.3.4 The results show that queues in the Do Minimum and Do Something are approximately equal. There are no meaningful queues outwith 08:00 to 09:00 in any scenario. The LDP2 development therefore additional impact on queues.

7.3.5 Figure 7.4 shows the queueing on the Abbotsinch Road/Inchinnan Road and Greenock Road areas:

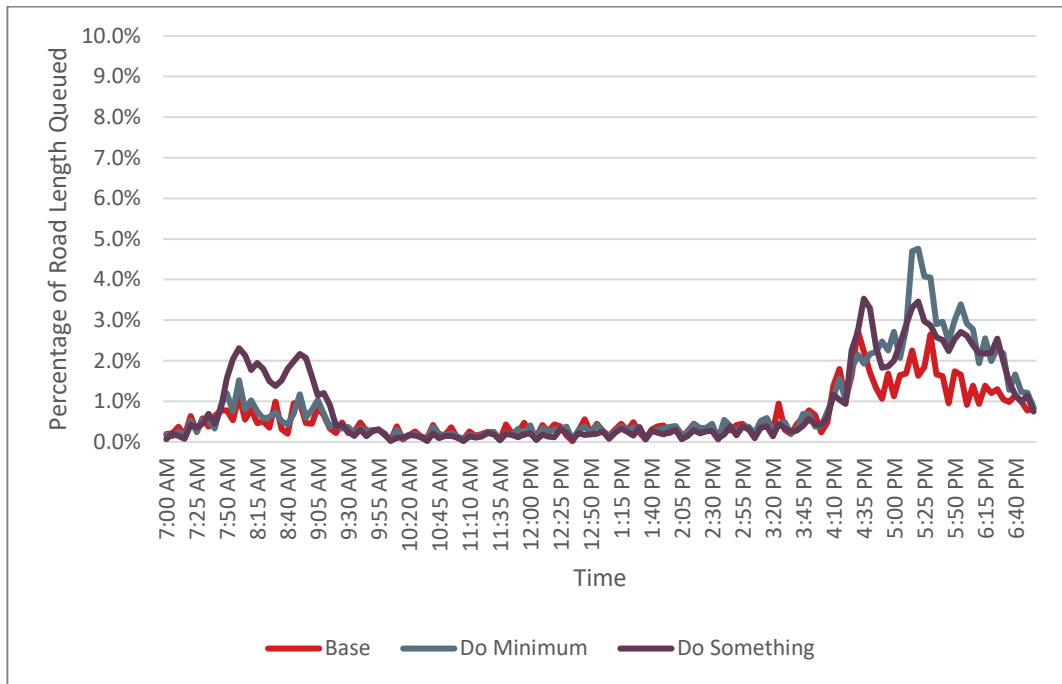


Figure 7.4 : Abbotsinch/Inchinnan Queueing

7.3.6 The results show there is broadly similar queueing in both future scenarios, even though the Do Something model contains the large AMIDS development. This implies the proposed changes to the Abbotsinch Road/Inchinnan Road/Greenock Road junction in the Do Something help mitigate the impact of the additional development. Again, the LDP2 development does not have a significant additional impact.

7.3.7 As noted previously, there are constraints at this junction that limit the scale of the possible improvements. Even if it were possible to improve the junction further, it may not be desirable as it may induce traffic to reroute along Greenock Road in preference to using the M8.

7.3.8 Figure 7.5 shows the queuing in the vicinity of Glasgow Airport:

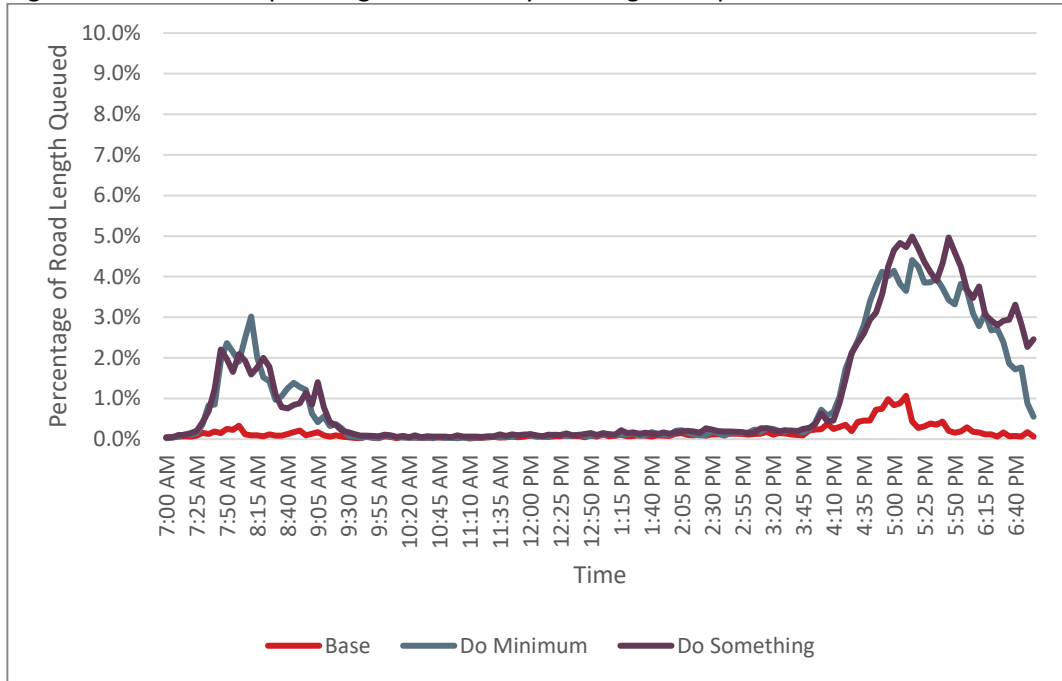


Figure 7.5 : Airport Area Queues

7.3.9 The Do Something model has higher queuing in the PM period compared to the Do Minimum model. This is attributed to generally greater traffic flows and, in particular, greater flow from the AMIDS site. St Andrew’s Drive, which runs in a westbound direction, allows access to the M8 and therefore attracts a number of trips from new developments.

7.3.10 The queues around the Braehead area are shown in Figure 7.6 below.

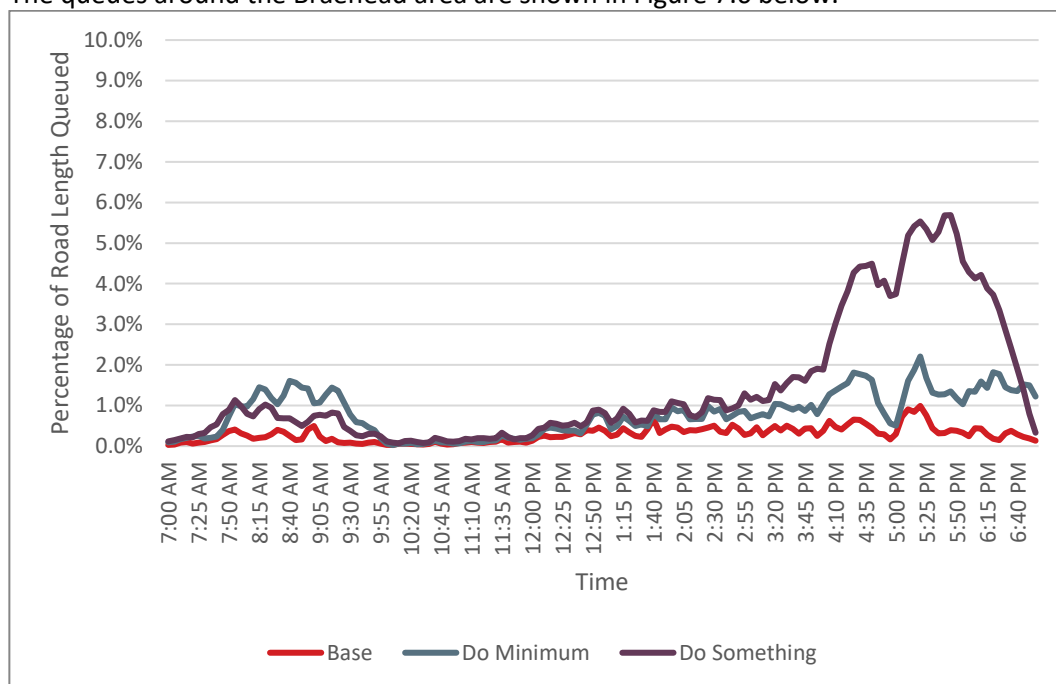


Figure 7.6 : Braehead Queues

7.3.11 Queues in the Do Something scenario are higher than those in the Do Minimum scenario, reaching 6% of road space compared with 2%. The reason is due to the new Clyde Crossing attracting traffic either side of the Clyde, much of which also now uses local roads around the Hillington Junction

7.3.12 The queues in the Do Something scenario for this area generally form westbound on Renfrew Road, King’s Inch Road and King’s Inch Drive. The roundabout north of Hillington junction known locally as the Audi roundabout shows some increases in delay.

7.3.13 The queues in the north of Renfrew are shown in Figure 7.7 below.

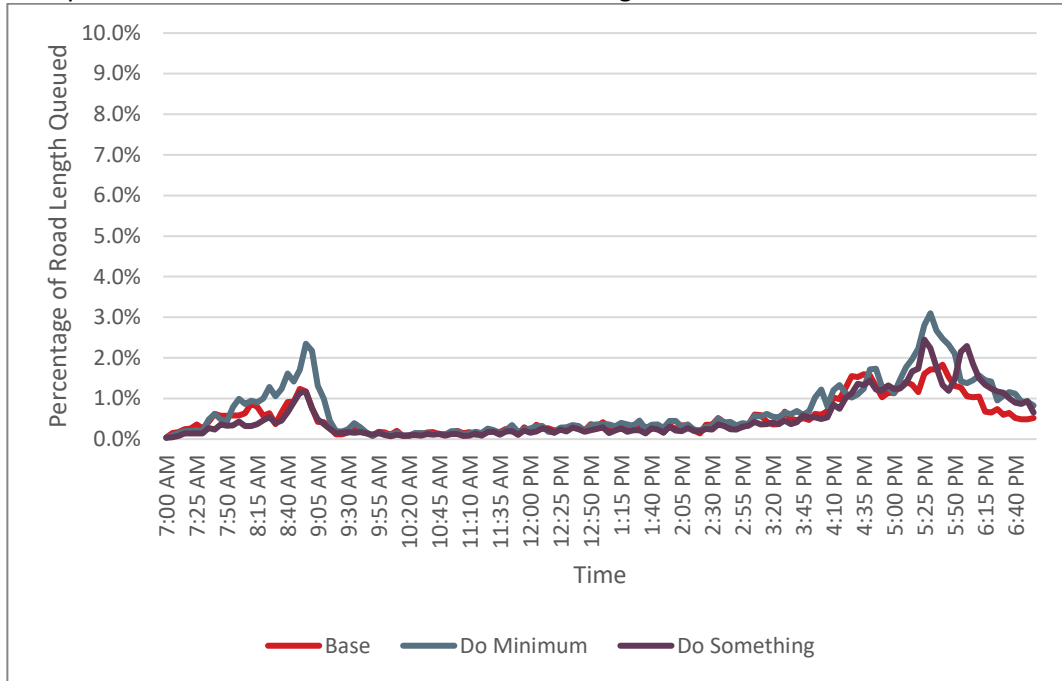


Figure 7.7 : Renfrew North Queues

7.3.14 Queues are generally low in all scenarios as a percentage of road space. However, the Do Minimum generally has higher queues than the Do Something. The reason is due to the new Renfrew Northern Development Road in the Do Something acting to relieve congestion along Inchinnan Road and Renfrew Cross. Queues in other areas are not significant.

7.3.15 The queues in the south of Renfrew are shown in Figure 7.8 below.

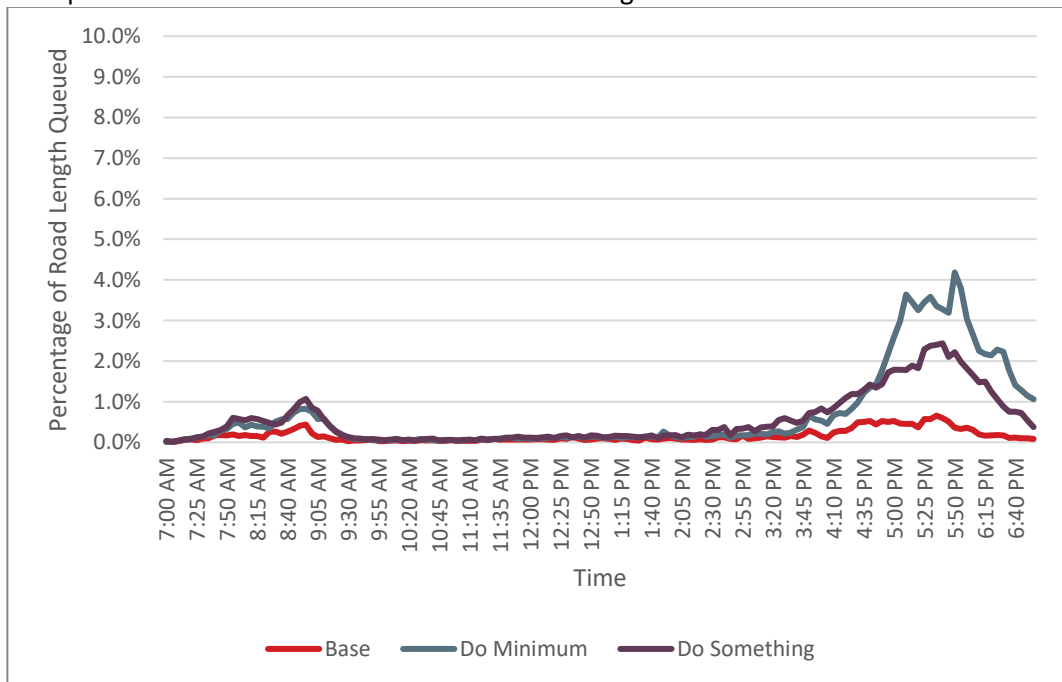


Figure 7.8 : Renfrew South Queues

7.3.16 Queues are again lower in the Do Something compared with the Do Minimum. There are two specific areas where queueing will reduce as a result of infrastructure proposed for the Do Something. The first was in the area around Porterfield Road, where there are queues of vehicles exiting the business park in the area. This is relieved in the Do Something by the proposed Wright Street Bridge. The second area is on the M8 westbound, where queueing in the Do Minimum is relieved by the new Clyde Crossing.

7.3.17 Figure 7.9 shows the queues in the Paisley area, south of the M8.

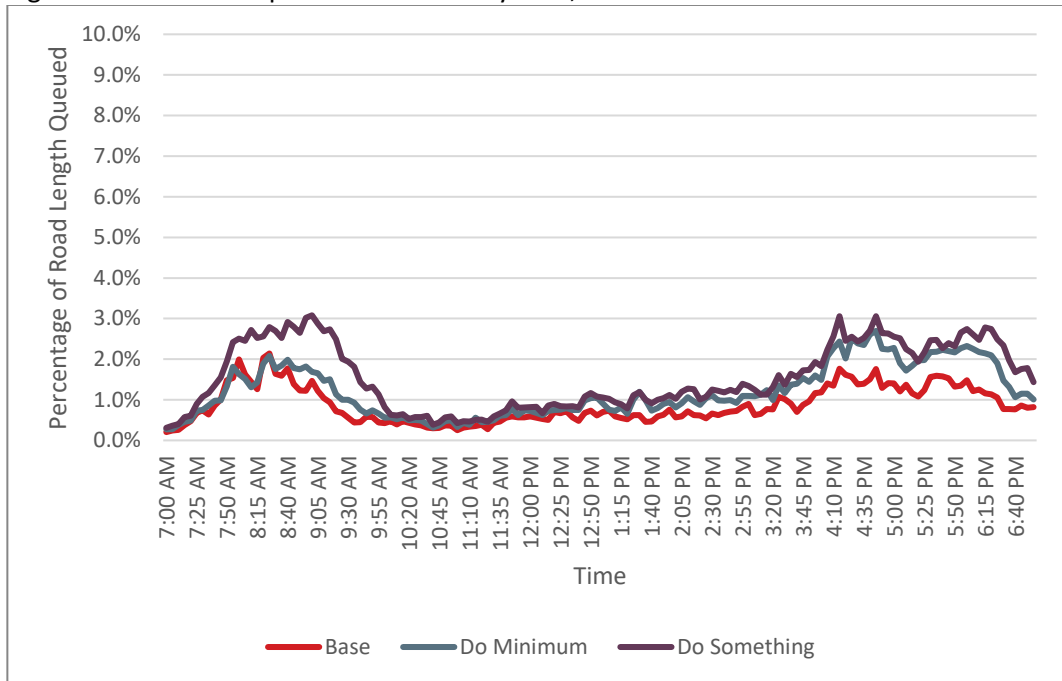


Figure 7.9 : Paisley (south of M8) Queues

7.3.18 The Do Something queues are typically higher than the Do Minimum model. The increase stems from the increase in development traffic in the Paisley area. The difference in queued vehicles maximises at around 1% of available road space. This queueing was not significant, being observed on Inchinnan Road and in the vicinity of the gyratory.

7.3.19 Figure 7.10 shows the queues at the St. James Interchange.

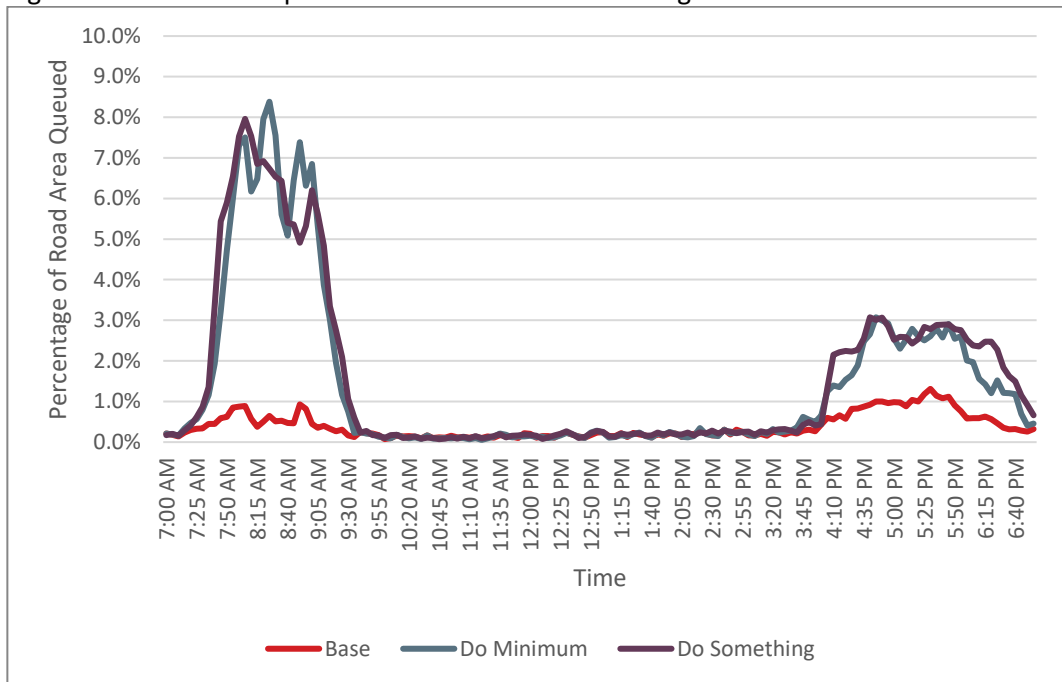


Figure 7.10 : St. James Interchange Queues

7.3.20 Throughout the day, the Do Something queues are similar to the Do Minimum scenario. The overall difference between the Do Minimum and Do Something is minimal. There was therefore little additional impact from the new development proposed in the LDP2.

7.3.21 Finally, Figure 7.11 shows the queueing in the whole modelled area south of the River Clyde, which includes all the areas previously under discussion as well as all other roads.

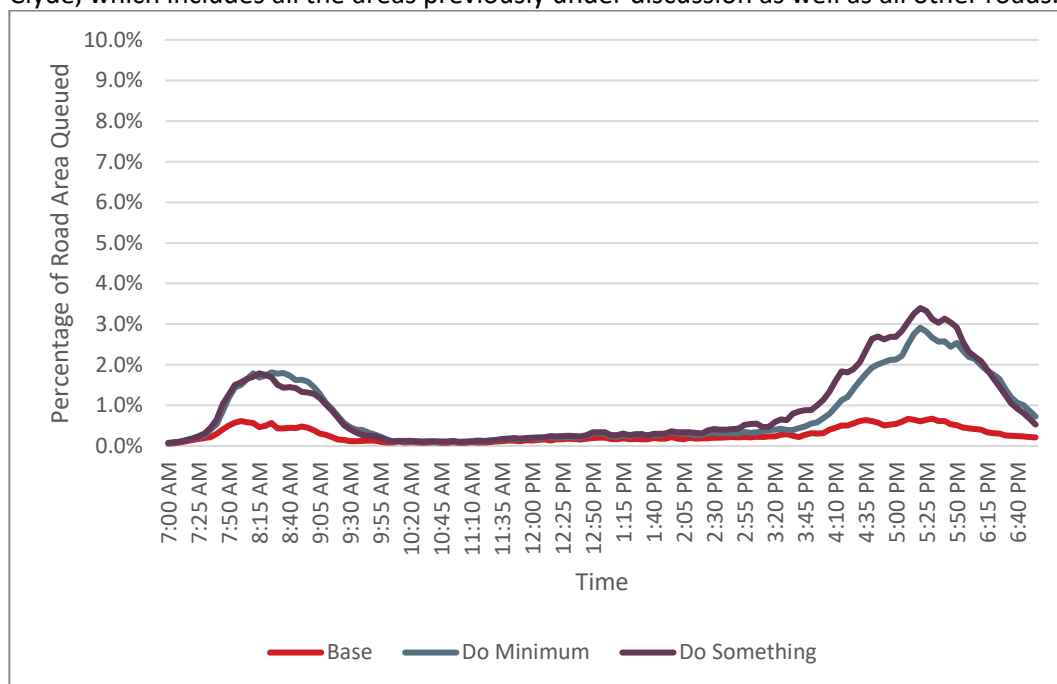


Figure 7.11 : South of Clyde Queues

7.3.22 Results show that in the AM period, queues in the two future year models are similar. However, in the PM period, queues in the Do Something model are slightly higher than in the Do Minimum, with queues reaching around 3.5% of available road space compared with around 3%. **However it is considered this increase is not significant.**

7.3.23 As observed, areas of notable queueing in the Do Something include the area around the new Clyde Crossing and Paisley. The queueing here is counterbalanced by areas of reduced queueing in others, such as Renfrew town centre.

7.4 Journey Times

7.4.1 The average journey times from and to various areas in the model was obtained for each model period.

7.4.2 Figure 7.12 shows the different sectors in which journey times have been taken. Every single zone in the model is within a given sector. The AMIDS sector is only in the Do Something scenario.

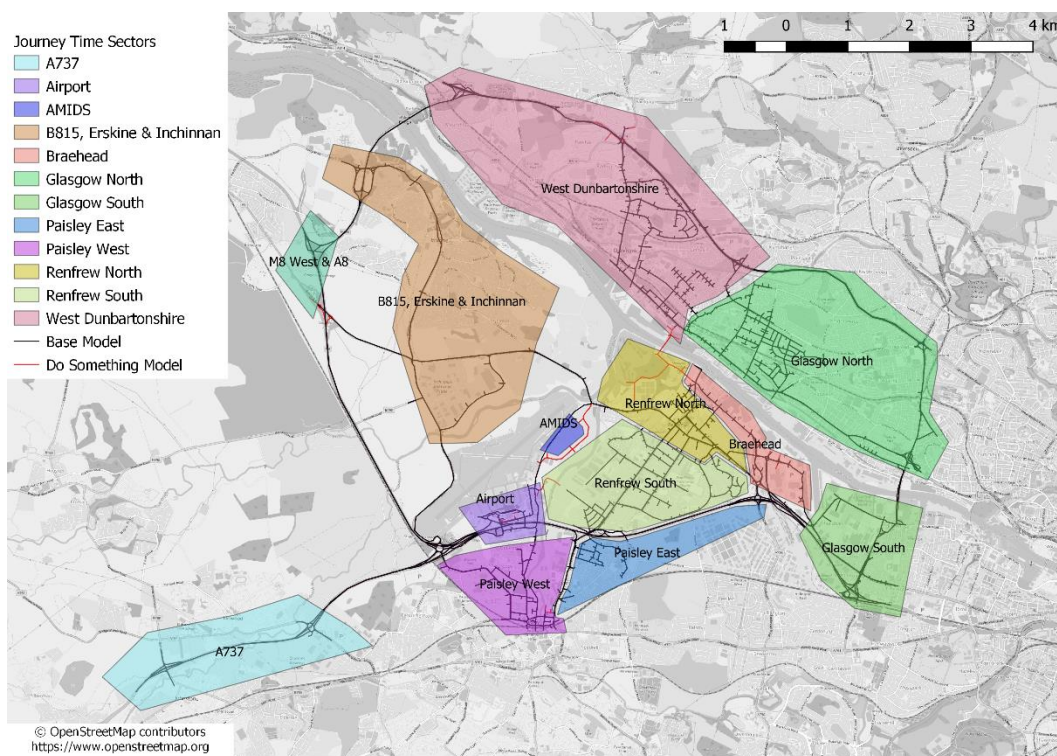


Figure 7.12 : Journey Time Sector Locations

7.4.3

Table 7.7 shows the AM average journey time of the Base model, the Do Minimum model journey times relative to the Base, and the Do Something model journey times relative to the Base. The times are calculated by summing the times of all journeys divided by the number of journeys.

Table 7.7 : AM (07:00 – 10:00) Average Journey Times

Sector	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	01:31	06:05		08:03	11:24	14:06	09:56	07:46	08:34	07:17	12:07	09:45	10:27	06:25
Airport	05:27	01:44		07:21	10:01	12:09	07:33	06:53	07:01	04:43	05:19	07:42	11:49	06:25
AMIDS														
B815, Erskine & Inchinnan	08:22	06:24		02:35	11:29	14:15	11:00	04:35	09:18	08:45	07:40	10:10	06:37	07:33
Braehead	11:25	09:11		12:46	02:16	07:26	03:28	12:24	05:14	11:16	05:06	05:32	15:47	05:38
Glasgow North	12:12	10:48		14:00	07:36	01:48	04:55	12:38	08:33	13:01	10:31	11:12	08:58	04:48
Glasgow South	07:45	06:02		10:34	03:34	05:11	03:34	08:33	03:10	07:47	05:45	06:47	12:46	06:02
M8 West & A8	07:51	06:13		03:16	11:49	12:45	10:12	00:00	08:38	09:04	08:55	10:08	05:06	08:28
Paisley East	06:07	05:03		08:43	03:26	10:14	03:31	07:21	04:46	03:32	05:53	05:49	13:39	04:47
Paisley West	06:31	05:50		10:58	12:31	15:58	10:43	09:55	04:34	03:42	10:36	09:33	14:30	07:35
Renfrew North	11:43	06:12		09:17	04:19	12:33	08:16	10:11	07:26	09:32	04:01	04:33	17:21	07:28
Renfrew South	09:37	07:40		10:47	06:27	12:10	07:46	10:15	05:57	09:02	04:21	02:20	16:14	06:16
West Dunbartonshire	12:52	13:12		07:03	14:42	08:53	12:08	06:46	13:24	14:52	16:13	15:57	04:39	07:26
All	04:46	05:59		07:04	05:26	05:30	07:05	08:25	05:20	07:01	06:53	05:33	07:10	06:21

Sector	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	55%	65%		47%	60%	55%	62%	30%	66%	57%	46%	57%	36%	57%
Airport	1%	-26%		0%	9%	32%	21%	-20%	21%	7%	12%	-2%	34%	11%
AMIDS														
B815, Erskine & Inchinnan	7%	5%		1%	15%	14%	17%	1%	17%	10%	4%	7%	-3%	10%
Braehead	17%	14%		6%	25%	45%	14%	6%	50%	23%	15%	21%	25%	37%
Glasgow North	8%	4%		-2%	10%	9%	-2%	-2%	8%	7%	10%	8%	5%	8%
Glasgow South	7%	1%		3%	15%	25%	26%	1%	14%	4%	13%	9%	12%	9%
M8 West & A8	8%	20%		11%	10%	14%	17%		15%	15%	10%	6%	-1%	11%
Paisley East	2%	-2%		0%	31%	28%	8%	-8%	10%	2%	4%	4%	10%	8%
Paisley West	3%	-5%		-3%	20%	25%	17%	-6%	9%	1%	4%	5%	1%	5%
Renfrew North	5%	1%		-1%	12%	27%	18%	10%	14%	10%	2%	8%	19%	14%
Renfrew South	11%	9%		3%	22%	30%	23%	7%	21%	13%	6%	7%	18%	17%
West Dunbartonshire	1%	1%		-18%	15%	5%	14%	-25%	13%	9%	8%	9%	2%	4%
All	18%	7%		3%	34%	17%	22%	-3%	22%	10%	11%	16%	7%	14%

Sector	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	40%	12%	13:23	9%	2%	-4%	4%	10%	5%	12%	5%	5%	6%	8%
Airport	3%	-1%	03:12	5%	-4%	-17%	-4%	1%	-5%	23%	23%	3%	-37%	-1%
AMIDS	07:35	04:38		06:26	09:59	13:47	11:04	07:00	10:25	06:37	05:44	07:49	08:14	09:09
B815, Erskine & Inchinnan	3%	12%	06:33	1%	-7%	-11%	-6%	-1%	0%	10%	6%	1%	-8%	-3%
Braehead	-6%	0%	09:25	-3%	-2%	-21%	-3%	-4%	-8%	-6%	-4%	-1%	-40%	-9%
Glasgow North	1%	1%	12:38	-2%	-2%	-6%	0%	0%	5%	4%	-15%	-4%	-11%	-4%
Glasgow South	2%	5%	08:53	0%	2%	-18%	-18%	1%	0%	6%	0%	0%	-13%	-5%
M8 West & A8	1%	5%	07:00	0%	-6%	-8%	-6%		-3%	-1%	4%	0%	-6%	-5%
Paisley East	0%	-1%	07:01	1%	-4%	-11%	-2%	0%	-1%	10%	8%	5%	-17%	7%
Paisley West	6%	45%	09:56	21%	1%	-10%	1%	16%	25%	110%	29%	15%	7%	26%
Renfrew North	5%	12%	04:22	-2%	-9%	-31%	-13%	-1%	-4%	16%	-4%	1%	-61%	-6%
Renfrew South	5%	9%	07:39	4%	-14%	-20%	-13%	4%	-4%	8%	2%	25%	-36%	0%
West Dunbartonshire	1%	-8%	11:54	1%	-11%	-4%	2%	0%	-2%	1%	-34%	-15%	-5%	1%
All	11%	13%	08:27	5%	2%	-7%	-1%	3%	6%	22%	9%	11%	-5%	2%

7.4.4

The tables above indicate the following::

- Journey times in the Do Minimum are overall 14% higher than in the Base. The Do Something journey times are overall 1% lower than the Do Minimum. Therefore, even with the greater traffic volumes in that model, the **Do Something infrastructure provides relief. Overall, the LDP2 development does not result in increased additional delay after proving the additional infrastructure.**
- Journey times from the A737 sector are over 50% greater in the Do Minimum. Journey times are lower in the Do Something, implying the additional traffic from the A737 in this scenario does not result in increased delay. **The LDP2 development therefore does not result in increased delay.**

- Journey times to the M8 west and A8 west have fallen in both the Do Minimum and Do Something models compared to the Base. This can be explained by the addition of the new Bishopton junction.
- Journey times to and from Paisley West have increased in the Do Something model compared with the Do Minimum. This is due to two main reasons:
 - Congestion around the Paisley gyratory area. Renfrewshire Council are currently investigating measures to improve circulation in this area.
 - Congestion at the southern end of Paisley Road in Renfrew. Further investigation is required in relation to infrastructure improvements in this area, but there is scope to reoptimise the Paisley Road/Wright Street traffic signals and the Paisley Road/Cockels Road traffic signals.

7.4.5

Table 7.8 shows the interpeak average journey time of the Base model, the Do Minimum journey times relative to the Base, and the Do Something journey times relative to the Do Minimum.

Table 7.8 : IP (10:00 – 16:00) Average Journey Times

Sector	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	01:28	05:57		07:47	10:20	11:48	08:43	07:33	07:12	06:17	11:15	08:58	10:13	05:29
Airport	05:41	02:02		06:56	08:43	10:28	06:16	06:32	05:42	05:15	06:03	06:04	13:03	05:48
AMIDS														
B815, Erskine & Inchinnan	07:57	06:29		02:21	11:09	12:44	09:46	04:40	08:39	09:14	08:18	09:21	06:19	07:21
Braehead	10:55	08:50		11:32	02:23	07:21	03:49	11:49	04:28	10:59	05:23	06:16	15:09	05:43
Glasgow North	11:51	10:15		13:43	07:21	01:43	04:45	12:13	07:42	12:48	10:17	10:27	08:26	04:43
Glasgow South	07:48	05:52		10:34	03:28	04:39	03:04	08:12	02:52	07:38	05:55	06:23	11:56	05:45
M8 West & A8	07:39	06:03		03:14	10:19	11:20	08:39	00:00	07:37	09:16	09:00	09:10	04:54	08:01
Paisley East	05:55	05:14		08:30	04:08	08:52	03:31	06:38	04:02	03:26	06:42	05:30	12:13	04:37
Paisley West	06:22	05:34		10:29	11:57	14:17	09:38	09:04	04:20	02:44	10:09	09:01	13:24	06:39
Renfrew North	11:17	06:24		08:27	04:28	10:47	07:08	09:35	06:23	09:30	03:43	04:33	15:43	06:26
Renfrew South	09:04	07:05		10:16	05:11	10:23	06:51	09:44	04:56	08:15	04:41	02:13	14:17	05:02
West Dunbartonshire	11:09	10:19		05:58	13:13	08:21	11:32	04:43	11:46	13:45	14:30	14:01	03:46	06:01
All	05:09	05:33		07:09	05:32	04:49	05:58	07:50	04:54	06:29	06:12	04:57	06:02	05:43

Sector	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	0%	-1%		0%	20%	10%	12%	-22%	11%	2%	8%	8%	2%	12%
Airport				-1%	7%	7%	15%	-10%	8%	5%	5%	1%	6%	6%
AMIDS														
B815, Erskine & Inchinnan	3%	2%		0%	8%	3%	6%	1%	8%	4%	2%	3%	1%	2%
Braehead	9%	5%		7%	31%	13%	14%	4%	21%	12%	9%	11%	11%	18%
Glasgow North	7%	6%		0%	6%	8%	-5%	1%	6%	7%	5%	5%	1%	4%
Glasgow South	6%	4%		3%	11%	2%	12%	5%	6%	7%	9%	7%	5%	7%
M8 West & A8	-7%	10%		12%	16%	4%	6%		6%	5%	11%	2%	0%	6%
Paisley East	6%	9%		2%	29%	9%	15%	3%	11%	6%	5%	6%	7%	11%
Paisley West	3%	-3%		-2%	18%	11%	11%	-4%	7%	4%	5%	6%	4%	6%
Renfrew North	5%	-4%		2%	9%	8%	8%	9%	6%	6%	2%	4%	12%	7%
Renfrew South	4%	1%		1%	12%	10%	10%	2%	8%	6%	5%	4%	12%	8%
West Dunbartonshire	2%	5%		0%	11%	-4%	2%	0%	5%	5%	7%	6%	-6%	-1%
All	9%	1%		1%	21%	4%	9%	1%	9%	7%	8%	8%	2%	6%

Sector	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	0%	-3%	08:14	1%	3%	0%	1%	-1%	2%	1%	5%	2%	0%	2%
Airport	2%	-4%	03:07	7%	10%	0%	2%	2%	6%	11%	13%	7%	-20%	3%
AMIDS	07:37	04:15		06:18	09:48	11:57	09:55	06:56	08:14	07:03	05:56	07:35	09:52	07:51
B815, Erskine & Inchinnan	1%	3%	05:35	0%	-5%	-2%	0%	-1%	1%	6%	-6%	-1%	-5%	-1%
Braehead	1%	5%	09:18	-4%	1%	-1%	1%	0%	3%	2%	-2%	1%	-26%	0%
Glasgow North	6%	6%	12:33	0%	1%	-3%	0%	2%	13%	4%	-9%	2%	-5%	0%
Glasgow South	6%	8%	08:58	3%	4%	-2%	-1%	5%	14%	7%	7%	5%	-2%	4%
M8 West & A8	-1%	-4%	06:57	-1%	0%	-1%	0%	0%	1%	1%	-7%	-1%	-4%	-1%
Paisley East	-2%	-7%	07:16	-1%	-2%	4%	-9%	-1%	-2%	6%	3%	1%	-8%	2%
Paisley West	0%	4%	06:29	2%	3%	-4%	1%	-1%	0%	4%	8%	0%	-6%	0%
Renfrew North	3%	10%	04:59	-4%	-5%	-15%	0%	-3%	2%	10%	-4%	1%	-54%	0%
Renfrew South	1%	2%	07:11	-2%	-3%	-2%	-1%	0%	1%	2%	2%	17%	-25%	5%
West Dunbartonshire	0%	-5%	10:23	-2%	-9%	1%	3%	-1%	3%	-2%	-39%	-14%	-2%	3%
All	4%	3%	07:25	-1%	2%	0%	1%	1%	8%	4%	3%	6%	-1%	2%

7.4.6

The key findings in the interpeak period are:

- There is limited additional congestion in any of the future year scenarios. Journey times in the Do Minimum are 6% greater than the Base overall and 2% greater in the Do Something compared with the Do Minimum. The overall Base journey time is around 40 seconds quicker than in the AM period.

7.4.7

Table 7.9 shows the PM average journey time of the Base model, the Do Minimum journey times relative to the Base, and the Do Something journey times relative to the Do Minimum.

Table 7.9 : PM (16:00 – 19:00) Average Journey Times

Sector	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	01:31	06:03		07:57	09:59	11:44	08:09	07:41	06:48	07:01	11:42	09:54	09:55	04:40
Airport	06:21	01:31		07:38	08:42	11:09	05:58	07:10	05:49	05:04	06:57	07:42	16:20	05:47
AMIDS														
B815, Erskine & Inchinnan	08:46	07:06		02:32	11:24	13:06	09:51	05:15	08:43	09:29	08:21	10:57	05:43	07:11
Braehead	11:36	08:45		13:15	02:22	07:39	04:01	13:27	05:02	11:09	04:59	06:58	15:47	06:29
Glasgow North	12:43	10:40		14:23	07:22	01:45	04:12	12:51	07:46	13:50	11:10	11:39	08:25	04:58
Glasgow South	08:09	06:12		11:30	03:36	04:51	03:06	08:35	03:00	08:35	06:30	07:14	12:33	06:06
M8 West & A8	08:00	06:25		03:22	11:35	11:47	09:23	00:00	08:03	08:46	09:39	10:42	04:45	07:57
Paisley East	07:28	06:51		10:09	04:55	09:40	04:43	08:03	04:06	04:10	07:54	06:30	12:32	05:54
Paisley West	11:04	06:01		11:24	12:25	15:24	11:35	11:12	05:32	04:07	11:15	10:55	14:25	08:27
Renfrew North	12:17	05:56		09:28	03:55	11:34	07:44	10:06	07:37	10:31	03:48	04:39	16:45	07:44
Renfrew South	10:22	07:17		11:32	06:39	11:38	07:58	10:58	05:28	08:56	05:10	02:24	15:01	05:38
West Dunbartonshire	12:34	11:01		07:16	13:36	09:17	11:55	05:30	12:40	14:13	15:09	15:53	04:13	06:52
All	05:35	05:48		07:57	05:47	04:48	06:02	08:51	05:18	07:26	06:59	05:52	06:39	06:09

Sector	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	4%	11%		7%	30%	57%	11%	-11%	20%	7%	19%	22%	14%	22%
Airport	10%	9%		5%	16%	61%	22%	-6%	20%	9%	13%	22%	23%	15%
AMIDS														
B815, Erskine & Inchinnan	6%	12%		2%	20%	26%	11%	-1%	13%	10%	7%	11%	8%	9%
Braehead	37%	49%		23%	33%	66%	29%	19%	31%	20%	35%	27%	55%	43%
Glasgow North	39%	44%		20%	22%	25%	6%	21%	30%	30%	24%	25%	42%	30%
Glasgow South	45%	49%		38%	77%	130%	193%	45%	135%	30%	103%	125%	71%	84%
M8 West & A8	13%	29%		8%	12%	29%	5%	10%	15%	16%	13%	9%	14%	14%
Paisley East	42%	47%		30%	32%	73%	7%	39%	34%	4%	19%	28%	39%	26%
Paisley West	18%	12%		14%	33%	56%	18%	13%	23%	26%	18%	24%	21%	22%
Renfrew North	26%	19%		15%	20%	54%	21%	24%	17%	15%	29%	13%	45%	25%
Renfrew South	45%	41%		35%	13%	70%	34%	40%	33%	27%	48%	41%	51%	44%
West Dunbartonshire	9%	16%		-5%	24%	9%	4%	-5%	13%	11%	13%	15%	21%	12%
All	33%	34%		18%	39%	44%	26%	19%	42%	17%	35%	45%	36%	33%

Sector	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	3%	0%	09:11	-3%	5%	-16%	3%	-8%	5%	-1%	1%	7%	-8%	-1%
Airport	96%	86%	04:05	63%	62%	1%	38%	51%	72%	125%	50%	60%	-14%	67%
AMIDS	11:25	04:53		07:47	14:02	16:01	12:46	09:05	11:41	08:32	07:59	12:10	11:52	10:56
B815, Erskine & Inchinnan	2%	7%	06:22	-1%	-3%	-12%	2%	-1%	3%	8%	-5%	2%	-8%	-1%
Braehead	5%	18%	19:15	4%	34%	-7%	23%	2%	43%	19%	21%	24%	-34%	12%
Glasgow North	18%	23%	17:43	-5%	38%	-11%	30%	-3%	56%	19%	13%	26%	-25%	-1%
Glasgow South	5%	9%	12:42	-1%	13%	-25%	-30%	1%	11%	15%	-4%	-13%	-17%	-7%
M8 West & A8	0%	2%	06:50	-1%	-1%	-12%	1%	-1%	-1%	-1%	-7%	1%	-10%	-4%
Paisley East	-18%	-24%	10:05	-12%	6%	-14%	-4%	-19%	1%	13%	4%	3%	-19%	-4%
Paisley West	0%	14%	07:58	5%	10%	-16%	6%	2%	11%	5%	15%	11%	-5%	4%
Renfrew North	-2%	5%	05:09	-9%	-2%	-31%	4%	-7%	9%	15%	-20%	0%	-59%	-5%
Renfrew South	-12%	-1%	08:14	-19%	-1%	-25%	-6%	-16%	-5%	1%	-21%	-7%	-33%	-9%
West Dunbartonshire	-1%	-3%	11:49	-3%	-8%	-6%	12%	-2%	3%	-5%	-30%	-12%	-15%	-4%
All	8%	6%	09:48	-2%	15%	-12%	6%	-3%	16%	13%	2%	7%	-15%	0%

7.4.8

Key findings in the PM period are:

- Journey times have increased by over 30% compared with the Base in the Do Minimum. This is a greater increase than that observed in the other time periods. Journey times in the Do Something are 3% lower than in the Do Minimum. This means the **increased volume of development from the LDP2 does not increase overall average journey times after the provision of the new infrastructure.**
- There is a very large increase in journey times in the Do Minimum from Glasgow South, which includes the M8 east. This increase is due to general increases in traffic from Glasgow in the future. The increase is lower in the Do Something, implying that the infrastructure changes (mainly the Clyde Crossing) provide some relief.

- As in other periods, the Do Something experiences increased journey times from and to Paisley West.

7.4.9 In summary, the journey times to and from the strategic sectors (the A737, the M8 West & A8 and Glasgow South) in the Do Something show the following results in comparison to the Do Minimum:

- Times from the A737 to the other two strategic sectors are lower or stay the same. This implies that the increased demand in this area does not result in increased delay per vehicle.
- Times from Glasgow South to the other strategic sectors are approximately the same in the AM and IP, and are faster in the PM.
- Times from the M8 west and the A8 are generally faster or stay the same in all periods.

7.4.10 Journey times in the Do Something compared with the Do Minimum in more localised sectors show the following:

- Journey times from all sectors, except for AMIDS and the two Paisley sectors have fallen compared with the Do Minimum.
- Journey times from the A737 have not increased in any period compared with the Do Minimum, implying that the additional demand in the Do Something does not result in significantly increased delay.
- Overall journey times from Paisley West have increased. This is a result of a slight increase in delay on an already congested network.
- In particular, journey times between Renfrew and Paisley have increased slightly. Additional delay is observed at the southern end of Paisley Road, just north of the M8 Junction 27.
- However, journey times between the north and south of the model have fallen substantially. This is due to the existence of the new bridge over the Clyde.
- Journey times from the M8 and A8, where traffic from the new Dargavel Village Community Growth Area will enter the model network, have not increased in the Do Something.

7.4.11 In conclusion, journey times are expected to increase at a number of locations across Renfrewshire. However, the Do Something scenario does not result in increased average journey times compared with the Do Minimum scenario for the AM and PM peak periods. There are some increased journey times to and from some areas and some reduced journey times to and from other areas. **Therefore, the LDP2 development does not impose an overall increased burden on the traffic network.**

7.4.12 Appendix C shows the respective tables for sector to sector counts, and Appendix D shows the sector to sector distances.

8. SUMMARY & CONCLUSION

8.1 Summary

8.1.1 Two different model scenarios have been assessed using the Renfrewshire Paramics model in this project. They are known as the Do Minimum and the Do Something at a future year of 2029.

8.1.2 The Do Minimum model contains only infrastructure that has already been built or is already consented to go ahead. Within the Renfrewshire Council area, the most significant change in the Do Minimum model from the Base is the opening of the new M8 junction 29A. This gives access to the M8 in an eastbound direction, and access from the M8 in a westbound direction. There are no slips in the opposite direction. This new junction does not only assist drivers to and from the existing village of Bishopton, but assists those going to and from the proposed Dargavel Village Community Growth Area, which has been represented in the modelling.

8.1.3 The proposed developments in the Do Minimum are those that have already received planning consent. Overall demand is 9% higher in the Do Minimum compared with the Base scenario – of which, only a proportion occurs due to new development within Renfrewshire Council area.

8.1.4 The Do Something model contains all those infrastructure improvements as in the Do Minimum model and several other pieces of infrastructure. The major piece of infrastructure in this scenario is the new CWRR – the Clyde Waterfront and Renfrew Riverside. It includes the proposed Clyde Crossing and Renfrew Northern Development Road (RNDR). The Clyde Crossing is a new bridge between the existing Erskine Bridge and the Clyde Tunnel. The RNDR is a road running between Inchinnan Road and the Clyde Crossing.

8.1.5 The Do Something model contains all the developments as in the Do Minimum model, plus a number of potential future developments. One notable development is the AMIDS development, situated north of Glasgow Airport. **Overall demand as a result of the Local Development Plan being implemented is only 3% in the Do Something compared with the Do Minimum.**

8.2 Conclusion

8.2.1 The results demonstrate that the new development proposed within the Local Development Plan Proposed Plan can be accommodated within Renfrewshire without significant additional impacts on the road network.

8.2.2 The most important piece of infrastructure in the Do Something is the Clyde Waterfront and Renfrew Riverside (CWRR). This is comprised of the Clyde Crossing, a new bridge across the River Clyde, and the Renfrew Northern Development Road (RNDR).

8.2.3 The road traffic advantages of the CWRR are numerous:

- Relief to strategic roads, partly through redistribution of local to strategic route trips and vice versa and partly through removal of local trips using strategic traffic routes going to and from local communities;
- Removal of traffic from Renfrew town centre via the RNDR;
- Easing traffic heading to and from the large AMIDS development, in conjunction with improvements to the Abbotsinch Road/Greenock Road/Inchinnan Road junction.

8.2.4 No additional congestion was observed on the A737 compared with the Do Minimum scenario, even though there is increased development entering the network from this area.

8.2.5 Overall it is considered that new development proposed within the Renfrewshire Local Development Plan Proposed Plan can be accommodated within Renfrewshire without significant additional impacts on the road network.

8.2.6 However, it is clear that areas of congestion and capacity constraints will remain at key locations across the network.

APPENDICES

Renfrewshire LDP Transport Assessment

Renfrewshire LDP Cumulative Assessment

GB01T17N62_190307

Model Development & Results

A. DO MINIMUM MATRIX TOTALS

The matrix totals for the Do Minimum scenario, as compared to the Base, are shown in Table A.1 to Table A.6. The tables show the new development demands and the number of vehicles from the Base matrix that switch to a new development.

Table A.1 : AM Light Vehicle Total Demands

			Base		New		Total		Grand
			Inside	Outside	Inside	Outside	Inside	Outside	Total
Base Model	Base	Inside	16665	22299	0	0	16665	22299	38965
		Outside	26555	45299	0	0	26555	45299	71855
	New	Inside	0	0	0	0	0	0	0
		Outside	0	0	0	0	0	0	0
	Total	Inside	16665	22299	0	0	16665	22299	38965
		Outside	26555	45299	0	0	26555	45299	71855
	Grand Total		43221	67599	0	0	43221	67599	110819

			Base		New		Total		Grand
			Inside	Outside	Inside	Outside	Inside	Outside	Total
Do Minimum Model	Base	Inside	15569	21524	1057	815	16626	22340	38966
		Outside	24739	44031	2004	0	26743	44031	70774
	New	Inside	1135	2409	103	117	1239	2526	3765
		Outside	1776	0	151	4799	1928	4799	6727
	Total	Inside	16705	23933	1160	933	17865	24866	42731
		Outside	26516	44031	2155	4799	28671	48831	77502
	Grand Total		43221	67965	3315	5732	46536	73697	120233

			Base		New		Total		Grand
			Inside	Outside	Inside	Outside	Inside	Outside	Total
Difference	Base	Inside	-1096	-775	1057	815	-39	40	1
		Outside	-1816	-1268	2004	0	188	-1268	-1080
	New	Inside	1135	2409	103	117	1239	2526	3765
		Outside	1776	0	151	4799	1928	4799	6727
	Total	Inside	39	1634	1160	933	1200	2567	3767
		Outside	-39	-1268	2155	4799	2116	3531	5647
	Grand Total		0	366	3315	5732	3315	6098	9414

Table A.2 : AM Heavy Vehicle Total Demands

		Base		New		Total		Grand Total	
		Inside	Outside	Inside	Outside	Inside	Outside		
Base Model	Base	Inside	559	2167	0	0	559	2167	2726
		Outside	2174	5615	0	0	2174	5615	7789
	New	Inside	0	0	0	0	0	0	0
		Outside	0	0	0	0	0	0	0
	Total	Inside	559	2167	0	0	559	2167	2726
		Outside	2174	5615	0	0	2174	5615	7789
Grand Total		2734	7782	0	0	2734	7782	10516	

		Base		New		Total		Grand Total	
		Inside	Outside	Inside	Outside	Inside	Outside		
Do Minimum Model	Base	Inside	502	2121	75	29	577	2150	2727
		Outside	2169	5432	125	0	2294	5432	7727
	New	Inside	40	69	2	2	42	72	114
		Outside	23	0	2	817	25	817	842
	Total	Inside	542	2190	77	32	619	2222	2841
		Outside	2192	5432	128	817	2319	6249	8568
Grand Total		2734	7622	205	848	2939	8471	11409	

		Base		New		Total		Grand Total	
		Inside	Outside	Inside	Outside	Inside	Outside		
Difference	Base	Inside	-57	-46	75	29	18	-17	1
		Outside	-5	-183	125	0	120	-183	-62
	New	Inside	40	69	2	2	42	72	114
		Outside	23	0	2	817	25	817	842
	Total	Inside	-18	23	77	32	60	55	114
		Outside	18	-183	128	817	145	634	779
Grand Total		0	-160	205	848	205	689	894	

Table A.3 : IP Light Vehicle Total Demands

		Base		New		Total		Grand	
		Inside	Outside	Inside	Outside	Inside	Outside	Total	
Base Model	Base	Inside	40726	49090	0	0	40726	49090	89816
		Outside	49601	74107	0	0	49601	74107	123708
	New	Inside	0	0	0	0	0	0	0
		Outside	0	0	0	0	0	0	0
	Total	Inside	40726	49090	0	0	40726	49090	89816
		Outside	49601	74107	0	0	49601	74107	123708
Grand Total		90328	123197	0	0	90328	123197	213524	

		Base		New		Total		Grand	
		Inside	Outside	Inside	Outside	Inside	Outside	Total	
Do Minimum Model	Base	Inside	38386	46849	2278	2304	40664	49153	89817
		Outside	47184	73892	4511	0	51695	73892	125587
	New	Inside	2403	4738	136	290	2539	5029	7567
		Outside	2355	0	259	8915	2614	8915	11529
	Total	Inside	40789	51587	2414	2594	43203	54182	97385
		Outside	49538	73892	4770	8915	54309	82807	137116
Grand Total		90328	125480	7184	11509	97512	136989	234501	

		Base		New		Total		Grand	
		Inside	Outside	Inside	Outside	Inside	Outside	Total	
Difference	Base	Inside	-2340	-2241	2278	2304	-62	63	1
		Outside	-2418	-214	4511	0	2093	-214	1879
	New	Inside	2403	4738	136	290	2539	5029	7567
		Outside	2355	0	259	8915	2614	8915	11529
	Total	Inside	63	2497	2414	2594	2477	5092	7568
		Outside	-63	-214	4770	8915	4707	8701	13408
Grand Total		0	2283	7184	11509	7184	13792	20976	

Table A.4 : IP Heavy Vehicle Total Demands

		Base		New		Total		Grand	
		Inside	Outside	Inside	Outside	Inside	Outside	Total	
Base Model	Base	Inside	1226	3117	0	0	1226	3117	4343
		Outside	3343	10398	0	0	3343	10398	13741
	New	Inside	0	0	0	0	0	0	0
		Outside	0	0	0	0	0	0	0
	Total	Inside	1226	3117	0	0	1226	3117	4343
		Outside	3343	10398	0	0	3343	10398	13741
Grand Total		4570	13514	0	0	4570	13514	18084	

		Base		New		Total		Grand	
		Inside	Outside	Inside	Outside	Inside	Outside	Total	
Do Minimum Model	Base	Inside	1120	3059	124	40	1244	3100	4344
		Outside	3325	10319	209	0	3534	10319	13853
	New	Inside	89	154	7	5	96	159	255
		Outside	36	0	5	1247	41	1247	1288
	Total	Inside	1209	3214	131	45	1340	3259	4598
		Outside	3361	10319	214	1247	3575	11566	15140
Grand Total		4570	13532	345	1292	4915	14824	19739	

		Base		New		Total		Grand	
		Inside	Outside	Inside	Outside	Inside	Outside	Total	
Difference	Base	Inside	-106	-58	124	40	18	-17	0
		Outside	-19	-79	209	0	191	-79	112
	New	Inside	89	154	7	5	96	159	255
		Outside	36	0	5	1247	41	1247	1288
	Total	Inside	-18	97	131	45	113	142	255
		Outside	18	-79	214	1247	231	1168	1399
Grand Total		0	18	345	1292	345	1310	1655	

Table A.5 : PM Light Vehicle Total Demands

		Base		New		Total		Grand	
		Inside	Outside	Inside	Outside	Inside	Outside	Total	
Base Model	Base	Inside	25768	33311	0	0	25768	33311	59080
		Outside	29560	51094	0	0	29560	51094	80653
	New	Inside	0	0	0	0	0	0	0
		Outside	0	0	0	0	0	0	0
	Total	Inside	25768	33311	0	0	25768	33311	59080
		Outside	29560	51094	0	0	29560	51094	80653
	Grand Total		55328	84405	0	0	55328	84405	139733

		Base		New		Total		Grand	
		Inside	Outside	Inside	Outside	Inside	Outside	Total	
Do Minimum Model	Base	Inside	24299	31488	1431	1862	25730	33350	59080
		Outside	28284	50009	2886	0	31169	50009	81178
	New	Inside	1508	2849	93	193	1601	3042	4642
		Outside	1237	0	139	6095	1376	6095	7471
	Total	Inside	25807	34337	1523	2055	27330	36392	63722
		Outside	29521	50009	3025	6095	32545	56104	88649
	Grand Total		55328	84345	4548	8150	59876	92496	152371

		Base		New		Total		Grand	
		Inside	Outside	Inside	Outside	Inside	Outside	Total	
Difference	Base	Inside	-1469	-1823	1431	1862	-38	39	0
		Outside	-1276	-1085	2886	0	1610	-1085	525
	New	Inside	1508	2849	93	193	1601	3042	4642
		Outside	1237	0	139	6095	1376	6095	7471
	Total	Inside	39	1025	1523	2055	1562	3080	4643
		Outside	-39	-1085	3025	6095	2986	5010	7996
	Grand Total		0	-60	4548	8150	4548	8090	12638

Table A.6 : PM Heavy Vehicle Total Demands

		Base		New		Total		Grand Total	
		Inside	Outside	Inside	Outside	Inside	Outside		
		Base Model	Base	Inside	240	962	0		0
Outside	1217			3356	0	0	1217	3356	4573
New	Inside		0	0	0	0	0	0	0
	Outside		0	0	0	0	0	0	0
Total	Inside		240	962	0	0	240	962	1202
	Outside		1217	3356	0	0	1217	3356	4573
Grand Total			1457	4318	0	0	1457	4318	5775

		Base		New		Total		Grand Total	
		Inside	Outside	Inside	Outside	Inside	Outside		
		Do Minimum Model	Base	Inside	225	954	14		10
Outside	1205			3295	25	0	1230	3295	4525
New	Inside		16	29	0	0	17	29	46
	Outside		10	0	0	433	11	433	444
Total	Inside		241	983	14	10	255	993	1248
	Outside		1216	3295	25	433	1241	3728	4969
Grand Total			1457	4278	39	443	1496	4721	6217

		Base		New		Total		Grand Total	
		Inside	Outside	Inside	Outside	Inside	Outside		
		Difference	Base	Inside	-15	-8	14		10
Outside	-12			-61	25	0	13	-61	-48
New	Inside		16	29	0	0	17	29	46
	Outside		10	0	0	433	11	433	444
Total	Inside		1	21	14	10	15	31	46
	Outside		-1	-61	25	433	24	372	396
Grand Total			0	-41	39	443	39	403	442

B. DO SOMETHING MATRIX TOTALS

The matrix totals for the Do Something scenario, as compared to the Base, are shown in Table B.1 to Table B.6. The tables show the new development demands and the number of vehicles from the Base matrix that switch to a new development.

Table B.1 : AM Light Vehicle Total Demands

			Base		New		Total		Grand
			Inside	Outside	Inside	Outside	Inside	Outside	Total
Base Model	Base	Inside	16665	22299	0	0	16665	22299	38965
		Outside	26555	45299	0	0	26555	45299	71855
	New	Inside	0	0	0	0	0	0	0
		Outside	0	0	0	0	0	0	0
	Total	Inside	16665	22299	0	0	16665	22299	38965
		Outside	26555	45299	0	0	26555	45299	71855
Grand Total			43221	67599	0	0	43221	67599	110819

			Base		New		Total		Grand
			Inside	Outside	Inside	Outside	Inside	Outside	Total
Do Something Model	Base	Inside	15110	21025	1672	1159	16782	22183	38966
		Outside	24341	43733	3745	0	28086	43733	71820
	New	Inside	1439	3130	175	180	1614	3310	4925
		Outside	2331	0	315	5259	2645	5259	7904
	Total	Inside	16549	24155	1847	1339	18396	25494	43890
		Outside	26672	43733	4060	5259	30732	48992	79724
Grand Total			43221	67889	5907	6597	49128	74486	123614

			Base		New		Total		Grand
			Inside	Outside	Inside	Outside	Inside	Outside	Total
Difference	Base	Inside	-1556	-1275	1672	1159	117	-116	1
		Outside	-2214	-1566	3745	0	1531	-1566	-35
	New	Inside	1439	3130	175	180	1614	3310	4925
		Outside	2331	0	315	5259	2645	5259	7904
	Total	Inside	-117	1856	1847	1339	1731	3194	4925
		Outside	117	-1566	4060	5259	4176	3693	7869
Grand Total			0	290	5907	6597	5907	6887	12795

Table B.2 : AM Heavy Vehicle Total Demands

		Base		New		Total		Grand	
		Inside	Outside	Inside	Outside	Inside	Outside	Total	
Base Model	Base	Inside	559	2167	0	0	559	2167	2726
		Outside	2174	5615	0	0	2174	5615	7789
	New	Inside	0	0	0	0	0	0	0
		Outside	0	0	0	0	0	0	0
	Total	Inside	559	2167	0	0	559	2167	2726
		Outside	2174	5615	0	0	2174	5615	7789
Grand Total		2734	7782	0	0	2734	7782	10516	

		Base		New		Total		Grand	
		Inside	Outside	Inside	Outside	Inside	Outside	Total	
Do Something Model	Base	Inside	481	2108	102	36	583	2145	2728
		Outside	2169	5434	203	0	2373	5434	7807
	New	Inside	55	117	5	4	61	121	181
		Outside	29	0	4	859	33	859	892
	Total	Inside	536	2225	107	40	643	2265	2909
		Outside	2198	5434	208	859	2405	6293	8699
Grand Total		2734	7659	315	899	3049	8559	11607	

		Base		New		Total		Grand	
		Inside	Outside	Inside	Outside	Inside	Outside	Total	
Difference	Base	Inside	-79	-59	102	36	23	-22	1
		Outside	-5	-181	203	0	198	-181	18
	New	Inside	55	117	5	4	61	121	181
		Outside	29	0	4	859	33	859	892
	Total	Inside	-23	58	107	40	84	98	182
		Outside	23	-181	208	859	231	678	910
Grand Total		0	-123	315	899	315	777	1092	

Table B.3 : IP Light Vehicle Total Demands

		Base		New		Total		Grand	
		Inside	Outside	Inside	Outside	Inside	Outside	Total	
Base Model	Base	Inside	40726	49090	0	0	40726	49090	89816
		Outside	49601	74107	0	0	49601	74107	123708
	New	Inside	0	0	0	0	0	0	0
		Outside	0	0	0	0	0	0	0
	Total	Inside	40726	49090	0	0	40726	49090	89816
		Outside	49601	74107	0	0	49601	74107	123708
Grand Total		90328	123197	0	0	90328	123197	213524	

		Base		New		Total		Grand	
		Inside	Outside	Inside	Outside	Inside	Outside	Total	
Do Something Model	Base	Inside	37741	46166	2891	3021	40632	49188	89820
		Outside	46395	73760	6054	0	52449	73760	126209
	New	Inside	3083	6453	247	480	3329	6933	10263
		Outside	3109	0	425	9386	3533	9386	12919
	Total	Inside	40824	52620	3138	3501	43961	56121	100082
		Outside	49504	73760	6478	9386	55982	83146	139128
Grand Total		90328	126380	9616	12887	99944	139267	239210	

		Base		New		Total		Grand	
		Inside	Outside	Inside	Outside	Inside	Outside	Total	
Difference	Base	Inside	-2985	-2924	2891	3021	-94	97	3
		Outside	-3206	-347	6054	0	2848	-347	2501
	New	Inside	3083	6453	247	480	3329	6933	10263
		Outside	3109	0	425	9386	3533	9386	12919
	Total	Inside	97	3529	3138	3501	3235	7031	10266
		Outside	-97	-347	6478	9386	6381	9039	15420
Grand Total		0	3183	9616	12887	9616	16070	25686	

Table B.4 : IP Heavy Vehicle Total Demands

		Base		New		Total		Grand Total	
		Inside	Outside	Inside	Outside	Inside	Outside	Total	
Base Model	Base	Inside	1226	3117	0	0	1226	3117	4343
		Outside	3343	10398	0	0	3343	10398	13741
	New	Inside	0	0	0	0	0	0	0
		Outside	0	0	0	0	0	0	0
	Total	Inside	1226	3117	0	0	1226	3117	4343
		Outside	3343	10398	0	0	3343	10398	13741
Grand Total		4570	13514	0	0	4570	13514	18084	

		Base		New		Total		Grand Total	
		Inside	Outside	Inside	Outside	Inside	Outside	Total	
Do Something Model	Base	Inside	1084	3046	165	48	1250	3095	4344
		Outside	3322	10297	348	0	3670	10297	13967
	New	Inside	119	266	18	8	137	273	410
		Outside	44	0	8	1308	52	1308	1360
	Total	Inside	1204	3312	183	56	1387	3368	4755
		Outside	3366	10297	355	1308	3721	11605	15327
Grand Total		4570	13609	538	1364	5108	14973	20081	

		Base		New		Total		Grand Total	
		Inside	Outside	Inside	Outside	Inside	Outside	Total	
Difference	Base	Inside	-142	-71	165	48	24	-22	1
		Outside	-22	-101	348	0	326	-101	226
	New	Inside	119	266	18	8	137	273	410
		Outside	44	0	8	1308	52	1308	1360
	Total	Inside	-23	195	183	56	160	251	411
		Outside	23	-101	355	1308	378	1208	1586
Grand Total		0	95	538	1364	538	1459	1997	

Table B.5 : PM Light Vehicle Total Demands

		Base		New		Total		Grand Total	
		Inside	Outside	Inside	Outside	Inside	Outside		
Base Model	Base	Inside	25768	33311	0	0	25768	33311	59080
		Outside	29560	51094	0	0	29560	51094	80653
	New	Inside	0	0	0	0	0	0	0
		Outside	0	0	0	0	0	0	0
	Total	Inside	25768	33311	0	0	25768	33311	59080
		Outside	29560	51094	0	0	29560	51094	80653
Grand Total		55328	84405	0	0	55328	84405	139733	

		Base		New		Total		Grand Total	
		Inside	Outside	Inside	Outside	Inside	Outside		
Do Something Model	Base	Inside	23848	31077	1729	2431	25576	33507	59083
		Outside	27688	49969	3569	0	31258	49969	81226
	New	Inside	2114	4494	174	365	2288	4860	7148
		Outside	1677	0	222	6465	1900	6465	8364
	Total	Inside	25962	35571	1902	2796	27864	38367	66231
		Outside	29366	49969	3791	6465	33157	56434	89591
Grand Total		55328	85540	5694	9260	61022	94801	155822	

		Base		New		Total		Grand Total	
		Inside	Outside	Inside	Outside	Inside	Outside		
Difference	Base	Inside	-1921	-2235	1729	2431	-192	196	4
		Outside	-1871	-1125	3569	0	1698	-1125	573
	New	Inside	2114	4494	174	365	2288	4860	7148
		Outside	1677	0	222	6465	1900	6465	8364
	Total	Inside	194	2260	1902	2796	2096	5055	7152
		Outside	-194	-1125	3791	6465	3598	5340	8938
Grand Total		0	1135	5694	9260	5694	10395	16089	

Table B.6 : PM Heavy Vehicle Total Demands

		Base		New		Total		Grand	
		Inside	Outside	Inside	Outside	Inside	Outside	Total	
Base Model	Base	Inside	240	962	0	0	240	962	1202
		Outside	1217	3356	0	0	1217	3356	4573
	New	Inside	0	0	0	0	0	0	0
		Outside	0	0	0	0	0	0	0
	Total	Inside	240	962	0	0	240	962	1202
		Outside	1217	3356	0	0	1217	3356	4573
Grand Total		1457	4318	0	0	1457	4318	5775	

		Base		New		Total		Grand	
		Inside	Outside	Inside	Outside	Inside	Outside	Total	
Do Something Model	Base	Inside	219	952	19	12	238	964	1202
		Outside	1202	3281	39	0	1241	3281	4522
	New	Inside	23	46	1	1	23	47	71
		Outside	13	0	1	429	13	429	442
	Total	Inside	242	999	19	13	261	1011	1273
		Outside	1215	3281	39	429	1254	3710	4964
Grand Total		1457	4280	59	442	1516	4722	6237	

		Base		New		Total		Grand	
		Inside	Outside	Inside	Outside	Inside	Outside	Total	
Difference	Base	Inside	-20	-10	19	12	-2	2	0
		Outside	-15	-75	39	0	24	-75	-51
	New	Inside	23	46	1	1	23	47	71
		Outside	13	0	1	429	13	429	442
	Total	Inside	2	37	19	13	21	49	71
		Outside	-2	-75	39	429	37	354	391
Grand Total		0	-39	59	442	59	403	462	

C. SECTOR TO SECTOR COUNTS

The following tables show the count of vehicles from and to each journey time sector. The reason for the differences are mostly due to traffic growth, but the gravity model applied to the Do Something scenario also accounts for some changes. After the model has been applied, the flows travelling to the other side of the River Clyde increase, with a reduction in flow travelling to sectors on the same side. The counts in the Base (and AMIDS in the Do Something) have been rounded to the nearest 100 vehicles.

Table C.1 : AM (07:00 – 10:00) Sector to Sector Counts

Sector From\Sector To	A737	Airport	AMIDS	8815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	5900	200	0	700	100	1000	3800	400	600	300	200	300	800	14100
Airport	400	300	0	300	0	100	1400	200	100	500	0	0	0	3300
AMIDS	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8815, Erskine & Inchinnan	300	500	0	1000	100	500	900	700	200	700	500	200	800	6500
Braehead	0	0	0	100	200	100	500	100	100	0	100	200	0	1400
Glasgow North	400	200	0	200	500	13100	3600	700	400	600	200	200	4400	24400
Glasgow South	2500	900	0	400	900	3400	2400	1900	3100	1400	500	400	900	18600
M8 West & A8	200	300	0	500	100	700	1100	0	200	800	400	200	700	5000
Paisley East	200	300	0	200	500	300	3300	200	300	1100	500	800	200	7900
Paisley West	300	600	0	300	100	400	1200	900	1500	2900	500	500	700	9700
Renfrew North	100	100	0	200	400	300	700	200	400	600	600	500	100	4200
Renfrew South	200	100	0	200	100	500	1300	300	600	500	800	2200	100	6900
West Dunbartonshire	500	0	0	700	100	6200	1100	1200	200	600	100	100	8500	19300
All	11100	3700	0	4800	3000	26500	21300	6600	7700	9800	4400	5400	17100	121400

Sector From\Sector To	A737	Airport	AMIDS	8815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	0%	14%		3%	136%	1%	-3%	3%	3%	10%	16%	19%	17%	2%
Airport	19%	19%		2%	3900%	17%	12%	9%	12%	6%	32%	55%	142%	12%
AMIDS														
8815, Erskine & Inchinnan	4%	-3%		8%	33%	3%	19%	10%	-2%	4%	2%	2%	-2%	6%
Braehead	120%	350%		28%	-3%	47%	13%	32%	20%	86%	13%	18%	204%	24%
Glasgow North	6%	32%		19%	33%	6%	19%	17%	7%	10%	21%	21%	15%	11%
Glasgow South	5%	12%		-1%	14%	13%	43%	6%	1%	-3%	1%	7%	5%	11%
M8 West & A8	7%	6%		45%	44%	21%	24%		12%	7%	3%	9%	34%	21%
Paisley East	8%	6%		-2%	9%	-3%	1%	6%	-8%	0%	-4%	2%	1%	1%
Paisley West	8%	9%		5%	96%	4%	-2%	-5%	0%	7%	11%	13%	-8%	4%
Renfrew North	31%	9%		11%	21%	14%	9%	29%	7%	15%	7%	7%	50%	13%
Renfrew South	11%	6%		-4%	40%	-2%	2%	11%	-1%	5%	2%	1%	15%	3%
West Dunbartonshire	22%	37%		1%	239%	7%	14%	18%	12%	7%	36%	56%	9%	10%
All	4%	10%		9%	27%	7%	12%	9%	2%	5%	5%	6%	11%	8%

Sector From\Sector To	A737	Airport	AMIDS	8815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	0%	13%	0	13%	19%	6%	-1%	0%	7%	16%	19%	14%	1%	3%
Airport	3%	1%	0	1%	-5%	-8%	-4%	1%	-1%	2%	-2%	-4%	-14%	0%
AMIDS	100	0	0	0	0	0	200	0	0	100	0	0	0	500
8815, Erskine & Inchinnan	9%	-5%	400	3%	-7%	7%	-3%	3%	-1%	2%	-11%	-12%	-1%	5%
Braehead	-6%	4%	0	-6%	-6%	11%	-4%	-6%	-1%	-1%	3%	-3%	40%	0%
Glasgow North	6%	12%	100	9%	10%	0%	0%	4%	9%	-2%	49%	26%	-6%	0%
Glasgow South	-1%	1%	400	3%	0%	2%	1%	-2%	0%	-2%	2%	1%	3%	2%
M8 West & A8	3%	-9%	300	4%	-3%	3%	-4%		2%	3%	-16%	-10%	0%	3%
Paisley East	-3%	-5%	100	-3%	-8%	27%	-4%	-4%	1%	1%	-6%	-3%	179%	4%
Paisley West	3%	-1%	700	0%	4%	3%	-6%	3%	0%	1%	3%	1%	9%	7%
Renfrew North	-4%	-9%	100	-6%	-9%	50%	-9%	-6%	-7%	-9%	-10%	-10%	308%	3%
Renfrew South	-2%	-1%	0	-1%	-3%	22%	-6%	-4%	-3%	-3%	-8%	-5%	143%	0%
West Dunbartonshire	4%	15%	0	9%	56%	-5%	35%	2%	24%	22%	181%	82%	-5%	2%
All	1%	0%	2200	5%	2%	1%	1%	1%	1%	3%	2%	0%	1%	3%

Table C.2 : IP (10:00 – 16:00) Sector to Sector Counts

Sector From\Sector To	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	9200	600	0	900	900	1500	3300	600	800	600	300	500	800	20000
Airport	1100	800	0	700	0	200	3600	300	100	1000	200	200	0	8300
AMIDS	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B815, Erskine & Inchinnan	500	500	0	1300	500	600	1100	1000	400	700	400	200	1200	8400
Braehead	500	0	0	600	1500	800	4500	400	1500	600	1400	1000	300	13100
Glasgow North	900	200	0	300	1500	23000	4100	1100	600	900	300	400	8800	42200
Glasgow South	4600	2400	0	700	5100	4700	3800	3600	4200	2300	800	700	1900	34800
M8 West & A8	200	400	0	900	900	1300	2500	0	500	1200	600	200	1500	10100
Paisley East	800	800	0	400	2000	500	6000	400	500	3100	900	1200	400	16900
Paisley West	800	1100	0	500	400	500	1800	1000	3200	4500	600	1000	900	16500
Renfrew North	200	100	0	600	800	400	1100	500	1000	1100	2100	1800	100	9800
Renfrew South	500	100	0	300	800	400	1100	500	900	1000	1700	4800	100	12200
West Dunbartonshire	800	100	0	1600	300	9800	1800	2000	500	900	100	100	21300	39200
All	20400	7100	0	8700	14700	43500	34700	11400	14300	17900	9400	12100	37400	231600

Sector From\Sector To	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	0%	8%		3%	27%	8%	19%	1%	3%	9%	20%	12%	12%	7%
Airport	18%	18%		-2%	667%	17%	11%	9%	5%	10%	9%	10%	33%	11%
AMIDS														
B815, Erskine & Inchinnan	4%	-7%		10%	26%	2%	-6%	31%	-8%	10%	8%	-8%	3%	7%
Braehead	29%	214%		20%	1%	34%	8%	35%	9%	30%	11%	15%	64%	14%
Glasgow North	8%	20%		10%	17%	8%	14%	10%	4%	10%	18%	10%	12%	10%
Glasgow South	16%	11%		-2%	6%	7%	40%	14%	2%	18%	5%	4%	24%	13%
M8 West & A8	8%	9%		28%	27%	14%	28%		4%	5%	20%	11%	14%	18%
Paisley East	3%	9%		-4%	5%	1%	2%	12%	-6%	1%	0%	-2%	4%	2%
Paisley West	7%	9%		12%	31%	7%	4%	5%	1%	11%	19%	9%	14%	8%
Renfrew North	18%	8%		2%	19%	16%	5%	17%	4%	10%	3%	2%	33%	7%
Renfrew South	10%	14%		-7%	16%	9%	4%	13%	-3%	8%	3%	0%	25%	4%
West Dunbartonshire	8%	10%		4%	63%	14%	23%	9%	6%	10%	38%	29%	9%	11%
All	7%	10%		7%	13%	10%	14%	13%	2%	10%	8%	3%	11%	10%

Sector From\Sector To	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	0%	6%	100	11%	6%	0%	0%	5%	5%	5%	5%	7%	-2%	2%
Airport	0%	1%	0	-3%	7%	2%	-1%	-2%	-1%	1%	-8%	-1%	-8%	0%
AMIDS	400	0	0	200	0	0	400	200	0	400	100	0	0	1700
B815, Erskine & Inchinnan	3%	1%	200	7%	0%	6%	5%	3%	3%	12%	-6%	0%	2%	6%
Braehead	-2%	82%	0	-1%	-1%	5%	-1%	-3%	-2%	4%	-6%	-1%	33%	0%
Glasgow North	7%	4%	100	7%	4%	-1%	3%	4%	12%	5%	49%	17%	-5%	0%
Glasgow South	-1%	0%	300	5%	-1%	3%	0%	-1%	-1%	-3%	-3%	0%	7%	1%
M8 West & A8	0%	0%	100	5%	1%	-1%	1%		2%	2%	-2%	0%	-2%	1%
Paisley East	-2%	-5%	200	-1%	-6%	13%	-3%	-1%	6%	1%	-6%	-1%	134%	2%
Paisley West	0%	-1%	600	9%	2%	1%	-1%	-2%	0%	3%	-1%	2%	5%	4%
Renfrew North	-6%	-8%	0	-6%	-6%	41%	-5%	-9%	-5%	-3%	-11%	-5%	436%	2%
Renfrew South	-4%	2%	0	-5%	-2%	26%	-3%	-4%	-1%	4%	-5%	-2%	131%	1%
West Dunbartonshire	1%	4%	0	3%	19%	-4%	16%	0%	60%	3%	419%	103%	-3%	1%
All	2%	0%	1500	6%	0%	0%	2%	1%	2%	4%	2%	0%	1%	2%

Table C.3 : PM (16:00 – 19:00) Sector to Sector Counts

Sector From\Sector To	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	7600	200	0	600	200	600	2100	300	300	400	200	300	700	13500
Airport	800	600	0	400	0	100	1400	100	100	800	200	200	0	4800
AMIDS	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B815, Erskine & Inchinnan	400	300	0	1100	300	300	500	900	200	700	300	300	700	5900
Braehead	200	0	0	500	900	700	2100	300	700	300	1000	500	200	7500
Glasgow North	800	200	0	300	1200	15700	3200	1000	400	600	200	300	6600	30500
Glasgow South	3900	800	0	300	2300	4000	2200	1300	2300	700	800	1500	1100	21300
M8 West & A8	200	200	0	600	400	500	500	0	200	1000	400	300	1000	5300
Paisley East	700	400	0	200	900	200	3000	400	300	1800	600	1000	300	9800
Paisley West	500	200	0	400	200	200	900	800	1600	2700	600	800	600	9400
Renfrew North	100	0	0	700	200	300	900	600	500	700	1000	800	100	5800
Renfrew South	500	0	0	300	100	200	900	400	800	500	1000	3800	100	8600
West Dunbartonshire	700	0	0	1200	200	6100	800	1200	200	800	100	100	11900	23200
All	16300	2900	0	6800	6800	29000	18500	7300	7500	10900	6400	9800	23400	145500

Sector From\Sector To	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	0%	16%		5%	41%	8%	10%	36%	3%	13%	13%	10%	40%	7%
Airport	17%	11%		-2%	286%	16%	11%	13%	0%	10%	4%	3%	19%	10%
AMIDS														
B815, Erskine & Inchinnan	1%	-5%		6%	34%	11%	-7%	31%	-10%	6%	5%	-7%	6%	8%
Braehead	46%	900%		13%	1%	36%	9%	20%	11%	37%	13%	19%	73%	17%
Glasgow North	3%	13%		6%	12%	6%	20%	11%	0%	-15%	14%	1%	8%	8%
Glasgow South	2%	10%		75%	10%	14%	50%	26%	2%	15%	4%	0%	24%	15%
M8 West & A8	17%	14%		11%	13%	20%	24%		5%	4%	28%	1%	23%	15%
Paisley East	1%	9%		-4%	10%	3%	0%	12%	-8%	0%	3%	-3%	4%	2%
Paisley West	7%	12%		11%	30%	16%	0%	-6%	1%	8%	16%	6%	-8%	5%
Renfrew North	17%	8%		2%	38%	19%	0%	8%	1%	10%	6%	0%	41%	6%
Renfrew South	9%	16%		-1%	40%	24%	1%	16%	-2%	8%	4%	0%	26%	4%
West Dunbartonshire	23%	1%		-4%	51%	11%	23%	18%	0%	1%	18%	6%	9%	10%
All	4%	10%		7%	14%	9%	14%	17%	1%	6%	9%	2%	11%	9%

Sector From\Sector To	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	0%	5%	0	11%	5%	4%	0%	1%	4%	5%	11%	4%	-5%	1%
Airport	0%	0%	0	2%	19%	15%	-2%	7%	14%	-1%	8%	5%	25%	0%
AMIDS	500	0	0	100	0	0	500	0	0	400	0	100	0	1800
B815, Erskine & Inchinnan	0%	0%	100	7%	3%	8%	0%	3%	4%	7%	1%	-1%	1%	4%
Braehead	-11%	7%	0	-5%	-7%	11%	-9%	-4%	-5%	-1%	-6%	-9%	92%	0%
Glasgow North	-1%	3%	0	14%	3%	-1%	6%	4%	16%	17%	15%	38%	-6%	0%
Glasgow South	0%	-1%	100	-8%	-1%	-1%	2%	-4%	-2%	-12%	1%	-4%	25%	1%
M8 West & A8	1%	-2%	0	5%	-1%	0%	-1%	-1%	0%	1%	-3%	-2%	-2%	1%
Paisley East	-5%	-3%	0	5%	-2%	37%	-2%	4%	7%	4%	1%	-3%	29%	2%
Paisley West	-5%	2%	100	9%	8%	6%	-4%	7%	4%	5%	1%	4%	5%	5%
Renfrew North	-12%	-4%	0	-3%	-5%	35%	-7%	-3%	-3%	-1%	-4%	-6%	172%	1%
Renfrew South	-8%	-12%	0	-1%	-1%	36%	-6%	2%	-2%	6%	-1%	-5%	114%	0%
West Dunbartonshire	3%	-2%	0	6%	-3%	-2%	31%	3%	56%	4%	77%	207%	-4%	1%
All	2%	0%	400	5%	0%	1%	3%	2%	3%	6%	2%	1%	1%	2%

D. SECTOR TO SECTOR AVERAGE DISTANCES

The following tables show the average distance that vehicle must travel between each sector. There is typically little difference between the Base and the Do Minimum, but the Do Something shows a large reduction in travel distance between each side of the River Clyde as a result of the new Clyde Crossing.

Table D.1 : AM (07:00 – 10:00) Sector to Sector Distances (km)

Sector	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	1.5	6.4		11.3	11.2	15.2	12.7	10.1	9.1	6.2	10.7	9.1	15.1	7.7
Airport	5.9	0.9		8.5	6.5	10.5	7.6	7.5	4.8	2.2	3.8	4.4	14.2	6.1
AMIDS														
B815, Erskine & Inchinnan	10.8	7.2		2.6	10.4	15.2	13.7	5.7	10.0	7.3	6.4	8.7	7.0	8.1
Braehead	11.2	6.7		11.2	0.7	5.6	2.6	9.7	2.2	6.5	2.2	2.5	12.8	3.7
Glasgow North	15.5	11.6		14.8	6.4	1.3	4.0	15.5	8.2	11.6	8.4	9.0	6.0	3.9
Glasgow South	12.3	8.2		14.5	3.7	3.6	2.8	13.9	3.8	8.6	4.8	6.0	13.8	7.2
M8 West & A8	9.9	7.3		4.1	10.3	15.2	13.8	0.0	10.1	8.2	7.5	8.8	5.8	9.6
Paisley East	8.4	5.3		10.3	1.9	8.6	3.7	9.9	3.4	1.6	3.1	2.9	14.3	4.1
Paisley West	5.6	2.8		8.9	6.9	12.0	8.7	8.4	1.8	1.1	5.6	4.0	13.8	5.0
Renfrew North	10.5	4.3		7.1	1.9	7.8	5.0	8.7	3.1	5.1	1.4	1.8	14.6	4.3
Renfrew South	9.1	4.7		9.0	3.1	8.4	5.3	9.5	2.7	4.2	1.8	1.1	15.4	4.0
West Dunbartonshire	15.1	13.2		6.4	13.8	6.3	15.4	6.1	14.5	13.8	14.7	15.8	2.2	5.7
All	6.2	6.0		7.7	4.2	4.4	7.4	10.1	4.6	5.2	4.6	3.5	5.4	5.8

Sector	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	0%	3%		-1%	2%	1%	0%	-9%	0%	2%	0%	1%	0%	1%
Airport	1%	-21%		0%	2%	-1%	-1%	-13%	-3%	7%	8%	-11%	11%	-2%
AMIDS														
B815, Erskine & Inchinnan	0%	0%		0%	-4%	-2%	-3%	-1%	0%	-1%	0%	-2%	-3%	-1%
Braehead	-1%	2%		-10%	4%	8%	4%	19%	4%	3%	0%	5%	0%	20%
Glasgow North	2%	0%		0%	2%	1%	-6%	-4%	1%	2%	1%	2%	-4%	1%
Glasgow South	0%	-1%		0%	0%	0%	0%	-1%	-1%	0%	0%	1%	3%	-3%
M8 West & A8	-5%	1%		6%	12%	-2%	0%	0%	-1%	0%	9%	8%	1%	0%
Paisley East	0%	-1%		0%	7%	0%	0%	-3%	1%	0%	0%	1%	5%	0%
Paisley West	1%	-2%		-3%	3%	4%	0%	-5%	0%	0%	1%	0%	0%	-3%
Renfrew North	2%	1%		-3%	0%	1%	1%	8%	1%	3%	1%	6%	3%	5%
Renfrew South	1%	2%		-1%	9%	0%	2%	5%	4%	1%	2%	3%	1%	3%
West Dunbartonshire	1%	4%		1%	-5%	-5%	-5%	3%	0%	3%	-1%	0%	5%	1%
All	4%	0%		-3%	16%	-1%	-4%	-2%	1%	1%	4%	7%	0%	0%

Sector	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	0%	0%	8.6	0%	0%	-1%	0%	0%	0%	0%	3%	0%	-2%	0%
Airport	0%	-4%	2.5	2%	2%	-3%	0%	0%	1%	5%	12%	-1%	-47%	-1%
AMIDS	8.0	3.2	0.0	6.9	5.7	9.7	9.0	7.7	5.8	3.5	3.2	4.1	5.9	7.2
B815, Erskine & Inchinnan	1%	3%	5.9	-1%	3%	-3%	1%	-2%	3%	4%	4%	4%	-7%	-1%
Braehead	2%	4%	5.1	8%	-1%	-8%	0%	1%	11%	3%	3%	0%	-45%	-4%
Glasgow North	-2%	-4%	10.3	-7%	-5%	1%	2%	0%	-1%	-7%	-26%	-13%	-1%	0%
Glasgow South	0%	0%	9.3	1%	0%	0%	-3%	0%	0%	0%	1%	1%	-6%	0%
M8 West & A8	0%	1%	6.6	0%	2%	0%	0%	0%	1%	1%	6%	3%	-2%	-1%
Paisley East	-1%	0%	6.2	0%	3%	0%	0%	0%	-2%	2%	5%	5%	-41%	4%
Paisley West	0%	5%	3.9	1%	-1%	-10%	0%	1%	-1%	1%	2%	-2%	-12%	-3%
Renfrew North	1%	8%	2.4	2%	0%	-21%	0%	3%	1%	6%	2%	7%	-70%	-3%
Renfrew South	0%	0%	4.0	3%	-2%	-7%	-2%	1%	-1%	0%	5%	34%	-53%	2%
West Dunbartonshire	-2%	-18%	8.4	0%	-39%	2%	-14%	1%	-19%	-10%	-63%	-47%	-1%	0%
All	0%	1%	6.0	1%	-1%	1%	0%	0%	1%	0%	-1%	5%	-3%	0%

Table D.2 : IP (10:00 – 16:00) Sector to Sector Distances (km)

Sector	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	1.6	6.4		11.2	11.1	15.2	12.7	10.1	8.8	5.9	10.6	9.4	15.1	7.0
Airport	6.3	1.0		8.0	5.9	10.9	7.6	7.5	4.0	2.5	4.0	4.0	14.6	6.0
AMIDS														
B815, Erskine & Inchinnan	11.0	7.5		2.4	10.9	15.8	14.1	6.0	10.6	8.1	7.0	9.1	7.1	8.6
Braehead	11.2	6.7		9.5	0.8	6.2	3.2	11.0	1.9	6.3	2.2	2.6	13.6	4.0
Glasgow North	15.6	11.3		15.0	6.3	1.2	4.0	15.6	7.8	11.4	8.2	8.6	5.9	4.0
Glasgow South	12.5	8.2		14.4	3.4	3.8	2.6	13.9	3.7	8.5	4.9	5.5	14.3	7.3
M8 West & A8	10.2	7.4		4.1	11.3	15.5	13.9	0.0	10.1	8.7	8.1	9.5	5.9	10.2
Paisley East	8.1	5.4		10.3	2.1	8.6	3.6	9.5	2.7	1.4	3.4	2.8	13.9	3.9
Paisley West	5.7	2.8		9.1	6.9	11.9	8.8	8.2	1.8	0.9	5.6	4.1	13.5	4.6
Renfrew North	10.8	4.5		6.6	1.9	7.9	4.8	8.3	3.0	5.2	1.3	1.8	14.3	3.8
Renfrew South	9.2	4.6		8.6	2.4	8.8	5.7	9.3	2.6	3.8	1.9	1.1	15.0	3.3
West Dunbartonshire	15.4	12.8		6.7	15.3	6.0	15.7	5.8	14.5	14.0	15.0	15.9	2.0	4.9
All	6.8	6.0		7.8	4.7	4.1	6.8	10.4	4.2	4.8	3.7	3.0	4.7	5.4

Sector	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	0%	2%		-1%	1%	0%	0%	-9%	0%	1%	1%	-1%	0%	4%
Airport	1%	-37%		-1%	9%	-2%	-1%	-7%	-1%	6%	3%	-5%	1%	-2%
AMIDS														
B815, Erskine & Inchinnan	0%	1%		-1%	-4%	0%	0%	-1%	1%	-3%	-1%	-2%	1%	-3%
Braehead	1%	3%		3%	2%	1%	1%	11%	9%	3%	1%	4%	-3%	10%
Glasgow North	0%	0%		-1%	2%	4%	-5%	-2%	0%	1%	0%	1%	-5%	-1%
Glasgow South	0%	-1%		0%	1%	-1%	11%	0%	-2%	-2%	0%	1%	2%	1%
M8 West & A8	-7%	1%		9%	6%	-1%	0%		-1%	0%	10%	5%	1%	2%
Paisley East	0%	-1%		-1%	7%	0%	-1%	-1%	0%	3%	0%	1%	3%	1%
Paisley West	1%	-2%		-3%	5%	3%	2%	-4%	0%	0%	3%	0%	1%	1%
Renfrew North	0%	-3%		0%	0%	0%	0%	9%	0%	2%	0%	2%	0%	4%
Renfrew South	0%	0%		-1%	6%	0%	1%	7%	1%	0%	2%	2%	1%	5%
West Dunbartonshire	1%	3%		2%	-5%	-2%	1%	3%	1%	2%	1%	1%	3%	3%
All	5%	-1%		-1%	9%	1%	1%	0%	0%	2%	6%	4%	3%	2%

Sector	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	0%	0%	8.6	1%	0%	0%	0%	0%	0%	0%	6%	0%	-3%	0%
Airport	0%	-3%	2.5	3%	2%	-3%	0%	0%	1%	2%	12%	1%	-29%	0%
AMIDS	8.2	3.2	0.0	6.8	6.1	9.8	9.0	8.0	5.1	3.8	3.4	4.5	7.6	6.9
B815, Erskine & Inchinnan	0%	2%	6.4	0%	-1%	-1%	1%	-1%	1%	2%	3%	2%	-4%	-1%
Braehead	1%	2%	5.5	-1%	0%	-3%	0%	0%	2%	0%	6%	1%	-38%	-2%
Glasgow North	-2%	-3%	9.9	-5%	-3%	0%	0%	-1%	-1%	-7%	-24%	-6%	0%	0%
Glasgow South	0%	0%	9.3	1%	0%	0%	-2%	0%	1%	0%	2%	1%	-5%	0%
M8 West & A8	0%	0%	8.1	0%	-1%	0%	0%	0%	0%	-1%	1%	0%	-1%	0%
Paisley East	0%	0%	6.1	1%	1%	2%	0%	0%	-5%	2%	6%	2%	-37%	2%
Paisley West	0%	2%	3.8	1%	-2%	-7%	-1%	0%	-1%	0%	3%	-1%	-12%	-3%
Renfrew North	1%	8%	2.8	2%	1%	-22%	2%	2%	3%	5%	5%	7%	-68%	0%
Renfrew South	0%	1%	4.0	4%	-2%	-7%	0%	1%	2%	-1%	9%	27%	-46%	4%
West Dunbartonshire	-3%	-11%	8.0	-2%	-30%	1%	-7%	0%	-29%	-10%	-66%	-48%	1%	-1%
All	0%	0%	6.2	0%	-1%	0%	1%	0%	1%	-2%	3%	6%	-2%	0%

Table D.3 : PM (16:00 – 19:00) Sector to Sector Distances (km)

Sector	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	1.6	6.2		11.0	10.9	15.0	12.4	9.9	8.4	6.0	10.2	9.2	14.6	5.9
Airport	6.3	0.7		8.3	6.7	11.3	7.7	7.5	4.3	2.3	4.1	4.4	15.4	5.5
AMIDS														
B815, Erskine & Inchinnan	11.1	8.0		2.4	11.9	15.5	14.2	6.7	10.5	7.9	6.6	9.4	6.3	7.9
Braehead	11.2	6.9		10.7	0.7	6.2	3.3	10.3	2.1	6.2	2.0	2.4	13.1	4.3
Glasgow North	15.5	11.2		14.6	6.2	1.3	3.5	15.2	7.6	12.0	8.3	8.5	5.9	4.1
Glasgow South	12.2	8.2		13.6	3.3	3.7	2.5	13.9	3.5	8.7	4.6	4.6	13.6	6.8
M8 West & A8	10.2	7.4		4.1	10.6	15.2	13.8	0.0	9.8	8.2	7.9	9.0	5.8	8.7
Paisley East	8.2	5.4		10.2	1.7	8.8	3.5	9.7	2.4	1.3	3.2	2.5	14.1	4.1
Paisley West	5.7	2.9		8.7	7.4	12.1	9.1	8.3	2.0	1.0	5.3	4.2	13.4	4.8
Renfrew North	10.7	3.8		6.7	1.7	8.1	5.0	7.7	3.4	5.3	1.2	1.7	14.2	4.6
Renfrew South	9.2	4.4		8.7	2.6	8.9	5.6	9.5	2.6	3.9	1.9	1.0	15.0	3.4
West Dunbartonshire	15.4	12.6		7.6	14.4	6.4	14.6	6.0	14.6	14.0	14.6	16.0	2.1	5.2
All	6.7	6.0		7.7	4.6	3.8	6.2	9.9	4.0	5.0	4.0	3.2	5.1	5.3

Sector	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	0%	2%		0%	2%	3%	0%	-9%	0%	1%	3%	1%	1%	7%
Airport	0%	-1%		0%	-4%	1%	-1%	-11%	-2%	7%	1%	-2%	5%	0%
AMIDS														
B815, Erskine & Inchinnan	-1%	0%		1%	-6%	-3%	0%	-5%	0%	-2%	-2%	-4%	3%	-3%
Braehead	1%	0%		-7%	4%	-2%	2%	13%	7%	2%	7%	8%	3%	10%
Glasgow North	1%	0%		-2%	3%	3%	-3%	-2%	0%	2%	1%	1%	1%	0%
Glasgow South	0%	0%		-7%	3%	0%	4%	0%	-1%	-3%	0%	1%	5%	0%
M8 West & A8	-5%	1%		5%	7%	-3%	0%	-1%	-2%	9%	7%	2%	2%	2%
Paisley East	0%	0%		0%	10%	3%	-1%	0%	-1%	1%	0%	3%	4%	2%
Paisley West	1%	0%		-1%	2%	8%	0%	-4%	0%	1%	4%	2%	2%	-1%
Renfrew North	0%	9%		0%	2%	0%	1%	10%	0%	1%	3%	2%	6%	4%
Renfrew South	1%	1%		-1%	3%	1%	2%	4%	2%	1%	4%	2%	4%	6%
West Dunbartonshire	1%	1%		-1%	0%	-6%	0%	2%	1%	1%	1%	-1%	4%	0%
All	3%	0%		1%	8%	1%	-2%	0%	0%	-1%	5%	2%	6%	2%

Sector	A737	Airport	AMIDS	B815, Erskine & Inchinnan	Braehead	Glasgow North	Glasgow South	M8 West & A8	Paisley East	Paisley West	Renfrew North	Renfrew South	West Dunbartonshire	All
A737	0%	1%	8.5	0%	1%	-2%	0%	0%	0%	1%	7%	3%	-2%	0%
Airport	6%	2%	2.3	4%	0%	-12%	1%	3%	0%	5%	13%	4%	-40%	2%
AMIDS	8.5	3.2	0.0	6.8	5.7	9.5	9.5	8.2	6.0	3.8	3.1	4.3	7.0	7.3
B815, Erskine & Inchinnan	0%	2%	6.6	-1%	-1%	-3%	1%	-2%	1%	2%	2%	4%	-3%	-1%
Braehead	0%	5%	6.2	4%	2%	-4%	0%	0%	2%	0%	1%	1%	-46%	-3%
Glasgow North	1%	0%	10.0	-9%	-3%	-1%	0%	-2%	2%	-7%	-16%	-8%	-3%	-1%
Glasgow South	0%	0%	9.5	3%	0%	0%	-4%	0%	1%	2%	2%	1%	-15%	-1%
M8 West & A8	0%	0%	7.2	-1%	-1%	0%	0%	0%	0%	0%	1%	0%	-2%	-1%
Paisley East	1%	0%	6.3	1%	2%	-3%	-1%	0%	-5%	4%	7%	1%	-17%	1%
Paisley West	0%	2%	3.8	0%	-1%	-13%	-1%	-1%	0%	1%	5%	1%	-11%	-3%
Renfrew North	6%	5%	2.4	2%	1%	-23%	0%	6%	5%	9%	4%	3%	-67%	-2%
Renfrew South	0%	7%	4.5	3%	1%	-10%	0%	1%	3%	0%	8%	22%	-41%	5%
West Dunbartonshire	-1%	-8%	8.5	-2%	-32%	1%	-8%	1%	-20%	-8%	-59%	-52%	0%	0%
All	1%	0%	6.8	-1%	-2%	1%	2%	-1%	3%	-2%	2%	7%	-4%	0%